VOLUME 5 - APPENDIX 3
ALTERATION OF TERRAIN APPLICATION

Granite Reliable Power Wind Park
Granite Reliable Power, LLC
Coos County, New Hampshire

horizons Engineering PLLC

ALTERATION OF TERRAIN APPLICATION
FOR THE
GRANITE RELIABLE POWER WIND PARK
FOR
GRANITE RELIABLE POWER, LLC

JULY 2008

STATE OF NEW HAMPSHIRE - PHILIP L. BEAULIEU No. 11909 LICENSED PROFESSIONAL ENGINEER

7-11-08

DATE OF PRINT
JUL 11 2008
HORIZONS ENGINEERING

FOR REVIEW

PROJECT NUMBER 07090
Horizons Engineering, L.L.C.

34 School Street
Littleton, NH 03561
Phone 603.444.4111
Fax 603.444.1343
email@horizonsengineering.com

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ALTERATION OF TERRAIN APPLICATION

R.S.A. 485-A:17
Department of Environmental Services - Water Division
29 Hazen Drive, PO Box 95
Concord, New Hampshire 03302-0095

Application Date: July 2008 | File Number (DES use): ___________

Granite Reliable Power - Phillip's Brook Wind Project Name of Project	see attached Map & Lot Number
Dummer, Millsfield, Odell, Irving's Location, Dixville Location of Project (town)	Coos County County

1.	Granite Reliable Power, LLC. Name of Owner		
	Pip Decker, Associate Contact Name	860-581-5010 Telephone Number	
	8 railroad avenue Mailing Address	Fax Number	
	Essex City/Town	CT State	06426 Zip Code
2.	Desired Permit Holder Name (if different from applicant)		
	Contact Name	Telephone Number	
	Mailing Address	Fax Number	
	City/Town	State	Zip Code
3.	Horizons Engineering, LLC Engineering Company		
	Philip Beaulieu, P.E. Contact Name	603-444-4111 Telephone Number	
	34 School Street Mailing Address	603-444-1343 Fax Number	
	Littleton City/Town	NH State	03561 Zip Code
	pbeaulieu@horizonsengineering.com Engineer's email address		

4. Describe the project briefly and answer questions below:

see attached narrative

Total Area of Disturbance: 8,837,017 square | Number of Lots Proposed: 0
Total Wetland Impact: 558,144 square feet | Total Length of Roadway: 163,680 feet
Total Impervious Cover: _____ square feet | Water Supply Engineering approval needed? YES ☐ NO ☒

5. To complete application, attach the following:

- ☒ Application Fee (www.des.nh.gov/SiteSpecific/FeeSchedule.htm)
- ☒ USGS Map (1" = 2,000' scale with the site boundaries outlined)
- ☒ One Set of Design Plans
- ☒ One Copy of the Drainage Report
- ☒ A Completed "Shoreland Protection Certification" (see reverse side of this application)

Philip Beaulieu - Agent
Applicant's Name

[signature] 7-11-08
Signature (owner or agent) and Date

Shoreland Protection Certification

The New Hampshire Shoreland Protection Act (RSA 483-B) requires that applicants for environmental permits which involve work in the shoreland area "demonstrate to the satisfaction of the department (of environmental services) that the proposal meets or exceeds the development standards of this chapter." The certification contained here in is an acceptable vehicle for such a demonstration when submitted with an environmental permit application.

The protected shoreland is defined to be all land located within 250 feet of a reference line. The reference line means:

(a) For natural fresh water bodies without artificial impoundments, the natural mean high water level as determined by the division of water resources of the department.

(b) For artificially impounded fresh water bodies, the waterline at full pond as determined by the elevation of the top of the impoundment structure.

(c) For coastal waters, the highest observable tide line, which means a line defining the furthest landward limit of tidal flow, not including storm events, which can be recognized by indicators such as the presence of a strand line of flotsam and debris, the landward margin of salt tolerant vegetation, or a physical barrier that blocks further flow of the tide.

(d) For rivers, the ordinary high water mark.

In the case of rivers, the law applies to all fourth order or higher streams of the state with the exception of rivers or river segments designated for management and protection under RSA 483 prior to January 1, 1993. Lists of fourth order and higher streams and river segments designated under RSA 483 are available at no cost from the Department of Environmental Services.

Statement of Compliance

1) Will the project for which a permit is hereby requested involve construction, land clearing, or other development within the protected shoreland as defined above? Answer yes or no. Answer no

2) If the project involves construction, land clearing, or other development within the protected shoreland, will it meet or exceed the development standards of RSA 483-B? Answer yes, or not applicable. Answer na

If not applicable, state why (1).
(Note, the development standards are not applicable in only three situations: (1) the project is not located in the shoreland zone, (2) the activities are exempted under section 483-B:9,V or section 483-B:19 of the Act, or (3) the Commissioner of the Department of Environmental Services has granted a variance from a specific standard.)

Certification

As owner or agent for the owner of the subject property, by my signature below, I certify that:

(a) My responses to questions 1 and 2 above are correct to the best of my knowledge,

(b) I am familiar with the requirements of RSA 483-B and have knowledge of the development activities which will be undertaken,

(c) The plans and other information submitted with this permit application provide a complete description of the project and demonstrate how compliance will be accomplished, and

(d) I understand that false information given in this certification may result in revocation of any permit granted by the Department of Environmental Services as a result of this application, liability for remediation or restoration of the land affected, fines up to $20,000 for each day of continuing violation, imprisonment or other penalties.

Certified by ______________________ Date 7-11-08

Name (print or type) Philip Beaulieu

Indicate whether owner or agent Agent

Property Tax Map and Lot Numbers
07090-Granite Reliable Power, LLC
Granite Reliable Power Wind Park - Coos County, NH
July 2008

Coos County Towns

Columbia Tax Map 424, Lot 2
Columbia Tax Map 425, Lot 6

Dummer Tax Map R1, Lot 1
Dummer Tax Map R1, Lot 2

Coos County Unincorporated Places

Map 1620, Lot 1.1 (Odell)
Map 1620, Lot 2 (Millsfield)

Map 1623, Lot 1 (Ervings Location)
Map 1623, Lot 14 (Millsfield)

Map 1626, Lot 1 (Dixville)

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Section 1

PROJECT DESCRIPTION

Granite Reliable Power, LLC. wishes to develop a renewable energy wind park located in Coos County, New Hampshire. The project proposes work within five separate Town / Unincorporated Place boundaries; Dummer, Millsfield, Odell, Irving's Location and Dixville. The project consists of the construction of 33 – 3.0 megawatt wind turbines, 12 miles of proposed roadway, and upgrades to 19 miles of existing roadways. The project is located on several parcels of land, with three separate land owners. The existing parcels of land have historically been used for industrial logging operations and total more than 60,000 acres.

The proposed project consists of upgrading 19 miles of existing roadways, construction of 12 miles of new roadways, proposed switching station, proposed substation / staging area, 33 wind turbines, approximately 30 miles of overhead and underground power transmission lines, and 2 construction stockpiling / staging areas. The majority of new roads and all of the wind turbines are proposed on three separate and distinct ridgelines, in the Phillip's Brook and Clear Stream watersheds, identified as Dixville, Owl Head / Mount Kelsey, and Fishbrook. The total area of contiguous disturbance has been calculated to be 202.87 acres or 8,837,017 square feet. The following table depicts the allocation of disturbance areas. The Overall Site Layout Exhibit can be found in **Section 1**.

Disturbance Description	Disturbance Area (acres)	Towns / Unincorporated Places Involved
Dummer Pond Road Upgrades	21.12	Dummer, Millsfield, Odell, Erving's Location
Dixville Road Upgrades	10.41	Millsfield, Dixville
Owl Head Spur Upgrades	0.75	Millsfield
Fishbrook Spur Upgrades	8.11	Millsfield
Phillips Brook/Dixville Connector Road Construction	8.65	Erving's Location, Millsfield
Fishbrook Turbine String Construction	46.34	Millsfield
Owl Head / Kelsey Turbine String Construction	55.75	Millsfield
Dixville Turbine String Construction	26.96	Dixville
Switching Station Construction	3.29	Dummer
Substation / Staging Area Construction	13.21	Dummer
Kelsey Staging / Storage Area	2.55	Millsfield
Dixville Staging / Storage Area	2.58	Dixville, Millsfield
Fishbrook Cross-Country Power Line	3.15	Millsfield
Total Disturbance	**202.87 ($8,837,017 ft^2$)**	

EXISTING SITE CONDITIONS

The proposed project is located approximately 6 miles north of Milan, New Hampshire, 8 miles northeast of Stark, New Hampshire and 8 miles west of Errol, New Hampshire. The project is located within five Towns / Unincorporated Places; Dummer, Millsfield, Odell, Irving's Location and Dixville. The proposed project is on three separate parcels of land totaling more than 60,000 acres. The project parcels have historically and are currently being used for industrial forestry operations. Because of the historic use, the project site is laced with a large network of gravel logging roads, many of which are still actively in use. The project parcels encompass; the headwaters of Phillip's Brook, West Branch of Clear Stream, Phillip's Pond, Big Dummer Pond, Little Dummer Pond, Bragg Pond, Millsfield Pond, several named and unnamed streams and small beaver ponds.

Although the project occurs on a large tract of land, the proposed project sites make up only approximately 0.6% of the total parcel area. In an effort to maintain a manageable project scope and study area, the project site has been described as a corridor along the proposed roads and existing roads requiring improvements, the switching station, the substation / laydown area, the 2 storage / staging areas, and a corridor along all the power transmission lines. For the purposes of this permit application, any areas within the project parcel not affected by the proposed project will not be discussed.

Most of the existing roadways are within the Phillip's Brook valley with several spur roads accessing the multiple ridgelines. These roads were constructed in order to gain access to the site for timber harvesting operations. Dummer Pond Road is the main road which bisects nearly the entire project parcel. It stretches from Route 16 near the Pontook Reservoir approximately 14 miles north. The road ranges in travel width from 25 feet wide near Route 16 to approximately 12 feet wide at the northern end. Corrugated metal culverts have been installed at wetland crossings, stream channel crossings and drainage diversions. Areas along the existing roadways range from dense spruce/fir and hardwoods stands to clear cuts. There are multiple historic log yards along the existing roadways, some of which are currently in use while others have been reclaimed and left to regenerate. The existing Fishbrook spur road is approximately 17 feet in travel width and extends to the ridgeline which is approximately 2.0 miles east of the intersection of Dummer Pond Road. This road also passes through large historic clear cuts, with little or no mature timber stands. There is also a small spur road at the base of Owl Head mountain that was installed to access the log yard located on the west side of the mountain. In order to access the Dixville ridgeline, approximately 2.3 miles of existing gravel logging roads on the north side of the West Branch of Clear Stream will also require upgrades.

The location of the proposed switching station near the intersection of Dummer Pond Road and Route 16 is located within the Town of Dummer, New Hampshire. The site is mostly forested with an easterly aspect with an average grade of 15%. Drainage currently flows down slope following the existing topography and eventually discharges to a large forested wetland flowing adjacent to Dummer Pond Road. At the entrance to the proposed substation there is a small intermittent stream channel, crossed by an existing snowmobile bridge. An existing overhead power line right of way is directly adjacent to the location of the proposed switching station. Soils are comprised mostly of 559 (Skerry), which is in Hydrologic Soil Group C.

The substation / staging area is proposed in an area adjacent to Dummer Pond Road, 6 miles north of the entrance onto Route 16 in Dummer, New Hampshire. The site was clear cut approximately 5 years ago, and has relatively mild grades ranging from 1.0% to 6.0%. The site is bordered on the north, west and south by a large forested wetland. Soils are 723 (Peru-Pillsbury Association), which is on the Coos County Hydric Soils List. Near the center of the staging area is a small isolated wetland pocket, which is believed to have been created from historic repeated logging traffic in the area.

The Kelsey staging area located near the base of Kelsey and Owl Head mountains is proposed at the site of a current log yard, which was established in 2007. The site is cleared of all trees and approximately 2/3 of the site has been graded level with a mixture of gravel and slash material. A small diversion trench has been constructed upslope of the existing log yard, which serves to convey runoff from the slope above around the log yard. The area is laced with skidder ruts, which channelize the concentrated runoff toward a perennial stream located approximately 350 feet to the south. Soils at this site are comprised of 762 (Plaisted-Howland Association), which is Hydrologic Soil Group C.

The Dixville staging area is located in Millsfield, New Hampshire near the base of Dixville Peak. The site is currently sparsely forested with a mixture of northern hardwoods and spruce/fir. The site has a southerly aspect with an average grade of 8%. Soils are 750 (Saddleback-Glebe-Ricker Association), which is comprised mostly of Saddleback soils which are in HSG C/D. The site is located on a small shelf on the side of the undulating hillside. There is a small isolated wetland at the base of the steep slope above the site and also a wetland bisecting the site, which is believed to be fed by groundwater seeps flowing from the base of the steep slope above the proposed staging area. Flow from the seeps eventually channelizes forming a small intermittent stream channel flowing southerly to a culvert beneath the existing logging road approximately 150 feet to the south.

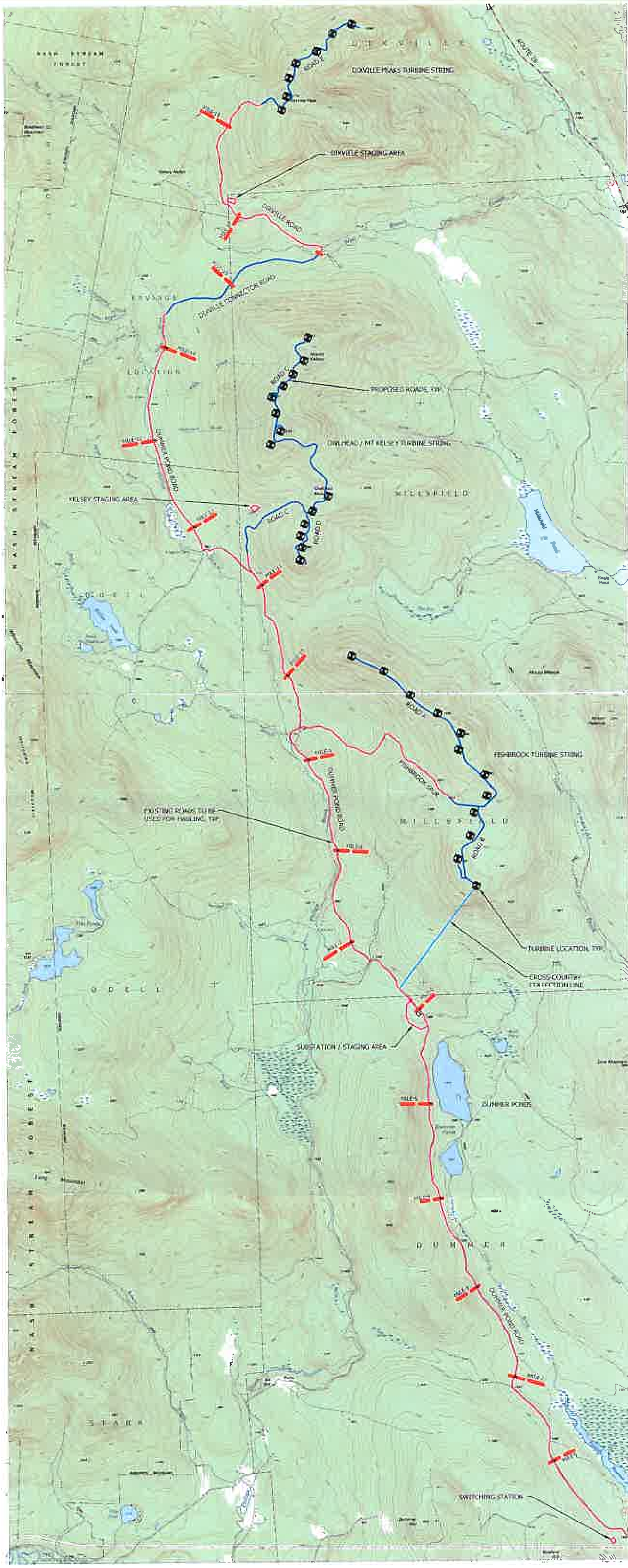
The Fishbrook Ridgeline is the lowest of the three ridgelines within the project area with the highest peak at approximately 2,890 feet in elevation. Most of the ridgeline shows evidence of historic and repeated timber harvesting operations. There are several skidding trails up to and along the ridgeline. Vegetation is comprised mostly of northern hardwoods, with sparse spruce/fir thickets. The area is relatively open with dense undergrowth and successional vegetation, due to the historic logging operations. Soils are comprised of 738 (Glebe-Saddleback-Sisk Association), with a substantial pocket of 895 (Bucksport Muck), on the southern end of the ridge. Bucksport Muck is on the Coos County Hydric Soils List. The area surrounding this mapping unit is also denoted as wetland on the National Wetland Inventory (NWI) map.

The Kelsey / Owl Head peaks range in elevation from 2,848 feet near Owl Head to 3,462 feet at the northern end of Mount Kelsey. Areas above 2,700 feet in elevation, which have not been logged, consist of dense, high elevation spruce/fir forests, ledge outcrops and a variety of mosses as ground cover. Soils are comprised of 750 (Saddleback-Glebe-Ricker Association), located on Mount Kelsey and 738 (Glebe-Saddleback-Sisk Association), near the southern end of the Kelsey Ridgeline and Owl Head peak. There are a number of high elevation forested wetlands along the ridgeline, located predominantly in saddles and drainage depressions.

The Dixville ridgeline is located on the northern most end of the project area and is the highest ridgeline with Dixville Peak at 3,478. There is an existing gravel logging road which accesses the ridgeline, which is used as an all terrain vehicle and snowmobile trail. There are several other snowmobile trails traversing the mountain side. Soils and vegetation on the ridgeline are consistent with Mount Kelsey. Soils are comprised of 750 (Saddleback-Glebe-Ricker Association). There are several high elevation forested wetlands along the ridgeline, located predominantly in saddles and drainage depressions.

Side hills of all three ridgelines include large portions of open clear cuts, skidding trails, gravel logging roads and log yards. Soils for the remainder of the site vary depending on geographic location, but can be considered predominantly rocky soils, with the majority being in HSG C. Soils information has been taken from the "Coos County Soil Survey", provided by the US Department of Agriculture (USDA) and Natural Resources Conservation Service (NRCS). Soils mapping, soils descriptions and a summary of the Hydrologic Soil Groups used in the drainage analysis can be found in **Section 5**.

Overall Site Layout Plan



OVERALL SHEET LEGEND

- EXISTING ROAD TO BE UPGRADED
- PROPOSED ROAD
- PROPOSED TOWER

0 1250 2500 5000 10000

SCALE IN FEET

horizons Engineering LLC
34 School Street
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Phone 603.444.4111 · Fax 603.444.1343

GRANITE RELIABLE POWER, LLC

GRANITE RELIABLE POWER WIND PARK

COOS COUNTY, NEW HAMPSHIRE

OVERALL SITE LAYOUT EXHIBIT

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JULY 2008	PROJECT #: 07090
ENGIN'D BY: PLB	DRAWN BY: PLB
CHECK'D BY: WML	ARCHIVE #: H-4547

SHEET 1 OF 1

T:\07090 NEP - Phillips Br Wind Turbines\DWGS\FINAL\07090-overall-exhibit.dwg, 7/10/2008 1:30:14 PM, pbeaulieu

SECTION 2

SECTION 2

PRE AND POST DEVELOPMENT DRAINAGE ANALYSIS

The New Hampshire Department of Environmental Services typically requires that all drainage improvements be sized for the 10-year recurrence interval storm. SCS TR-20, run under HydroCAD Version 8.0, was used to model pre- and post-development runoff. HydroCAD as well as AutoCAD based hydrology applications were used to determine culvert, treatment swale and stone fill sizing. The 2-year, 24-hour rainfall intensity used in the pre- versus post-development analysis is 2.7 inches. The 10-year, 24-hour rainfall intensity used in the pre- versus post-development analysis as well as determining drainage structure capacity is 3.9 inches. Rainfall distribution maps can be found in **Section 5**.

The Pre-development analysis revealed 14 locations where runoff from the site could be analyzed, analysis points 1 thru 14. The drainage analysis was completed by first, delineating the drainage areas associated with the 14 analysis points, and then determining how they were affected by the proposed project. Based on the initial pre-development analysis, it was evident that the hydrologic modeling was extremely conservative. When compared to unit acre flows recorded at numerous stream gages throughout the North Country, the flows from the pre-development areas at the site were dramatically higher. Based on this comparison it was determined that calibrating the Runoff Curve Numbers (RCN) was necessary to produce more realistic peak values. Calibrating the RCNs involved collecting recorded peak flow data from streams throughout the North Country and determining an appropriate unit acre flow to calibrate the RCNs in a specific on site drainage area. Once the unit flow was determined, a representative drainage area on site was used to adjust the given RCN values to meet the unit acre flow requirements. The drainage area associated with Bridge-2 was chosen to calibrate the curve numbers, because this area included all the hydrologic soil groups and land covers in the project area. It was also representative of the drainage areas associated with drainage structure sizing, and where an accurate cross-section of the stream channel was measured. The cross-section was used to check the accuracy of the CN calibration effort, bridge-3 area was also used to check the accuracy of the calibration. A copy of the CN calibration calculations can be found in **Section 5.**

The post-development drainage areas differ from pre-development due to the modified topography at the site, increase in hard surface area, and a decrease in the amount of forested area. Although the entire project area is located in an industrial forest, where timber harvesting operations are continual, the CN values associated with cleared area were taken as an instantaneous representation of the current property conditions. Therefore the post-development CN values did not reflect any re-generation of existing cleared area over time, or additional cleared areas due to future timber harvesting operations outside of the project scope.

The following table outlines the 2-year and 10-year pre- versus post-development flows:

Analysis Pont	Contributing Area (acres) Pre	Pre-Dev. 2-yr peak flow (cfs)	Post-Dev. 2-yr peak flow (cfs)	Contributing Area (acres) Post	Pre-Dev. 10-yr peak flow (cfs)	Post-Dev. 10-yr peak flow (cfs)
1	101.01	0.48	0.48	101.01	8.53	8.53
2	224.42	2.45	2.45	224.42	31.98	32.56
3	639.61	7.04	7.04	639.61	47.84	47.84
4	65.79	0.53	0.53	65.79	7.63	7.63
5	708.58	8.49	8.49	708.58	64.92	64.92
6	4,109.11	50.14	50.14	4,109.06	218.50	218.49
7	14,080.00	209.91	209.94	14,081.83	1407.57	1407.75
8	1,916.09	29.89	29.88	1,915.73	206.50	206.46
9	2,556.04	19.08	19.07	2,554.91	178.13	178.05
10	2,172.66	32.35	32.33	2,171.34	218.83	218.70
11	3,602.81	94.10	94.10	3,602.96	565.54	565.57
12	1,276.26	31.75	31.75	1,276.26	259.15	259.15
13	1,131.82	19.87	19.78	1,131.82	163.82	165.18
14	646.10	16.26	16.28	647.05	135.44	135.64

DRAINAGE DESIGN

For a project of this nature there are two phases of activity which require attention when dealing with stormwater runoff. These are the construction phase and the operation phase, following completion of construction. This site has been designed to minimize the effects of both phases. Due to the linear nature of the project, a standard storm water management plan for construction activities would be difficult to implement, therefore the approach for minimizing construction related impacts would be to provide a flexible management plan. This management approach starts with preventative measures that reduces the vulnerability of the ground surface to erosive forces and also provides construction crews with the knowledge and tools needed to install and adapt sediment controls to meet the changing site conditions. These management elements form the basis of the Storm Water Pollution Prevention Plan (SWPPP) that is developed for compliance with the EPA's Construction General Permit (CGP), include silt fence, culvert inlet protection, stone check dams, temporary sediment basins, hay bales, etc. Frequent monitoring of the erosion and sediment controls that are performed during construction ensures that the controls are implemented in a timely manner, adjusted if needed, and maintained in working order until the project is permanently stabilized.

Post construction related impacts can be further separated into; impacts related to the existing roads and those related to the proposed roads. Because many of the existing ditch lines along the existing roads are now considered jurisdictional wetlands, little opportunity exists to provide treatment or attenuation of storm water from the areas associated with the newly widened portions of the road. As such, a different approach has been taken to mitigate these incremental increases in roadway surface. The approach includes stabilizing the roadway surface with crushed gravel to resist rutting and retard erosive forces that currently act on the existing roadway. Treatment swales have been designed for locations that can accommodate them. Numerous existing culverts will be replaced due to the roadway improvements, many of these existing corrugated metal culverts located at perennial and large intermittent stream crossings will be replaced either with buried invert box culverts or pre-cast bridge structures. In both cases the span has been designed to accommodate 120% of the bankfull width. Bankfull widths were calculated using the New Hampshire 2005 Regional Hydraulic Geometry Curve data. The data was then compared to actual field measurements of the existing channels at the proposed bridge locations, and the more conservative of the two methods was used. Box culvert and bridge sizing calculations can be found in **Section 5**. Increasing the size of the culverts and installing box culverts will allow for increased access by aquatic and riparian organisms. Unstabilized ditch lines and ditch lines being re-graded as part of this project will be stabilized by either the installation of erosion control matting on flatter slopes, or stone fill lining on the steeper channel slopes. When taken in the watershed context, these improvements are anticipated to offset the potential impacts associated with the areas where widening is proposed.

Where new access roads are proposed a design approach has been selected to influence the existing hydraulic and hydrologic conditions as little as possible. This is contrary to typical projects where flow is concentrated, diverted, attenuated and treated. The proposed design approach is based on preventing the generation of runoff with erosive potential and treating the runoff as close to the source as possible in the event that erosion does occur, while maintaining the existing diffuse drainage patterns. In order to accomplish this, the approach includes:

1. Applying a suitable roadway base as well as surface material (bankrun and crushed gravel), that can support heavy equipment and transport vehicles, prevent compaction of sub-base materials, and provide a durable travel surface that resists rutting during and after construction.
2. Providing short distances between proposed culverts beneath the access roads, to ensure that storm water and shallow groundwater will encounter minimal diversion and channelization by the roadside ditches. The frequent culvert spacing will also minimize the amount of storm water concentrated in any one channel, allowing for a better ability to maintain the existing drainage patterns.
3. Precipitation falling on steeper roadway surfaces will be diverted off the sides of the roadway through the use of rubber diverters installed at regular intervals. These intervals are based on road grades, which will shorten flow paths of storm water, minimizing the erosive potential of the road surface.
4. Stabilizing the proposed ditch lines with either erosion control matting on shallow slopes, or stone fill lining on the steeper channel slopes. This will retard the erosive velocities in the ditch lines when runoff is conveyed in non-sheet flow conditions.
5. Installing sediment traps at culvert outlets to collect any solids that may be entrained in storm water runoff and to encourage the re-distribution of runoff onto the forest floor, where runoff can be infiltrated back into the ground and sediments can be filtered in the duff layer downslope of the culvert locations.

6. Strategically locating proposed culverts at locations to provide longer travel times across native soils and vegetation upslope of wetlands or surface waters. Previous studies of similar land uses (logging roads) located adjacent to forested areas have shown that a predictable degree of solids removal can be achieved in these natural forested buffers.
7. Stabilizing proposed cut and fill slopes with erosion control matting on slopes between 3:1 and 1-1/2:1 and stone fill armoring all slopes 1-1/2:1 and steeper.

The drainage design associated with the staging areas, switching station and tower pad locations generally followed the approach described above. These areas included larger areas of gravel which was more difficult to discourage long flow paths. In order to accommodate the runoff from the gravel pad areas, a proposed pervious berm is to be installed along the top of the slope. In some locations temporary slope drains are proposed to convey storm water in controlled locations and large temporary sediment basins are also proposed. These accommodations will discourage sediment transport during and after construction activities. Although the gravel areas mentioned above will remain during the post construction operation period, large areas will be seeded and allowed to naturally re-generate. In order to construct the turbines a gravel area 200 feet in diameter is required. After construction the only area that will be maintained is an area large enough to allow maintenance vehicle access. The remaining area will be allowed to re-generate. The Dixville and Kelsey staging areas will also be allowed to re-generate, creating wetlands where the sediment basins were installed. The construction staging area around the substation will be seeded and allowed to re-generate. Also once construction is complete, the re-graded areas associated with the proposed roads will be seeded and naturally re-vegetate.

A hydraulic analysis was conducted for each of the existing culverts to be replaced. TR-20 modeling was used to size the replacement culverts. In some cases the modeling would allow for smaller replacement culverts than the existing, in these cases the proposed culverts will be the same size as existing. In an attempt to minimize hydraulic and hydrologic modeling to size the proposed culverts along the ridgelines, an excel spreadsheet was used to approximate 10-year peak flows based on drainage area size, and use a modified manning's equation to determine the appropriate culvert sizes. The excel model was calibrated by inputting data from a large representative group of culverts, which were sized using the TR-20 modeling procedure. This model was tested against the TR-20 method for accuracy. A copy of the culvert sizing model can be found in **Section 5**.

horizons Engineering PLLC

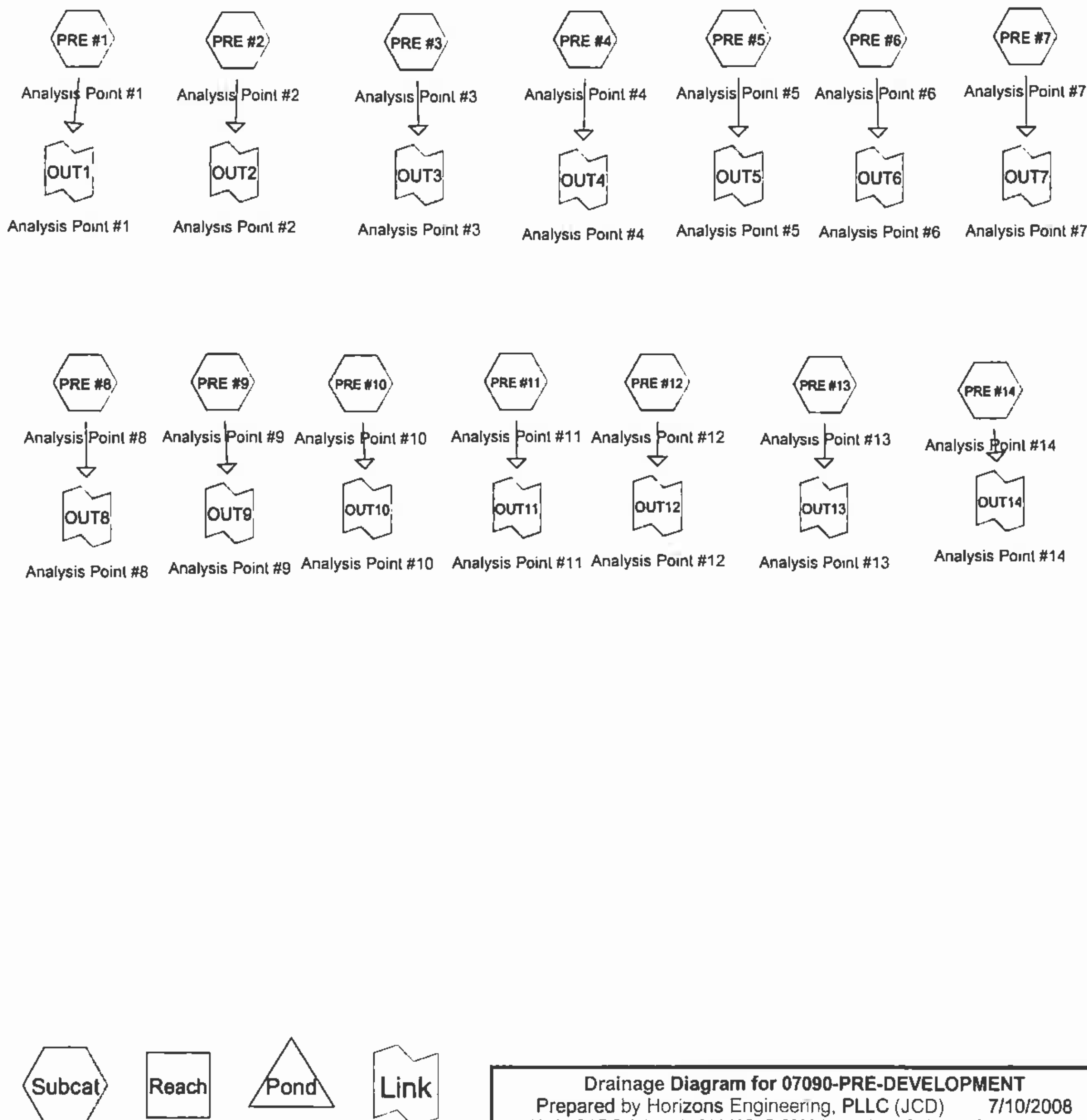
SECTION 3

SECTION 3

2-Year Drainage Computations

Pre and Post Development

2-Year Pre-Development Model Results



Drainage **Diagram for 07090-PRE-DEVELOPMENT**
Prepared by Horizons Engineering, **PLLC** (JCD) 7/10/2008
HydroCAD® 8.00 **s/n** 002765 **© 2006** HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
19.420	30	Brush, Good, HSG A (PRE #7)
27.660	32	Woods, Good, HSG A (PRE #7)
11.620	36	Brush, Good, HSG B (PRE #1,PRE #11,PRE #2,PRE #7)
456.700	42	Woods, Good, HSG B (PRE #1,PRE #11,PRE #12,PRE #2,PRE #7)
2,852.910	49	Brush, Good, HSG C (PRE #1,PRE #11,PRE #2,PRE #3,PRE #4,PRE #5,PRE #6,PRE #7,P
13,113.940	53	Woods, Good, HSG C (PRE #1,PRE #10,PRE #11,PRE #12,PRE #13,PRE #14,PRE #2,PRI
1,281.950	55	Brush, Good, HSG D (PRE #11,PRE #5,PRE #6,PRE #7,PRE #8,PRE #9)
15,202.730	58	Woods, Good, HSG D (PRE #10,PRE #11,PRE #12,PRE #13,PRE #14,PRE #3,PRE #5,PRI
35.850	89	Gravel roads, HSG C (PRE #2,PRE #3,PRE #4,PRE #5,PRE #6,PRE #7)
227.520	98	Water (PRE #6,PRE #7)
33,230.300		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PRE #1: Analysis Point #1 Runoff Area=101.010 ac Runoff Depth=0.05"
Flow Length=4,123' Tc=42.1 min CN=50 Runoff=0.48 cfs 0.385 af

Subcatchment PRE #10: Analysis Point #10 Runoff Area=2,172.660 ac Runoff Depth=0.12"
Flow Length=15,514' Tc=124.0 min CN=55 Runoff=32.35 cfs 22.155 af

Subcatchment PRE #11: Analysis Point #11 Runoff Area=3,602.810 ac Runoff Depth=0.16"
Flow Length=23,248' Tc=88.9 min CN=57 Runoff=94.10 cfs 48.773 af

Subcatchment PRE #12: Analysis Point #12 Runoff Area=1,276.260 ac Runoff Depth=0.14"
Flow Length=16,392' Tc=50.3 min CN=56 Runoff=31.75 cfs 15.075 af

Subcatchment PRE #13: Analysis Point #13 Runoff Area=1,131.820 ac Runoff Depth=0.12"
Flow Length=15,139' Tc=68.8 min CN=55 Runoff=19.87 cfs 11.541 af

Subcatchment PRE #14: Analysis Point #14 Runoff Area=646.100 ac Runoff Depth=0.14"
Flow Length=6,304' Tc=48.1 min CN=56 Runoff=16.26 cfs 7.632 af

Subcatchment PRE #2: Analysis Point #2 Runoff Area=224.420 ac Runoff Depth=0.09"
Flow Length=4,750' Tc=44.7 min CN=53 Runoff=2.45 cfs 1.639 af

Subcatchment PRE #3: Analysis Point #3 Runoff Area=639.610 ac Runoff Depth=0.10"
Flow Length=10,653' Tc=166.3 min CN=54 Runoff=7.04 cfs 5.560 af

Subcatchment PRE #4: Analysis Point #4 Runoff Area=65.790 ac Runoff Depth=0.07"
Flow Length=4,314' Tc=47.5 min CN=52 Runoff=0.53 cfs 0.396 af

Subcatchment PRE #5: Analysis Point #5 Runoff Area=708.580 ac Runoff Depth=0.10"
Flow Length=6,798' Tc=118.5 min CN=54 Runoff=8.49 cfs 6.160 af

Subcatchment PRE #6: Analysis Point #6 Runoff Area=4,109.110 ac Runoff Depth>0.14"
Flow Length=35,165' Tc=386.5 min CN=56 Runoff=50.14 cfs 48.293 af

Subcatchment PRE #7: Analysis Point #7 Runoff Area=14,080.000 ac Runoff Depth=0.12"
Flow Length=31,171' Tc=123.2 min CN=55 Runoff=209.91 cfs 143.575 af

Subcatchment PRE #8: Analysis Point #8 Runoff Area=1,916.090 ac Runoff Depth=0.12"
Flow Length=15,581' Tc=107.5 min CN=55 Runoff=29.89 cfs 19.539 af

Subcatchment PRE #9: Analysis Point #9 Runoff Area=2,556.040 ac Runoff Depth=0.07"
Flow Length=13,053' Tc=116.5 min CN=52 Runoff=19.08 cfs 15.399 af

Link OUT1: Analysis Point #1 Inflow=0.48 cfs 0.385 af
Primary=0.48 cfs 0.385 af

Link OUT10: Analysis Point #10	Inflow=32.35 cfs 22.155 af Primary=32.35 cfs 22.155 af
Link OUT11: Analysis Point #11	Inflow=94.10 cfs 48.773 af Primary=94.10 cfs 48.773 af
Link OUT12: Analysis Point #12	Inflow=31.75 cfs 15.075 af Primary=31.75 cfs 15.075 af
Link OUT13: Analysis Point #13	Inflow=19.87 cfs 11.541 af Primary=19.87 cfs 11.541 af
Link OUT14: Analysis Point #14	Inflow=16.26 cfs 7.632 af Primary=16.26 cfs 7.632 af
Link OUT2: Analysis Point #2	Inflow=2.45 cfs 1.639 af Primary=2.45 cfs 1.639 af
Link OUT3: Analysis Point #3	Inflow=7.04 cfs 5.560 af Primary=7.04 cfs 5.560 af
Link OUT4: Analysis Point #4	Inflow=0.53 cfs 0.396 af Primary=0.53 cfs 0.396 af
Link OUT5: Analysis Point #5	Inflow=8.49 cfs 6.160 af Primary=8.49 cfs 6.160 af
Link OUT6: Analysis Point #6	Inflow=50.14 cfs 48.293 af Primary=50.14 cfs 48.293 af
Link OUT7: Analysis Point #7	Inflow=209.91 cfs 143.575 af Primary=209.91 cfs 143.575 af
Link OUT8: Analysis Point #8	Inflow=29.89 cfs 19.539 af Primary=29.89 cfs 19.539 af
Link OUT9: Analysis Point #9	Inflow=19.08 cfs 15.399 af Primary=19.08 cfs 15.399 af

Total Runoff Area = 33,230.300 ac Runoff Volume = 346.123 af Average Runoff Depth = 0.12"
99.32% Pervious Area = 33,002.780 ac 0.68% Impervious Area = 227.520 ac

Subcatchment PRE #1: Analysis Point #1

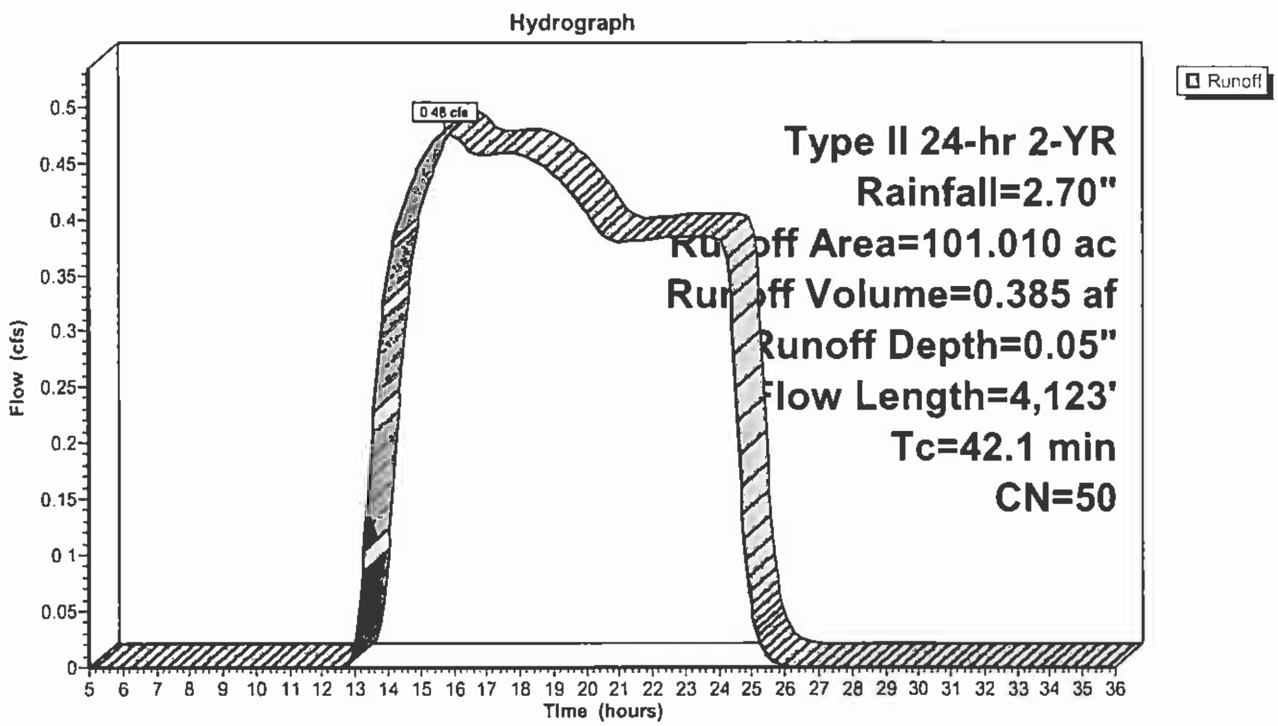
Runoff = 0.48 cfs @ 15.75 hrs, Volume= 0.385 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
0.830	36	Brush, Good, HSG B
3.960	42	Woods, Good, HSG B
61.040	49	Brush, Good, HSG C
35.180	53	Woods, Good, HSG C
101.010	50	Weighted Average
101.010		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.3	1,719	0.2560	2.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.5	386	0.1400	2.62		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
18.1	1,918	0.1250	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
42.1	4,123	Total			

Subcatchment PRE #1: Analysis Point #1



Subcatchment PRE #10: Analysis Point #10

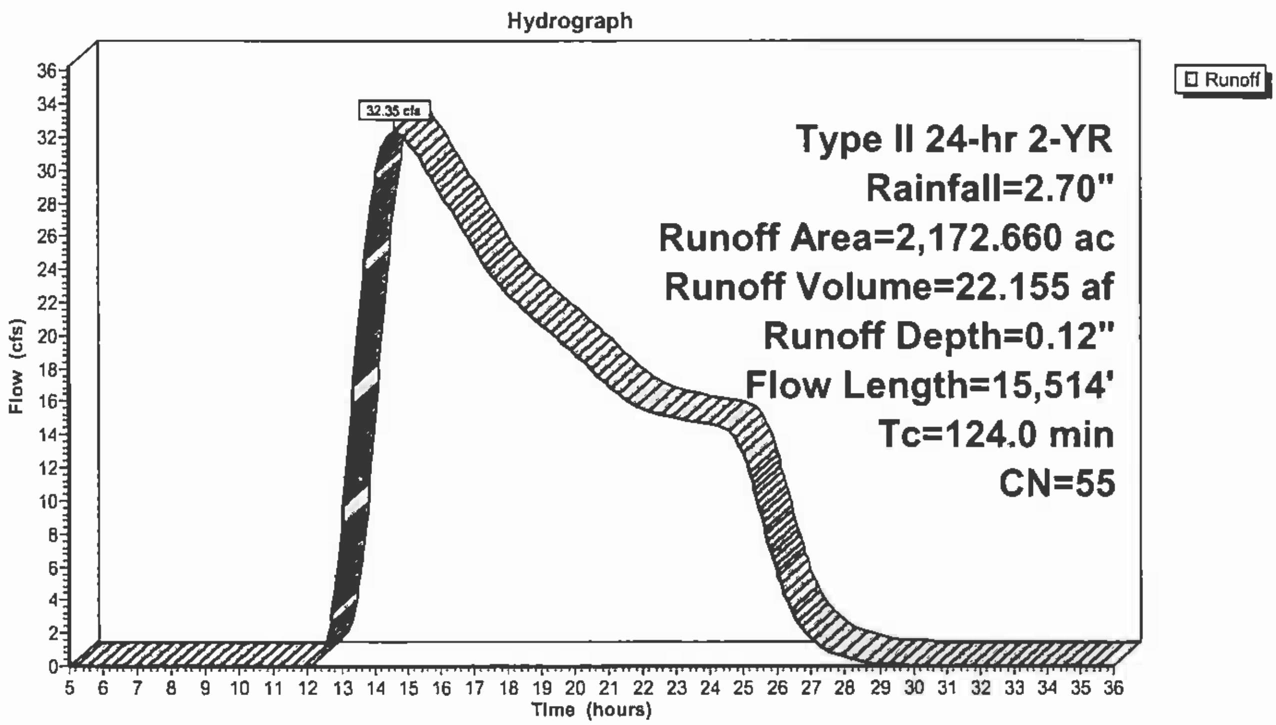
Runoff = 32.35 cfs @ 14.60 hrs, Volume= 22.155 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1,198.040	53	Woods, Good, HSG C
974.620	58	Woods, Good, HSG D
2,172.660	55	Weighted Average
2,172.660		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	100	0.0250	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
92.7	10,588	0.1450	1.90		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
9.9	4,826	0.0250	8.12	172.58	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
124.0	15,514	Total			

Subcatchment PRE #10: Analysis Point #10



Subcatchment PRE #11: Analysis Point #11

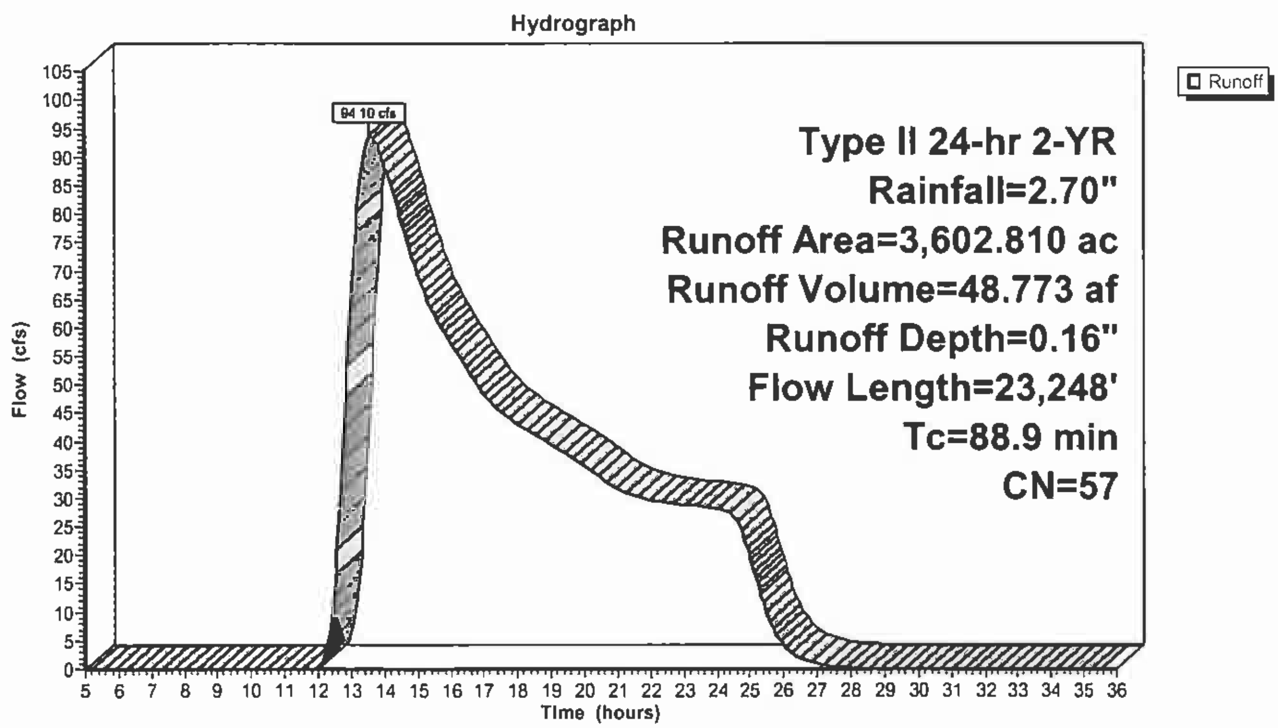
Runoff = 94.10 cfs @ 13.55 hrs, Volume= 48.773 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
0.400	36	Brush, Good, HSG B
99.480	42	Woods, Good, HSG B
1.500	49	Brush, Good, HSG C
730.170	53	Woods, Good, HSG C
7.670	55	Brush, Good, HSG D
2,763.590	58	Woods, Good, HSG D
3,602.810	57	Weighted Average
3,602.810		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
33.0	3,286	0.1100	1.66		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
36.0	19,862	0.0320	9.19	195.25	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
88.9	23,248	Total			

Subcatchment PRE #11: Analysis Point #11



Subcatchment PRE #12: Analysis Point #12

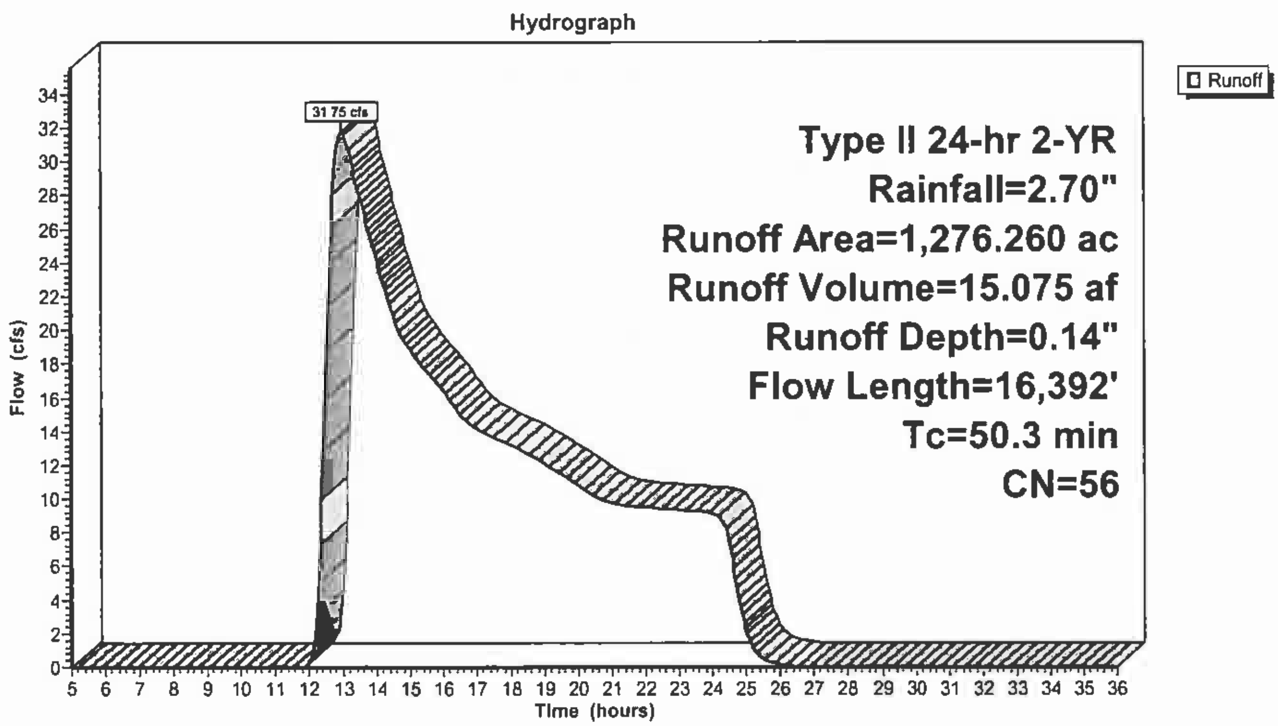
Runoff = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
91.980	42	Woods, Good, HSG B
300.340	53	Woods, Good, HSG C
883.940	58	Woods, Good, HSG D
1,276.260	56	Weighted Average
1,276.260		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.3	3,147	0.2950	2.72		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
14.8	13,145	0.0830	14.80	314.45	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
50.3	16,392	Total			

Subcatchment PRE #12: Analysis Point #12



Subcatchment PRE #13: Analysis Point #13

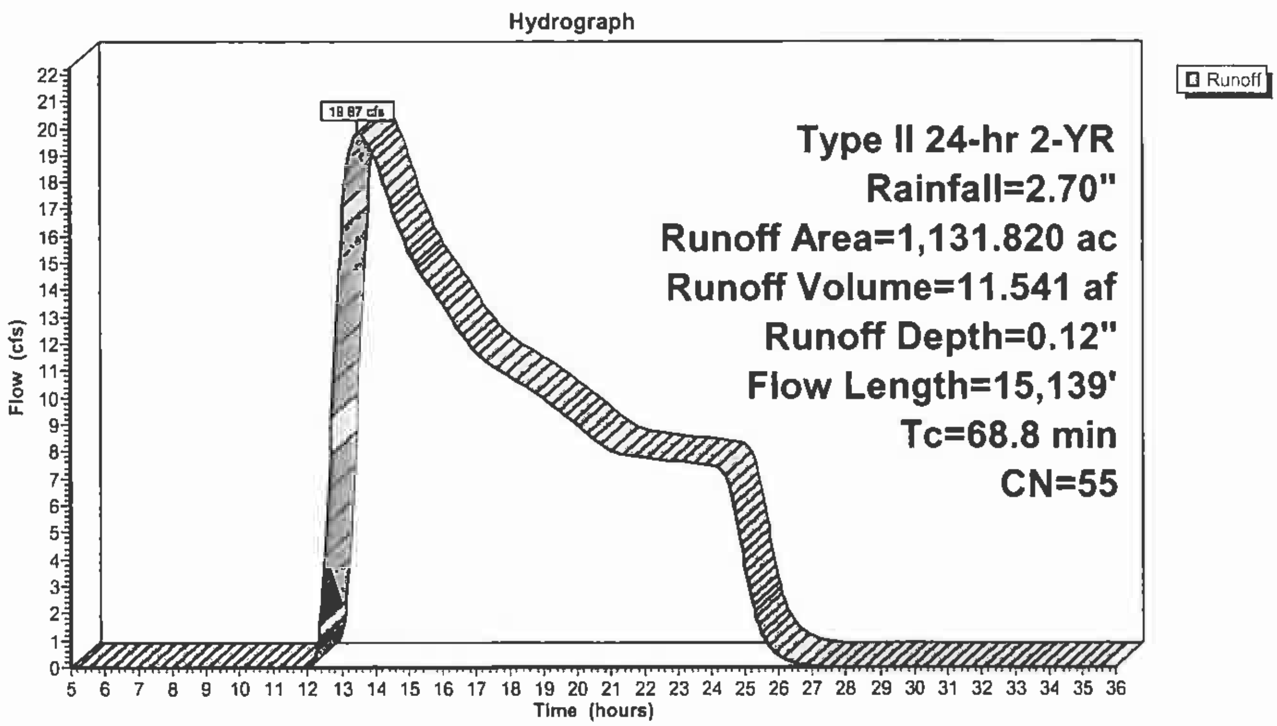
Runoff = 19.87 cfs @ 13.52 hrs, Volume= 11.541 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
710.860	53	Woods, Good, HSG C
420.960	58	Woods, Good, HSG D
1,131.820	55	Weighted Average
1,131.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
34.3	4,378	0.1810	2.13		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
5.7	6,301	0.1280	18.38	390.50	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
8.9	4,360	0.0250	8.12	172.58	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
68.8	15,139	Total			

Subcatchment PRE #13: Analysis Point #13



Subcatchment PRE #14: Analysis Point #14

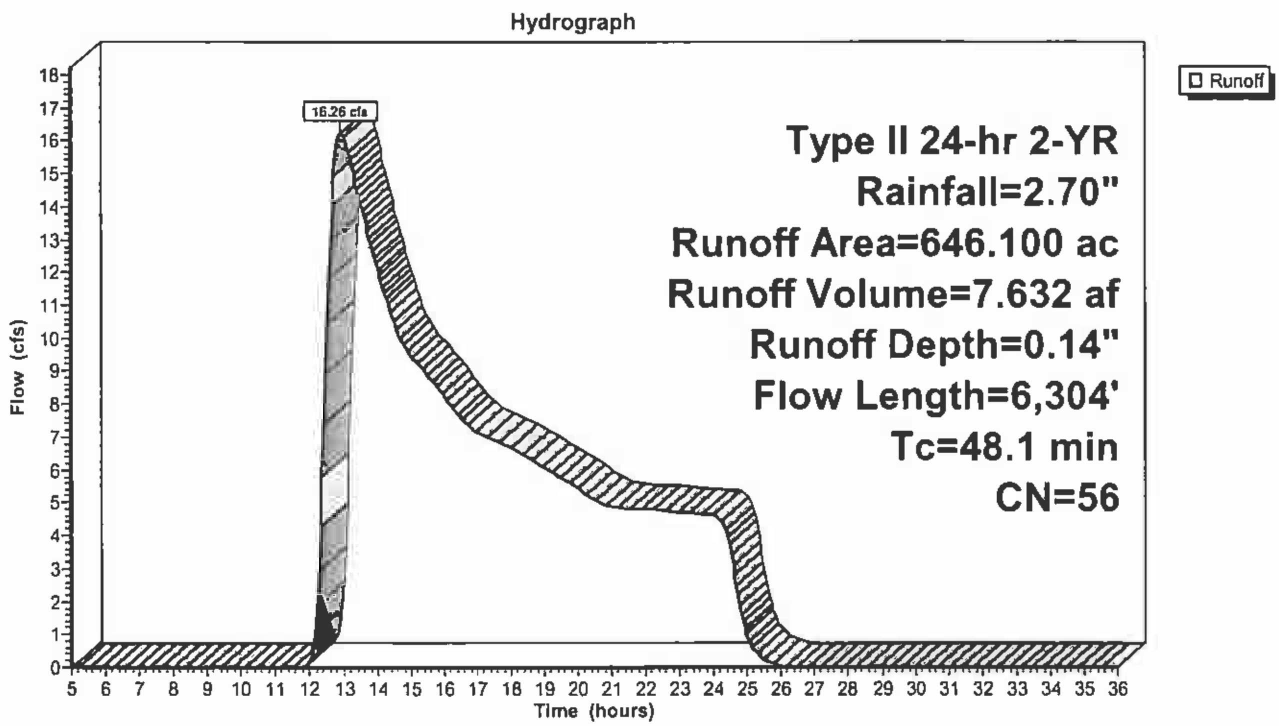
Runoff = 16.26 cfs @ 12.92 hrs, Volume= 7.632 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
194.130	53	Woods, Good, HSG C
451.970	58	Woods, Good, HSG D
646.100	56	Weighted Average
646.100		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.4	2,275	0.3200	2.83		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.9	3,929	0.1070	16.80	357.03	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
48.1	6,304	Total			

Subcatchment PRE #14: Analysis Point #14



Subcatchment PRE #2: Analysis Point #2

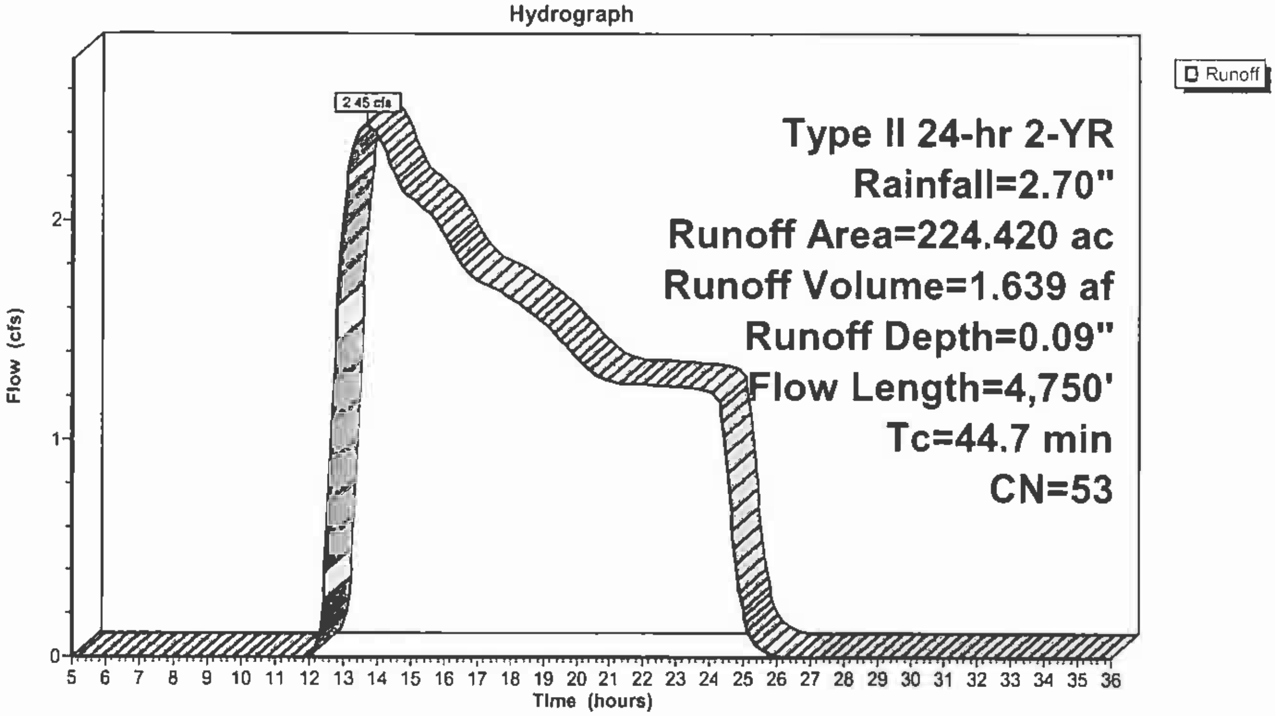
Runoff = 2.45 cfs @ 13.64 hrs, Volume= 1.639 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1.420	89	Gravel roads, HSG C
0.070	36	Brush, Good, HSG B
0.070	42	Woods, Good, HSG B
11.550	49	Brush, Good, HSG C
211.310	53	Woods, Good, HSG C
224.420	53	Weighted Average
224.420		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
25.8	3,410	0.1940	2.20		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	523	0.0500	8.83	106.00	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
0.0	28	0.0620	9.71	30.51	**Circular Channel (pipe), 24" cmp** Diam= 24.0" Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.024
4.6	387	0.0770	1.39		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	302	0.0150	4.84	58.06	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
44.7	4,750	Total			

Subcatchment PRE #2: Analysis Point #2



Subcatchment PRE #3: Analysis Point #3

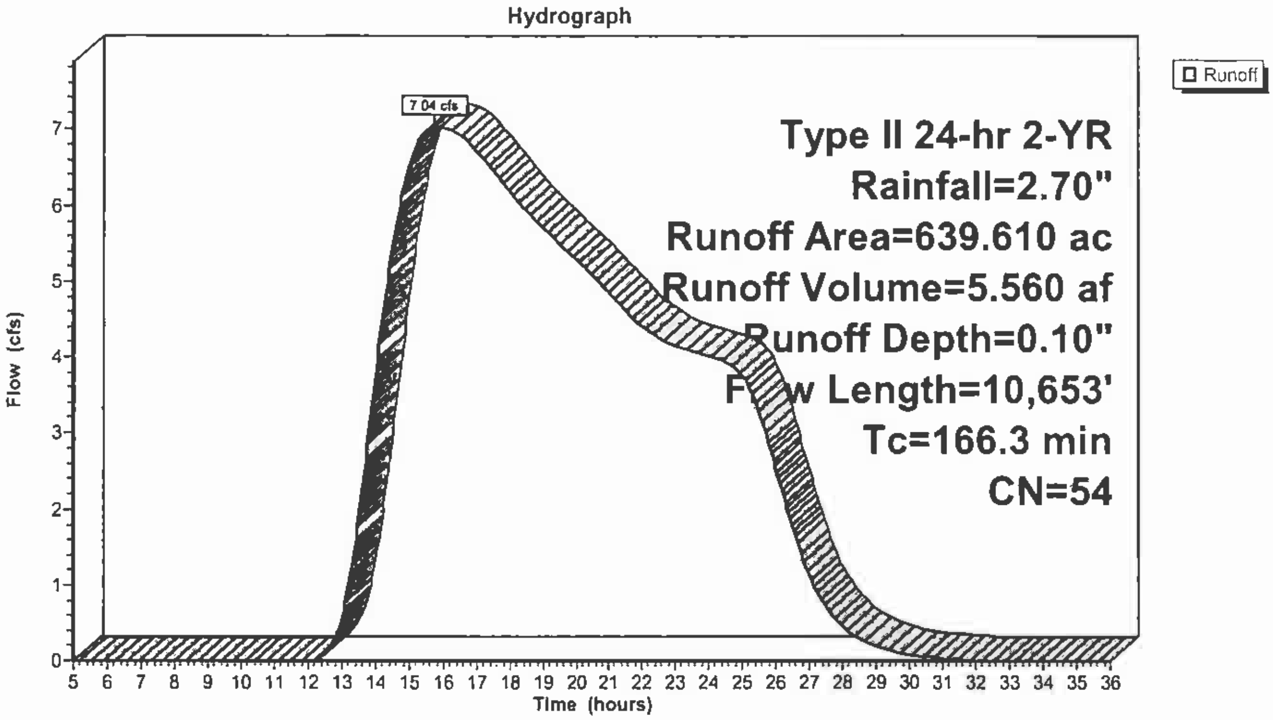
Runoff = 7.04 cfs @ 15.75 hrs, Volume= 5.560 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1.220	89	Gravel roads, HSG C
19.610	49	Brush, Good, HSG C
425.780	53	Woods, Good, HSG C
193.000	58	Woods, Good, HSG D
639.610	54	Weighted Average
639.610		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.1100	0.08		**Sheet Flow, sheet** Woods: Dense underbrush n= 0.800 P2= 2.70"
102.1	6,200	0.0410	1.01		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.1	1,900	0.0680	10.31	116.02	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=6.00' D=1.50' Z= 1.0 '/' Top.W=9.00' n= 0.040
0.0	25	0.0770	23.75	788.02	**Circular Channel (pipe), box culvert** Diam= 78.0" Area= 33.2 sf Perim= 20.4' r= 1.63' n= 0.024
40.5	2,428	0.0400	1.00		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
166.3	10,653	Total			

Subcatchment PRE #3: Analysis Point #3



Subcatchment PRE #4: Analysis Point #4

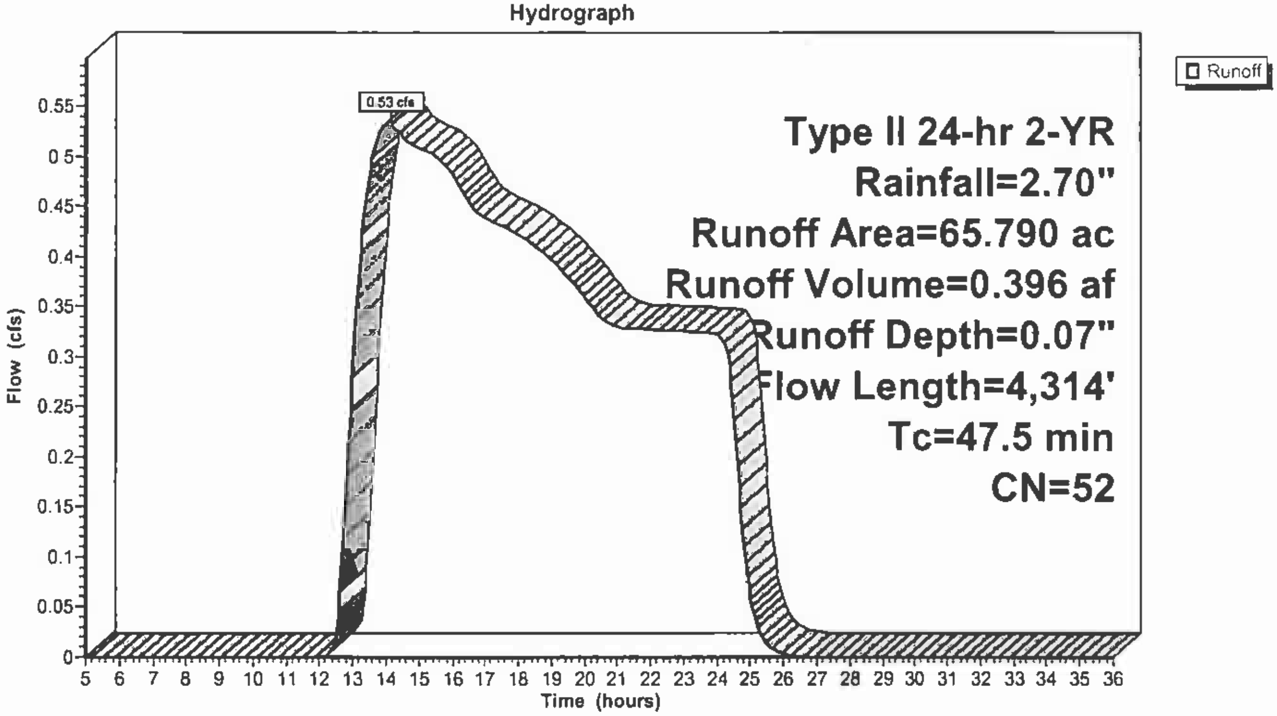
Runoff = 0.53 cfs @ 14.10 hrs, Volume= 0.396 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
0.580	89	Gravel roads, HSG C
29.800	49	Brush, Good, HSG C
35.410	53	Woods, Good, HSG C
65.790	52	Weighted Average
65.790		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0900	0.13		**Sheet Flow, sheet**
					Woods: Light underbrush n= 0.400 P2= 2.70"
15.4	1,750	0.1430	1.89		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
1.7	965	0.0780	9.68	58.09	**Trap/Vee/Rect Channel Flow, ditch**
					Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.040
0.1	40	0.0250	5.09	9.00	**Circular Channel (pipe), culvert**
					Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.024
17.5	1,459	0.0770	1.39		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
47.5	4,314	Total			

Subcatchment PRE #4: Analysis Point #4



Subcatchment PRE #5: Analysis Point #5

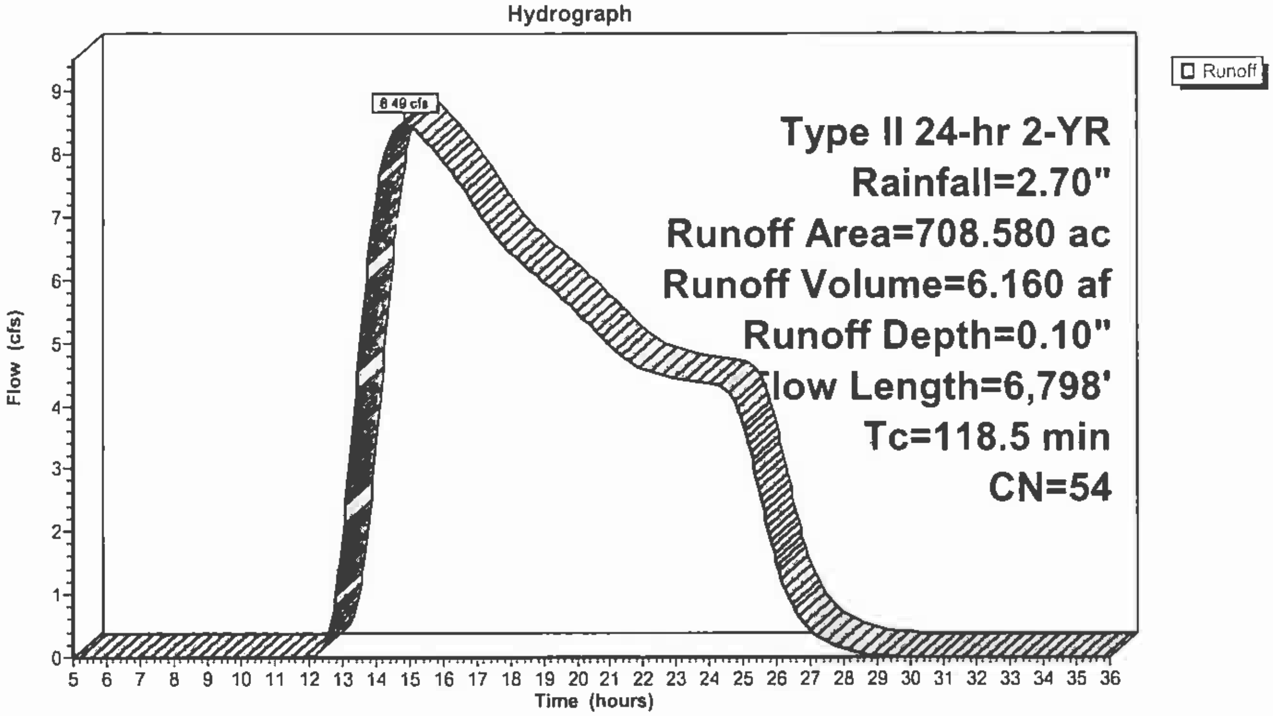
Runoff = 8.49 cfs @ 14.85 hrs, Volume= 6.160 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
2.300	89	Gravel roads, HSG C
23.080	49	Brush, Good, HSG C
600.860	53	Woods, Good, HSG C
15.370	55	Brush, Good, HSG D
66.970	58	Woods, Good, HSG D
708.580	54	Weighted Average
708.580		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
39.1	3,800	0.1050	1.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	410	0.1120	11.86	80.07	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
41.0	1,738	0.0200	0.71		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
17.9	750	0.0100	0.70		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
118.5	6,798	Total			

Subcatchment PRE #5: Analysis Point #5



Subcatchment PRE #6: Analysis Point #6

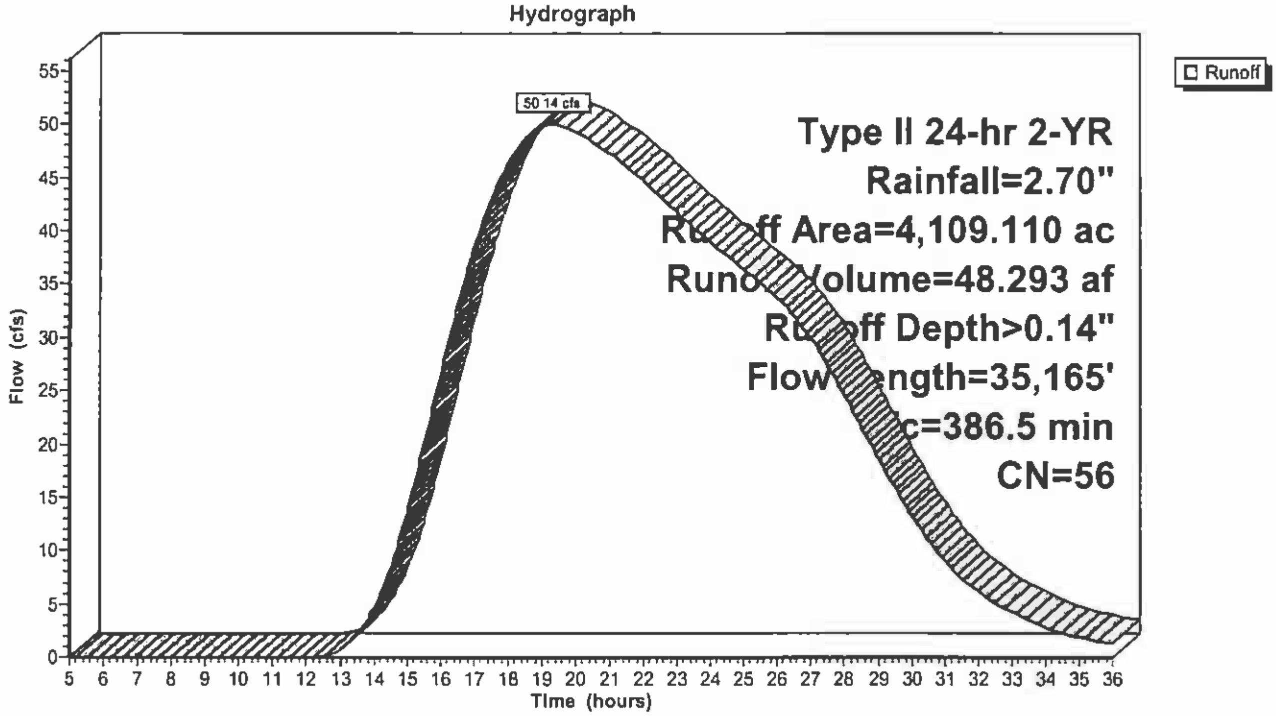
Runoff = 50.14 cfs @ 19.32 hrs, Volume= 48.293 af, Depth> 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
147.410	98	Water
10.230	89	Gravel roads, HSG C
728.760	49	Brush, Good, HSG C
1,640.880	53	Woods, Good, HSG C
120.700	55	Brush, Good, HSG D
1,461.130	58	Woods, Good, HSG D
4,109.110	56	Weighted Average
3,961.700		Pervious Area
147.410		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
39.0	5,035	0.1850	2.15		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.4	1,300	0.0250	6.47	64.67	**Trap/Vee/Rect Channel Flow, channel** Bot.W=3.00' D=2.00' Z= 1.0 '/' Top.W=7.00' n= 0.040
41.8	1,710	0.0500	0.68		**Lag/CN Method,**
9.8	5,500	0.0400	9.38	140.73	**Trap/Vee/Rect Channel Flow, 2** Bot.W=3.50' D=2.50' Z= 1.0 '/' Top.W=8.50' n= 0.040
3.4	4,255		20.85		**Lake or Reservoir,** Mean Depth= 13.50'
3.5	1,400	0.0170	6.70	142.31	**Trap/Vee/Rect Channel Flow, 3** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
2.4	1,740		12.17		**Lake or Reservoir,** Mean Depth= 4.60'
11.3	5,640	0.0190	8.29	445.86	**Trap/Vee/Rect Channel Flow, 4** Bot.W=19.00' D=2.50' Z= 1.0 '/' Top.W=24.00' n= 0.040
0.6	350		9.83		**Lake or Reservoir,** Mean Depth= 3.00'
1.5	930	0.0300	10.42	560.24	**Trap/Vee/Rect Channel Flow, 5** Bot.W=19.00' D=2.50' Z= 1.0 '/' Top.W=24.00' n= 0.040
110.8	2,725	0.0150	0.41		**Lag/CN Method,**
7.4	1,480	0.0030	3.31	186.37	**Trap/Vee/Rect Channel Flow, 6** Bot.W=20.00' D=2.50' Z= 1.0 '/' Top.W=25.00' n= 0.040
136.1	1,000	0.0020	0.12		**Lag/CN Method,**
3.7	2,000	0.0220	8.97	504.70	**Trap/Vee/Rect Channel Flow, 7** Bot.W=20.00' D=2.50' Z= 1.0 '/' Top.W=25.00' n= 0.040
386.5	35,165	Total			

Subcatchment PRE #6: Analysis Point #6



Subcatchment PRE #7: Analysis Point #7

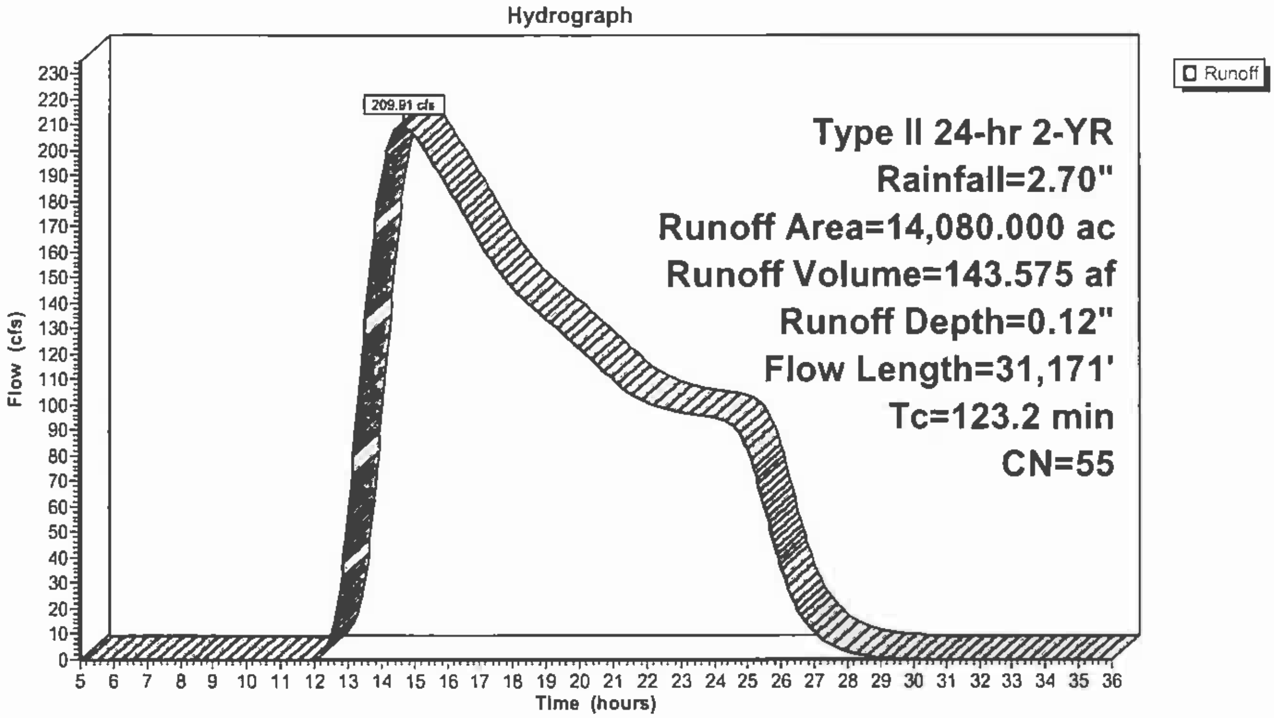
Runoff = 209.91 cfs @ 14.63 hrs, Volume= 143.575 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
80.110	98	Water
20.100	89	Gravel roads, HSG C
19.420	30	Brush, Good, HSG A
27.660	32	Woods, Good, HSG A
10.320	36	Brush, Good, HSG B
261.210	42	Woods, Good, HSG B
505.570	49	Brush, Good, HSG C
5,842.250	53	Woods, Good, HSG C
387.290	55	Brush, Good, HSG D
6,926.070	58	Woods, Good, HSG D
14,080.000	55	Weighted Average
13,999.890		Pervious Area
80.110		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1400	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
81.8	9,568	0.1520	1.95		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
7.9	6,381	0.0300	13.49	1,240.91	**Trap/Vee/Rect Channel Flow, channel Xs-2** Bot.W=19.00' D=4.00' Z= 1.0 '/' Top.W=27.00' n= 0.040
21.9	14,212	0.0160	10.79	2,115.29	**Trap/Vee/Rect Channel Flow, channel Xs-3** Bot.W=45.00' D=4.00' Z= 1.0 '/' Top.W=53.00' n= 0.040
0.9	910	0.0160	16.51	8,979.82	**Trap/Vee/Rect Channel Flow, channel Xs-4** Bot.W=60.00' D=8.00' Z= 1.0 '/' Top.W=76.00' n= 0.040
123.2	31,171	Total			

Subcatchment PRE #7: Analysis Point #7



Subcatchment PRE #8: Analysis Point #8

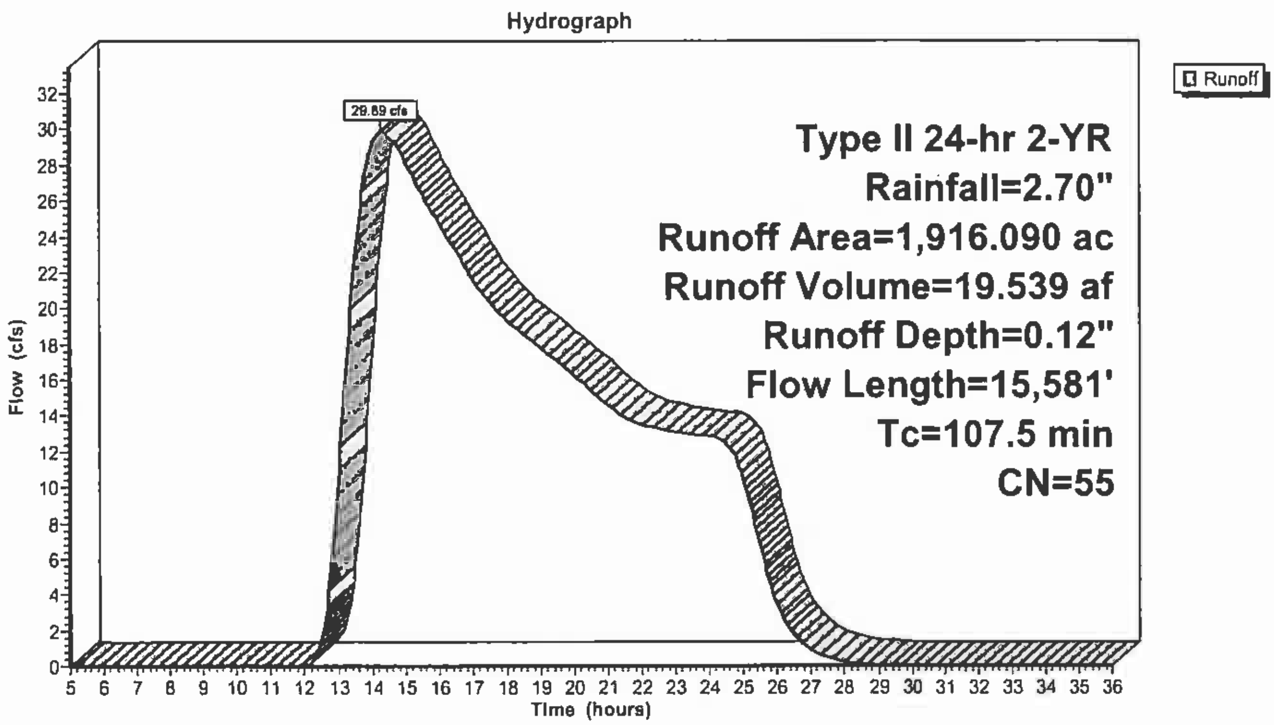
Runoff = 29.89 cfs @ 14.25 hrs, Volume= 19.539 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1,146.060	53	Woods, Good, HSG C
31.200	55	Brush, Good, HSG D
738.830	58	Woods, Good, HSG D
1,916.090	55	Weighted Average
1,916.090		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0600	0.11		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
78.5	7,444	0.1000	1.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
13.9	8,037	0.0350	9.61	204.20	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
107.5	15,581	Total			

Subcatchment PRE #8: Analysis Point #8



Subcatchment PRE #9: Analysis Point #9

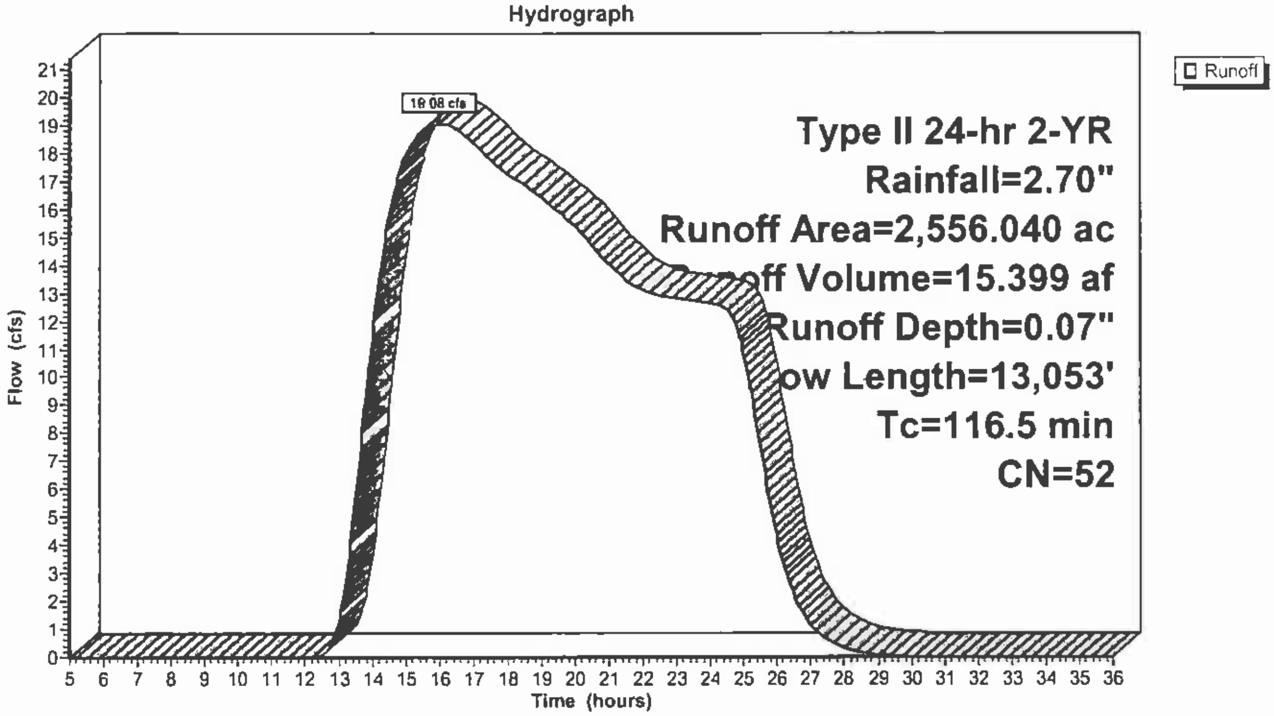
Runoff = 19.08 cfs @ 15.95 hrs, Volume= 15.399 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1,472.000	49	Brush, Good, HSG C
42.670	53	Woods, Good, HSG C
719.720	55	Brush, Good, HSG D
321.650	58	Woods, Good, HSG D
2,556.040	52	Weighted Average
2,556.040		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
56.3	2,136	0.0160	0.63		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.5	1,417	0.0330	9.33	198.28	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
20.3	4,425	0.0050	3.63	77.18	**Trap/Vee/Rect Channel Flow, bog** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
6.6	4,975	0.0600	12.58	267.36	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
116.5	13,053	Total			

Subcatchment PRE #9: Analysis Point #9

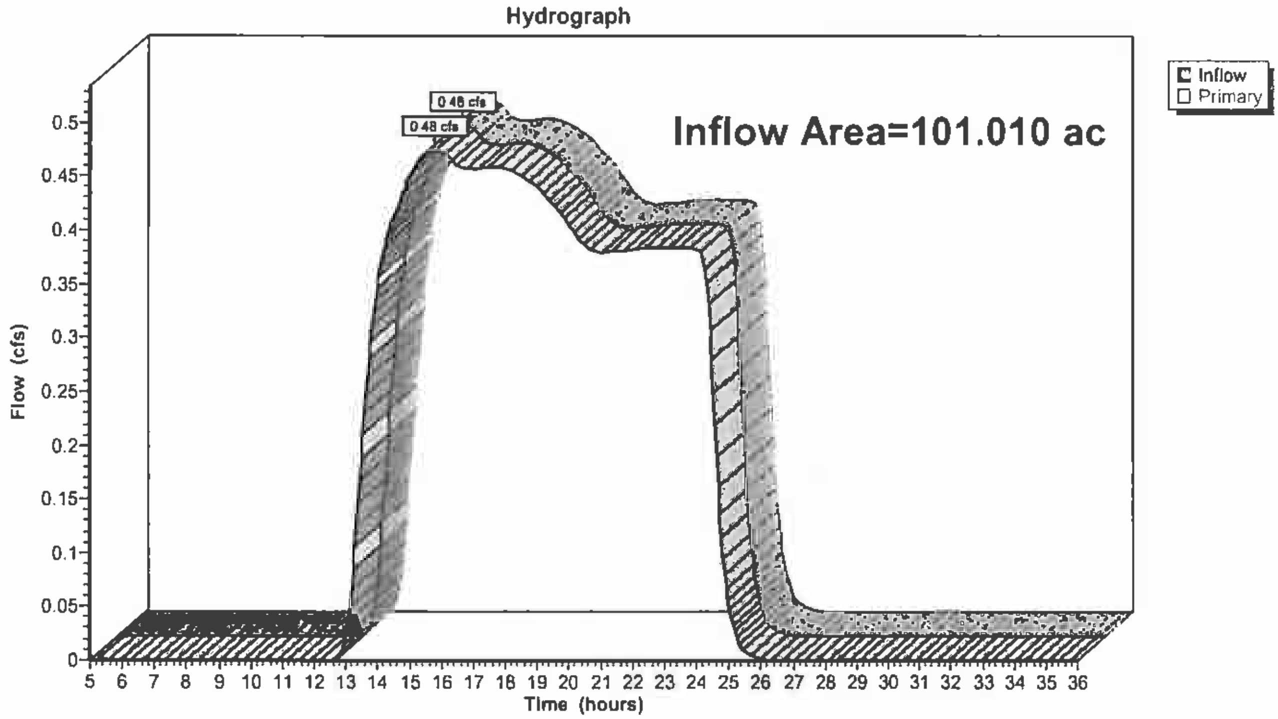


Link OUT1: Analysis Point #1

Inflow Area = 101.010 ac, Inflow Depth = 0.05" for 2-YR event
Inflow = 0.48 cfs @ 15.75 hrs, Volume= 0.385 af
Primary = 0.48 cfs @ 15.75 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT1: Analysis Point #1

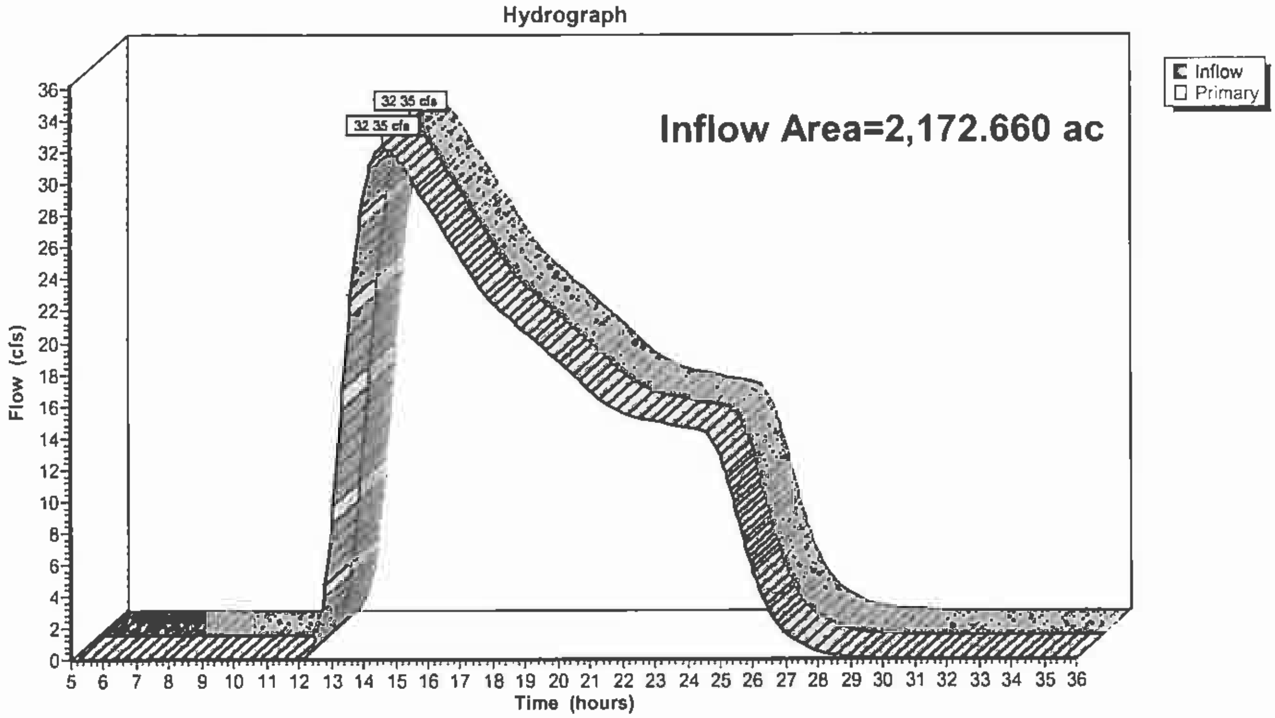


Link OUT10: Analysis Point #10

Inflow Area = 2,172.660 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 32.35 cfs @ 14.60 hrs, Volume= 22.155 af
Primary = 32.35 cfs @ 14.60 hrs, Volume= 22.155 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT10: Analysis Point #10

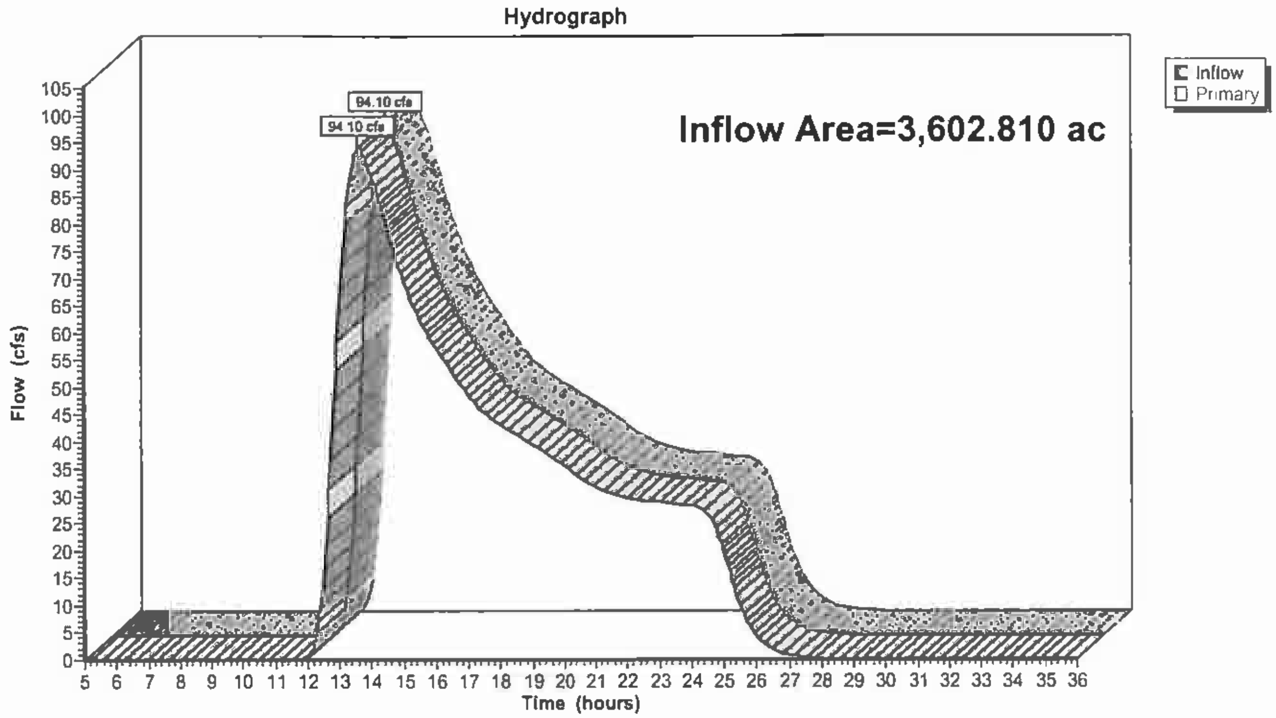


Link OUT11: Analysis Point #11

Inflow Area = 3,602.810 ac, Inflow Depth = 0.16" for 2-YR event
Inflow = 94.10 cfs @ 13.55 hrs, Volume= 48.773 af
Primary = 94.10 cfs @ 13.55 hrs, Volume= 48.773 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT11: Analysis Point #11

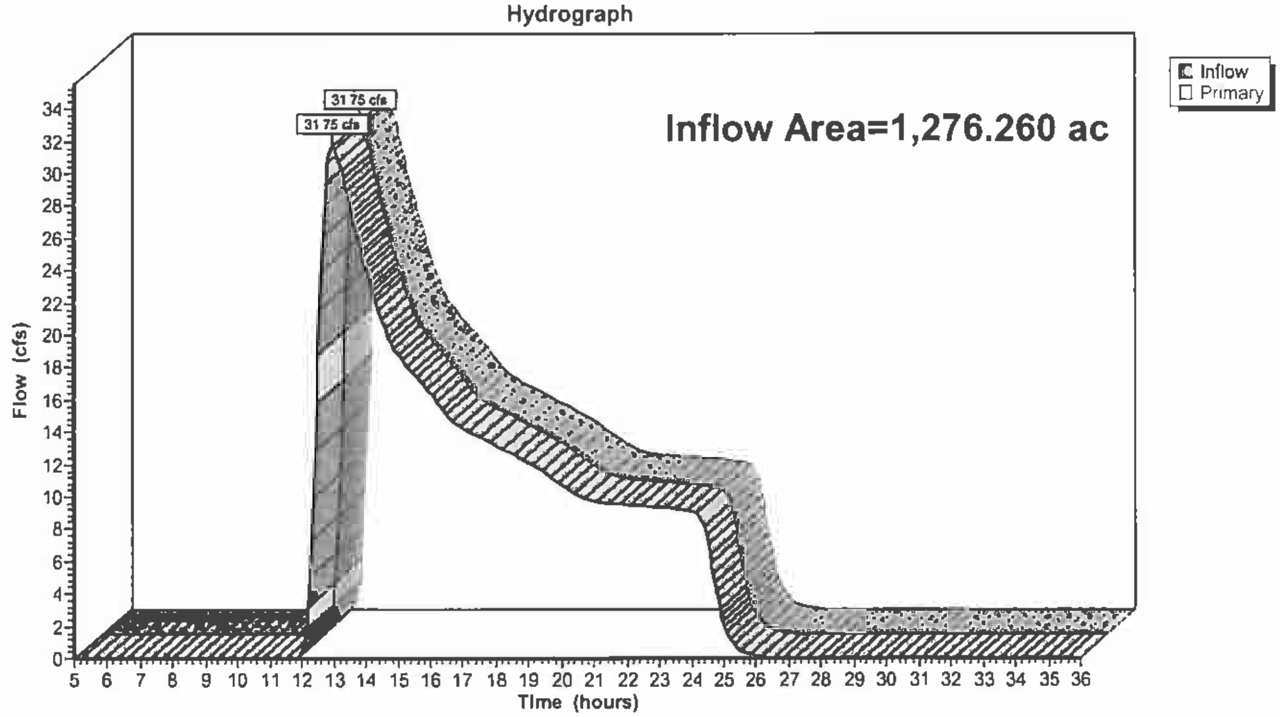


Link OUT12: Analysis Point #12

Inflow Area = 1,276.260 ac, Inflow Depth = 0.14" for 2-YR event
Inflow = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af
Primary = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT12: Analysis Point #12

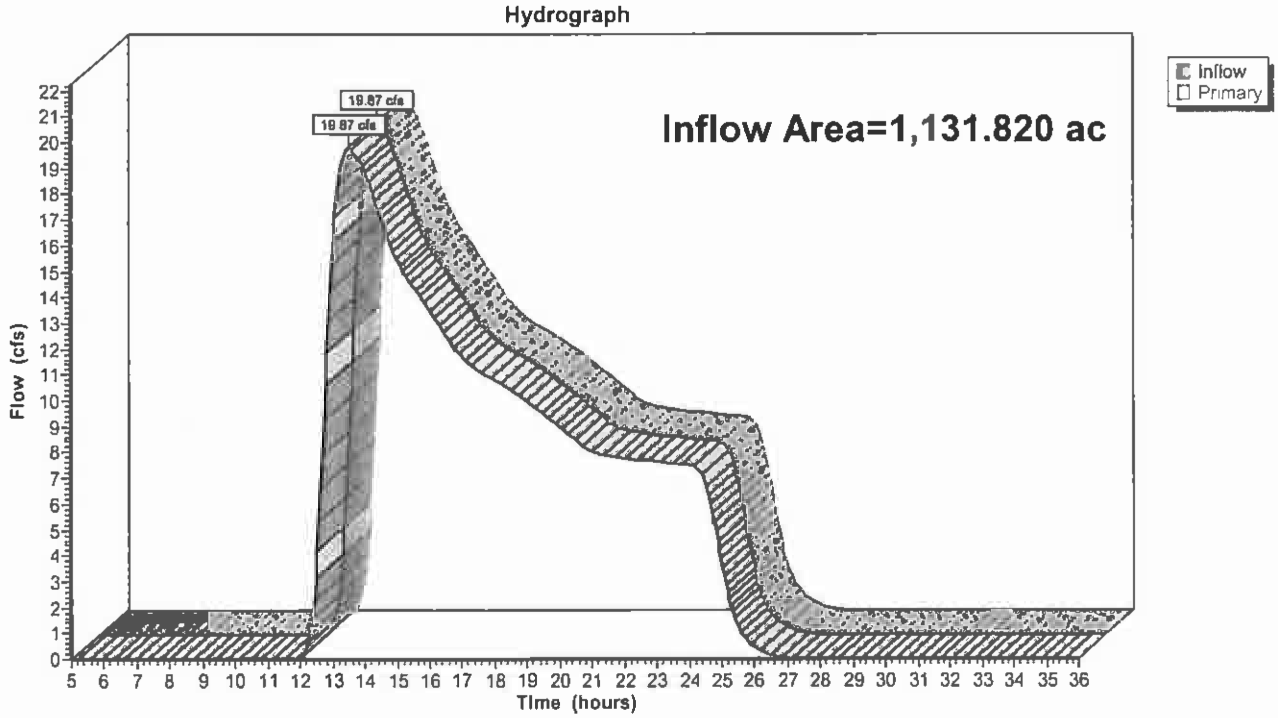


Link OUT13: Analysis Point #13

Inflow Area =	1,131.820 ac,	Inflow Depth = 0.12"	for 2-YR event
Inflow =	19.87 cfs @ 13.52 hrs,	Volume=	11.541 af
Primary =	19.87 cfs @ 13.52 hrs,	Volume=	11.541 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT13: Analysis Point #13

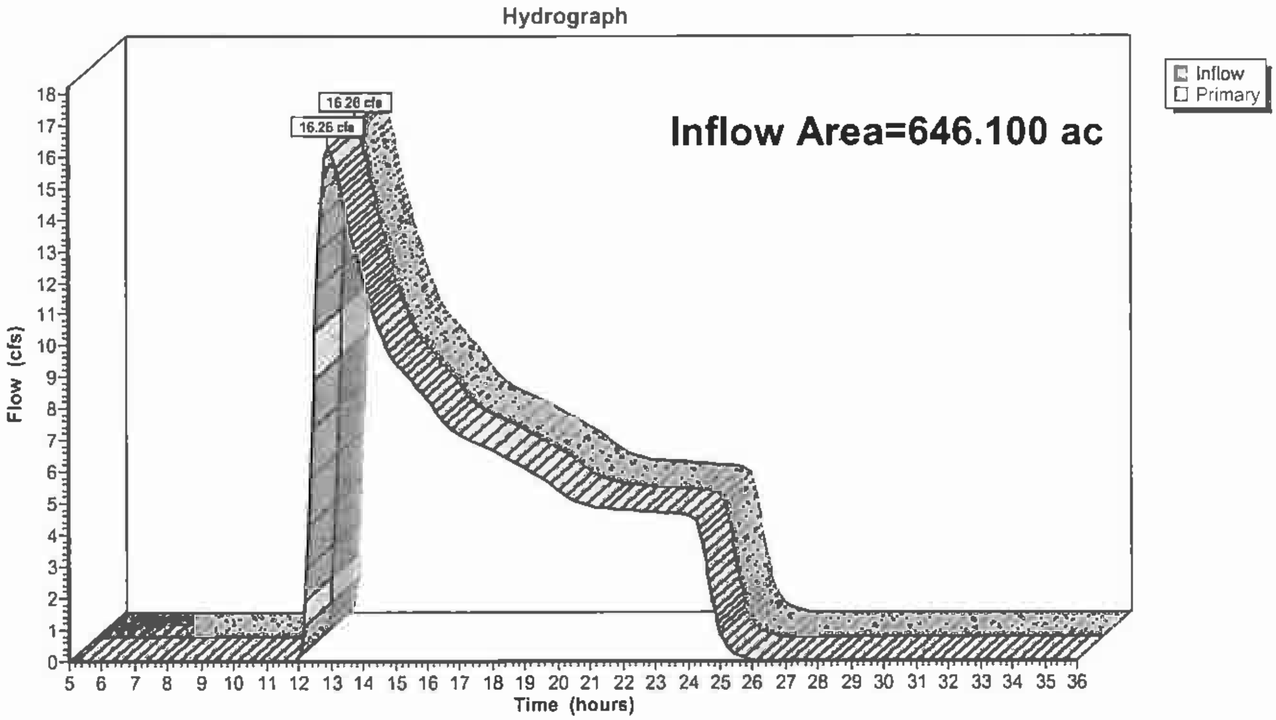


Link OUT14: Analysis Point #14

Inflow Area =	646.100 ac, Inflow Depth = 0.14"	for 2-YR event	
Inflow =	16.26 cfs @ 12.92 hrs, Volume=	7.632 af	
Primary =	16.26 cfs @ 12.92 hrs, Volume=	7.632 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT14: Analysis Point #14

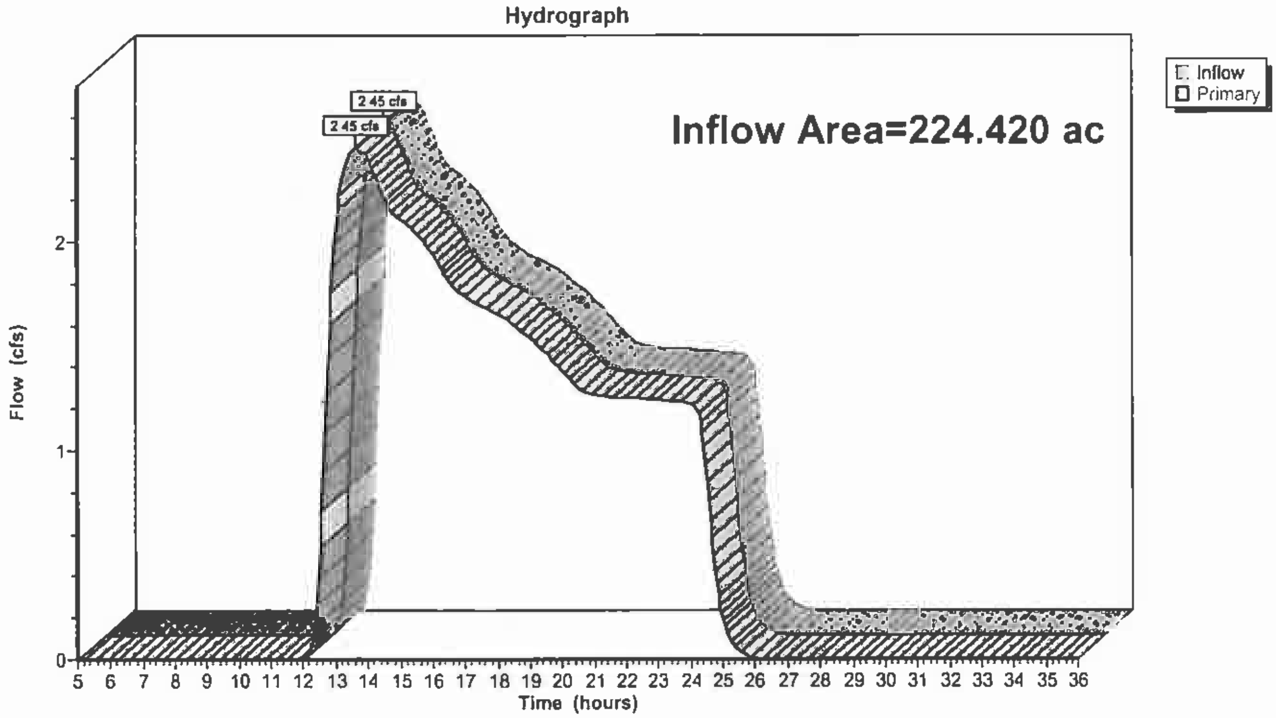


Link OUT2: Analysis Point #2

Inflow Area =	224.420 ac,	Inflow Depth = 0.09"	for 2-YR event	
Inflow =	2.45 cfs @	13.64 hrs, Volume=	1.639 af	
Primary =	2.45 cfs @	13.64 hrs, Volume=	1.639 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT2: Analysis Point #2

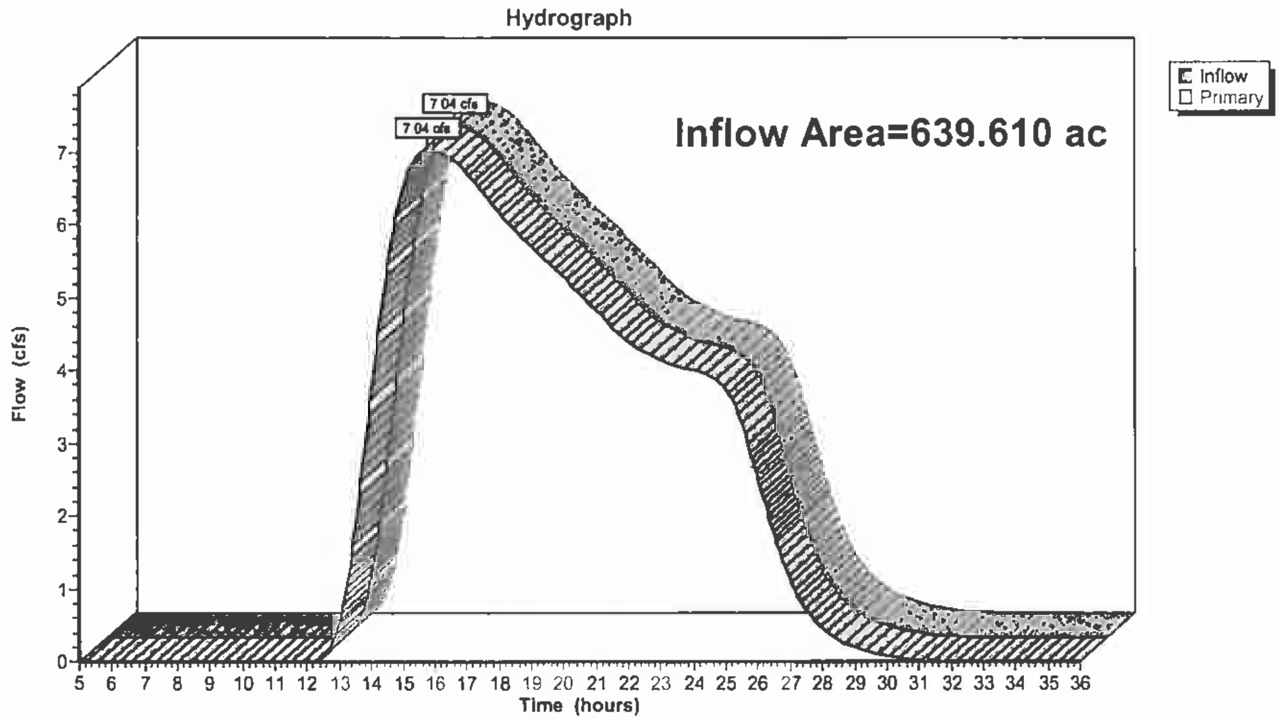


Link OUT3: Analysis Point #3

Inflow Area =	639.610 ac,	Inflow Depth = 0.10"	for 2-YR event
Inflow =	7.04 cfs @ 15.75 hrs,	Volume=	5.560 af
Primary =	7.04 cfs @ 15.75 hrs,	Volume=	5.560 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT3: Analysis Point #3

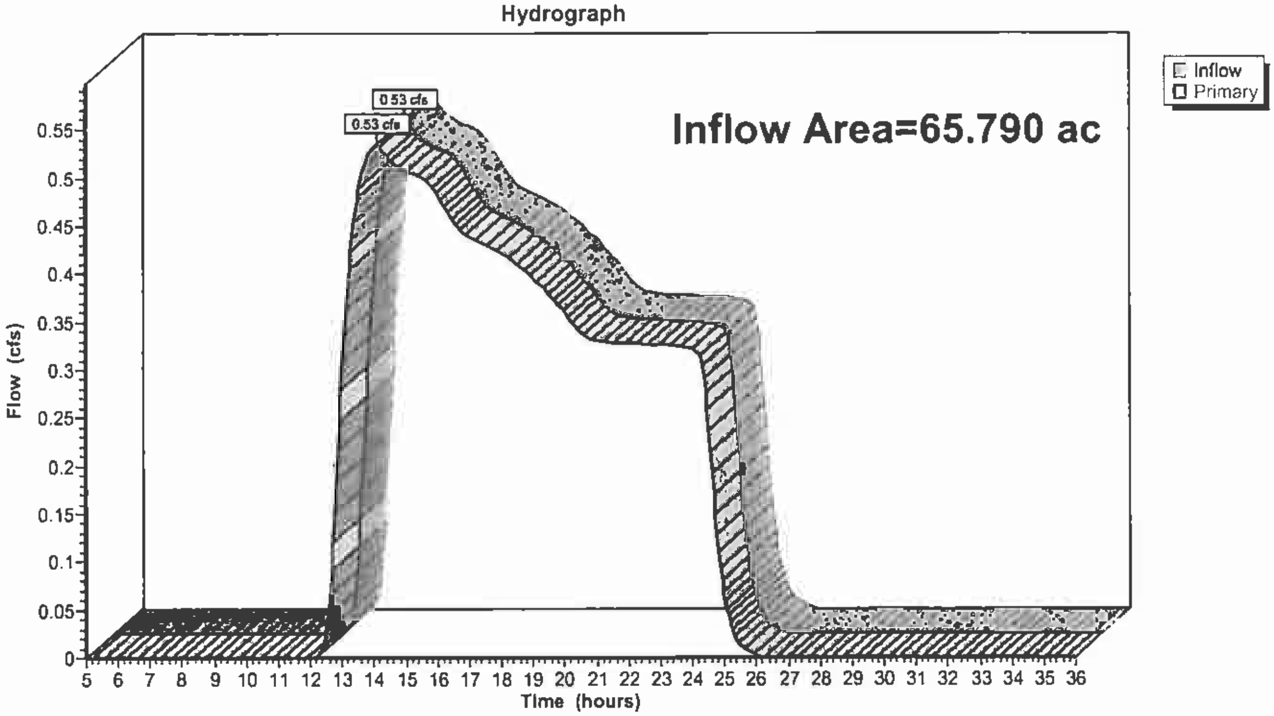


Link OUT4: Analysis Point #4

Inflow Area =	65.790 ac, Inflow Depth = 0.07"	for 2-YR event	
Inflow =	0.53 cfs @ 14.10 hrs, Volume=	0.396 af	
Primary =	0.53 cfs @ 14.10 hrs, Volume=	0.396 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT4: Analysis Point #4

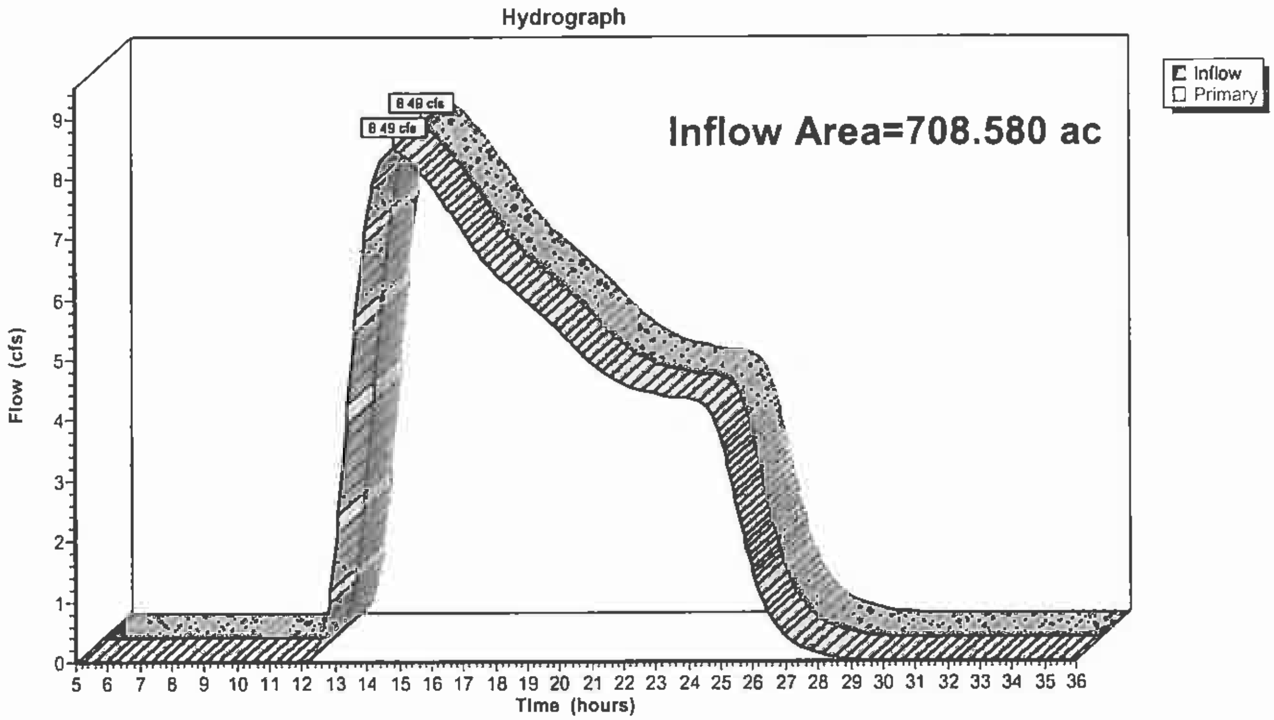


Link OUT5: Analysis Point #5

Inflow Area =	708.580 ac, Inflow Depth = 0.10"	for 2-YR event	
Inflow =	8.49 cfs @ 14.85 hrs, Volume=	6.160 af	
Primary =	8.49 cfs @ 14.85 hrs, Volume=	6.160 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT5: Analysis Point #5

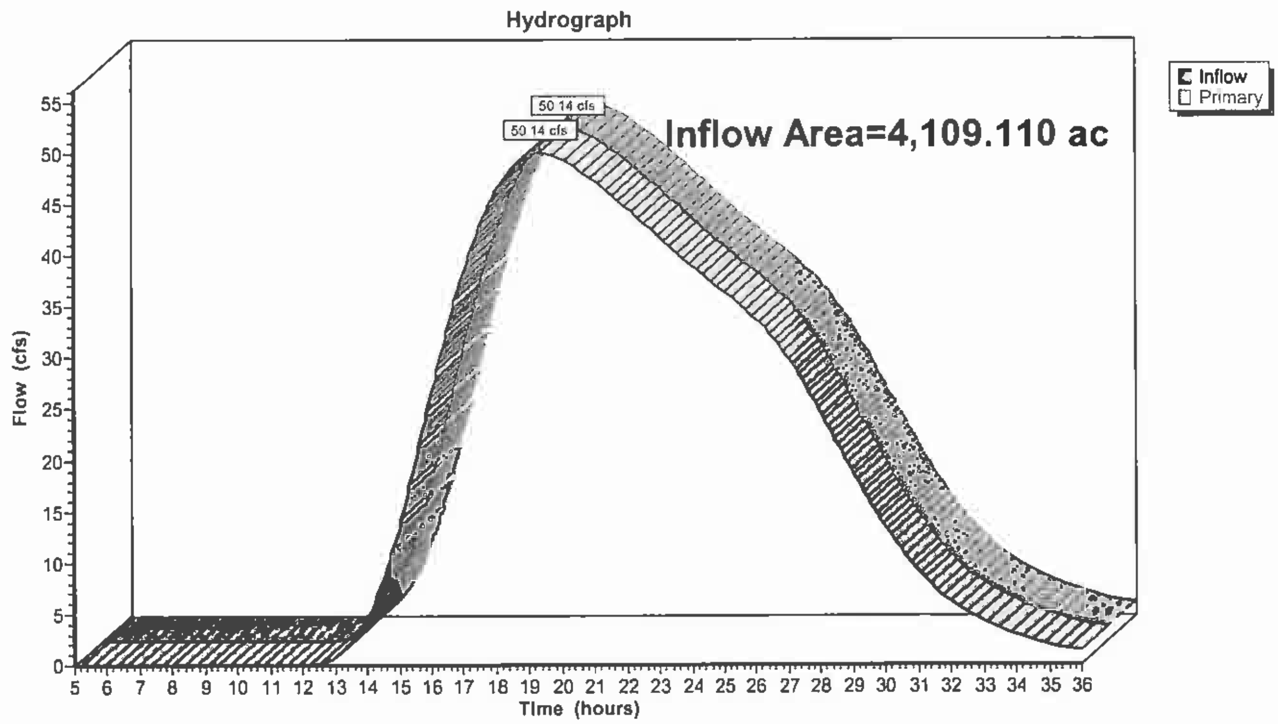


Link OUT6: Analysis Point #6

Inflow Area =	4,109.110 ac,	Inflow Depth > 0.14"	for 2-YR event		
Inflow =	50.14 cfs @	19.32 hrs,	Volume=	48.293 af	
Primary =	50.14 cfs @	19.32 hrs,	Volume=	48.293 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT6: Analysis Point #6

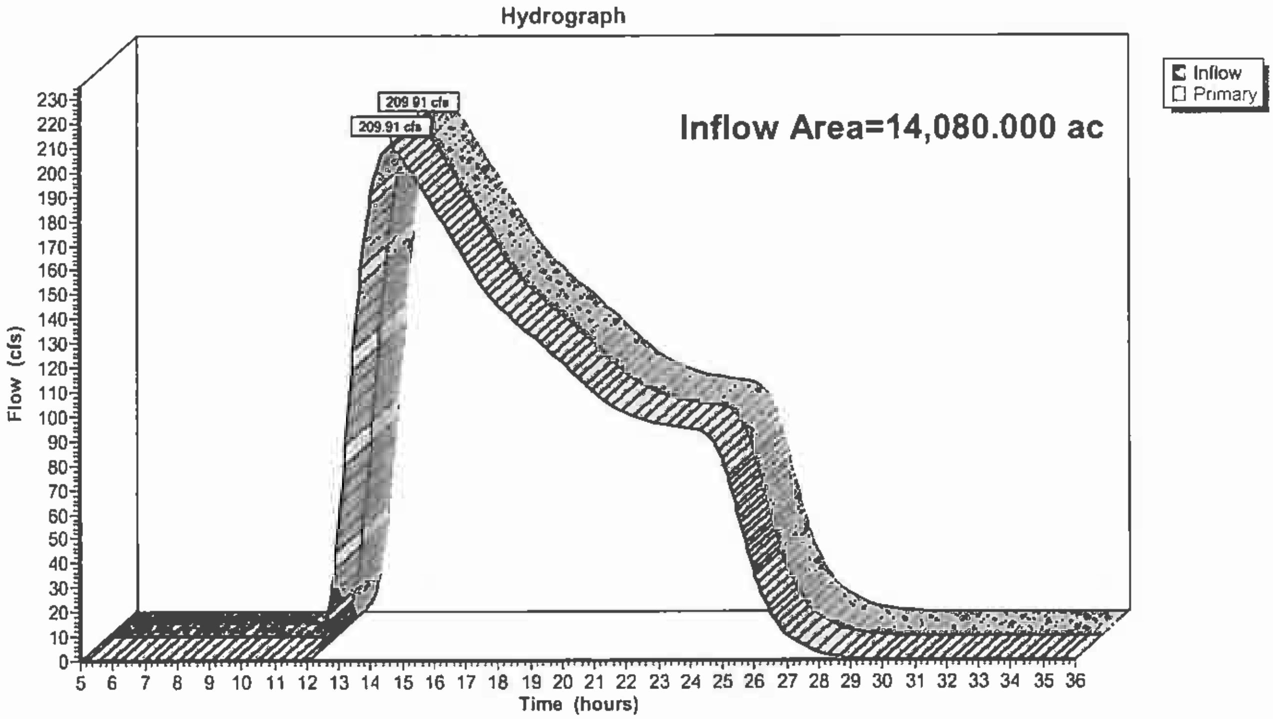


Link OUT7: Analysis Point #7

Inflow Area = 14,080.000 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 209.91 cfs @ 14.63 hrs, Volume= 143.575 af
Primary = 209.91 cfs @ 14.63 hrs, Volume= 143.575 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT7: Analysis Point #7

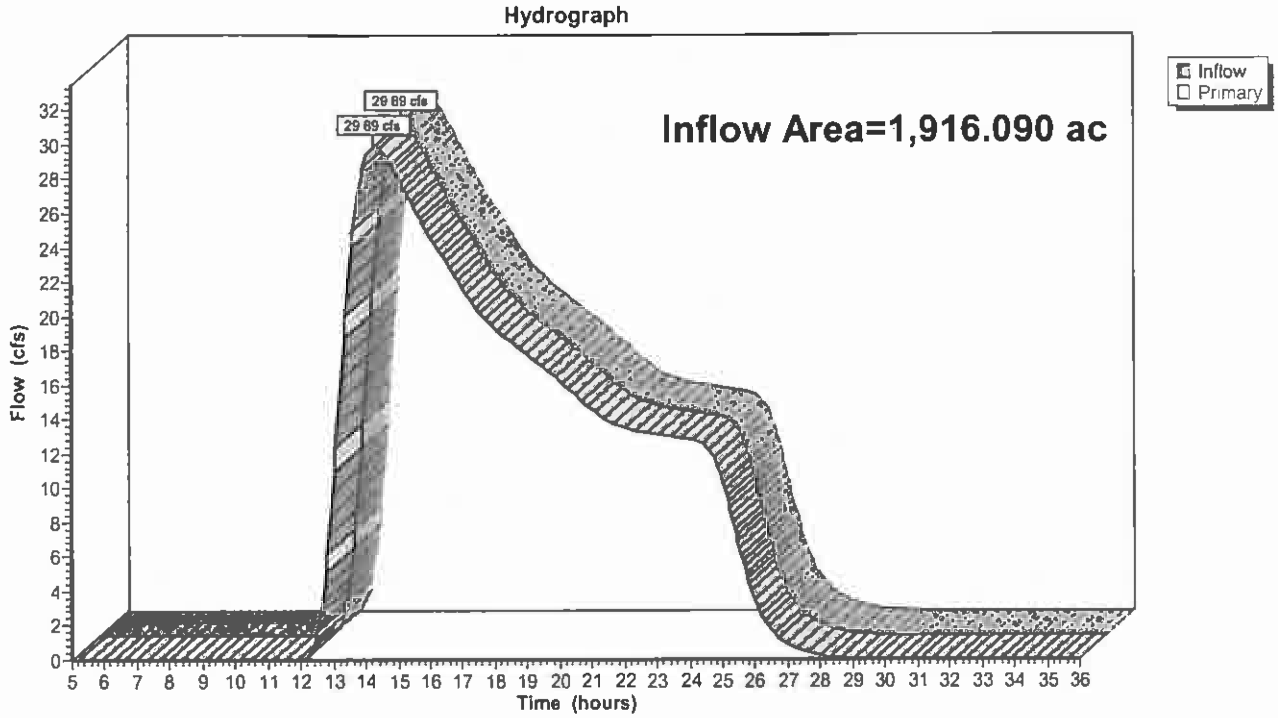


Link OUT8: Analysis Point #8

Inflow Area = 1,916.090 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 29.89 cfs @ 14.25 hrs, Volume= 19.539 af
Primary = 29.89 cfs @ 14.25 hrs, Volume= 19.539 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT8: Analysis Point #8

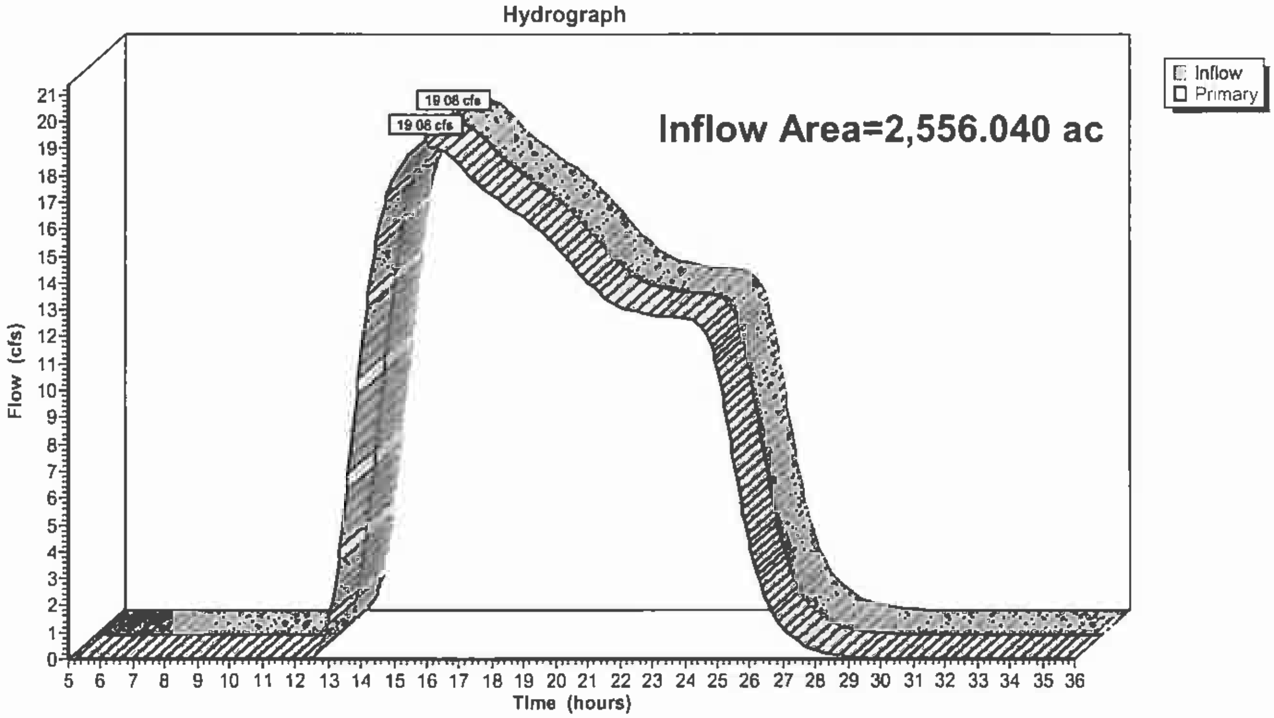


Link OUT9: Analysis Point #9

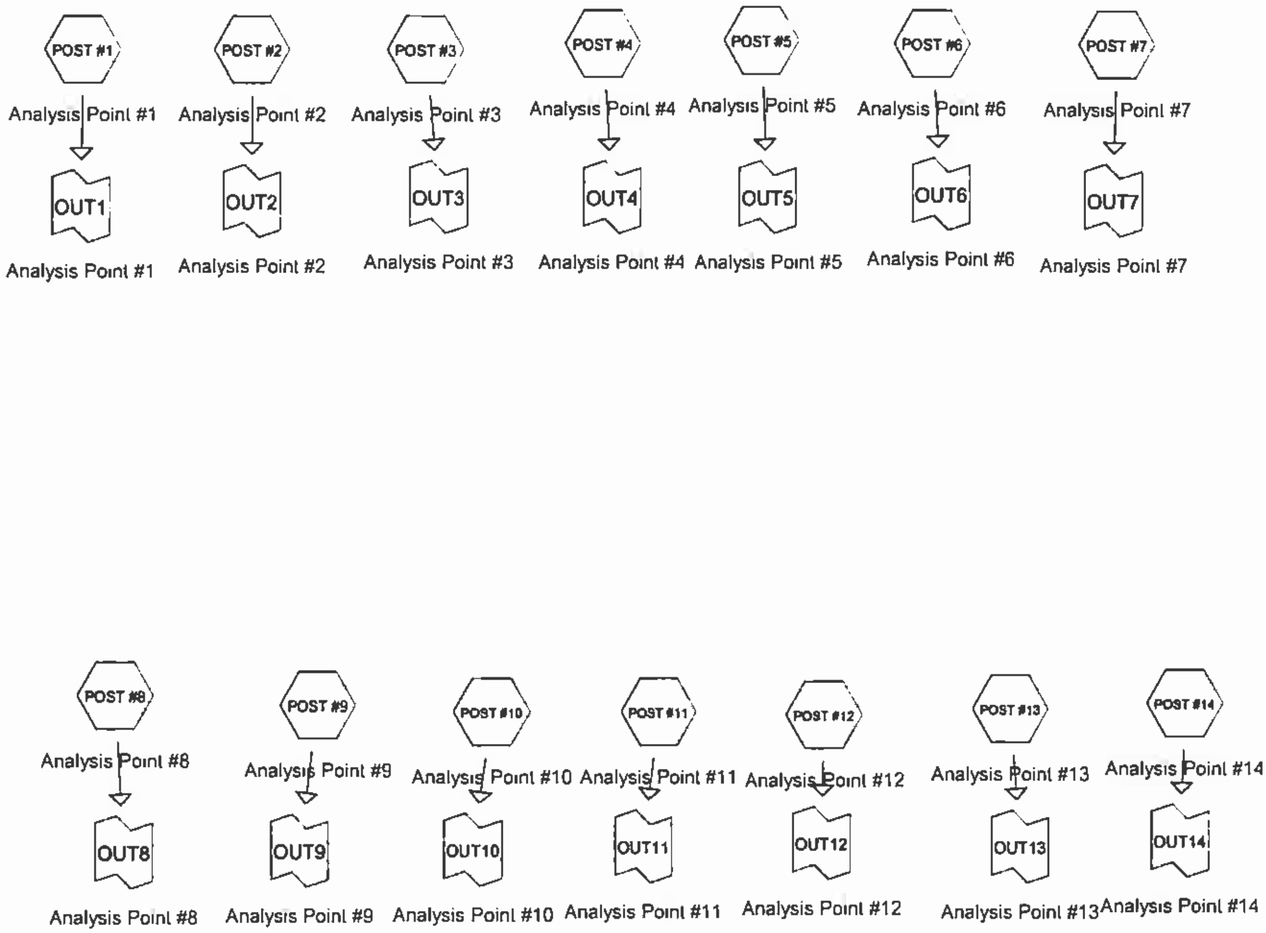
Inflow Area = 2,556.040 ac, Inflow Depth = 0.07" for 2-YR event
Inflow = 19.08 cfs @ 15.95 hrs, Volume= 15.399 af
Primary = 19.08 cfs @ 15.95 hrs, Volume= 15.399 af, Atten= 0%, Lag= 0.0 min

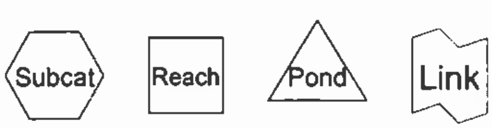
Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT9: Analysis Point #9



2-Year Post-Development Model Results





Drainage Diagram for 07090-POST-DEVELOPMENT
Prepared by Horizons Engineering, PLLC (JCD) 7/10/2008
HydroCAD® 8.00 s/n 002765 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
19.420	30	Brush, Good, HSG A (POST #7)
27.660	32	Woods, Good, HSG A (POST #7)
11.560	36	Brush, Good, HSG B (POST #1,POST #11,POST #2,POST #7)
456.603	42	Woods, Good, HSG B (POST #1,POST #11,POST #12,POST #2,POST #7)
2,847.773	49	Brush, Good, HSG C (POST #1,POST #11,POST #2,POST #3,POST #4,POST #5,POST #6
13,119.094	53	Woods, Good, HSG C (POST #1,POST #10,POST #11,POST #12,POST #13,POST #14,PC
1,347.867	55	Brush, Good, HSG D (POST #10,POST #11,POST #12,POST #5,POST #6,POST #7,POST
15,052.386	58	Woods, Good, HSG D (POST #10,POST #11,POST #12,POST #13,POST #14,POST #3,PC
120.495	89	Gravel roads, HSG C (POST #1,POST #10,POST #11,POST #12,POST #13,POST #2,POS
227.520	98	Water (POST #6,POST #7)
33,230.378		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment POST #1: Analysis Point #1 Runoff Area=101.010 ac Runoff Depth=0.05"
Flow Length=4,123' Tc=42.1 min CN=50 Runoff=0.48 cfs 0.385 af

Subcatchment POST #10: Analysis Point #10 Runoff Area=2,171.342 ac Runoff Depth=0.12"
Flow Length=15,514' Tc=124.0 min CN=55 Runoff=32.33 cfs 22.141 af

Subcatchment POST #11: Analysis Point #11 Runoff Area=3,602.956 ac Runoff Depth=0.16"
Flow Length=23,248' Tc=88.9 min CN=57 Runoff=94.10 cfs 48.775 af

Subcatchment POST #12: Analysis Point #12 Runoff Area=1,276.260 ac Runoff Depth=0.14"
Flow Length=16,392' Tc=50.3 min CN=56 Runoff=31.75 cfs 15.075 af

Subcatchment POST #13: Analysis Point #13 Runoff Area=1,131.820 ac Runoff Depth=0.12"
Flow Length=15,069' Tc=68.3 min CN=55 Runoff=19.78 cfs 11.541 af

Subcatchment POST #14: Analysis Point #14 Runoff Area=647.054 ac Runoff Depth=0.14"
Flow Length=6,304' Tc=48.1 min CN=56 Runoff=16.28 cfs 7.643 af

Subcatchment POST #2: Analysis Point #2 Runoff Area=224.420 ac Runoff Depth=0.09"
Flow Length=4,765' Tc=43.4 min CN=53 Runoff=2.45 cfs 1.639 af

Subcatchment POST #3: Analysis Point #3 Runoff Area=639.610 ac Runoff Depth=0.10"
Flow Length=10,660' Tc=166.3 min CN=54 Runoff=7.04 cfs 5.560 af

Subcatchment POST #4: Analysis Point #4 Runoff Area=65.790 ac Runoff Depth=0.07"
Flow Length=4,314' Tc=47.5 min CN=52 Runoff=0.53 cfs 0.396 af

Subcatchment POST #5: Analysis Point #5 Runoff Area=708.580 ac Runoff Depth=0.10"
Flow Length=6,798' Tc=118.5 min CN=54 Runoff=8.49 cfs 6.160 af

Subcatchment POST #6: Analysis Point #6 Runoff Area=4,109.066 ac Runoff Depth>0.14"
Flow Length=35,165' Tc=386.5 min CN=56 Runoff=50.14 cfs 48.293 af

Subcatchment POST #7: Analysis Point #7 Runoff Area=14,081.831 ac Runoff Depth=0.12"
Flow Length=31,171' Tc=123.2 min CN=55 Runoff=209.94 cfs 143.594 af

Subcatchment POST #8: Analysis Point #8 Runoff Area=1,915.733 ac Runoff Depth=0.12"
Flow Length=15,581' Tc=107.5 min CN=55 Runoff=29.88 cfs 19.535 af

Subcatchment POST #9: Analysis Point #9 Runoff Area=2,554.906 ac Runoff Depth=0.07"
Flow Length=13,053' Tc=116.5 min CN=52 Runoff=19.07 cfs 15.392 af

Link OUT1: Analysis Point #1 Inflow=0.48 cfs 0.385 af
Primary=0.48 cfs 0.385 af

Link OUT10: Analysis Point #10	Inflow=32.33 cfs 22.141 af Primary=32.33 cfs 22.141 af
Link OUT11: Analysis Point #11	Inflow=94.10 cfs 48.775 af Primary=94.10 cfs 48.775 af
Link OUT12: Analysis Point #12	Inflow=31.75 cfs 15.075 af Primary=31.75 cfs 15.075 af
Link OUT13: Analysis Point #13	Inflow=19.78 cfs 11.541 af Primary=19.78 cfs 11.541 af
Link OUT14: Analysis Point #14	Inflow=16.28 cfs 7.643 af Primary=16.28 cfs 7.643 af
Link OUT2: Analysis Point #2	Inflow=2.45 cfs 1.639 af Primary=2.45 cfs 1.639 af
Link OUT3: Analysis Point #3	Inflow=7.04 cfs 5.560 af Primary=7.04 cfs 5.560 af
Link OUT4: Analysis Point #4	Inflow=0.53 cfs 0.396 af Primary=0.53 cfs 0.396 af
Link OUT5: Analysis Point #5	Inflow=8.49 cfs 6.160 af Primary=8.49 cfs 6.160 af
Link OUT6: Analysis Point #6	Inflow=50.14 cfs 48.293 af Primary=50.14 cfs 48.293 af
Link OUT7: Analysis Point #7	Inflow=209.94 cfs 143.594 af Primary=209.94 cfs 143.594 af
Link OUT8: Analysis Point #8	Inflow=29.88 cfs 19.535 af Primary=29.88 cfs 19.535 af
Link OUT9: Analysis Point #9	Inflow=19.07 cfs 15.392 af Primary=19.07 cfs 15.392 af

Total Runoff Area = 33,230.378 ac Runoff Volume = 346.131 af Average Runoff Depth = 0.12"
99.32% Pervious Area = 33,002.858 ac 0.68% Impervious Area = 227.520 ac

Subcatchment POST #1: Analysis Point #1

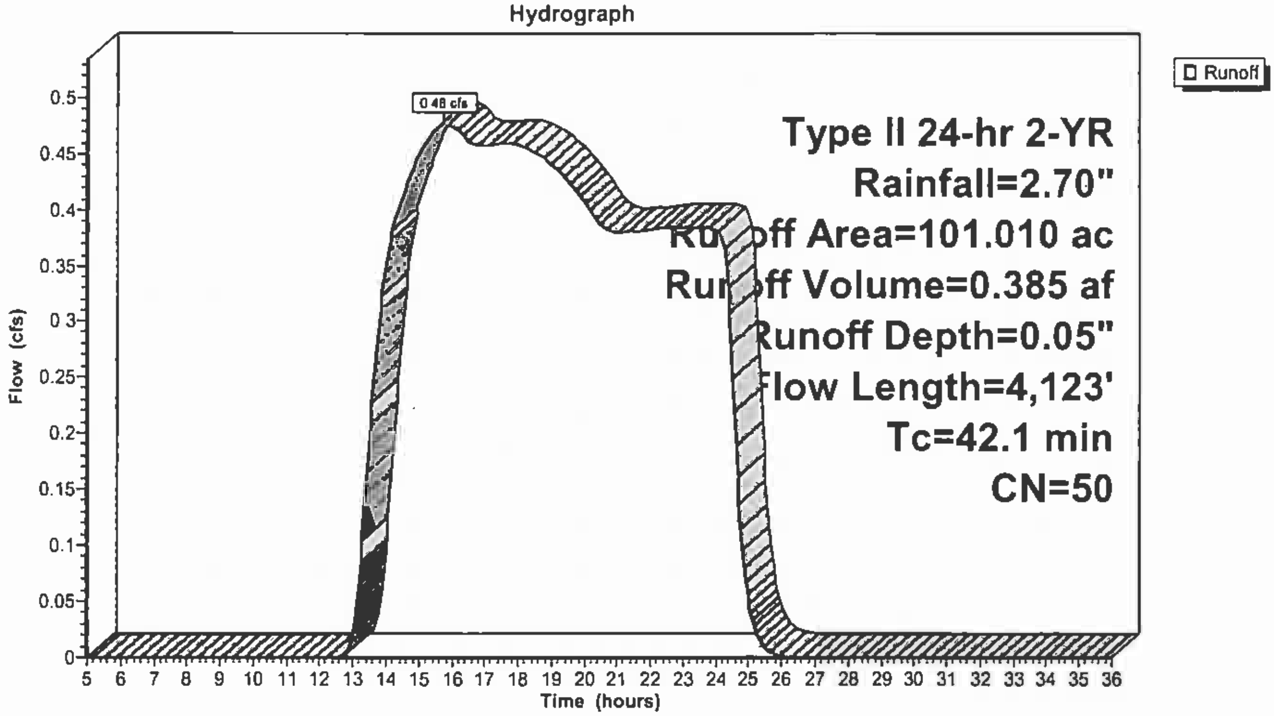
Runoff = 0.48 cfs @ 15.75 hrs, Volume= 0.385 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
0.560	89	Gravel roads, HSG C
0.830	36	Brush, Good, HSG B
3.960	42	Woods, Good, HSG B
60.981	49	Brush, Good, HSG C
34.679	53	Woods, Good, HSG C
101.010	50	Weighted Average
101.010		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.3	1,719	0.2560	2.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.5	386	0.1400	2.62		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
18.1	1,918	0.1250	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
42.1	4,123	Total			

Subcatchment POST #1: Analysis Point #1



Subcatchment POST #10: Analysis Point #10

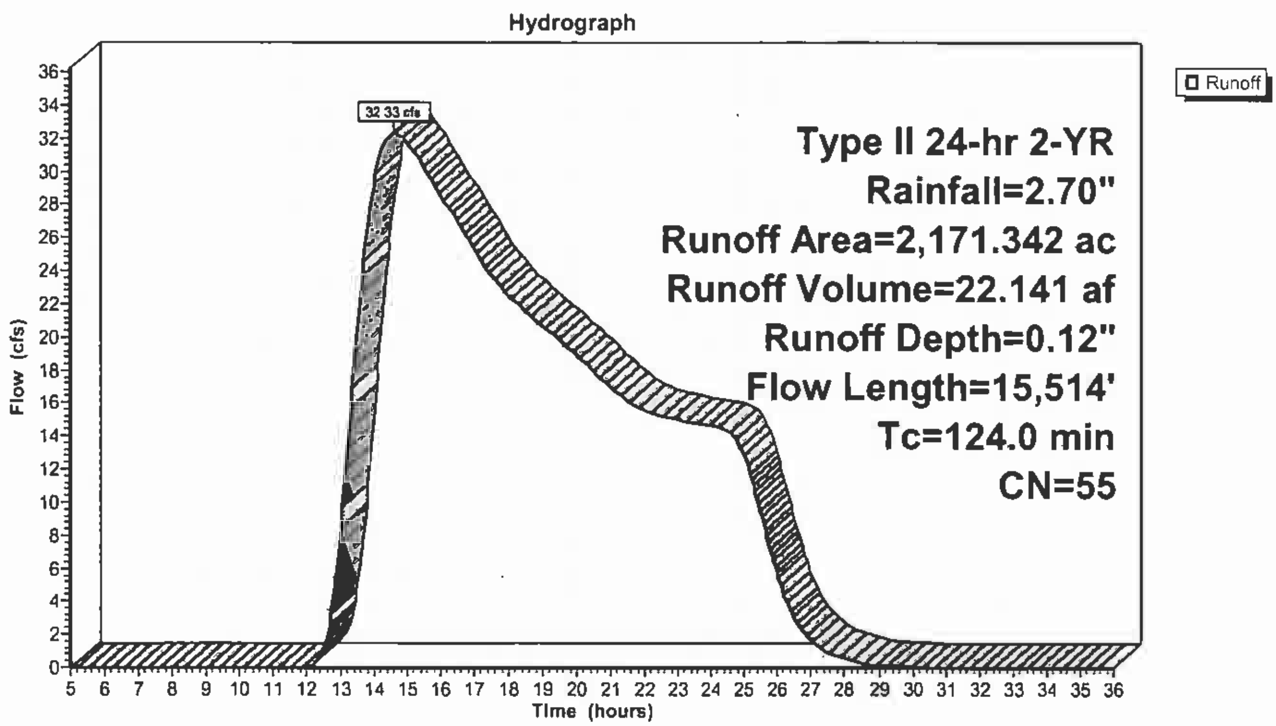
Runoff = 32.33 cfs @ 14.60 hrs, Volume= 22.141 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
5.477	89	Gravel roads, HSG C
1,198.040	53	Woods, Good, HSG C
4.019	55	Brush, Good, HSG D
963.806	58	Woods, Good, HSG D
2,171.342	55	Weighted Average
2,171.342		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	100	0.0250	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
92.7	10,588	0.1450	1.90		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
9.9	4,826	0.0250	8.12	172.58	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
124.0	15,514	Total			

Subcatchment POST #10: Analysis Point #10



Subcatchment POST #11: Analysis Point #11

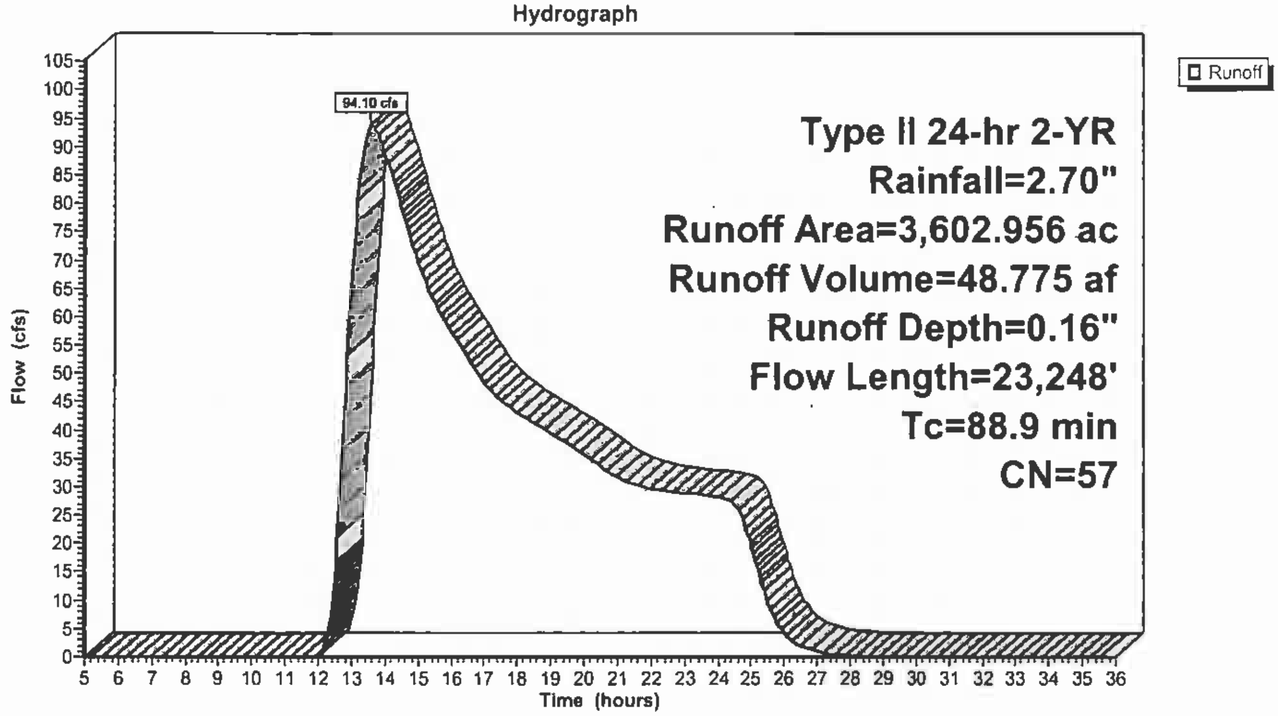
Runoff = 94.10 cfs @ 13.55 hrs, Volume= 48.775 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
7.299	89	Gravel roads, HSG C
0.400	36	Brush, Good, HSG B
99.480	42	Woods, Good, HSG B
3.668	49	Brush, Good, HSG C
726.502	53	Woods, Good, HSG C
20.991	55	Brush, Good, HSG D
2,744.616	58	Woods, Good, HSG D
3,602.956	57	Weighted Average
3,602.956		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
33.0	3,286	0.1100	1.66		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
36.0	19,862	0.0320	9.19	195.25	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
88.9	23,248	Total			

Subcatchment POST #11: Analysis Point #11



Subcatchment POST #12: Analysis Point #12

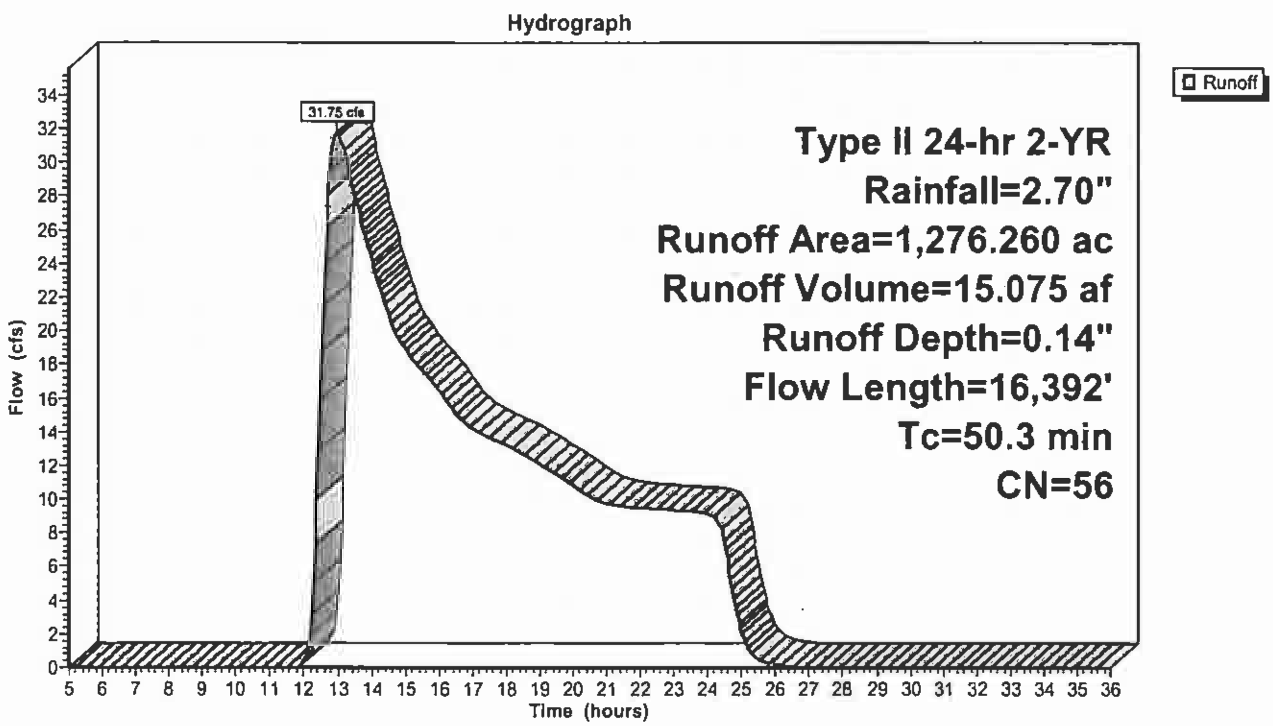
Runoff = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
5.567	89	Gravel roads, HSG C
91.980	42	Woods, Good, HSG B
300.340	53	Woods, Good, HSG C
5.336	55	Brush, Good, HSG D
873.037	58	Woods, Good, HSG D
1,276.260	56	Weighted Average
1,276.260		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.3	3,147	0.2950	2.72		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
14.8	13,145	0.0830	14.80	314.45	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
50.3	16,392	Total			

Subcatchment POST #12: Analysis Point #12



Subcatchment POST #13: Analysis Point #13

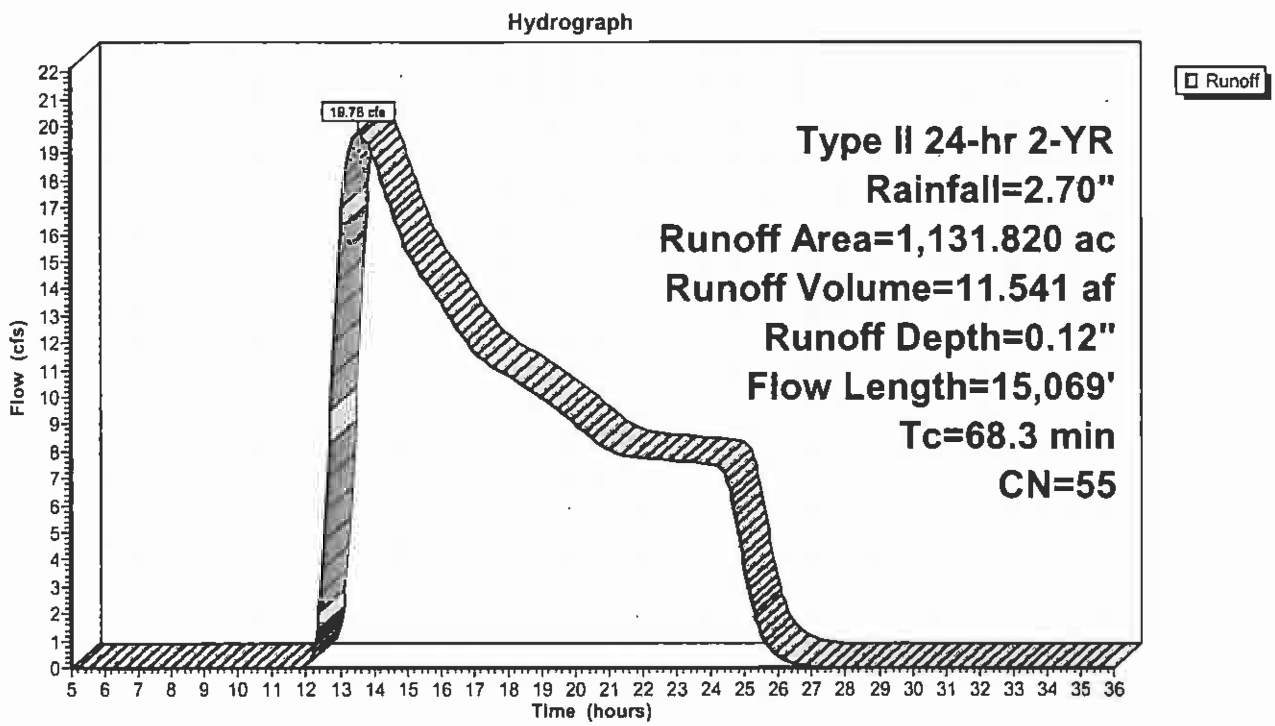
Runoff = 19.78 cfs @ 13.53 hrs, Volume= 11.541 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
3.626	89	Gravel roads, HSG C
714.483	53	Woods, Good, HSG C
413.711	58	Woods, Good, HSG D
1,131.820	55	Weighted Average
1,131.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
33.8	4,308	0.1810	2.13		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
5.7	6,301	0.1280	18.38	390.50	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
8.9	4,360	0.0250	8.12	172.58	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
68.3	15,069	Total			

Subcatchment POST #13: Analysis Point #13



Subcatchment POST #14: Analysis Point #14

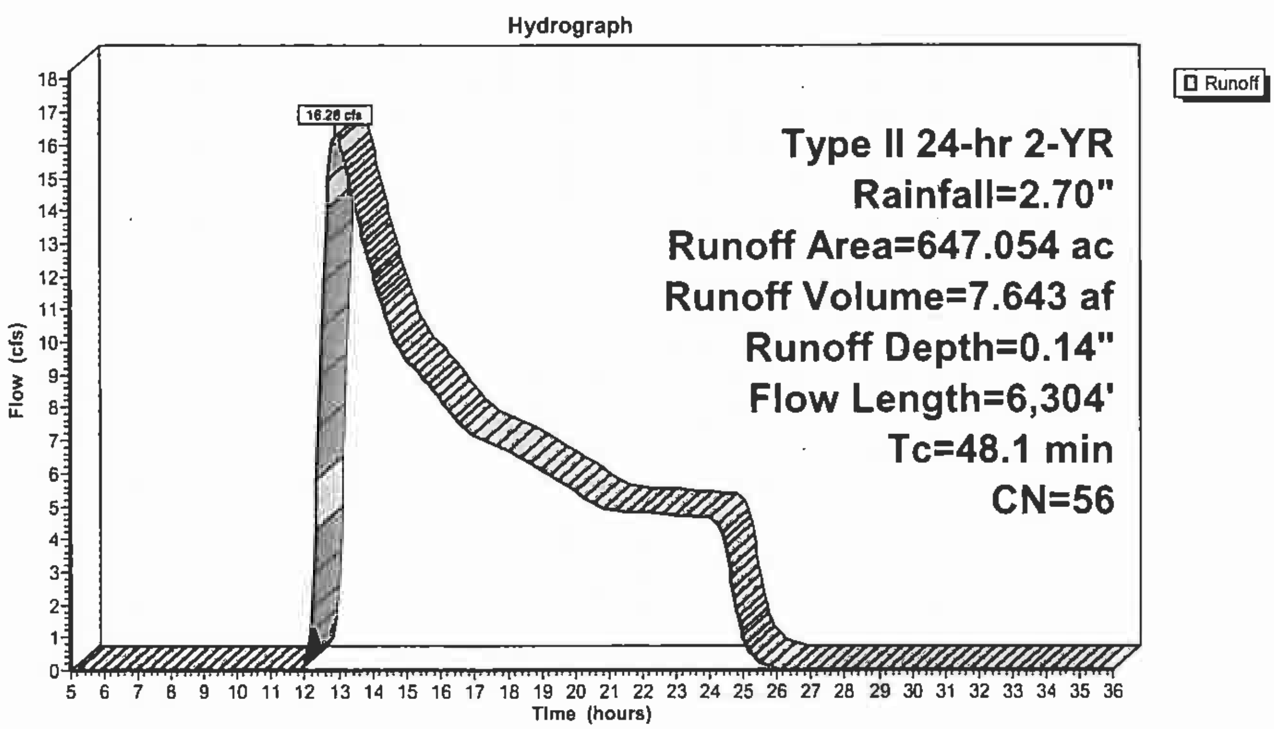
Runoff = 16.28 cfs @ 12.92 hrs, Volume= 7.643 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1.437	53	Woods, Good, HSG C
195.264	53	Woods, Good, HSG C
450.353	58	Woods, Good, HSG D
647.054	56	Weighted Average
647.054		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.4	2,275	0.3200	2.83		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.9	3,929	0.1070	16.80	357.03	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
48.1	6,304	Total			

Subcatchment POST #14: Analysis Point #14



Subcatchment POST #2: Analysis Point #2

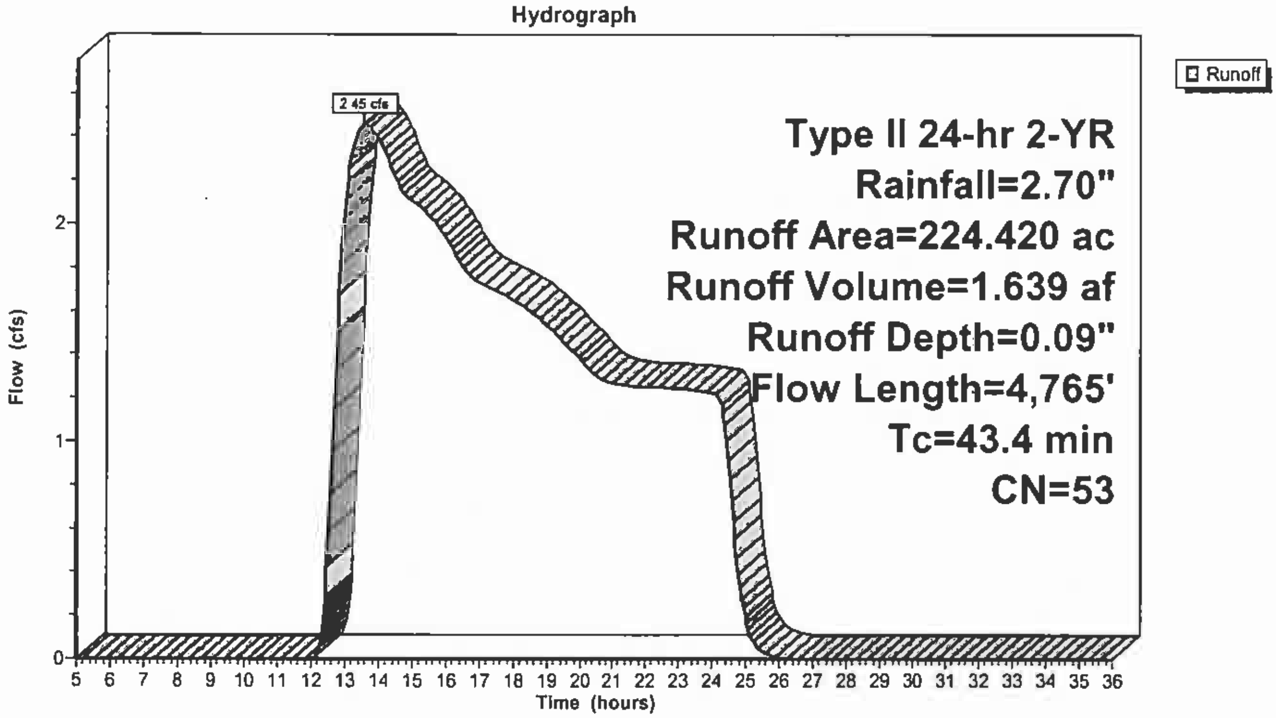
Runoff = 2.45 cfs @ 13.55 hrs, Volume= 1.639 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
2.810	89	Gravel roads, HSG C
0.070	36	Brush, Good, HSG B
0.070	42	Woods, Good, HSG B
11.250	49	Brush, Good, HSG C
210.220	53	Woods, Good, HSG C
224.420	53	Weighted Average
224.420		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.0	3,175	0.1940	2.20		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	55	0.0600	15.29	48.02	**Circular Channel (pipe), CV4A** Diam= 24.0" Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015
1.3	700	0.0500	8.83	106.00	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
0.1	46	0.0380	12.17	38.22	**Circular Channel (pipe), CV4** Diam= 24.0" Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015
4.6	387	0.0770	1.39		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	302	0.0150	4.84	58.06	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
43.4	4,765	Total			

Subcatchment POST #2: Analysis Point #2



Subcatchment POST #3: Analysis Point #3

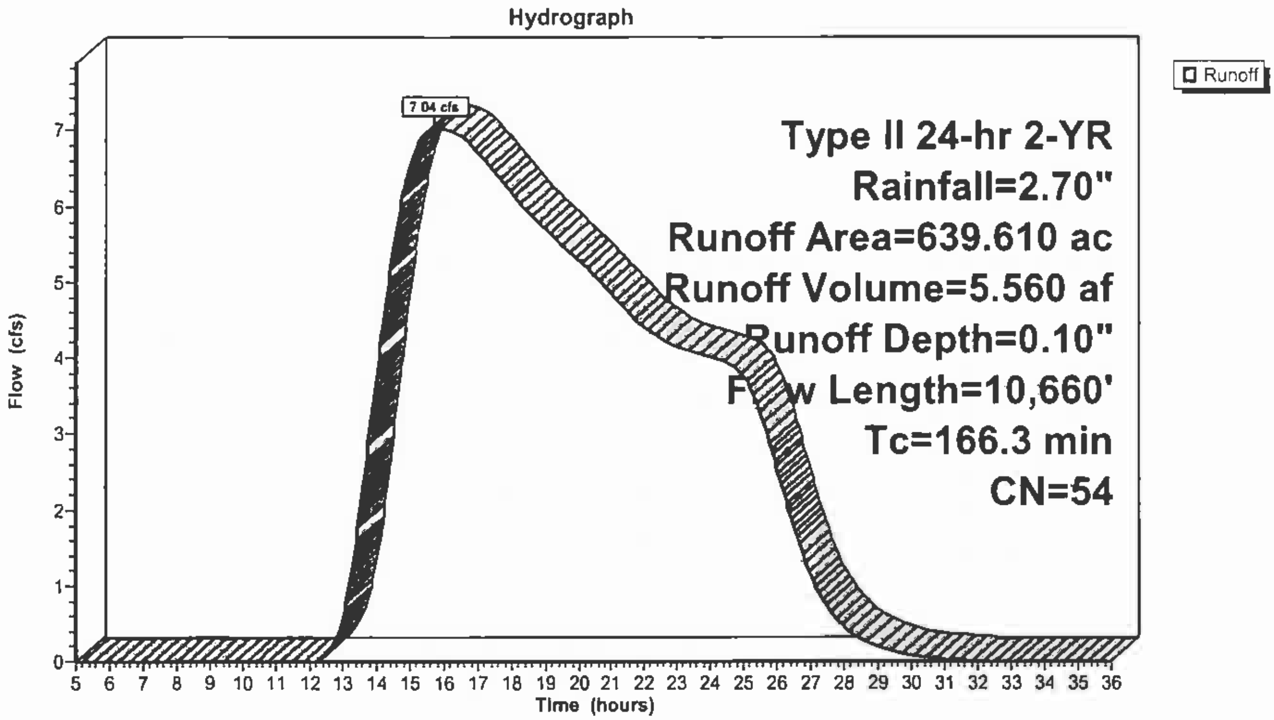
Runoff = 7.04 cfs @ 15.75 hrs, Volume= 5.560 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1.220	89	Gravel roads, HSG C
19.610	49	Brush, Good, HSG C
425.780	53	Woods, Good, HSG C
193.000	58	Woods, Good, HSG D
639.610	54	Weighted Average
639.610		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.1100	0.08		**Sheet Flow, sheet** Woods: Dense underbrush n= 0.800 P2= 2.70"
102.1	6,200	0.0410	1.01		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.1	1,900	0.0680	10.31	116.02	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=6.00' D=1.50' Z= 1.0 '/' Top.W=9.00' n= 0.040
0.0	32	0.0625	17.00	883.94	**Trap/Vee/Rect Channel Flow, box culvert** Bot.W=13.00' D=4.00' n= 0.040
40.5	2,428	0.0400	1.00		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
166.3	10,660	Total			

Subcatchment POST #3: Analysis Point #3



Subcatchment POST #4: Analysis Point #4

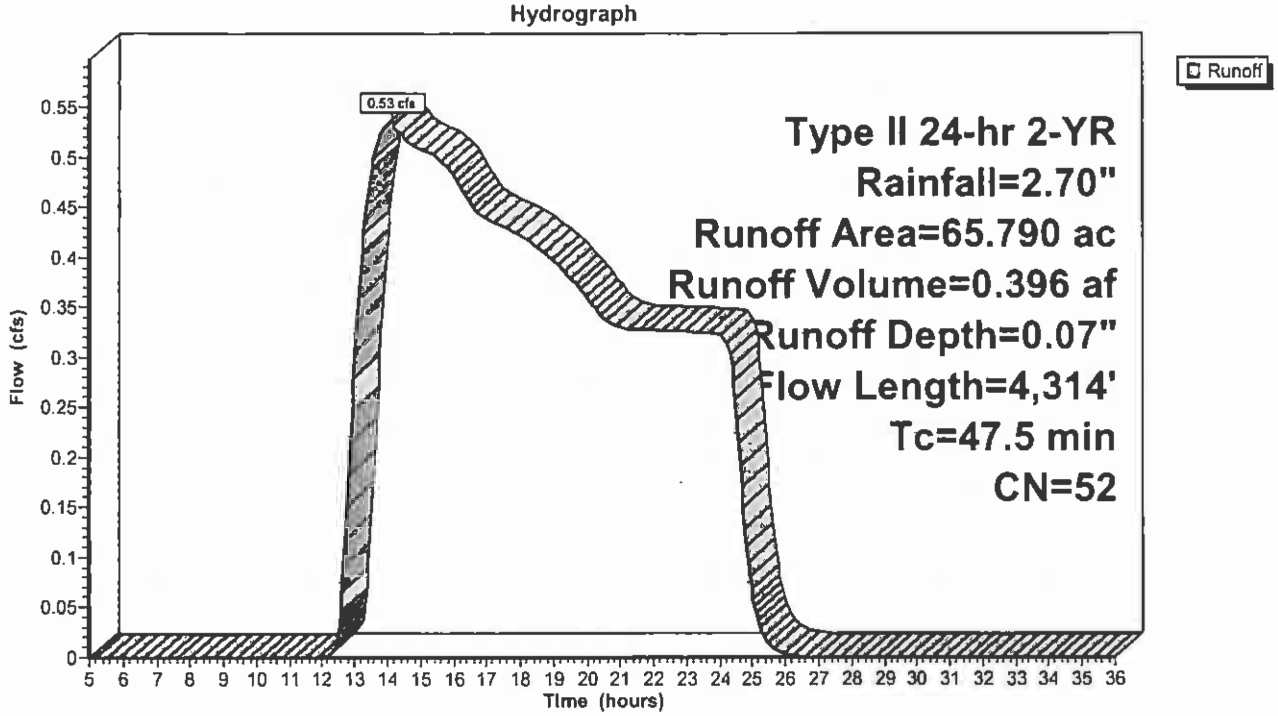
Runoff = 0.53 cfs @ 14.10 hrs, Volume= 0.396 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
0.580	89	Gravel roads, HSG C
29.800	49	Brush, Good, HSG C
35.410	53	Woods, Good, HSG C
65.790	52	Weighted Average
65.790		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0900	0.13		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
15.4	1,750	0.1430	1.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.7	965	0.0780	9.68	58.09	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.040
0.1	40	0.0100	5.15	9.10	**Circular Channel (pipe), culvert** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.015
17.5	1,459	0.0770	1.39		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
47.5	4,314	Total			

Subcatchment POST #4: Analysis Point #4



Subcatchment POST #5: Analysis Point #5

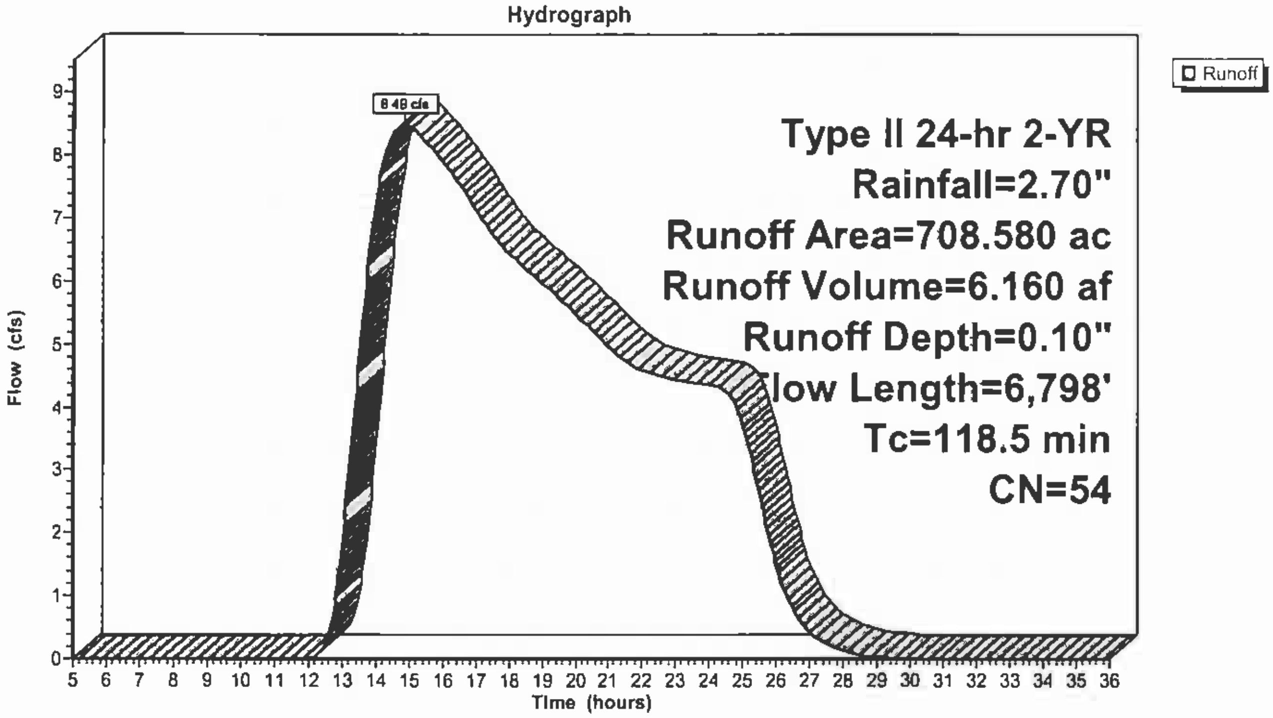
Runoff = 8.49 cfs @ 14.85 hrs, Volume= 6.160 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
2.300	89	Gravel roads, HSG C
23.080	49	Brush, Good, HSG C
600.860	53	Woods, Good, HSG C
15.790	55	Brush, Good, HSG D
66.550	58	Woods, Good, HSG D
708.580	54	Weighted Average
708.580		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
39.1	3,800	0.1050	1.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	410	0.1120	11.86	80.07	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
41.0	1,738	0.0200	0.71		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
17.9	750	0.0100	0.70		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
118.5	6,798	Total			

Subcatchment POST #5: Analysis Point #5



Subcatchment POST #6: Analysis Point #6

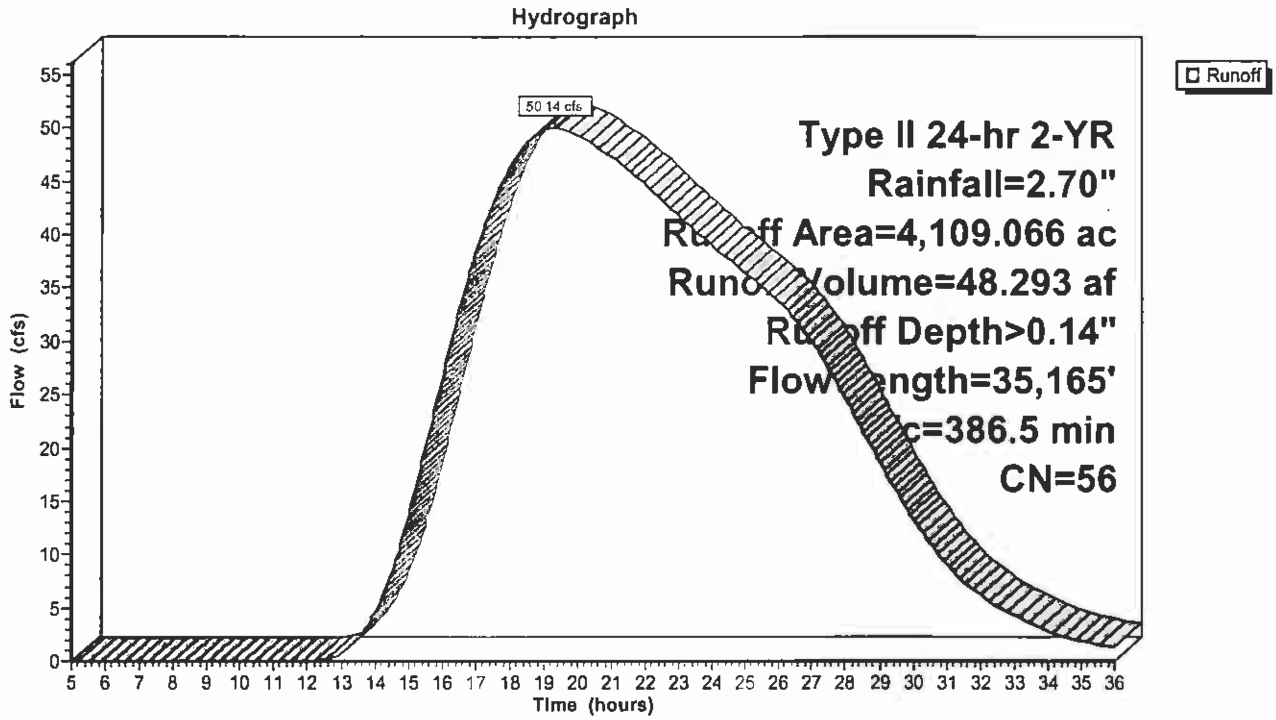
Runoff = 50.14 cfs @ 19.32 hrs, Volume= 48.293 af, Depth> 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
147.410	98	Water
22.511	89	Gravel roads, HSG C
716.479	49	Brush, Good, HSG C
1,640.880	53	Woods, Good, HSG C
120.700	55	Brush, Good, HSG D
1,461.086	58	Woods, Good, HSG D
4,109.066	56	Weighted Average
3,961.656		Pervious Area
147.410		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
39.0	5,035	0.1850	2.15		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.4	1,300	0.0250	6.47	64.67	**Trap/Vee/Rect Channel Flow, channel** Bot.W=3.00' D=2.00' Z= 1.0 '/' Top.W=7.00' n= 0.040
41.8	1,710	0.0500	0.68		**Lag/CN Method,**
9.8	5,500	0.0400	9.38	140.73	**Trap/Vee/Rect Channel Flow, 2** Bot.W=3.50' D=2.50' Z= 1.0 '/' Top.W=8.50' n= 0.040
3.4	4,255		20.85		**Lake or Reservoir,** Mean Depth= 13.50'
3.5	1,400	0.0170	6.70	142.31	**Trap/Vee/Rect Channel Flow, 3** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
2.4	1,740		12.17		**Lake or Reservoir,** Mean Depth= 4.60'
11.3	5,640	0.0190	8.29	445.86	**Trap/Vee/Rect Channel Flow, 4** Bot.W=19.00' D=2.50' Z= 1.0 '/' Top.W=24.00' n= 0.040
0.6	350		9.83		**Lake or Reservoir,** Mean Depth= 3.00'
1.5	930	0.0300	10.42	560.24	**Trap/Vee/Rect Channel Flow, 5** Bot.W=19.00' D=2.50' Z= 1.0 '/' Top.W=24.00' n= 0.040
110.8	2,725	0.0150	0.41		**Lag/CN Method,**
7.4	1,480	0.0030	3.31	186.37	**Trap/Vee/Rect Channel Flow, 6** Bot.W=20.00' D=2.50' Z= 1.0 '/' Top.W=25.00' n= 0.040
136.1	1,000	0.0020	0.12		**Lag/CN Method,**
3.7	2,000	0.0220	8.97	504.70	**Trap/Vee/Rect Channel Flow, 7** Bot.W=20.00' D=2.50' Z= 1.0 '/' Top.W=25.00' n= 0.040
386.5	35,165	Total			

Subcatchment POST #6: Analysis Point #6



Subcatchment POST #7: Analysis Point #7

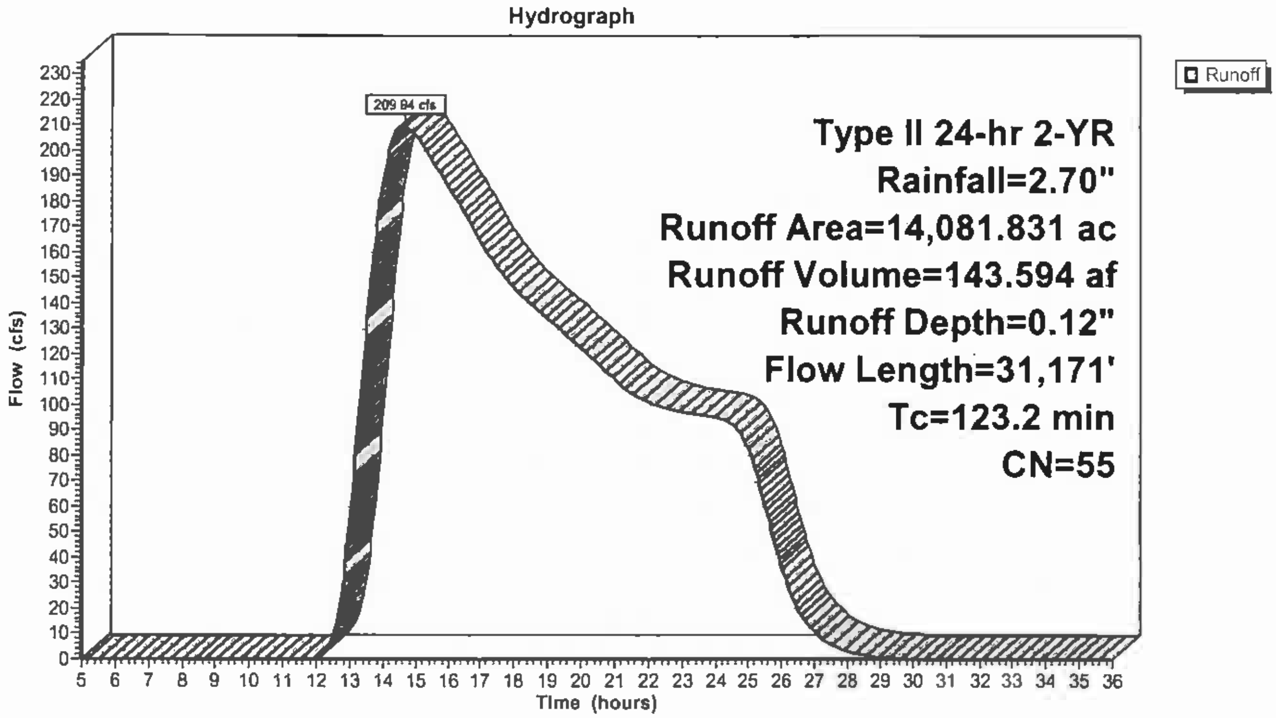
Runoff = 209.94 cfs @ 14.63 hrs, Volume= 143.594 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
80.110	98	Water
58.985	89	Gravel roads, HSG C
19.420	30	Brush, Good, HSG A
27.660	32	Woods, Good, HSG A
10.260	36	Brush, Good, HSG B
261.113	42	Woods, Good, HSG B
510.905	49	Brush, Good, HSG C
5,846.469	53	Woods, Good, HSG C
419.374	55	Brush, Good, HSG D
6,847.535	58	Woods, Good, HSG D
14,081.831	55	Weighted Average
14,001.721		Pervious Area
80.110		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1400	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
81.8	9,568	0.1520	1.95		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
7.9	6,381	0.0300	13.49	1,240.91	**Trap/Vee/Rect Channel Flow, channel Xs-2** Bot.W=19.00' D=4.00' Z= 1.0 '/' Top.W=27.00' n= 0.040
21.9	14,212	0.0160	10.79	2,115.29	**Trap/Vee/Rect Channel Flow, channel Xs-3** Bot.W=45.00' D=4.00' Z= 1.0 '/' Top.W=53.00' n= 0.040
0.9	910	0.0160	16.51	8,979.82	**Trap/Vee/Rect Channel Flow, channel Xs-4** Bot.W=60.00' D=8.00' Z= 1.0 '/' Top.W=76.00' n= 0.040
123.2	31,171	Total			

Subcatchment POST #7: Analysis Point #7



Subcatchment POST #8: Analysis Point #8

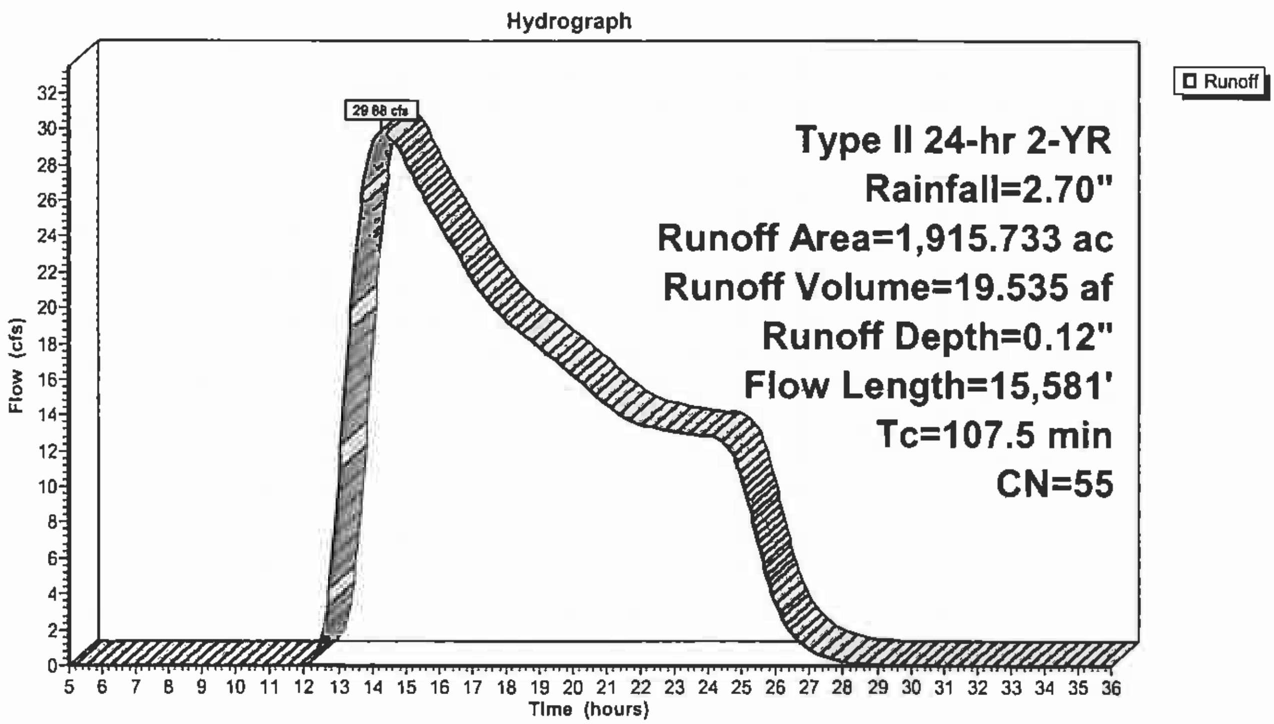
Runoff = 29.88 cfs @ 14.25 hrs, Volume= 19.535 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
1,146.060	53	Woods, Good, HSG C
31.200	55	Brush, Good, HSG D
737.002	58	Woods, Good, HSG D
0.657	89	Gravel roads, HSG C
0.814	55	Brush, Good, HSG D
1,915.733	55	Weighted Average
1,915.733		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0600	0.11		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
78.5	7,444	0.1000	1.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
13.9	8,037	0.0350	9.61	204.20	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
107.5	15,581	Total			

Subcatchment POST #8: Analysis Point #8



Subcatchment POST #9: Analysis Point #9

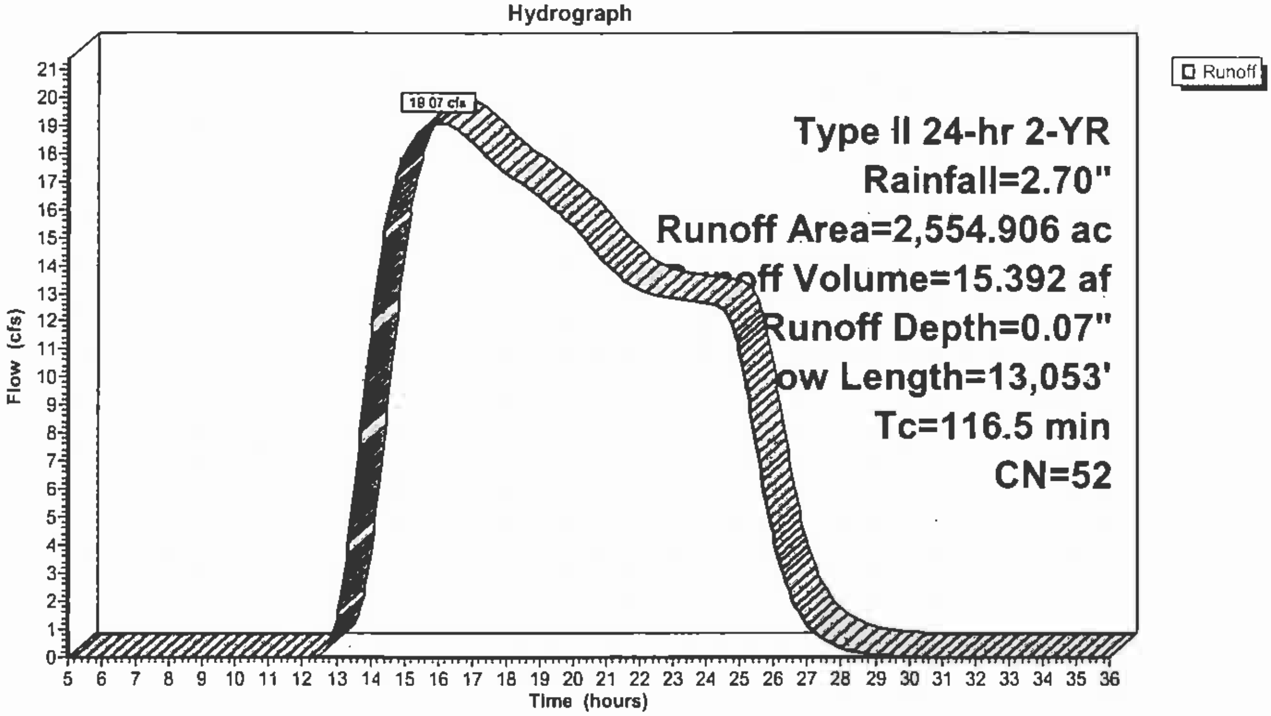
Runoff = 19.07 cfs @ 15.95 hrs, Volume= 15.392 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-YR Rainfall=2.70"

Area (ac)	CN	Description
8.903	89	Gravel roads, HSG C
1,472.000	49	Brush, Good, HSG C
42.670	53	Woods, Good, HSG C
729.643	55	Brush, Good, HSG D
301.690	58	Woods, Good, HSG D
2,554.906	52	Weighted Average
2,554.906		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
56.3	2,136	0.0160	0.63		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.5	1,417	0.0330	9.33	198.28	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
20.3	4,425	0.0050	3.63	77.18	**Trap/Vee/Rect Channel Flow, bog** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
6.6	4,975	0.0600	12.58	267.36	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
116.5	13,053	Total			

Subcatchment POST #9: Analysis Point #9

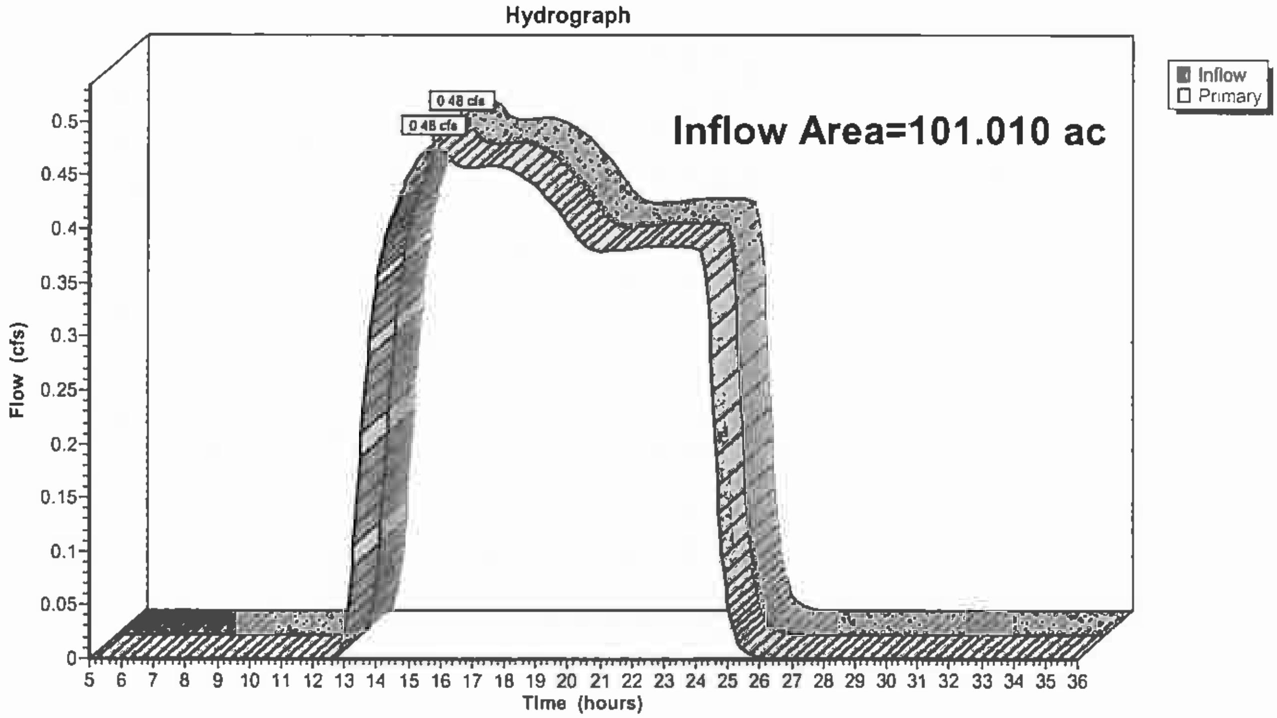


Link OUT1: Analysis Point #1

Inflow Area =	101.010 ac, Inflow Depth = 0.05" for 2-YR event	
Inflow =	0.48 cfs @ 15.75 hrs, Volume=	0.385 af
Primary =	0.48 cfs @ 15.75 hrs, Volume=	0.385 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT1: Analysis Point #1

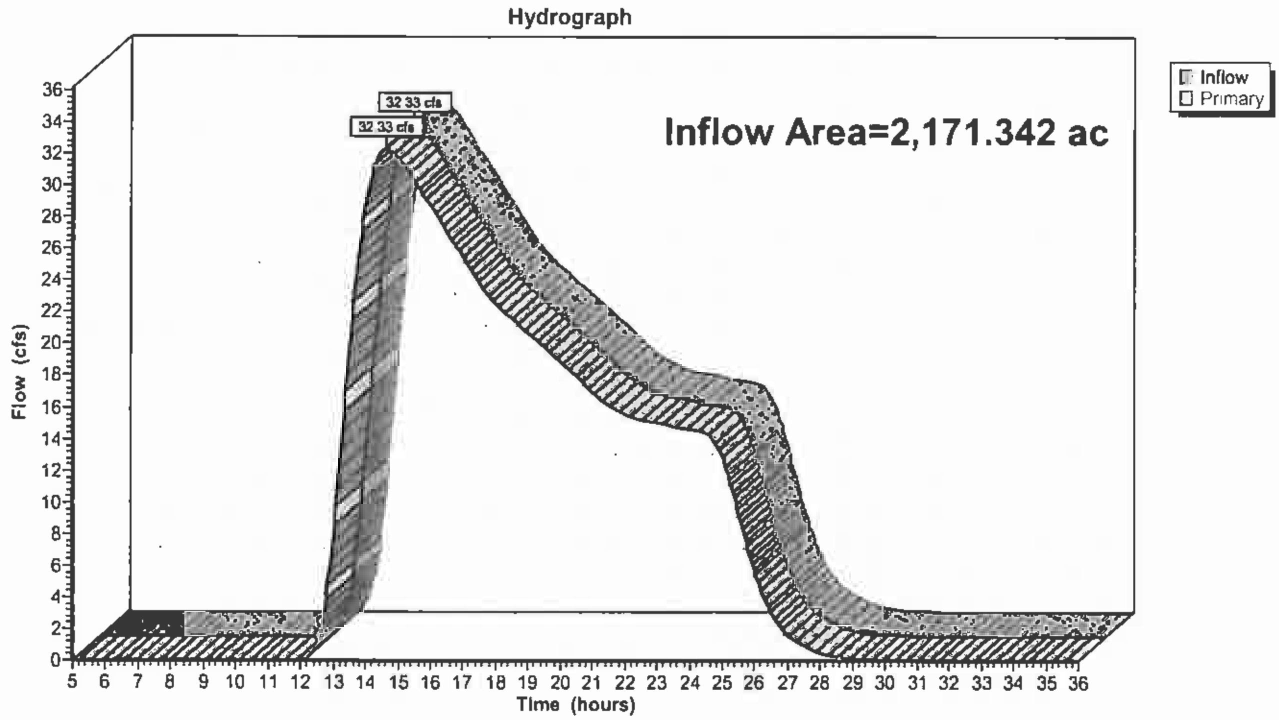


Link OUT10: Analysis Point #10

Inflow Area = 2,171.342 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 32.33 cfs @ 14.60 hrs, Volume= 22.141 af
Primary = 32.33 cfs @ 14.60 hrs, Volume= 22.141 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT10: Analysis Point #10

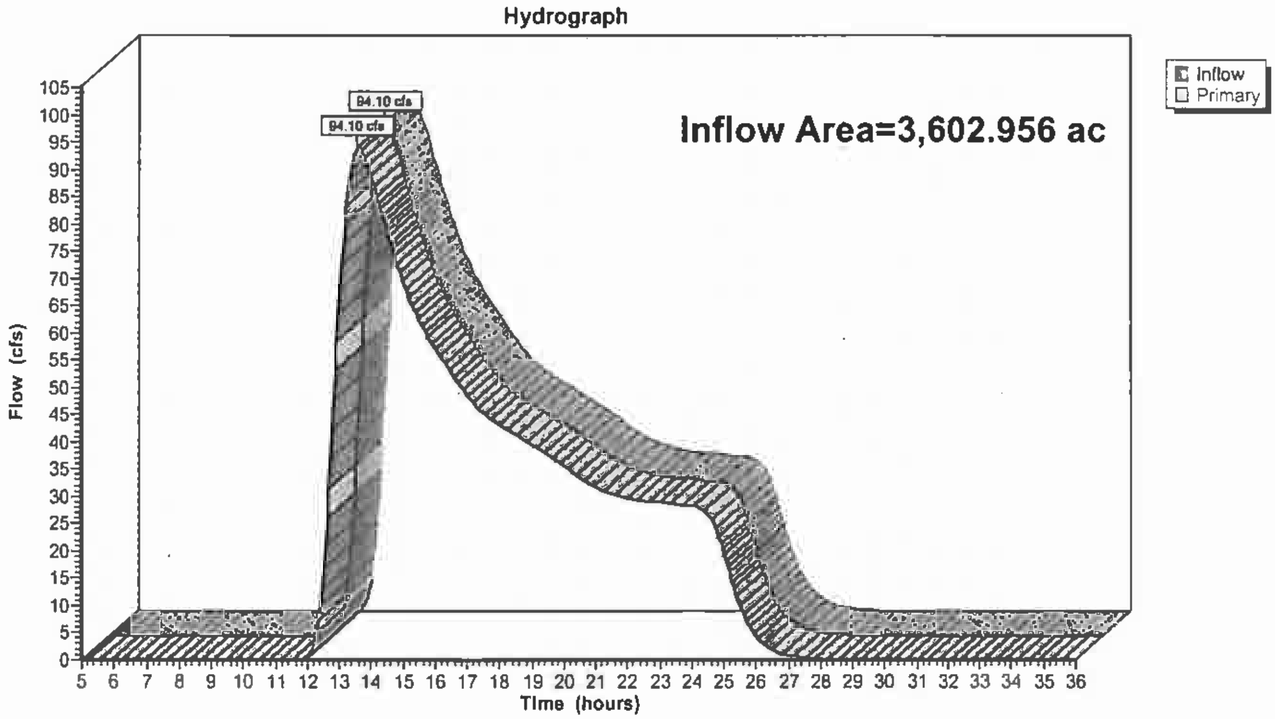


Link OUT11: Analysis Point #11

Inflow Area = 3,602.956 ac, Inflow Depth = 0.16" for 2-YR event
Inflow = 94.10 cfs @ 13.55 hrs, Volume= 48.775 af
Primary = 94.10 cfs @ 13.55 hrs, Volume= 48.775 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT11: Analysis Point #11

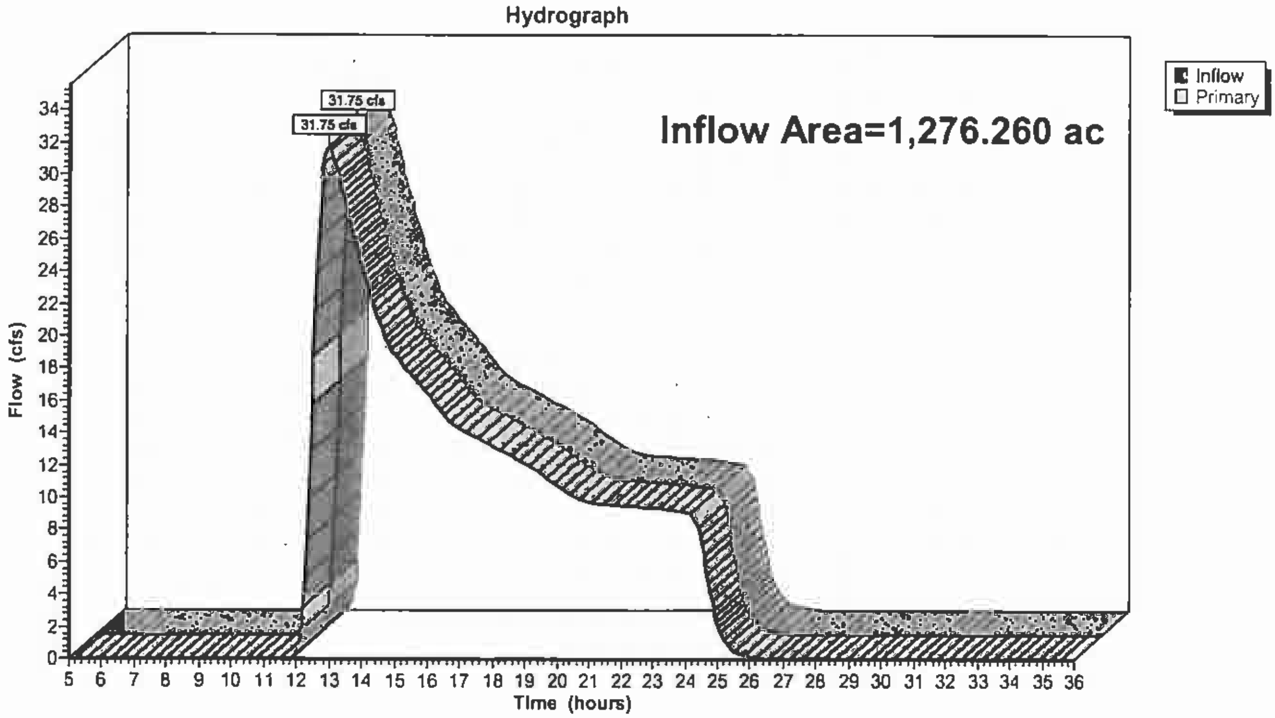


Link OUT12: Analysis Point #12

Inflow Area = 1,276.260 ac, Inflow Depth = 0.14" for 2-YR event
Inflow = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af
Primary = 31.75 cfs @ 12.95 hrs, Volume= 15.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT12: Analysis Point #12

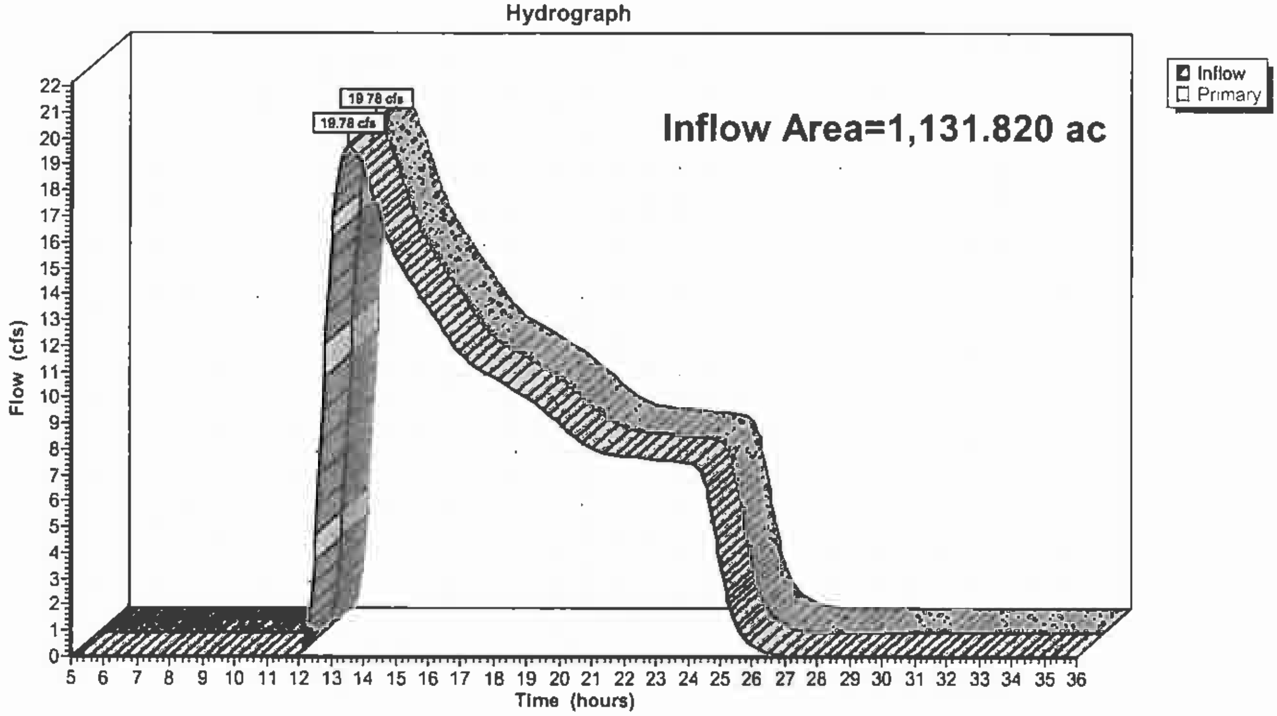


Link OUT13: Analysis Point #13

Inflow Area = 1,131.820 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 19.78 cfs @ 13.53 hrs, Volume= 11.541 af
Primary = 19.78 cfs @ 13.53 hrs, Volume= 11.541 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT13: Analysis Point #13

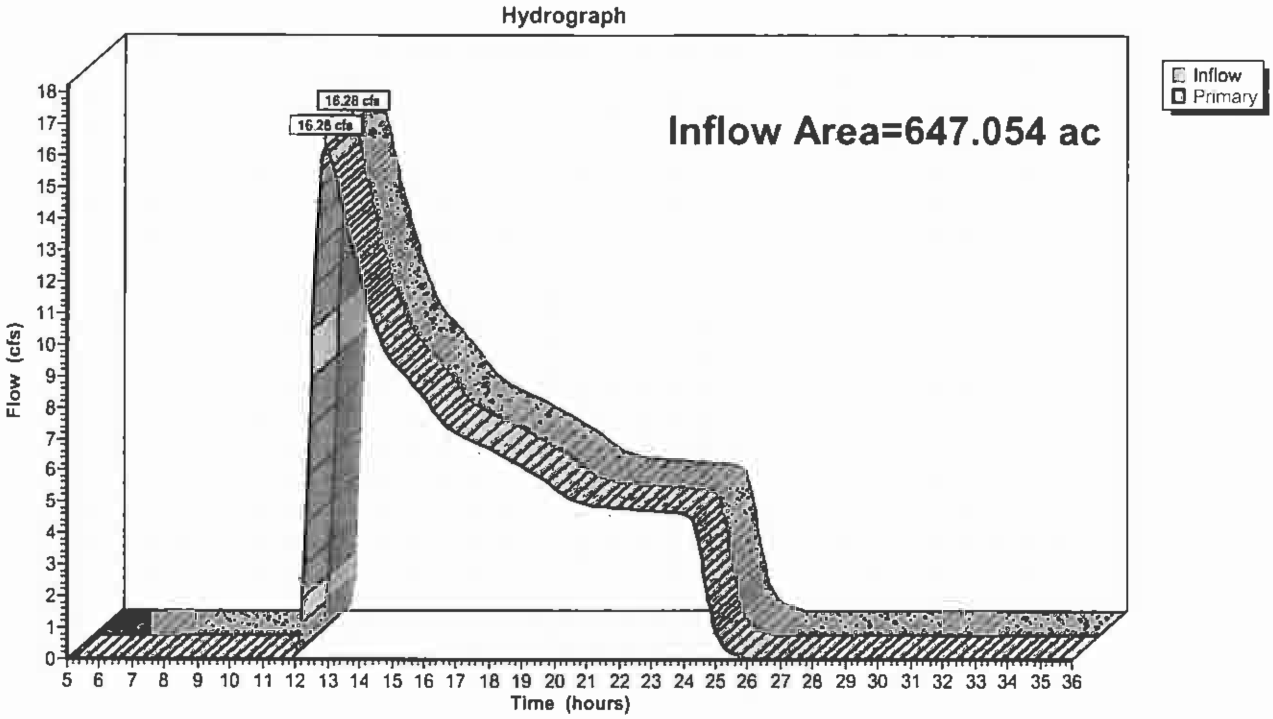


Link OUT14: Analysis Point #14

Inflow Area = 647.054 ac, Inflow Depth = 0.14" for 2-YR event
Inflow = 16.28 cfs @ 12.92 hrs, Volume= 7.643 af
Primary = 16.28 cfs @ 12.92 hrs, Volume= 7.643 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT14: Analysis Point #14

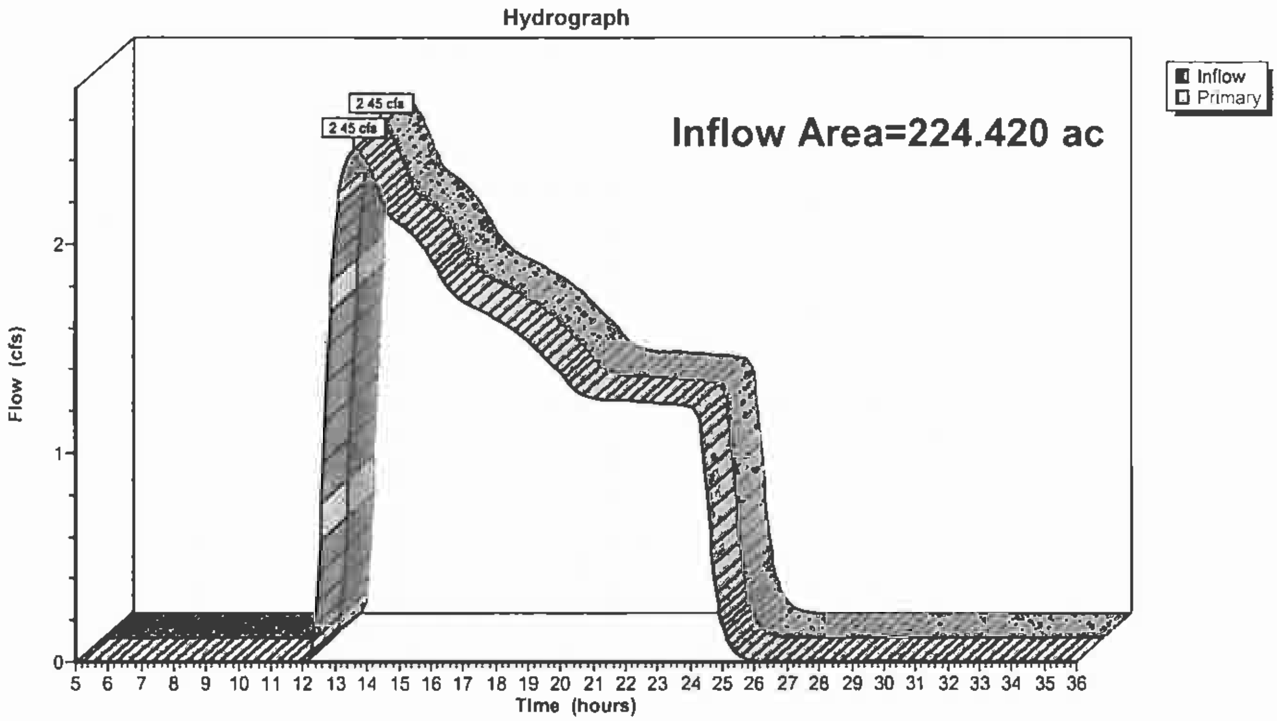


Link OUT2: Analysis Point #2

Inflow Area =	224.420 ac,	Inflow Depth = 0.09"	for 2-YR event	
Inflow =	2.45 cfs @	13.55 hrs, Volume=	1.639 af	
Primary =	2.45 cfs @	13.55 hrs, Volume=	1.639 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT2: Analysis Point #2

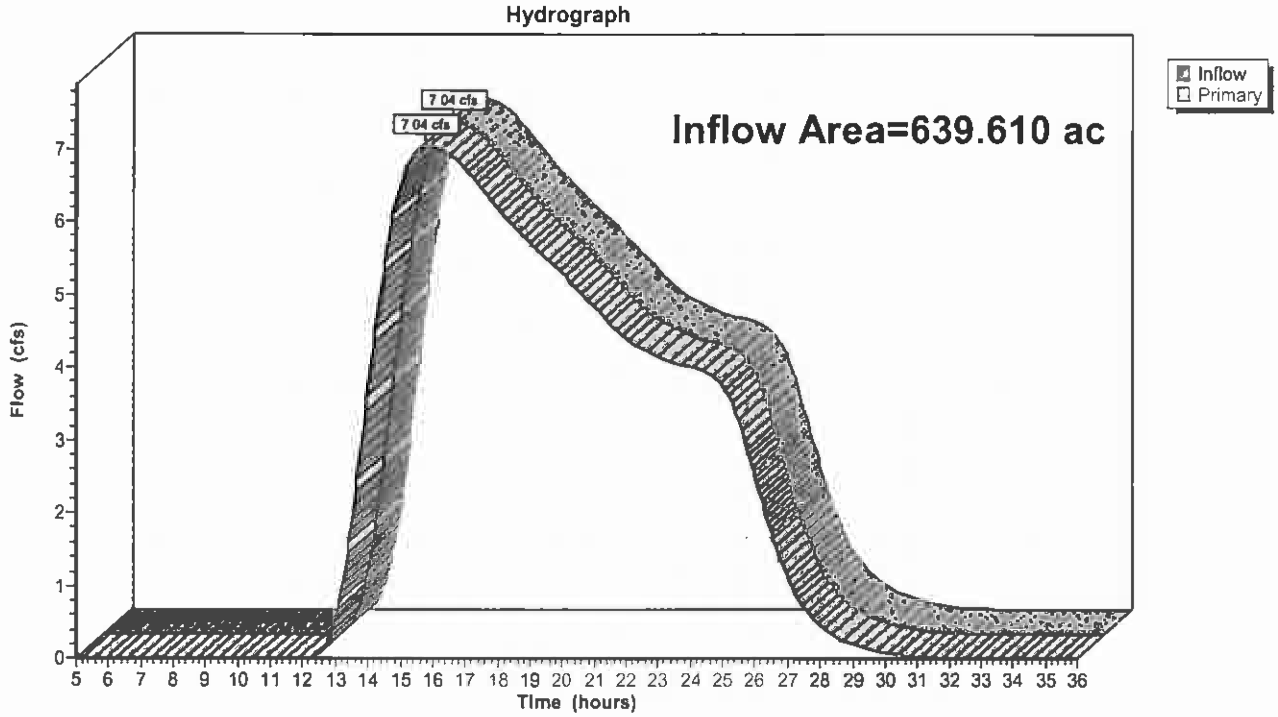


Link OUT3: Analysis Point #3

Inflow Area =	639.610 ac,	Inflow Depth = 0.10"	for 2-YR event	
Inflow =	7.04 cfs @	15.75 hrs, Volume=	5.560 af	
Primary =	7.04 cfs @	15.75 hrs, Volume=	5.560 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT3: Analysis Point #3

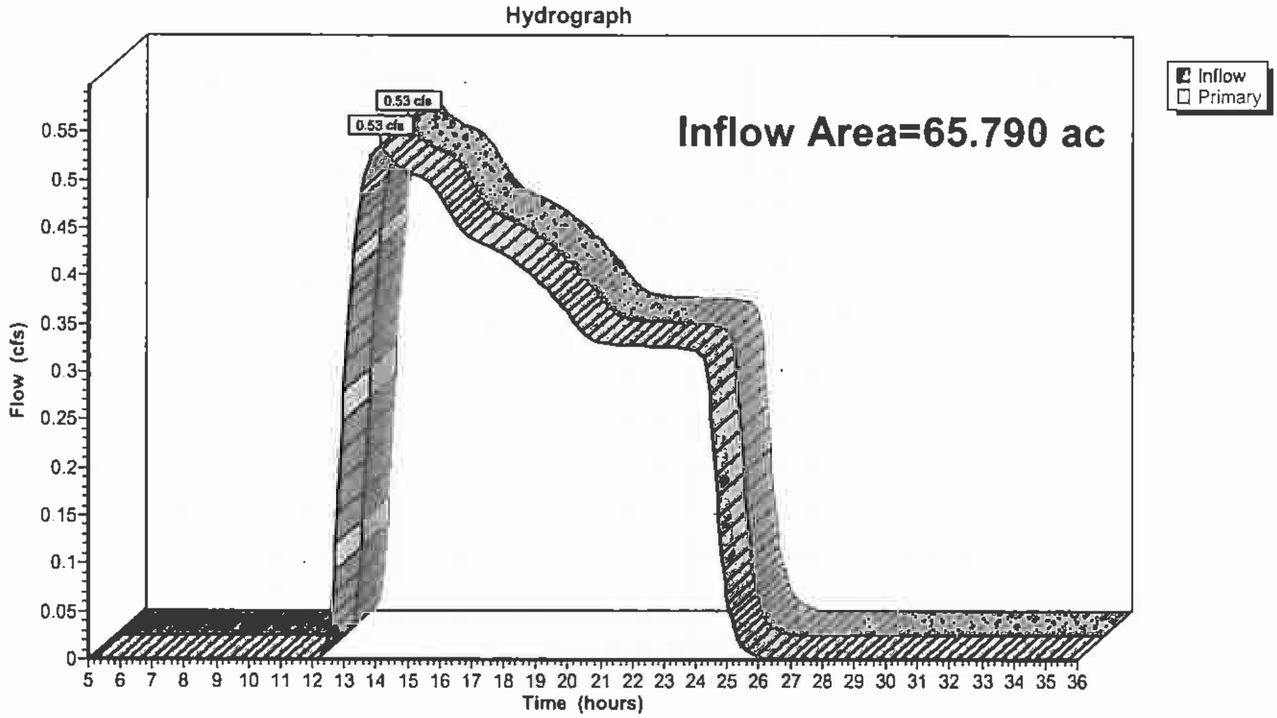


Link OUT4: Analysis Point #4

Inflow Area =	65.790 ac, Inflow Depth = 0.07" for 2-YR event	
Inflow =	0.53 cfs @ 14.10 hrs, Volume=	0.396 af
Primary =	0.53 cfs @ 14.10 hrs, Volume=	0.396 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

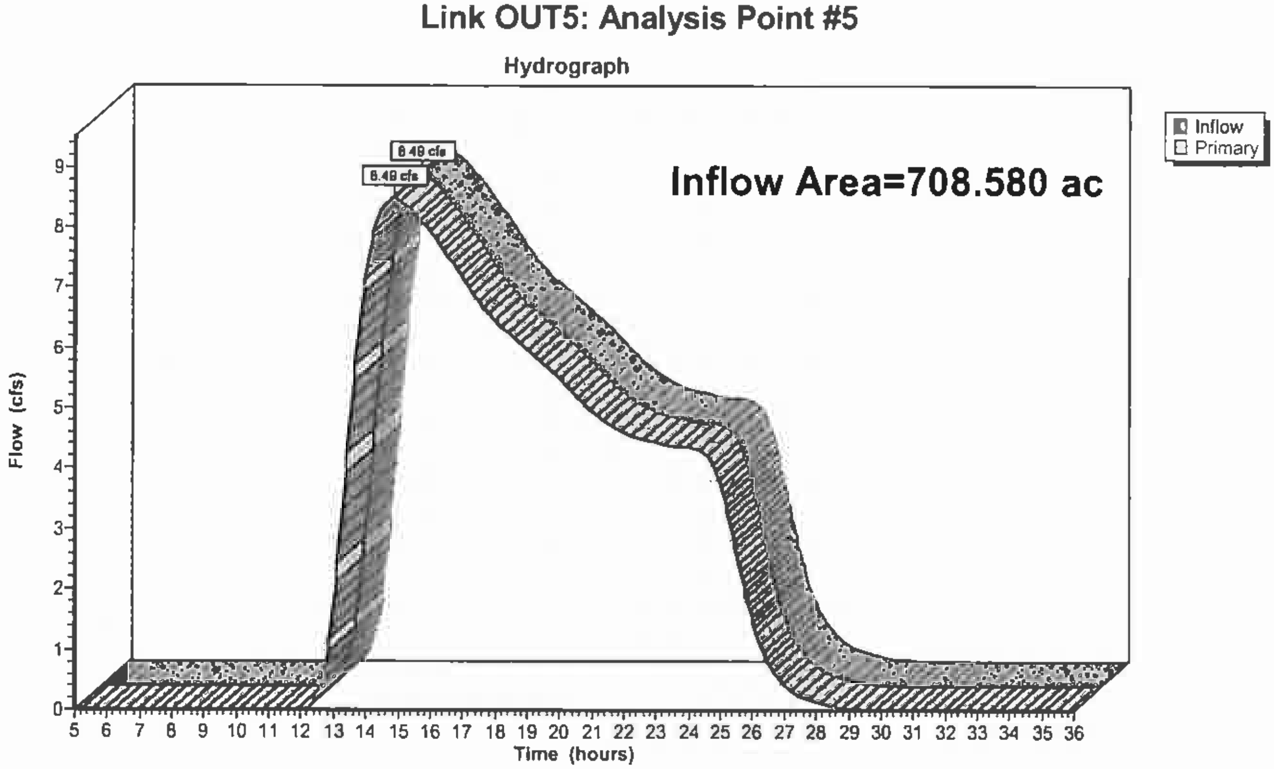
Link OUT4: Analysis Point #4



Link OUT5: Analysis Point #5

Inflow Area =	708.580 ac,	Inflow Depth = 0.10"	for 2-YR event	
Inflow =	8.49 cfs @	14.85 hrs, Volume=	6.160 af	
Primary =	8.49 cfs @	14.85 hrs, Volume=	6.160 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

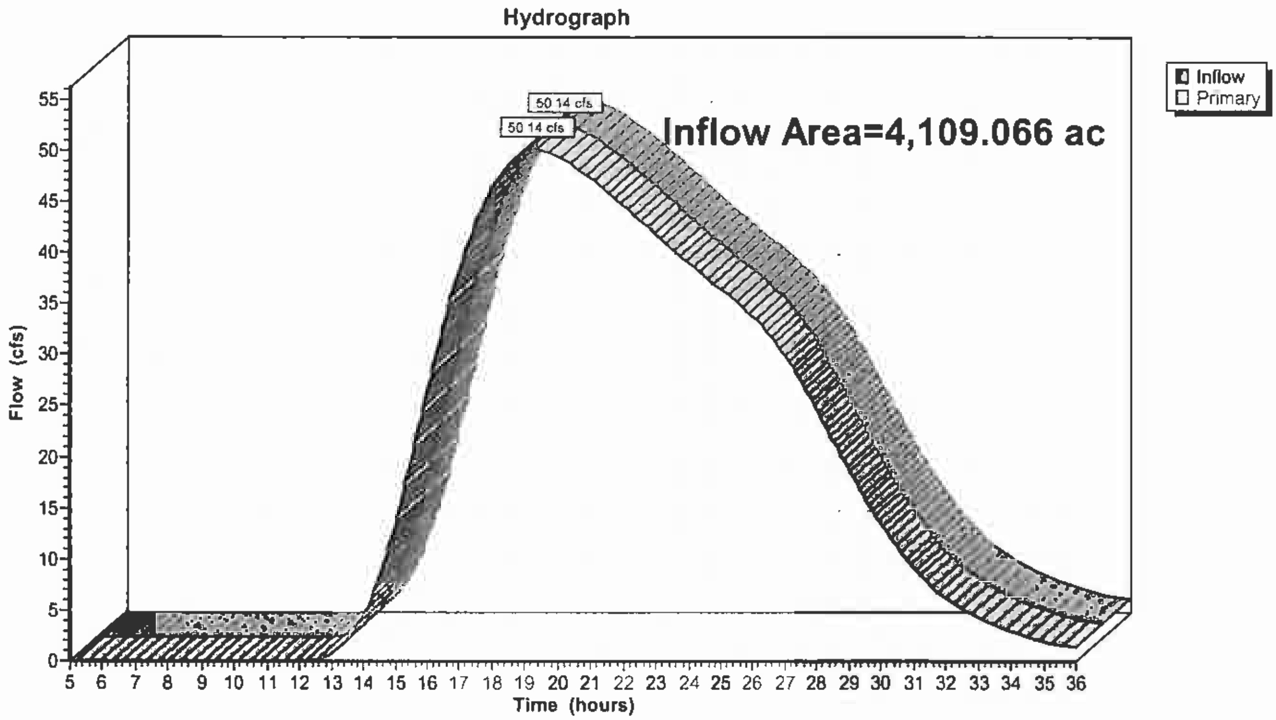


Link OUT6: Analysis Point #6

Inflow Area = 4,109.066 ac, Inflow Depth > 0.14" for 2-YR event
Inflow = 50.14 cfs @ 19.32 hrs, Volume= 48.293 af
Primary = 50.14 cfs @ 19.32 hrs, Volume= 48.293 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT6: Analysis Point #6

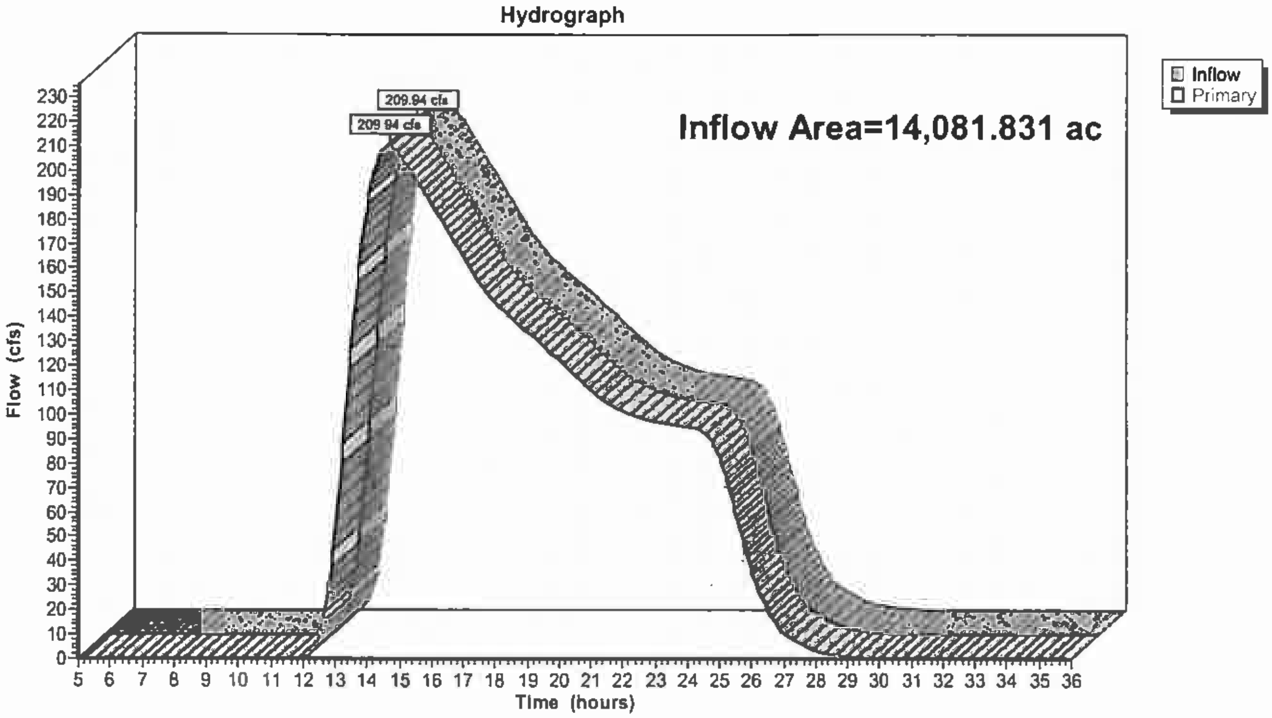


Link OUT7: Analysis Point #7

Inflow Area = 14,081.831 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 209.94 cfs @ 14.63 hrs, Volume= 143.594 af
Primary = 209.94 cfs @ 14.63 hrs, Volume= 143.594 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT7: Analysis Point #7

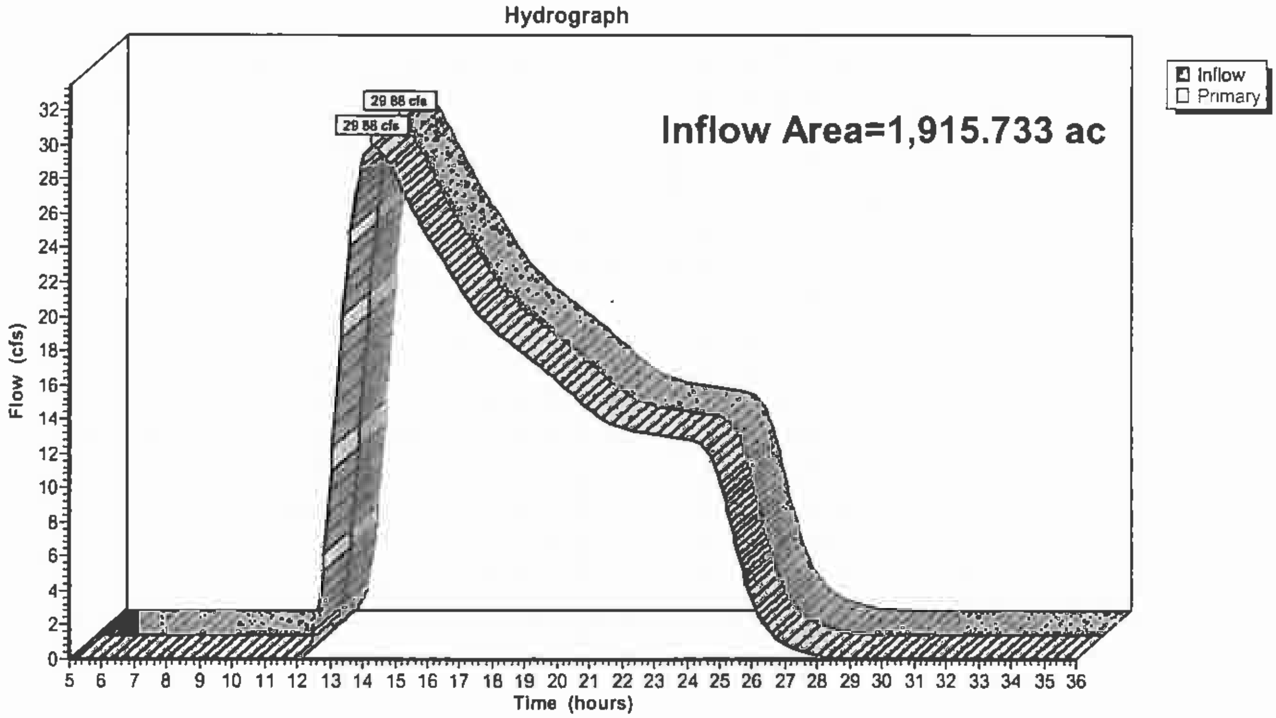


Link OUT8: Analysis Point #8

Inflow Area = 1,915.733 ac, Inflow Depth = 0.12" for 2-YR event
Inflow = 29.88 cfs @ 14.25 hrs, Volume= 19.535 af
Primary = 29.88 cfs @ 14.25 hrs, Volume= 19.535 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT8: Analysis Point #8

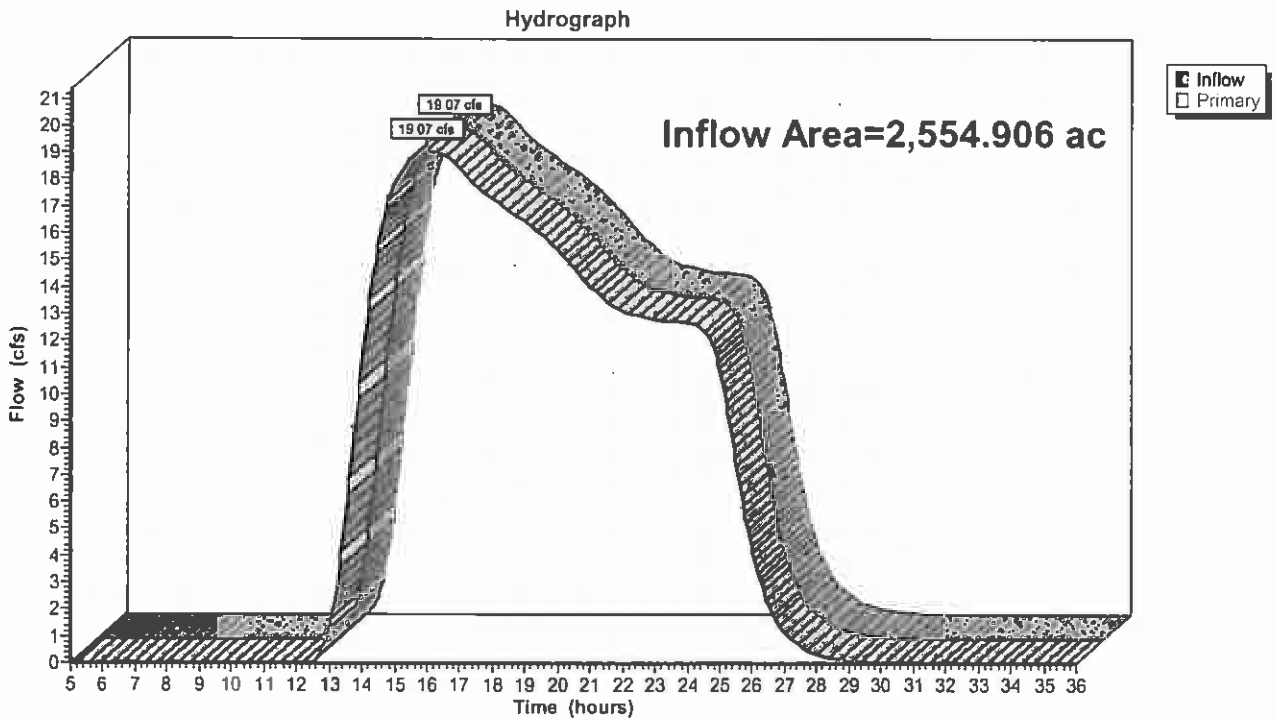


Link OUT9: Analysis Point #9

Inflow Area =	2,554.906 ac,	Inflow Depth = 0.07"	for 2-YR event	
Inflow =	19.07 cfs @	15.95 hrs, Volume=	15.392 af	
Primary =	19.07 cfs @	15.95 hrs, Volume=	15.392 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Link OUT9: Analysis Point #9



10-Year Drainage Summaries

Pre and Post Development

10-Year Pre Development Model Results (Summaries)

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PRE #1: Analysis Point #1 Runoff Area=101.010 ac Runoff Depth=0.30"
Flow Length=4,123' Tc=42.1 min CN=50 Runoff=8.53 cfs 2.554 af

Subcatchment PRE #10: Analysis Point #10 Runoff Area=2,172.660 ac Runoff Depth=0.49"
Flow Length=15,514' Tc=124.0 min CN=55 Runoff=218.83 cfs 88.817 af

Subcatchment PRE #11: Analysis Point #11 Runoff Area=3,602.810 ac Runoff Depth=0.58"
Flow Length=23,248' Tc=88.9 min CN=57 Runoff=565.54 cfs 172.795 af

Subcatchment PRE #12: Analysis Point #12 Runoff Area=1,276.260 ac Runoff Depth=0.53"
Flow Length=16,392' Tc=50.3 min CN=56 Runoff=259.15 cfs 56.617 af

Subcatchment PRE #13: Analysis Point #13 Runoff Area=1,131.820 ac Runoff Depth=0.49"
Flow Length=15,139' Tc=68.8 min CN=55 Runoff=163.82 cfs 46.268 af

Subcatchment PRE #14: Analysis Point #14 Runoff Area=646.100 ac Runoff Depth=0.53"
Flow Length=6,304' Tc=48.1 min CN=56 Runoff=135.44 cfs 28.662 af

Subcatchment PRE #2: Analysis Point #2 Runoff Area=224.420 ac Runoff Depth=0.41"
Flow Length=4,750' Tc=44.7 min CN=53 Runoff=31.98 cfs 7.691 af

Subcatchment PRE #3: Analysis Point #3 Runoff Area=639.610 ac Runoff Depth=0.45"
Flow Length=10,653' Tc=166.3 min CN=54 Runoff=47.84 cfs 23.996 af

Subcatchment PRE #4: Analysis Point #4 Runoff Area=65.790 ac Runoff Depth=0.37"
Flow Length=4,314' Tc=47.5 min CN=52 Runoff=7.63 cfs 2.049 af

Subcatchment PRE #5: Analysis Point #5 Runoff Area=708.580 ac Runoff Depth=0.45"
Flow Length=6,798' Tc=118.5 min CN=54 Runoff=64.92 cfs 26.583 af

Subcatchment PRE #6: Analysis Point #6 Runoff Area=4,109.110 ac Runoff Depth>0.53"
Flow Length=35,165' Tc=386.5 min CN=56 Runoff=218.50 cfs 181.665 af

Subcatchment PRE #7: Analysis Point #7 Runoff Area=14,080.000 ac Runoff Depth=0.49"
Flow Length=31,171' Tc=123.2 min CN=55 Runoff=1,407.57 cfs 575.582 af

Subcatchment PRE #8: Analysis Point #8 Runoff Area=1,916.090 ac Runoff Depth=0.49"
Flow Length=15,581' Tc=107.5 min CN=55 Runoff=206.50 cfs 78.329 af

Subcatchment PRE #9: Analysis Point #9 Runoff Area=2,556.040 ac Runoff Depth=0.37"
Flow Length=13,053' Tc=116.5 min CN=52 Runoff=178.13 cfs 79.622 af

Link OUT1: Analysis Point #1 Inflow=8.53 cfs 2.554 af
Primary=8.53 cfs 2.554 af

Link OUT10: Analysis Point #10	Inflow=218.83 cfs 88.817 af Primary=218.83 cfs 88.817 af
Link OUT11: Analysis Point #11	Inflow=565.54 cfs 172.795 af Primary=565.54 cfs 172.795 af
Link OUT12: Analysis Point #12	Inflow=259.15 cfs 56.617 af Primary=259.15 cfs 56.617 af
Link OUT13: Analysis Point #13	Inflow=163.82 cfs 46.268 af Primary=163.82 cfs 46.268 af
Link OUT14: Analysis Point #14	Inflow=135.44 cfs 28.662 af Primary=135.44 cfs 28.662 af
Link OUT2: Analysis Point #2	Inflow=31.98 cfs 7.691 af Primary=31.98 cfs 7.691 af
Link OUT3: Analysis Point #3	Inflow=47.84 cfs 23.996 af Primary=47.84 cfs 23.996 af
Link OUT4: Analysis Point #4	Inflow=7.63 cfs 2.049 af Primary=7.63 cfs 2.049 af
Link OUT5: Analysis Point #5	Inflow=64.92 cfs 26.583 af Primary=64.92 cfs 26.583 af
Link OUT6: Analysis Point #6	Inflow=218.50 cfs 181.665 af Primary=218.50 cfs 181.665 af
Link OUT7: Analysis Point #7	Inflow=1,407.57 cfs 575.582 af Primary=1,407.57 cfs 575.582 af
Link OUT8: Analysis Point #8	Inflow=206.50 cfs 78.329 af Primary=206.50 cfs 78.329 af
Link OUT9: Analysis Point #9	Inflow=178.13 cfs 79.622 af Primary=178.13 cfs 79.622 af

Total Runoff Area = 33,230.300 ac Runoff Volume = 1,371.230 af Average Runoff Depth = 0.50"
99.32% Pervious Area = 33,002.780 ac 0.68% Impervious Area = 227.520 ac

10-Year Post Development Model Results (Summaries)

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment POST #1: Analysis Point #1 Runoff Area=101.010 ac Runoff Depth=0.30"
Flow Length=4,123' Tc=42.1 min CN=50 Runoff=8.53 cfs 2.554 af

Subcatchment POST #10: Analysis Point #10 Runoff Area=2,171.342 ac Runoff Depth=0.49"
Flow Length=15,514' Tc=124.0 min CN=55 Runoff=218.70 cfs 88.763 af

Subcatchment POST #11: Analysis Point #11 Runoff Area=3,602.956 ac Runoff Depth=0.58"
Flow Length=23,248' Tc=88.9 min CN=57 Runoff=565.57 cfs 172.802 af

Subcatchment POST #12: Analysis Point #12 Runoff Area=1,276.260 ac Runoff Depth=0.53"
Flow Length=16,392' Tc=50.3 min CN=56 Runoff=259.15 cfs 56.617 af

Subcatchment POST #13: Analysis Point #13 Runoff Area=1,131.820 ac Runoff Depth=0.49"
Flow Length=15,069' Tc=68.3 min CN=55 Runoff=165.18 cfs 46.268 af

Subcatchment POST #14: Analysis Point #14 Runoff Area=647.054 ac Runoff Depth=0.53"
Flow Length=6,304' Tc=48.1 min CN=56 Runoff=135.64 cfs 28.704 af

Subcatchment POST #2: Analysis Point #2 Runoff Area=224.420 ac Runoff Depth=0.41"
Flow Length=4,765' Tc=43.4 min CN=53 Runoff=32.56 cfs 7.691 af

Subcatchment POST #3: Analysis Point #3 Runoff Area=639.610 ac Runoff Depth=0.45"
Flow Length=10,660' Tc=166.3 min CN=54 Runoff=47.84 cfs 23.996 af

Subcatchment POST #4: Analysis Point #4 Runoff Area=65.790 ac Runoff Depth=0.37"
Flow Length=4,314' Tc=47.5 min CN=52 Runoff=7.63 cfs 2.049 af

Subcatchment POST #5: Analysis Point #5 Runoff Area=708.580 ac Runoff Depth=0.45"
Flow Length=6,798' Tc=118.5 min CN=54 Runoff=64.92 cfs 26.583 af

Subcatchment POST #6: Analysis Point #6 Runoff Area=4,109.066 ac Runoff Depth>0.53"
Flow Length=35,165' Tc=386.5 min CN=56 Runoff=218.49 cfs 181.663 af

Subcatchment POST #7: Analysis Point #7 Runoff Area=14,081.831 ac Runoff Depth=0.49"
Flow Length=31,171' Tc=123.2 min CN=55 Runoff=1,407.75 cfs 575.657 af

Subcatchment POST #8: Analysis Point #8 Runoff Area=1,915.733 ac Runoff Depth=0.49"
Flow Length=15,581' Tc=107.5 min CN=55 Runoff=206.46 cfs 78.314 af

Subcatchment POST #9: Analysis Point #9 Runoff Area=2,554.906 ac Runoff Depth=0.37"
Flow Length=13,053' Tc=116.5 min CN=52 Runoff=178.05 cfs 79.587 af

Link OUT1: Analysis Point #1 Inflow=8.53 cfs 2.554 af
Primary=8.53 cfs 2.554 af

Link OUT10: Analysis Point #10	Inflow=218.70 cfs 88.763 af Primary=218.70 cfs 88.763 af
Link OUT11: Analysis Point #11	Inflow=565.57 cfs 172.802 af Primary=565.57 cfs 172.802 af
Link OUT12: Analysis Point #12	Inflow=259.15 cfs 56.617 af Primary=259.15 cfs 56.617 af
Link OUT13: Analysis Point #13	Inflow=165.18 cfs 46.268 af Primary=165.18 cfs 46.268 af
Link OUT14: Analysis Point #14	Inflow=135.64 cfs 28.704 af Primary=135.64 cfs 28.704 af
Link OUT2: Analysis Point #2	Inflow=32.56 cfs 7.691 af Primary=32.56 cfs 7.691 af
Link OUT3: Analysis Point #3	Inflow=47.84 cfs 23.996 af Primary=47.84 cfs 23.996 af
Link OUT4: Analysis Point #4	Inflow=7.63 cfs 2.049 af Primary=7.63 cfs 2.049 af
Link OUT5: Analysis Point #5	Inflow=64.92 cfs 26.583 af Primary=64.92 cfs 26.583 af
Link OUT6: Analysis Point #6	Inflow=218.49 cfs 181.663 af Primary=218.49 cfs 181.663 af
Link OUT7: Analysis Point #7	Inflow=1,407.75 cfs 575.657 af Primary=1,407.75 cfs 575.657 af
Link OUT8: Analysis Point #8	Inflow=206.46 cfs 78.314 af Primary=206.46 cfs 78.314 af
Link OUT9: Analysis Point #9	Inflow=178.05 cfs 79.587 af Primary=178.05 cfs 79.587 af

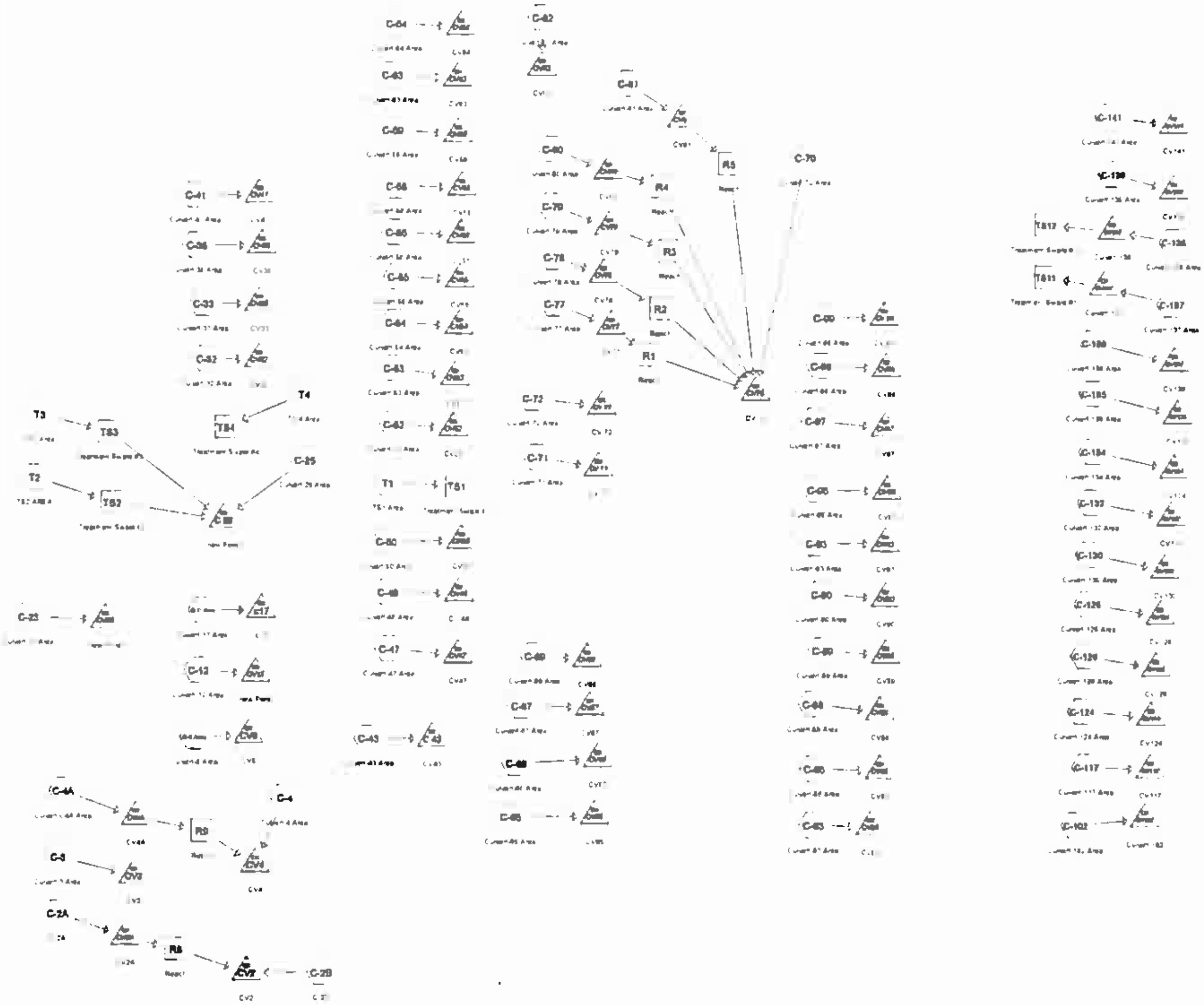
Total Runoff Area = 33,230.378 ac Runoff Volume = 1,371.249 af Average Runoff Depth = 0.50"
99.32% Pervious Area = 33,002.858 ac 0.68% Impervious Area = 227.520 ac

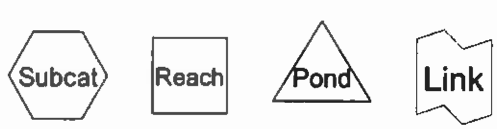
SECTION 4

SECTION 4

Culvert Sizing Model Results (10-Year Storm Event)

Existing Road Culverts (1-141)
(Dummer Pond Road)





Drainage Diagram for Xrds-Culvert-SIZING1-141
Prepared by Horizons Engineering, PLLC (JCD) 7/10/2008
HydroCAD® 8.00 s/n 002765 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.090	36	Brush, Good, HSG B (C-130)
6.720	42	Woods, Good, HSG B (C-130)
461.074	49	Brush, Good, HSG C (C-102,C-117,C-124,C-126,C-141,C-17 Area,C-23,C-25,C-2A,C-2B,C-
1,317.960	53	Woods, Good, HSG C (C-102,C-117,C-12,C-124,C-126,C-132,C-135,C-136,C-137,C-138,C-
52.681	55	Brush, Good, HSG D (C-126,C-128,C-130,C-132,C-132,C-134,C-135,C-136,C-137,C-138,C-
412.248	58	Woods, Good, HSG D (C-12,C-126,C-128,C-130,C-132,C-134,C-135,C-136,C-137,C-138,C-
7.478	89	Gravel roads, HSG C (C-102,C-117,C-12,C-124,C-126,C-128,C-130,C-132,C-134,C-135,C-
0.110	89	Gravel roads, HSG D (C-71,C-72)
0.090	91	Gravel roads, HSG D (C-132)
2,258.451		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment C-102: Culvert-102 Area Runoff Area=95.250 ac Runoff Depth=0.34"
Flow Length=5,377' Tc=48.9 min CN=51 Runoff=9.05 cfs 2.682 af

Subcatchment C-117: Culvert-117 Area Runoff Area=4.610 ac Runoff Depth=0.41"
Flow Length=2,650' Tc=29.2 min CN=53 Runoff=0.86 cfs 0.158 af

Subcatchment C-12: Culvert-12 Area Runoff Area=469.970 ac Runoff Depth=0.49"
Flow Length=8,200' Tc=118.0 min CN=55 Runoff=48.57 cfs 19.212 af

Subcatchment C-124: Culvert-124 Area Runoff Area=0.120 ac Runoff Depth=0.49"
Flow Length=213' Tc=14.8 min CN=55 Runoff=0.05 cfs 0.005 af

Subcatchment C-126: Culvert-126 Area Runoff Area=8.590 ac Runoff Depth=0.49"
Flow Length=1,345' Tc=28.0 min CN=55 Runoff=2.27 cfs 0.351 af

Subcatchment C-128: Culvert-128 Area Runoff Area=6.800 ac Runoff Depth=0.62"
Flow Length=1,139' Tc=42.0 min CN=58 Runoff=1.99 cfs 0.351 af

Subcatchment C-130: Culvert-130 Area Runoff Area=9.780 ac Runoff Depth=0.27"
Flow Length=2,352' Tc=12.6 min CN=49 Runoff=1.23 cfs 0.220 af

Subcatchment C-132: Culvert-132 Area Runoff Area=24.533 ac Runoff Depth=0.53"
Flow Length=4,532' Tc=53.3 min CN=56 Runoff=4.79 cfs 1.088 af

Subcatchment C-134: Culvert-134 Area Runoff Area=2.380 ac Runoff Depth=0.67"
Flow Length=755' Tc=17.8 min CN=59 Runoff=1.42 cfs 0.132 af

Subcatchment C-135: Culvert-135 Area Runoff Area=11.550 ac Runoff Depth=0.58"
Flow Length=3,703' Tc=33.2 min CN=57 Runoff=3.55 cfs 0.554 af

Subcatchment C-136: Culvert-136 Area Runoff Area=36.390 ac Runoff Depth=0.53"
Flow Length=3,417' Tc=25.7 min CN=56 Runoff=11.76 cfs 1.614 af

Subcatchment C-137: Culvert-137 Area Runoff Area=2.787 ac Runoff Depth=0.58"
Flow Length=1,270' Tc=16.3 min CN=57 Runoff=1.41 cfs 0.134 af

Subcatchment C-138: Culvert-138 Area Runoff Area=4.373 ac Runoff Depth=0.53"
Flow Length=1,735' Tc=17.5 min CN=56 Runoff=1.84 cfs 0.194 af

Subcatchment C-139: Culvert-139 Area Runoff Area=15.070 ac Runoff Depth=0.49"
Flow Length=2,417' Tc=23.0 min CN=55 Runoff=4.54 cfs 0.616 af

Subcatchment C-141: Culvert-141 Area Runoff Area=11.350 ac Runoff Depth=0.45"
Flow Length=2,444' Tc=22.0 min CN=54 Runoff=3.03 cfs 0.426 af

Subcatchment C-17 Area: Culvert-17 Area Runoff Area=33.690 ac Runoff Depth=0.30"
Flow Length=2,815' Tc=29.9 min CN=50 Runoff=3.38 cfs 0.852 af

Subcatchment C-23: Culvert-23 Area Runoff Area=84.290 ac Runoff Depth=0.41"
Flow Length=4,310' Tc=59.6 min CN=53 Runoff=10.06 cfs 2.889 af

Subcatchment C-25: Culvert-25 Area Runoff Area=322.130 ac Runoff Depth=0.45"
Flow Length=5,750' Tc=48.9 min CN=54 Runoff=50.65 cfs 12.085 af

Subcatchment C-2A: C-2A Runoff Area=2.090 ac Runoff Depth=0.49"
Flow Length=786' Tc=9.3 min CN=55 Runoff=1.11 cfs 0.085 af

Subcatchment C-2B: C-2B Runoff Area=4.010 ac Runoff Depth=0.49"
Flow Length=1,106' Tc=12.3 min CN=55 Runoff=1.82 cfs 0.164 af

Subcatchment C-3: Culvert-3 Area Runoff Area=0.670 ac Runoff Depth=0.45"
Flow Length=855' Tc=12.2 min CN=54 Runoff=0.26 cfs 0.025 af

Subcatchment C-32: Culvert-32 Area Runoff Area=113.779 ac Runoff Depth=0.30"
Flow Length=5,800' Tc=44.1 min CN=50 Runoff=9.34 cfs 2.876 af

Subcatchment C-33: Culvert-33 Area Runoff Area=1.890 ac Runoff Depth=0.49"
Flow Length=1,052' Tc=20.9 min CN=55 Runoff=0.61 cfs 0.077 af

Subcatchment C-38: Culvert-38 Area Runoff Area=28.481 ac Runoff Depth=0.30"
Flow Length=2,835' Tc=18.8 min CN=50 Runoff=3.72 cfs 0.720 af

Subcatchment C-4: Culvert-4 Area Runoff Area=2.450 ac Runoff Depth=0.58"
Flow Length=823' Tc=10.1 min CN=57 Runoff=1.63 cfs 0.118 af

Subcatchment C-41: Culvert-41 Area Runoff Area=7.767 ac Runoff Depth=0.41"
Flow Length=1,645' Tc=22.8 min CN=53 Runoff=1.70 cfs 0.266 af

Subcatchment C-43: Culvert-43 Area Runoff Area=51.179 ac Runoff Depth=0.30"
Flow Length=2,975' Tc=22.6 min CN=50 Runoff=5.98 cfs 1.294 af

Subcatchment C-47: Culvert-47 Area Runoff Area=36.460 ac Runoff Depth=0.37"
Flow Length=3,248' Tc=28.0 min CN=52 Runoff=5.80 cfs 1.136 af

Subcatchment C-48: Culvert-48 Area Runoff Area=84.380 ac Runoff Depth=0.37"
Flow Length=3,930' Tc=45.4 min CN=52 Runoff=10.06 cfs 2.628 af

Subcatchment C-4A: Culvert-C4A Area Runoff Area=110.940 ac Runoff Depth=0.41"
Flow Length=3,275' Tc=36.3 min CN=53 Runoff=17.97 cfs 3.802 af

Subcatchment C-50: Culvert-50 Area Runoff Area=9.679 ac Runoff Depth=0.30"
Flow Length=2,234' Tc=21.5 min CN=50 Runoff=1.16 cfs 0.245 af

Subcatchment C-52: Culvert-52 Area Runoff Area=3.807 ac Runoff Depth=0.34"
Flow Length=856' Tc=14.1 min CN=51 Runoff=0.75 cfs 0.107 af

Subcatchment C-53: Culvert-53 Area Runoff Area=8.986 ac Runoff Depth=0.41"
Flow Length=2,052' Tc=23.2 min CN=53 Runoff=1.94 cfs 0.308 af

Subcatchment C-54: Culvert-54 Area Runoff Area=11.950 ac Runoff Depth=0.34"
Flow Length=2,390' Tc=20.7 min CN=51 Runoff=1.86 cfs 0.336 af

Subcatchment C-55: Culvert-55 Area Runoff Area=30.710 ac Runoff Depth=0.37"
Flow Length=2,771' Tc=29.5 min CN=52 Runoff=4.73 cfs 0.957 af

Subcatchment C-56: Culvert-56 Area Runoff Area=5.681 ac Runoff Depth=0.37"
Flow Length=1,711' Tc=21.2 min CN=52 Runoff=1.08 cfs 0.177 af

Subcatchment C-58: Culvert-58 Area Runoff Area=17.537 ac Runoff Depth=0.34"
Flow Length=2,010' Tc=20.7 min CN=51 Runoff=2.73 cfs 0.494 af

Subcatchment C-59: Culvert-59 Area Runoff Area=30.140 ac Runoff Depth=0.34"
Flow Length=2,723' Tc=24.1 min CN=51 Runoff=4.28 cfs 0.849 af

Subcatchment C-63: Culvert-63 Area Runoff Area=7.450 ac Runoff Depth=0.53"
Flow Length=1,023' Tc=6.9 min CN=56 Runoff=5.19 cfs 0.330 af

Subcatchment C-64: Culvert-64 Area Runoff Area=6.080 ac Runoff Depth=0.53"
Flow Length=1,164' Tc=9.1 min CN=56 Runoff=3.73 cfs 0.270 af

Subcatchment C-65: Culvert-65 Area Runoff Area=8.377 ac Runoff Depth=0.37"
Flow Length=2,061' Tc=25.9 min CN=52 Runoff=1.40 cfs 0.261 af

Subcatchment C-66: Culvert-66 Area Runoff Area=8.080 ac Runoff Depth=0.58"
Flow Length=2,106' Tc=26.2 min CN=57 Runoff=2.94 cfs 0.388 af

Subcatchment C-67: Culvert-67 Area Runoff Area=2.070 ac Runoff Depth=0.58"
Flow Length=1,383' Tc=18.6 min CN=57 Runoff=0.96 cfs 0.099 af

Subcatchment C-69: Culvert-69 Area Runoff Area=36.358 ac Runoff Depth=0.49"
Flow Length=4,095' Tc=49.0 min CN=55 Runoff=6.59 cfs 1.486 af

Subcatchment C-70: Culvert-70 Area Runoff Area=204.998 ac Runoff Depth=0.45"
Flow Length=6,005' Tc=119.4 min CN=54 Runoff=18.25 cfs 7.691 af

Subcatchment C-71: Culvert-71 Area Runoff Area=1.510 ac Runoff Depth=0.58"
Flow Length=605' Tc=8.7 min CN=57 Runoff=1.06 cfs 0.072 af

Subcatchment C-72: Culvert-72 Area Runoff Area=11.320 ac Runoff Depth=0.53"
Flow Length=1,645' Tc=27.6 min CN=56 Runoff=3.47 cfs 0.502 af

Subcatchment C-77: Culvert-77 Area Runoff Area=6.640 ac Runoff Depth=0.41"
Flow Length=2,100' Tc=21.9 min CN=53 Runoff=1.49 cfs 0.228 af

Subcatchment C-78: Culvert-78 Area Runoff Area=17.730 ac Runoff Depth=0.41"
Flow Length=2,108' Tc=27.2 min CN=53 Runoff=3.45 cfs 0.608 af

Subcatchment C-79: Culvert-79 Area Runoff Area=16.480 ac Runoff Depth=0.41"
Flow Length=2,564' Tc=27.7 min CN=53 Runoff=3.18 cfs 0.565 af

Subcatchment C-8 Area: Culvert-8 Area Runoff Area=5.620 ac Runoff Depth=0.45"
Flow Length=1,360' Tc=26.3 min CN=54 Runoff=1.32 cfs 0.211 af

Subcatchment C-80: Culvert-80 Area Runoff Area=5.630 ac Runoff Depth=0.41"
Flow Length=2,000' Tc=20.4 min CN=53 Runoff=1.33 cfs 0.193 af

Subcatchment C-81: Culvert-81 Area Runoff Area=10.550 ac Runoff Depth=0.37"
Flow Length=2,245' Tc=37.6 min CN=52 Runoff=1.41 cfs 0.329 af

Subcatchment C-82: Culvert-82 Area Runoff Area=15.510 ac Runoff Depth=0.41"
Flow Length=2,275' Tc=43.4 min CN=53 Runoff=2.25 cfs 0.532 af

Subcatchment C-83: Culvert-83 Area Runoff Area=1.630 ac Runoff Depth=0.41"
Flow Length=1,281' Tc=25.4 min CN=53 Runoff=0.33 cfs 0.056 af

Subcatchment C-86: Culvert-86 Area Runoff Area=14.710 ac Runoff Depth=0.45"
Flow Length=2,522' Tc=39.6 min CN=54 Runoff=2.65 cfs 0.552 af

Subcatchment C-88: Culvert-88 Area Runoff Area=23.400 ac Runoff Depth=0.41"
Flow Length=1,795' Tc=27.1 min CN=53 Runoff=4.57 cfs 0.802 af

Subcatchment C-89: Culvert-89 Area Runoff Area=0.800 ac Runoff Depth=0.53"
Flow Length=432' Tc=17.6 min CN=56 Runoff=0.34 cfs 0.035 af

Subcatchment C-90: Culvert-90 Area Runoff Area=26.100 ac Runoff Depth=0.37"
Flow Length=2,860' Tc=35.9 min CN=52 Runoff=3.57 cfs 0.813 af

Subcatchment C-93: Culvert-93 Area Runoff Area=4.250 ac Runoff Depth=0.45"
Flow Length=1,510' Tc=19.0 min CN=54 Runoff=1.25 cfs 0.159 af

Subcatchment C-96: Culvert-96 Area Runoff Area=38.886 ac Runoff Depth=0.30"
Flow Length=3,380' Tc=41.5 min CN=50 Runoff=3.31 cfs 0.983 af

Subcatchment C-97: Culvert-97 Area Runoff Area=1.020 ac Runoff Depth=0.45"
Flow Length=485' Tc=6.0 min CN=54 Runoff=0.57 cfs 0.038 af

Subcatchment C-98: Culvert-98 Area Runoff Area=0.270 ac Runoff Depth=0.41"
Flow Length=300' Tc=3.6 min CN=53 Runoff=0.14 cfs 0.009 af

Subcatchment C-99: Culvert-99 Area Runoff Area=39.820 ac Runoff Depth=0.34"
Flow Length=4,345' Tc=50.0 min CN=51 Runoff=3.76 cfs 1.121 af

Subcatchment T1: TS1 Area Runoff Area=3.160 ac Runoff Depth=0.34"
Flow Length=1,048' Tc=7.7 min CN=51 Runoff=0.89 cfs 0.089 af

Subcatchment T2: TS2 AREA Runoff Area=18.560 ac Runoff Depth=0.41"
Flow Length=2,968' Tc=42.7 min CN=53 Runoff=2.72 cfs 0.636 af

Subcatchment T3: TS3 Area Runoff Area=14.200 ac Runoff Depth=0.45"
Flow Length=1,965' Tc=35.8 min CN=54 Runoff=2.73 cfs 0.533 af

Subcatchment T4: TS 4 Area Runoff Area=0.993 ac Runoff Depth=0.71"
Flow Length=798' Tc=11.1 min CN=60 Runoff=0.87 cfs 0.059 af

Reach R1: Reach Avg. Depth=0.11' Max Vel=1.48 fps Inflow=1.49 cfs 0.228 af
n=0.040 L=3,002.0' S=0.0346 '/' Capacity=41.65 cfs Outflow=0.72 cfs 0.227 af

Reach R2: Reach Avg. Depth=0.21' Max Vel=2.14 fps Inflow=3.45 cfs 0.608 af
n=0.040 L=3,185.0' S=0.0336 '/' Capacity=41.01 cfs Outflow=2.16 cfs 0.607 af

Reach R3: Reach Avg. Depth=0.19' Max Vel=2.06 fps Inflow=3.18 cfs 0.565 af
n=0.040 L=3,713.0' S=0.0353 '/' Capacity=42.03 cfs Outflow=1.84 cfs 0.564 af

Reach R4: Reach Avg. Depth=0.08' Max Vel=1.24 fps Inflow=1.33 cfs 0.193 af
n=0.040 L=4,435.0' S=0.0336 '/' Capacity=41.01 cfs Outflow=0.45 cfs 0.192 af

Reach R5: Reach Avg. Depth=0.11' Max Vel=1.42 fps Inflow=1.41 cfs 0.329 af
n=0.040 L=5,053.0' S=0.0307 '/' Capacity=39.19 cfs Outflow=0.71 cfs 0.327 af

Reach R8: Reach Avg. Depth=0.06' Max Vel=1.57 fps Inflow=1.11 cfs 0.085 af
n=0.040 L=995.0' S=0.0774 '/' Capacity=106.64 cfs Outflow=0.64 cfs 0.085 af

Reach R9: Reach Avg. Depth=0.83' Max Vel=5.88 fps Inflow=17.97 cfs 3.802 af
n=0.040 L=697.0' S=0.0581 '/' Capacity=114.27 cfs Outflow=17.86 cfs 3.802 af

Reach TS1: Treatment Swale #1 Avg. Depth=0.26' Max Vel=0.66 fps Inflow=0.89 cfs 0.089 af
n=0.040 L=100.0' S=0.0025 '/' Capacity=41.98 cfs Outflow=0.80 cfs 0.089 af

Reach TS11: Treatment Swale #11 Inflow=1.41 cfs 0.134 af
Outflow=1.41 cfs 0.134 af

Reach TS12: Treatment Swale #12 Inflow=1.84 cfs 0.194 af
Outflow=1.84 cfs 0.194 af

Reach TS2: Treatment Swale #2 Avg. Depth=0.64' Max Vel=0.71 fps Inflow=2.72 cfs 0.636 af
n=0.040 L=100.0' S=0.0010 '/' Capacity=26.55 cfs Outflow=2.71 cfs 0.636 af

Reach TS3: Treatment Swale #3 Avg. Depth=0.50' Max Vel=0.98 fps Inflow=2.73 cfs 0.533 af
n=0.040 L=100.0' S=0.0025 '/' Capacity=41.98 cfs Outflow=2.71 cfs 0.533 af

Reach TS4: Treatment Swale #4 Avg. Depth=0.26' Max Vel=0.67 fps Inflow=0.87 cfs 0.059 af
n=0.040 L=100.0' S=0.0025 '/' Capacity=41.98 cfs Outflow=0.80 cfs 0.059 af

Pond C 25: (new Pond) Peak Elev=1,190.96' Inflow=55.73 cfs 13.254 af
12.00' x 2.00' x 40.0' Culvert Outflow=55.73 cfs 13.254 af

Pond C 43: CV43 Peak Elev=1,358.64' Inflow=5.98 cfs 1.294 af
5.00' x 2.00' x 32.0' Culvert Outflow=5.98 cfs 1.294 af

Pond c17: c17	Peak Elev=1,276.10' Inflow=3.38 cfs 0.852 af 18.0" x 40.0' Culvert Outflow=3.38 cfs 0.852 af
Pond CV 71: CV 71	Peak Elev=1,423.68' Inflow=1.06 cfs 0.072 af 5.00' x 2.00' x 32.0' Culvert Outflow=1.06 cfs 0.072 af
Pond CV 72: CV 72	Peak Elev=1,427.24' Inflow=3.47 cfs 0.502 af 4.00' x 2.00' x 32.0' Culvert Outflow=3.47 cfs 0.502 af
Pond CV 99: CV 99	Peak Elev=1,661.73' Inflow=3.76 cfs 1.121 af 4.00' x 2.00' x 40.0' Culvert Outflow=3.76 cfs 1.121 af
Pond CV102: Culvert 102	Peak Elev=1,669.60' Inflow=9.05 cfs 2.682 af 6.00' x 2.00' x 32.0' Culvert Outflow=9.05 cfs 2.682 af
Pond CV117: CV117	Peak Elev=1,655.98' Inflow=0.86 cfs 0.158 af 15.0" x 30.0' Culvert Outflow=0.86 cfs 0.158 af
Pond CV12: (new Pond)	Peak Elev=1,274.30' Inflow=48.57 cfs 19.212 af 13.00' x 2.00' x 32.0' Culvert Outflow=48.57 cfs 19.212 af
Pond CV124: CV124	Peak Elev=1,667.22' Inflow=0.05 cfs 0.005 af 15.0" x 30.0' Culvert Outflow=0.05 cfs 0.005 af
Pond CV126: CV126	Peak Elev=1,677.25' Inflow=2.27 cfs 0.351 af 15.0" x 30.0' Culvert Outflow=2.27 cfs 0.351 af
Pond CV128: CV128	Peak Elev=1,692.45' Inflow=1.99 cfs 0.351 af 15.0" x 35.0' Culvert Outflow=1.99 cfs 0.351 af
Pond CV130: CV130	Peak Elev=1,705.00' Inflow=1.23 cfs 0.220 af 18.0" x 30.0' Culvert Outflow=1.23 cfs 0.220 af
Pond CV132: CV132	Peak Elev=1,784.12' Inflow=4.79 cfs 1.088 af 18.0" x 35.0' Culvert Outflow=4.79 cfs 1.088 af
Pond CV134: CV134	Peak Elev=1,797.81' Inflow=1.42 cfs 0.132 af 15.0" x 35.0' Culvert Outflow=1.42 cfs 0.132 af
Pond CV135: CV135	Peak Elev=1,806.43' Inflow=3.55 cfs 0.554 af 18.0" x 35.0' Culvert Outflow=3.55 cfs 0.554 af
Pond CV136: CV136	Peak Elev=1,816.36' Inflow=11.76 cfs 1.614 af 24.0" x 35.0' Culvert Outflow=11.76 cfs 1.614 af
Pond CV137: Culvert 137	Peak Elev=1,828.51' Inflow=1.41 cfs 0.134 af 24.0" x 35.0' Culvert Outflow=1.41 cfs 0.134 af
Pond CV138: Culvert 138	Peak Elev=1,844.38' Inflow=1.84 cfs 0.194 af 18.0" x 30.8' Culvert Outflow=1.84 cfs 0.194 af

Pond CV139: CV139	Peak Elev=1,856.04'	Inflow=4.54 cfs	0.616 af
	18.0" x 35.0' Culvert	Outflow=4.54 cfs	0.616 af
Pond CV141: CV141	Peak Elev=1,883.57'	Inflow=3.03 cfs	0.426 af
	18.0" x 35.0' Culvert	Outflow=3.03 cfs	0.426 af
Pond CV2: CV2	Peak Elev=1,203.49'	Inflow=1.82 cfs	0.249 af
	36.0" x 42.0' Culvert	Outflow=1.82 cfs	0.249 af
Pond CV23: (new Pond)	Peak Elev=1,204.20'	Inflow=10.06 cfs	2.889 af
	6.00' x 2.00' x 40.0' Culvert	Outflow=10.06 cfs	2.889 af
Pond CV2A: CV2A	Peak Elev=1,284.52'	Inflow=1.11 cfs	0.085 af
	15.0" x 40.0' Culvert	Outflow=1.11 cfs	0.085 af
Pond CV3: CV3	Peak Elev=1,215.22'	Inflow=0.26 cfs	0.025 af
	18.0" x 55.0' Culvert	Outflow=0.26 cfs	0.025 af
Pond CV32: CV32	Peak Elev=1,345.76'	Inflow=9.34 cfs	2.876 af
	24.0" x 40.0' Culvert	Outflow=9.34 cfs	2.876 af
Pond CV33: CV33	Peak Elev=1,344.24'	Inflow=0.61 cfs	0.077 af
	18.0" x 45.0' Culvert	Outflow=0.61 cfs	0.077 af
Pond CV38: CV38	Peak Elev=1,355.18'	Inflow=3.72 cfs	0.720 af
	24.0" x 35.0' Culvert	Outflow=3.72 cfs	0.720 af
Pond CV4: CV4	Peak Elev=1,218.19'	Inflow=18.17 cfs	3.920 af
	24.0" x 46.0' Culvert	Outflow=18.17 cfs	3.920 af
Pond CV41: CV41	Peak Elev=1,355.08'	Inflow=1.70 cfs	0.266 af
	18.0" x 35.0' Culvert	Outflow=1.70 cfs	0.266 af
Pond CV47: CV47	Peak Elev=1,371.39'	Inflow=5.80 cfs	1.136 af
	30.0" x 35.0' Culvert	Outflow=5.80 cfs	1.136 af
Pond CV48: CV 48	Peak Elev=1,379.40'	Inflow=10.06 cfs	2.628 af
	6.00' x 2.00' x 32.0' Culvert	Outflow=10.06 cfs	2.628 af
Pond CV4A: CV4A	Peak Elev=1,262.91'	Inflow=17.97 cfs	3.802 af
	24.0" x 55.0' Culvert	Outflow=17.97 cfs	3.802 af
Pond CV50: CV50	Peak Elev=1,406.35'	Inflow=1.16 cfs	0.245 af
	18.0" x 35.0' Culvert	Outflow=1.16 cfs	0.245 af
Pond CV52: CV52	Peak Elev=1,414.42'	Inflow=0.75 cfs	0.107 af
	24.0" x 35.0' Culvert	Outflow=0.75 cfs	0.107 af
Pond CV53: CV53	Peak Elev=1,416.48'	Inflow=1.94 cfs	0.308 af
	18.0" x 35.0' Culvert	Outflow=1.94 cfs	0.308 af

Pond CV54: CV54 Peak Elev=1,410.89' Inflow=1.86 cfs 0.336 af
24.0" x 35.0' Culvert Outflow=1.86 cfs 0.336 af

Pond CV55: CV55 Peak Elev=1,407.57' Inflow=4.73 cfs 0.957 af
24.0" x 35.0' Culvert Outflow=4.73 cfs 0.957 af

Pond CV56: CV56 Peak Elev=1,419.28' Inflow=1.08 cfs 0.177 af
18.0" x 30.0' Culvert Outflow=1.08 cfs 0.177 af

Pond CV58: CV58 Peak Elev=1,412.29' Inflow=2.73 cfs 0.494 af
24.0" x 35.0' Culvert Outflow=2.73 cfs 0.494 af

Pond CV59: CV59 Peak Elev=1,405.41' Inflow=4.28 cfs 0.849 af
24.0" x 35.0' Culvert Outflow=4.28 cfs 0.849 af

Pond CV63: CV63 Peak Elev=1,394.23' Inflow=5.19 cfs 0.330 af
18.0" x 35.0' Culvert Outflow=5.19 cfs 0.330 af

Pond CV64: CV64 Peak Elev=1,429.03' Inflow=3.73 cfs 0.270 af
15.0" x 32.0' Culvert Outflow=3.73 cfs 0.270 af

Pond CV65: CV65 Peak Elev=1,437.05' Inflow=1.40 cfs 0.261 af
24.0" x 35.0' Culvert Outflow=1.40 cfs 0.261 af

Pond CV66: CV66 Peak Elev=1,439.72' Inflow=2.94 cfs 0.388 af
24.0" x 35.0' Culvert Outflow=2.94 cfs 0.388 af

Pond CV67: CV67 Peak Elev=1,441.95' Inflow=0.96 cfs 0.099 af
18.0" x 42.0' Culvert Outflow=0.96 cfs 0.099 af

Pond CV69: CV69 Peak Elev=1,424.20' Inflow=6.59 cfs 1.486 af
24.0" x 32.0' Culvert Outflow=6.59 cfs 1.486 af

Pond CV70: CV 70 Peak Elev=1,424.67' Inflow=22.55 cfs 9.610 af
9.00' x 2.00' x 32.0' Culvert Outflow=22.55 cfs 9.610 af

Pond CV77: CV77 Peak Elev=1,532.86' Inflow=1.49 cfs 0.228 af
18.0" x 30.0' Culvert Outflow=1.49 cfs 0.228 af

Pond CV78: CV78 Peak Elev=1,536.42' Inflow=3.45 cfs 0.608 af
18.0" x 35.0' Culvert Outflow=3.45 cfs 0.608 af

Pond CV79: CV79 Peak Elev=1,559.38' Inflow=3.18 cfs 0.565 af
18.0" x 34.0' Culvert Outflow=3.18 cfs 0.565 af

Pond CV8: CV8 Peak Elev=1,258.23' Inflow=1.32 cfs 0.211 af
15.0" x 35.0' Culvert Outflow=1.32 cfs 0.211 af

Pond CV80: CV80 Peak Elev=1,576.37' Inflow=1.33 cfs 0.193 af
18.0" x 34.0' Culvert Outflow=1.33 cfs 0.193 af

Pond CV81: CV81	Peak Elev=1,582.72' Inflow=1.41 cfs 0.329 af 18.0" x 34.0' Culvert Outflow=1.41 cfs 0.329 af
Pond CV82: CV82	Peak Elev=1,579.21' Inflow=2.25 cfs 0.532 af 15.0" x 30.0' Culvert Outflow=2.25 cfs 0.532 af
Pond CV83: CV83	Peak Elev=1,578.86' Inflow=0.33 cfs 0.056 af 18.0" x 65.0' Culvert Outflow=0.33 cfs 0.056 af
Pond CV86: CV86	Peak Elev=1,559.76' Inflow=2.65 cfs 0.552 af 18.0" x 30.0' Culvert Outflow=2.65 cfs 0.552 af
Pond CV88: CV88	Peak Elev=1,576.43' Inflow=4.57 cfs 0.802 af 15.0" x 30.0' Culvert Outflow=4.57 cfs 0.802 af
Pond CV89: CV89	Peak Elev=1,571.75' Inflow=0.34 cfs 0.035 af 18.0" x 30.0' Culvert Outflow=0.34 cfs 0.035 af
Pond CV90: CV90	Peak Elev=1,569.12' Inflow=3.57 cfs 0.813 af 15.0" x 30.0' Culvert Outflow=3.57 cfs 0.813 af
Pond CV93: CV93	Peak Elev=1,579.42' Inflow=1.25 cfs 0.159 af 18.0" x 30.0' Culvert Outflow=1.25 cfs 0.159 af
Pond CV96: CV96	Peak Elev=1,628.36' Inflow=3.31 cfs 0.983 af 18.0" x 30.0' Culvert Outflow=3.31 cfs 0.983 af
Pond CV97: CV97	Peak Elev=1,653.64' Inflow=0.57 cfs 0.038 af 15.0" x 35.0' Culvert Outflow=0.57 cfs 0.038 af
Pond CV98: CV98	Peak Elev=1,659.67' Inflow=0.14 cfs 0.009 af 15.0" x 40.0' Culvert Outflow=0.14 cfs 0.009 af

Total Runoff Area = 2,258.451 ac Runoff Volume = 79.877 af Average Runoff Depth = 0.42"
100.00% Pervious Area = 2,258.451 ac 0.00% Impervious Area = 0.000 ac

Subcatchment C-102: Culvert-102 Area

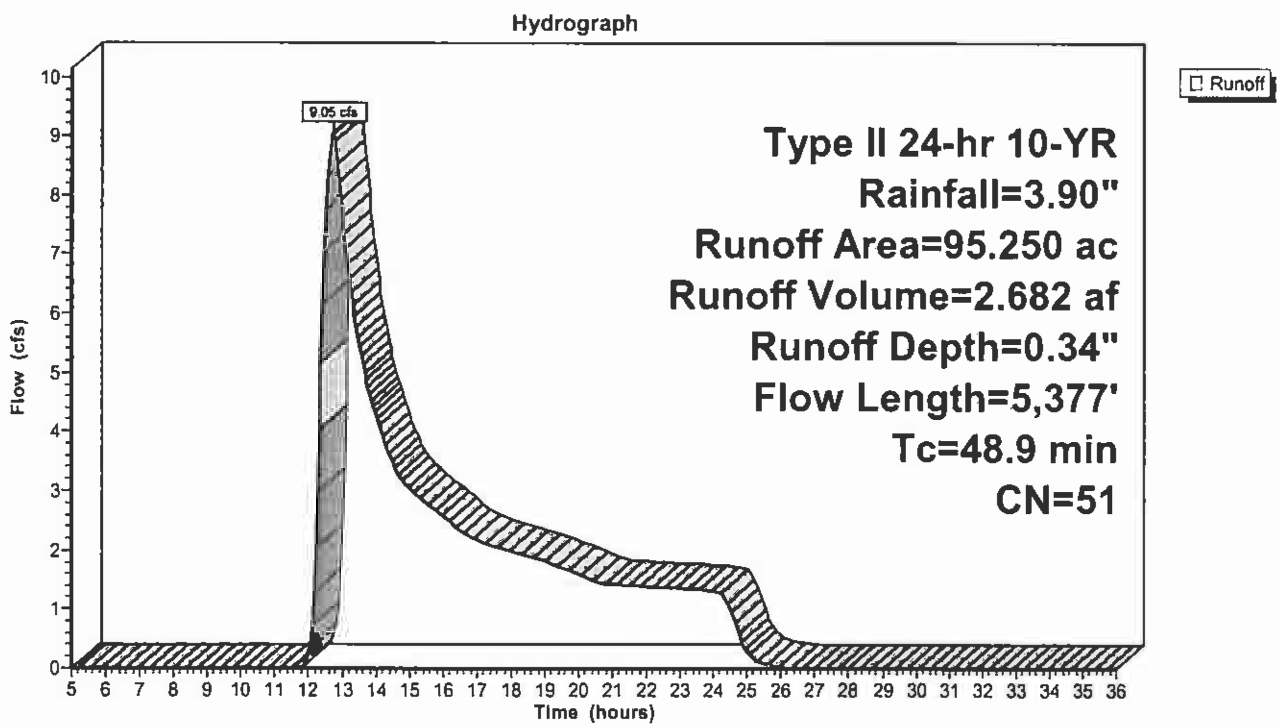
Runoff = 9.05 cfs @ 12.71 hrs, Volume= 2.682 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.123	89	Gravel roads, HSG C
48.336	49	Brush, Good, HSG C
46.791	53	Woods, Good, HSG C
95.250	51	Weighted Average
95.250		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
23.1	2,823	0.1660	2.04		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
16.1	2,454	0.1320	2.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
48.9	5,377	Total			

Subcatchment C-102: Culvert-102 Area



Subcatchment C-117: Culvert-117 Area

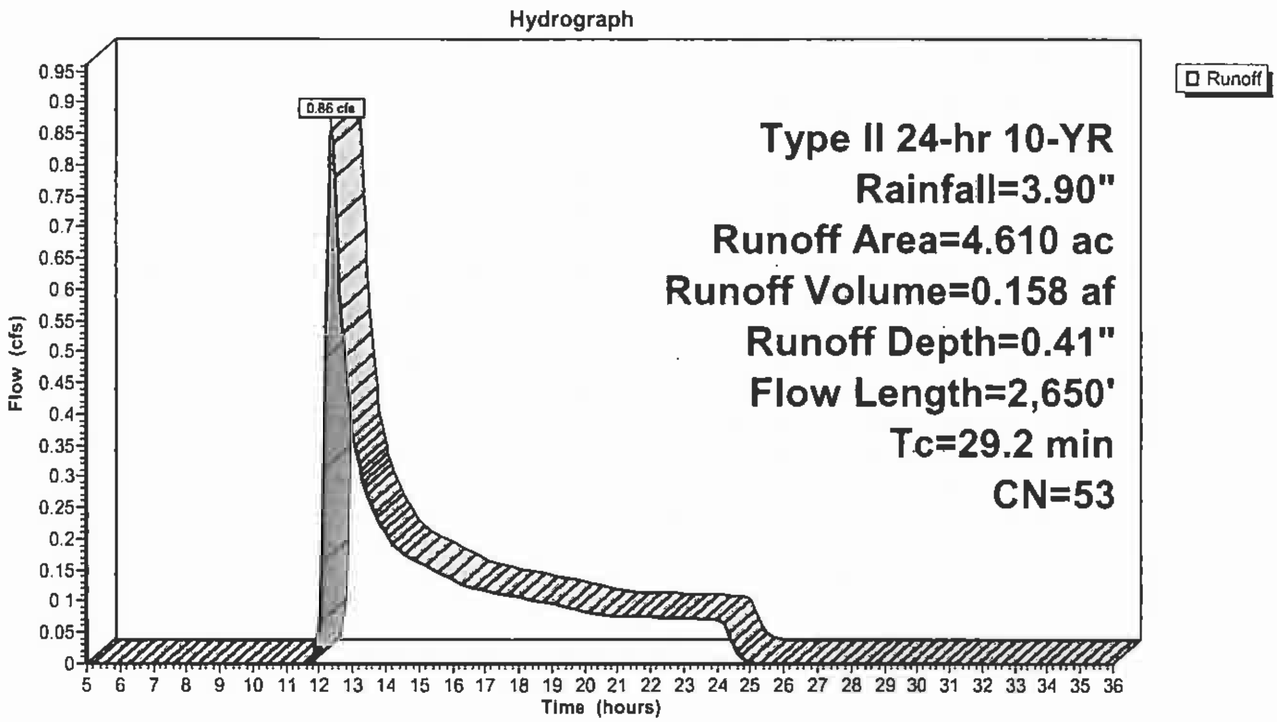
Runoff = 0.86 cfs @ 12.34 hrs, Volume= 0.158 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.100	49	Brush, Good, HSG C
4.460	53	Woods, Good, HSG C
4.610	53	Weighted Average
4.610		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.5	2,550	0.1900	2.18		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
29.2	2,650	Total			

Subcatchment C-117: Culvert-117 Area



Subcatchment C-12: Culvert-12 Area

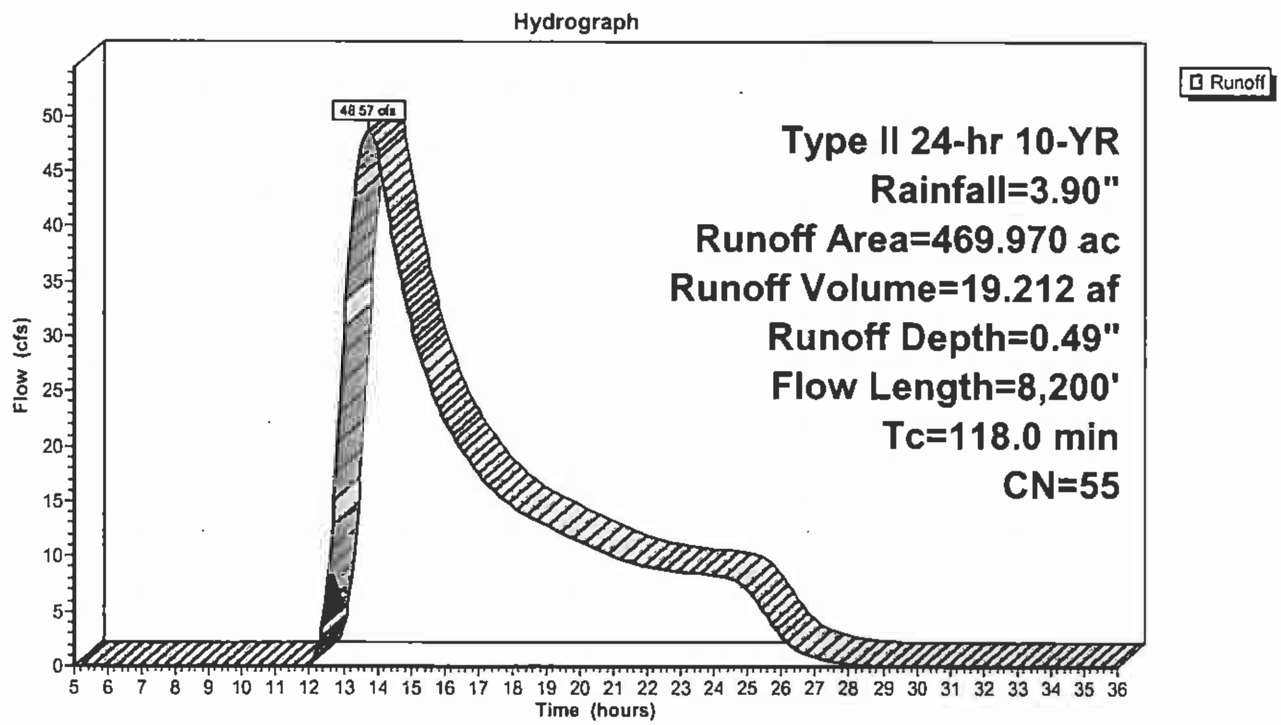
Runoff = 48.57 cfs @ 13.75 hrs, Volume= 19.212 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.010	89	Gravel roads, HSG C
193.000	58	Woods, Good, HSG D
276.960	53	Woods, Good, HSG C
469.970	55	Weighted Average
469.970		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
102.1	6,200	0.0410	1.01		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.1	1,900	0.0680	7.75	29.06	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.50' Z= 1.0 '/' Top.W=4.00' n= 0.040
118.0	8,200	Total			

Subcatchment C-12: Culvert-12 Area



Subcatchment C-124: Culvert-124 Area

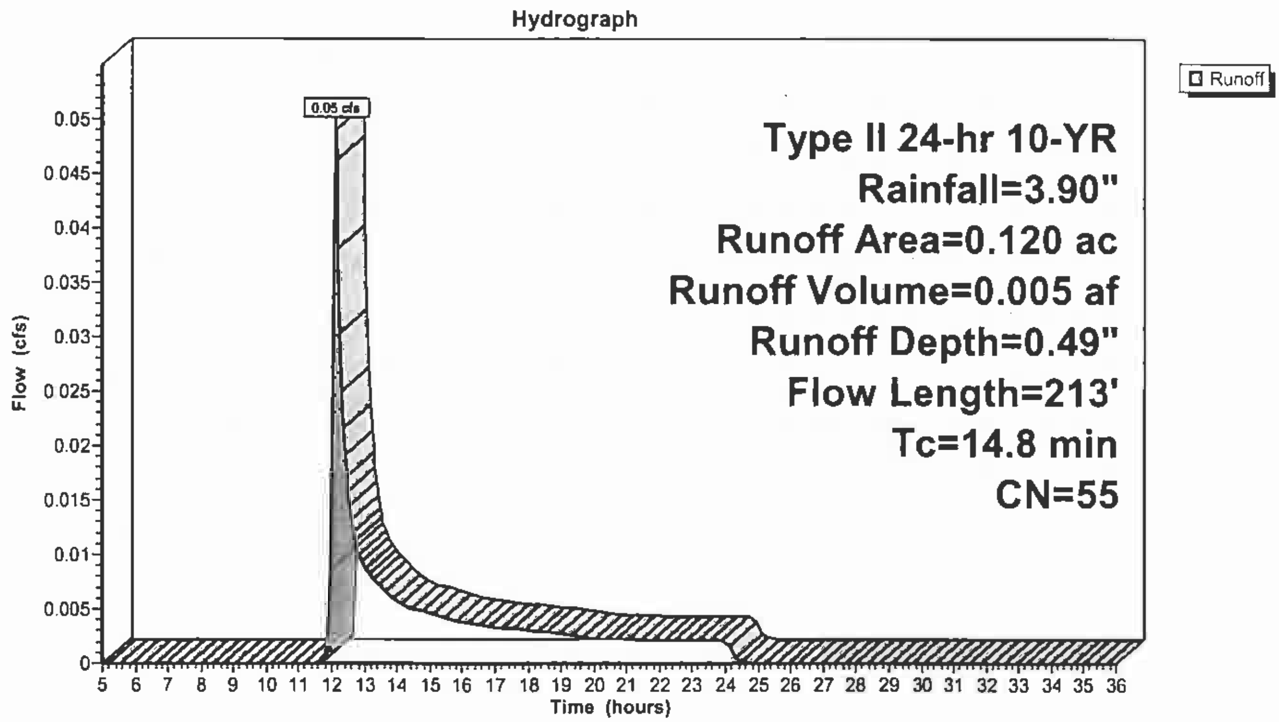
Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.005 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.008	89	Gravel roads, HSG C
0.015	49	Brush, Good, HSG C
0.097	53	Woods, Good, HSG C
0.120	55	Weighted Average
0.120		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	100	0.0780	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.2	113	0.0970	1.56		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
14.8	213	Total			

Subcatchment C-124: Culvert-124 Area



Subcatchment C-126: Culvert-126 Area

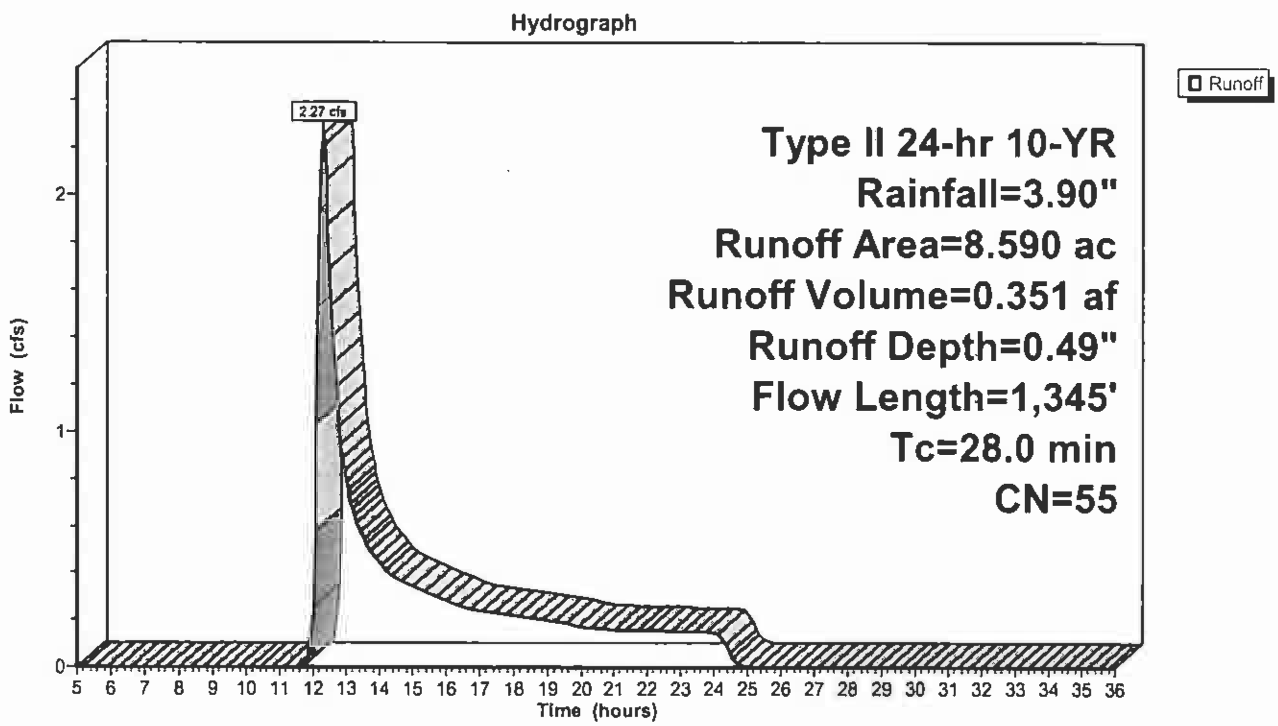
Runoff = 2.27 cfs @ 12.31 hrs, Volume= 0.351 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
6.150	53	Woods, Good, HSG C
0.020	55	Brush, Good, HSG D
2.290	58	Woods, Good, HSG D
8.590	55	Weighted Average
8.590		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.5	1,110	0.1030	1.60		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	135	0.0440	7.05	52.91	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.040
28.0	1,345	Total			

Subcatchment C-126: Culvert-126 Area



Subcatchment C-128: Culvert-128 Area

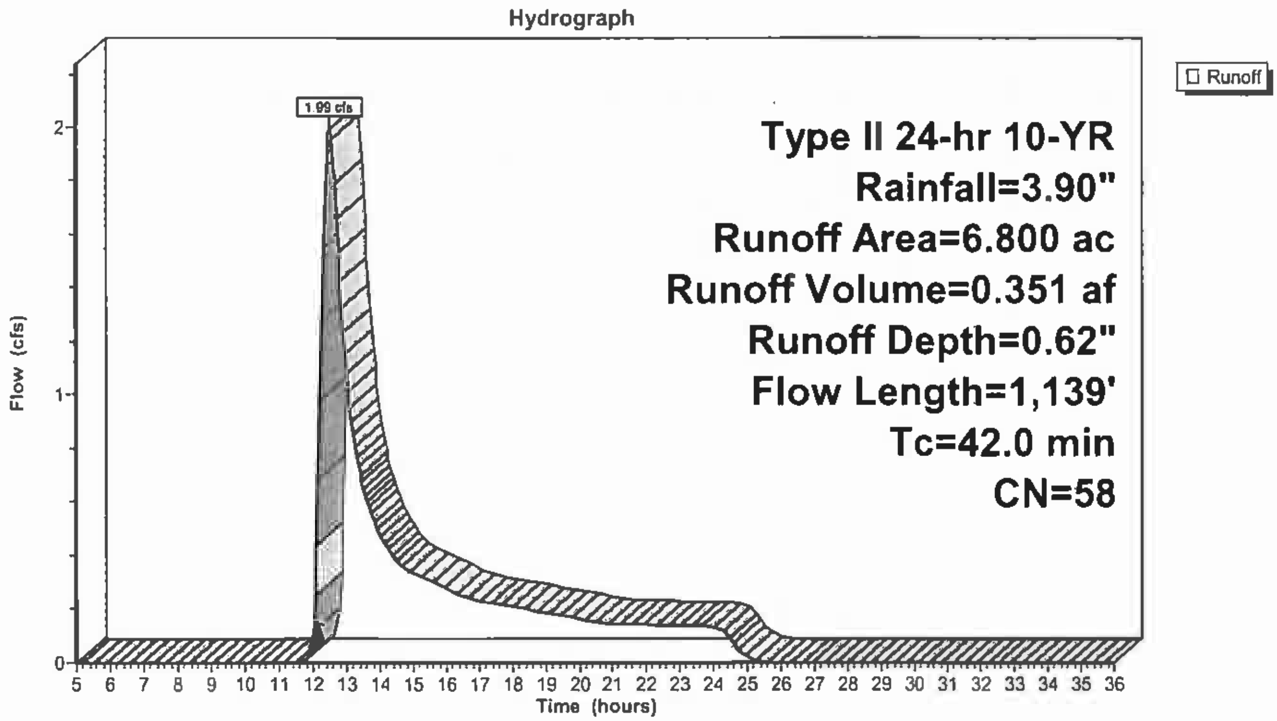
Runoff = 1.99 cfs @ 12.49 hrs, Volume= 0.351 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.082	89	Gravel roads, HSG C
0.185	55	Brush, Good, HSG D
6.533	58	Woods, Good, HSG D
6.800	58	Weighted Average
6.800		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.2	1,039	0.0960	1.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
42.0	1,139	Total			

Subcatchment C-128: Culvert-128 Area



Subcatchment C-130: Culvert-130 Area

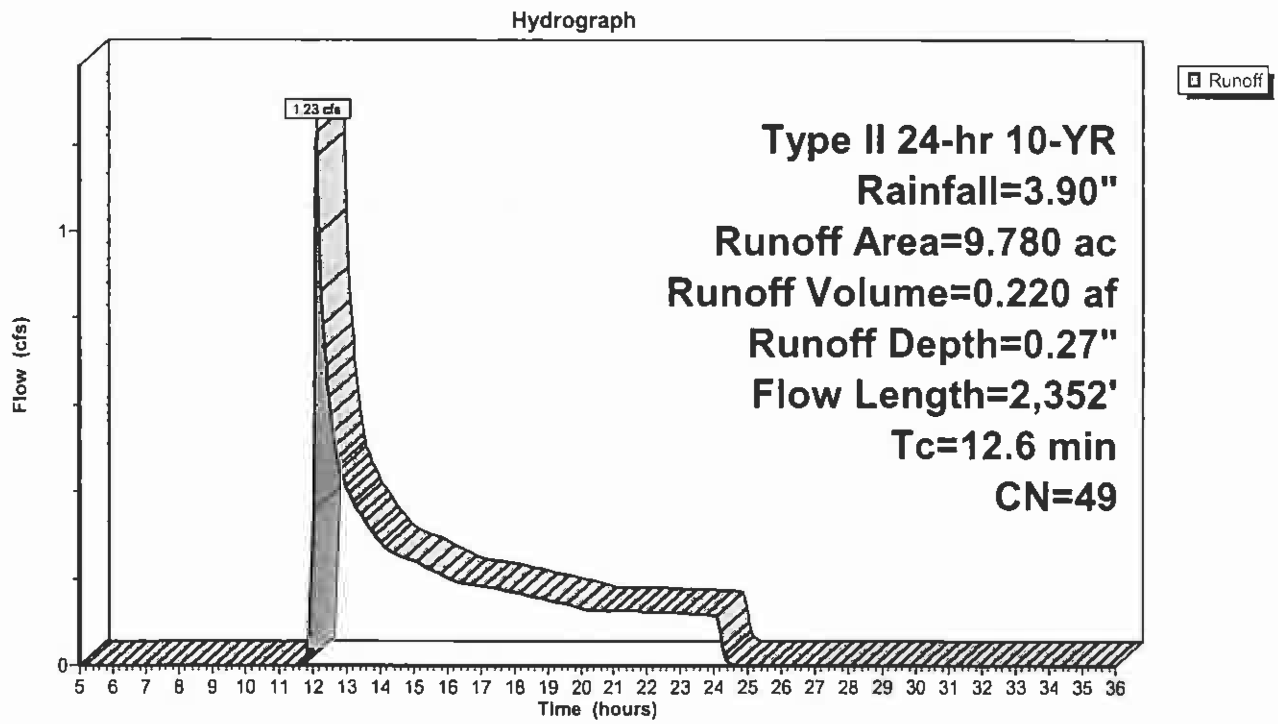
Runoff = 1.23 cfs @ 12.12 hrs, Volume= 0.220 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.690	89	Gravel roads, HSG C
0.090	36	Brush, Good, HSG B
6.720	42	Woods, Good, HSG B
0.930	55	Brush, Good, HSG D
1.350	58	Woods, Good, HSG D
9.780	49	Weighted Average
9.780		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.1000	0.30		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
3.8	342	0.0470	1.52		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
3.2	1,910	0.0630	9.91	118.98	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
12.6	2,352	Total			

Subcatchment C-130: Culvert-130 Area



Subcatchment C-132: Culvert-132 Area

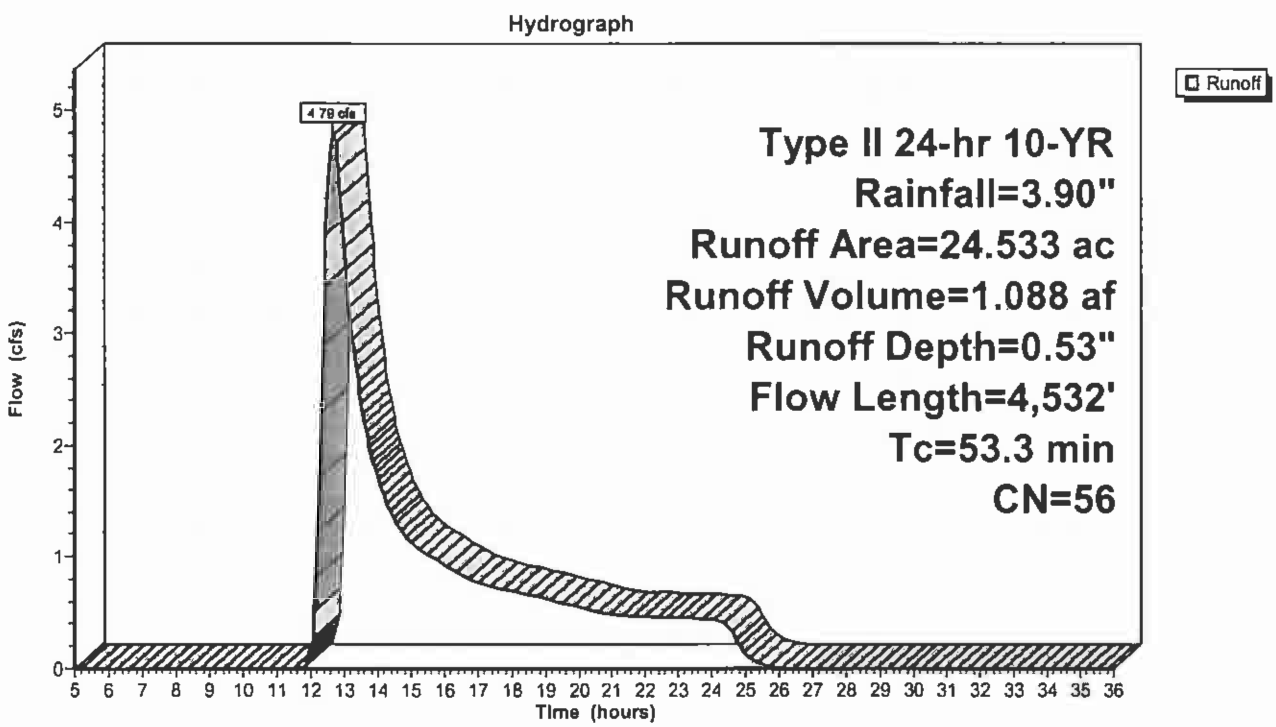
Runoff = 4.79 cfs @ 12.68 hrs, Volume= 1.088 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.045	89	Gravel roads, HSG C
9.360	53	Woods, Good, HSG C
0.098	55	Brush, Good, HSG D
14.920	58	Woods, Good, HSG D
0.090	91	Gravel roads, HSG D
0.020	55	Brush, Good, HSG D
24.533	56	Weighted Average
24.533		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2200	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
44.3	4,432	0.1110	1.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
53.3	4,532	Total			

Subcatchment C-132: Culvert-132 Area



Subcatchment C-134: Culvert-134 Area

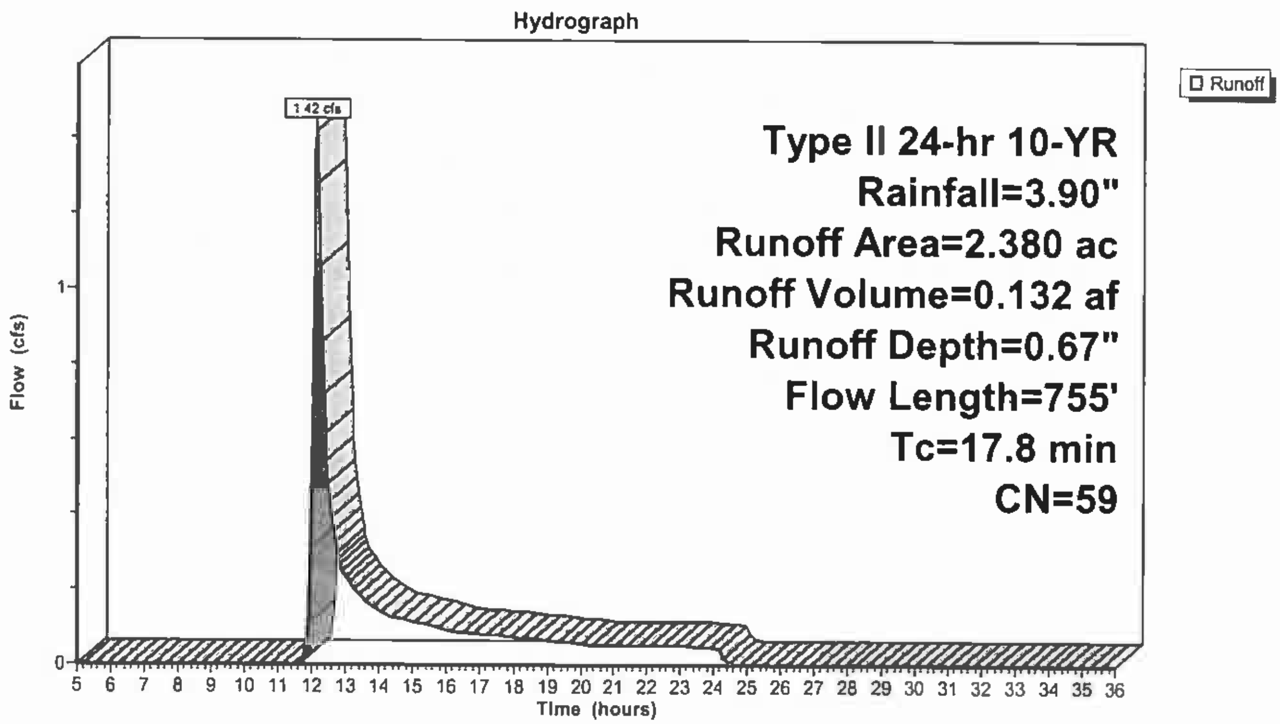
Runoff = 1.42 cfs @ 12.14 hrs, Volume= 0.132 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.069	89	Gravel roads, HSG C
0.090	55	Brush, Good, HSG D
2.221	58	Woods, Good, HSG D
2.380	59	Weighted Average
2.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.7	539	0.1000	1.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	116	0.0340	7.28	87.41	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
17.8	755	Total			

Subcatchment C-134: Culvert-134 Area



Subcatchment C-135: Culvert-135 Area

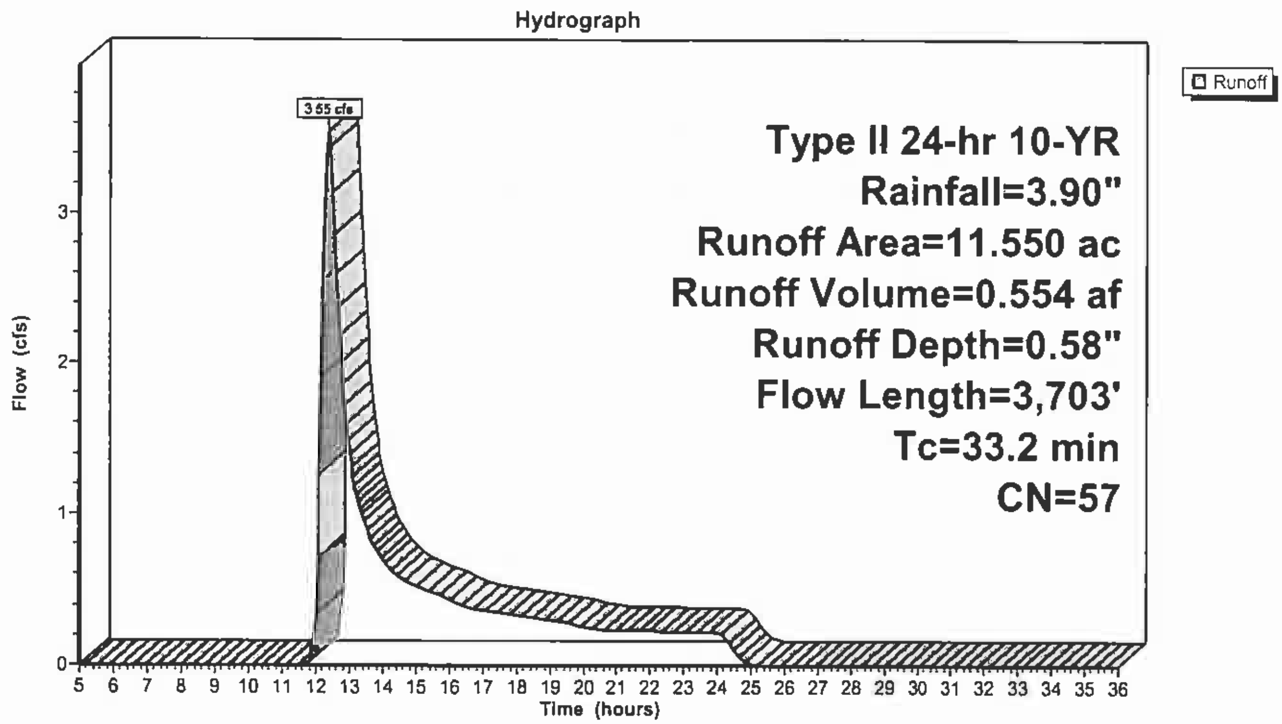
Runoff = 3.55 cfs @ 12.37 hrs, Volume= 0.554 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.043	89	Gravel roads, HSG C
3.450	53	Woods, Good, HSG C
0.068	55	Brush, Good, HSG D
7.989	58	Woods, Good, HSG D
11.550	57	Weighted Average
11.550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
22.7	3,517	0.2670	2.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	86	0.0810	11.14	222.80	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 4.0 '/' Top.W=18.00' n= 0.040
33.2	3,703	Total			

Subcatchment C-135: Culvert-135 Area



Subcatchment C-136: Culvert-136 Area

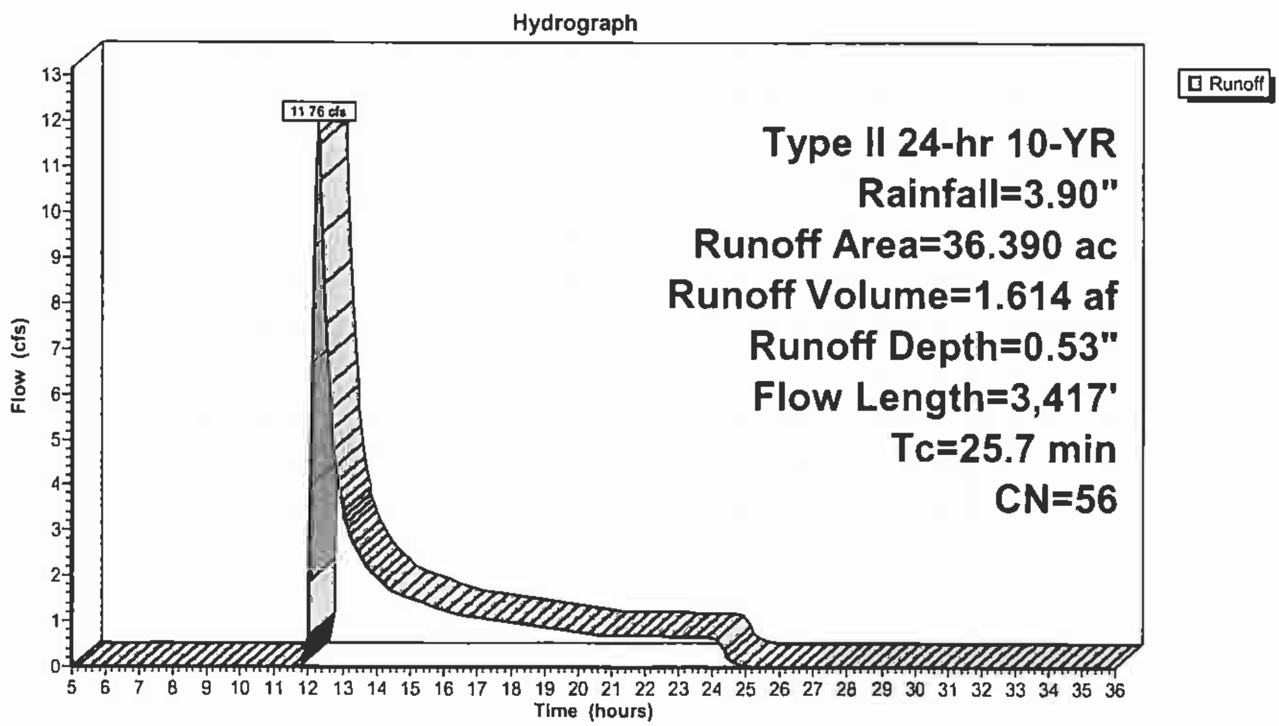
Runoff = 11.76 cfs @ 12.26 hrs, Volume= 1.614 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
16.857	53	Woods, Good, HSG C
1.447	55	Brush, Good, HSG D
18.016	58	Woods, Good, HSG D
36.390	56	Weighted Average
36.390		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.9	2,564	0.3310	2.88		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	586	0.0990	11.73	117.33	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 2.0 '/' Top.W=9.00' n= 0.040
0.3	167	0.0600	9.65	154.42	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.040
25.7	3,417	Total			

Subcatchment C-136: Culvert-136 Area



Subcatchment C-137: Culvert-137 Area

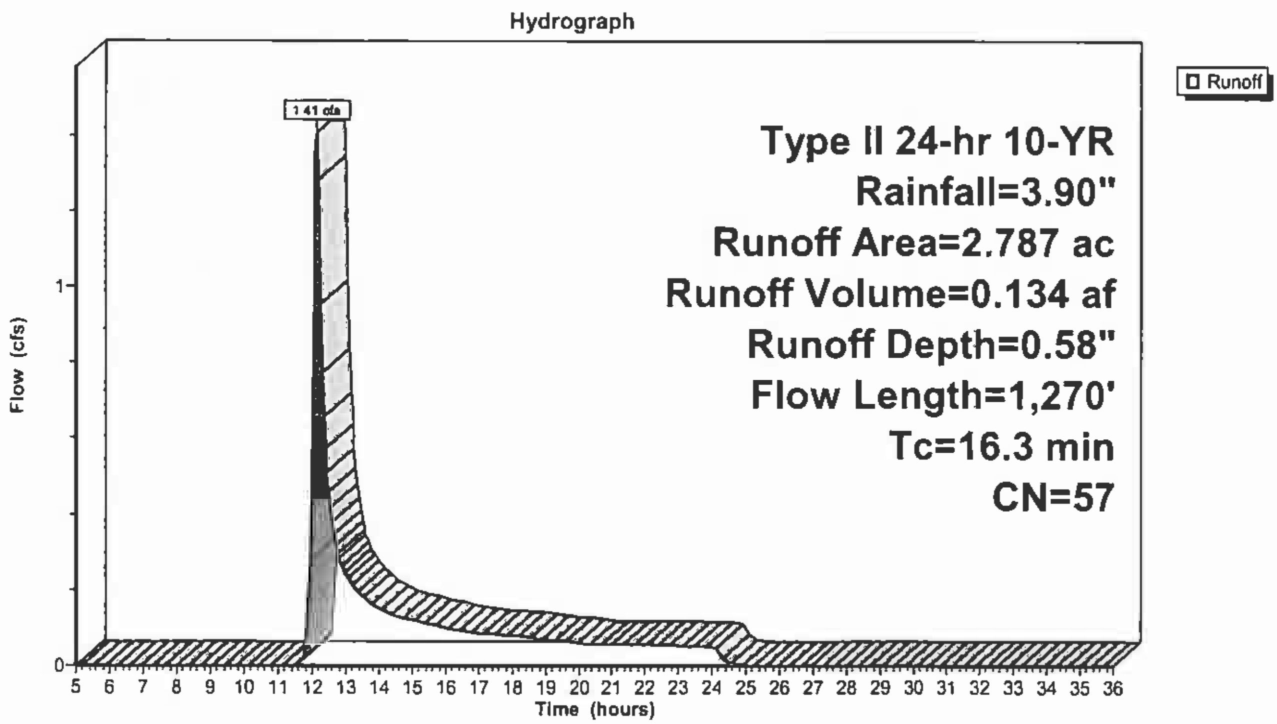
Runoff = 1.41 cfs @ 12.12 hrs, Volume= 0.134 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.071	89	Gravel roads, HSG C
0.705	53	Woods, Good, HSG C
0.317	55	Brush, Good, HSG D
1.694	58	Woods, Good, HSG D
2.787	57	Weighted Average
2.787		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.3400	0.22		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
8.6	1,058	0.1690	2.06		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	112	0.0710	10.50	167.98	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.040
16.3	1,270	Total			

Subcatchment C-137: Culvert-137 Area



Subcatchment C-138: Culvert-138 Area

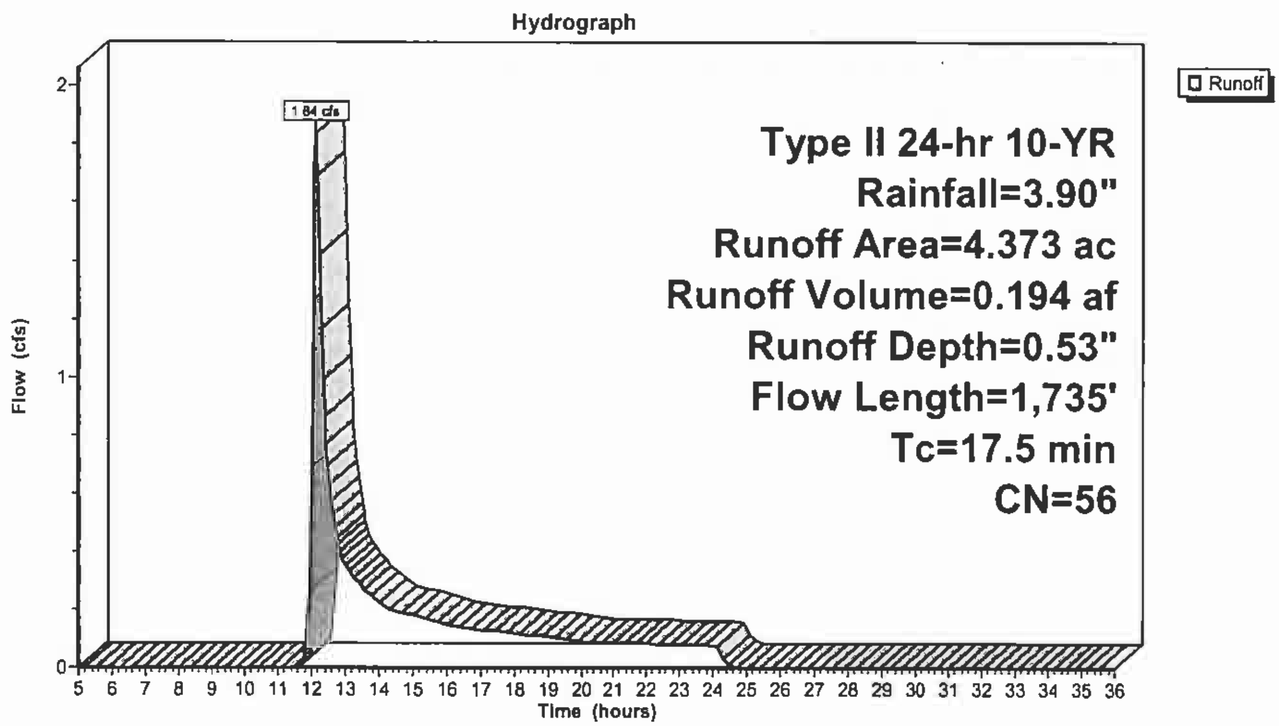
Runoff = 1.84 cfs @ 12.15 hrs, Volume= 0.194 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.043	89	Gravel roads, HSG C
2.385	53	Woods, Good, HSG C
0.063	55	Brush, Good, HSG D
1.882	58	Woods, Good, HSG D
4.373	56	Weighted Average
4.373		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.4200	0.24		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.4	1,555	0.2490	2.49		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	80	0.0500	8.45	118.28	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 3.0 '/' Top.W=13.00' n= 0.040
17.5	1,735	Total			

Subcatchment C-138: Culvert-138 Area



Subcatchment C-139: Culvert-139 Area

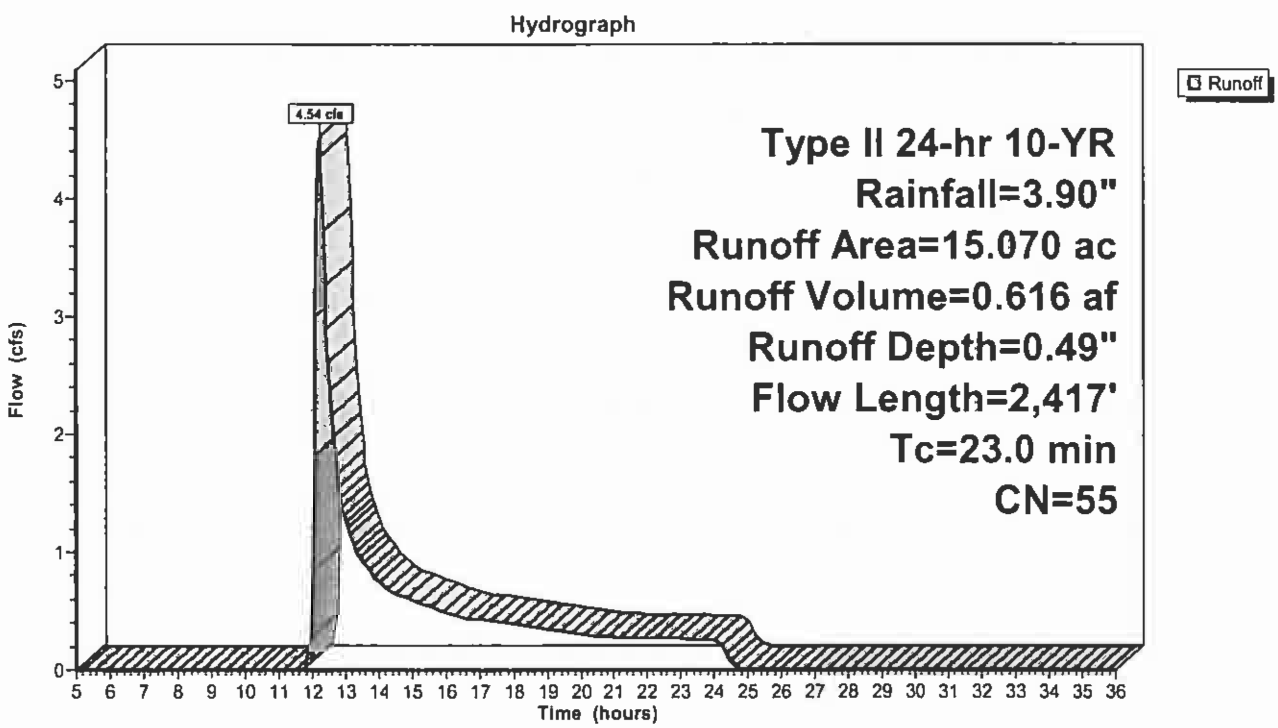
Runoff = 4.54 cfs @ 12.23 hrs, Volume= 0.616 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.063	89	Gravel roads, HSG C
8.491	53	Woods, Good, HSG C
0.075	55	Brush, Good, HSG D
6.441	58	Woods, Good, HSG D
15.070	55	Weighted Average
15.070		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2100	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.9	2,317	0.3070	2.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
23.0	2,417	Total			

Subcatchment C-139: Culvert-139 Area



Subcatchment C-141: Culvert-141 Area

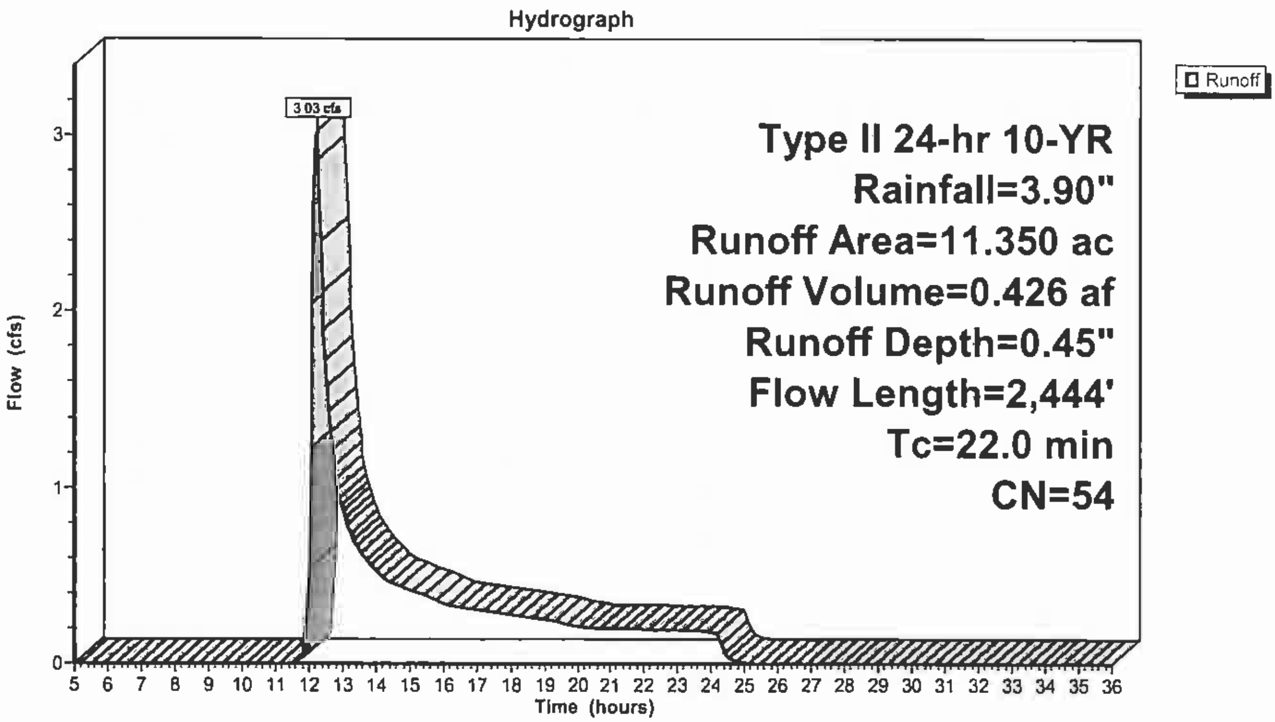
Runoff = 3.03 cfs @ 12.22 hrs, Volume= 0.426 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.052	89	Gravel roads, HSG C
0.080	49	Brush, Good, HSG C
9.889	53	Woods, Good, HSG C
1.329	58	Woods, Good, HSG D
11.350	54	Weighted Average
11.350		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.3000	0.21		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.0	2,275	0.2940	2.71		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	69	0.0570	9.43	113.17	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
22.0	2,444	Total			

Subcatchment C-141: Culvert-141 Area



Subcatchment C-17 Area: Culvert-17 Area

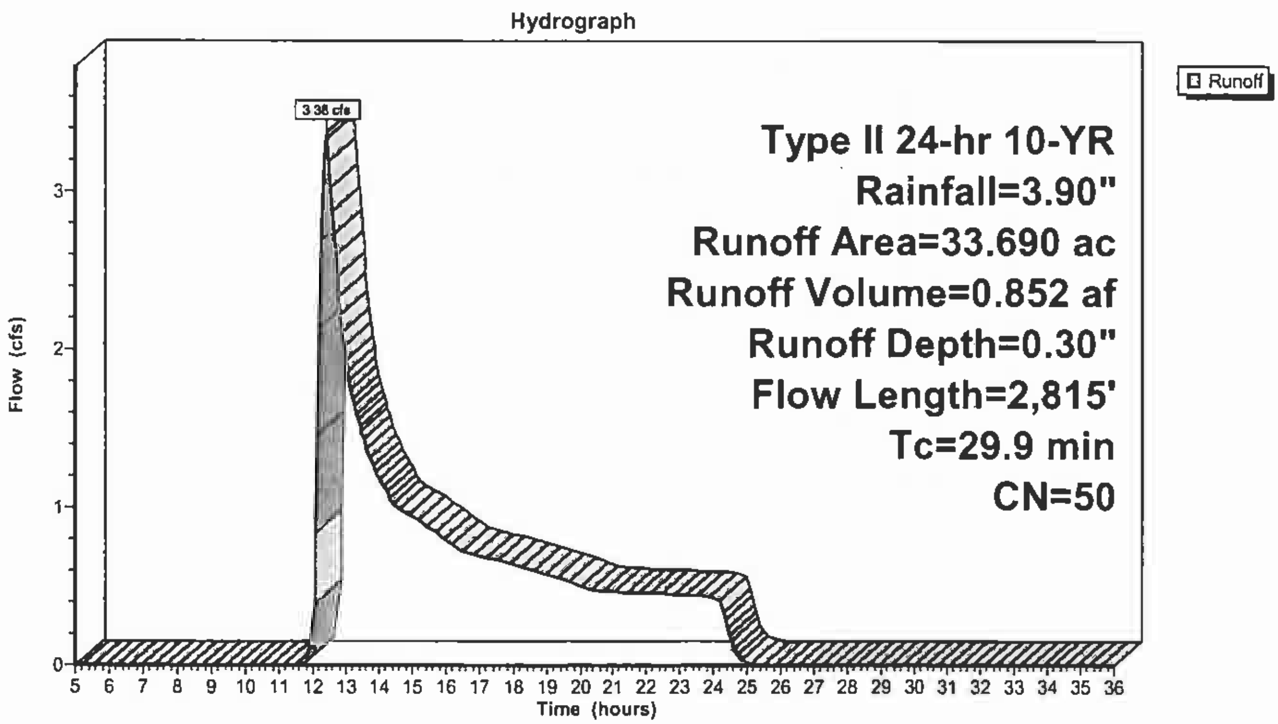
Runoff = 3.38 cfs @ 12.41 hrs, Volume= 0.852 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.240	89	Gravel roads, HSG C
25.560	49	Brush, Good, HSG C
7.890	53	Woods, Good, HSG C
33.690	50	Weighted Average
33.690		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0900	0.13		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
15.4	1,750	0.1430	1.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.7	965	0.0780	9.68	58.09	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.040
29.9	2,815	Total			

Subcatchment C-17 Area: Culvert-17 Area



Subcatchment C-23: Culvert-23 Area

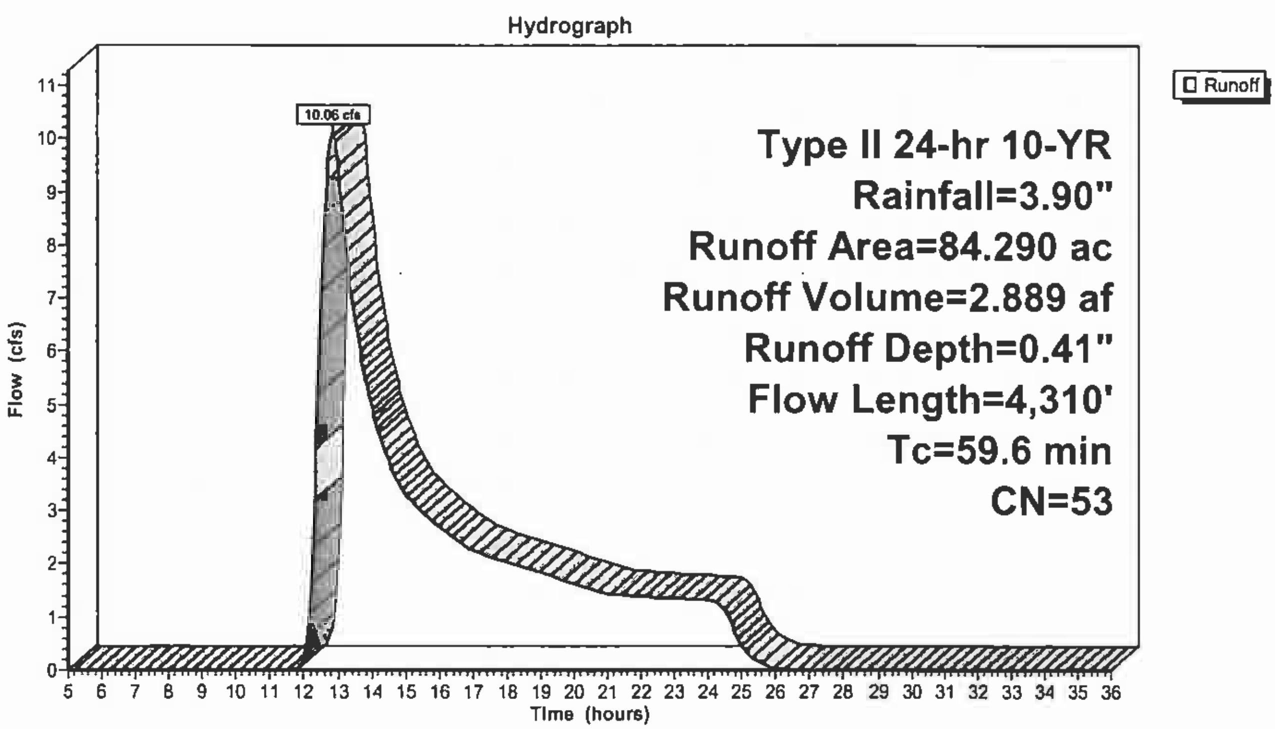
Runoff = 10.06 cfs @ 12.84 hrs, Volume= 2.889 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.140	89	Gravel roads, HSG C
83.750	53	Woods, Good, HSG C
0.400	49	Brush, Good, HSG C
84.290	53	Weighted Average
84.290		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
39.1	3,800	0.1050	1.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	410	0.1120	11.86	80.07	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
59.6	4,310	Total			

Subcatchment C-23: Culvert-23 Area



Subcatchment C-25: Culvert-25 Area

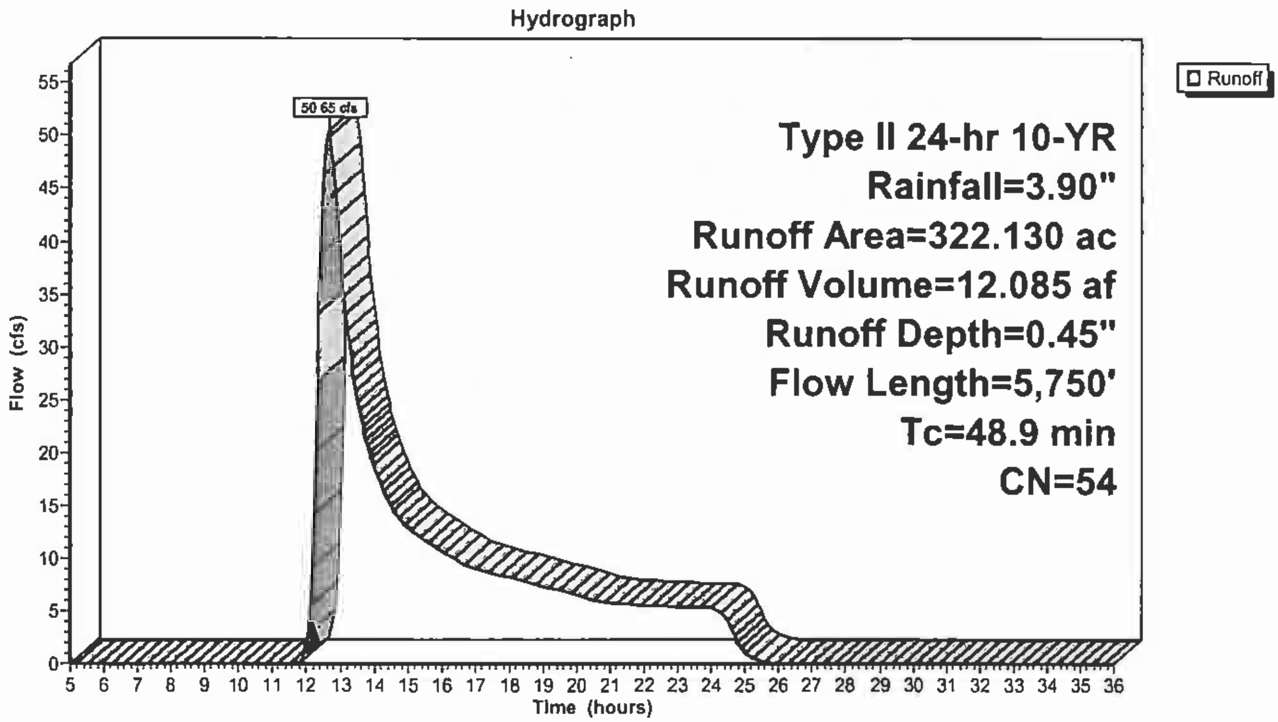
Runoff = 50.65 cfs @ 12.65 hrs, Volume= 12.085 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
5.290	49	Brush, Good, HSG C
258.870	53	Woods, Good, HSG C
57.850	58	Woods, Good, HSG D
322.130	54	Weighted Average
322.130		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
15.0	2,300	0.1330	2.55		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
18.8	1,830	0.1050	1.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.8	1,520	0.0640	8.97	60.53	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
48.9	5,750	Total			

Subcatchment C-25: Culvert-25 Area



Subcatchment C-2A: C-2A

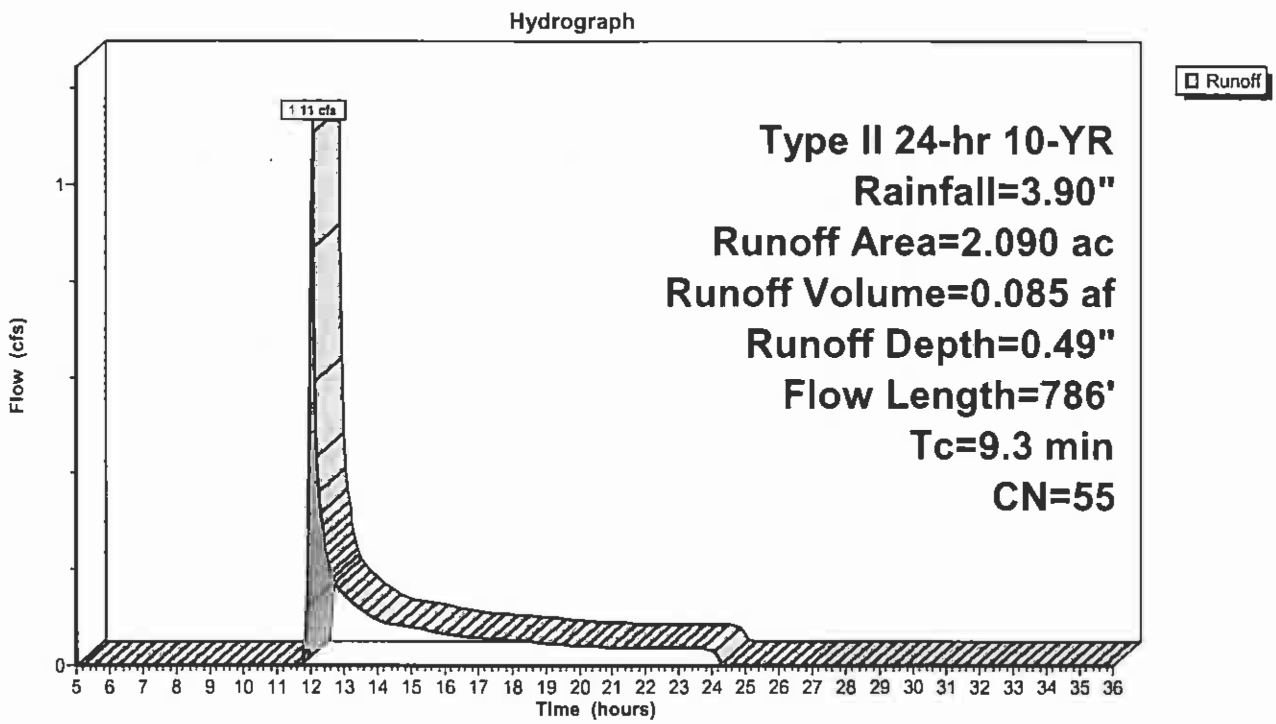
Runoff = 1.11 cfs @ 12.04 hrs, Volume= 0.085 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.155	89	Gravel roads, HSG C
0.524	49	Brush, Good, HSG C
1.411	53	Woods, Good, HSG C
2.090	55	Weighted Average
2.090		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	120	0.1500	0.36		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
3.0	375	0.1760	2.10		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	291	0.0210	5.72	68.69	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
9.3	786	Total			

Subcatchment C-2A: C-2A



Subcatchment C-2B: C-2B

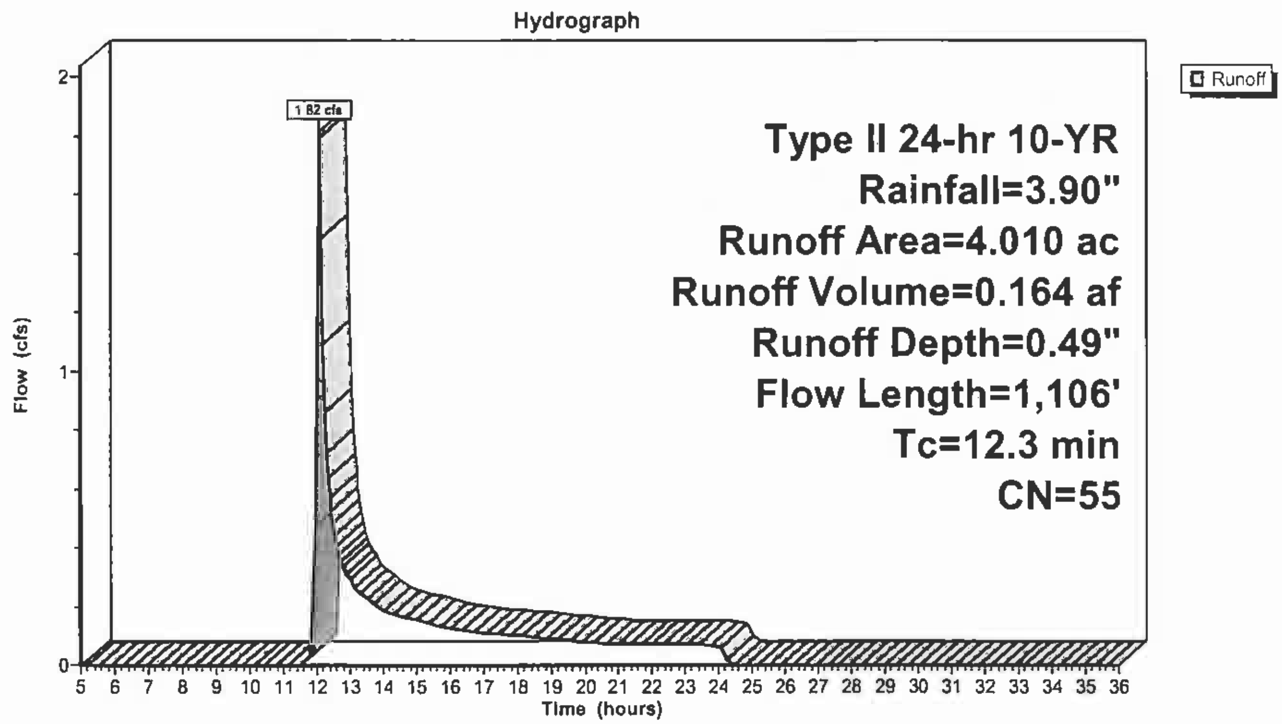
Runoff = 1.82 cfs @ 12.08 hrs, Volume= 0.164 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.245	89	Gravel roads, HSG C
0.221	49	Brush, Good, HSG C
3.544	53	Woods, Good, HSG C
4.010	55	Weighted Average
4.010		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	190	0.0210	1.46		**Sheet Flow, sheet** Smooth surfaces n= 0.011 P2= 2.70"
10.1	916	0.0920	1.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
12.3	1,106	Total			

Subcatchment C-2B: C-2B



Subcatchment C-3: Culvert-3 Area

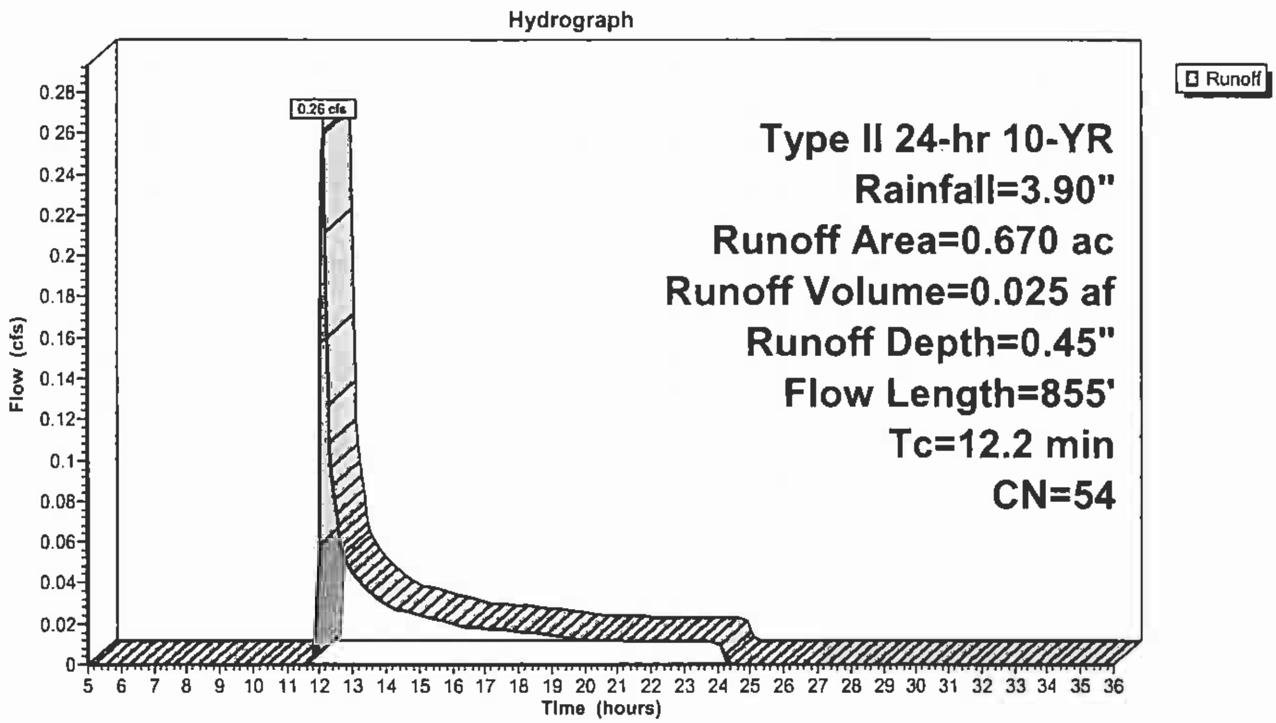
Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.029	89	Gravel roads, HSG C
0.063	49	Brush, Good, HSG C
0.578	53	Woods, Good, HSG C
0.670	54	Weighted Average
0.670		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	45	0.3550	0.42		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
10.4	810	0.0670	1.29		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
12.2	855	Total			

Subcatchment C-3: Culvert-3 Area



Subcatchment C-32: Culvert-32 Area

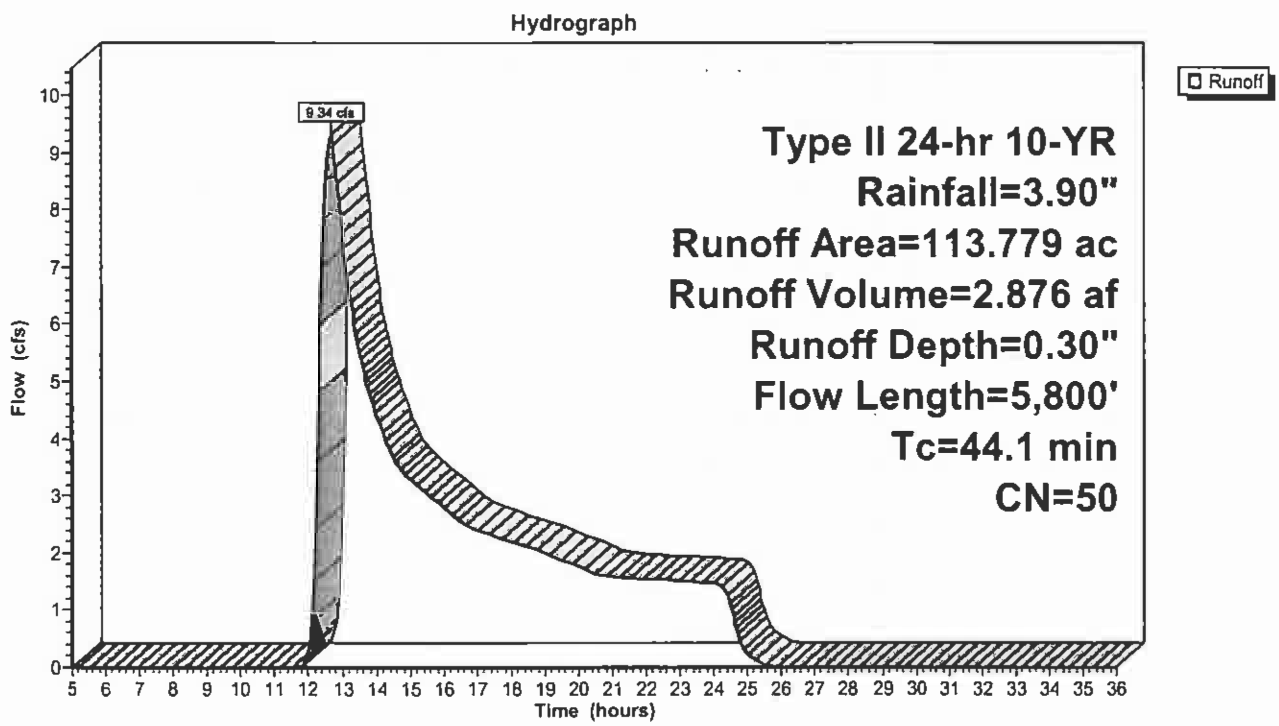
Runoff = 9.34 cfs @ 12.66 hrs, Volume= 2.876 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.019	89	Gravel roads, HSG C
98.310	49	Brush, Good, HSG C
15.450	53	Woods, Good, HSG C
113.779	50	Weighted Average
113.779		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0500	0.23		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
15.0	2,300	0.1330	2.55		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
18.8	1,830	0.1050	1.62		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
2.9	1,570	0.0640	8.97	60.53	**Trap/Vee/Rect Channel Flow, channel** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
44.1	5,800	Total			

Subcatchment C-32: Culvert-32 Area



Subcatchment C-33: Culvert-33 Area

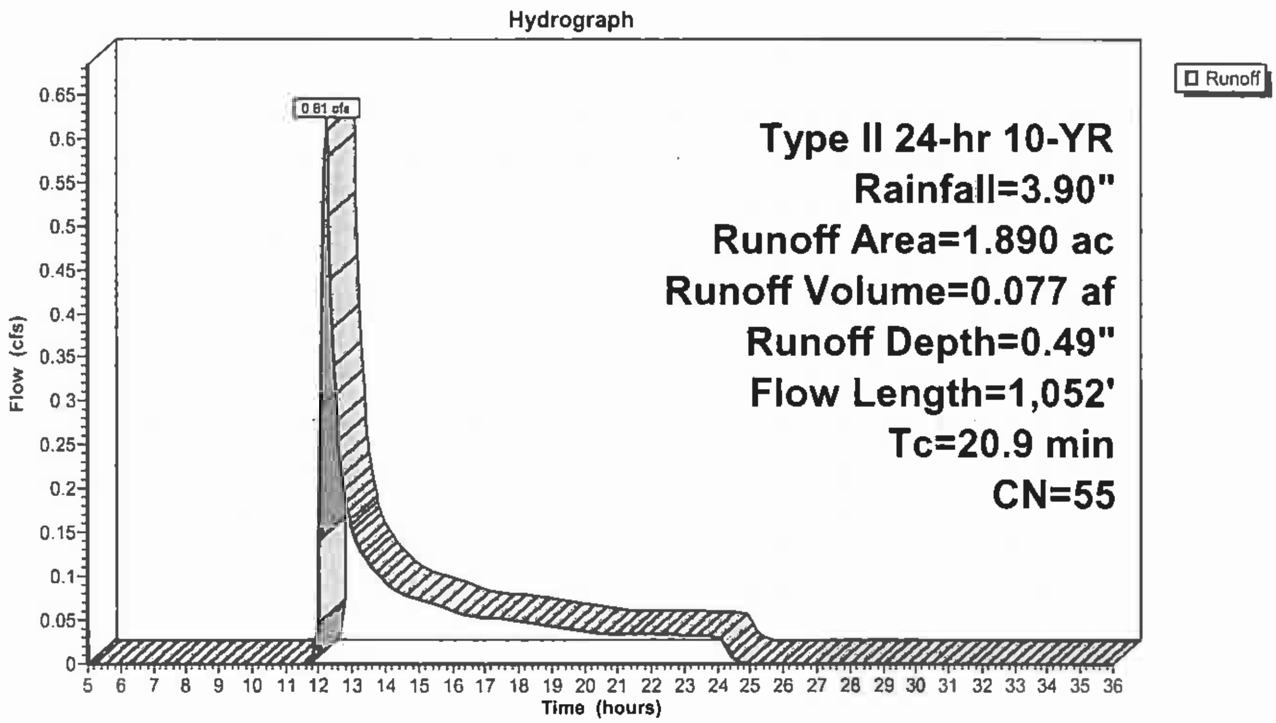
Runoff = 0.61 cfs @ 12.20 hrs, Volume= 0.077 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
1.800	53	Woods, Good, HSG C
1.890	55	Weighted Average
1.890		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.1	952	0.1210	1.74		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
20.9	1,052	Total			

Subcatchment C-33: Culvert-33 Area



Subcatchment C-38: Culvert-38 Area

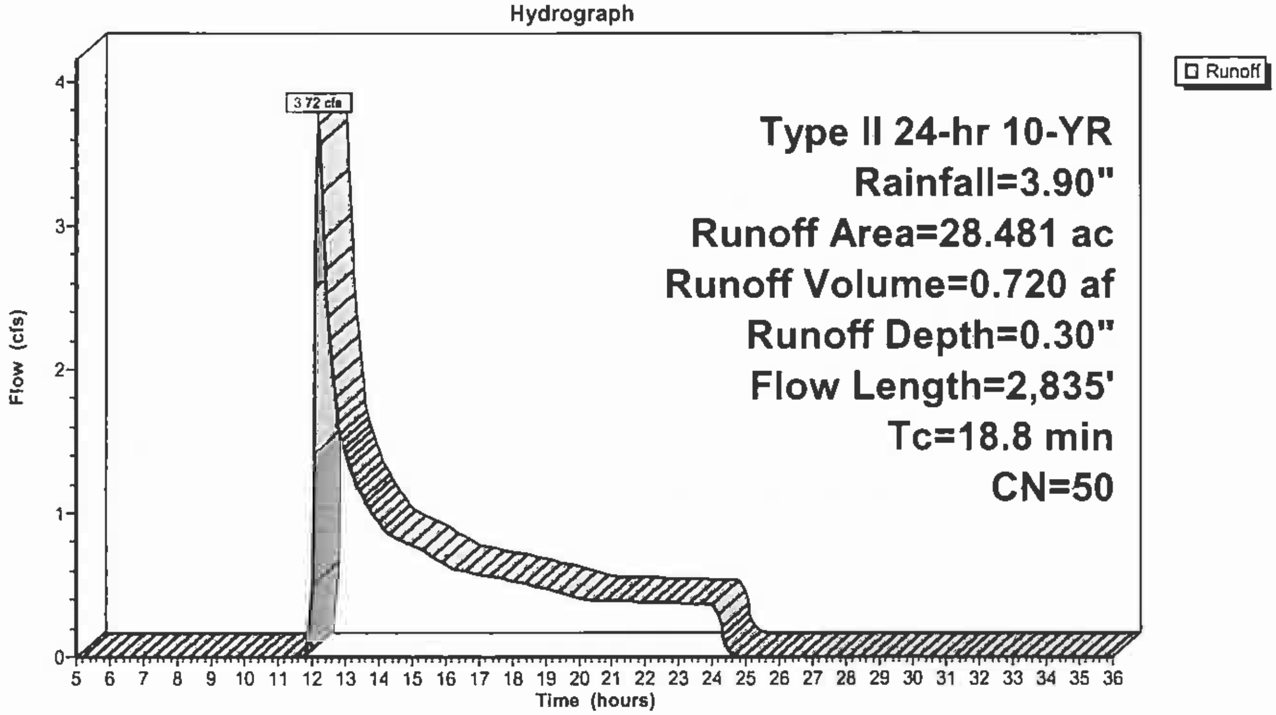
Runoff = 3.72 cfs @ 12.21 hrs, Volume= 0.720 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.006	89	Gravel roads, HSG C
22.470	49	Brush, Good, HSG C
5.990	53	Woods, Good, HSG C
0.015	55	Brush, Good, HSG D
28.481	50	Weighted Average
28.481		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.2600	0.44		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
5.5	1,115	0.2330	3.38		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
3.4	430	0.0930	2.13		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
3.9	860	0.2700	3.64		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
2.2	330	0.2480	2.49		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
18.8	2,835	Total			

Subcatchment C-38: Culvert-38 Area



Subcatchment C-4: Culvert-4 Area

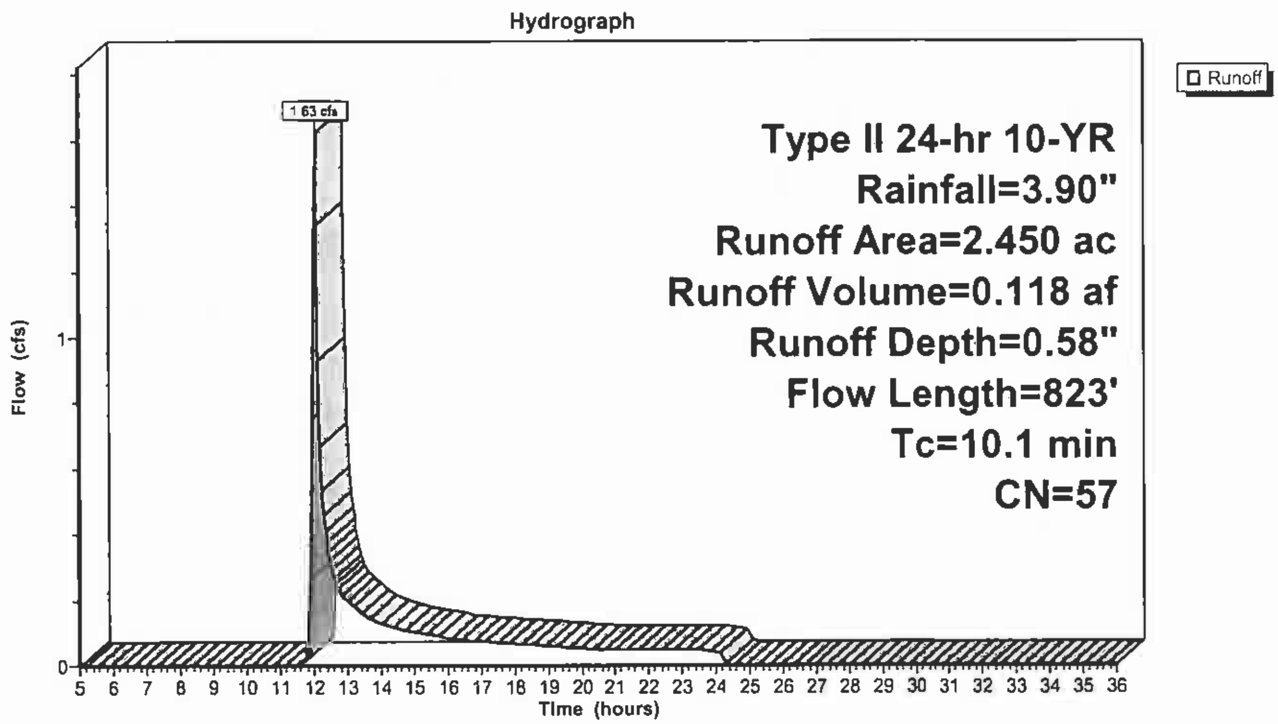
Runoff = 1.63 cfs @ 12.05 hrs, Volume= 0.118 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.298	89	Gravel roads, HSG C
0.428	49	Brush, Good, HSG C
1.724	53	Woods, Good, HSG C
2.450	57	Weighted Average
2.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	50	0.2800	0.39		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
7.7	611	0.0700	1.32		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	162	0.0610	9.76	117.08	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
10.1	823	Total			

Subcatchment C-4: Culvert-4 Area



Subcatchment C-41: Culvert-41 Area

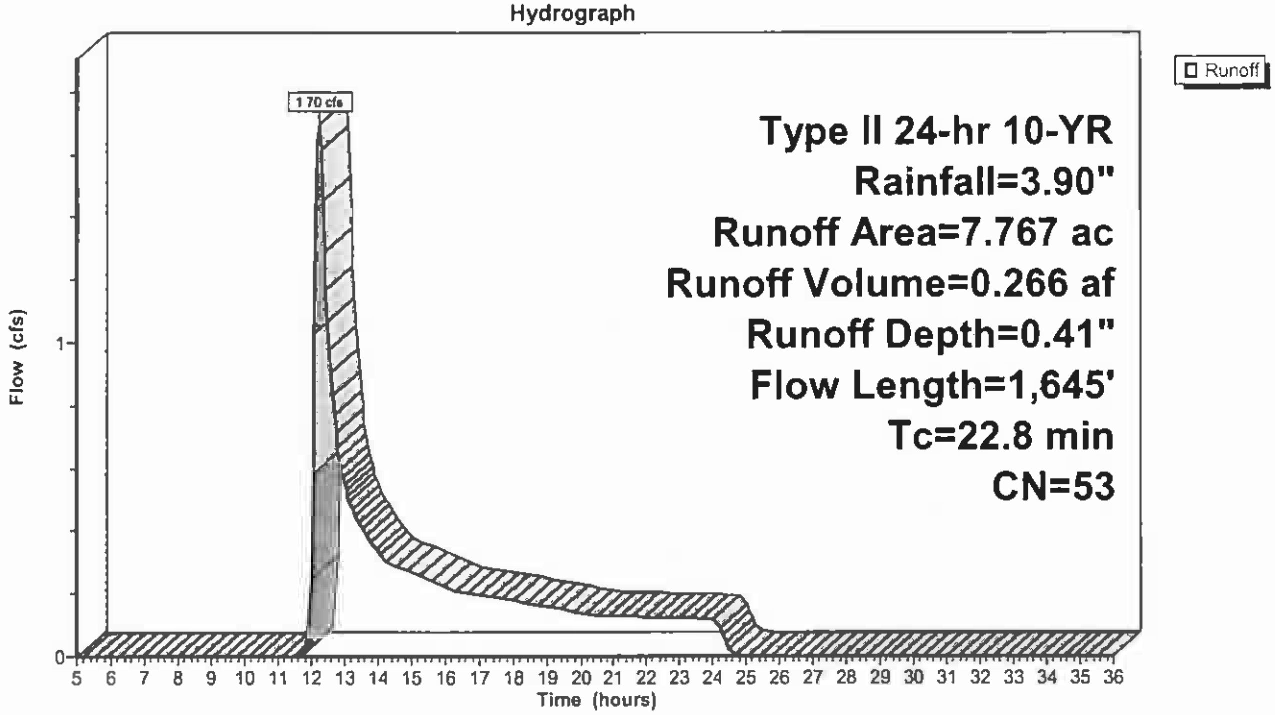
Runoff = 1.70 cfs @ 12.24 hrs, Volume= 0.266 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.184	89	Gravel roads, HSG C
1.290	49	Brush, Good, HSG C
6.280	53	Woods, Good, HSG C
0.013	55	Brush, Good, HSG D
7.767	53	Weighted Average
7.767		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
0.8	160	0.4000	3.16		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
1.8	380	0.2630	3.59		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
6.4	890	0.2130	2.31		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.4	115	0.0210	5.02	30.14	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.040
22.8	1,645	Total			

Subcatchment C-41: Culvert-41 Area



Subcatchment C-43: Culvert-43 Area

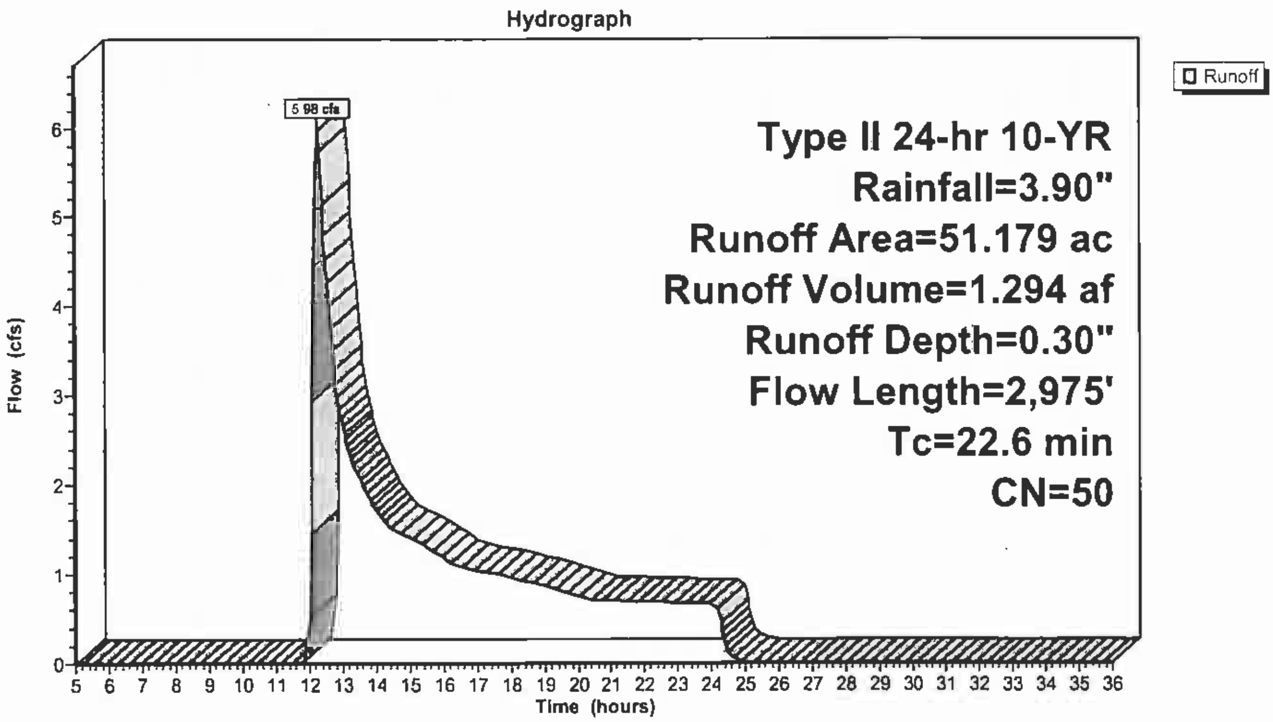
Runoff = 5.98 cfs @ 12.27 hrs, Volume= 1.294 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.025	89	Gravel roads, HSG C
35.352	49	Brush, Good, HSG C
15.802	53	Woods, Good, HSG C
51.179	50	Weighted Average
51.179		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.3500	0.49		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
3.1	705	0.2860	3.74		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
16.1	2,170	0.2010	2.24		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
22.6	2,975	Total			

Subcatchment C-43: Culvert-43 Area



Subcatchment C-47: Culvert-47 Area

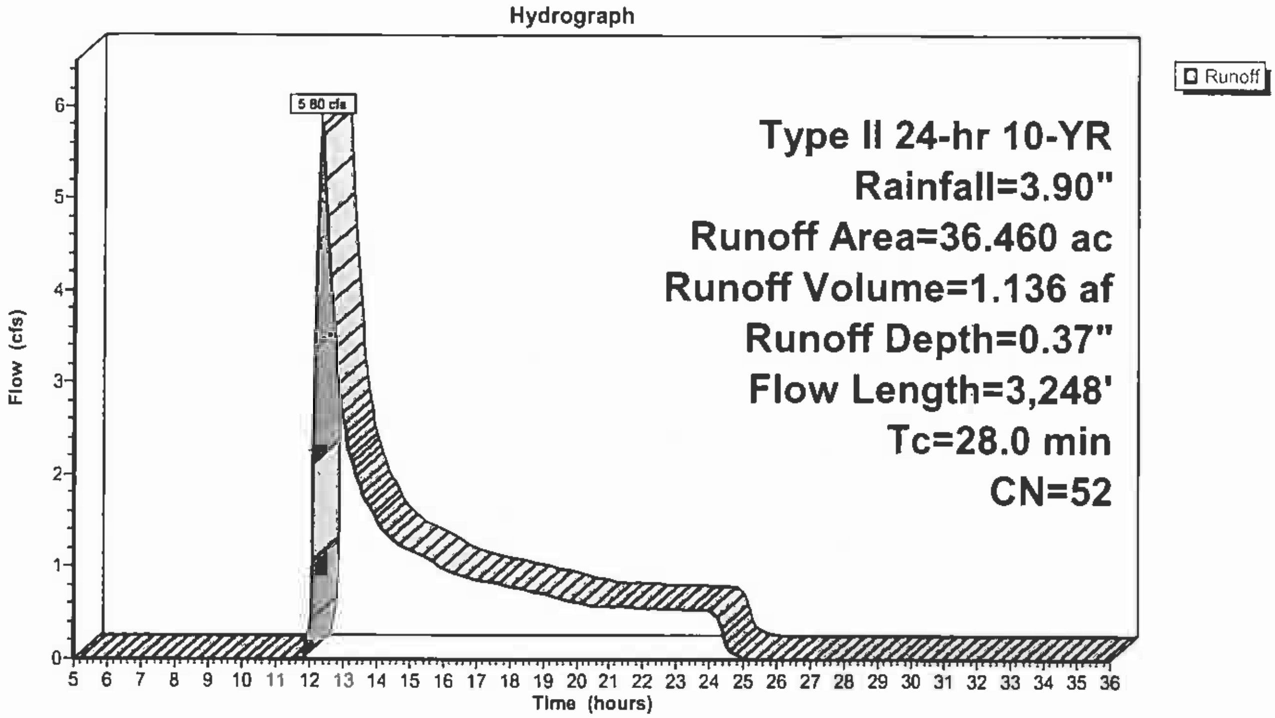
Runoff = 5.80 cfs @ 12.34 hrs, Volume= 1.136 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
11.630	49	Brush, Good, HSG C
24.770	53	Woods, Good, HSG C
36.460	52	Weighted Average
36.460		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.1000	0.30		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
1.7	325	0.2000	3.13		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
5.5	300	0.0170	0.91		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
7.9	1,640	0.2460	3.47		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
7.1	850	0.1580	1.99		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.2	33	0.0050	2.70	21.64	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
28.0	3,248	Total			

Subcatchment C-47: Culvert-47 Area



Subcatchment C-48: Culvert-48 Area

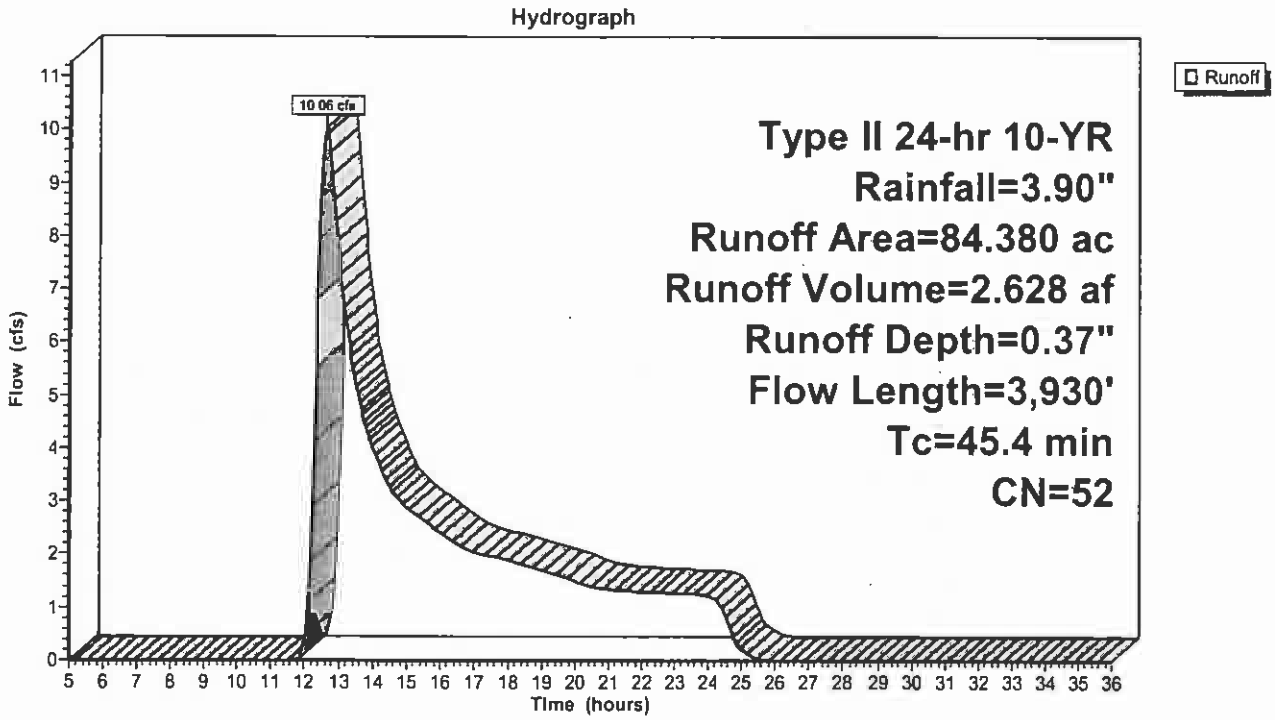
Runoff = 10.06 cfs @ 12.63 hrs, Volume= 2.628 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
54.920	53	Woods, Good, HSG C
29.430	49	Brush, Good, HSG C
84.380	52	Weighted Average
84.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
7.9	750	0.1010	1.59		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.9	255	0.0470	1.08		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
19.5	2,465	0.1780	2.11		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	360	0.1000	8.55	25.66	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 1.0 '/' Top.W=4.00' n= 0.040
45.4	3,930	Total			

Subcatchment C-48: Culvert-48 Area



Subcatchment C-4A: Culvert-C4A Area

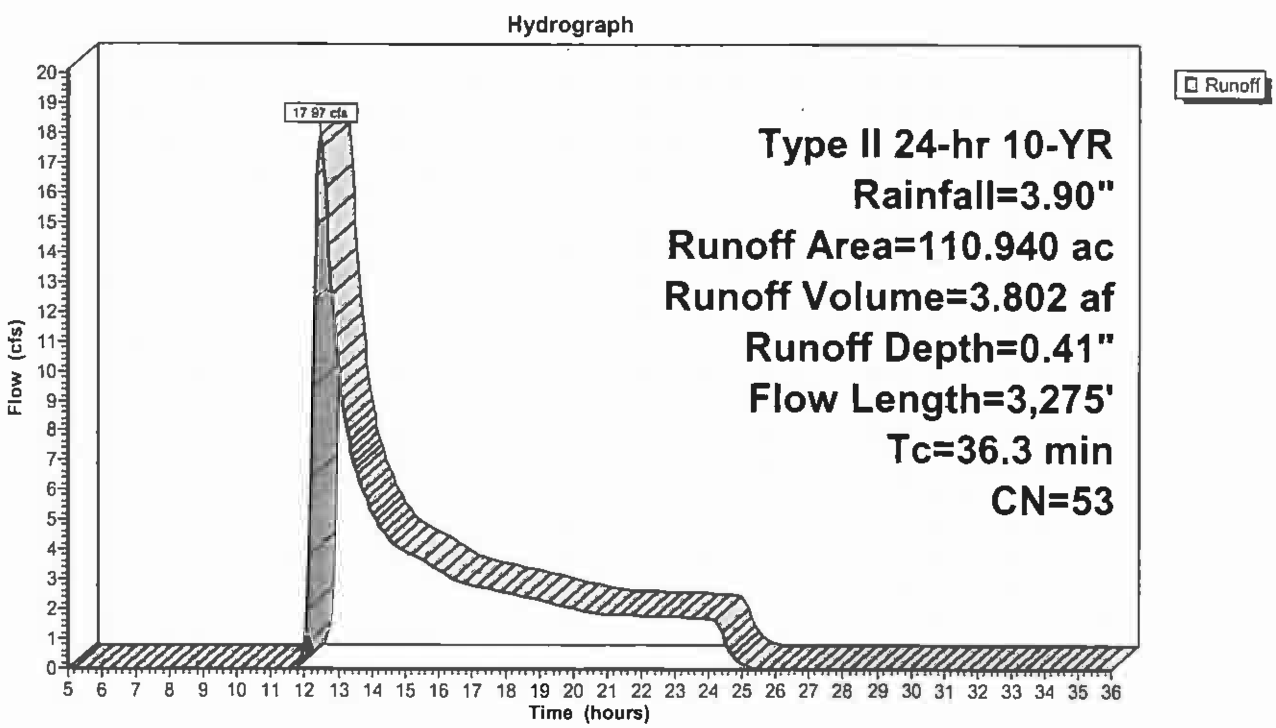
Runoff = 17.97 cfs @ 12.46 hrs, Volume= 3.802 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.083	89	Gravel roads, HSG C
9.600	49	Brush, Good, HSG C
101.257	53	Woods, Good, HSG C
110.940	53	Weighted Average
110.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.0	3,175	0.1940	2.20		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
36.3	3,275	Total			

Subcatchment C-4A: Culvert-C4A Area



Subcatchment C-50: Culvert-50 Area

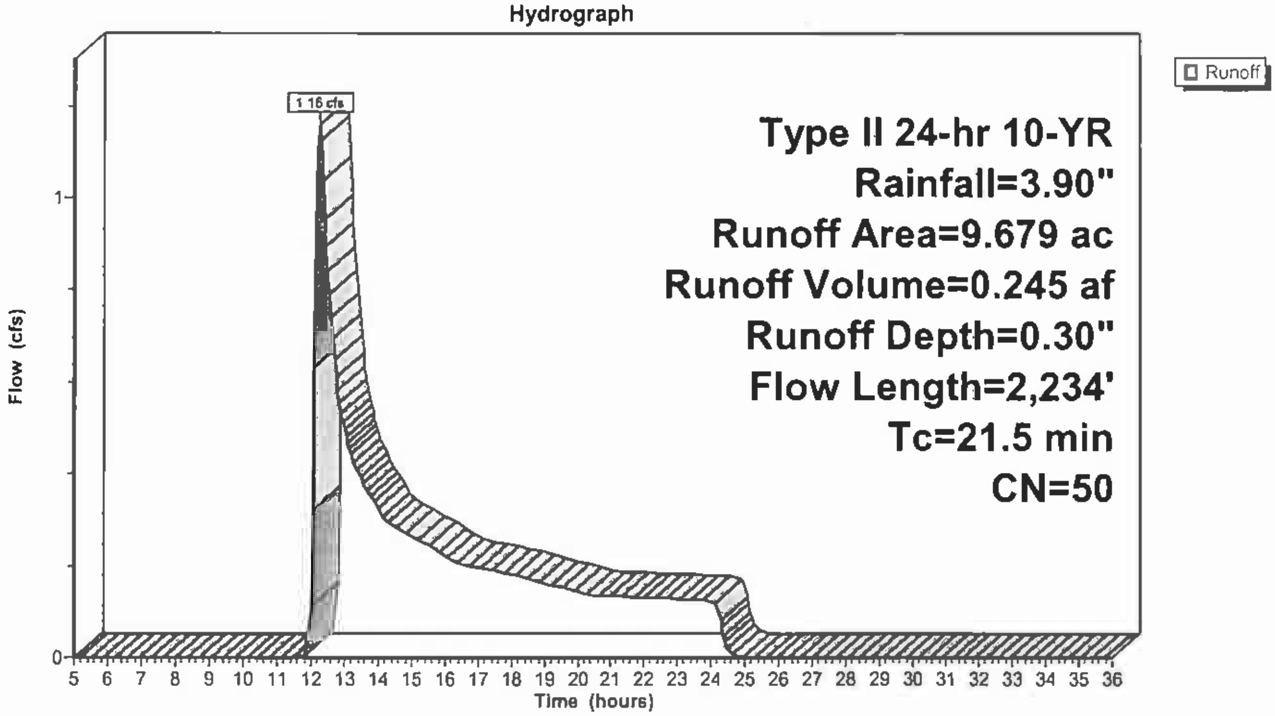
Runoff = 1.16 cfs @ 12.26 hrs, Volume= 0.245 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.089	89	Gravel roads, HSG C
6.890	49	Brush, Good, HSG C
2.700	53	Woods, Good, HSG C
9.679	50	Weighted Average
9.679		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
3.8	540	0.2260	2.38		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
6.9	1,432	0.2440	3.46		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.0	120	0.1500	1.94		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.1	42	0.0450	8.11	64.92	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
21.5	2,234	Total			

Subcatchment C-50: Culvert-50 Area



Subcatchment C-52: Culvert-52 Area

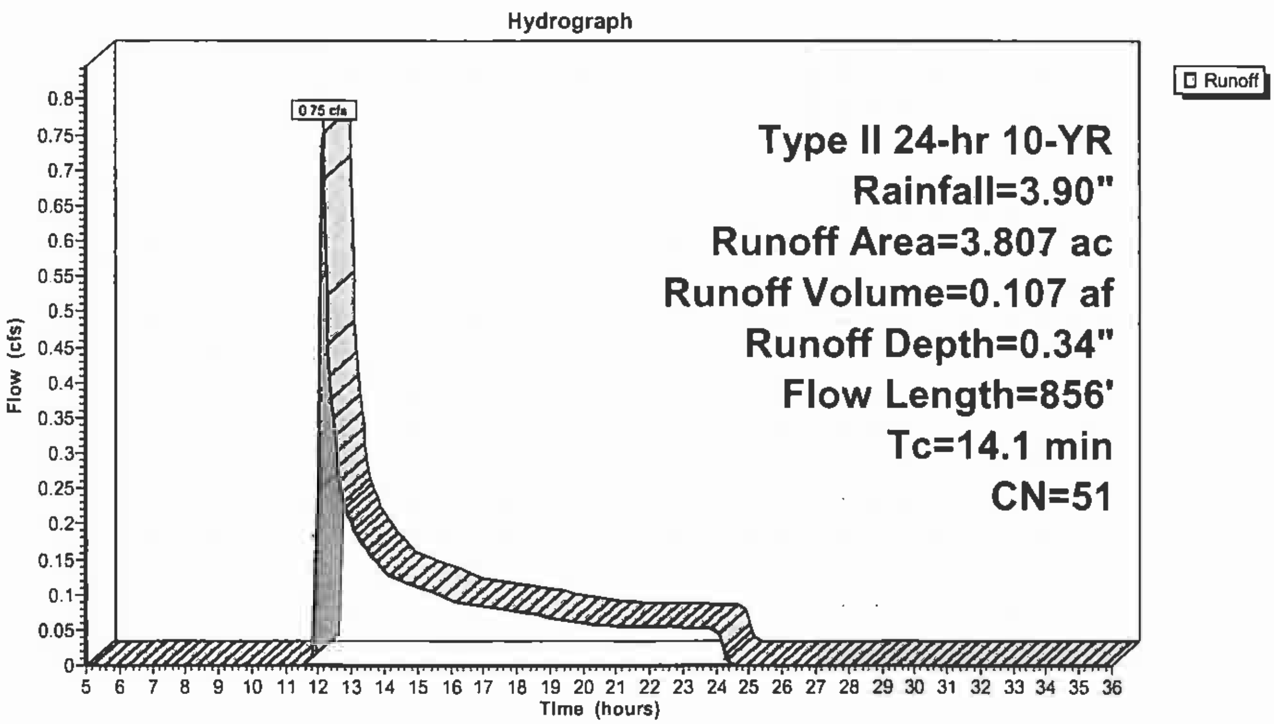
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 0.107 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.099	89	Gravel roads, HSG C
2.800	49	Brush, Good, HSG C
0.908	53	Woods, Good, HSG C
3.807	51	Weighted Average
3.807		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2600	0.38		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
2.1	426	0.2250	3.32		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.1	130	0.1690	2.06		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
8.7	250	0.0100	0.48	0.03	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.05' Z= 1.0 '/' Top.W=1.10' n= 0.040
14.1	856	Total			

Subcatchment C-52: Culvert-52 Area



Subcatchment C-53: Culvert-53 Area

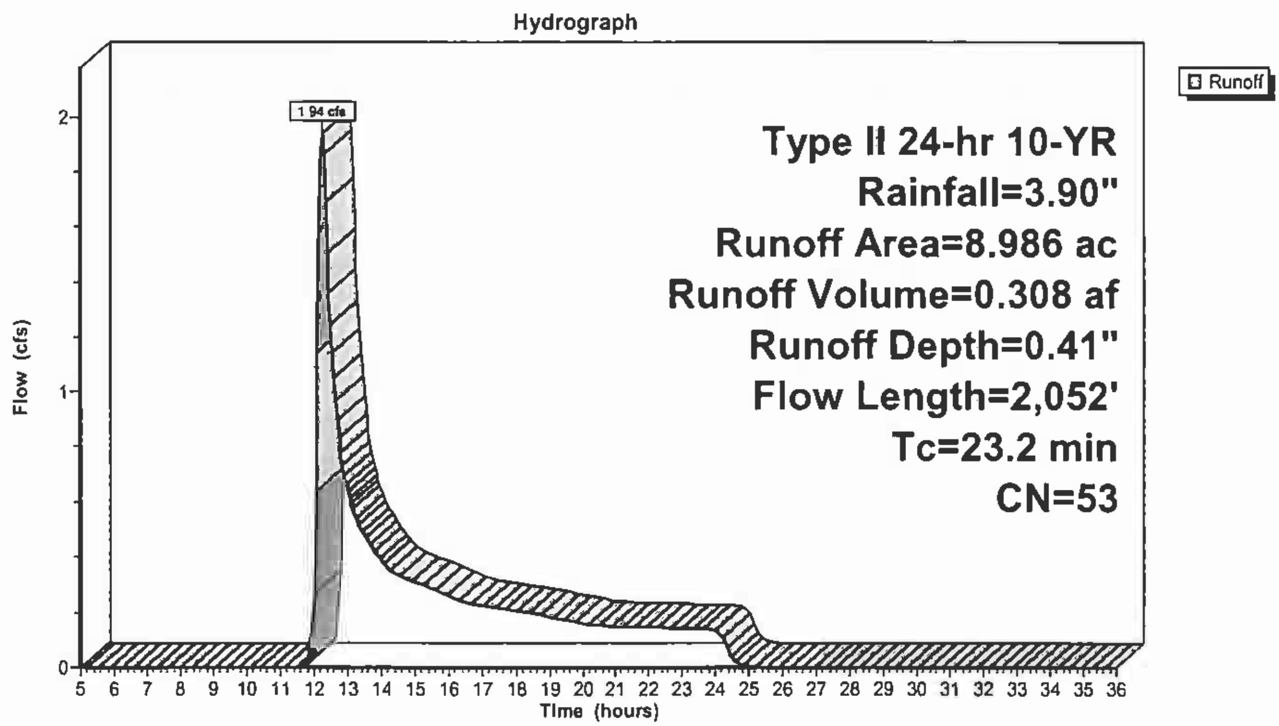
Runoff = 1.94 cfs @ 12.25 hrs, Volume= 0.308 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.056	89	Gravel roads, HSG C
1.590	49	Brush, Good, HSG C
7.340	53	Woods, Good, HSG C
8.986	53	Weighted Average
8.986		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
2.4	370	0.2700	2.60		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
6.5	1,370	0.2500	3.50		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
2.5	212	0.0804	1.42		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
23.2	2,052	Total			

Subcatchment C-53: Culvert-53 Area



Subcatchment C-54: Culvert-54 Area

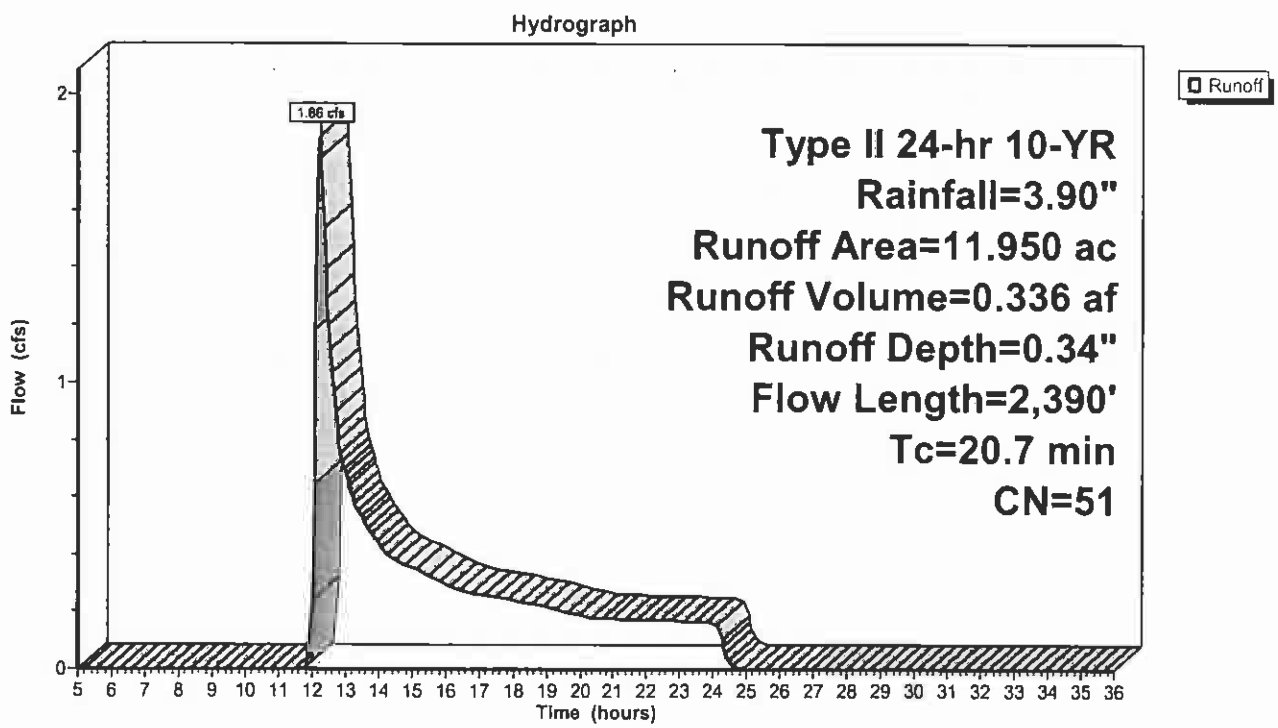
Runoff = 1.86 cfs @ 12.23 hrs, Volume= 0.336 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
7.610	49	Brush, Good, HSG C
4.230	53	Woods, Good, HSG C
11.950	51	Weighted Average
11.950		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	75	0.2530	0.19		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
5.8	765	0.1930	2.20		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
6.4	1,355	0.2520	3.51		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.8	195	0.1280	1.79		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
20.7	2,390	Total			

Subcatchment C-54: Culvert-54 Area



Subcatchment C-55: Culvert-55 Area

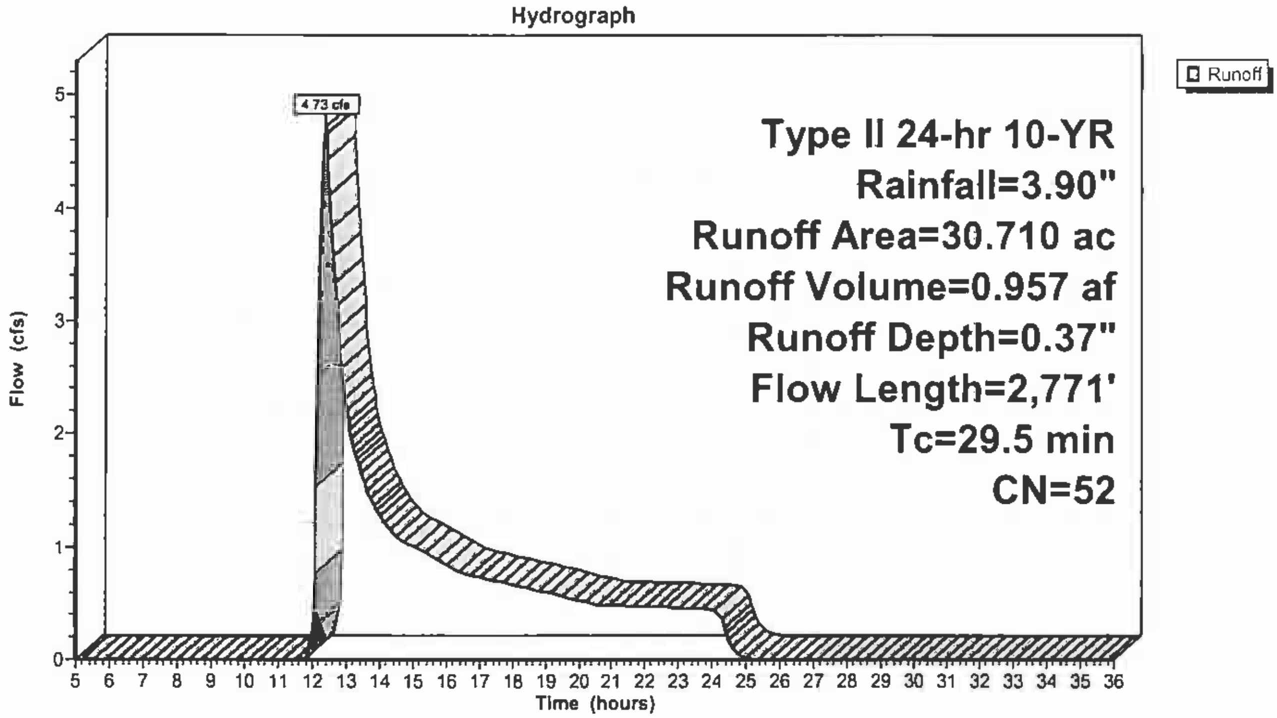
Runoff = 4.73 cfs @ 12.36 hrs, Volume= 0.957 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
10.550	49	Brush, Good, HSG C
20.010	53	Woods, Good, HSG C
30.710	52	Weighted Average
30.710		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
10.7	1,225	0.1470	1.92		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
5.6	1,210	0.2680	3.62		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
0.6	86	0.2210	2.35		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.3	150	0.0510	8.64	69.11	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
29.5	2,771	Total			

Subcatchment C-55: Culvert-55 Area



Subcatchment C-56: Culvert-56 Area

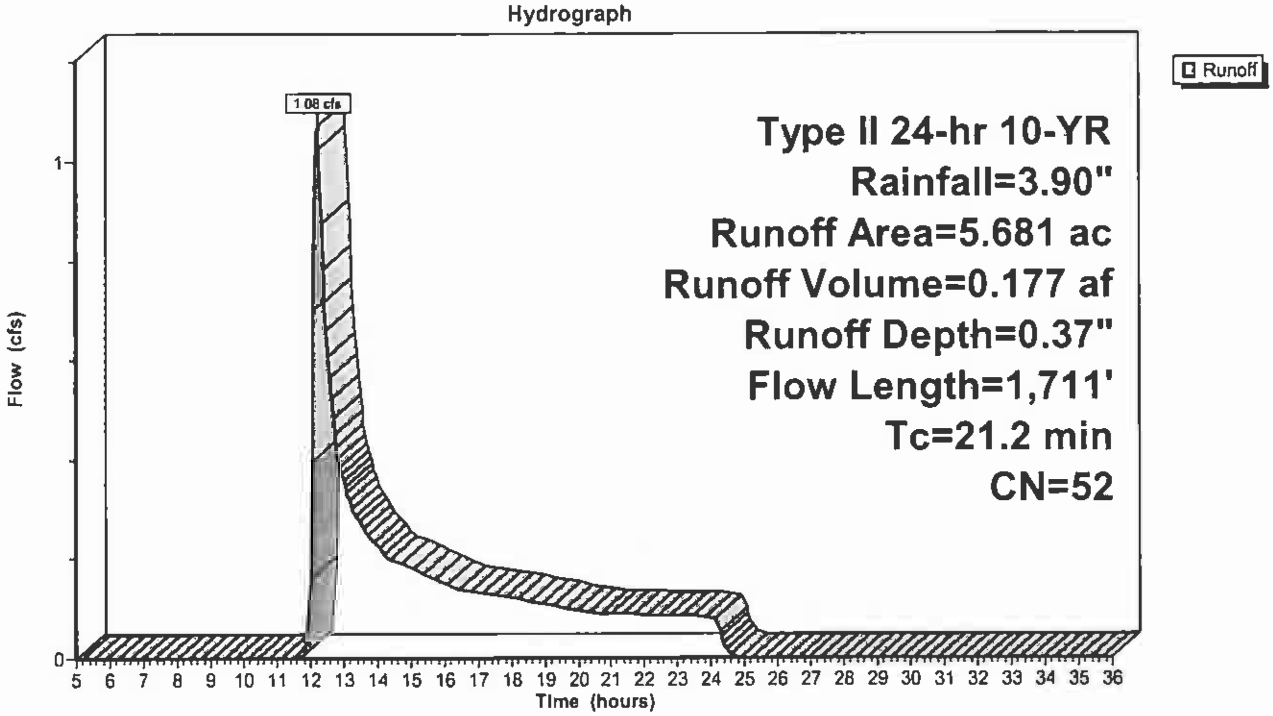
Runoff = 1.08 cfs @ 12.23 hrs, Volume= 0.177 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.021	89	Gravel roads, HSG C
1.900	49	Brush, Good, HSG C
3.760	53	Woods, Good, HSG C
5.681	52	Weighted Average
5.681		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
2.6	325	0.1780	2.11		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
1.0	210	0.2670	3.62		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
2.6	530	0.4600	3.39		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
1.2	270	0.2960	3.81		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.8	240	0.2080	2.28		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.2	36	0.2220	3.30		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
21.2	1,711	Total			

Subcatchment C-56: Culvert-56 Area



Subcatchment C-58: Culvert-58 Area

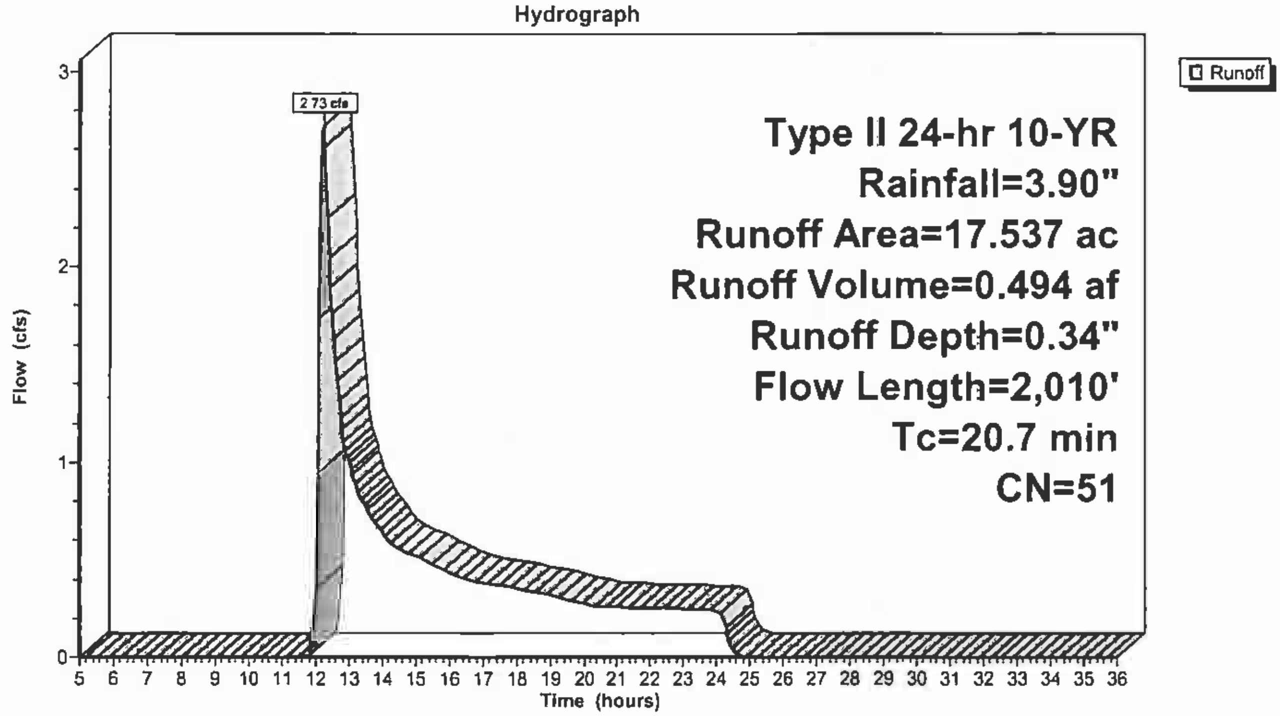
Runoff = 2.73 cfs @ 12.23 hrs, Volume= 0.494 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.167	89	Gravel roads, HSG C
8.920	49	Brush, Good, HSG C
8.450	53	Woods, Good, HSG C
17.537	51	Weighted Average
17.537		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1700	0.17		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
4.4	735	0.3070	2.77		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
3.6	800	0.2730	3.66		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
2.4	325	0.2000	2.24		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.4	50	0.0070	2.02	4.03	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 1.0 '/' Top.W=3.00' n= 0.040
20.7	2,010	Total			

Subcatchment C-58: Culvert-58 Area



Subcatchment C-59: Culvert-59 Area

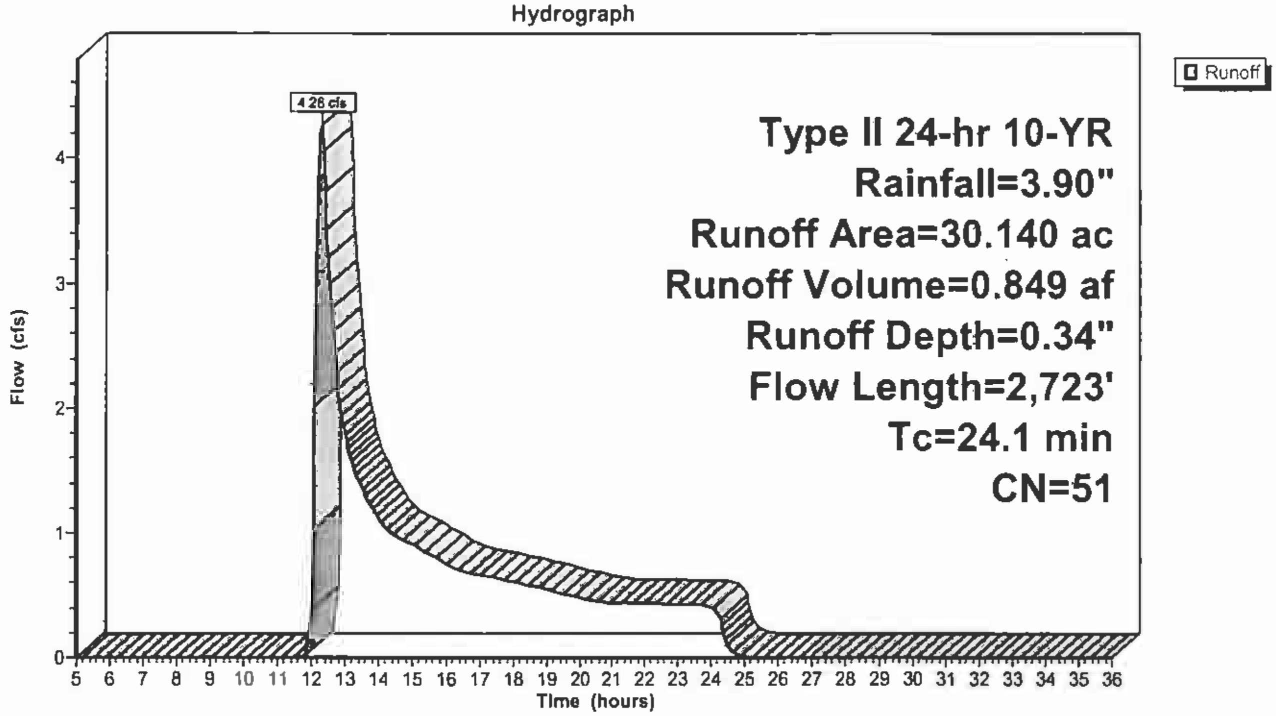
Runoff = 4.28 cfs @ 12.28 hrs, Volume= 0.849 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
12.290	49	Brush, Good, HSG C
17.760	53	Woods, Good, HSG C
30.140	51	Weighted Average
30.140		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	80	0.2630	0.19		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
9.9	1,230	0.1710	2.07		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
5.6	1,163	0.2410	3.44		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.5	200	0.2000	2.24		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.1	50	0.0690	10.05	80.38	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
24.1	2,723	Total			

Subcatchment C-59: Culvert-59 Area



Subcatchment C-63: Culvert-63 Area

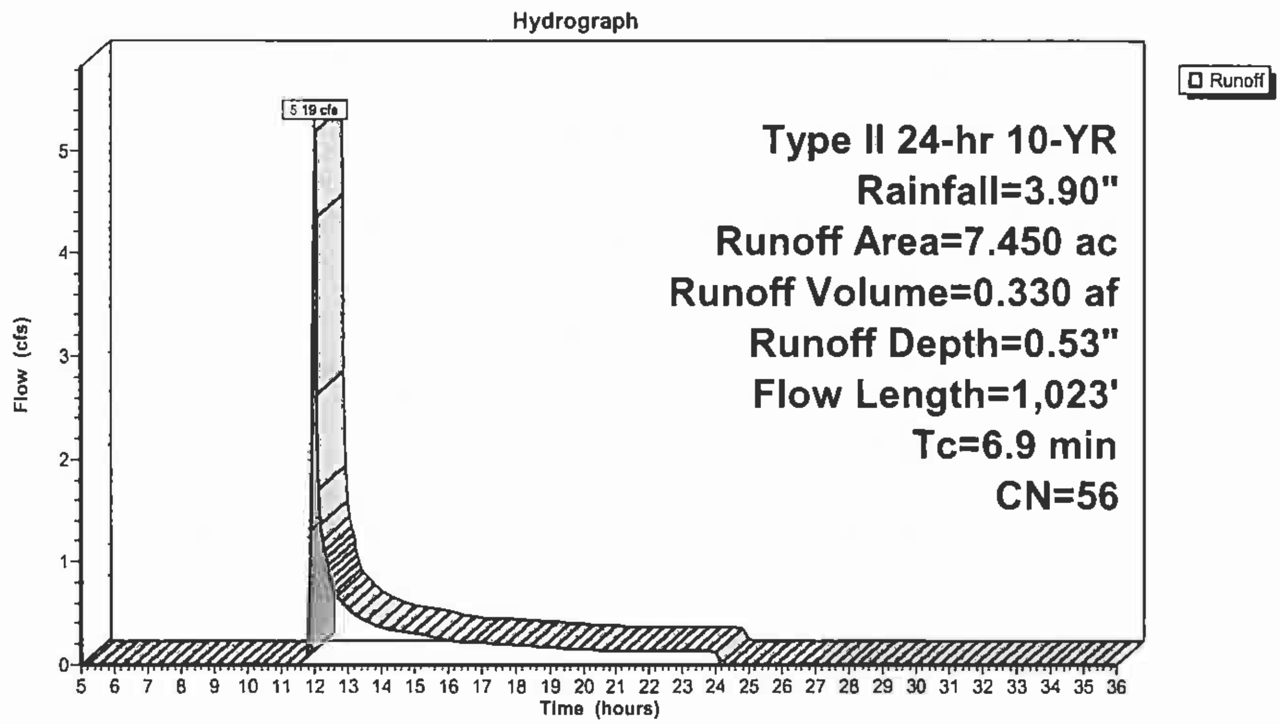
Runoff = 5.19 cfs @ 12.01 hrs, Volume= 0.330 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.137	89	Gravel roads, HSG C
6.138	55	Brush, Good, HSG D
1.175	58	Woods, Good, HSG D
7.450	56	Weighted Average
7.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2800	0.45		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.7	662	0.3350	4.05		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.5	261	0.0460	8.47	101.67	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
6.9	1,023	Total			

Subcatchment C-63: Culvert-63 Area



Subcatchment C-64: Culvert-64 Area

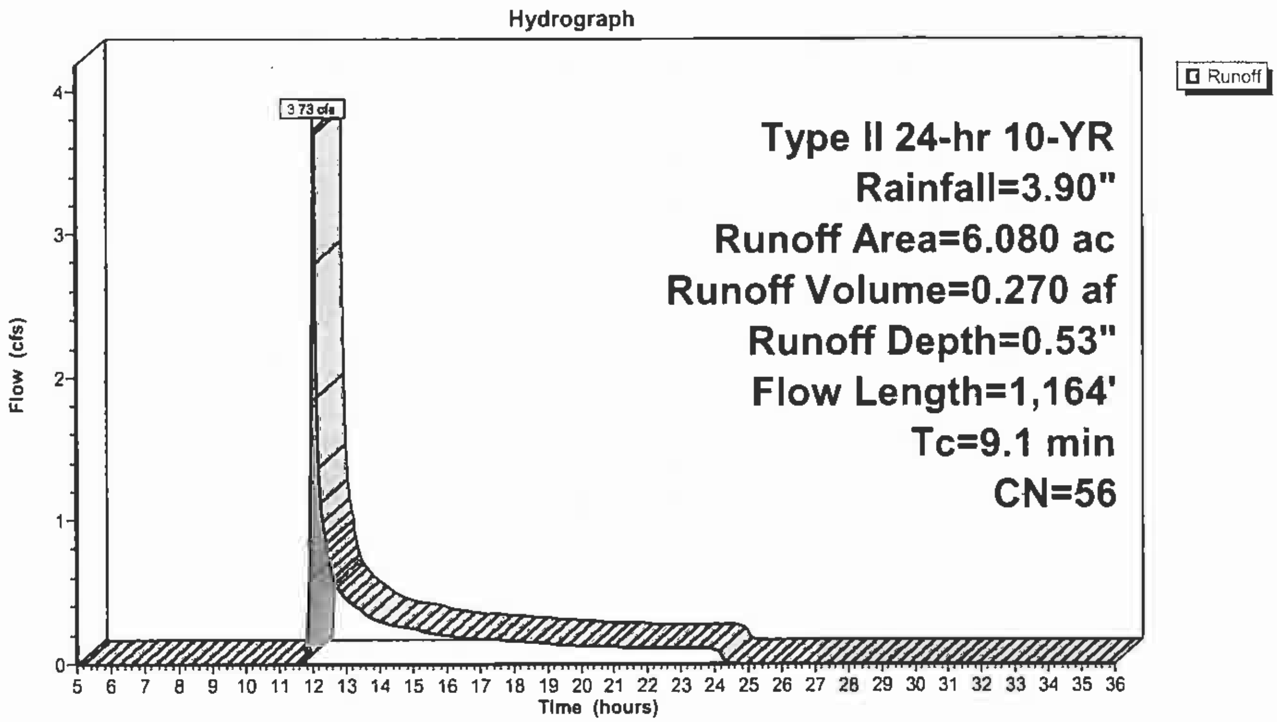
Runoff = 3.73 cfs @ 12.04 hrs, Volume= 0.270 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.078	89	Gravel roads, HSG C
4.609	55	Brush, Good, HSG D
1.393	58	Woods, Good, HSG D
6.080	56	Weighted Average
6.080		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.2100	0.40		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
3.3	730	0.2820	3.72		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.5	242	0.2800	2.65		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	92	0.0650	15.09	603.64	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=4.00' Z= 2.0 '/' Top.W=18.00' n= 0.040
9.1	1,164	Total			

Subcatchment C-64: Culvert-64 Area



Subcatchment C-65: Culvert-65 Area

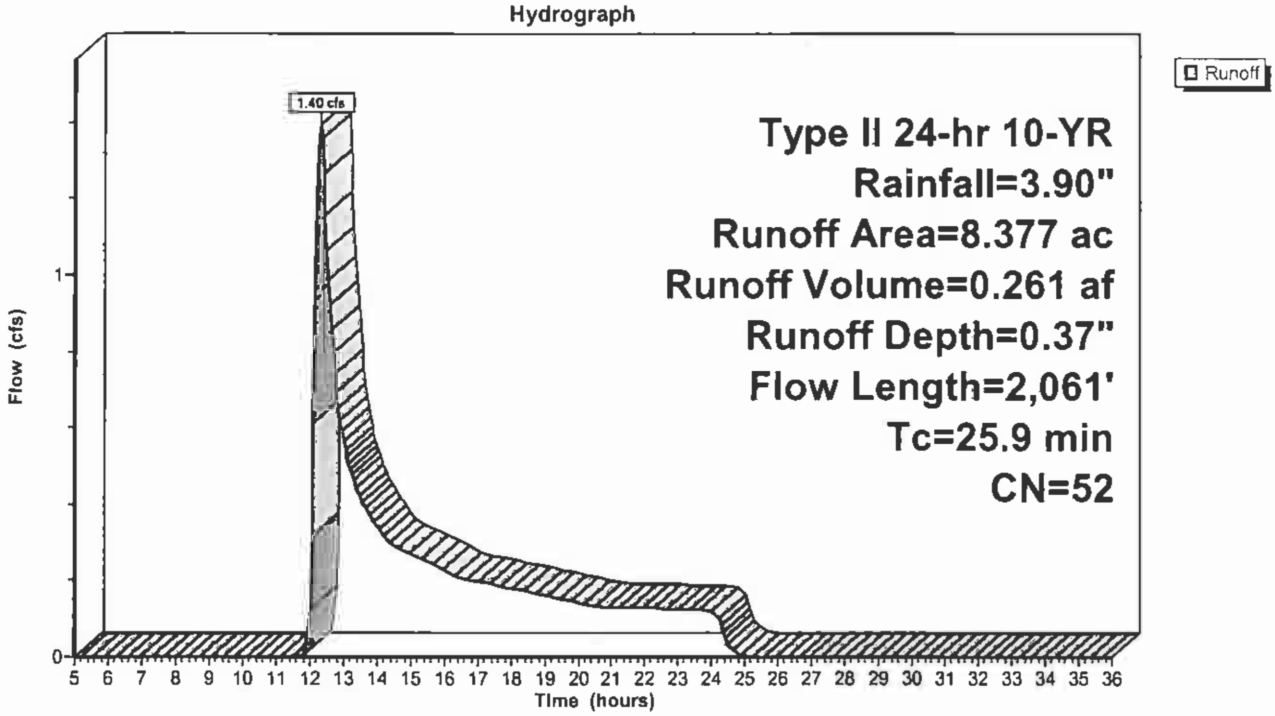
Runoff = 1.40 cfs @ 12.30 hrs, Volume= 0.261 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.027	89	Gravel roads, HSG C
3.270	49	Brush, Good, HSG C
5.080	53	Woods, Good, HSG C
8.377	52	Weighted Average
8.377		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1300	0.15		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
9.3	946	0.1160	1.70		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
3.6	745	0.2440	3.46		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.8	220	0.1640	2.02		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.1	50	0.0600	9.37	74.96	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
25.9	2,061	Total			

Subcatchment C-65: Culvert-65 Area



Subcatchment C-66: Culvert-66 Area

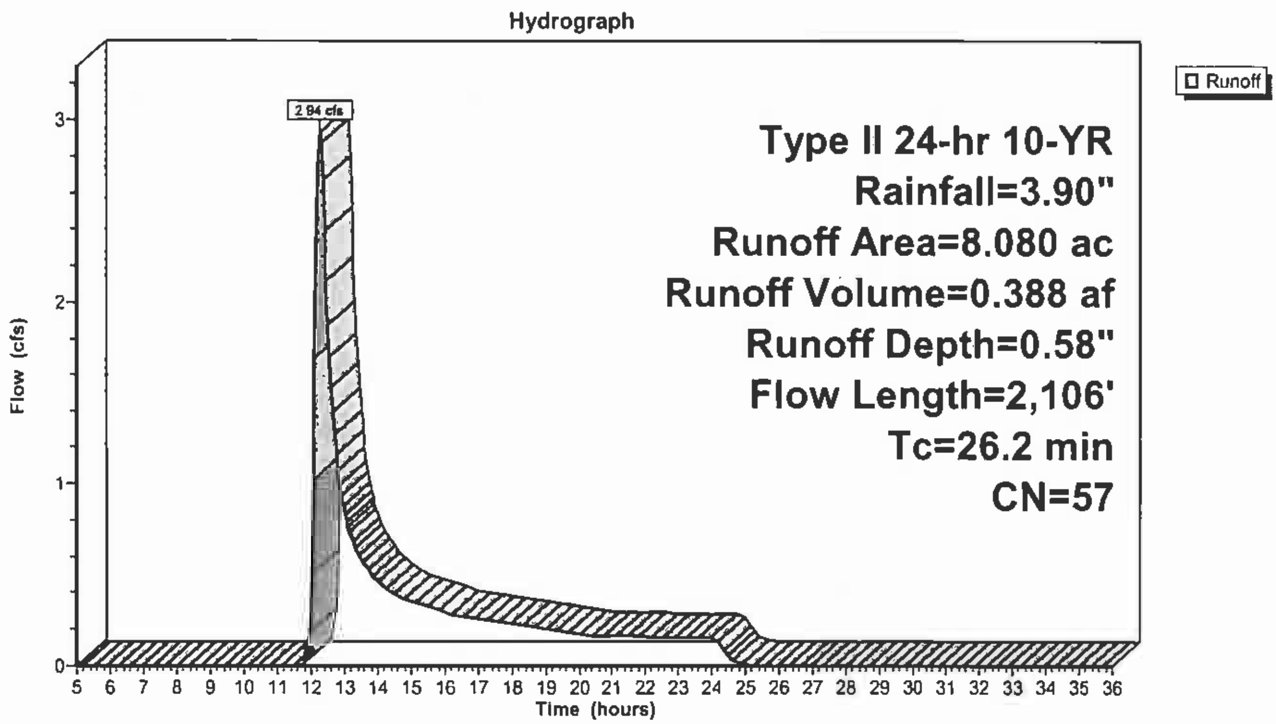
Runoff = 2.94 cfs @ 12.26 hrs, Volume= 0.388 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.021	89	Gravel roads, HSG C
2.656	55	Brush, Good, HSG D
5.403	58	Woods, Good, HSG D
8.080	57	Weighted Average
8.080		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.8	1,150	0.1250	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.6	516	0.2280	3.34		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.6	340	0.1850	2.15		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
26.2	2,106	Total			

Subcatchment C-66: Culvert-66 Area



Subcatchment C-67: Culvert-67 Area

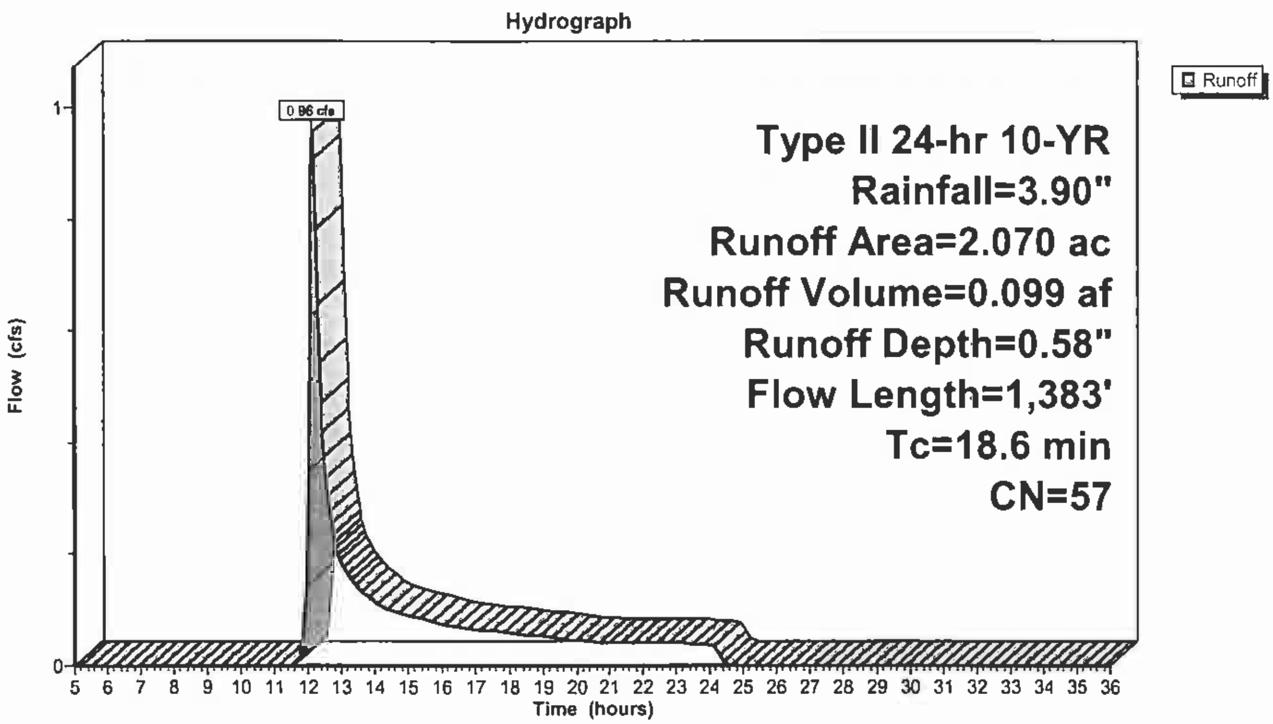
Runoff = 0.96 cfs @ 12.16 hrs, Volume= 0.099 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.011	89	Gravel roads, HSG C
0.770	55	Brush, Good, HSG D
1.289	58	Woods, Good, HSG D
2.070	57	Weighted Average
2.070		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.9	492	0.1780	2.11		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.4	462	0.2120	3.22		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.6	329	0.1760	2.10		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
18.6	1,383	Total			

Subcatchment C-67: Culvert-67 Area



Subcatchment C-69: Culvert-69 Area

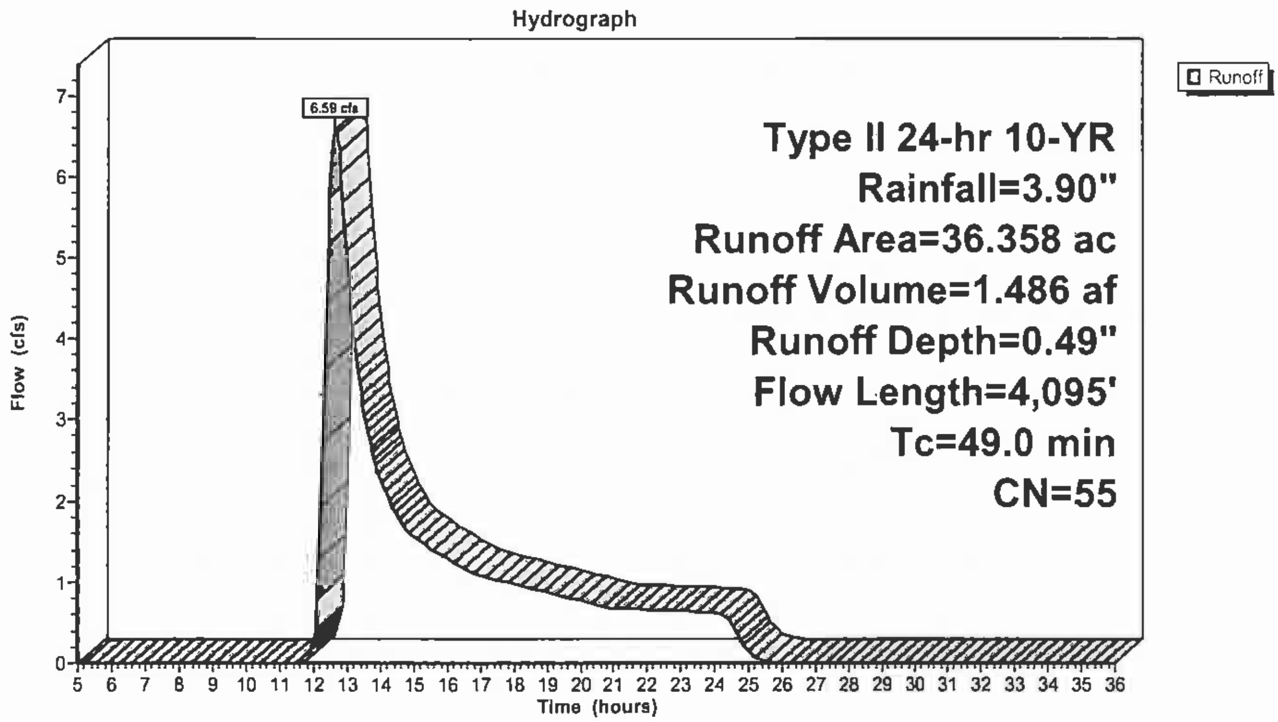
Runoff = 6.59 cfs @ 12.63 hrs, Volume= 1.486 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.038	89	Gravel roads, HSG C
2.280	49	Brush, Good, HSG C
20.080	53	Woods, Good, HSG C
0.080	55	Brush, Good, HSG D
13.880	58	Woods, Good, HSG D
36.358	55	Weighted Average
36.358		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
28.7	2,950	0.1170	1.71		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
2.0	335	0.1640	2.83		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
6.6	630	0.1020	1.60		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.3	80	0.0100	3.83	30.60	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
49.0	4,095	Total			

Subcatchment C-69: Culvert-69 Area



Subcatchment C-70: Culvert-70 Area

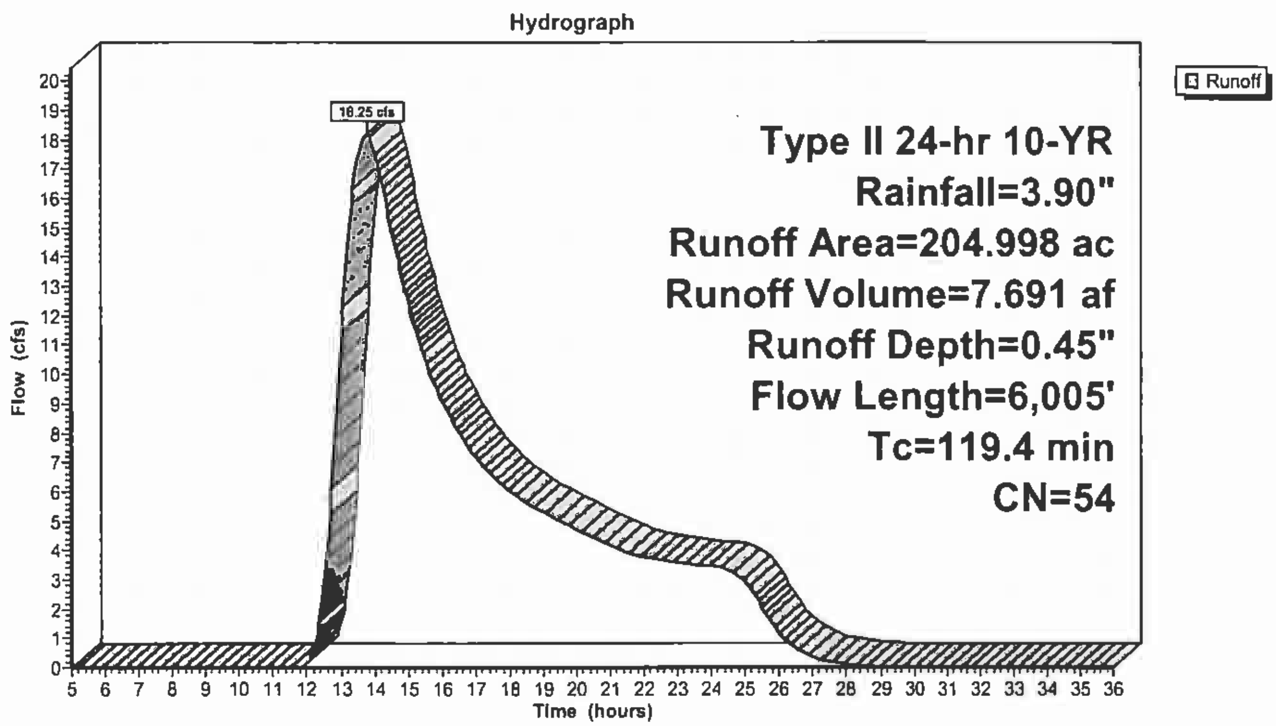
Runoff = 18.25 cfs @ 13.78 hrs, Volume= 7.691 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.538	89	Gravel roads, HSG C
44.150	49	Brush, Good, HSG C
68.480	53	Woods, Good, HSG C
24.210	55	Brush, Good, HSG D
67.620	58	Woods, Good, HSG D
204.998	54	Weighted Average
204.998		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0920	0.13		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
106.7	5,905	0.0340	0.92		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
119.4	6,005	Total			

Subcatchment C-70: Culvert-70 Area



Subcatchment C-71: Culvert-71 Area

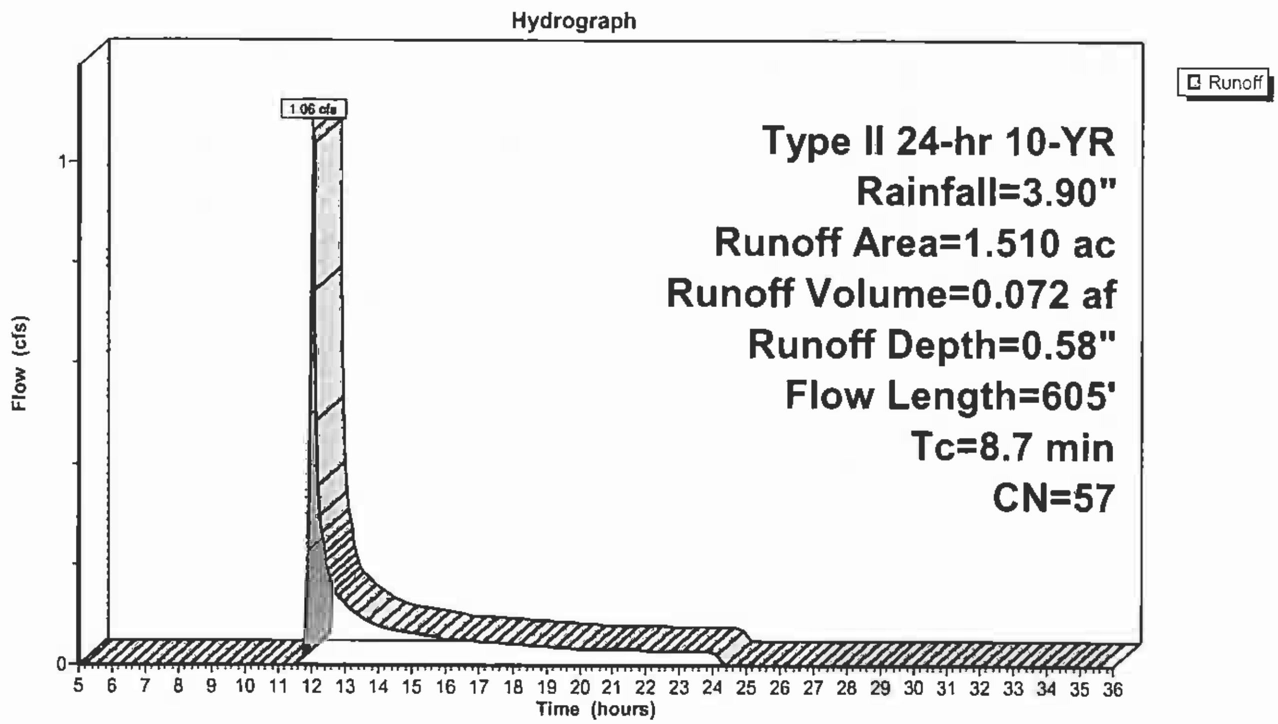
Runoff = 1.06 cfs @ 12.03 hrs, Volume= 0.072 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG D
0.730	55	Brush, Good, HSG D
0.740	58	Woods, Good, HSG D
1.510	57	Weighted Average
1.510		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0450	0.19		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
2.9	325	0.0710	1.87		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.8	80	0.1000	1.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	150	0.0120	4.19	33.52	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
8.7	605	Total			

Subcatchment C-71: Culvert-71 Area



Subcatchment C-72: Culvert-72 Area

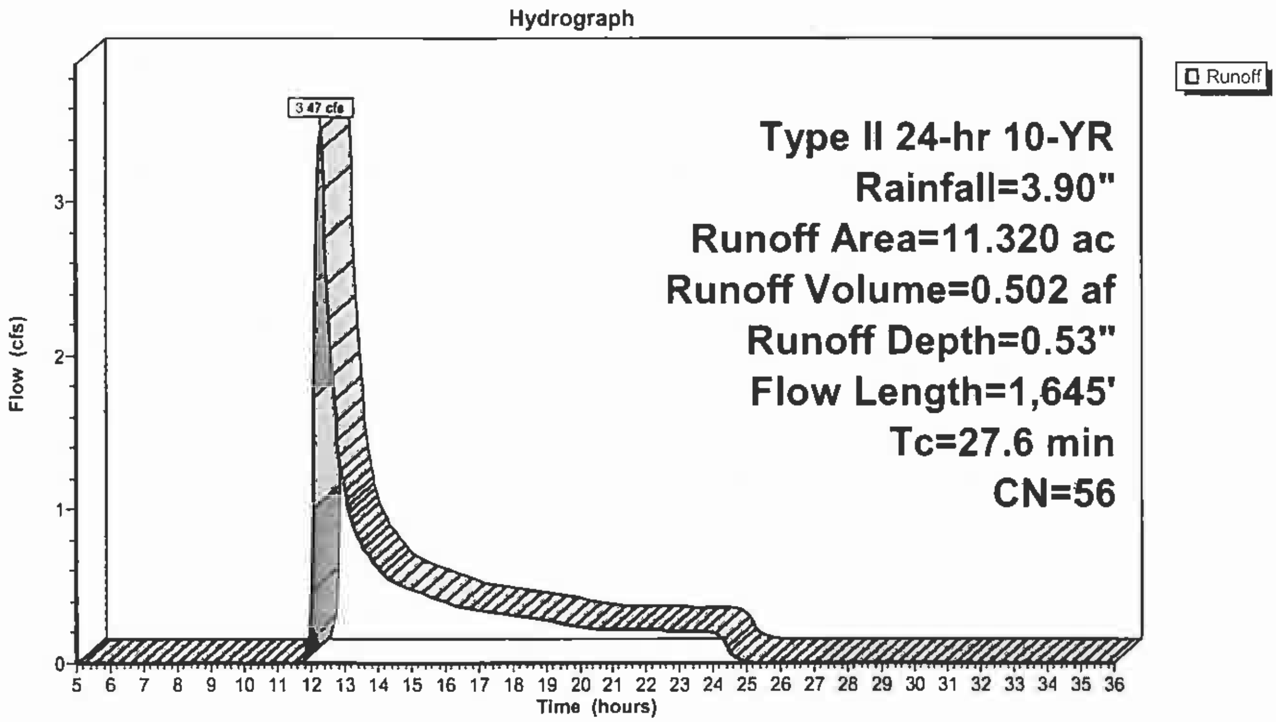
Runoff = 3.47 cfs @ 12.29 hrs, Volume= 0.502 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG D
9.530	55	Brush, Good, HSG D
1.720	58	Woods, Good, HSG D
11.320	56	Weighted Average
11.320		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0200	0.16		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
15.1	1,400	0.0490	1.55		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.8	145	0.0760	1.38		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
27.6	1,645	Total			

Subcatchment C-72: Culvert-72 Area



Subcatchment C-77: Culvert-77 Area

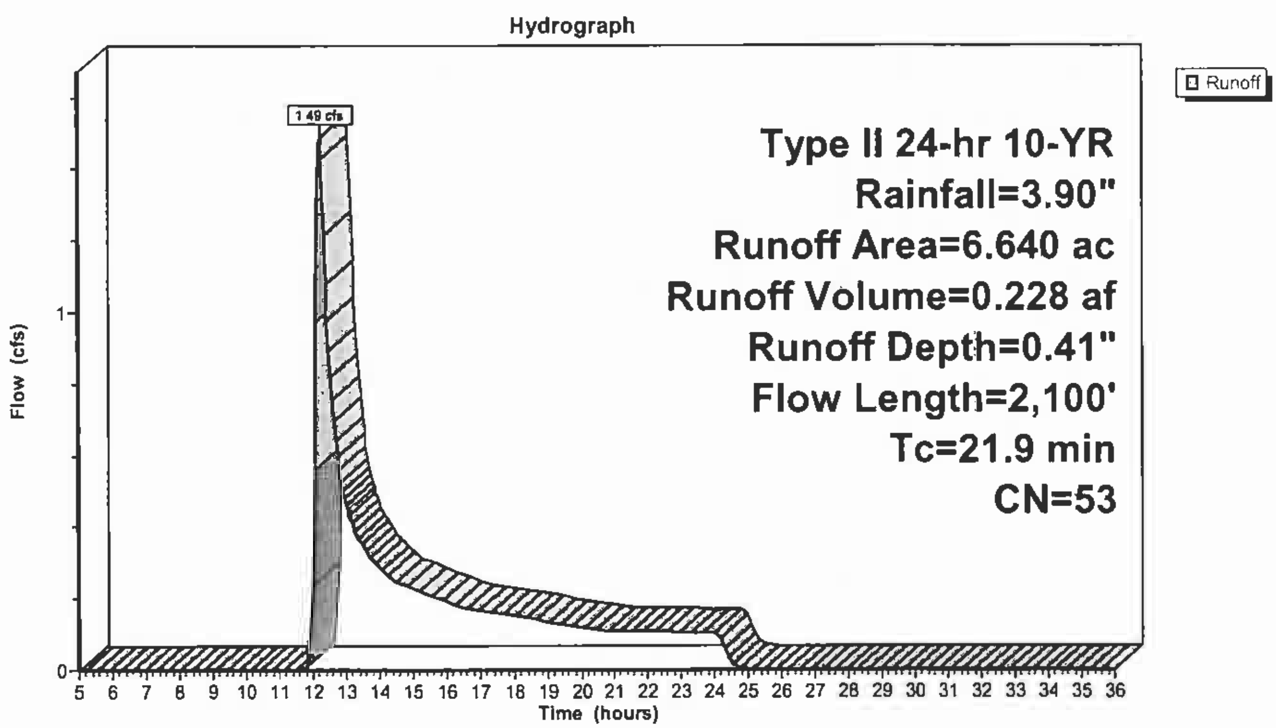
Runoff = 1.49 cfs @ 12.23 hrs, Volume= 0.228 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.140	49	Brush, Good, HSG C
6.410	53	Woods, Good, HSG C
6.640	53	Weighted Average
6.640		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
12.3	1,875	0.1320	2.54		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
0.5	125	0.0150	4.12	30.89	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.040
21.9	2,100	Total			

Subcatchment C-77: Culvert-77 Area



Subcatchment C-78: Culvert-78 Area

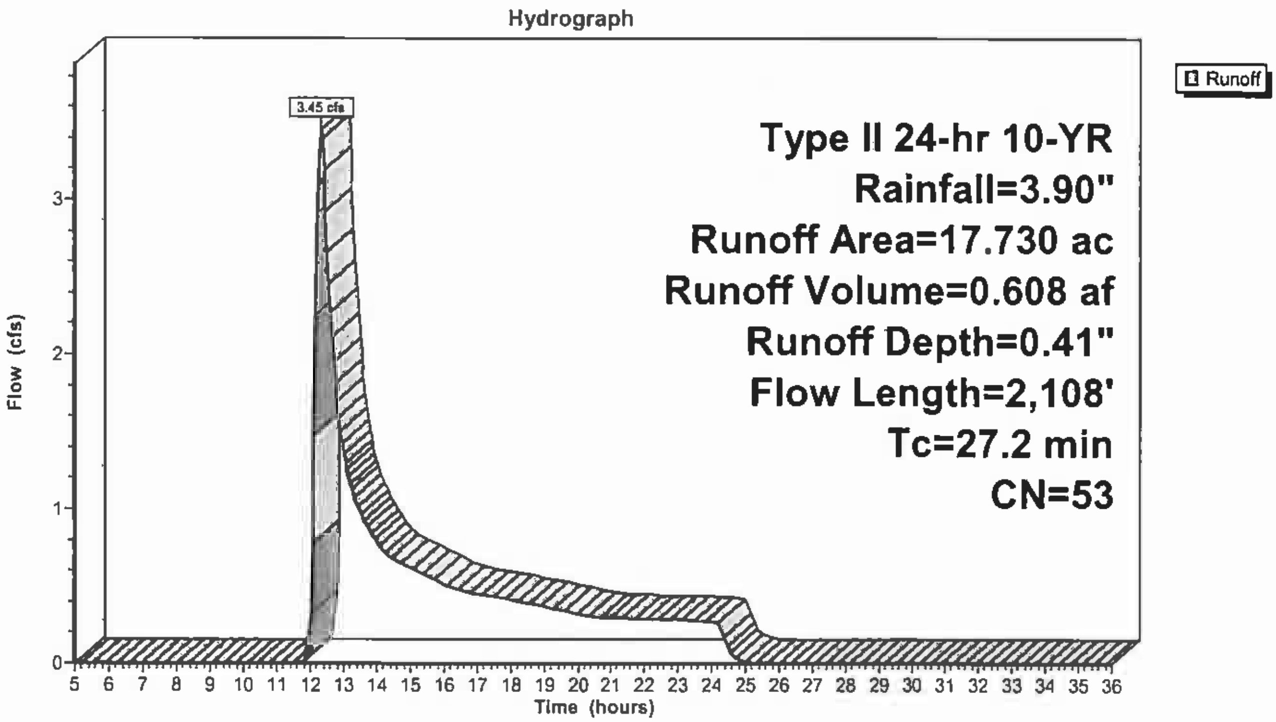
Runoff = 3.45 cfs @ 12.31 hrs, Volume= 0.608 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.290	49	Brush, Good, HSG C
17.330	53	Woods, Good, HSG C
17.730	53	Weighted Average
17.730		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
12.8	1,915	0.1260	2.48		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
0.3	93	0.0200	4.76	35.67	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.040
27.2	2,108	Total			

Subcatchment C-78: Culvert-78 Area



Subcatchment C-79: Culvert-79 Area

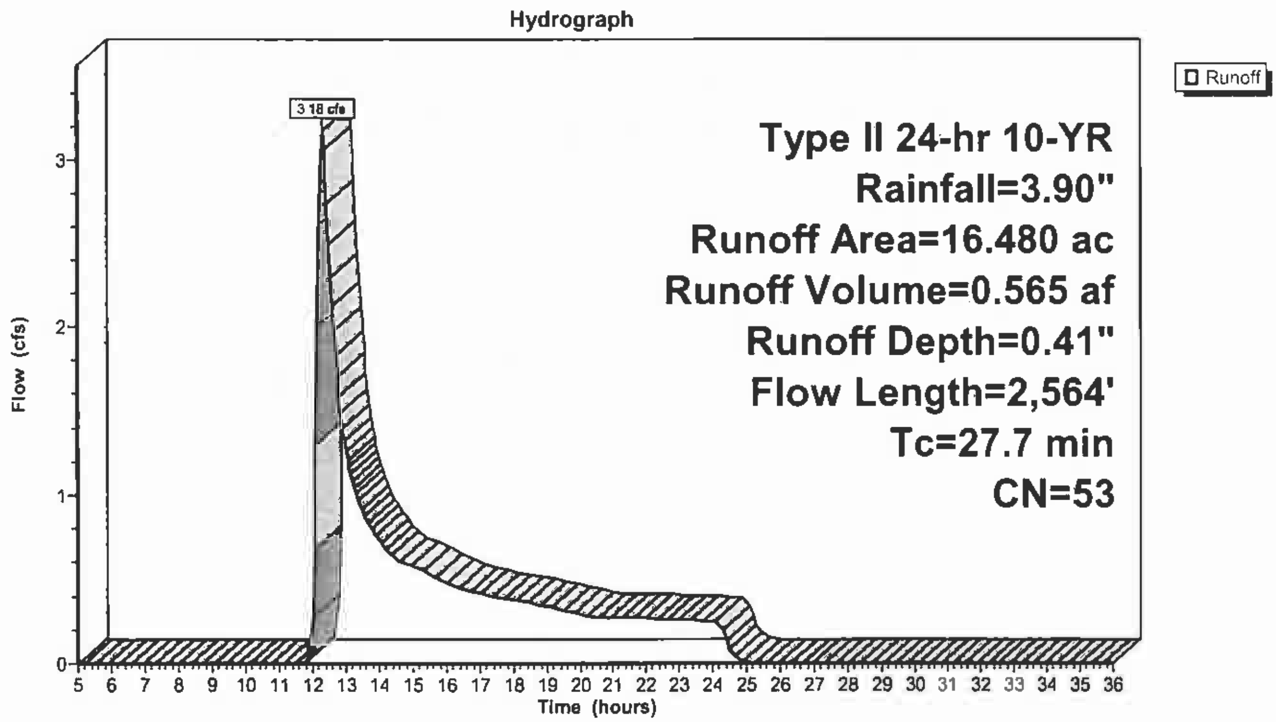
Runoff = 3.18 cfs @ 12.32 hrs, Volume= 0.565 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
0.230	49	Brush, Good, HSG C
16.120	53	Woods, Good, HSG C
16.480	53	Weighted Average
16.480		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
17.1	2,135	0.0880	2.08		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
1.5	329	0.0180	3.62	14.47	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
27.7	2,564	Total			

Subcatchment C-79: Culvert-79 Area



Subcatchment C-8 Area: Culvert-8 Area

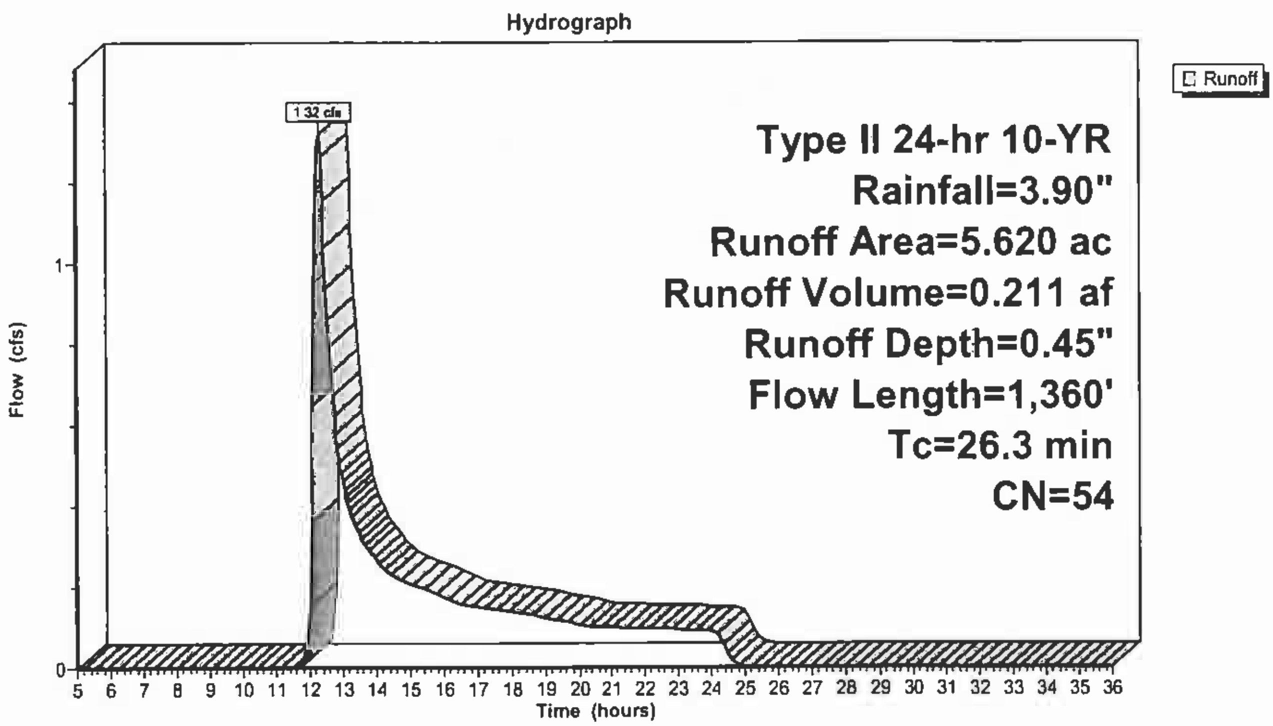
Runoff = 1.32 cfs @ 12.29 hrs, Volume= 0.211 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
4.320	53	Woods, Good, HSG C
0.080	89	Gravel roads, HSG C
1.220	53	Woods, Good, HSG C
5.620	54	Weighted Average
5.620		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0620	0.11		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
10.1	1,070	0.1240	1.76		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.3	190	0.0070	2.49	9.32	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.50' Z= 1.0 '/' Top.W=4.00' n= 0.040
26.3	1,360	Total			

Subcatchment C-8 Area: Culvert-8 Area



Subcatchment C-80: Culvert-80 Area

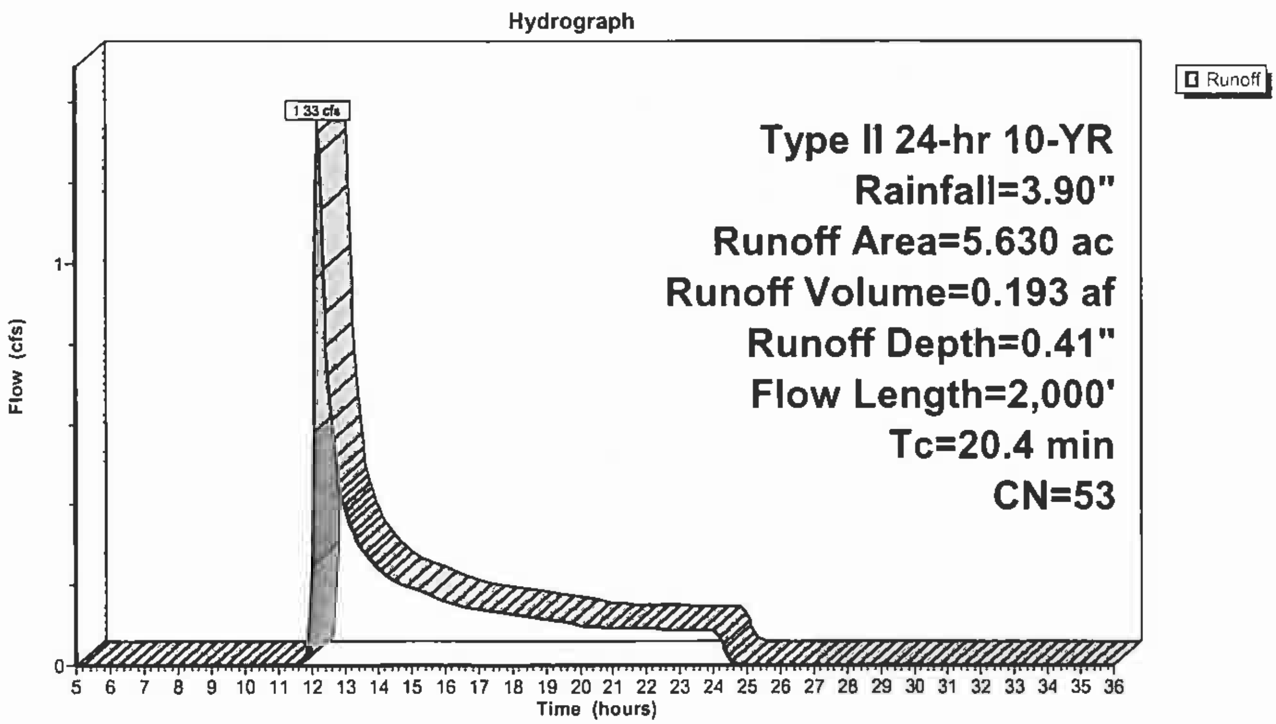
Runoff = 1.33 cfs @ 12.21 hrs, Volume= 0.193 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.110	49	Brush, Good, HSG C
5.430	53	Woods, Good, HSG C
5.630	53	Weighted Average
5.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	80	0.0500	0.22		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 2.70"
13.6	1,780	0.0970	2.18		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
0.6	140	0.0240	4.18	16.70	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
20.4	2,000	Total			

Subcatchment C-80: Culvert-80 Area



Subcatchment C-81: Culvert-81 Area

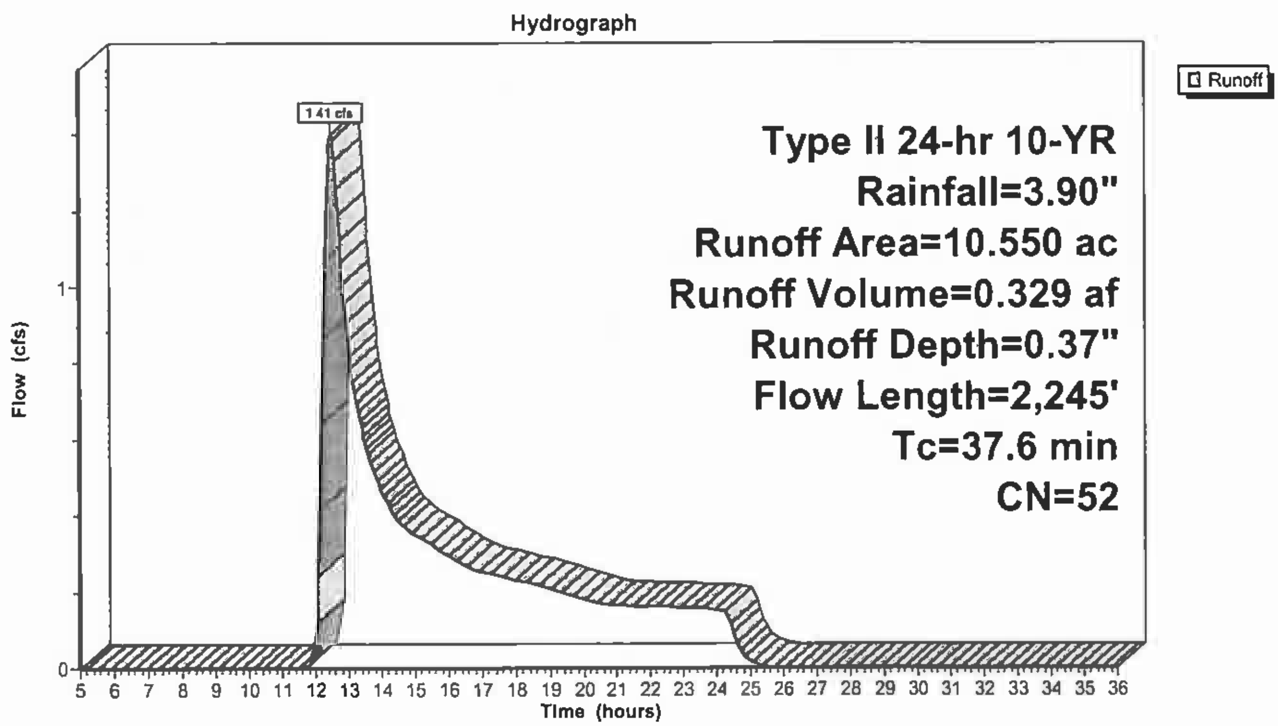
Runoff = 1.41 cfs @ 12.50 hrs, Volume= 0.329 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
3.320	49	Brush, Good, HSG C
7.160	53	Woods, Good, HSG C
10.550	52	Weighted Average
10.550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
21.0	1,865	0.0880	1.48		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.4	280	0.0790	10.75	86.01	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
37.6	2,245	Total			

Subcatchment C-81: Culvert-81 Area



Subcatchment C-82: Culvert-82 Area

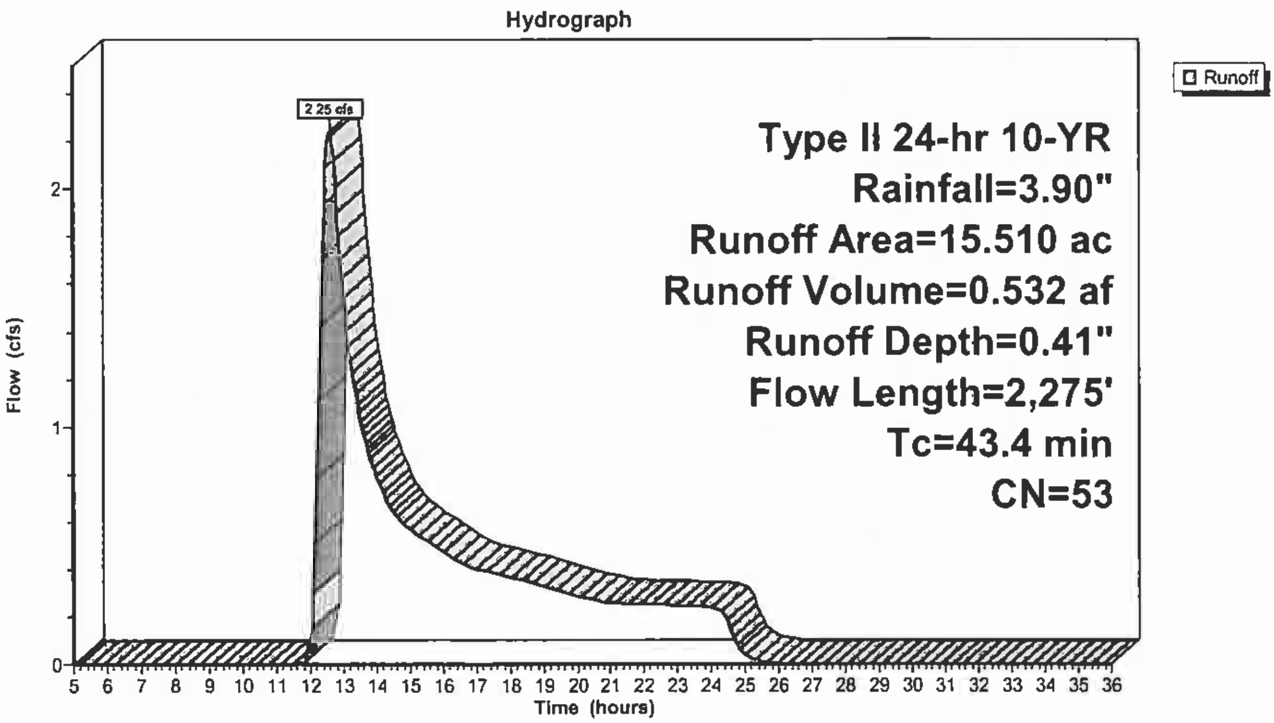
Runoff = 2.25 cfs @ 12.58 hrs, Volume= 0.532 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
0.450	49	Brush, Good, HSG C
14.910	53	Woods, Good, HSG C
15.510	53	Weighted Average
15.510		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0350	0.09		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
24.7	2,175	0.0860	1.47		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
43.4	2,275	Total			

Subcatchment C-82: Culvert-82 Area



Subcatchment C-83: Culvert-83 Area

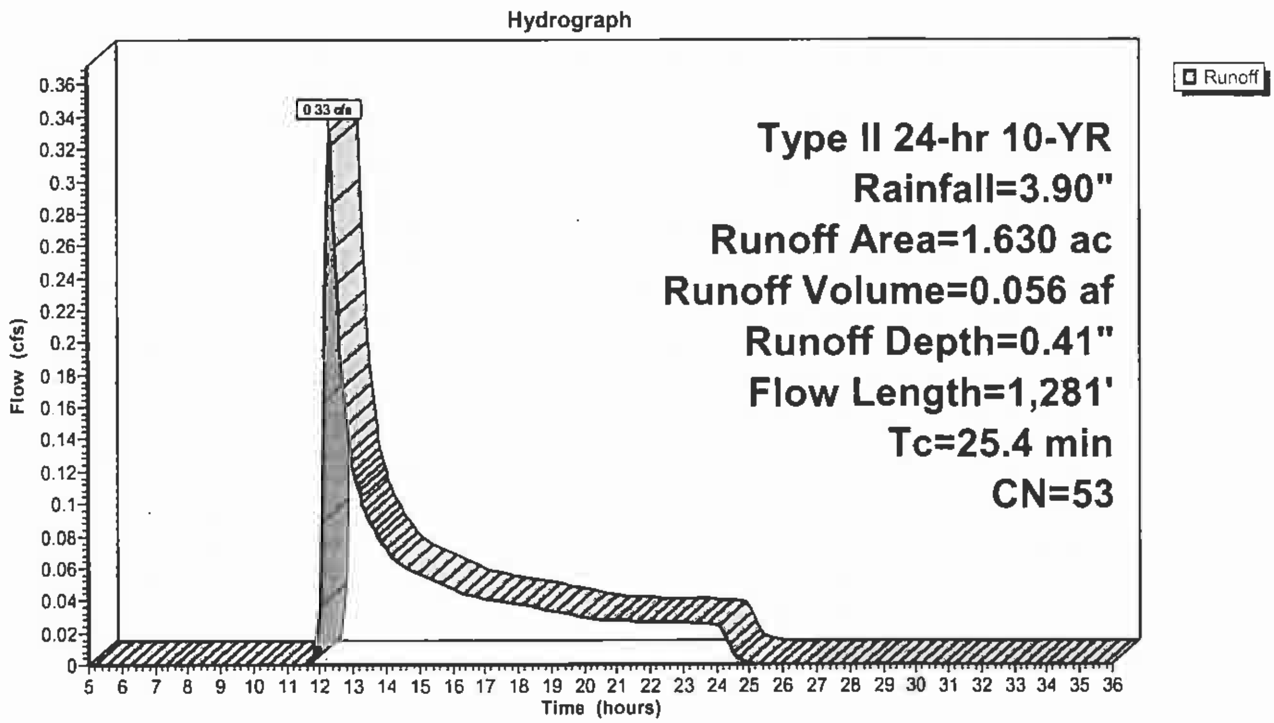
Runoff = 0.33 cfs @ 12.28 hrs, Volume= 0.056 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.126	49	Brush, Good, HSG C
1.474	53	Woods, Good, HSG C
1.630	53	Weighted Average
1.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0900	0.13		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.6	1,181	0.0970	1.56		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
25.4	1,281	Total			

Subcatchment C-83: Culvert-83 Area



Subcatchment C-86: Culvert-86 Area

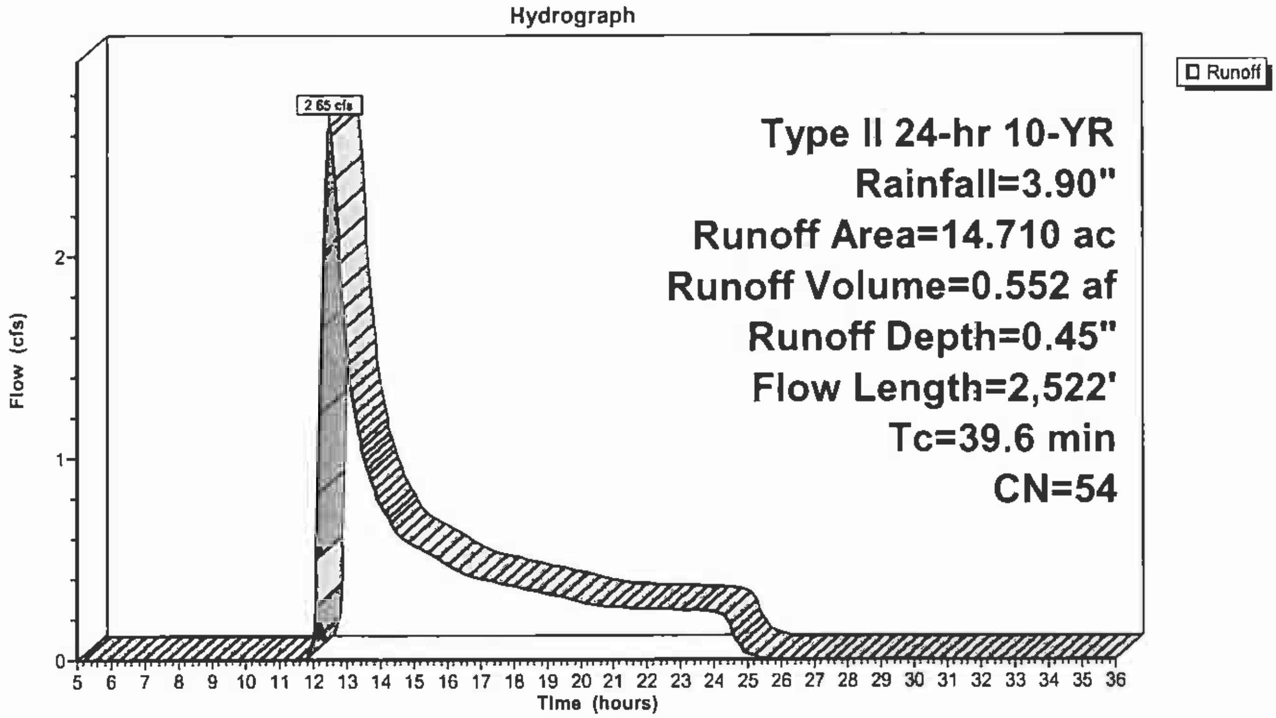
Runoff = 2.65 cfs @ 12.50 hrs, Volume= 0.552 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.390	89	Gravel roads, HSG C
0.250	49	Brush, Good, HSG C
14.070	53	Woods, Good, HSG C
14.710	54	Weighted Average
14.710		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.7	1,232	0.0780	1.40		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
7.1	355	0.0280	0.84		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
4.4	375	0.0800	1.41		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
1.6	460	0.0210	4.87	36.55	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.040
39.6	2,522	Total			

Subcatchment C-86: Culvert-86 Area



Subcatchment C-88: Culvert-88 Area

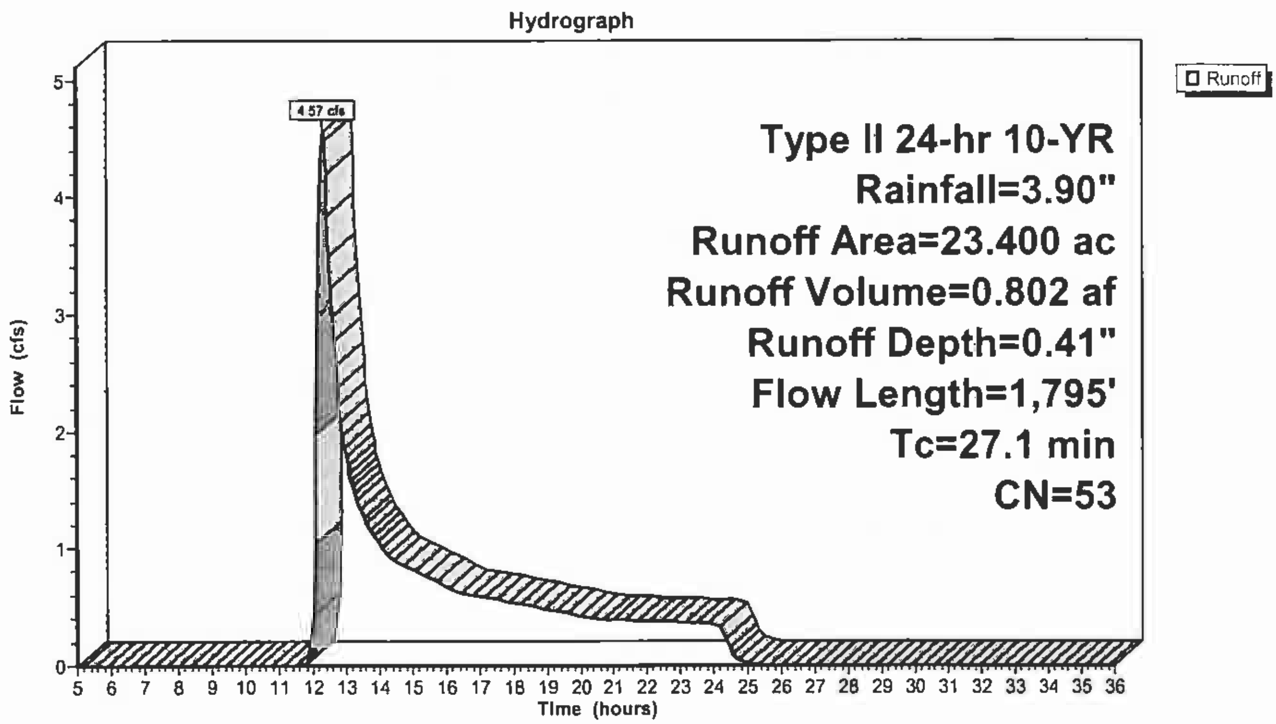
Runoff = 4.57 cfs @ 12.31 hrs, Volume= 0.802 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
23.160	53	Woods, Good, HSG C
23.400	53	Weighted Average
23.400		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	65	0.1540	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.2	520	0.1110	1.67		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
3.9	220	0.0360	0.95		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
10.7	990	0.0950	1.54		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
27.1	1,795	Total			

Subcatchment C-88: Culvert-88 Area



Subcatchment C-89: Culvert-89 Area

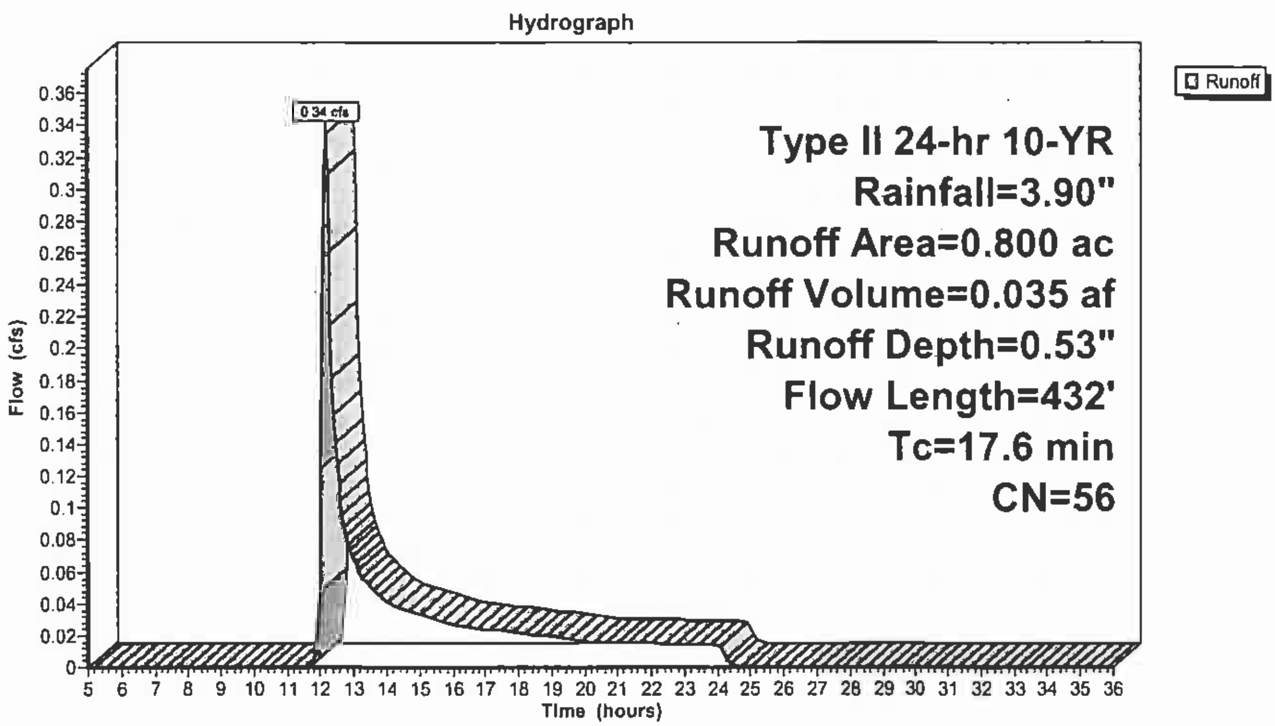
Runoff = 0.34 cfs @ 12.15 hrs, Volume= 0.035 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.020	49	Brush, Good, HSG C
0.720	53	Woods, Good, HSG C
0.800	56	Weighted Average
0.800		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	60	0.0250	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.3	350	0.1260	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	22	0.0100	2.70	10.78	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
17.6	432	Total			

Subcatchment C-89: Culvert-89 Area



Subcatchment C-90: Culvert-90 Area

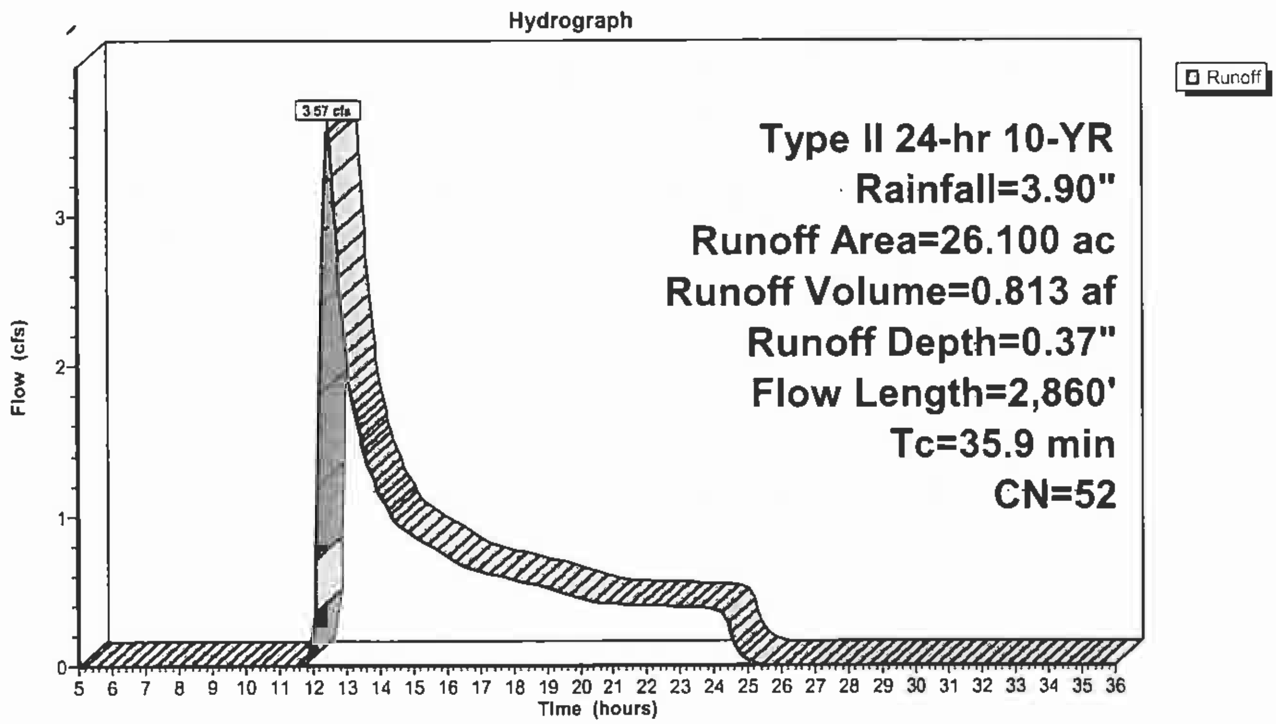
Runoff = 3.57 cfs @ 12.47 hrs, Volume= 0.813 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.180	89	Gravel roads, HSG C
9.360	49	Brush, Good, HSG C
16.560	53	Woods, Good, HSG C
26.100	52	Weighted Average
26.100		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0700	0.26		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
9.5	865	0.0470	1.52		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.2	1,680	0.0850	1.46		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	215	0.0190	5.45	65.34	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
35.9	2,860	Total			

Subcatchment C-90: Culvert-90 Area



Subcatchment C-93: Culvert-93 Area

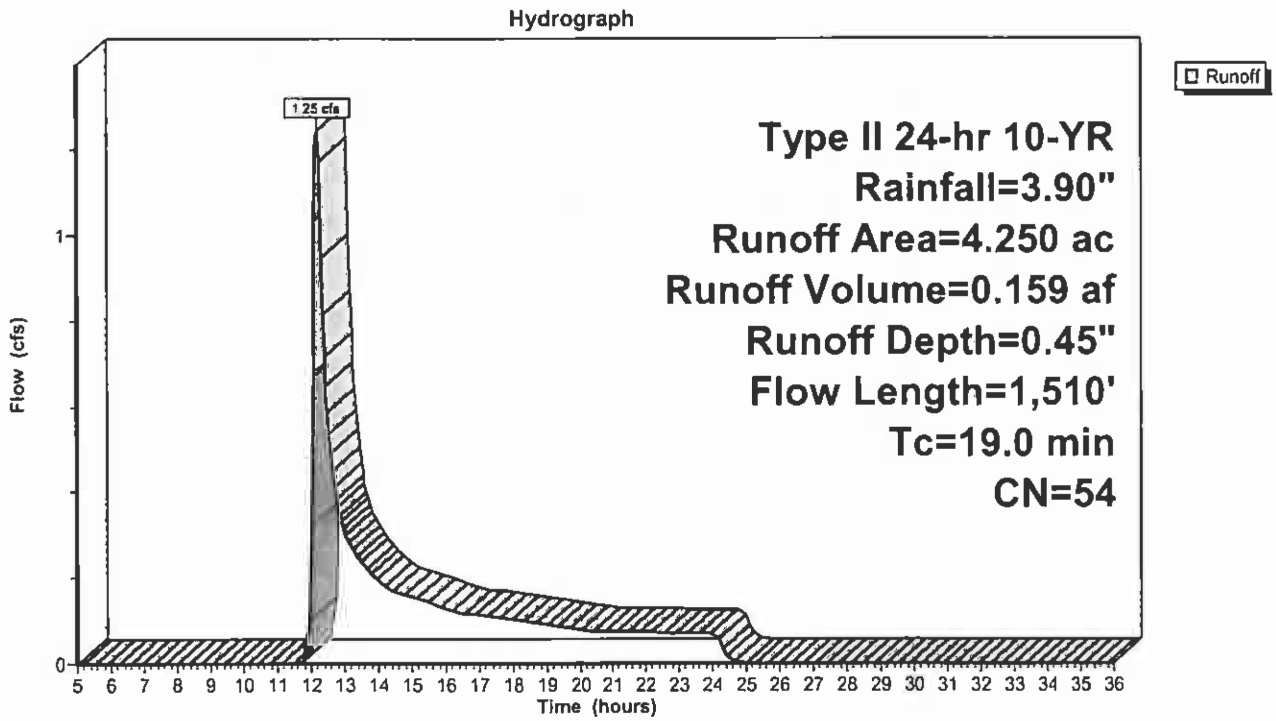
Runoff = 1.25 cfs @ 12.18 hrs, Volume= 0.159 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
4.090	53	Woods, Good, HSG C
4.250	54	Weighted Average
4.250		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.1200	0.32		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
0.8	100	0.0900	2.10		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
12.7	1,165	0.0940	1.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	145	0.0560	9.35	112.18	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
19.0	1,510	Total			

Subcatchment C-93: Culvert-93 Area



Subcatchment C-96: Culvert-96 Area

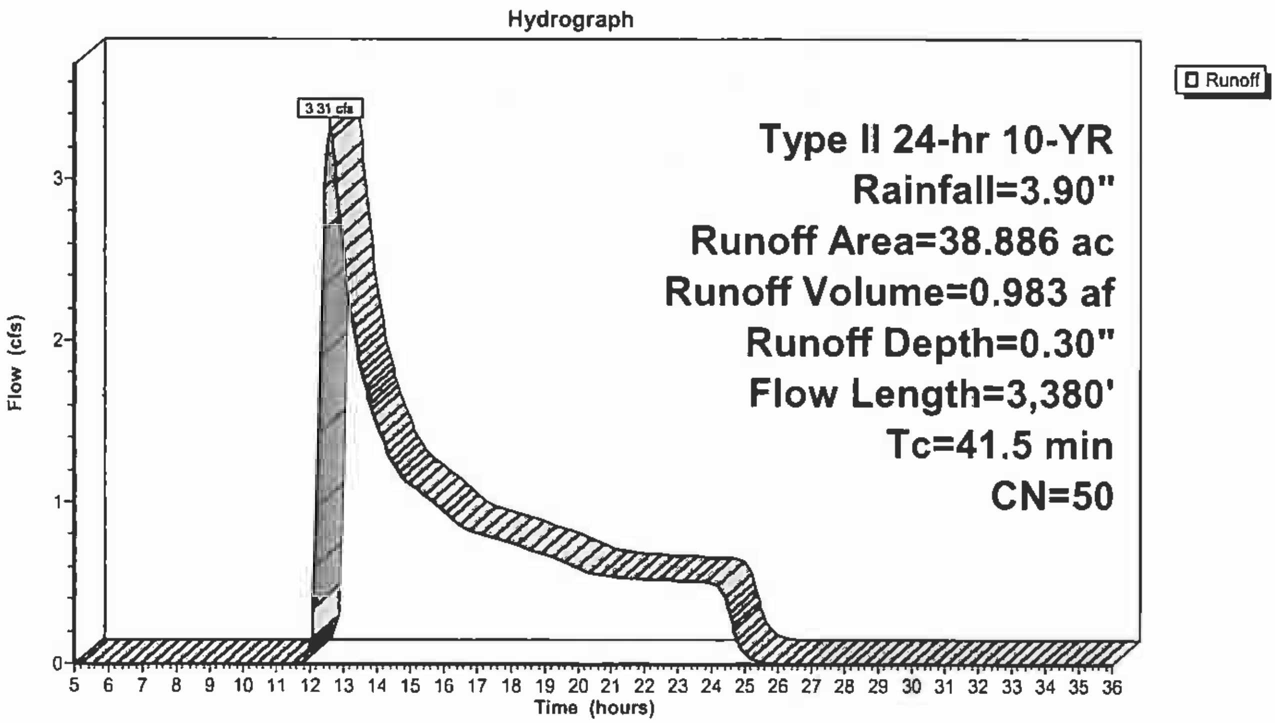
Runoff = 3.31 cfs @ 12.61 hrs, Volume= 0.983 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.075	89	Gravel roads, HSG C
30.651	49	Brush, Good, HSG C
8.160	53	Woods, Good, HSG C
38.886	50	Weighted Average
38.886		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
17.4	1,470	0.0790	1.41		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
14.4	1,590	0.0690	1.84		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.4	220	0.0450	8.76	122.65	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=2.00' Z= 2.0 '/' Top.W=11.00' n= 0.040
41.5	3,380	Total			

Subcatchment C-96: Culvert-96 Area



Subcatchment C-97: Culvert-97 Area

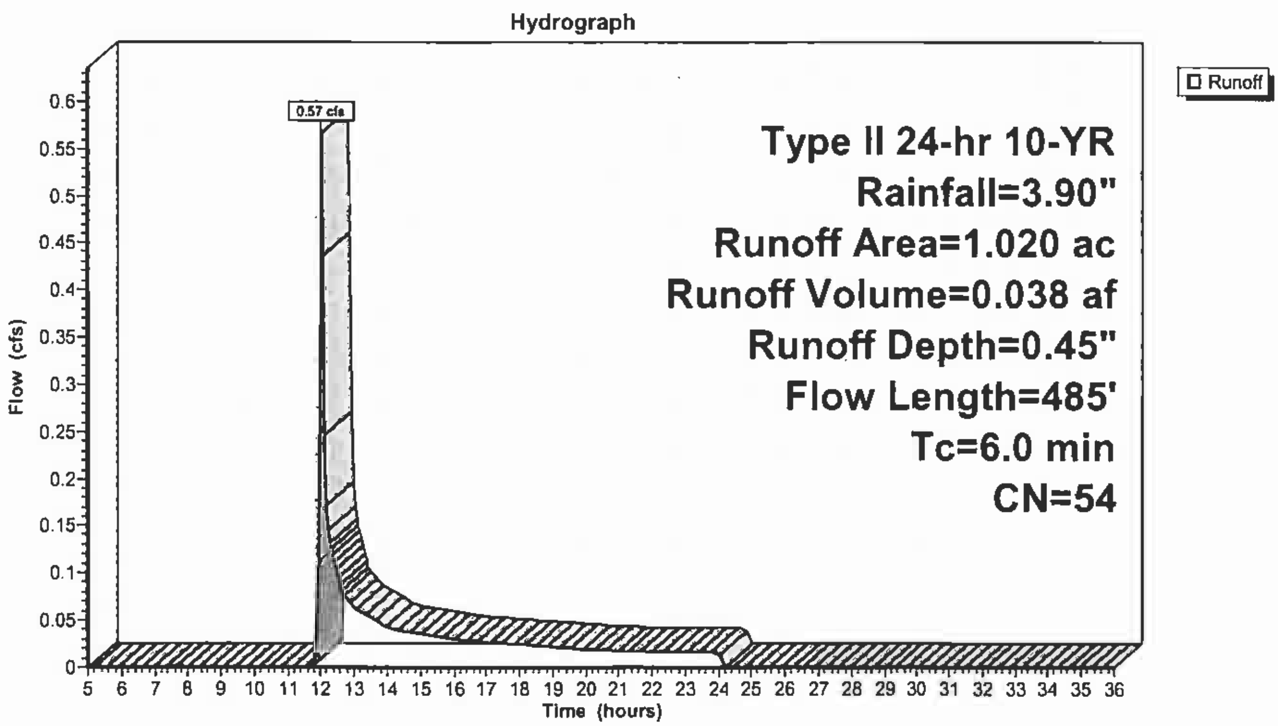
Runoff = 0.57 cfs @ 12.00 hrs, Volume= 0.038 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
0.820	49	Brush, Good, HSG C
0.080	53	Woods, Good, HSG C
1.020	54	Weighted Average
1.020		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0700	0.22		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.0	345	0.1650	2.84		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.3	90	0.0420	5.52	22.10	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
6.0	485	Total			

Subcatchment C-97: Culvert-97 Area



Subcatchment C-98: Culvert-98 Area

[49] Hint: Tc<2dt may require smaller dt

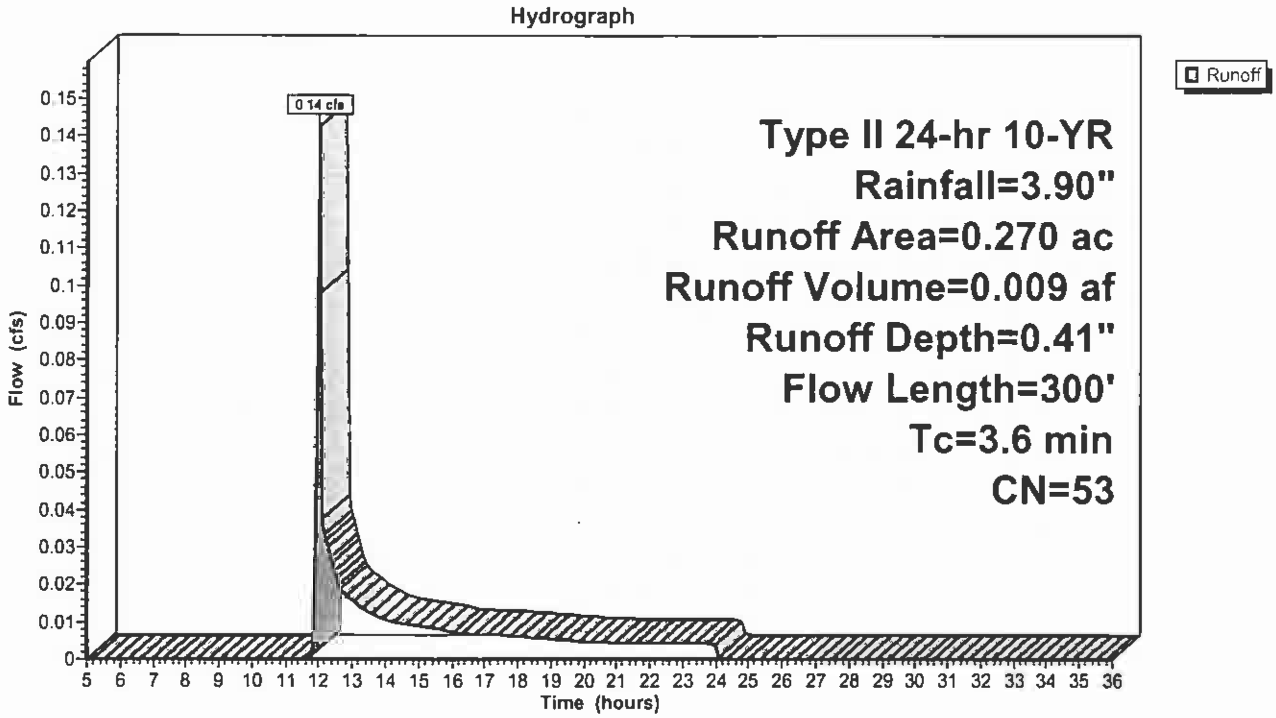
Runoff = 0.14 cfs @ 11.97 hrs, Volume= 0.009 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.020	89	Gravel roads, HSG C
0.180	49	Brush, Good, HSG C
0.070	53	Woods, Good, HSG C
0.270	53	Weighted Average
0.270		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	40	0.1500	0.29		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
0.9	160	0.1630	2.83		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.3	60	0.3330	2.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	40	0.0290	4.59	18.36	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
3.6	300	Total			

Subcatchment C-98: Culvert-98 Area



Subcatchment C-99: Culvert-99 Area

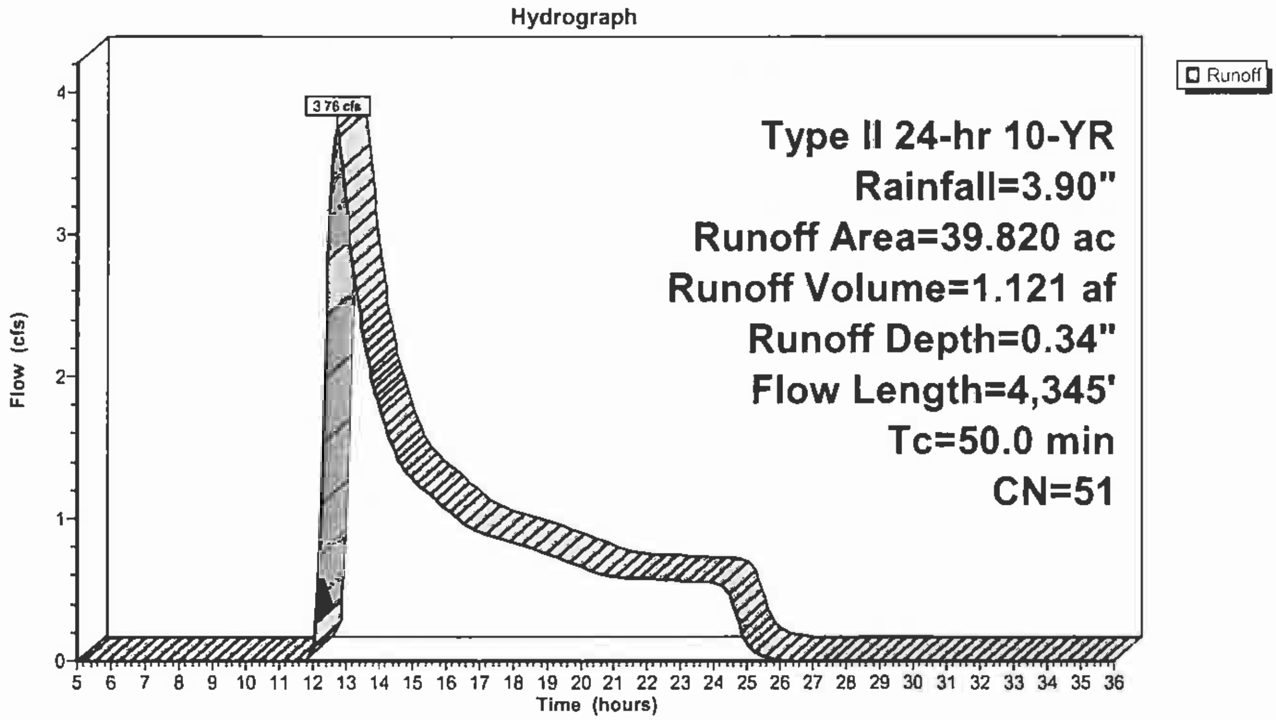
Runoff = 3.76 cfs @ 12.73 hrs, Volume= 1.121 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
19.740	49	Brush, Good, HSG C
19.950	53	Woods, Good, HSG C
39.820	51	Weighted Average
39.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
10.1	1,200	0.1580	1.99		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.3	1,365	0.1550	2.76		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.4	1,400	0.0580	1.20		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	280	0.0580	11.25	225.04	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=2.50' Z= 2.0 '/' Top.W=13.00' n= 0.040
50.0	4,345	Total			

Subcatchment C-99: Culvert-99 Area



Subcatchment T1: TS1 Area

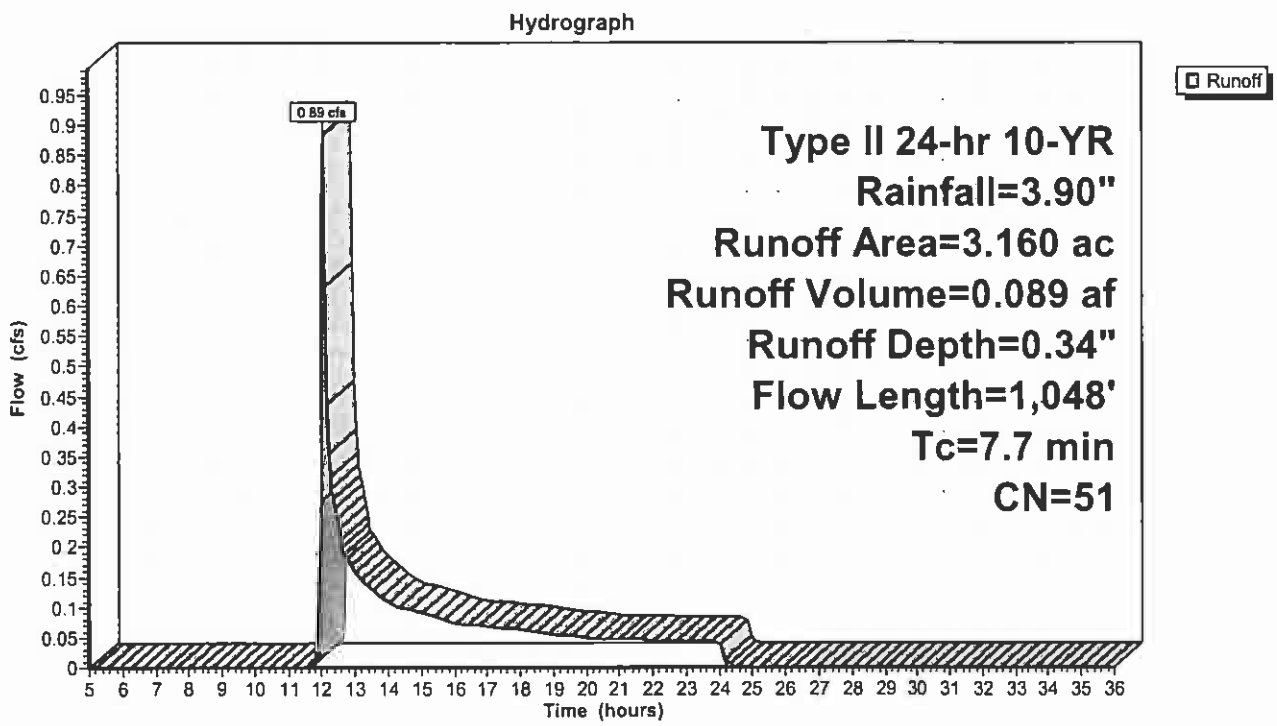
Runoff = 0.89 cfs @ 12.04 hrs, Volume= 0.089 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.078	89	Gravel roads, HSG C
2.122	49	Brush, Good, HSG C
0.960	53	Woods, Good, HSG C
3.160	51	Weighted Average
3.160		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.3000	0.46		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.7	649	0.3230	3.98		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.0	182	0.3400	2.92		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	117	0.0170	5.15	61.81	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
7.7	1,048	Total			

Subcatchment T1: TS1 Area



Subcatchment T2: TS2 AREA

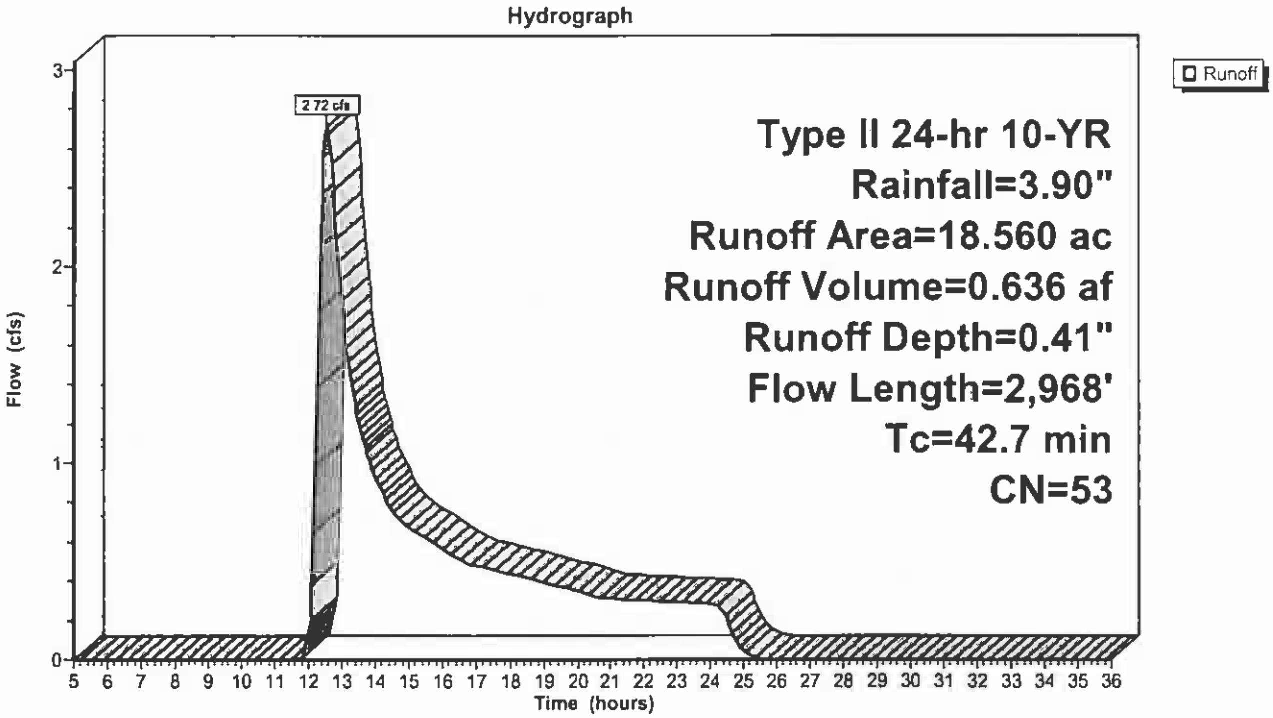
Runoff = 2.72 cfs @ 12.57 hrs, Volume= 0.636 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.240	89	Gravel roads, HSG C
0.600	49	Brush, Good, HSG C
17.720	53	Woods, Good, HSG C
18.560	53	Weighted Average
18.560		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.3	2,090	0.1300	1.80		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	115	0.0870	11.65	139.82	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
0.1	33	0.0900	9.66	17.07	**Circular Channel (pipe), culvert** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.024
6.9	630	0.0930	1.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
42.7	2,968	Total			

Subcatchment T2: TS2 AREA



Subcatchment T3: TS3 Area

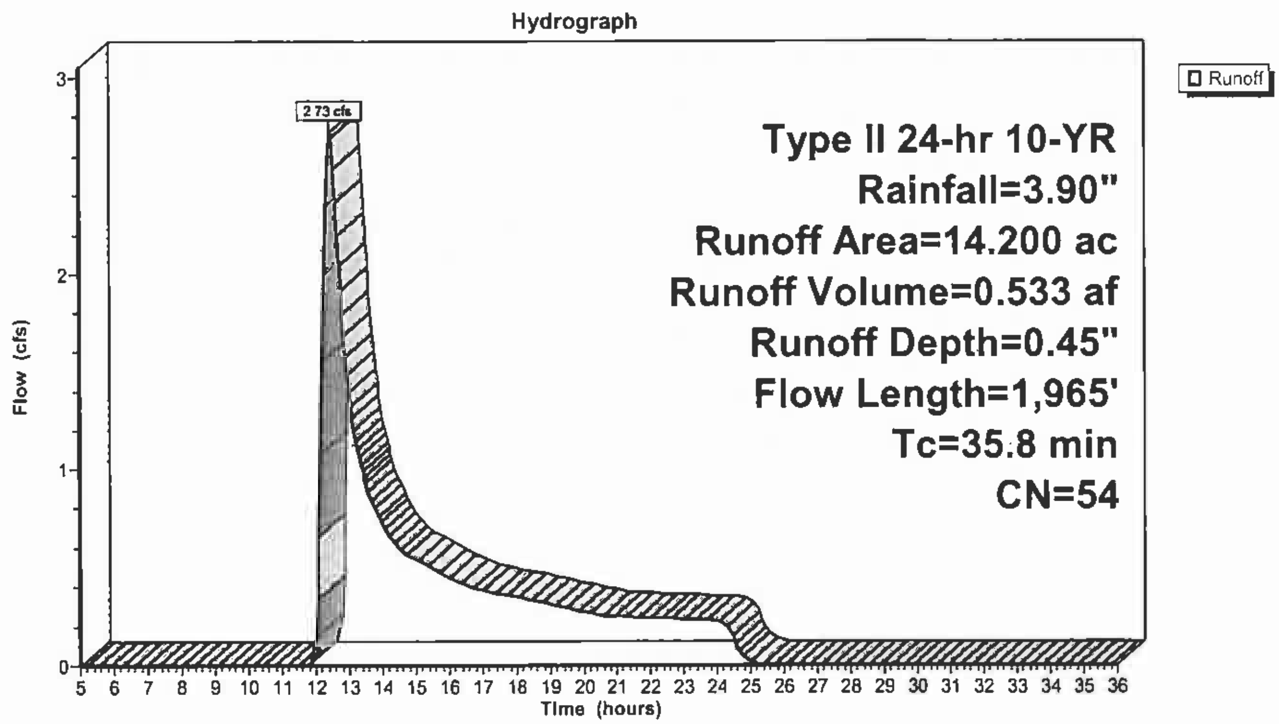
Runoff = 2.73 cfs @ 12.44 hrs, Volume= 0.533 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.200	89	Gravel roads, HSG C
0.960	49	Brush, Good, HSG C
9.530	53	Woods, Good, HSG C
0.350	55	Brush, Good, HSG D
3.160	58	Woods, Good, HSG D
14.200	54	Weighted Average
14.200		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
23.5	1,865	0.0700	1.32		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
35.8	1,965	Total			

Subcatchment T3: TS3 Area



Subcatchment T4: TS 4 Area

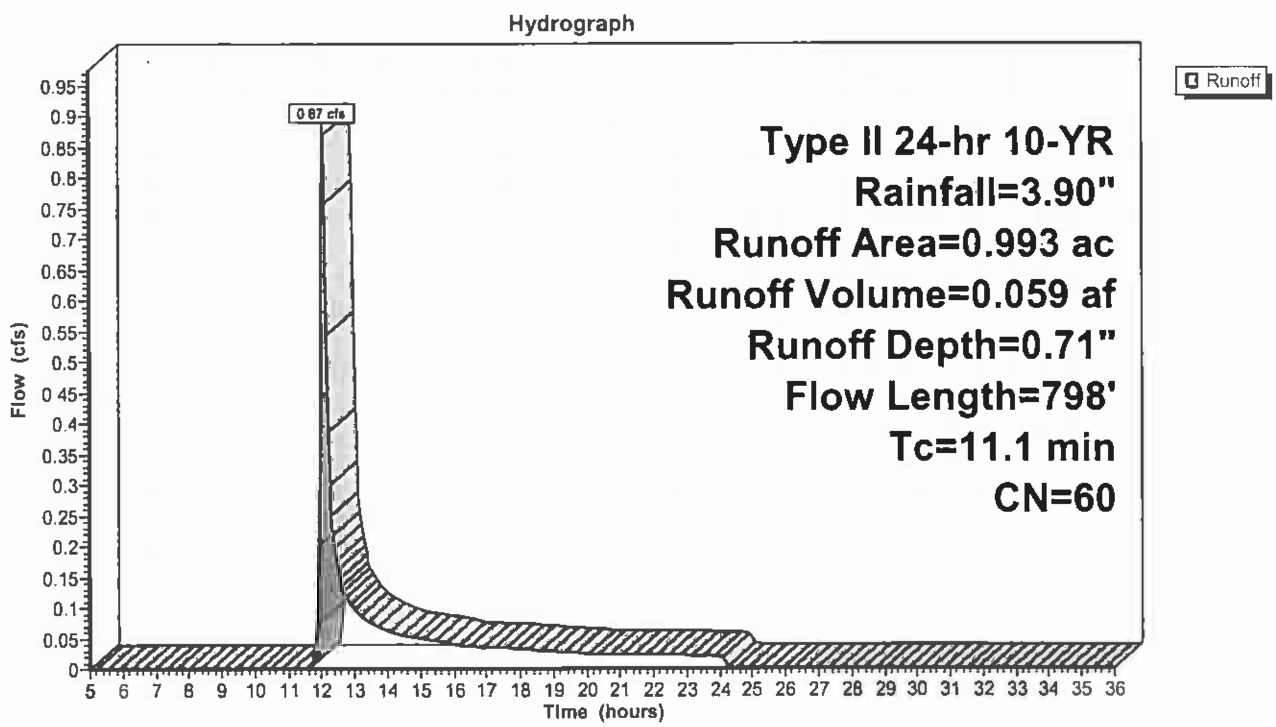
Runoff = 0.87 cfs @ 12.05 hrs, Volume= 0.059 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.140	89	Gravel roads, HSG C
0.146	49	Brush, Good, HSG C
0.087	53	Woods, Good, HSG C
0.267	55	Brush, Good, HSG D
0.353	58	Woods, Good, HSG D
0.993	60	Weighted Average
0.993		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	70	0.0850	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.2	728	0.0620	9.75	194.93	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 4.0 '/' Top.W=18.00' n= 0.040
11.1	798	Total			

Subcatchment T4: TS 4 Area



Reach R1: Reach

Inflow Area = 6.640 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 1.49 cfs @ 12.23 hrs, Volume= 0.228 af
Outflow = 0.72 cfs @ 13.19 hrs, Volume= 0.227 af, Atten= 51%, Lag= 57.7 min

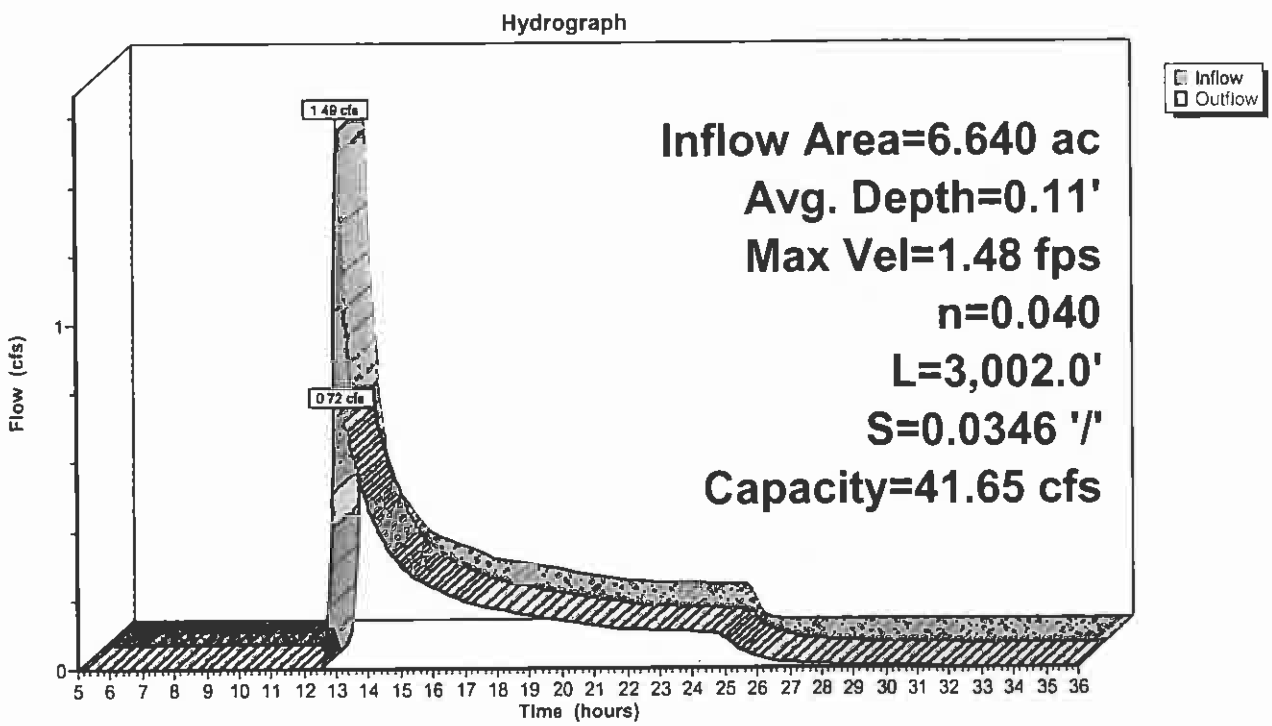
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.48 fps, Min. Travel Time= 33.7 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 79.0 min

Peak Storage= 1,466 cf @ 12.62 hrs, Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 41.65 cfs

4.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 12.00'
Length= 3,002.0' Slope= 0.0346 '/'
Inlet Invert= 1,529.00', Outlet Invert= 1,425.00'

‡

Reach R1: Reach



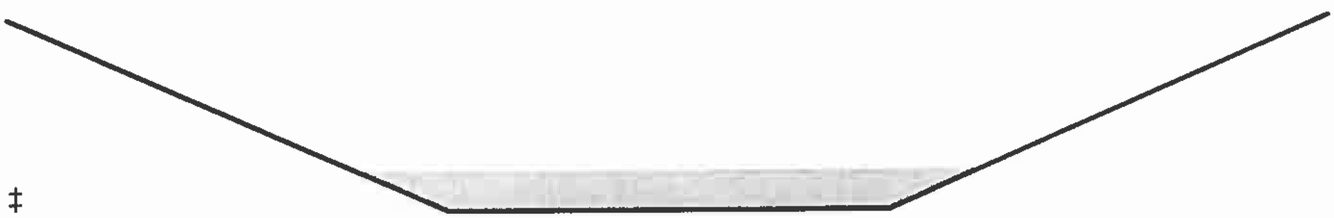
Reach R2: Reach

Inflow Area = 17.730 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 3.45 cfs @ 12.31 hrs, Volume= 0.608 af
Outflow = 2.16 cfs @ 13.05 hrs, Volume= 0.607 af, Atten= 38%, Lag= 44.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 24.8 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 63.0 min

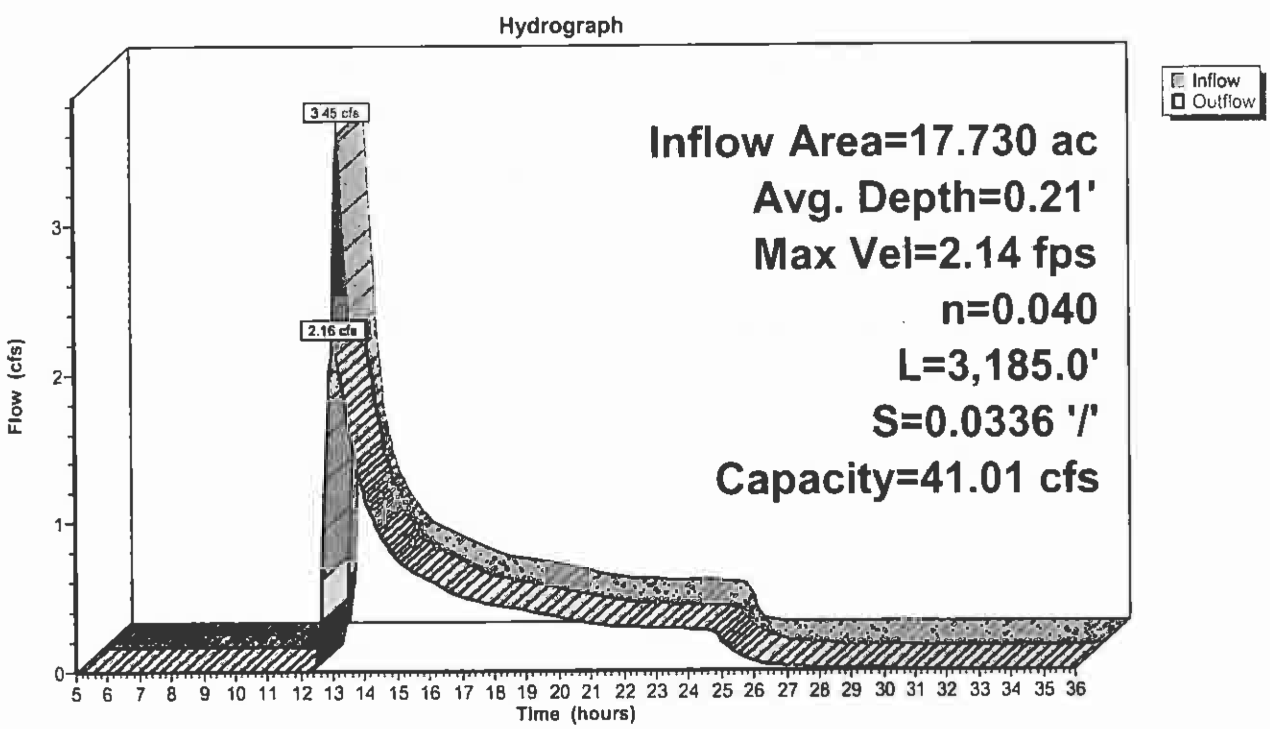
Peak Storage= 3,213 cf @ 12.64 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 41.01 cfs

4.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 12.00'
Length= 3,185.0' Slope= 0.0336 '/'
Inlet Invert= 1,532.00', Outlet Invert= 1,425.00'



‡

Reach R2: Reach



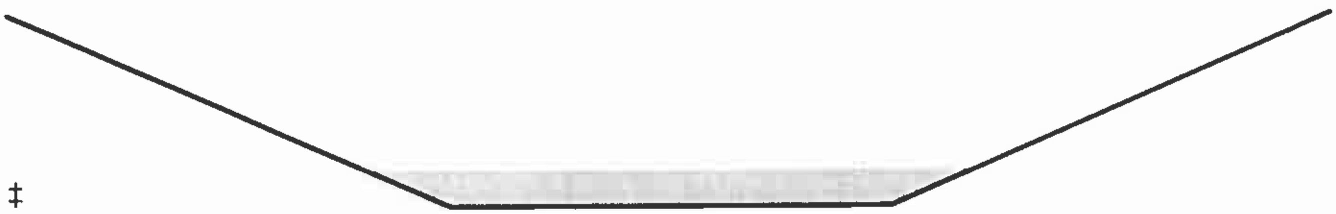
Reach R3: Reach

Inflow Area = 16.480 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 3.18 cfs @ 12.32 hrs, Volume= 0.565 af
Outflow = 1.84 cfs @ 13.20 hrs, Volume= 0.564 af, Atten= 42%, Lag= 52.8 min

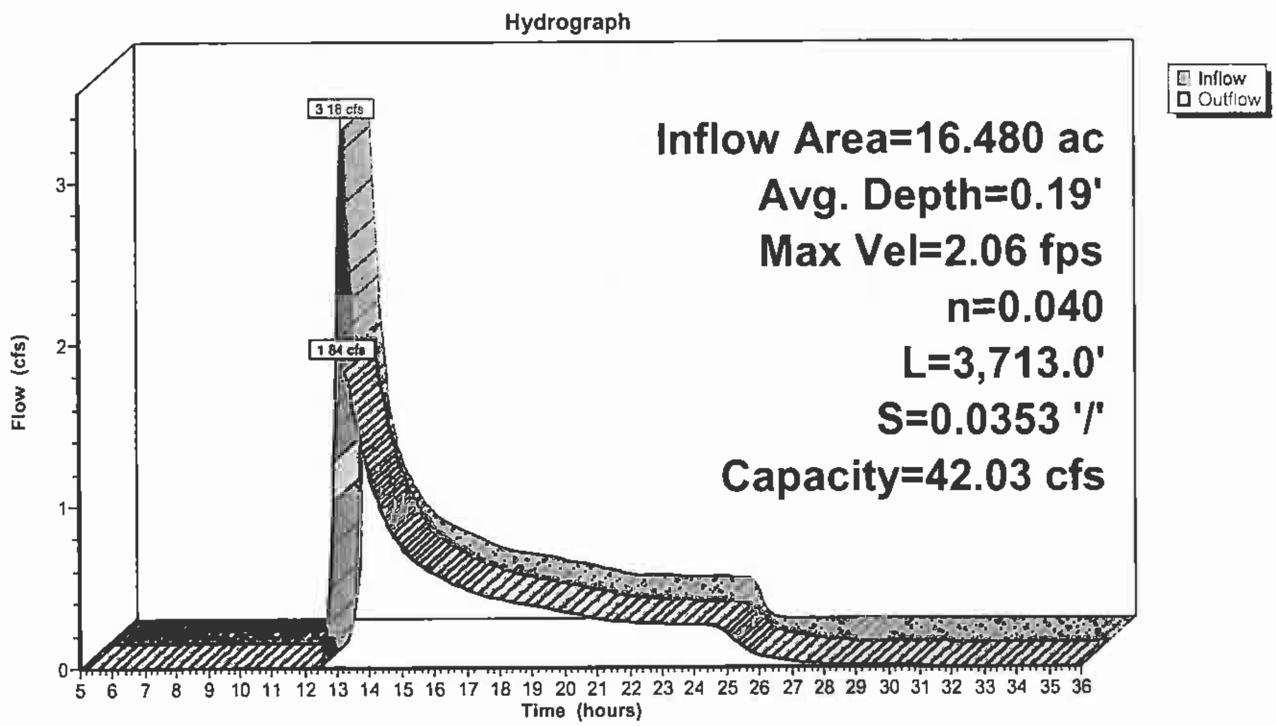
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 30.0 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 73.5 min

Peak Storage= 3,316 cf @ 12.70 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 42.03 cfs

4.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 12.00'
Length= 3,713.0' Slope= 0.0353 '/'
Inlet Invert= 1,556.00', Outlet Invert= 1,425.00'



Reach R3: Reach



Reach R4: Reach

Inflow Area =	5.630 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	1.33 cfs @	12.21 hrs, Volume=	0.193 af	
Outflow =	0.45 cfs @	13.80 hrs, Volume=	0.192 af,	Atten= 66%, Lag= 95.8 min

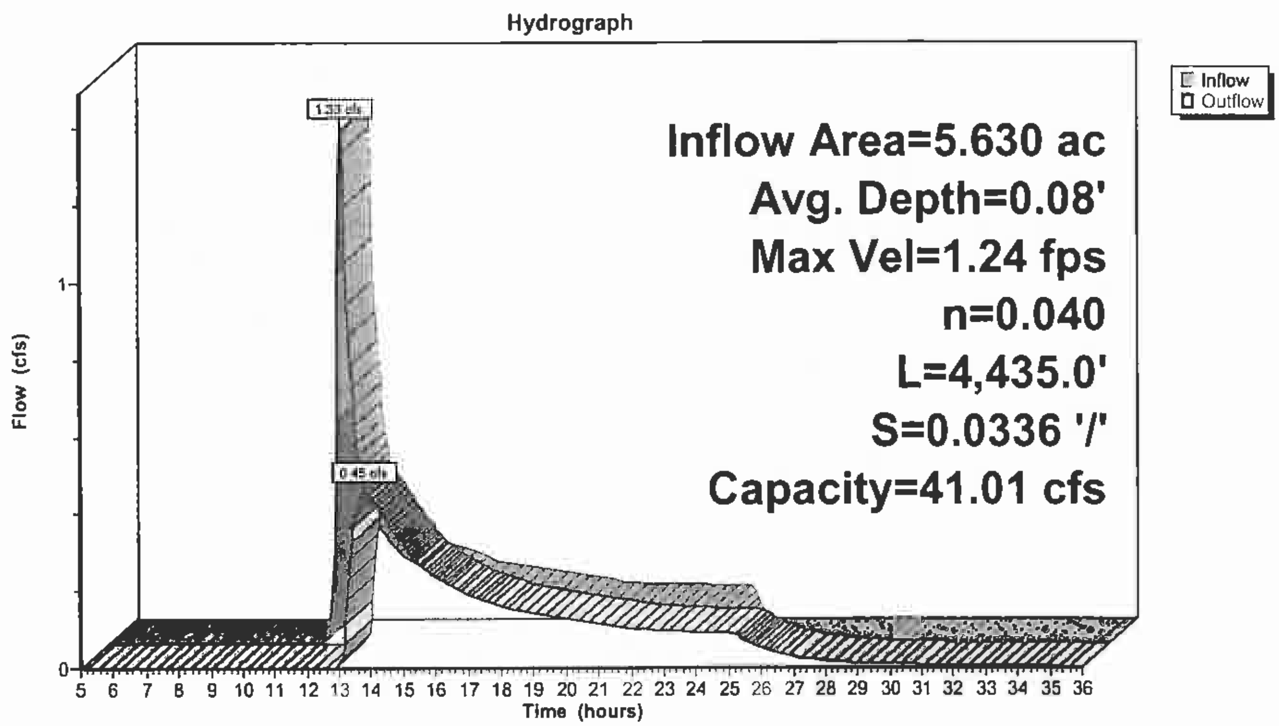
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.24 fps, Min. Travel Time= 59.5 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 122.4 min

Peak Storage= 1,617 cf @ 12.81 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 41.01 cfs

4.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 12.00'
Length= 4,435.0' Slope= 0.0336 '/'
Inlet Invert= 1,574.00', Outlet Invert= 1,425.00'

‡

Reach R4: Reach



Reach R5: Reach

Inflow Area = 10.550 ac, Inflow Depth = 0.37" for 10-YR event
Inflow = 1.41 cfs @ 12.50 hrs, Volume= 0.329 af
Outflow = 0.71 cfs @ 14.22 hrs, Volume= 0.327 af, Atten= 50%, Lag= 103.4 min

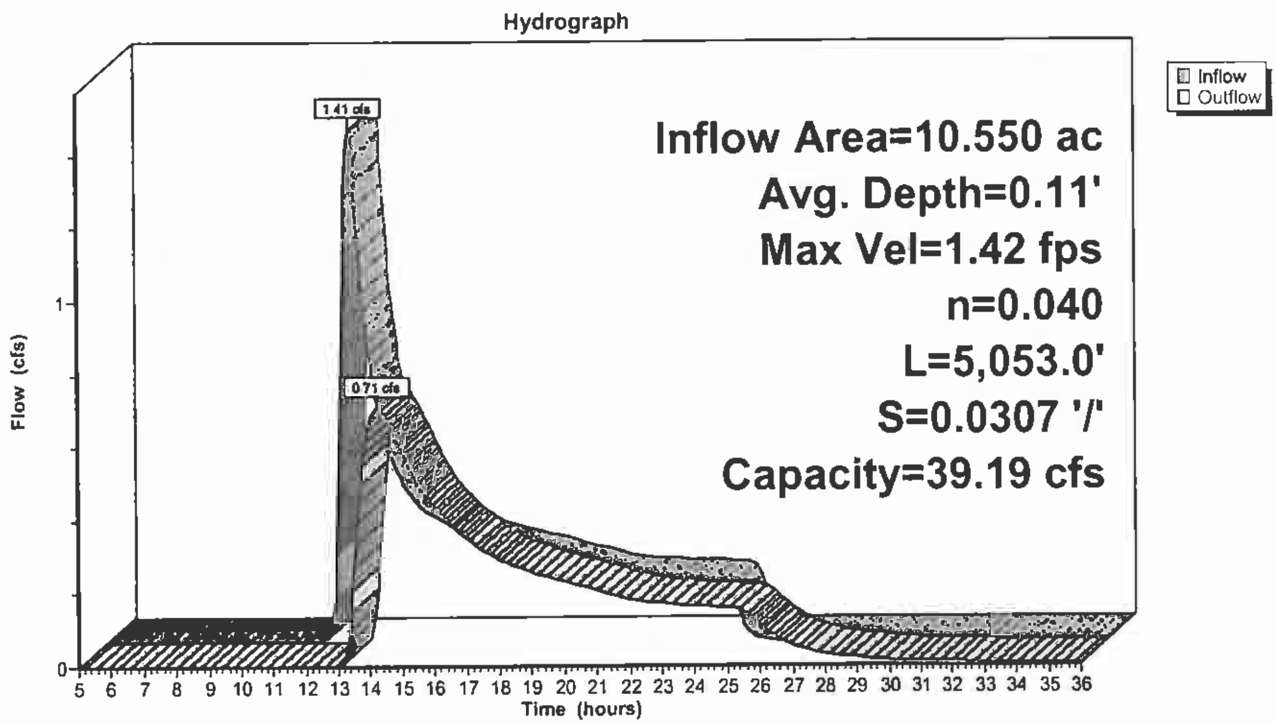
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.42 fps, Min. Travel Time= 59.5 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 120.9 min

Peak Storage= 2,524 cf @ 13.23 hrs, Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 39.19 cfs

4.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 12.00'
Length= 5,053.0' Slope= 0.0307 '/'
Inlet Invert= 1,580.00', Outlet Invert= 1,425.00'

‡

Reach R5: Reach



Reach R8: Reach

Inflow Area = 2.090 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 1.11 cfs @ 12.04 hrs, Volume= 0.085 af
Outflow = 0.64 cfs @ 12.32 hrs, Volume= 0.085 af, Atten= 42%, Lag= 16.8 min

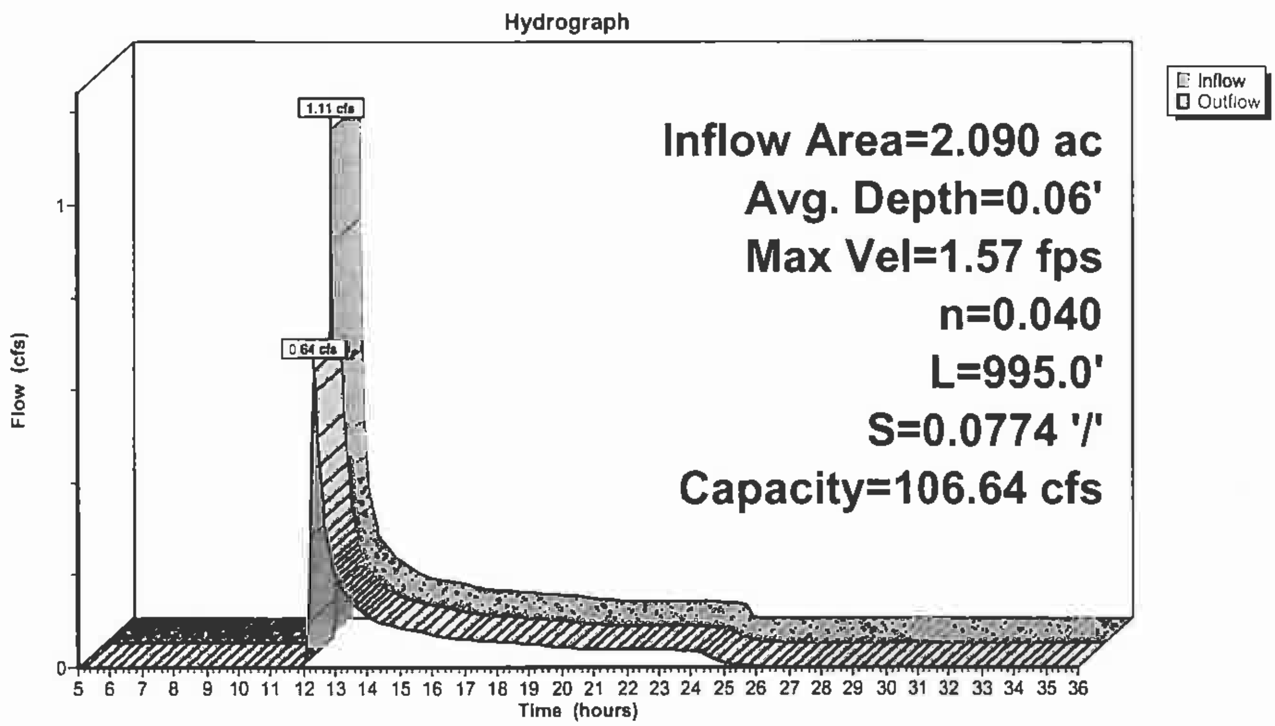
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.57 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 26.2 min

Peak Storage= 413 cf @ 12.15 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 106.64 cfs

6.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 8.0 '/' Top Width= 22.00'
Length= 995.0' Slope= 0.0774 '/'
Inlet Invert= 1,283.00', Outlet Invert= 1,206.00'

‡

Reach R8: Reach



Reach R9: Reach

[79] Warning: Submerged Pond CV4A Primary device # 1 OUTLET by 0.33'

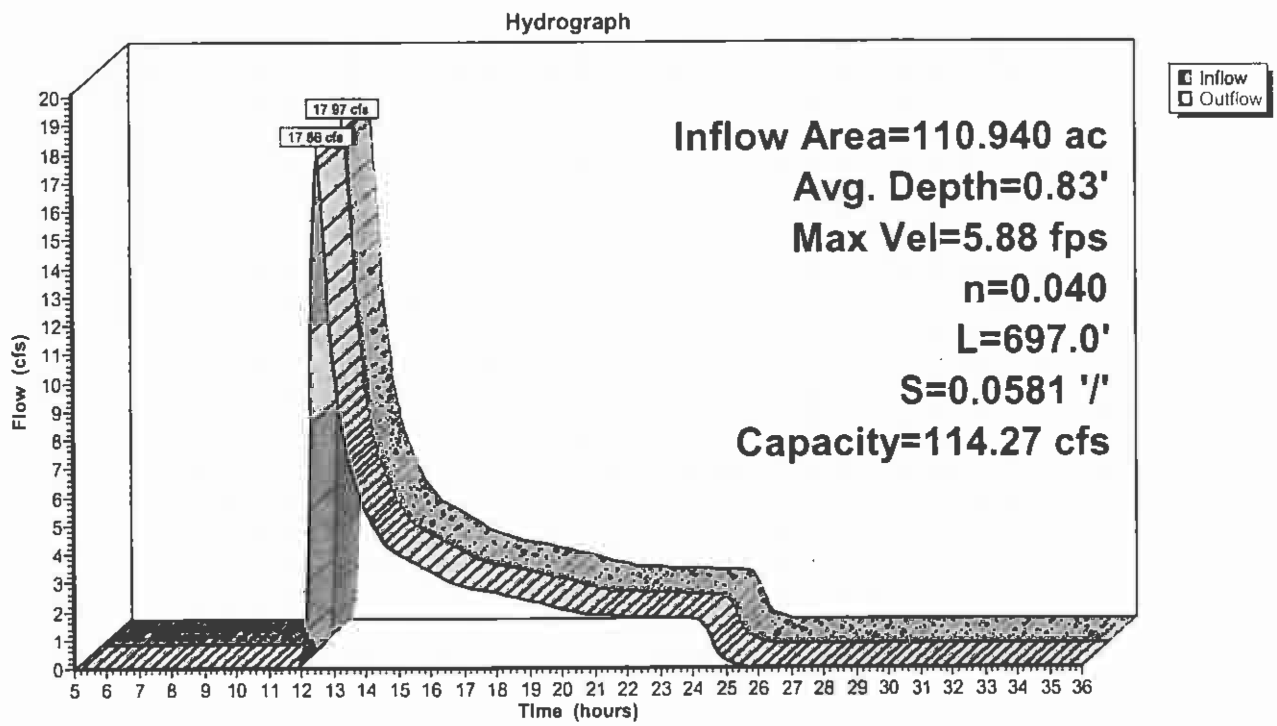
Inflow Area =	110.940 ac,	Inflow Depth = 0.41" for 10-YR event	
Inflow =	17.97 cfs @ 12.46 hrs,	Volume=	3.802 af
Outflow =	17.86 cfs @ 12.52 hrs,	Volume=	3.802 af, Atten= 1%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.88 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 3.02 fps, Avg. Travel Time= 3.8 min

Peak Storage= 2,122 cf @ 12.49 hrs, Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 114.27 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 697.0' Slope= 0.0581 '/'
Inlet Invert= 1,256.50', Outlet Invert= 1,216.00'

Reach R9: Reach



Reach TS1: Treatment Swale #1

Inflow Area = 3.160 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 0.89 cfs @ 12.04 hrs, Volume= 0.089 af
Outflow = 0.80 cfs @ 12.12 hrs, Volume= 0.089 af, Atten= 10%, Lag= 4.6 min

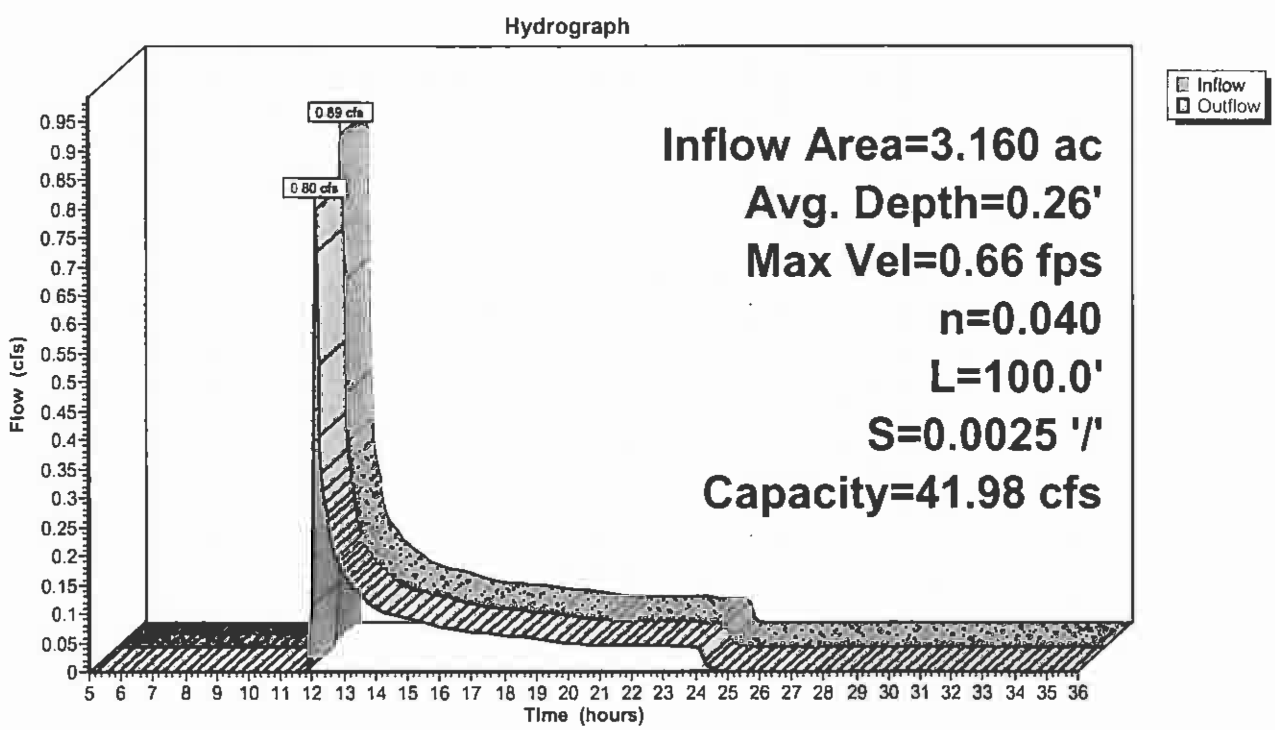
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.66 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 6.2 min

Peak Storage= 122 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 41.98 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0025 '/'
Inlet Invert= 1,413.25', Outlet Invert= 1,413.00'

‡

Reach TS1: Treatment Swale #1



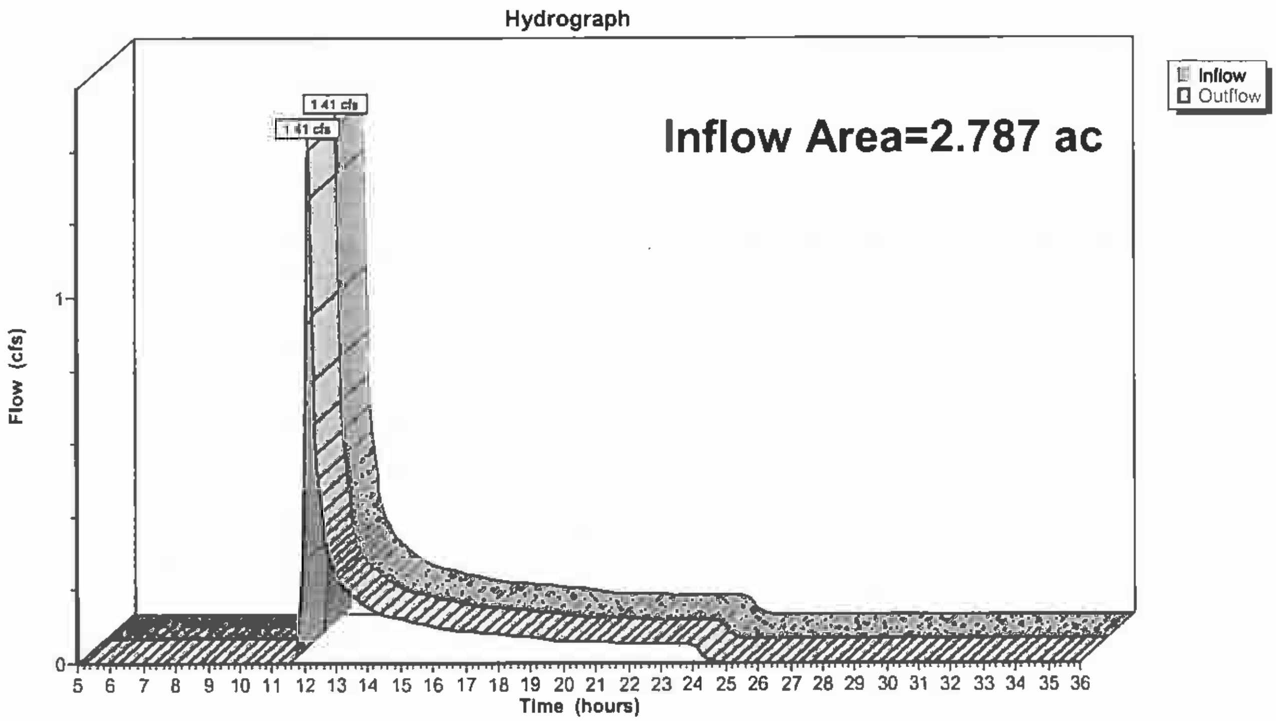
Reach TS11: Treatment Swale #11

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	2.787 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	1.41 cfs @	12.12 hrs, Volume=	0.134 af	
Outflow =	1.41 cfs @	12.12 hrs, Volume=	0.134 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS11: Treatment Swale #11



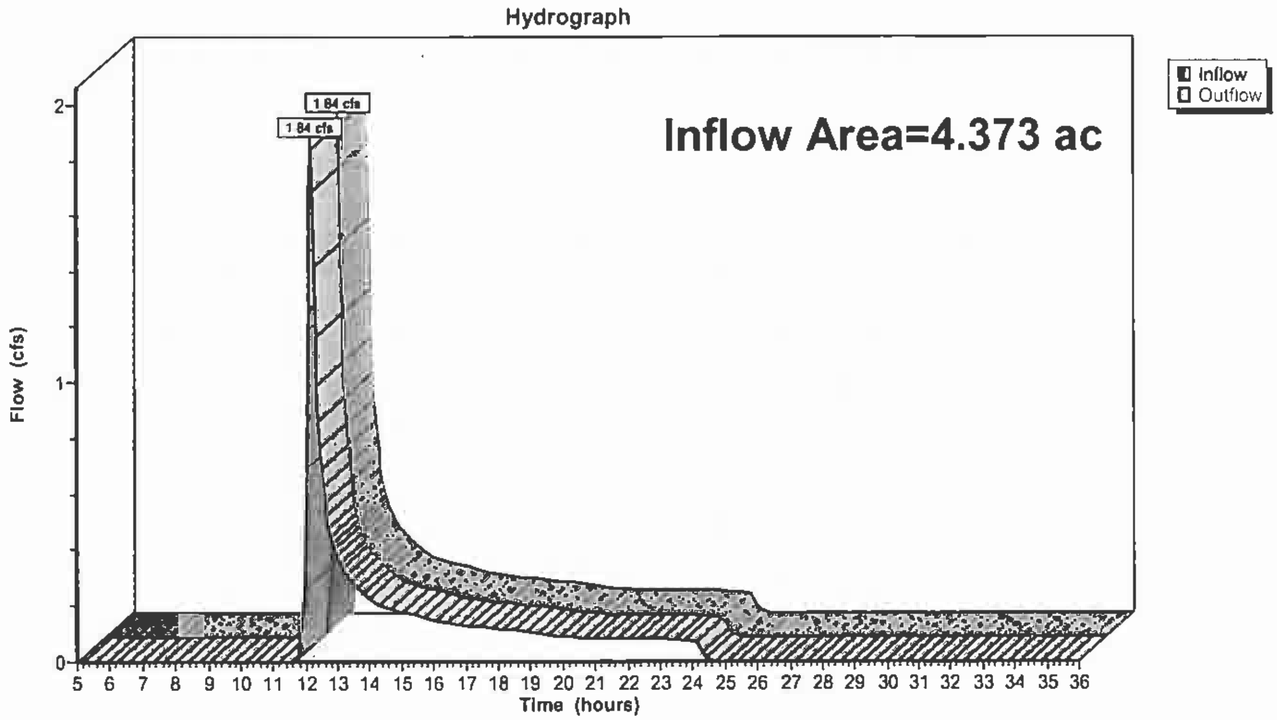
Reach TS12: Treatment Swale #12

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	4.373 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	1.84 cfs @	12.15 hrs, Volume=	0.194 af	
Outflow =	1.84 cfs @	12.15 hrs, Volume=	0.194 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS12: Treatment Swale #12



Reach TS2: Treatment Swale #2

Inflow Area = 18.560 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 2.72 cfs @ 12.57 hrs, Volume= 0.636 af
Outflow = 2.71 cfs @ 12.63 hrs, Volume= 0.636 af, Atten= 0%, Lag= 4.0 min

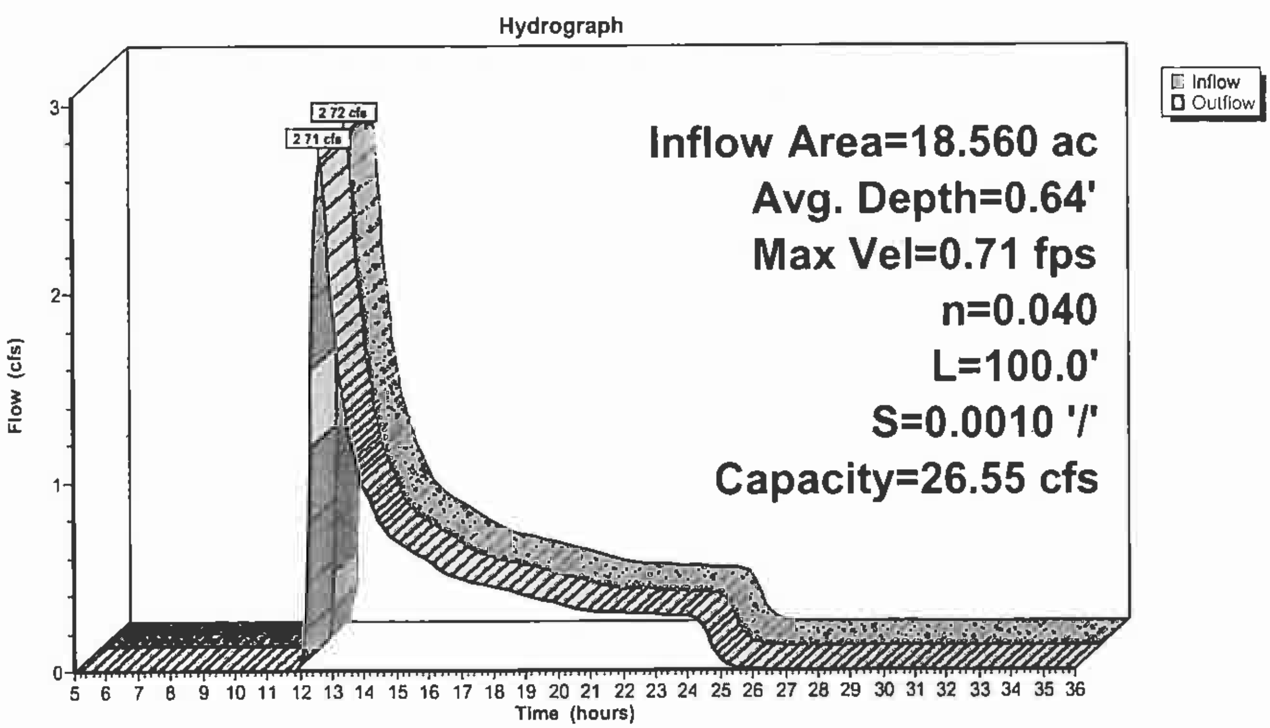
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.71 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 4.7 min

Peak Storage= 381 cf @ 12.59 hrs, Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0010 '/'
Inlet Invert= 1,200.10', Outlet Invert= 1,200.00'

‡

Reach TS2: Treatment Swale #2



Reach TS3: Treatment Swale #3

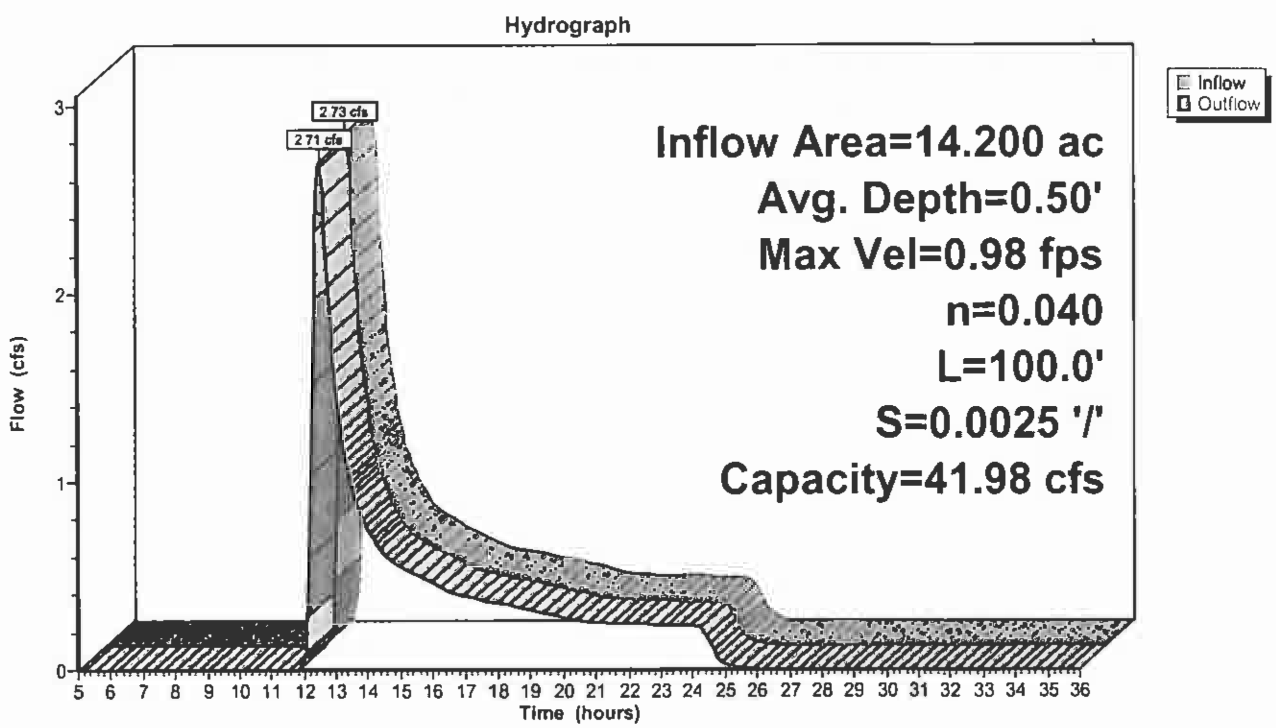
Inflow Area = 14.200 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 2.73 cfs @ 12.44 hrs, Volume= 0.533 af
Outflow = 2.71 cfs @ 12.49 hrs, Volume= 0.533 af, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.98 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 3.5 min

Peak Storage= 277 cf @ 12.46 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 41.98 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0025 '/'
Inlet Invert= 1,202.25', Outlet Invert= 1,202.00'

Reach TS3: Treatment Swale #3



Reach TS4: Treatment Swale #4

Inflow Area = 0.993 ac, Inflow Depth = 0.71" for 10-YR event
Inflow = 0.87 cfs @ 12.05 hrs, Volume= 0.059 af
Outflow = 0.80 cfs @ 12.13 hrs, Volume= 0.059 af, Atten= 8%, Lag= 4.4 min

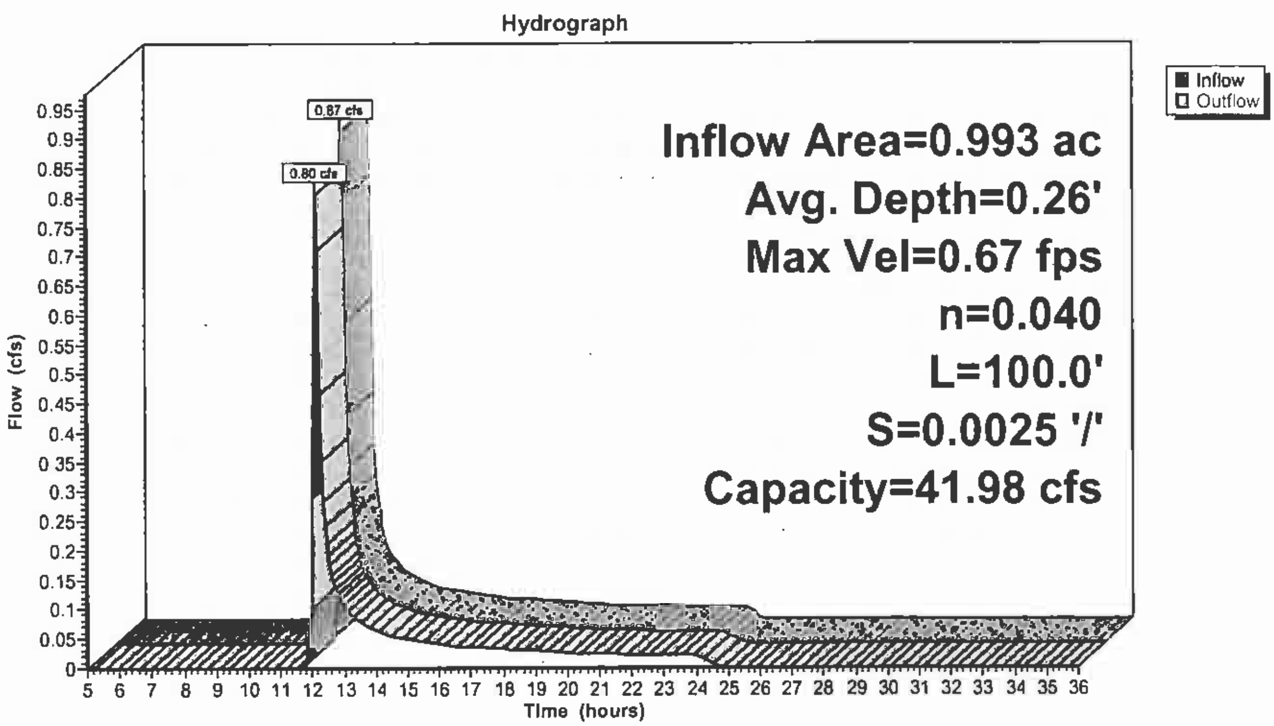
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.67 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 7.5 min

Peak Storage= 122 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 41.98 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0025 '/'
Inlet Invert= 1,194.25', Outlet Invert= 1,194.00'

‡

Reach TS4: Treatment Swale #4



Pond C 25: (new Pond)

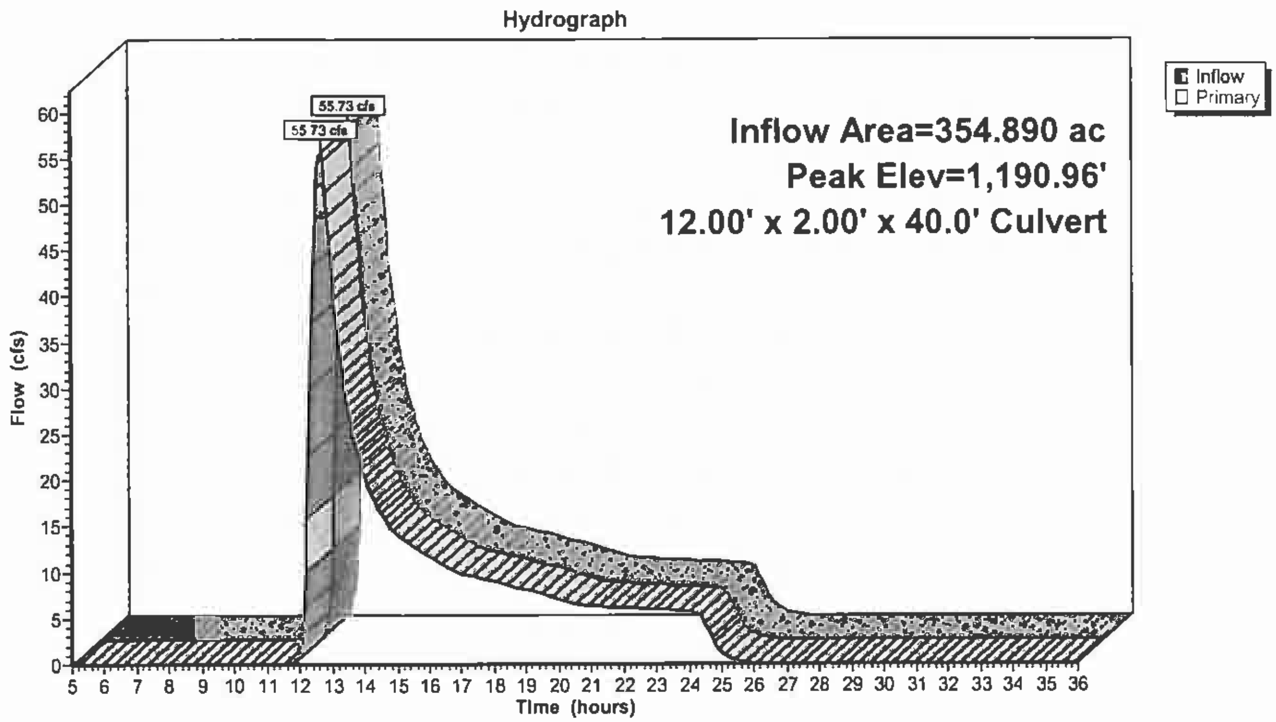
Inflow Area =	354.890 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	55.73 cfs @	12.64 hrs, Volume=	13.254 af	
Outflow =	55.73 cfs @	12.64 hrs, Volume=	13.254 af,	Atten= 0%, Lag= 0.0 min
Primary =	55.73 cfs @	12.64 hrs, Volume=	13.254 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,190.96' @ 12.64 hrs
Flood Elev= 1,196.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,189.50'	**12.00' W x 2.00' H x 40.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,188.80' S= 0.0175 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=55.66 cfs @ 12.64 hrs HW=1,190.95' (Free Discharge)
└─**1=Culvert** (Barrel Controls 55.66 cfs @ 4.25 fps)

Pond C 25: (new Pond)



Pond C 43: CV43

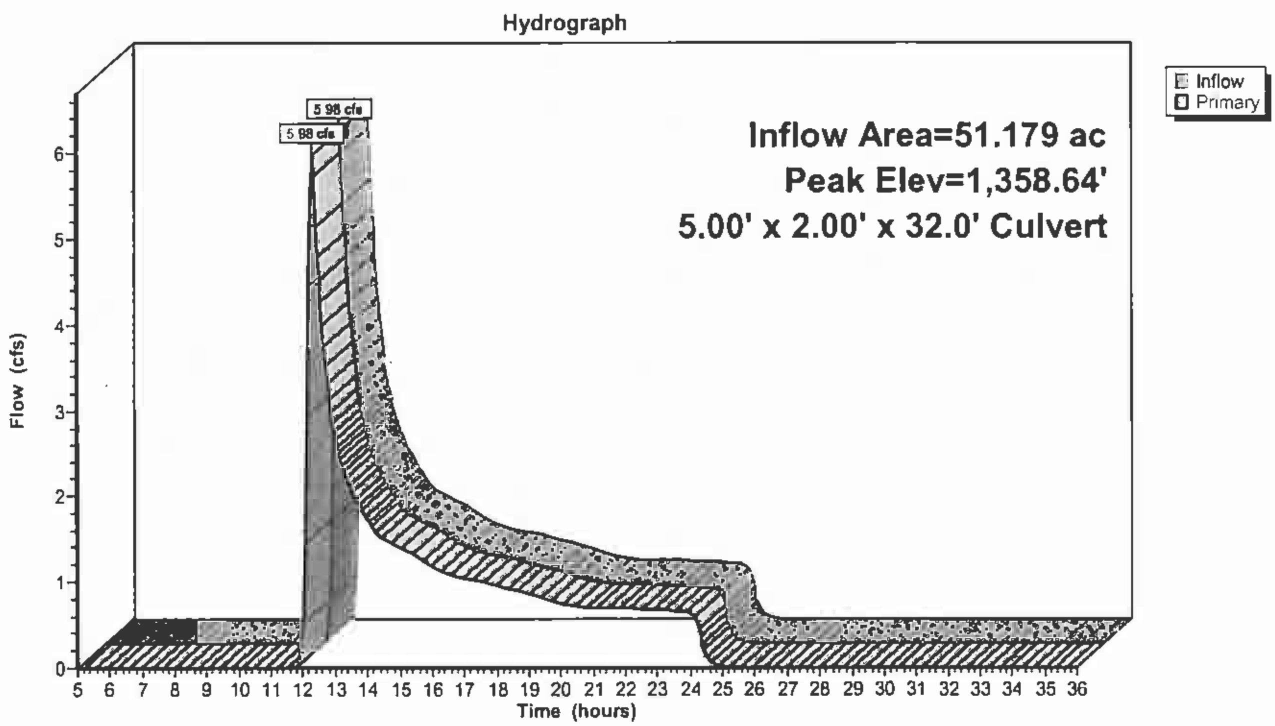
Inflow Area =	51.179 ac,	Inflow Depth = 0.30"	for 10-YR event	
Inflow =	5.98 cfs @	12.27 hrs, Volume=	1.294 af	
Outflow =	5.98 cfs @	12.27 hrs, Volume=	1.294 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.98 cfs @	12.27 hrs, Volume=	1.294 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,358.64' @ 12.27 hrs
Flood Elev= 1,362.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,358.00'	**5.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,357.50' S= 0.0156 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=5.92 cfs @ 12.27 hrs HW=1,358.63' (Free Discharge)
└─1=**Culvert** (Barrel Controls 5.92 cfs @ 2.50 fps)

Pond C 43: CV43



Pond c17: c17

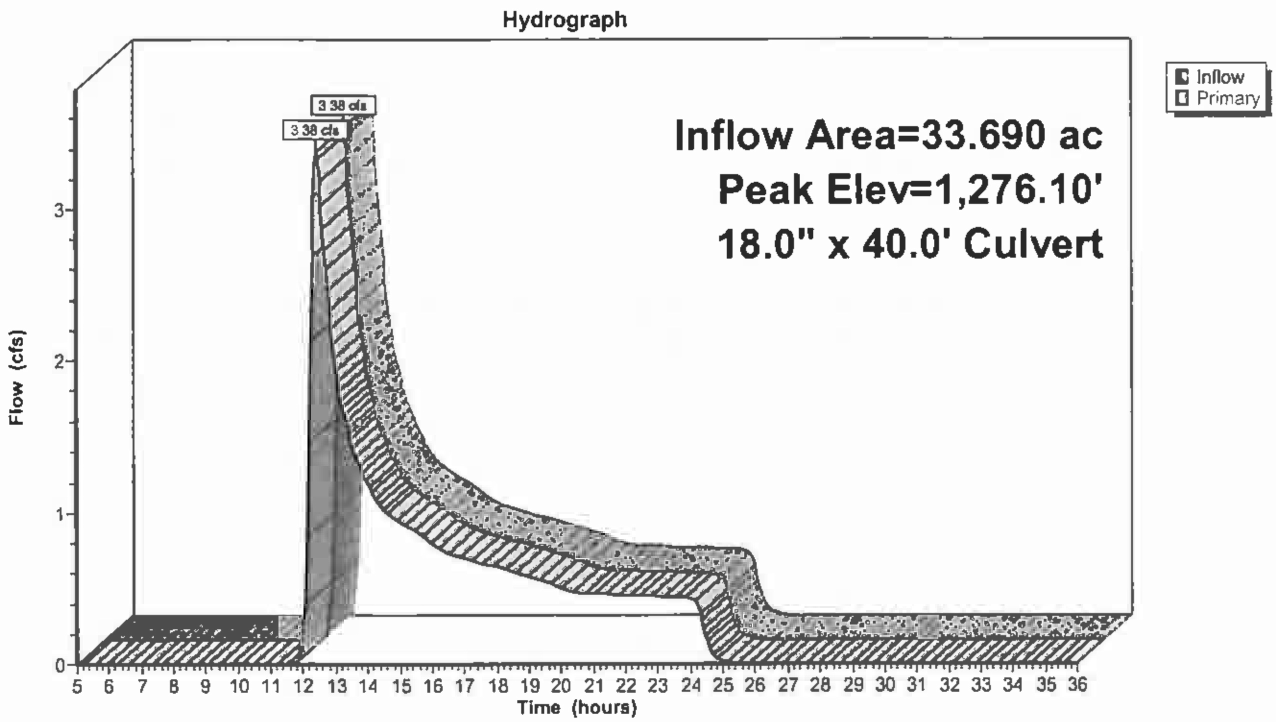
Inflow Area =	33.690 ac,	Inflow Depth = 0.30"	for 10-YR event	
Inflow =	3.38 cfs @	12.41 hrs, Volume=	0.852 af	
Outflow =	3.38 cfs @	12.41 hrs, Volume=	0.852 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.38 cfs @	12.41 hrs, Volume=	0.852 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,276.10' @ 12.41 hrs
Flood Elev= 1,278.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,275.10'	**18.0" x 40.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,274.70' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.37 cfs @ 12.41 hrs HW=1,276.10' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 3.37 cfs @ 2.69 fps)

Pond c17: c17



Pond CV 71: CV 71

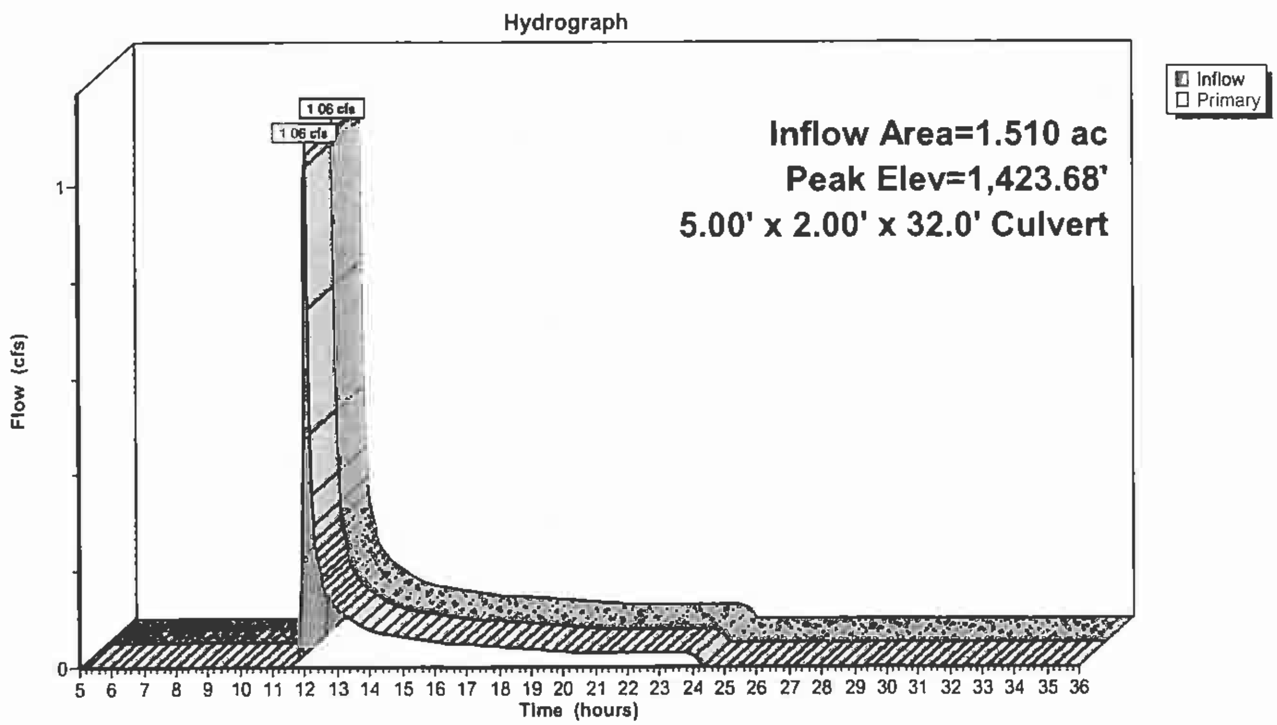
Inflow Area = 1.510 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.06 cfs @ 12.03 hrs, Volume= 0.072 af
Outflow = 1.06 cfs @ 12.03 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.03 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,423.68' @ 12.03 hrs
Flood Elev= 1,427.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,423.50'	**5.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,422.50' S= 0.0313 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=1.02 cfs @ 12.03 hrs HW=1,423.67' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.02 cfs @ 1.18 fps)

Pond CV 71: CV 71



Pond CV 72: CV 72

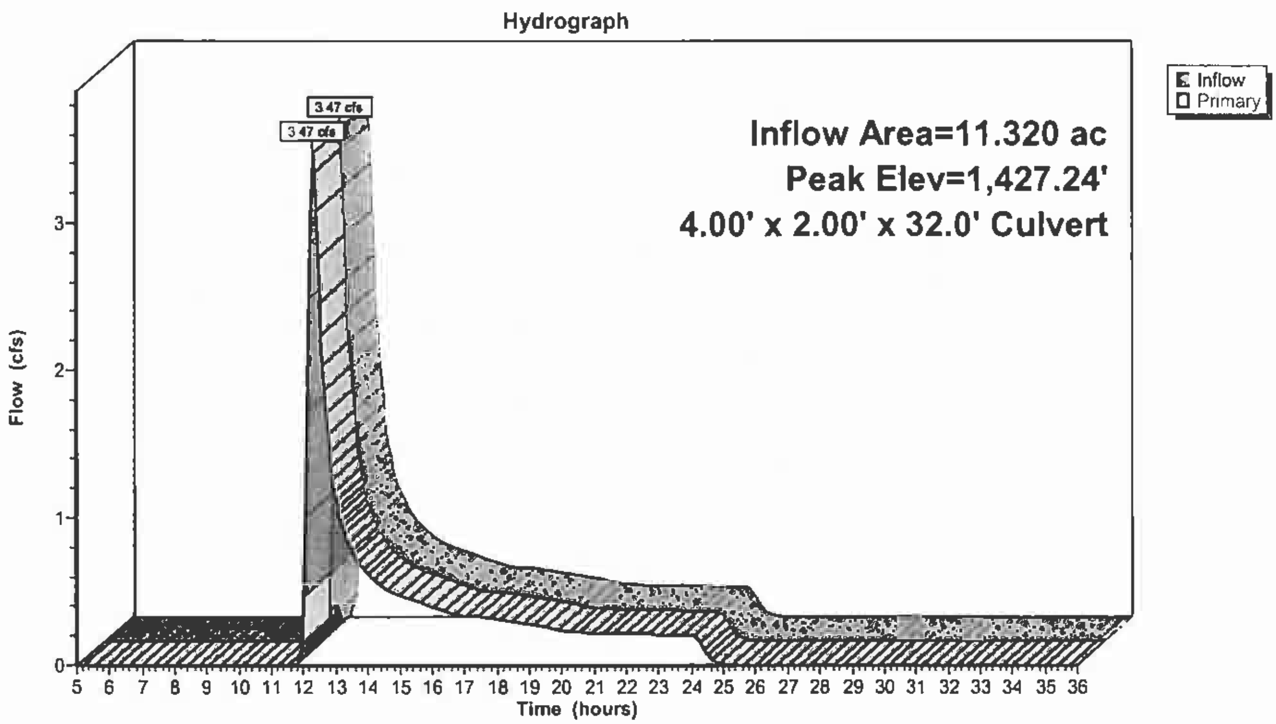
Inflow Area =	11.320 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	3.47 cfs @ 12.29 hrs, Volume=	0.502 af	
Outflow =	3.47 cfs @ 12.29 hrs, Volume=	0.502 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.47 cfs @ 12.29 hrs, Volume=	0.502 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,427.24' @ 12.29 hrs
Flood Elev= 1,430.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,426.60'	**4.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,426.40' S= 0.0062 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=3.46 cfs @ 12.29 hrs HW=1,427.24' (Free Discharge)
└─1=**Culvert** (Barrel Controls 3.46 cfs @ 1.81 fps)

Pond CV 72: CV 72



Pond CV 99: CV 99

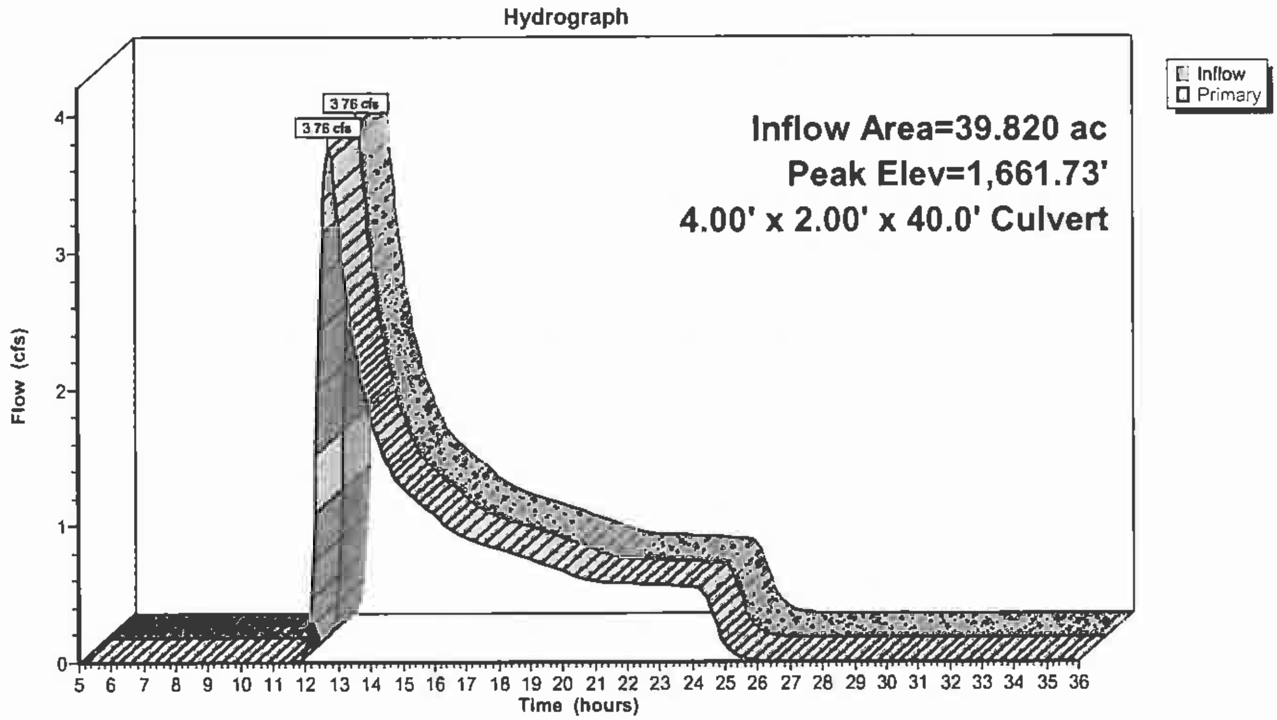
Inflow Area =	39.820 ac, Inflow Depth = 0.34"	for 10-YR event
Inflow =	3.76 cfs @ 12.73 hrs, Volume=	1.121 af
Outflow =	3.76 cfs @ 12.73 hrs, Volume=	1.121 af, Atten= 0%, Lag= 0.0 min
Primary =	3.76 cfs @ 12.73 hrs, Volume=	1.121 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,661.73' @ 12.73 hrs
Flood Elev= 1,665.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,661.25'	**4.00' W x 2.00' H x 40.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,658.00' S= 0.0813 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=3.75 cfs @ 12.73 hrs HW=1,661.73' (Free Discharge)
└─1=**Culvert** (Inlet Controls 3.75 cfs @ 1.96 fps)

Pond CV 99: CV 99



Pond CV102: Culvert 102

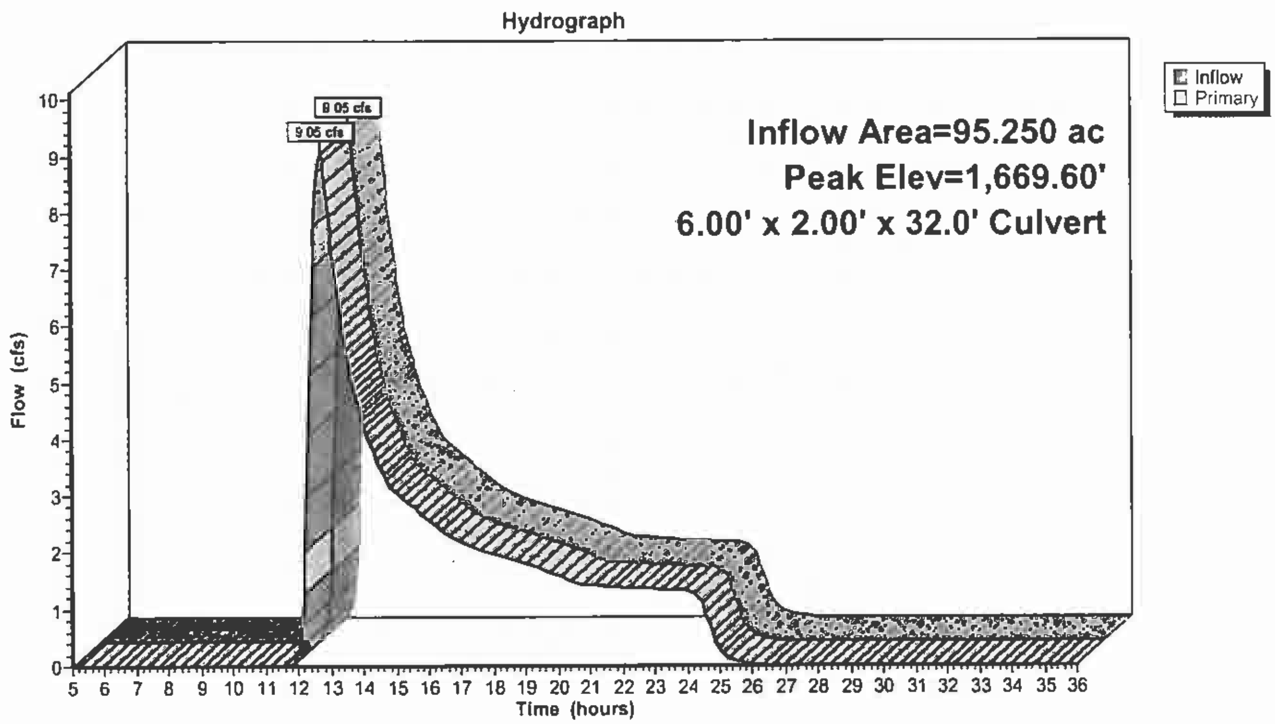
Inflow Area = 95.250 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 9.05 cfs @ 12.71 hrs, Volume= 2.682 af
Outflow = 9.05 cfs @ 12.71 hrs, Volume= 2.682 af, Atten= 0%, Lag= 0.0 min
Primary = 9.05 cfs @ 12.71 hrs, Volume= 2.682 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,669.60' @ 12.71 hrs
Flood Elev= 1,671.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,669.00'	**6.00' W x 2.00' H x 32.0' long Culvert** Box, headwall w/3 square edges, Ke= 0.500 Outlet Invert= 1,667.50' S= 0.0469 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=9.04 cfs @ 12.71 hrs HW=1,669.60' (Free Discharge)
└─1=**Culvert** (Inlet Controls 9.04 cfs @ 2.49 fps)

Pond CV102: Culvert 102



Pond CV117: CV117

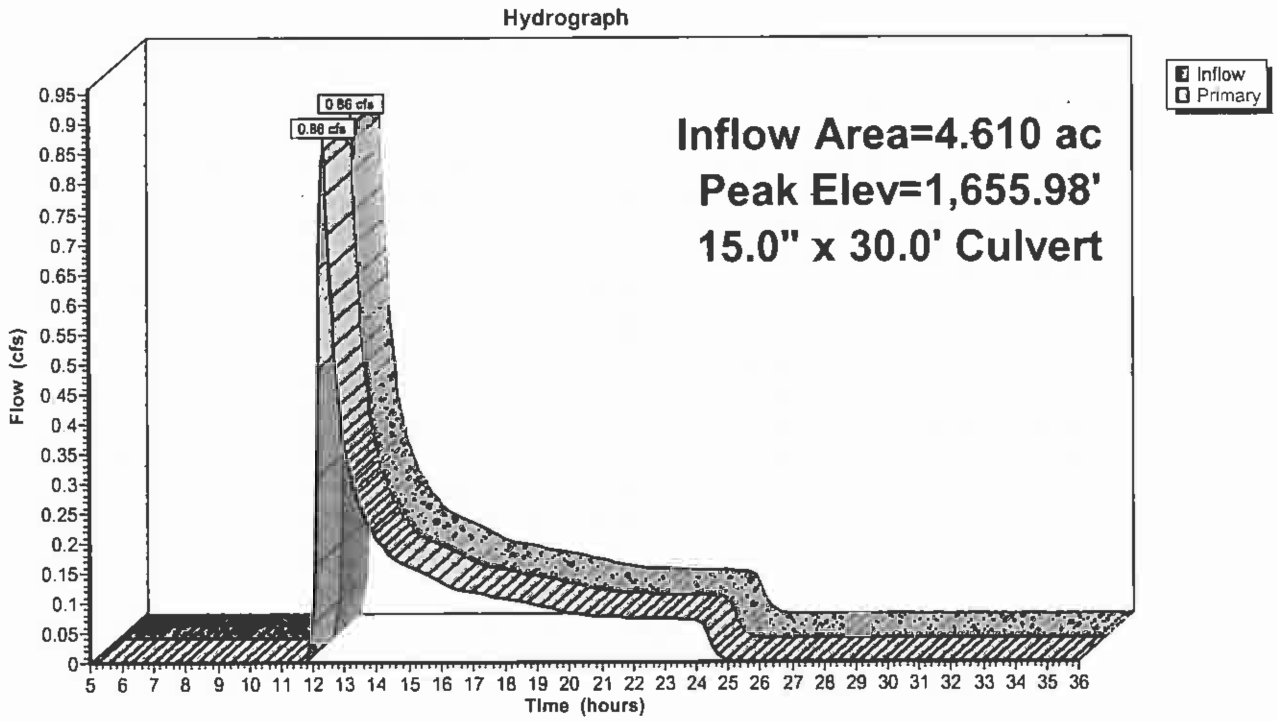
Inflow Area =	4.610 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	0.86 cfs @	12.34 hrs, Volume=	0.158 af	
Outflow =	0.86 cfs @	12.34 hrs, Volume=	0.158 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.86 cfs @	12.34 hrs, Volume=	0.158 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,655.98' @ 12.34 hrs
Flood Elev= 1,658.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,655.50'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,655.20' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.85 cfs @ 12.34 hrs HW=1,655.98' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.85 cfs @ 2.94 fps)

Pond CV117: CV117



Pond CV12: (new Pond)

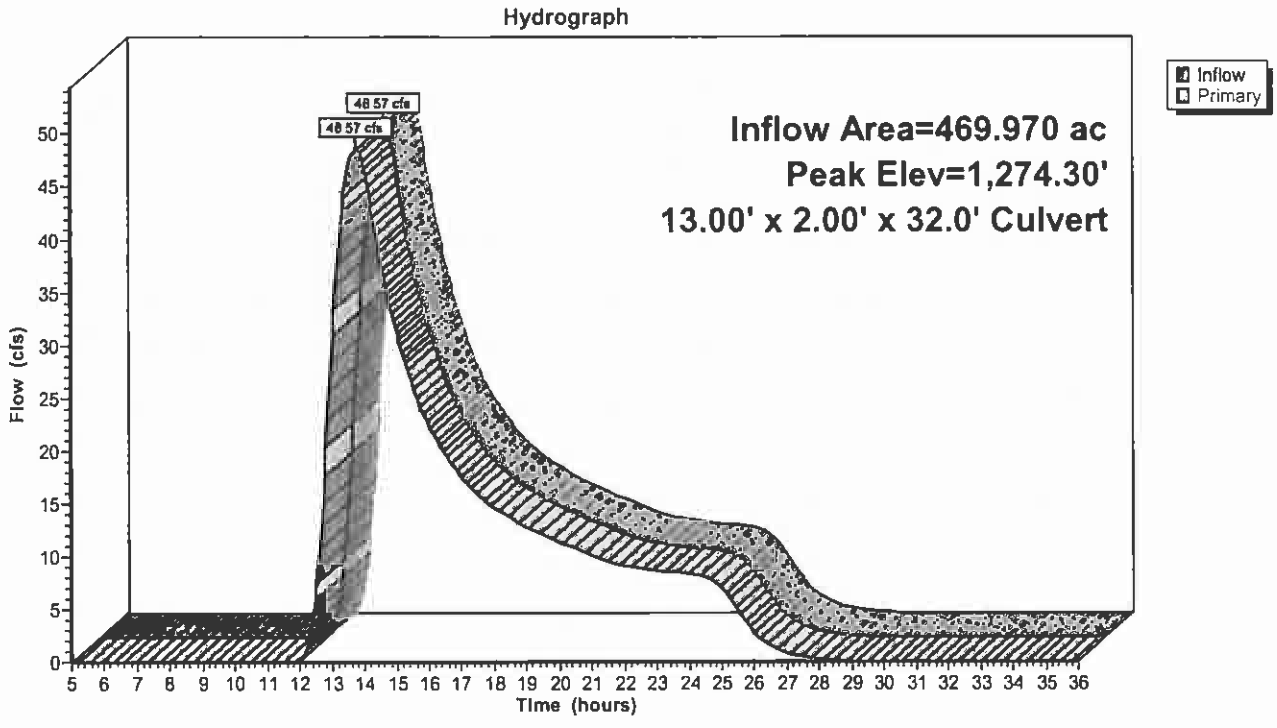
Inflow Area = 469.970 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 48.57 cfs @ 13.75 hrs, Volume= 19.212 af
Outflow = 48.57 cfs @ 13.75 hrs, Volume= 19.212 af, Atten= 0%, Lag= 0.0 min
Primary = 48.57 cfs @ 13.75 hrs, Volume= 19.212 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,274.30' @ 13.75 hrs
Flood Elev= 1,278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,273.10'	**13.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,271.10' S= 0.0625 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=48.56 cfs @ 13.75 hrs HW=1,274.30' (Free Discharge)
└─**1=Culvert** (Inlet Controls 48.56 cfs @ 3.11 fps)

Pond CV12: (new Pond)



Pond CV124: CV124

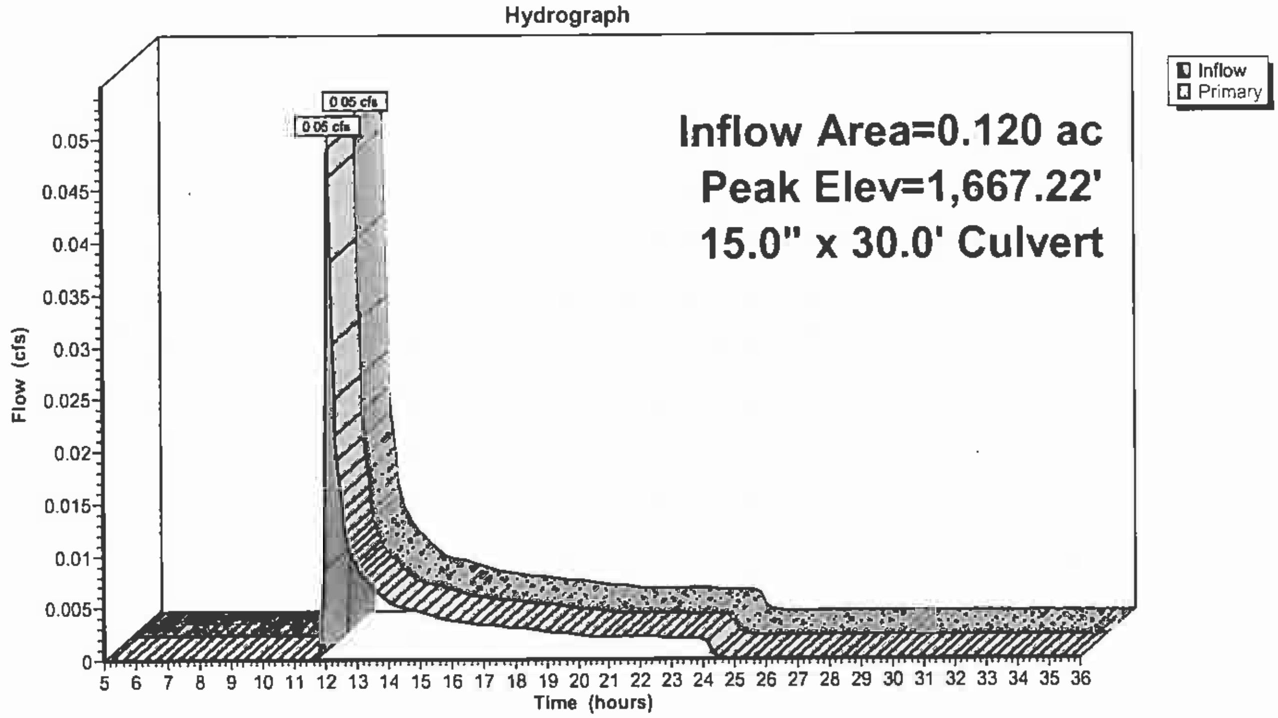
Inflow Area =	0.120 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	0.05 cfs @ 12.11 hrs, Volume=	0.005 af	
Outflow =	0.05 cfs @ 12.11 hrs, Volume=	0.005 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.05 cfs @ 12.11 hrs, Volume=	0.005 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,667.22' @ 12.11 hrs
Flood Elev= 1,670.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,667.10'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,666.85' S= 0.0083 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.05 cfs @ 12.11 hrs HW=1,667.21' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 0.05 cfs @ 1.28 fps)

Pond CV124: CV124



Pond CV126: CV126

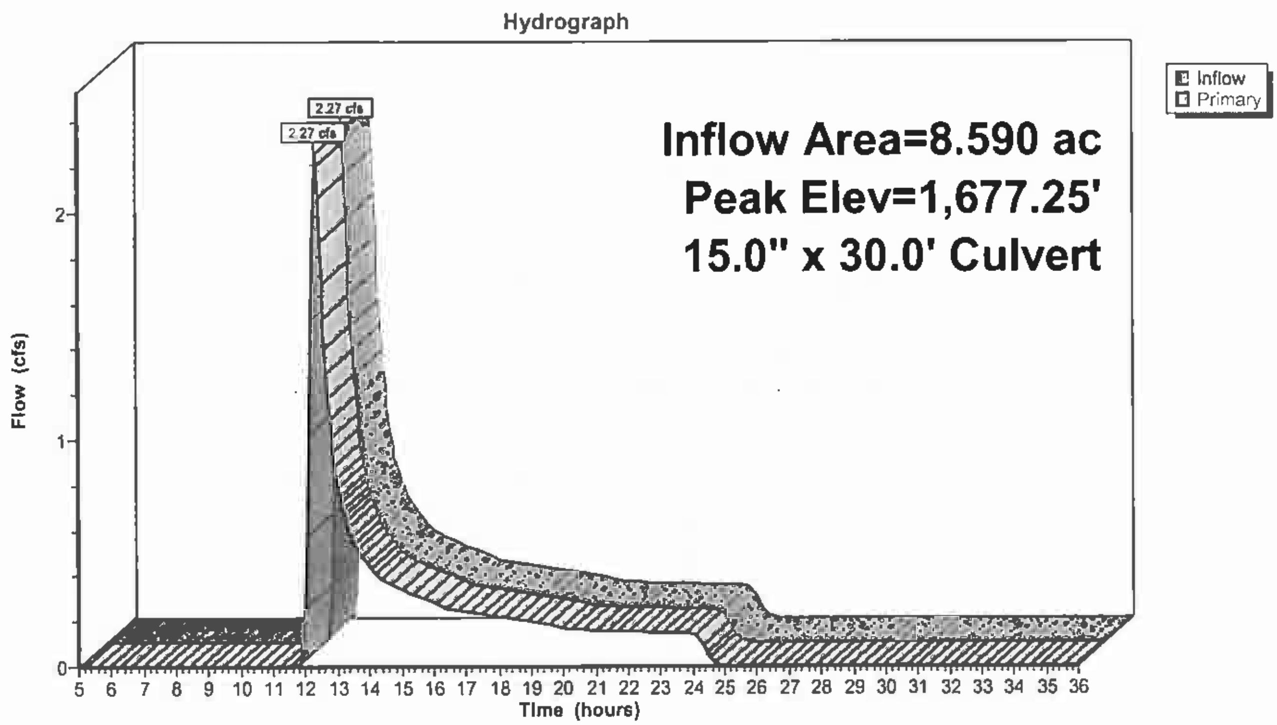
Inflow Area =	8.590 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	2.27 cfs @ 12.31 hrs, Volume=	0.351 af	
Outflow =	2.27 cfs @ 12.31 hrs, Volume=	0.351 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.27 cfs @ 12.31 hrs, Volume=	0.351 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,677.25' @ 12.31 hrs
Flood Elev= 1,679.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,676.50'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,675.50' S= 0.0333 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.26 cfs @ 12.31 hrs HW=1,677.25' (Free Discharge)
└─1=**Culvert** (Inlet Controls 2.26 cfs @ 2.95 fps)

Pond CV126: CV126



Pond CV128: CV128

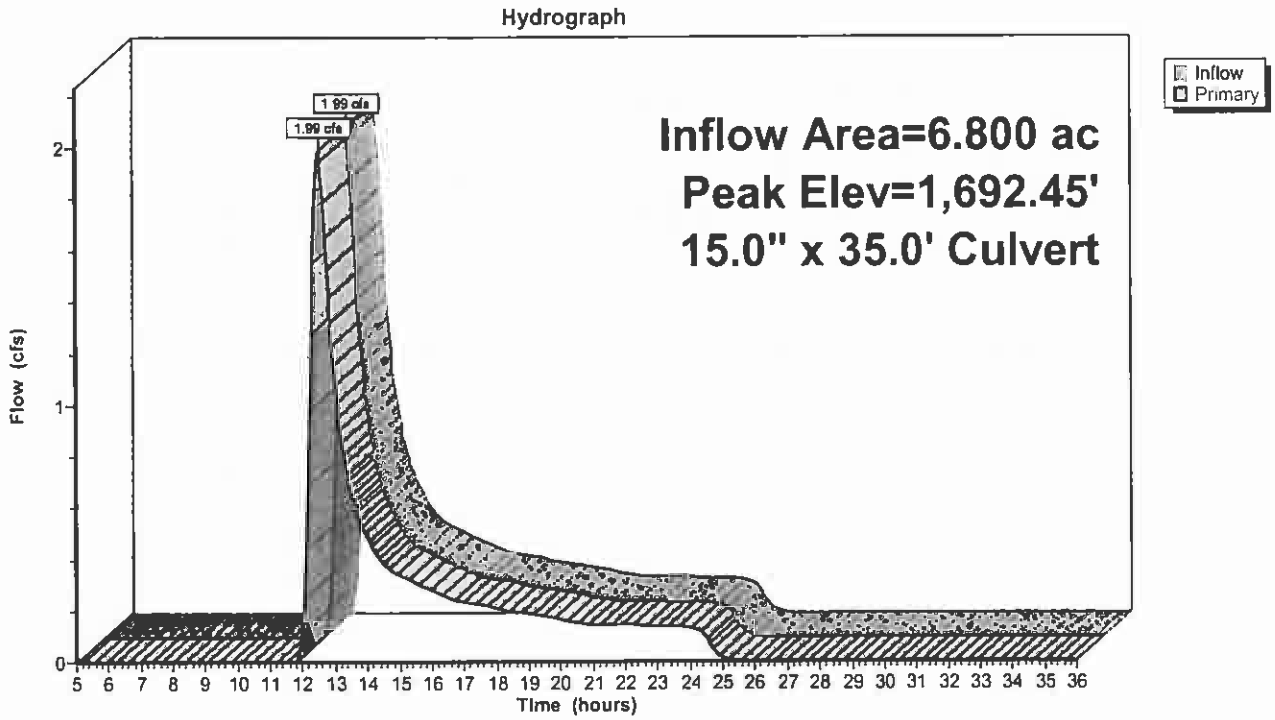
Inflow Area =	6.800 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	1.99 cfs @ 12.49 hrs, Volume=	0.351 af	
Outflow =	1.99 cfs @ 12.49 hrs, Volume=	0.351 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.99 cfs @ 12.49 hrs, Volume=	0.351 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,692.45' @ 12.49 hrs
Flood Elev= 1,695.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,691.75'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,691.00' S= 0.0214 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.99 cfs @ 12.49 hrs HW=1,692.45' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.99 cfs @ 2.84 fps)

Pond CV128: CV128



Pond CV130: CV130

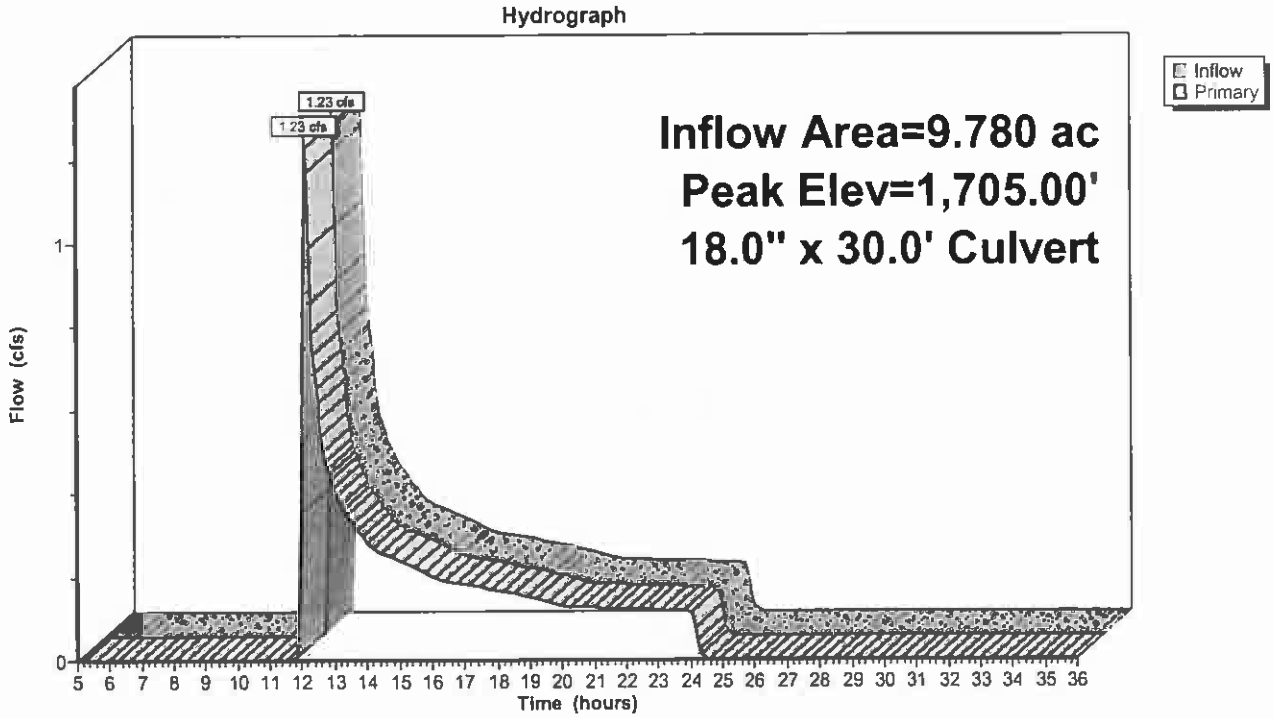
Inflow Area = 9.780 ac, Inflow Depth = 0.27" for 10-YR event
Inflow = 1.23 cfs @ 12.12 hrs, Volume= 0.220 af
Outflow = 1.23 cfs @ 12.12 hrs, Volume= 0.220 af, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.12 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,705.00' @ 12.12 hrs
Flood Elev= 1,707.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,704.50'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,703.50' S= 0.0333 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.19 cfs @ 12.12 hrs HW=1,704.99' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 1.19 cfs @ 2.38 fps)

Pond CV130: CV130



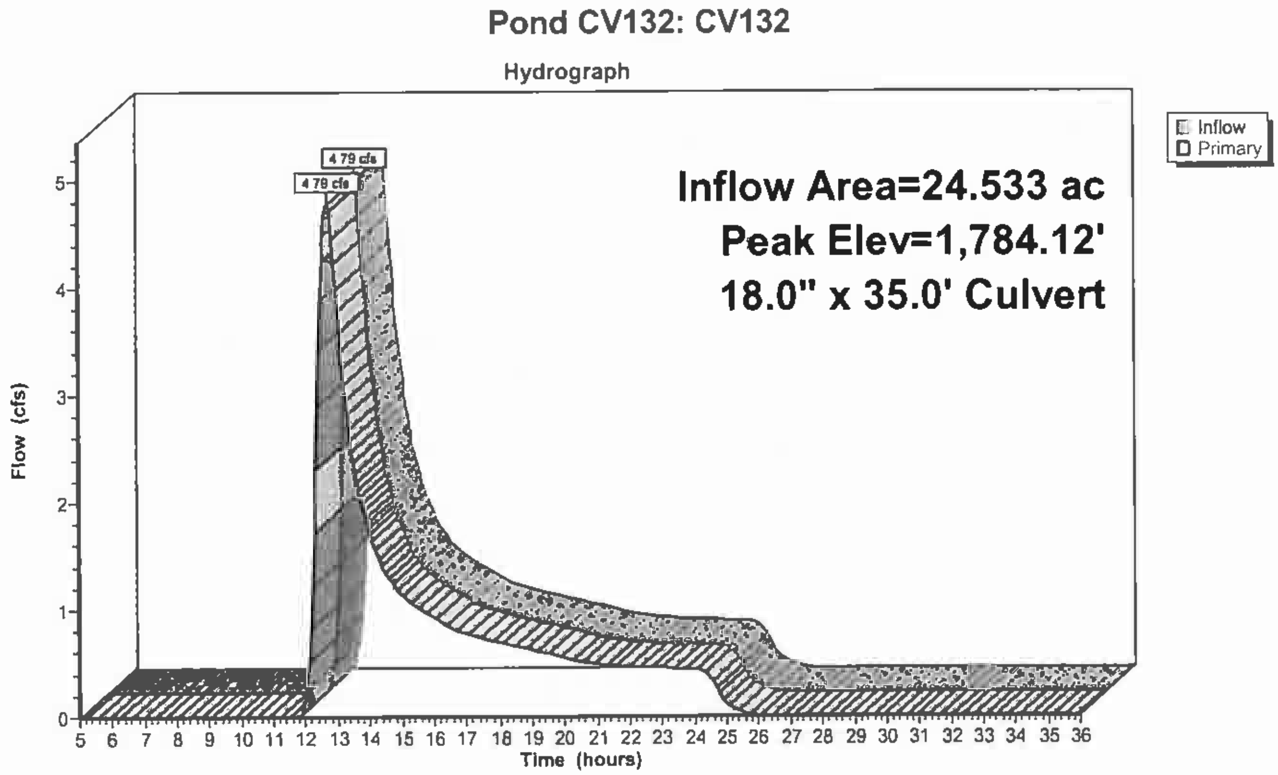
Pond CV132: CV132

Inflow Area =	24.533 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	4.79 cfs @ 12.68 hrs, Volume=	1.088 af	
Outflow =	4.79 cfs @ 12.68 hrs, Volume=	1.088 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.79 cfs @ 12.68 hrs, Volume=	1.088 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,784.12' @ 12.68 hrs
Flood Elev= 1,787.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,783.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,782.50' S= 0.0143 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.78 cfs @ 12.68 hrs HW=1,784.12' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 4.78 cfs @ 4.70 fps)



Pond CV134: CV134

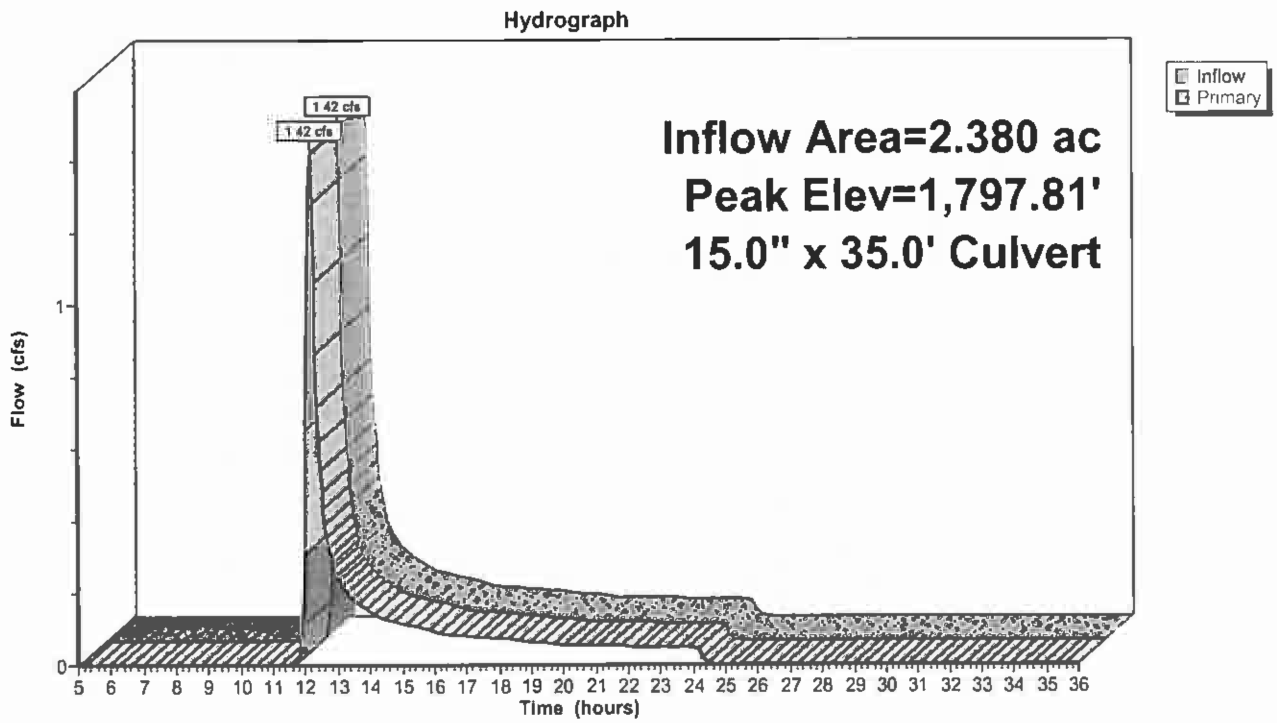
Inflow Area =	2.380 ac, Inflow Depth = 0.67"	for 10-YR event	
Inflow =	1.42 cfs @ 12.14 hrs, Volume=	0.132 af	
Outflow =	1.42 cfs @ 12.14 hrs, Volume=	0.132 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.42 cfs @ 12.14 hrs, Volume=	0.132 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,797.81' @ 12.14 hrs
Flood Elev= 1,800.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,797.20'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,796.80' S= 0.0114 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.41 cfs @ 12.14 hrs HW=1,797.81' (Free Discharge)
└1=**Culvert** (Barrel Controls 1.41 cfs @ 3.47 fps)

Pond CV134: CV134



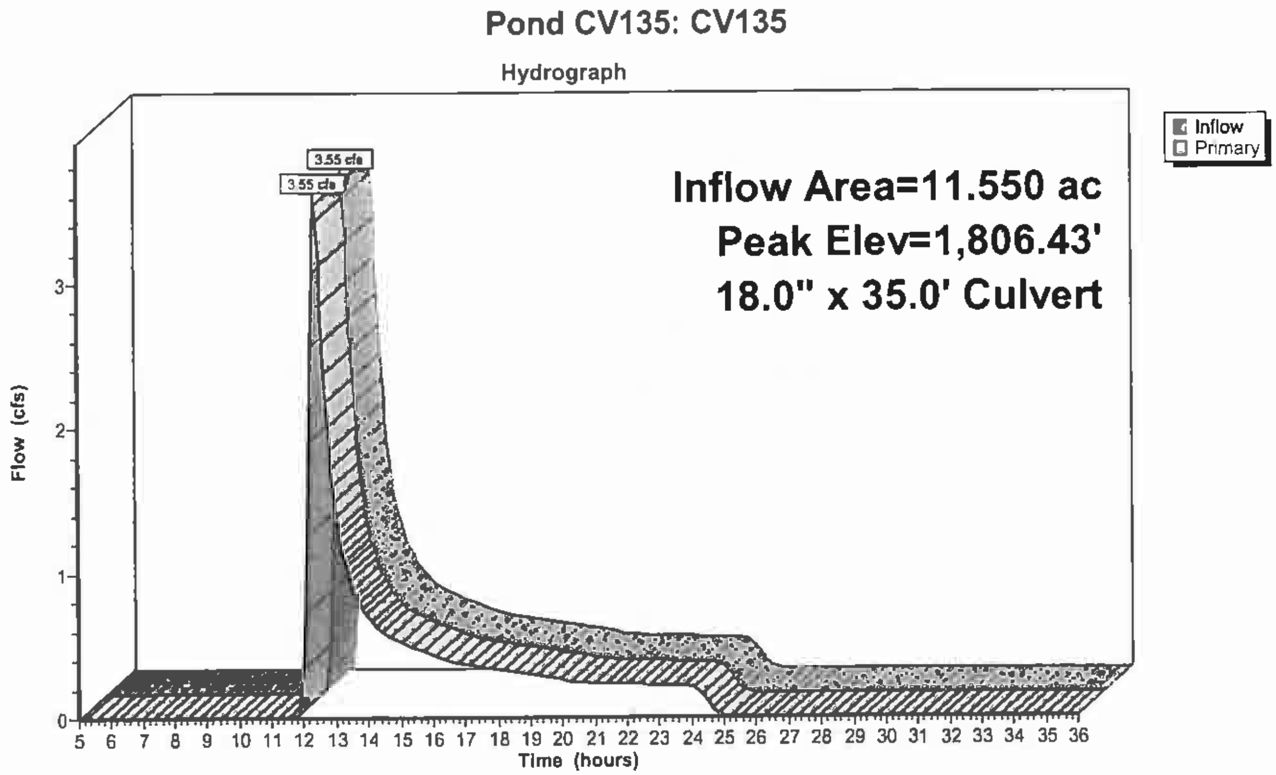
Pond CV135: CV135

Inflow Area =	11.550 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	3.55 cfs @	12.37 hrs, Volume=	0.554 af	
Outflow =	3.55 cfs @	12.37 hrs, Volume=	0.554 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.55 cfs @	12.37 hrs, Volume=	0.554 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,806.43' @ 12.37 hrs
Flood Elev= 1,808.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,805.50'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,805.00' S= 0.0143 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.53 cfs @ 12.37 hrs HW=1,806.42' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.53 cfs @ 4.42 fps)



Pond CV136: CV136

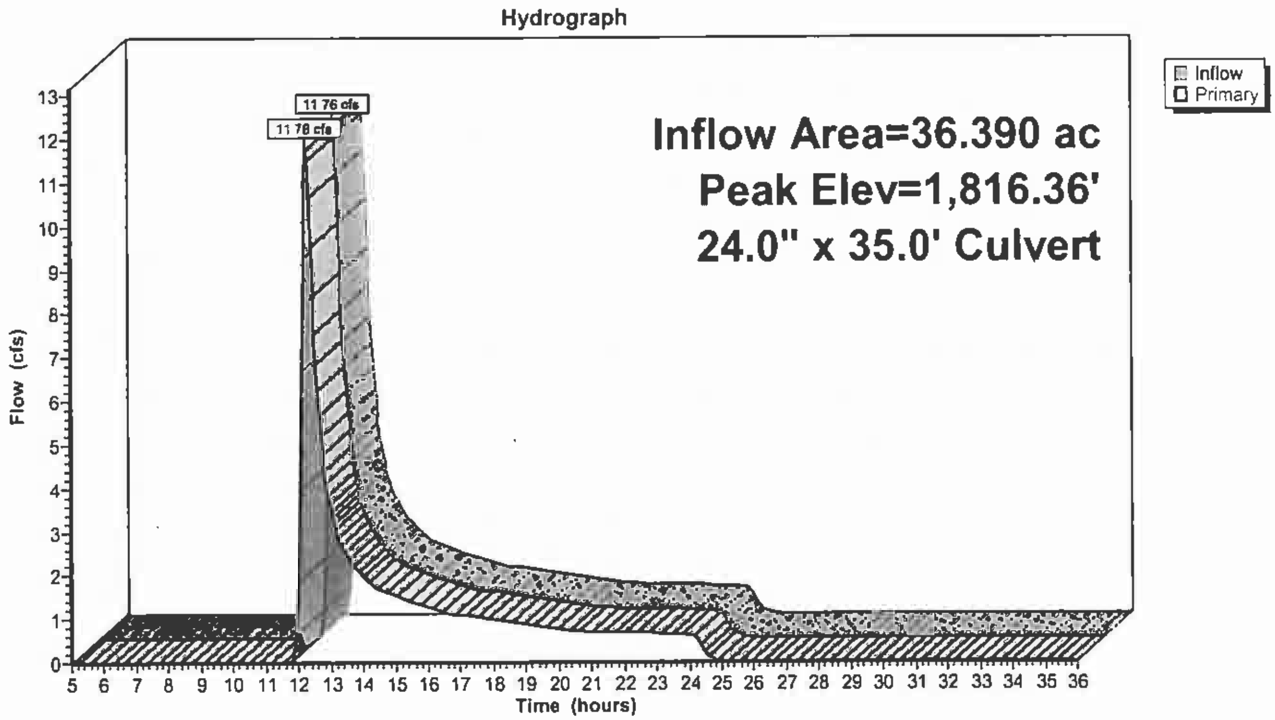
Inflow Area = 36.390 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 11.76 cfs @ 12.26 hrs, Volume= 1.614 af
Outflow = 11.76 cfs @ 12.26 hrs, Volume= 1.614 af, Atten= 0%, Lag= 0.0 min
Primary = 11.76 cfs @ 12.26 hrs, Volume= 1.614 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,816.36' @ 12.26 hrs
Flood Elev= 1,818.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,814.75'	**24.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,813.18' S= 0.0449 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=11.67 cfs @ 12.26 hrs HW=1,816.36' (Free Discharge)
↳1=**Culvert** (Inlet Controls 11.67 cfs @ 4.32 fps)

Pond CV136: CV136



Pond CV137: Culvert 137

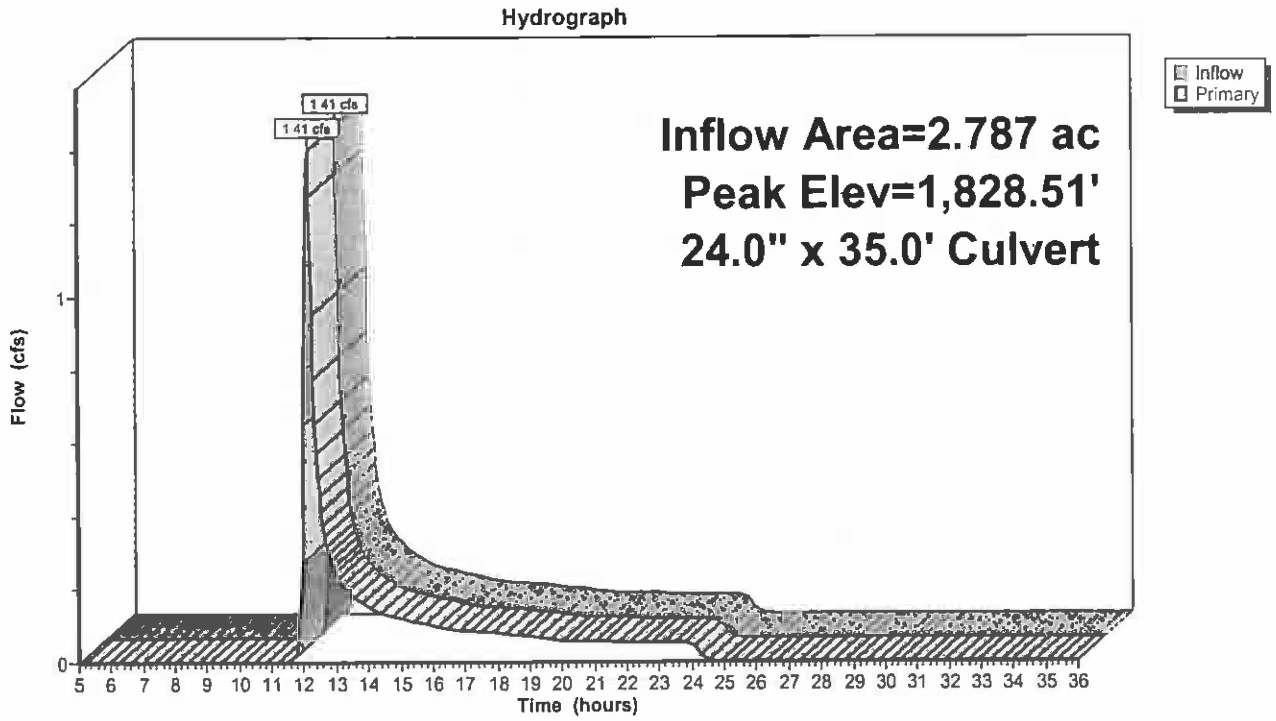
Inflow Area =	2.787 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	1.41 cfs @ 12.12 hrs, Volume=	0.134 af	
Outflow =	1.41 cfs @ 12.12 hrs, Volume=	0.134 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.41 cfs @ 12.12 hrs, Volume=	0.134 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,828.51' @ 12.12 hrs
Flood Elev= 1,831.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,828.00'	**24.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,827.60' S= 0.0114 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.37 cfs @ 12.12 hrs HW=1,828.51' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.37 cfs @ 3.29 fps)

Pond CV137: Culvert 137



Pond CV138: Culvert 138

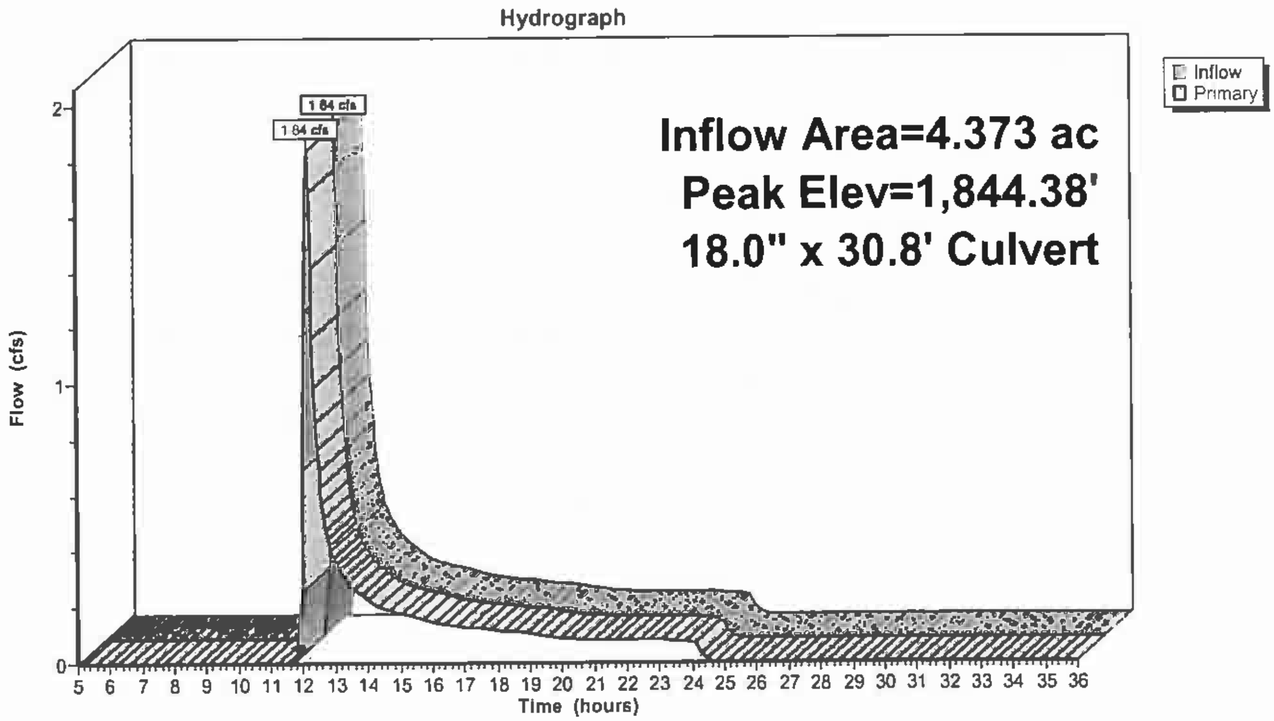
Inflow Area =	4.373 ac,	Inflow Depth = 0.53"	for 10-YR event
Inflow =	1.84 cfs @ 12.15 hrs,	Volume=	0.194 af
Outflow =	1.84 cfs @ 12.15 hrs,	Volume=	0.194 af, Atten= 0%, Lag= 0.0 min
Primary =	1.84 cfs @ 12.15 hrs,	Volume=	0.194 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,844.38' @ 12.15 hrs
Flood Elev= 1,845.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,843.76'	**18.0" x 30.8' long Culvert** CMP, square edge headwall, Ke= 0.500 Outlet Invert= 1,842.74' S= 0.0331 '/' Cc= 0.900 n= 0.024

Primary **OutFlow** Max=1.83 cfs @ 12.15 hrs HW=1,844.38' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.83 cfs @ 2.68 fps)

Pond CV138: Culvert 138



Pond CV139: CV139

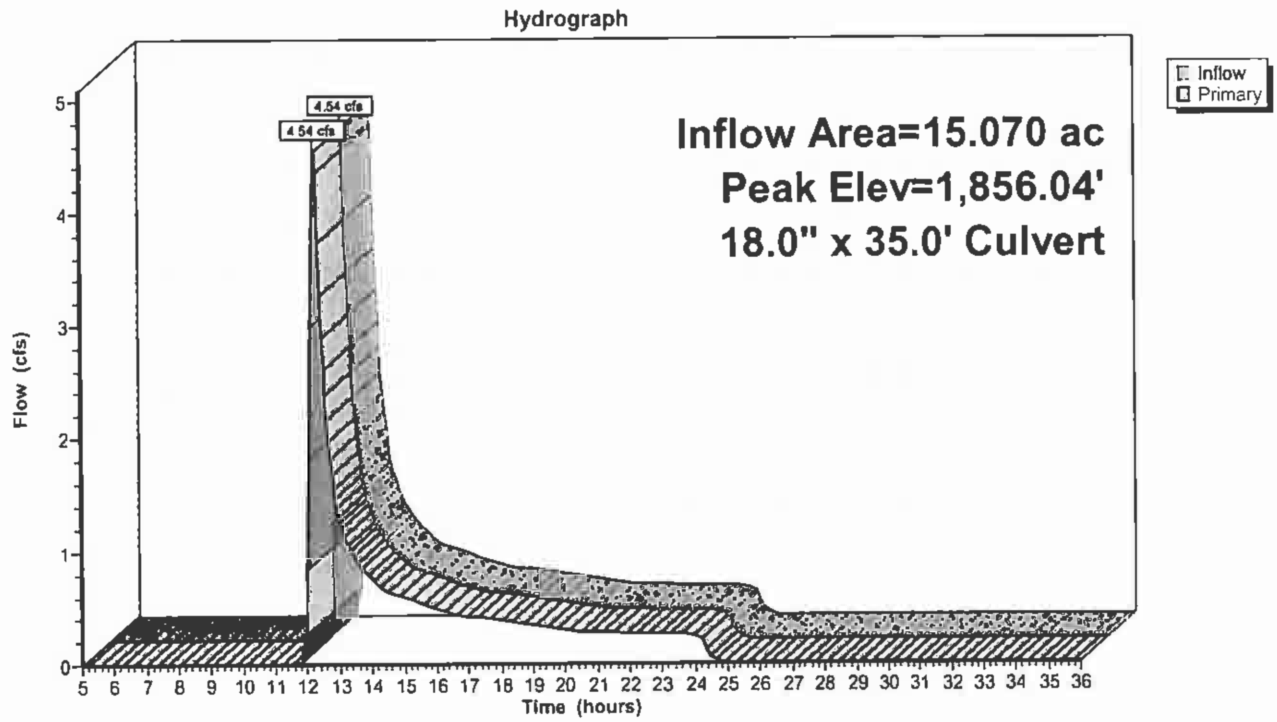
Inflow Area =	15.070 ac, Inflow Depth = 0.49"	for 10-YR event		
Inflow =	4.54 cfs @	12.23 hrs, Volume=	0.616 af	
Outflow =	4.54 cfs @	12.23 hrs, Volume=	0.616 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.54 cfs @	12.23 hrs, Volume=	0.616 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,856.04' @ 12.23 hrs
Flood Elev= 1,858.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,855.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,854.00' S= 0.0286 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.50 cfs @ 12.23 hrs HW=1,856.03' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 4.50 cfs @ 3.46 fps)

Pond CV139: CV139



Pond CV141: CV141

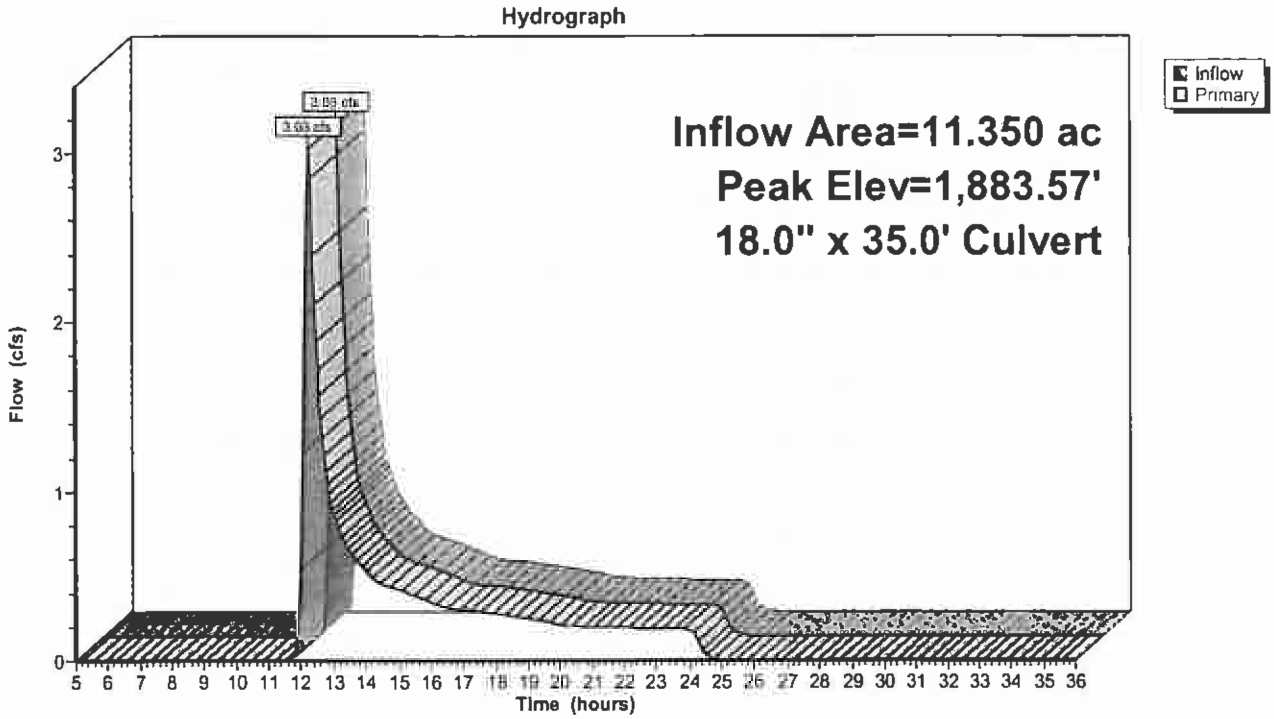
Inflow Area =	11.350 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	3.03 cfs @	12.22 hrs, Volume=	0.426 af	
Outflow =	3.03 cfs @	12.22 hrs, Volume=	0.426 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.03 cfs @	12.22 hrs, Volume=	0.426 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,883.57' @ 12.22 hrs
Flood Elev= 1,886.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,882.75'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,881.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.99 cfs @ 12.22 hrs HW=1,883.56' (Free Discharge)
└─1=**Culvert** (Inlet Controls 2.99 cfs @ 3.07 fps)

Pond CV141: CV141



Pond CV2: CV2

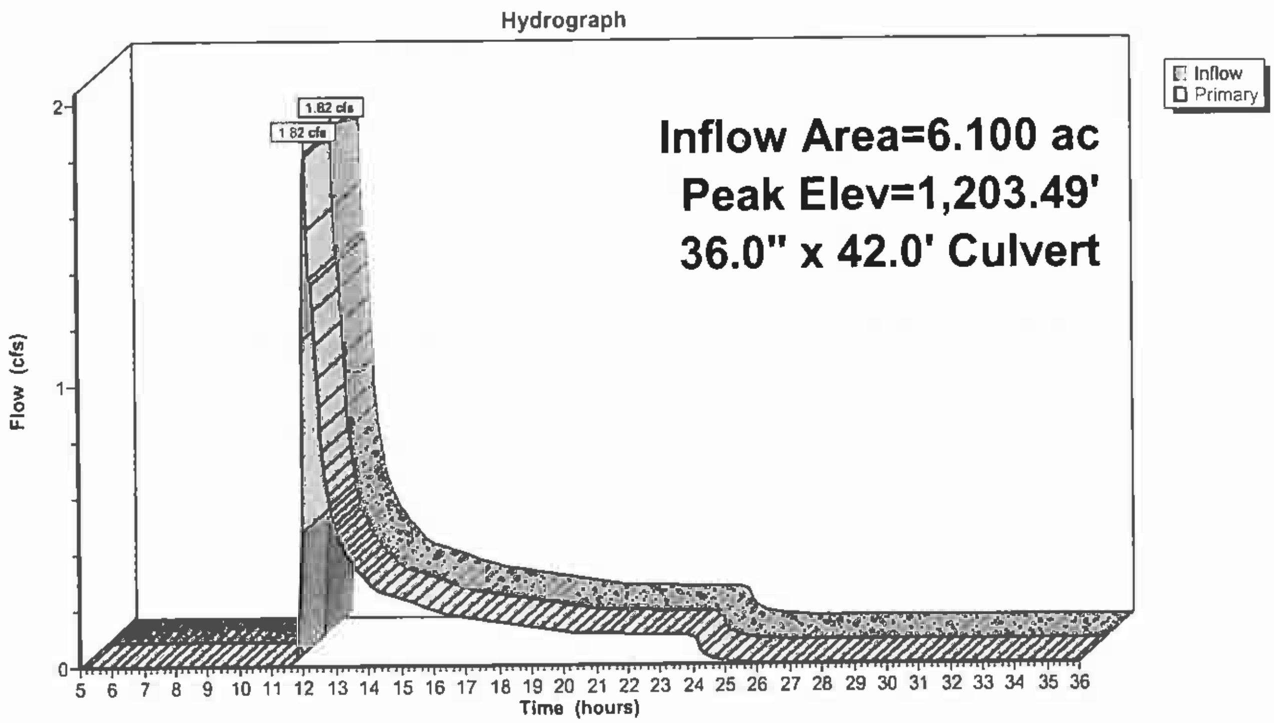
Inflow Area = 6.100 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 1.82 cfs @ 12.09 hrs, Volume= 0.249 af
Outflow = 1.82 cfs @ 12.09 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.09 hrs, Volume= 0.249 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,203.49' @ 12.09 hrs
Flood Elev= 1,206.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,203.00'	**36.0" x 42.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,201.00' S= 0.0476 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.79 cfs @ 12.09 hrs HW=1,203.49' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.79 cfs @ 2.38 fps)

Pond CV2: CV2



Pond CV23: (new Pond)

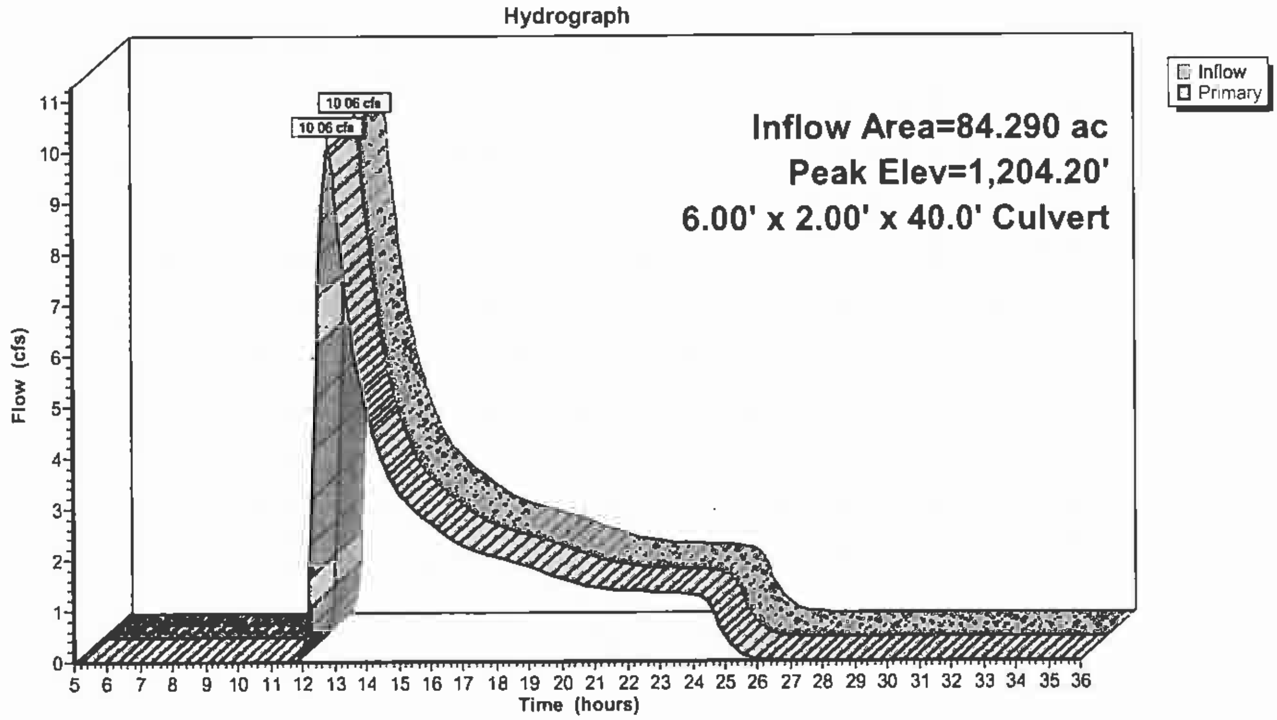
Inflow Area =	84.290 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	10.06 cfs @ 12.84 hrs, Volume=	2.889 af	
Outflow =	10.06 cfs @ 12.84 hrs, Volume=	2.889 af,	Atten= 0%, Lag= 0.0 min
Primary =	10.06 cfs @ 12.84 hrs, Volume=	2.889 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,204.20' @ 12.84 hrs
Flood Elev= 1,207.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,203.50'	**6.00' W x 2.00' H x 40.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,201.48' S= 0.0505 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=10.05 cfs @ 12.84 hrs HW=1,204.20' (Free Discharge)
1=Culvert (Inlet Controls 10.05 cfs @ 2.38 fps)

Pond CV23: (new Pond)



Pond CV2A: CV2A

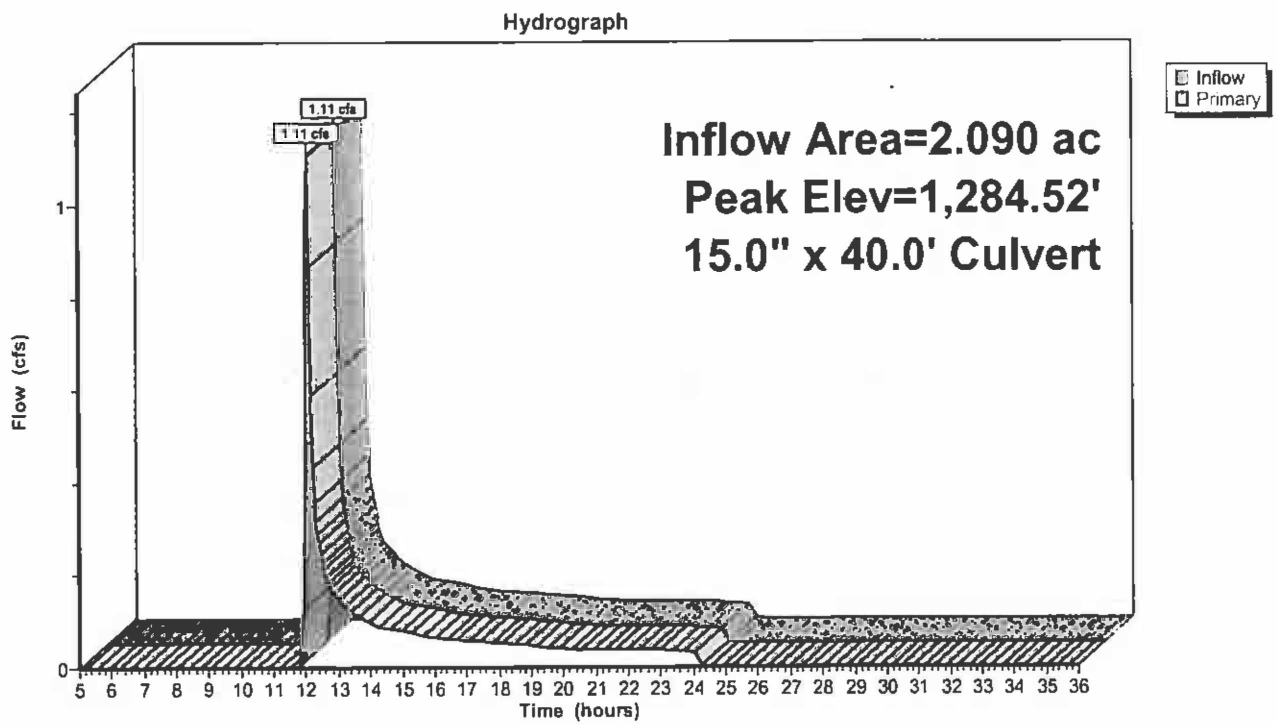
Inflow Area =	2.090 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	1.11 cfs @ 12.04 hrs, Volume=	0.085 af	
Outflow =	1.11 cfs @ 12.04 hrs, Volume=	0.085 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.11 cfs @ 12.04 hrs, Volume=	0.085 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,284.52' @ 12.04 hrs
Flood Elev= 1,287.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,284.00'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,283.50' S= 0.0125 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.09 cfs @ 12.04 hrs HW=1,284.51' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 1.09 cfs @ 3.40 fps)

Pond CV2A: CV2A



Pond CV3: CV3

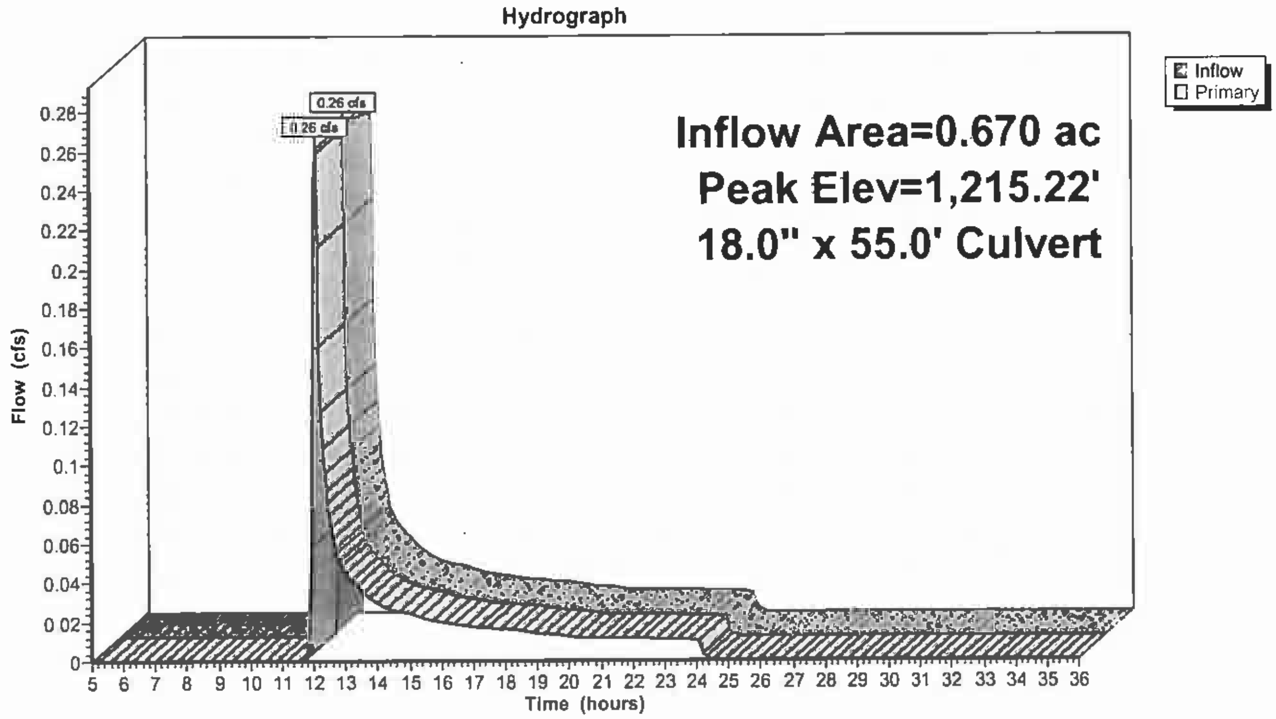
Inflow Area = 0.670 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.26 cfs @ 12.09 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.09 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,215.22' @ 12.09 hrs
Flood Elev= 1,218.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,215.00'	**18.0" x 55.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,213.75' S= 0.0227 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.25 cfs @ 12.09 hrs HW=1,215.22' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.25 cfs @ 1.59 fps)

Pond CV3: CV3



Pond CV32: CV32

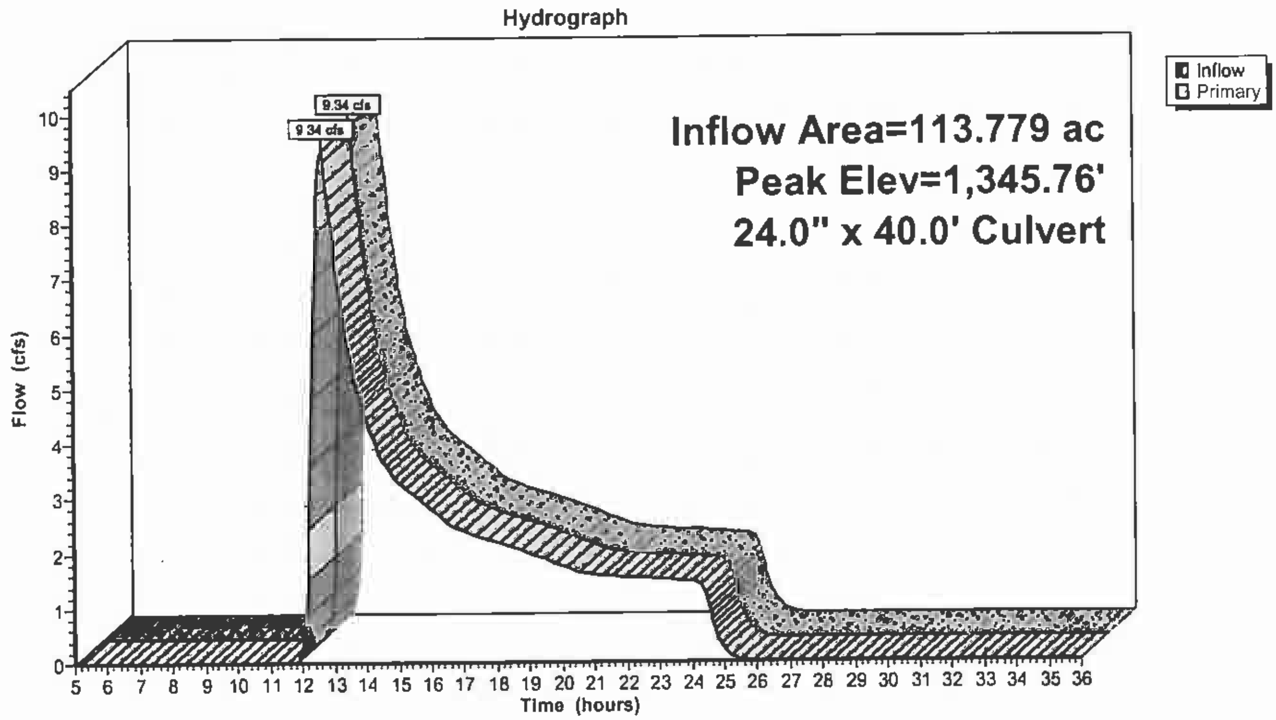
Inflow Area =	113.779 ac, Inflow Depth = 0.30"	for 10-YR event	
Inflow =	9.34 cfs @ 12.66 hrs, Volume=	2.876 af	
Outflow =	9.34 cfs @ 12.66 hrs, Volume=	2.876 af,	Atten= 0%, Lag= 0.0 min
Primary =	9.34 cfs @ 12.66 hrs, Volume=	2.876 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,345.76' @ 12.66 hrs
Flood Elev= 1,347.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,343.95'	**24.0" x 40.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,342.90' S= 0.0262 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=9.34 cfs @ 12.66 hrs HW=1,345.76' (Free Discharge)
└─1=**Culvert** (Barrel Controls 9.34 cfs @ 4.11 fps)

Pond CV32: CV32



Pond CV33: CV33

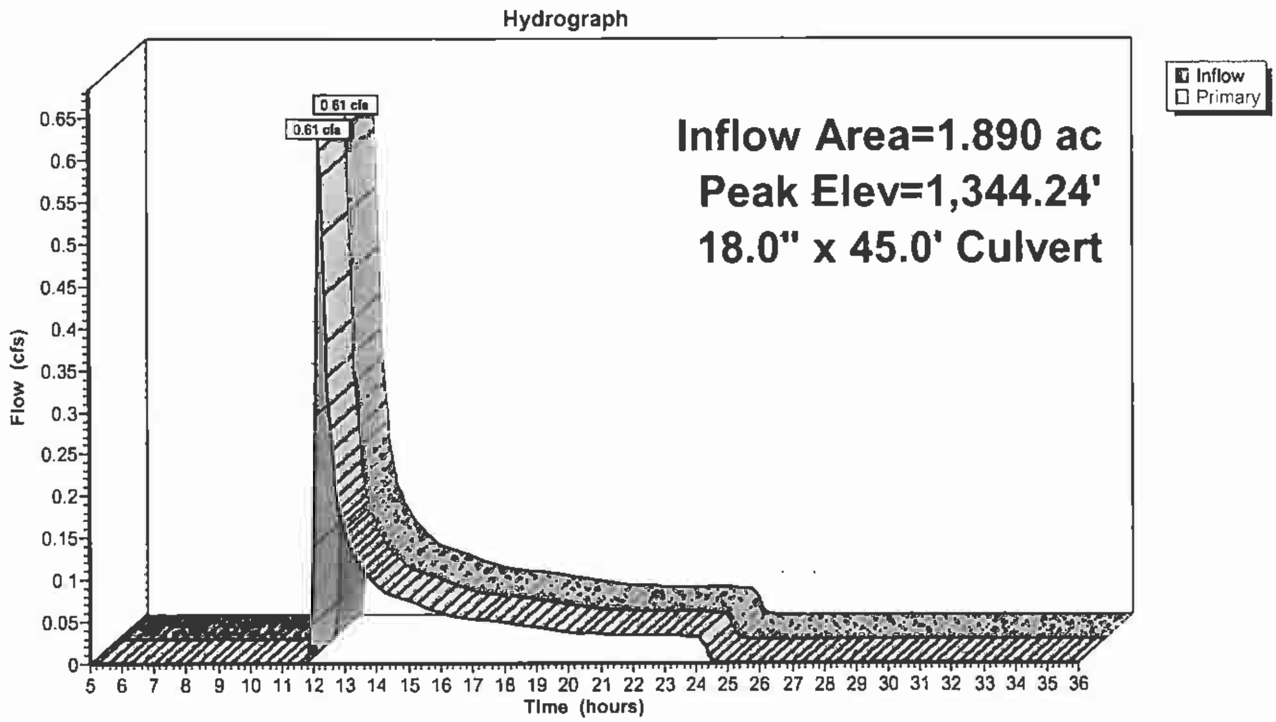
Inflow Area =	1.890 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	0.61 cfs @	12.20 hrs,	Volume=	0.077 af
Outflow =	0.61 cfs @	12.20 hrs,	Volume=	0.077 af, Atten= 0%, Lag= 0.0 min
Primary =	0.61 cfs @	12.20 hrs,	Volume=	0.077 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,344.24' @ 12.20 hrs
Flood Elev= 1,347.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,343.90'	**18.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,342.00' S= 0.0422 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.61 cfs @ 12.20 hrs HW=1,344.24' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.61 cfs @ 2.00 fps)

Pond CV33: CV33



Pond CV38: CV38

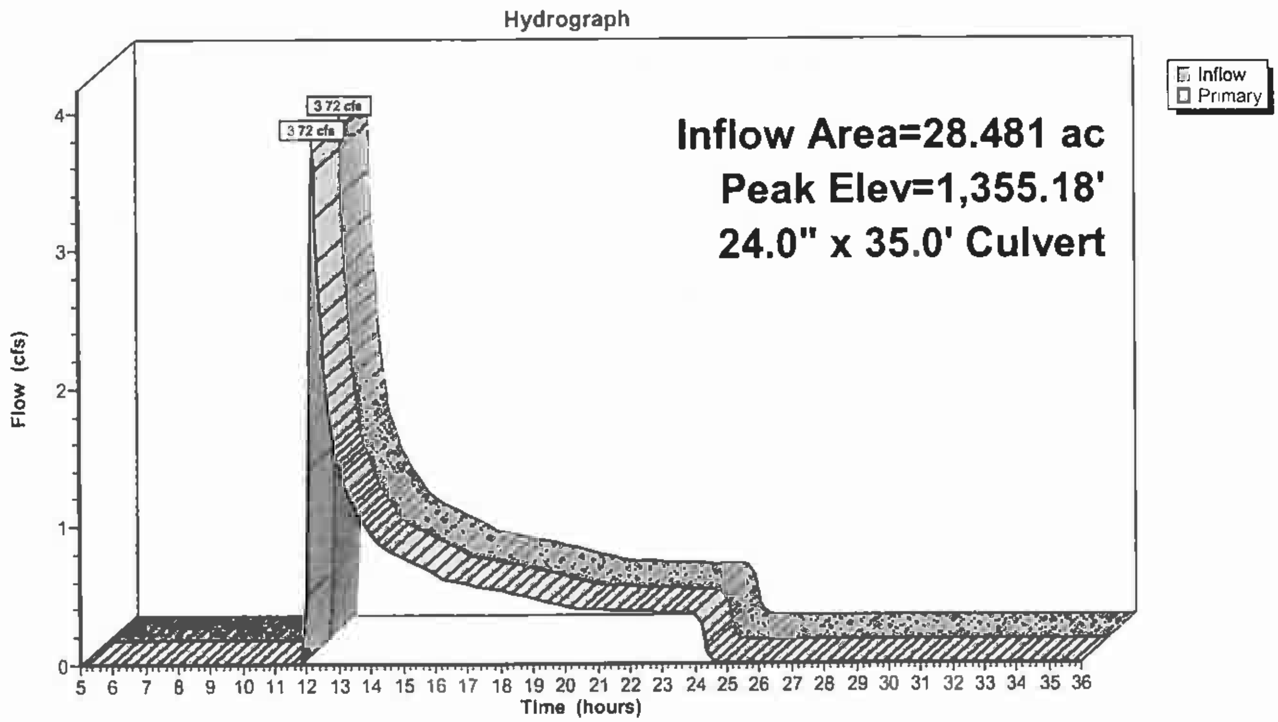
Inflow Area =	28.481 ac, Inflow Depth = 0.30"	for 10-YR event	
Inflow =	3.72 cfs @ 12.21 hrs, Volume=	0.720 af	
Outflow =	3.72 cfs @ 12.21 hrs, Volume=	0.720 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.72 cfs @ 12.21 hrs, Volume=	0.720 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,355.18' @ 12.21 hrs
Flood Elev= 1,358.11'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,354.25'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,353.27' S= 0.0280 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.68 cfs @ 12.21 hrs HW=1,355.18' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 3.68 cfs @ 2.59 fps)

Pond CV38: CV38



Pond CV4: CV4

[61] Hint: Submerged 5% of Reach R9 bottom

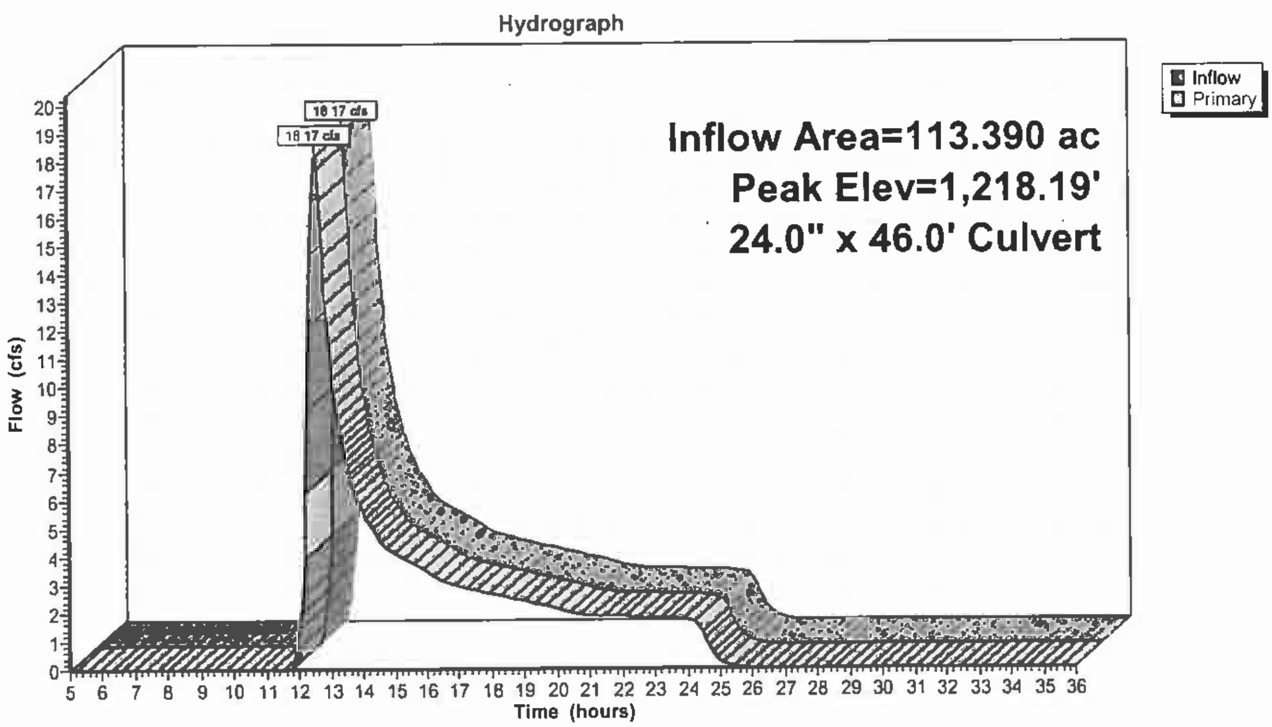
Inflow Area =	113.390 ac,	Inflow Depth = 0.41"	for 10-YR event		
Inflow =	18.17 cfs @	12.52 hrs,	Volume=	3.920 af	
Outflow =	18.17 cfs @	12.52 hrs,	Volume=	3.920 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.17 cfs @	12.52 hrs,	Volume=	3.920 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,218.19' @ 12.52 hrs
Flood Elev= 1,219.34'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,215.75'	**24.0" x 46.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,214.00' S= 0.0380 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=18.11 cfs @ 12.52 hrs HW=1,218.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 18.11 cfs @ 5.77 fps)

Pond CV4: CV4



Pond CV41: CV41

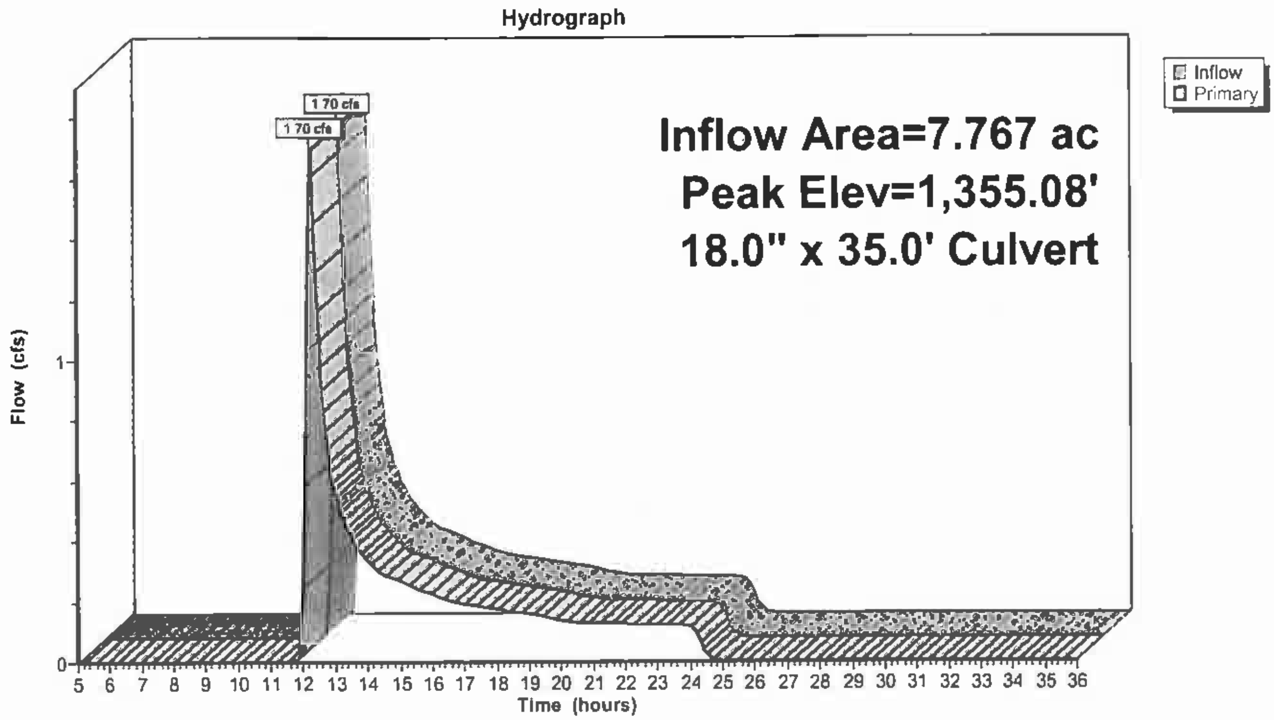
Inflow Area =	7.767 ac,	Inflow Depth = 0.41"	for 10-YR event
Inflow =	1.70 cfs @	12.24 hrs, Volume=	0.266 af
Outflow =	1.70 cfs @	12.24 hrs, Volume=	0.266 af, Atten= 0%, Lag= 0.0 min
Primary =	1.70 cfs @	12.24 hrs, Volume=	0.266 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,355.08' @ 12.24 hrs
Flood Elev= 1,357.91'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,354.41'	**18.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,353.12' S= 0.0369 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.69 cfs @ 12.24 hrs HW=1,355.08' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.69 cfs @ 2.20 fps)

Pond CV41: CV41



Pond CV47: CV47

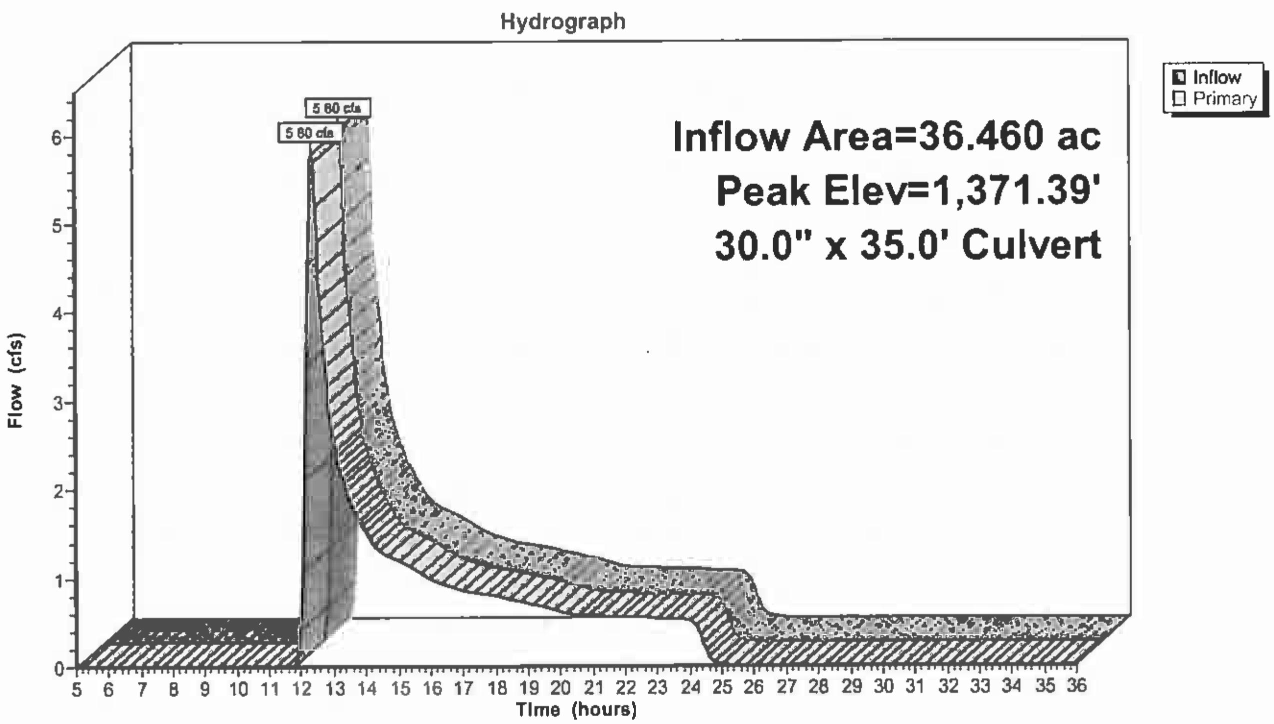
Inflow Area =	36.460 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	5.80 cfs @ 12.34 hrs, Volume=	1.136 af	
Outflow =	5.80 cfs @ 12.34 hrs, Volume=	1.136 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.80 cfs @ 12.34 hrs, Volume=	1.136 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,371.39' @ 12.34 hrs
Flood Elev= 1,374.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,370.30'	**30.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,369.30' S= 0.0286 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.77 cfs @ 12.34 hrs HW=1,371.39' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 5.77 cfs @ 2.81 fps)

Pond CV47: CV47



Pond CV48: CV 48

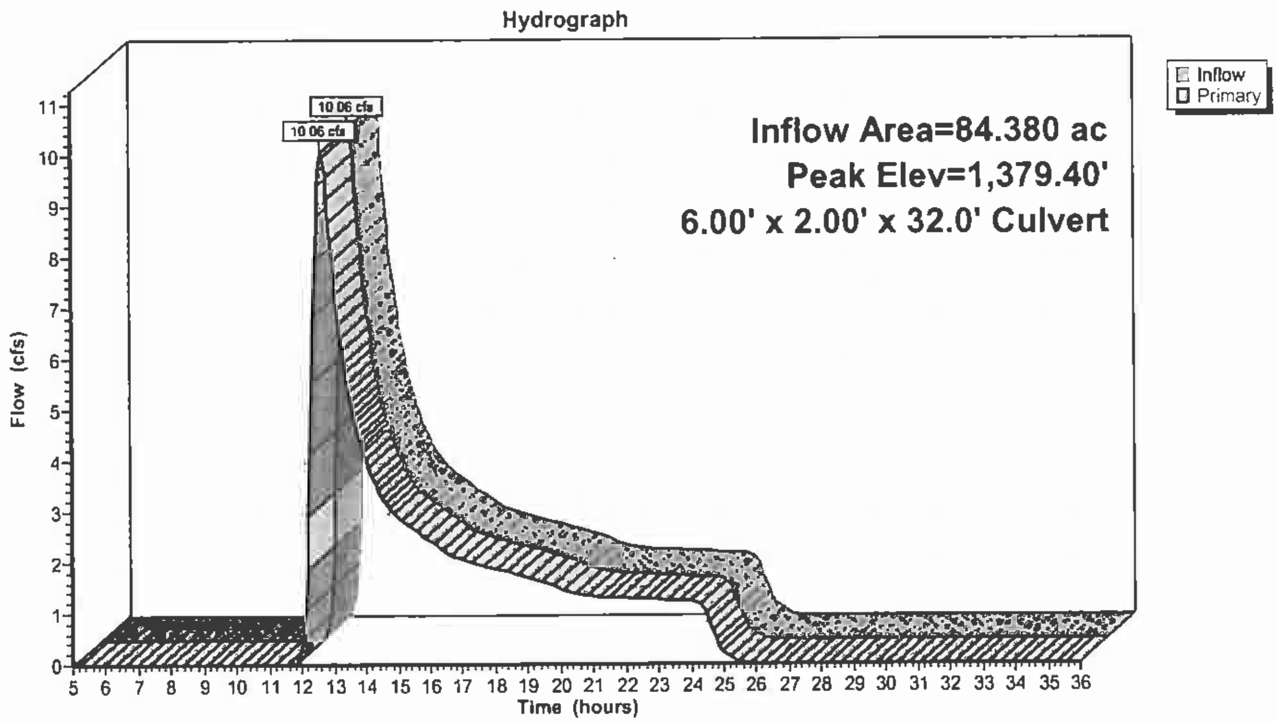
Inflow Area =	84.380 ac,	Inflow Depth = 0.37"	for 10-YR event	
Inflow =	10.06 cfs @	12.63 hrs, Volume=	2.628 af	
Outflow =	10.06 cfs @	12.63 hrs, Volume=	2.628 af,	Atten= 0%, Lag= 0.0 min
Primary =	10.06 cfs @	12.63 hrs, Volume=	2.628 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,379.40' @ 12.63 hrs
Flood Elev= 1,382.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.70'	**6.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,377.24' S= 0.0456 '/' Cc= 0.900 n= 0.040

Primary **OutFlow** Max=10.04 cfs @ 12.63 hrs HW=1,379.40' (Free Discharge)
└1=**Culvert** (Inlet Controls 10.04 cfs @ 2.38 fps)

Pond CV48: CV 48



Pond CV4A: CV4A

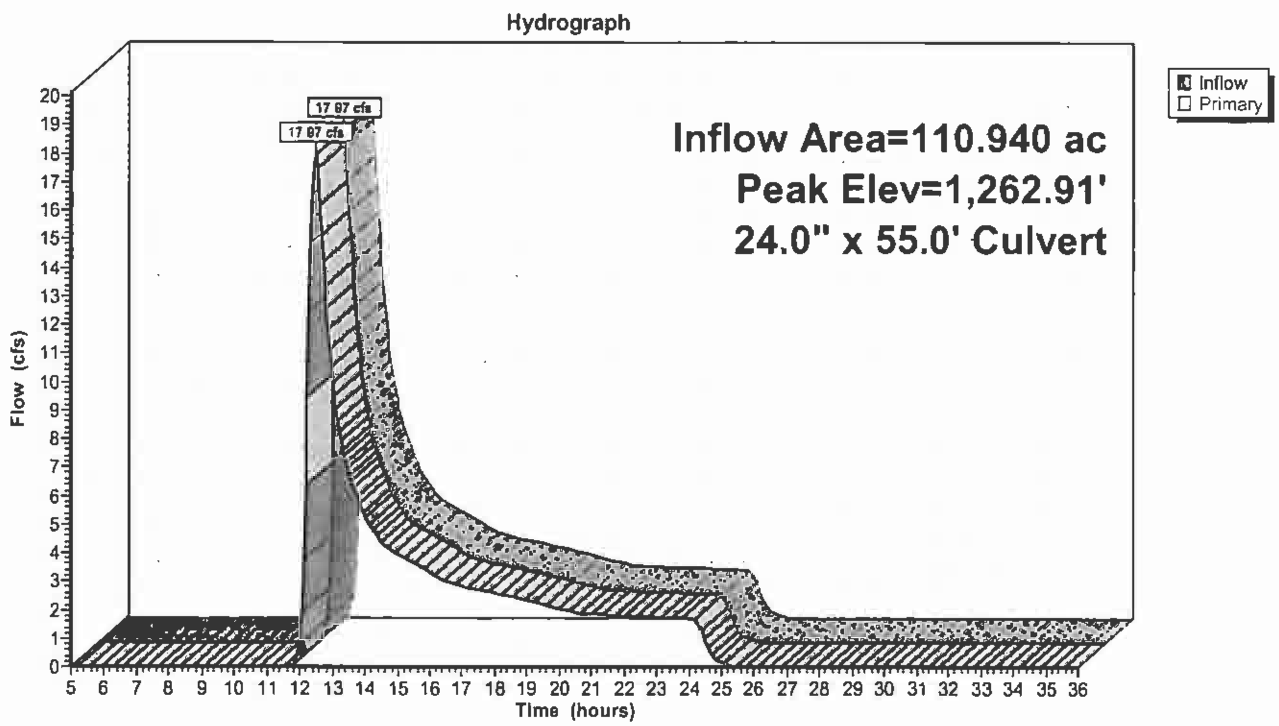
Inflow Area = 110.940 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 17.97 cfs @ 12.46 hrs, Volume= 3.802 af
Outflow = 17.97 cfs @ 12.46 hrs, Volume= 3.802 af, Atten= 0%, Lag= 0.0 min
Primary = 17.97 cfs @ 12.46 hrs, Volume= 3.802 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,262.91' @ 12.46 hrs
Flood Elev= 1,265.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,260.50'	**24.0" x 55.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,257.00' S= 0.0636 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=17.93 cfs @ 12.46 hrs HW=1,262.90' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 17.93 cfs @ 5.71 fps)

Pond CV4A: CV4A



Pond CV50: CV50

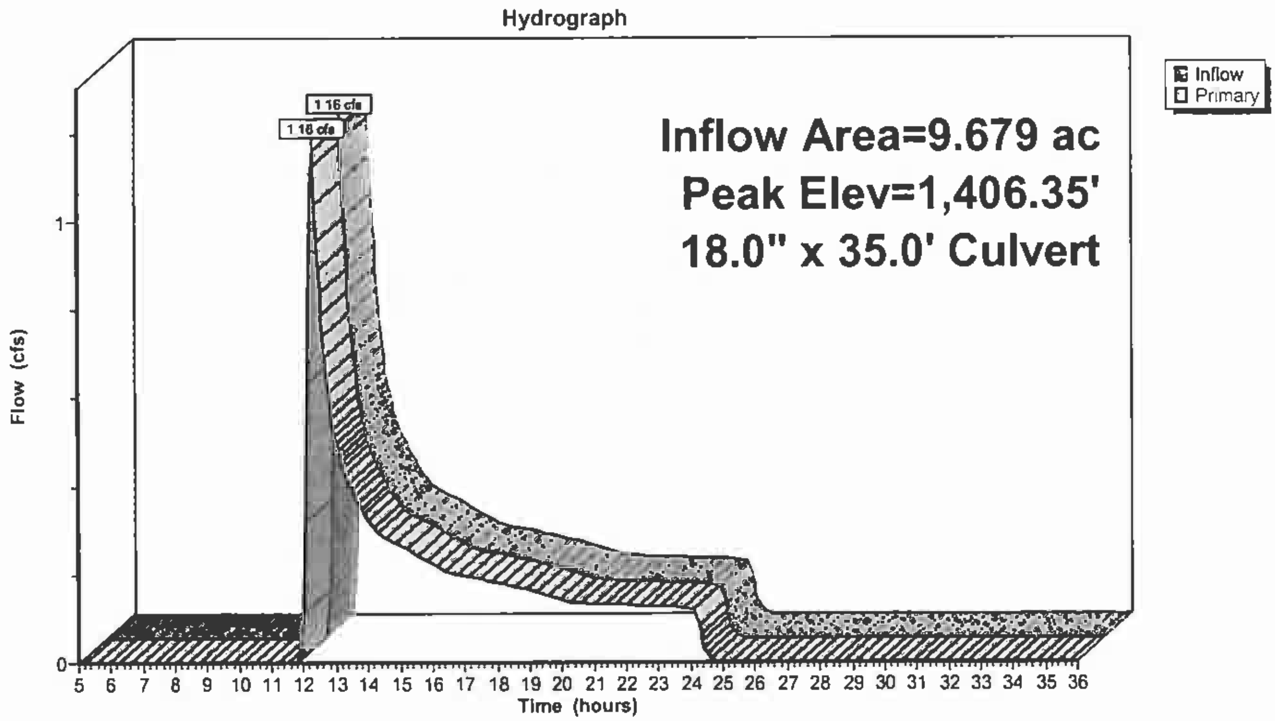
Inflow Area =	9.679 ac,	Inflow Depth = 0.30"	for 10-YR event	
Inflow =	1.16 cfs @	12.26 hrs, Volume=	0.245 af	
Outflow =	1.16 cfs @	12.26 hrs, Volume=	0.245 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.16 cfs @	12.26 hrs, Volume=	0.245 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,406.35' @ 12.26 hrs
Flood Elev= 1,408.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,405.80'	**18.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,404.92' S= 0.0251 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.16 cfs @ 12.26 hrs HW=1,406.35' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.16 cfs @ 1.99 fps)

Pond CV50: CV50



Pond CV52: CV52

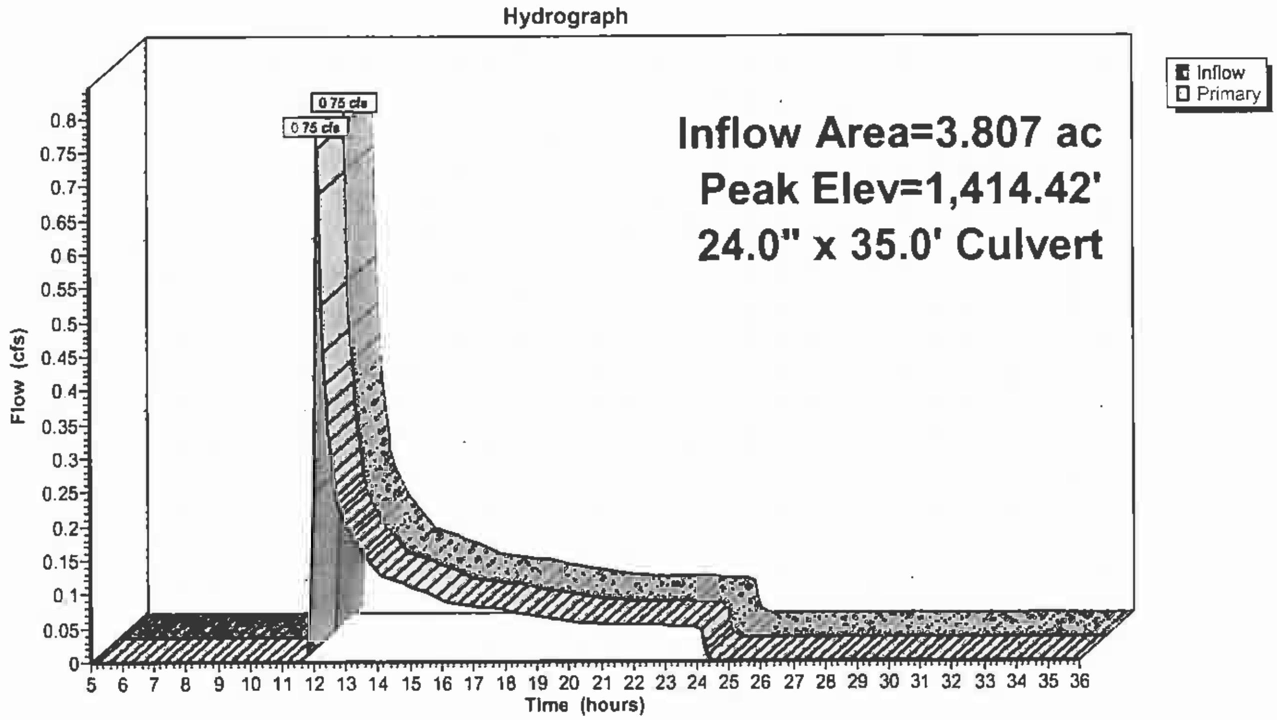
Inflow Area = 3.807 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 0.75 cfs @ 12.13 hrs, Volume= 0.107 af
Outflow = 0.75 cfs @ 12.13 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.13 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,414.42' @ 12.13 hrs
Flood Elev= 1,417.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,414.00'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,413.75' S= 0.0071 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.74 cfs @ 12.13 hrs HW=1,414.41' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.74 cfs @ 2.39 fps)

Pond CV52: CV52



Pond CV53: CV53

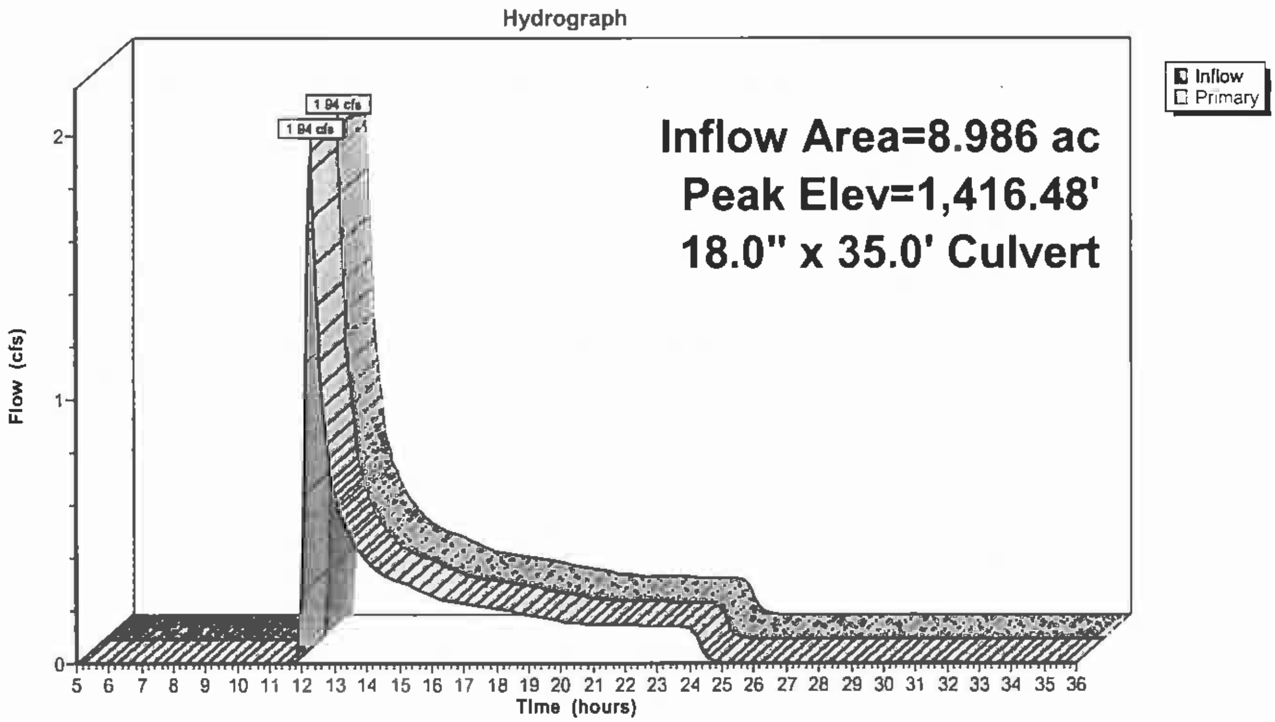
Inflow Area =	8.986 ac,	Inflow Depth = 0.41"	for 10-YR event		
Inflow =	1.94 cfs @	12.25 hrs,	Volume=	0.308 af	
Outflow =	1.94 cfs @	12.25 hrs,	Volume=	0.308 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.94 cfs @	12.25 hrs,	Volume=	0.308 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,416.48' @ 12.25 hrs
Flood Elev= 1,419.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,415.75'	**18.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,413.80' S= 0.0557 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.94 cfs @ 12.25 hrs HW=1,416.48' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 1.94 cfs @ 2.29 fps)

Pond CV53: CV53



Pond CV54: CV54

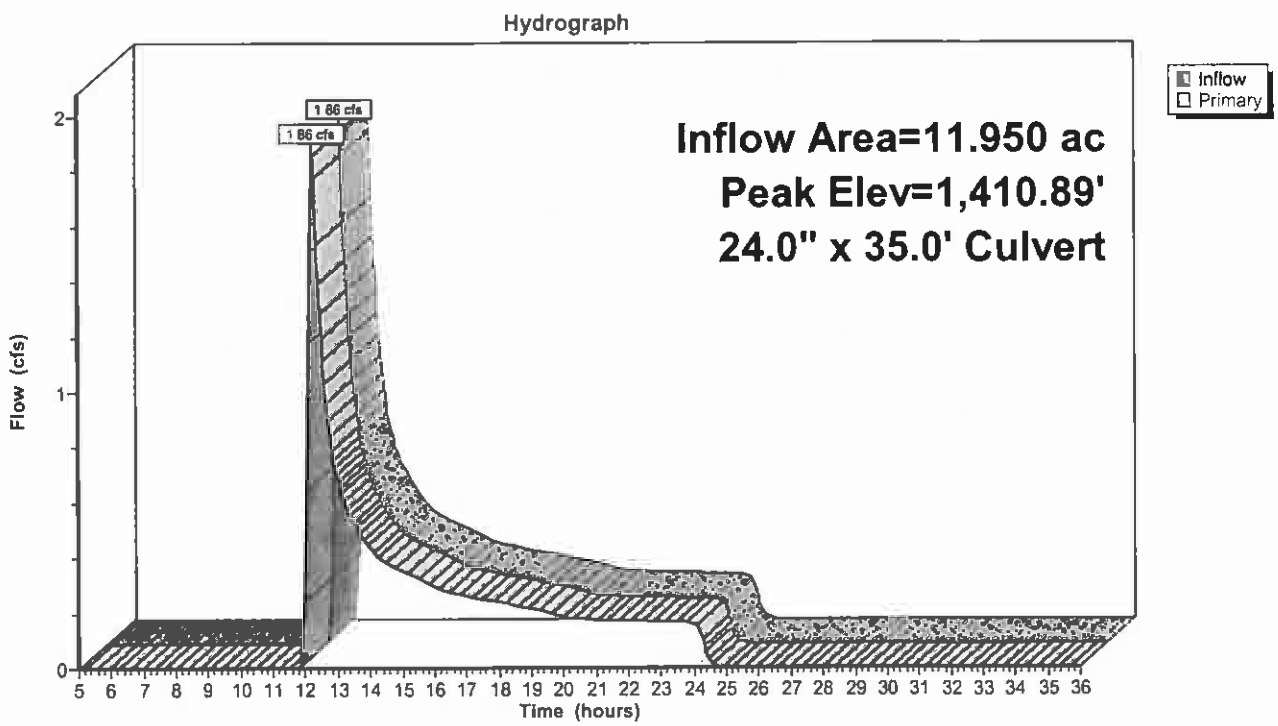
Inflow Area = 11.950 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 1.86 cfs @ 12.23 hrs, Volume= 0.336 af
Outflow = 1.86 cfs @ 12.23 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.0 min
Primary = 1.86 cfs @ 12.23 hrs, Volume= 0.336 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,410.89' @ 12.23 hrs
Flood Elev= 1,414.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,410.25'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,409.00' S= 0.0357 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.84 cfs @ 12.23 hrs HW=1,410.89' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.84 cfs @ 2.14 fps)

Pond CV54: CV54



Pond CV55: CV55

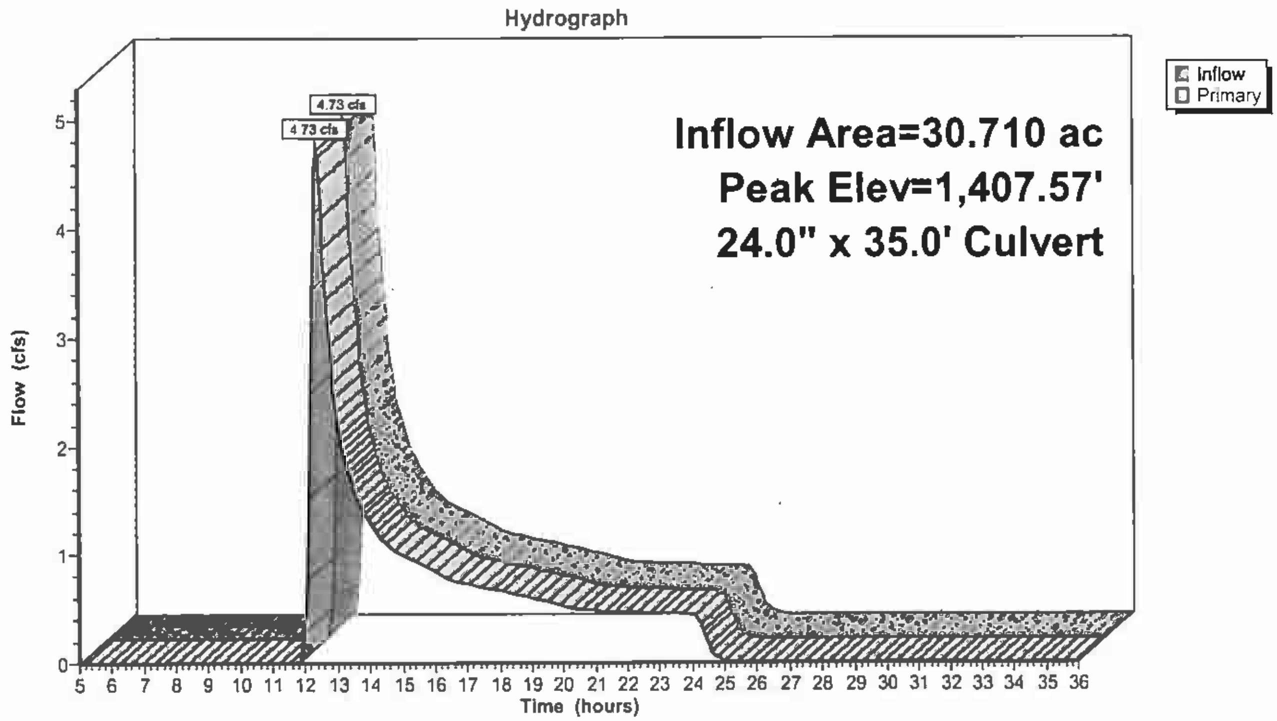
Inflow Area =	30.710 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	4.73 cfs @ 12.36 hrs, Volume=	0.957 af	
Outflow =	4.73 cfs @ 12.36 hrs, Volume=	0.957 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.73 cfs @ 12.36 hrs, Volume=	0.957 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,407.57' @ 12.36 hrs
Flood Elev= 1,411.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,406.50'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,405.50' S= 0.0286 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.71 cfs @ 12.36 hrs HW=1,407.56' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 4.71 cfs @ 2.77 fps)

Pond CV55: CV55



Pond CV56: CV56

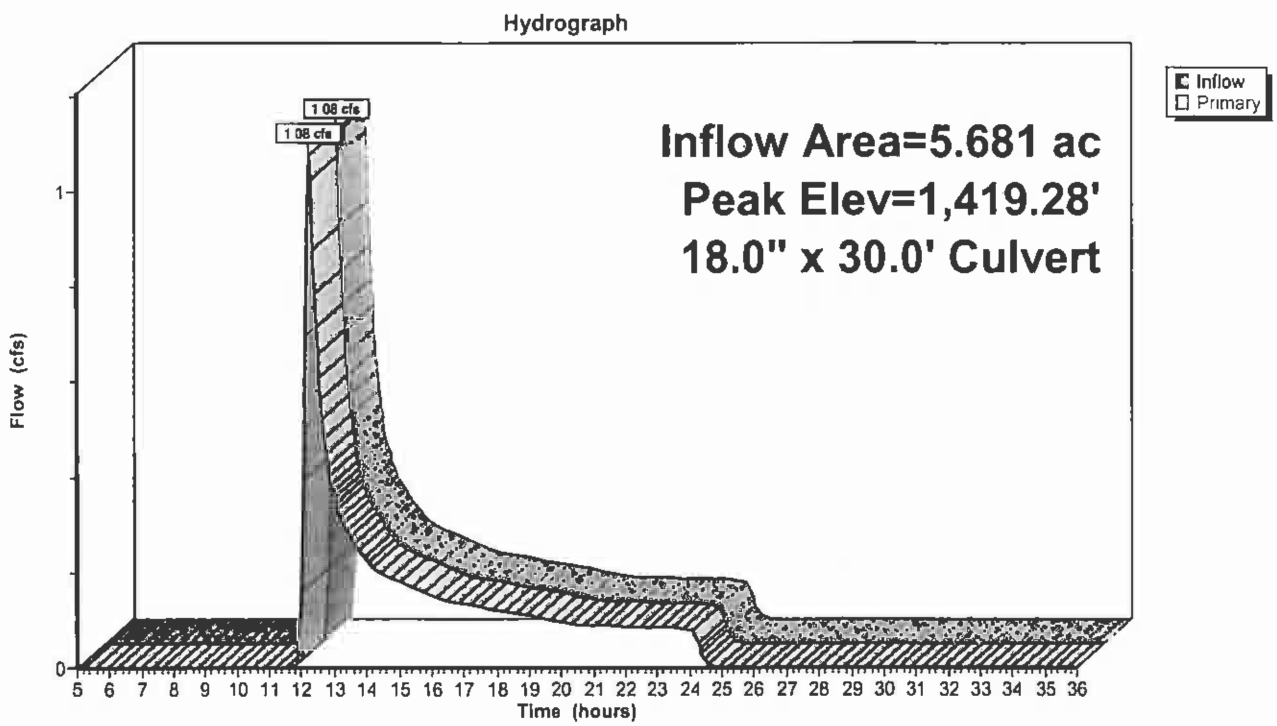
Inflow Area =	5.681 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	1.08 cfs @ 12.23 hrs, Volume=	0.177 af	
Outflow =	1.08 cfs @ 12.23 hrs, Volume=	0.177 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.08 cfs @ 12.23 hrs, Volume=	0.177 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,419.28' @ 12.23 hrs
Flood Elev= 1,422.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,418.75'	**18.0" x 30.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,418.25' S= 0.0167 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.07 cfs @ 12.23 hrs HW=1,419.27' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.07 cfs @ 1.94 fps)

Pond CV56: CV56



Pond CV58: CV58

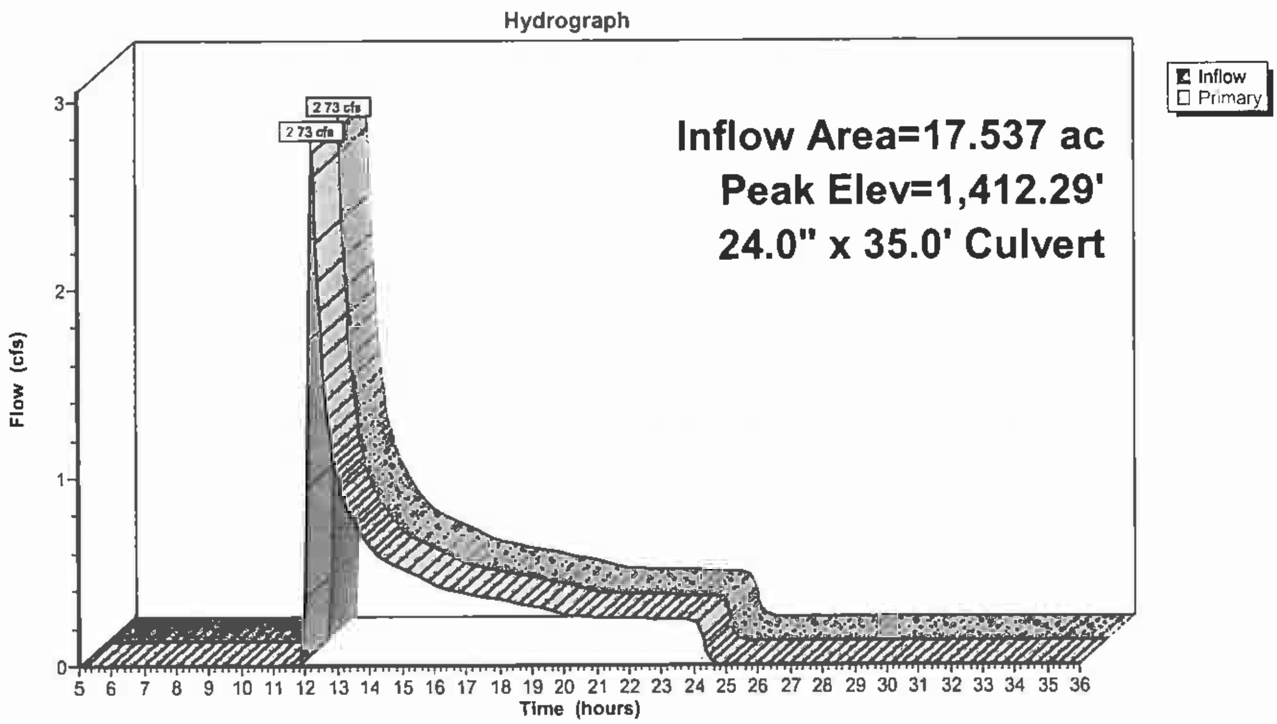
Inflow Area =	17.537 ac, Inflow Depth = 0.34"	for 10-YR event	
Inflow =	2.73 cfs @ 12.23 hrs, Volume=	0.494 af	
Outflow =	2.73 cfs @ 12.23 hrs, Volume=	0.494 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.73 cfs @ 12.23 hrs, Volume=	0.494 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,412.29' @ 12.23 hrs
Flood Elev= 1,415.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,411.50'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,411.15' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.71 cfs @ 12.23 hrs HW=1,412.29' (Free Discharge)
1=Culvert (Barrel Controls 2.71 cfs @ 3.50 fps)

Pond CV58: CV58



Pond CV59: CV59

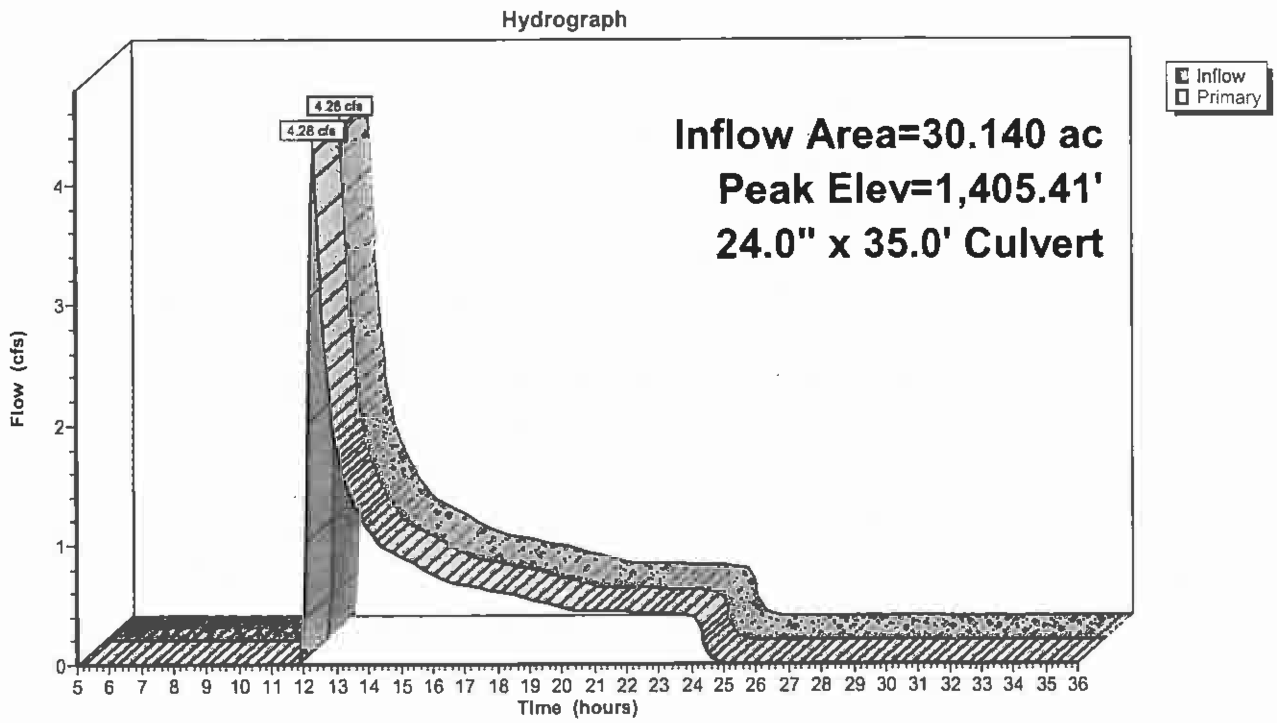
Inflow Area =	30.140 ac, Inflow Depth = 0.34"	for 10-YR event	
Inflow =	4.28 cfs @ 12.28 hrs, Volume=	0.849 af	
Outflow =	4.28 cfs @ 12.28 hrs, Volume=	0.849 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.28 cfs @ 12.28 hrs, Volume=	0.849 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,405.41' @ 12.28 hrs
Flood Elev= 1,408.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,404.40'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,404.00' S= 0.0114 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.25 cfs @ 12.28 hrs HW=1,405.40' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.25 cfs @ 2.69 fps)

Pond CV59: CV59



Pond CV63: CV63

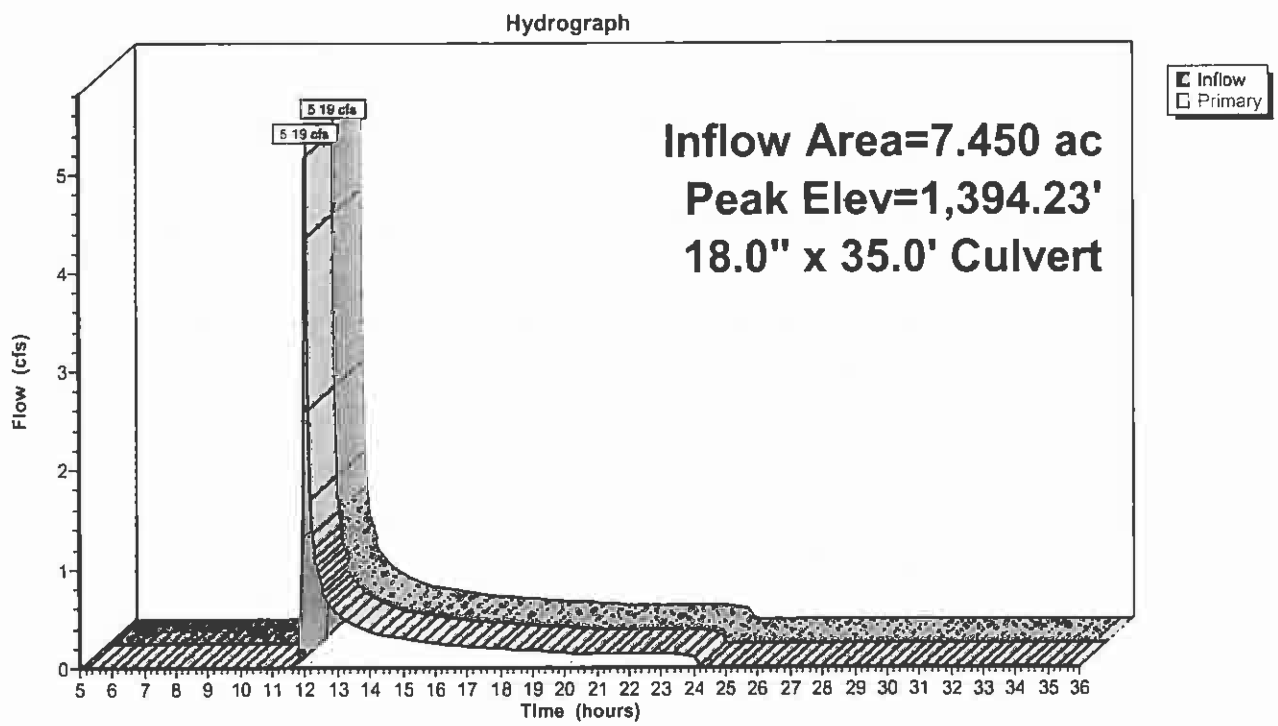
Inflow Area =	7.450 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	5.19 cfs @	12.01 hrs, Volume=	0.330 af	
Outflow =	5.19 cfs @	12.01 hrs, Volume=	0.330 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.19 cfs @	12.01 hrs, Volume=	0.330 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,394.23' @ 12.01 hrs
Flood Elev= 1,396.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,393.10'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,390.75' S= 0.0671 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.01 cfs @ 12.01 hrs HW=1,394.21' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 5.01 cfs @ 3.58 fps)

Pond CV63: CV63



Pond CV64: CV64

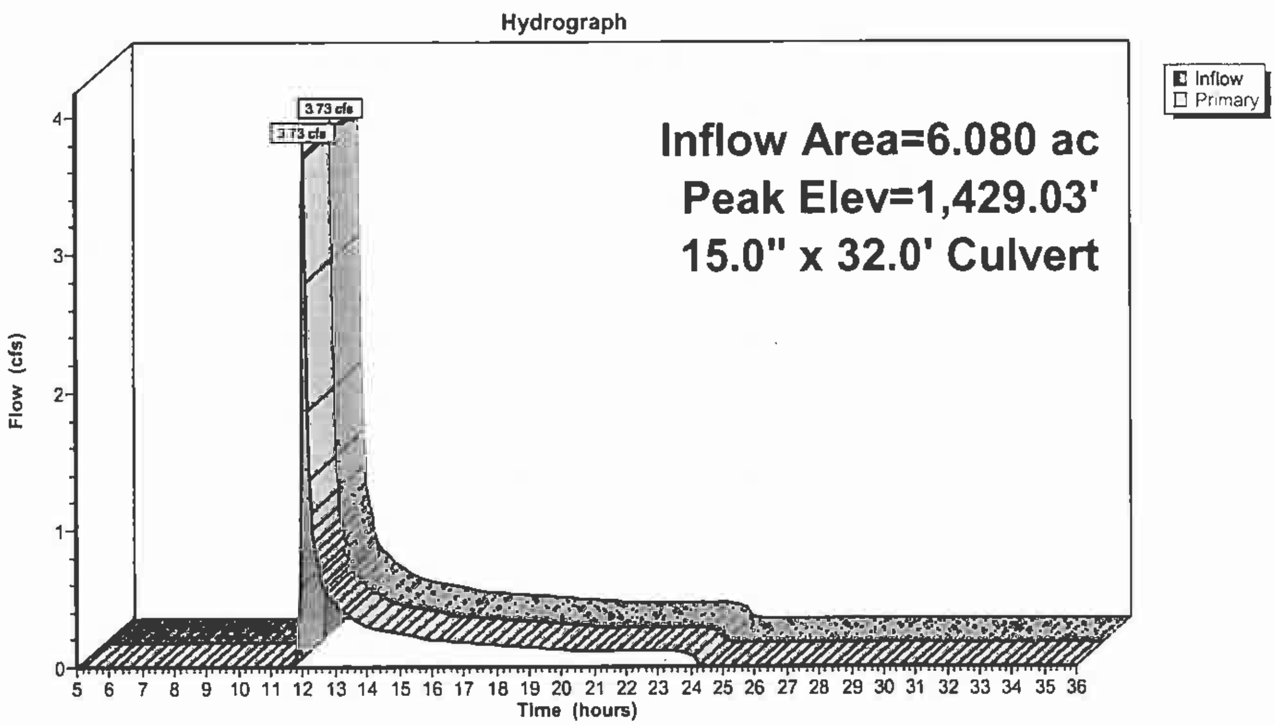
Inflow Area =	6.080 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	3.73 cfs @ 12.04 hrs, Volume=	0.270 af	
Outflow =	3.73 cfs @ 12.04 hrs, Volume=	0.270 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.73 cfs @ 12.04 hrs, Volume=	0.270 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,429.03' @ 12.04 hrs
Flood Elev= 1,431.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,428.00'	**15.0" x 32.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,425.00' S= 0.0938 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.63 cfs @ 12.04 hrs HW=1,429.01' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 3.63 cfs @ 3.42 fps)

Pond CV64: CV64



Pond CV65: CV65

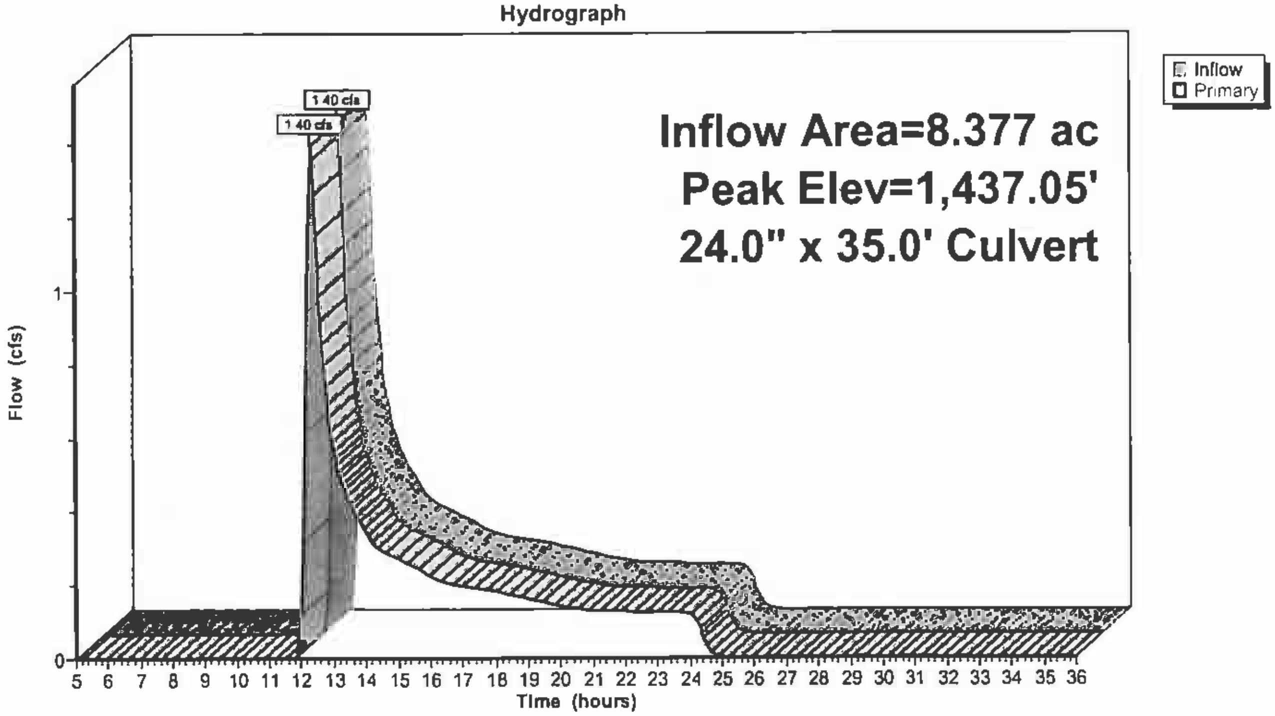
Inflow Area =	8.377 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	1.40 cfs @ 12.30 hrs, Volume=	0.261 af	
Outflow =	1.40 cfs @ 12.30 hrs, Volume=	0.261 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.40 cfs @ 12.30 hrs, Volume=	0.261 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,437.05' @ 12.30 hrs
Flood Elev= 1,440.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,436.50'	**24.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,434.25' S= 0.0643 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.40 cfs @ 12.30 hrs HW=1,437.05' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.40 cfs @ 1.99 fps)

Pond CV65: CV65



Pond CV66: CV66

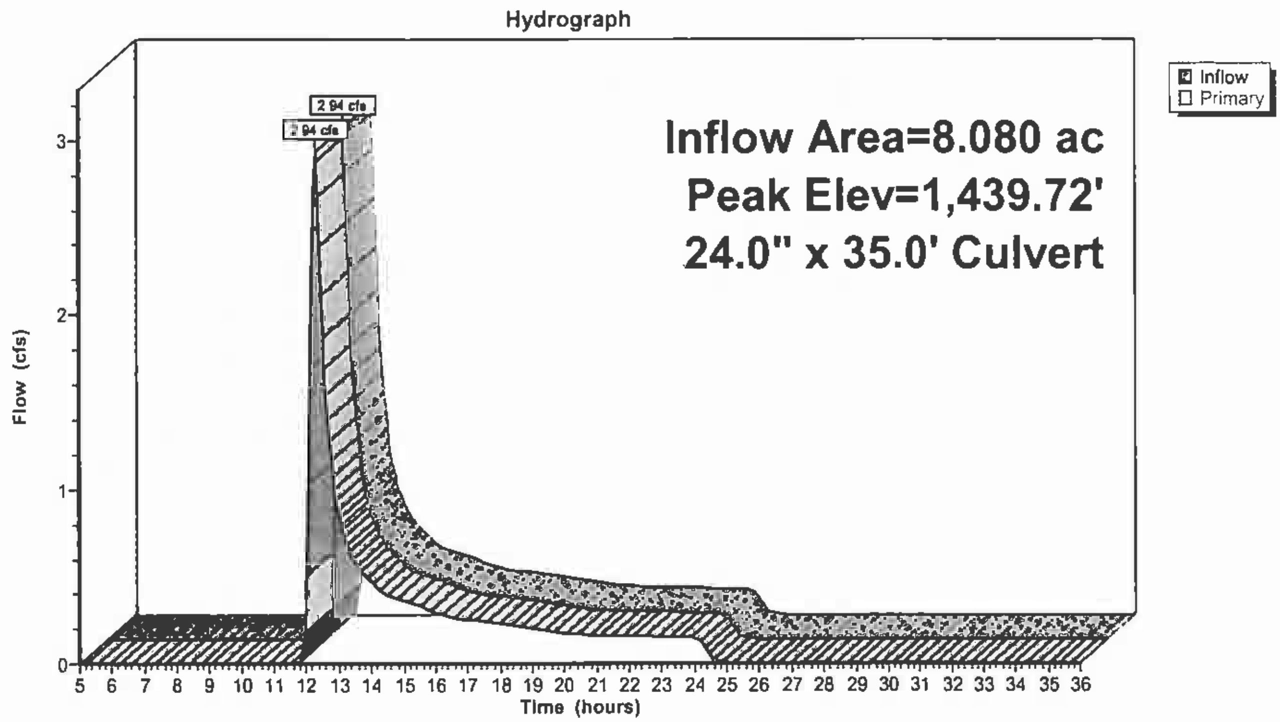
Inflow Area =	8.080 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	2.94 cfs @	12.26 hrs, Volume=	0.388 af	
Outflow =	2.94 cfs @	12.26 hrs, Volume=	0.388 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.94 cfs @	12.26 hrs, Volume=	0.388 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,439.72' @ 12.26 hrs
Flood Elev= 1,442.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,439.00'	**24.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,437.95' S= 0.0300 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.91 cfs @ 12.26 hrs HW=1,439.72' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 2.91 cfs @ 2.88 fps)

Pond CV66: CV66



Pond CV67: CV67

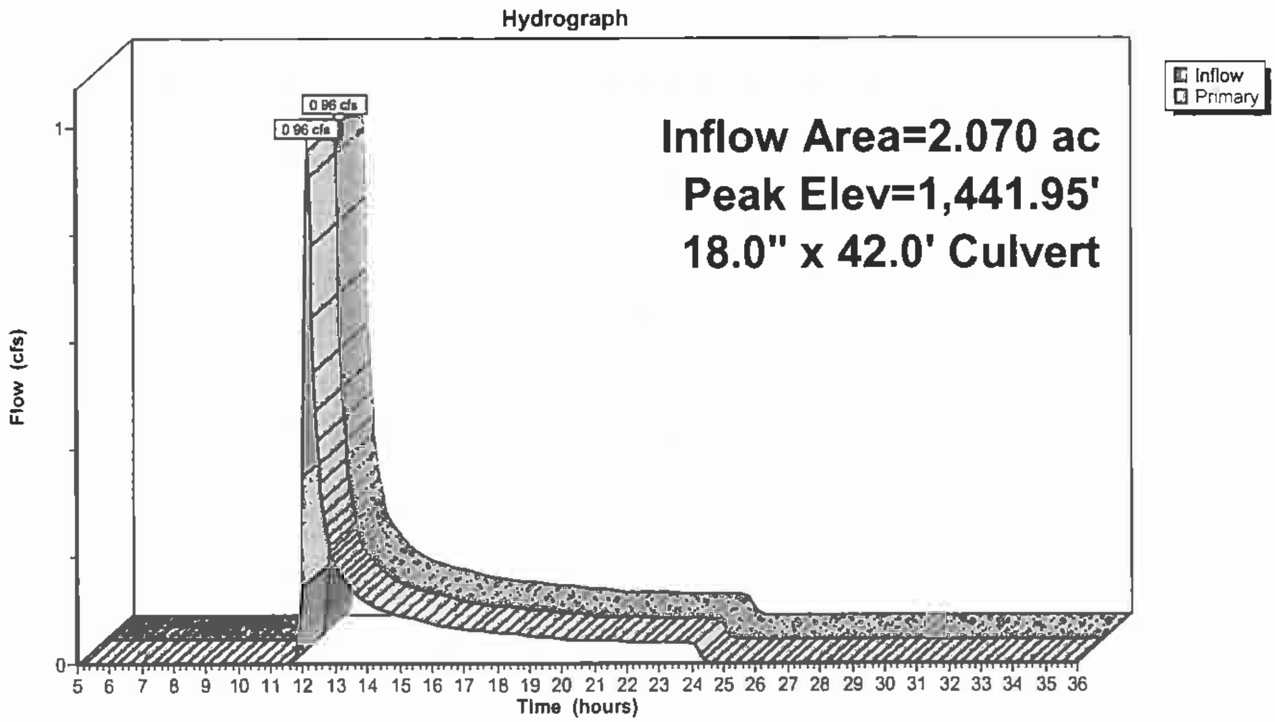
Inflow Area =	2.070 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	0.96 cfs @ 12.16 hrs, Volume=	0.099 af	
Outflow =	0.96 cfs @ 12.16 hrs, Volume=	0.099 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.96 cfs @ 12.16 hrs, Volume=	0.099 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,441.95' @ 12.16 hrs
Flood Elev= 1,445.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,441.50'	**18.0" x 42.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,441.00' S= 0.0119 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.95 cfs @ 12.16 hrs HW=1,441.95' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 0.95 cfs @ 3.19 fps)

Pond CV67: CV67



Pond CV69: CV69

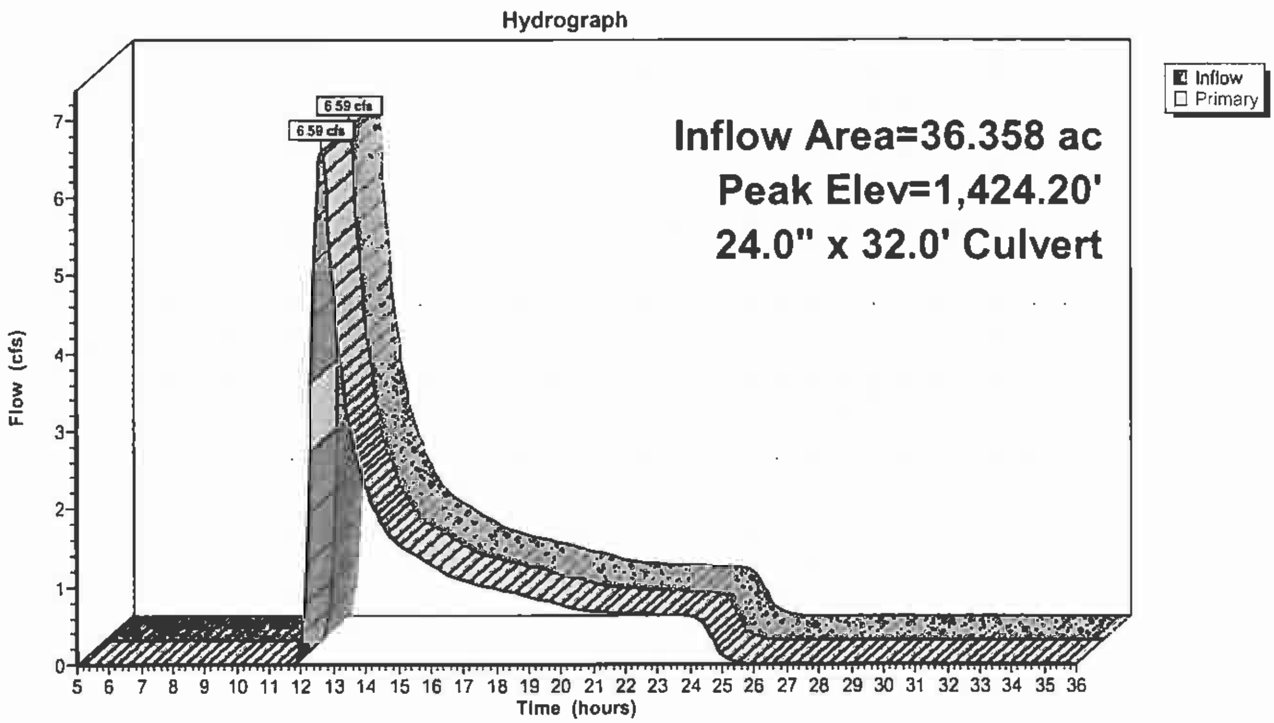
Inflow Area =	36.358 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	6.59 cfs @ 12.63 hrs, Volume=	1.486 af	
Outflow =	6.59 cfs @ 12.63 hrs, Volume=	1.486 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.59 cfs @ 12.63 hrs, Volume=	1.486 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,424.20' @ 12.63 hrs
Flood Elev= 1,426.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,422.75'	**24.0" x 32.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,422.58' S= 0.0053 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=6.58 cfs @ 12.63 hrs HW=1,424.20' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 6.58 cfs @ 3.78 fps)

Pond CV69: CV69



Pond CV70: CV 70

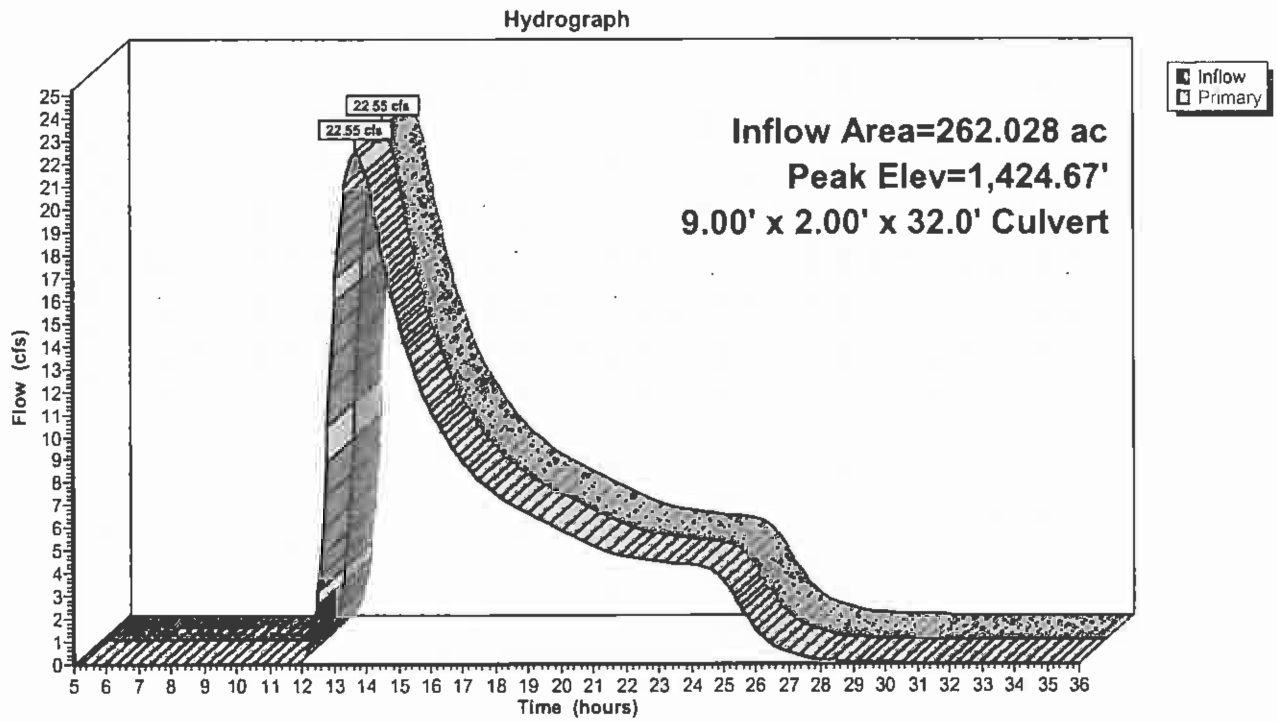
Inflow Area =	262.028 ac,	Inflow Depth > 0.44"	for 10-YR event	
Inflow =	22.55 cfs @	13.69 hrs, Volume=	9.610 af	
Outflow =	22.55 cfs @	13.69 hrs, Volume=	9.610 af,	Atten= 0%, Lag= 0.0 min
Primary =	22.55 cfs @	13.69 hrs, Volume=	9.610 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,424.67' @ 13.69 hrs
Flood Elev= 1,427.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,423.75'	**9.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,422.50' S= 0.0391 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=22.54 cfs @ 13.69 hrs HW=1,424.67' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 22.54 cfs @ 2.72 fps)

Pond CV70: CV 70



Pond CV77: CV77

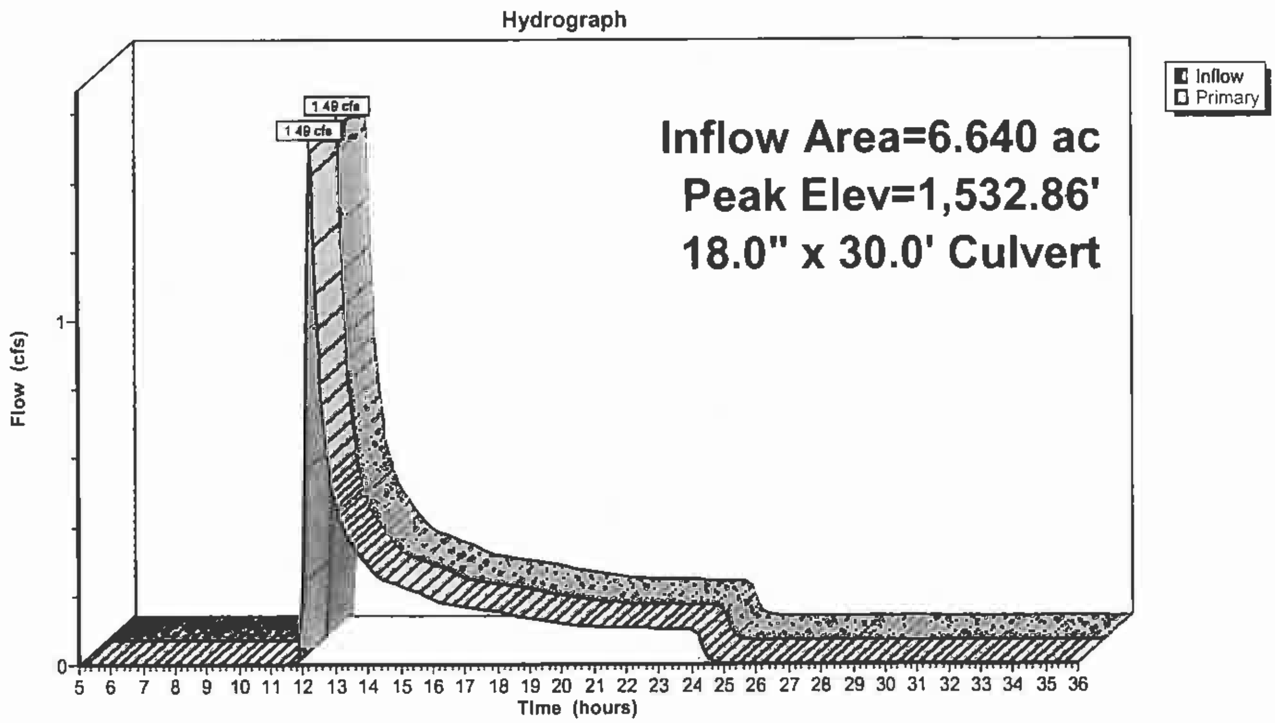
Inflow Area = 6.640 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 1.49 cfs @ 12.23 hrs, Volume= 0.228 af
Outflow = 1.49 cfs @ 12.23 hrs, Volume= 0.228 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.23 hrs, Volume= 0.228 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,532.86' @ 12.23 hrs
Flood Elev= 1,534.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,532.23'	**18.0" x 30.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,530.45' S= 0.0593 '/' Cc= 0.900 n= 0.024

Primary **OutFlow** Max=1.48 cfs @ 12.23 hrs HW=1,532.85' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.48 cfs @ 2.12 fps)

Pond CV77: CV77



Pond CV78: CV78

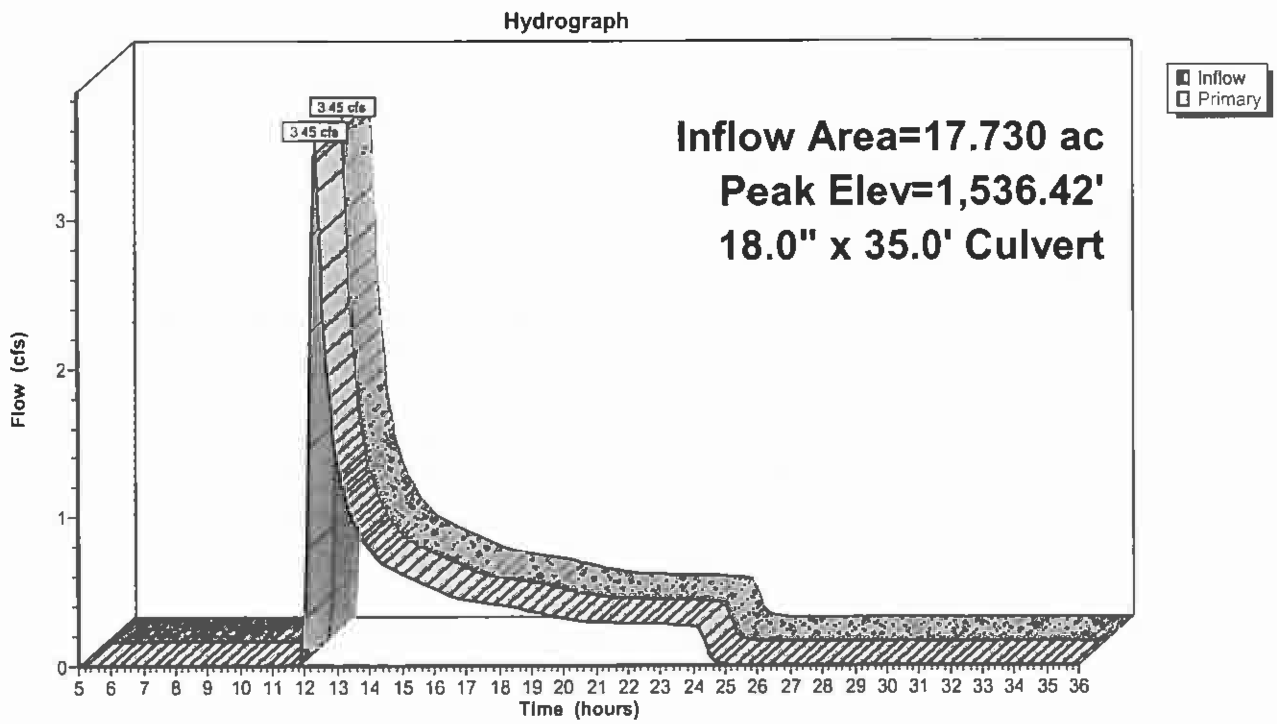
Inflow Area =	17.730 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	3.45 cfs @ 12.31 hrs, Volume=	0.608 af	
Outflow =	3.45 cfs @ 12.31 hrs, Volume=	0.608 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.45 cfs @ 12.31 hrs, Volume=	0.608 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,536.42' @ 12.31 hrs
Flood Elev= 1,536.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,535.40'	**18.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,533.31' S= 0.0597 '/' Cc= 0.900 n= 0.024

Primary OutFlow Max=3.44 cfs @ 12.31 hrs HW=1,536.41' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.44 cfs @ 2.71 fps)

Pond CV78: CV78



Pond CV79: CV79

[57] Hint: Peaked at 1,559.38' (Flood elevation advised)

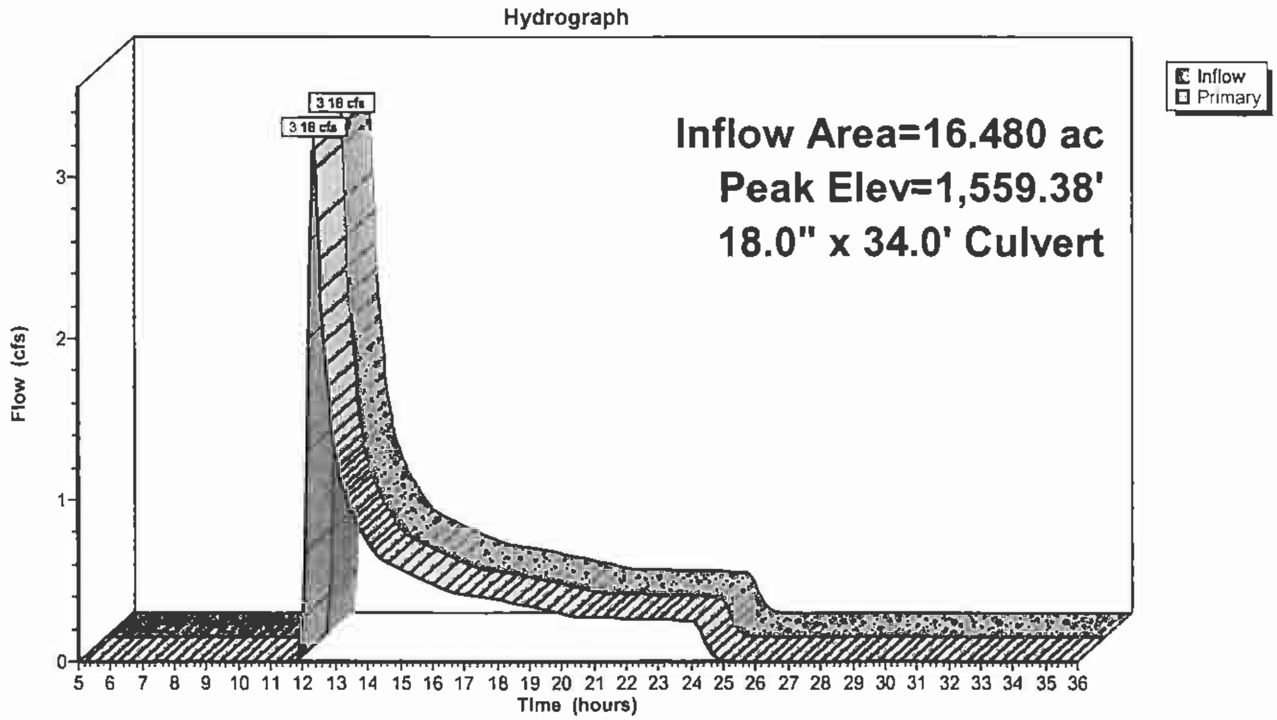
Inflow Area =	16.480 ac,	Inflow Depth = 0.41"	for 10-YR event
Inflow =	3.18 cfs @ 12.32 hrs,	Volume=	0.565 af
Outflow =	3.18 cfs @ 12.32 hrs,	Volume=	0.565 af, Atten= 0%, Lag= 0.0 min
Primary =	3.18 cfs @ 12.32 hrs,	Volume=	0.565 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,559.38' @ 12.32 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,558.54'	**18.0" x 34.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 1,557.17' S= 0.0403 '/' Cc= 0.900 n= 0.024

Primary OutFlow Max=3.15 cfs @ 12.32 hrs HW=1,559.38' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 3.15 cfs @ 3.11 fps)

Pond CV79: CV79



Pond CV8: CV8

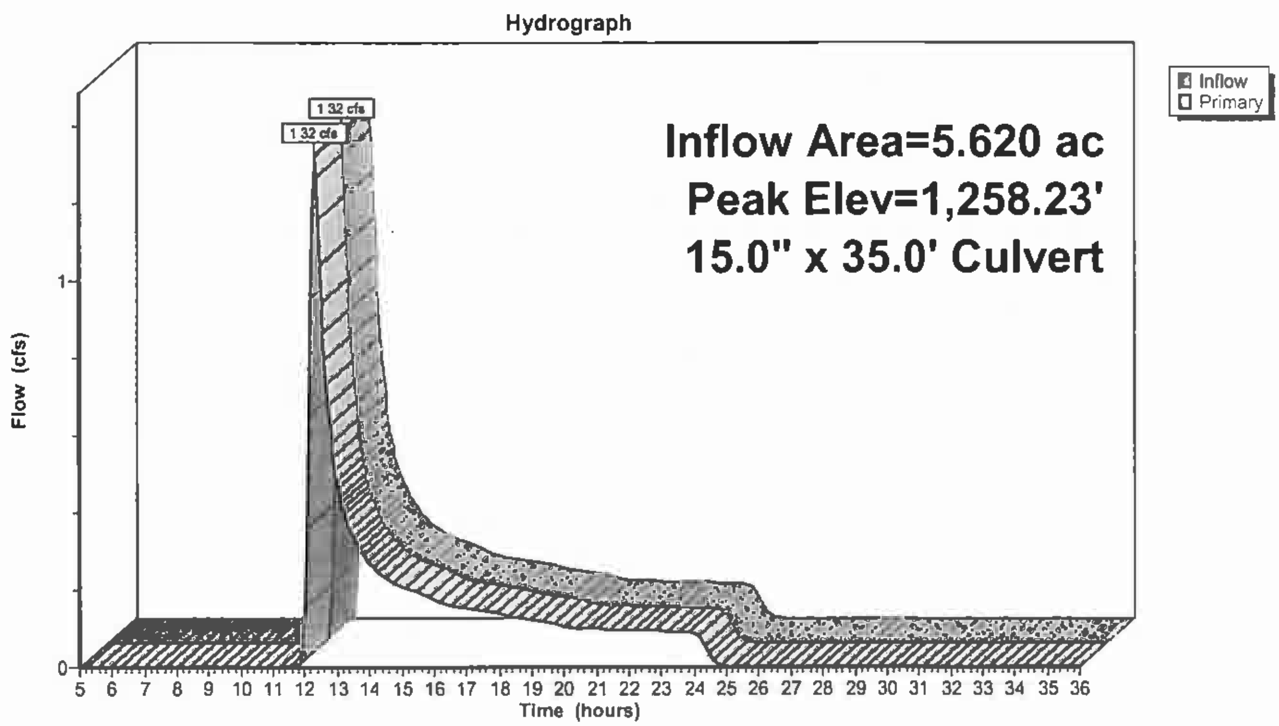
Inflow Area = 5.620 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.32 cfs @ 12.29 hrs, Volume= 0.211 af
Outflow = 1.32 cfs @ 12.29 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.29 hrs, Volume= 0.211 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,258.23' @ 12.29 hrs
Flood Elev= 1,260.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,257.60'	**15.0" x 35.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,256.24' S= 0.0389 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.32 cfs @ 12.29 hrs HW=1,258.23' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.32 cfs @ 2.13 fps)

Pond CV8: CV8



Pond CV80: CV80

[57] Hint: Peaked at 1,576.37' (Flood elevation advised)

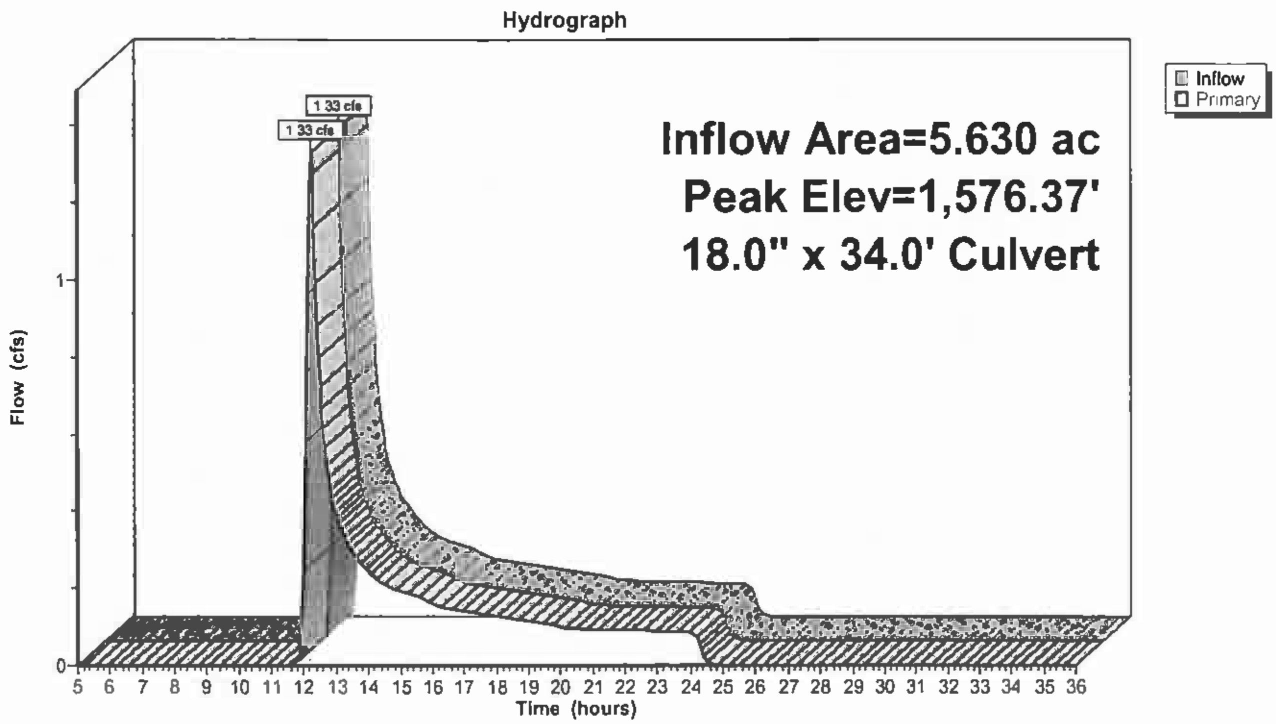
Inflow Area = 5.630 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 1.33 cfs @ 12.21 hrs, Volume= 0.193 af
Outflow = 1.33 cfs @ 12.21 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
Primary = 1.33 cfs @ 12.21 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,576.37' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,575.82'	**18.0" x 34.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 1,574.98' S= 0.0247 '/' Cc= 0.900 n= 0.024

Primary **OutFlow** Max=1.32 cfs @ 12.21 hrs HW=1,576.36' (Free Discharge)
└1=**Culvert** (Barrel Controls 1.32 cfs @ 3.40 fps)

Pond CV80: CV80



Pond CV81: CV81

[57] Hint: Peaked at 1,582.72' (Flood elevation advised)

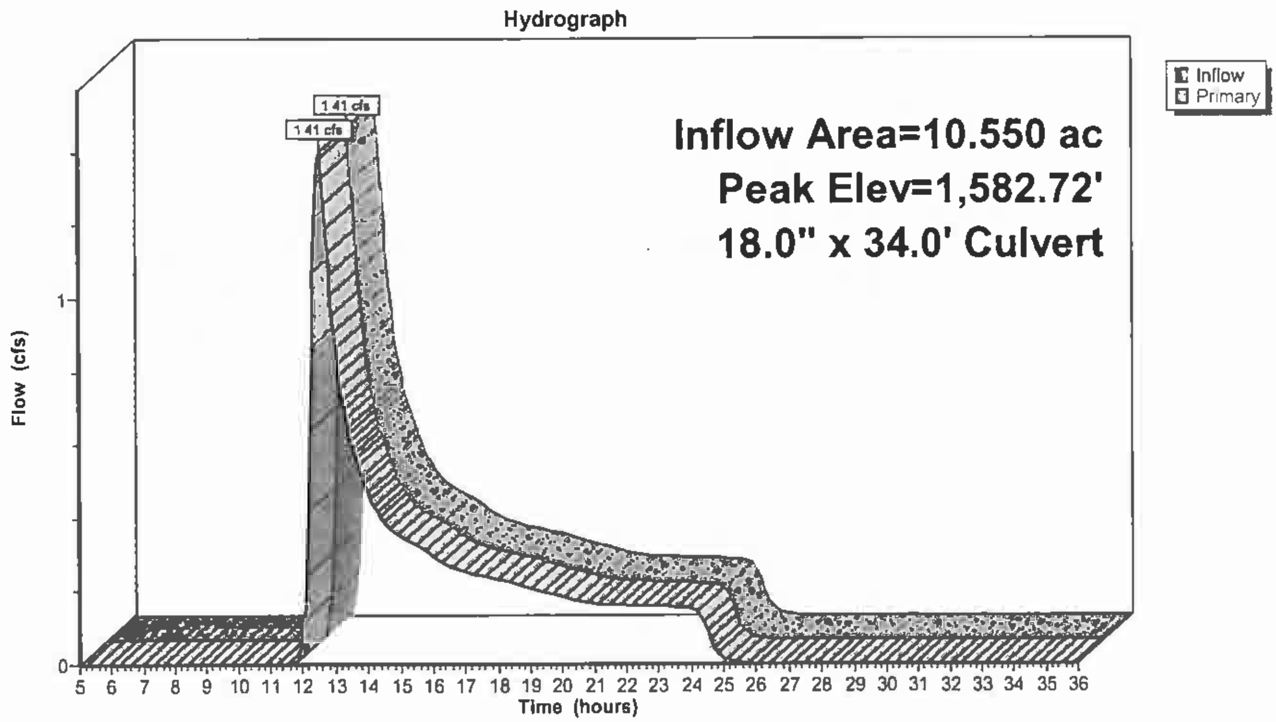
Inflow Area =	10.550 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	1.41 cfs @ 12.50 hrs, Volume=	0.329 af	
Outflow =	1.41 cfs @ 12.50 hrs, Volume=	0.329 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.41 cfs @ 12.50 hrs, Volume=	0.329 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,582.72' @ 12.50 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,582.19'	**18.0" x 34.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 1,581.08' S= 0.0326 '/' Cc= 0.900 n= 0.024

Primary OutFlow Max=1.40 cfs @ 12.50 hrs HW=1,582.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.40 cfs @ 2.49 fps)

Pond CV81: CV81



Pond CV82: CV82

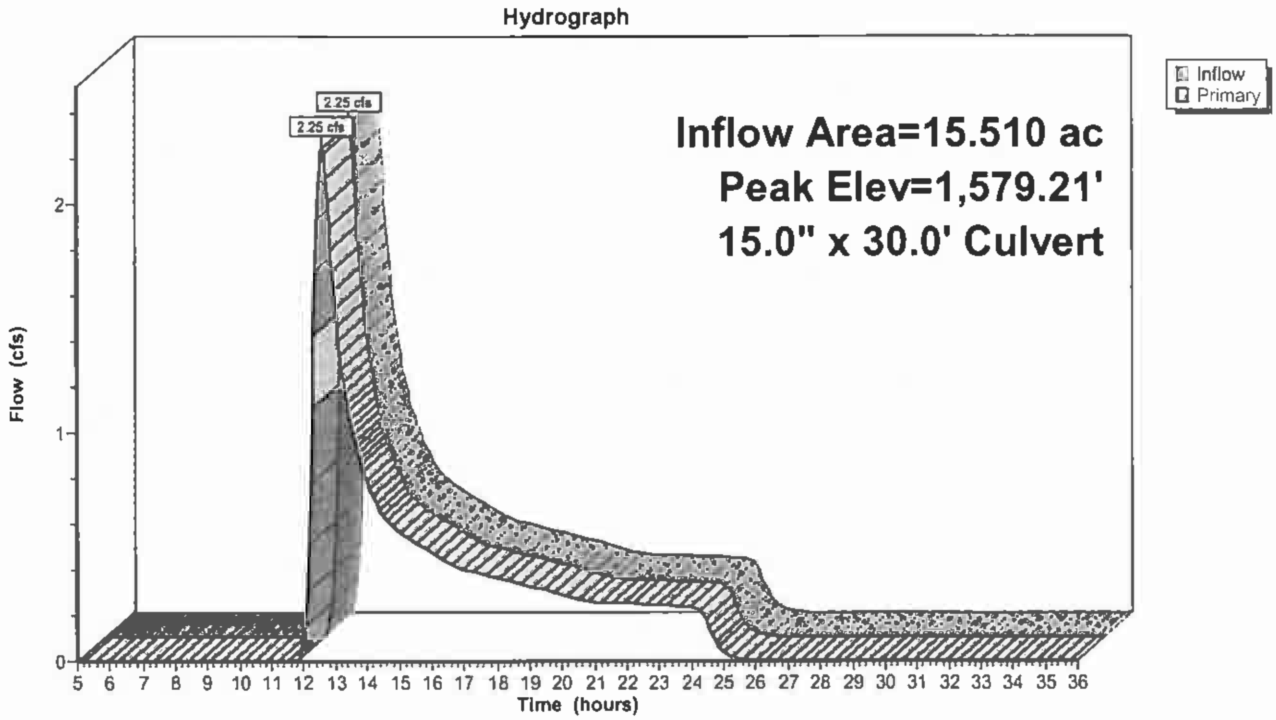
Inflow Area =	15.510 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	2.25 cfs @ 12.58 hrs, Volume=	0.532 af	
Outflow =	2.25 cfs @ 12.58 hrs, Volume=	0.532 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.25 cfs @ 12.58 hrs, Volume=	0.532 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,579.21' @ 12.58 hrs
Flood Elev= 1,581.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,578.34'	**15.0" x 30.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,578.04' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.24 cfs @ 12.58 hrs HW=1,579.21' (Free Discharge)
└─1=**Culvert** (Barrel Controls 2.24 cfs @ 3.45 fps)

Pond CV82: CV82



Pond CV83: CV83

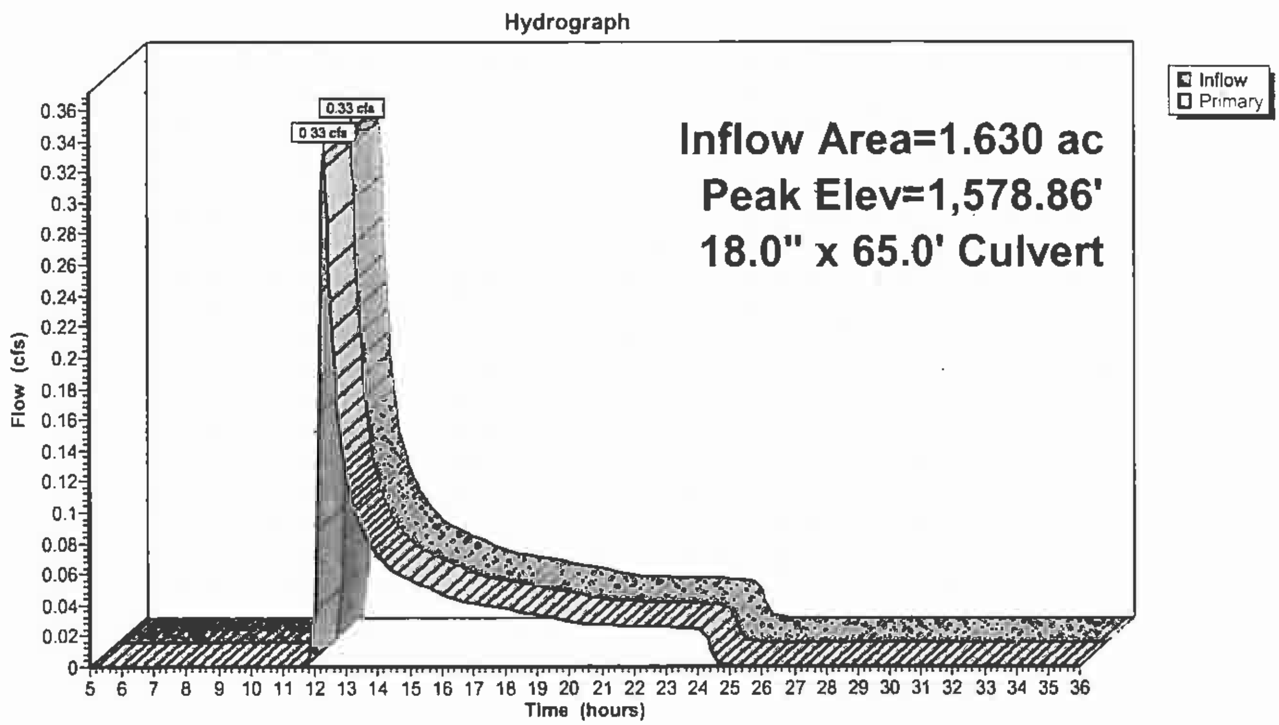
Inflow Area =	1.630 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	0.33 cfs @	12.28 hrs, Volume=	0.056 af	
Outflow =	0.33 cfs @	12.28 hrs, Volume=	0.056 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.33 cfs @	12.28 hrs, Volume=	0.056 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,578.86' @ 12.28 hrs
Flood Elev= 1,582.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,578.60'	**18.0" x 65.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,577.90' S= 0.0108 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.33 cfs @ 12.28 hrs HW=1,578.86' (Free Discharge)
└─1=**Culvert** (Barrel Controls 0.33 cfs @ 2.41 fps)

Pond CV83: CV83



Pond CV86: CV86

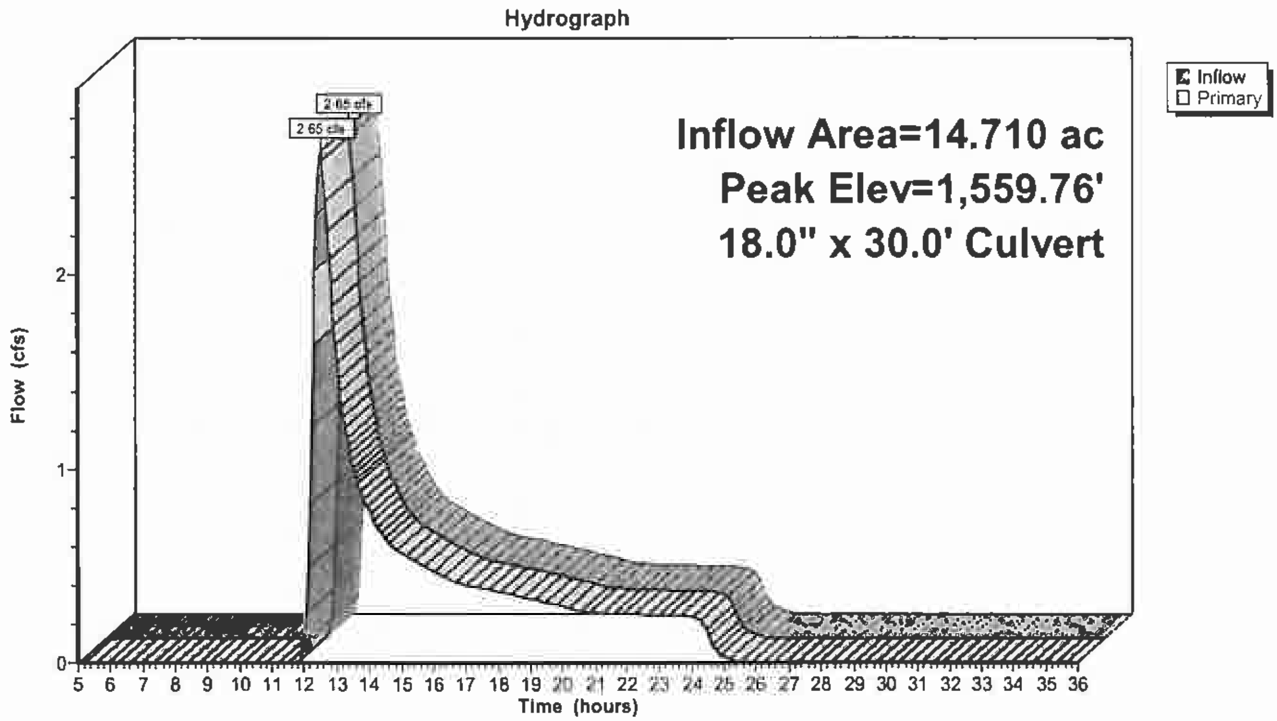
Inflow Area =	14.710 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	2.65 cfs @ 12.50 hrs, Volume=	0.552 af	
Outflow =	2.65 cfs @ 12.50 hrs, Volume=	0.552 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.65 cfs @ 12.50 hrs, Volume=	0.552 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,559.76' @ 12.50 hrs
Flood Elev= 1,562.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,559.00'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,558.50' S= 0.0167 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.64 cfs @ 12.50 hrs HW=1,559.76' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.64 cfs @ 4.27 fps)

Pond CV86: CV86



Pond CV88: CV88

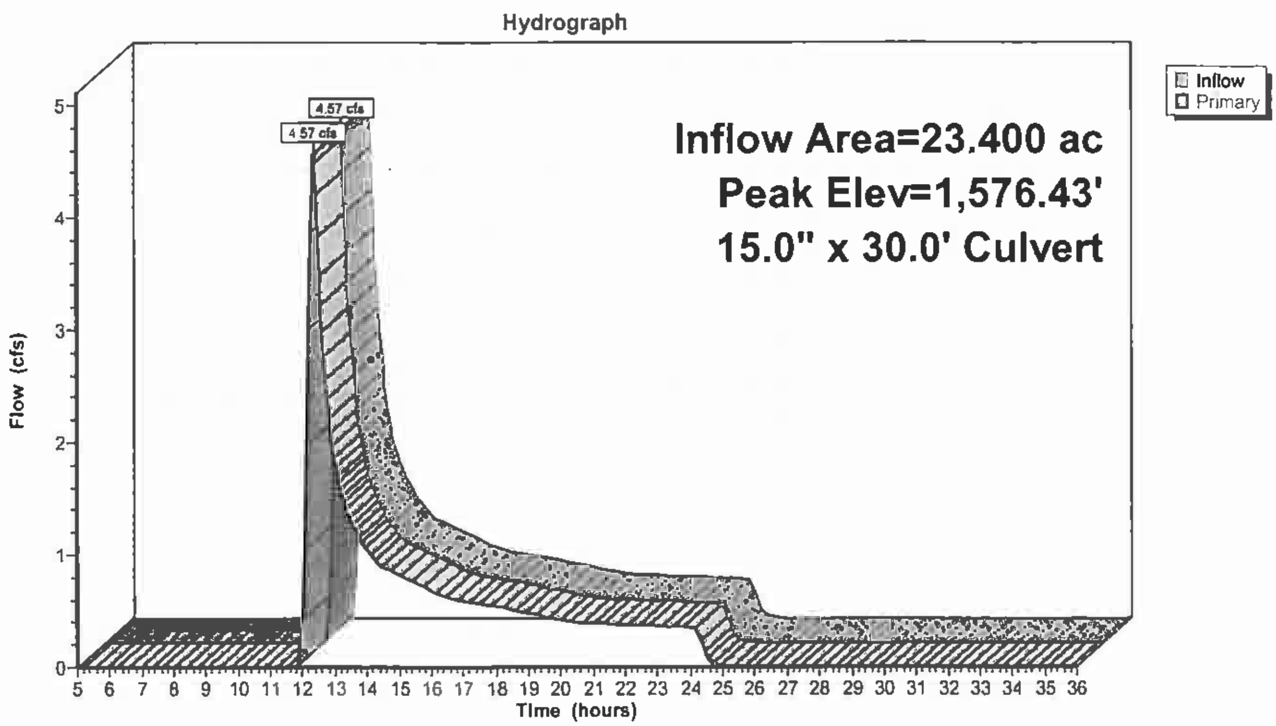
Inflow Area = 23.400 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 4.57 cfs @ 12.31 hrs, Volume= 0.802 af
Outflow = 4.57 cfs @ 12.31 hrs, Volume= 0.802 af, Atten= 0%, Lag= 0.0 min
Primary = 4.57 cfs @ 12.31 hrs, Volume= 0.802 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,576.43' @ 12.31 hrs
Flood Elev= 1,578.43'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,575.18'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,574.75' S= 0.0143 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.55 cfs @ 12.31 hrs HW=1,576.42' (Free Discharge)
└─**1=Culvert** (Barrel Controls 4.55 cfs @ 4.63 fps)

Pond CV88: CV88



Pond CV89: CV89

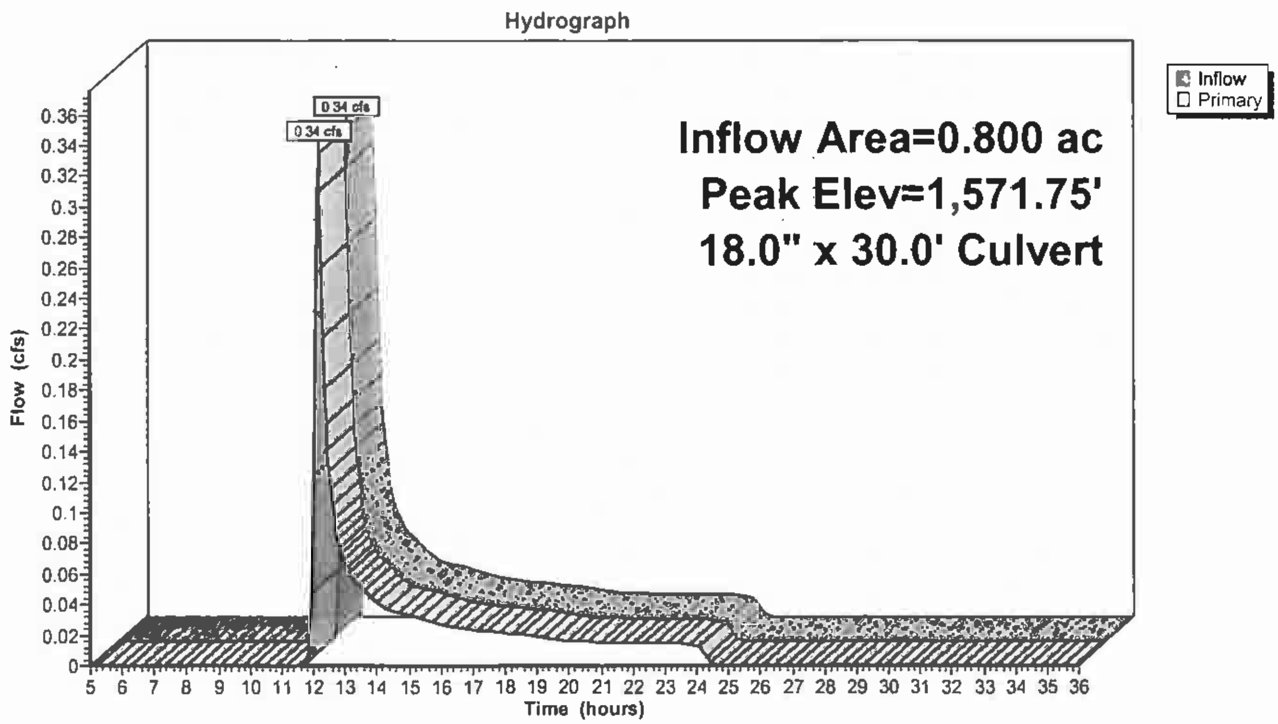
Inflow Area =	0.800 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	0.34 cfs @ 12.15 hrs, Volume=	0.035 af	
Outflow =	0.34 cfs @ 12.15 hrs, Volume=	0.035 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.34 cfs @ 12.15 hrs, Volume=	0.035 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,571.75' @ 12.15 hrs
Flood Elev= 1,575.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,571.50'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,570.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.33 cfs @ 12.15 hrs HW=1,571.75' (Free Discharge)
└─1=**Culvert** (Inlet Controls 0.33 cfs @ 1.71 fps)

Pond CV89: CV89



Pond CV90: CV90

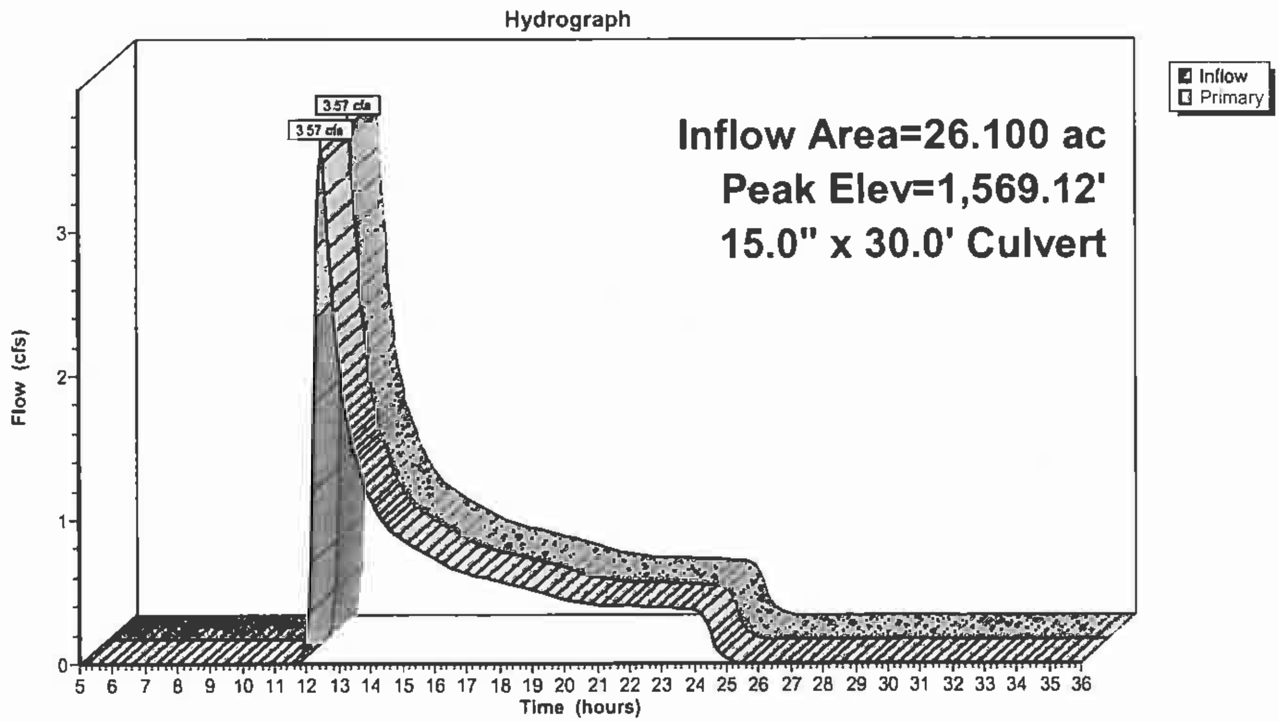
Inflow Area = 26.100 ac, Inflow Depth = 0.37" for 10-YR event
Inflow = 3.57 cfs @ 12.47 hrs, Volume= 0.813 af
Outflow = 3.57 cfs @ 12.47 hrs, Volume= 0.813 af, Atten= 0%, Lag= 0.0 min
Primary = 3.57 cfs @ 12.47 hrs, Volume= 0.813 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,569.12' @ 12.47 hrs
Flood Elev= 1,571.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,568.00'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,567.70' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.56 cfs @ 12.47 hrs HW=1,569.12' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.56 cfs @ 4.07 fps)

Pond CV90: CV90



Pond CV93: CV93

Inflow Area = 4.250 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.25 cfs @ 12.18 hrs, Volume= 0.159 af
Outflow = 1.25 cfs @ 12.18 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.18 hrs, Volume= 0.159 af

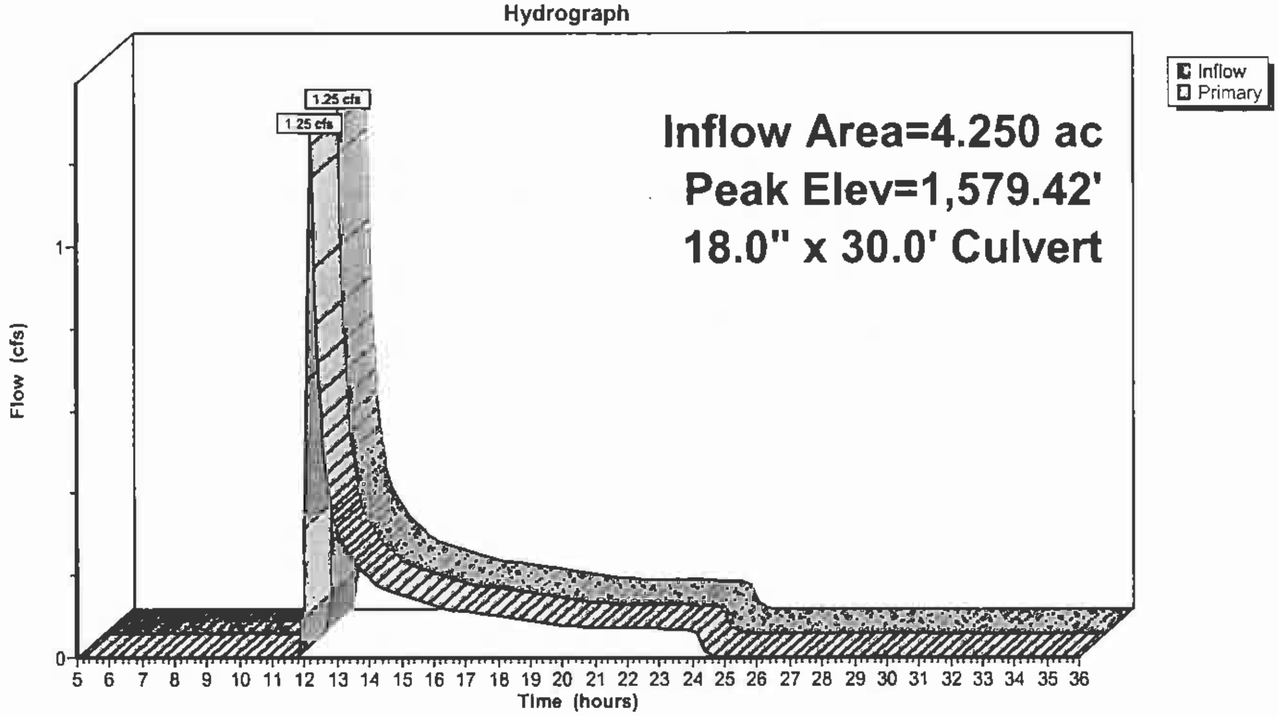
Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,579.42' @ 12.18 hrs
Flood Elev= 1,582.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,578.87'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,578.57' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.23 cfs @ 12.18 hrs HW=1,579.42' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.23 cfs @ 3.14 fps)

Pond CV93: CV93

Hydrograph



Pond CV96: CV96

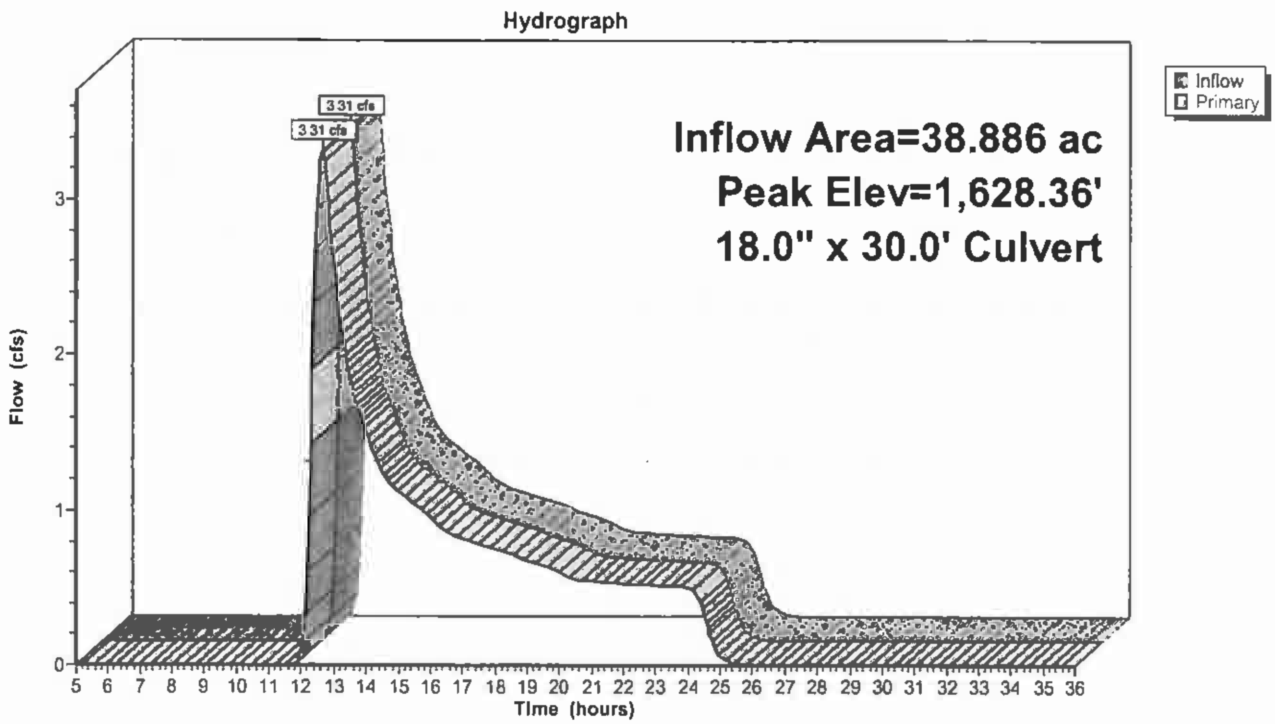
Inflow Area =	38.886 ac,	Inflow Depth = 0.30"	for 10-YR event	
Inflow =	3.31 cfs @	12.61 hrs, Volume=	0.983 af	
Outflow =	3.31 cfs @	12.61 hrs, Volume=	0.983 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.31 cfs @	12.61 hrs, Volume=	0.983 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,628.36' @ 12.61 hrs
Flood Elev= 1,631.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,627.50'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,626.50' S= 0.0333 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.30 cfs @ 12.61 hrs HW=1,628.36' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.30 cfs @ 3.15 fps)

Pond CV96: CV96



Pond CV97: CV97

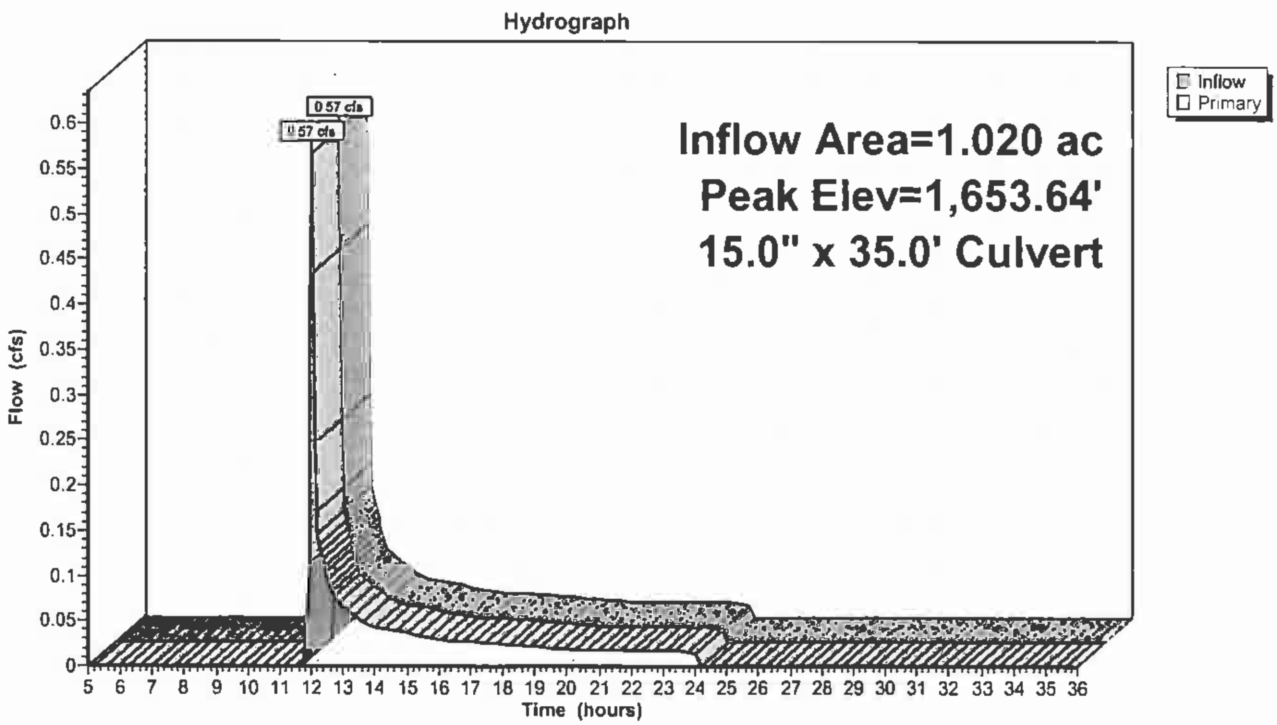
Inflow Area = 1.020 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 0.57 cfs @ 12.00 hrs, Volume= 0.038 af
Outflow = 0.57 cfs @ 12.00 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 12.00 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,653.64' @ 12.00 hrs
Flood Elev= 1,656.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,653.25'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,652.95' S= 0.0086 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.55 cfs @ 12.00 hrs HW=1,653.64' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.55 cfs @ 2.56 fps)

Pond CV97: CV97



Pond CV98: CV98

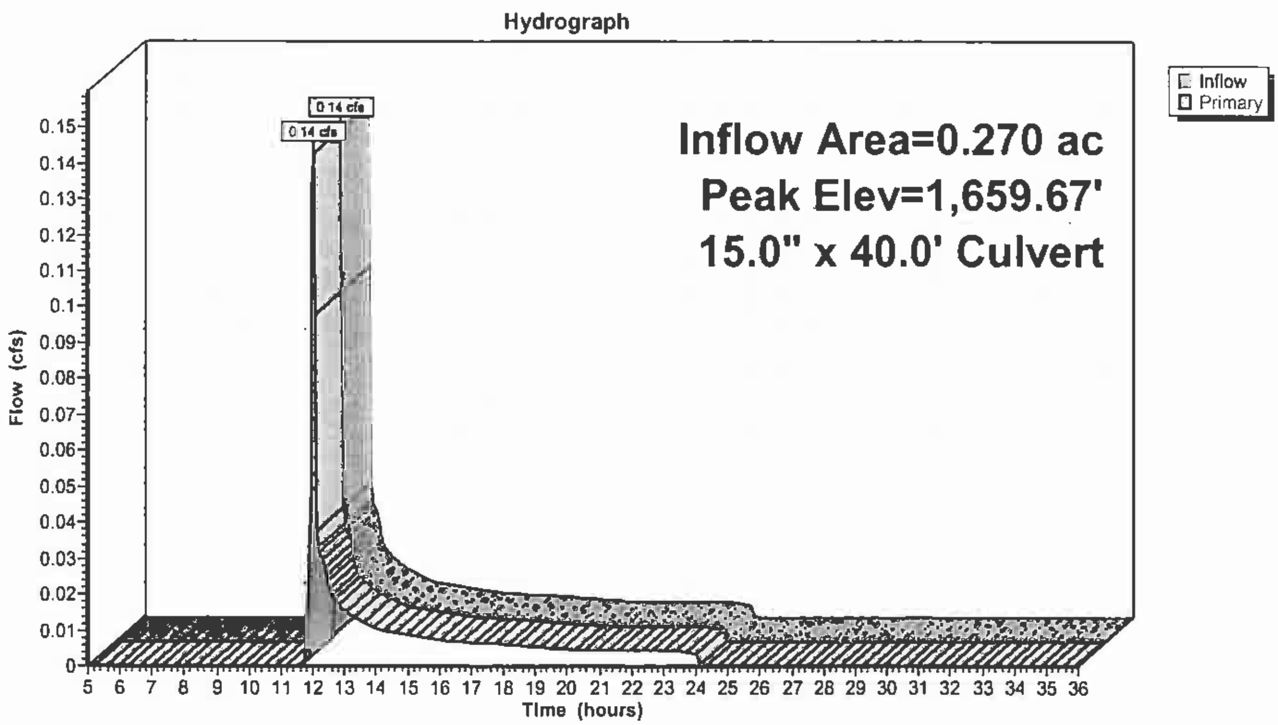
Inflow Area = 0.270 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 0.14 cfs @ 11.97 hrs, Volume= 0.009 af
Outflow = 0.14 cfs @ 11.97 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 11.97 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,659.67' @ 11.97 hrs
Flood Elev= 1,663.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,659.50'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,657.00' S= 0.0625 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.13 cfs @ 11.97 hrs HW=1,659.66' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 0.13 cfs @ 1.38 fps)

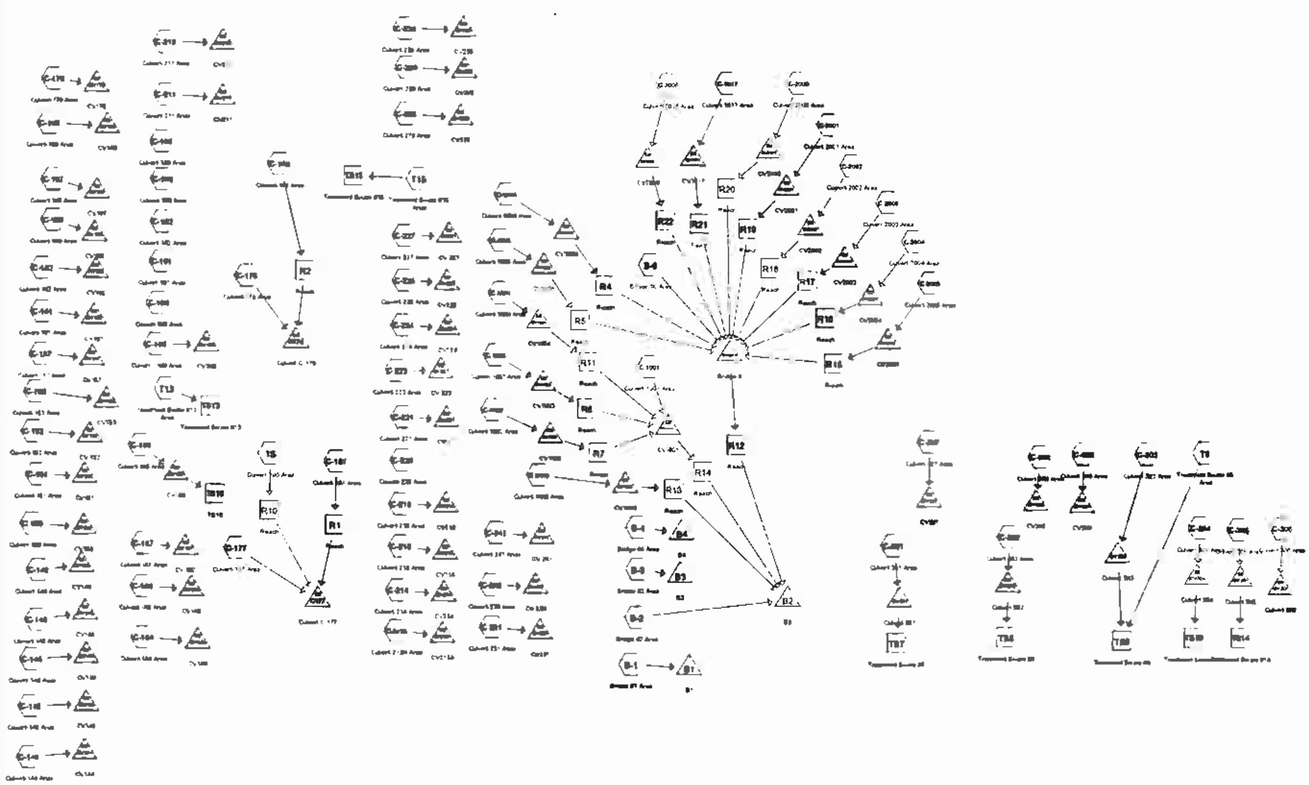
Pond CV98: CV98



Existing Road Culverts (142-309)
(Dummer Pond Road)

&

Existing Road Culverts (1000-1017), (2000-2007)
(Fishbrook Spur)



Subcat Reach Pond Link

Drainage Diagram for Xrds-Culvert-SIZING142-1007
Prepared by Horizons Engineering, PLLC (JCD) 7/10/2008
HydroCAD® 8.00 s/n 002765 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
2.090	36	Brush, Good, HSG B (B-2,B-3,B-3)
68.060	42	Woods, Good, HSG B (B-2,B-3,B-3)
263.025	49	Brush, Good, HSG C (1S,B-1,B-2,B-3,B-3,B-4,B-6,C-1000,C-1001,C-1002,C-1003,C-1004,C
0.710	49	Pasture/grassland/range, Good, HSG C (C-211)
1,375.281	53	Woods, Good, HSG C (B-1,B-2,B-3,B-3,B-3,B-4,B-6,C-1000,C-1001,C-1002,C-1003,C-1004
0.400	55	Brush, Good, HSG C (C-197)
283.183	55	Brush, Good, HSG D (1S,B-1,B-2,B-3,B-4,B-6,C-1000,C-1003,C-1004,C-1006,C-1017,C-14
14.210	58	Brush, Good, HSG D (C-233)
1,227.088	58	Woods, Good, HSG D (1S,B-1,B-2,B-3,B-3,B-3,B-4,B-6,C-1000,C-1002,C-1003,C-1004,C-1
25.614	89	Gravel roads, HSG C (1S,B-1,B-2,B-3,B-4,B-6,C-1000,C-1001,C-1002,C-1003,C-1004,C-10
4.258	91	Gravel roads, HSG D (B-2,C-1003,C-1004)
3,263.919		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Culvert-196 Area Runoff Area=10.970 ac Runoff Depth=0.37"
Flow Length=2,552' Tc=19.8 min CN=52 Runoff=2.18 cfs 0.342 af

Subcatchment B-1: Bridge #1 Area Runoff Area=666.147 ac Runoff Depth=0.45"
Flow Length=11,586' Tc=51.8 min CN=54 Runoff=101.00 cfs 24.991 af

Subcatchment B-2: Bridge #2 Area Runoff Area=391.580 ac Runoff Depth=0.53"
Flow Length=7,599' Tc=45.6 min CN=56 Runoff=85.03 cfs 17.371 af

Subcatchment B-3: Bridge #3 Area Runoff Area=407.020 ac Runoff Depth=0.45"
Flow Length=5,480' Tc=34.8 min CN=54 Runoff=79.68 cfs 15.270 af

Subcatchment B-4: Bridge #4 Area Runoff Area=311.000 ac Runoff Depth=0.58"
Flow Length=9,525' Tc=37.0 min CN=57 Runoff=88.47 cfs 14.916 af

Subcatchment B-6: Bridge #6 Area Runoff Area=100.218 ac Runoff Depth=0.45"
Flow Length=6,116' Tc=84.1 min CN=54 Runoff=11.10 cfs 3.760 af

Subcatchment C-1000: Culvert-1000 Area Runoff Area=24.540 ac Runoff Depth=0.45"
Flow Length=2,065' Tc=37.3 min CN=54 Runoff=4.59 cfs 0.921 af

Subcatchment C-1001: Culvert-1001 Area Runoff Area=11.570 ac Runoff Depth=0.49"
Flow Length=1,123' Tc=19.7 min CN=55 Runoff=3.88 cfs 0.473 af

Subcatchment C-1002: Culvert-1002 Area Runoff Area=12.920 ac Runoff Depth=0.45"
Flow Length=2,603' Tc=25.4 min CN=54 Runoff=3.12 cfs 0.485 af

Subcatchment C-1003: Culvert-1003 Area Runoff Area=24.553 ac Runoff Depth=0.53"
Flow Length=2,901' Tc=46.7 min CN=56 Runoff=5.24 cfs 1.089 af

Subcatchment C-1004: Culvert-1004 Area Runoff Area=22.910 ac Runoff Depth=0.49"
Flow Length=3,295' Tc=42.0 min CN=55 Runoff=4.59 cfs 0.937 af

Subcatchment C-1005: Culvert-1005 Area Runoff Area=21.110 ac Runoff Depth=0.45"
Flow Length=3,064' Tc=30.1 min CN=54 Runoff=4.55 cfs 0.792 af

Subcatchment C-1006: Culvert-1006 Area Runoff Area=45.595 ac Runoff Depth=0.53"
Flow Length=2,634' Tc=33.5 min CN=56 Runoff=12.21 cfs 2.023 af

Subcatchment C-1017: Culvert-1017 Area Runoff Area=24.494 ac Runoff Depth=0.45"
Flow Length=2,813' Tc=22.7 min CN=54 Runoff=6.38 cfs 0.919 af

Subcatchment C-144: Culvert-144 Area Runoff Area=3.040 ac Runoff Depth=0.45"
Flow Length=1,615' Tc=17.7 min CN=54 Runoff=0.94 cfs 0.114 af

Subcatchment C-145: Culvert-145 Area Runoff Area=1.880 ac Runoff Depth=0.53"
Flow Length=940' Tc=13.6 min CN=56 Runoff=0.93 cfs 0.083 af

Subcatchment C-146: Culvert-146 Area Runoff Area=12.970 ac Runoff Depth=0.49"
Flow Length=2,459' Tc=38.9 min CN=55 Runoff=2.73 cfs 0.530 af

Subcatchment C-148: Culvert-148 Area Runoff Area=6.700 ac Runoff Depth=0.58"
Flow Length=2,425' Tc=23.5 min CN=57 Runoff=2.63 cfs 0.321 af

Subcatchment C-149: Culvert-149 Area Runoff Area=13.410 ac Runoff Depth=0.58"
Flow Length=3,080' Tc=28.4 min CN=57 Runoff=4.60 cfs 0.643 af

Subcatchment C-150: Culvert-150 Area Runoff Area=17.870 ac Runoff Depth=0.53"
Flow Length=2,595' Tc=23.1 min CN=56 Runoff=6.22 cfs 0.793 af

Subcatchment C-151: Culvert-151 Area Runoff Area=2.340 ac Runoff Depth=0.58"
Flow Length=846' Tc=10.3 min CN=57 Runoff=1.54 cfs 0.112 af

Subcatchment C-152: Culvert-152 Area Runoff Area=95.420 ac Runoff Depth=0.41"
Flow Length=4,070' Tc=38.0 min CN=53 Runoff=15.02 cfs 3.270 af

Subcatchment C-153: Culvert-153 Area Runoff Area=1.160 ac Runoff Depth=0.53"
Flow Length=1,006' Tc=12.6 min CN=56 Runoff=0.60 cfs 0.051 af

Subcatchment C-157: Culvert-157 Area Runoff Area=6.670 ac Runoff Depth=0.41"
Flow Length=1,329' Tc=19.3 min CN=53 Runoff=1.63 cfs 0.229 af

Subcatchment C-161: Culvert-161 Area Runoff Area=13.960 ac Runoff Depth=0.41"
Flow Length=3,070' Tc=28.4 min CN=53 Runoff=2.64 cfs 0.478 af

Subcatchment C-162: Culvert-162 Area Runoff Area=11.050 ac Runoff Depth=0.45"
Flow Length=2,868' Tc=23.2 min CN=54 Runoff=2.84 cfs 0.415 af

Subcatchment C-166: Culvert-166 Area Runoff Area=5.400 ac Runoff Depth=0.45"
Flow Length=3,040' Tc=26.2 min CN=54 Runoff=1.28 cfs 0.203 af

Subcatchment C-167: Culvert-167 Area Runoff Area=11.517 ac Runoff Depth=0.49"
Flow Length=2,472' Tc=23.1 min CN=55 Runoff=3.46 cfs 0.471 af

Subcatchment C-169: Culvert-169 Area Runoff Area=11.409 ac Runoff Depth=0.45"
Flow Length=2,499' Tc=23.2 min CN=54 Runoff=2.93 cfs 0.428 af

Subcatchment C-170: Culvert-170 Area Runoff Area=8.280 ac Runoff Depth=0.37"
Flow Length=2,553' Tc=22.3 min CN=52 Runoff=1.52 cfs 0.258 af

Subcatchment C-177: Culvert-177 Area Runoff Area=2.240 ac Runoff Depth=0.34"
Flow Length=520' Tc=3.3 min CN=51 Runoff=0.81 cfs 0.063 af

Subcatchment C-178: Culvert-178 Area Runoff Area=2.910 ac Runoff Depth=0.34"
Flow Length=690' Tc=4.2 min CN=51 Runoff=1.03 cfs 0.082 af

Subcatchment C-184: Culvert-184 Area Runoff Area=5.940 ac Runoff Depth=0.41"
Flow Length=2,735' Tc=22.8 min CN=53 Runoff=1.30 cfs 0.204 af

Subcatchment C-186: Culvert-186 Area Runoff Area=1.210 ac Runoff Depth=0.67"
Flow Length=1,218' Tc=16.9 min CN=59 Runoff=0.75 cfs 0.067 af

Subcatchment C-187: Culvert-187 Area Runoff Area=35.640 ac Runoff Depth=0.49"
Flow Length=2,790' Tc=23.9 min CN=55 Runoff=10.48 cfs 1.457 af

Subcatchment C-188: Culvert-188 Area Runoff Area=3.280 ac Runoff Depth=0.58"
Flow Length=1,747' Tc=26.7 min CN=57 Runoff=1.18 cfs 0.157 af

Subcatchment C-189: Culvert - 189 Area Runoff Area=29.530 ac Runoff Depth=0.45"
Flow Length=6,701' Tc=26.4 min CN=54 Runoff=6.94 cfs 1.108 af

Subcatchment C-190: Culvert-190 Area Runoff Area=1.520 ac Runoff Depth=0.30"
Flow Length=827' Tc=7.7 min CN=50 Runoff=0.34 cfs 0.038 af

Subcatchment C-191: Culvert-191 Area Runoff Area=2.520 ac Runoff Depth=0.34"
Flow Length=1,430' Tc=9.9 min CN=51 Runoff=0.63 cfs 0.071 af

Subcatchment C-192: Culvert-192 Area Runoff Area=0.690 ac Runoff Depth=0.30"
Flow Length=610' Tc=6.1 min CN=50 Runoff=0.17 cfs 0.017 af

Subcatchment C-193: Culvert-193 Area Runoff Area=15.580 ac Runoff Depth=0.37"
Flow Length=2,583' Tc=15.8 min CN=52 Runoff=3.60 cfs 0.485 af

Subcatchment C-196: Culvert-196 Area Runoff Area=10.970 ac Runoff Depth=0.37"
Flow Length=2,552' Tc=19.8 min CN=52 Runoff=2.18 cfs 0.342 af

Subcatchment C-197: Culvert-197 Area Runoff Area=5.450 ac Runoff Depth=0.30"
Flow Length=2,190' Tc=20.3 min CN=50 Runoff=0.68 cfs 0.138 af

Subcatchment C-198: Culvert-198 Area Runoff Area=0.960 ac Runoff Depth=0.34"
Flow Length=745' Tc=6.9 min CN=51 Runoff=0.28 cfs 0.027 af

Subcatchment C-2000: Culvert-2000 Area Runoff Area=16.206 ac Runoff Depth=0.37"
Flow Length=1,918' Tc=19.9 min CN=52 Runoff=3.22 cfs 0.505 af

Subcatchment C-2001: Culvert-2001 Area Runoff Area=17.998 ac Runoff Depth=0.41"
Flow Length=2,310' Tc=23.0 min CN=53 Runoff=3.92 cfs 0.617 af

Subcatchment C-2002: Culvert-2002 Area Runoff Area=52.222 ac Runoff Depth=0.49"
Flow Length=3,718' Tc=35.8 min CN=55 Runoff=11.64 cfs 2.135 af

Subcatchment C-2003: Culvert-2003 Area Runoff Area=4.631 ac Runoff Depth=0.45"
Flow Length=1,426' Tc=16.6 min CN=54 Runoff=1.49 cfs 0.174 af

Subcatchment C-2004: Culvert-2004 Area Runoff Area=14.013 ac Runoff Depth=0.67"
Flow Length=2,427' Tc=22.4 min CN=59 Runoff=7.19 cfs 0.778 af

Subcatchment C-2005: Culvert-2005 Area Runoff Area=38.880 ac Runoff Depth=0.62"
Flow Length=2,956' Tc=21.2 min CN=58 Runoff=18.46 cfs 2.009 af

Subcatchment C-2006: Culvert-2006 Area Runoff Area=7.112 ac Runoff Depth=0.34"
Flow Length=2,240' Tc=24.2 min CN=51 Runoff=1.01 cfs 0.200 af

Subcatchment C-211: Culvert-211 Area Runoff Area=8.870 ac Runoff Depth=0.49"
Flow Length=2,123' Tc=28.7 min CN=55 Runoff=2.30 cfs 0.363 af

Subcatchment C-212: Culvert-212 Area Runoff Area=15.830 ac Runoff Depth=0.49"
Flow Length=3,842' Tc=42.2 min CN=55 Runoff=3.17 cfs 0.647 af

Subcatchment C-212A: Culvert-212A Area Runoff Area=35.820 ac Runoff Depth=0.45"
Flow Length=4,226' Tc=44.6 min CN=54 Runoff=5.99 cfs 1.344 af

Subcatchment C-214: Culvert-214 Area Runoff Area=19.150 ac Runoff Depth=0.45"
Flow Length=3,949' Tc=41.9 min CN=54 Runoff=3.33 cfs 0.718 af

Subcatchment C-218: Culvert-218 Area Runoff Area=21.950 ac Runoff Depth=0.49"
Flow Length=3,557' Tc=42.0 min CN=55 Runoff=4.40 cfs 0.897 af

Subcatchment C-219: Culvert-219 Area Runoff Area=7.890 ac Runoff Depth=0.49"
Flow Length=3,127' Tc=37.7 min CN=55 Runoff=1.70 cfs 0.323 af

Subcatchment C-220: Culvert-220 Area Runoff Area=114.860 ac Runoff Depth=0.49"
Flow Length=6,498' Tc=36.1 min CN=55 Runoff=25.47 cfs 4.695 af

Subcatchment C-221: Culvert-221 Area Runoff Area=26.630 ac Runoff Depth=0.53"
Flow Length=5,285' Tc=48.3 min CN=56 Runoff=5.57 cfs 1.181 af

Subcatchment C-223: Culvert-223 Area Runoff Area=51.360 ac Runoff Depth=0.49"
Flow Length=4,806' Tc=45.7 min CN=55 Runoff=9.77 cfs 2.100 af

Subcatchment C-224: Culvert-224 Area Runoff Area=61.000 ac Runoff Depth=0.49"
Flow Length=6,161' Tc=46.1 min CN=55 Runoff=11.52 cfs 2.494 af

Subcatchment C-225: Culvert-225 Area Runoff Area=2.270 ac Runoff Depth=0.67"
Flow Length=507' Tc=18.6 min CN=59 Runoff=1.32 cfs 0.126 af

Subcatchment C-227: Culvert-227 Area Runoff Area=155.804 ac Runoff Depth=0.58"
Flow Length=7,295' Tc=36.8 min CN=57 Runoff=44.57 cfs 7.473 af

Subcatchment C-228: Culvert-228 Area Runoff Area=13.900 ac Runoff Depth=0.49"
Flow Length=2,385' Tc=24.5 min CN=55 Runoff=4.02 cfs 0.568 af

Subcatchment C-229: Culvert-229 Area Runoff Area=6.470 ac Runoff Depth=0.45"
Flow Length=2,035' Tc=23.5 min CN=54 Runoff=1.65 cfs 0.243 af

Subcatchment C-230: Culvert-230 Area Runoff Area=6.330 ac Runoff Depth=0.45"
Flow Length=2,074' Tc=23.2 min CN=54 Runoff=1.62 cfs 0.237 af

Subcatchment C-231: Culvert-231 Area Runoff Area=2.910 ac Runoff Depth=0.45"
Flow Length=1,292' Tc=19.5 min CN=54 Runoff=0.84 cfs 0.109 af

Subcatchment C-233: Culvert-233 Area Runoff Area=80.740 ac Runoff Depth=0.49"
Flow Length=6,855' Tc=39.4 min CN=55 Runoff=16.90 cfs 3.301 af

Subcatchment C-241: Culvert-241 Area Runoff Area=11.330 ac Runoff Depth=0.41"
Flow Length=3,072' Tc=32.8 min CN=53 Runoff=1.95 cfs 0.388 af

Subcatchment C-301: Culvert 301 Area Runoff Area=1.480 ac Runoff Depth=0.76"
Flow Length=445' Tc=15.5 min CN=61 Runoff=1.18 cfs 0.094 af

Subcatchment C-302: Culvert 302 Area Runoff Area=17.703 ac Runoff Depth=0.41"
Flow Length=3,687' Tc=51.9 min CN=53 Runoff=2.31 cfs 0.607 af

Subcatchment C-303: Culvert 303 Area Runoff Area=5.550 ac Runoff Depth=0.30"
Flow Length=1,187' Tc=12.2 min CN=50 Runoff=0.95 cfs 0.140 af

Subcatchment C-304: Culvert 304 Area Runoff Area=1.140 ac Runoff Depth=0.67"
Flow Length=895' Tc=23.9 min CN=59 Runoff=0.56 cfs 0.063 af

Subcatchment C-305: Culvert 305 Area Runoff Area=1.846 ac Runoff Depth=0.53"
Flow Length=1,253' Tc=16.9 min CN=56 Runoff=0.79 cfs 0.082 af

Subcatchment C-306: Culvert 306 Area Runoff Area=0.590 ac Runoff Depth=0.41"
Flow Length=245' Tc=8.3 min CN=53 Runoff=0.24 cfs 0.020 af

Subcatchment C-307: Culvert 307 Area Runoff Area=5.240 ac Runoff Depth=0.41"
Flow Length=1,318' Tc=18.8 min CN=53 Runoff=1.30 cfs 0.180 af

Subcatchment C-308: Culvert 308 Area Runoff Area=18.030 ac Runoff Depth=0.45"
Flow Length=3,323' Tc=29.0 min CN=54 Runoff=3.98 cfs 0.676 af

Subcatchment C-309: Culvert 309 Area Runoff Area=0.940 ac Runoff Depth=0.53"
Flow Length=282' Tc=13.4 min CN=56 Runoff=0.47 cfs 0.042 af

Subcatchment T13: Treatment Swale #13 Area Runoff Area=0.545 ac Runoff Depth=0.62"
Flow Length=175' Slope=0.0280 '/' Tc=32.0 min CN=58 Runoff=0.19 cfs 0.028 af

Subcatchment T15: Treatment Swale #15 Area Runoff Area=0.302 ac Runoff Depth=0.97"
Flow Length=138' Slope=0.0300 '/' Tc=11.7 min CN=65 Runoff=0.39 cfs 0.024 af

Subcatchment T9: Treatment Swale #9 Area Runoff Area=0.234 ac Runoff Depth=0.71"
Flow Length=185' Tc=4.6 min CN=60 Runoff=0.27 cfs 0.014 af

Reach R1: Reach Avg. Depth=0.04' Max Vel=1.47 fps Inflow=0.68 cfs 0.138 af
n=0.040 L=570.0' S=0.1211 '/' Capacity=196.84 cfs Outflow=0.60 cfs 0.138 af

Reach R10: Reach Avg. Depth=0.11' Max Vel=2.83 fps Inflow=2.18 cfs 0.342 af
n=0.040 L=445.0' S=0.1303 '/' Capacity=138.40 cfs Outflow=2.12 cfs 0.342 af

Reach R11: Reach Avg. Depth=0.14' Max Vel=3.51 fps Inflow=4.59 cfs 0.937 af
n=0.040 L=988.0' S=0.1508 '/' Capacity=192.97 cfs Outflow=4.51 cfs 0.937 af

Reach R12: Reach Avg. Depth=1.41' Max Vel=7.81 fps Inflow=57.66 cfs 13.911 af
n=0.040 L=4,680.0' S=0.0577 '/' Capacity=287.66 cfs Outflow=53.04 cfs 13.910 af

Reach R13: Reach Avg. Depth=0.35' Max Vel=3.66 fps Inflow=4.59 cfs 0.921 af
n=0.040 L=4,560.0' S=0.0572 '/' Capacity=25.79 cfs Outflow=3.44 cfs 0.920 af

Reach R14: Reach Avg. Depth=0.67' Max Vel=5.22 fps Inflow=13.20 cfs 2.983 af
n=0.040 L=4,690.0' S=0.0576 '/' Capacity=287.35 cfs Outflow=11.71 cfs 2.983 af

Reach R15: Reach Avg. Depth=0.63' Max Vel=6.03 fps Inflow=18.46 cfs 2.009 af
n=0.040 L=5,267.0' S=0.0816 '/' Capacity=135.44 cfs Outflow=12.41 cfs 2.009 af

Reach R16: Reach Avg. Depth=0.37' Max Vel=4.52 fps Inflow=7.19 cfs 0.778 af
n=0.040 L=4,850.0' S=0.0825 '/' Capacity=136.13 cfs Outflow=4.54 cfs 0.778 af

Reach R17: Reach Avg. Depth=0.12' Max Vel=2.39 fps Inflow=1.49 cfs 0.174 af
n=0.040 L=4,353.0' S=0.0836 '/' Capacity=137.08 cfs Outflow=0.64 cfs 0.174 af

Reach R18: Reach Avg. Depth=0.56' Max Vel=5.86 fps Inflow=11.64 cfs 2.135 af
n=0.040 L=3,888.0' S=0.0882 '/' Capacity=140.79 cfs Outflow=10.19 cfs 2.135 af

Reach R19: Reach Avg. Depth=0.27' Max Vel=3.95 fps Inflow=3.92 cfs 0.617 af
n=0.040 L=3,793.0' S=0.0883 '/' Capacity=140.88 cfs Outflow=2.69 cfs 0.617 af

Reach R2: Reach Avg. Depth=0.02' Max Vel=0.90 fps Inflow=0.28 cfs 0.027 af
n=0.040 L=630.0' S=0.1421 '/' Capacity=213.24 cfs Outflow=0.14 cfs 0.027 af

Reach R20: Reach Avg. Depth=0.24' Max Vel=3.87 fps Inflow=3.22 cfs 0.505 af
n=0.040 L=2,940.0' S=0.0969 '/' Capacity=147.59 cfs Outflow=2.29 cfs 0.505 af

Reach R21: Reach Avg. Depth=0.38' Max Vel=5.23 fps Inflow=6.38 cfs 0.919 af
n=0.040 L=2,261.0' S=0.1057 '/' Capacity=154.12 cfs Outflow=5.53 cfs 0.919 af

Reach R22: Reach Avg. Depth=0.13' Max Vel=2.71 fps Inflow=1.01 cfs 0.200 af
n=0.040 L=2,251.0' S=0.0991 '/' Capacity=149.20 cfs Outflow=0.77 cfs 0.200 af

Reach R4: Reach Avg. Depth=0.28' Max Vel=4.71 fps Inflow=12.21 cfs 2.023 af
n=0.040 L=1,492.0' S=0.1253 '/' Capacity=740.02 cfs Outflow=11.74 cfs 2.023 af

Reach R5: Reach Avg. Depth=0.16' Max Vel=3.43 fps Inflow=4.55 cfs 0.792 af
n=0.040 L=1,372.0' S=0.1243 '/' Capacity=736.87 cfs Outflow=4.23 cfs 0.792 af

Reach R6: Reach Avg. Depth=0.18' Max Vel=3.98 fps Inflow=5.24 cfs 1.089 af
n=0.040 L=923.0' S=0.1473 '/' Capacity=147.15 cfs Outflow=5.19 cfs 1.089 af

Reach R7: Reach Avg. Depth=0.17' Max Vel=3.36 fps Inflow=3.12 cfs 0.485 af
n=0.040 L=939.0' S=0.1209 '/' Capacity=551.69 cfs Outflow=2.95 cfs 0.485 af

Reach TS10: Treatment Swale #10 Avg. Depth=0.26' Max Vel=0.43 fps Inflow=0.56 cfs 0.063 af
n=0.040 L=100.0' S=0.0010 '/' Capacity=26.55 cfs Outflow=0.53 cfs 0.063 af

Reach TS13: Treatment Swale #13 Inflow=0.19 cfs 0.028 af
Outflow=0.19 cfs 0.028 af

Reach TS14: Treatment Swale #14 Inflow=0.79 cfs 0.082 af
Outflow=0.79 cfs 0.082 af

Reach TS15: Treatment Swale #15 Inflow=0.39 cfs 0.024 af
Outflow=0.39 cfs 0.024 af

Reach TS16: TS16 Avg. Depth=0.31' Max Vel=0.75 fps Inflow=1.18 cfs 0.157 af
n=0.040 L=100.0' S=0.0025 '/' Capacity=41.98 cfs Outflow=1.16 cfs 0.157 af

Reach TS7: Treatment Swale #7 Inflow=1.18 cfs 0.094 af
Outflow=1.18 cfs 0.094 af

Reach TS8: Treatment Swale #8 Avg. Depth=0.59' Max Vel=0.68 fps Inflow=2.31 cfs 0.607 af
n=0.040 L=100.0' S=0.0010 '/' Capacity=26.55 cfs Outflow=2.30 cfs 0.607 af

Reach TS9: Treatment Swale #9 Inflow=1.02 cfs 0.154 af
Outflow=1.02 cfs 0.154 af

Pond B1: B1 Inflow=101.00 cfs 24.991 af
Primary=101.00 cfs 24.991 af

Pond B2: B2 Inflow=126.68 cfs 35.185 af
Primary=126.68 cfs 35.185 af

Pond B3: B3 Inflow=79.68 cfs 15.270 af
Primary=79.68 cfs 15.270 af

Pond B4: B4 Inflow=88.47 cfs 14.916 af
Primary=88.47 cfs 14.916 af

Pond Bridge 6: Bridge 6 Inflow=57.66 cfs 13.911 af
Primary=57.66 cfs 13.911 af

Pond C177: Culvert C-177 Peak Elev=2,059.83' Inflow=2.71 cfs 0.543 af
18.0" x 30.0' Culvert Outflow=2.71 cfs 0.543 af

Pond C178: Culvert C-178 Peak Elev=2,058.16' Inflow=1.03 cfs 0.109 af
24.0" x 30.0' Culvert Outflow=1.03 cfs 0.109 af

Pond Culvert 1001: Cv1001 Peak Elev=2,036.01' Inflow=13.20 cfs 2.983 af
24.0" x 35.0' Culvert Outflow=13.20 cfs 2.983 af

Pond CV 152: CV 152 Peak Elev=1,954.90' Inflow=15.02 cfs 3.270 af
9.00' x 2.00' x 32.0' Culvert Outflow=15.02 cfs 3.270 af

Pond CV 187: CV 187
Peak Elev=2,015.14' Inflow=10.48 cfs 1.457 af
4.00' x 2.00' x 40.0' Culvert Outflow=10.48 cfs 1.457 af

Pond CV 223: CV 223
Peak Elev=2,038.28' Inflow=9.77 cfs 2.100 af
5.00' x 2.00' x 32.0' Culvert Outflow=9.77 cfs 2.100 af

Pond CV 227: CV 227
Peak Elev=2,049.57' Inflow=44.57 cfs 7.473 af
8.00' x 2.00' x 32.0' Culvert Outflow=44.57 cfs 7.473 af

Pond CV 233: CV 233
Peak Elev=2,042.61' Inflow=16.90 cfs 3.301 af
6.00' x 2.00' x 32.0' Culvert Outflow=16.90 cfs 3.301 af

Pond CV 241: CV 241
Peak Elev=2,129.02' Inflow=1.95 cfs 0.388 af
5.00' x 2.00' x 40.0' Culvert Outflow=1.95 cfs 0.388 af

Pond CV1000: CV1000
Peak Elev=2,027.30' Inflow=4.59 cfs 0.921 af
18.0" x 35.0' Culvert Outflow=4.59 cfs 0.921 af

Pond CV1002: CV1002
Peak Elev=2,150.83' Inflow=3.12 cfs 0.485 af
18.0" x 35.0' Culvert Outflow=3.12 cfs 0.485 af

Pond CV1003: CV1003
Peak Elev=2,176.39' Inflow=5.24 cfs 1.089 af
18.0" x 45.0' Culvert Outflow=5.24 cfs 1.089 af

Pond CV1004: CV1004
Peak Elev=2,186.30' Inflow=4.59 cfs 0.937 af
18.0" x 40.0' Culvert Outflow=4.59 cfs 0.937 af

Pond CV1005: CV1005
Peak Elev=2,207.04' Inflow=4.55 cfs 0.792 af
18.0" x 35.0' Culvert Outflow=4.55 cfs 0.792 af

Pond CV1006: CV1006
Peak Elev=2,225.81' Inflow=12.21 cfs 2.023 af
18.0" x 40.0' Culvert Outflow=12.21 cfs 2.023 af

Pond CV1017: CV1017
Peak Elev=2,275.84' Inflow=6.38 cfs 0.919 af
18.0" x 35.0' Culvert Outflow=6.38 cfs 0.919 af

Pond CV144: CV144
Peak Elev=1,907.71' Inflow=0.94 cfs 0.114 af
15.0" x 35.0' Culvert Outflow=0.94 cfs 0.114 af

Pond CV145: CV145
Peak Elev=1,918.58' Inflow=0.93 cfs 0.083 af
18.0" x 35.0' Culvert Outflow=0.93 cfs 0.083 af

Pond CV146: CV146
Peak Elev=1,933.27' Inflow=2.73 cfs 0.530 af
18.0" x 35.0' Culvert Outflow=2.73 cfs 0.530 af

Pond CV148: CV148
Peak Elev=1,948.34' Inflow=2.63 cfs 0.321 af
15.0" x 35.0' Culvert Outflow=2.63 cfs 0.321 af

Pond CV149: CV149
Peak Elev=1,956.50' Inflow=4.60 cfs 0.643 af
18.0" x 30.0' Culvert Outflow=4.60 cfs 0.643 af

Pond CV150: CV150	Peak Elev=1,962.13' Inflow=6.22 cfs 0.793 af 15.0" x 35.0' Culvert Outflow=6.22 cfs 0.793 af
Pond CV151: CV151	Peak Elev=1,960.30' Inflow=1.54 cfs 0.112 af 15.0" x 30.0' Culvert Outflow=1.54 cfs 0.112 af
Pond CV153: CV153	Peak Elev=1,958.86' Inflow=0.60 cfs 0.051 af 15.0" x 30.0' Culvert Outflow=0.60 cfs 0.051 af
Pond CV157: CV157	Peak Elev=1,949.83' Inflow=1.63 cfs 0.229 af 18.0" x 35.0' Culvert Outflow=1.63 cfs 0.229 af
Pond CV161: CV161	Peak Elev=1,975.13' Inflow=2.64 cfs 0.478 af 18.0" x 38.0' Culvert Outflow=2.64 cfs 0.478 af
Pond CV162: CV162	Peak Elev=1,984.32' Inflow=2.84 cfs 0.415 af 18.0" x 38.0' Culvert Outflow=2.84 cfs 0.415 af
Pond CV166: CV166	Peak Elev=2,044.01' Inflow=1.28 cfs 0.203 af 18.0" x 30.0' Culvert Outflow=1.28 cfs 0.203 af
Pond CV167: CV167	Peak Elev=2,066.38' Inflow=3.46 cfs 0.471 af 18.0" x 30.0' Culvert Outflow=3.46 cfs 0.471 af
Pond CV169: CV169	Peak Elev=2,088.72' Inflow=2.93 cfs 0.428 af 24.0" x 40.0' Culvert Outflow=2.93 cfs 0.428 af
Pond CV170: CV170	Peak Elev=2,088.51' Inflow=1.52 cfs 0.258 af 24.0" x 32.0' Culvert Outflow=1.52 cfs 0.258 af
Pond CV184: CV184	Peak Elev=2,043.65' Inflow=1.30 cfs 0.204 af 15.0" x 30.0' Culvert Outflow=1.30 cfs 0.204 af
Pond CV186: CV186	Peak Elev=2,025.41' Inflow=0.75 cfs 0.067 af 15.0" x 35.0' Culvert Outflow=0.75 cfs 0.067 af
Pond CV188: CV188	Peak Elev=2,005.90' Inflow=1.18 cfs 0.157 af 15.0" x 60.0' Culvert Outflow=1.18 cfs 0.157 af
Pond CV189: CV189	Peak Elev=1,995.47' Inflow=6.94 cfs 1.108 af 18.0" x 72.0' Culvert Outflow=6.94 cfs 1.108 af
Pond CV2000: CV2000	Peak Elev=2,320.94' Inflow=3.22 cfs 0.505 af 18.0" x 35.0' Culvert Outflow=3.22 cfs 0.505 af
Pond CV2001: CV2001	Peak Elev=2,374.45' Inflow=3.92 cfs 0.617 af 18.0" x 42.0' Culvert Outflow=3.92 cfs 0.617 af
Pond CV2002: CV2002	Peak Elev=2,380.83' Inflow=11.64 cfs 2.135 af 18.0" x 35.0' Culvert Outflow=11.64 cfs 2.135 af

Pond CV2003: CV2003	Peak Elev=2,399.60'	Inflow=1.49 cfs 0.174 af
	18.0" x 40.0' Culvert	Outflow=1.49 cfs 0.174 af
Pond CV2004: CV2004	Peak Elev=2,437.16'	Inflow=7.19 cfs 0.778 af
	18.0" x 36.0' Culvert	Outflow=7.19 cfs 0.778 af
Pond CV2005: CV2005	Peak Elev=2,468.92'	Inflow=18.46 cfs 2.009 af
	24.0" x 40.0' Culvert	Outflow=18.46 cfs 2.009 af
Pond CV2006: CV2006	Peak Elev=2,258.88'	Inflow=1.01 cfs 0.200 af
	15.0" x 40.0' Culvert	Outflow=1.01 cfs 0.200 af
Pond CV211: CV211	Peak Elev=2,008.77'	Inflow=2.30 cfs 0.363 af
	15.0" x 32.0' Culvert	Outflow=2.30 cfs 0.363 af
Pond CV212: CV212	Peak Elev=2,009.45'	Inflow=3.17 cfs 0.647 af
	15.0" x 30.0' Culvert	Outflow=3.17 cfs 0.647 af
Pond CV212A: CV212A	Peak Elev=2,010.12'	Inflow=5.99 cfs 1.344 af
	18.0" x 30.0' Culvert	Outflow=5.99 cfs 1.344 af
Pond CV214: CV214	Peak Elev=2,010.10'	Inflow=3.33 cfs 0.718 af
	15.0" x 30.0' Culvert	Outflow=3.33 cfs 0.718 af
Pond CV218: CV218	Peak Elev=2,009.51'	Inflow=4.40 cfs 0.897 af
	18.0" x 30.0' Culvert	Outflow=4.40 cfs 0.897 af
Pond CV219: CV219	Peak Elev=2,014.04'	Inflow=1.70 cfs 0.323 af
	18.0" x 30.0' Culvert	Outflow=1.70 cfs 0.323 af
Pond CV221: CV221	Peak Elev=2,010.44'	Inflow=5.57 cfs 1.181 af
	18.0" x 30.0' Culvert	Outflow=5.57 cfs 1.181 af
Pond CV224: CV224	Peak Elev=2,043.48'	Inflow=11.52 cfs 2.494 af
	18.0" x 30.0' Culvert	Outflow=11.52 cfs 2.494 af
Pond CV225: CV225	Peak Elev=2,039.46'	Inflow=1.32 cfs 0.126 af
	18.0" x 35.0' Culvert	Outflow=1.32 cfs 0.126 af
Pond CV228: CV228	Peak Elev=2,042.96'	Inflow=4.02 cfs 0.568 af
	18.0" x 30.0' Culvert	Outflow=4.02 cfs 0.568 af
Pond CV229: CV229	Peak Elev=2,042.16'	Inflow=1.65 cfs 0.243 af
	18.0" x 35.0' Culvert	Outflow=1.65 cfs 0.243 af
Pond CV230: CV230	Peak Elev=2,042.48'	Inflow=1.62 cfs 0.237 af
	18.0" x 35.0' Culvert	Outflow=1.62 cfs 0.237 af
Pond CV231: CV231	Peak Elev=2,043.98'	Inflow=0.84 cfs 0.109 af
	18.0" x 35.0' Culvert	Outflow=0.84 cfs 0.109 af

Pond CV301: Culvert 301 Inflow=1.18 cfs 0.094 af
Primary=1.18 cfs 0.094 af

Pond CV302: Culvert 302 Peak Elev=1,533.26' Inflow=2.31 cfs 0.607 af
15.0" x 60.0' Culvert Outflow=2.31 cfs 0.607 af

Pond CV303: Culvert 303 Inflow=0.95 cfs 0.140 af
Primary=0.95 cfs 0.140 af

Pond CV304: Culvert 304 Peak Elev=1,771.36' Inflow=0.56 cfs 0.063 af
15.0" x 30.0' Culvert Outflow=0.56 cfs 0.063 af

Pond CV305: Culvert 305 Peak Elev=2,049.21' Inflow=0.79 cfs 0.082 af
15.0" x 30.0' Culvert Outflow=0.79 cfs 0.082 af

Pond CV306: Culvert 306 Peak Elev=2,049.02' Inflow=0.24 cfs 0.020 af
15.0" x 30.0' Culvert Outflow=0.24 cfs 0.020 af

Pond CV307: CV307 Peak Elev=2,049.69' Inflow=1.30 cfs 0.180 af
15.0" x 30.0' Culvert Outflow=1.30 cfs 0.180 af

Pond CV308: CV308 Peak Elev=2,153.16' Inflow=3.98 cfs 0.676 af
4.00' x 2.00' x 32.0' Culvert Outflow=3.98 cfs 0.676 af

Pond CV309: CV309 Peak Elev=2,211.36' Inflow=0.47 cfs 0.042 af
15.0" x 30.0' Culvert Outflow=0.47 cfs 0.042 af

Total Runoff Area = 3,263.919 ac Runoff Volume = 132.538 af Average Runoff Depth = 0.49"
100.00% Pervious Area = 3,263.919 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Culvert-196 Area

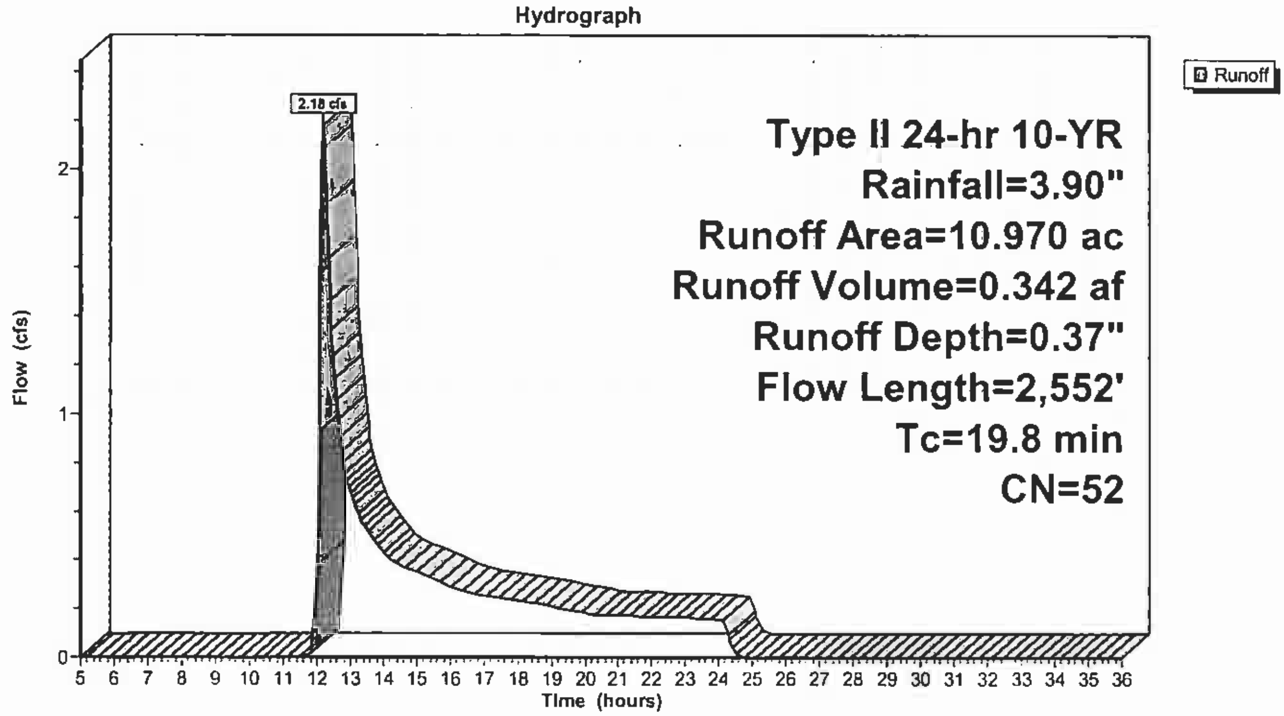
Runoff = 2.18 cfs @ 12.21 hrs, Volume= 0.342 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
6.440	49	Brush, Good, HSG C
1.360	55	Brush, Good, HSG D
3.130	58	Woods, Good, HSG D
10.970	52	Weighted Average
10.970		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.3000	0.21		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.2	558	0.3370	2.90		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.5	1,798	0.2550	3.53		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	96	0.0630	7.89	47.34	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.50' Z= 2.0 '/' Top.W=7.00' n= 0.040
19.8	2,552	Total			

Subcatchment 1S: Culvert-196 Area



Subcatchment B-1: Bridge #1 Area

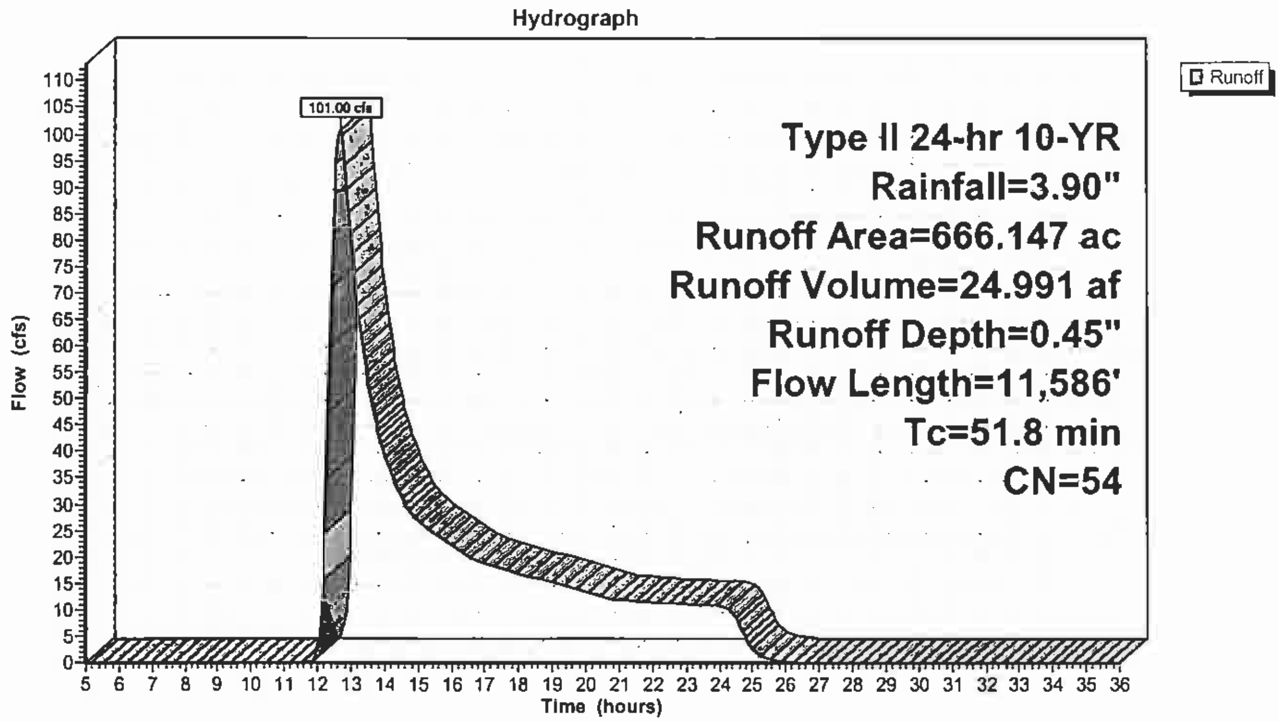
Runoff = 101.00 cfs @ 12.69 hrs, Volume= 24.991 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
7.723	89	Gravel roads, HSG C
32.911	49	Brush, Good, HSG C
489.800	53	Woods, Good, HSG C
53.346	55	Brush, Good, HSG D
82.367	58	Woods, Good, HSG D
666.147	54	Weighted Average
666.147		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.8	355	0.0960	1.55		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
0.2	44	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
17.9	1,562	0.0430	1.45		**Shallow Concentrated Flow, shallow concentrated** Short Grass Pasture Kv= 7.0 fps
6.9	780	0.1440	1.90		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
4.6	4,090	0.1340	14.97	149.72	**Trap/Vee/Rect Channel Flow, channel** Bot.W=3.00' D=2.00' Z= 1.0 '/' Top.W=7.00' n= 0.040
7.0	4,655	0.0520	11.11	244.33	**Trap/Vee/Rect Channel Flow, channel** Bot.W=9.00' D=2.00' Z= 1.0 '/' Top.W=13.00' n= 0.040
51.8	11,586	Total			

Subcatchment B-1: Bridge #1 Area



Subcatchment B-2: Bridge #2 Area

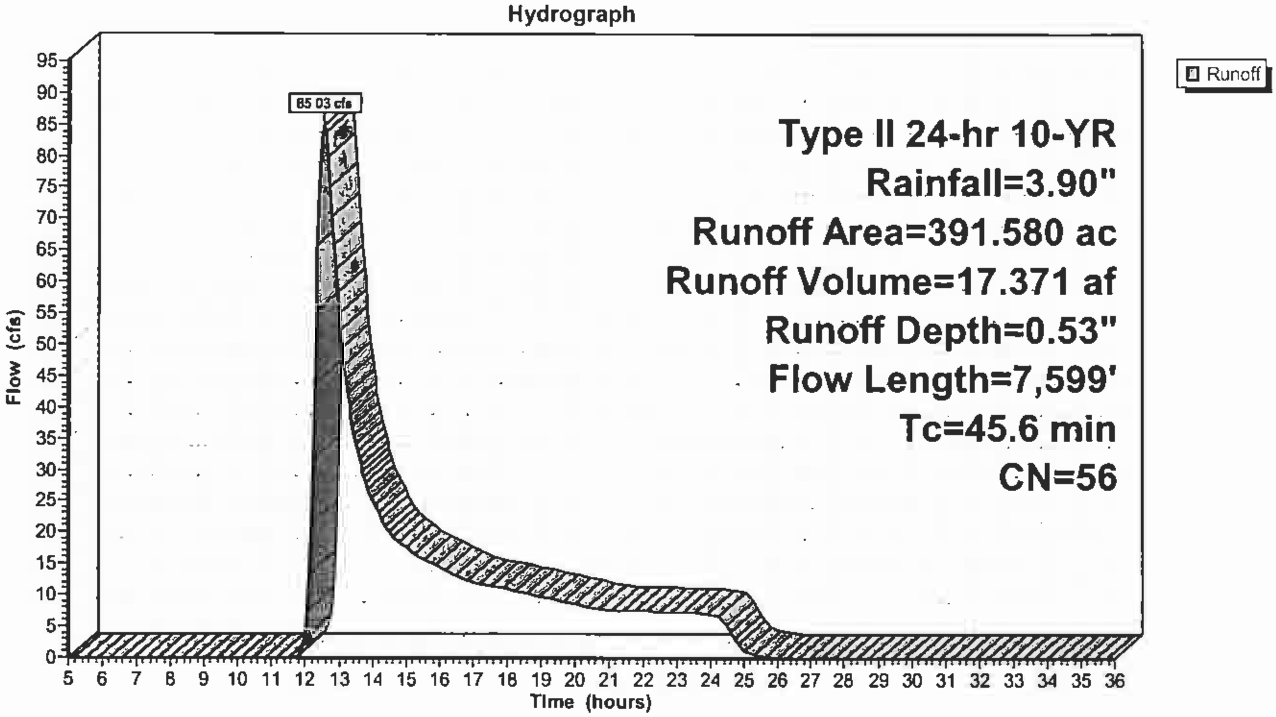
Runoff = 85.03 cfs @ 12.57 hrs, Volume= 17.371 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1.466	89	Gravel roads, HSG C
0.070	36	Brush, Good, HSG B
2.060	42	Woods, Good, HSG B
3.520	49	Brush, Good, HSG C
169.860	53	Woods, Good, HSG C
3.471	55	Brush, Good, HSG D
207.502	58	Woods, Good, HSG D
3.631	91	Gravel roads, HSG D
391.580	56	Weighted Average
391.580		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
2.5	439	0.3550	2.98		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
25.9	3,500	0.2030	2.25		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
4.9	3,560	0.0510	12.15	318.81	**Trap/Vee/Rect Channel Flow, channel** Bot.W=8.00' D=2.50' Z= 1.0 '/' Top.W=13.00' n= 0.040
45.6	7,599	Total			

Subcatchment B-2: Bridge #2 Area



Subcatchment B-3: Bridge #3 Area

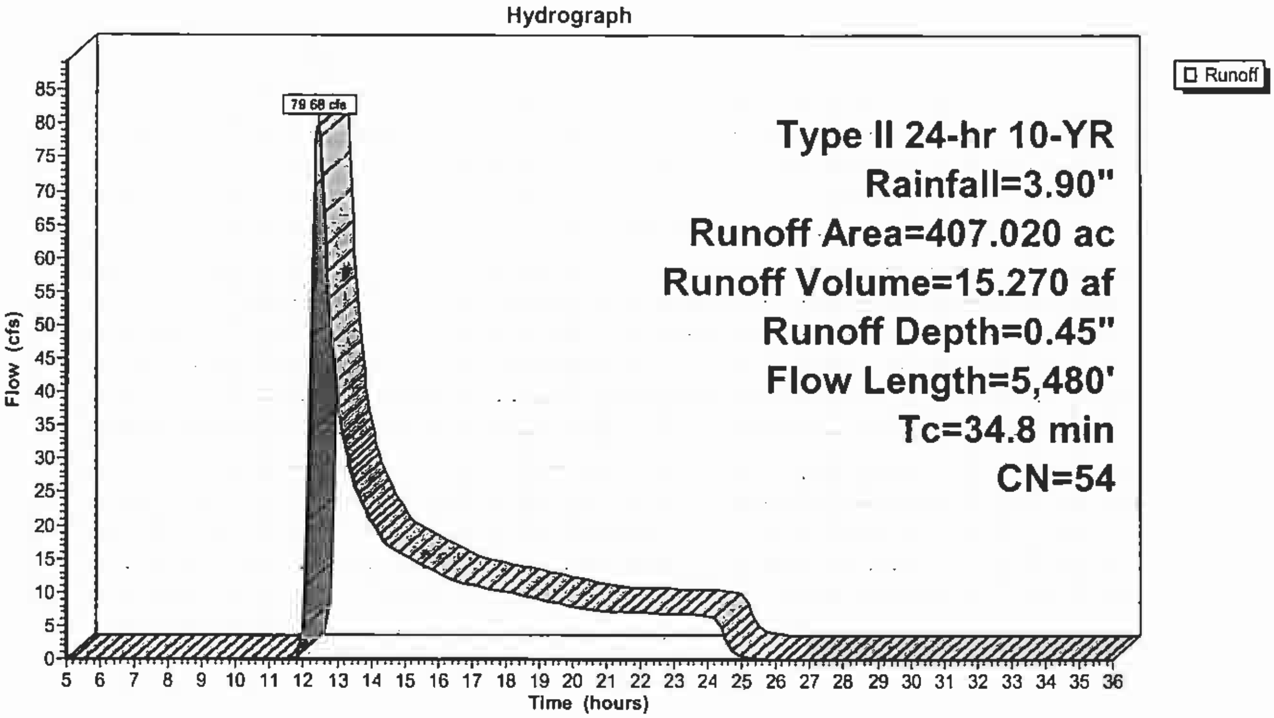
Runoff = 79.68 cfs @ 12.42 hrs, Volume= 15.270 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
1.140	36	Brush, Good, HSG B
52.630	42	Woods, Good, HSG B
7.650	49	Brush, Good, HSG C
54.040	53	Woods, Good, HSG C
0.120	55	Brush, Good, HSG D
205.610	58	Woods, Good, HSG D
1.880	53	Woods, Good, HSG C
6.510	58	Woods, Good, HSG D
47.190	53	Woods, Good, HSG C
1.200	49	Brush, Good, HSG C
13.370	42	Woods, Good, HSG B
0.880	36	Brush, Good, HSG B
14.740	58	Woods, Good, HSG D
407.020	54	Weighted Average
407.020		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.2500	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.9	2,300	0.2660	2.58		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
8.5	855	0.1130	1.68		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
2.9	2,225	0.1020	12.67	114.02	**Trap/Vee/Rect Channel Flow, channel** Bot.W=2.50' D=2.00' Z= 1.0 '/' Top.W=6.50' n= 0.040
34.8	5,480	Total			

Subcatchment B-3: Bridge #3 Area



Subcatchment B-4: Bridge #4 Area

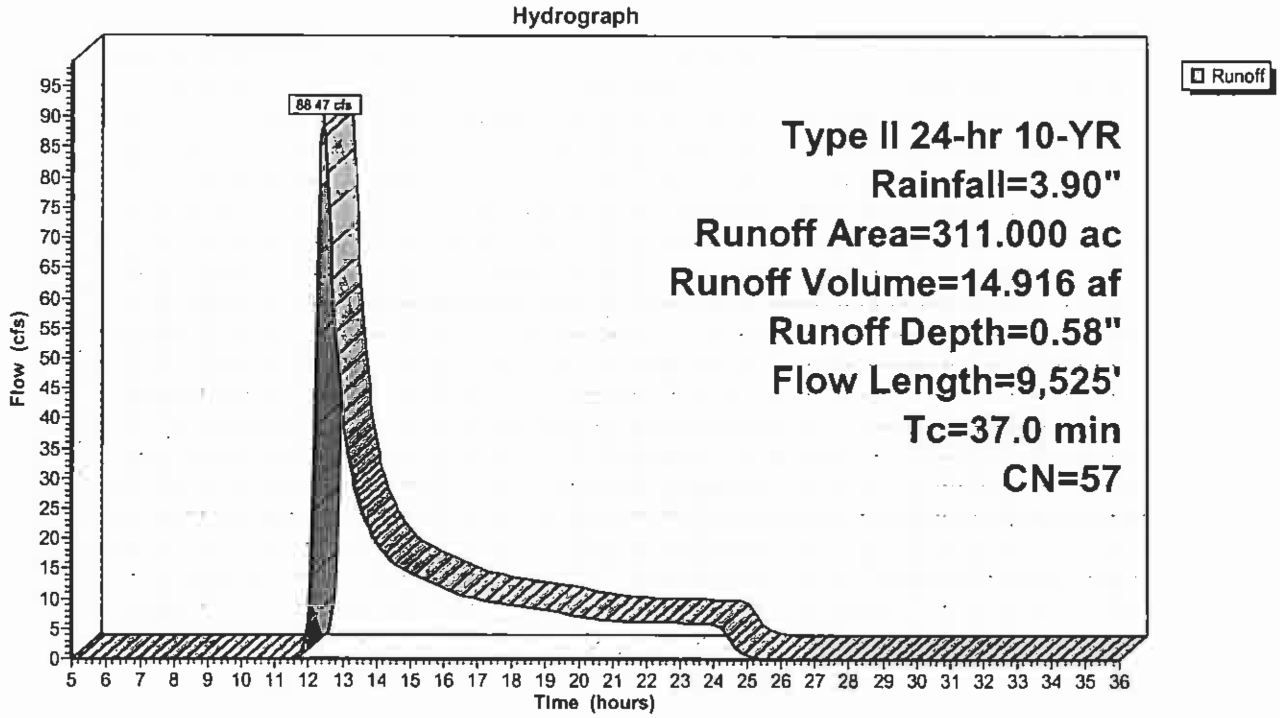
Runoff = 88.47 cfs @ 12.43 hrs, Volume= 14.916 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.020	89	Gravel roads, HSG C
6.460	49	Brush, Good, HSG C
23.120	53	Woods, Good, HSG C
49.220	55	Brush, Good, HSG D
232.180	58	Woods, Good, HSG D
311.000	57	Weighted Average
311.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
14.8	1,900	0.1840	2.14		**Shallow Concentrated Flow, shallow concentrated** Woodland Kv= 5.0 fps
3.4	3,290	0.1660	15.95	318.96	**Trap/Vee/Rect Channel Flow, channel** Bot.W=2.00' D=2.00' Z= 4.0 '/' Top.W=18.00' n= 0.040
2.6	4,235	0.1180	27.00	3,401.73	**Trap/Vee/Rect Channel Flow, channel** Bot.W=3.00' D=6.00' Z= 3.0 '/' Top.W=39.00' n= 0.040
37.0	9,525	Total			

Subcatchment B-4: Bridge #4 Area



Subcatchment B-6: Bridge #6 Area

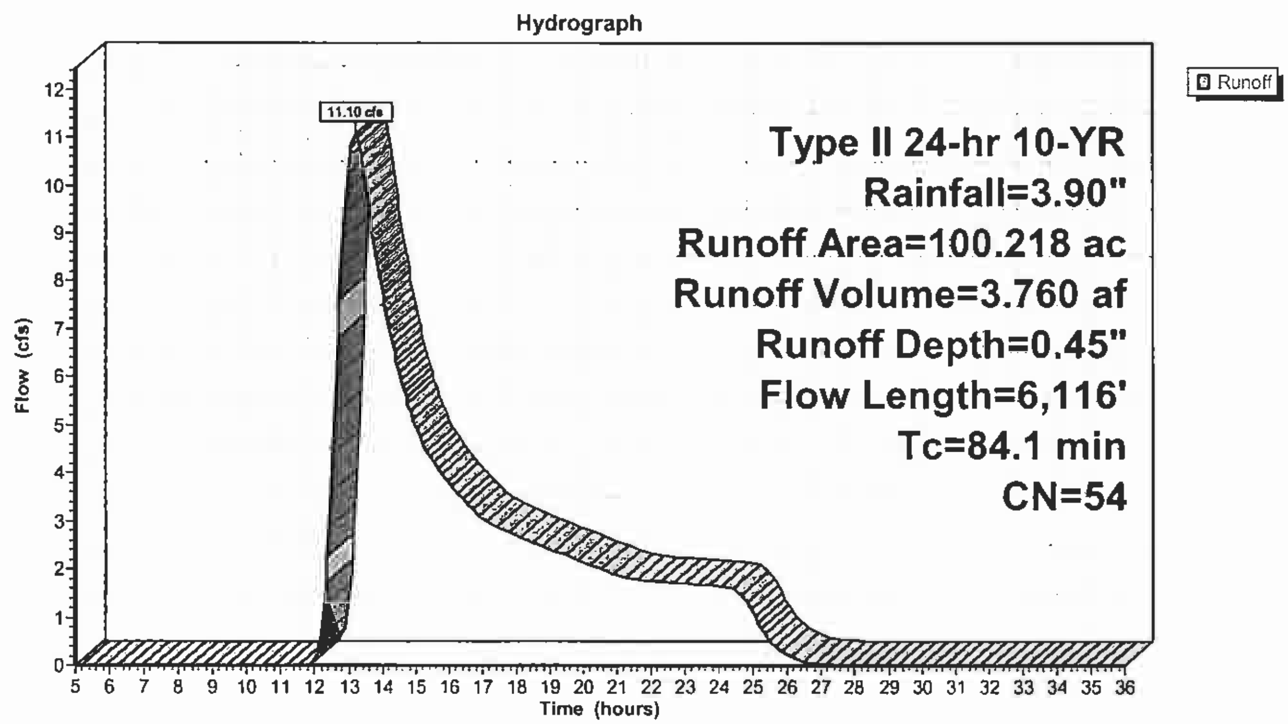
Runoff = 11.10 cfs @ 13.20 hrs, Volume= 3.760 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
2.350	89	Gravel roads, HSG C
1.937	49	Brush, Good, HSG C
82.158	53	Woods, Good, HSG C
4.009	55	Brush, Good, HSG D
9.764	58	Woods, Good, HSG D
100.218	54	Weighted Average
100.218		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
70.0	6,016	0.0820	1.43		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
84.1	6,116	Total			

Subcatchment B-6: Bridge #6 Area



Subcatchment C-1000: Culvert-1000 Area

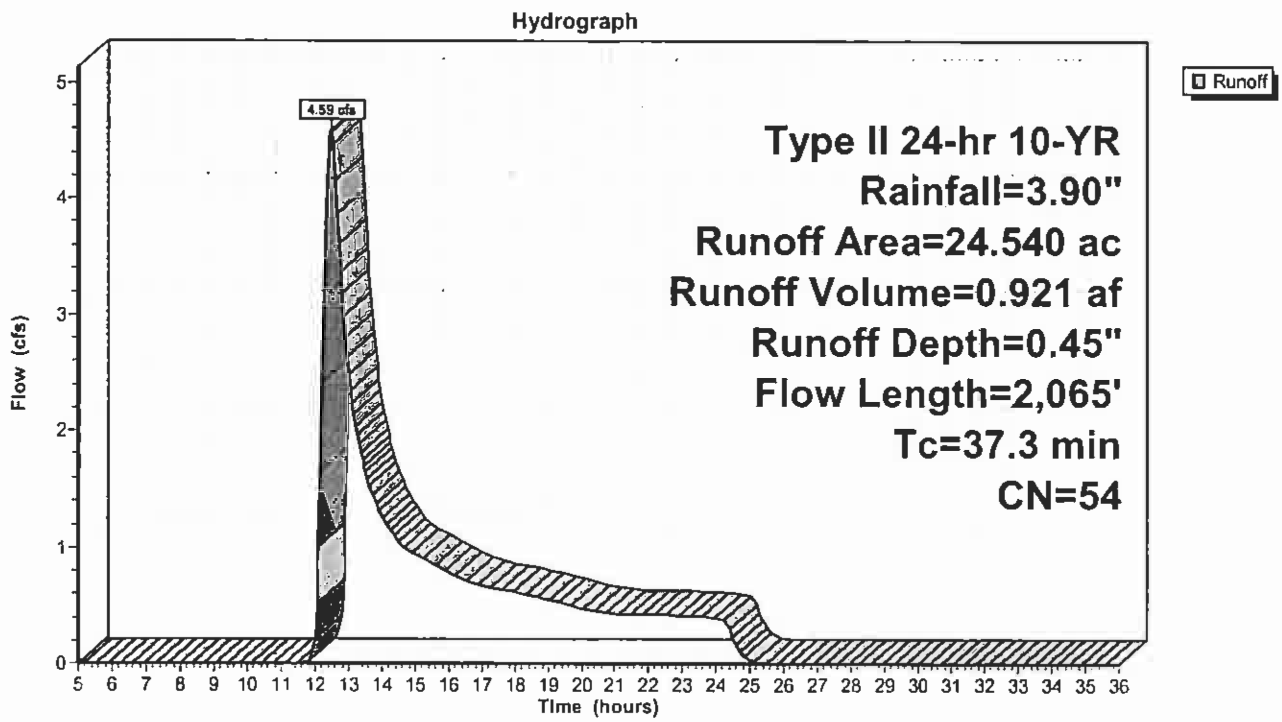
Runoff = 4.59 cfs @ 12.46 hrs, Volume= 0.921 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.480	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
23.410	53	Woods, Good, HSG C
0.160	55	Brush, Good, HSG D
0.430	58	Woods, Good, HSG D
24.540	54	Weighted Average
24.540		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.2	1,890	0.1340	1.83		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	75	0.0400	7.88	126.08	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.040
37.3	2,065	Total			

Subcatchment C-1000: Culvert-1000 Area



Subcatchment C-1001: Culvert-1001 Area

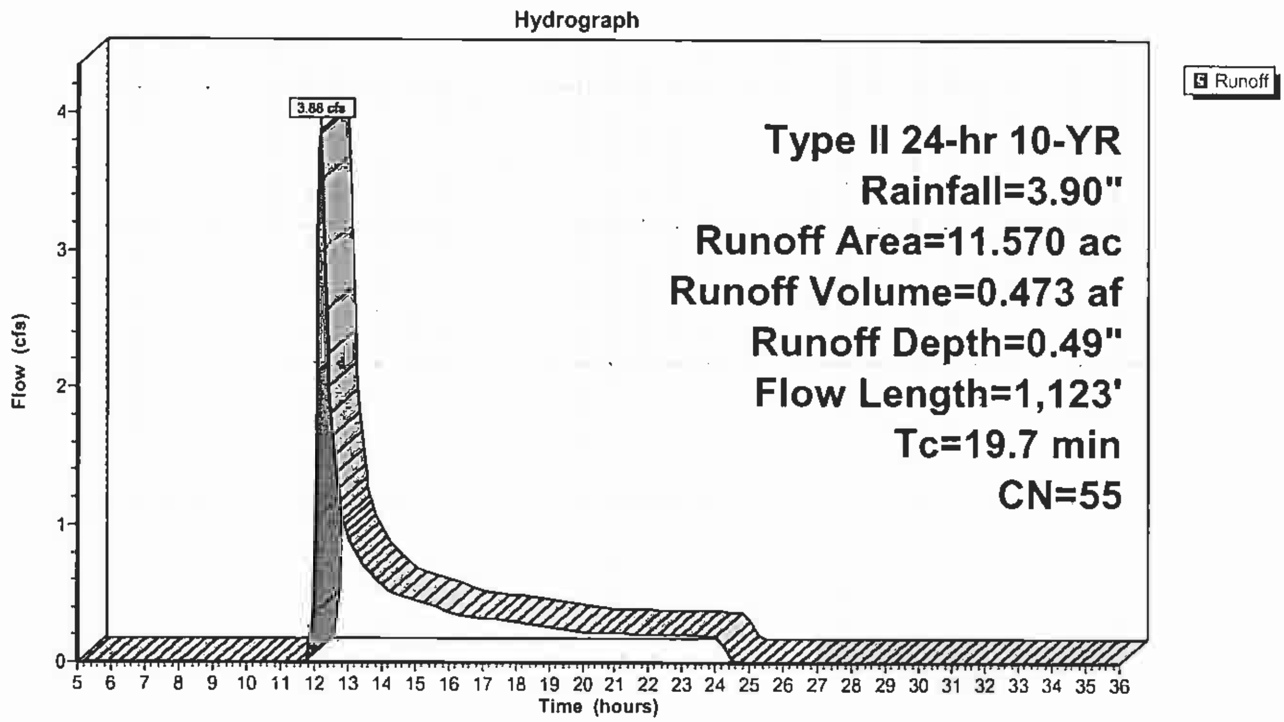
Runoff = 3.88 cfs @ 12.18 hrs, Volume= 0.473 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.520	89	Gravel roads, HSG C
0.270	49	Brush, Good, HSG C
10.780	53	Woods, Good, HSG C
11.570	55	Weighted Average
11.570		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
8.2	976	0.1590	1.99		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	47	0.0420	5.82	29.12	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.00' Z= 2.0 '/' Top.W=7.00' n= 0.040
19.7	1,123	Total			

Subcatchment C-1001: Culvert-1001 Area



Subcatchment C-1002: Culvert-1002 Area

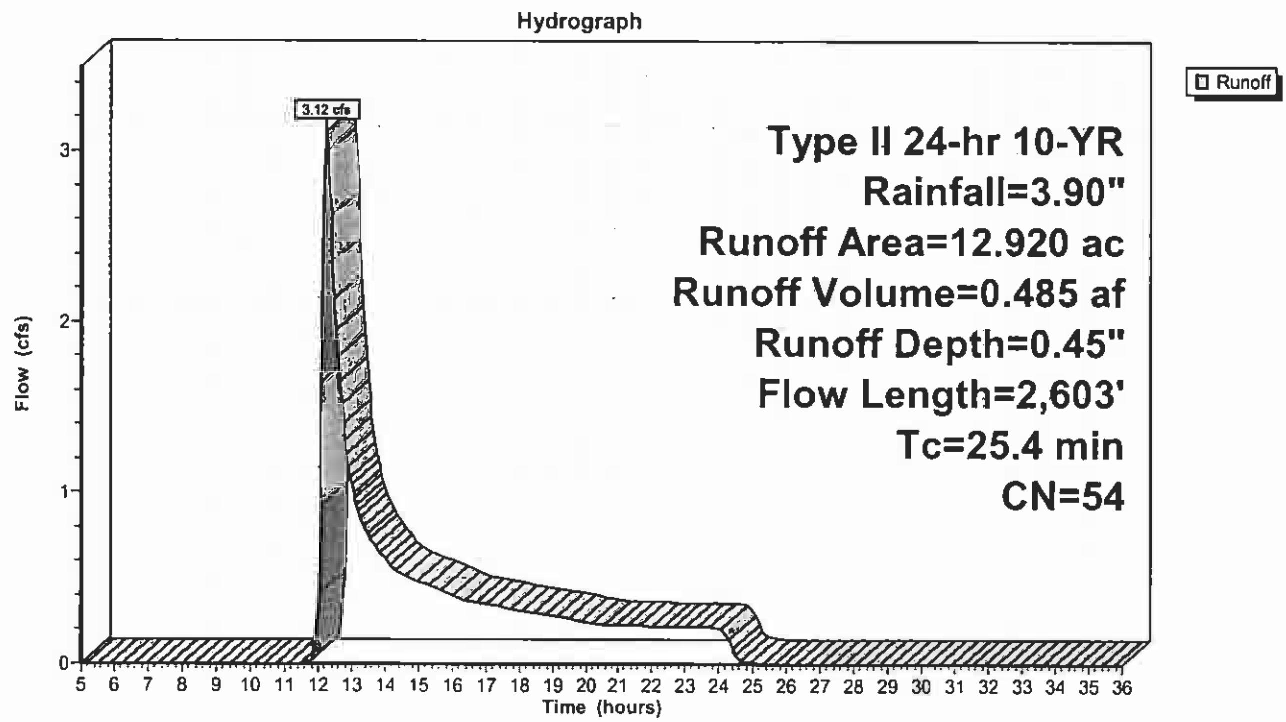
Runoff = 3.12 cfs @ 12.27 hrs, Volume= 0.485 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.091	89	Gravel roads, HSG C
0.081	49	Brush, Good, HSG C
11.644	53	Woods, Good, HSG C
1.104	58	Woods, Good, HSG D
12.920	54	Weighted Average
12.920		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.8	2,300	0.2700	2.60		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	203	0.1180	9.08	45.42	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.040
25.4	2,603	Total			

Subcatchment C-1002: Culvert-1002 Area



Subcatchment C-1003: Culvert-1003 Area

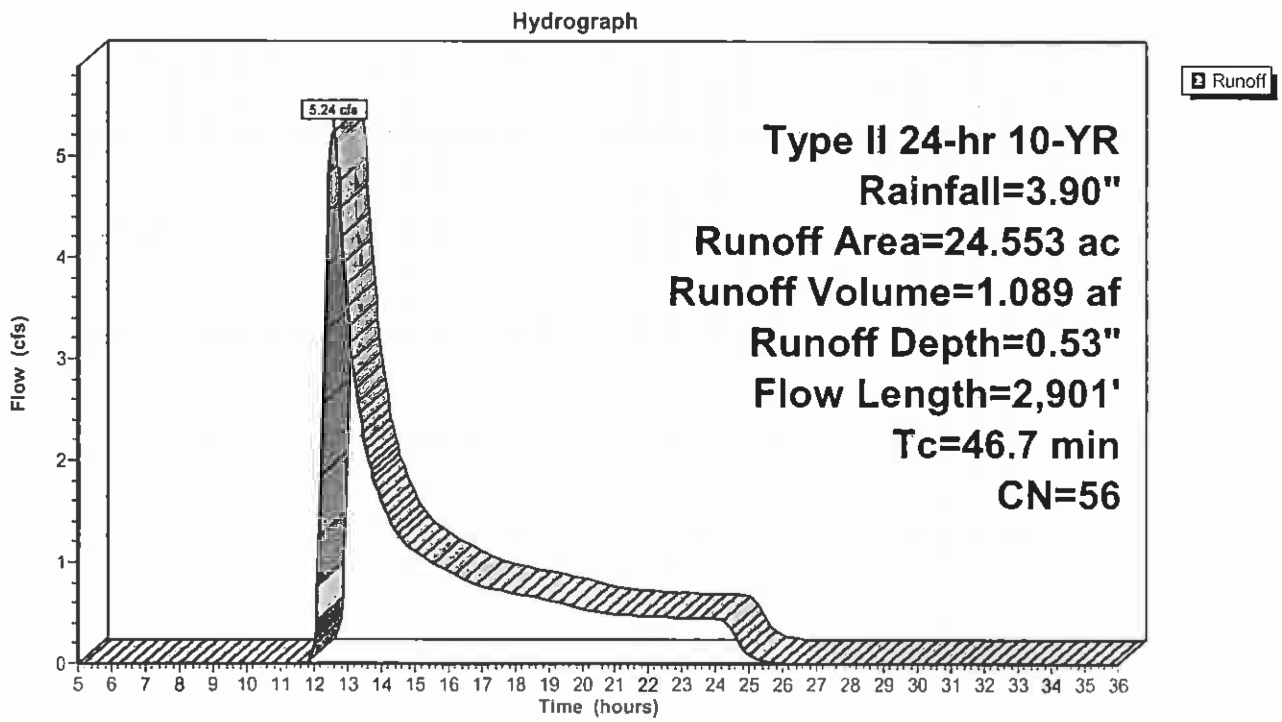
Runoff = 5.24 cfs @ 12.59 hrs, Volume= 1.089 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.061	89	Gravel roads, HSG C
0.082	49	Brush, Good, HSG C
14.559	53	Woods, Good, HSG C
8.794	58	Woods, Good, HSG D
0.460	55	Brush, Good, HSG D
0.597	91	Gravel roads, HSG D
24.553	56	Weighted Average
24.553		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	100	0.0180	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
22.0	2,643	0.1610	2.01		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	158	0.0690	10.38	124.52	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
46.7	2,901	Total			

Subcatchment C-1003: Culvert-1003 Area



Subcatchment C-1004: Culvert-1004 Area

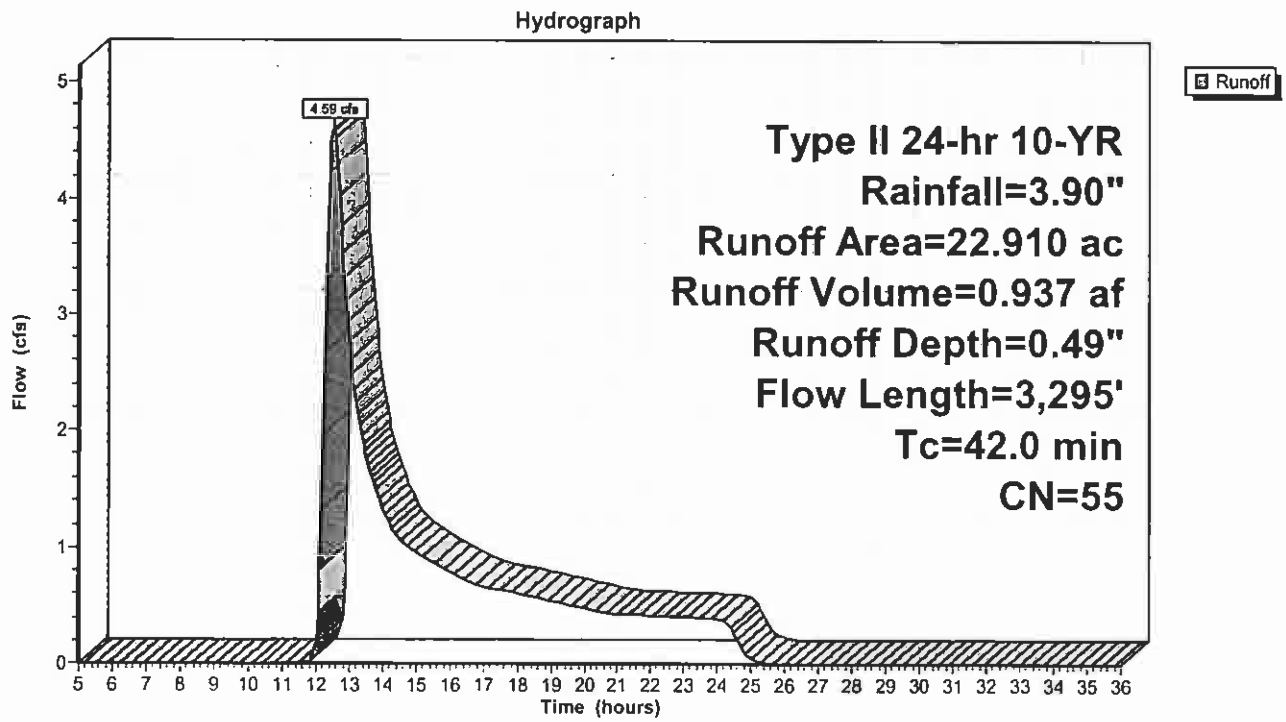
Runoff = 4.59 cfs @ 12.53 hrs, Volume= 0.937 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.069	89	Gravel roads, HSG C
0.099	49	Brush, Good, HSG C
12.812	53	Woods, Good, HSG C
9.660	58	Woods, Good, HSG D
0.240	55	Brush, Good, HSG D
0.030	91	Gravel roads, HSG D
22.910	55	Weighted Average
22.910		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	100	0.0250	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.8	2,851	0.2310	2.40		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	344	0.0700	6.88	41.28	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 4.0 '/' Top.W=10.00' n= 0.040
42.0	3,295	Total			

Subcatchment C-1004: Culvert-1004 Area



Subcatchment C-1005: Culvert-1005 Area

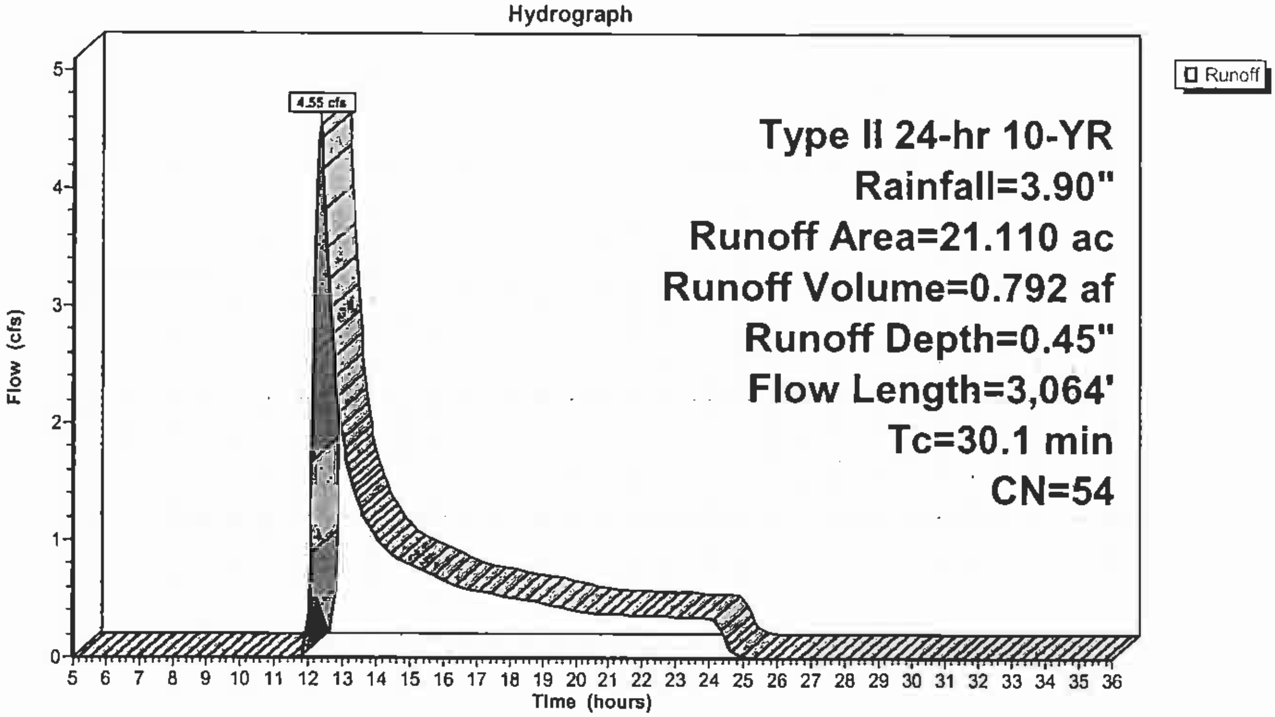
Runoff = 4.55 cfs @ 12.35 hrs, Volume= 0.792 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
3.250	49	Brush, Good, HSG C
13.020	53	Woods, Good, HSG C
4.730	58	Woods, Good, HSG D
21.110	54	Weighted Average
21.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.7	1,638	0.2590	2.54		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.1	536	0.1720	2.90		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
5.7	700	0.1660	2.04		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	90	0.0550	8.74	87.45	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 2.0 '/' Top.W=9.00' n= 0.040
30.1	3,064	Total			

Subcatchment C-1005: Culvert-1005 Area



Subcatchment C-1006: Culvert-1006 Area

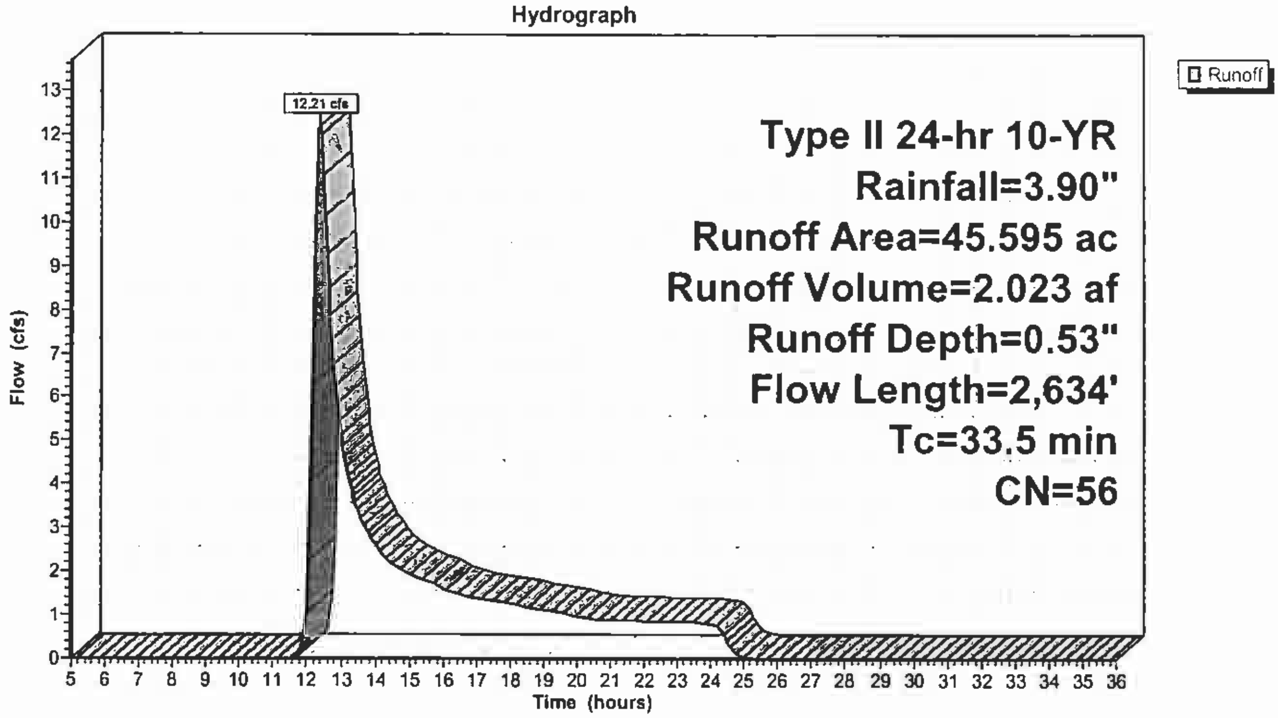
Runoff = 12.21 cfs @ 12.38 hrs, Volume= 2.023 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
2.095	89	Gravel roads, HSG C
9.335	49	Brush, Good, HSG C
8.906	53	Woods, Good, HSG C
9.446	55	Brush, Good, HSG D
15.813	58	Woods, Good, HSG D
45.595	56	Weighted Average
45.595		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.7	170	0.1050	1.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.1	404	0.0990	2.20		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	45	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
4.4	629	0.1180	2.40		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.3	966	0.1200	1.73		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	320	0.0470	8.56	102.77	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
33.5	2,634	Total			

Subcatchment C-1006: Culvert-1006 Area



Subcatchment C-1017: Culvert-1017 Area

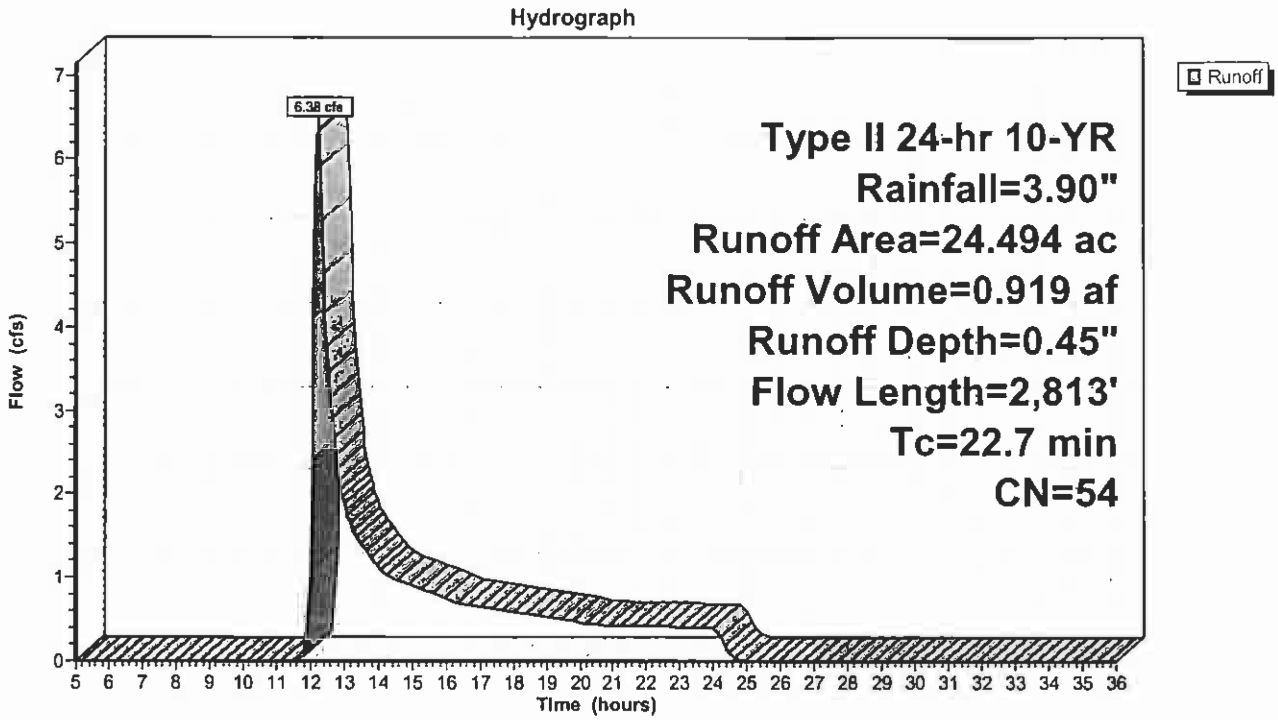
Runoff = 6.38 cfs @ 12.23 hrs, Volume= 0.919 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.672	89	Gravel roads, HSG C
10.993	49	Brush, Good, HSG C
5.224	53	Woods, Good, HSG C
0.947	55	Brush, Good, HSG D
6.658	58	Woods, Good, HSG D
24.494	54	Weighted Average
24.494		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	100	0.1400	0.34		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
1.8	173	0.0520	1.60		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	55	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
0.2	131	0.0910	11.92	143.00	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
8.2	1,224	0.2470	2.48		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.3	845	0.2150	3.25		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
3.1	285	0.0910	1.51		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
22.7	2,813	Total			

Subcatchment C-1017: Culvert-1017 Area



Subcatchment C-144: Culvert-144 Area

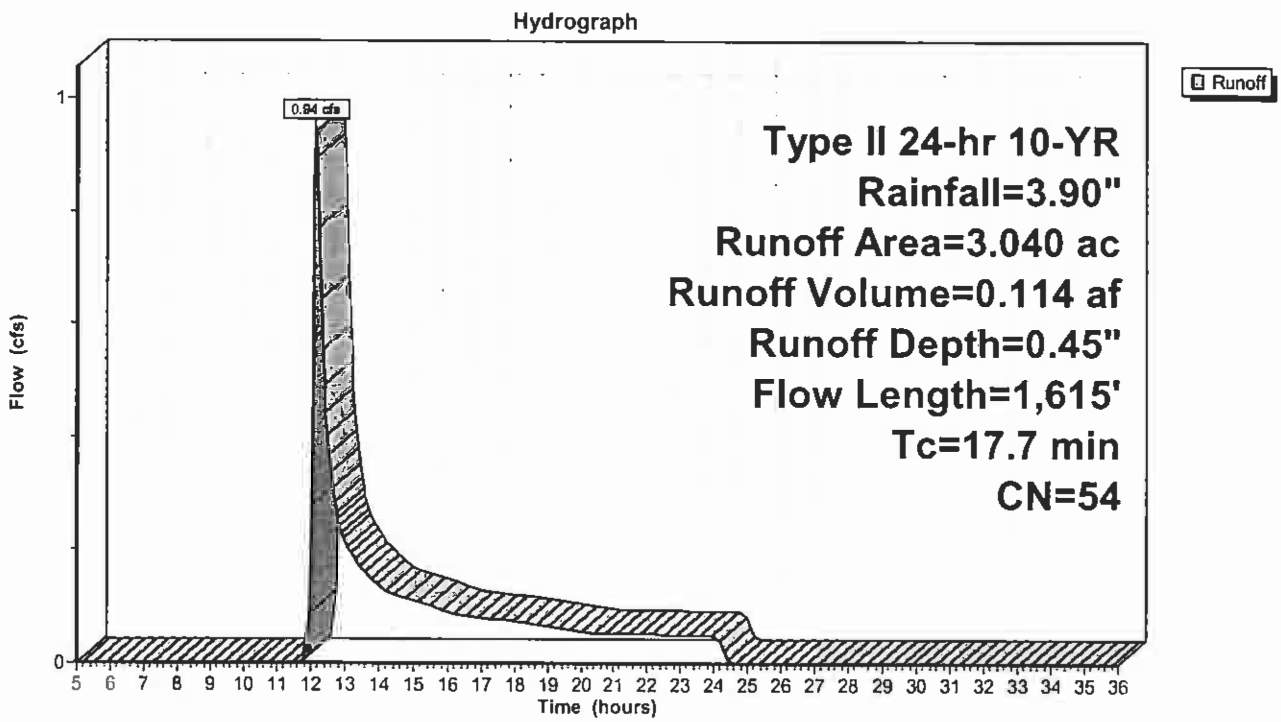
Runoff = 0.94 cfs @ 12.16 hrs, Volume= 0.114 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.020	49	Brush, Good, HSG C
2.560	53	Woods, Good, HSG C
0.050	55	Brush, Good, HSG D
0.330	58	Woods, Good, HSG D
3.040	54	Weighted Average
3.040		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.3400	0.22		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.2	1,515	0.2450	2.47		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
17.7	1,615	Total			

Subcatchment C-144: Culvert-144 Area



Subcatchment C-145: Culvert-145 Area

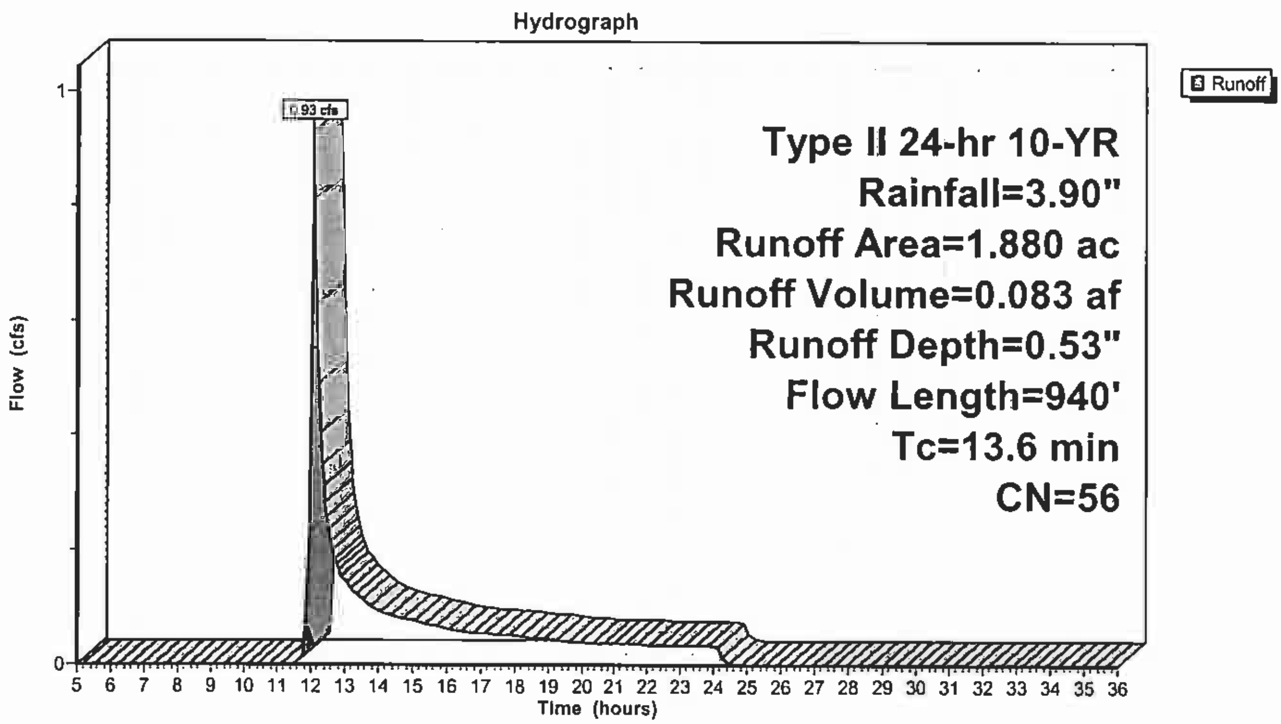
Runoff = 0.93 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
1.050	53	Woods, Good, HSG C
0.050	55	Brush, Good, HSG D
0.730	58	Woods, Good, HSG D
1.880	56	Weighted Average
1.880		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.3500	0.22		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
6.2	840	0.2070	2.27		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
13.6	940	Total			

Subcatchment C-145: Culvert-145 Area



Subcatchment C-146: Culvert-146 Area

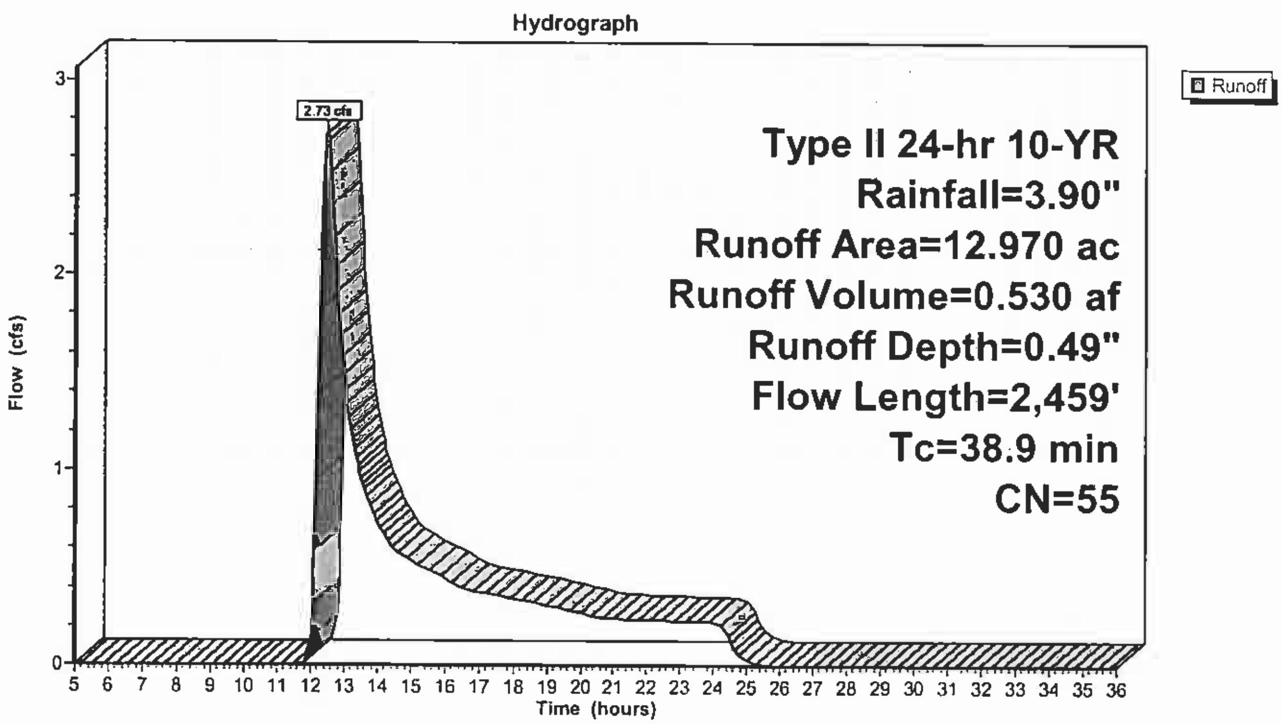
Runoff = 2.73 cfs @ 12.48 hrs, Volume= 0.530 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.069	89	Gravel roads, HSG C
6.906	53	Woods, Good, HSG C
0.138	55	Brush, Good, HSG D
5.857	58	Woods, Good, HSG D
12.970	55	Weighted Average
12.970		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
28.8	2,150	0.0620	1.24		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	209	0.0620	7.83	46.96	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.50' Z= 2.0 '/' Top.W=7.00' n= 0.040
38.9	2,459	Total			

Subcatchment C-146: Culvert-146 Area



Subcatchment C-148: Culvert-148 Area

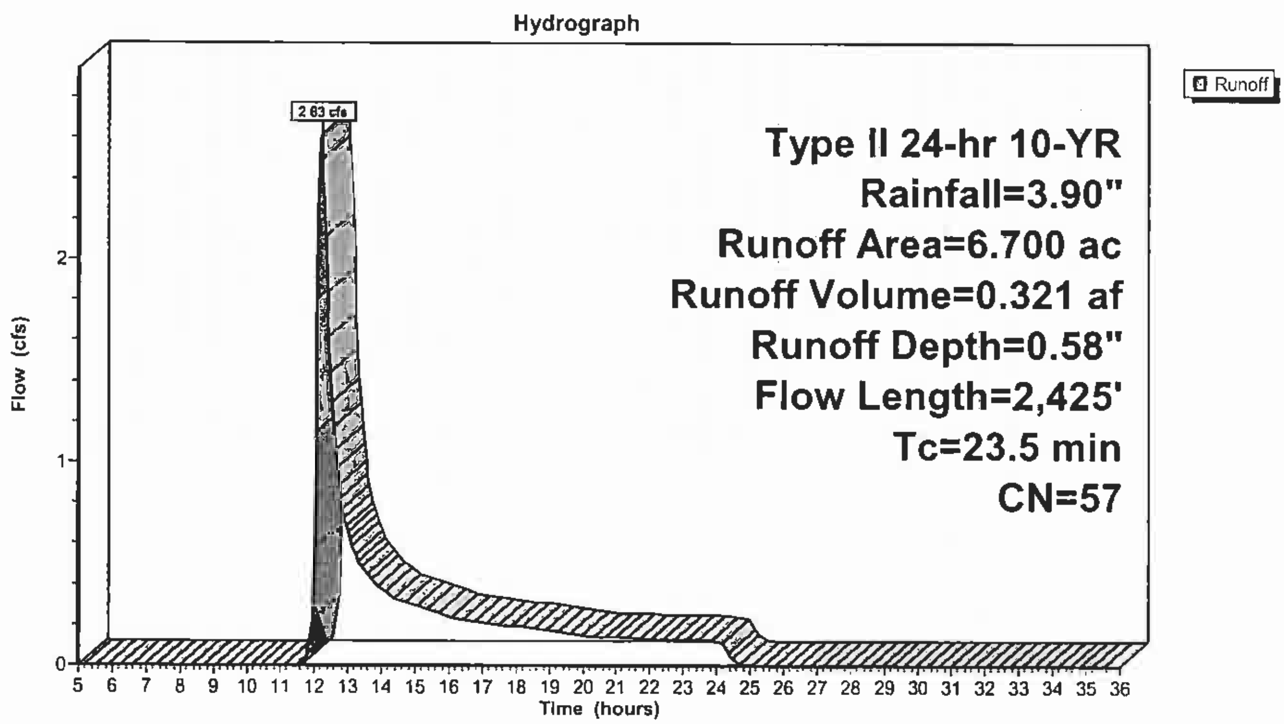
Runoff = 2.63 cfs @ 12.22 hrs, Volume= 0.321 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
2.290	53	Woods, Good, HSG C
0.060	55	Brush, Good, HSG D
4.280	58	Woods, Good, HSG D
6.700	57	Weighted Average
6.700		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.7	2,200	0.2850	2.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	125	0.0240	6.12	73.44	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
23.5	2,425	Total			

Subcatchment C-148: Culvert-148 Area



Subcatchment C-149: Culvert-149 Area

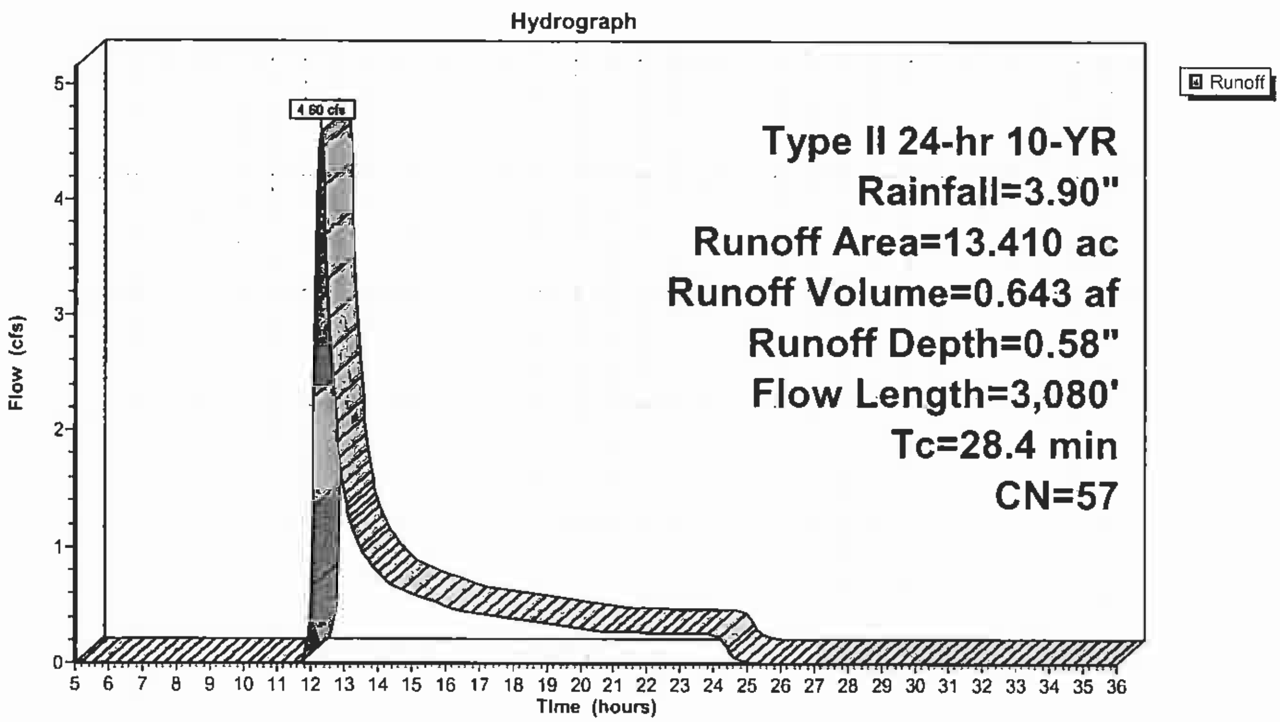
Runoff = 4.60 cfs @ 12.30 hrs, Volume= 0.643 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
4.070	53	Woods, Good, HSG C
0.150	55	Brush, Good, HSG D
9.110	58	Woods, Good, HSG D
13.410	57	Weighted Average
13.410		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
18.8	2,880	0.2610	2.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	100	0.0200	5.59	67.04	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
28.4	3,080	Total			

Subcatchment C-149: Culvert-149 Area



Subcatchment C-150: Culvert-150 Area

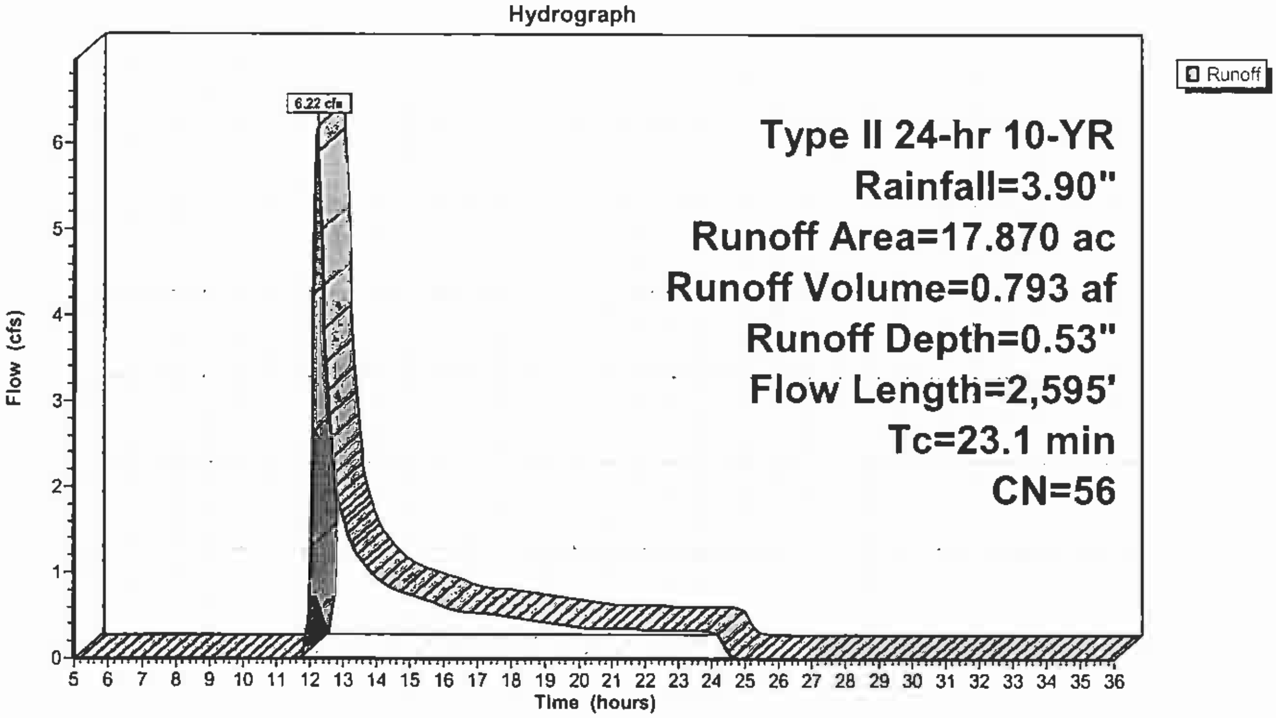
Runoff = 6.22 cfs @ 12.22 hrs, Volume= 0.793 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.170	89	Gravel roads, HSG C
6.320	53	Woods, Good, HSG C
2.690	55	Brush, Good, HSG D
8.690	58	Woods, Good, HSG D
17.870	56	Weighted Average
17.870		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	80	0.2750	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.7	1,850	0.2760	2.63		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	55	0.4400	3.32		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.6	350	0.1940	2.20		**Shallow Concentrated Flow, 350** Woodland Kv= 5.0 fps
1.6	260	0.1540	2.75		**Shallow Concentrated Flow, 350** Short Grass Pasture Kv= 7.0 fps
23.1	2,595	Total			

Subcatchment C-150: Culvert-150 Area



Subcatchment C-151: Culvert-151 Area

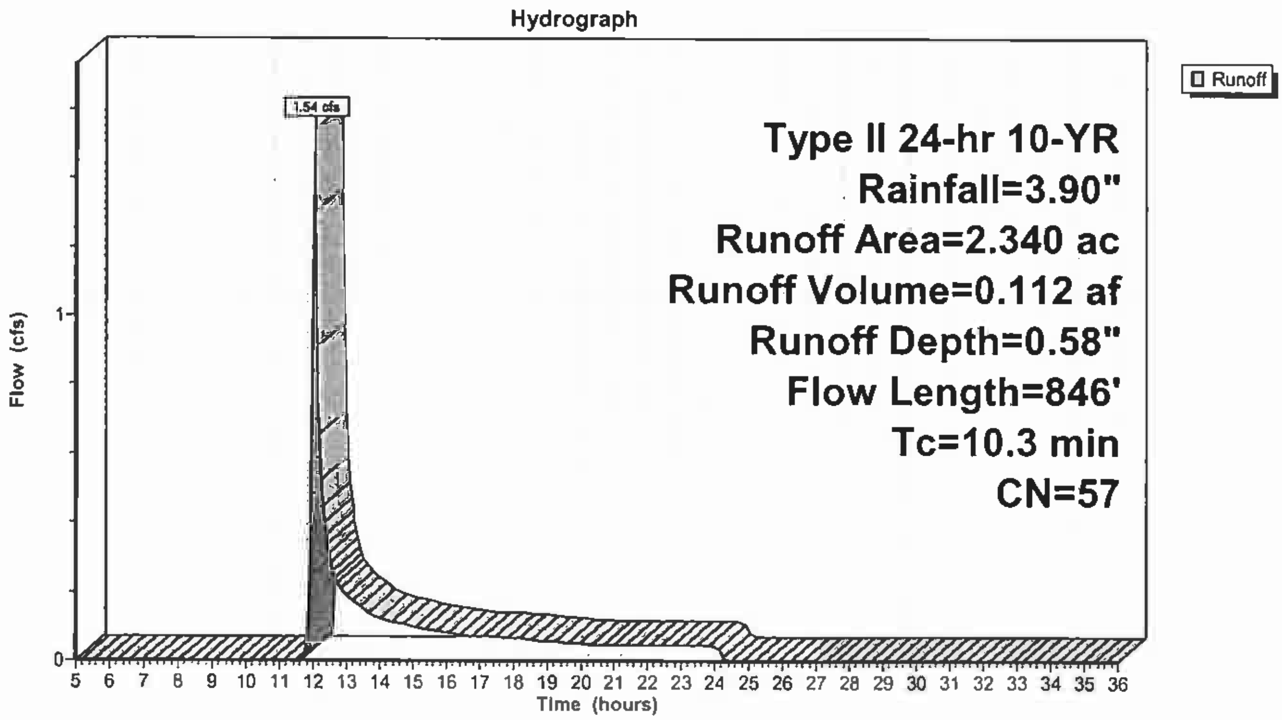
Runoff = 1.54 cfs @ 12.05 hrs, Volume= 0.112 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
1.300	55	Brush, Good, HSG D
0.990	58	Woods, Good, HSG D
2.340	57	Weighted Average
2.340		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.2200	0.41		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.0	330	0.1520	2.73		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
4.2	416	0.1100	1.66		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
10.3	846	Total			

Subcatchment C-151: Culvert-151 Area



Subcatchment C-152: Culvert-152 Area

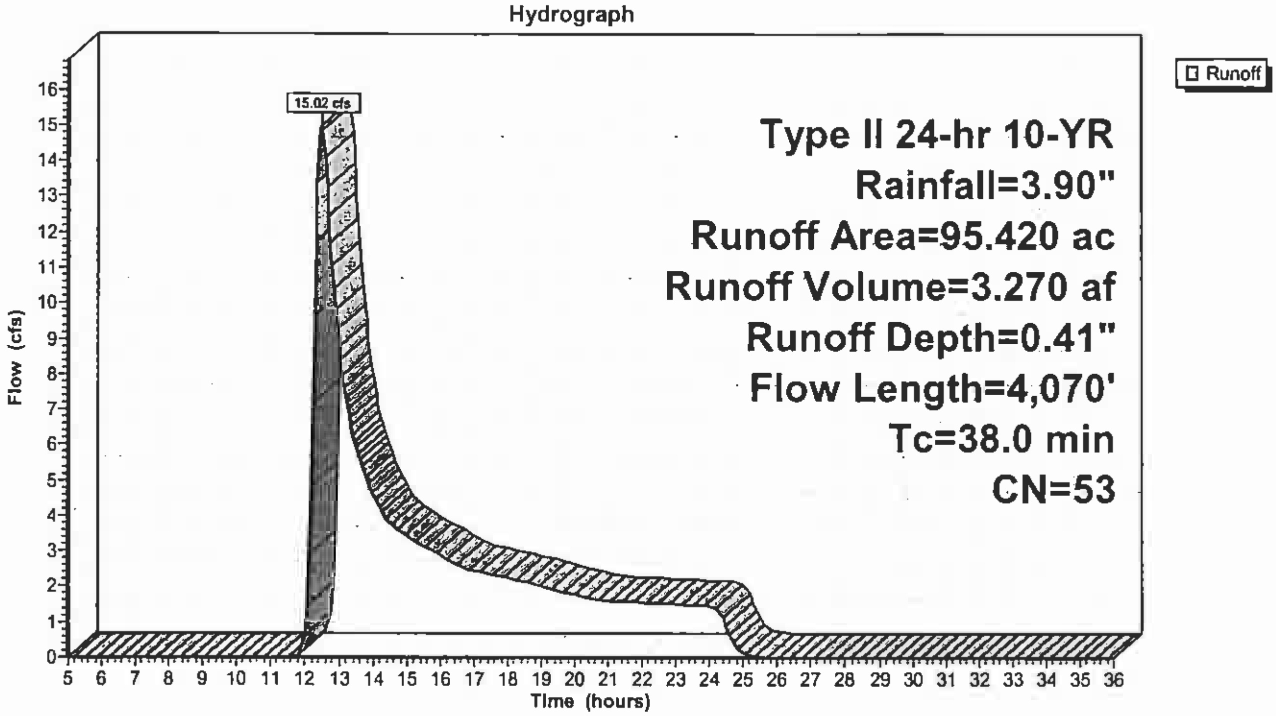
Runoff = 15.02 cfs @ 12.48 hrs, Volume= 3.270 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
32.210	49	Brush, Good, HSG C
23.110	53	Woods, Good, HSG C
16.630	55	Brush, Good, HSG D
23.410	58	Woods, Good, HSG D
95.420	53	Weighted Average
95.420		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
2.8	560	0.4420	3.32		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.3	280	0.2500	3.50		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.5	1,300	0.2070	2.27		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.7	645	0.1090	2.31		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.8	1,085	0.1360	1.84		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	100	0.0800	10.03	67.67	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.50' Z= 1.0 '/' Top.W=6.00' n= 0.040
38.0	4,070	Total			

Subcatchment C-152: Culvert-152 Area



Subcatchment C-153: Culvert-153 Area

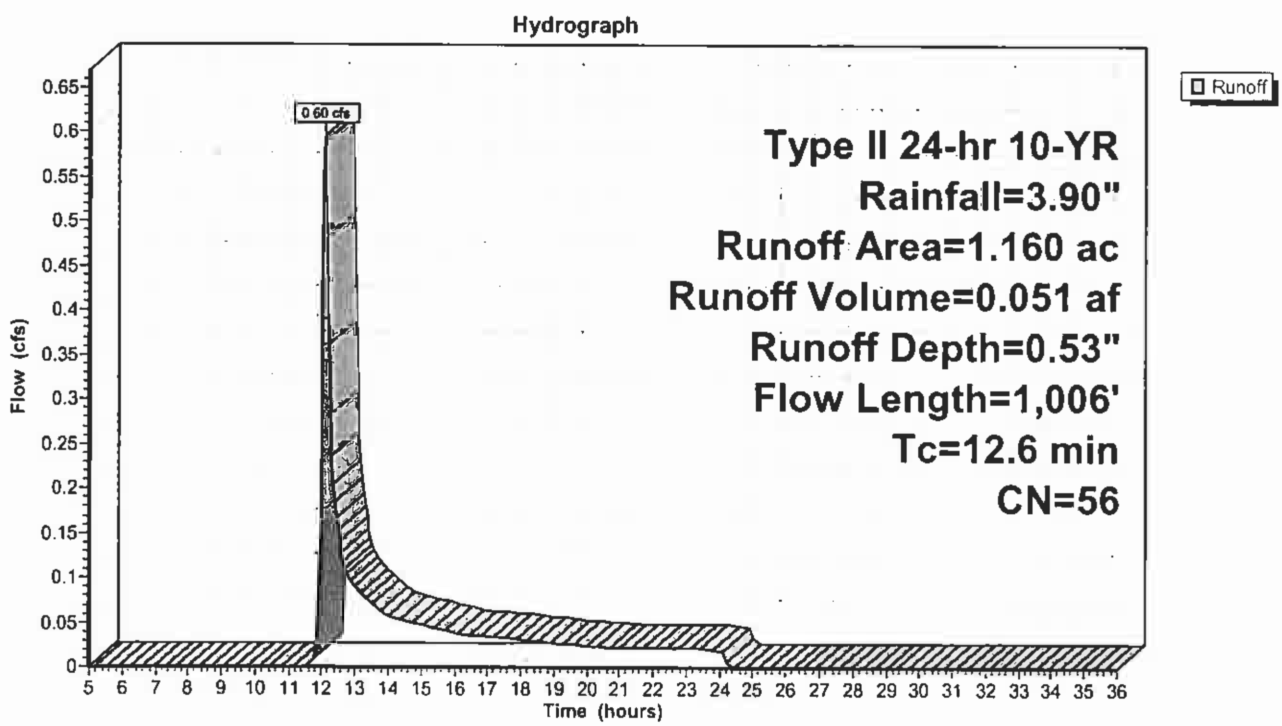
Runoff = 0.60 cfs @ 12.08 hrs, Volume= 0.051 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.024	89	Gravel roads, HSG C
0.028	49	Brush, Good, HSG C
0.515	53	Woods, Good, HSG C
0.032	55	Brush, Good, HSG D
0.561	58	Woods, Good, HSG D
1.160	56	Weighted Average
1.160		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	135	0.2600	0.46		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
7.7	871	0.1440	1.90		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
12.6	1,006	Total			

Subcatchment C-153: Culvert-153 Area



Subcatchment C-157: Culvert-157 Area

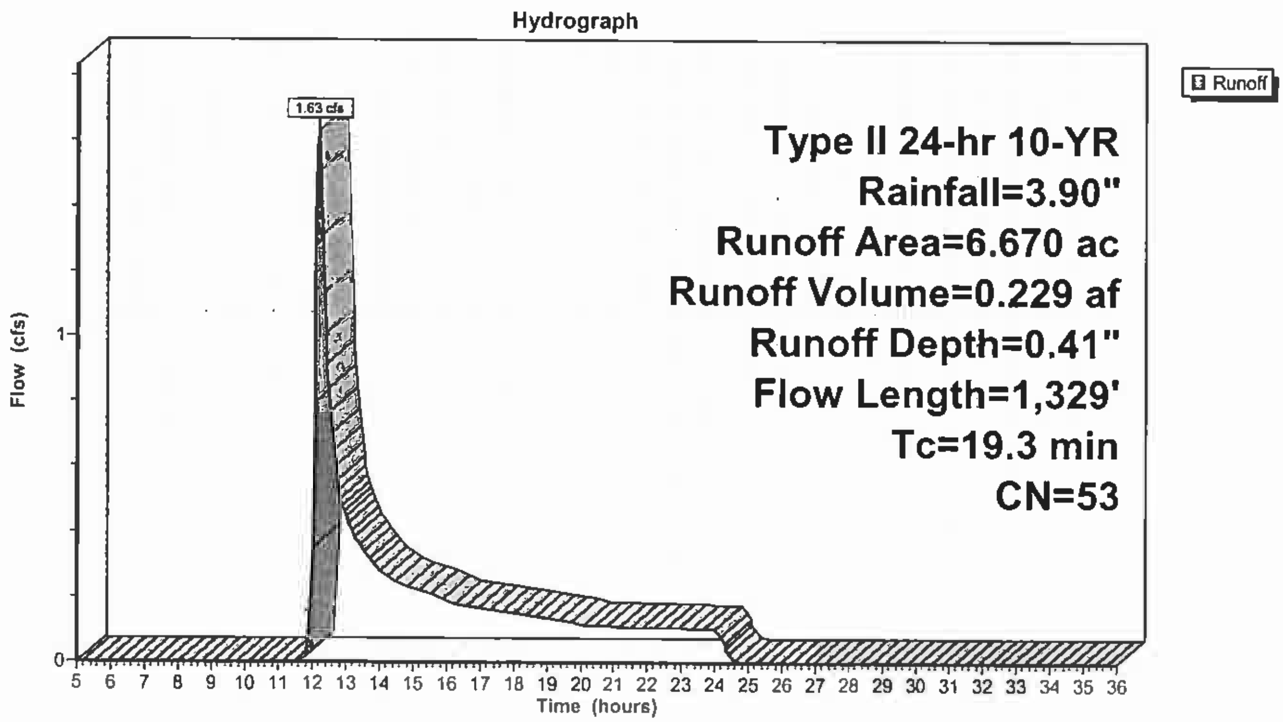
Runoff = 1.63 cfs @ 12.19 hrs, Volume= 0.229 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.050	49	Brush, Good, HSG C
6.570	53	Woods, Good, HSG C
6.670	53	Weighted Average
6.670		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
8.6	1,088	0.1760	2.10		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	141	0.0420	7.07	56.54	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
19.3	1,329	Total			

Subcatchment C-157: Culvert-157 Area



Subcatchment C-161: Culvert-161 Area

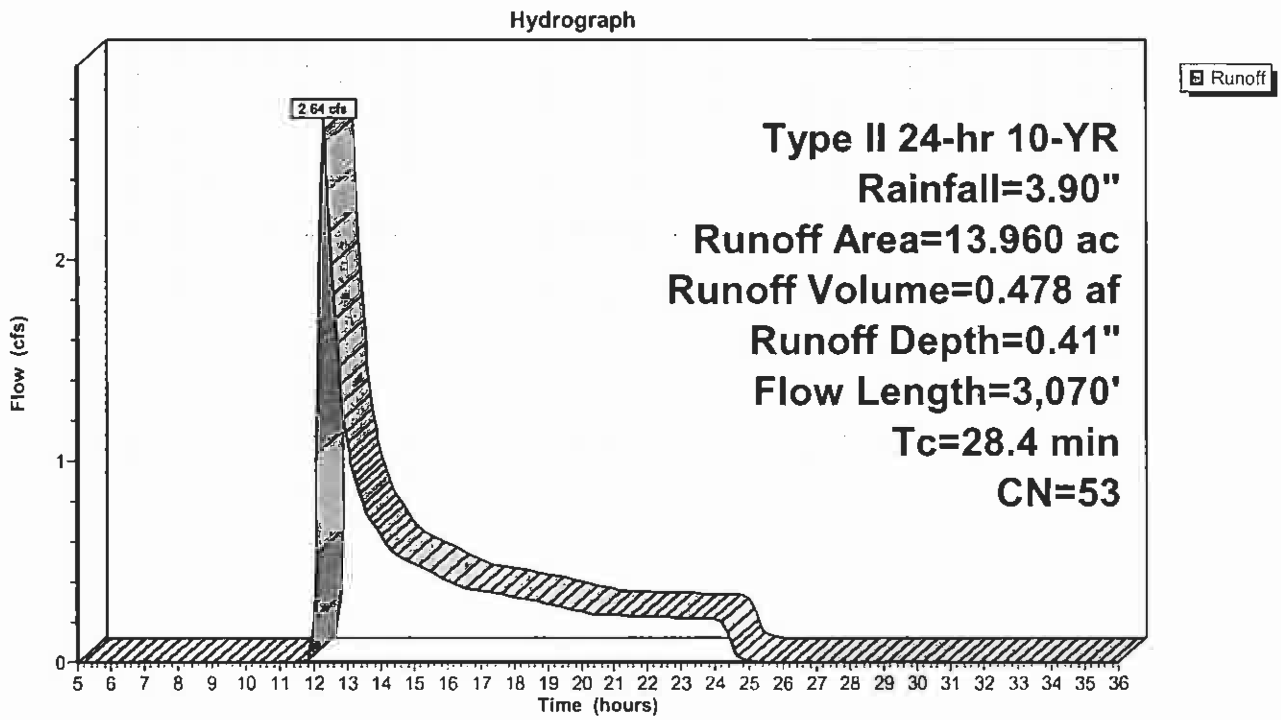
Runoff = 2.64 cfs @ 12.33 hrs, Volume= 0.478 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
2.400	49	Brush, Good, HSG C
9.100	53	Woods, Good, HSG C
2.430	58	Woods, Good, HSG D
13.960	53	Weighted Average
13.960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
2.8	550	0.4270	3.27		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.1	450	0.2670	3.62		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
13.8	1,970	0.2250	2.37		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
28.4	3,070	Total			

Subcatchment C-161: Culvert-161 Area



Subcatchment C-162: Culvert-162 Area

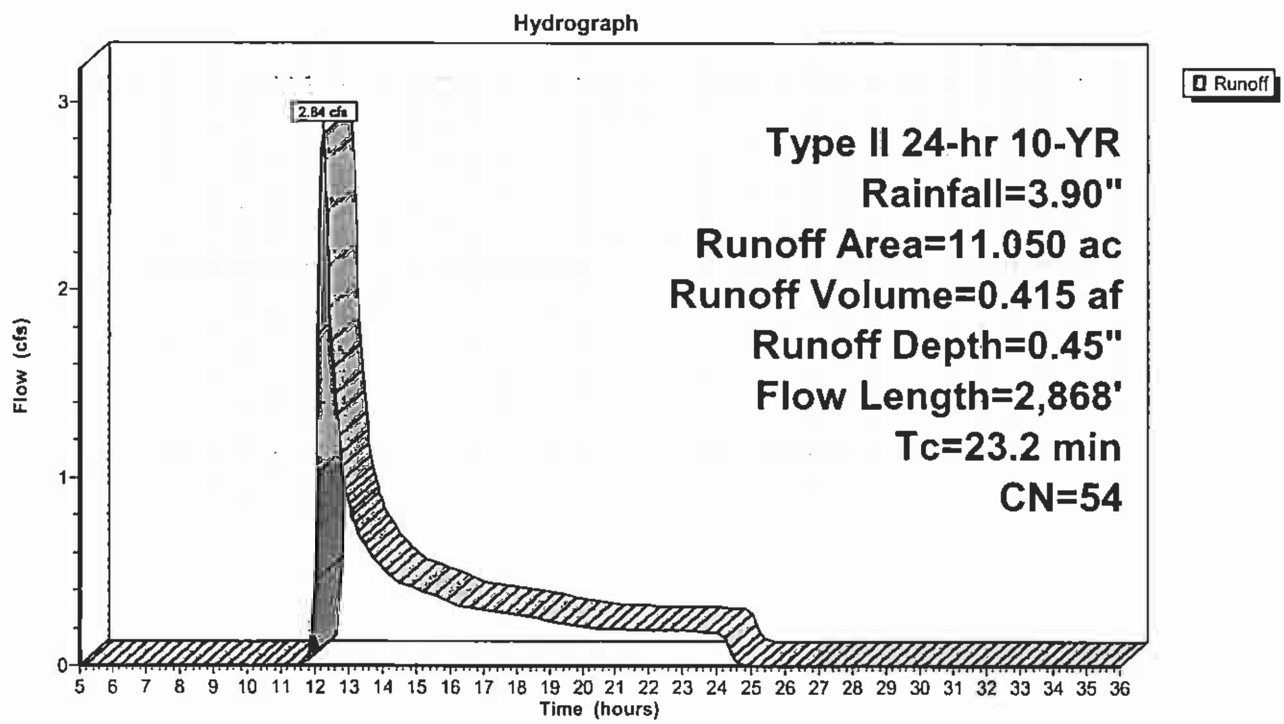
Runoff = 2.84 cfs @ 12.24 hrs, Volume= 0.415 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
8.470	53	Woods, Good, HSG C
2.510	58	Woods, Good, HSG D
11.050	54	Weighted Average
11.050		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	60	0.2670	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.7	2,808	0.2800	2.65		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
23.2	2,868	Total			

Subcatchment C-162: Culvert-162 Area



Subcatchment C-166: Culvert-166 Area

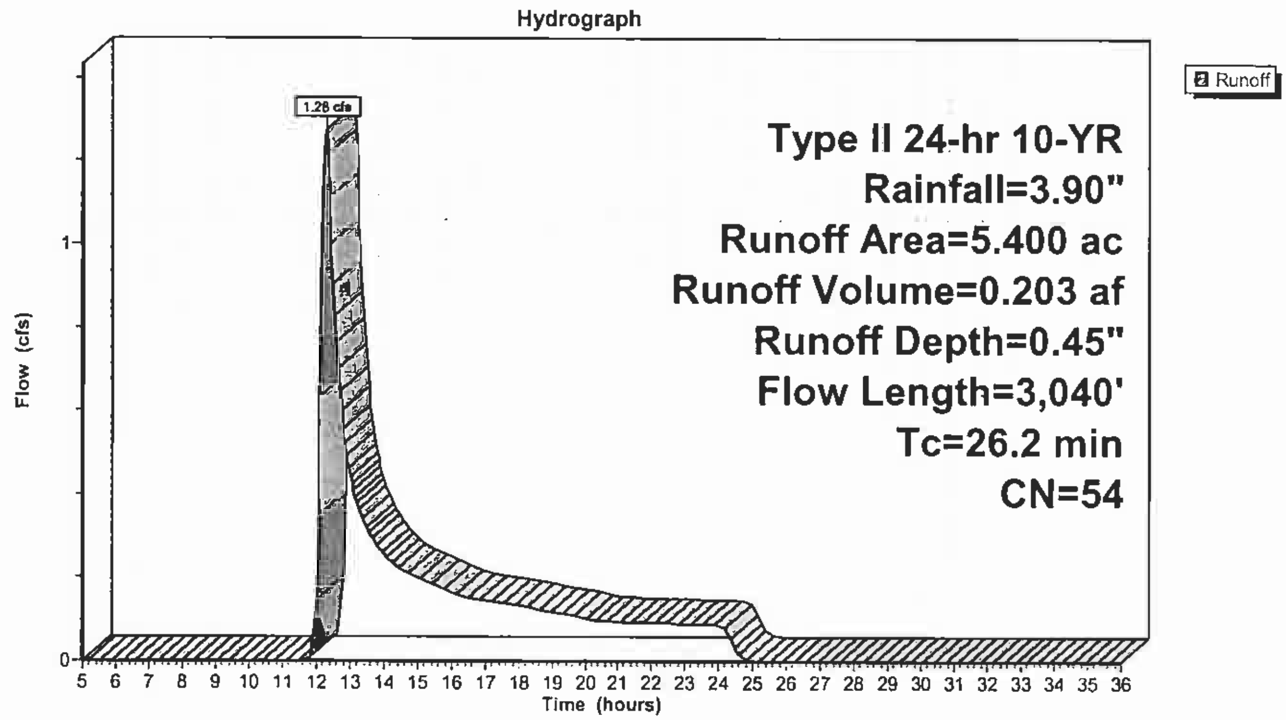
Runoff = 1.28 cfs @ 12.29 hrs, Volume= 0.203 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.530	49	Brush, Good, HSG C
3.430	53	Woods, Good, HSG C
0.050	55	Brush, Good, HSG D
1.340	58	Woods, Good, HSG D
5.400	54	Weighted Average
5.400		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2800	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
18.1	2,900	0.2850	2.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.0	40	0.1500	15.26	244.15	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.040
26.2	3,040	Total			

Subcatchment C-166: Culvert-166 Area



Subcatchment C-167: Culvert-167 Area

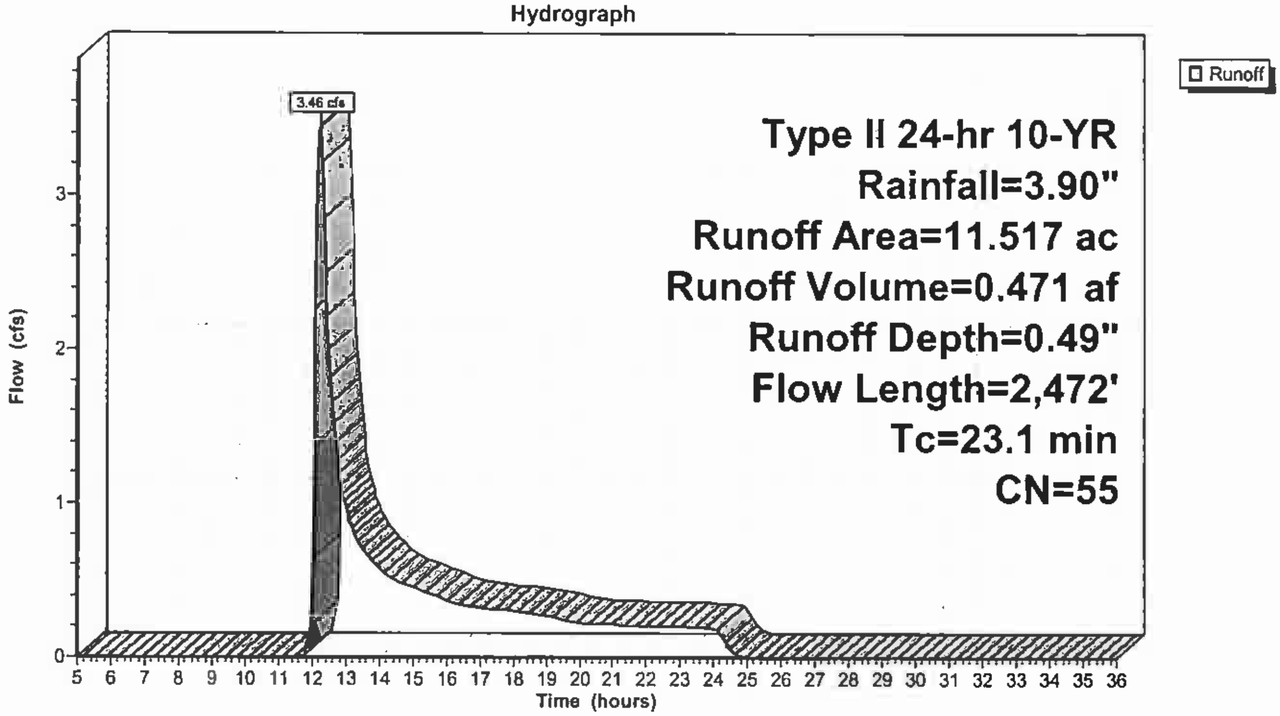
Runoff = 3.46 cfs @ 12.23 hrs, Volume= 0.471 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.140	89	Gravel roads, HSG C
1.980	49	Brush, Good, HSG C
5.160	53	Woods, Good, HSG C
0.087	55	Brush, Good, HSG D
4.150	58	Woods, Good, HSG D
11.517	55	Weighted Average
11.517		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1700	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.8	1,044	0.3660	3.02		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	175	0.2620	3.58		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.2	355	0.2900	2.69		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	188	0.2820	3.72		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
3.4	530	0.2720	2.61		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	80	0.0750	7.38	29.53	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
23.1	2,472	Total			

Subcatchment C-167: Culvert-167 Area



Subcatchment C-169: Culvert-169 Area

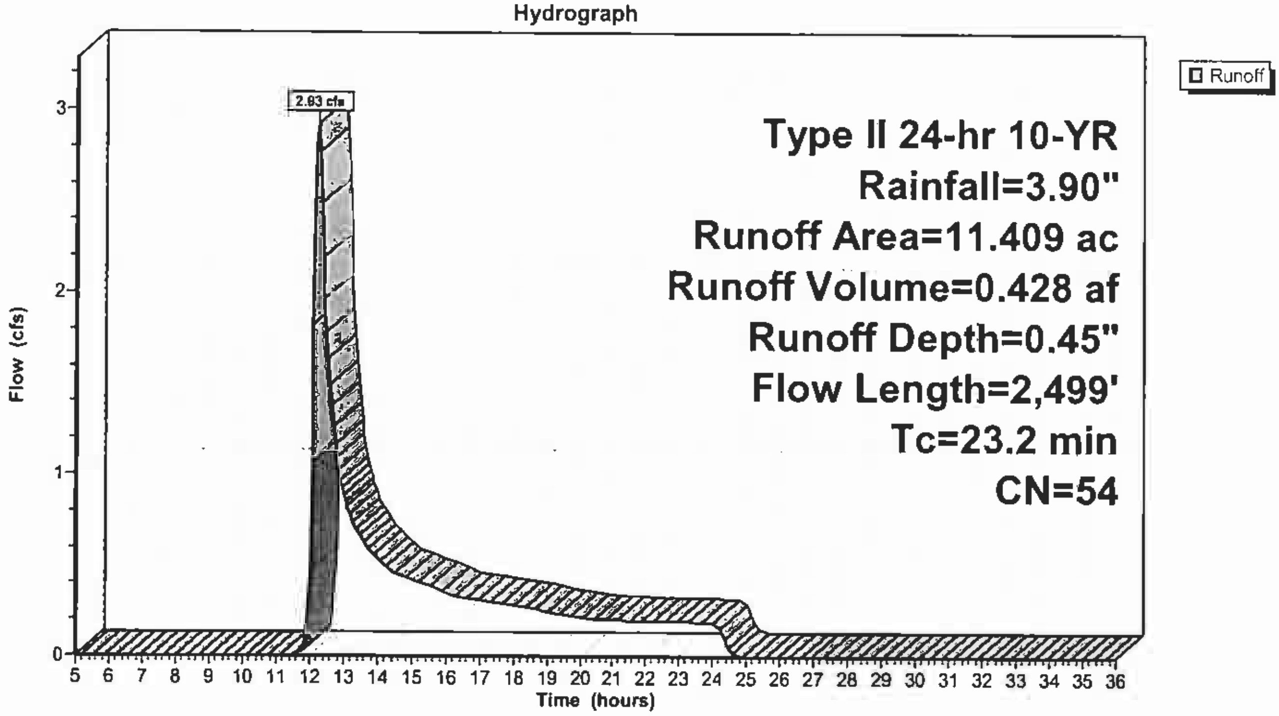
Runoff = 2.93 cfs @ 12.24 hrs, Volume= 0.428 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.114	89	Gravel roads, HSG C
4.530	49	Brush, Good, HSG C
1.540	53	Woods, Good, HSG C
0.239	55	Brush, Good, HSG D
4.986	58	Woods, Good, HSG D
11.409	54	Weighted Average
11.409		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1300	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
4.9	914	0.3800	3.08		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.8	1,080	0.2830	3.72		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.2	325	0.2430	2.46		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	80	0.0500	8.83	106.00	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
23.2	2,499	Total			

Subcatchment C-169: Culvert-169 Area



Subcatchment C-170: Culvert-170 Area

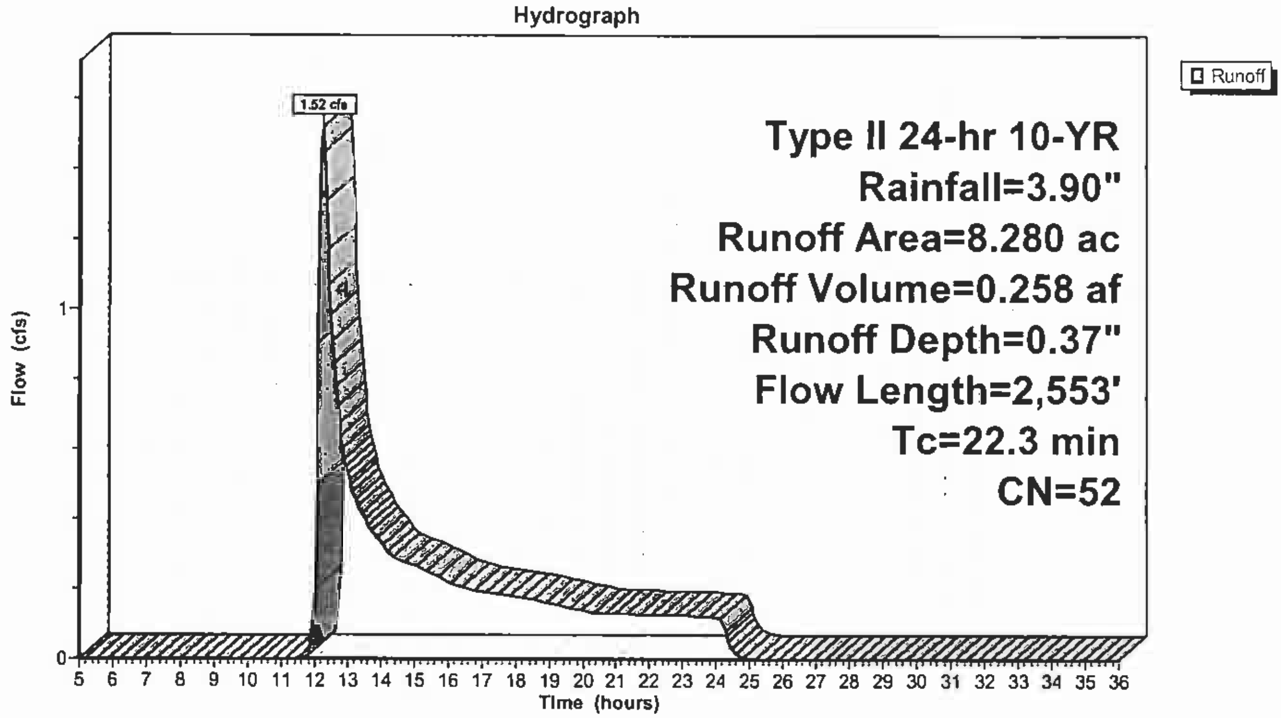
Runoff = 1.52 cfs @ 12.24 hrs, Volume= 0.258 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.083	89	Gravel roads, HSG C
4.624	49	Brush, Good, HSG C
2.280	53	Woods, Good, HSG C
1.293	58	Woods, Good, HSG D
8.280	52	Weighted Average
8.280		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.4	990	0.3700	3.04		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.3	950	0.2800	3.70		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.5	385	0.2650	2.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	128	0.0230	3.77	11.32	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 2.0 '/' Top.W=5.00' n= 0.040
22.3	2,553	Total			

Subcatchment C-170: Culvert-170 Area



Subcatchment C-177: Culvert-177 Area

[49] Hint: Tc<2dt may require smaller dt

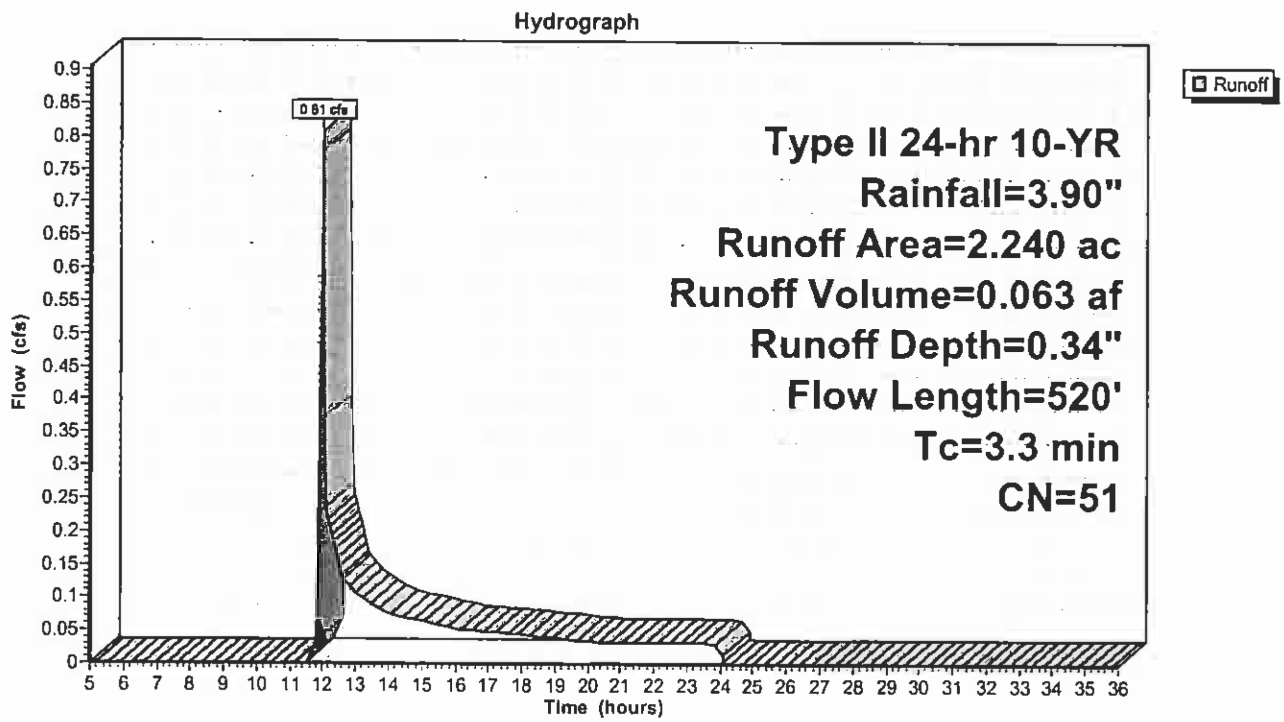
Runoff = 0.81 cfs @ 11.98 hrs, Volume= 0.063 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
2.110	49	Brush, Good, HSG C
2.240	51	Weighted Average
2.240		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	20	0.1000	1.74		**Sheet Flow, sheet** Smooth surfaces n= 0.011 P2= 2.70"
3.1	500	0.1460	2.67		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
3.3	520	Total			

Subcatchment C-177: Culvert-177 Area



Subcatchment C-178: Culvert-178 Area

[49] Hint: Tc<2dt may require smaller dt

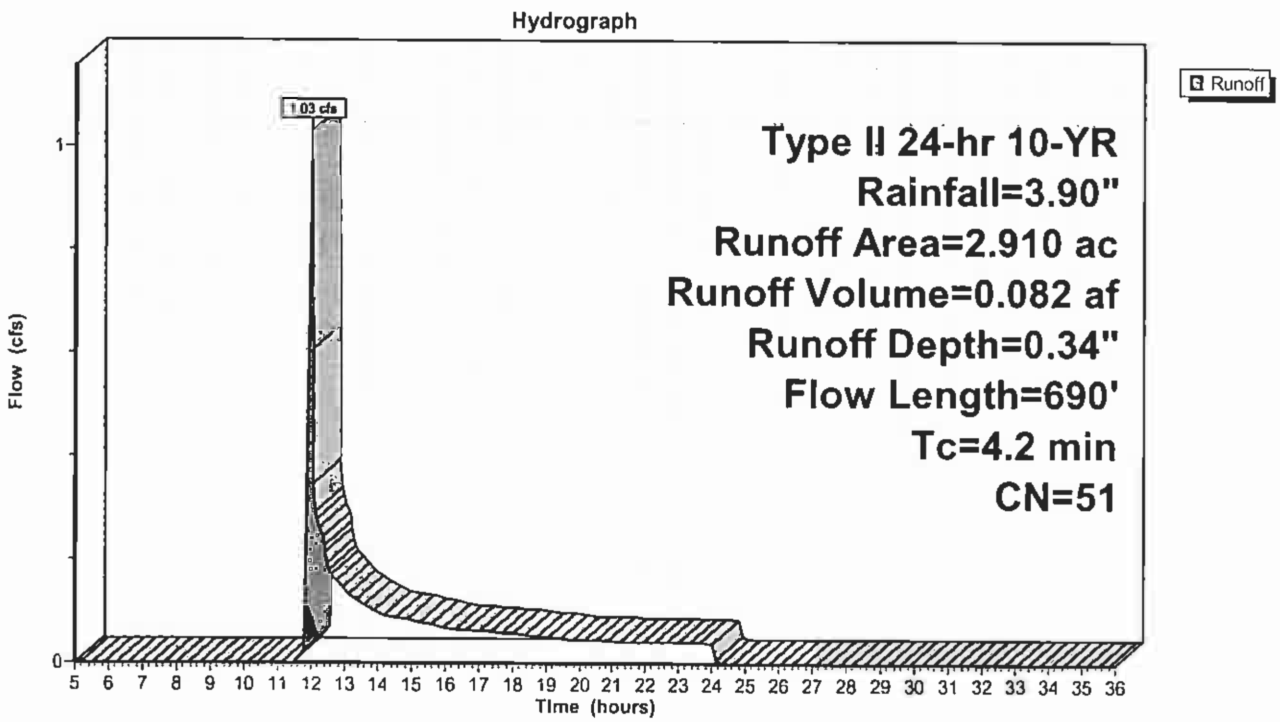
Runoff = 1.03 cfs @ 11.99 hrs, Volume= 0.082 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
2.680	49	Brush, Good, HSG C
0.100	53	Woods, Good, HSG C
2.910	51	Weighted Average
2.910		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	38	0.1000	1.98		**Sheet Flow, sheet** Smooth surfaces n= 0.011 P2= 2.70"
3.7	610	0.1540	2.75		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	42	0.0240	4.18	16.70	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
4.2	690	Total			

Subcatchment C-178: Culvert-178 Area



Subcatchment C-184: Culvert-184 Area

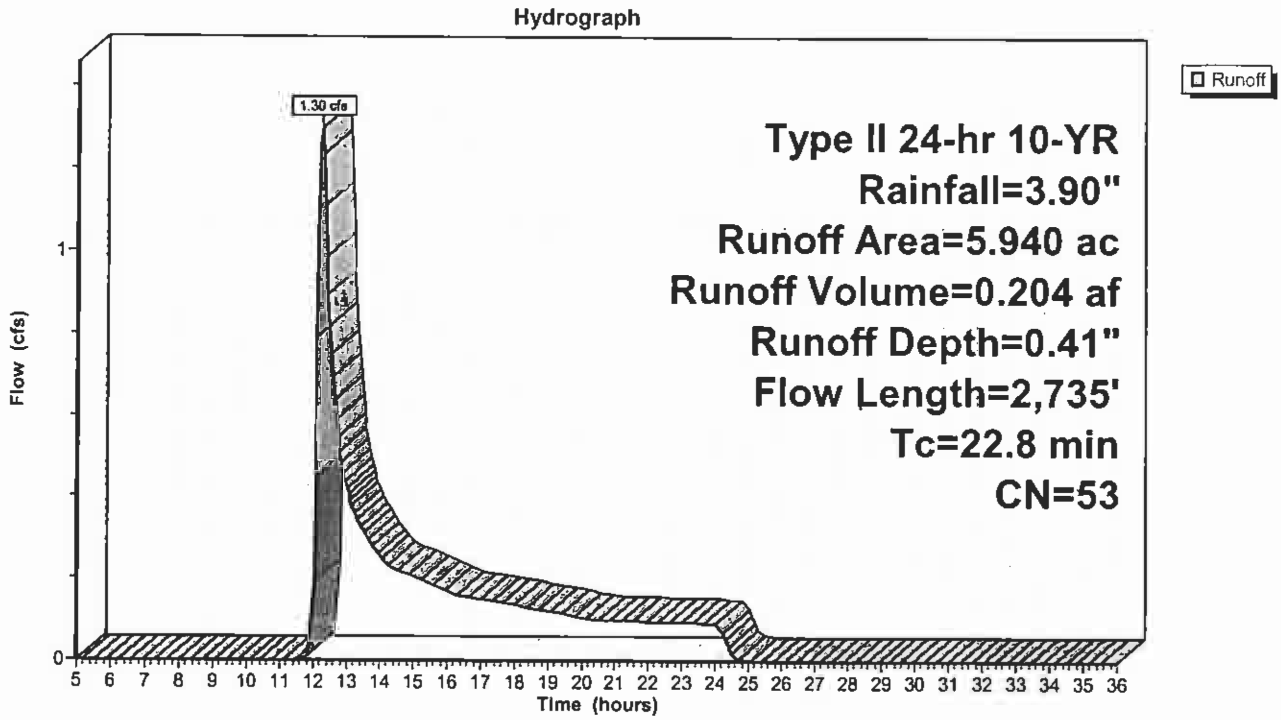
Runoff = 1.30 cfs @ 12.24 hrs, Volume= 0.204 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
2.540	49	Brush, Good, HSG C
1.630	53	Woods, Good, HSG C
0.040	55	Brush, Good, HSG D
1.680	58	Woods, Good, HSG D
5.940	53	Weighted Average
5.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.1500	0.35		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
4.7	865	0.1960	3.10		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	100	0.1300	8.69	17.38	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 1.0 '/' Top.W=3.00' n= 0.040
0.1	27	0.0560	7.62	13.46	**Circular Channel (pipe), pipe** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.024
12.5	1,510	0.1630	2.02		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.5	133	0.0370	4.79	14.36	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 2.0 '/' Top.W=5.00' n= 0.040
22.8	2,735	Total			

Subcatchment C-184: Culvert-184 Area



Subcatchment C-186: Culvert-186 Area

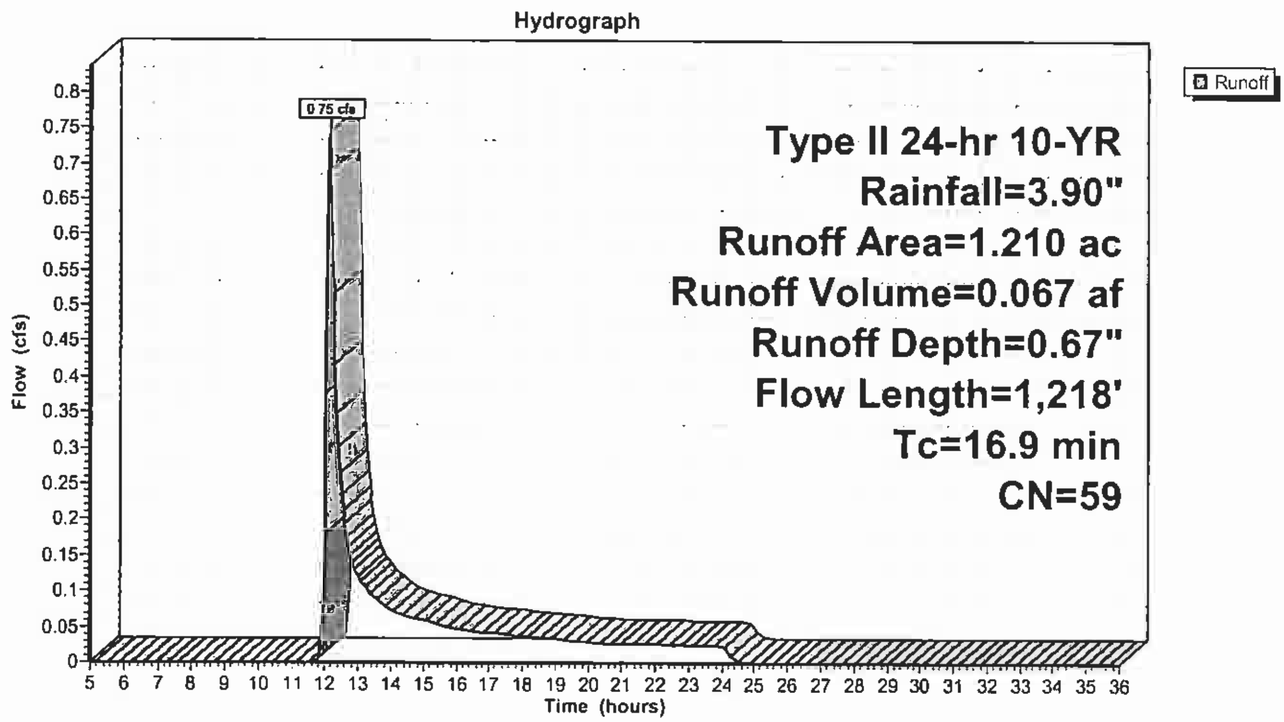
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 0.067 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
0.100	53	Woods, Good, HSG C
0.990	58	Woods, Good, HSG D
1.210	59	Weighted Average
1.210		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	68	0.2050	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.7	1,035	0.1270	1.78		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	115	0.0870	4.77	8.34	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.50' Z= 5.0 '/' Top.W=6.00' n= 0.040
16.9	1,218	Total			

Subcatchment C-186: Culvert-186 Area



Subcatchment C-187: Culvert-187 Area

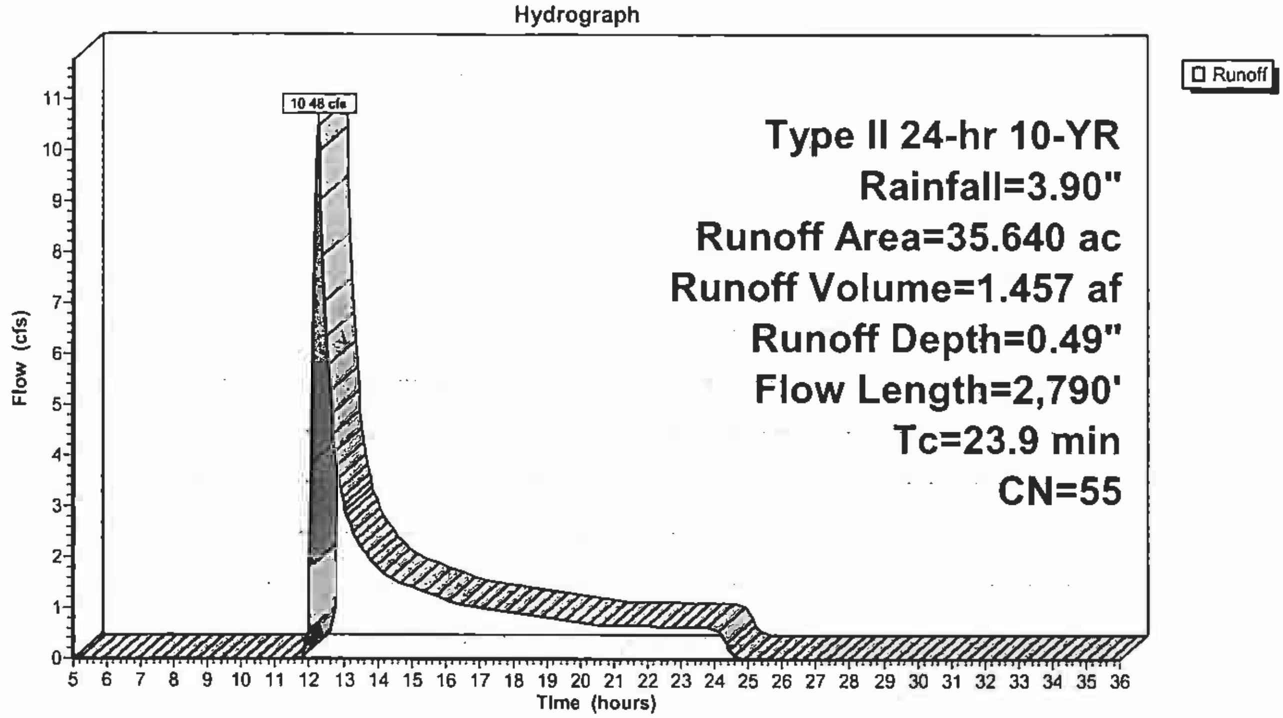
Runoff = 10.48 cfs @ 12.24 hrs, Volume= 1.457 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
7.200	49	Brush, Good, HSG C
10.240	53	Woods, Good, HSG C
3.200	55	Brush, Good, HSG D
14.950	58	Woods, Good, HSG D
35.640	55	Weighted Average
35.640		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.4440	0.25		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.3	1,240	0.1620	2.01		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
5.8	1,120	0.2140	3.24		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.0	330	0.0910	5.61	8.41	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=0.50' Z= 2.0 '/' Top.W=4.00' n= 0.040
23.9	2,790	Total			

Subcatchment C-187: Culvert-187 Area



Subcatchment C-188: Culvert-188 Area

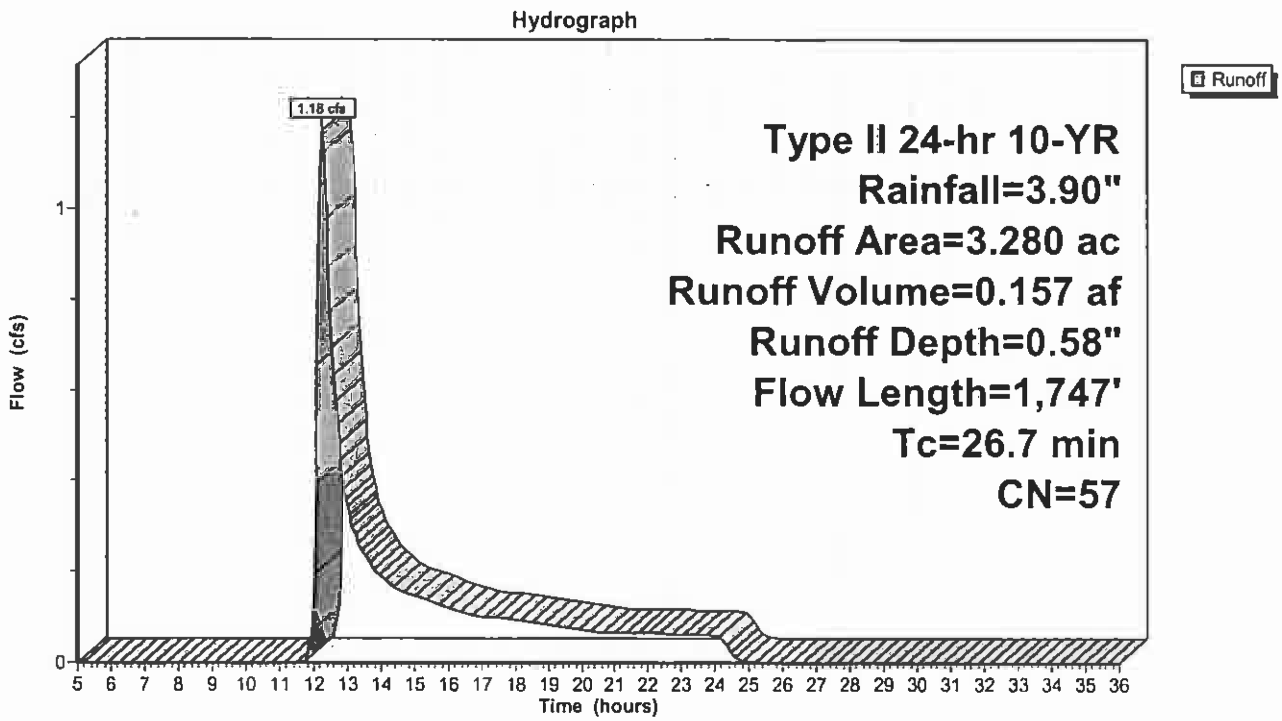
Runoff = 1.18 cfs @ 12.27 hrs, Volume= 0.157 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
1.030	53	Woods, Good, HSG C
2.110	58	Woods, Good, HSG D
3.280	57	Weighted Average
3.280		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.6	1,450	0.1090	1.65		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	197	0.0350	4.86	29.19	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 4.0 '/' Top.W=10.00' n= 0.040
26.7	1,747	Total			

Subcatchment C-188: Culvert-188 Area



Subcatchment C-189: Culvert - 189 Area

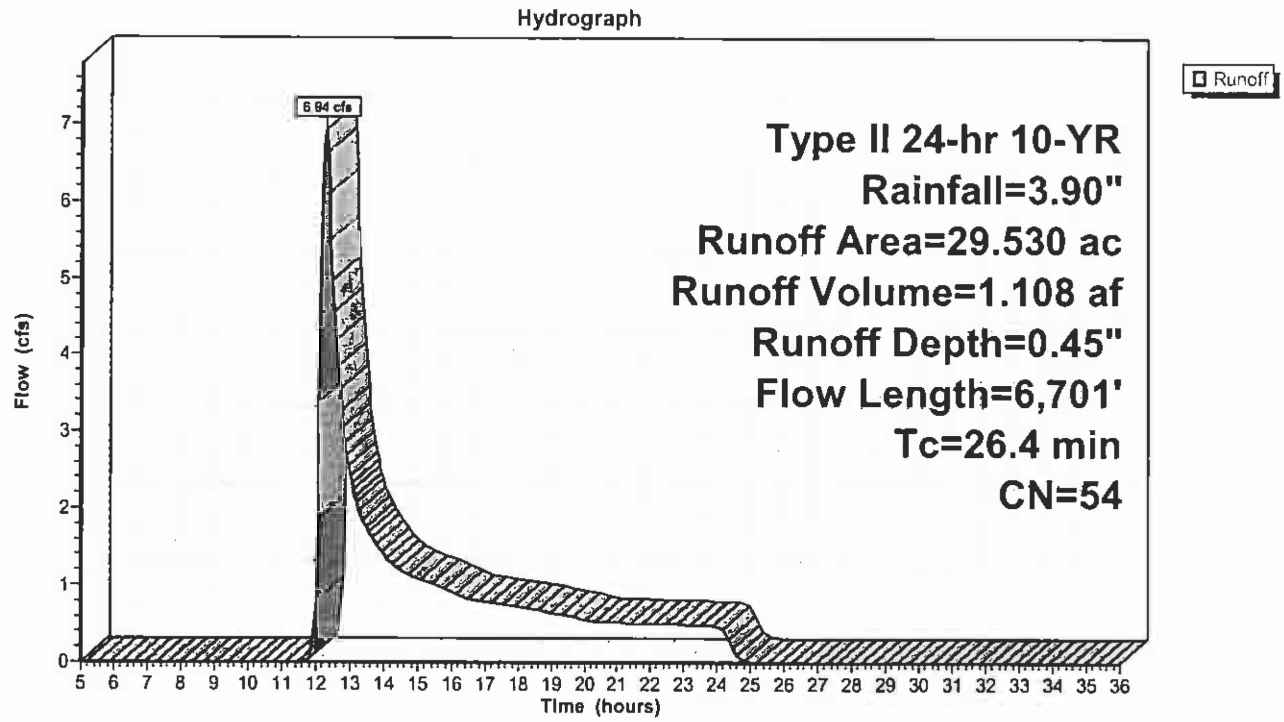
Runoff = 6.94 cfs @ 12.29 hrs, Volume= 1.108 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
22.020	53	Woods, Good, HSG C
0.100	55	Brush, Good, HSG D
4.570	58	Woods, Good, HSG D
0.150	89	Gravel roads, HSG C
0.630	49	Brush, Good, HSG C
1.830	53	Woods, Good, HSG C
0.230	58	Woods, Good, HSG D
29.530	54	Weighted Average
29.530		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.8	1,571	0.2850	2.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.4	355	0.1240	2.46		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.7	1,263	0.1070	12.29	193.56	**Trap/Vee/Rect Channel Flow, channel** Bot.W=6.00' D=1.50' Z= 3.0 '/' Top.W=15.00' n= 0.040
3.0	3,412	0.0900	19.10	1,299.12	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=5.00' D=4.00' Z= 3.0 '/' Top.W=29.00' n= 0.040
26.4	6,701	Total			

Subcatchment C-189: Culvert - 189 Area



Subcatchment C-190: Culvert-190 Area

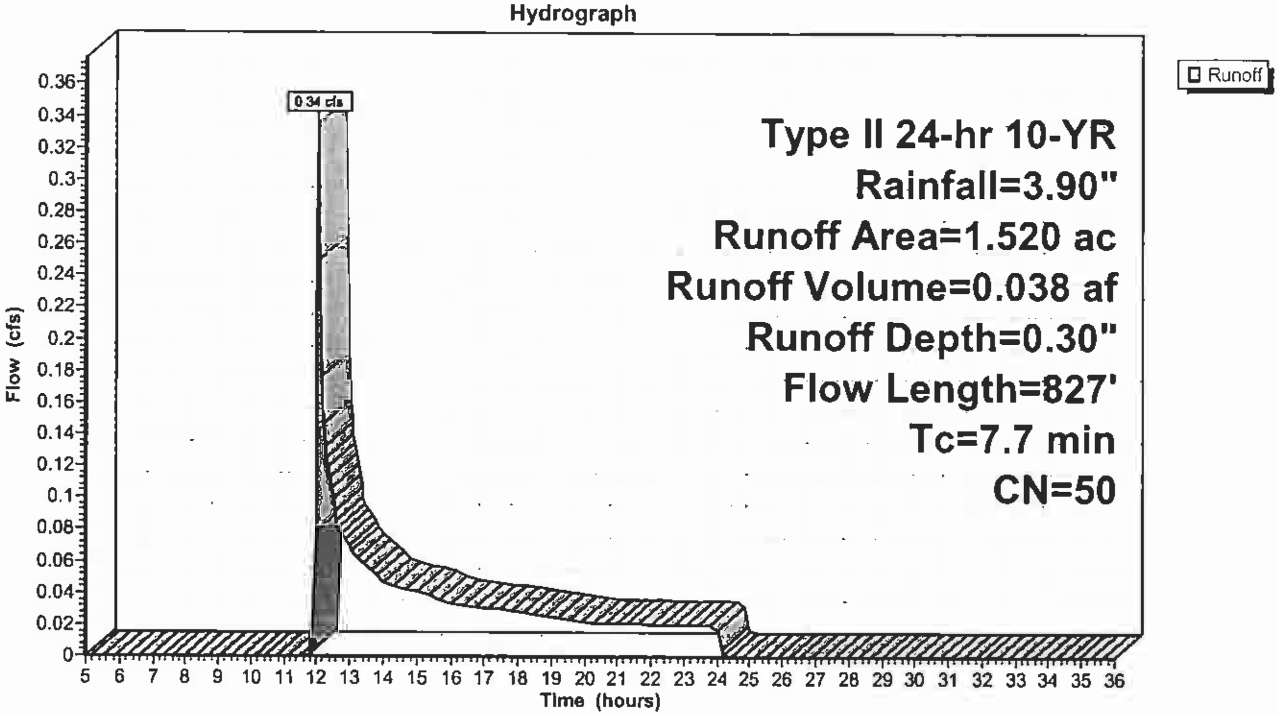
Runoff = 0.34 cfs @ 12.05 hrs, Volume= 0.038 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.020	89	Gravel roads, HSG C
1.180	49	Brush, Good, HSG C
0.320	53	Woods, Good, HSG C
1.520	50	Weighted Average
1.520		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.2200	0.41		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
1.1	250	0.2760	3.68		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.1	185	0.3350	2.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.3	260	0.2230	3.31		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0630	9.36	93.59	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 2.0 '/' Top.W=9.00' n= 0.040
7.7	827	Total			

Subcatchment C-190: Culvert-190 Area



Subcatchment C-191: Culvert-191 Area

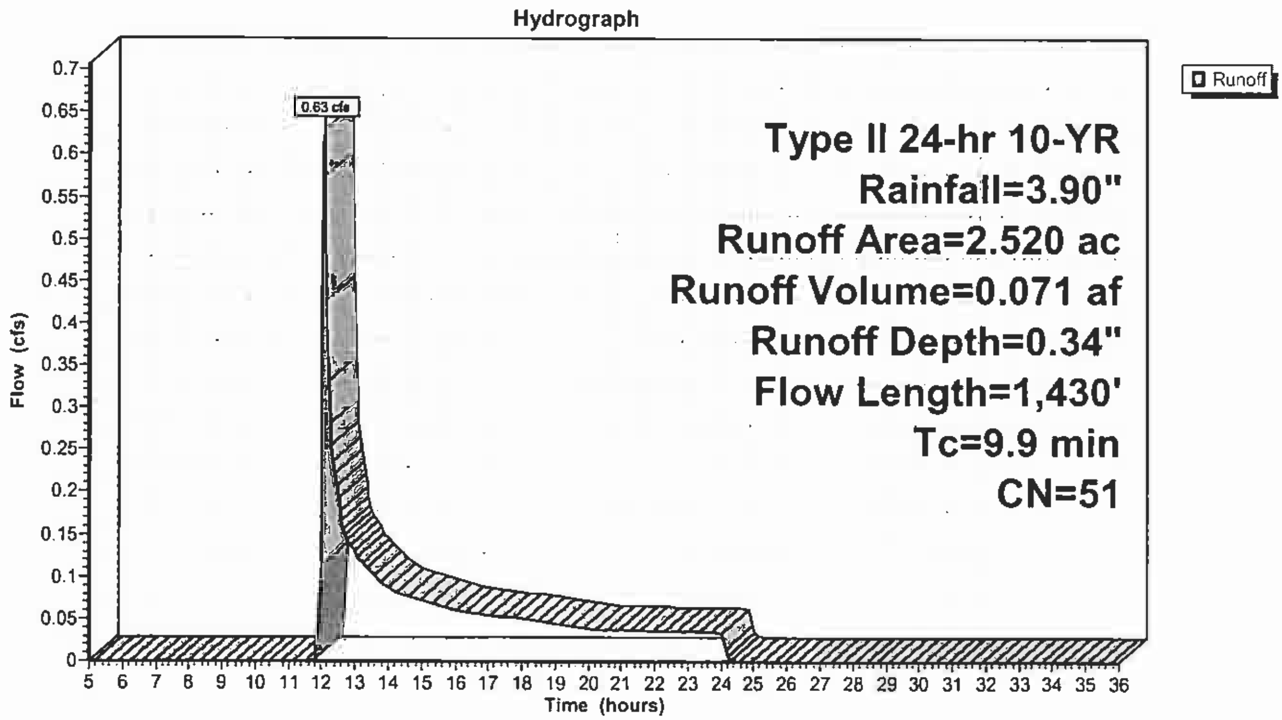
Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.071 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
2.080	49	Brush, Good, HSG C
0.380	53	Woods, Good, HSG C
2.520	51	Weighted Average
2.520		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2800	0.45		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
6.2	1,330	0.2600	3.57		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.9	1,430	Total			

Subcatchment C-191: Culvert-191 Area



Subcatchment C-192: Culvert-192 Area

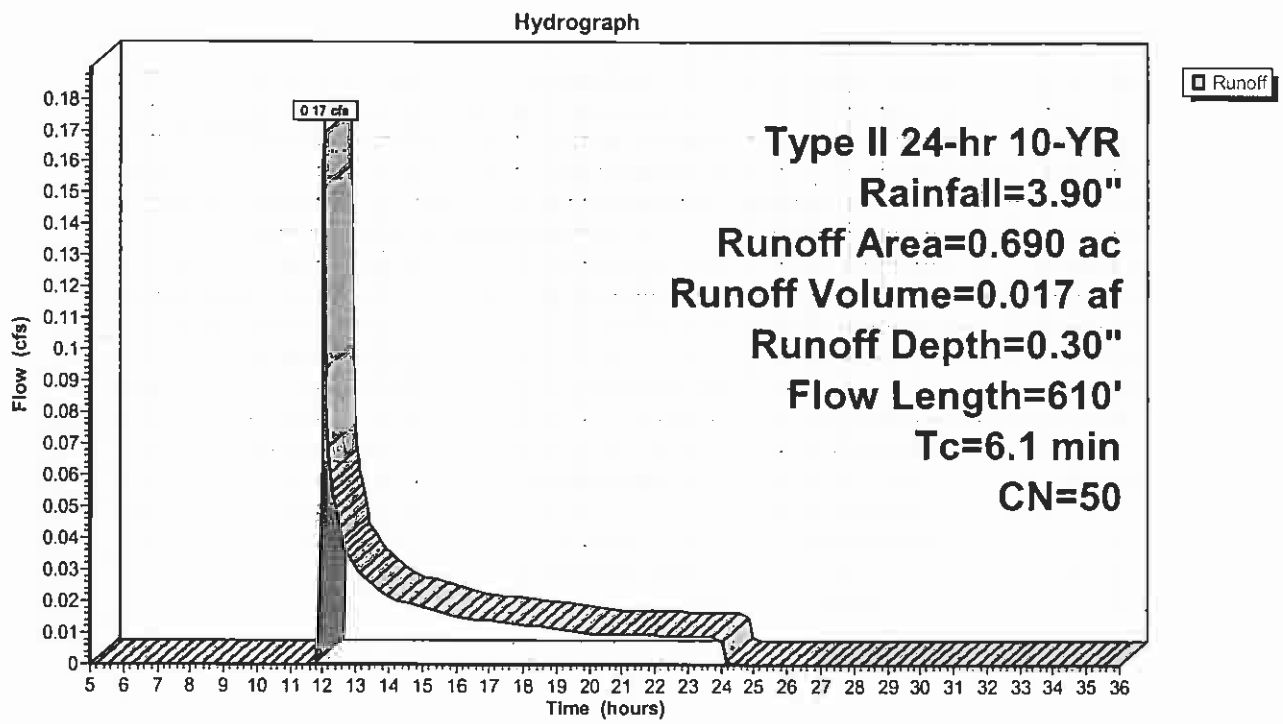
Runoff = 0.17 cfs @ 12.02 hrs, Volume= 0.017 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.020	89	Gravel roads, HSG C
0.630	49	Brush, Good, HSG C
0.040	53	Woods, Good, HSG C
0.690	50	Weighted Average
0.690		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.3000	0.46		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.5	510	0.2360	3.40		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
6.1	610	Total			

Subcatchment C-192: Culvert-192 Area



Subcatchment C-193: Culvert-193 Area

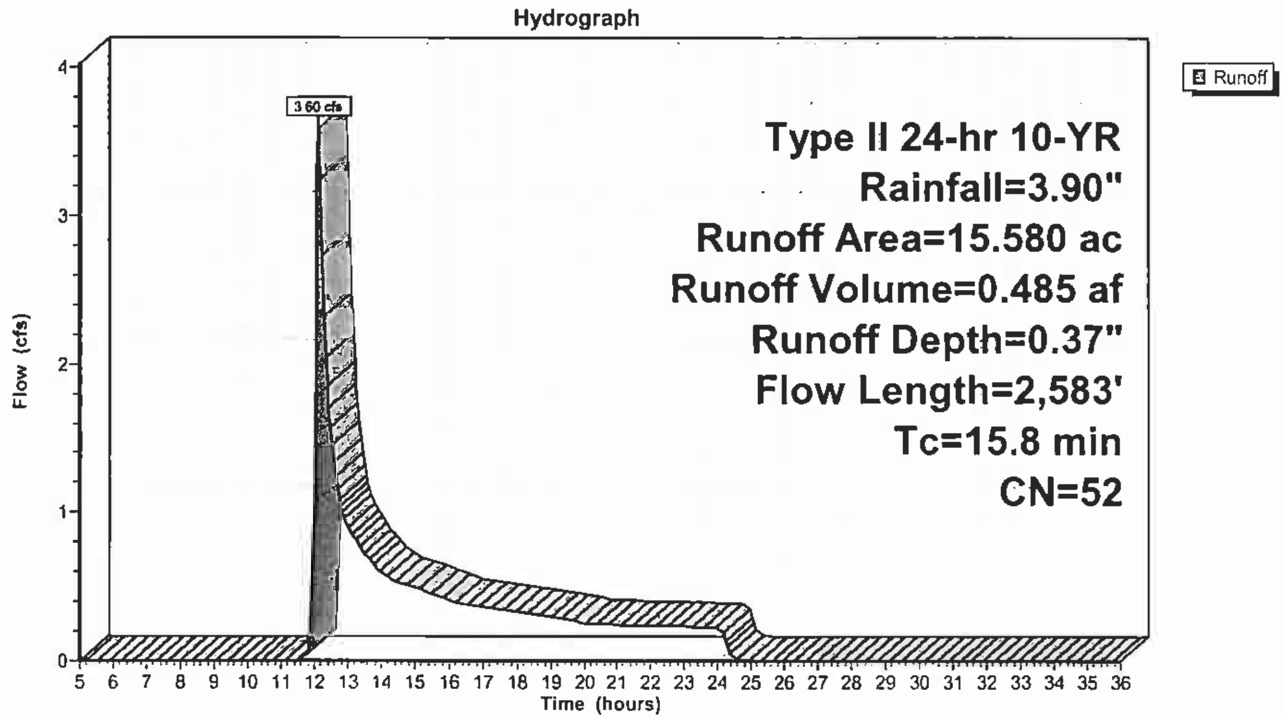
Runoff = 3.60 cfs @ 12.15 hrs, Volume= 0.485 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
10.490	49	Brush, Good, HSG C
0.020	53	Woods, Good, HSG C
0.730	55	Brush, Good, HSG D
4.290	58	Woods, Good, HSG D
15.580	52	Weighted Average
15.580		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.2600	0.49		**Sheet Flow, sheet** Range n= 0.130 P2= 2.70"
3.9	670	0.3340	2.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.5	1,813	0.2550	3.53		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
15.8	2,583	Total			

Subcatchment C-193: Culvert-193 Area



Subcatchment C-196: Culvert-196 Area

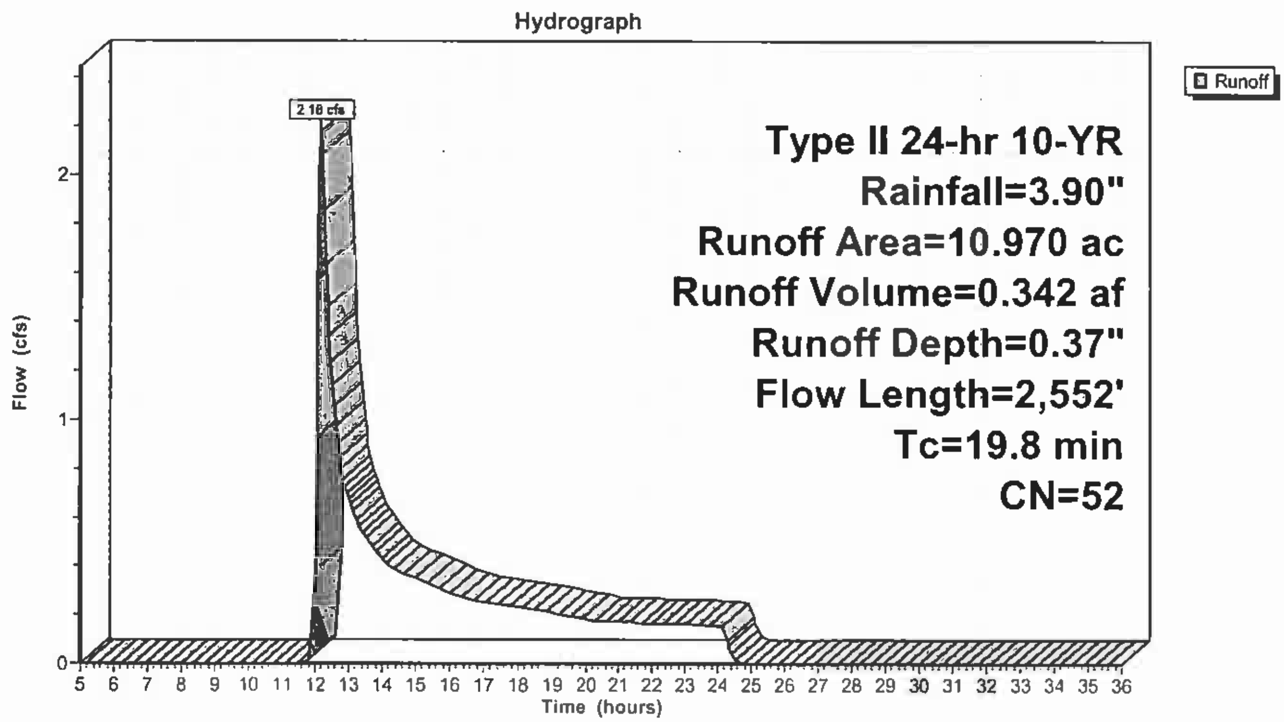
Runoff = 2.18 cfs @ 12.21 hrs, Volume= 0.342 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
6.440	49	Brush, Good, HSG C
1.360	55	Brush, Good, HSG D
3.130	58	Woods, Good, HSG D
10.970	52	Weighted Average
10.970		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.3000	0.21		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.2	558	0.3370	2.90		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.5	1,798	0.2550	3.53		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	96	0.0630	7.89	47.34	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.50' Z= 2.0 '/' Top.W=7.00' n= 0.040
19.8	2,552	Total			

Subcatchment C-196: Culvert-196 Area



Subcatchment C-197: Culvert-197 Area

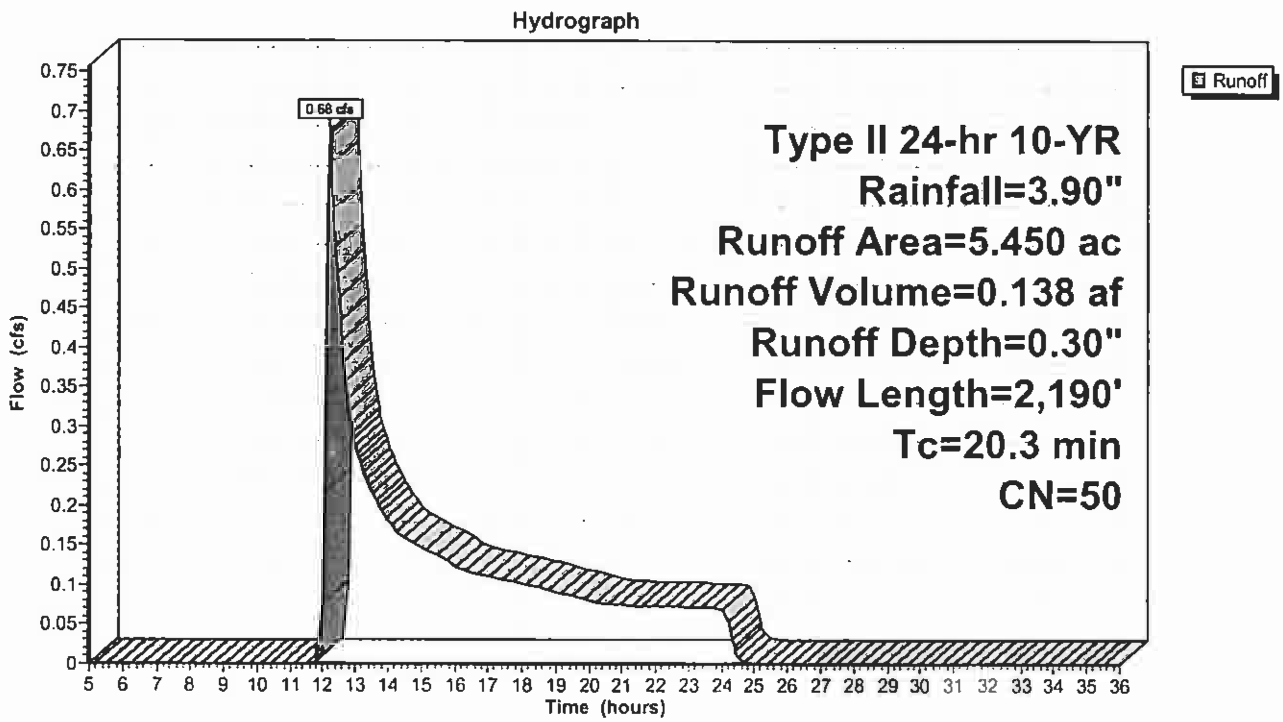
Runoff = 0.68 cfs @ 12.23 hrs, Volume= 0.138 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
4.760	49	Brush, Good, HSG C
0.400	55	Brush, Good, HSG C
0.250	58	Woods, Good, HSG D
5.450	50	Weighted Average
5.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.7	300	0.3330	2.89		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.2	1,750	0.2570	3.55		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.0	40	0.1250	17.37	338.81	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=3.00' Z= 1.5 '/' Top.W=11.00' n= 0.040
20.3	2,190	Total			

Subcatchment C-197: Culvert-197 Area



Subcatchment C-198: Culvert-198 Area

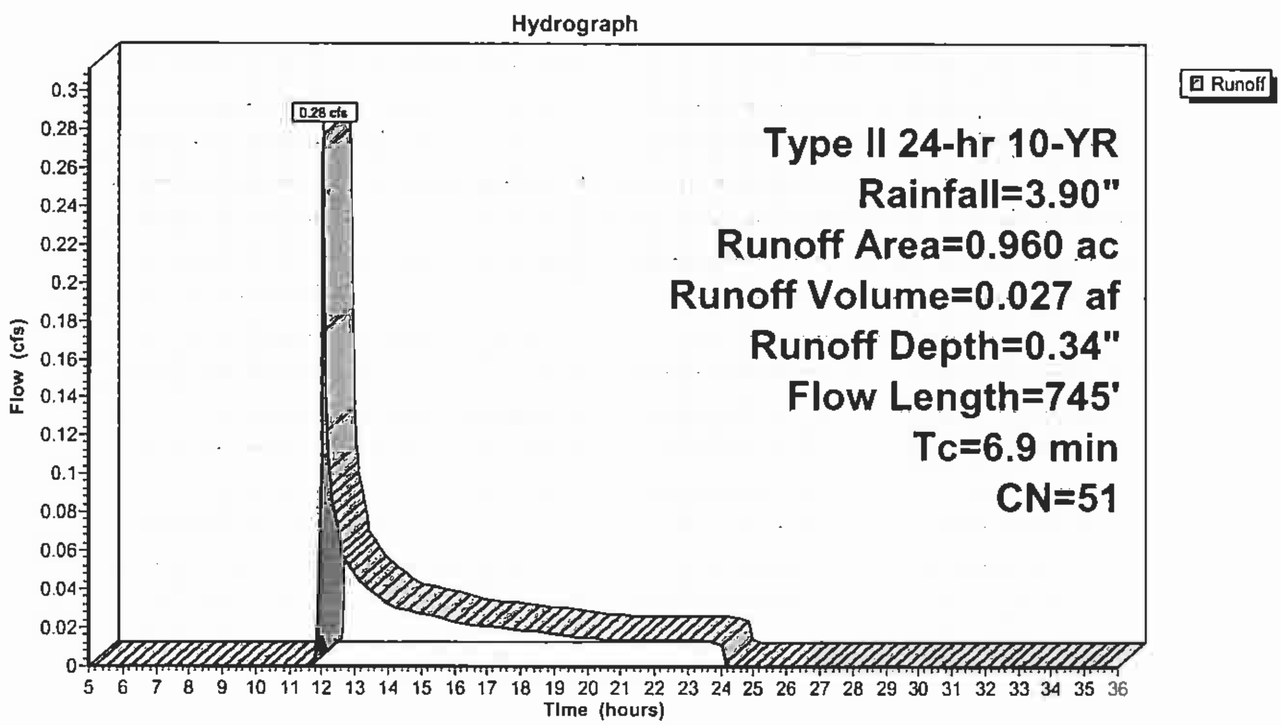
Runoff = 0.28 cfs @ 12.03 hrs, Volume= 0.027 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.910	49	Brush, Good, HSG C
0.960	51	Weighted Average
0.960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1900	0.38		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.4	530	0.2880	3.76		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	115	0.1130	12.53	125.35	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 2.0 '/' Top.W=9.00' n= 0.040
6.9	745	Total			

Subcatchment C-198: Culvert-198 Area



Subcatchment C-2000: Culvert-2000 Area

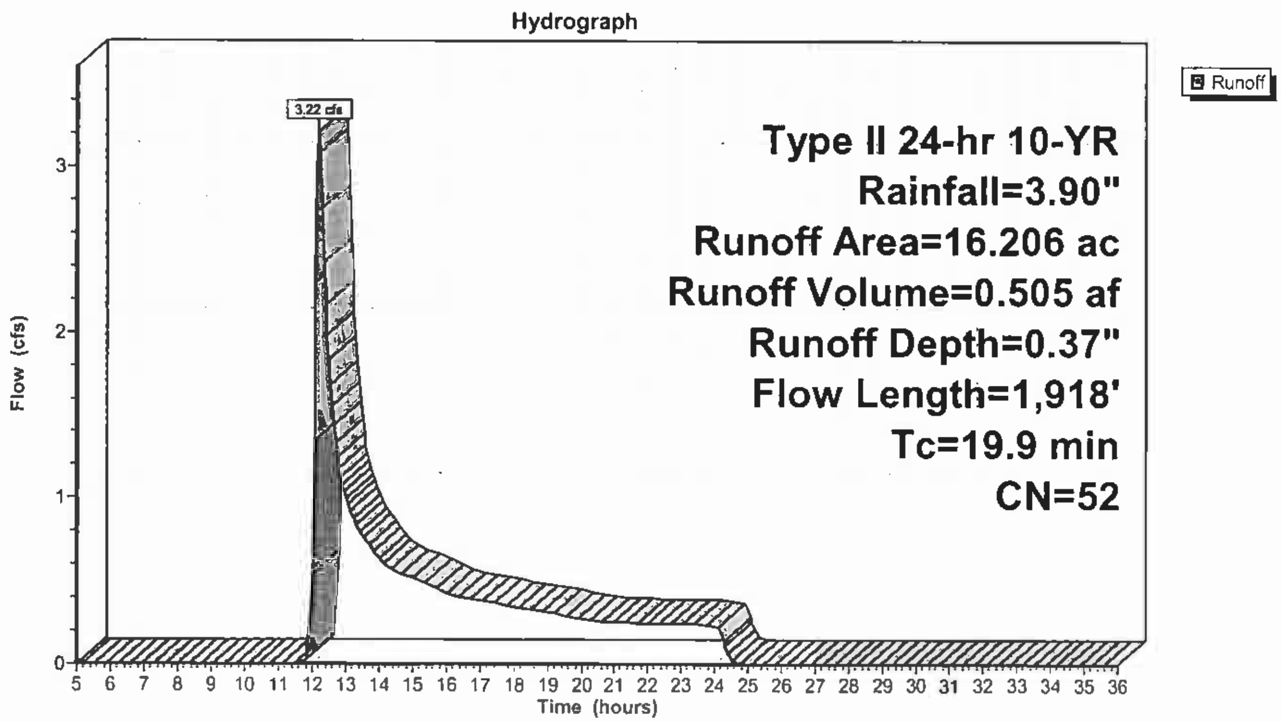
Runoff = 3.22 cfs @ 12.21 hrs, Volume= 0.505 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.231	89	Gravel roads, HSG C
8.958	49	Brush, Good, HSG C
3.131	53	Woods, Good, HSG C
0.083	55	Brush, Good, HSG D
3.803	58	Woods, Good, HSG D
16.206	52	Weighted Average
16.206		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
6.3	972	0.2610	2.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.3	846	0.2200	3.28		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.9	1,918	Total			

Subcatchment C-2000: Culvert-2000 Area



Subcatchment C-2001: Culvert-2001 Area

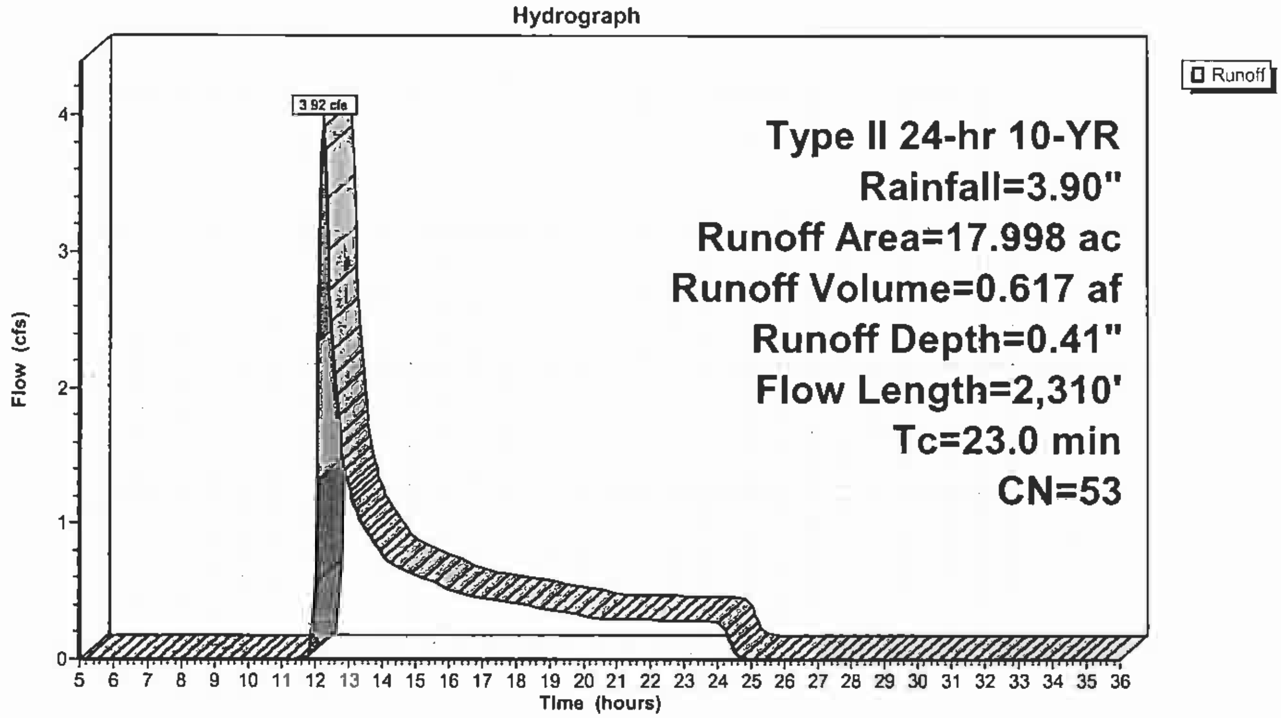
Runoff = 3.92 cfs @ 12.25 hrs, Volume= 0.617 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.399	89	Gravel roads, HSG C
9.820	49	Brush, Good, HSG C
2.312	53	Woods, Good, HSG C
1.708	55	Brush, Good, HSG D
3.759	58	Woods, Good, HSG D
17.998	53	Weighted Average
17.998		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0300	0.18		**Sheet Flow, sheet**
					Grass: Short n= 0.150 P2= 2.70"
1.5	188	0.0850	2.04		**Shallow Concentrated Flow, shallow**
					Short Grass Pasture Kv= 7.0 fps
0.2	110	0.0900	11.85	142.21	**Trap/Vee/Rect Channel Flow, ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
0.2	45	0.0100	3.93	3.09	**Circular Channel (pipe), culvert**
					Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
8.4	1,194	0.2260	2.38		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
3.6	673	0.1930	3.08		**Shallow Concentrated Flow, shallow**
					Short Grass Pasture Kv= 7.0 fps
23.0	2,310	Total			

Subcatchment C-2001: Culvert-2001 Area



Subcatchment C-2002: Culvert-2002 Area

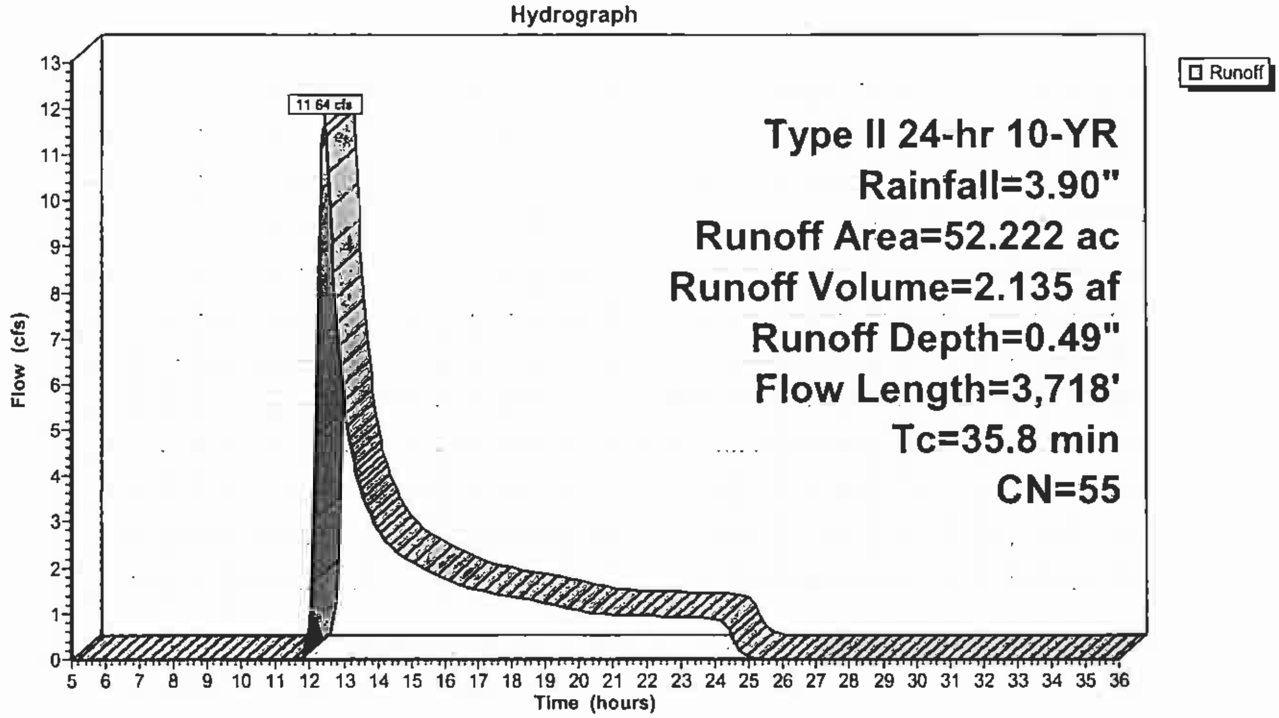
Runoff = 11.64 cfs @ 12.43 hrs, Volume= 2.135 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1.326	89	Gravel roads, HSG C
17.190	49	Brush, Good, HSG C
0.526	53	Woods, Good, HSG C
21.667	55	Brush, Good, HSG D
11.513	58	Woods, Good, HSG D
52.222	55	Weighted Average
52.222		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.0	360	0.0830	2.02		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
5.8	547	0.0990	1.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	45	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
1.5	146	0.0990	1.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
12.7	2,048	0.1470	2.68		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.8	472	0.0580	9.51	114.16	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
35.8	3,718	Total			

Subcatchment C-2002: Culvert-2002 Area



Subcatchment C-2003: Culvert-2003 Area

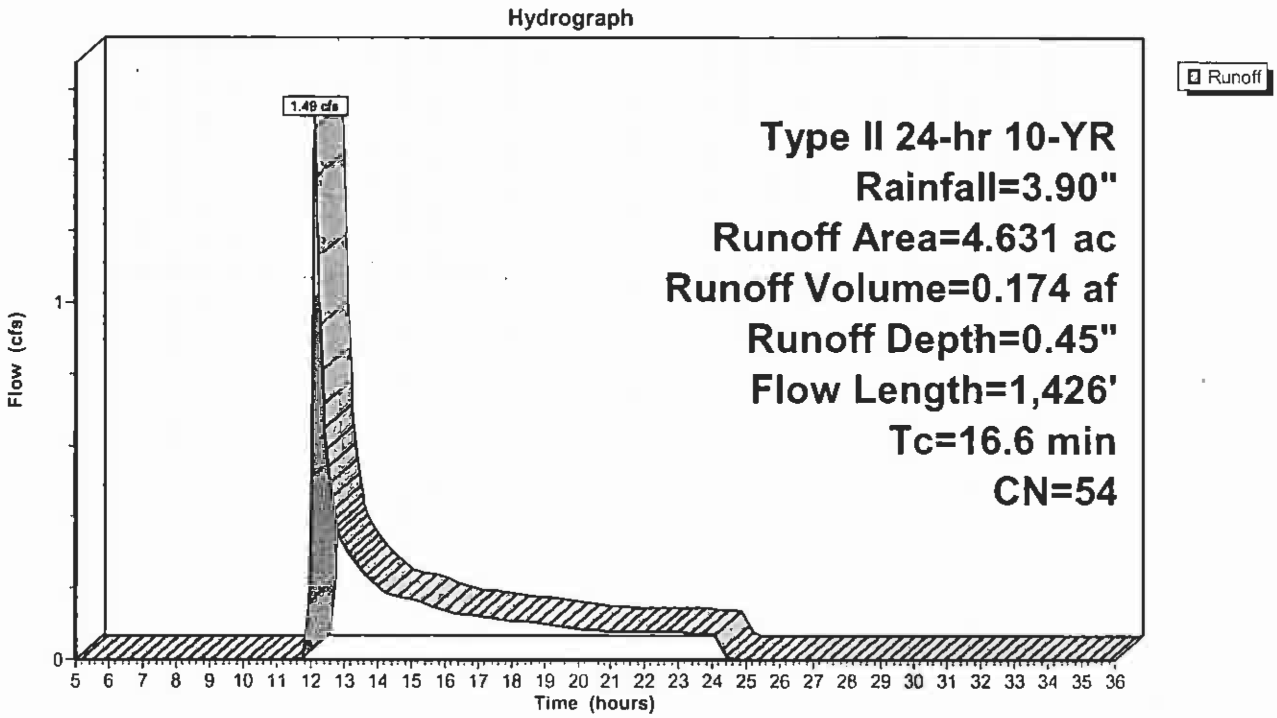
Runoff = 1.49 cfs @ 12.15 hrs, Volume= 0.174 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.128	89	Gravel roads, HSG C
2.086	49	Brush, Good, HSG C
1.390	55	Brush, Good, HSG D
1.027	58	Woods, Good, HSG D
4.631	54	Weighted Average
4.631		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2200	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.2	158	0.1900	2.18		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
5.9	820	0.1100	2.32		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.5	348	0.0920	11.98	143.78	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
16.6	1,426	Total			

Subcatchment C-2003: Culvert-2003 Area



Subcatchment C-2004: Culvert-2004 Area

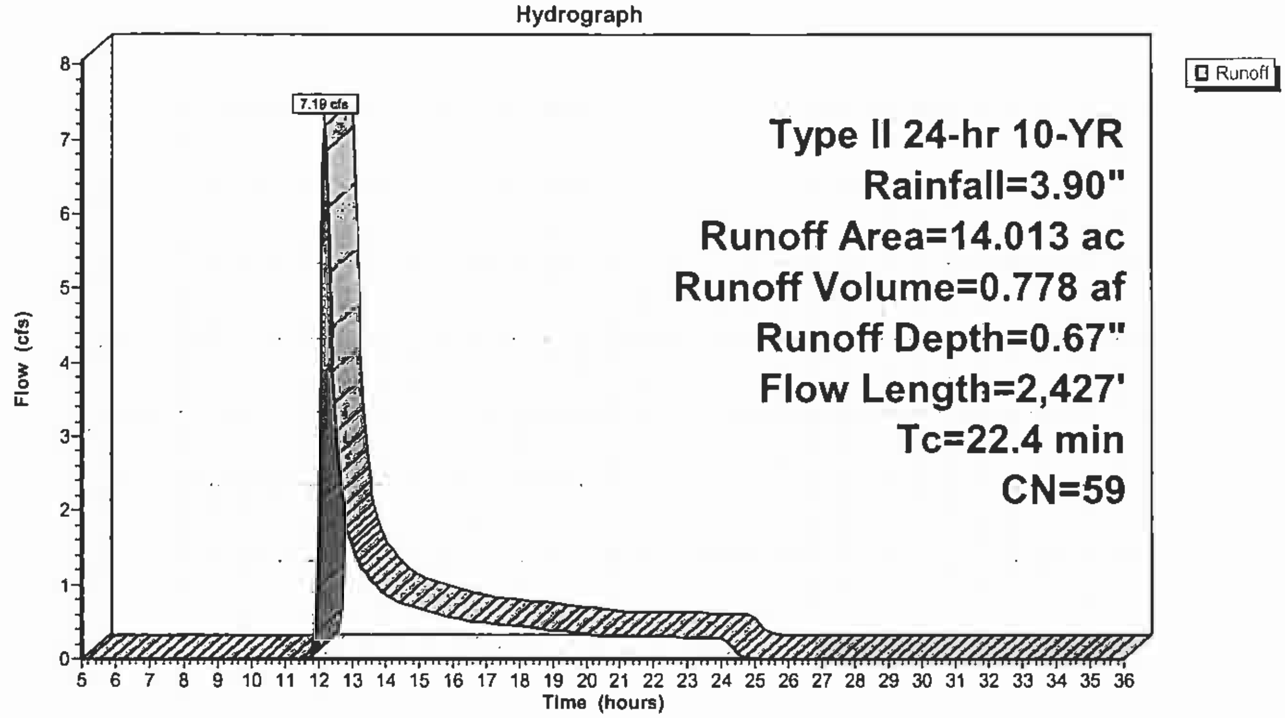
Runoff = 7.19 cfs @ 12.20 hrs, Volume= 0.778 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.964	89	Gravel roads, HSG C
0.122	49	Brush, Good, HSG C
5.523	55	Brush, Good, HSG D
7.404	58	Woods, Good, HSG D
14.013	59	Weighted Average
14.013		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.5	106	0.2450	3.46		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	41	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
2.1	245	0.1470	1.92		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.5	1,315	0.1370	2.59		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.9	620	0.0930	12.05	144.56	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
22.4	2,427	Total			

Subcatchment C-2004: Culvert-2004 Area



Subcatchment C-2005: Culvert-2005 Area

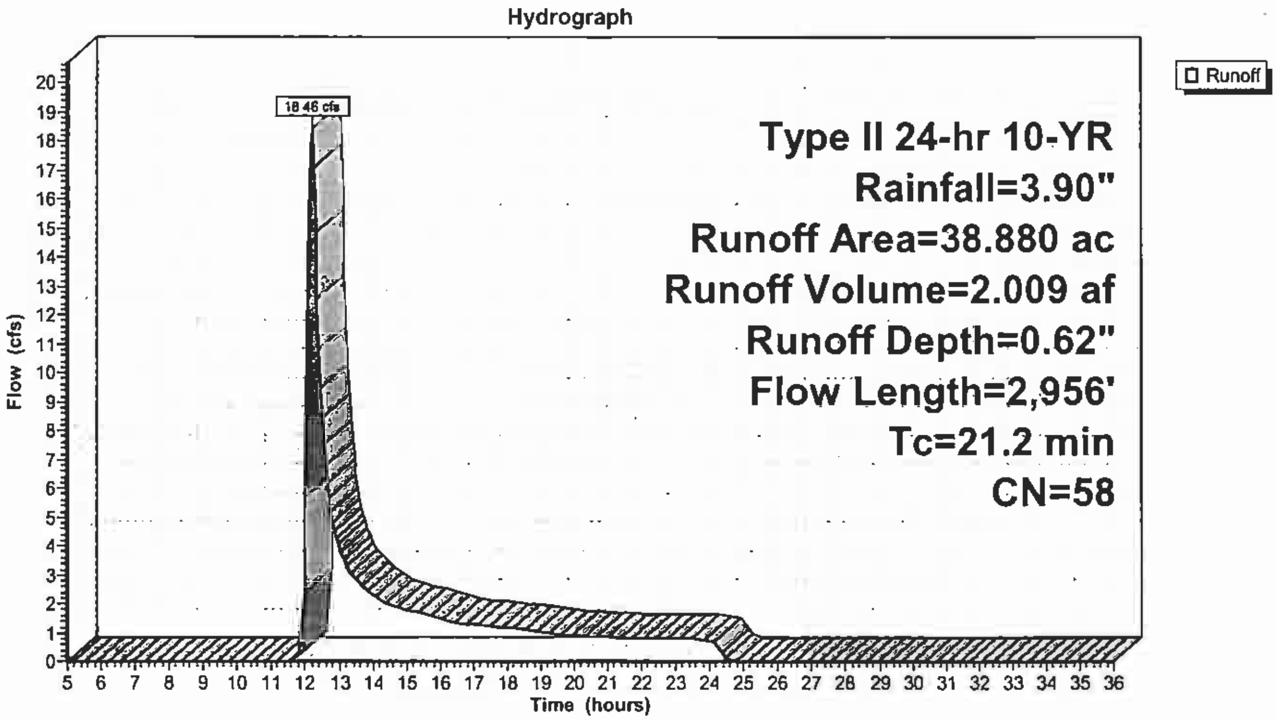
Runoff = 18.46 cfs @ 12.19 hrs, Volume= 2.009 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
1.978	89	Gravel roads, HSG C
19.343	55	Brush, Good, HSG D
17.559	58	Woods, Good, HSG D
38.880	58	Weighted Average
38.880		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1400	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.2	598	0.1470	1.92		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	42	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
2.9	328	0.0730	1.89		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0100	3.93	3.09	**Circular Channel (pipe), culvert** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.015
2.0	1,838	0.0620	15.61	749.45	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=4.00' D=4.00' Z= 2.0 '/' Top.W=20.00' n= 0.040
21.2	2,956	Total			

Subcatchment C-2005: Culvert-2005 Area



Subcatchment C-2006: Culvert-2006 Area

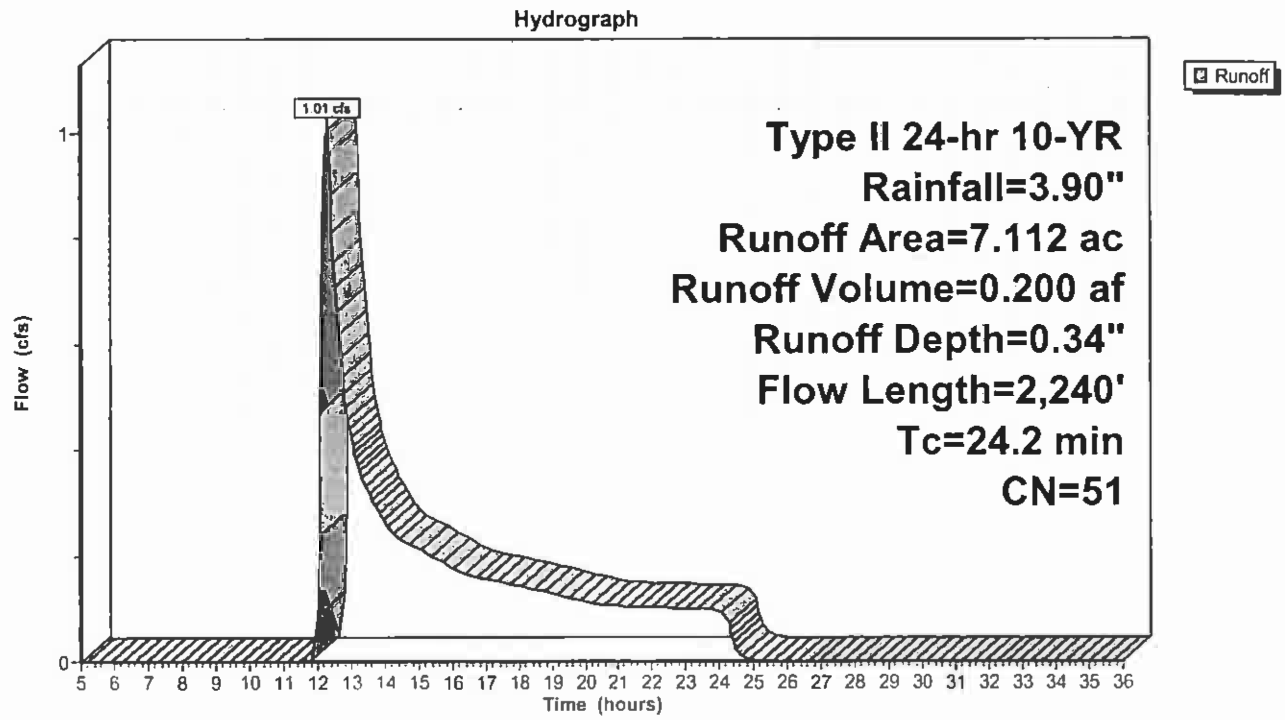
Runoff = 1.01 cfs @ 12.29 hrs, Volume= 0.200 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.056	89	Gravel roads, HSG C
4.883	49	Brush, Good, HSG C
1.286	53	Woods, Good, HSG C
0.887	58	Woods, Good, HSG D
7.112	51	Weighted Average
7.112		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.0	772	0.2600	2.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
5.4	1,098	0.2310	3.36		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
2.4	270	0.1410	1.88		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
24.2	2,240	Total			

Subcatchment C-2006: Culvert-2006 Area



Subcatchment C-211: Culvert-211 Area

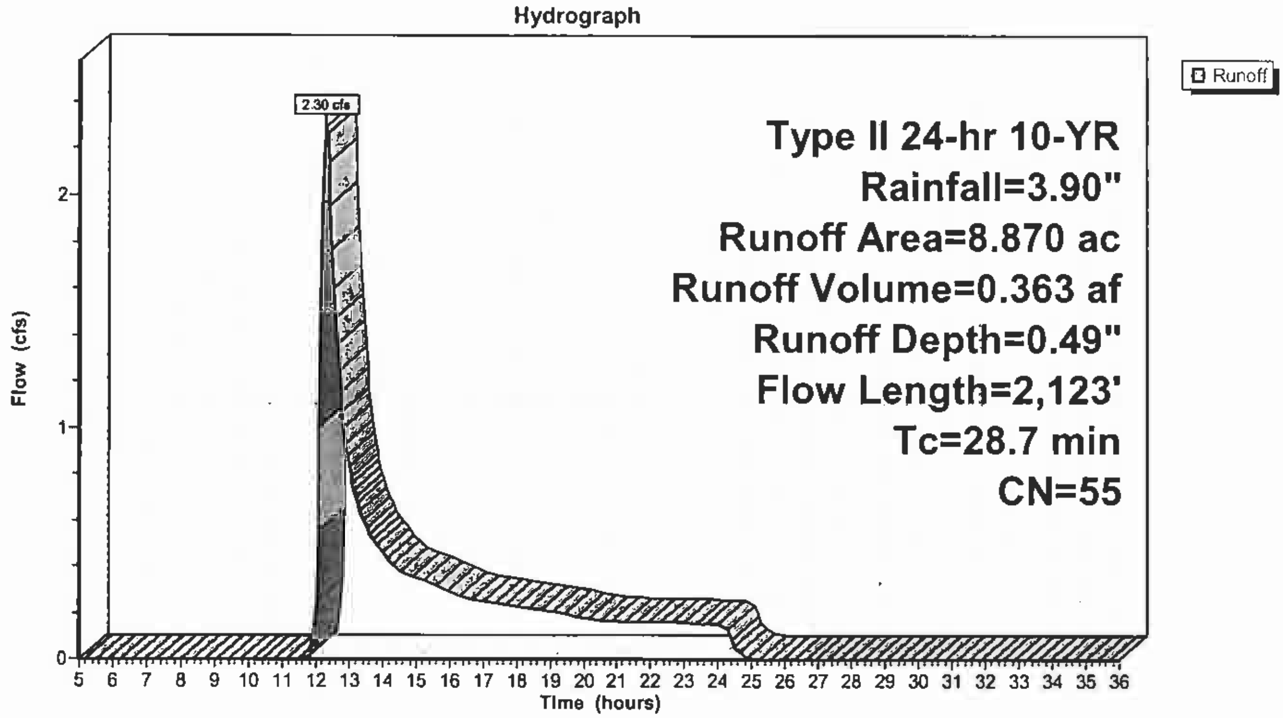
Runoff = 2.30 cfs @ 12.32 hrs, Volume= 0.363 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.710	49	Pasture/grassland/range, Good, HSG C
4.940	53	Woods, Good, HSG C
0.370	55	Brush, Good, HSG D
2.800	58	Woods, Good, HSG D
8.870	55	Weighted Average
8.870		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet**
					Woods: Light underbrush n= 0.400 P2= 2.70"
6.7	828	0.1690	2.06		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
3.0	365	0.0820	2.00		**Shallow Concentrated Flow, shallow**
					Short Grass Pasture Kv= 7.0 fps
7.1	745	0.1210	1.74		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
0.5	85	0.0250	2.59	3.89	**Trap/Vee/Rect Channel Flow, ditch**
					Bot.W=1.00' D=0.50' Z= 4.0 '/' Top.W=5.00' n= 0.040
28.7	2,123	Total			

Subcatchment C-211: Culvert-211 Area



Subcatchment C-212: Culvert-212 Area

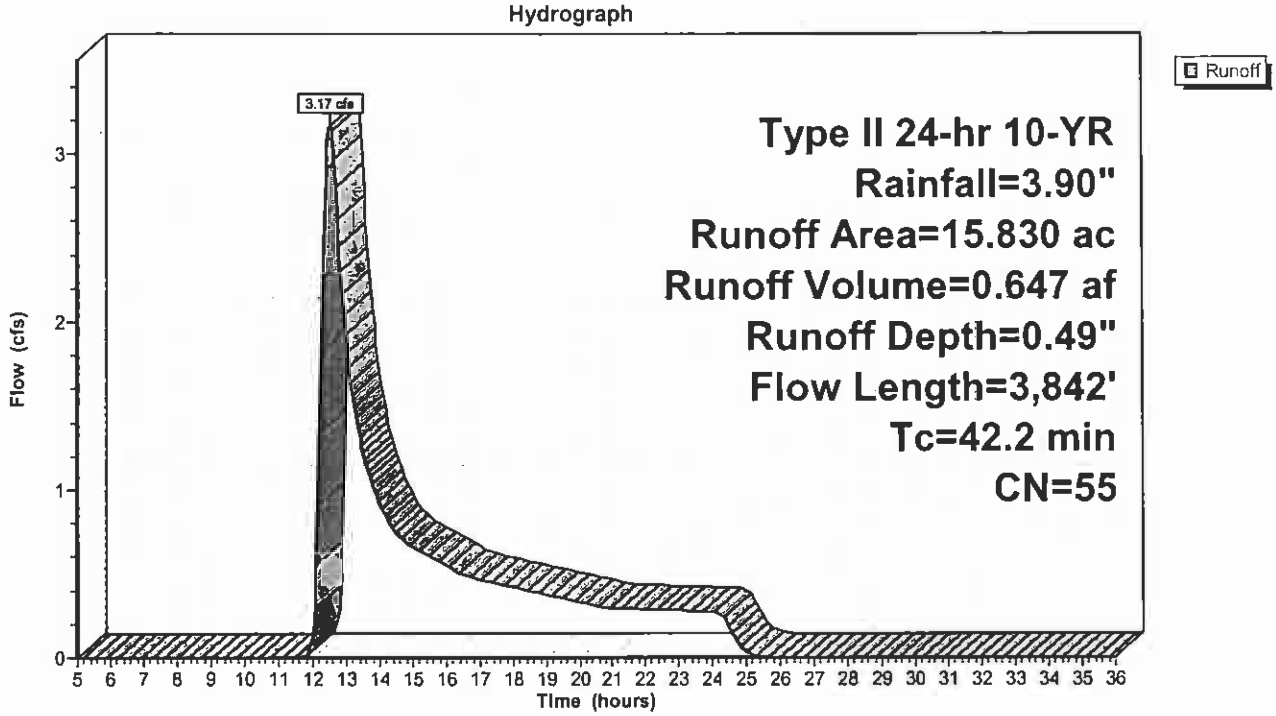
Runoff = 3.17 cfs @ 12.53 hrs, Volume= 0.647 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.020	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
10.180	53	Woods, Good, HSG C
0.470	55	Brush, Good, HSG D
5.070	58	Woods, Good, HSG D
15.830	55	Weighted Average
15.830		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2400	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
23.7	2,937	0.1700	2.06		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	40	0.0400	6.44	11.38	**Circular Channel (pipe), culvert** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.024
9.4	738	0.0690	1.31		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	27	0.0100	1.64	2.46	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.50' Z= 4.0 '/' Top.W=5.00' n= 0.040
42.2	3,842	Total			

Subcatchment C-212: Culvert-212 Area



Subcatchment C-212A: Culvert-212A Area

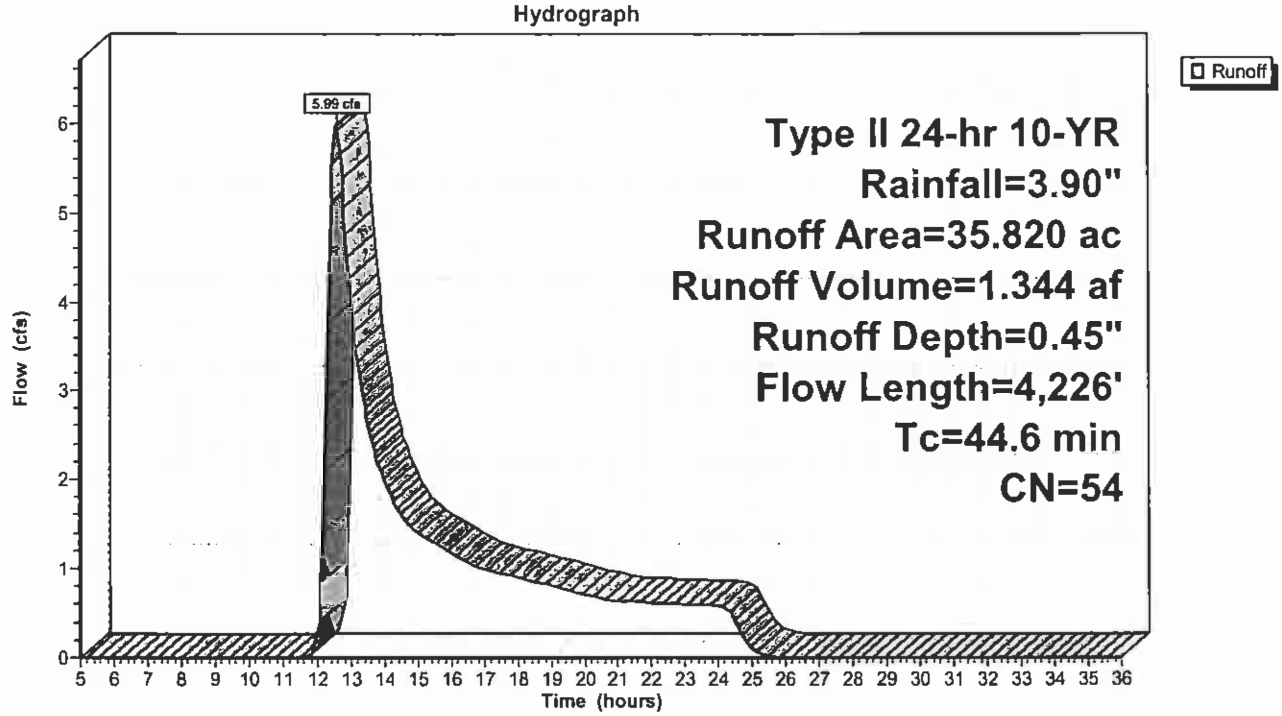
Runoff = 5.99 cfs @ 12.57 hrs, Volume= 1.344 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.300	49	Brush, Good, HSG C
31.260	53	Woods, Good, HSG C
0.550	55	Brush, Good, HSG D
3.680	58	Woods, Good, HSG D
35.820	54	Weighted Average
35.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1800	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.4	3,250	0.1970	2.22		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	35	0.0280	5.39	9.52	**Circular Channel (pipe), culvert** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.024
10.4	841	0.0730	1.35		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
44.6	4,226	Total			

Subcatchment C-212A: Culvert-212A Area



Subcatchment C-214: Culvert-214 Area

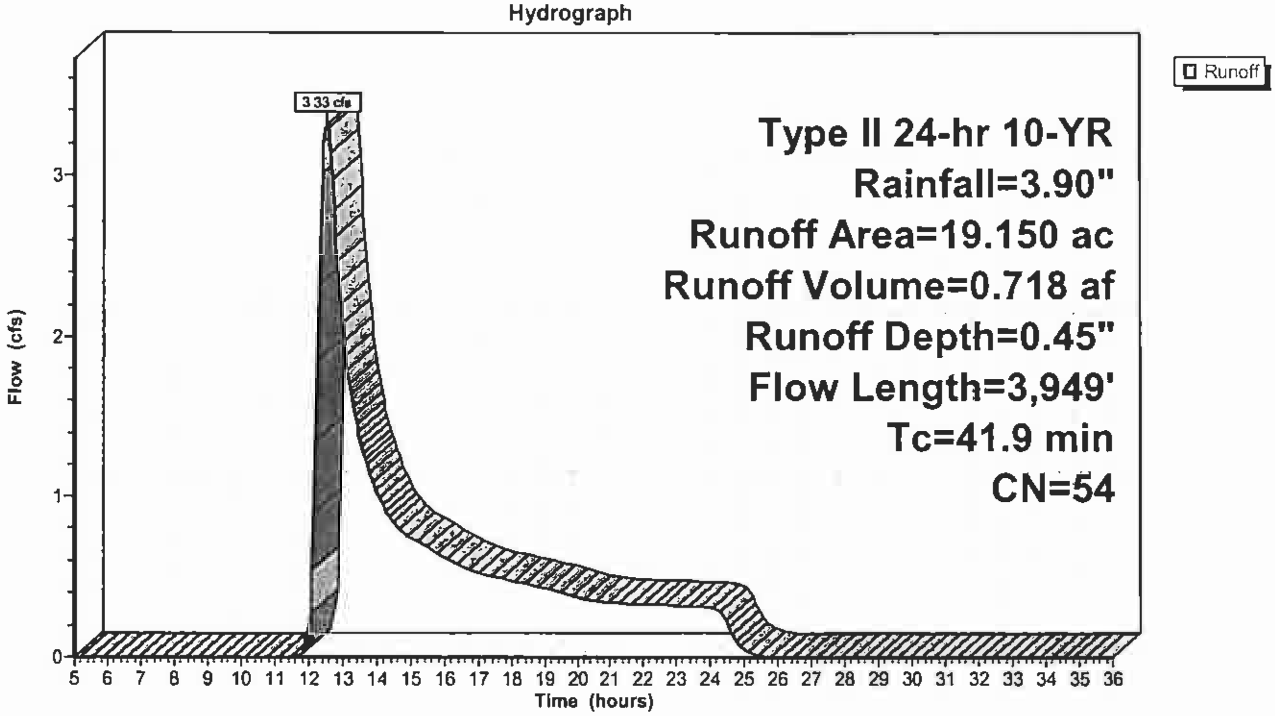
Runoff = 3.33 cfs @ 12.54 hrs, Volume= 0.718 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.620	49	Brush, Good, HSG C
13.840	53	Woods, Good, HSG C
0.030	55	Brush, Good, HSG D
4.610	58	Woods, Good, HSG D
19.150	54	Weighted Average
19.150		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.3000	0.21		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.3	1,765	0.2300	2.40		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	150	0.0720	3.14	0.78	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=0.50' Z= 1.0 '/' Top.W=1.00' n= 0.040
20.9	1,934	0.0950	1.54		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
41.9	3,949	Total			

Subcatchment C-214: Culvert-214 Area



Subcatchment C-218: Culvert-218 Area

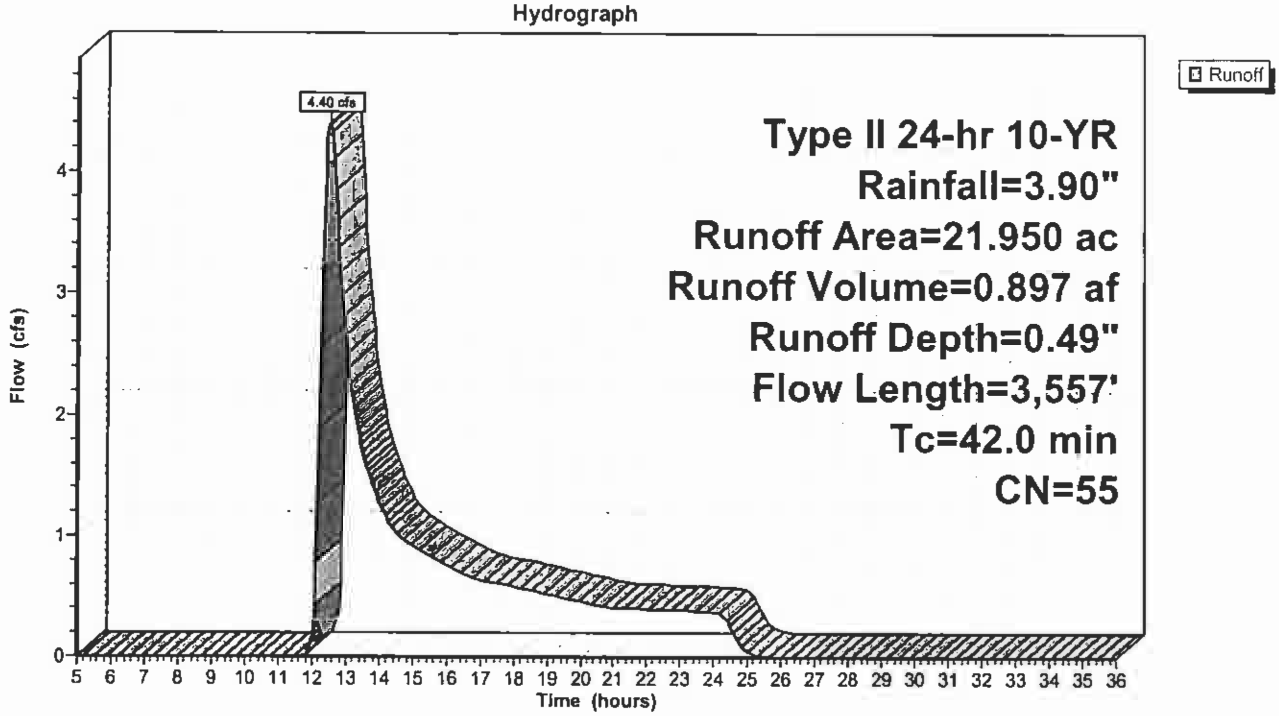
Runoff = 4.40 cfs @ 12.53 hrs, Volume= 0.897 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
1.160	49	Brush, Good, HSG C
13.540	53	Woods, Good, HSG C
7.120	58	Woods, Good, HSG D
21.950	55	Weighted Average
21.950		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
6.3	938	0.2460	2.48		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	104	0.1200	2.42		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
24.7	2,300	0.0960	1.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	115	0.0130	1.87	2.80	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.50' Z= 4.0 '/' Top.W=5.00' n= 0.040
42.0	3,557	Total			

Subcatchment C-218: Culvert-218 Area



Subcatchment C-219: Culvert-219 Area

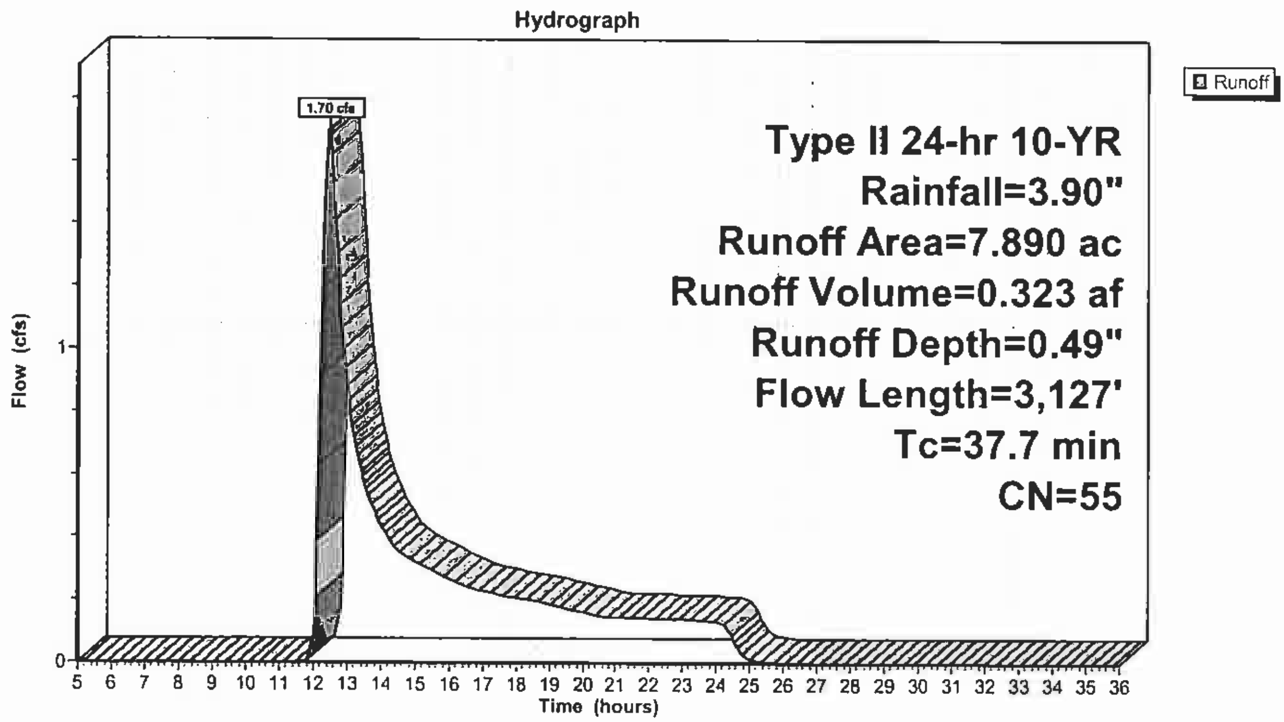
Runoff = 1.70 cfs @ 12.46 hrs, Volume= 0.323 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
4.520	53	Woods, Good, HSG C
3.280	58	Woods, Good, HSG D
7.890	55	Weighted Average
7.890		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
27.9	2,980	0.1270	1.78		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.5	47	0.0120	1.58	1.58	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=0.50' Z= 4.0 '/' Top.W=4.00' n= 0.040
37.7	3,127	Total			

Subcatchment C-219: Culvert-219 Area



Subcatchment C-220: Culvert-220 Area

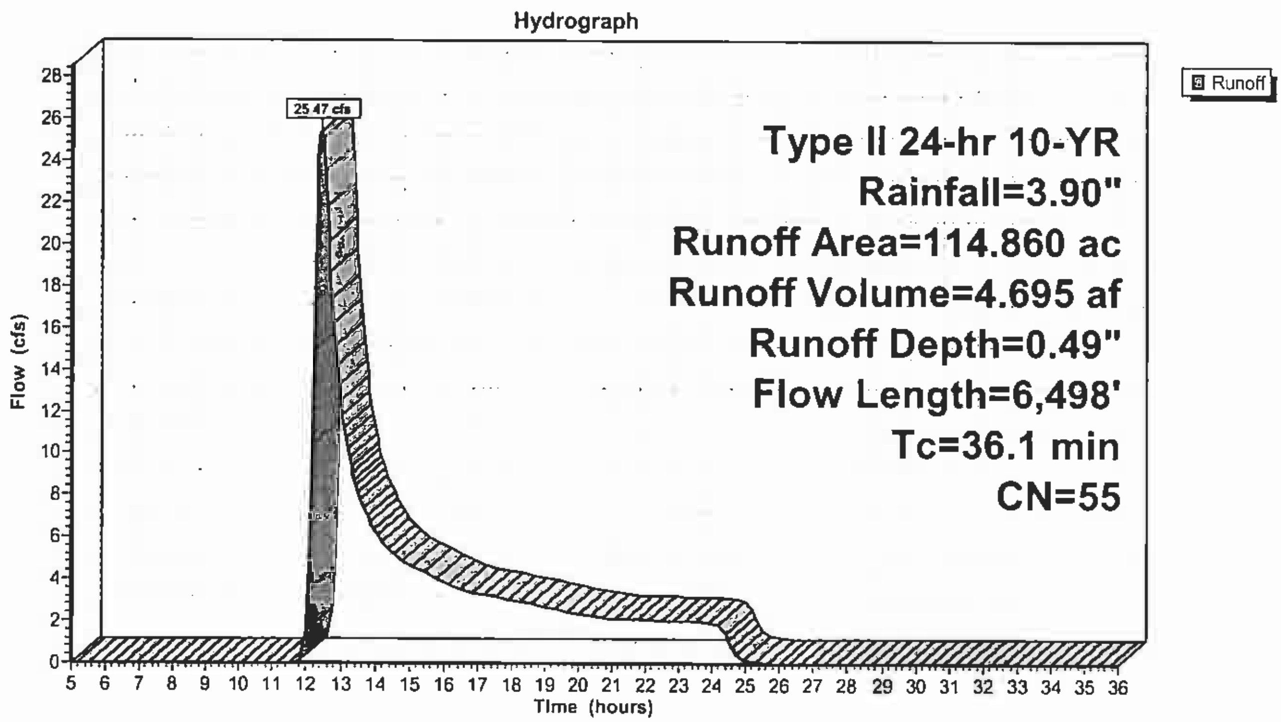
Runoff = 25.47 cfs @ 12.43 hrs, Volume= 4.695 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
0.200	49	Brush, Good, HSG C
74.600	53	Woods, Good, HSG C
39.940	58	Woods, Good, HSG D
114.860	55	Weighted Average
114.860		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
22.9	3,503	0.2610	2.55		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.7	2,895	0.0990	12.99	311.70	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=4.00' D=2.00' Z= 4.0 '/' Top.W=20.00' n= 0.040
36.1	6,498	Total			

Subcatchment C-220: Culvert-220 Area



Subcatchment C-221: Culvert-221 Area

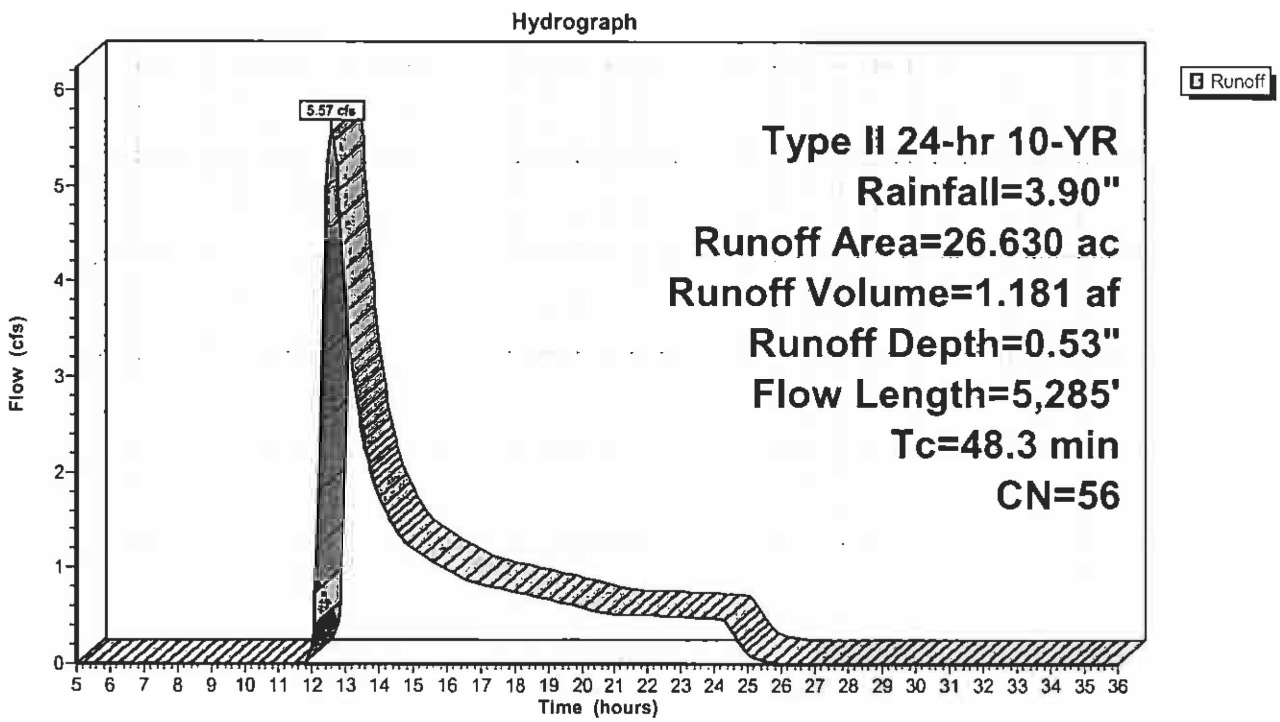
Runoff = 5.57 cfs @ 12.61 hrs, Volume= 1.181 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.160	89	Gravel roads, HSG C
1.180	49	Brush, Good, HSG C
9.180	53	Woods, Good, HSG C
0.860	55	Brush, Good, HSG D
15.250	58	Woods, Good, HSG D
26.630	56	Weighted Average
26.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	100	0.3100	0.21		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
40.5	5,185	0.1820	2.13		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
48.3	5,285	Total			

Subcatchment C-221: Culvert-221 Area



Subcatchment C-223: Culvert-223 Area

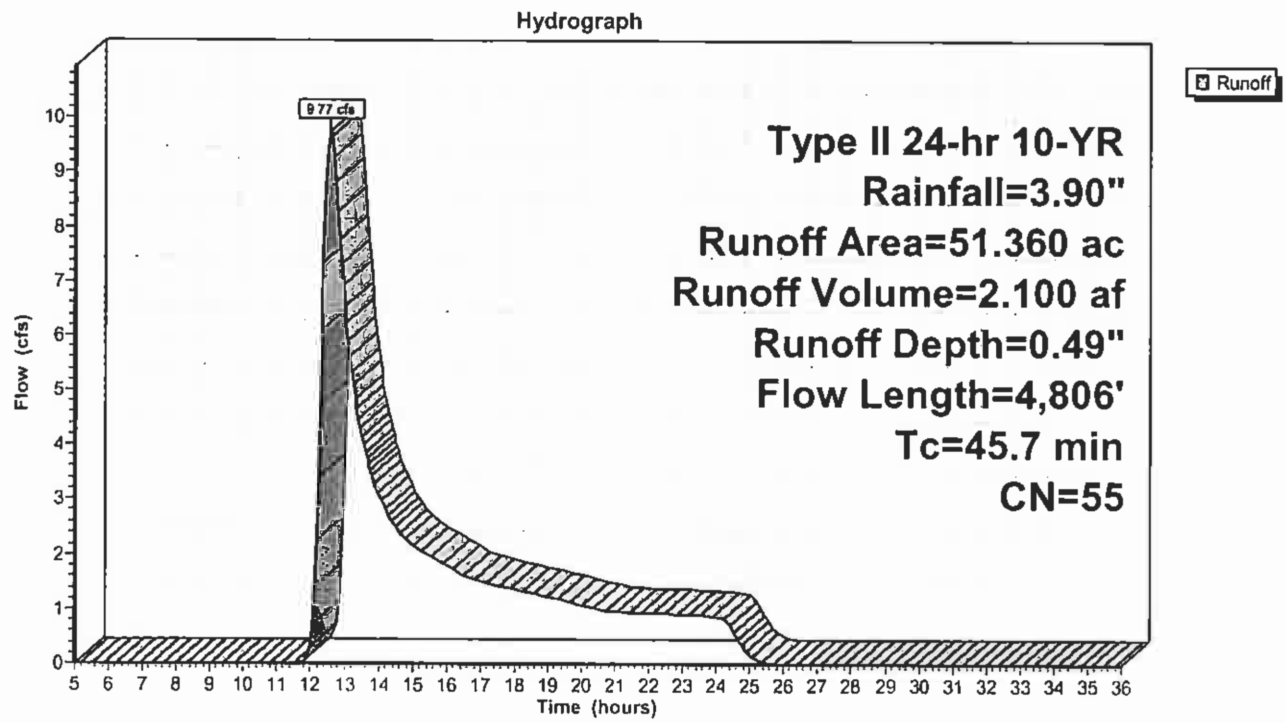
Runoff = 9.77 cfs @ 12.57 hrs, Volume= 2.100 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
8.150	49	Brush, Good, HSG C
19.200	53	Woods, Good, HSG C
2.280	55	Brush, Good, HSG D
21.650	58	Woods, Good, HSG D
51.360	55	Weighted Average
51.360		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
35.3	4,428	0.1750	2.09		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	278	0.0750	21.18	2,541.75	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=6.00' Z= 3.0 '/' Top.W=38.00' n= 0.040
45.7	4,806	Total			

Subcatchment C-223: Culvert-223 Area



Subcatchment C-224: Culvert-224 Area

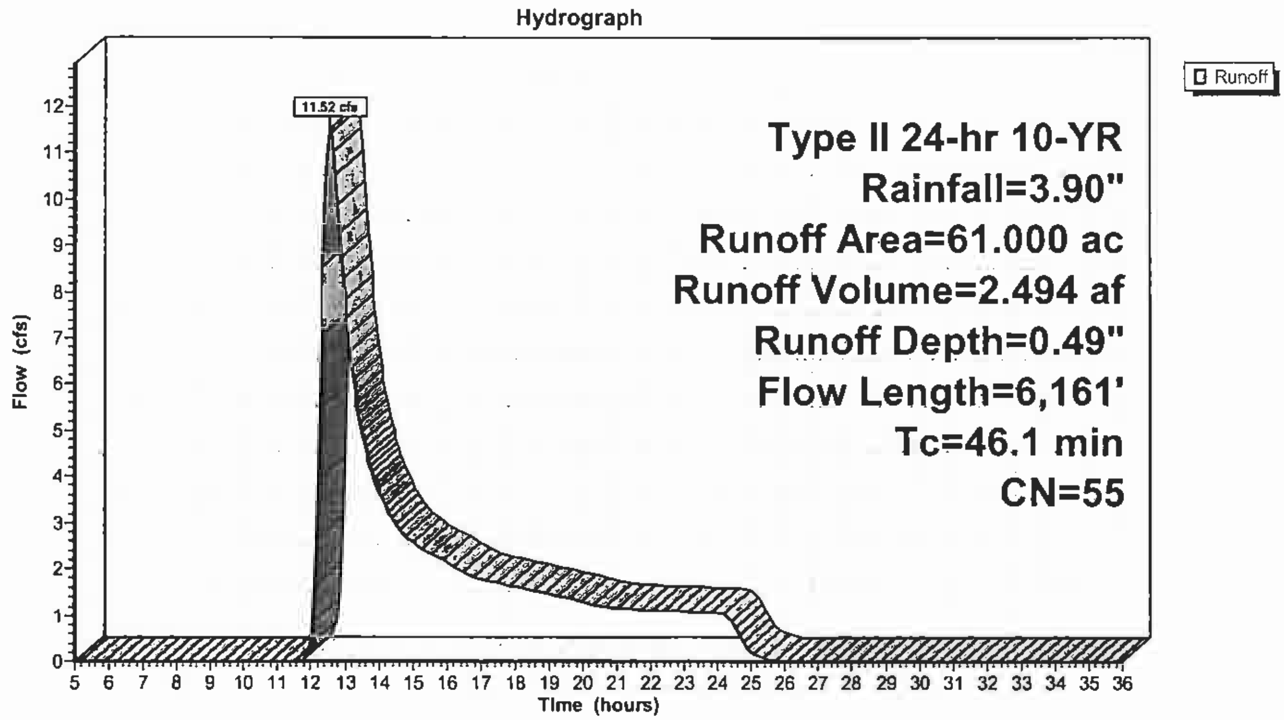
Runoff = 11.52 cfs @ 12.58 hrs, Volume= 2.494 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.130	89	Gravel roads, HSG C
16.250	49	Brush, Good, HSG C
2.270	53	Woods, Good, HSG C
12.070	55	Brush, Good, HSG D
30.280	58	Woods, Good, HSG D
61.000	55	Weighted Average
61.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2200	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.5	2,898	0.2460	2.48		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
16.6	2,519	0.1300	2.52		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.0	644	0.0710	10.31	288.76	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 6.0 '/' Top.W=26.00' n= 0.040
46.1	6,161	Total			

Subcatchment C-224: Culvert-224 Area



Subcatchment C-225: Culvert-225 Area

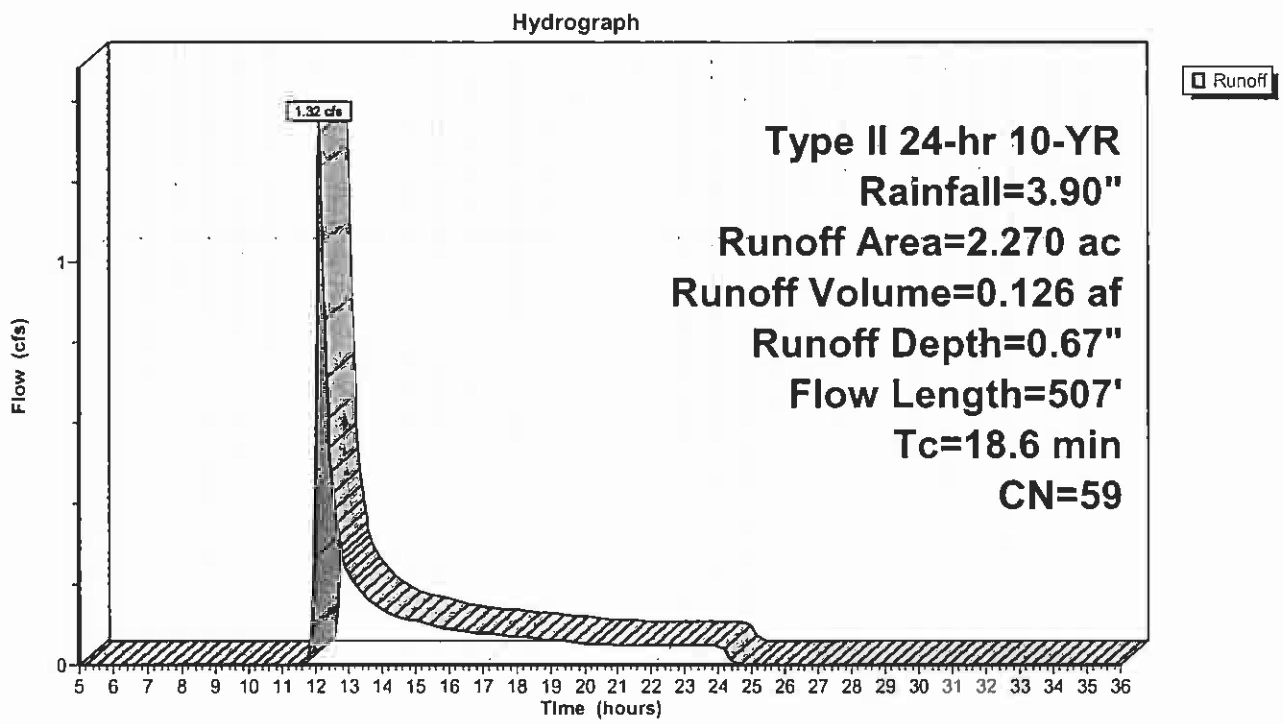
Runoff = 1.32 cfs @ 12.15 hrs, Volume= 0.126 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.080	55	Brush, Good, HSG D
2.110	58	Woods, Good, HSG D
2.270	59	Weighted Average
2.270		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	100	0.0650	0.11		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.4	323	0.0990	1.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	84	0.0200	2.36	2.95	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.50' Z= 3.0 '/' Top.W=4.00' n= 0.040
18.6	507	Total			

Subcatchment C-225: Culvert-225 Area



Subcatchment C-227: Culvert-227 Area

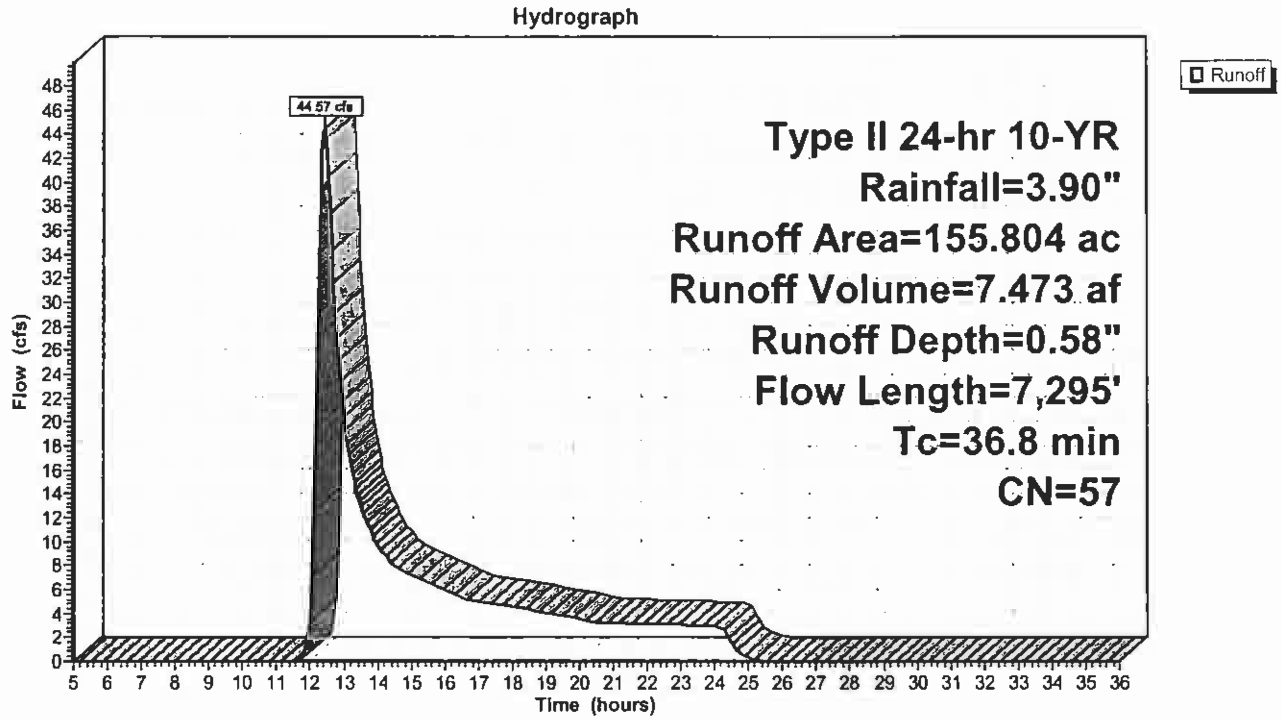
Runoff = 44.57 cfs @ 12.42 hrs, Volume= 7.473 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
10.103	49	Brush, Good, HSG C
1.594	53	Woods, Good, HSG C
16.263	55	Brush, Good, HSG D
127.804	58	Woods, Good, HSG D
155.804	57	Weighted Average
155.804		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
20.9	3,150	0.2520	2.51		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.8	2,515	0.1500	23.92	2,296.09	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=4.00' D=4.00' Z= 5.0 '/' Top.W=44.00' n= 0.040
2.3	1,530	0.0610	11.08	332.32	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.50' Z= 4.0 '/' Top.W=22.00' n= 0.040
36.8	7,295	Total			

Subcatchment C-227: Culvert-227 Area



Subcatchment C-228: Culvert-228 Area

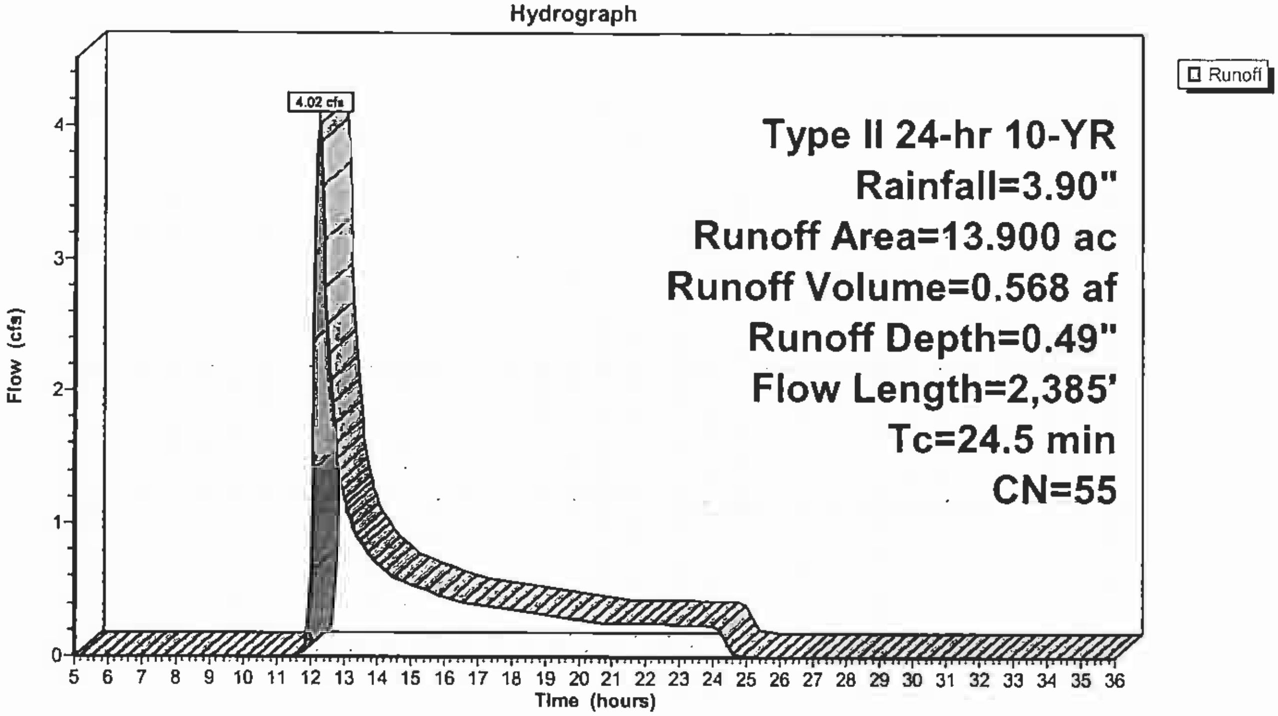
Runoff = 4.02 cfs @ 12.25 hrs, Volume= 0.568 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.140	89	Gravel roads, HSG C
0.360	49	Brush, Good, HSG C
5.060	53	Woods, Good, HSG C
7.890	55	Brush, Good, HSG D
0.450	58	Woods, Good, HSG D
13.900	55	Weighted Average
13.900		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1100	0.31		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
13.8	1,757	0.0920	2.12		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
4.9	470	0.1020	1.60		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	58	0.0200	2.36	2.95	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=0.50' Z= 3.0 '/' Top.W=4.00' n= 0.040
24.5	2,385	Total			

Subcatchment C-228: Culvert-228 Area



Subcatchment C-229: Culvert-229 Area

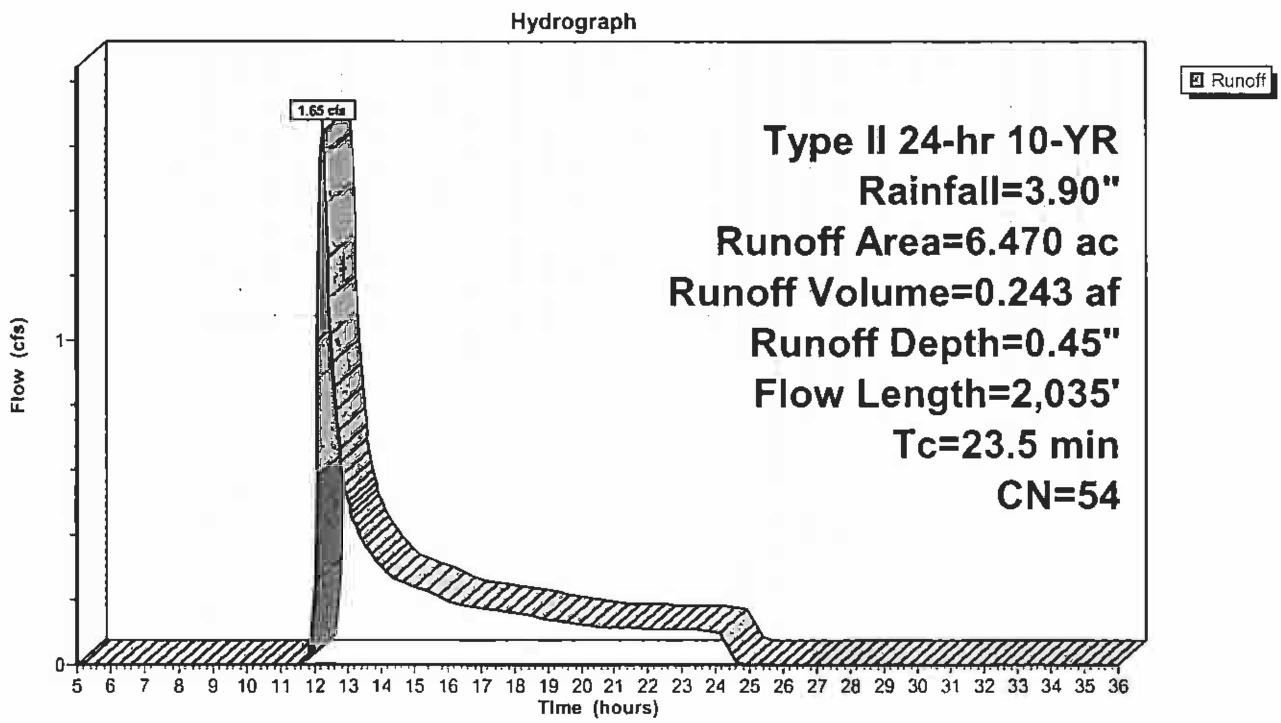
Runoff = 1.65 cfs @ 12.25 hrs, Volume= 0.243 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.130	49	Brush, Good, HSG C
2.750	53	Woods, Good, HSG C
3.470	55	Brush, Good, HSG D
0.060	58	Woods, Good, HSG D
6.470	54	Weighted Average
6.470		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.1000	0.30		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
10.0	1,250	0.0890	2.09		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
7.9	685	0.0830	1.44		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
23.5	2,035	Total			

Subcatchment C-229: Culvert-229 Area



Subcatchment C-230: Culvert-230 Area

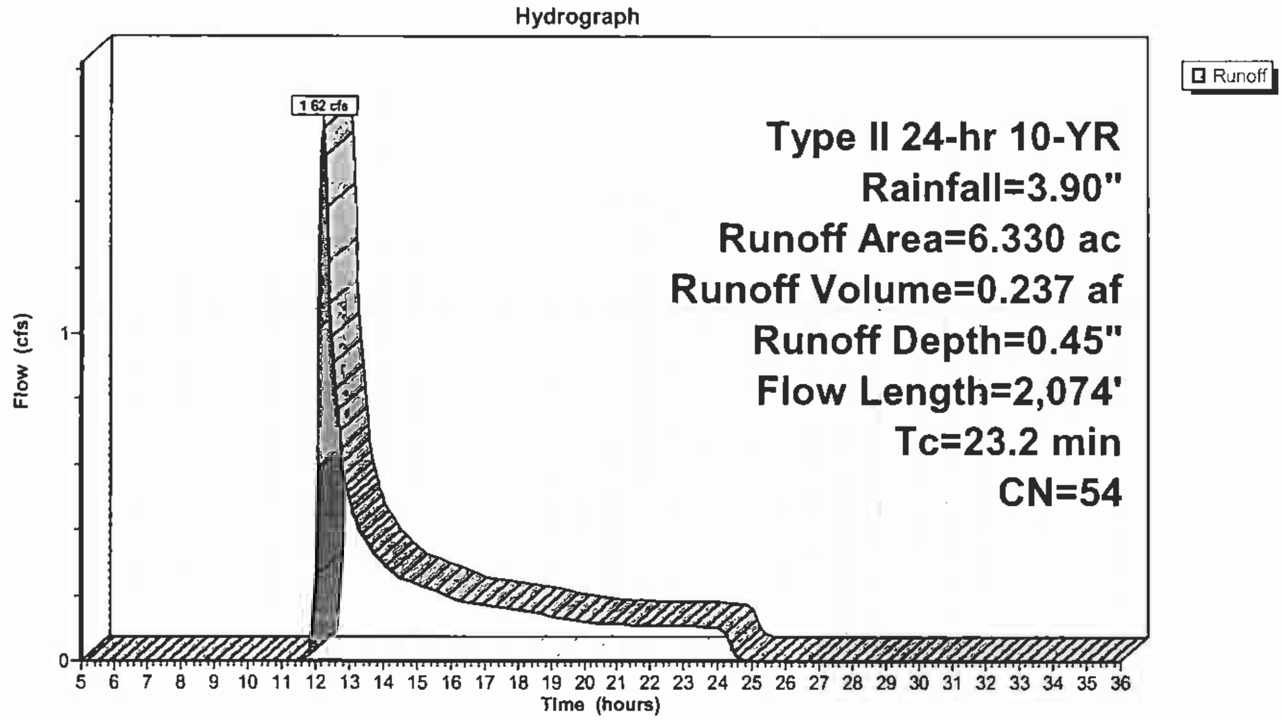
Runoff = 1.62 cfs @ 12.24 hrs, Volume= 0.237 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.100	49	Brush, Good, HSG C
3.740	53	Woods, Good, HSG C
2.040	55	Brush, Good, HSG D
0.390	58	Woods, Good, HSG D
6.330	54	Weighted Average
6.330		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.1100	0.31		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
9.3	1,134	0.0850	2.04		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
7.6	700	0.0940	1.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.9	140	0.0100	2.47	12.33	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 4.0 '/' Top.W=9.00' n= 0.040
23.2	2,074	Total			

Subcatchment C-230: Culvert-230 Area



Subcatchment C-231: Culvert-231 Area

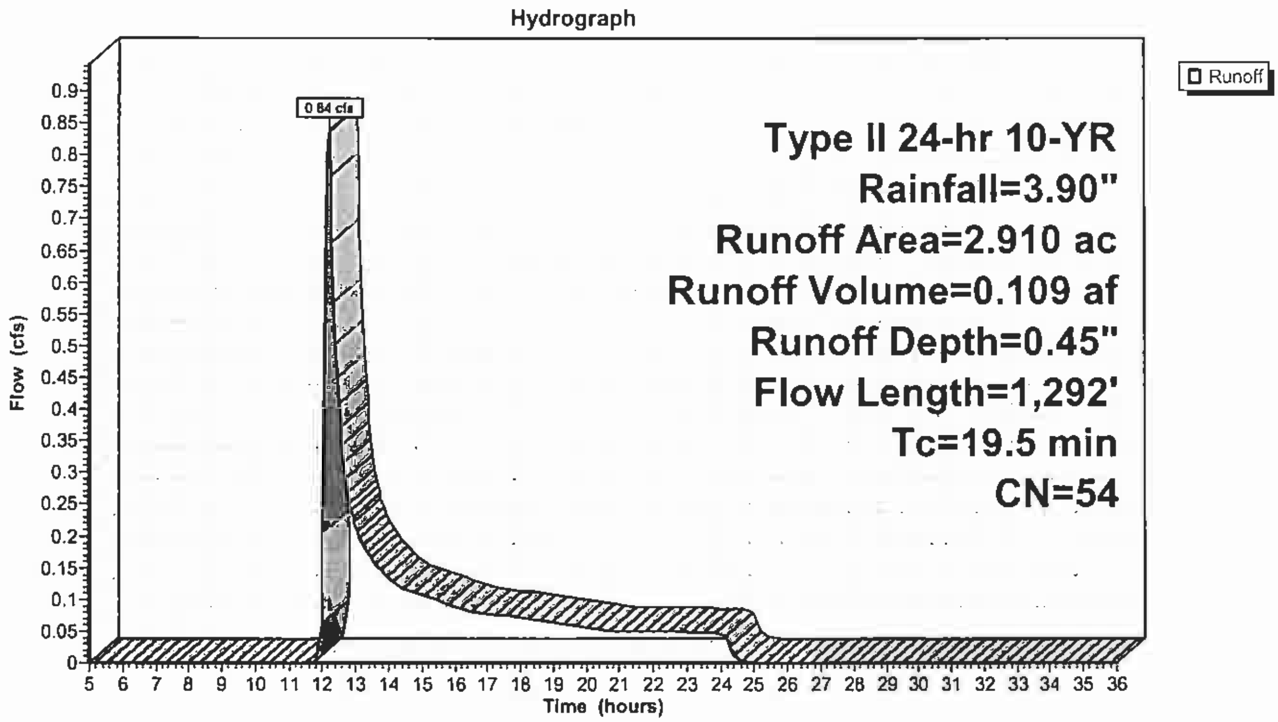
Runoff = 0.84 cfs @ 12.19 hrs, Volume= 0.109 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.070	49	Brush, Good, HSG C
2.410	53	Woods, Good, HSG C
0.270	55	Brush, Good, HSG D
0.120	58	Woods, Good, HSG D
2.910	54	Weighted Average
2.910		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0600	0.24		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
2.6	294	0.0710	1.87		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.1	778	0.0820	1.43		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.9	120	0.0080	2.21	11.03	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 4.0 '/' Top.W=9.00' n= 0.040
19.5	1,292	Total			

Subcatchment C-231: Culvert-231 Area



Subcatchment C-233: Culvert-233 Area

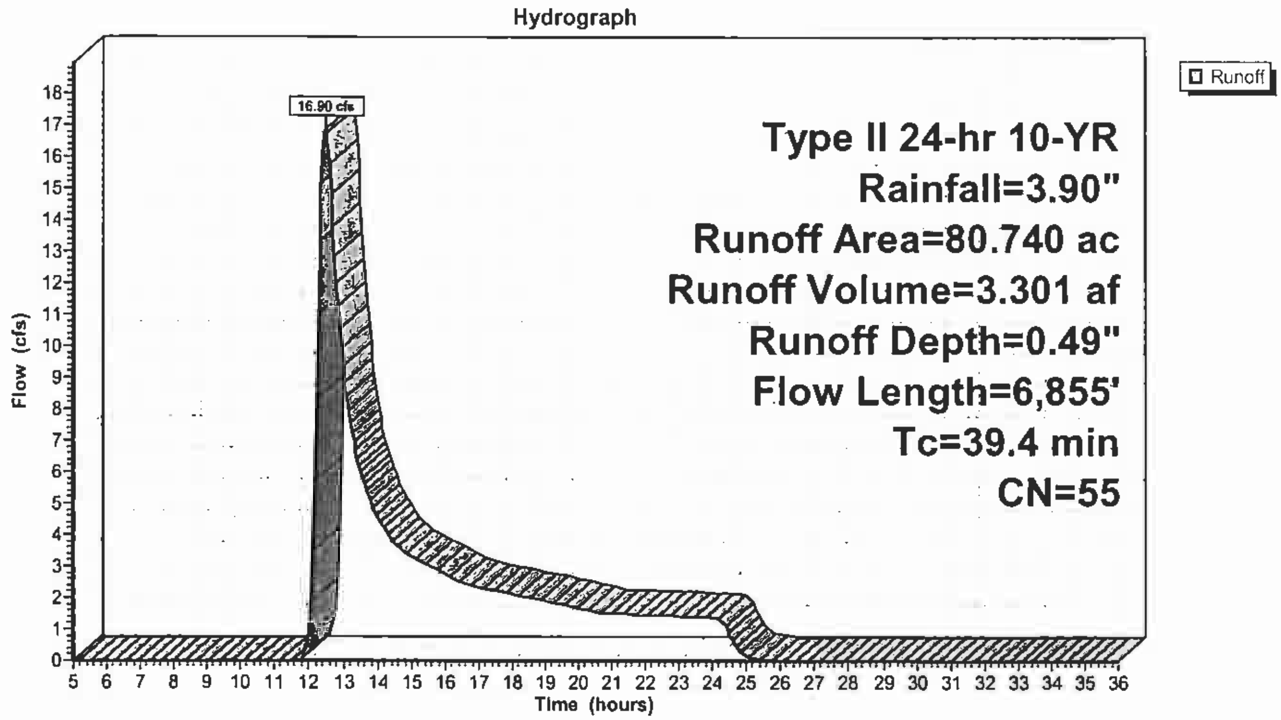
Runoff = 16.90 cfs @ 12.48 hrs, Volume= 3.301 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.110	49	Brush, Good, HSG C
31.630	53	Woods, Good, HSG C
34.700	55	Brush, Good, HSG D
14.210	58	Brush, Good, HSG D
80.740	55	Weighted Average
80.740		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0600	0.11		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
21.3	3,258	0.2590	2.54		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.2	238	0.2270	3.34		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.8	3,259	0.1150	30.74	4,426.83	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=8.00' Z= 2.0 '/' Top.W=34.00' n= 0.040
39.4	6,855	Total			

Subcatchment C-233: Culvert-233 Area



Subcatchment C-241: Culvert-241 Area

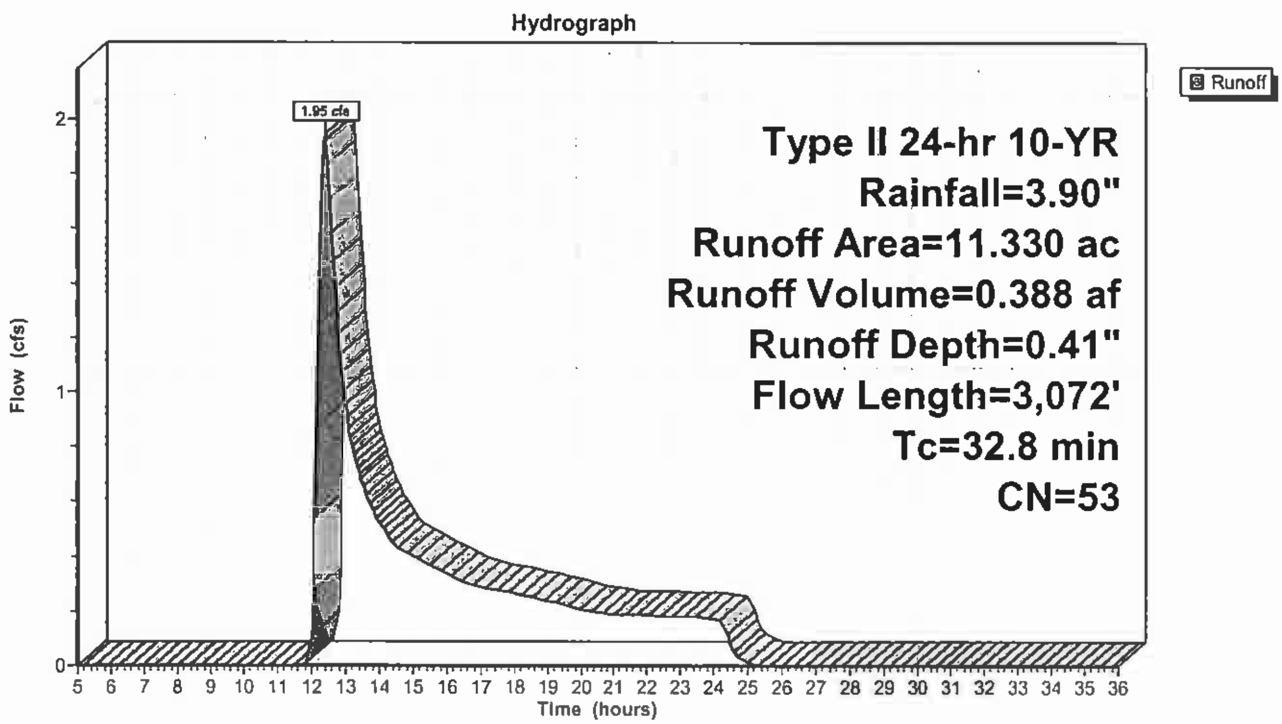
Runoff = 1.95 cfs @ 12.40 hrs, Volume= 0.388 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.060	49	Brush, Good, HSG C
11.230	53	Woods, Good, HSG C
11.330	53	Weighted Average
11.330		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2200	0.19		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
23.6	2,890	0.1670	2.04		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	82	0.0970	8.24	41.18	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.040
32.8	3,072	Total			

Subcatchment C-241: Culvert-241 Area



Subcatchment C-301: Culvert 301 Area

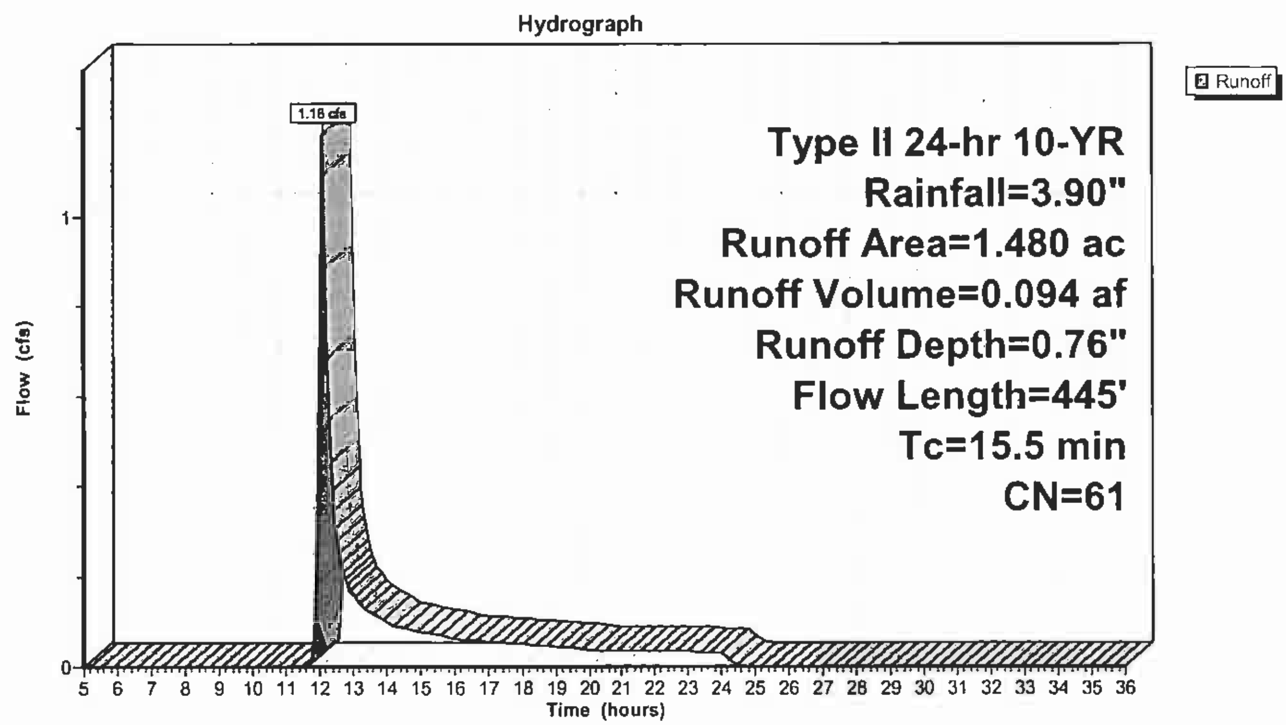
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.094 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.347	89	Gravel roads, HSG C
0.245	49	Brush, Good, HSG C
0.888	53	Woods, Good, HSG C
1.480	61	Weighted Average
1.480		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.0	103	0.1260	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	242	0.0960	11.71	163.90	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 3.0 '/' Top.W=13.00' n= 0.040
15.5	445	Total			

Subcatchment C-301: Culvert 301 Area



Subcatchment C-302: Culvert 302 Area

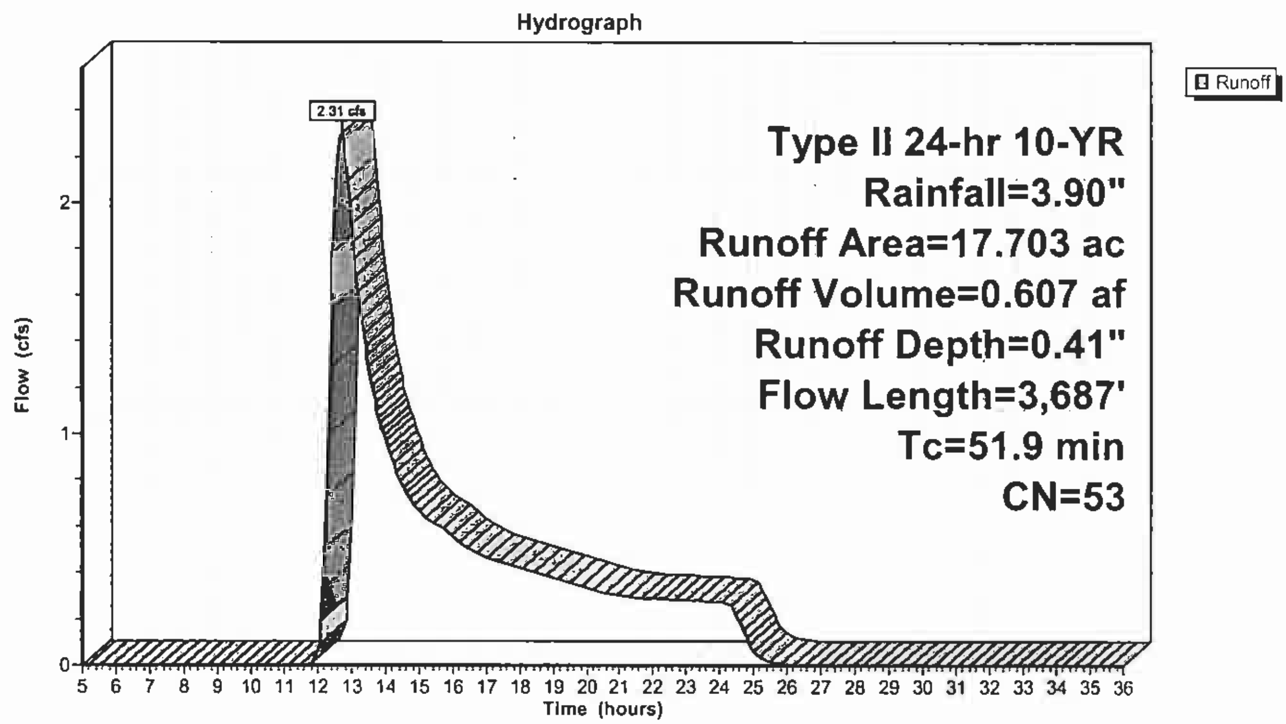
Runoff = 2.31 cfs @ 12.71 hrs, Volume= 0.607 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.248	89	Gravel roads, HSG C
0.275	49	Brush, Good, HSG C
17.180	53	Woods, Good, HSG C
17.703	53	Weighted Average
17.703		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0900	0.13		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
35.7	2,620	0.0600	1.22		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.4	967	0.0300	4.69	32.84	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.00' Z= 4.0 '/' Top.W=11.00' n= 0.040
51.9	3,687	Total			

Subcatchment C-302: Culvert 302 Area



Subcatchment C-303: Culvert 303 Area

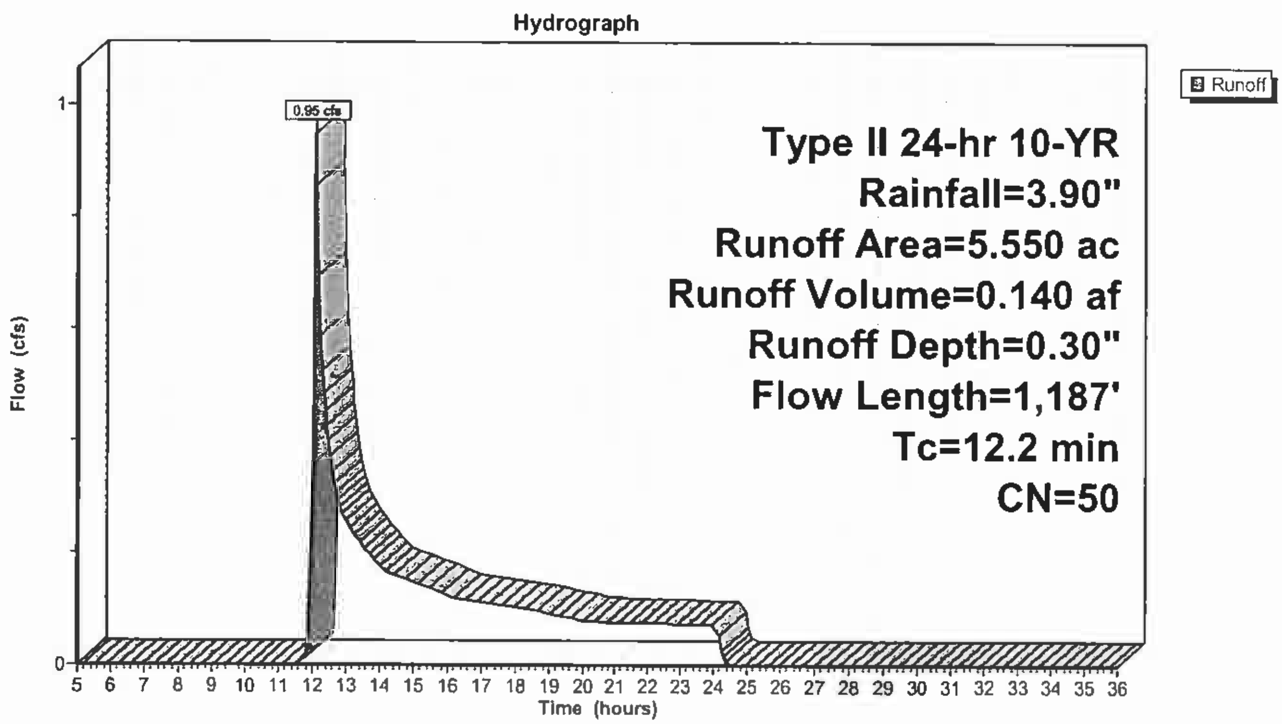
Runoff = 0.95 cfs @ 12.11 hrs, Volume= 0.140 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
5.440	49	Brush, Good, HSG C
5.550	50	Weighted Average
5.550		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0700	0.26		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
4.6	646	0.1140	2.36		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.1	441	0.0310	6.67	120.00	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 4.0 '/' Top.W=17.00' n= 0.040
12.2	1,187	Total			

Subcatchment C-303: Culvert 303 Area



Subcatchment C-304: Culvert 304 Area

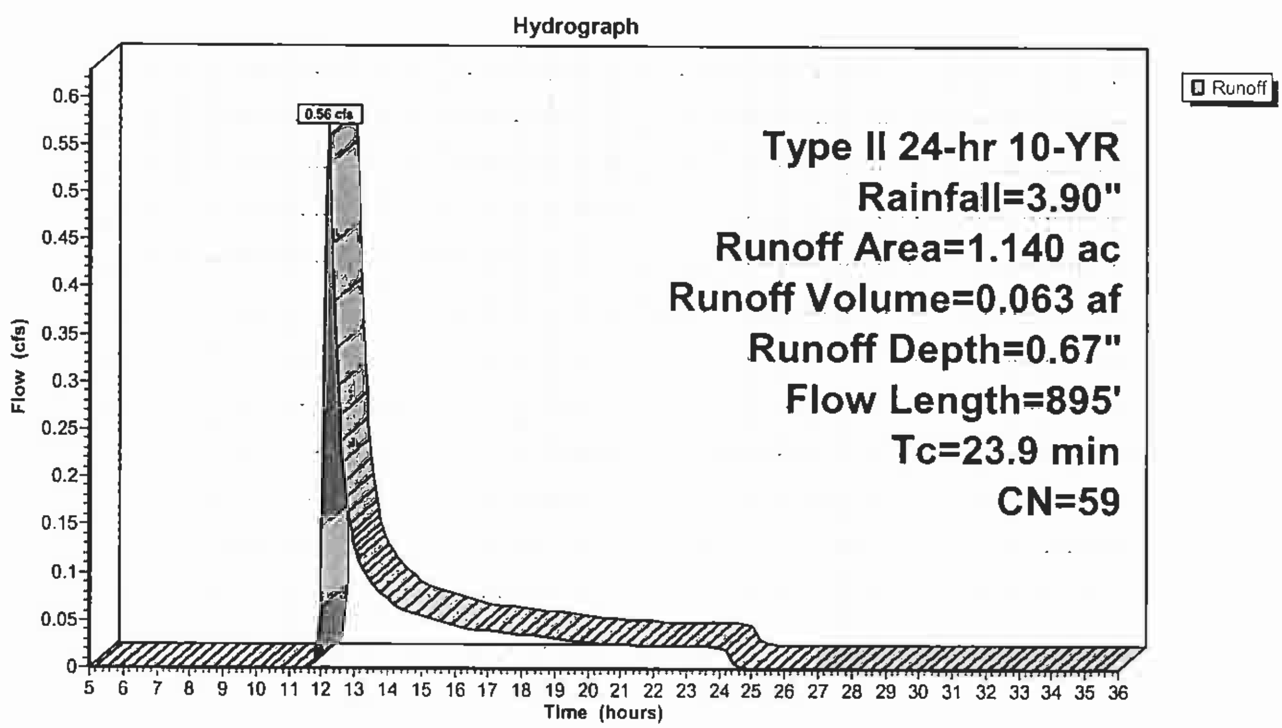
Runoff = 0.56 cfs @ 12.22 hrs, Volume= 0.063 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.044	89	Gravel roads, HSG C
0.053	55	Brush, Good, HSG D
1.043	58	Woods, Good, HSG D
1.140	59	Weighted Average
1.140		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.6	678	0.0560	1.18		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	117	0.0600	13.99	503.59	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=4.00' Z= 2.0 '/' Top.W=17.00' n= 0.040
23.9	895	Total			

Subcatchment C-304: Culvert 304 Area



Subcatchment C-305: Culvert 305 Area

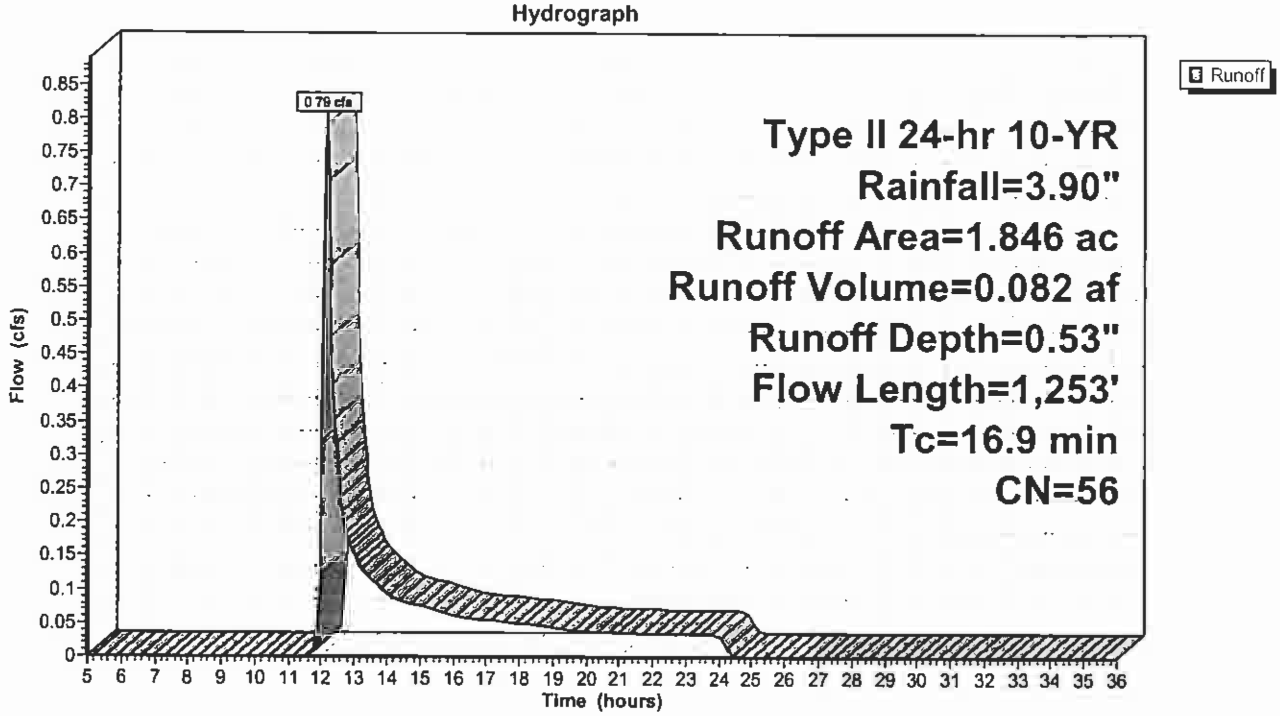
Runoff = 0.79 cfs @ 12.14 hrs, Volume= 0.082 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.037	49	Brush, Good, HSG C
0.396	53	Woods, Good, HSG C
0.777	55	Brush, Good, HSG D
0.606	58	Woods, Good, HSG D
1.846	56	Weighted Average
1.846		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0900	0.29		**Sheet Flow, sheet**
					Grass: Short n= 0.150 P2= 2.70"
5.1	624	0.0850	2.04		**Shallow Concentrated Flow, shallow**
					Short Grass Pasture Kv= 7.0 fps
5.5	454	0.0770	1.39		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
0.5	75	0.0200	2.29	4.00	**Trap/Vee/Rect Channel Flow, ditch**
					Bot.W=1.00' D=0.50' Z= 5.0 '/' Top.W=6.00' n= 0.040
16.9	1,253	Total			

Subcatchment C-305: Culvert 305 Area



Subcatchment C-306: Culvert 306 Area

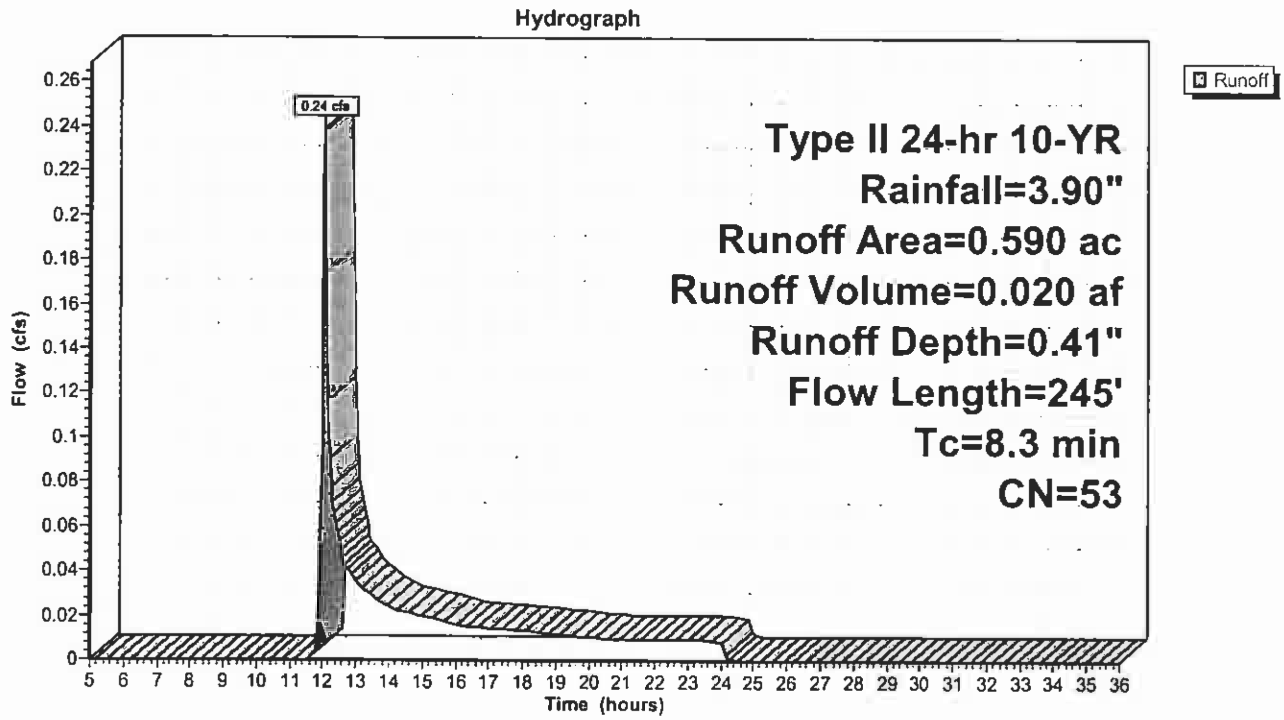
Runoff = 0.24 cfs @ 12.04 hrs, Volume= 0.020 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.039	89	Gravel roads, HSG C
0.418	49	Brush, Good, HSG C
0.133	53	Woods, Good, HSG C
0.590	53	Weighted Average
0.590		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0600	0.24		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
1.4	145	0.0620	1.74		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
8.3	245	Total			

Subcatchment C-306: Culvert 306 Area



Subcatchment C-307: Culvert 307 Area

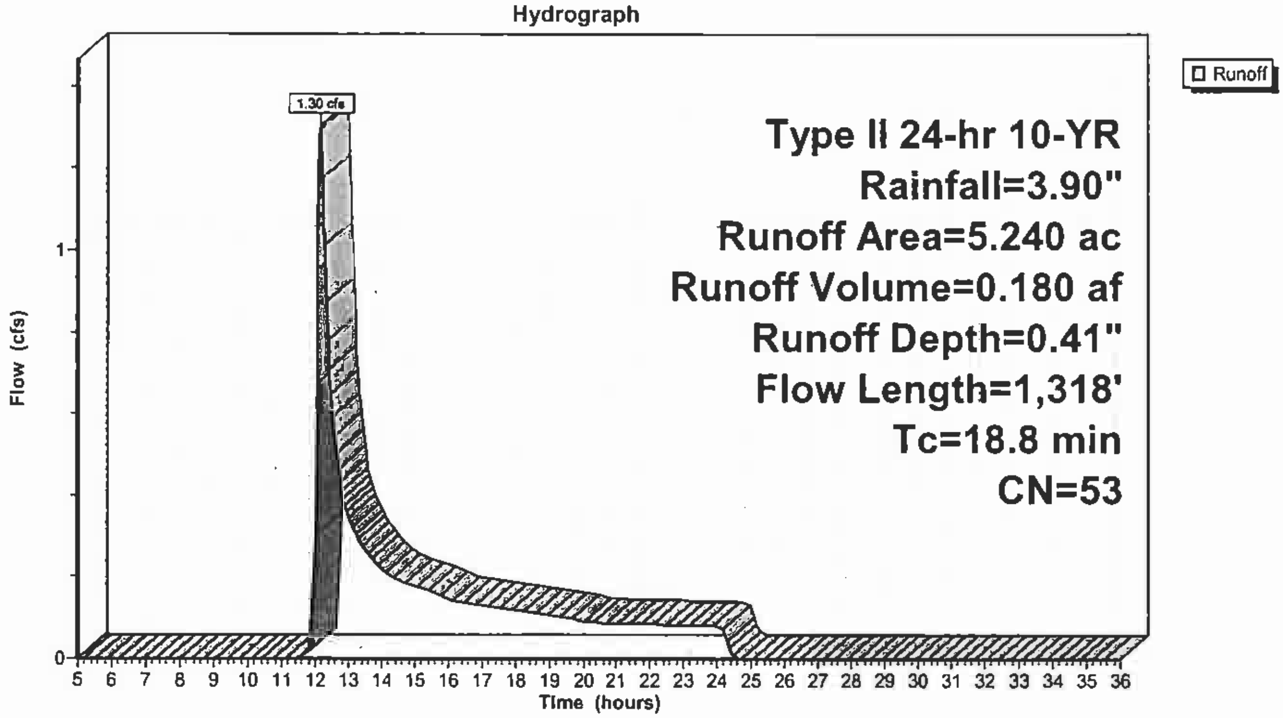
Runoff = 1.30 cfs @ 12.18 hrs, Volume= 0.180 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.075	89	Gravel roads, HSG C
1.317	49	Brush, Good, HSG C
2.237	53	Woods, Good, HSG C
1.611	55	Brush, Good, HSG D
5.240	53	Weighted Average
5.240		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.1000	0.30		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
4.3	488	0.0730	1.89		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
7.0	445	0.0450	1.06		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.5	162	0.0620	1.74		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
0.4	123	0.0160	5.14	92.58	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=2.00' Z= 2.0 & 4.0 '/' Top.W=15.00' n= 0.040
18.8	1,318	Total			

Subcatchment C-307: Culvert 307 Area



Subcatchment C-308: Culvert 308 Area

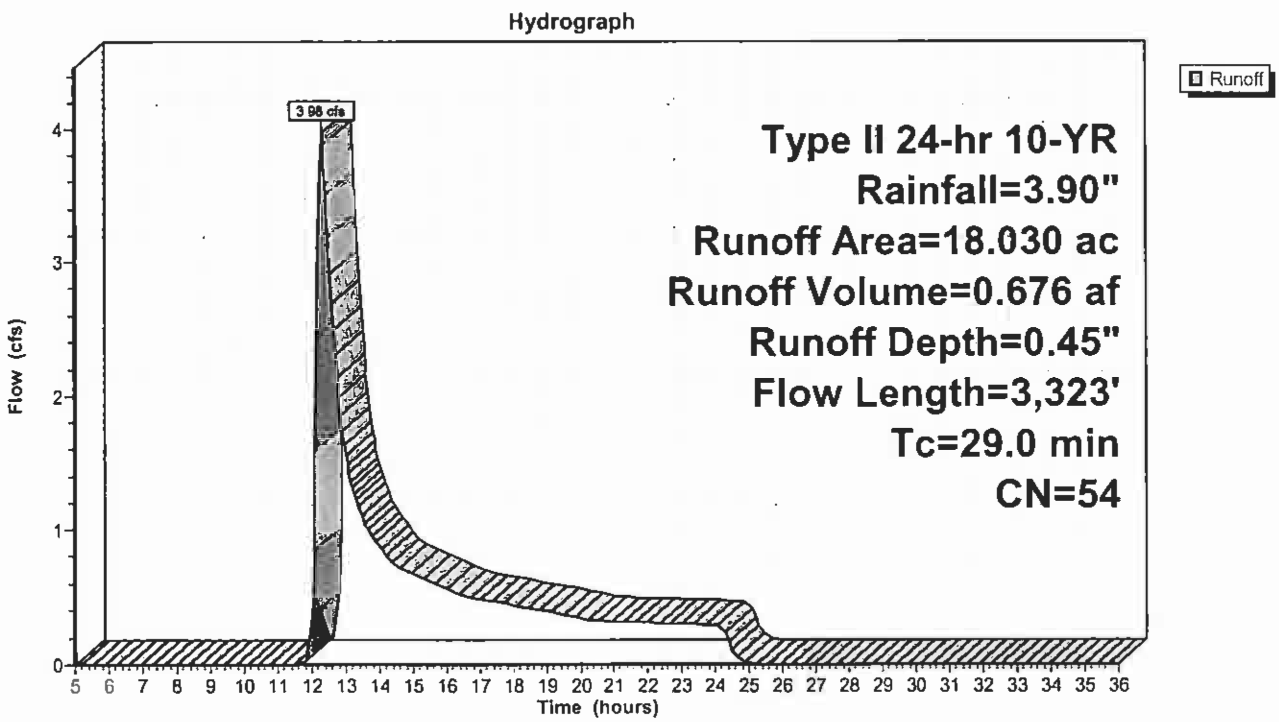
Runoff = 3.98 cfs @ 12.33 hrs, Volume= 0.676 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.043	89	Gravel roads, HSG C
0.063	49	Brush, Good, HSG C
14.910	53	Woods, Good, HSG C
3.014	58	Woods, Good, HSG D
18.030	54	Weighted Average
18.030		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2200	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.4	2,420	0.1730	2.08		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.6	803	0.1540	23.54	1,318.08	**Trap/Vee/Rect Channel Flow, swale** Bot.W=2.00' D=4.00' Z= 3.0 '/' Top.W=26.00' n= 0.040
29.0	3,323	Total			

Subcatchment C-308: Culvert 308 Area



Subcatchment C-309: Culvert 309 Area

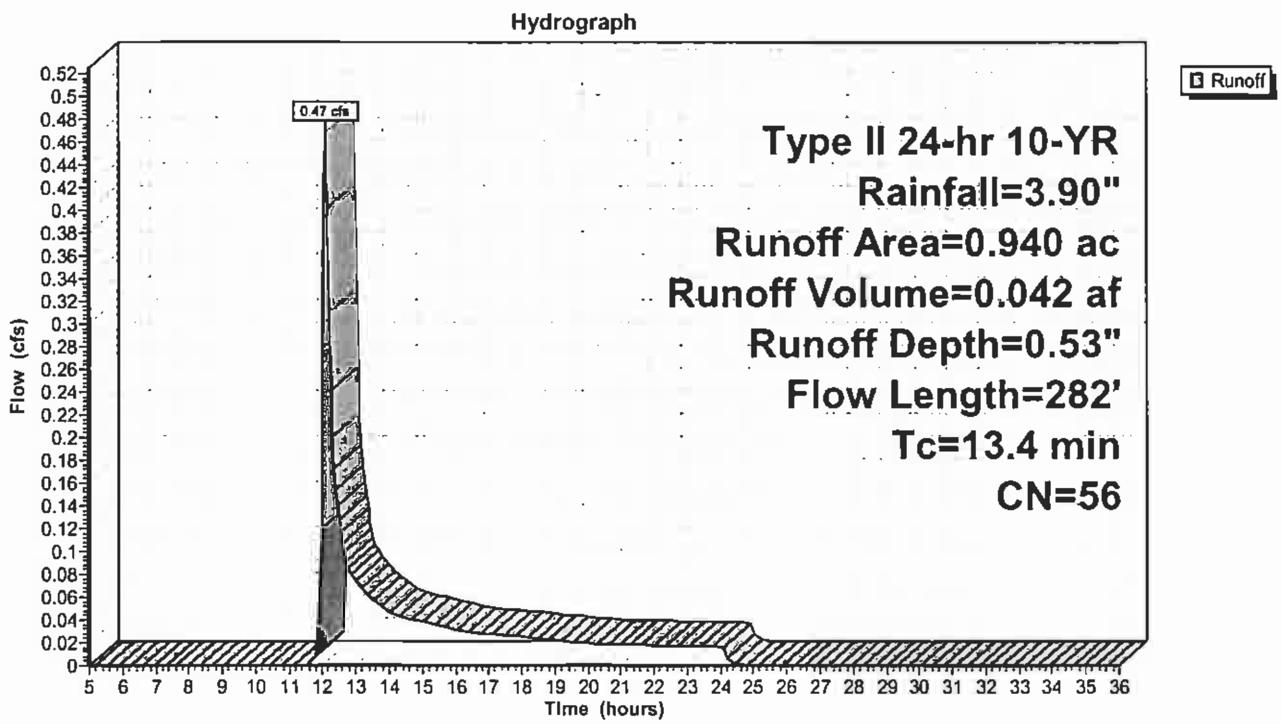
Runoff = 0.47 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.126	89	Gravel roads, HSG C
0.350	49	Brush, Good, HSG C
0.464	53	Woods, Good, HSG C
0.940	56	Weighted Average
0.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
2.0	182	0.0880	1.48		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
13.4	282	Total			

Subcatchment C-309: Culvert 309 Area



Subcatchment T13: Treatment Swale #13 Area

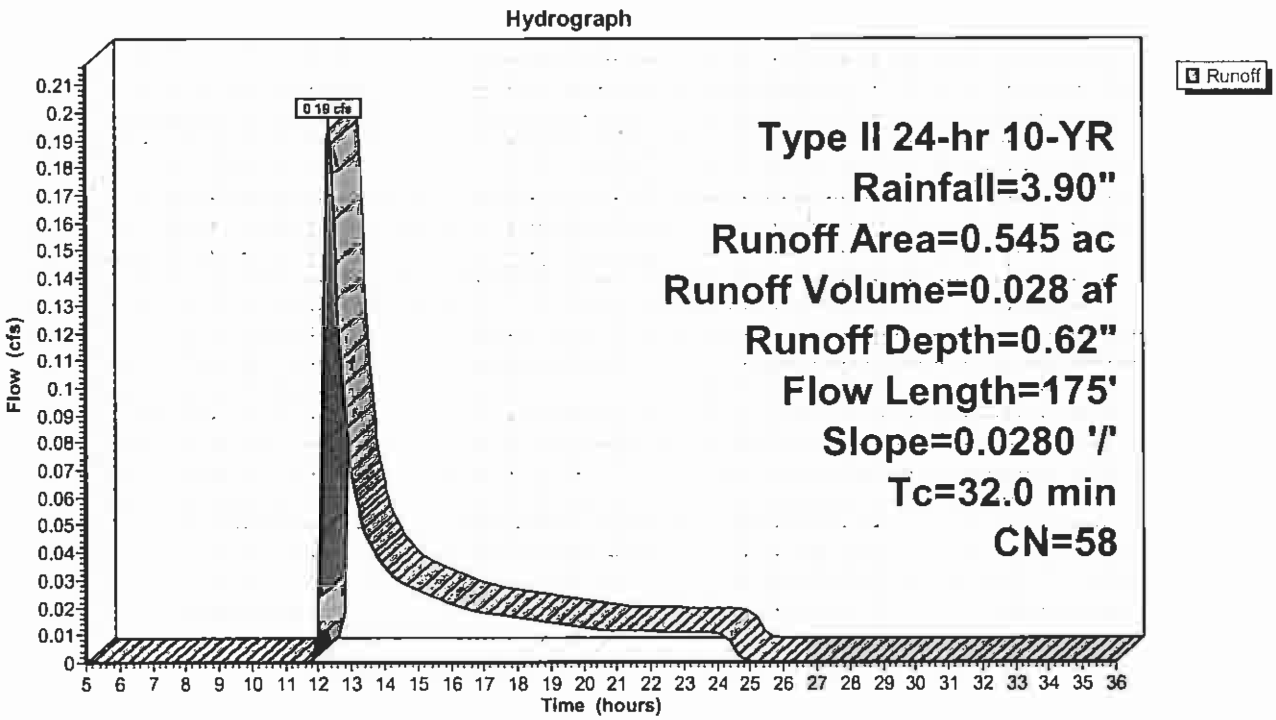
Runoff = 0.19 cfs @ 12.34 hrs, Volume= 0.028 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.078	89	Gravel roads, HSG C
0.077	49	Brush, Good, HSG C
0.390	53	Woods, Good, HSG C
0.545	58	Weighted Average
0.545		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.0	175	0.0280	0.09		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"

Subcatchment T13: Treatment Swale #13 Area



Subcatchment T15: Treatment Swale #15 Area

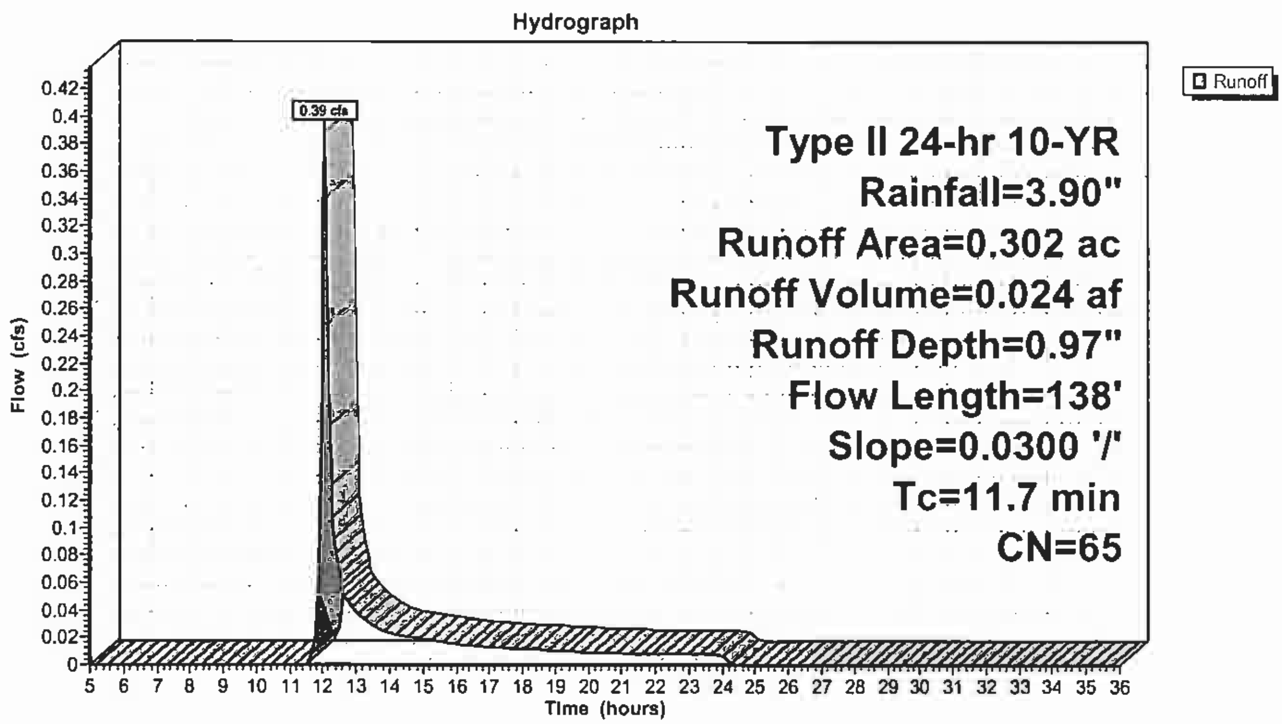
Runoff = 0.39 cfs @ 12.05 hrs, Volume= 0.024 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
0.182	49	Brush, Good, HSG C
0.302	65	Weighted Average
0.302		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	138	0.0300	0.20		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"

Subcatchment T15: Treatment Swale #15 Area



Subcatchment T9: Treatment Swale #9 Area

[49] Hint: Tc<2dt may require smaller dt

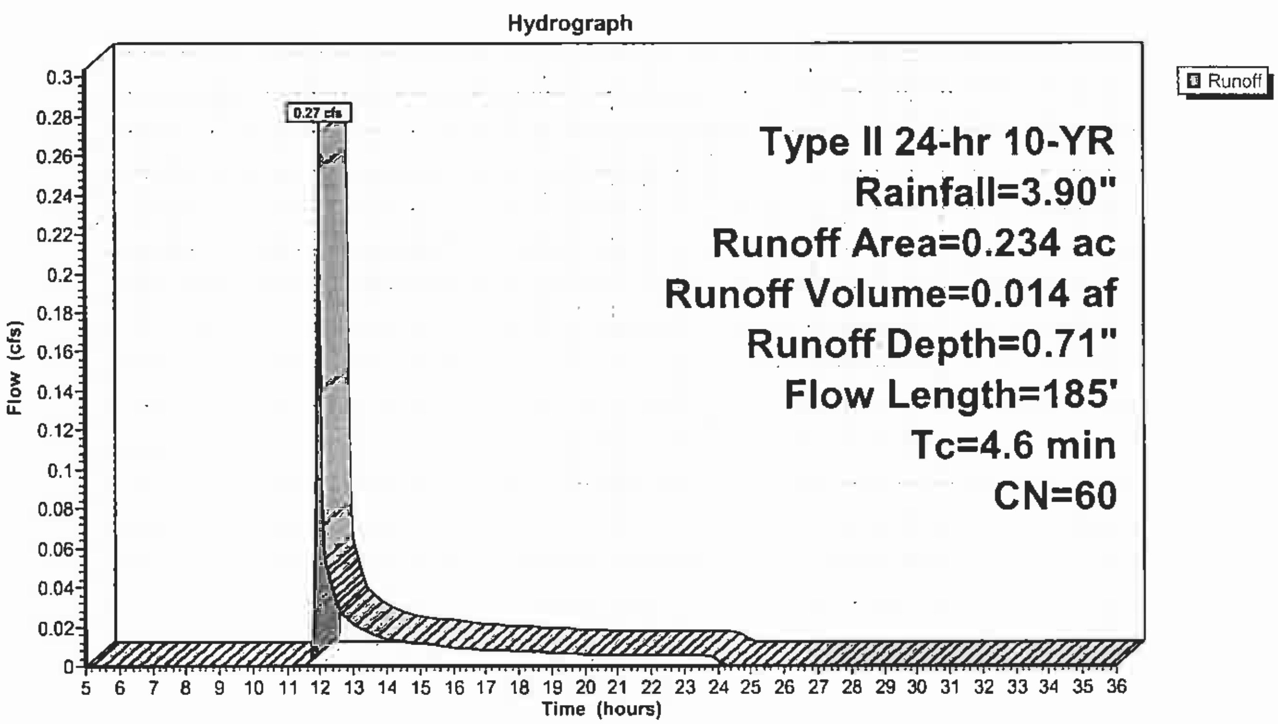
Runoff = 0.27 cfs @ 11.97 hrs, Volume= 0.014 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.065	89	Gravel roads, HSG C
0.169	49	Brush, Good, HSG C
0.234	60	Weighted Average
0.234		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	55	0.0570	0.21		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
0.3	130	0.0310	6.73	295.93	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 10.0 '/' Top.W=42.00' n= 0.040
4.6	185	Total			

Subcatchment T9: Treatment Swale #9 Area



Reach R1: Reach

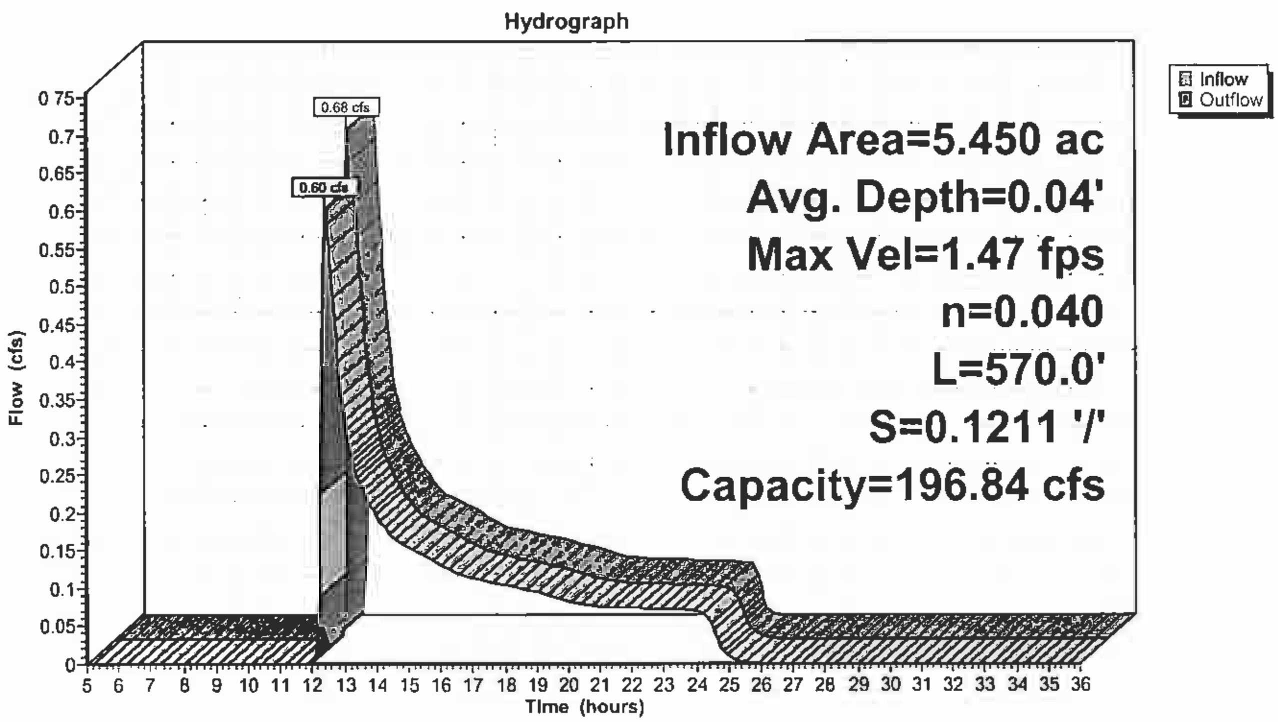
Inflow Area = 5.450 ac, Inflow Depth = 0.30" for 10-YR event
Inflow = 0.68 cfs @ 12.23 hrs, Volume= 0.138 af
Outflow = 0.60 cfs @ 12.44 hrs, Volume= 0.138 af, Atten= 11%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.47 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 12.3 min

Peak Storage= 235 cf @ 12.33 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 196.84 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 570.0' Slope= 0.1211 '/'
Inlet Invert= 2,131.00', Outlet Invert= 2,062.00'

Reach R1: Reach



Reach R10: Reach

Inflow Area = 10.970 ac, Inflow Depth = 0.37" for 10-YR event
Inflow = 2.18 cfs @ 12.21 hrs, Volume= 0.342 af
Outflow = 2.12 cfs @ 12.28 hrs, Volume= 0.342 af, Atten= 3%, Lag= 4.7 min

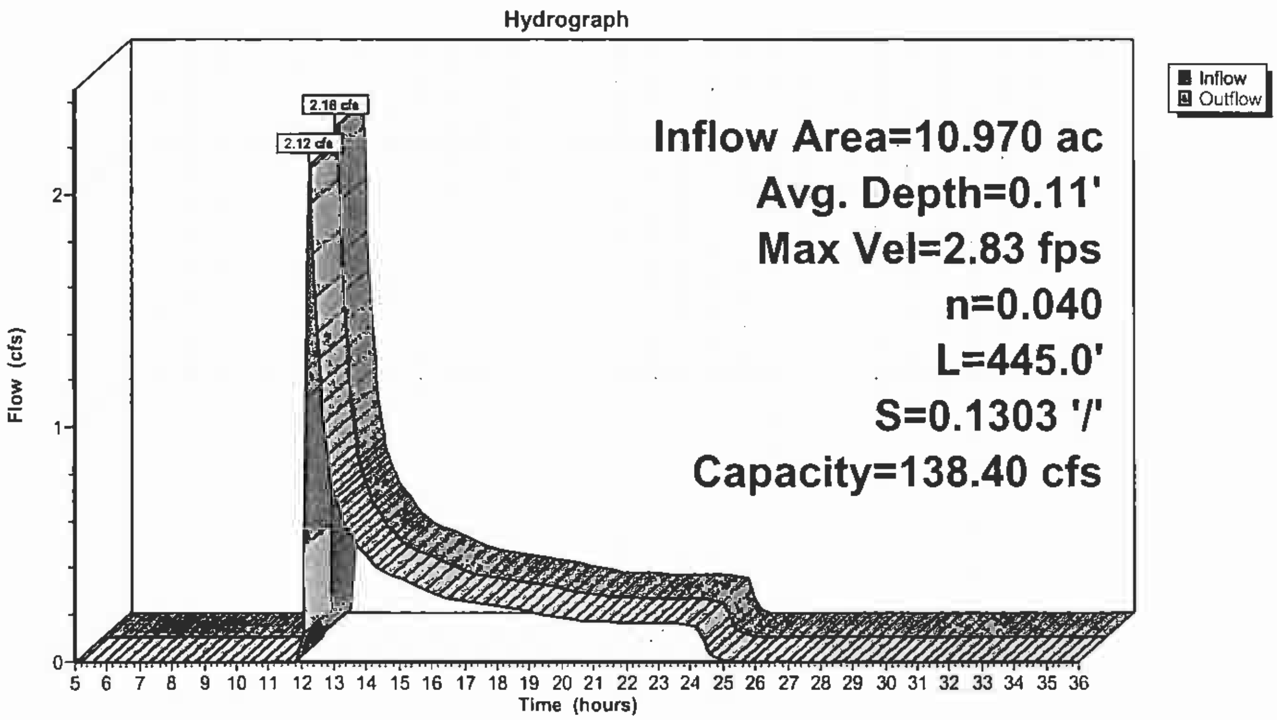
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.83 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 5.8 min

Peak Storage= 335 cf @ 12.24 hrs, Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 138.40 cfs

6.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 8.0 '/' Top Width= 22.00'
Length= 445.0' Slope= 0.1303 '/'
Inlet Invert= 2,118.00', Outlet Invert= 2,060.00'

‡

Reach R10: Reach



Reach R11: Reach

Inflow Area = 22.910 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 4.59 cfs @ 12.53 hrs, Volume= 0.937 af
Outflow = 4.51 cfs @ 12.66 hrs, Volume= 0.937 af, Atten= 2%, Lag= 8.1 min

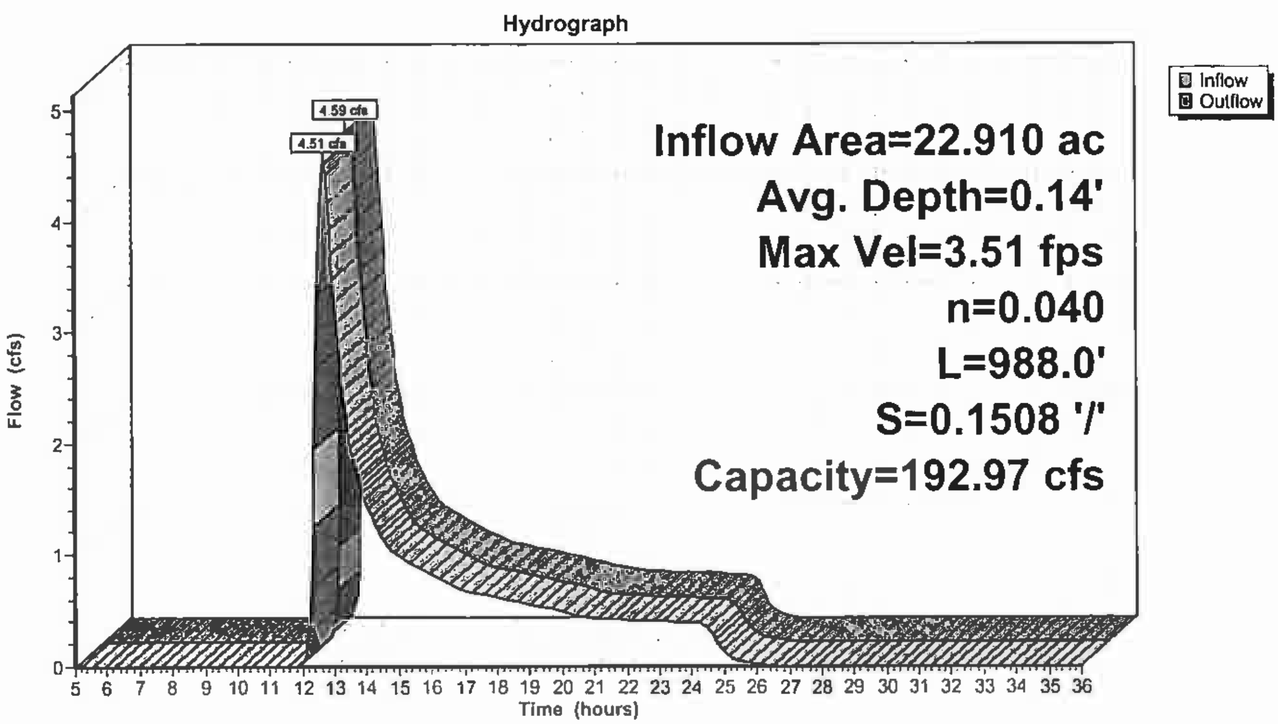
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 10.4 min

Peak Storage= 1,275 cf @ 12.58 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 192.97 cfs

8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 988.0' Slope= 0.1508 '/'
Inlet Invert= 2,183.00', Outlet Invert= 2,034.00'

‡

Reach R11: Reach



Reach R12: Reach

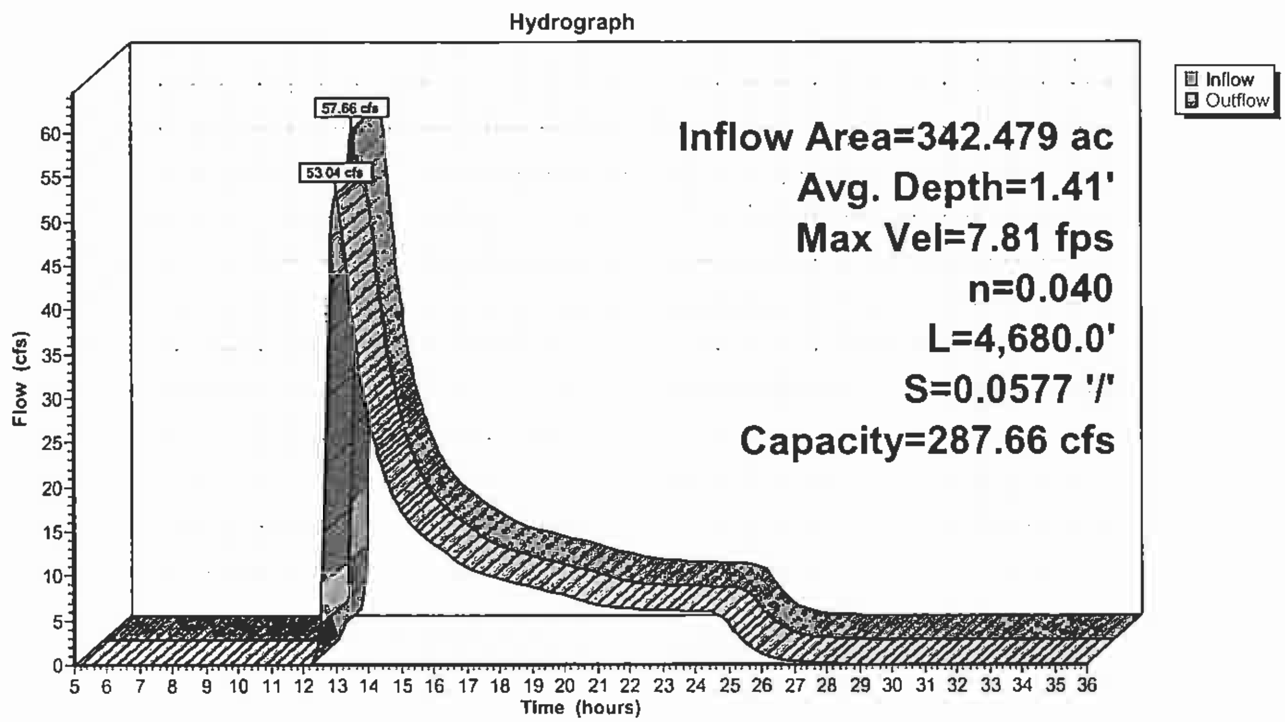
Inflow Area = 342.479 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 57.66 cfs @ 12.66 hrs, Volume= 13.911 af
Outflow = 53.04 cfs @ 13.01 hrs, Volume= 13.910 af, Atten= 8%, Lag= 20.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.81 fps, Min. Travel Time= 10.0 min
Avg. Velocity = 3.27 fps, Avg. Travel Time= 23.9 min

Peak Storage= 31,838 cf @ 12.84 hrs, Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 287.66 cfs

2.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 4,680.0' Slope= 0.0577 '/'
Inlet Invert= 2,032.00', Outlet Invert= 1,762.00'

Reach R12: Reach



Reach R13: Reach

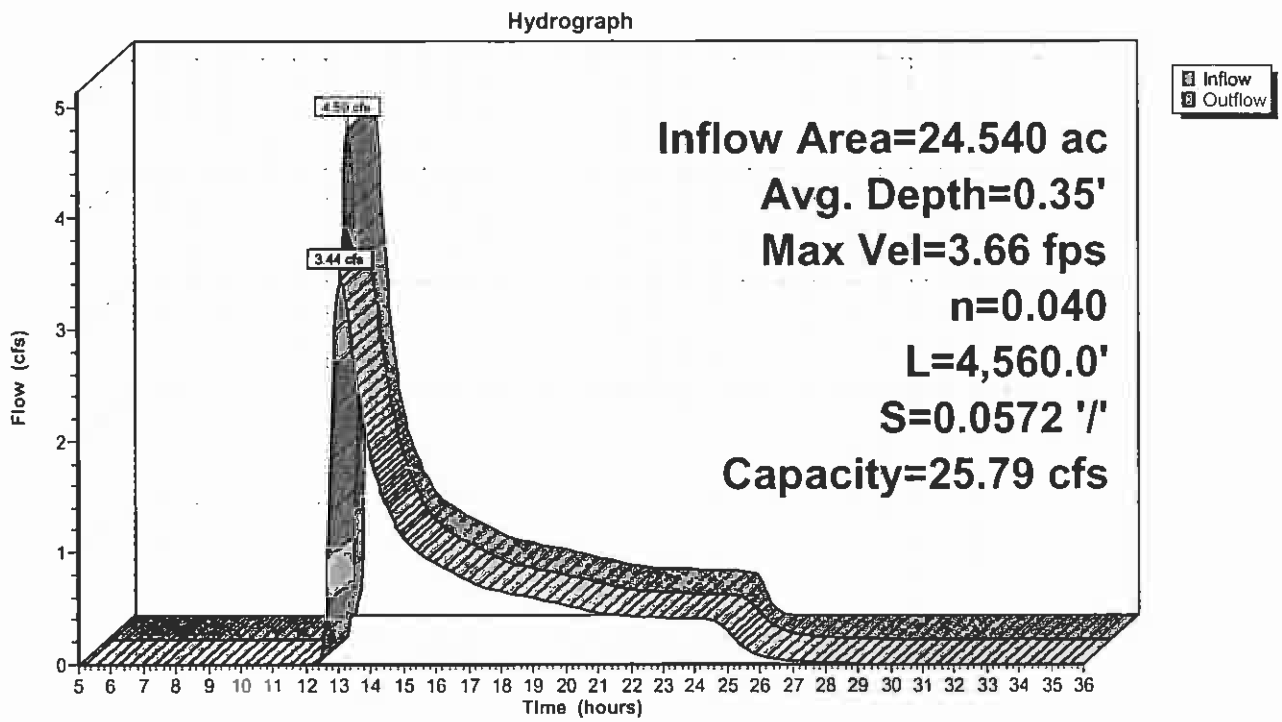
Inflow Area = 24.540 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 4.59 cfs @ 12.46 hrs, Volume= 0.921 af
Outflow = 3.44 cfs @ 13.09 hrs, Volume= 0.920 af, Atten= 25%, Lag= 37.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 20.8 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 53.8 min

Peak Storage= 4,290 cf @ 12.74 hrs, Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 25.79 cfs

2.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 4,560.0' Slope= 0.0572 '/'
Inlet Invert= 2,023.00', Outlet Invert= 1,762.00'

Reach R13: Reach



Reach R14: Reach

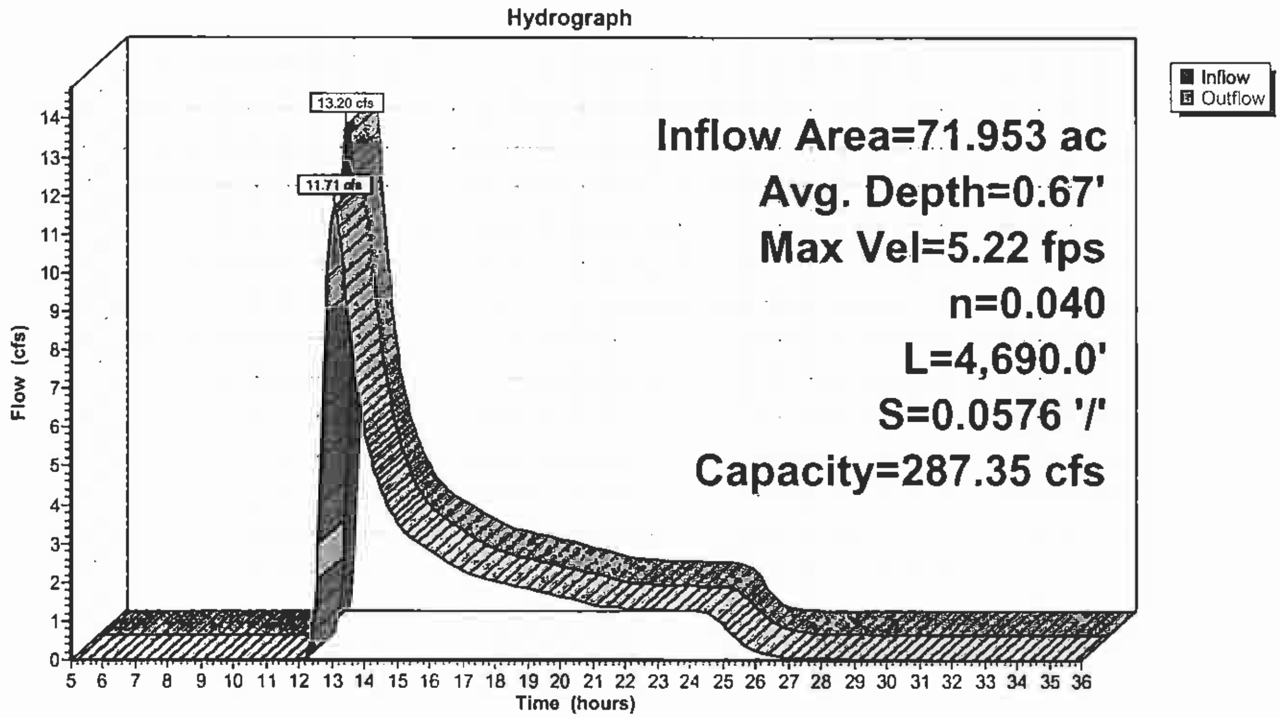
Inflow Area = 71.953 ac, Inflow Depth = 0.50" for 10-YR event
Inflow = 13.20 cfs @ 12.61 hrs, Volume= 2.983 af
Outflow = 11.71 cfs @ 13.07 hrs, Volume= 2.983 af, Atten= 11%, Lag= 27.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.22 fps, Min. Travel Time= 15.0 min
Avg. Velocity = 2.16 fps, Avg. Travel Time= 36.2 min

Peak Storage= 10,514 cf @ 12.82 hrs, Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 287.35 cfs

2.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 4,690.0' Slope= 0.0576 '/'
Inlet Invert= 2,032.00', Outlet Invert= 1,762.00'

Reach R14: Reach



Reach R15: Reach

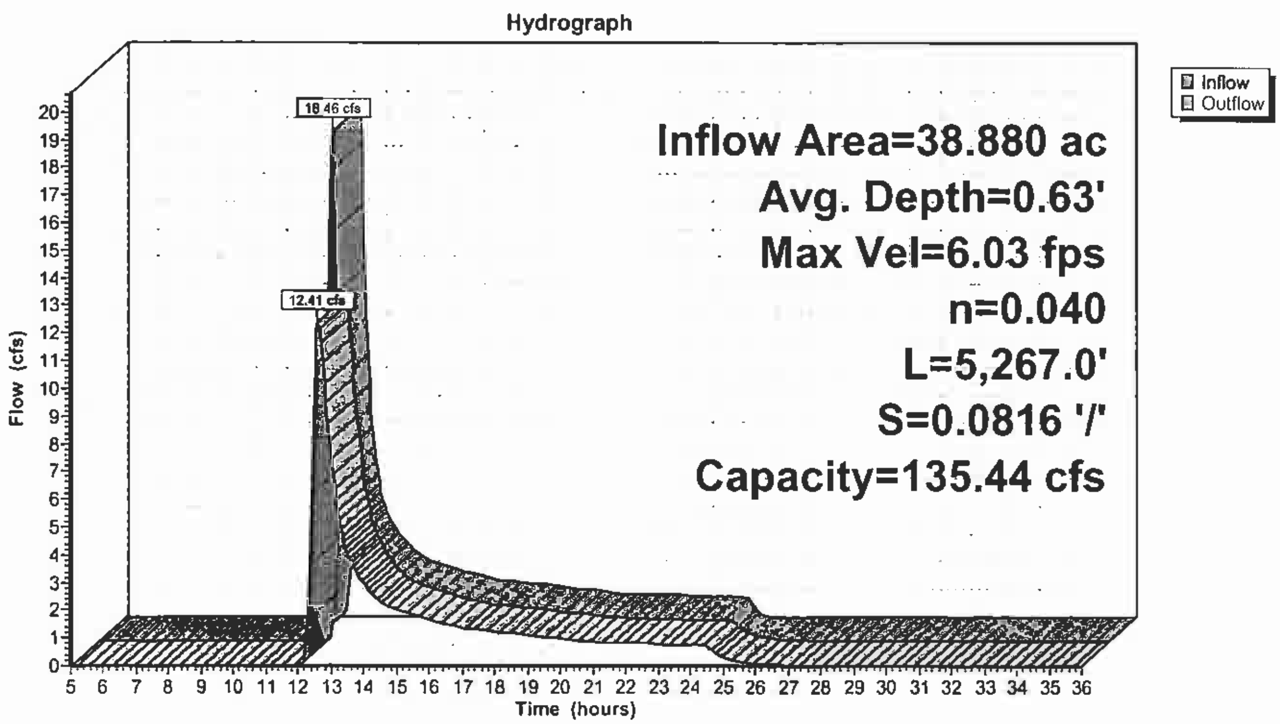
Inflow Area =	38.880 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	18.46 cfs @ 12.19 hrs, Volume=	2.009 af	
Outflow =	12.41 cfs @ 12.60 hrs, Volume=	2.009 af,	Atten= 33%, Lag= 24.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.03 fps, Min. Travel Time= 14.6 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 42.8 min

Peak Storage= 10,880 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 135.44 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 5,267.0' Slope= 0.0816 '/'
Inlet Invert= 2,464.00', Outlet Invert= 2,034.00'

Reach R15: Reach



Reach R16: Reach

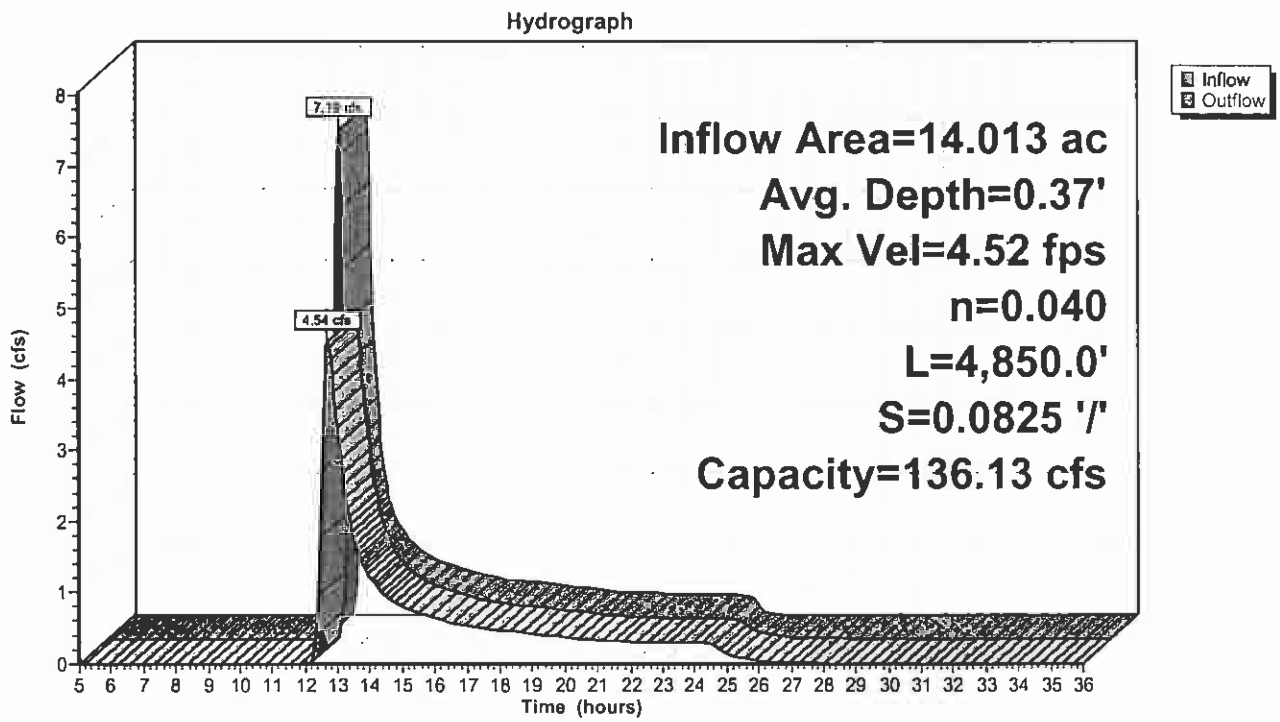
Inflow Area = 14.013 ac, Inflow Depth = 0.67" for 10-YR event
Inflow = 7.19 cfs @ 12.20 hrs, Volume= 0.778 af
Outflow = 4.54 cfs @ 12.70 hrs, Volume= 0.778 af, Atten= 37%, Lag= 29.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.52 fps, Min. Travel Time= 17.9 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 51.0 min

Peak Storage= 4,870 cf @ 12.40 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 136.13 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 4,850.0' Slope= 0.0825 '/'
Inlet Invert= 2,434.00', Outlet Invert= 2,034.00'

Reach R16: Reach



Reach R17: Reach

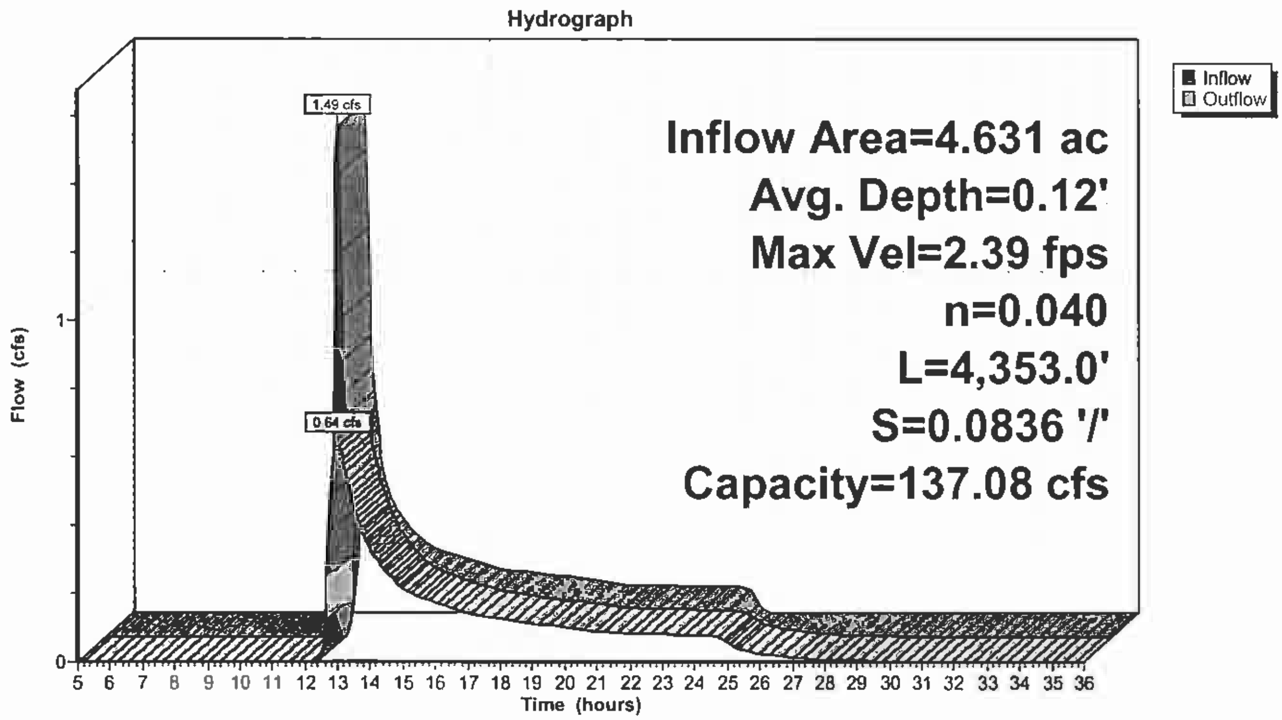
Inflow Area = 4.631 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.49 cfs @ 12.15 hrs, Volume= 0.174 af
Outflow = 0.64 cfs @ 12.97 hrs, Volume= 0.174 af, Atten= 57%, Lag= 49.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.39 fps, Min. Travel Time= 30.3 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 64.4 min

Peak Storage= 1,158 cf @ 12.46 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 137.08 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 4,353.0' Slope= 0.0836 '/'
Inlet Invert= 2,398.00', Outlet Invert= 2,034.00'

Reach R17: Reach



Reach R18: Reach

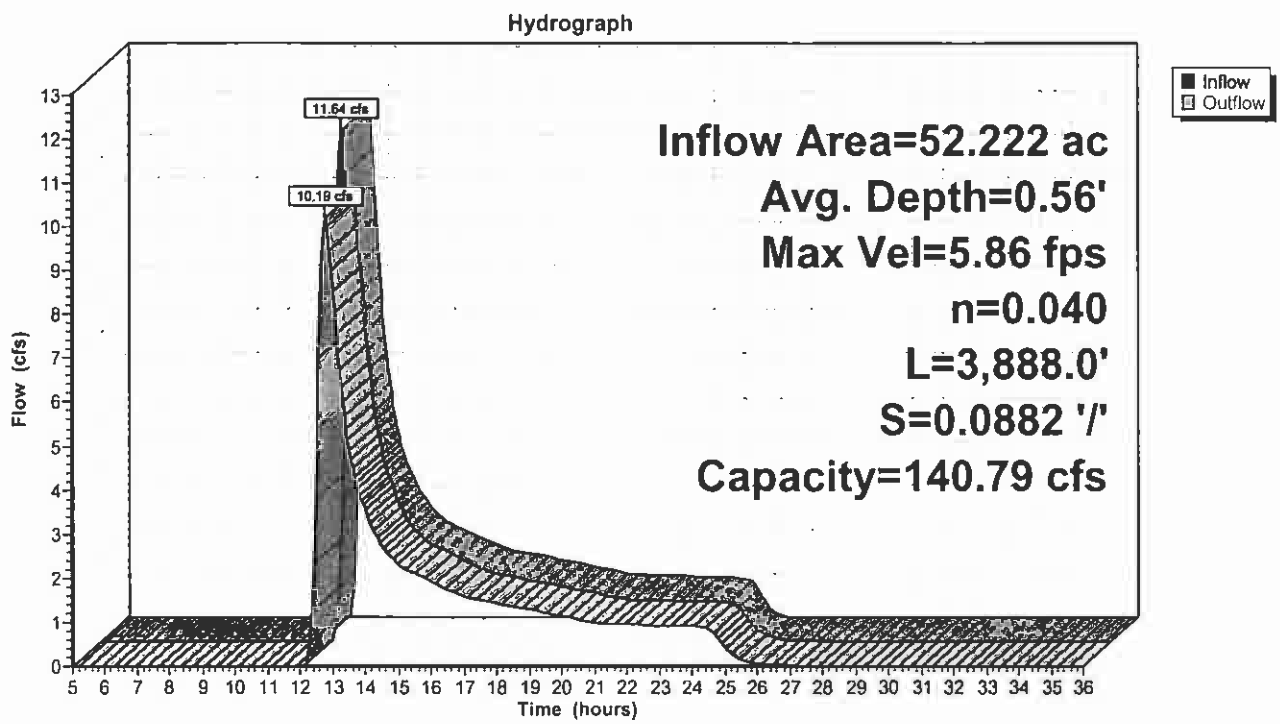
Inflow Area = 52.222 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 11.64 cfs @ 12.43 hrs, Volume= 2.135 af
Outflow = 10.19 cfs @ 12.77 hrs, Volume= 2.135 af, Atten= 12%, Lag= 20.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 28.4 min

Peak Storage= 6,775 cf @ 12.58 hrs, Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 140.79 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 3,888.0' Slope= 0.0882 '/'
Inlet Invert= 2,377.00', Outlet Invert= 2,034.00'

Reach R18: Reach



Reach R19: Reach

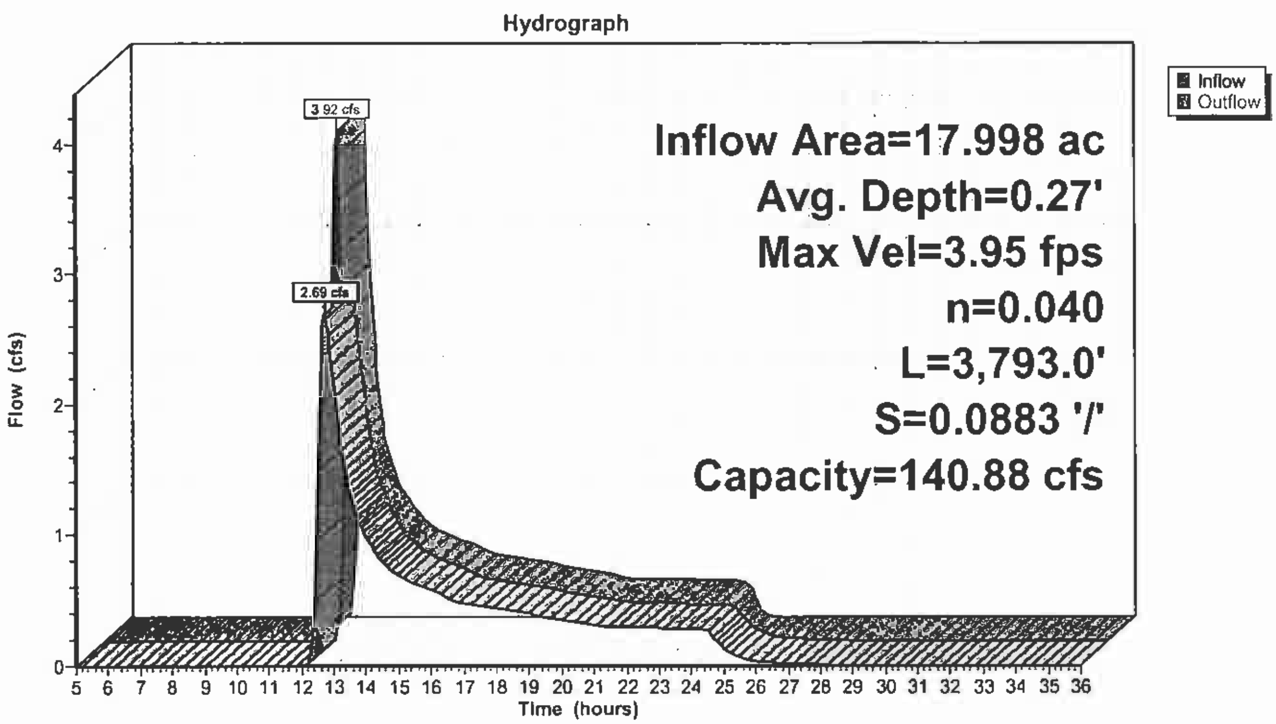
Inflow Area =	17.998 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	3.92 cfs @ 12.25 hrs, Volume=	0.617 af	
Outflow =	2.69 cfs @ 12.73 hrs, Volume=	0.617 af,	Atten= 31%, Lag= 28.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.95 fps, Min. Travel Time= 16.0 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 38.3 min

Peak Storage= 2,596 cf @ 12.46 hrs, Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 140.88 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 3,793.0' Slope= 0.0883 '/'
Inlet Invert= 2,369.00', Outlet Invert= 2,034.00'

Reach R19: Reach



Reach R2: Reach

Inflow Area = 0.960 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 0.28 cfs @ 12.03 hrs, Volume= 0.027 af
Outflow = 0.14 cfs @ 12.34 hrs, Volume= 0.027 af, Atten= 50%, Lag= 18.7 min

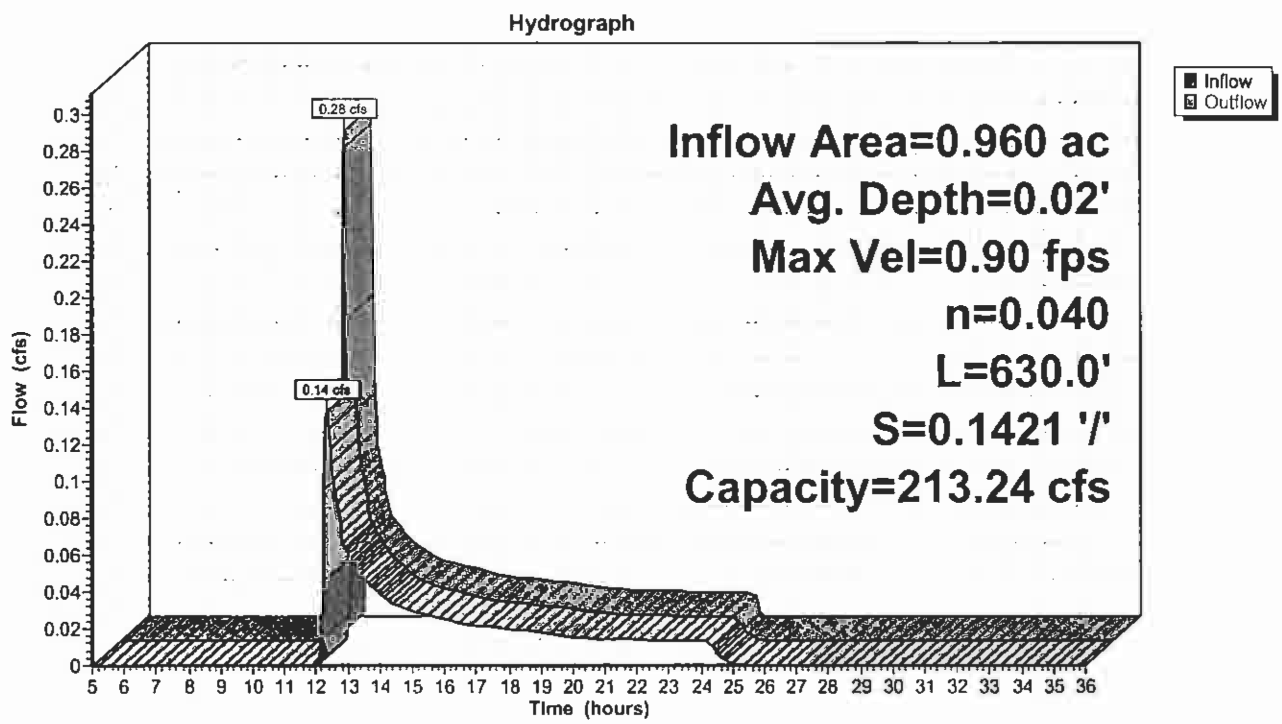
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.90 fps, Min. Travel Time= 11.7 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 16.1 min

Peak Storage= 97 cf @ 12.14 hrs, Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 213.24 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 630.0' Slope= 0.1421 '/'
Inlet Invert= 2,150.00', Outlet Invert= 2,060.50'

‡

Reach R2: Reach



Reach R20: Reach

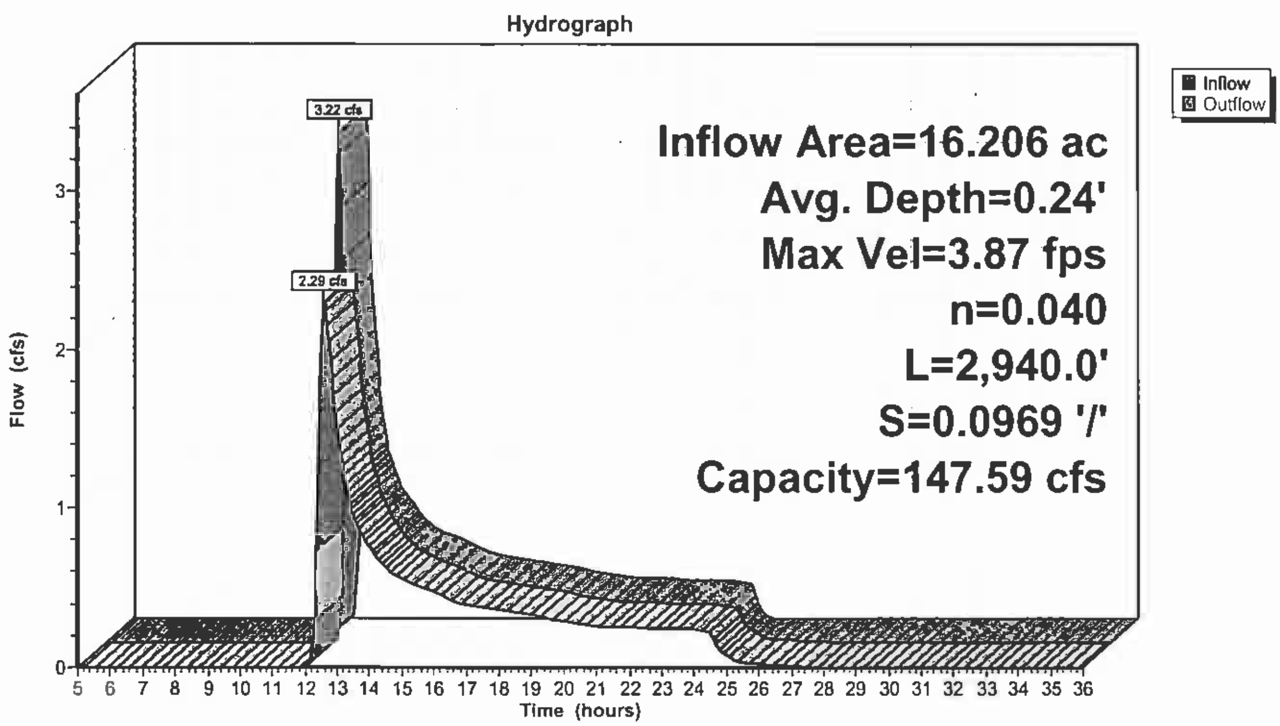
Inflow Area = 16.206 ac, Inflow Depth = 0.37" for 10-YR event
Inflow = 3.22 cfs @ 12.21 hrs, Volume= 0.505 af
Outflow = 2.29 cfs @ 12.59 hrs, Volume= 0.505 af, Atten= 29%, Lag= 23.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 12.7 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 28.6 min

Peak Storage= 1,748 cf @ 12.38 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 147.59 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 2,940.0' Slope= 0.0969 '/'
Inlet Invert= 2,319.00', Outlet Invert= 2,034.00'

Reach R20: Reach



Reach R21: Reach

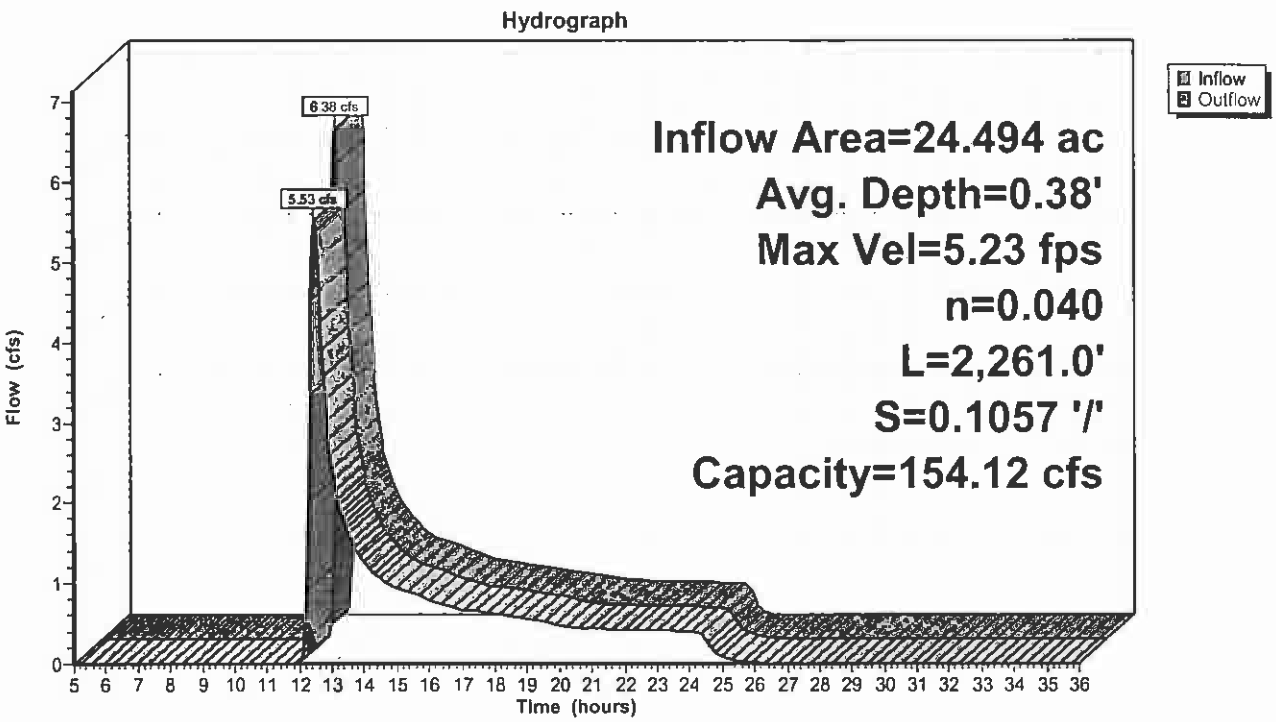
Inflow Area =	24.494 ac,	Inflow Depth = 0.45"	for 10-YR event		
Inflow =	6.38 cfs @	12.23 hrs,	Volume=	0.919 af	
Outflow =	5.53 cfs @	12.46 hrs,	Volume=	0.919 af,	Atten= 13%, Lag= 13.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 17.2 min

Peak Storage= 2,399 cf @ 12.33 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 154.12 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 2,261.0' Slope= 0.1057 '/'
Inlet Invert= 2,273.00', Outlet Invert= 2,034.00'

Reach R21: Reach



Reach R22: Reach

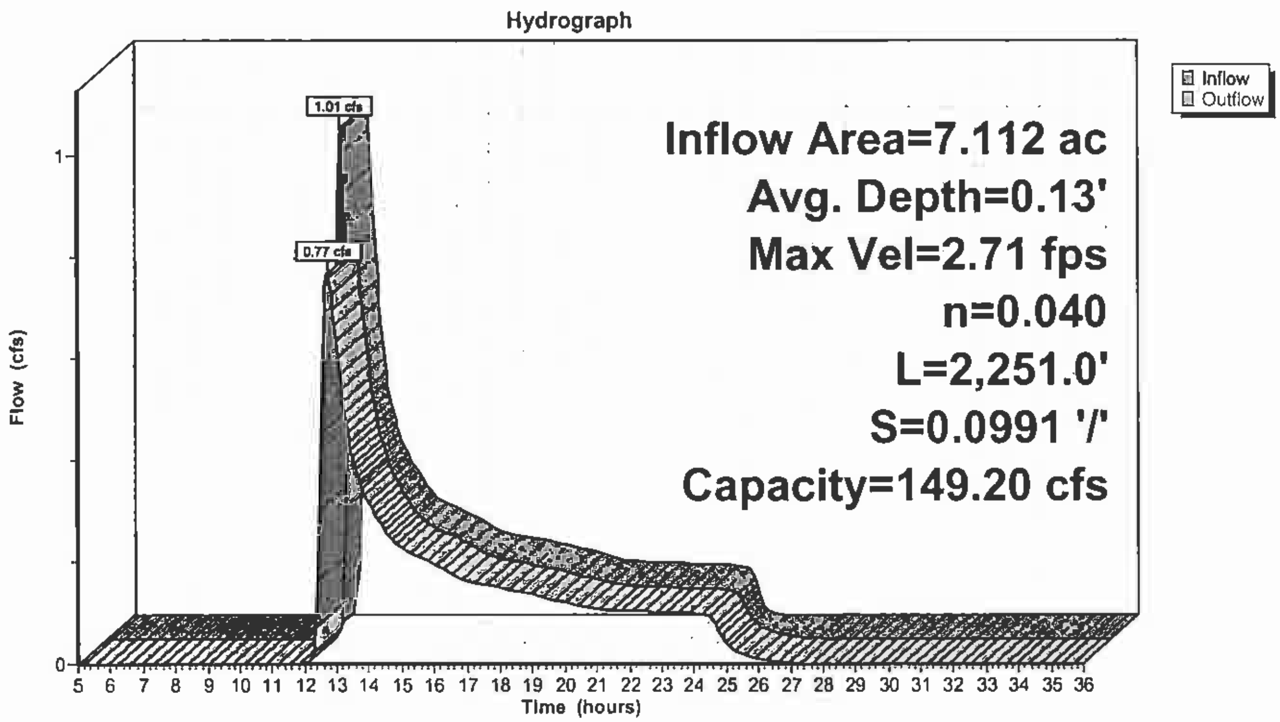
Inflow Area = 7.112 ac, Inflow Depth = 0.34" for 10-YR event
Inflow = 1.01 cfs @ 12.29 hrs, Volume= 0.200 af
Outflow = 0.77 cfs @ 12.72 hrs, Volume= 0.200 af, Atten= 24%, Lag= 26.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.71 fps, Min. Travel Time= 13.9 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 27.4 min

Peak Storage= 641 cf @ 12.49 hrs, Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 149.20 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 2,251.0' Slope= 0.0991 '/'
Inlet Invert= 2,257.00', Outlet Invert= 2,034.00'

Reach R22: Reach



Reach R4: Reach

Inflow Area = 45.595 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 12.21 cfs @ 12.38 hrs, Volume= 2.023 af
Outflow = 11.74 cfs @ 12.54 hrs, Volume= 2.023 af, Atten= 4%, Lag= 9.7 min

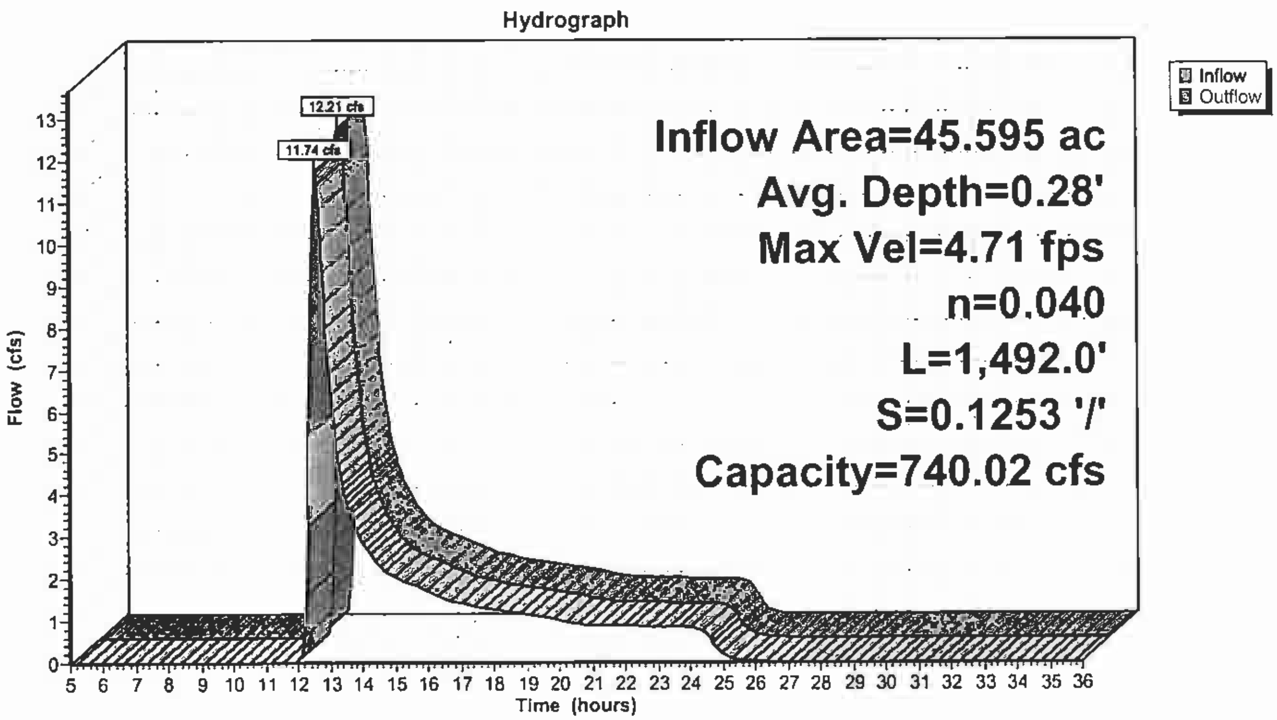
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.71 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 2.11 fps, Avg. Travel Time= 11.8 min

Peak Storage= 3,735 cf @ 12.45 hrs, Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 740.02 cfs

6.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 46.00'
Length= 1,492.0' Slope= 0.1253 '/'
Inlet Invert= 2,221.00', Outlet Invert= 2,034.00'

‡

Reach R4: Reach



Reach R5: Reach

Inflow Area = 21.110 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 4.55 cfs @ 12.35 hrs, Volume= 0.792 af
Outflow = 4.23 cfs @ 12.55 hrs, Volume= 0.792 af, Atten= 7%, Lag= 12.3 min

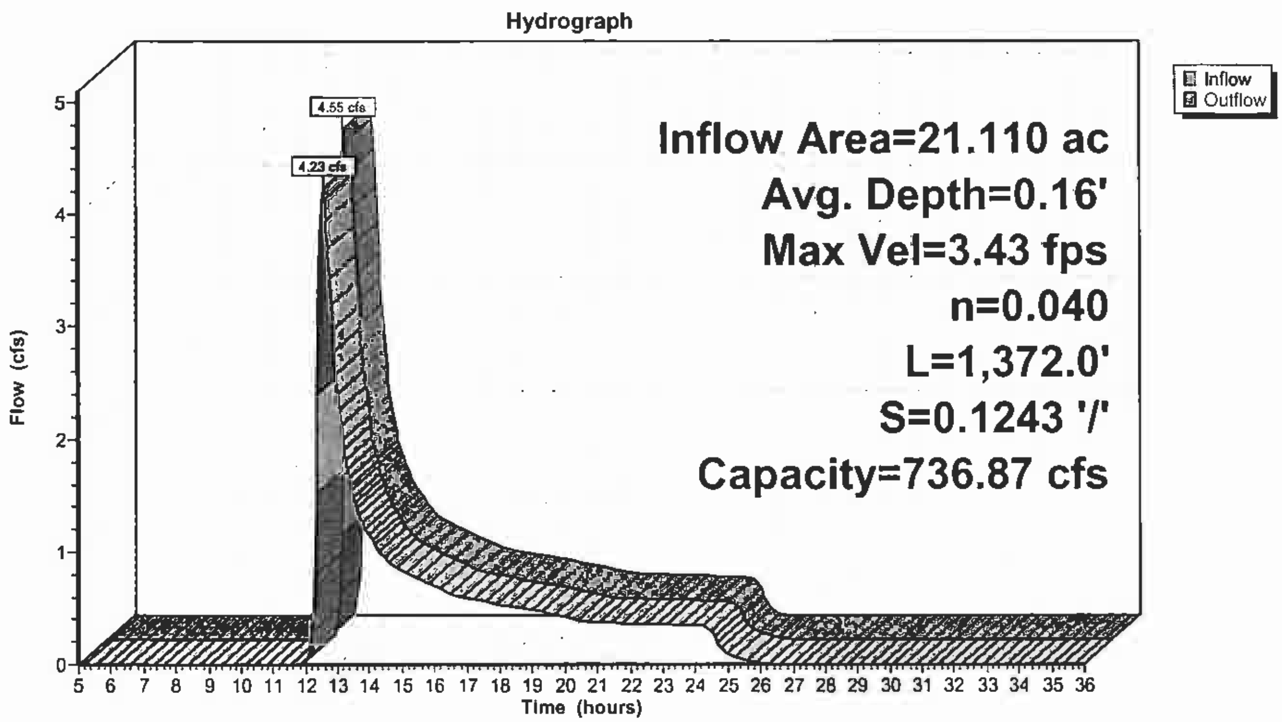
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.43 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 14.2 min

Peak Storage= 1,700 cf @ 12.44 hrs, Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 736.87 cfs

6.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 46.00'
Length= 1,372.0' Slope= 0.1243 '/'
Inlet Invert= 2,204.50', Outlet Invert= 2,034.00'

‡

Reach R5: Reach



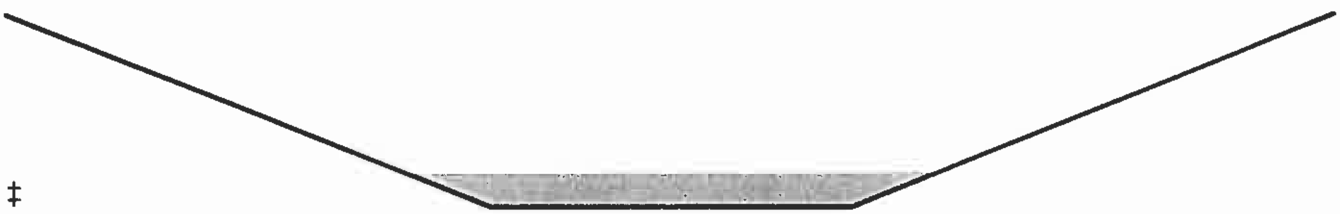
Reach R6: Reach

Inflow Area = 24.553 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 5.24 cfs @ 12.59 hrs, Volume= 1.089 af
Outflow = 5.19 cfs @ 12.70 hrs, Volume= 1.089 af, Atten= 1%, Lag= 6.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 8.5 min

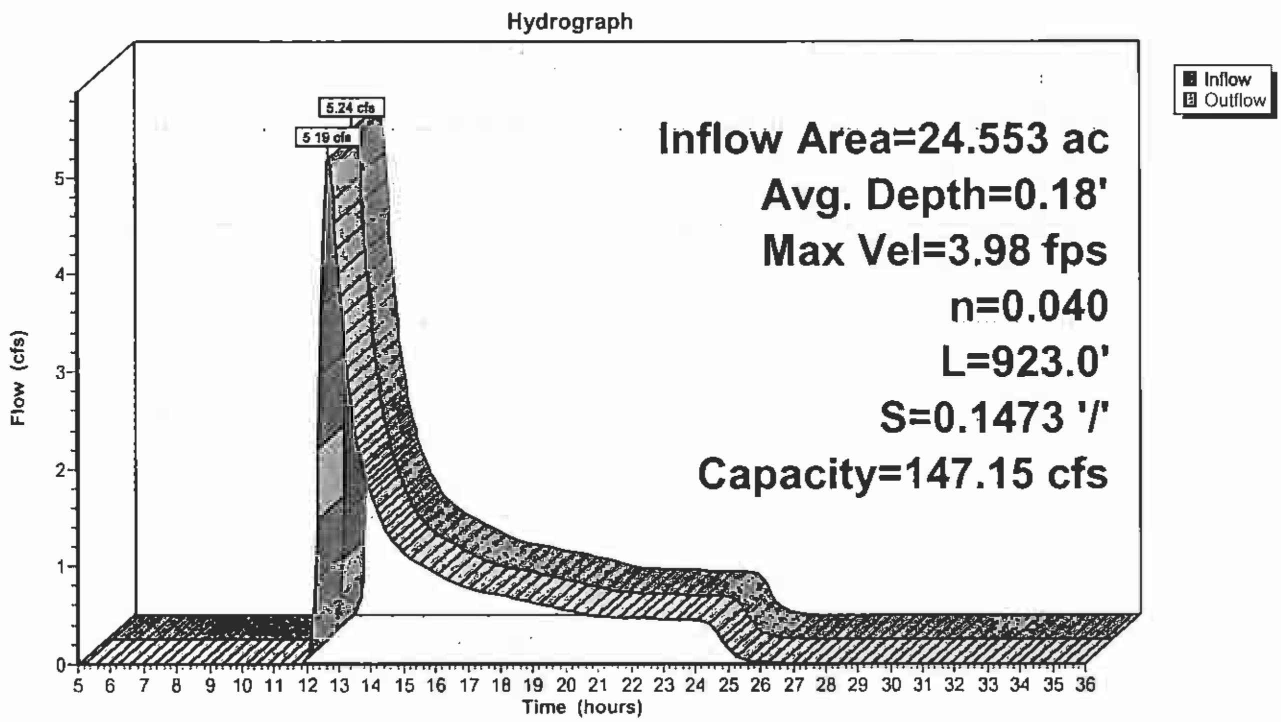
Peak Storage= 1,205 cf @ 12.63 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 147.15 cfs

6.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 8.0 '/' Top Width= 22.00'
Length= 923.0' Slope= 0.1473 '/'
Inlet Invert= 2,171.00', Outlet Invert= 2,035.00'



‡

Reach R6: Reach



Reach R7: Reach

Inflow Area = 12.920 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 3.12 cfs @ 12.27 hrs, Volume= 0.485 af
Outflow = 2.95 cfs @ 12.42 hrs, Volume= 0.485 af, Atten= 5%, Lag= 8.7 min

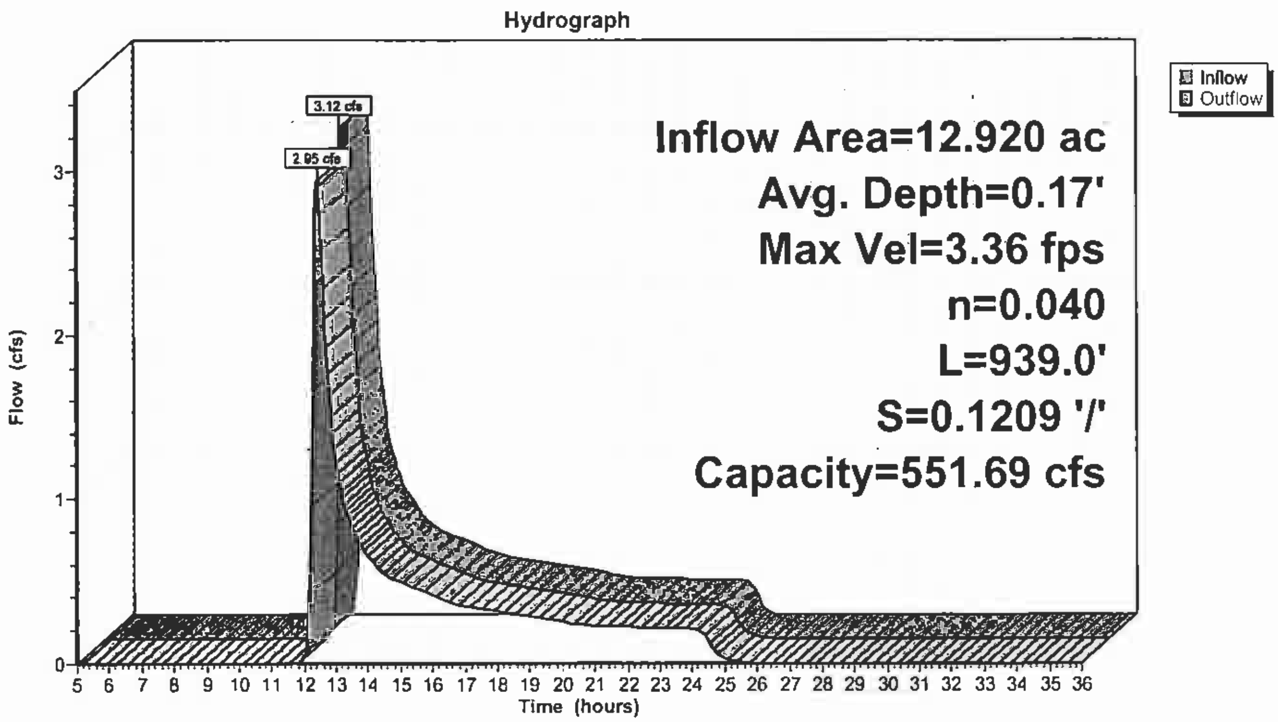
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 9.9 min

Peak Storage= 830 cf @ 12.34 hrs, Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 551.69 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 8.0 '/' Top Width= 36.00'
Length= 939.0' Slope= 0.1209 '/'
Inlet Invert= 2,147.50', Outlet Invert= 2,034.00'

‡

Reach R7: Reach



Reach TS10: Treatment Swale #10

Inflow Area =	1.140 ac,	Inflow Depth = 0.67"	for 10-YR event	
Inflow =	0.56 cfs @	12.22 hrs, Volume=	0.063 af	
Outflow =	0.53 cfs @	12.34 hrs, Volume=	0.063 af,	Atten= 5%, Lag= 7.1 min

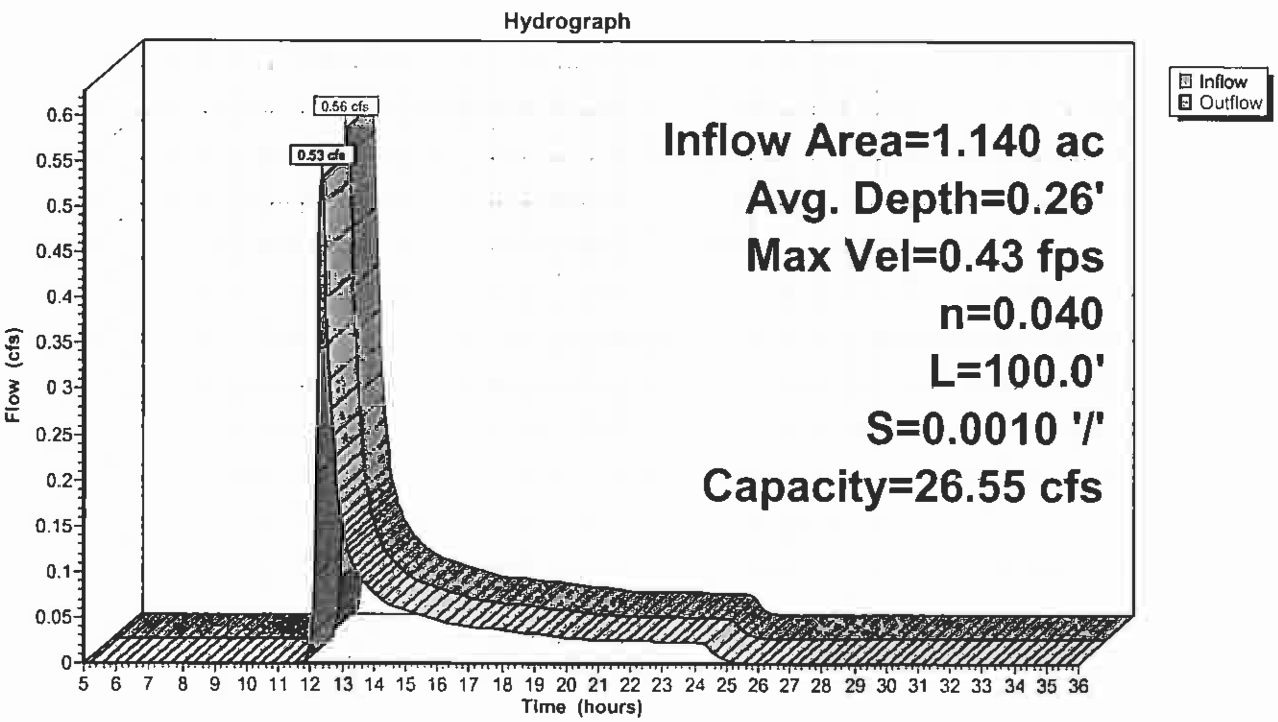
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.43 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 10.2 min

Peak Storage= 125 cf @ 12.27 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0010 '/'
Inlet Invert= 1,770.10', Outlet Invert= 1,770.00'

‡

Reach TS10: Treatment Swale #10



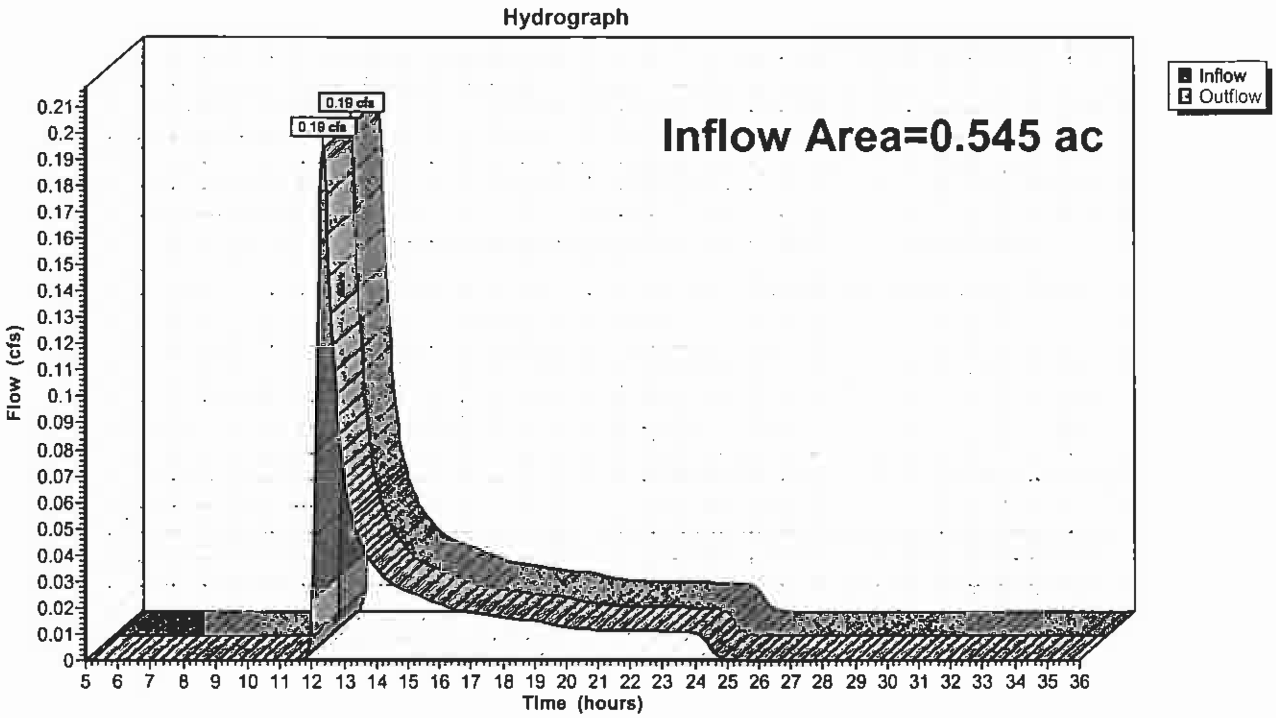
Reach TS13: Treatment Swale #13

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	0.545 ac,	Inflow Depth = 0.62"	for 10-YR event	
Inflow =	0.19 cfs @	12.34 hrs, Volume=	0.028 af	
Outflow =	0.19 cfs @	12.34 hrs, Volume=	0.028 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS13: Treatment Swale #13



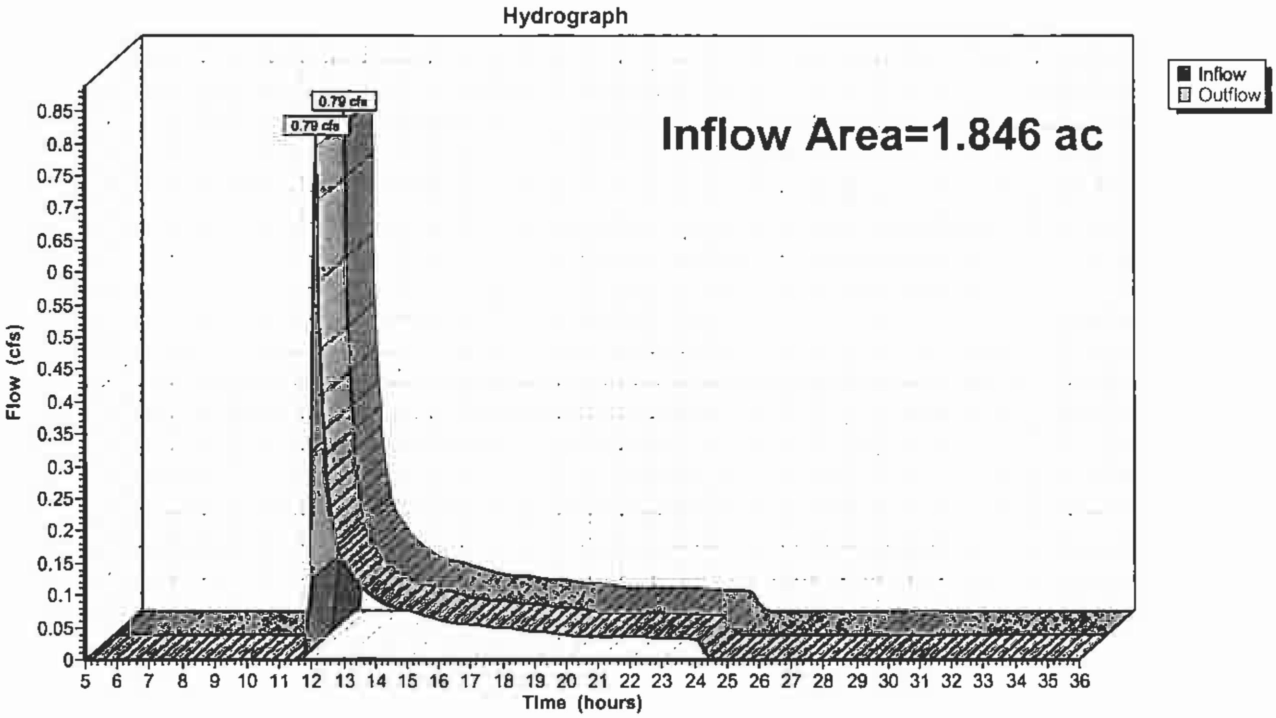
Reach TS14: Treatment Swale #14

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1.846 ac,	Inflow Depth = 0.53"	for 10-YR event
Inflow =	0.79 cfs @ 12.14 hrs,	Volume=	0.082 af
Outflow =	0.79 cfs @ 12.14 hrs,	Volume=	0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS14: Treatment Swale #14



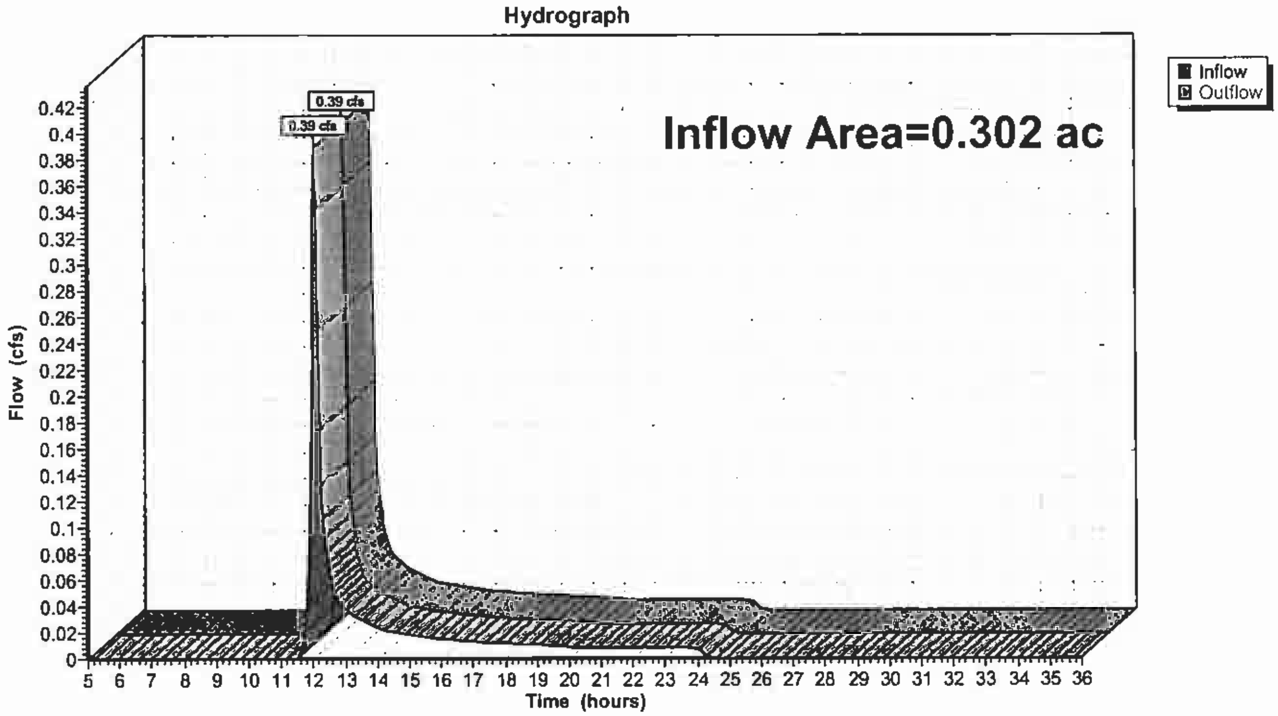
Reach TS15: Treatment Swale #15

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.302 ac, Inflow Depth = 0.97" for 10-YR event
Inflow = 0.39 cfs @ 12.05 hrs, Volume= 0.024 af
Outflow = 0.39 cfs @ 12.05 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS15: Treatment Swale #15



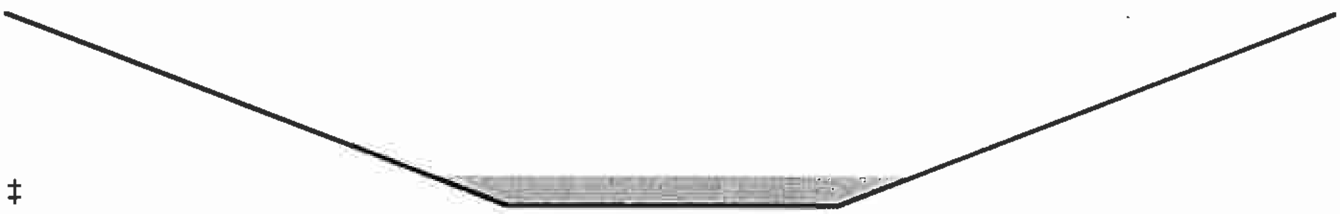
Reach TS16: TS16

Inflow Area = 3.280 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.18 cfs @ 12.27 hrs, Volume= 0.157 af
Outflow = 1.16 cfs @ 12.34 hrs, Volume= 0.157 af, Atten= 2%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.75 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 5.3 min

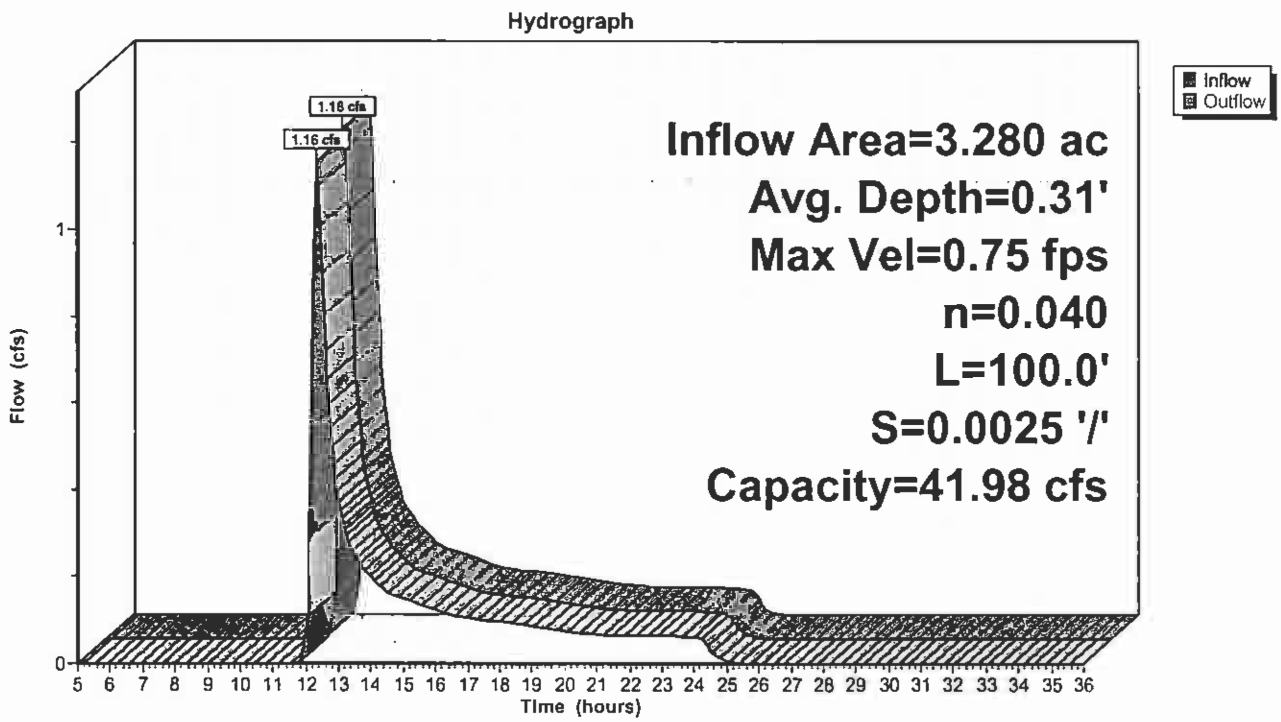
Peak Storage= 155 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 41.98 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0025 '/'
Inlet Invert= 2,004.25', Outlet Invert= 2,004.00'



‡

Reach TS16: TS16



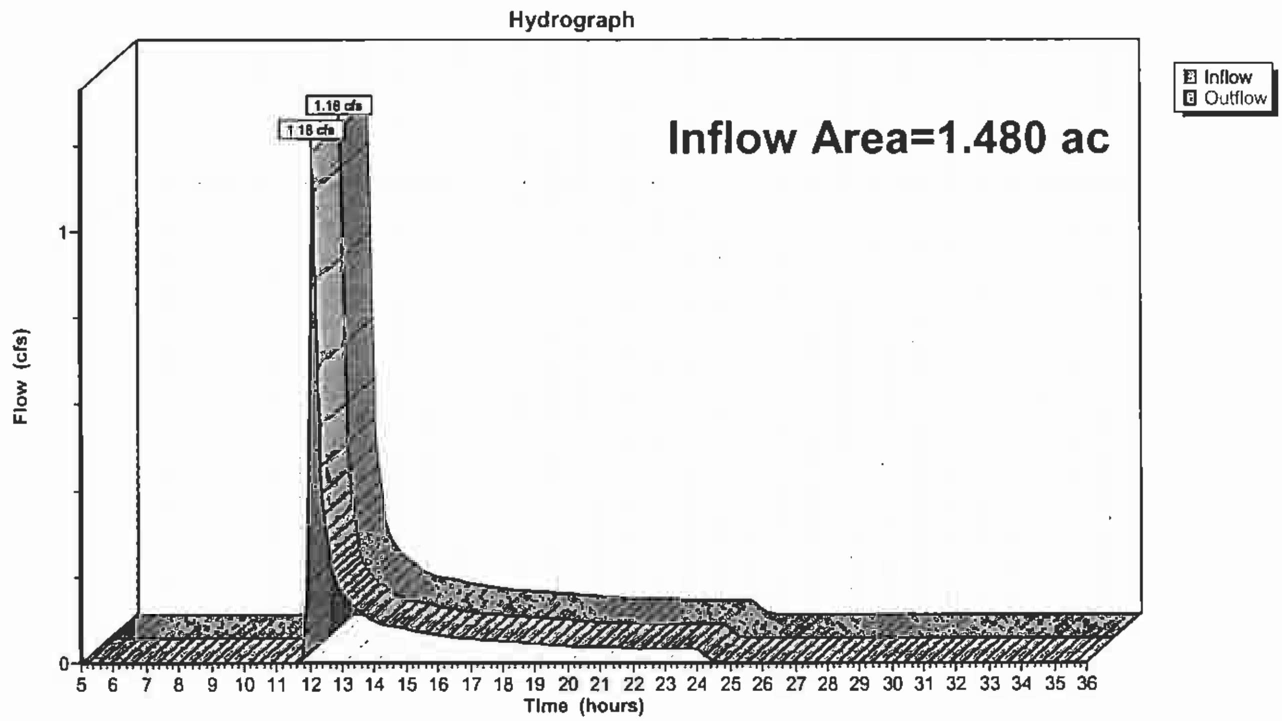
Reach TS7: Treatment Swale #7

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1.480 ac,	Inflow Depth = 0.76"	for 10-YR event
Inflow =	1.18 cfs @	12.10 hrs, Volume=	0.094 af
Outflow =	1.18 cfs @	12.10 hrs, Volume=	0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS7: Treatment Swale #7



Reach TS8: Treatment Swale #8

Inflow Area = 17.703 ac, Inflow Depth = 0.41" for 10-YR event
Inflow = 2.31 cfs @ 12.71 hrs, Volume= 0.607 af
Outflow = 2.30 cfs @ 12.78 hrs, Volume= 0.607 af, Atten= 0%, Lag= 4.1 min

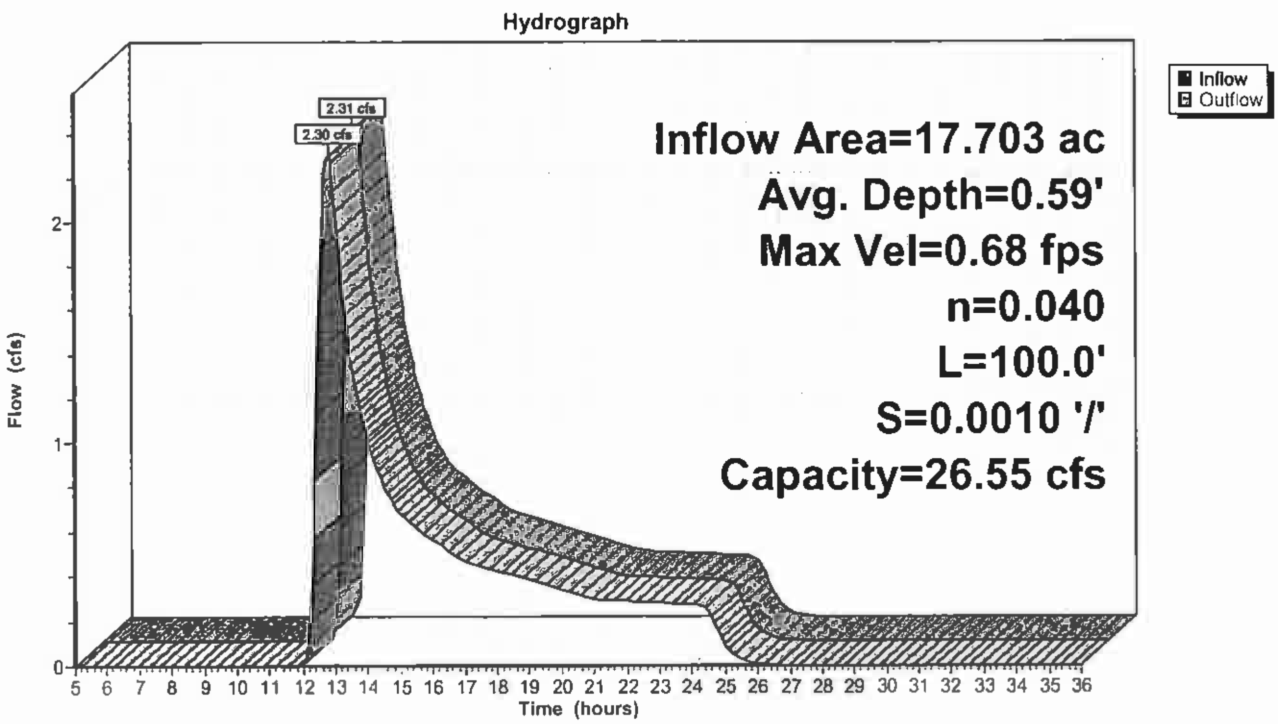
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.68 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 4.8 min

Peak Storage= 339 cf @ 12.74 hrs, Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0010 '/'
Inlet Invert= 1,530.10', Outlet Invert= 1,530.00'

‡

Reach TS8: Treatment Swale #8



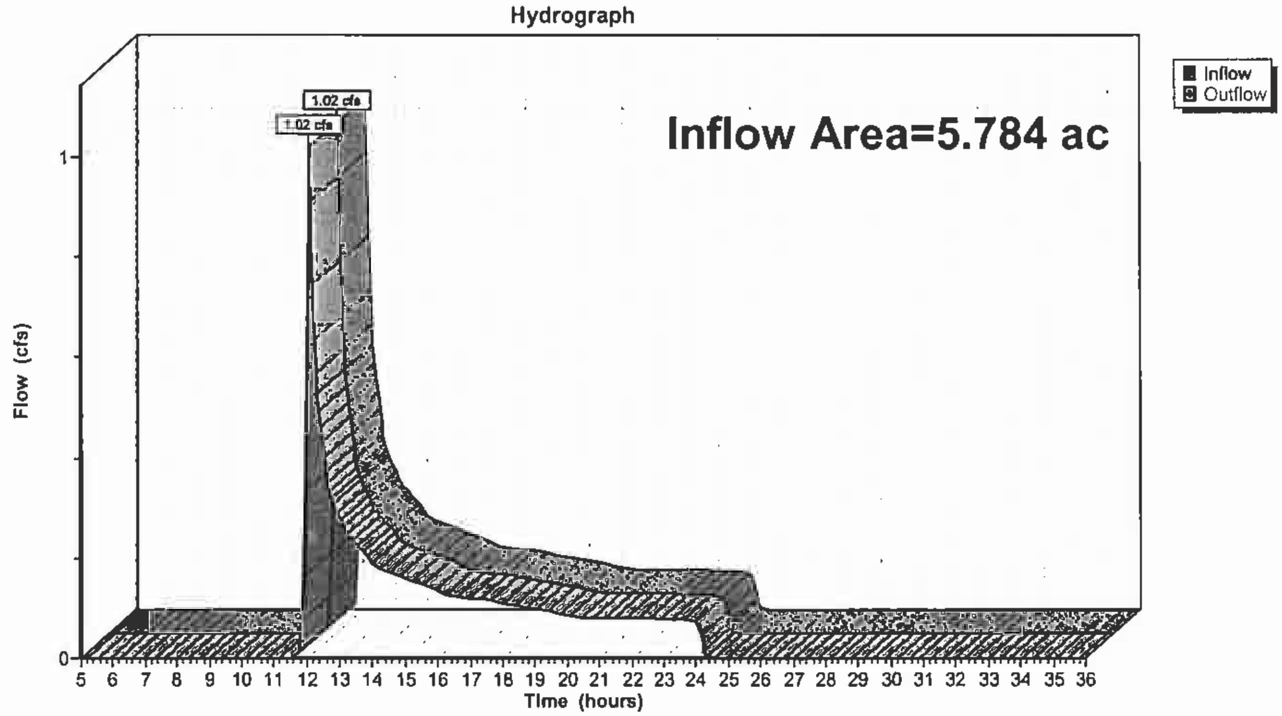
Reach TS9: Treatment Swale #9

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.784 ac, Inflow Depth = 0.32" for 10-YR event
Inflow = 1.02 cfs @ 12.10 hrs, Volume= 0.154 af
Outflow = 1.02 cfs @ 12.10 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Reach TS9: Treatment Swale #9



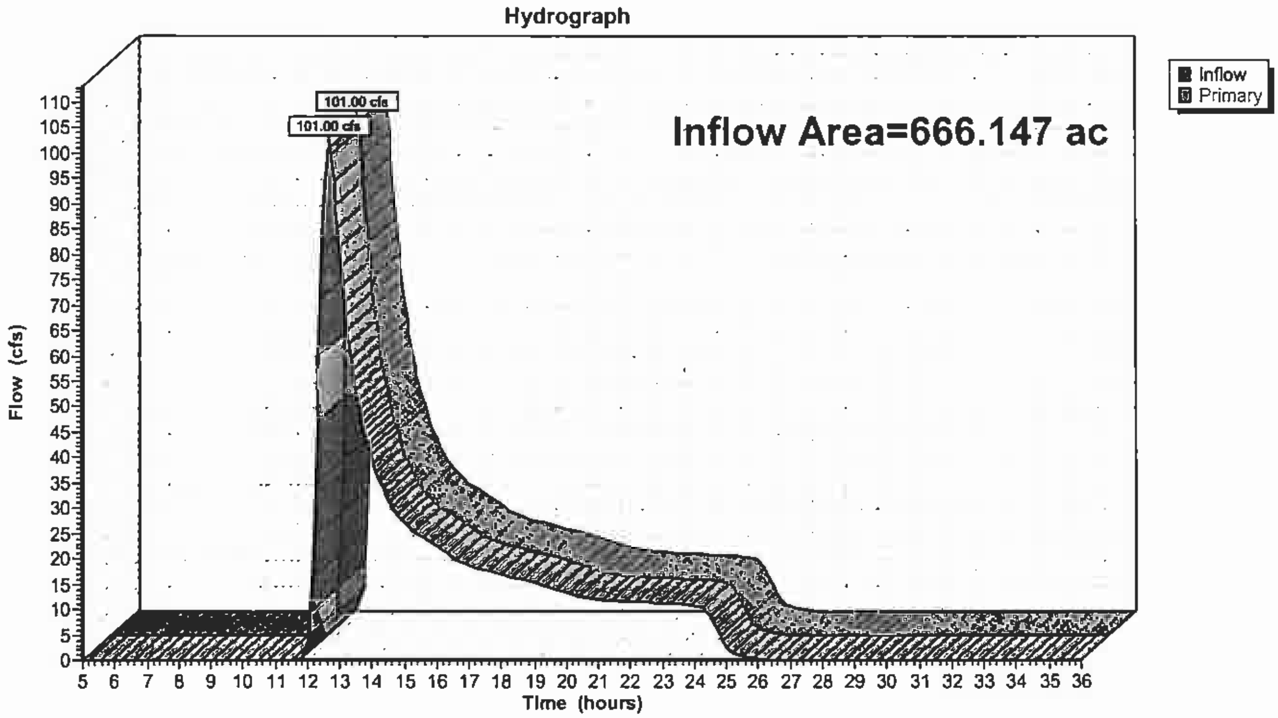
Pond B1: B1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	666.147 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	101.00 cfs @	12.69 hrs,	Volume=	24.991 af
Primary =	101.00 cfs @	12.69 hrs,	Volume=	24.991 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond B1: B1



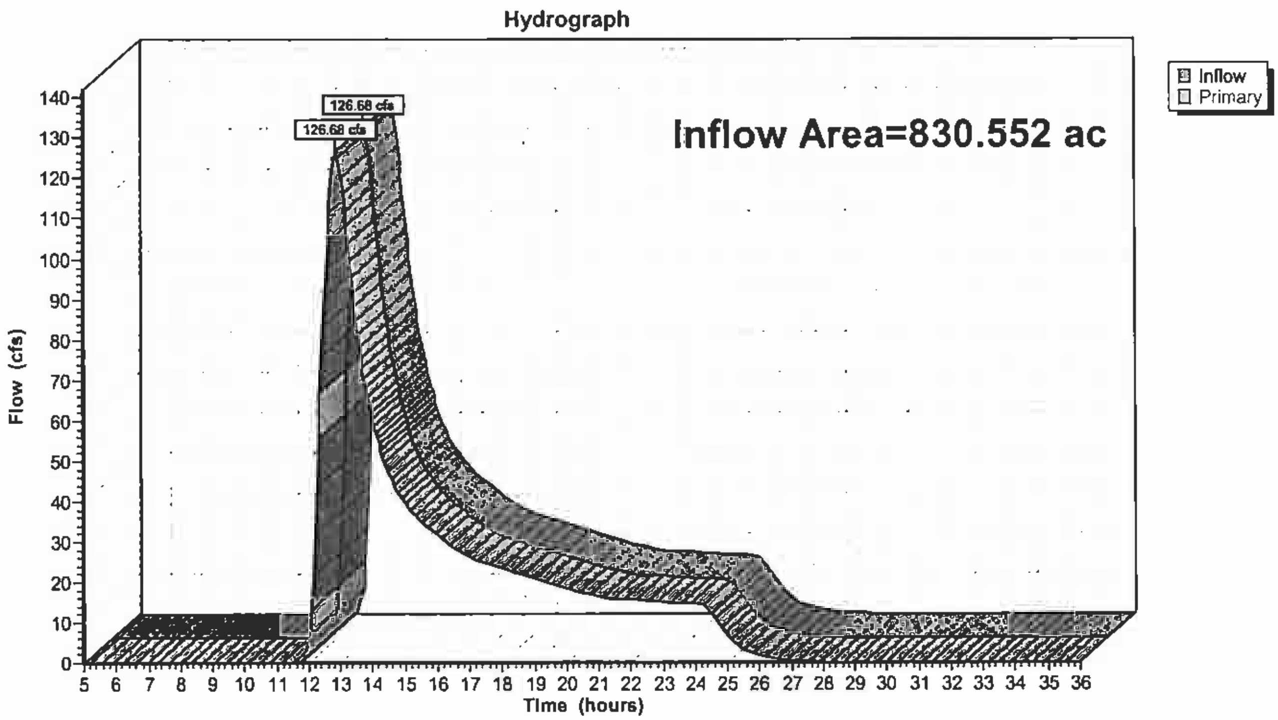
Pond B2: B2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	830.552 ac,	Inflow Depth = 0.51"	for 10-YR event	
Inflow =	126.68 cfs @	12.88 hrs, Volume=	35.185 af	
Primary =	126.68 cfs @	12.88 hrs, Volume=	35.185 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond B2: B2



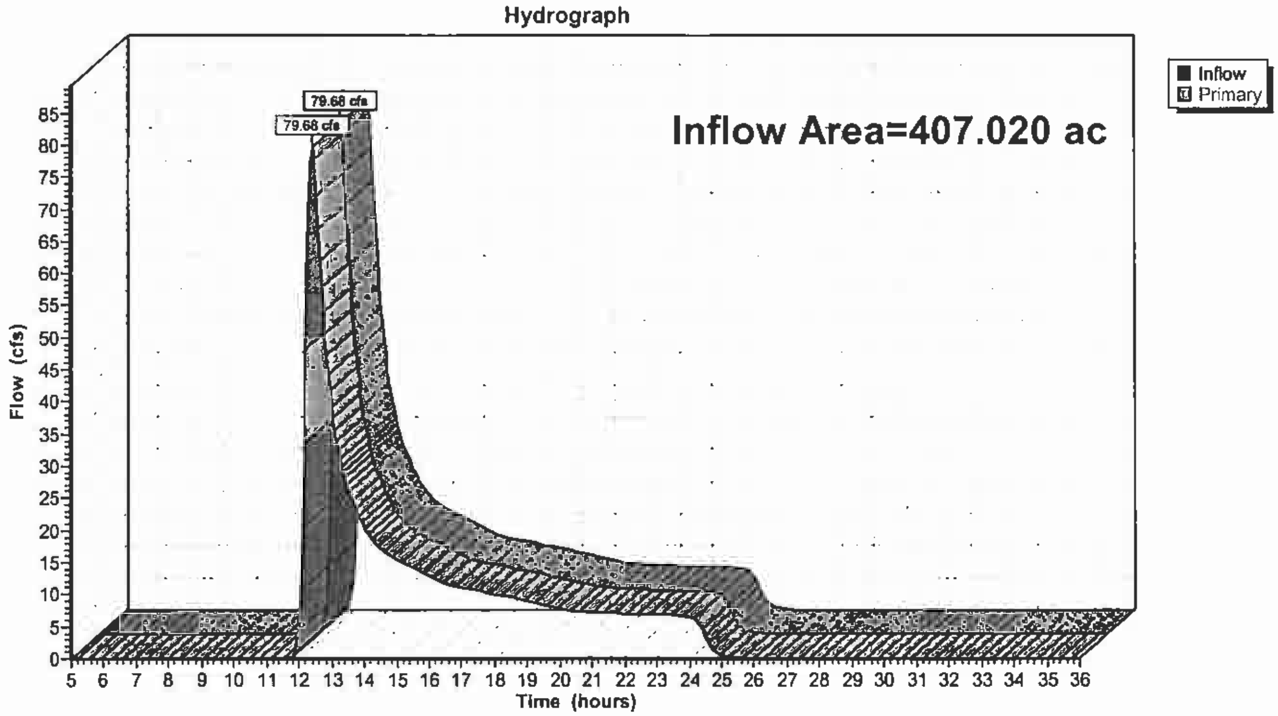
Pond B3: B3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	407.020 ac, Inflow Depth = 0.45"	for 10-YR event
Inflow =	79.68 cfs @ 12.42 hrs, Volume=	15.270 af
Primary =	79.68 cfs @ 12.42 hrs, Volume=	15.270 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond B3: B3



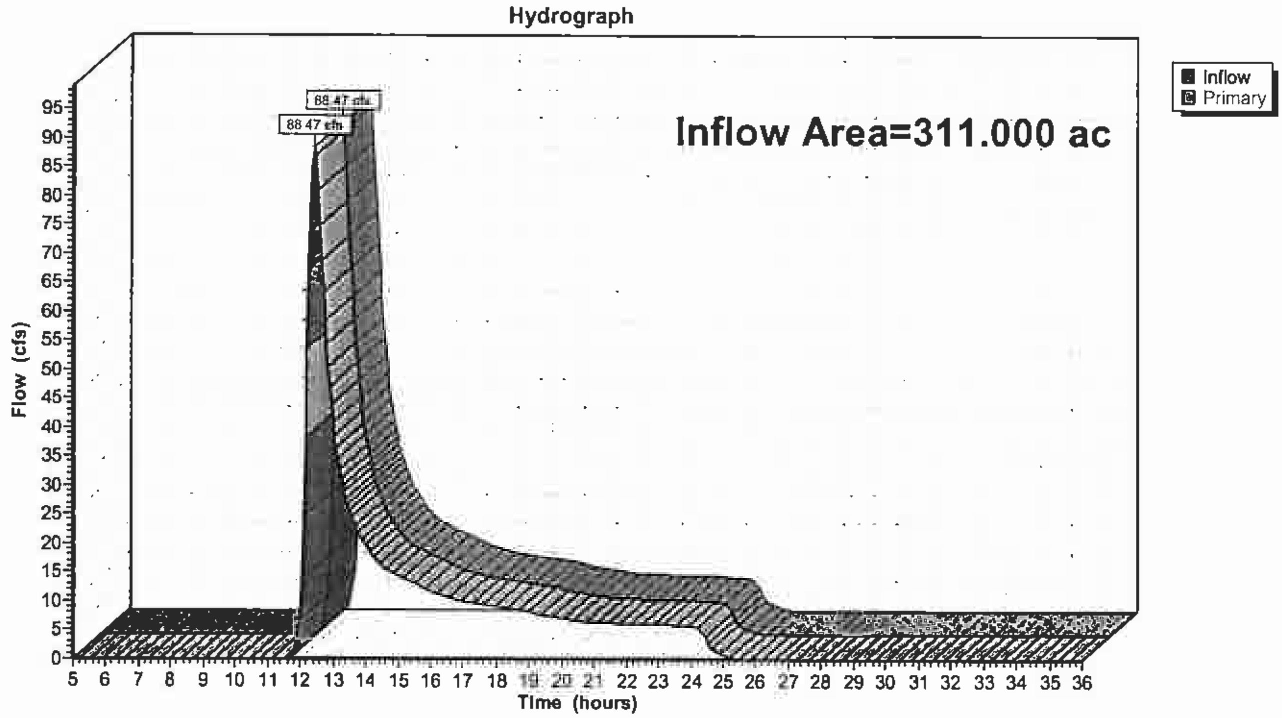
Pond B4: B4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	311.000 ac, Inflow Depth = 0.58"	for 10-YR event
Inflow =	88.47 cfs @ 12.43 hrs, Volume=	14.916 af
Primary =	88.47 cfs @ 12.43 hrs, Volume=	14.916 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond B4: B4



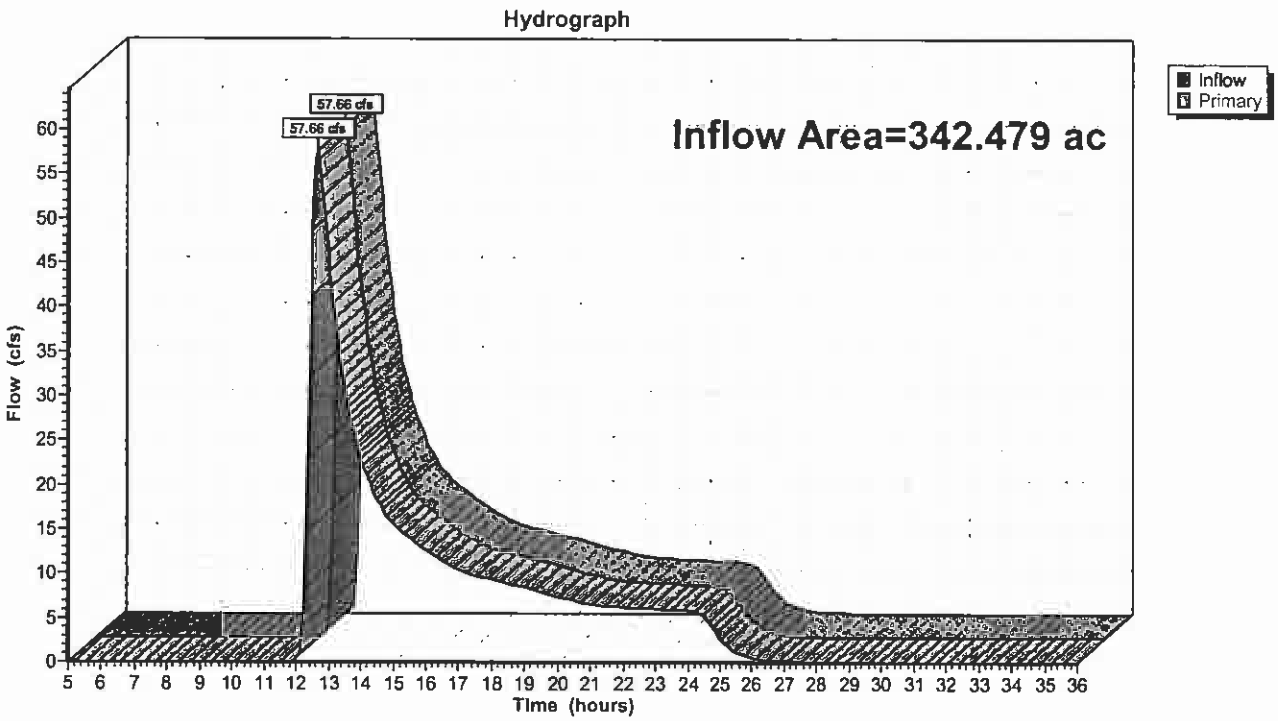
Pond Bridge 6: Bridge 6

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 342.479 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 57.66 cfs @ 12.66 hrs, Volume= 13.911 af
Primary = 57.66 cfs @ 12.66 hrs, Volume= 13.911 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond Bridge 6: Bridge 6



Pond C177: Culvert C-177

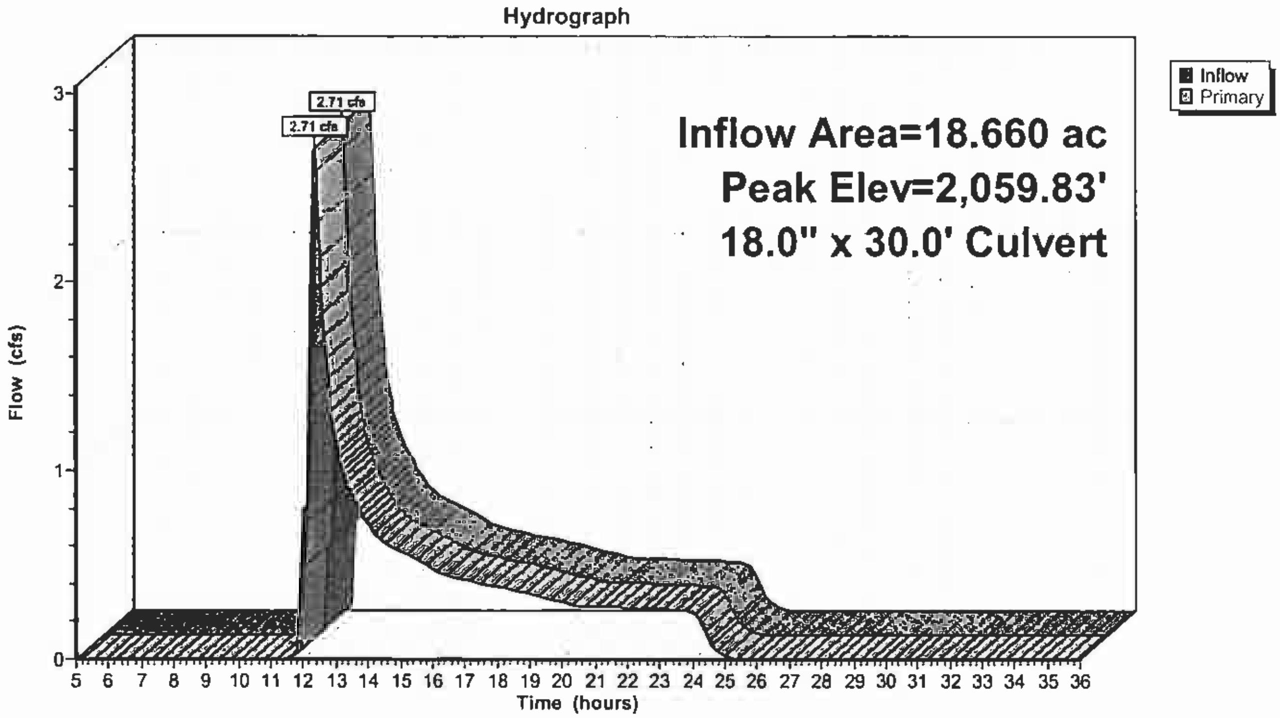
Inflow Area =	18.660 ac, Inflow Depth = 0.35"	for 10-YR event	
Inflow =	2.71 cfs @ 12.32 hrs, Volume=	0.543 af	
Outflow =	2.71 cfs @ 12.32 hrs, Volume=	0.543 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.71 cfs @ 12.32 hrs, Volume=	0.543 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,059.83' @ 12.32 hrs
Flood Elev= 2,062.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,059.00'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,058.65' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.68 cfs @ 12.32 hrs HW=2,059.83' (Free Discharge)
└─1=**Culvert** (Barrel Controls 2.68 cfs @ 3.89 fps)

Pond C177: Culvert C-177



Pond C178: Culvert C-178

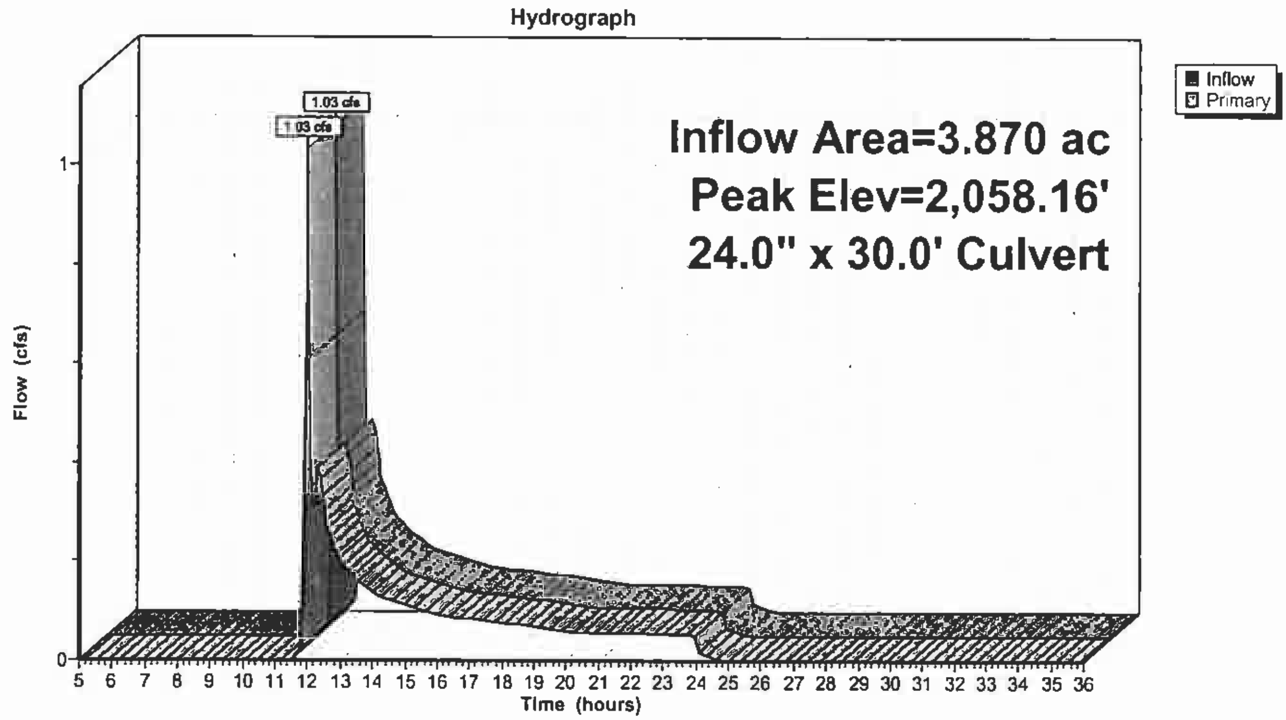
Inflow Area =	3.870 ac,	Inflow Depth = 0.34"	for 10-YR event	
Inflow =	1.03 cfs @	11.99 hrs, Volume=	0.109 af	
Outflow =	1.03 cfs @	11.99 hrs, Volume=	0.109 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.03 cfs @	11.99 hrs, Volume=	0.109 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,058.16' @ 11.99 hrs
Flood Elev= 2,061.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,057.75'	**24.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,056.15' S= 0.0533 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.00 cfs @ 11.99 hrs HW=2,058.16' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.00 cfs @ 2.17 fps)

Pond C178: Culvert C-178



Pond Culvert 1001: Cv1001

[61] Hint: Submerged 1% of Reach R11 bottom
[61] Hint: Submerged 1% of Reach R6 bottom
[61] Hint: Submerged 2% of Reach R7 bottom

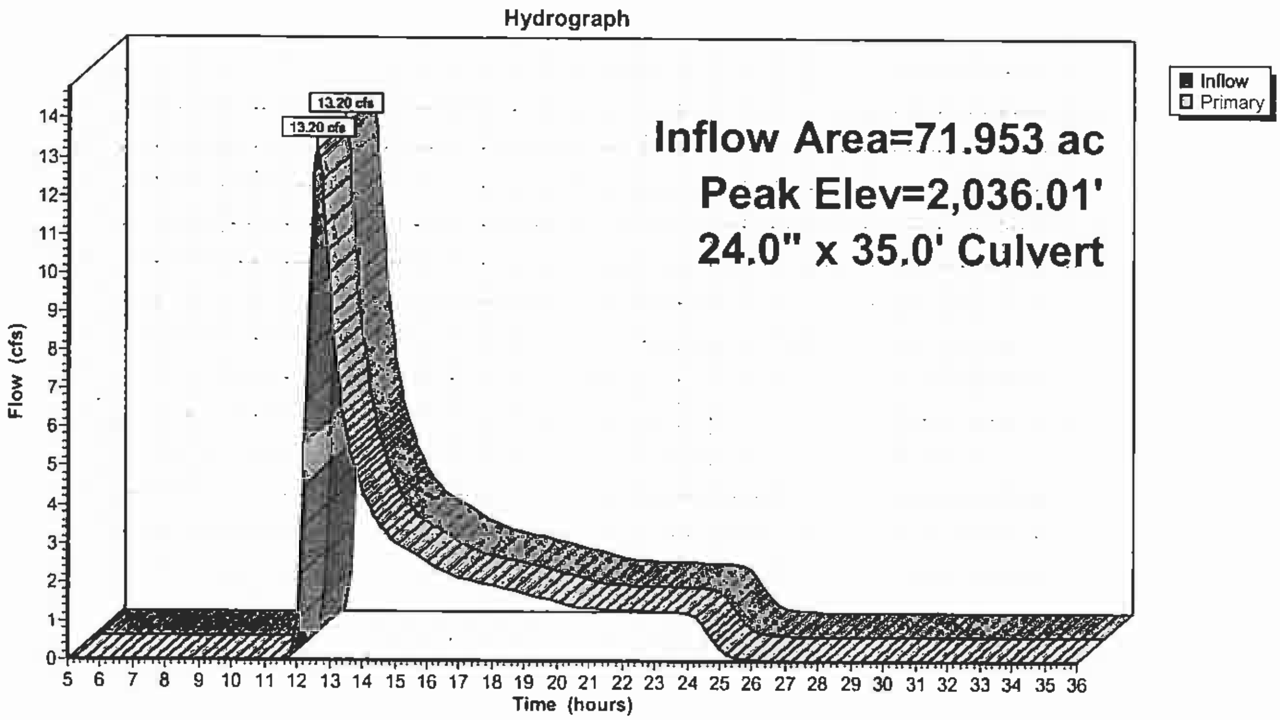
Inflow Area = 71.953 ac, Inflow Depth = 0.50" for 10-YR event
Inflow = 13.20 cfs @ 12.61 hrs, Volume= 2.983 af
Outflow = 13.20 cfs @ 12.61 hrs, Volume= 2.983 af, Atten= 0%, Lag= 0.0 min
Primary = 13.20 cfs @ 12.61 hrs, Volume= 2.983 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,036.01' @ 12.61 hrs
Flood Elev= 2,039.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,034.25'	**24.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,033.15' S= 0.0314 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=13.19 cfs @ 12.61 hrs HW=2,036.01' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 13.19 cfs @ 4.51 fps)

Pond Culvert 1001: Cv1001



Pond CV 152: CV 152

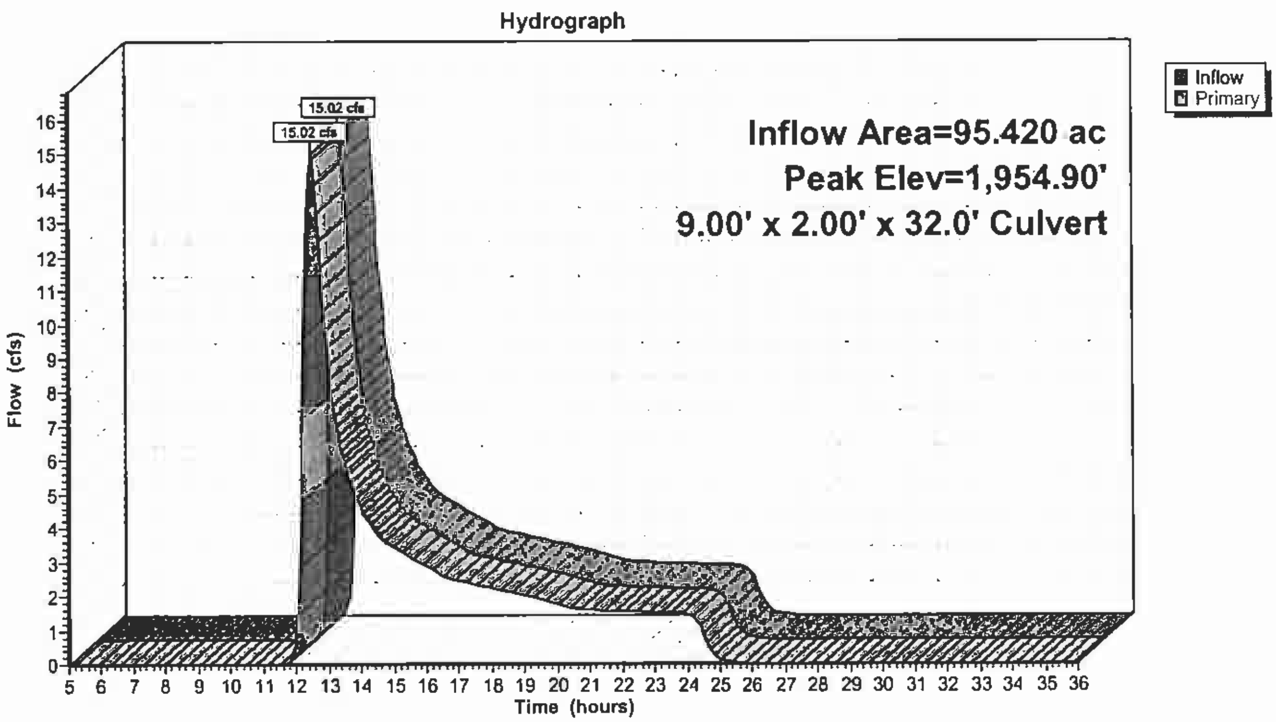
Inflow Area =	95.420 ac,	Inflow Depth = 0.41"	for 10-YR event		
Inflow =	15.02 cfs @	12.48 hrs,	Volume=	3.270 af	
Outflow =	15.02 cfs @	12.48 hrs,	Volume=	3.270 af,	Atten= 0%, Lag= 0.0 min
Primary =	15.02 cfs @	12.48 hrs,	Volume=	3.270 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,954.90' @ 12.48 hrs
Flood Elev= 1,959.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.20'	**9.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 1,951.00' S= 0.1000 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=14.97 cfs @ 12.48 hrs HW=1,954.90' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 14.97 cfs @ 2.37 fps)

Pond CV 152: CV 152



Pond CV 187: CV 187

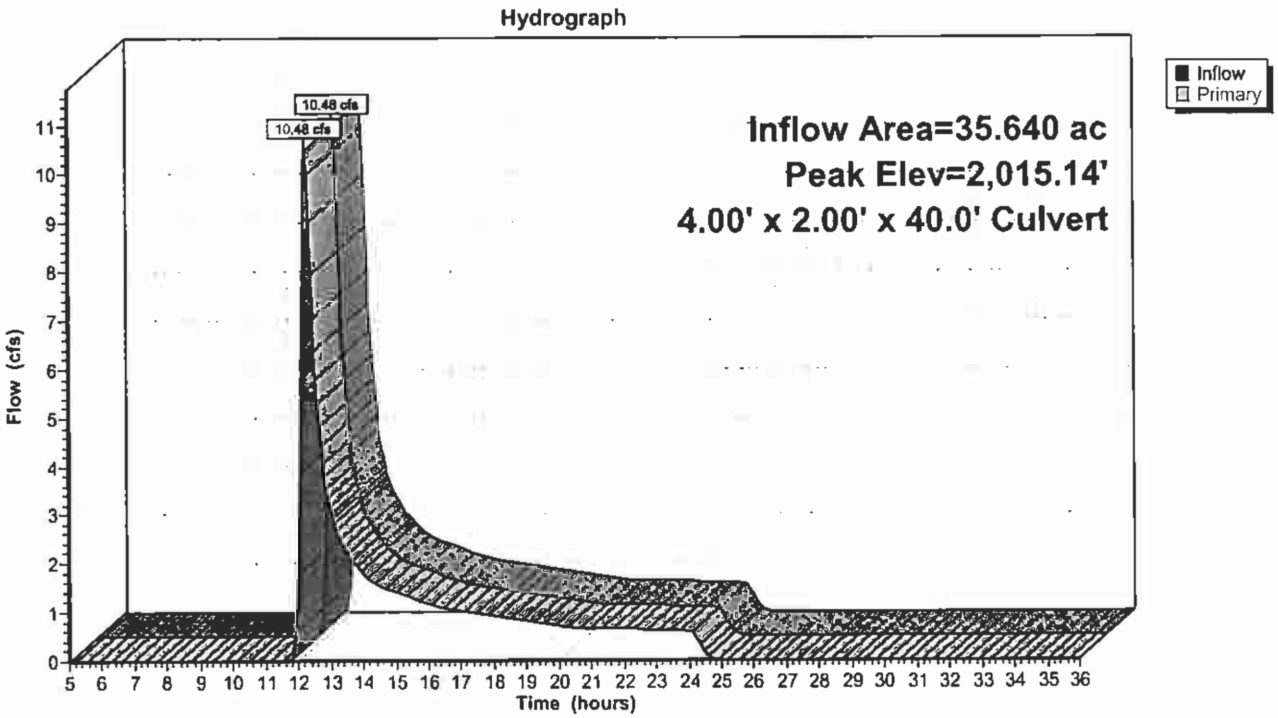
Inflow Area =	35.640 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	10.48 cfs @ 12.24 hrs, Volume=	1.457 af	
Outflow =	10.48 cfs @ 12.24 hrs, Volume=	1.457 af,	Atten= 0%, Lag= 0.0 min
Primary =	10.48 cfs @ 12.24 hrs, Volume=	1.457 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,015.14' @ 12.24 hrs
Flood Elev= 2,017.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,014.00'	**4.00' W x 2.00' H x 40.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 2,013.50' S= 0.0125 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=10.44 cfs @ 12.24 hrs HW=2,015.14' (Free Discharge)
↑**1=Culvert** (Barrel Controls 10.44 cfs @ 3.06 fps)

Pond CV 187: CV 187



Pond CV 223: CV 223

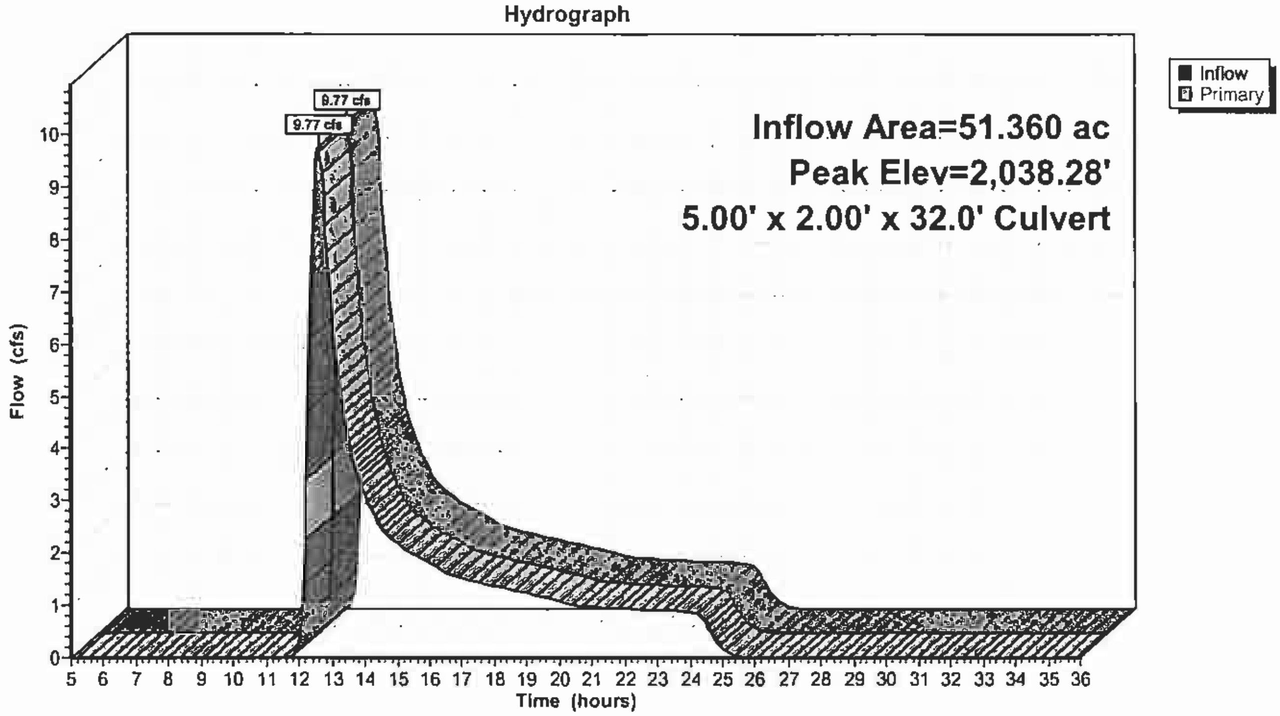
Inflow Area =	51.360 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	9.77 cfs @ 12.57 hrs, Volume=	2.100 af	
Outflow =	9.77 cfs @ 12.57 hrs, Volume=	2.100 af,	Atten= 0%, Lag= 0.0 min
Primary =	9.77 cfs @ 12.57 hrs, Volume=	2.100 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,038.28' @ 12.57 hrs
Flood Elev= 2,040.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,037.50'	**5.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 2,036.10' S= 0.0438 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=9.73 cfs @ 12.57 hrs HW=2,038.28' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 9.73 cfs @ 2.50 fps)

Pond CV 223: CV 223



Pond CV 227: CV 227

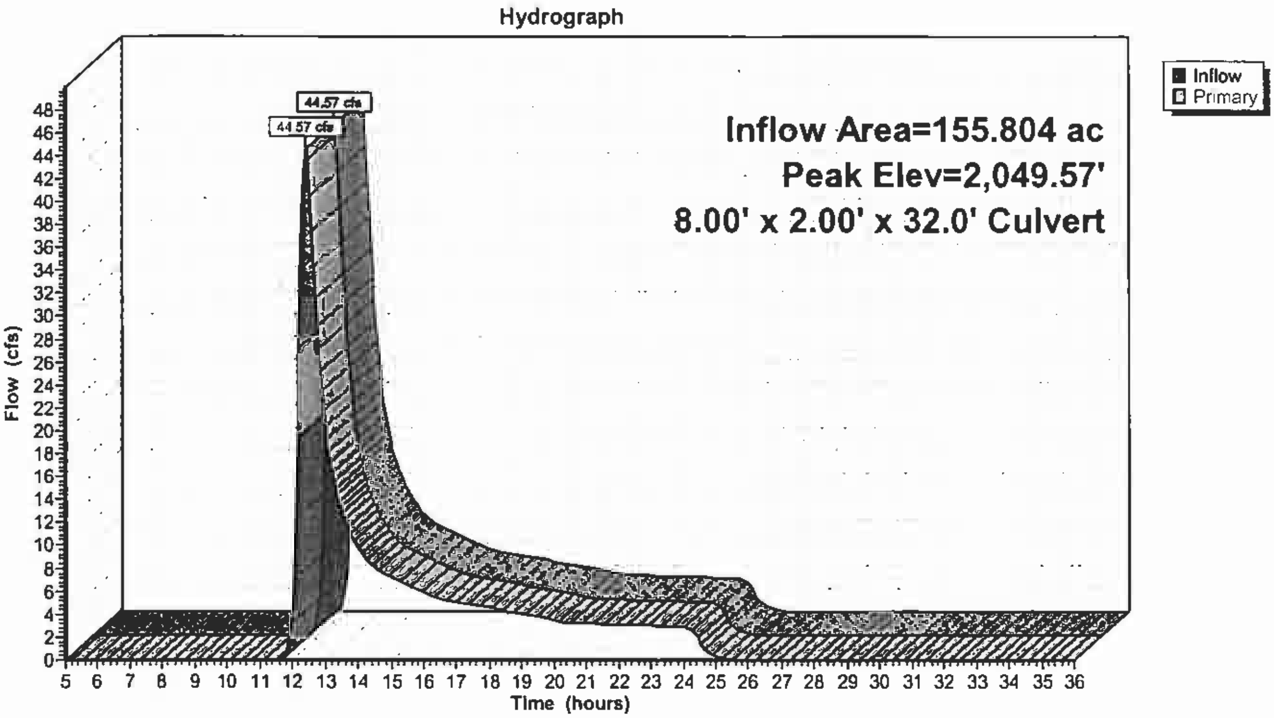
Inflow Area = 155.804 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 44.57 cfs @ 12.42 hrs, Volume= 7.473 af
Outflow = 44.57 cfs @ 12.42 hrs, Volume= 7.473 af, Atten= 0%, Lag= 0.0 min
Primary = 44.57 cfs @ 12.42 hrs, Volume= 7.473 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,049.57' @ 12.42 hrs
Flood Elev= 2,051.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,048.00'	**8.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 2,047.00' S= 0.0313 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=44.35 cfs @ 12.42 hrs HW=2,049.56' (Free Discharge)
└─**1=Culvert** (Inlet Controls 44.35 cfs @ 3.54 fps)

Pond CV 227: CV 227



Pond CV 233: CV 233

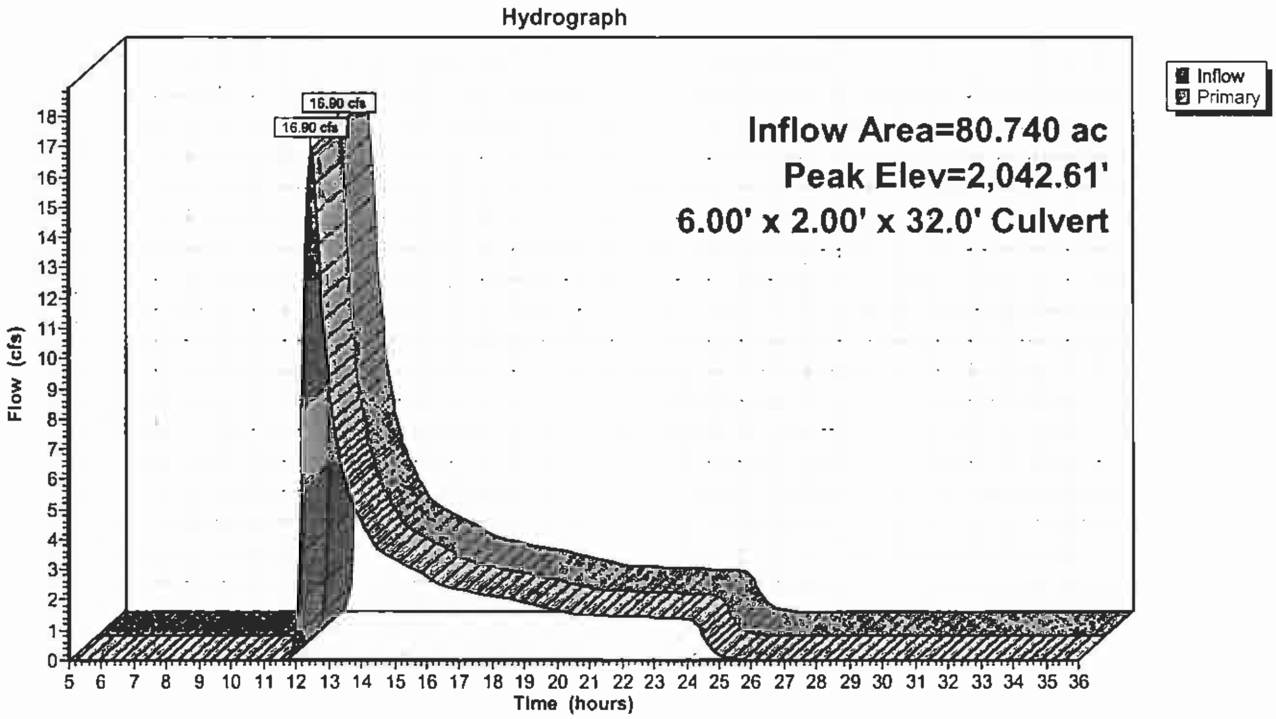
Inflow Area =	80.740 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	16.90 cfs @	12.48 hrs, Volume=	3.301 af	
Outflow =	16.90 cfs @	12.48 hrs, Volume=	3.301 af,	Atten= 0%, Lag= 0.0 min
Primary =	16.90 cfs @	12.48 hrs, Volume=	3.301 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,042.61' @ 12.48 hrs
Flood Elev= 2,044.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,041.50'	**6.00' W x 2.00' H x 32.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 2,041.00' S= 0.0156 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=16.85 cfs @ 12.48 hrs HW=2,042.61' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 16.85 cfs @ 3.39 fps)

Pond CV 233: CV 233



Pond CV 241: CV 241

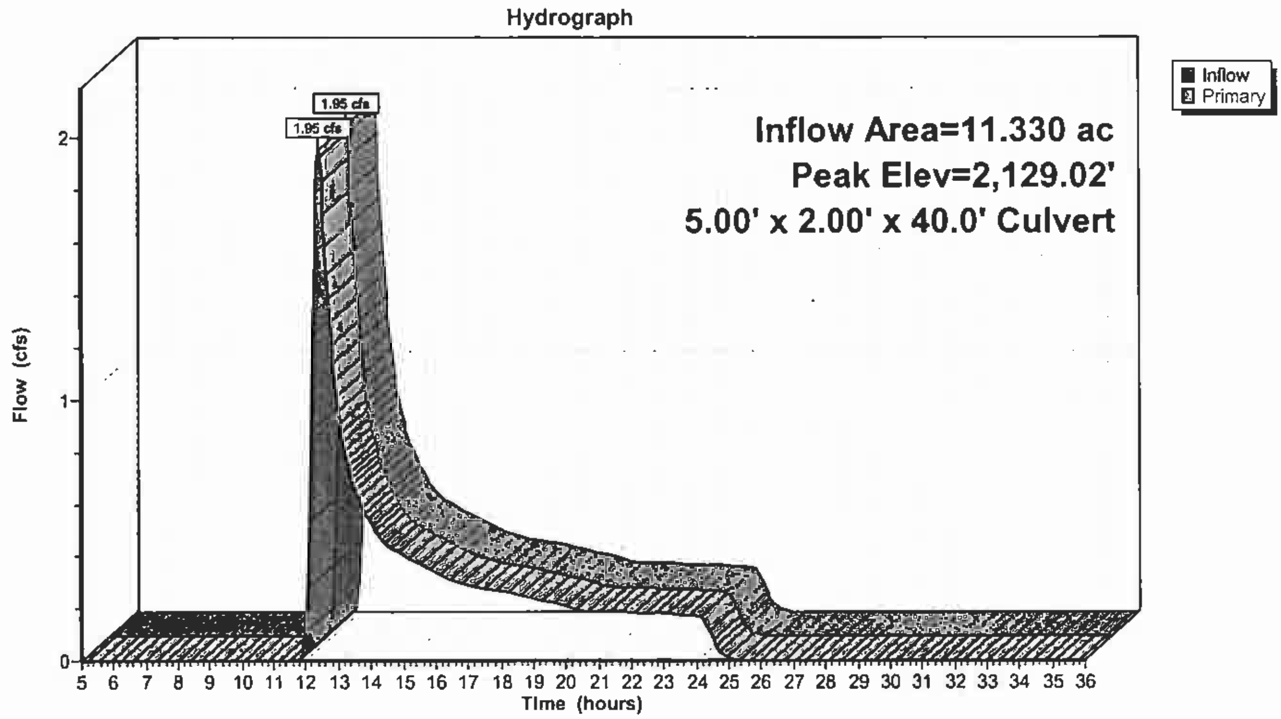
Inflow Area =	11.330 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	1.95 cfs @	12.40 hrs, Volume=	0.388 af	
Outflow =	1.95 cfs @	12.40 hrs, Volume=	0.388 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.95 cfs @	12.40 hrs, Volume=	0.388 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,129.02' @ 12.40 hrs
Flood Elev= 2,133.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,128.75'	**5.00' W x 2.00' H x 40.0' long Culvert** Box, 0° wingwalls, square crown edge, Ke= 0.700 Outlet Invert= 2,125.40' S= 0.0837 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=1.95 cfs @ 12.40 hrs HW=2,129.02' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.95 cfs @ 1.46 fps)

Pond CV 241: CV 241



Pond CV1000: CV1000

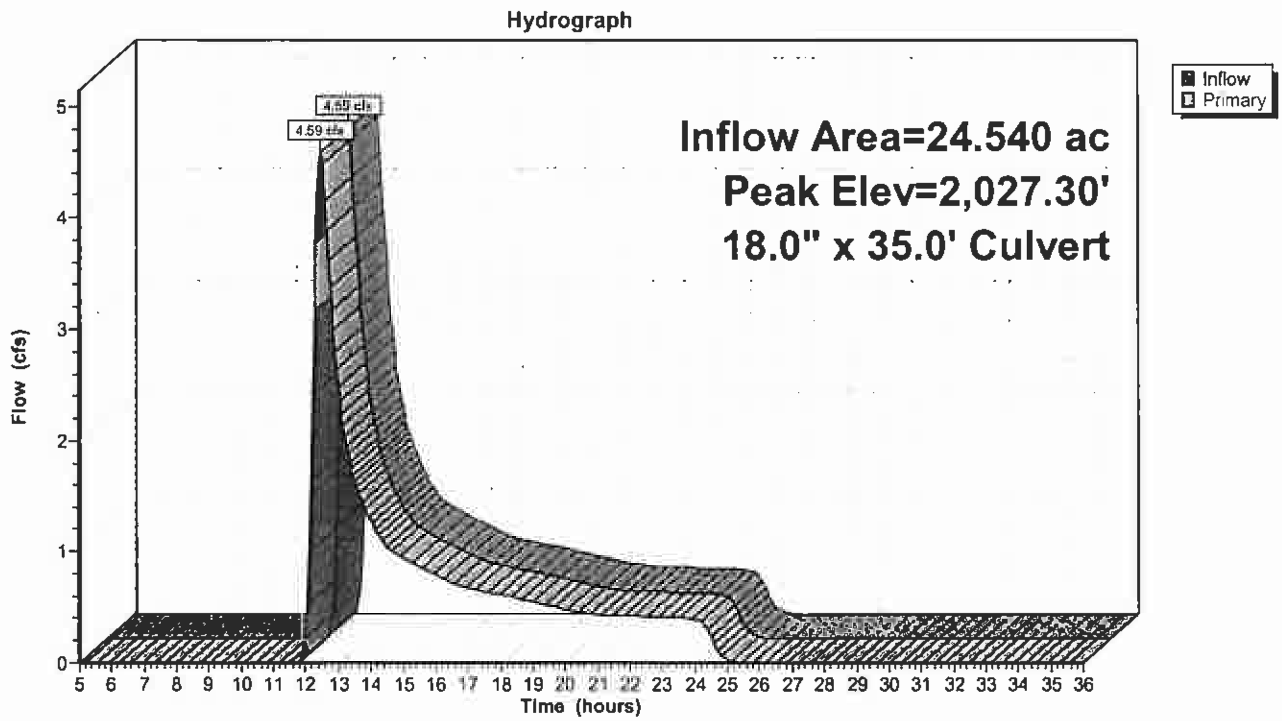
Inflow Area =	24.540 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	4.59 cfs @ 12.46 hrs, Volume=	0.921 af	
Outflow =	4.59 cfs @ 12.46 hrs, Volume=	0.921 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.59 cfs @ 12.46 hrs, Volume=	0.921 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,027.30' @ 12.46 hrs
Flood Elev= 2,030.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,026.25'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,024.25' S= 0.0571 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.57 cfs @ 12.46 hrs HW=2,027.29' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.57 cfs @ 3.48 fps)

Pond CV1000: CV1000



Pond CV1002: CV1002

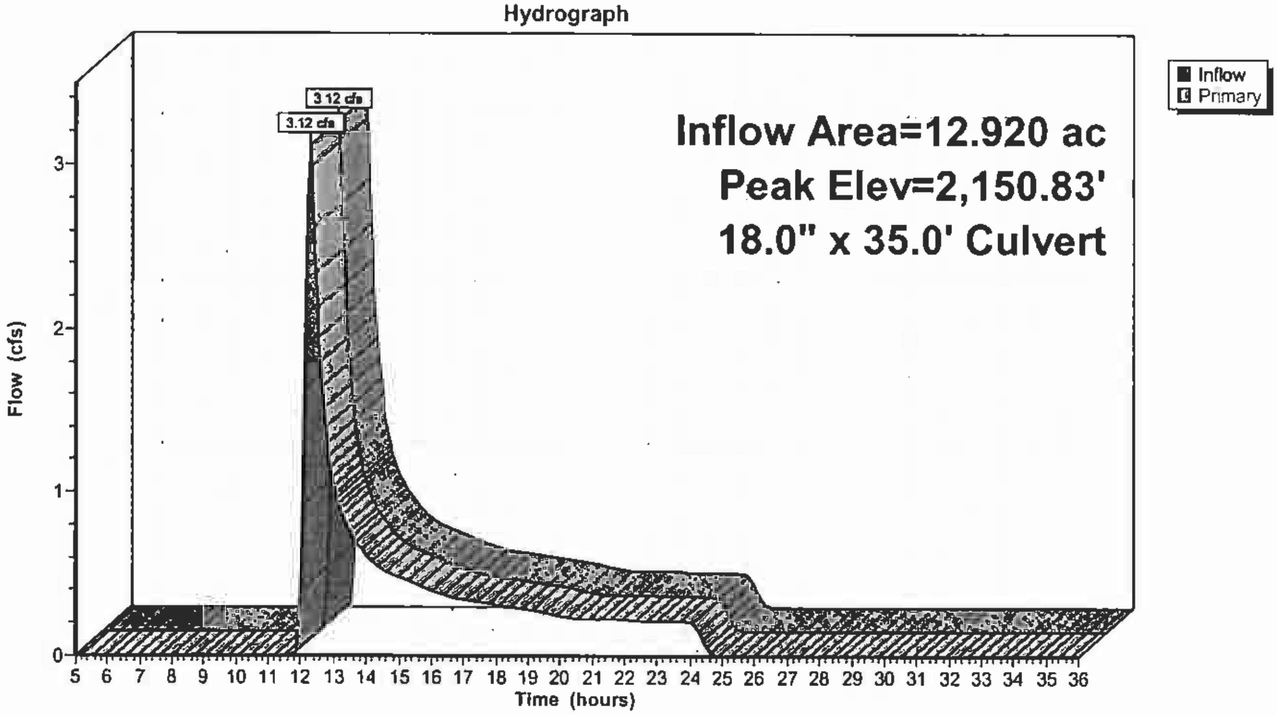
Inflow Area = 12.920 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 3.12 cfs @ 12.27 hrs, Volume= 0.485 af
Outflow = 3.12 cfs @ 12.27 hrs, Volume= 0.485 af, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.27 hrs, Volume= 0.485 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,150.83' @ 12.27 hrs
Flood Elev= 2,153.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,150.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,148.15' S= 0.0529 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.09 cfs @ 12.27 hrs HW=2,150.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.09 cfs @ 3.10 fps)

Pond CV1002: CV1002



Pond CV1003: CV1003

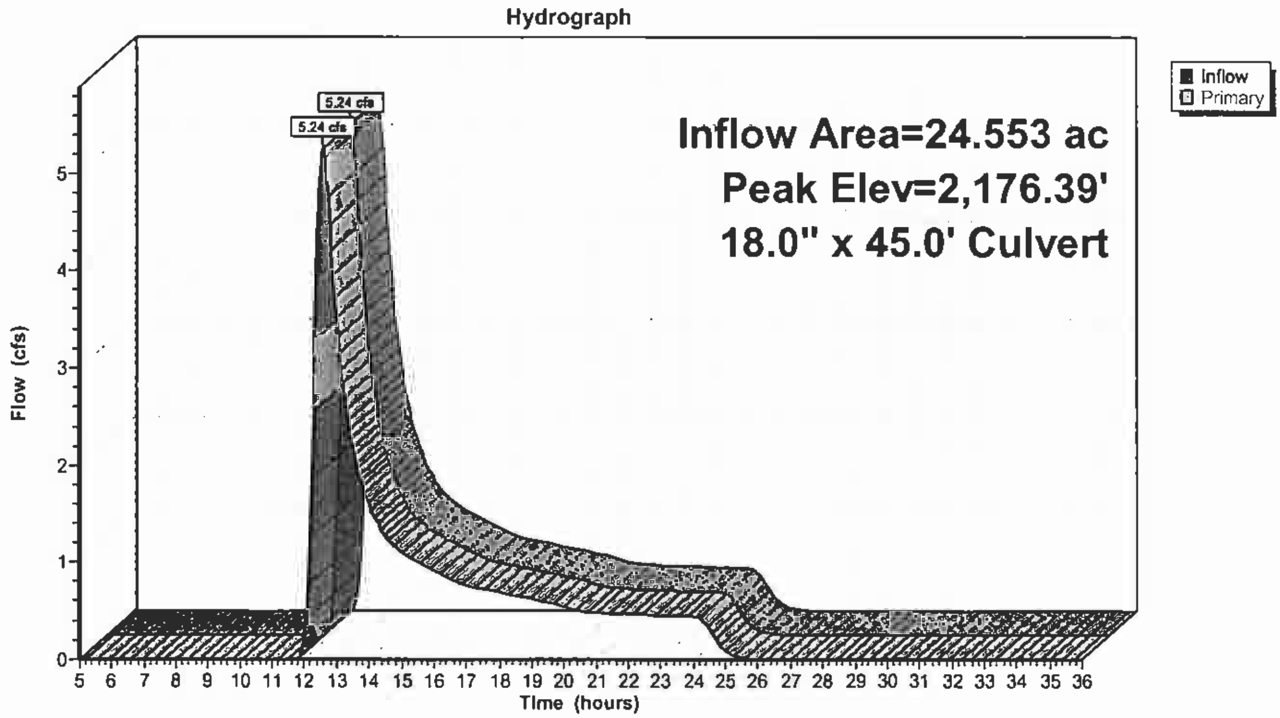
Inflow Area =	24.553 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	5.24 cfs @ 12.59 hrs, Volume=	1.089 af	
Outflow =	5.24 cfs @ 12.59 hrs, Volume=	1.089 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.24 cfs @ 12.59 hrs, Volume=	1.089 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,176.39' @ 12.59 hrs
Flood Elev= 2,178.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,175.25'	**18.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,172.00' S= 0.0722 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.23 cfs @ 12.59 hrs HW=2,176.39' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 5.23 cfs @ 3.63 fps)

Pond CV1003: CV1003



Pond CV1004: CV1004

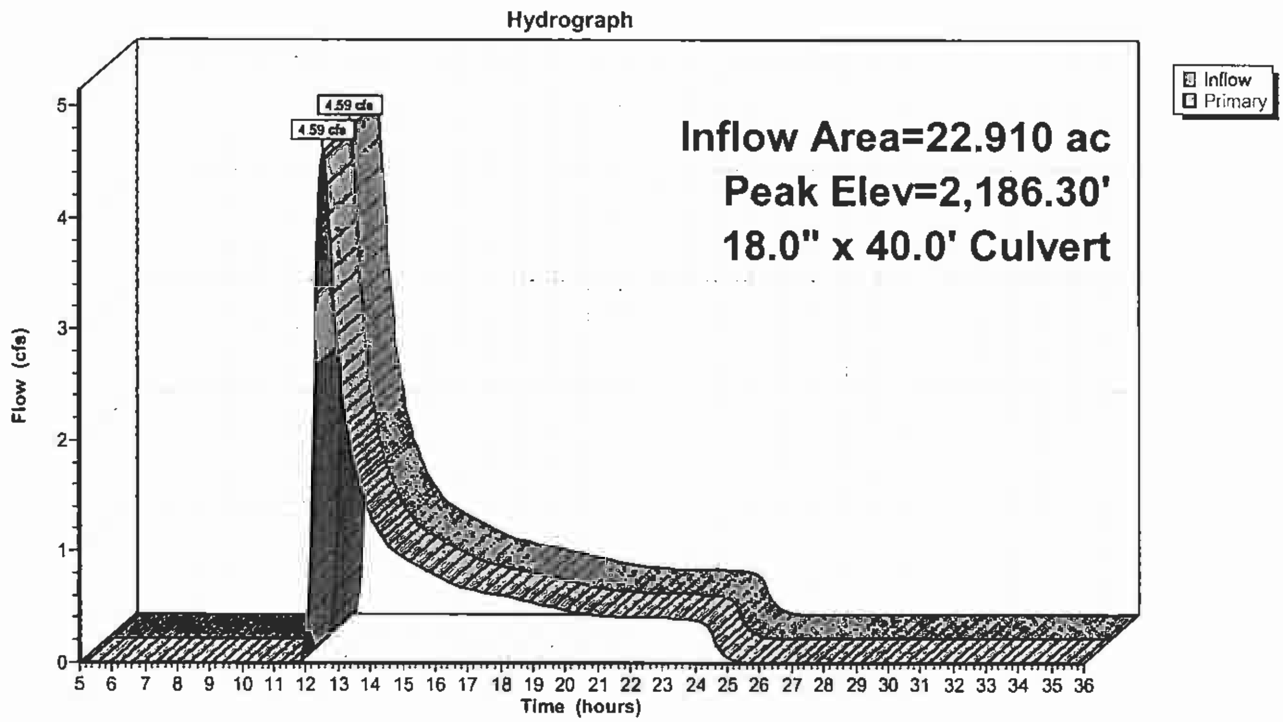
Inflow Area =	22.910 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	4.59 cfs @ 12.53 hrs, Volume=	0.937 af	
Outflow =	4.59 cfs @ 12.53 hrs, Volume=	0.937 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.59 cfs @ 12.53 hrs, Volume=	0.937 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,186.30' @ 12.53 hrs
Flood Elev= 2,188.84'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,185.25'	**18.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,184.00' S= 0.0313 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.58 cfs @ 12.53 hrs HW=2,186.30' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.58 cfs @ 3.48 fps)

Pond CV1004: CV1004



Pond CV1005: CV1005

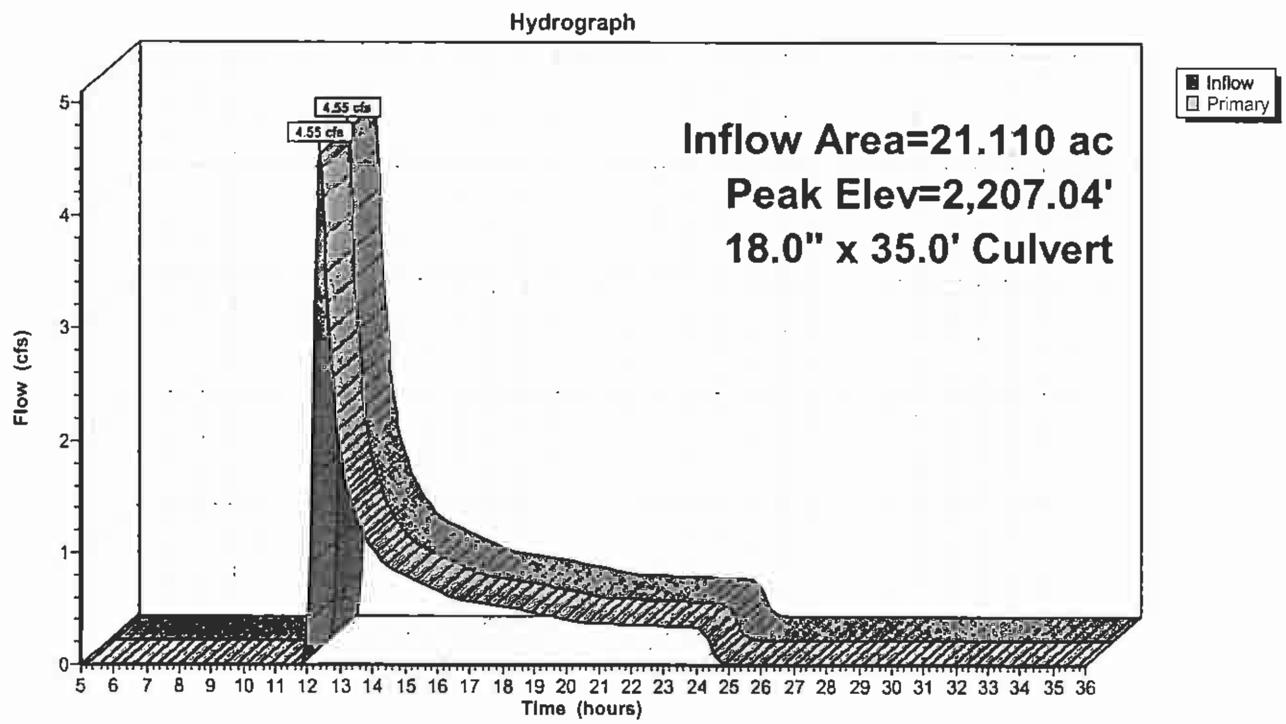
Inflow Area =	21.110 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	4.55 cfs @	12.35 hrs, Volume=	0.792 af	
Outflow =	4.55 cfs @	12.35 hrs, Volume=	0.792 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.55 cfs @	12.35 hrs, Volume=	0.792 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,207.04' @ 12.35 hrs
Flood Elev= 2,209.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,206.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,205.10' S= 0.0257 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.54 cfs @ 12.35 hrs HW=2,207.04' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.54 cfs @ 3.47 fps)

Pond CV1005: CV1005



Pond CV1006: CV1006

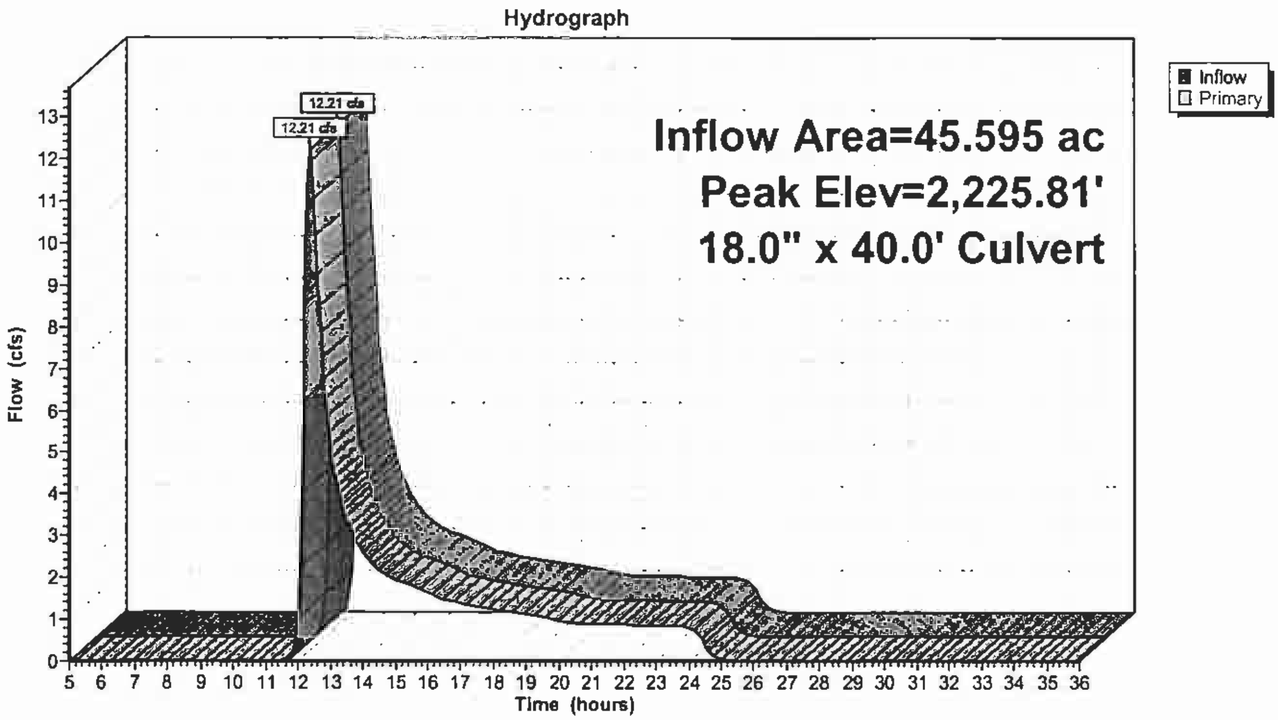
Inflow Area =	45.595 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	12.21 cfs @ 12.38 hrs, Volume=	2.023 af	
Outflow =	12.21 cfs @ 12.38 hrs, Volume=	2.023 af,	Atten= 0%, Lag= 0.0 min
Primary =	12.21 cfs @ 12.38 hrs, Volume=	2.023 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,225.81' @ 12.38 hrs
Flood Elev= 2,228.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,223.00'	**18.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,222.00' S= 0.0250 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=12.16 cfs @ 12.38 hrs HW=2,225.79' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 12.16 cfs @ 6.88 fps)

Pond CV1006: CV1006



Pond CV1017: CV1017

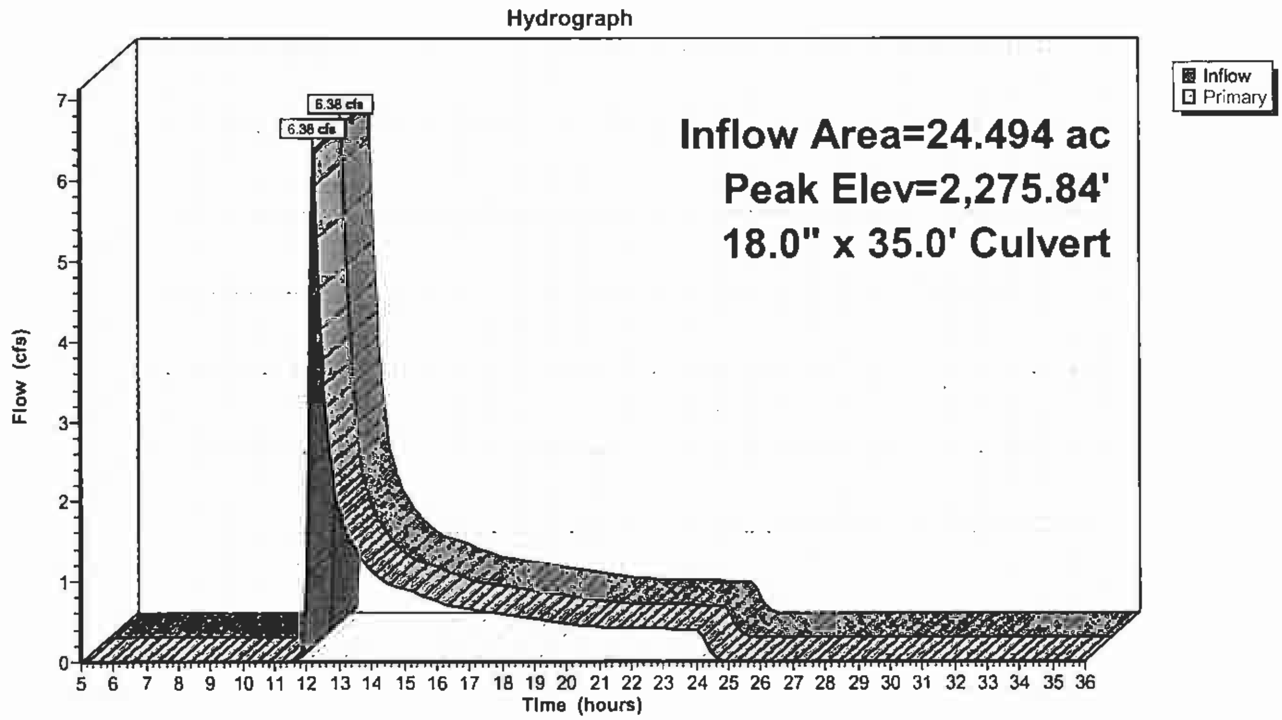
Inflow Area =	24.494 ac,	Inflow Depth = 0.45"	for 10-YR event		
Inflow =	6.38 cfs @	12.23 hrs,	Volume=	0.919 af	
Outflow =	6.38 cfs @	12.23 hrs,	Volume=	0.919 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.38 cfs @	12.23 hrs,	Volume=	0.919 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,275.84' @ 12.23 hrs
Flood Elev= 2,277.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,274.38'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,274.03' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=6.32 cfs @ 12.23 hrs HW=2,275.83' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.32 cfs @ 4.60 fps)

Pond CV1017: CV1017



Pond CV144: CV144

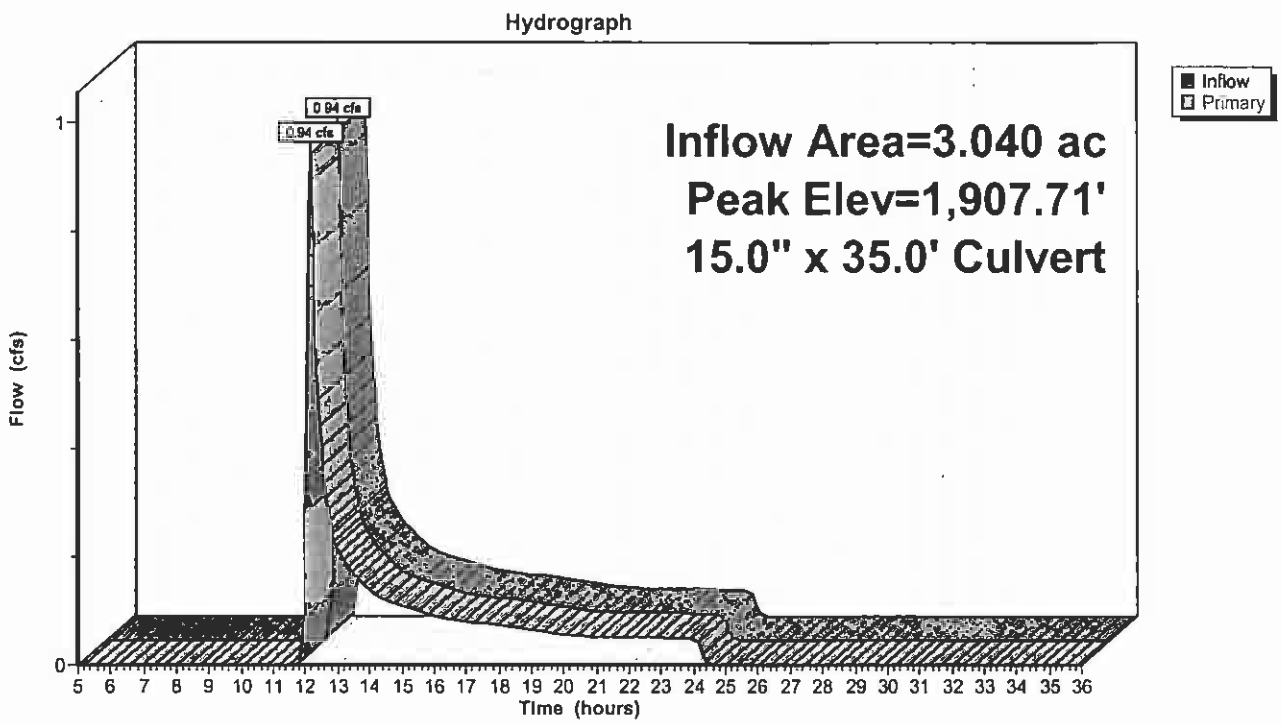
Inflow Area =	3.040 ac,	Inflow Depth = 0.45"	for 10-YR event		
Inflow =	0.94 cfs @	12.16 hrs,	Volume=	0.114 af	
Outflow =	0.94 cfs @	12.16 hrs,	Volume=	0.114 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.94 cfs @	12.16 hrs,	Volume=	0.114 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,907.71' @ 12.16 hrs
Flood Elev= 1,910.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,907.25'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,905.50' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.93 cfs @ 12.16 hrs HW=1,907.71' (Free Discharge)
1=Culvert (Inlet Controls 0.93 cfs @ 2.30 fps)

Pond CV144: CV144



Pond CV145: CV145

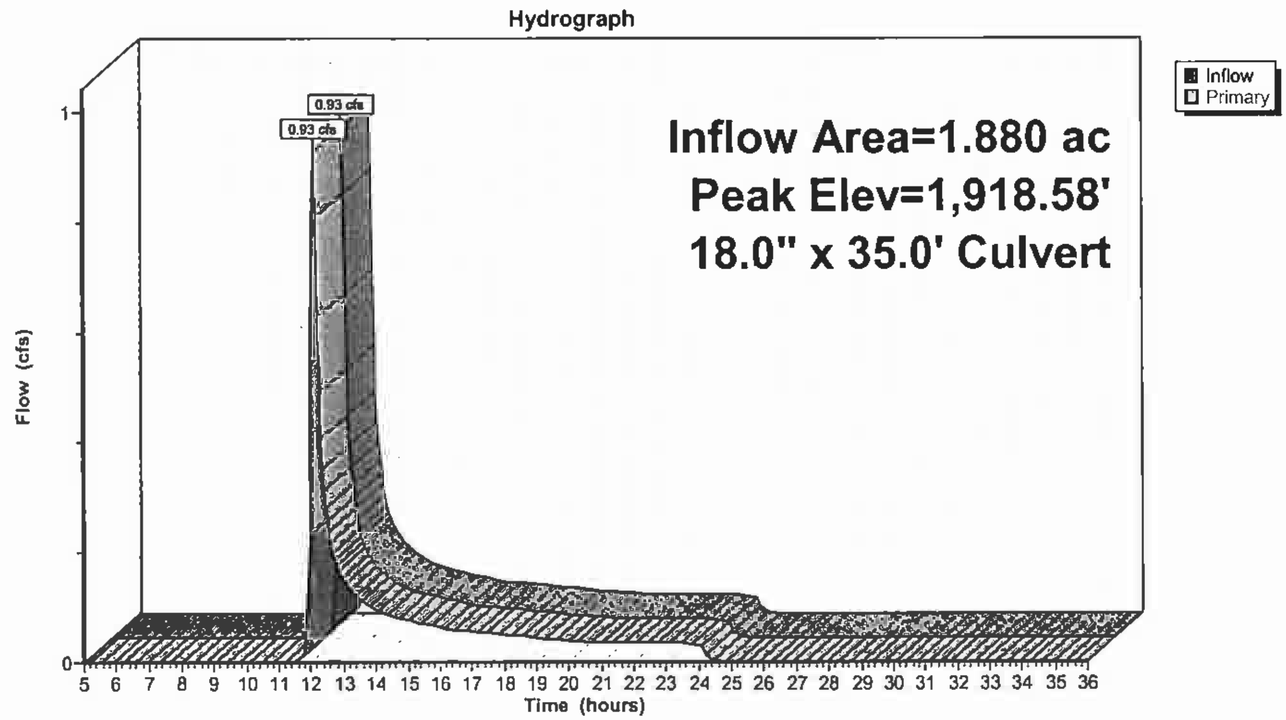
Inflow Area =	1.880 ac,	Inflow Depth = 0.53"	for 10-YR event
Inflow =	0.93 cfs @ 12.10 hrs,	Volume=	0.083 af
Outflow =	0.93 cfs @ 12.10 hrs,	Volume=	0.083 af, Atten= 0%, Lag= 0.0 min
Primary =	0.93 cfs @ 12.10 hrs,	Volume=	0.083 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,918.58' @ 12.10 hrs
Flood Elev= 1,921.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,918.15'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,917.25' S= 0.0257 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.92 cfs @ 12.10 hrs HW=1,918.58' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.92 cfs @ 2.23 fps)

Pond CV145: CV145



Pond CV146: CV146

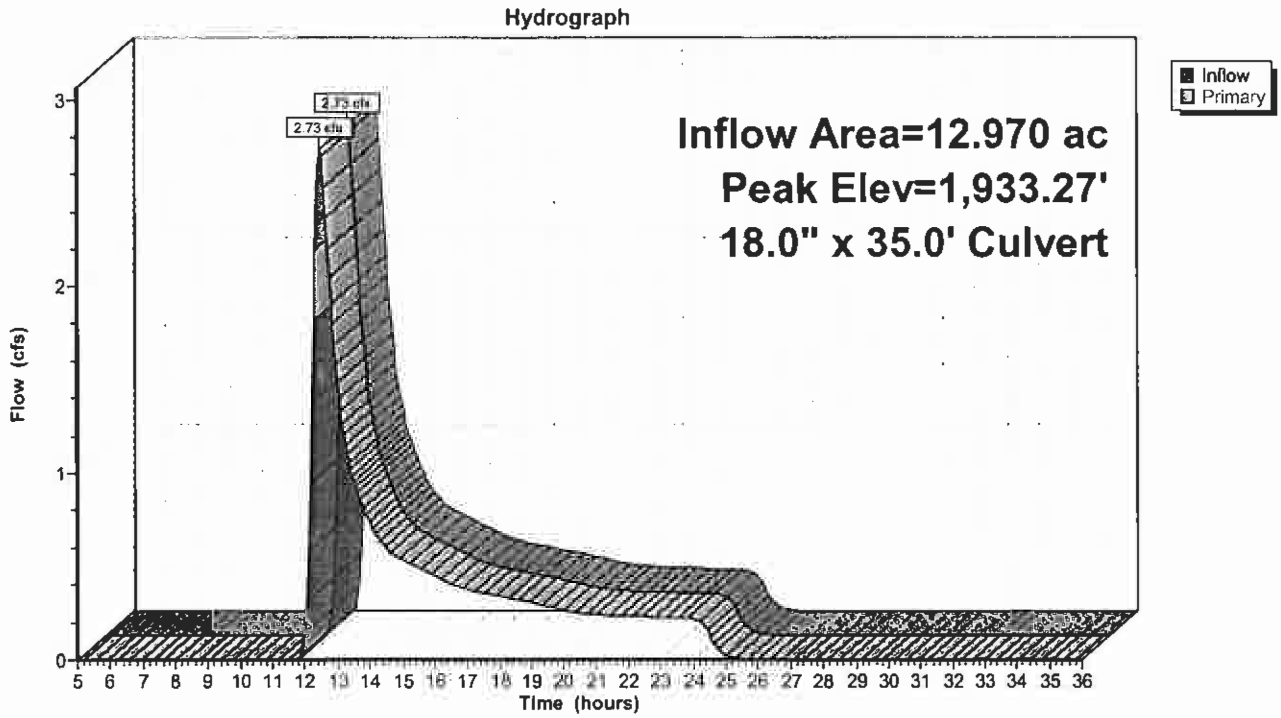
Inflow Area =	12.970 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	2.73 cfs @	12.48 hrs, Volume=	0.530 af	
Outflow =	2.73 cfs @	12.48 hrs, Volume=	0.530 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.73 cfs @	12.48 hrs, Volume=	0.530 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,933.27' @ 12.48 hrs
Flood Elev= 1,936.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,932.50'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,930.10' S= 0.0686 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.73 cfs @ 12.48 hrs HW=1,933.27' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.73 cfs @ 2.99 fps)

Pond CV146: CV146



Pond CV148: CV148

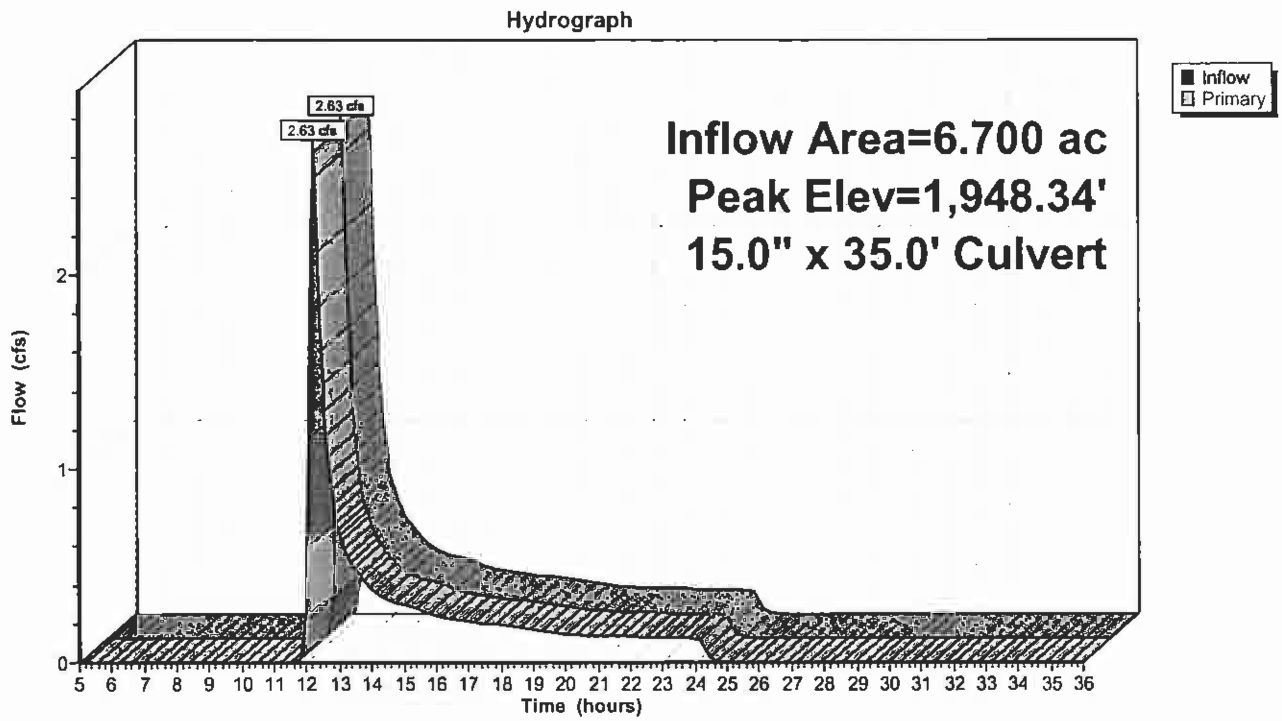
Inflow Area =	6.700 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	2.63 cfs @	12.22 hrs, Volume=	0.321 af	
Outflow =	2.63 cfs @	12.22 hrs, Volume=	0.321 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.63 cfs @	12.22 hrs, Volume=	0.321 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,948.34' @ 12.22 hrs
Flood Elev= 1,950.67'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,947.50'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,947.00' S= 0.0143 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.59 cfs @ 12.22 hrs HW=1,948.34' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.59 cfs @ 4.21 fps)

Pond CV148: CV148



Pond CV149: CV149

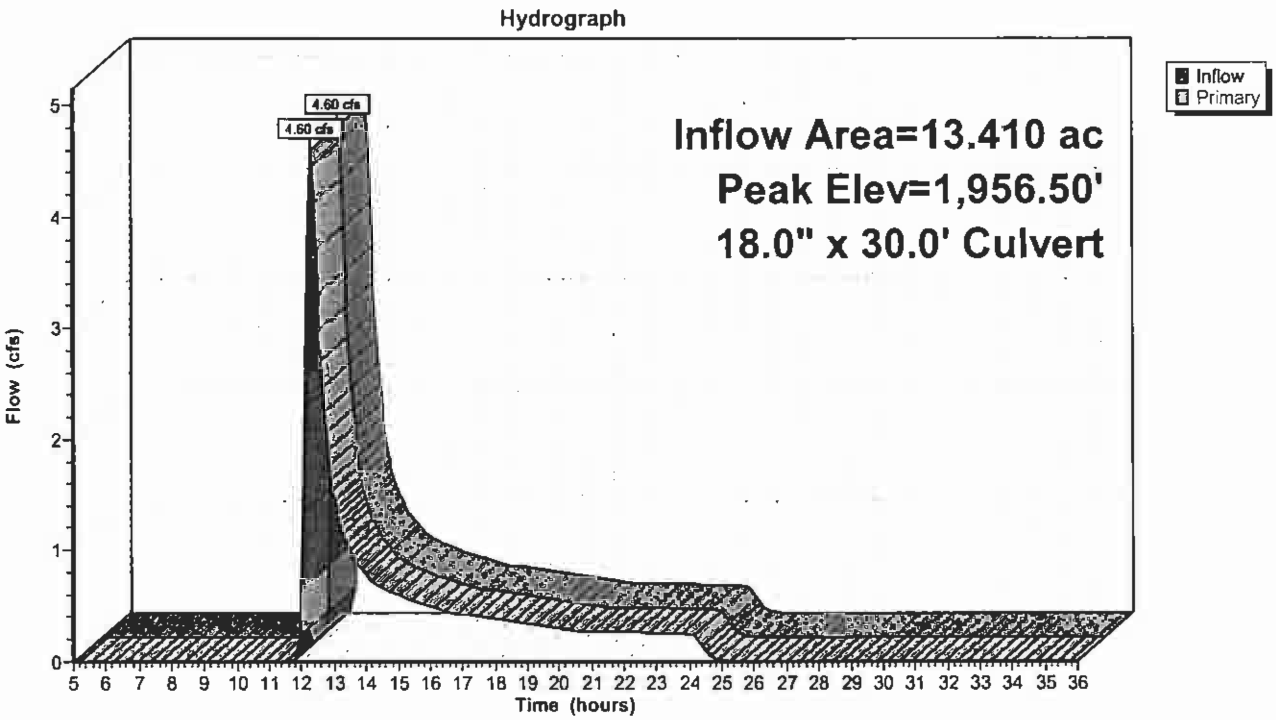
Inflow Area =	13.410 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	4.60 cfs @ 12.30 hrs, Volume=	0.643 af	
Outflow =	4.60 cfs @ 12.30 hrs, Volume=	0.643 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.60 cfs @ 12.30 hrs, Volume=	0.643 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,956.50' @ 12.30 hrs
Flood Elev= 1,958.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,955.45'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,954.25' S= 0.0400 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.59 cfs @ 12.30 hrs HW=1,956.50' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.59 cfs @ 3.48 fps)

Pond CV149: CV149



Pond CV150: CV150

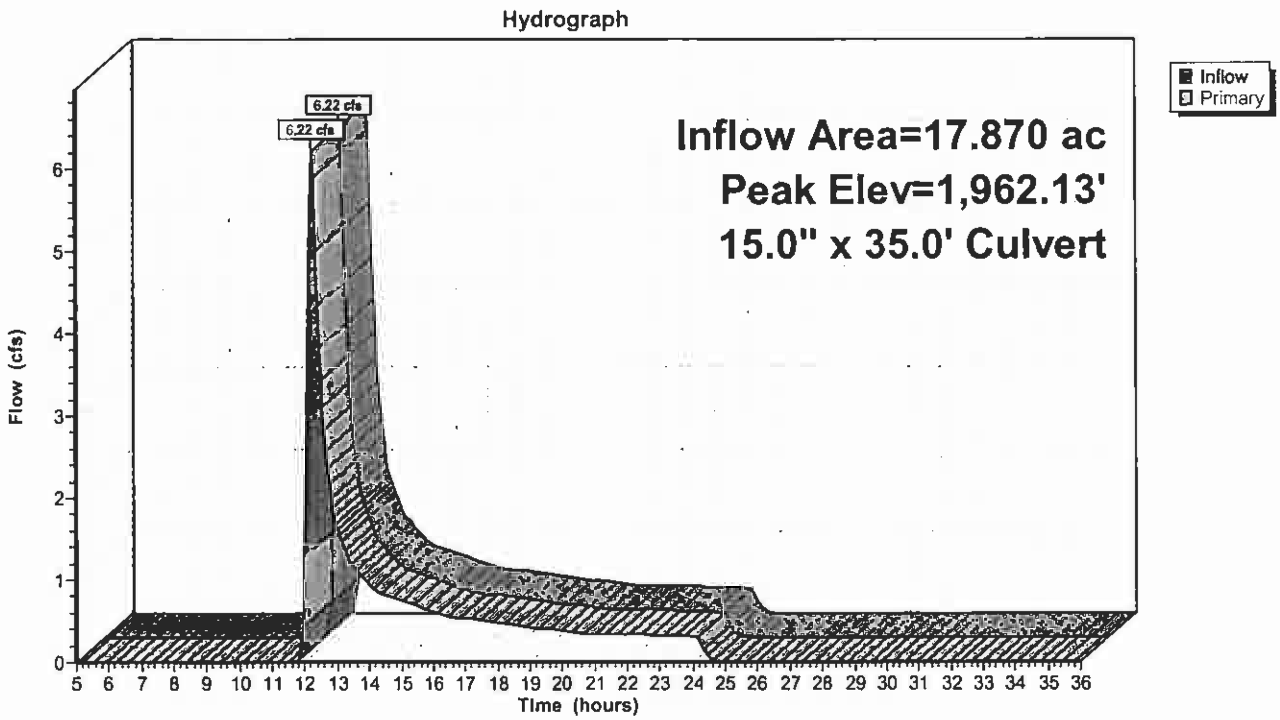
Inflow Area =	17.870 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	6.22 cfs @	12.22 hrs, Volume=	0.793 af	
Outflow =	6.22 cfs @	12.22 hrs, Volume=	0.793 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.22 cfs @	12.22 hrs, Volume=	0.793 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,962.13' @ 12.22 hrs
Flood Elev= 1,964.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,960.10'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,959.85' S= 0.0071 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=6.14 cfs @ 12.22 hrs HW=1,962.10' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.14 cfs @ 5.00 fps)

Pond CV150: CV150



Pond CV151: CV151

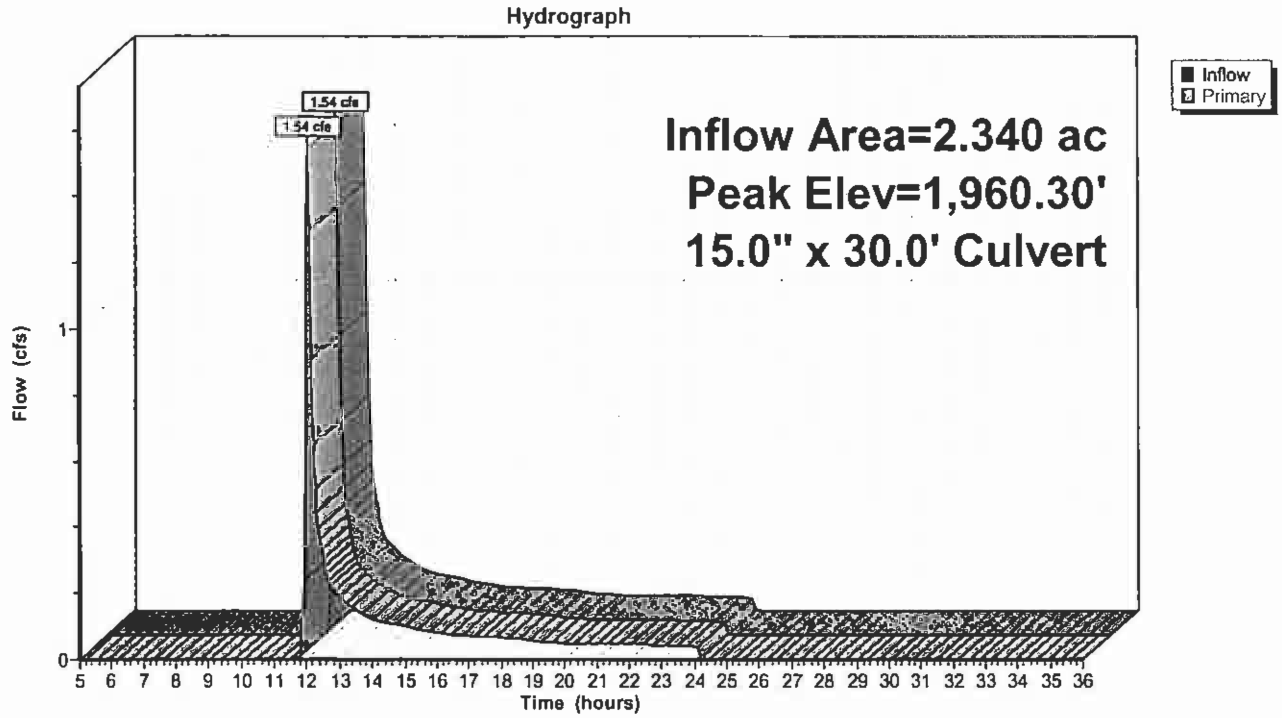
Inflow Area = 2.340 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.54 cfs @ 12.05 hrs, Volume= 0.112 af
Outflow = 1.54 cfs @ 12.05 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.05 hrs, Volume= 0.112 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,960.30' @ 12.05 hrs
Flood Elev= 1,962.54'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,959.70'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,958.50' S= 0.0400 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.54 cfs @ 12.05 hrs HW=1,960.30' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.54 cfs @ 2.64 fps)

Pond CV151: CV151



Pond CV153: CV153

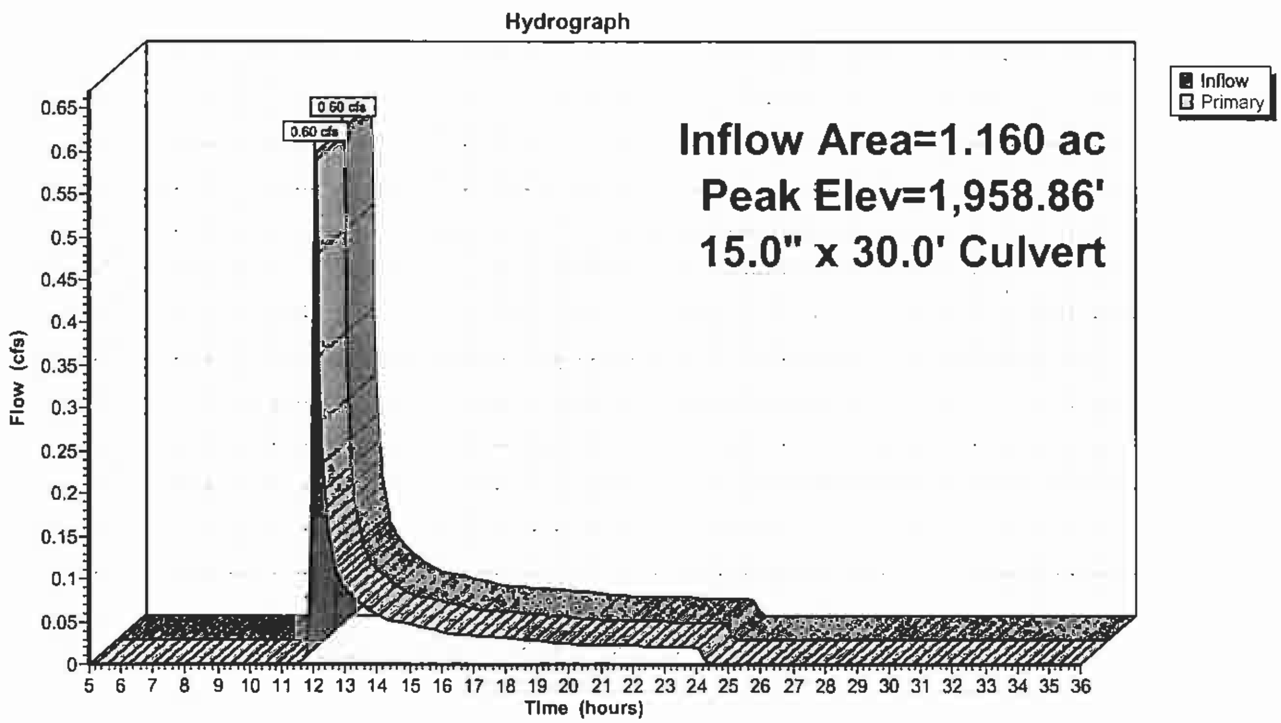
Inflow Area =	1.160 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	0.60 cfs @ 12.08 hrs, Volume=	0.051 af	
Outflow =	0.60 cfs @ 12.08 hrs, Volume=	0.051 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.60 cfs @ 12.08 hrs, Volume=	0.051 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,958.86' @ 12.08 hrs
Flood Elev= 1,962.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,958.50'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,958.00' S= 0.0167 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.58 cfs @ 12.08 hrs HW=1,958.86' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.58 cfs @ 2.03 fps)

Pond CV153: CV153



Pond CV157: CV157

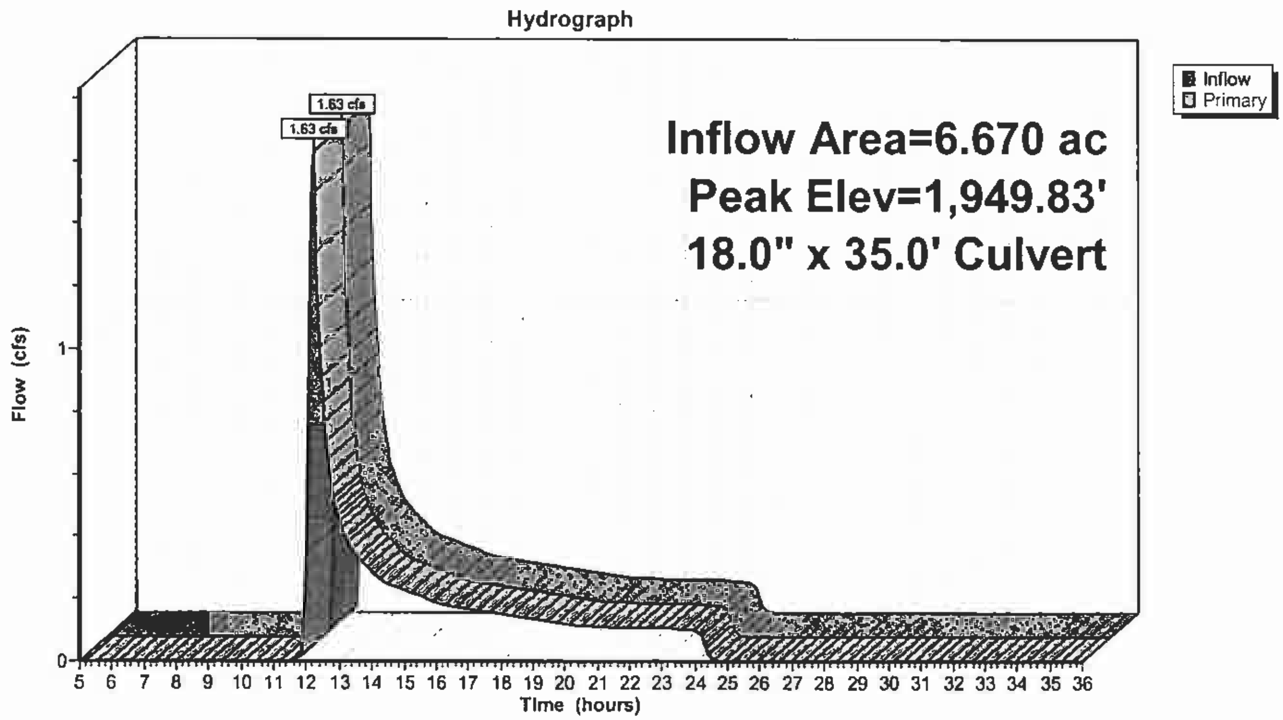
Inflow Area =	6.670 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	1.63 cfs @ 12.19 hrs, Volume=	0.229 af	
Outflow =	1.63 cfs @ 12.19 hrs, Volume=	0.229 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.63 cfs @ 12.19 hrs, Volume=	0.229 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,949.83' @ 12.19 hrs
Flood Elev= 1,952.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,949.25'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,948.25' S= 0.0286 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.62 cfs @ 12.19 hrs HW=1,949.83' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.62 cfs @ 2.59 fps)

Pond CV157: CV157



Pond CV161: CV161

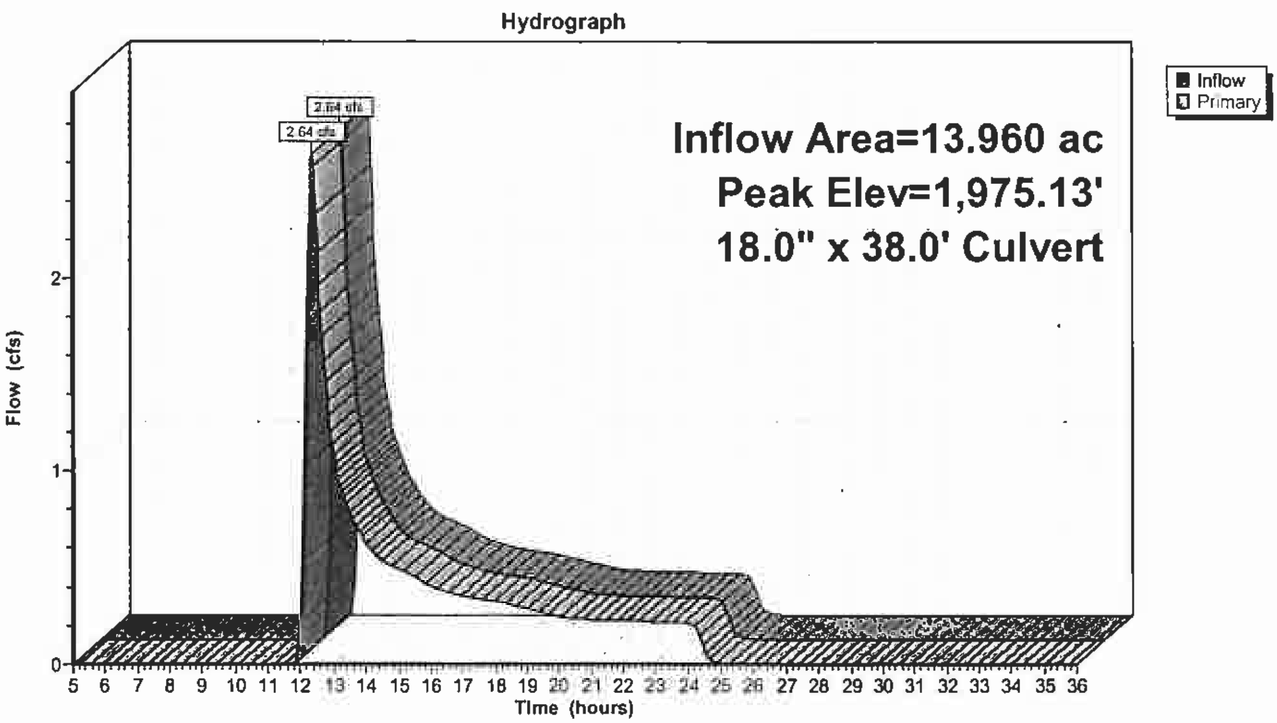
Inflow Area =	13.960 ac, Inflow Depth = 0.41" for 10-YR event	
Inflow =	2.64 cfs @ 12.33 hrs, Volume=	0.478 af
Outflow =	2.64 cfs @ 12.33 hrs, Volume=	0.478 af, Atten= 0%, Lag= 0.0 min
Primary =	2.64 cfs @ 12.33 hrs, Volume=	0.478 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,975.13' @ 12.33 hrs
Flood Elev= 1,977.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,974.30'	**18.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,973.92' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.63 cfs @ 12.33 hrs HW=1,975.13' (Free Discharge)
└—**1=Culvert** (Barrel Controls 2.63 cfs @ 3.81 fps)

Pond CV161: CV161



Pond CV162: CV162

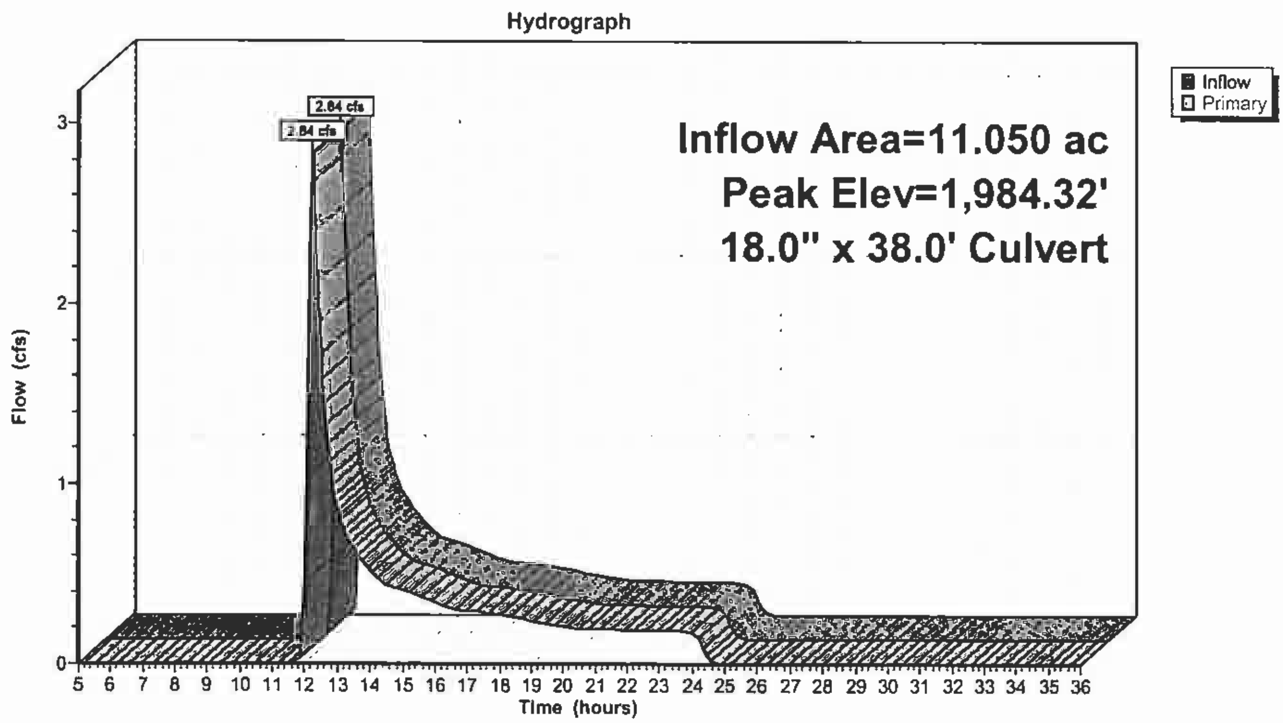
Inflow Area = 11.050 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 2.84 cfs @ 12.24 hrs, Volume= 0.415 af
Outflow = 2.84 cfs @ 12.24 hrs, Volume= 0.415 af, Atten= 0%, Lag= 0.0 min
Primary = 2.84 cfs @ 12.24 hrs, Volume= 0.415 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,984.32' @ 12.24 hrs
Flood Elev= 1,987.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,983.50'	**18.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,983.00' S= 0.0132 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.82 cfs @ 12.24 hrs HW=1,984.32' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.82 cfs @ 4.16 fps)

Pond CV162: CV162



Pond CV166: CV166

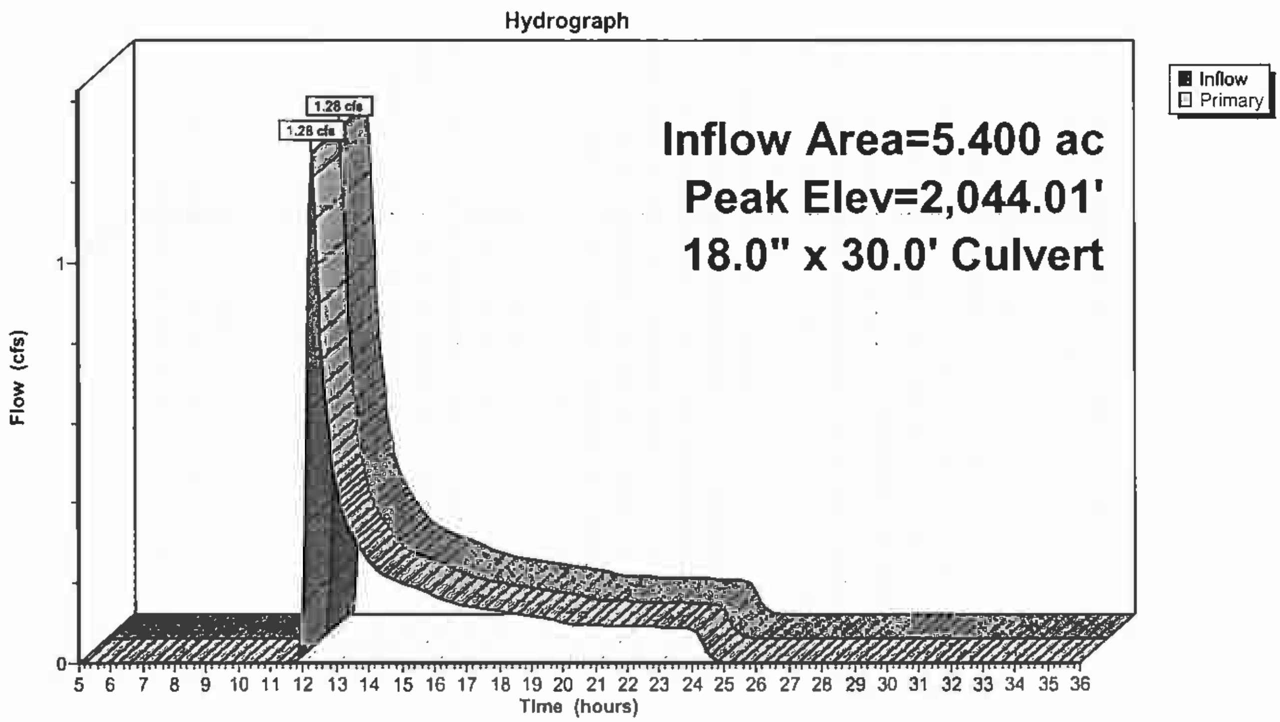
Inflow Area =	5.400 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.28 cfs @ 12.29 hrs, Volume=	0.203 af	
Outflow =	1.28 cfs @ 12.29 hrs, Volume=	0.203 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.28 cfs @ 12.29 hrs, Volume=	0.203 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,044.01' @ 12.29 hrs
Flood Elev= 2,046.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,043.50'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,042.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.27 cfs @ 12.29 hrs HW=2,044.01' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.27 cfs @ 2.42 fps)

Pond CV166: CV166



Pond CV167: CV167

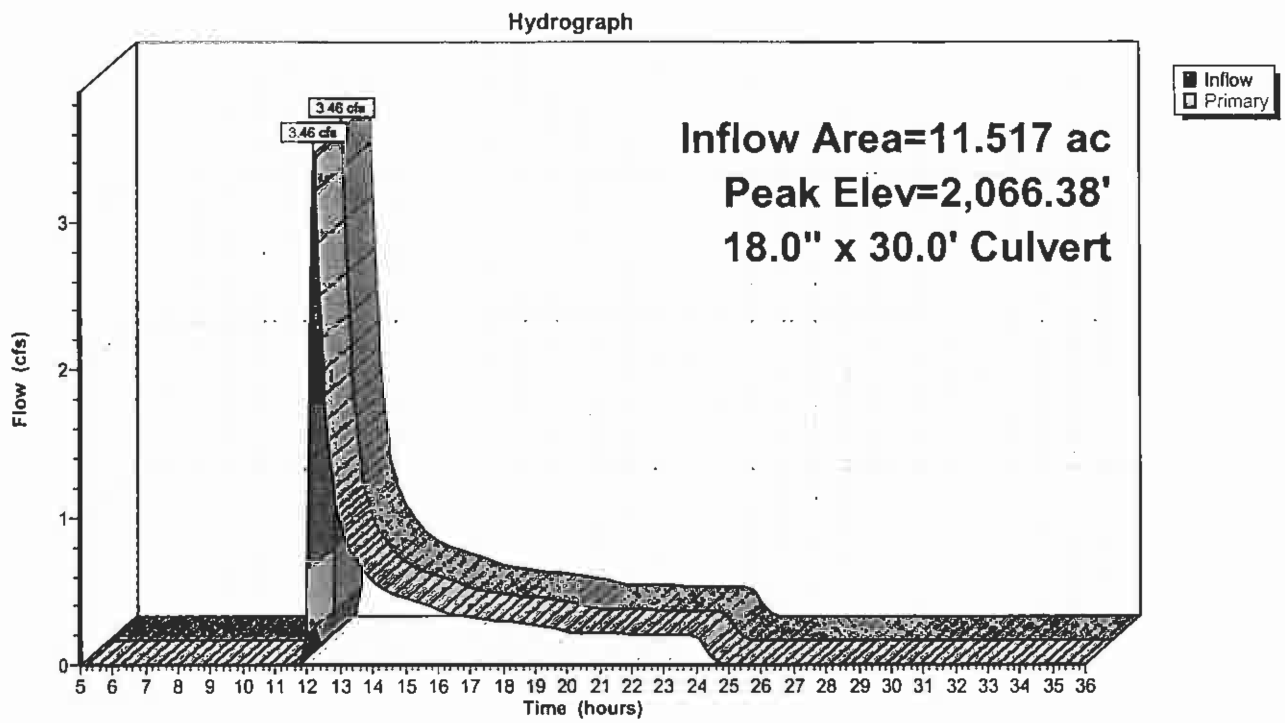
Inflow Area = 11.517 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 3.46 cfs @ 12.23 hrs, Volume= 0.471 af
Outflow = 3.46 cfs @ 12.23 hrs, Volume= 0.471 af, Atten= 0%, Lag= 0.0 min
Primary = 3.46 cfs @ 12.23 hrs, Volume= 0.471 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,066.38' @ 12.23 hrs
Flood Elev= 2,068.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.50'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,064.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.43 cfs @ 12.23 hrs HW=2,066.38' (Free Discharge)
└─1=**Culvert** (Inlet Controls 3.43 cfs @ 3.19 fps)

Pond CV167: CV167



Pond CV169: CV169

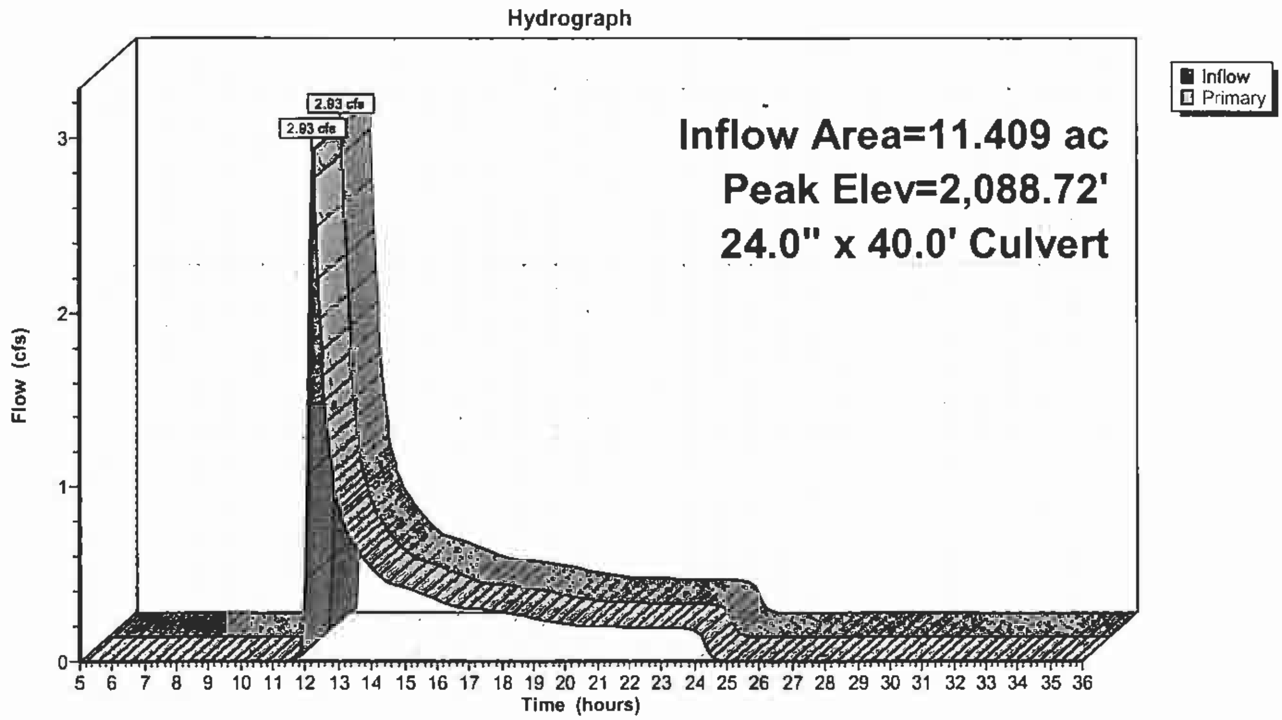
Inflow Area =	11.409 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	2.93 cfs @ 12.24 hrs, Volume=	0.428 af	
Outflow =	2.93 cfs @ 12.24 hrs, Volume=	0.428 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.93 cfs @ 12.24 hrs, Volume=	0.428 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,088.72' @ 12.24 hrs
Flood Elev= 2,092.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,088.00'	**24.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,087.00' S= 0.0250 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.91 cfs @ 12.24 hrs HW=2,088.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.91 cfs @ 2.88 fps)

Pond CV169: CV169



Pond CV170: CV170

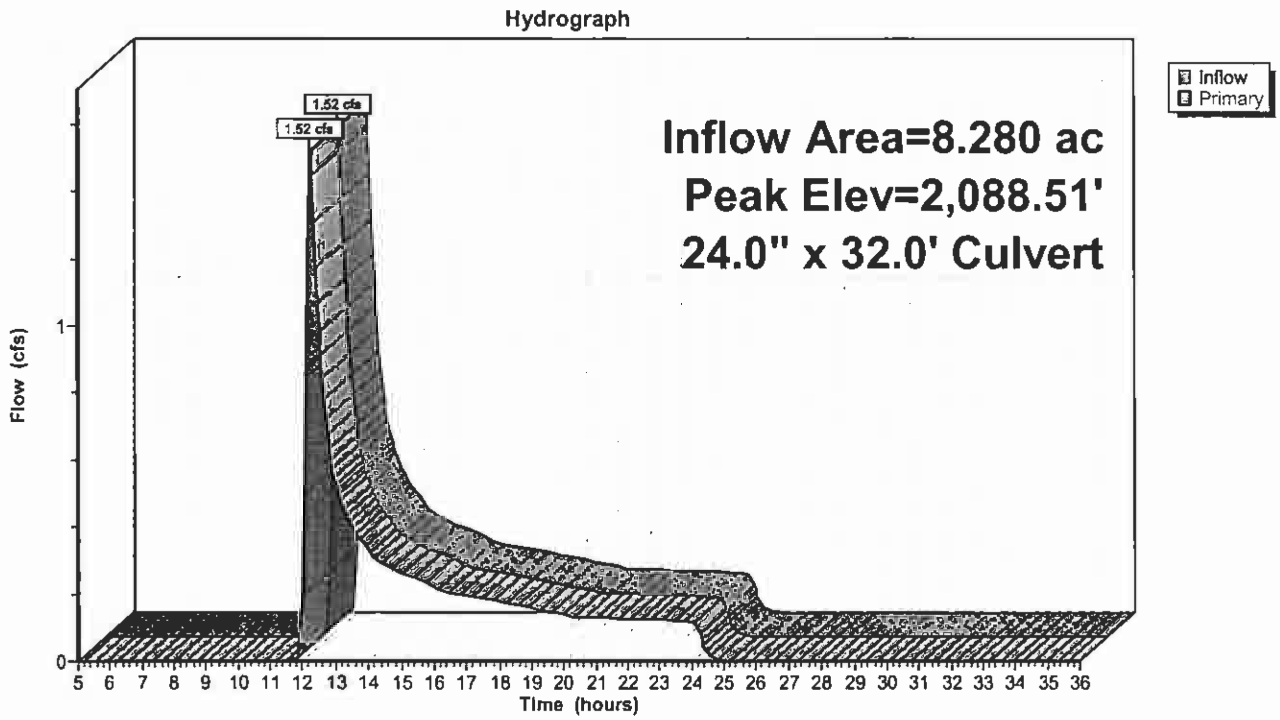
Inflow Area = 8.280 ac, Inflow Depth = 0.37" for 10-YR event
Inflow = 1.52 cfs @ 12.24 hrs, Volume= 0.258 af
Outflow = 1.52 cfs @ 12.24 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min
Primary = 1.52 cfs @ 12.24 hrs, Volume= 0.258 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,088.51' @ 12.24 hrs
Flood Elev= 2,092.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,088.00'	**24.0" x 32.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,086.00' S= 0.0625 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.52 cfs @ 12.24 hrs HW=2,088.51' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.52 cfs @ 2.42 fps)

Pond CV170: CV170



Pond CV184: CV184

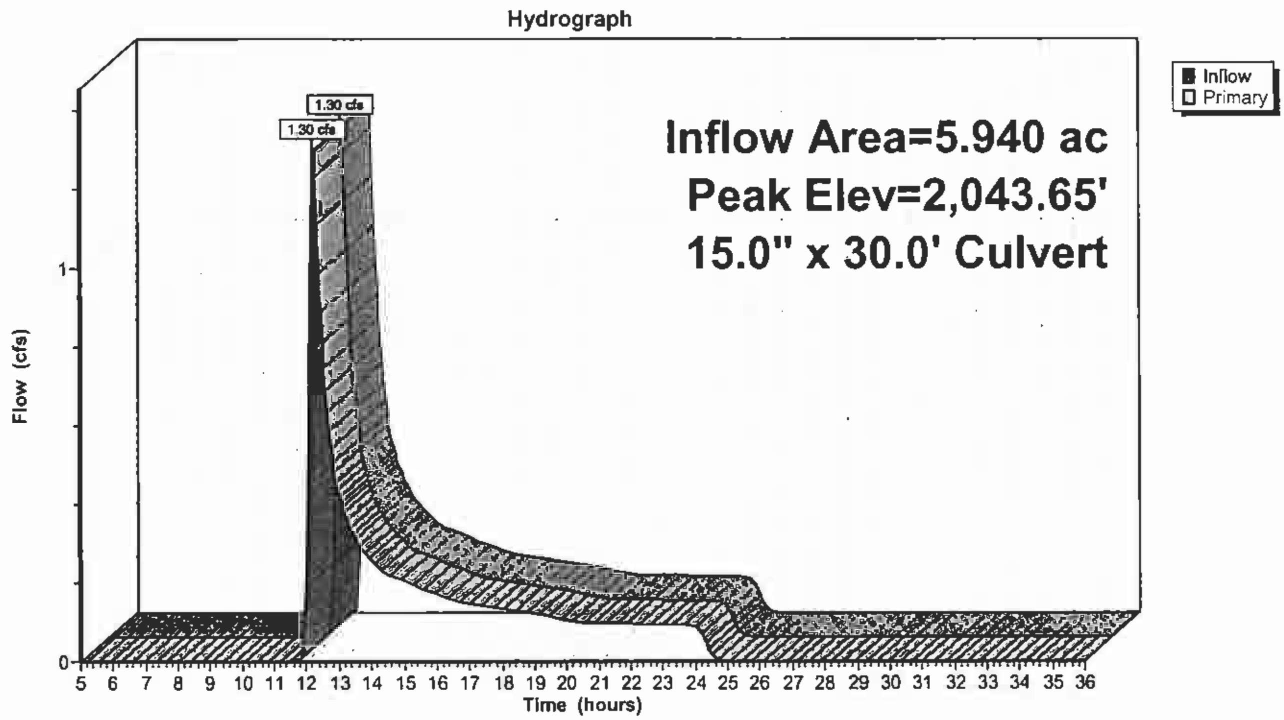
Inflow Area =	5.940 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	1.30 cfs @	12.24 hrs, Volume=	0.204 af	
Outflow =	1.30 cfs @	12.24 hrs, Volume=	0.204 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.30 cfs @	12.24 hrs, Volume=	0.204 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,043.65' @ 12.24 hrs
Flood Elev= 2,046.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,043.00'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,042.80' S= 0.0067 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.29 cfs @ 12.24 hrs HW=2,043.65' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 1.29 cfs @ 2.95 fps)

Pond CV184: CV184



Pond CV186: CV186

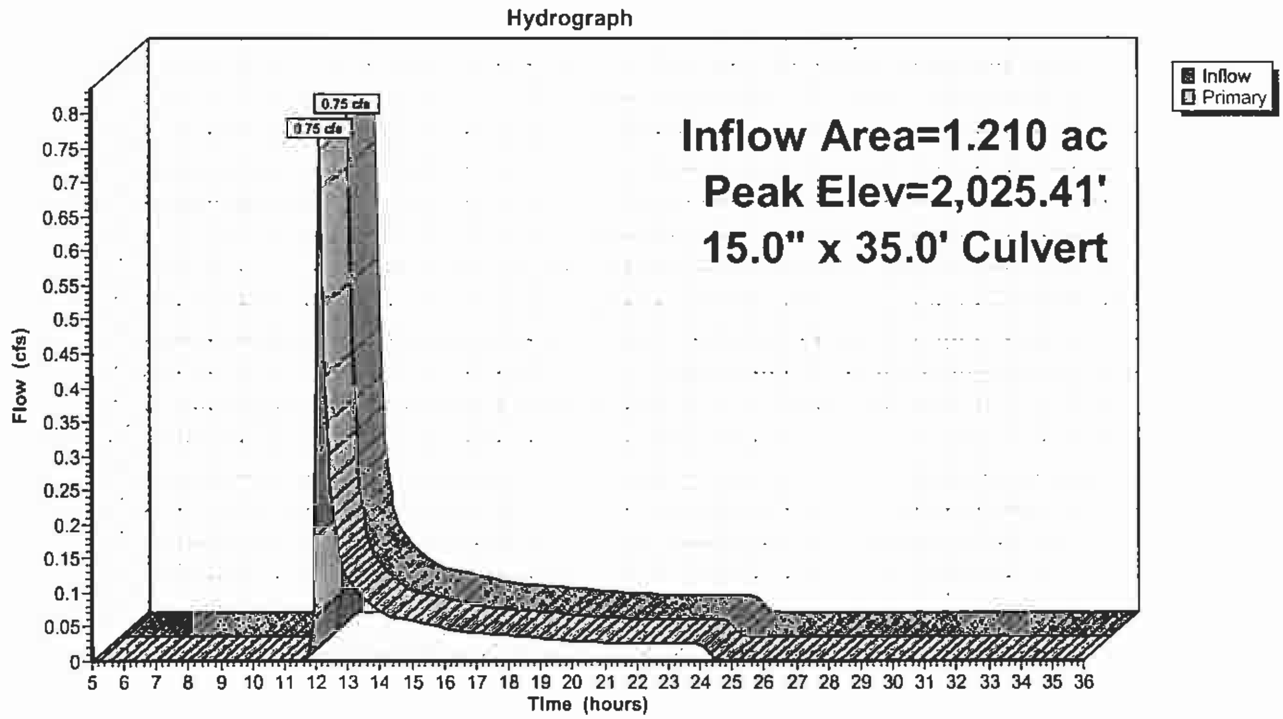
Inflow Area =	1.210 ac,	Inflow Depth = 0.67"	for 10-YR event	
Inflow =	0.75 cfs @	12.13 hrs, Volume=	0.067 af	
Outflow =	0.75 cfs @	12.13 hrs, Volume=	0.067 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.75 cfs @	12.13 hrs, Volume=	0.067 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,025.41' @ 12.13 hrs
Flood Elev= 2,028.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,025.00'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,024.00' S= 0.0286 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.73 cfs @ 12.13 hrs HW=2,025.40' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.73 cfs @ 2.16 fps)

Pond CV186: CV186



Pond CV188: CV188

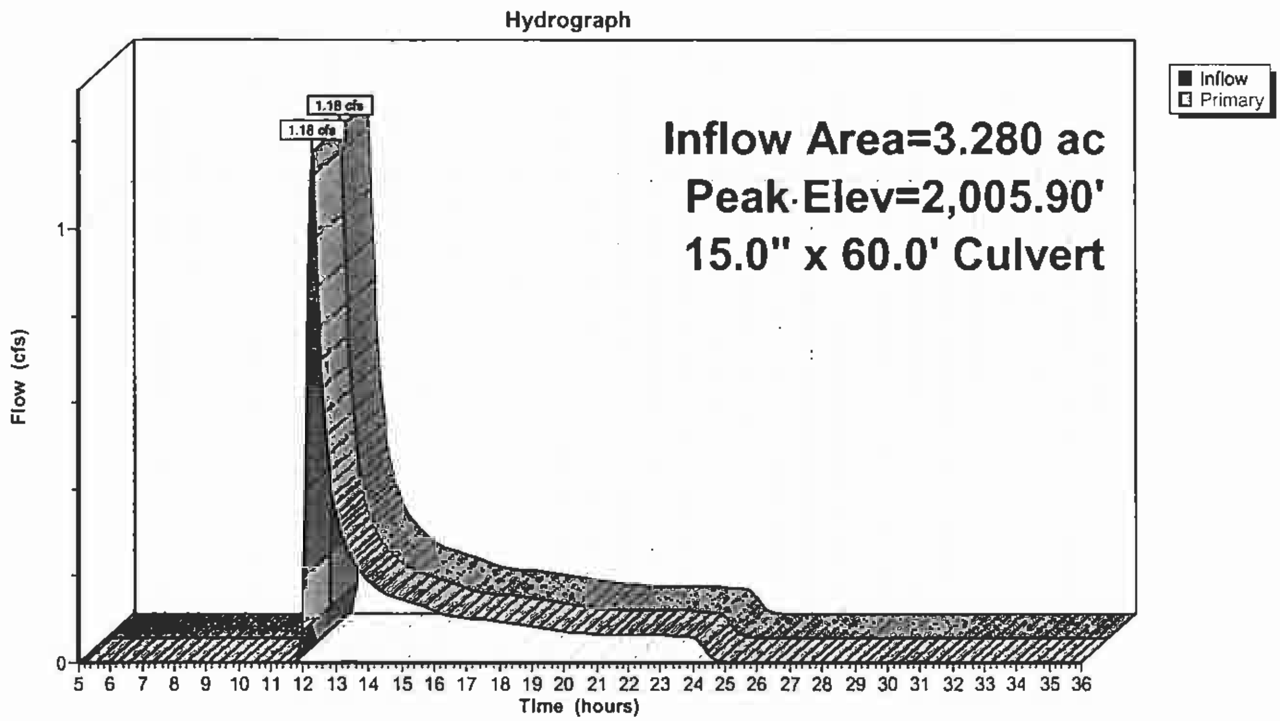
Inflow Area =	3.280 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	1.18 cfs @	12.27 hrs, Volume=	0.157 af	
Outflow =	1.18 cfs @	12.27 hrs, Volume=	0.157 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.18 cfs @	12.27 hrs, Volume=	0.157 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,005.90' @ 12.27 hrs
Flood Elev= 2,009.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,005.25'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,005.00' S= 0.0042 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.17 cfs @ 12.27 hrs HW=2,005.90' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.17 cfs @ 2.63 fps)

Pond CV188: CV188



Pond CV189: CV189

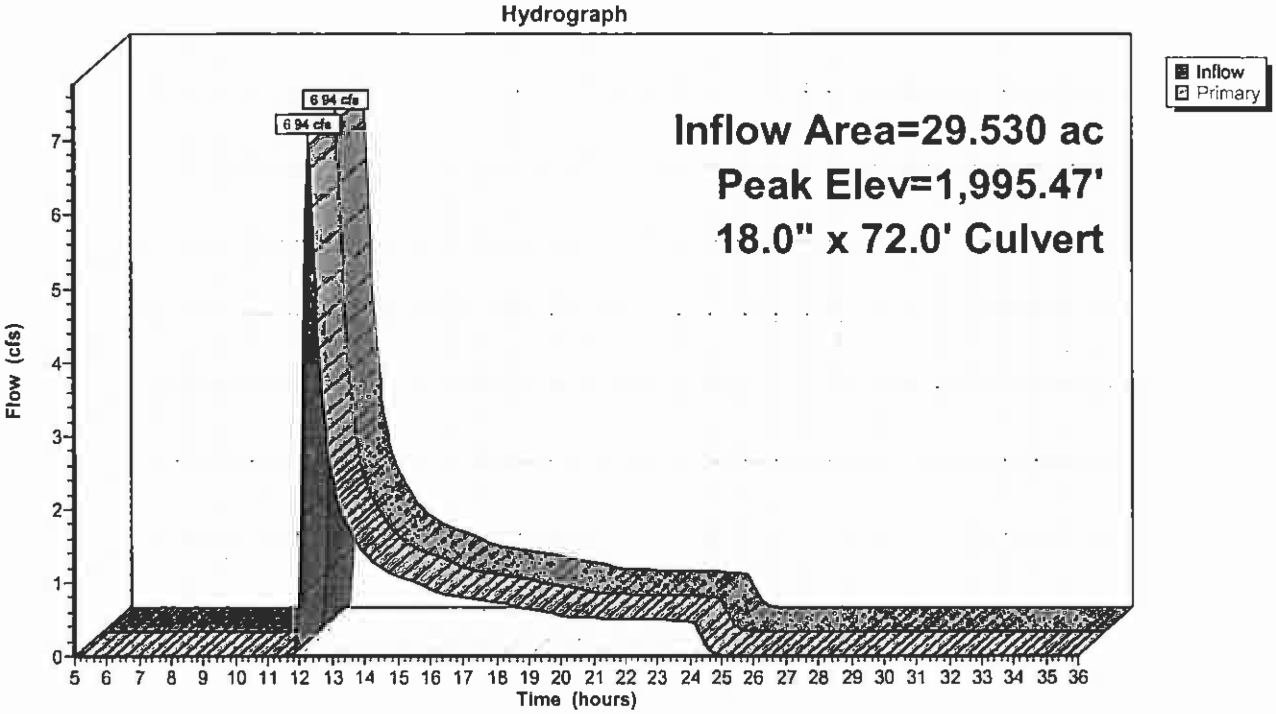
Inflow Area =	29.530 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	6.94 cfs @ 12.29 hrs, Volume=	1.108 af	
Outflow =	6.94 cfs @ 12.29 hrs, Volume=	1.108 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.94 cfs @ 12.29 hrs, Volume=	1.108 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,995.47' @ 12.29 hrs
Flood Elev= 1,997.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,994.00'	**18.0" x 72.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,993.25' S= 0.0104 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=6.90 cfs @ 12.29 hrs HW=1,995.46' (Free Discharge)
└─**1=Culvert** (Barrel Controls 6.90 cfs @ 5.00 fps)

Pond CV189: CV189



Pond CV2000: CV2000

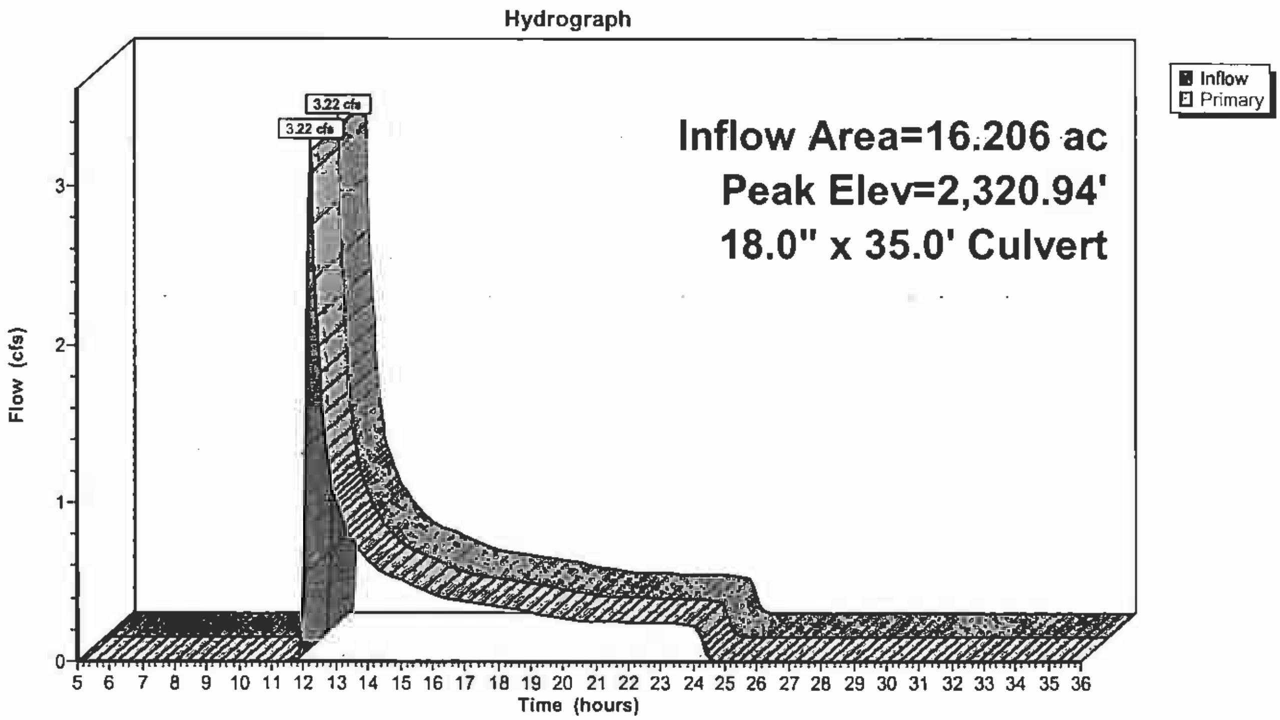
Inflow Area =	16.206 ac, Inflow Depth = 0.37"	for 10-YR event	
Inflow =	3.22 cfs @ 12.21 hrs, Volume=	0.505 af	
Outflow =	3.22 cfs @ 12.21 hrs, Volume=	0.505 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.22 cfs @ 12.21 hrs, Volume=	0.505 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,320.94' @ 12.21 hrs
Flood Elev= 2,323.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,320.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,319.65' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.20 cfs @ 12.21 hrs HW=2,320.93' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 3.20 cfs @ 3.95 fps)

Pond CV2000: CV2000



Pond CV2001: CV2001

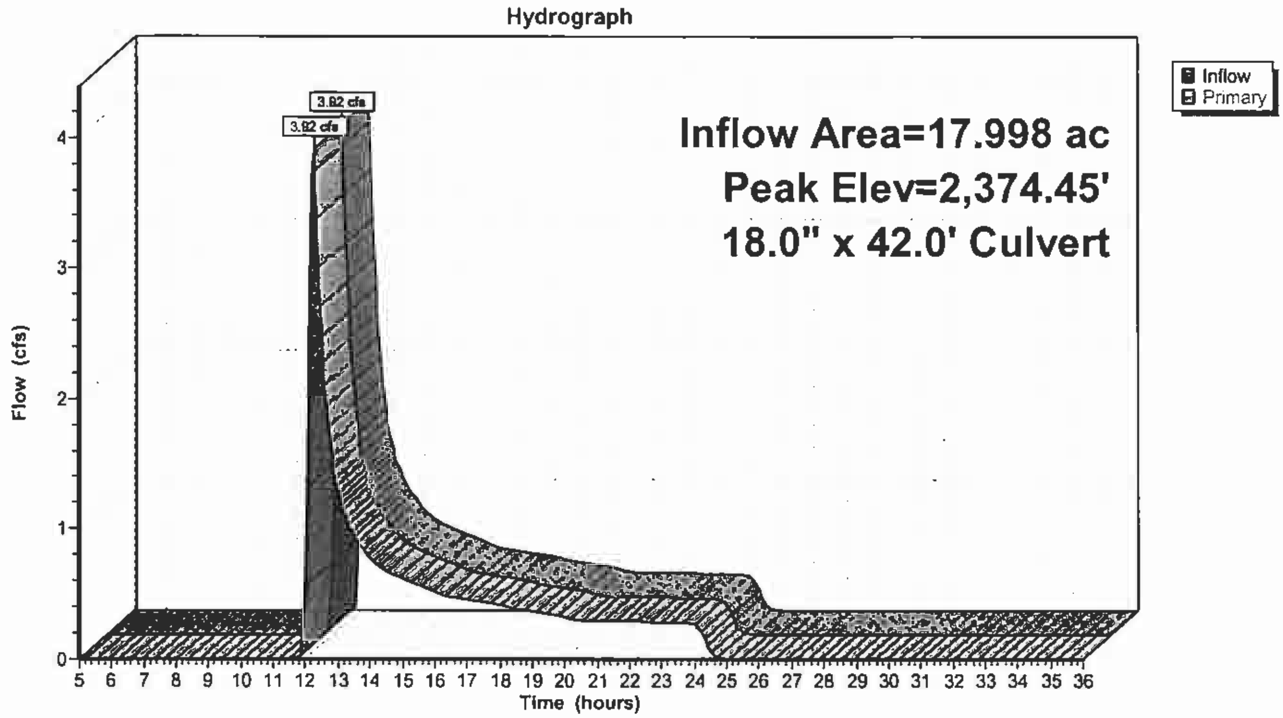
Inflow Area =	17.998 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	3.92 cfs @ 12.25 hrs, Volume=	0.617 af	
Outflow =	3.92 cfs @ 12.25 hrs, Volume=	0.617 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.92 cfs @ 12.25 hrs, Volume=	0.617 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,374.45' @ 12.25 hrs
Flood Elev= 2,379.11'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,373.50'	**18.0" x 42.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,370.00' S= 0.0833 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.91 cfs @ 12.25 hrs HW=2,374.45' (Free Discharge)
└─1=**Culvert** (Inlet Controls 3.91 cfs @ 3.32 fps)

Pond CV2001: CV2001



Pond CV2002: CV2002

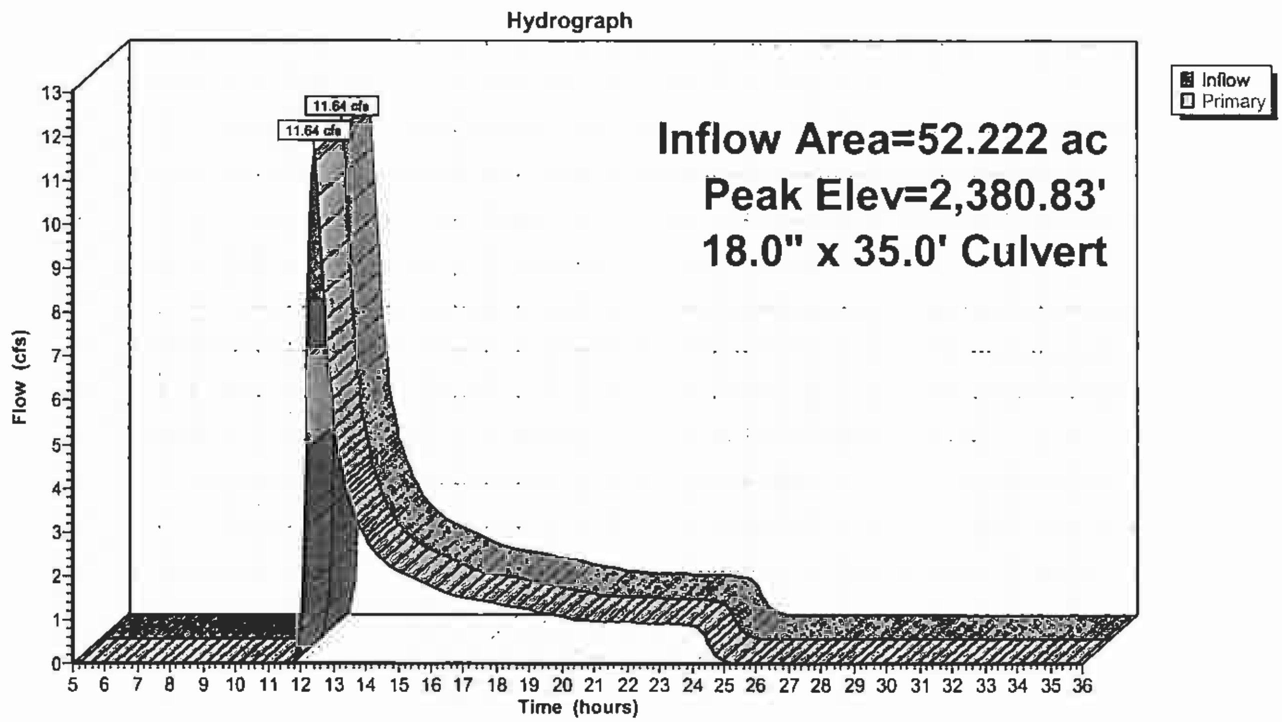
Inflow Area =	52.222 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	11.64 cfs @	12.43 hrs, Volume=	2.135 af	
Outflow =	11.64 cfs @	12.43 hrs, Volume=	2.135 af,	Atten= 0%, Lag= 0.0 min
Primary =	11.64 cfs @	12.43 hrs, Volume=	2.135 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,380.83' @ 12.43 hrs
Flood Elev= 2,381.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,378.10'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,377.75' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=11.59 cfs @ 12.43 hrs HW=2,380.82' (Free Discharge)
└─1=**Culvert** (Barrel Controls 11.59 cfs @ 6.56 fps)

Pond CV2002: CV2002



Pond CV2003: CV2003

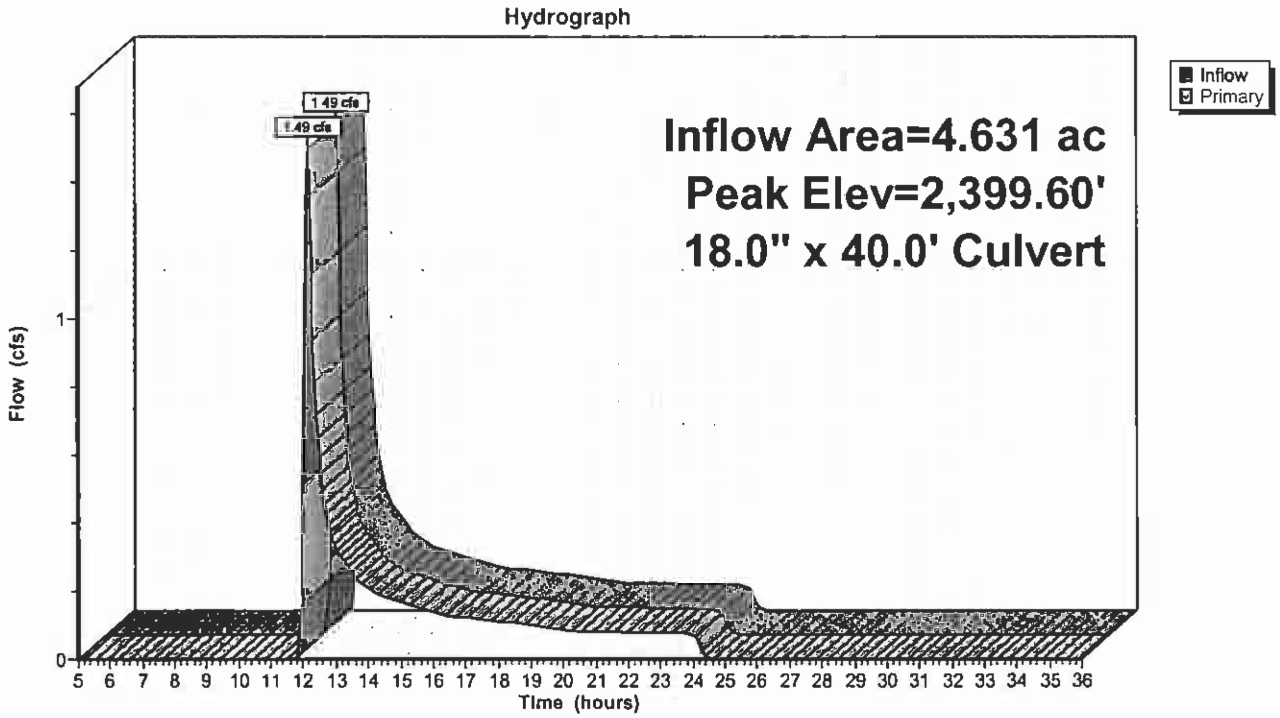
Inflow Area = 4.631 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.49 cfs @ 12.15 hrs, Volume= 0.174 af
Outflow = 1.49 cfs @ 12.15 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.15 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,399.60' @ 12.15 hrs
Flood Elev= 2,402.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,399.00'	**18.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,398.60' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.48 cfs @ 12.15 hrs HW=2,399.60' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.48 cfs @ 3.36 fps)

Pond CV2003: CV2003



Pond CV2004: CV2004

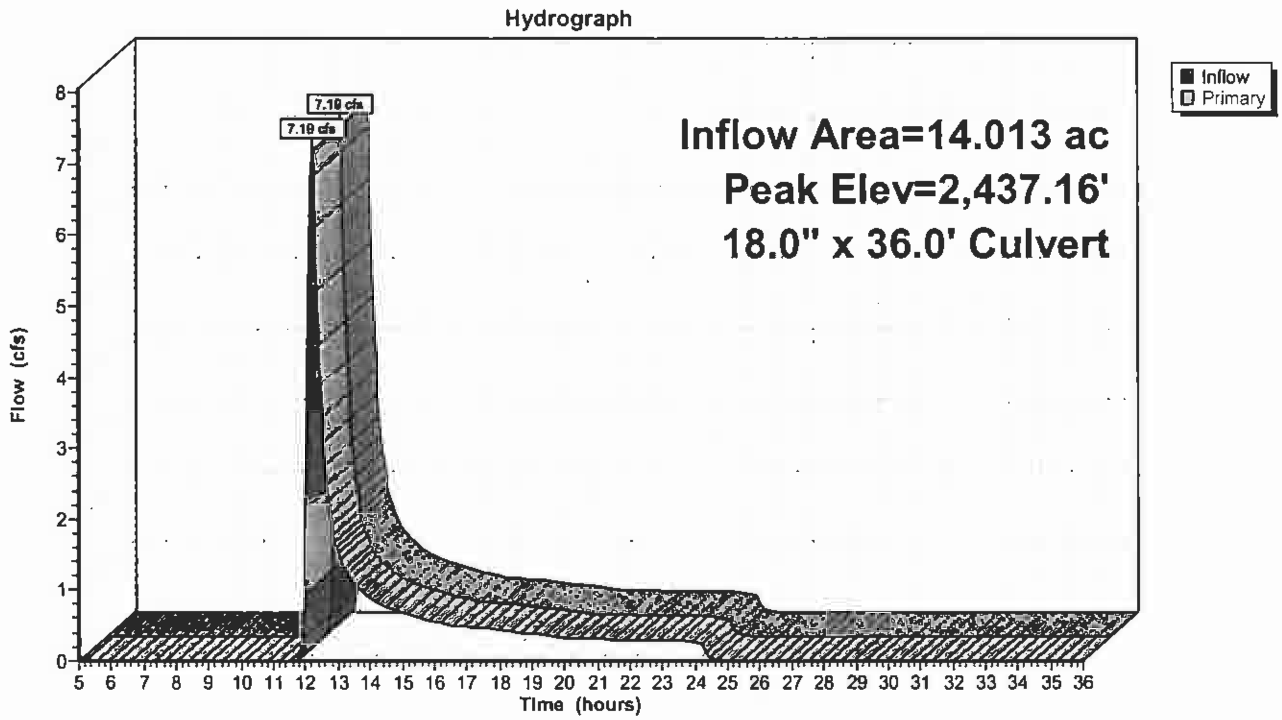
Inflow Area =	14.013 ac, Inflow Depth = 0.67"	for 10-YR event	
Inflow =	7.19 cfs @ 12.20 hrs, Volume=	0.778 af	
Outflow =	7.19 cfs @ 12.20 hrs, Volume=	0.778 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.19 cfs @ 12.20 hrs, Volume=	0.778 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,437.16' @ 12.20 hrs
Flood Elev= 2,439.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,435.56'	**18.0" x 36.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,435.20' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=7.18 cfs @ 12.20 hrs HW=2,437.16' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.18 cfs @ 4.74 fps)

Pond CV2004: CV2004



Pond CV2005: CV2005

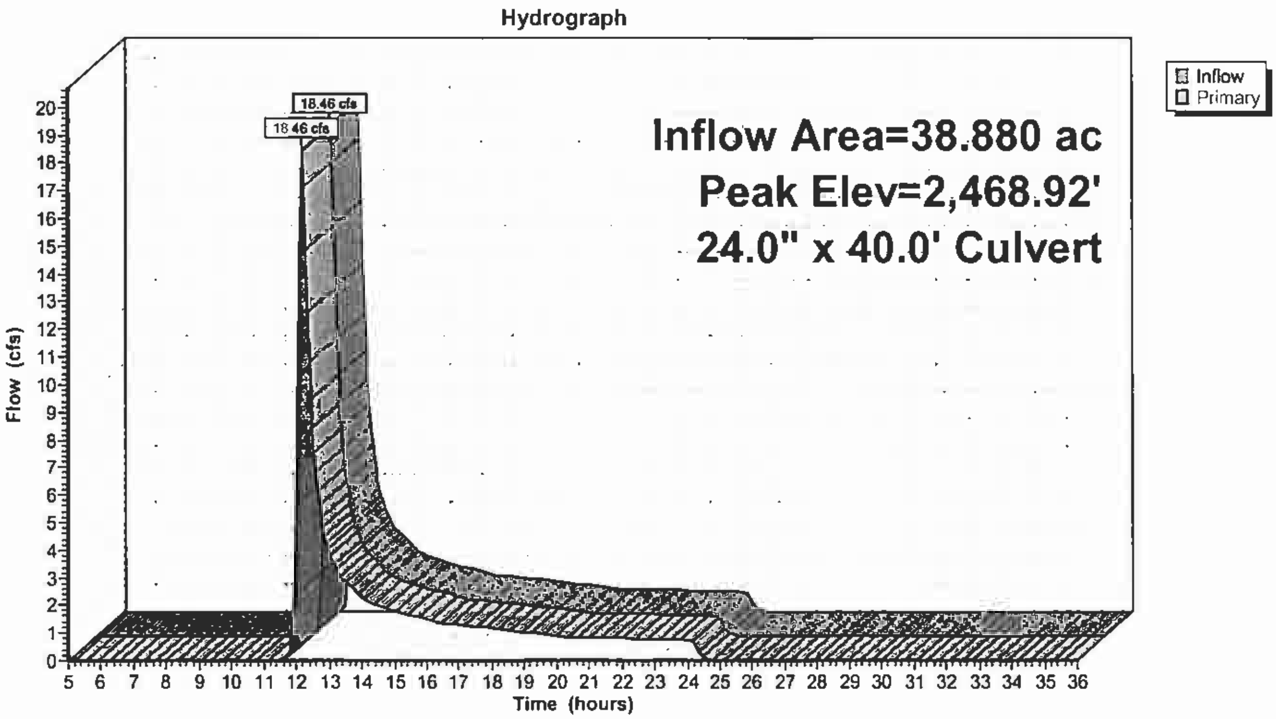
Inflow Area =	38.880 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	18.46 cfs @ 12.19 hrs, Volume=	2.009 af	
Outflow =	18.46 cfs @ 12.19 hrs, Volume=	2.009 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.46 cfs @ 12.19 hrs, Volume=	2.009 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,468.92' @ 12.18 hrs
Flood Elev= 2,469.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,466.15'	**24.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,465.75' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=18.30 cfs @ 12.19 hrs HW=2,468.89' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 18.30 cfs @ 5.83 fps)

Pond CV2005: CV2005



Pond CV2006: CV2006

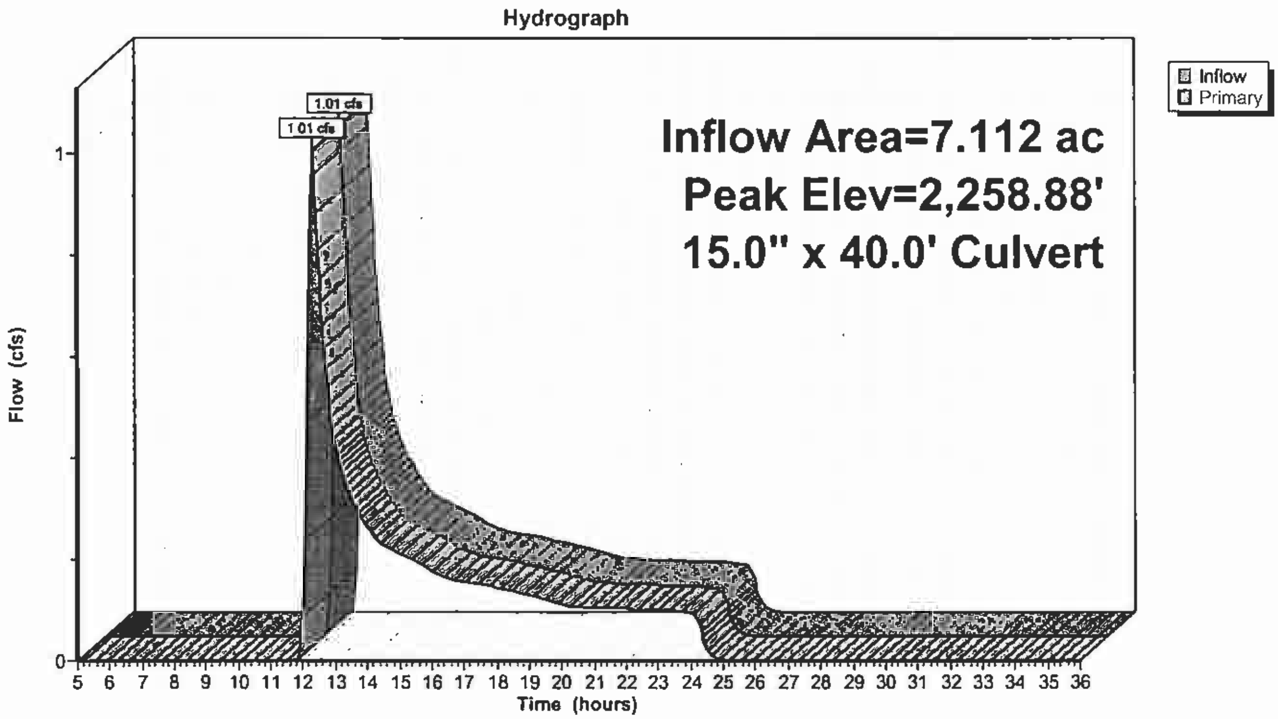
Inflow Area =	7.112 ac, Inflow Depth = 0.34"	for 10-YR event	
Inflow =	1.01 cfs @ 12.29 hrs, Volume=	0.200 af	
Outflow =	1.01 cfs @ 12.29 hrs, Volume=	0.200 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.01 cfs @ 12.29 hrs, Volume=	0.200 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,258.88' @ 12.29 hrs
Flood Elev= 2,261.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,258.40'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,257.75' S= 0.0163 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.00 cfs @ 12.29 hrs HW=2,258.87' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.00 cfs @ 2.34 fps)

Pond CV2006: CV2006



Pond CV211: CV211

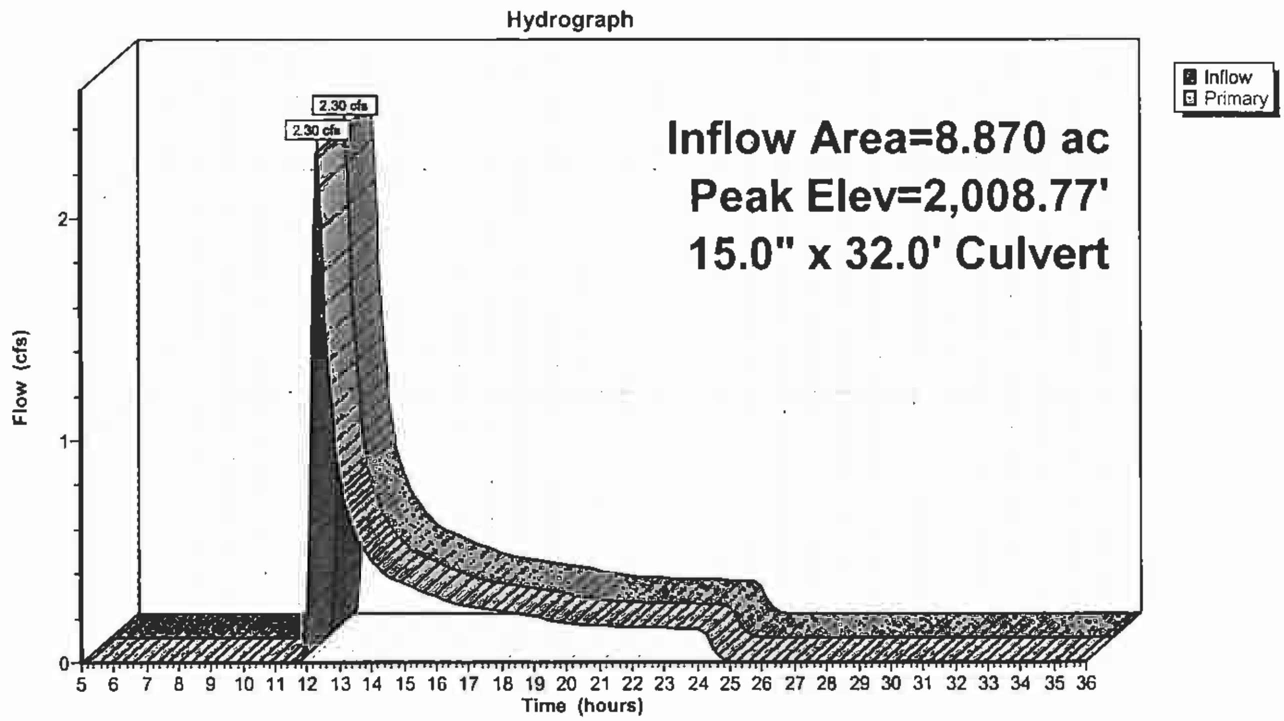
Inflow Area =	8.870 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	2.30 cfs @ 12.32 hrs, Volume=	0.363 af	
Outflow =	2.30 cfs @ 12.32 hrs, Volume=	0.363 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.30 cfs @ 12.32 hrs, Volume=	0.363 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,008.77' @ 12.32 hrs
Flood Elev= 2,011.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,008.00'	**15.0" x 32.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,007.50' S= 0.0156 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.29 cfs @ 12.32 hrs HW=2,008.76' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.29 cfs @ 4.16 fps)

Pond CV211: CV211



Pond CV212: CV212

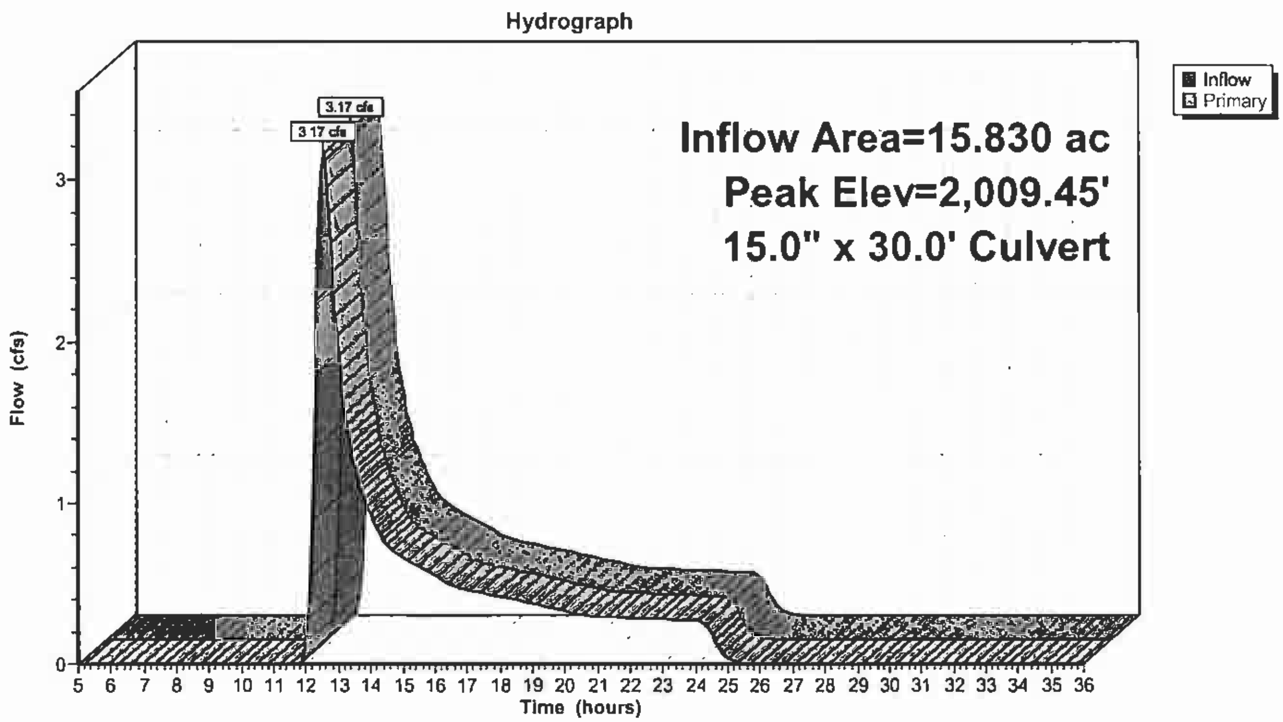
Inflow Area = 15.830 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 3.17 cfs @ 12.53 hrs, Volume= 0.647 af
Outflow = 3.17 cfs @ 12.53 hrs, Volume= 0.647 af, Atten= 0%, Lag= 0.0 min
Primary = 3.17 cfs @ 12.53 hrs, Volume= 0.647 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,009.45' @ 12.53 hrs
Flood Elev= 2,011.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,008.45'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,008.10' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.16 cfs @ 12.53 hrs HW=2,009.45' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.16 cfs @ 4.09 fps)

Pond CV212: CV212



Pond CV212A: CV212A

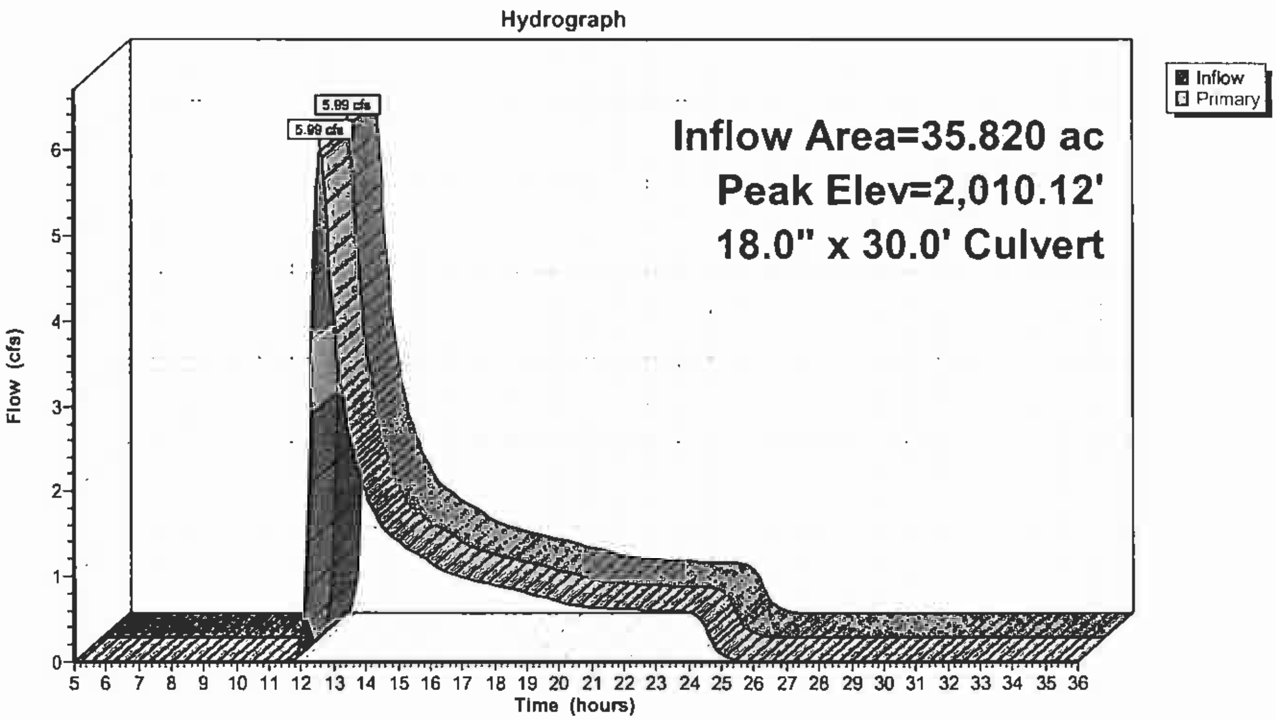
Inflow Area = 35.820 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 5.99 cfs @ 12.57 hrs, Volume= 1.344 af
Outflow = 5.99 cfs @ 12.57 hrs, Volume= 1.344 af, Atten= 0%, Lag= 0.0 min
Primary = 5.99 cfs @ 12.57 hrs, Volume= 1.344 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,010.12' @ 12.57 hrs
Flood Elev= 2,012.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,008.75'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,008.40' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.97 cfs @ 12.57 hrs HW=2,010.12' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 5.97 cfs @ 4.62 fps)

Pond CV212A: CV212A



Pond CV214: CV214

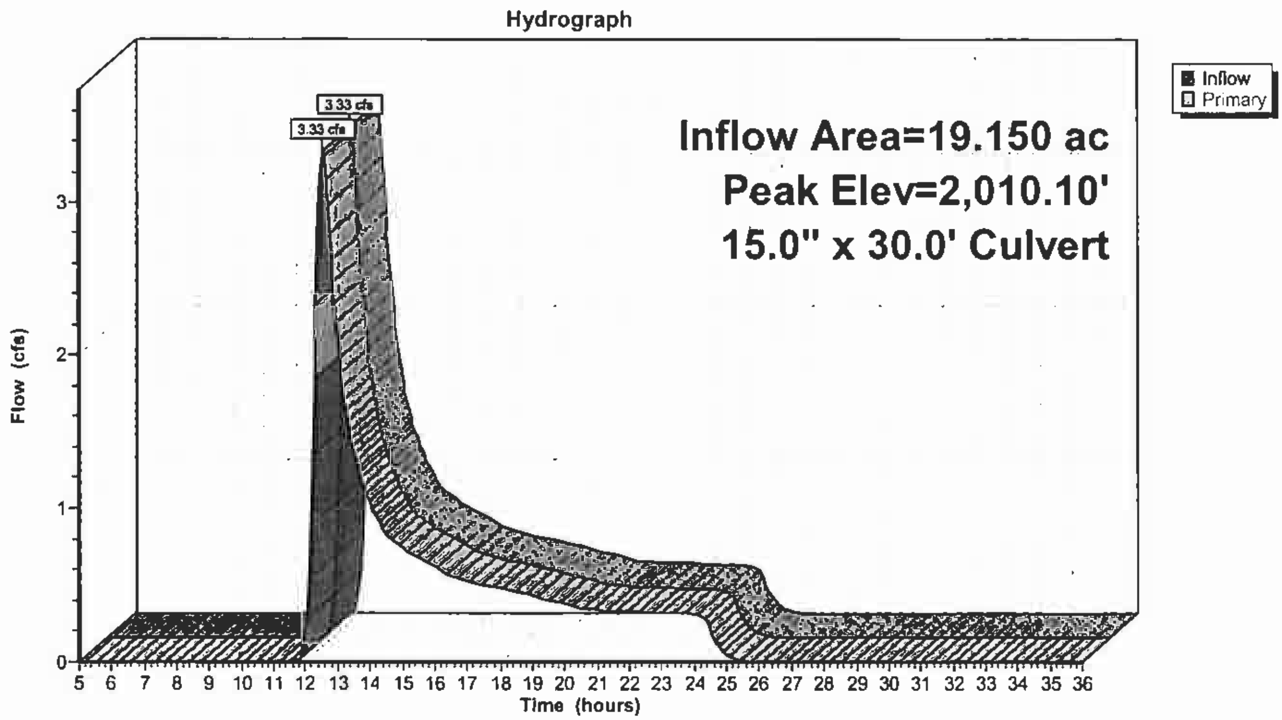
Inflow Area =	19.150 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	3.33 cfs @	12.54 hrs, Volume=	0.718 af	
Outflow =	3.33 cfs @	12.54 hrs, Volume=	0.718 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.33 cfs @	12.54 hrs, Volume=	0.718 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,010.10' @ 12.54 hrs
Flood Elev= 2,012.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.06'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,008.71' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.32 cfs @ 12.54 hrs HW=2,010.10' (Free Discharge)
└─**1=Culvert** (Barrel Controls 3.32 cfs @ 4.14 fps)

Pond CV214: CV214



Pond CV218: CV218

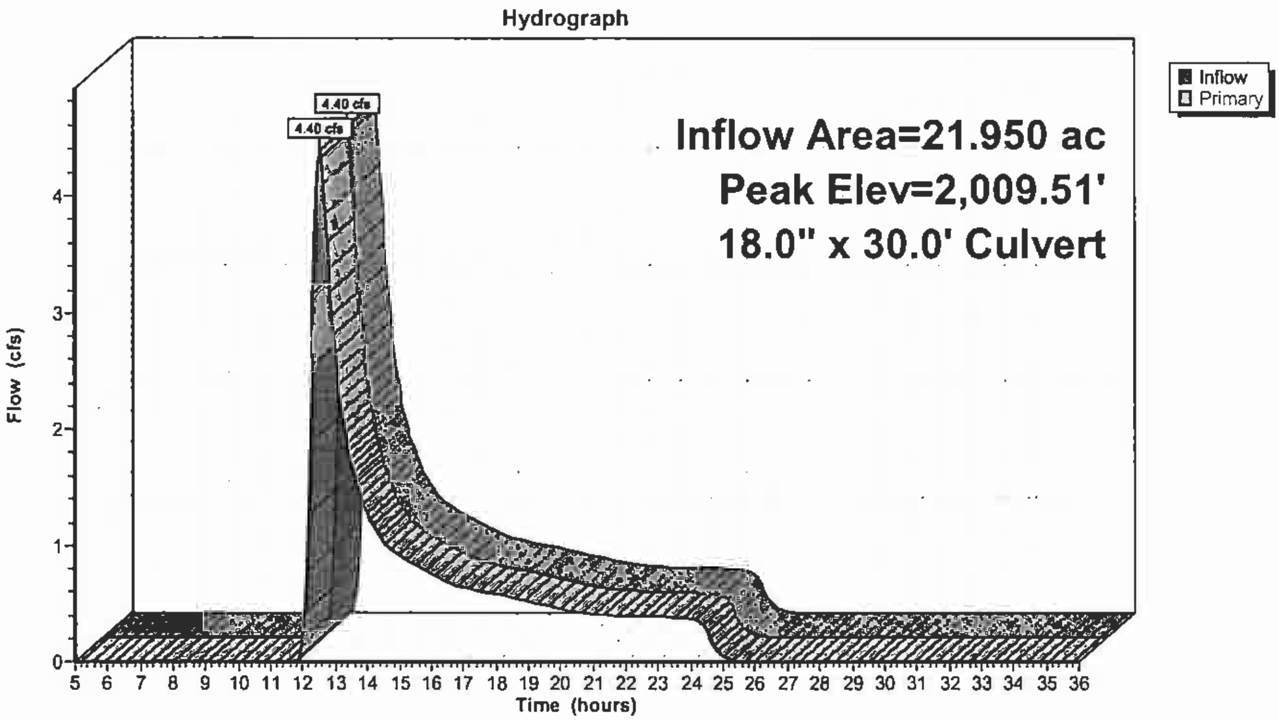
Inflow Area =	21.950 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	4.40 cfs @	12.53 hrs, Volume=	0.897 af	
Outflow =	4.40 cfs @	12.53 hrs, Volume=	0.897 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.40 cfs @	12.53 hrs, Volume=	0.897 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,009.51' @ 12.53 hrs
Flood Elev= 2,011.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,008.25'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,008.10' S= 0.0050 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.38 cfs @ 12.53 hrs HW=2,009.51' (Free Discharge)
└─**1=Culvert** (Barrel Controls 4.38 cfs @ 3.76 fps)

Pond CV218: CV218



Pond CV219: CV219

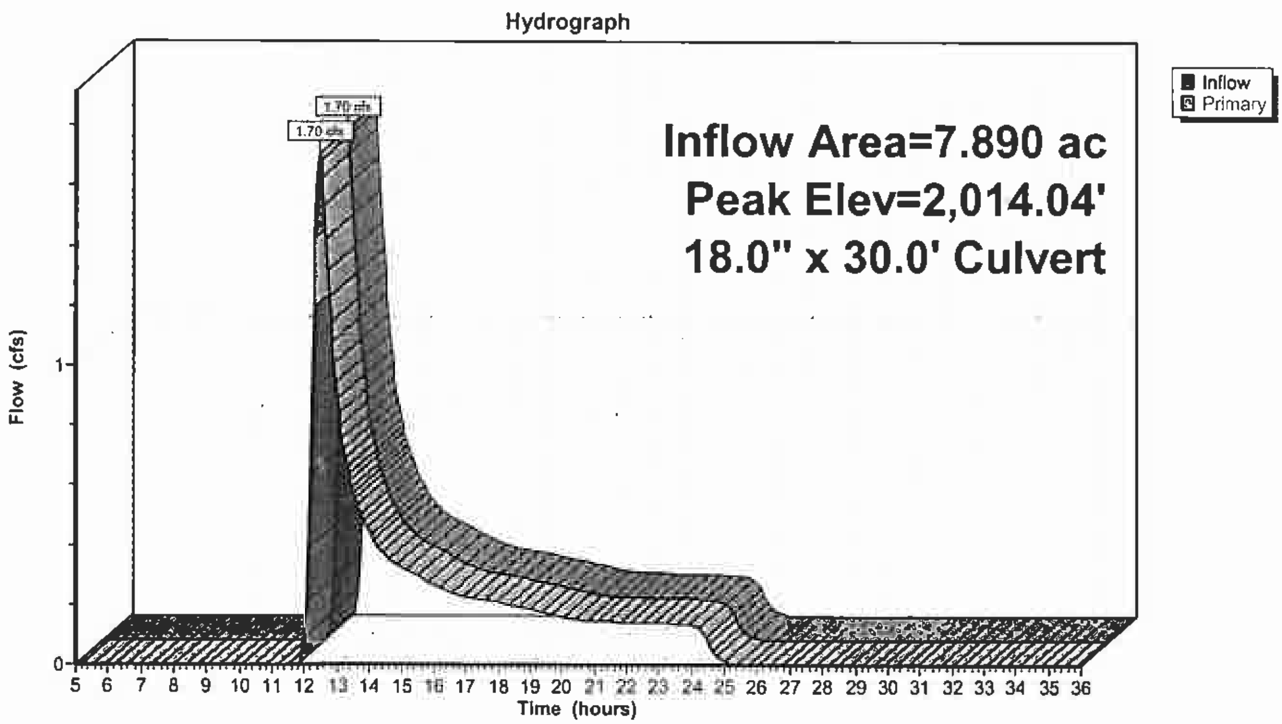
Inflow Area =	7.890 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	1.70 cfs @	12.46 hrs, Volume=	0.323 af	
Outflow =	1.70 cfs @	12.46 hrs, Volume=	0.323 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.70 cfs @	12.46 hrs, Volume=	0.323 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,014.04' @ 12.46 hrs
Flood Elev= 2,016.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,013.40'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,013.05' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.70 cfs @ 12.46 hrs HW=2,014.04' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.70 cfs @ 3.52 fps)

Pond CV219: CV219



Pond CV221: CV221

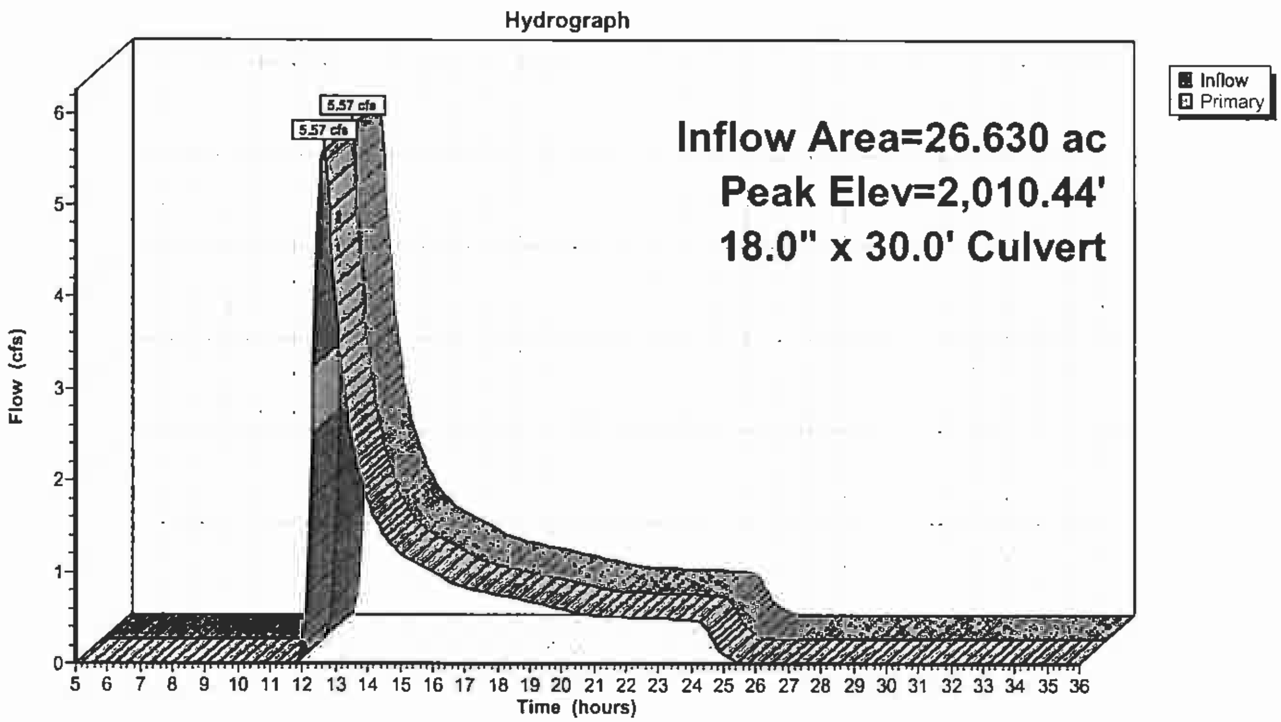
Inflow Area =	26.630 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	5.57 cfs @ 12.61 hrs, Volume=	1.181 af	
Outflow =	5.57 cfs @ 12.61 hrs, Volume=	1.181 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.57 cfs @ 12.61 hrs, Volume=	1.181 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,010.44' @ 12.61 hrs
Flood Elev= 2,012.71'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.25'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,008.25' S= 0.0333 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.56 cfs @ 12.61 hrs HW=2,010.44' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.56 cfs @ 3.71 fps)

Pond CV221: CV221



Pond CV224: CV224

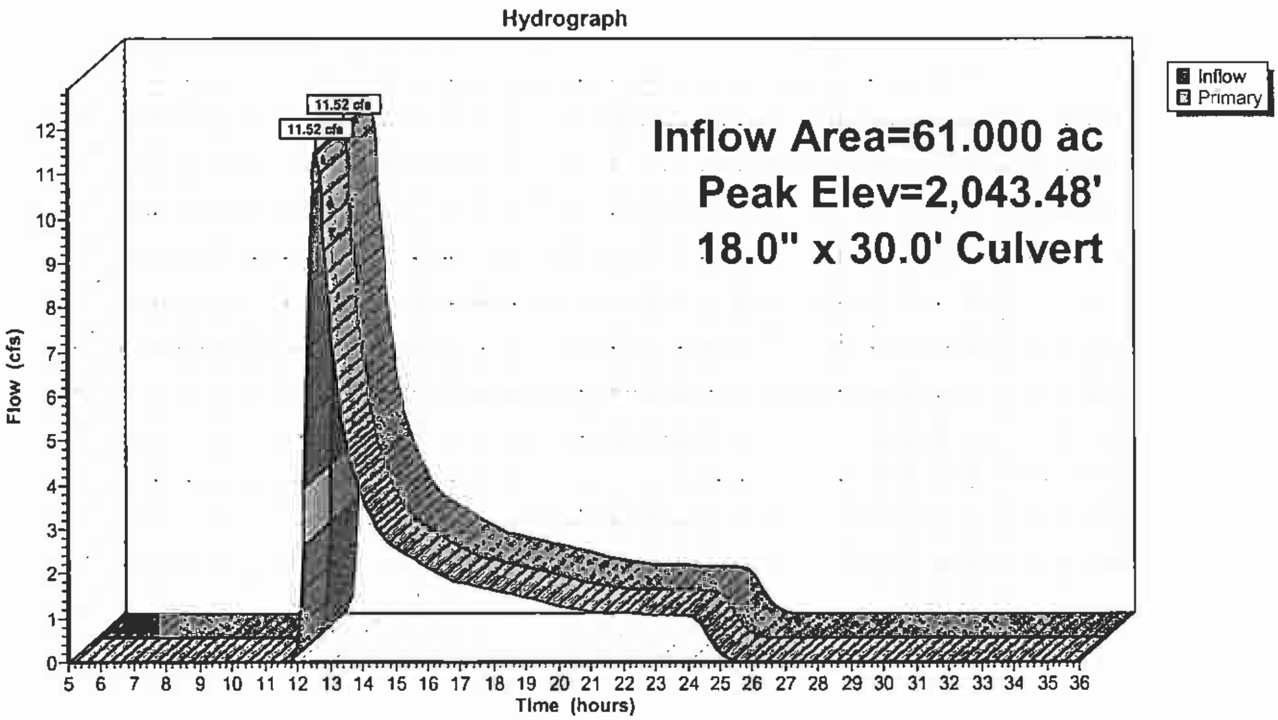
Inflow Area =	61.000 ac,	Inflow Depth = 0.49"	for 10-YR event
Inflow =	11.52 cfs @	12.58 hrs, Volume=	2.494 af
Outflow =	11.52 cfs @	12.58 hrs, Volume=	2.494 af, Atten= 0%, Lag= 0.0 min
Primary =	11.52 cfs @	12.58 hrs, Volume=	2.494 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,043.48' @ 12.58 hrs
Flood Elev= 2,044.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,040.90'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,040.25' S= 0.0217 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=11.50 cfs @ 12.58 hrs HW=2,043.48' (Free Discharge)
└─**1=Culvert** (Inlet Controls 11.50 cfs @ 6.51 fps)

Pond CV224: CV224



Pond CV225: CV225

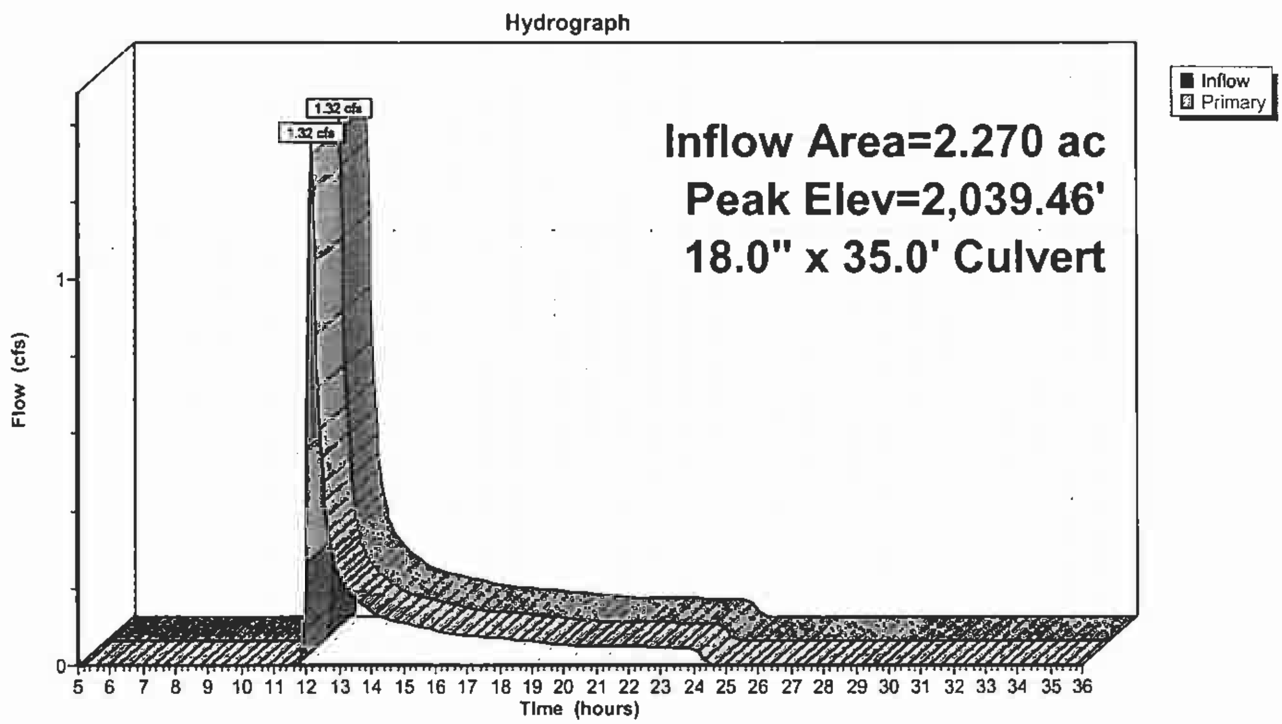
Inflow Area =	2.270 ac, Inflow Depth = 0.67"	for 10-YR event	
Inflow =	1.32 cfs @ 12.15 hrs, Volume=	0.126 af	
Outflow =	1.32 cfs @ 12.15 hrs, Volume=	0.126 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.32 cfs @ 12.15 hrs, Volume=	0.126 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,039.46' @ 12.15 hrs
Flood Elev= 2,042.44'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,038.94'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,037.75' S= 0.0340 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.32 cfs @ 12.15 hrs HW=2,039.46' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.32 cfs @ 2.45 fps)

Pond CV225: CV225



Pond CV228: CV228

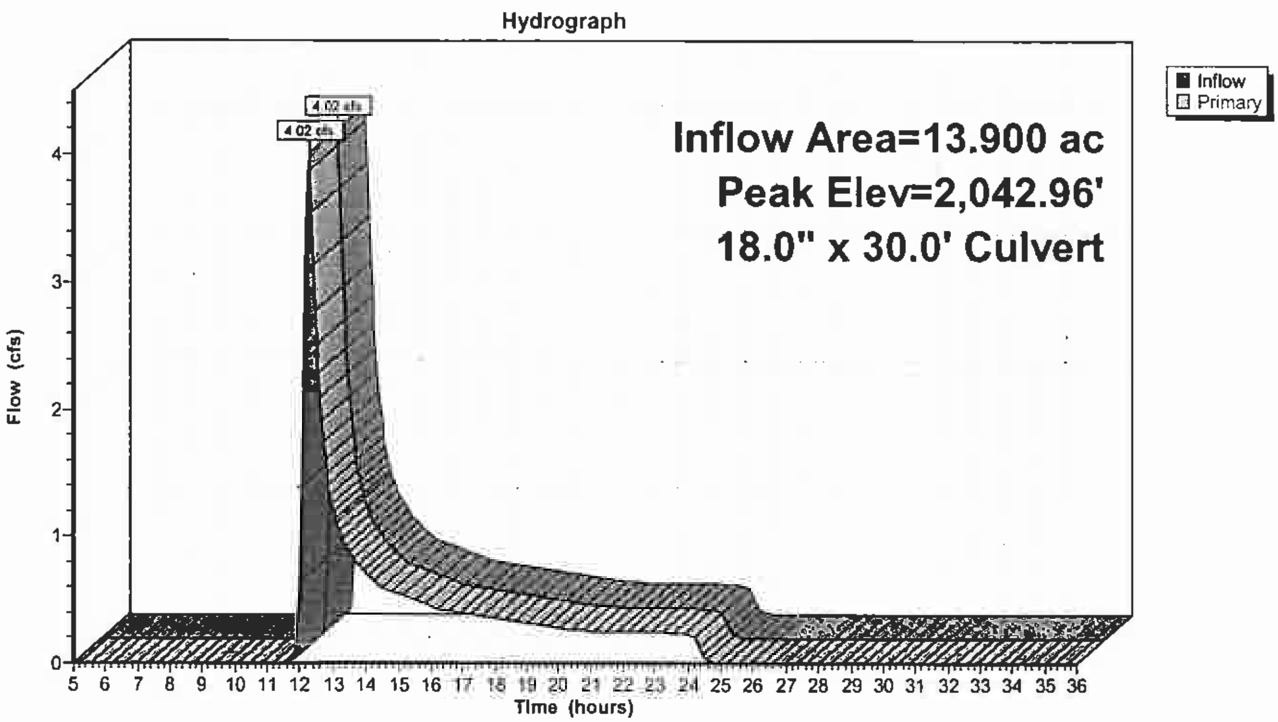
Inflow Area =	13.900 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	4.02 cfs @ 12.25 hrs, Volume=	0.568 af	
Outflow =	4.02 cfs @ 12.25 hrs, Volume=	0.568 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.02 cfs @ 12.25 hrs, Volume=	0.568 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,042.96' @ 12.25 hrs
Flood Elev= 2,045.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,042.00'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,040.75' S= 0.0417 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.01 cfs @ 12.25 hrs HW=2,042.96' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.01 cfs @ 3.34 fps)

Pond CV228: CV228



Pond CV229: CV229

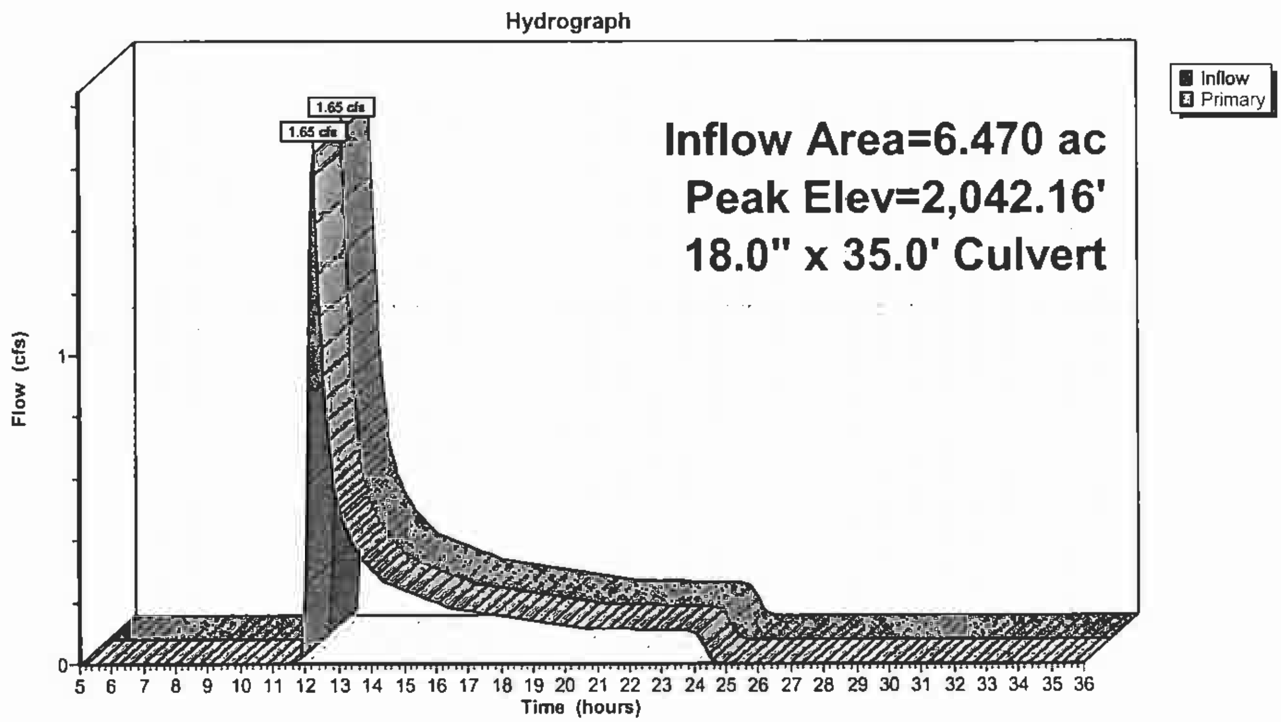
Inflow Area =	6.470 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.65 cfs @ 12.25 hrs, Volume=	0.243 af	
Outflow =	1.65 cfs @ 12.25 hrs, Volume=	0.243 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.65 cfs @ 12.25 hrs, Volume=	0.243 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,042.16' @ 12.25 hrs
Flood Elev= 2,045.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,041.58'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,041.00' S= 0.0166 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.64 cfs @ 12.25 hrs HW=2,042.16' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.64 cfs @ 2.59 fps)

Pond CV229: CV229



Pond CV230: CV230

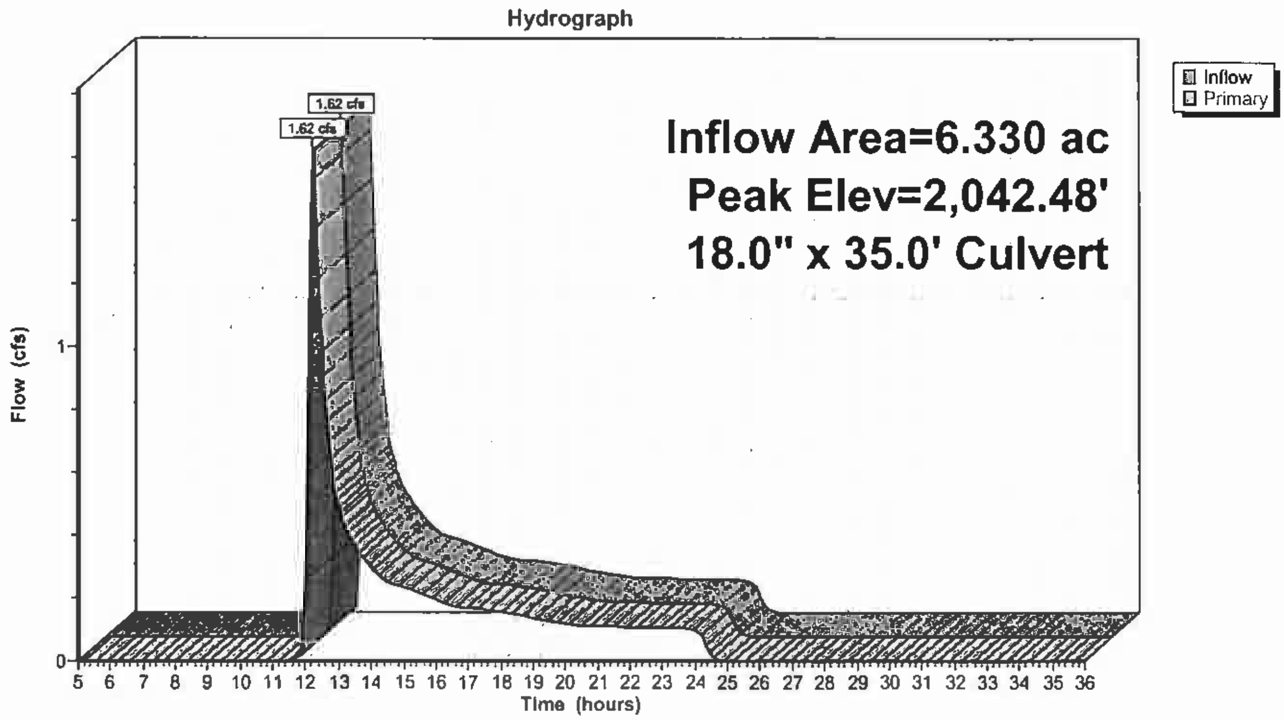
Inflow Area = 6.330 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.62 cfs @ 12.24 hrs, Volume= 0.237 af
Outflow = 1.62 cfs @ 12.24 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.24 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,042.48' @ 12.24 hrs
Flood Elev= 2,045.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,041.85'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,041.50' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.61 cfs @ 12.24 hrs HW=2,042.48' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.61 cfs @ 3.39 fps)

Pond CV230: CV230



Pond CV231: CV231

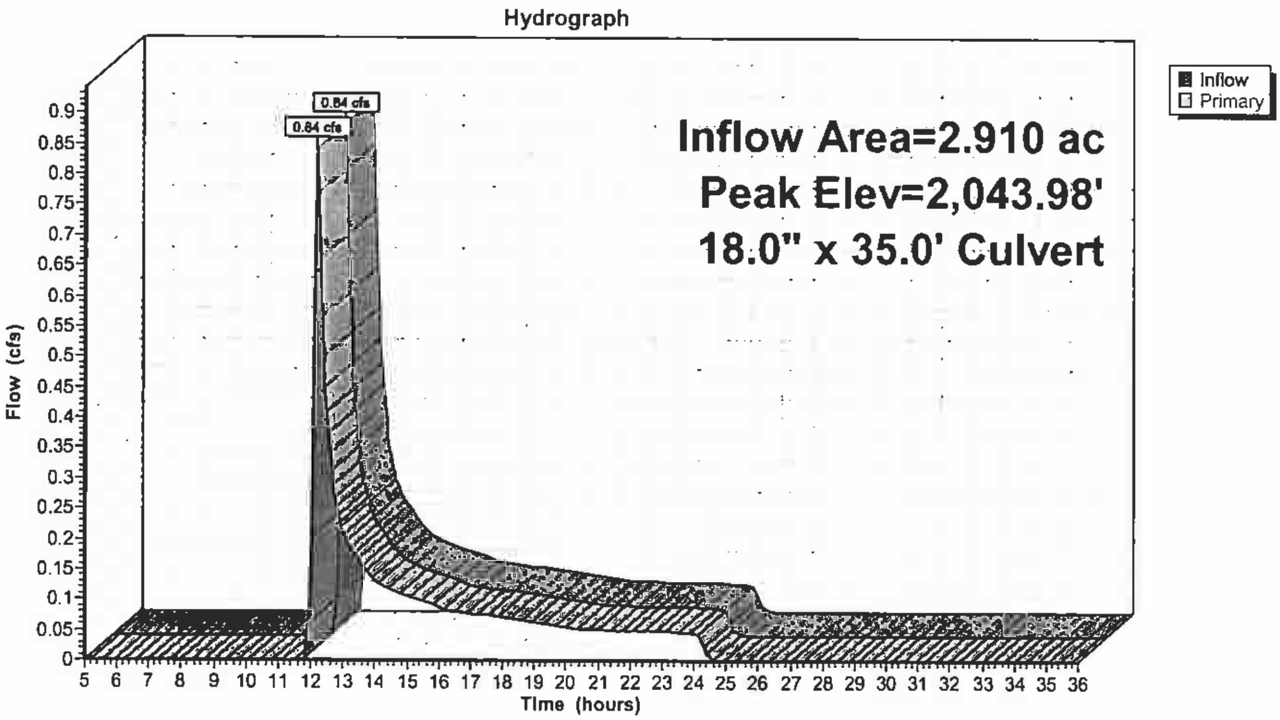
Inflow Area =	2.910 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	0.84 cfs @	12.19 hrs, Volume=	0.109 af	
Outflow =	0.84 cfs @	12.19 hrs, Volume=	0.109 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.84 cfs @	12.19 hrs, Volume=	0.109 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,043.98' @ 12.19 hrs
Flood Elev= 2,047.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,043.57'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,042.50' S= 0.0306 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.83 cfs @ 12.19 hrs HW=2,043.97' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.83 cfs @ 2.16 fps)

Pond CV231: CV231



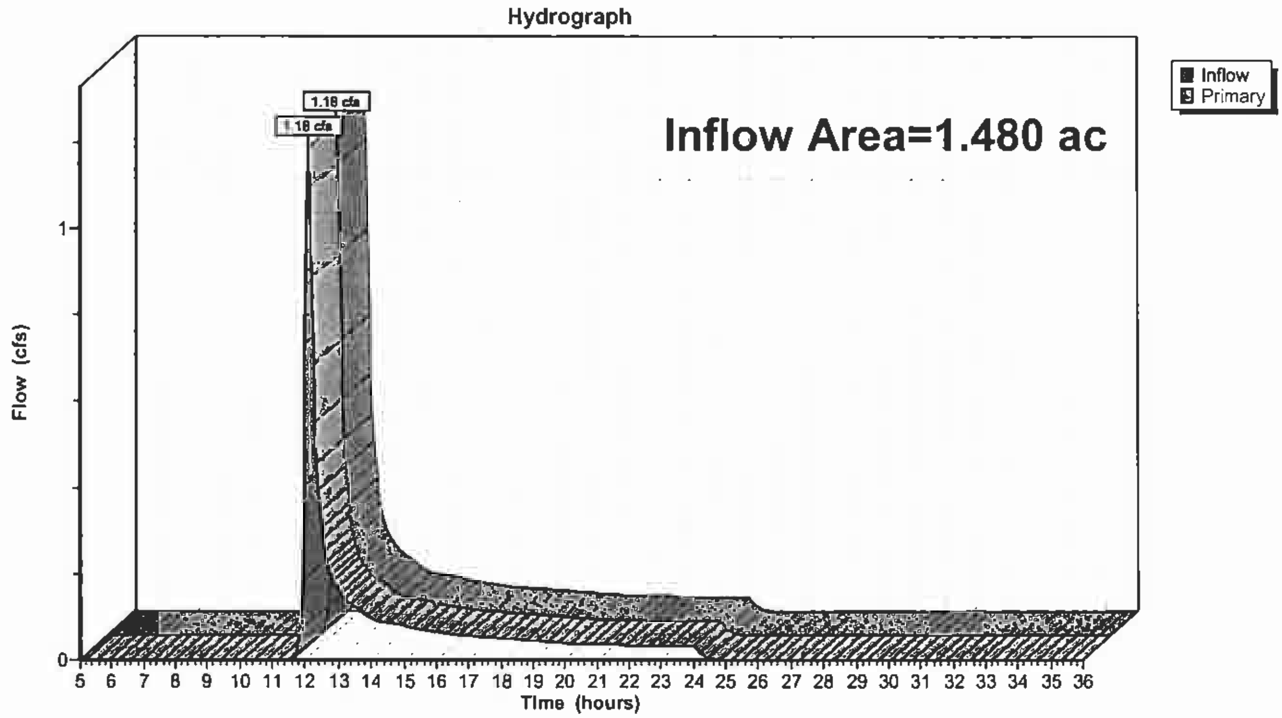
Pond CV301: Culvert 301

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1.480 ac,	Inflow Depth = 0.76"	for 10-YR event
Inflow =	1.18 cfs @	12.10 hrs, Volume=	0.094 af
Primary =	1.18 cfs @	12.10 hrs, Volume=	0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond CV301: Culvert 301



Pond CV302: Culvert 302

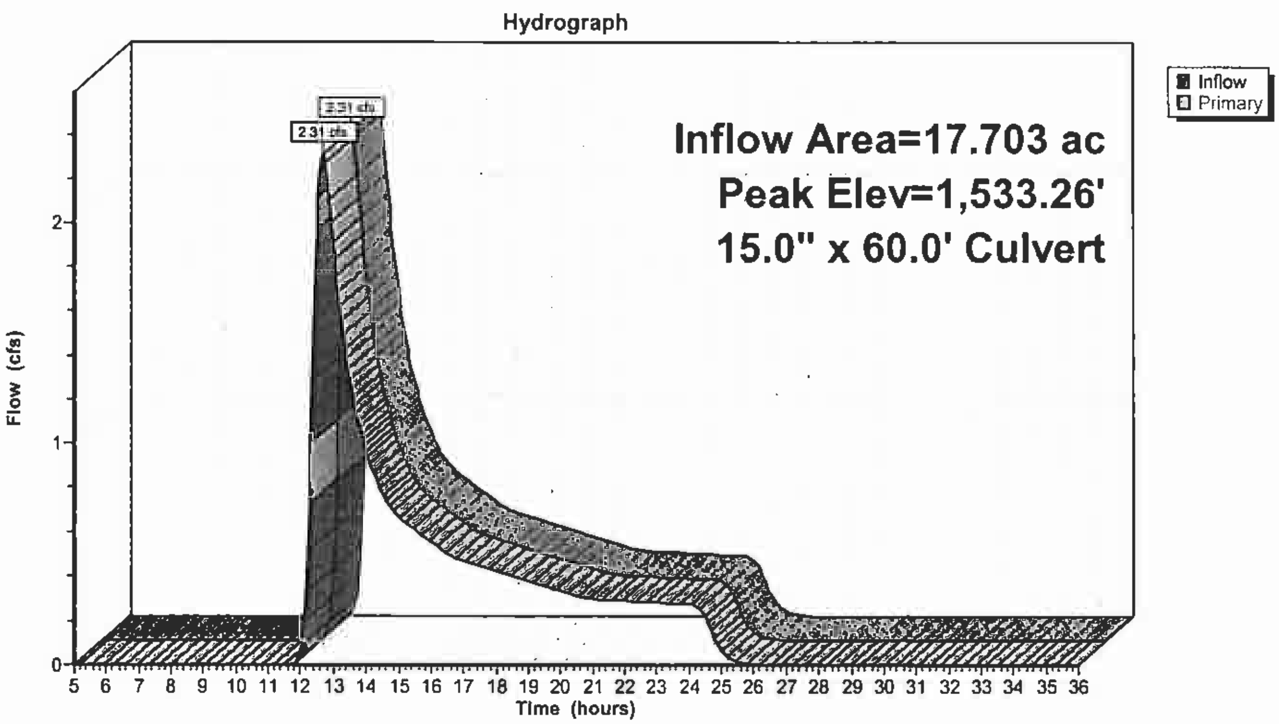
Inflow Area =	17.703 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	2.31 cfs @	12.71 hrs, Volume=	0.607 af	
Outflow =	2.31 cfs @	12.71 hrs, Volume=	0.607 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.31 cfs @	12.71 hrs, Volume=	0.607 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,533.26' @ 12.71 hrs
Flood Elev= 1,536.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,532.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,531.00' S= 0.0250 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.30 cfs @ 12.71 hrs HW=1,533.26' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 2.30 cfs @ 2.96 fps)

Pond CV302: Culvert 302



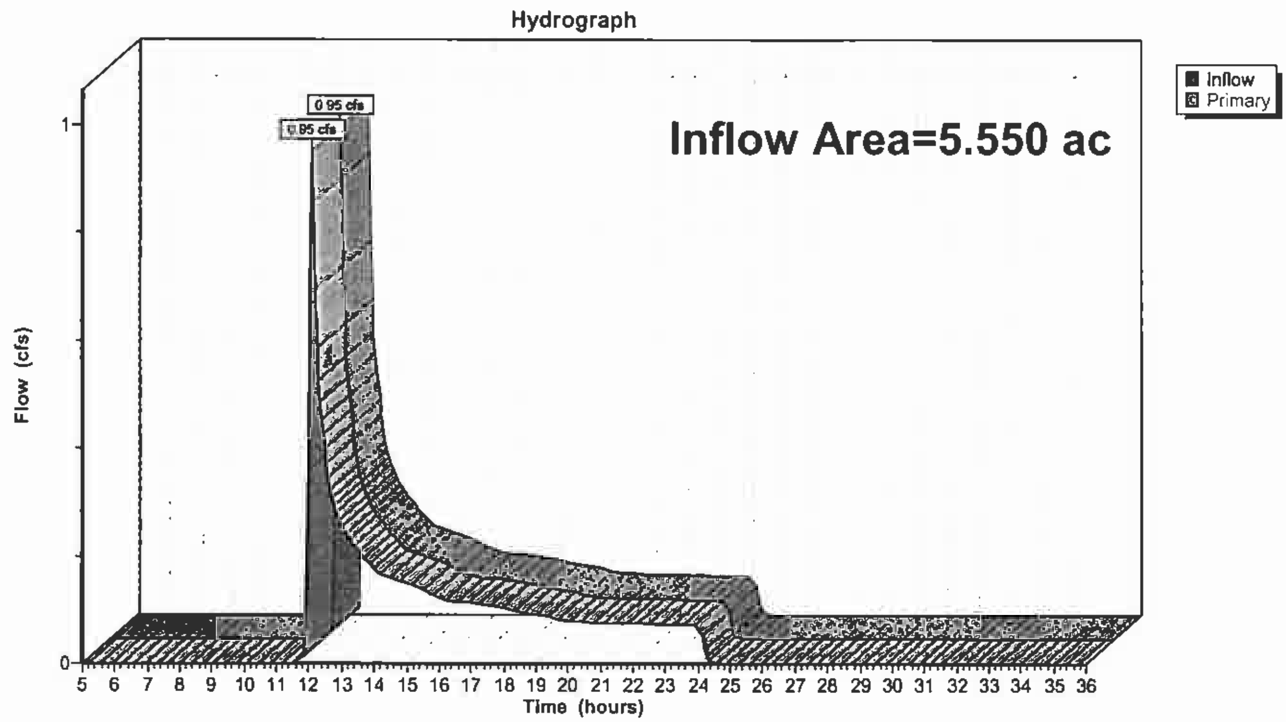
Pond CV303: Culvert 303

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	5.550 ac,	Inflow Depth = 0.30"	for 10-YR event		
Inflow =	0.95 cfs @	12.11 hrs,	Volume=	0.140 af	
Primary =	0.95 cfs @	12.11 hrs,	Volume=	0.140 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond CV303: Culvert 303



Pond CV304: Culvert 304

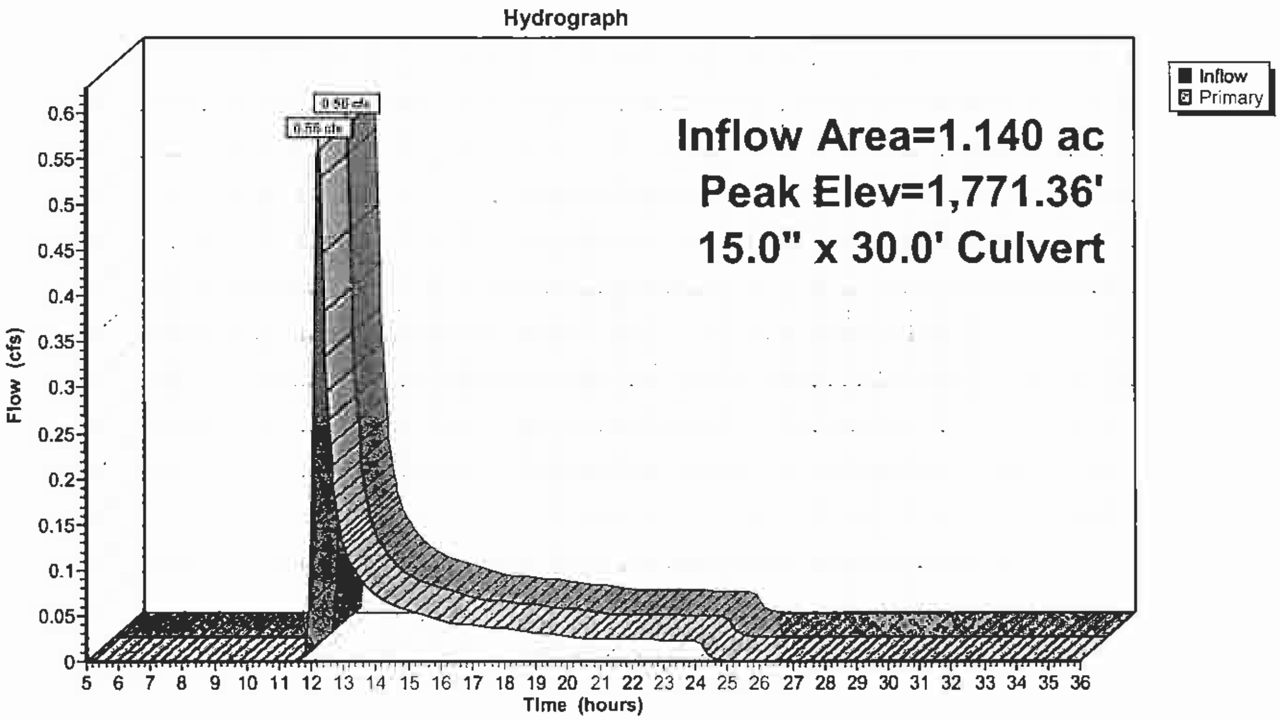
Inflow Area =	1.140 ac,	Inflow Depth = 0.67"	for 10-YR event	
Inflow =	0.56 cfs @	12.22 hrs, Volume=	0.063 af	
Outflow =	0.56 cfs @	12.22 hrs, Volume=	0.063 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.56 cfs @	12.22 hrs, Volume=	0.063 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,771.36' @ 12.22 hrs
Flood Elev= 1,774.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,770.95'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,770.75' S= 0.0067 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.55 cfs @ 12.22 hrs HW=1,771.36' (Free Discharge)
└─1=**Culvert** (Barrel Controls 0.55 cfs @ 2.38 fps)

Pond CV304: Culvert 304



Pond CV305: Culvert 305

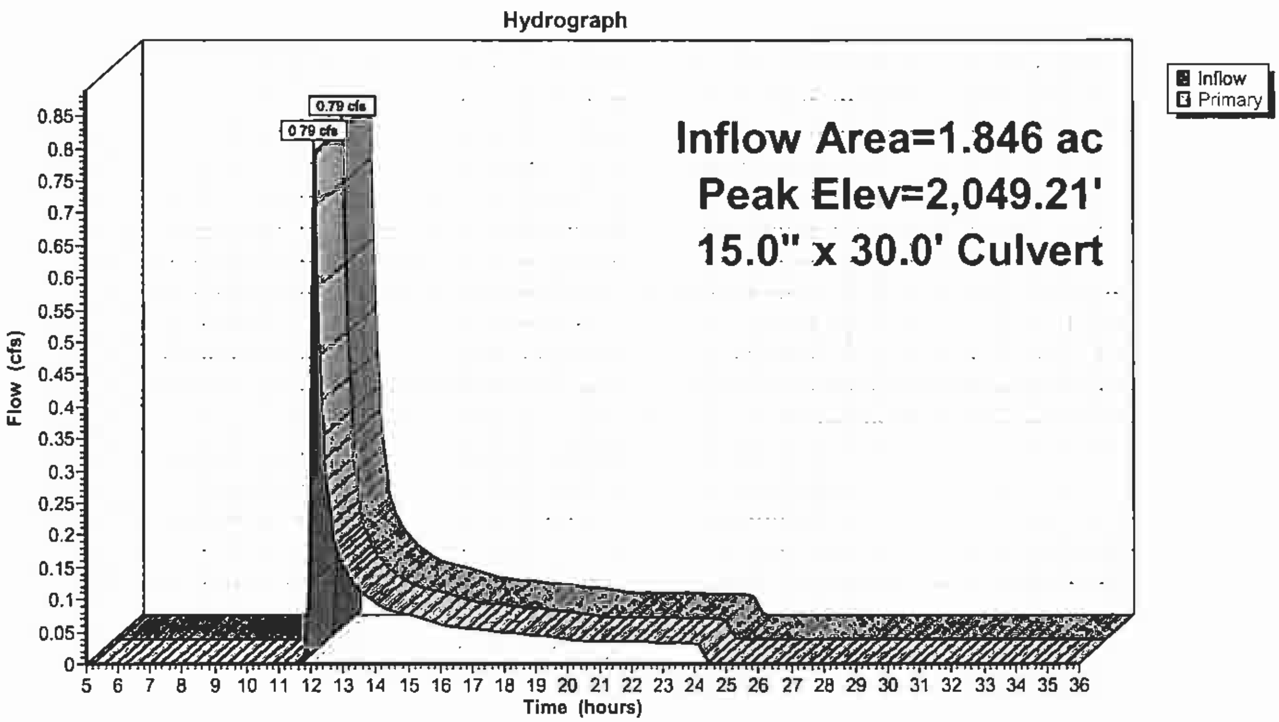
Inflow Area =	1.846 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	0.79 cfs @	12.14 hrs,	Volume=	0.082 af
Outflow =	0.79 cfs @	12.14 hrs,	Volume=	0.082 af, Atten= 0%, Lag= 0.0 min
Primary =	0.79 cfs @	12.14 hrs,	Volume=	0.082 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,049.21' @ 12.14 hrs
Flood Elev= 2,051.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,048.75'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,048.45' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.78 cfs @ 12.14 hrs HW=2,049.21' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.78 cfs @ 2.88 fps)

Pond CV305: Culvert 305



Pond CV306: Culvert 306

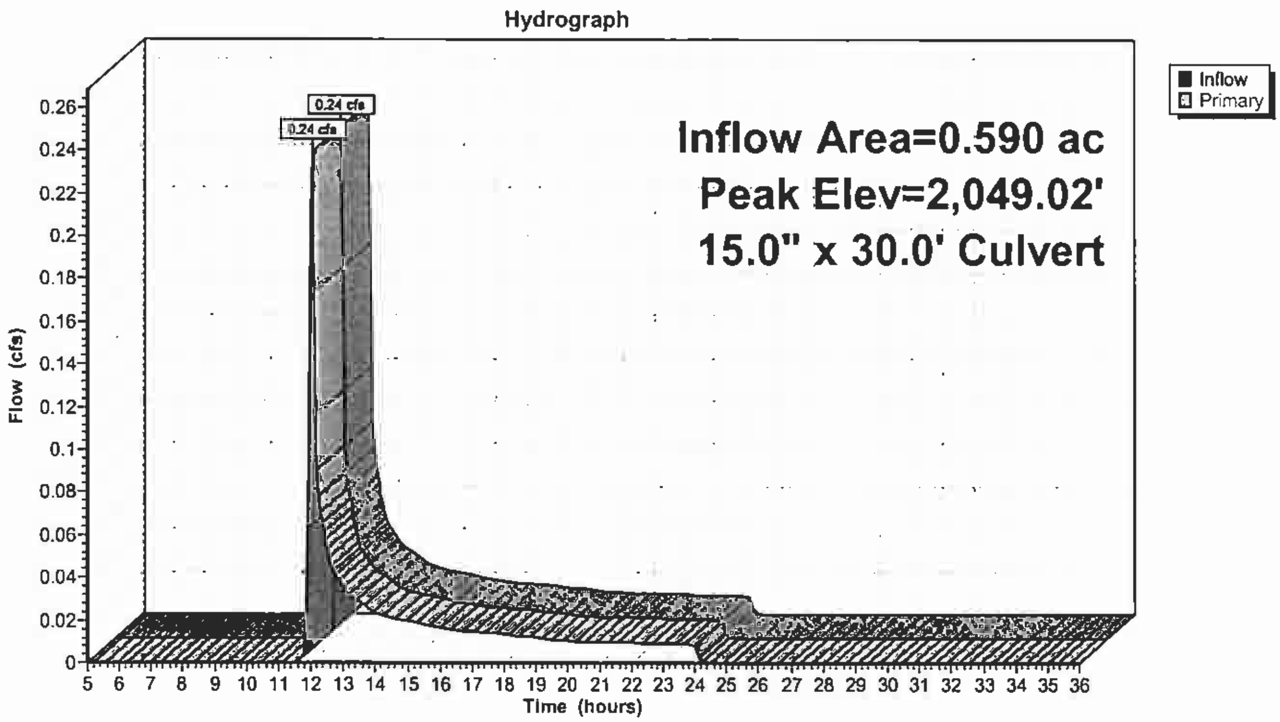
Inflow Area =	0.590 ac,	Inflow Depth = 0.41"	for 10-YR event	
Inflow =	0.24 cfs @	12.04 hrs, Volume=	0.020 af	
Outflow =	0.24 cfs @	12.04 hrs, Volume=	0.020 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.24 cfs @	12.04 hrs, Volume=	0.020 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,049.02' @ 12.04 hrs
Flood Elev= 2,051.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,048.80'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,048.25' S= 0.0183 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.23 cfs @ 12.04 hrs HW=2,049.02' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.23 cfs @ 1.60 fps)

Pond CV306: Culvert 306



Pond CV307: CV307

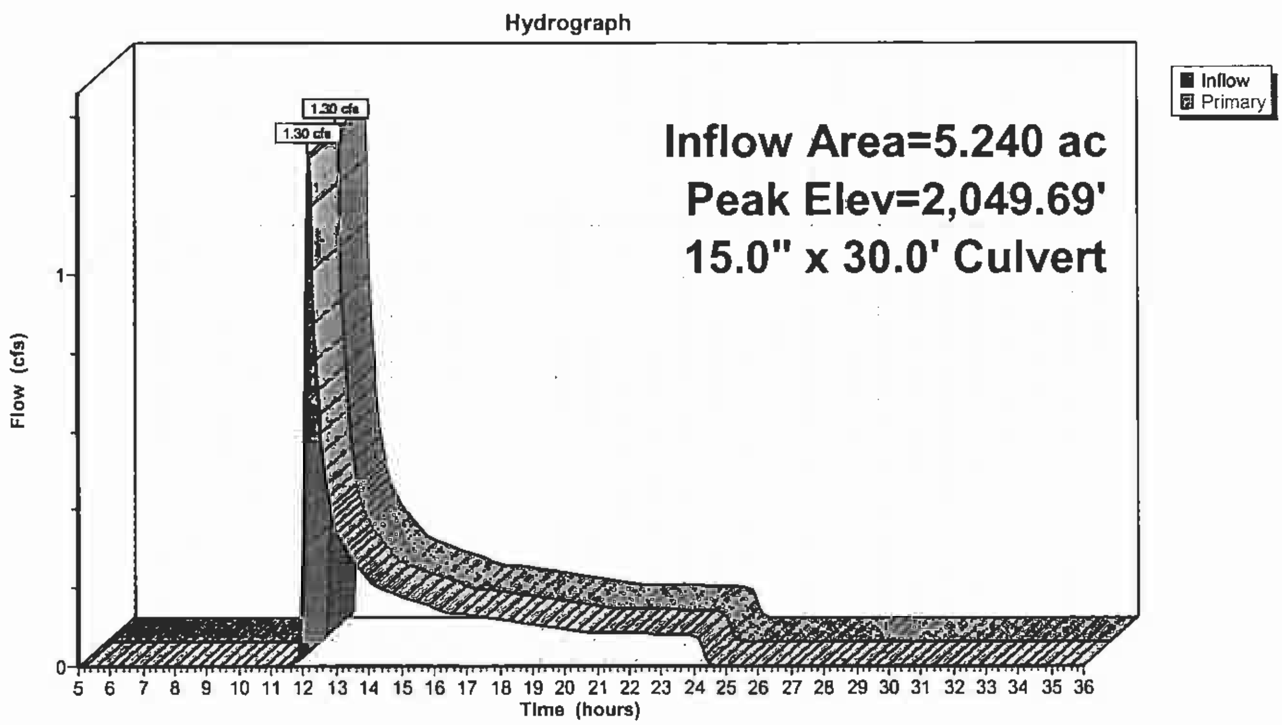
Inflow Area =	5.240 ac, Inflow Depth = 0.41"	for 10-YR event	
Inflow =	1.30 cfs @ 12.18 hrs, Volume=	0.180 af	
Outflow =	1.30 cfs @ 12.18 hrs, Volume=	0.180 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.30 cfs @ 12.18 hrs, Volume=	0.180 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,049.69' @ 12.18 hrs
Flood Elev= 2,052.44'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,049.10'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,048.75' S= 0.0117 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.29 cfs @ 12.18 hrs HW=2,049.68' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.29 cfs @ 3.37 fps)

Pond CV307: CV307



Pond CV308: CV308

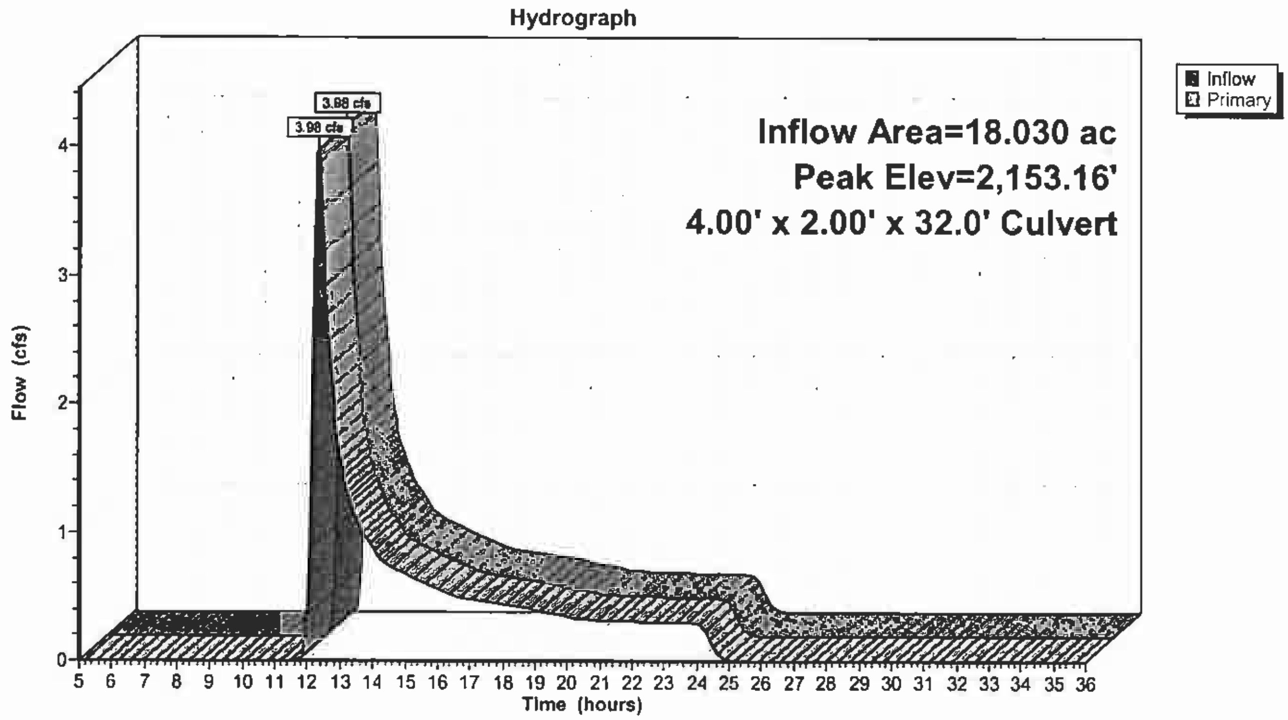
Inflow Area =	18.030 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	3.98 cfs @	12.33 hrs, Volume=	0.676 af	
Outflow =	3.98 cfs @	12.33 hrs, Volume=	0.676 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.98 cfs @	12.33 hrs, Volume=	0.676 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,153.16' @ 12.33 hrs
Flood Elev= 2,156.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,152.50'	**4.00' W x 2.00' H x 32.0' long Culvert** Box, headwall w/3 square edges, Ke= 0.500 Outlet Invert= 2,152.25' S= 0.0078 '/' Cc= 0.900 n= 0.040

Primary OutFlow Max=3.95 cfs @ 12.33 hrs HW=2,153.16' (Free Discharge)
└─1=**Culvert** (Barrel Controls 3.95 cfs @ 2.00 fps)

Pond CV308: CV308



Pond CV309: CV309

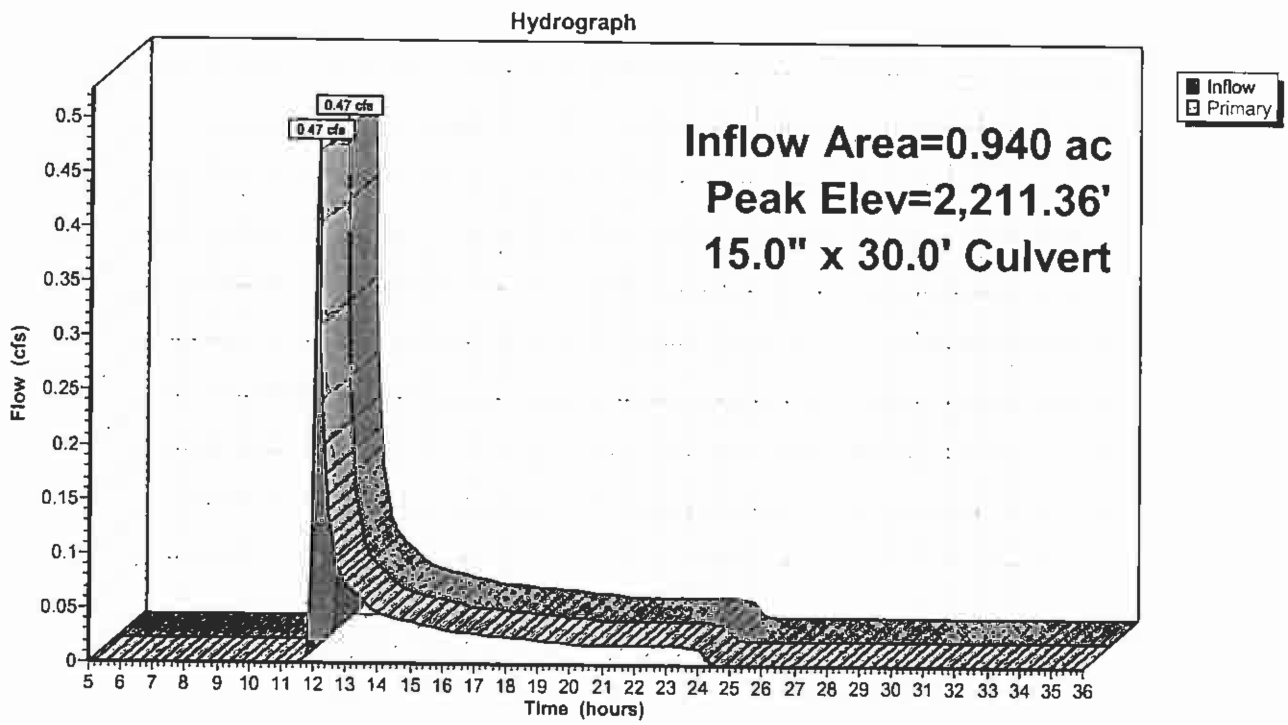
Inflow Area =	0.940 ac,	Inflow Depth = 0.53"	for 10-YR event		
Inflow =	0.47 cfs @	12.09 hrs,	Volume=	0.042 af	
Outflow =	0.47 cfs @	12.09 hrs,	Volume=	0.042 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.47 cfs @	12.09 hrs,	Volume=	0.042 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,211.36' @ 12.09 hrs
Flood Elev= 2,215.00'

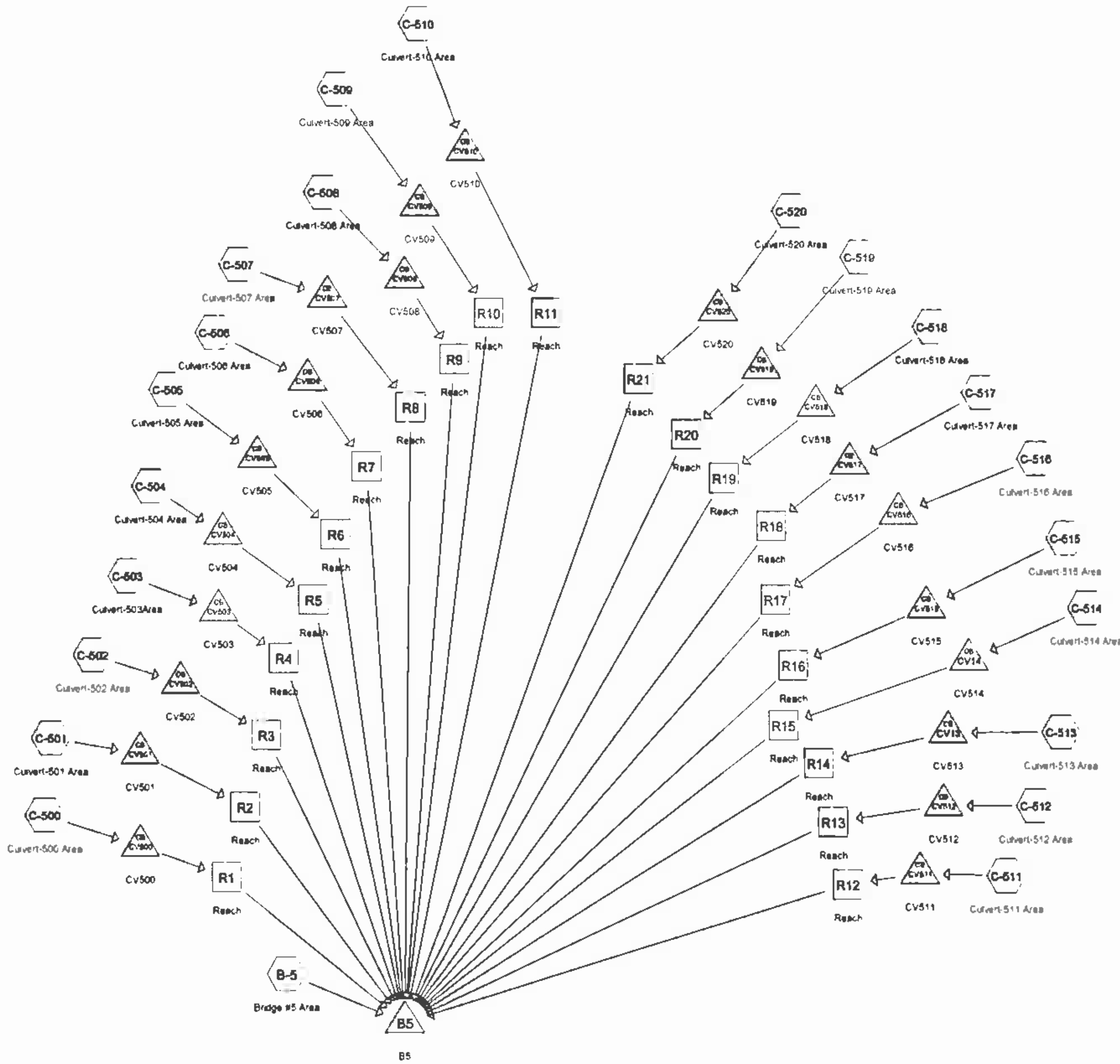
Device	Routing	Invert	Outlet Devices
#1	Primary	2,211.00'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,210.75' S= 0.0083 '/' Cc= 0.900 n= 0.015

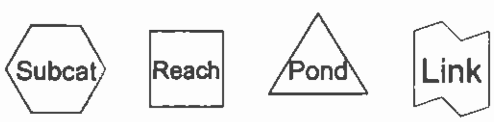
Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=2,211.36' (Free Discharge)
└─1=Culvert (Barrel Controls 0.46 cfs @ 2.41 fps)

Pond CV309: CV309



Existing Road Culverts (500 Series)
(Dixville Road)





Drainage Diagram for Xrds-Culvert-SIZING500-
Prepared by Horizons Engineering, PLLC (JCD) 7/10/2008
HydroCAD® 8.00 s/n 002765 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.138	36	Brush, Good, HSG B (B-5)
38.084	42	Woods, Good, HSG B (B-5)
4.706	49	Brush, Good, HSG C (B-5,C-502,C-503,C-504,C-505,C-511,C-512,C-518,C-519,C-520)
200.198	53	Woods, Good, HSG C (B-5,C-500,C-501,C-502,C-503,C-504,C-505,C-511,C-512,C-518,C-5
15.775	55	Brush, Good, HSG D (B-5,C-500,C-501,C-502,C-505,C-506,C-507,C-508,C-509,C-510,C-51
1,067.618	58	Woods, Good, HSG D (B-5,C-500,C-501,C-502,C-503,C-504,C-505,C-506,C-507,C-508,C-5
11.227	89	Gravel roads, HSG C (B-5,C-500,C-501,C-502,C-503,C-504,C-505,C-506,C-507,C-508,C-5(
1,337.746		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment B-5: Bridge #5 Area Runoff Area=1,027.591 ac Runoff Depth=0.58"
Flow Length=16,406' Tc=76.5 min CN=57 Runoff=177.97 cfs 49.284 af

Subcatchment C-500: Culvert-500 Area Runoff Area=21.750 ac Runoff Depth=0.49"
Flow Length=2,267' Tc=34.1 min CN=55 Runoff=5.02 cfs 0.889 af

Subcatchment C-501: Culvert-501 Area Runoff Area=11.910 ac Runoff Depth=0.58"
Flow Length=1,849' Tc=26.9 min CN=57 Runoff=4.24 cfs 0.571 af

Subcatchment C-502: Culvert-502 Area Runoff Area=5.150 ac Runoff Depth=0.62"
Flow Length=1,453' Tc=22.0 min CN=58 Runoff=2.39 cfs 0.266 af

Subcatchment C-503: Culvert-503Area Runoff Area=9.680 ac Runoff Depth=0.58"
Flow Length=1,848' Tc=48.3 min CN=57 Runoff=2.29 cfs 0.464 af

Subcatchment C-504: Culvert-504 Area Runoff Area=11.750 ac Runoff Depth=0.53"
Flow Length=2,071' Tc=28.9 min CN=56 Runoff=3.49 cfs 0.521 af

Subcatchment C-505: Culvert-505 Area Runoff Area=26.050 ac Runoff Depth=0.62"
Flow Length=2,135' Tc=26.7 min CN=58 Runoff=10.55 cfs 1.346 af

Subcatchment C-506: Culvert-506 Area Runoff Area=0.520 ac Runoff Depth=0.76"
Flow Length=426' Tc=15.3 min CN=61 Runoff=0.42 cfs 0.033 af

Subcatchment C-507: Culvert-507 Area Runoff Area=13.210 ac Runoff Depth=0.62"
Flow Length=1,980' Tc=45.4 min CN=58 Runoff=3.67 cfs 0.683 af

Subcatchment C-508: Culvert-508 Area Runoff Area=36.140 ac Runoff Depth=0.62"
Flow Length=4,218' Tc=47.1 min CN=58 Runoff=9.77 cfs 1.868 af

Subcatchment C-509: Culvert-509 Area Runoff Area=6.160 ac Runoff Depth=0.62"
Flow Length=1,053' Tc=22.2 min CN=58 Runoff=2.84 cfs 0.318 af

Subcatchment C-510: Culvert-510 Area Runoff Area=4.490 ac Runoff Depth=0.67"
Flow Length=564' Tc=19.3 min CN=59 Runoff=2.55 cfs 0.249 af

Subcatchment C-511: Culvert-511 Area Runoff Area=79.040 ac Runoff Depth=0.62"
Flow Length=4,354' Tc=50.2 min CN=58 Runoff=20.42 cfs 4.085 af

Subcatchment C-512: Culvert-512 Area Runoff Area=1.850 ac Runoff Depth=0.58"
Flow Length=652' Tc=12.3 min CN=57 Runoff=1.11 cfs 0.089 af

Subcatchment C-513: Culvert-513 Area Runoff Area=2.870 ac Runoff Depth=0.67"
Flow Length=352' Tc=25.8 min CN=59 Runoff=1.33 cfs 0.159 af

Subcatchment C-514: Culvert-514 Area Runoff Area=12.830 ac Runoff Depth=0.62"
Flow Length=2,938' Tc=28.1 min CN=58 Runoff=5.00 cfs 0.663 af

Subcatchment C-515: Culvert-515 Area Runoff Area=4.470 ac Runoff Depth=0.67"
Flow Length=797' Tc=18.4 min CN=59 Runoff=2.62 cfs 0.248 af

Subcatchment C-516: Culvert-516 Area Runoff Area=18.210 ac Runoff Depth=0.62"
Flow Length=3,756' Tc=48.2 min CN=58 Runoff=4.87 cfs 0.941 af

Subcatchment C-517: Culvert-517 Area Runoff Area=10.440 ac Runoff Depth=0.62"
Flow Length=2,442' Tc=22.8 min CN=58 Runoff=4.72 cfs 0.540 af

Subcatchment C-518: Culvert-518 Area Runoff Area=14.375 ac Runoff Depth=0.58"
Flow Length=3,029' Tc=42.8 min CN=57 Runoff=3.71 cfs 0.689 af

Subcatchment C-519: Culvert-519 Area Runoff Area=3.960 ac Runoff Depth=0.58"
Flow Length=2,674' Tc=27.1 min CN=57 Runoff=1.40 cfs 0.190 af

Subcatchment C-520: Culvert-520 Area Runoff Area=15.300 ac Runoff Depth=0.58"
Flow Length=2,820' Tc=41.0 min CN=57 Runoff=4.05 cfs 0.734 af

Reach R1: Reach Avg. Depth=0.39' Max Vel=5.34 fps Inflow=5.02 cfs 0.889 af
n=0.040 L=410.0' S=0.1024 '/' Capacity=97.94 cfs Outflow=4.98 cfs 0.889 af

Reach R10: Reach Avg. Depth=0.10' Max Vel=1.86 fps Inflow=2.84 cfs 0.318 af
n=0.040 L=4,404.0' S=0.0525 '/' Capacity=249.98 cfs Outflow=1.19 cfs 0.318 af

Reach R11: Reach Avg. Depth=0.09' Max Vel=1.73 fps Inflow=2.55 cfs 0.249 af
n=0.040 L=4,699.0' S=0.0577 '/' Capacity=262.12 cfs Outflow=0.90 cfs 0.249 af

Reach R12: Reach Avg. Depth=0.52' Max Vel=5.36 fps Inflow=20.42 cfs 4.085 af
n=0.040 L=4,889.0' S=0.0599 '/' Capacity=267.20 cfs Outflow=18.12 cfs 4.084 af

Reach R13: Reach Avg. Depth=0.03' Max Vel=1.02 fps Inflow=1.11 cfs 0.089 af
n=0.040 L=4,992.0' S=0.0633 '/' Capacity=274.61 cfs Outflow=0.20 cfs 0.089 af

Reach R14: Reach Avg. Depth=0.05' Max Vel=1.09 fps Inflow=1.33 cfs 0.159 af
n=0.040 L=7,213.0' S=0.0495 '/' Capacity=242.82 cfs Outflow=0.31 cfs 0.159 af

Reach R15: Reach Avg. Depth=0.13' Max Vel=1.88 fps Inflow=5.00 cfs 0.663 af
n=0.040 L=9,369.0' S=0.0393 '/' Capacity=216.32 cfs Outflow=1.54 cfs 0.659 af

Reach R16: Reach Avg. Depth=0.06' Max Vel=1.14 fps Inflow=2.62 cfs 0.248 af
n=0.040 L=9,400.0' S=0.0383 '/' Capacity=213.60 cfs Outflow=0.42 cfs 0.245 af

Reach R17: Reach Avg. Depth=0.16' Max Vel=2.19 fps Inflow=4.87 cfs 0.941 af
n=0.040 L=9,877.0' S=0.0409 '/' Capacity=220.75 cfs Outflow=2.22 cfs 0.935 af

Reach R18: Reach Avg. Depth=0.10' Max Vel=1.65 fps Inflow=4.72 cfs 0.540 af
n=0.040 L=10,879.0' S=0.0415 '/' Capacity=222.48 cfs Outflow=1.05 cfs 0.533 af

Reach R19: Reach Avg. Depth=0.12' Max Vel=1.83 fps Inflow=3.71 cfs 0.689 af
n=0.040 L=11,348.0' S=0.0434 '/' Capacity=227.27 cfs Outflow=1.32 cfs 0.681 af

Reach R2: Reach Avg. Depth=0.42' Max Vel=3.98 fps Inflow=4.24 cfs 0.571 af
n=0.040 L=1,050.0' S=0.0524 '/' Capacity=70.04 cfs Outflow=4.05 cfs 0.571 af

Reach R20: Reach Avg. Depth=0.04' Max Vel=0.94 fps Inflow=1.40 cfs 0.190 af
n=0.040 L=11,884.0' S=0.0423 '/' Capacity=224.55 cfs Outflow=0.23 cfs 0.182 af

Reach R21: Reach Avg. Depth=0.12' Max Vel=1.85 fps Inflow=4.05 cfs 0.734 af
n=0.040 L=11,895.0' S=0.0428 '/' Capacity=225.78 cfs Outflow=1.38 cfs 0.723 af

Reach R3: Reach Avg. Depth=0.14' Max Vel=1.84 fps Inflow=2.39 cfs 0.266 af
n=0.040 L=1,668.0' S=0.0342 '/' Capacity=201.77 cfs Outflow=1.64 cfs 0.266 af

Reach R4: Reach Avg. Depth=0.16' Max Vel=1.98 fps Inflow=2.29 cfs 0.464 af
n=0.040 L=2,118.0' S=0.0349 '/' Capacity=204.02 cfs Outflow=1.95 cfs 0.464 af

Reach R5: Reach Avg. Depth=0.19' Max Vel=2.22 fps Inflow=3.49 cfs 0.521 af
n=0.040 L=2,280.0' S=0.0360 '/' Capacity=206.99 cfs Outflow=2.54 cfs 0.521 af

Reach R6: Reach Avg. Depth=0.38' Max Vel=3.60 fps Inflow=10.55 cfs 1.346 af
n=0.040 L=2,290.0' S=0.0393 '/' Capacity=216.38 cfs Outflow=8.66 cfs 1.346 af

Reach R7: Reach Avg. Depth=0.02' Max Vel=0.65 fps Inflow=0.42 cfs 0.033 af
n=0.040 L=3,262.0' S=0.0420 '/' Capacity=223.68 cfs Outflow=0.08 cfs 0.033 af

Reach R8: Reach Avg. Depth=0.18' Max Vel=2.34 fps Inflow=3.67 cfs 0.683 af
n=0.040 L=3,763.0' S=0.0404 '/' Capacity=219.37 cfs Outflow=2.67 cfs 0.683 af

Reach R9: Reach Avg. Depth=0.35' Max Vel=3.65 fps Inflow=9.77 cfs 1.868 af
n=0.040 L=4,042.0' S=0.0443 '/' Capacity=229.69 cfs Outflow=8.13 cfs 1.868 af

Pond B5: B5 Inflow=220.57 cfs 64.783 af
Primary=220.57 cfs 64.783 af

Pond CV13: CV513 Peak Elev=2,528.86' Inflow=1.33 cfs 0.159 af
15.0" x 30.0' Culvert Outflow=1.33 cfs 0.159 af

Pond CV14: CV514 Peak Elev=2,541.09' Inflow=5.00 cfs 0.663 af
15.0" x 40.0' Culvert Outflow=5.00 cfs 0.663 af

Pond CV500: CV500 Peak Elev=2,216.11' Inflow=5.02 cfs 0.889 af
18.0" x 35.0' Culvert Outflow=5.02 cfs 0.889 af

Pond CV501: CV501 Peak Elev=2,227.42' Inflow=4.24 cfs 0.571 af
15.0" x 30.0' Culvert Outflow=4.24 cfs 0.571 af

Pond CV502: CV502 Peak Elev=2,237.21' Inflow=2.39 cfs 0.266 af
18.0" x 40.0' Culvert Outflow=2.39 cfs 0.266 af

Pond CV503: CV503	Peak Elev=2,246.52' Inflow=2.29 cfs 0.464 af	
	15.0" x 30.0' Culvert Outflow=2.29 cfs 0.464 af	
Pond CV504: CV504	Peak Elev=2,254.10' Inflow=3.49 cfs 0.521 af	
	15.0" x 30.0' Culvert Outflow=3.49 cfs 0.521 af	
Pond CV505: CV505	Peak Elev=2,263.45' Inflow=10.55 cfs 1.346 af	
	18.0" x 35.0' Culvert Outflow=10.55 cfs 1.346 af	
Pond CV506: CV506	Peak Elev=2,309.55' Inflow=0.42 cfs 0.033 af	
	15.0" x 40.0' Culvert Outflow=0.42 cfs 0.033 af	
Pond CV507: CV507	Peak Elev=2,324.77' Inflow=3.67 cfs 0.683 af	
	15.0" x 45.0' Culvert Outflow=3.67 cfs 0.683 af	
Pond CV508: CV508	Peak Elev=2,353.57' Inflow=9.77 cfs 1.868 af	
	18.0" x 40.0' Culvert Outflow=9.77 cfs 1.868 af	
Pond CV509: CV509	Peak Elev=2,403.78' Inflow=2.84 cfs 0.318 af	
	24.0" x 45.0' Culvert Outflow=2.84 cfs 0.318 af	
Pond CV510: CV510	Peak Elev=2,447.56' Inflow=2.55 cfs 0.249 af	
	15.0" x 40.0' Culvert Outflow=2.55 cfs 0.249 af	
Pond CV511: CV511	Peak Elev=2,477.57' Inflow=20.42 cfs 4.085 af	
	24.0" x 68.0' Culvert Outflow=20.42 cfs 4.085 af	
Pond CV512: CV512	Peak Elev=2,487.94' Inflow=1.11 cfs 0.089 af	
	15.0" x 40.0' Culvert Outflow=1.11 cfs 0.089 af	
Pond CV515: CV515	Peak Elev=2,536.82' Inflow=2.62 cfs 0.248 af	
	15.0" x 78.0' Culvert Outflow=2.62 cfs 0.248 af	
Pond CV516: CV516	Peak Elev=2,577.65' Inflow=4.87 cfs 0.941 af	
	15.0" x 38.0' Culvert Outflow=4.87 cfs 0.941 af	
Pond CV517: CV517	Peak Elev=2,624.62' Inflow=4.72 cfs 0.540 af	
	15.0" x 36.0' Culvert Outflow=4.72 cfs 0.540 af	
Pond CV518: CV518	Peak Elev=2,664.46' Inflow=3.71 cfs 0.689 af	
	15.0" x 38.0' Culvert Outflow=3.71 cfs 0.689 af	
Pond CV519: CV519	Peak Elev=2,675.01' Inflow=1.40 cfs 0.190 af	
	15.0" x 38.0' Culvert Outflow=1.40 cfs 0.190 af	
Pond CV520: CV520	Peak Elev=2,681.39' Inflow=4.05 cfs 0.734 af	
	15.0" x 38.0' Culvert Outflow=4.05 cfs 0.734 af	

Total Runoff Area = 1,337.746 ac Runoff Volume = 64.831 af Average Runoff Depth = 0.58"
100.00% Pervious Area = 1,337.746 ac 0.00% Impervious Area = 0.000 ac

Subcatchment B-5: Bridge #5 Area

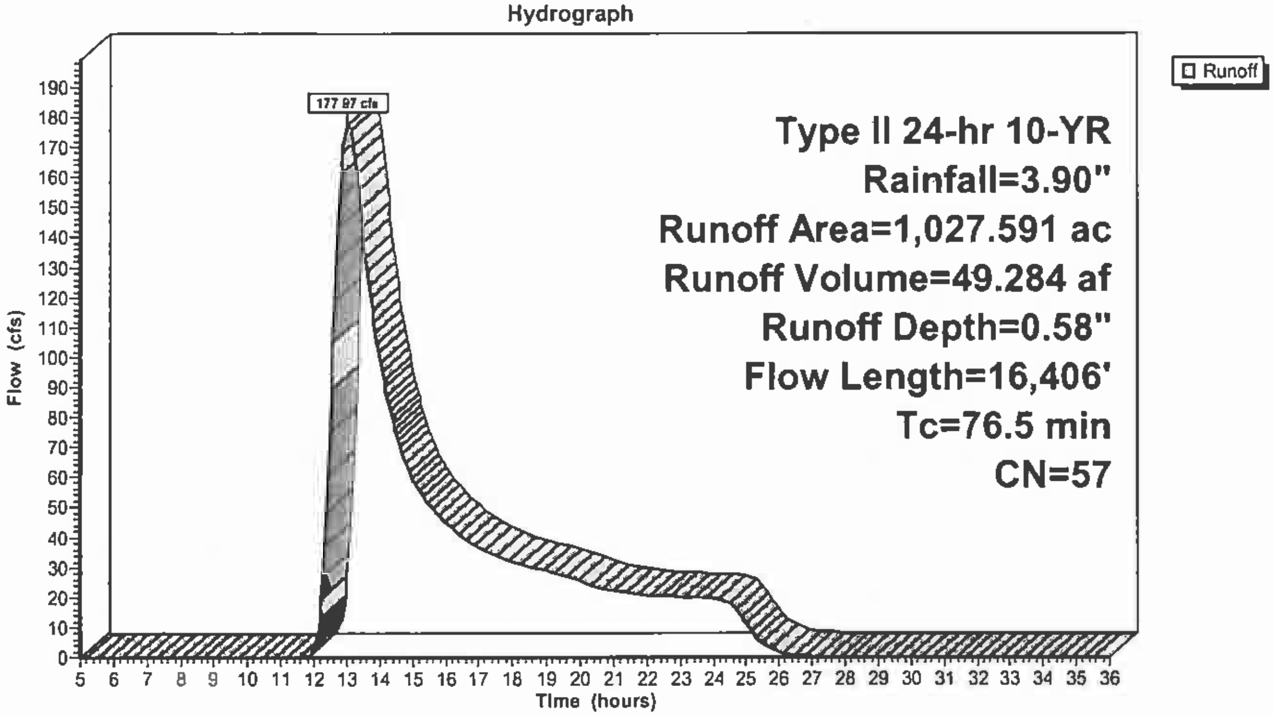
Runoff = 177.97 cfs @ 13.02 hrs, Volume= 49.284 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
9.402	89	Gravel roads, HSG C
0.138	36	Brush, Good, HSG B
38.084	42	Woods, Good, HSG B
4.176	49	Brush, Good, HSG C
169.288	53	Woods, Good, HSG C
13.535	55	Brush, Good, HSG D
792.968	58	Woods, Good, HSG D
1,027.591	57	Weighted Average
1,027.591		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
33.0	3,286	0.1100	1.66		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
23.6	13,020	0.0320	9.19	195.25	**Trap/Vee/Rect Channel Flow, stream** Bot.W=6.00' D=2.50' Z= 1.0 '/' Top.W=11.00' n= 0.040
76.5	16,406	Total			

Subcatchment B-5: Bridge #5 Area



Subcatchment C-500: Culvert-500 Area

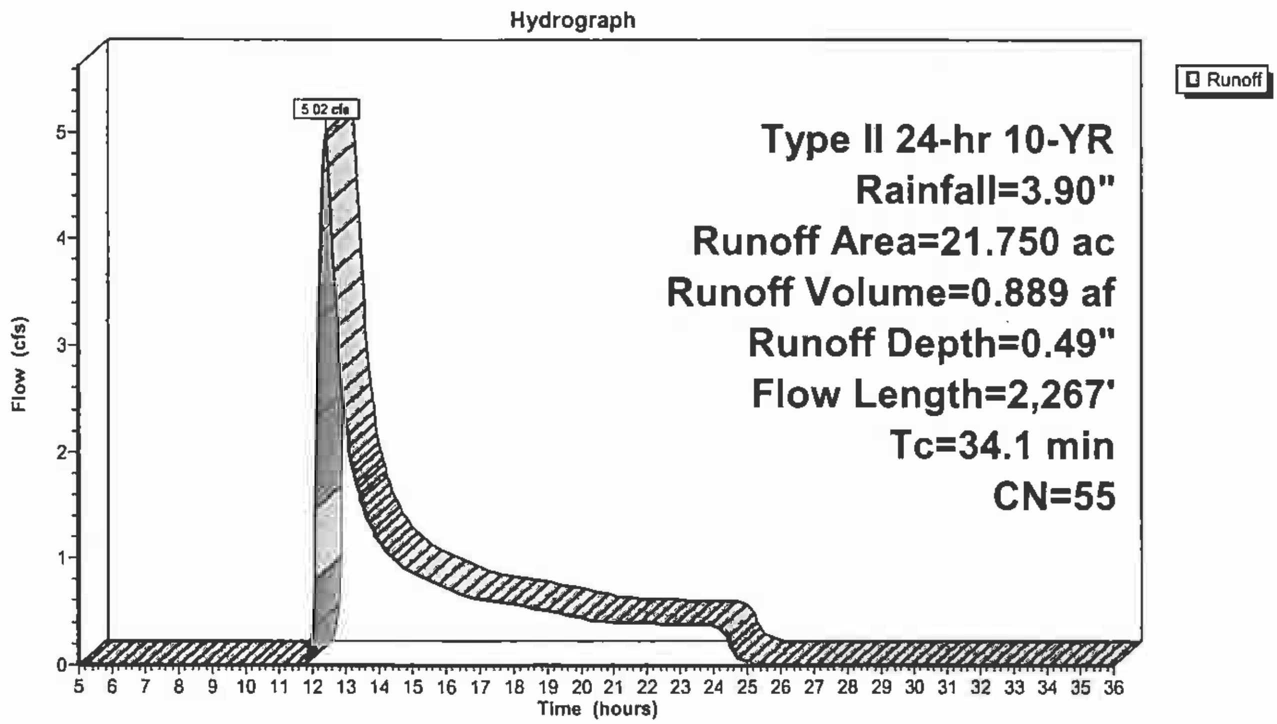
Runoff = 5.02 cfs @ 12.40 hrs, Volume= 0.889 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
12.040	53	Woods, Good, HSG C
0.130	55	Brush, Good, HSG D
9.490	58	Woods, Good, HSG D
21.750	55	Weighted Average
21.750		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
23.7	2,167	0.0930	1.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
34.1	2,267	Total			

Subcatchment C-500: Culvert-500 Area



Subcatchment C-501: Culvert-501 Area

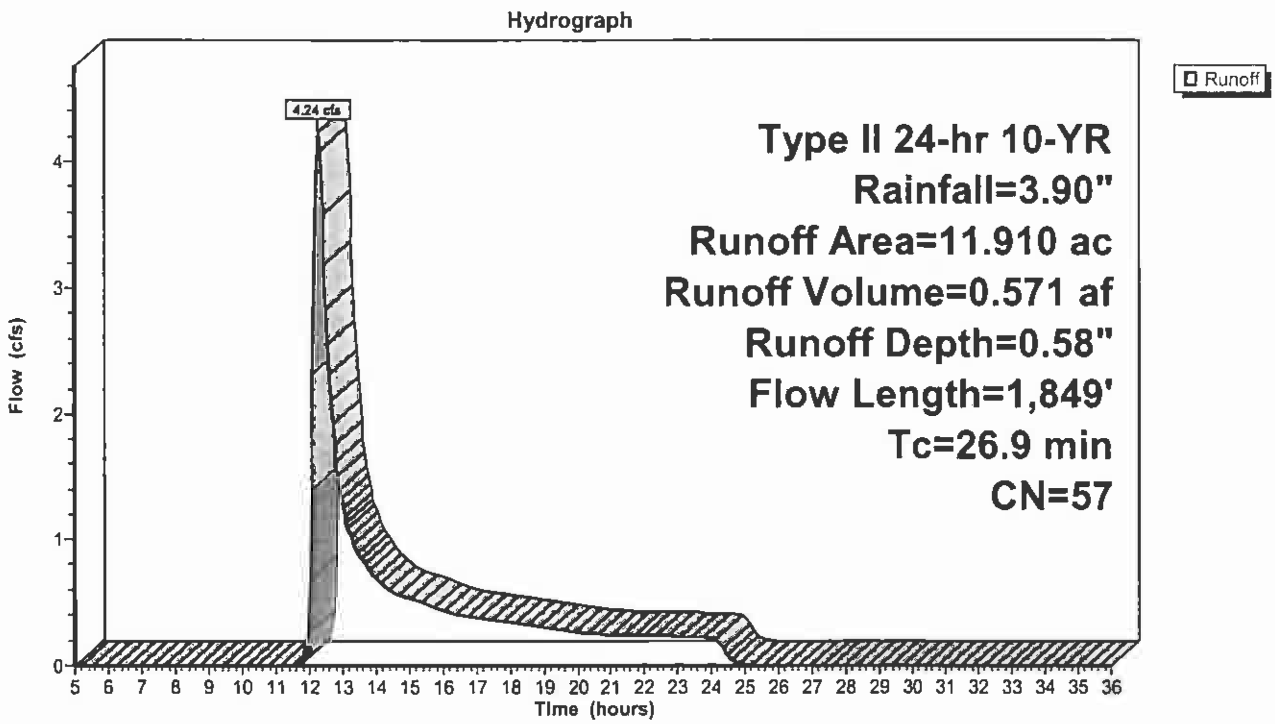
Runoff = 4.24 cfs @ 12.27 hrs, Volume= 0.571 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
2.790	53	Woods, Good, HSG C
0.100	55	Brush, Good, HSG D
8.920	58	Woods, Good, HSG D
11.910	57	Weighted Average
11.910		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
16.0	1,536	0.1030	1.60		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.5	213	0.0380	7.70	92.40	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
26.9	1,849	Total			

Subcatchment C-501: Culvert-501 Area



Subcatchment C-502: Culvert-502 Area

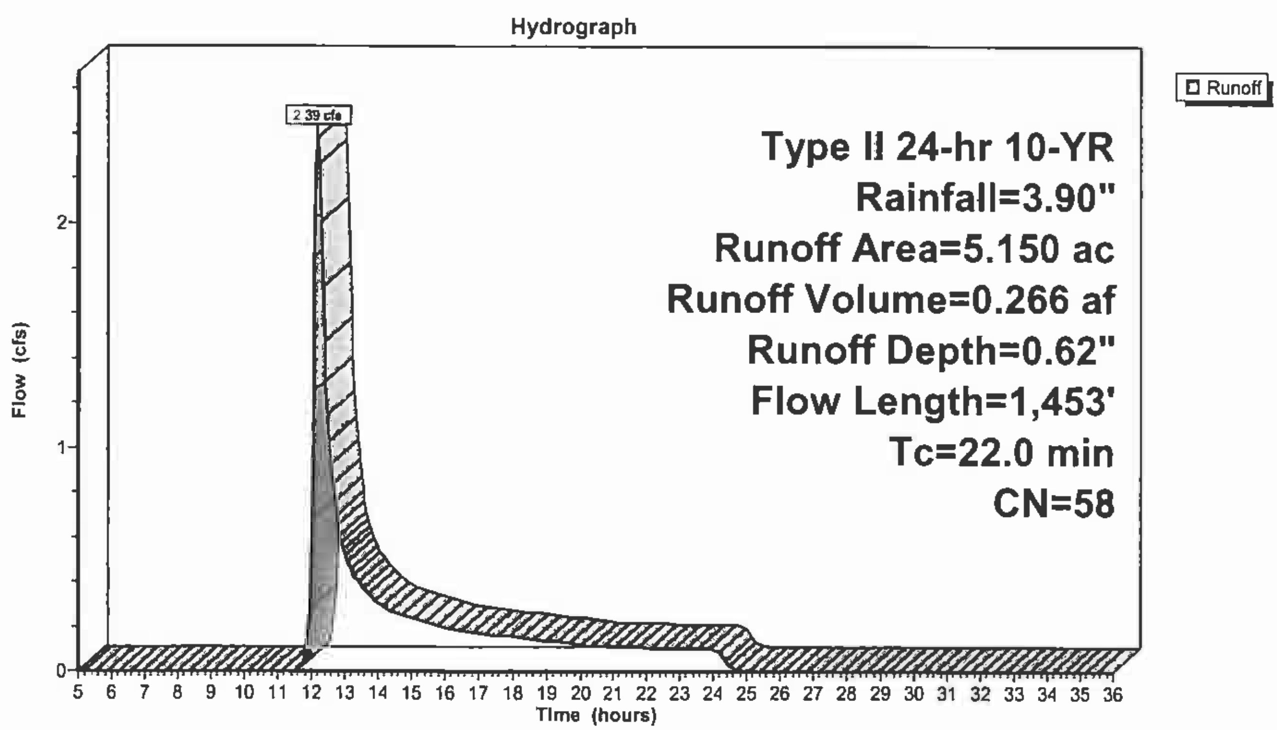
Runoff = 2.39 cfs @ 12.20 hrs, Volume= 0.266 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.020	49	Brush, Good, HSG C
0.430	53	Woods, Good, HSG C
0.040	55	Brush, Good, HSG D
4.600	58	Woods, Good, HSG D
5.150	58	Weighted Average
5.150		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.5	1,267	0.1150	1.70		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	86	0.0700	7.33	43.95	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.040
22.0	1,453	Total			

Subcatchment C-502: Culvert-502 Area



Subcatchment C-503: Culvert-503Area

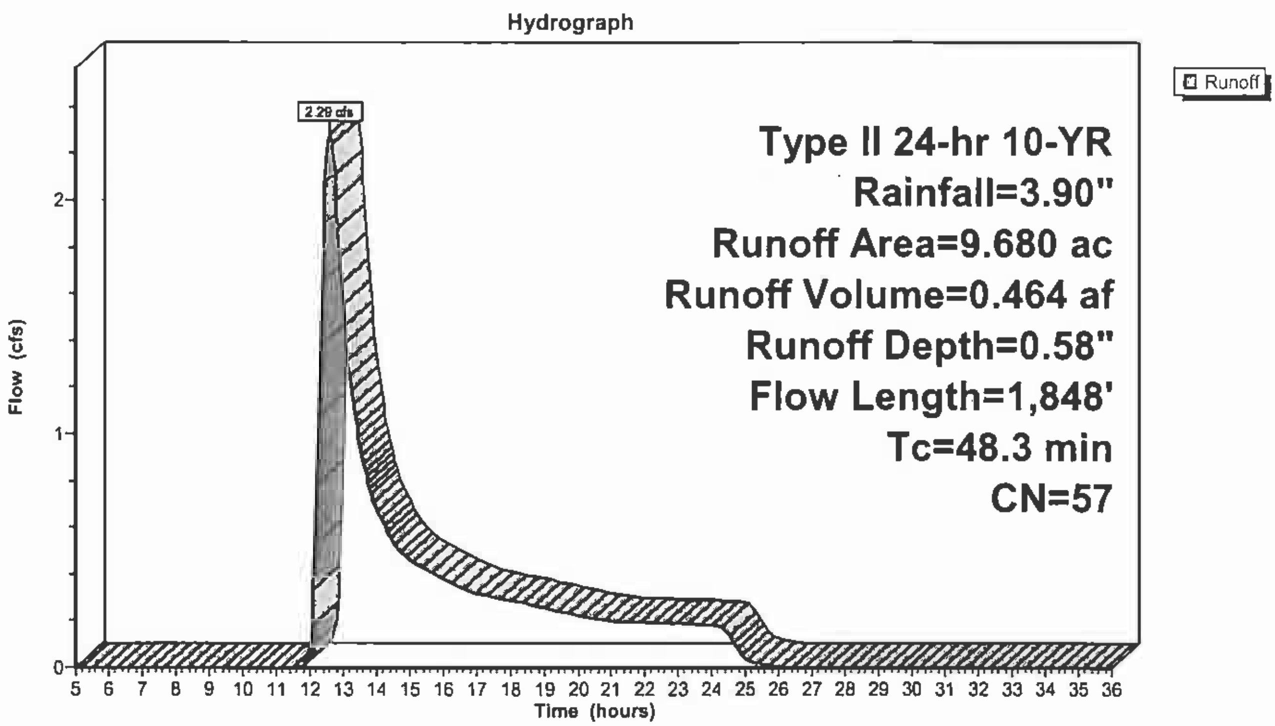
Runoff = 2.29 cfs @ 12.60 hrs, Volume= 0.464 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.030	49	Brush, Good, HSG C
1.880	53	Woods, Good, HSG C
7.710	58	Woods, Good, HSG D
9.680	57	Weighted Average
9.680		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.1	1,610	0.0990	1.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	138	0.0430	5.16	15.48	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=1.00' Z= 2.0 '/' Top.W=5.00' n= 0.040
48.3	1,848	Total			

Subcatchment C-503: Culvert-503Area



Subcatchment C-504: Culvert-504 Area

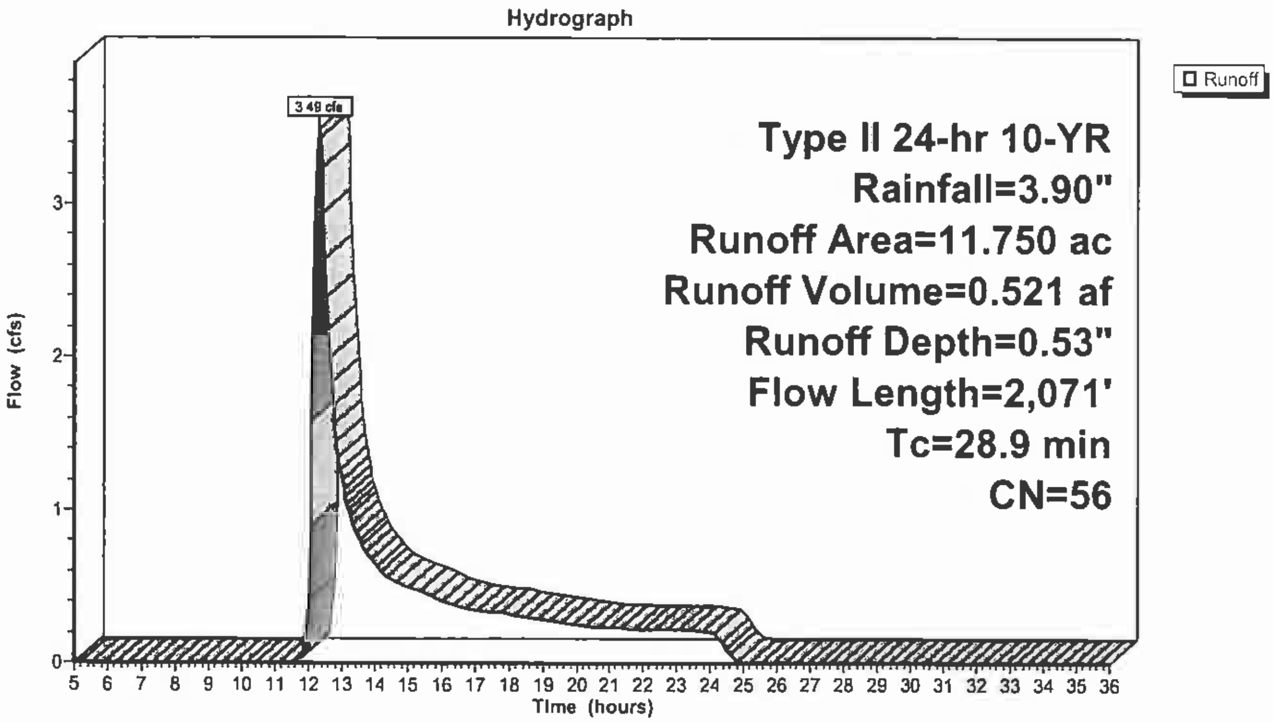
Runoff = 3.49 cfs @ 12.31 hrs, Volume= 0.521 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.050	49	Brush, Good, HSG C
4.540	53	Woods, Good, HSG C
7.110	58	Woods, Good, HSG D
11.750	56	Weighted Average
11.750		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.7	1,971	0.1990	2.23		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
28.9	2,071	Total			

Subcatchment C-504: Culvert-504 Area



Subcatchment C-505: Culvert-505 Area

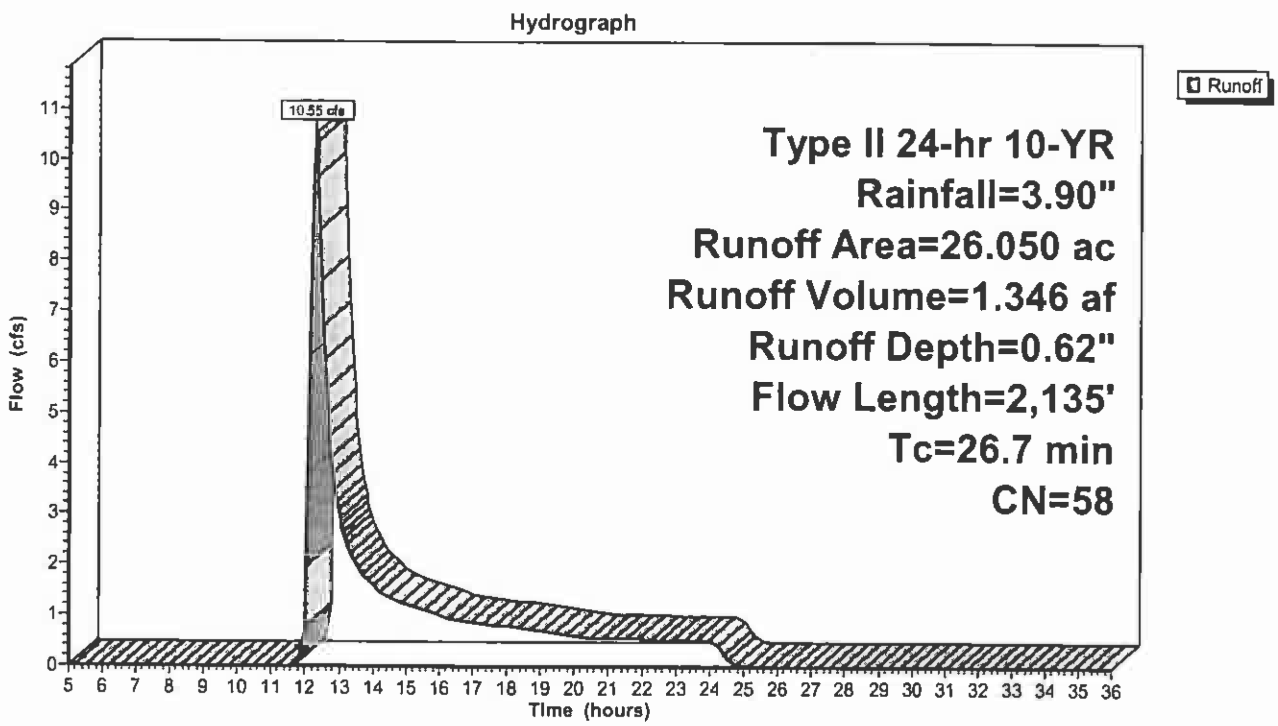
Runoff = 10.55 cfs @ 12.27 hrs, Volume= 1.346 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
1.100	53	Woods, Good, HSG C
0.110	55	Brush, Good, HSG D
24.650	58	Woods, Good, HSG D
26.050	58	Weighted Average
26.050		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.9	1,861	0.1990	2.23		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	174	0.0460	2.94	1.47	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=0.50' Z= 2.0 '/' Top.W=2.00' n= 0.040
26.7	2,135	Total			

Subcatchment C-505: Culvert-505 Area



Subcatchment C-506: Culvert-506 Area

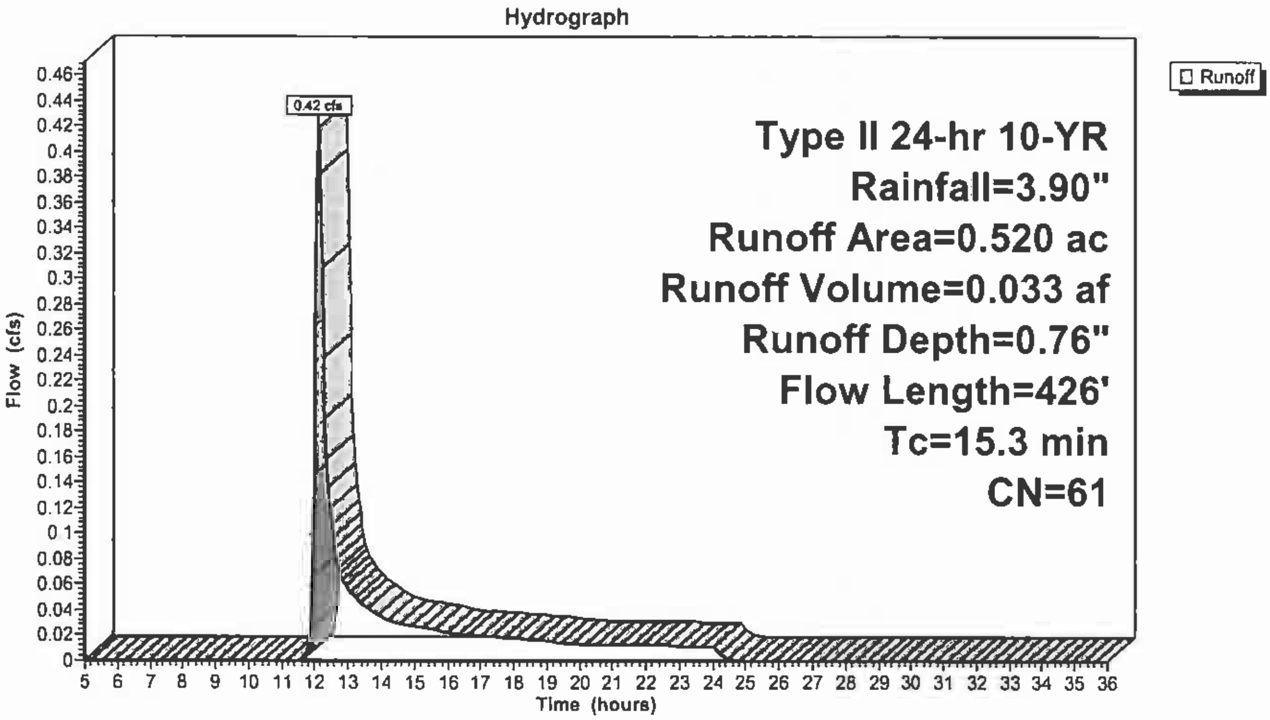
Runoff = 0.42 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.060	55	Brush, Good, HSG D
0.410	58	Woods, Good, HSG D
0.520	61	Weighted Average
0.520		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.0	326	0.1350	1.84		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
15.3	426	Total			

Subcatchment C-506: Culvert-506 Area



Subcatchment C-507: Culvert-507 Area

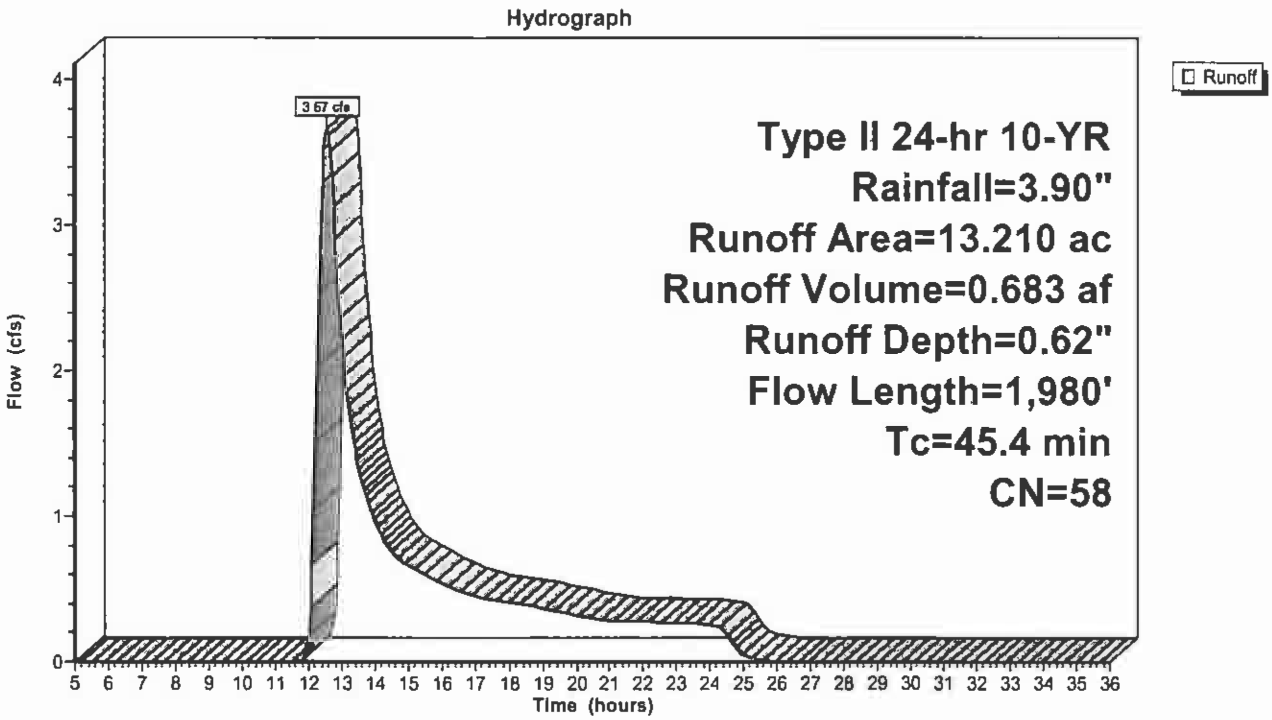
Runoff = 3.67 cfs @ 12.55 hrs, Volume= 0.683 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.060	55	Brush, Good, HSG D
13.090	58	Woods, Good, HSG D
13.210	58	Weighted Average
13.210		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0100	0.05		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.6	1,880	0.1830	2.14		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
45.4	1,980	Total			

Subcatchment C-507: Culvert-507 Area



Subcatchment C-508: Culvert-508 Area

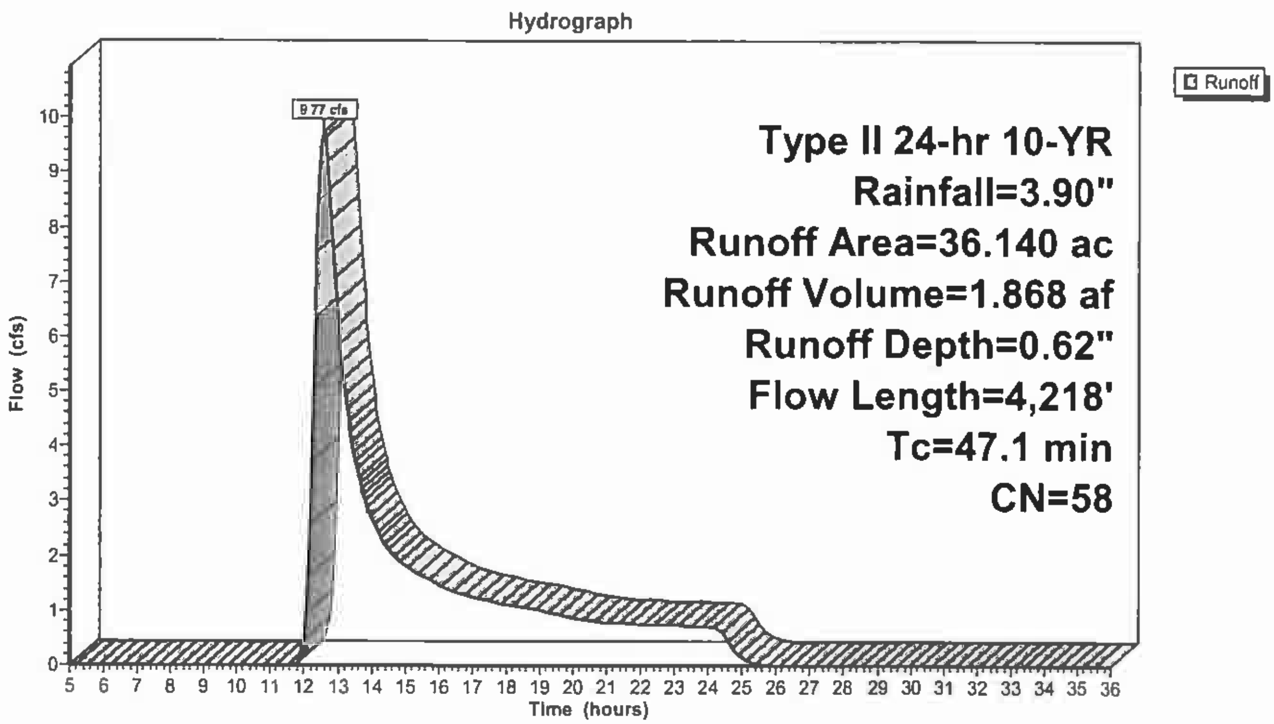
Runoff = 9.77 cfs @ 12.57 hrs, Volume= 1.868 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.140	55	Brush, Good, HSG D
35.910	58	Woods, Good, HSG D
36.140	58	Weighted Average
36.140		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
27.2	4,118	0.2550	2.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
47.1	4,218	Total			

Subcatchment C-508: Culvert-508 Area



Subcatchment C-509: Culvert-509 Area

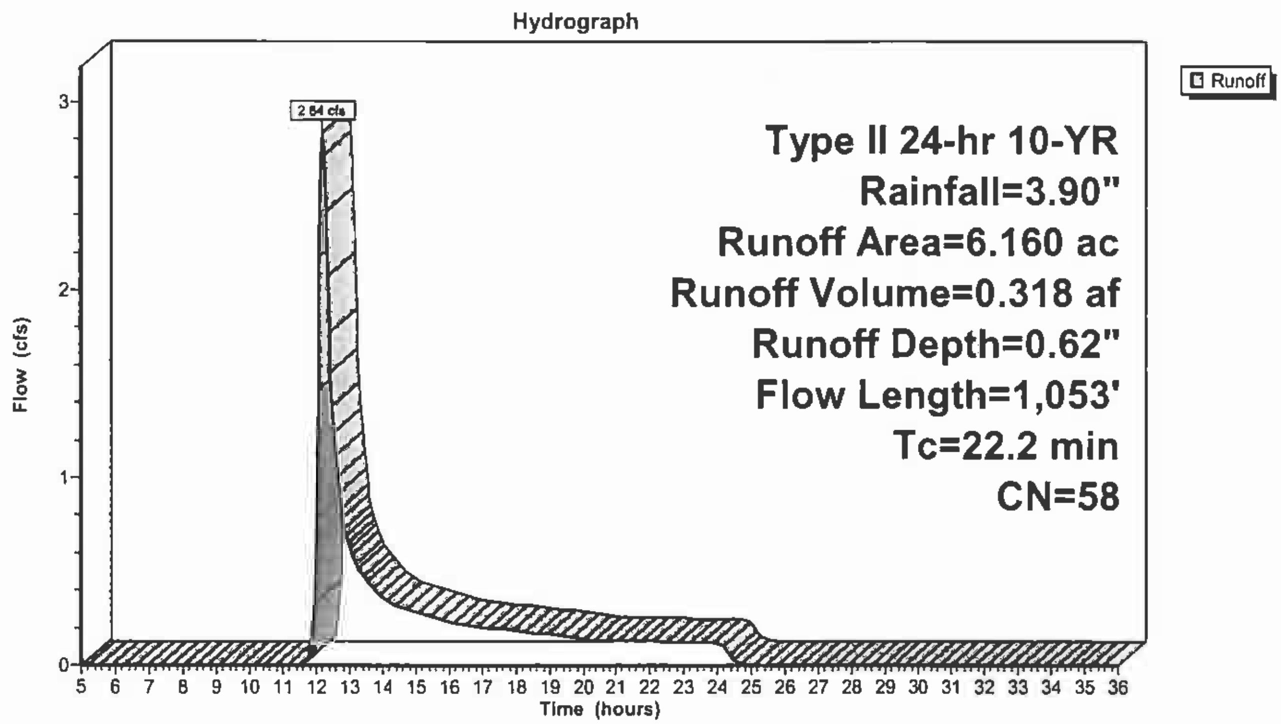
Runoff = 2.84 cfs @ 12.20 hrs, Volume= 0.318 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.120	55	Brush, Good, HSG D
5.950	58	Woods, Good, HSG D
6.160	58	Weighted Average
6.160		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
5.9	812	0.2110	2.30		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	141	0.1800	15.82	158.20	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=1.00' D=2.00' Z= 2.0 '/' Top.W=9.00' n= 0.040
22.2	1,053	Total			

Subcatchment C-509: Culvert-509 Area



Subcatchment C-510: Culvert-510 Area

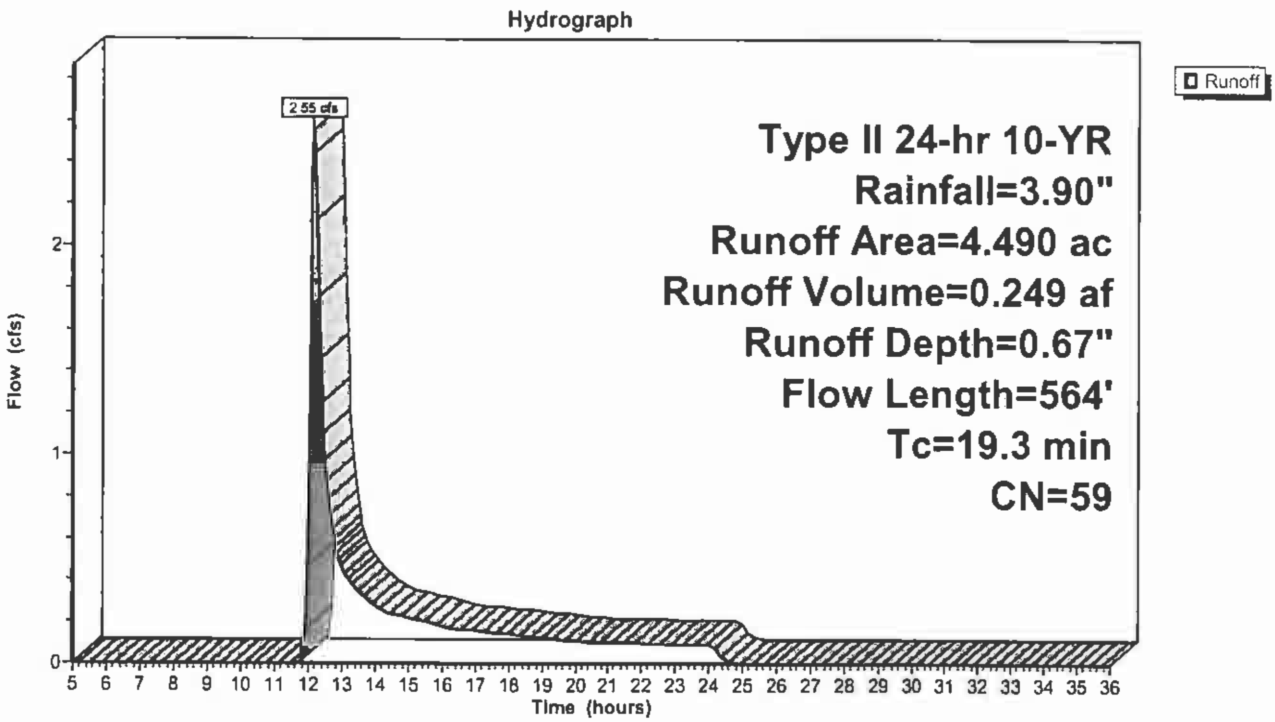
Runoff = 2.55 cfs @ 12.16 hrs, Volume= 0.249 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.270	55	Brush, Good, HSG D
4.110	58	Woods, Good, HSG D
4.490	59	Weighted Average
4.490		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.1	464	0.2540	2.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
19.3	564	Total			

Subcatchment C-510: Culvert-510 Area



Subcatchment C-511: Culvert-511 Area

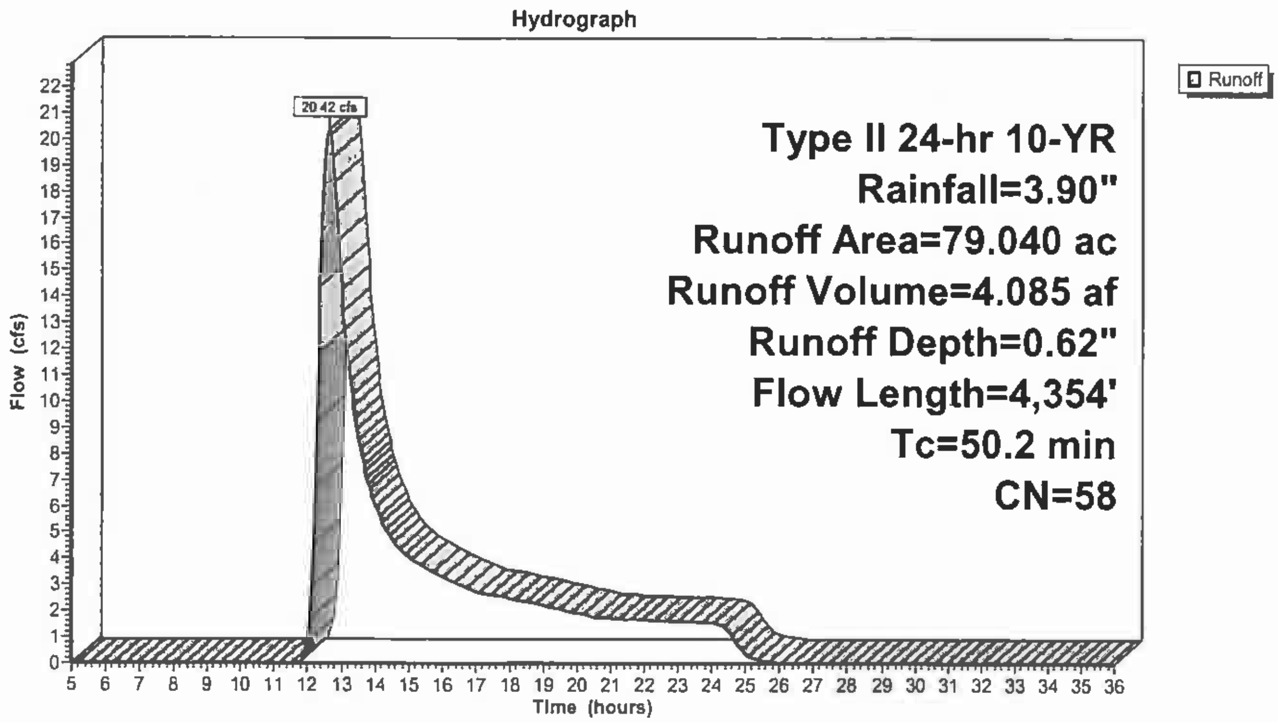
Runoff = 20.42 cfs @ 12.62 hrs, Volume= 4.085 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.030	49	Brush, Good, HSG C
0.100	53	Woods, Good, HSG C
0.460	55	Brush, Good, HSG D
78.410	58	Woods, Good, HSG D
79.040	58	Weighted Average
79.040		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	100	0.0300	0.08		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
30.3	4,254	0.2190	2.34		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
50.2	4,354	Total			

Subcatchment C-511: Culvert-511 Area



Subcatchment C-512: Culvert-512 Area

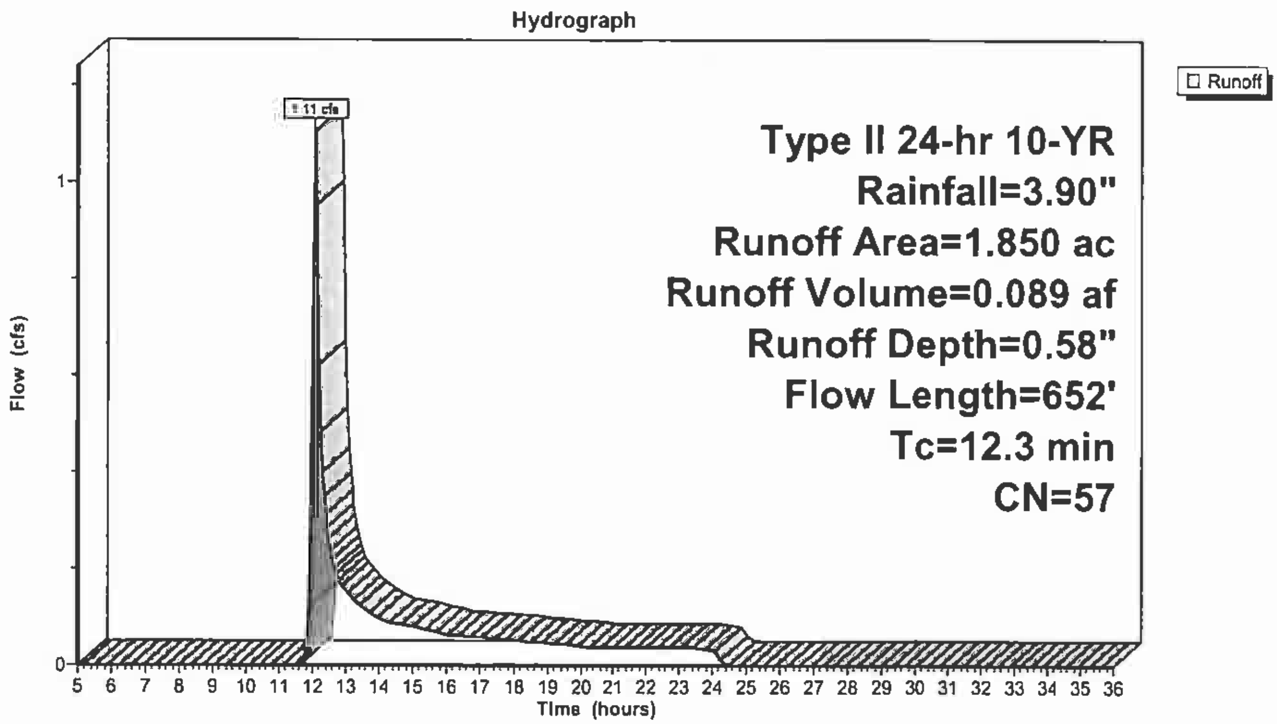
Runoff = 1.11 cfs @ 12.07 hrs, Volume= 0.089 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
0.130	49	Brush, Good, HSG C
0.790	53	Woods, Good, HSG C
0.020	55	Brush, Good, HSG D
0.790	58	Woods, Good, HSG D
1.850	57	Weighted Average
1.850		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.9	139	0.2880	2.68		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.0	413	0.0940	6.66	13.32	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.040
12.3	652	Total			

Subcatchment C-512: Culvert-512 Area



Subcatchment C-513: Culvert-513 Area

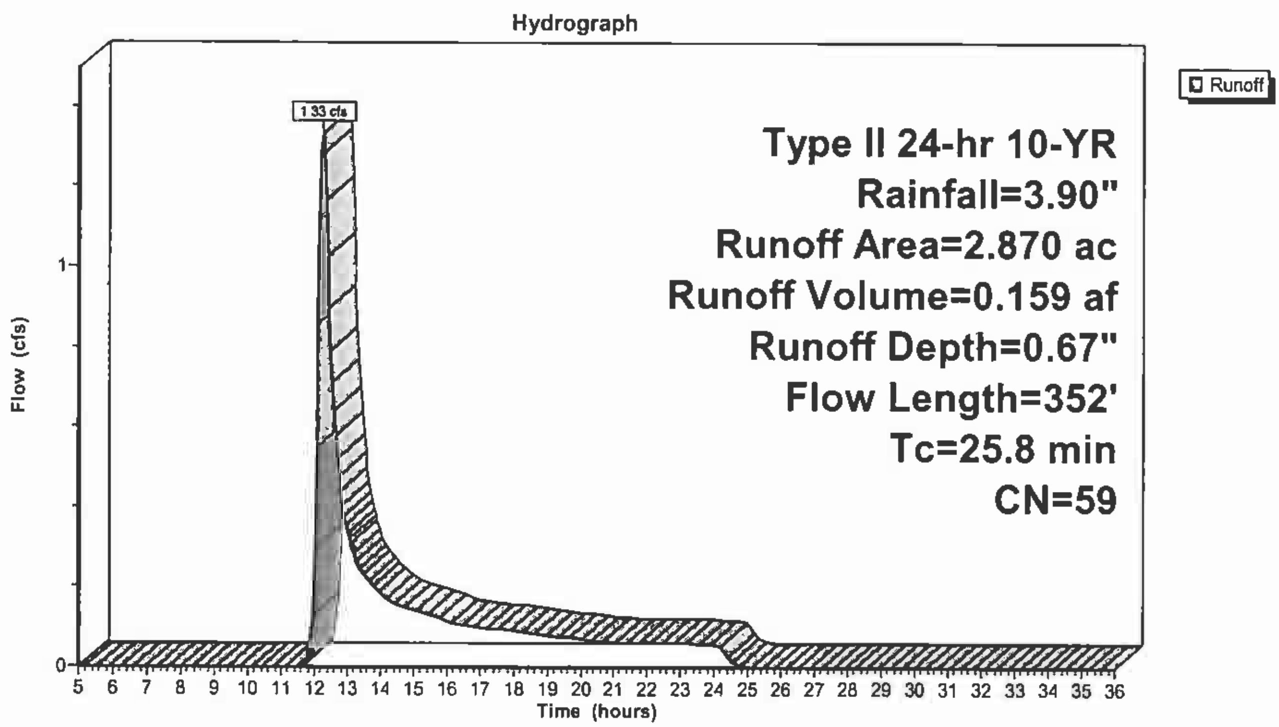
Runoff = 1.33 cfs @ 12.25 hrs, Volume= 0.159 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.050	55	Brush, Good, HSG D
2.740	58	Woods, Good, HSG D
2.870	59	Weighted Average
2.870		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0200	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
2.4	252	0.1270	1.78		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
25.8	352	Total			

Subcatchment C-513: Culvert-513 Area



Subcatchment C-514: Culvert-514 Area

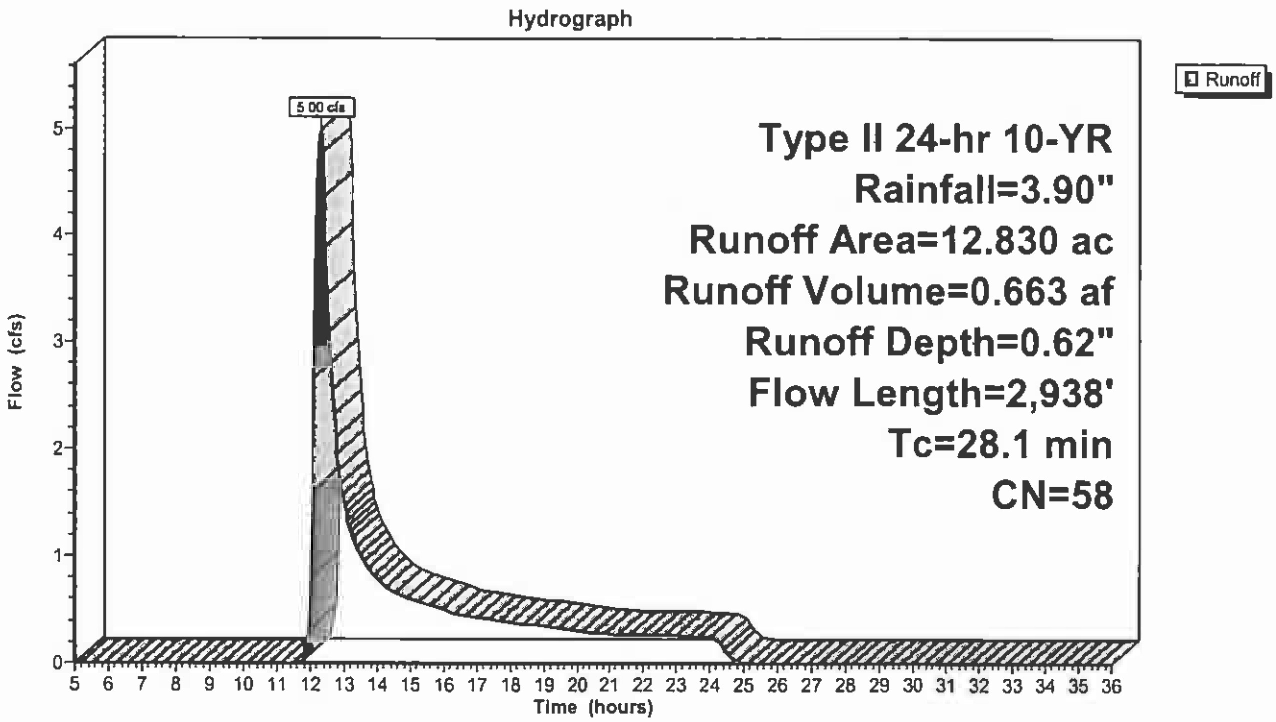
Runoff = 5.00 cfs @ 12.29 hrs, Volume= 0.663 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.090	55	Brush, Good, HSG D
12.630	58	Woods, Good, HSG D
12.830	58	Weighted Average
12.830		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.4200	0.24		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
21.2	2,838	0.1990	2.23		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
28.1	2,938	Total			

Subcatchment C-514: Culvert-514 Area



Subcatchment C-515: Culvert-515 Area

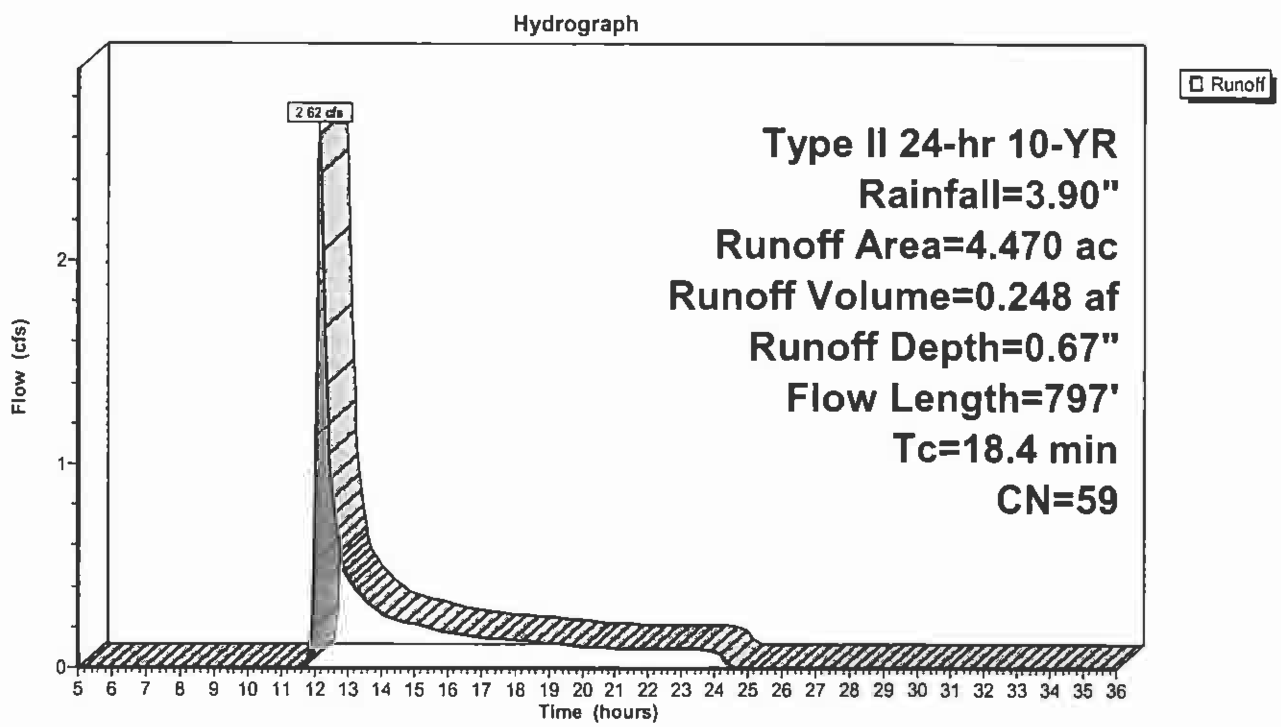
Runoff = 2.62 cfs @ 12.15 hrs, Volume= 0.248 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
0.300	55	Brush, Good, HSG D
4.020	58	Woods, Good, HSG D
4.470	59	Weighted Average
4.470		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
4.0	534	0.1960	2.21		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	163	0.0970	12.30	147.63	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
18.4	797	Total			

Subcatchment C-515: Culvert-515 Area



Subcatchment C-516: Culvert-516 Area

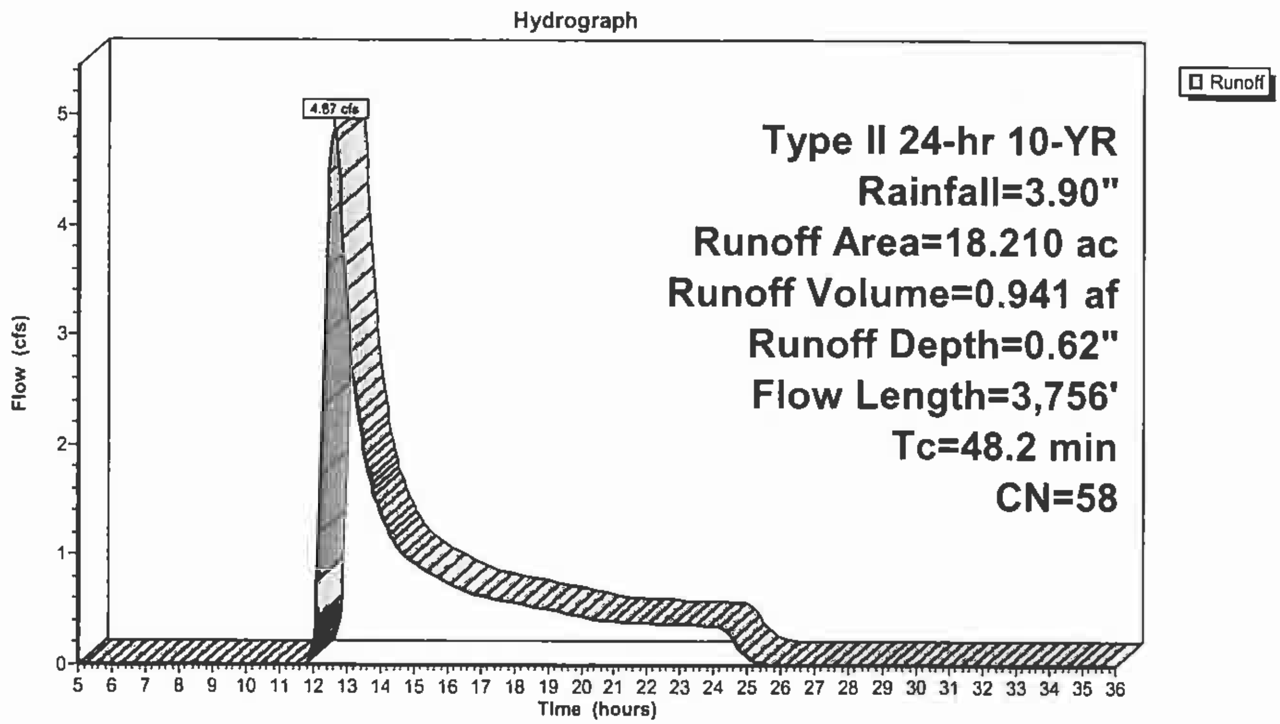
Runoff = 4.87 cfs @ 12.59 hrs, Volume= 0.941 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.150	89	Gravel roads, HSG C
0.180	55	Brush, Good, HSG D
17.880	58	Woods, Good, HSG D
18.210	58	Weighted Average
18.210		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0200	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.6	3,548	0.2310	2.40		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	108	0.0600	9.68	116.11	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
48.2	3,756	Total			

Subcatchment C-516: Culvert-516 Area



Subcatchment C-517: Culvert-517 Area

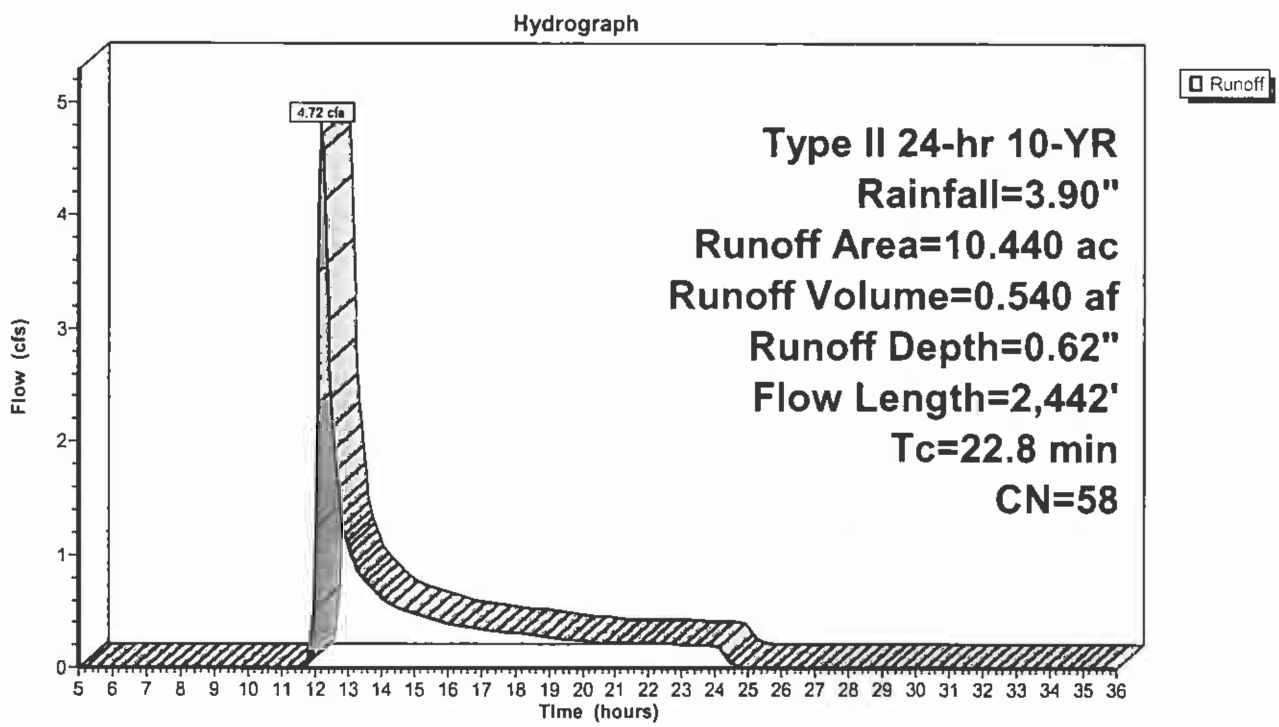
Runoff = 4.72 cfs @ 12.21 hrs, Volume= 0.540 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.110	55	Brush, Good, HSG D
10.240	58	Woods, Good, HSG D
10.440	58	Weighted Average
10.440		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2800	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.3	2,170	0.2550	2.52		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	172	0.1340	7.95	15.91	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.040
22.8	2,442	Total			

Subcatchment C-517: Culvert-517 Area



Subcatchment C-518: Culvert-518 Area

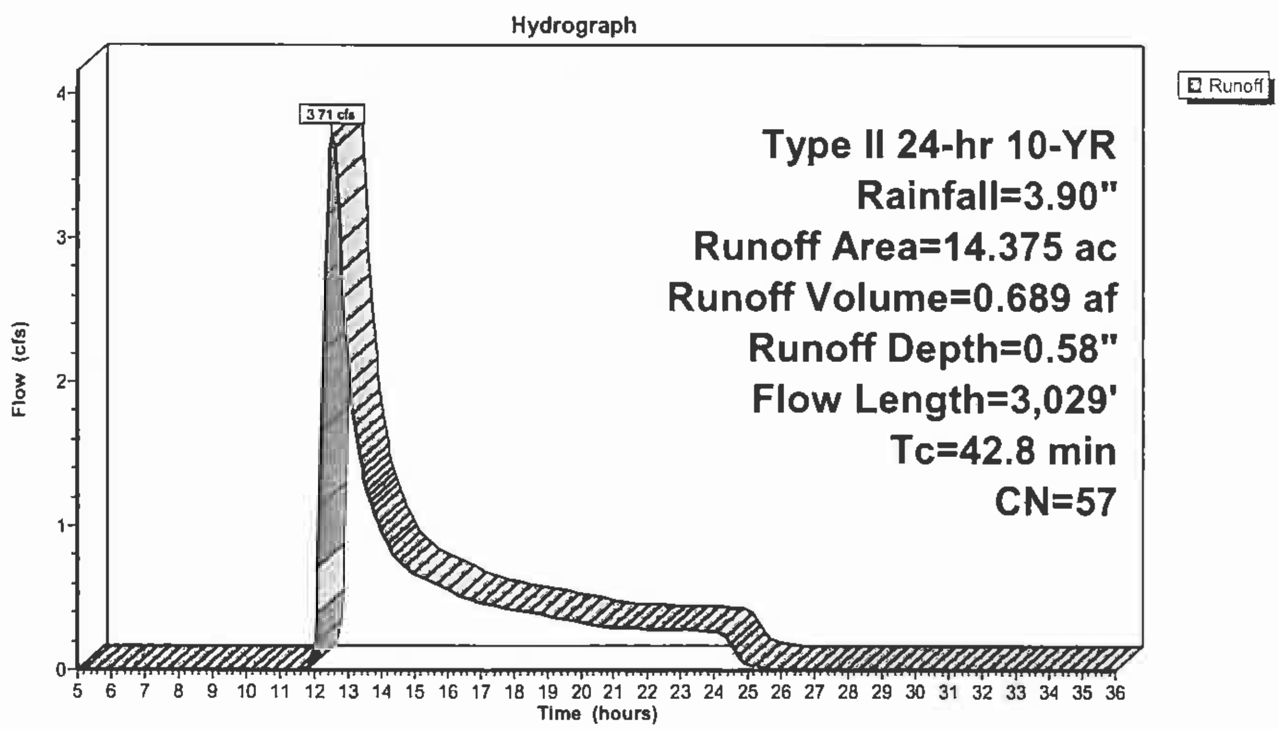
Runoff = 3.71 cfs @ 12.51 hrs, Volume= 0.689 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.085	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
2.370	53	Woods, Good, HSG C
11.830	58	Woods, Good, HSG D
14.375	57	Weighted Average
14.375		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0200	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
19.4	2,929	0.2530	2.51		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
42.8	3,029	Total			

Subcatchment C-518: Culvert-518 Area



Subcatchment C-519: Culvert-519 Area

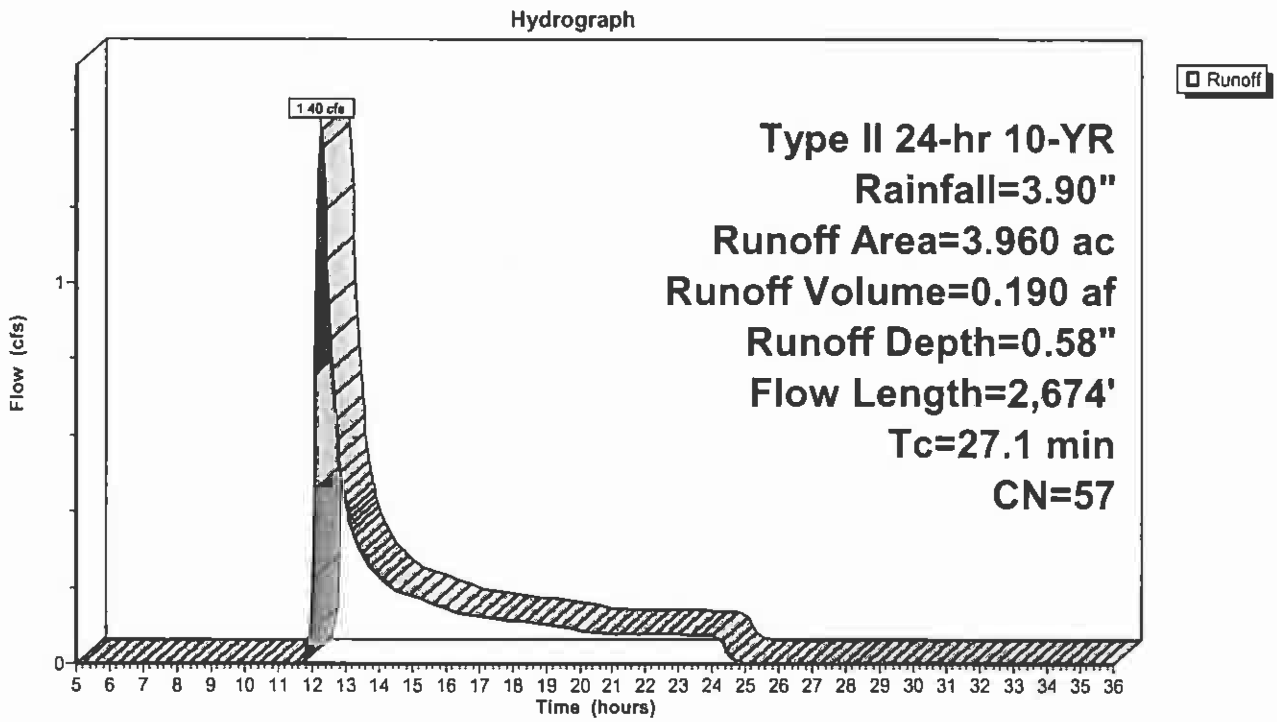
Runoff = 1.40 cfs @ 12.28 hrs, Volume= 0.190 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
1.220	53	Woods, Good, HSG C
2.670	58	Woods, Good, HSG D
3.960	57	Weighted Average
3.960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1400	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
16.4	2,574	0.2750	2.62		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
27.1	2,674	Total			

Subcatchment C-519: Culvert-519 Area



Subcatchment C-520: Culvert-520 Area

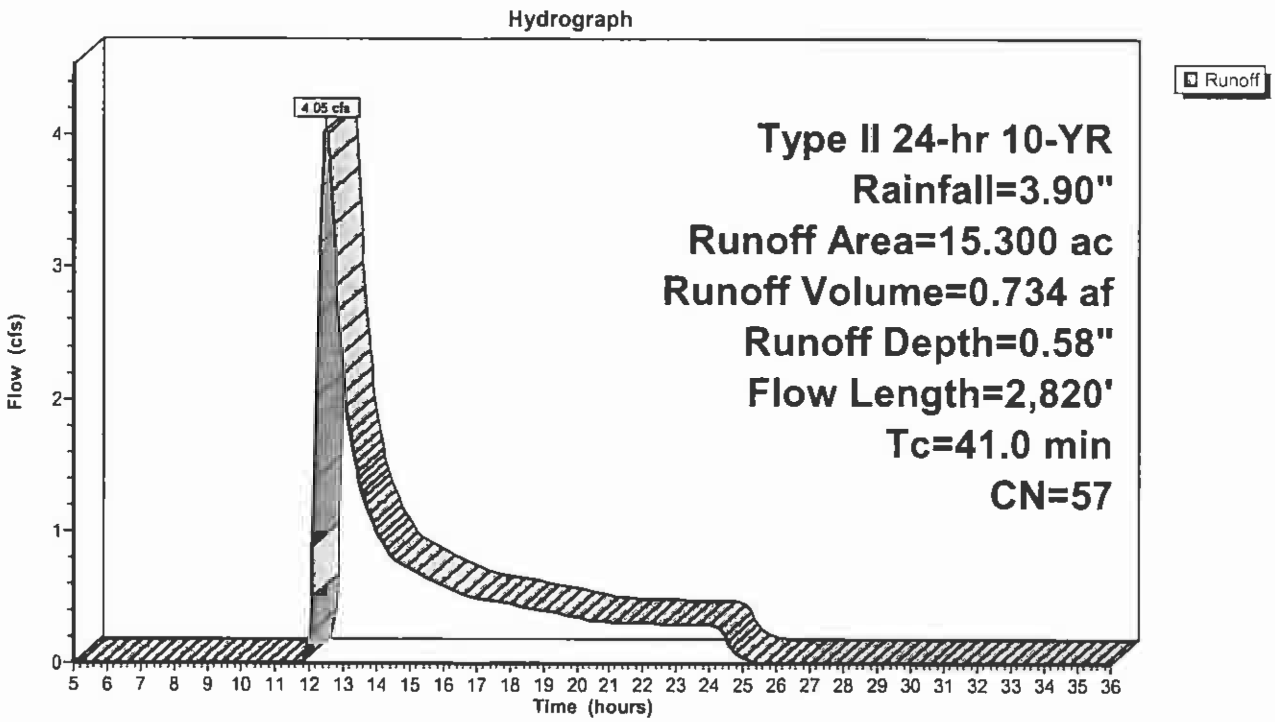
Runoff = 4.05 cfs @ 12.48 hrs, Volume= 0.734 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.100	49	Brush, Good, HSG C
3.650	53	Woods, Good, HSG C
11.490	58	Woods, Good, HSG D
15.300	57	Weighted Average
15.300		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0200	0.07		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.6	2,720	0.2650	2.57		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
41.0	2,820	Total			

Subcatchment C-520: Culvert-520 Area



Reach R1: Reach

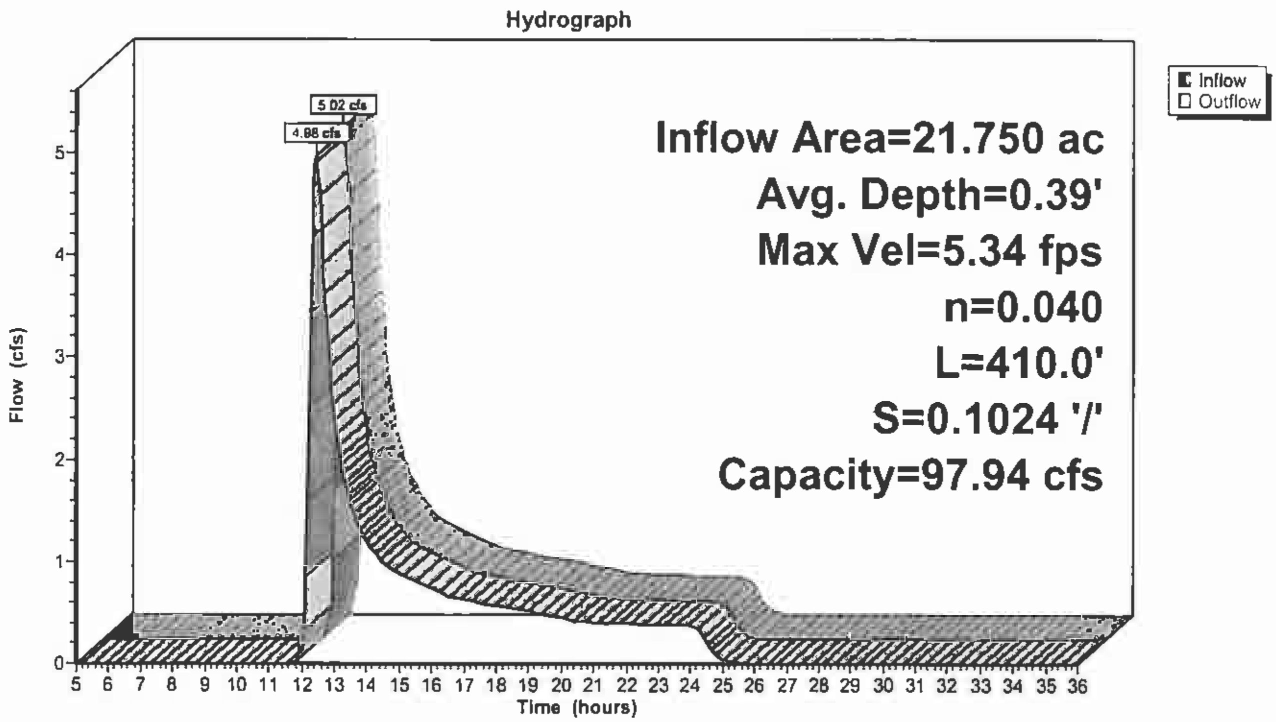
Inflow Area = 21.750 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 5.02 cfs @ 12.40 hrs, Volume= 0.889 af
Outflow = 4.98 cfs @ 12.44 hrs, Volume= 0.889 af, Atten= 1%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.34 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 2.7 min

Peak Storage= 384 cf @ 12.42 hrs, Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 97.94 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 410.0' Slope= 0.1024 '/'
Inlet Invert= 2,212.00', Outlet Invert= 2,170.00'

Reach R1: Reach



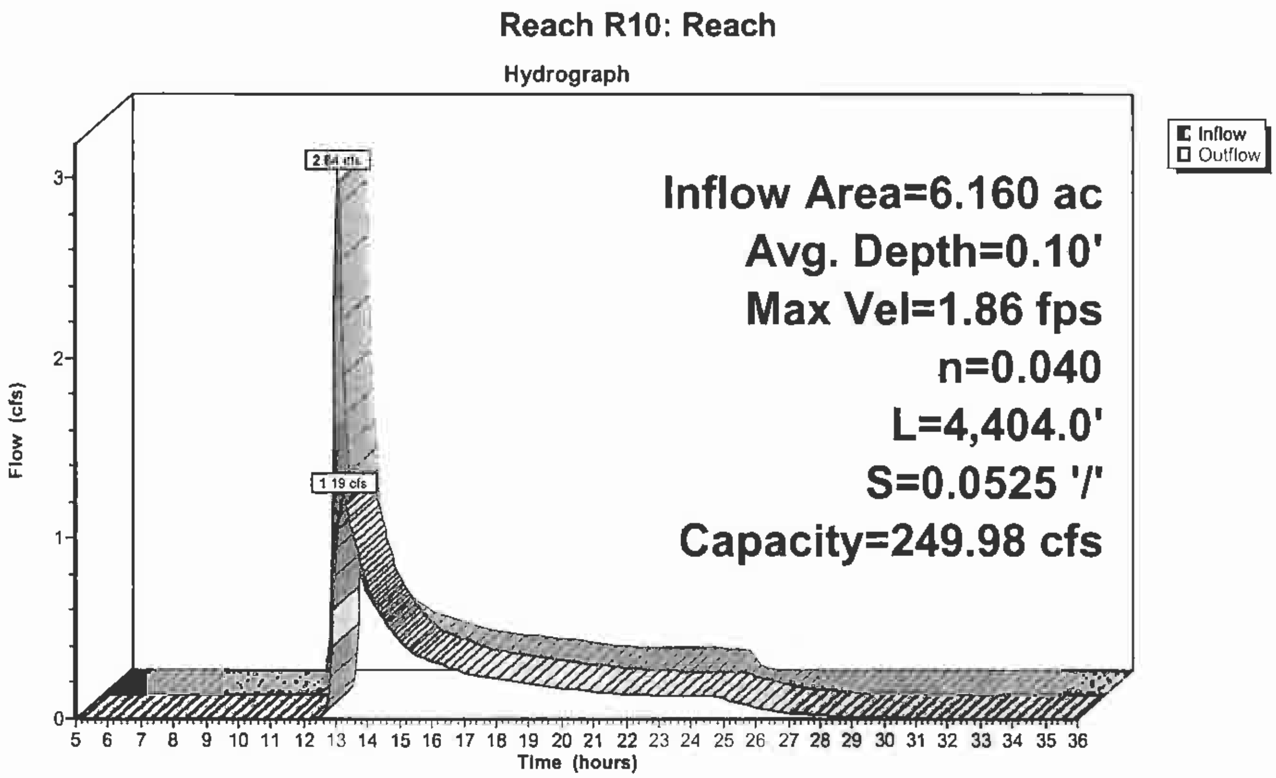
Reach R10: Reach

Inflow Area = 6.160 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 2.84 cfs @ 12.20 hrs, Volume= 0.318 af
Outflow = 1.19 cfs @ 13.23 hrs, Volume= 0.318 af, Atten= 58%, Lag= 61.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 39.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 83.3 min

Peak Storage= 2,822 cf @ 12.57 hrs, Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 249.98 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 4,404.0' Slope= 0.0525 '/'
Inlet Invert= 2,401.00', Outlet Invert= 2,170.00'



Reach R11: Reach

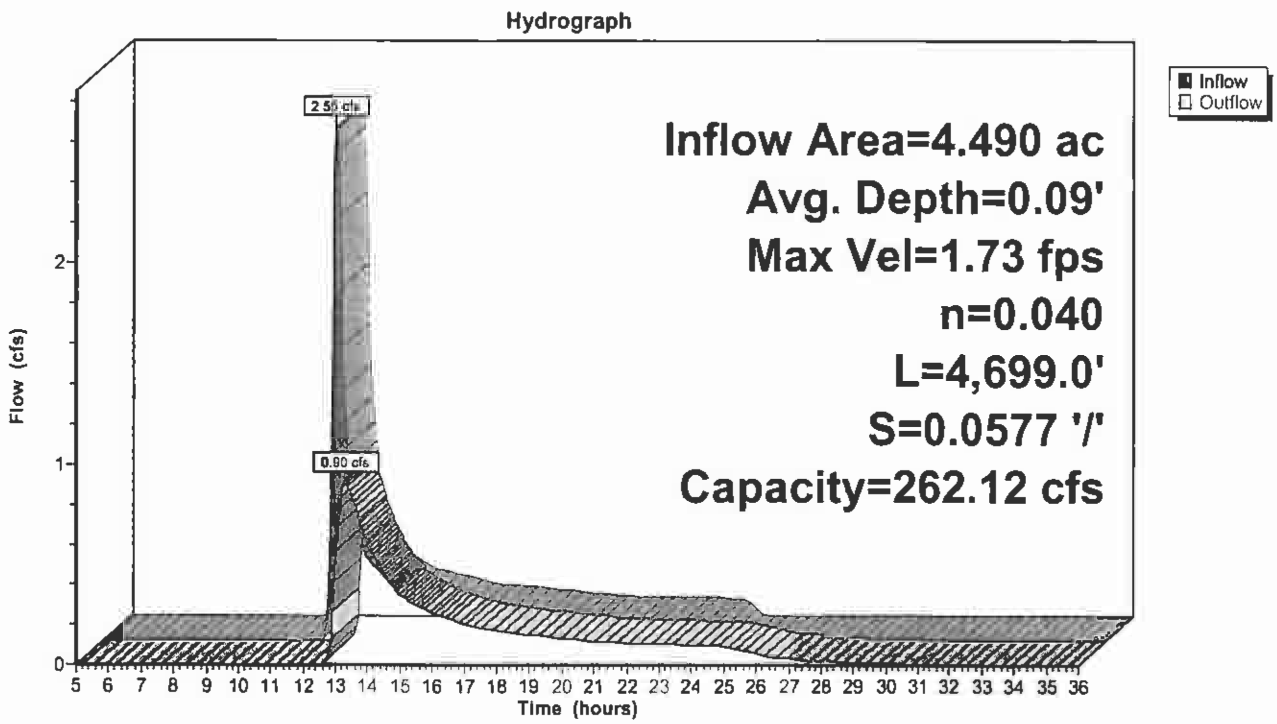
Inflow Area = 4.490 ac, Inflow Depth = 0.67" for 10-YR event
Inflow = 2.55 cfs @ 12.16 hrs, Volume= 0.249 af
Outflow = 0.90 cfs @ 13.29 hrs, Volume= 0.249 af, Atten= 65%, Lag= 68.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 45.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 90.5 min

Peak Storage= 2,456 cf @ 12.54 hrs, Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 262.12 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 4,699.0' Slope= 0.0577 '/'
Inlet Invert= 2,441.00', Outlet Invert= 2,170.00'

Reach R11: Reach



Reach R12: Reach

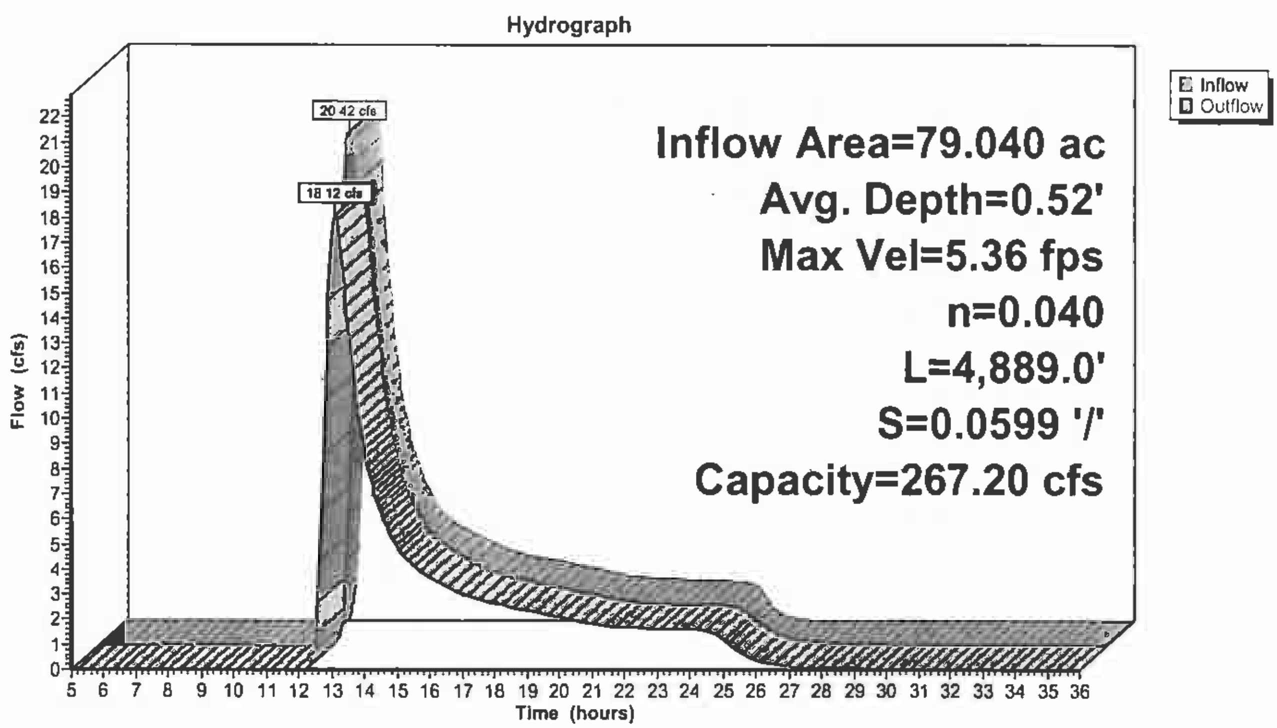
Inflow Area = 79.040 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 20.42 cfs @ 12.62 hrs, Volume= 4.085 af
Outflow = 18.12 cfs @ 13.07 hrs, Volume= 4.084 af, Atten= 11%, Lag= 26.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.36 fps, Min. Travel Time= 15.2 min
Avg. Velocity = 1.88 fps, Avg. Travel Time= 43.4 min

Peak Storage= 16,525 cf @ 12.81 hrs, Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 267.20 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 4,889.0' Slope= 0.0599 '/'
Inlet Invert= 2,463.00', Outlet Invert= 2,170.00'

Reach R12: Reach



Reach R13: Reach

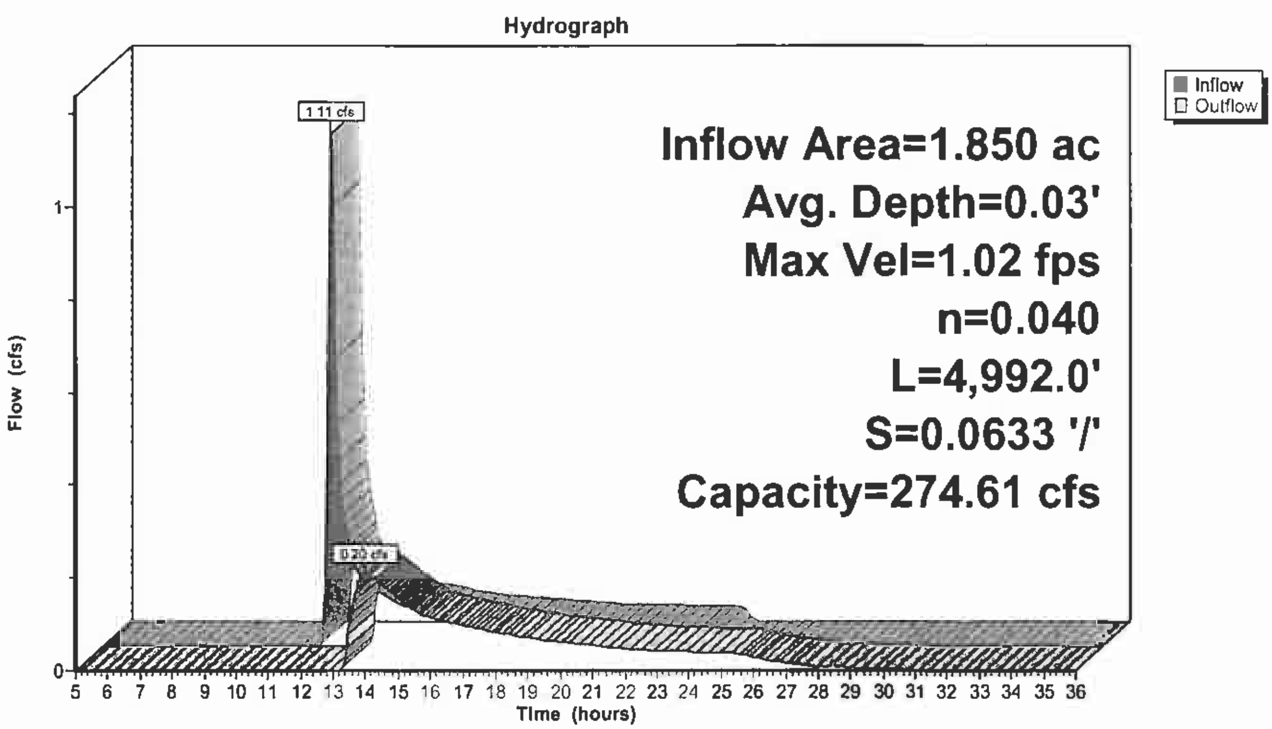
Inflow Area = 1.850 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.11 cfs @ 12.07 hrs, Volume= 0.089 af
Outflow = 0.20 cfs @ 14.00 hrs, Volume= 0.089 af, Atten= 82%, Lag= 115.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.02 fps, Min. Travel Time= 81.3 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 102.9 min

Peak Storage= 1,000 cf @ 12.64 hrs, Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 274.61 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 4,992.0' Slope= 0.0633 '/'
Inlet Invert= 2,486.00', Outlet Invert= 2,170.00'

Reach R13: Reach



Reach R14: Reach

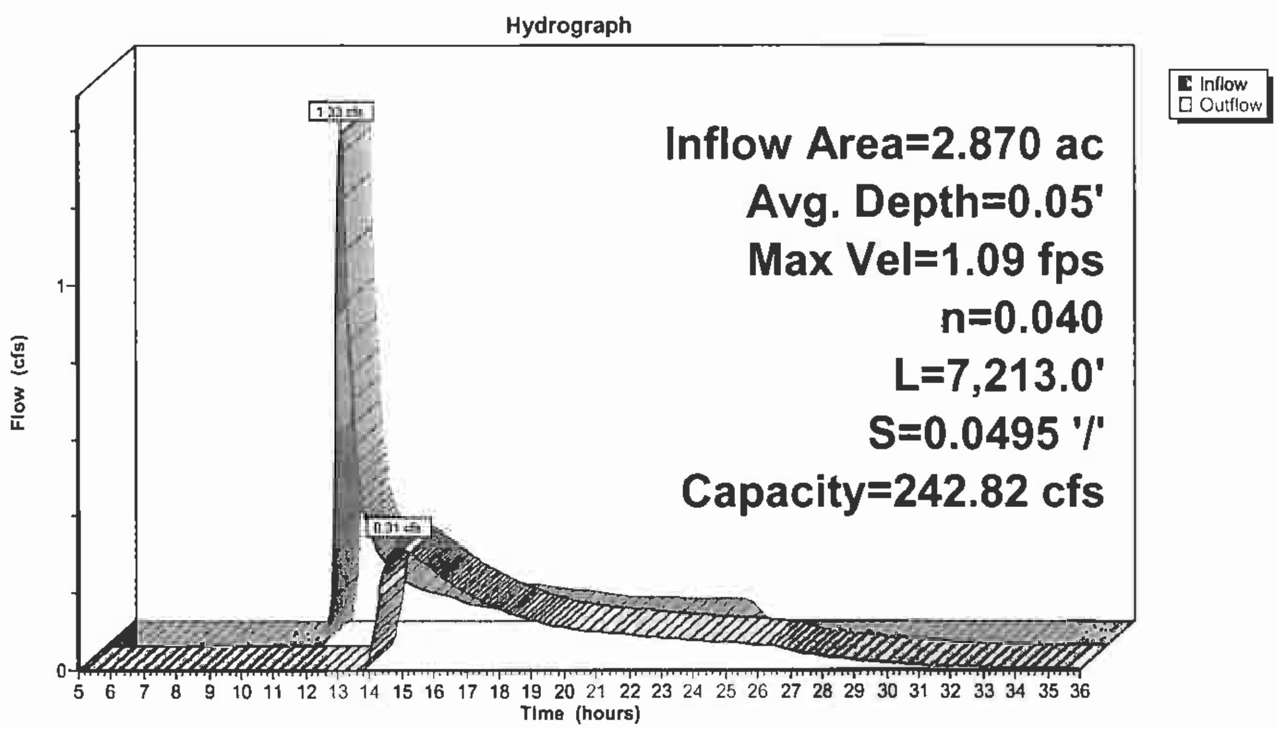
Inflow Area = 2.870 ac, Inflow Depth = 0.67" for 10-YR event
Inflow = 1.33 cfs @ 12.25 hrs, Volume= 0.159 af
Outflow = 0.31 cfs @ 14.90 hrs, Volume= 0.159 af, Atten= 76%, Lag= 159.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.09 fps, Min. Travel Time= 110.2 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 159.0 min

Peak Storage= 2,081 cf @ 13.07 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 242.82 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 7,213.0' Slope= 0.0495 '/'
Inlet Invert= 2,527.00', Outlet Invert= 2,170.00'

Reach R14: Reach



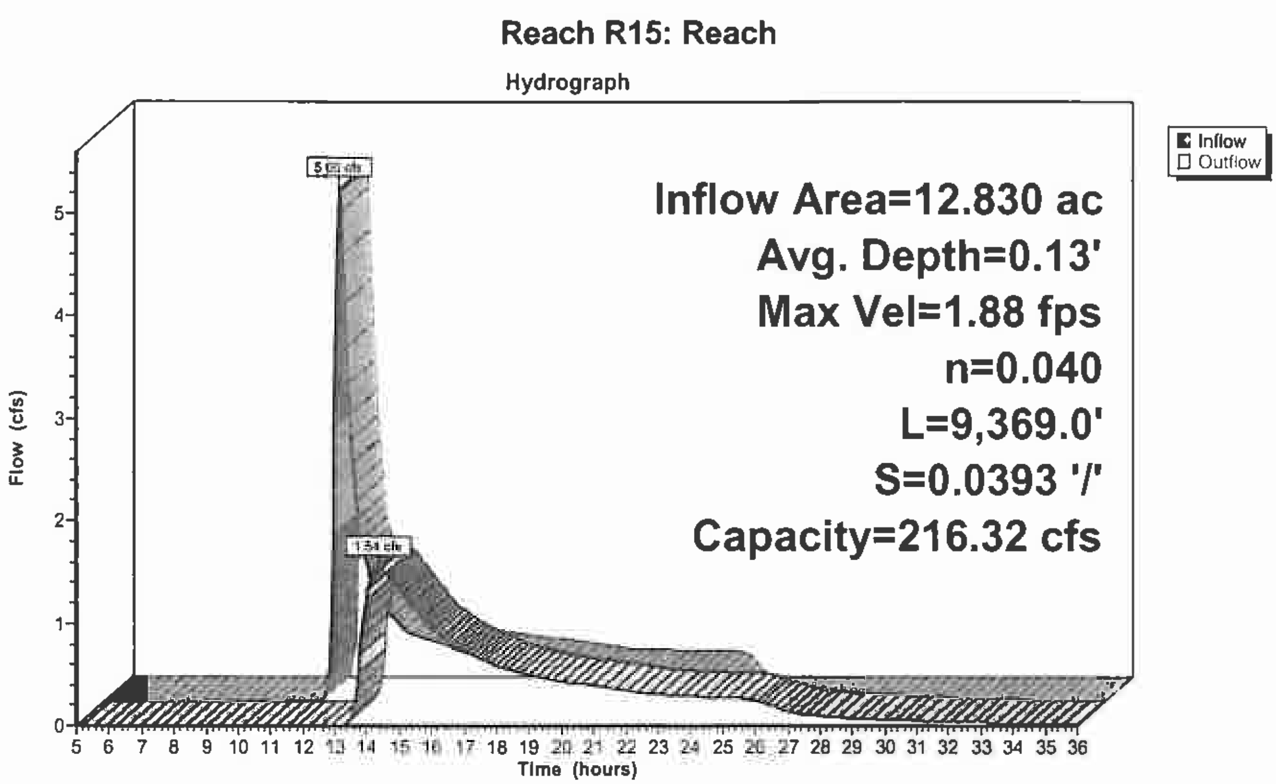
Reach R15: Reach

Inflow Area = 12.830 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 5.00 cfs @ 12.29 hrs, Volume= 0.663 af
Outflow = 1.54 cfs @ 14.35 hrs, Volume= 0.659 af, Atten= 69%, Lag= 124.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.88 fps, Min. Travel Time= 83.0 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 163.0 min

Peak Storage= 7,674 cf @ 12.97 hrs, Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 216.32 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 9,369.0' Slope= 0.0393 '/'
Inlet Invert= 2,538.00', Outlet Invert= 2,170.00'



Reach R16: Reach

[79] Warning: Submerged Pond CV515 Primary device # 1 OUTLET by 0.06'

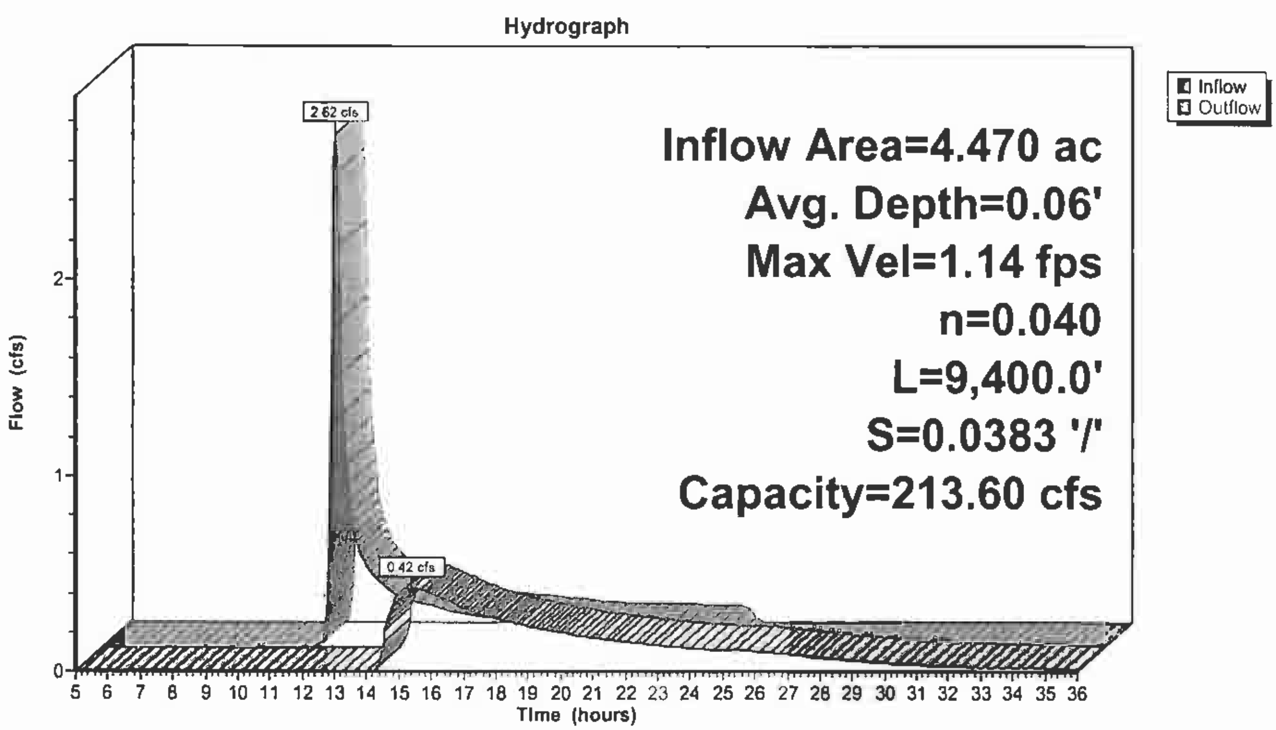
Inflow Area = 4.470 ac, Inflow Depth = 0.67" for 10-YR event
Inflow = 2.62 cfs @ 12.15 hrs, Volume= 0.248 af
Outflow = 0.42 cfs @ 15.36 hrs, Volume= 0.245 af, Atten= 84%, Lag= 192.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 137.2 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 212.6 min

Peak Storage= 3,498 cf @ 13.08 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 213.60 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 9,400.0' Slope= 0.0383 '/'
Inlet Invert= 2,530.00', Outlet Invert= 2,170.00'

Reach R16: Reach



Reach R17: Reach

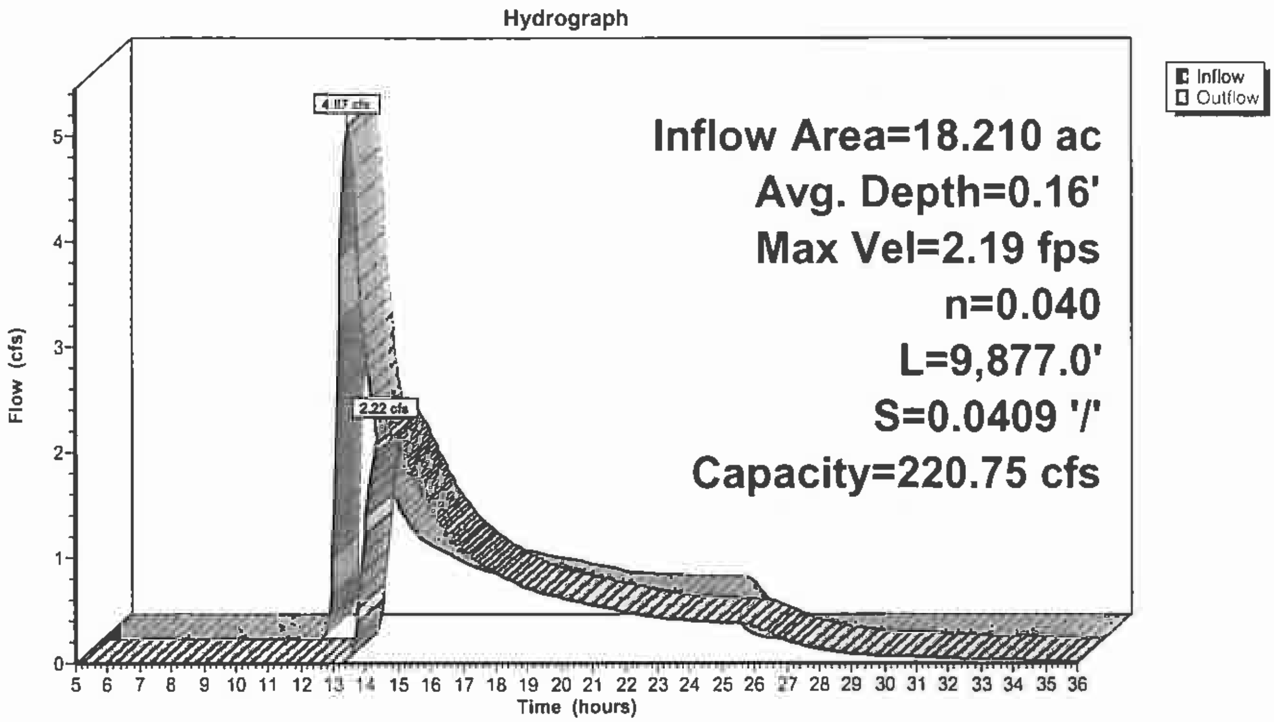
Inflow Area = 18.210 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 4.87 cfs @ 12.59 hrs, Volume= 0.941 af
Outflow = 2.22 cfs @ 14.59 hrs, Volume= 0.935 af, Atten= 54%, Lag= 120.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 75.2 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 152.6 min

Peak Storage= 9,997 cf @ 13.34 hrs, Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 220.75 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 9,877.0' Slope= 0.0409 '/'
Inlet Invert= 2,574.00', Outlet Invert= 2,170.00'

Reach R17: Reach



Reach R18: Reach

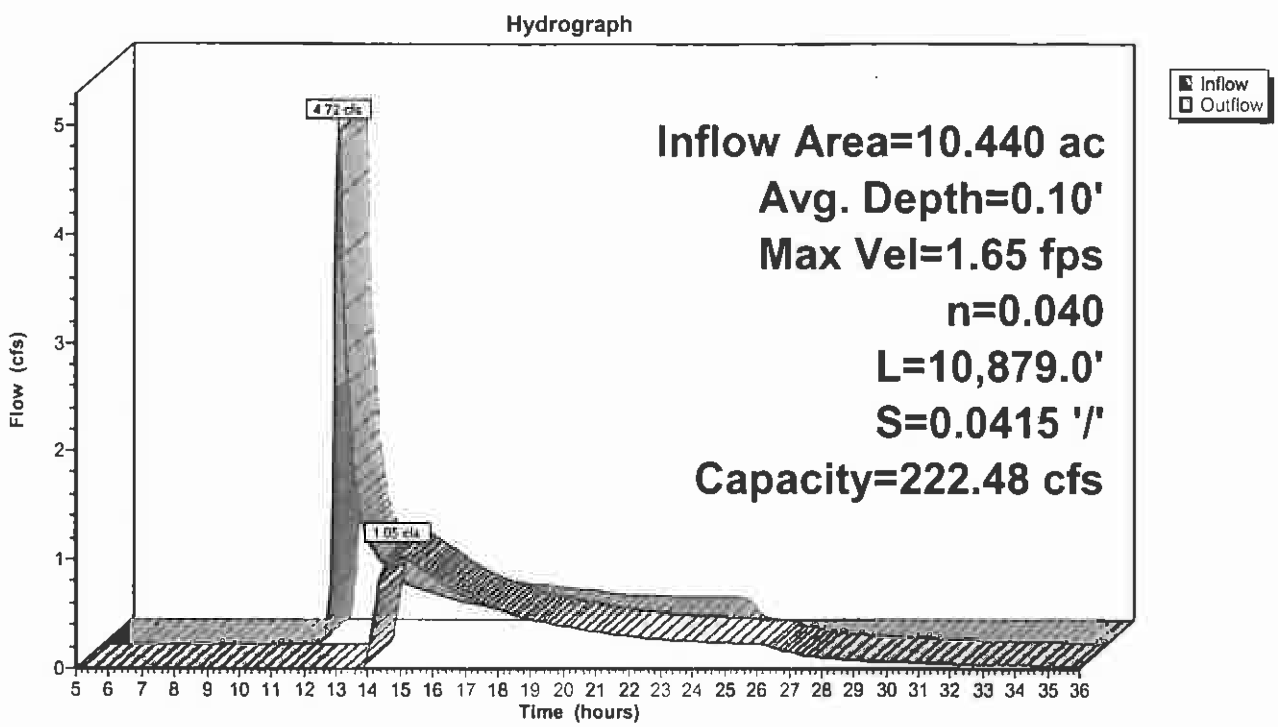
Inflow Area = 10.440 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 4.72 cfs @ 12.21 hrs, Volume= 0.540 af
Outflow = 1.05 cfs @ 14.86 hrs, Volume= 0.533 af, Atten= 78%, Lag= 159.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 110.1 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 195.9 min

Peak Storage= 6,908 cf @ 13.03 hrs, Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 222.48 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 10,879.0' Slope= 0.0415 '/'
Inlet Invert= 2,622.00', Outlet Invert= 2,170.00'

Reach R18: Reach



Reach R19: Reach

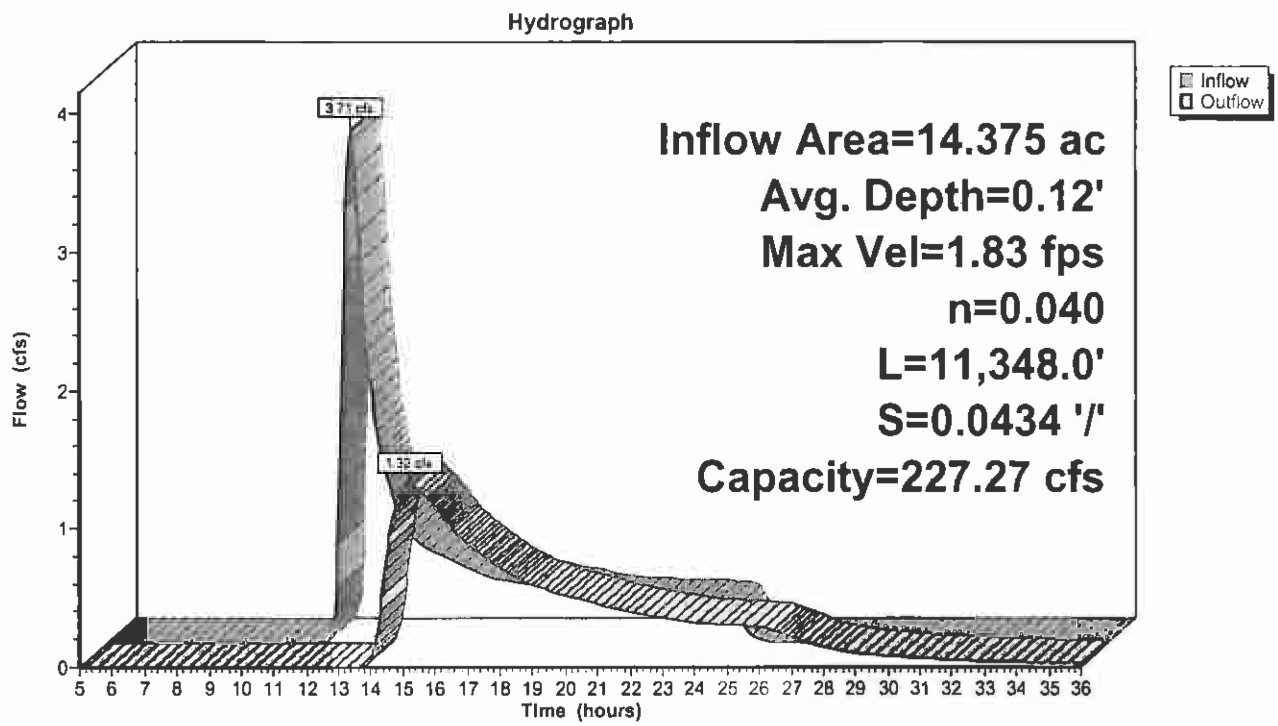
Inflow Area = 14.375 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 3.71 cfs @ 12.51 hrs, Volume= 0.689 af
Outflow = 1.32 cfs @ 15.20 hrs, Volume= 0.681 af, Atten= 64%, Lag= 160.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.83 fps, Min. Travel Time= 103.4 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 187.5 min

Peak Storage= 8,209 cf @ 13.47 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 227.27 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 11,348.0' Slope= 0.0434 '/'
Inlet Invert= 2,662.00', Outlet Invert= 2,170.00'

Reach R19: Reach



Reach R2: Reach

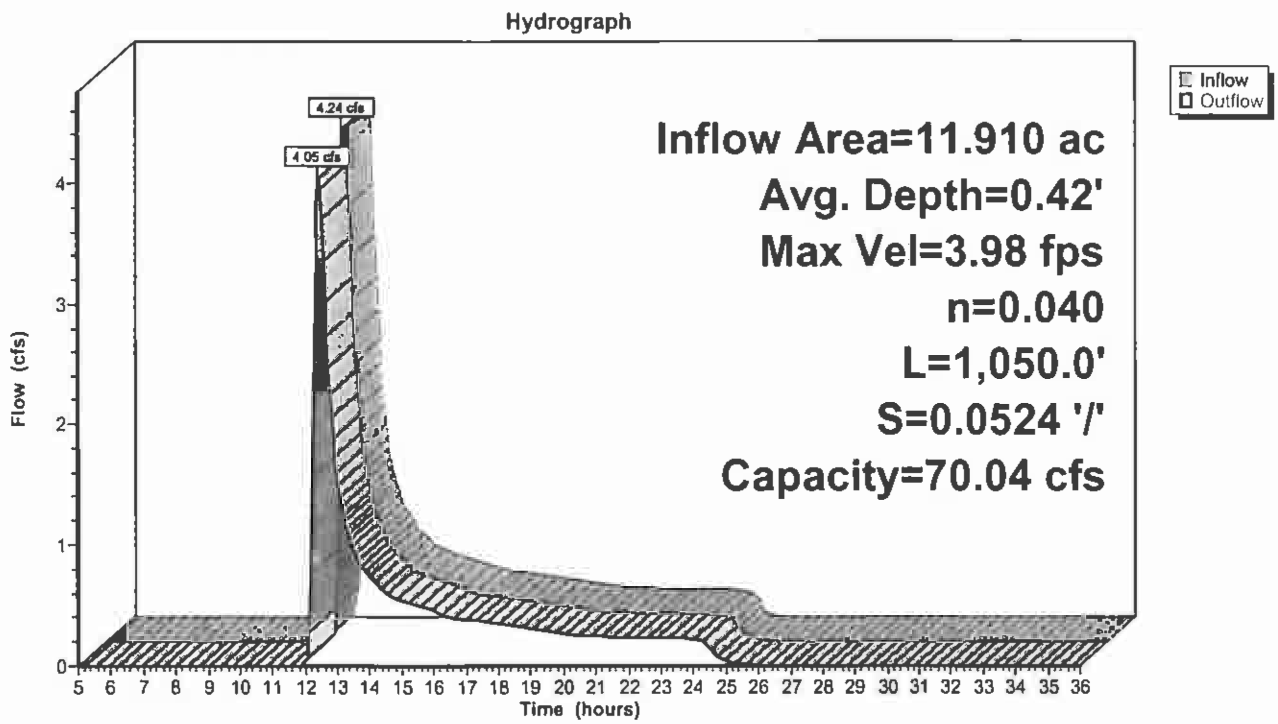
Inflow Area = 11.910 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 4.24 cfs @ 12.27 hrs, Volume= 0.571 af
Outflow = 4.05 cfs @ 12.41 hrs, Volume= 0.571 af, Atten= 5%, Lag= 8.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 11.0 min

Peak Storage= 1,074 cf @ 12.33 hrs, Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 70.04 cfs

2.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 1,050.0' Slope= 0.0524 '/'
Inlet Invert= 2,225.00', Outlet Invert= 2,170.00'

Reach R2: Reach



Reach R20: Reach

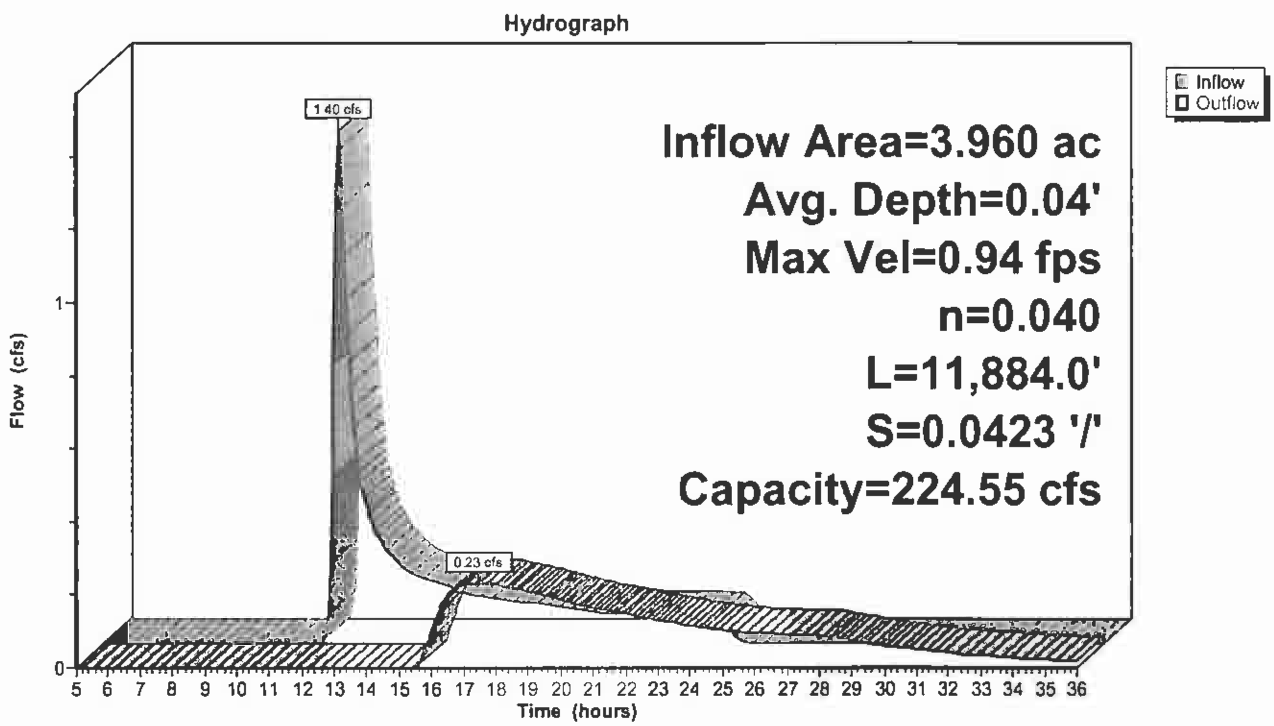
Inflow Area = 3.960 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.40 cfs @ 12.28 hrs, Volume= 0.190 af
Outflow = 0.23 cfs @ 17.47 hrs, Volume= 0.182 af, Atten= 83%, Lag= 311.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.94 fps, Min. Travel Time= 210.1 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 275.9 min

Peak Storage= 2,934 cf @ 13.97 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 224.55 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 11,884.0' Slope= 0.0423 '/'
Inlet Invert= 2,673.00', Outlet Invert= 2,170.00'

Reach R20: Reach



Reach R21: Reach

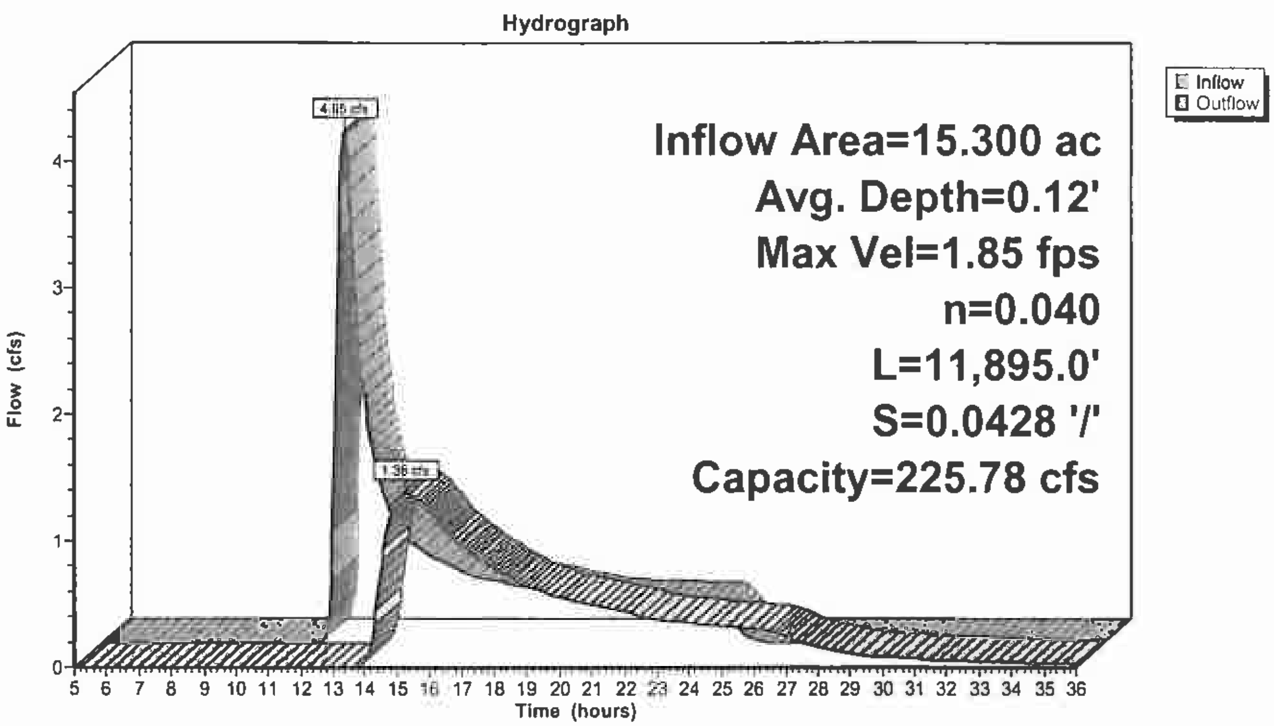
Inflow Area = 15.300 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 4.05 cfs @ 12.48 hrs, Volume= 0.734 af
Outflow = 1.38 cfs @ 15.25 hrs, Volume= 0.723 af, Atten= 66%, Lag= 165.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 fps, Min. Travel Time= 107.2 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 193.8 min

Peak Storage= 8,880 cf @ 13.46 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 225.78 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 11,895.0' Slope= 0.0428 '/'
Inlet Invert= 2,679.00', Outlet Invert= 2,170.00'

Reach R21: Reach



Reach R3: Reach

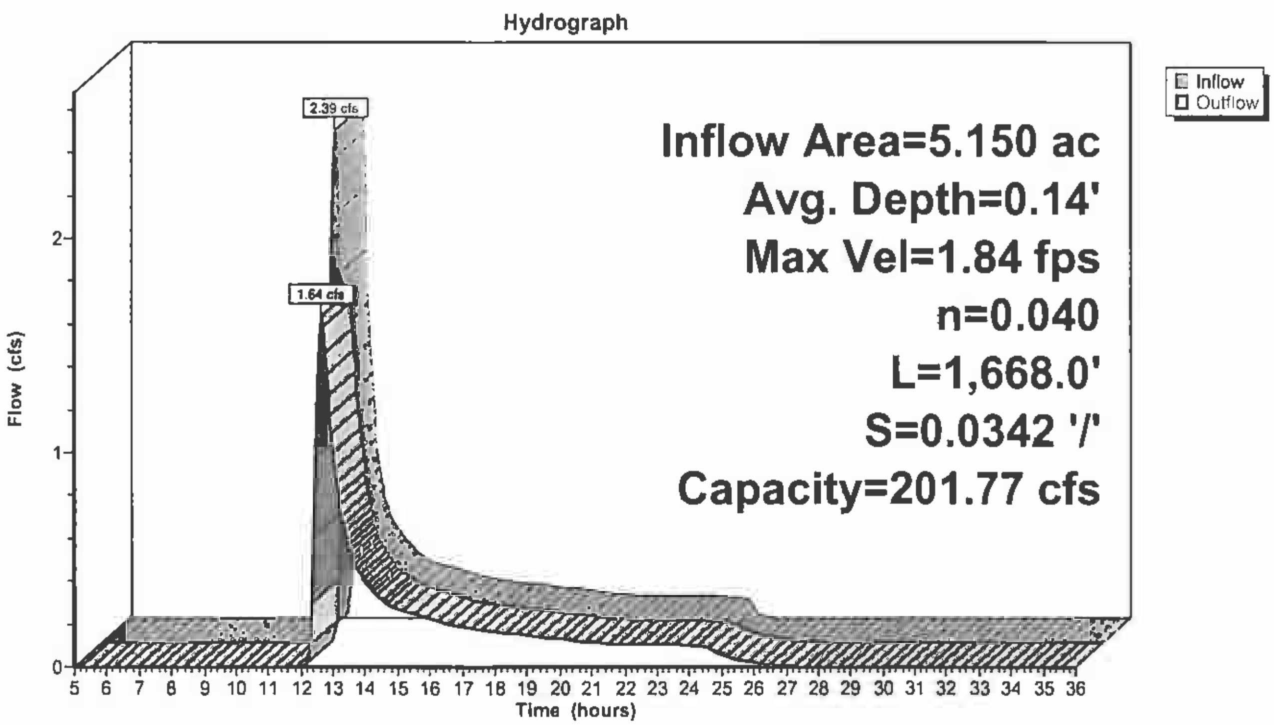
Inflow Area = 5.150 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 2.39 cfs @ 12.20 hrs, Volume= 0.266 af
Outflow = 1.64 cfs @ 12.62 hrs, Volume= 0.266 af, Atten= 32%, Lag= 25.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.84 fps, Min. Travel Time= 15.1 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 36.9 min

Peak Storage= 1,481 cf @ 12.37 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 201.77 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 1,668.0' Slope= 0.0342 '/'
Inlet Invert= 2,227.00', Outlet Invert= 2,170.00'

Reach R3: Reach



Reach R4: Reach

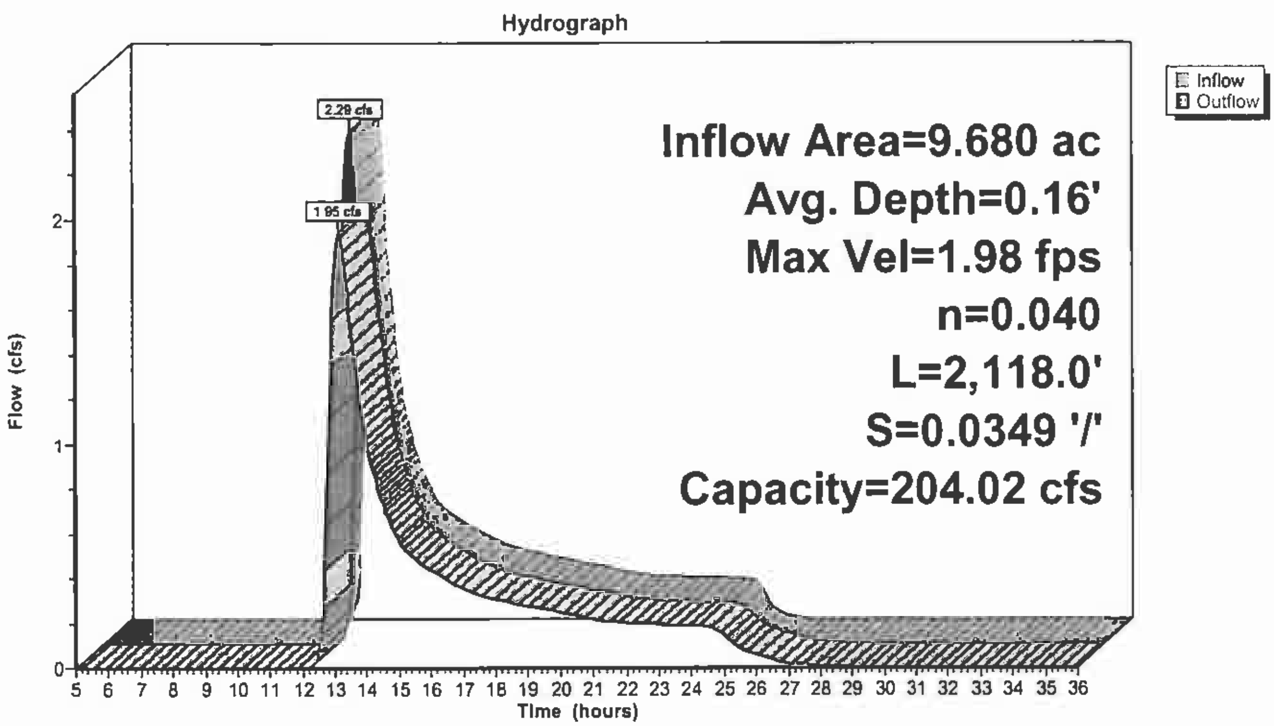
Inflow Area = 9.680 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 2.29 cfs @ 12.60 hrs, Volume= 0.464 af
Outflow = 1.95 cfs @ 13.12 hrs, Volume= 0.464 af, Atten= 15%, Lag= 31.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 17.8 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 40.5 min

Peak Storage= 2,081 cf @ 12.82 hrs, Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 204.02 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 2,118.0' Slope= 0.0349 '/'
Inlet Invert= 2,244.00', Outlet Invert= 2,170.00'

Reach R4: Reach



Reach R5: Reach

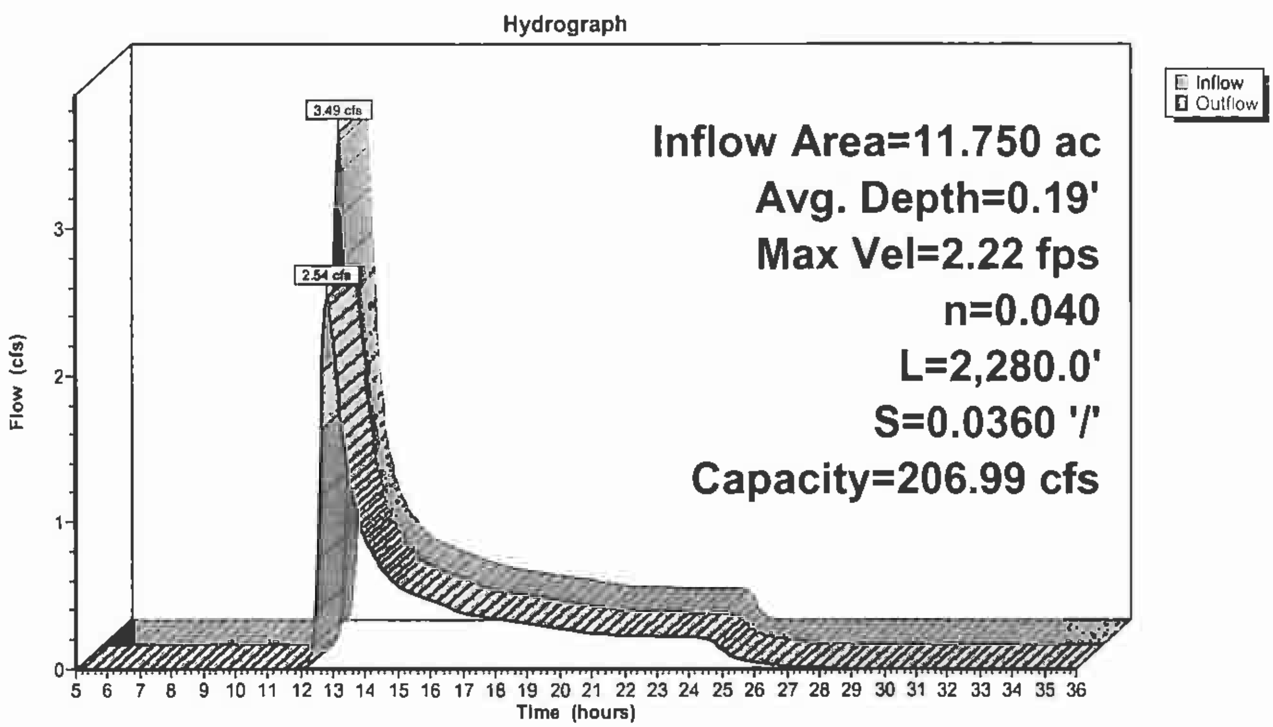
Inflow Area = 11.750 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 3.49 cfs @ 12.31 hrs, Volume= 0.521 af
Outflow = 2.54 cfs @ 12.81 hrs, Volume= 0.521 af, Atten= 27%, Lag= 30.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.22 fps, Min. Travel Time= 17.2 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 41.9 min

Peak Storage= 2,620 cf @ 12.52 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 206.99 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 2,280.0' Slope= 0.0360 '/'
Inlet Invert= 2,252.00', Outlet Invert= 2,170.00'

Reach R5: Reach



Reach R6: Reach

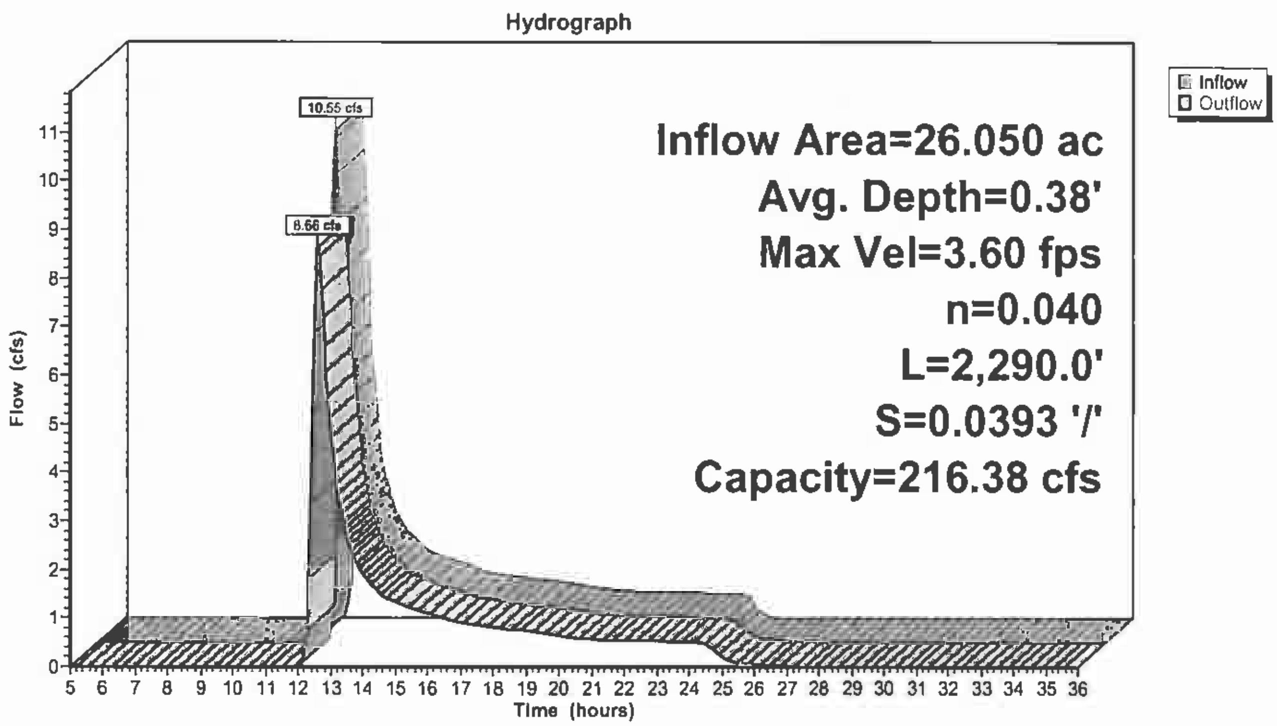
Inflow Area = 26.050 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 10.55 cfs @ 12.27 hrs, Volume= 1.346 af
Outflow = 8.66 cfs @ 12.58 hrs, Volume= 1.346 af, Atten= 18%, Lag= 18.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 31.2 min

Peak Storage= 5,543 cf @ 12.40 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 216.38 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 2,290.0' Slope= 0.0393 '/'
Inlet Invert= 2,260.00', Outlet Invert= 2,170.00'

Reach R6: Reach



Reach R7: Reach

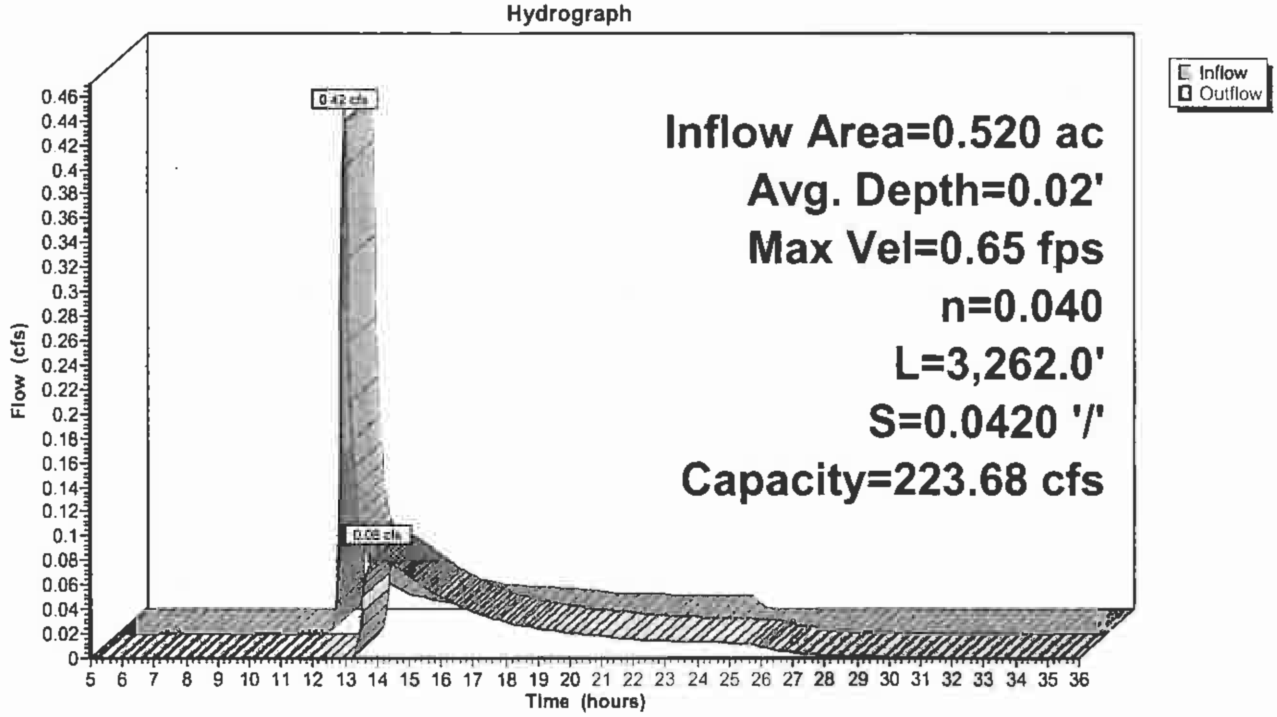
Inflow Area = 0.520 ac, Inflow Depth = 0.76" for 10-YR event
Inflow = 0.42 cfs @ 12.10 hrs, Volume= 0.033 af
Outflow = 0.08 cfs @ 14.03 hrs, Volume= 0.033 af, Atten= 80%, Lag= 115.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 83.9 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 83.9 min

Peak Storage= 417 cf @ 12.63 hrs, Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 223.68 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 3,262.0' Slope= 0.0420 '/'
Inlet Invert= 2,307.00', Outlet Invert= 2,170.00'

Reach R7: Reach



Reach R8: Reach

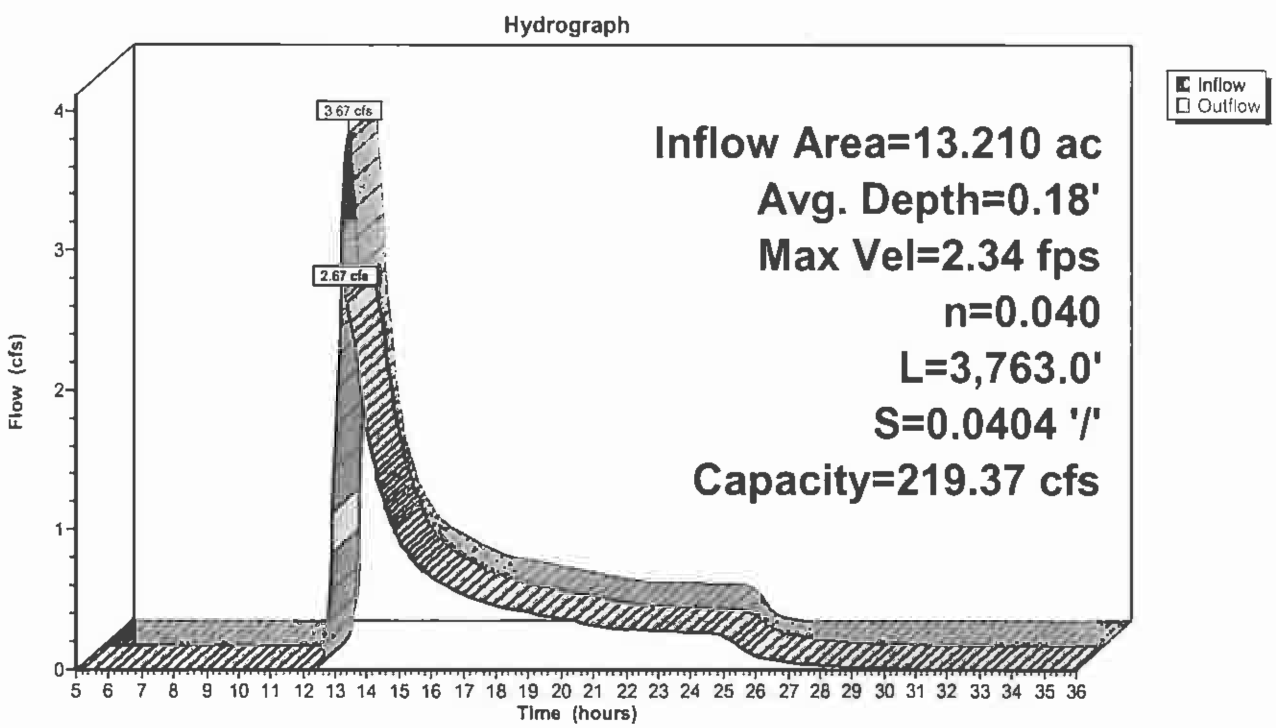
Inflow Area = 13.210 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 3.67 cfs @ 12.55 hrs, Volume= 0.683 af
Outflow = 2.67 cfs @ 13.31 hrs, Volume= 0.683 af, Atten= 27%, Lag= 45.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 26.8 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 64.9 min

Peak Storage= 4,292 cf @ 12.86 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 219.37 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 3,763.0' Slope= 0.0404 '/'
Inlet Invert= 2,322.00', Outlet Invert= 2,170.00'

Reach R8: Reach



Reach R9: Reach

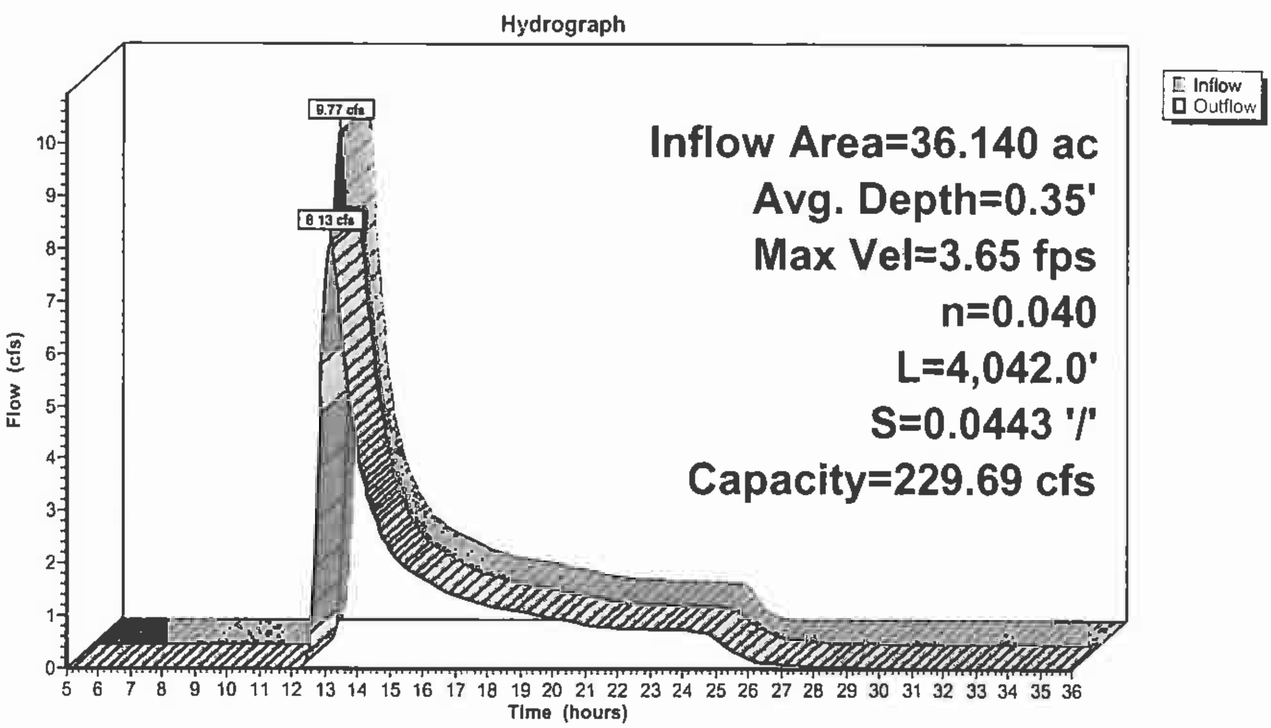
Inflow Area = 36.140 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 9.77 cfs @ 12.57 hrs, Volume= 1.868 af
Outflow = 8.13 cfs @ 13.11 hrs, Volume= 1.868 af, Atten= 17%, Lag= 32.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.65 fps, Min. Travel Time= 18.5 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 50.7 min

Peak Storage= 9,016 cf @ 12.80 hrs, Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 229.69 cfs

6.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 1.0 '/' Top Width= 11.00'
Length= 4,042.0' Slope= 0.0443 '/'
Inlet Invert= 2,349.00', Outlet Invert= 2,170.00'

Reach R9: Reach



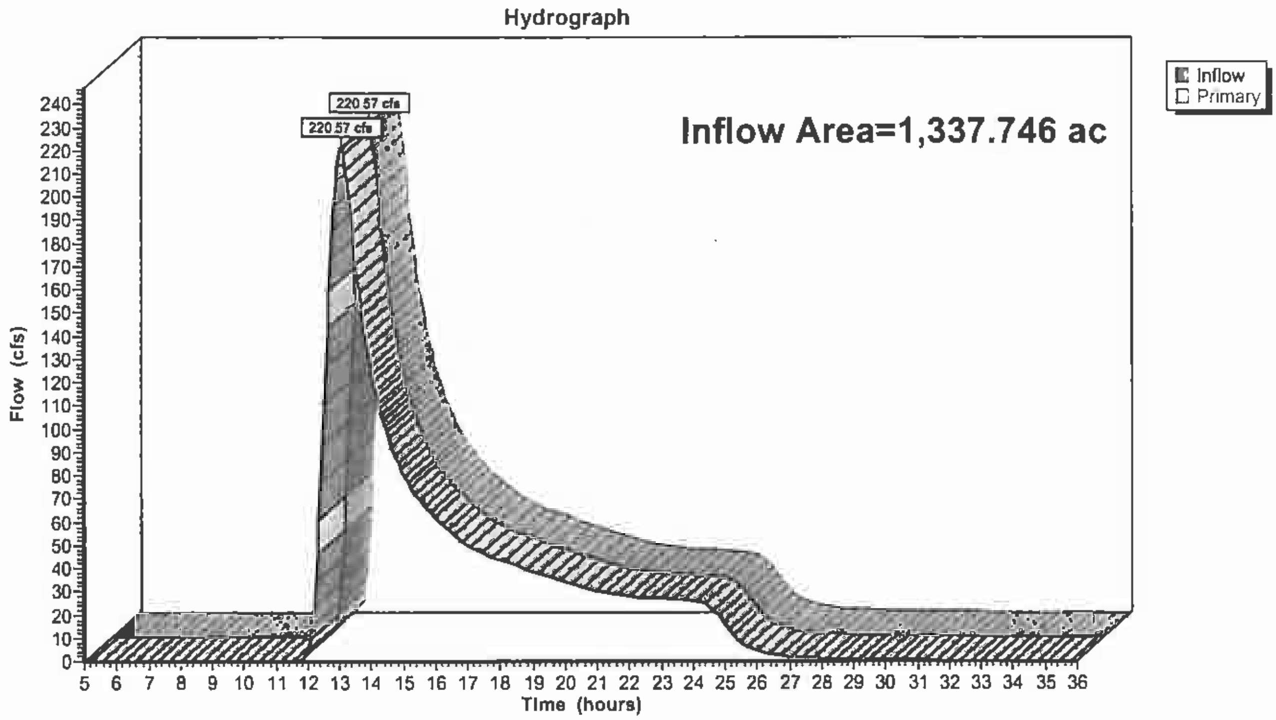
Pond B5: B5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,337.746 ac, Inflow Depth > 0.58" for 10-YR event
Inflow = 220.57 cfs @ 13.03 hrs, Volume= 64.783 af
Primary = 220.57 cfs @ 13.03 hrs, Volume= 64.783 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs

Pond B5: B5



Pond CV13: CV513

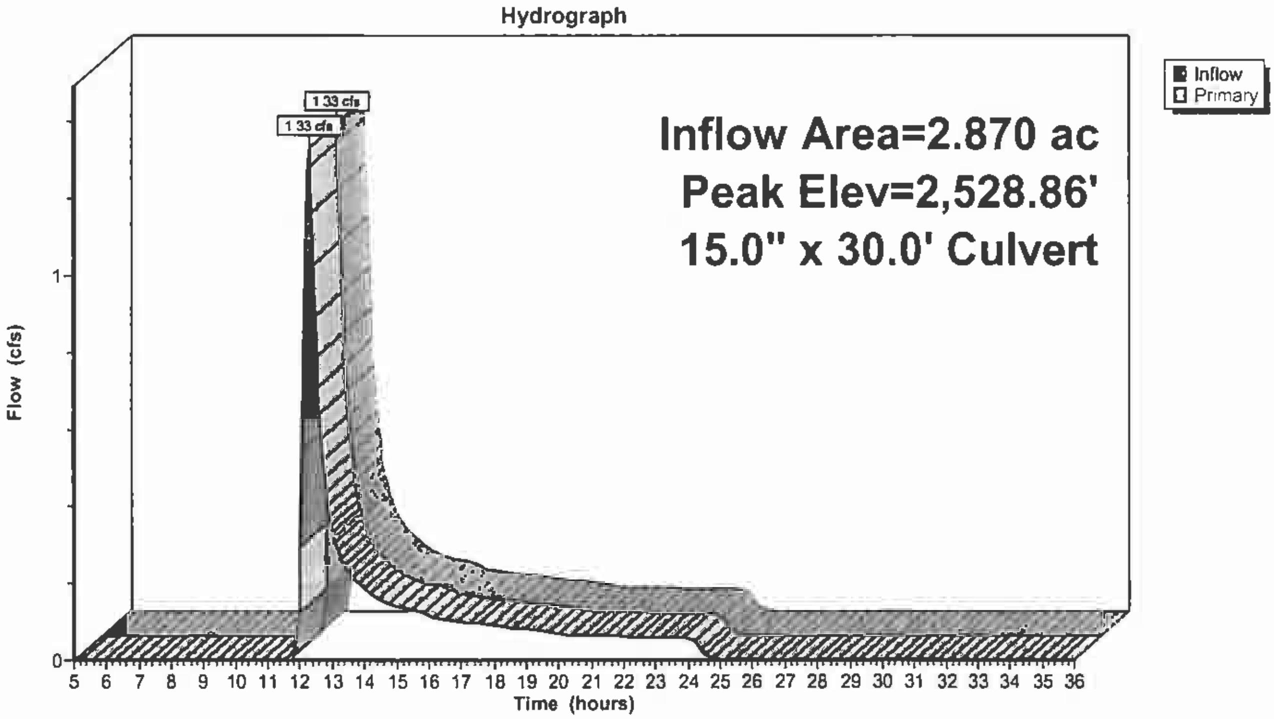
Inflow Area =	2.870 ac,	Inflow Depth = 0.67"	for 10-YR event	
Inflow =	1.33 cfs @	12.25 hrs, Volume=	0.159 af	
Outflow =	1.33 cfs @	12.25 hrs, Volume=	0.159 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.33 cfs @	12.25 hrs, Volume=	0.159 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,528.86' @ 12.25 hrs
Flood Elev= 2,531.47'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,528.25'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,527.95' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.33 cfs @ 12.25 hrs HW=2,528.86' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.33 cfs @ 3.26 fps)

Pond CV13: CV513



Pond CV14: CV514

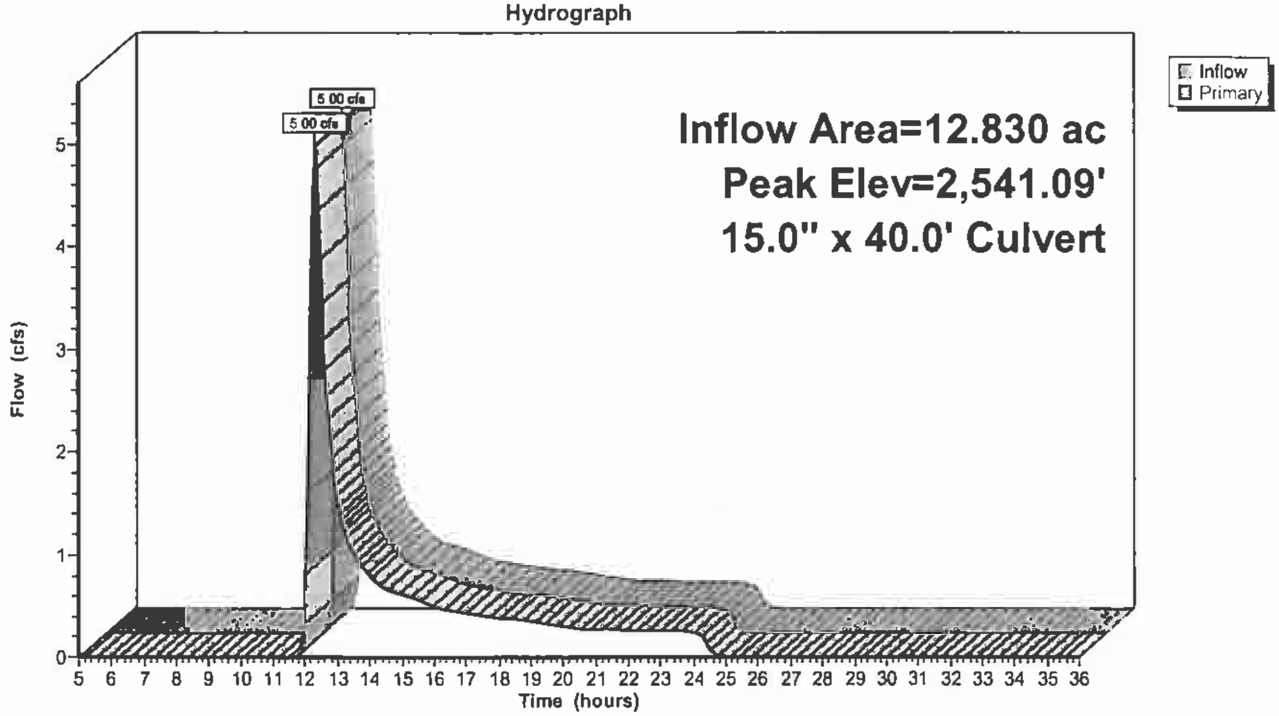
Inflow Area = 12.830 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 5.00 cfs @ 12.29 hrs, Volume= 0.663 af
Outflow = 5.00 cfs @ 12.29 hrs, Volume= 0.663 af, Atten= 0%, Lag= 0.0 min
Primary = 5.00 cfs @ 12.29 hrs, Volume= 0.663 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,541.09' @ 12.29 hrs
Flood Elev= 2,543.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,539.75'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,539.00' S= 0.0187 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.97 cfs @ 12.29 hrs HW=2,541.08' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.97 cfs @ 4.05 fps)

Pond CV14: CV514



Pond CV500: CV500

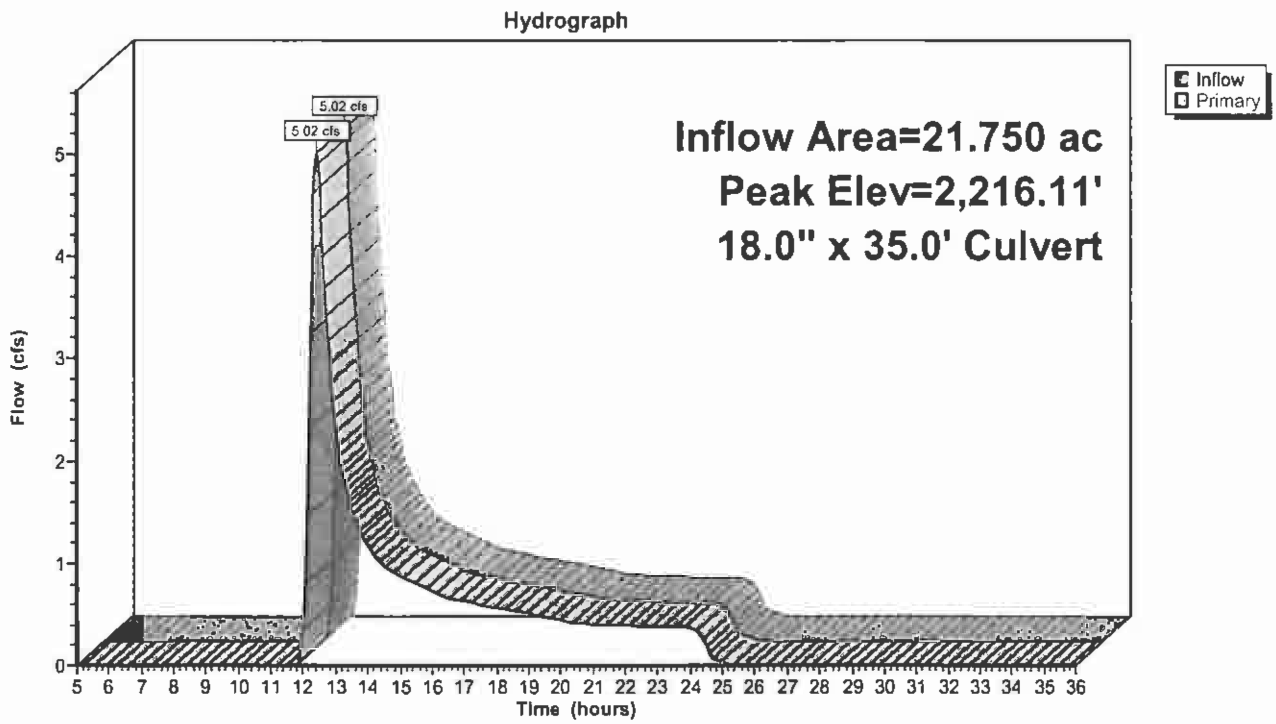
Inflow Area =	21.750 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	5.02 cfs @ 12.40 hrs, Volume=	0.889 af	
Outflow =	5.02 cfs @ 12.40 hrs, Volume=	0.889 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.02 cfs @ 12.40 hrs, Volume=	0.889 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,216.11' @ 12.40 hrs
Flood Elev= 2,218.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,215.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,213.75' S= 0.0357 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=5.02 cfs @ 12.40 hrs HW=2,216.11' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.02 cfs @ 3.58 fps)

Pond CV500: CV500



Pond CV501: CV501

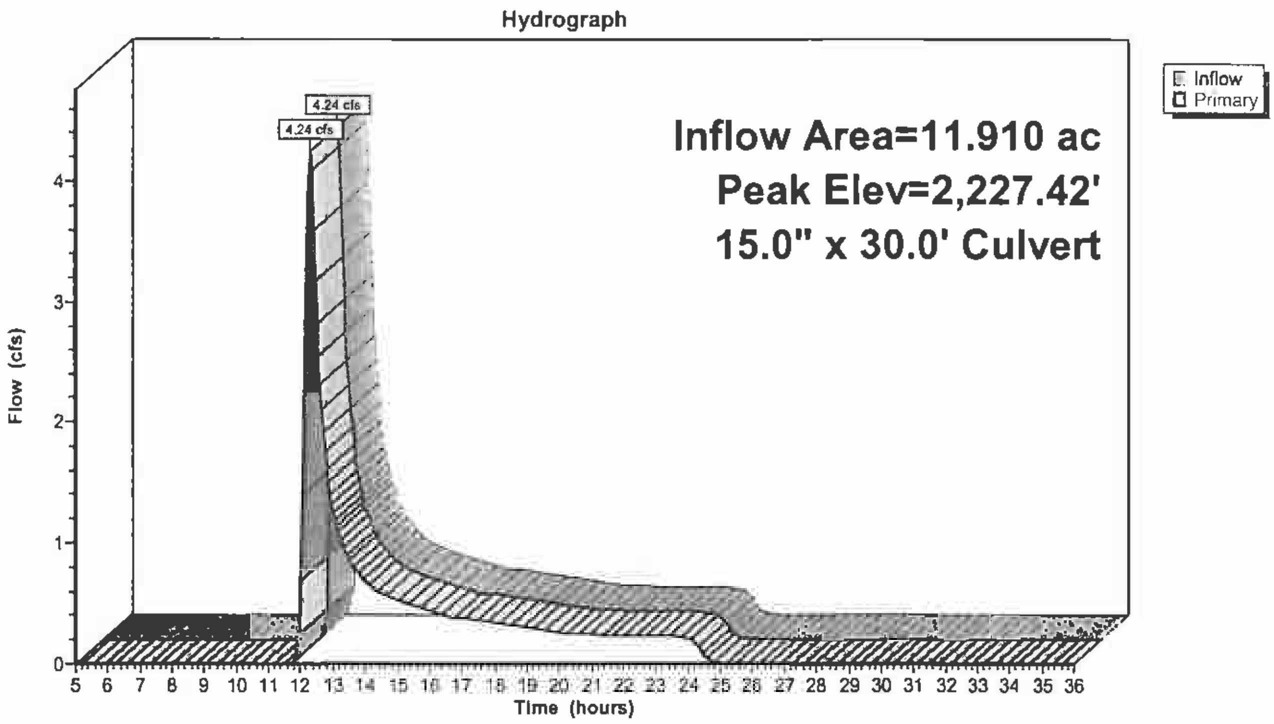
Inflow Area =	11.910 ac, Inflow Depth = 0.58"	for 10-YR event
Inflow =	4.24 cfs @ 12.27 hrs, Volume=	0.571 af
Outflow =	4.24 cfs @ 12.27 hrs, Volume=	0.571 af, Atten= 0%, Lag= 0.0 min
Primary =	4.24 cfs @ 12.27 hrs, Volume=	0.571 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,227.42' @ 12.27 hrs
Flood Elev= 2,229.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,226.15'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,225.85' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.21 cfs @ 12.27 hrs HW=2,227.41' (Free Discharge)
└─1=**Culvert** (Barrel Controls 4.21 cfs @ 4.22 fps)

Pond CV501: CV501



Pond CV502: CV502

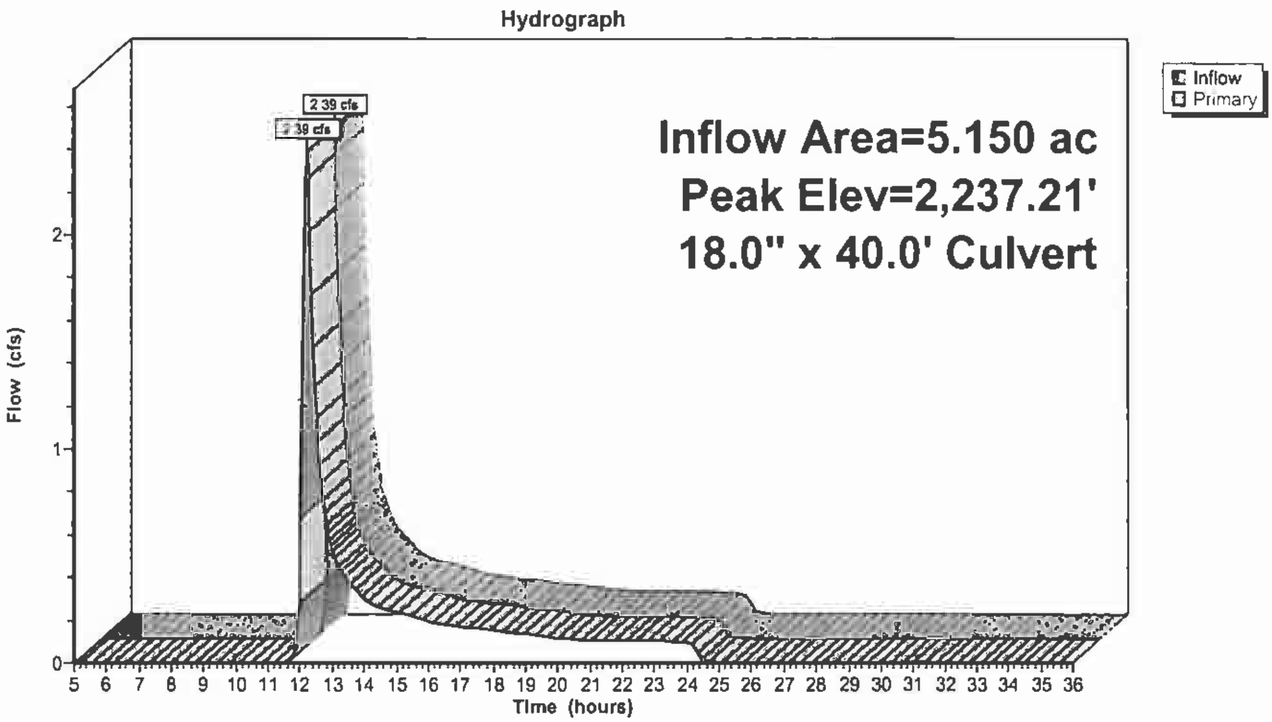
Inflow Area =	5.150 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	2.39 cfs @ 12.20 hrs, Volume=	0.266 af	
Outflow =	2.39 cfs @ 12.20 hrs, Volume=	0.266 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.39 cfs @ 12.20 hrs, Volume=	0.266 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,237.21' @ 12.20 hrs
Flood Elev= 2,240.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,236.50'	**18.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,228.00' S= 0.2125 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.39 cfs @ 12.20 hrs HW=2,237.21' (Free Discharge)
└─1=**Culvert** (Inlet Controls 2.39 cfs @ 2.88 fps)

Pond CV502: CV502



Pond CV503: CV503

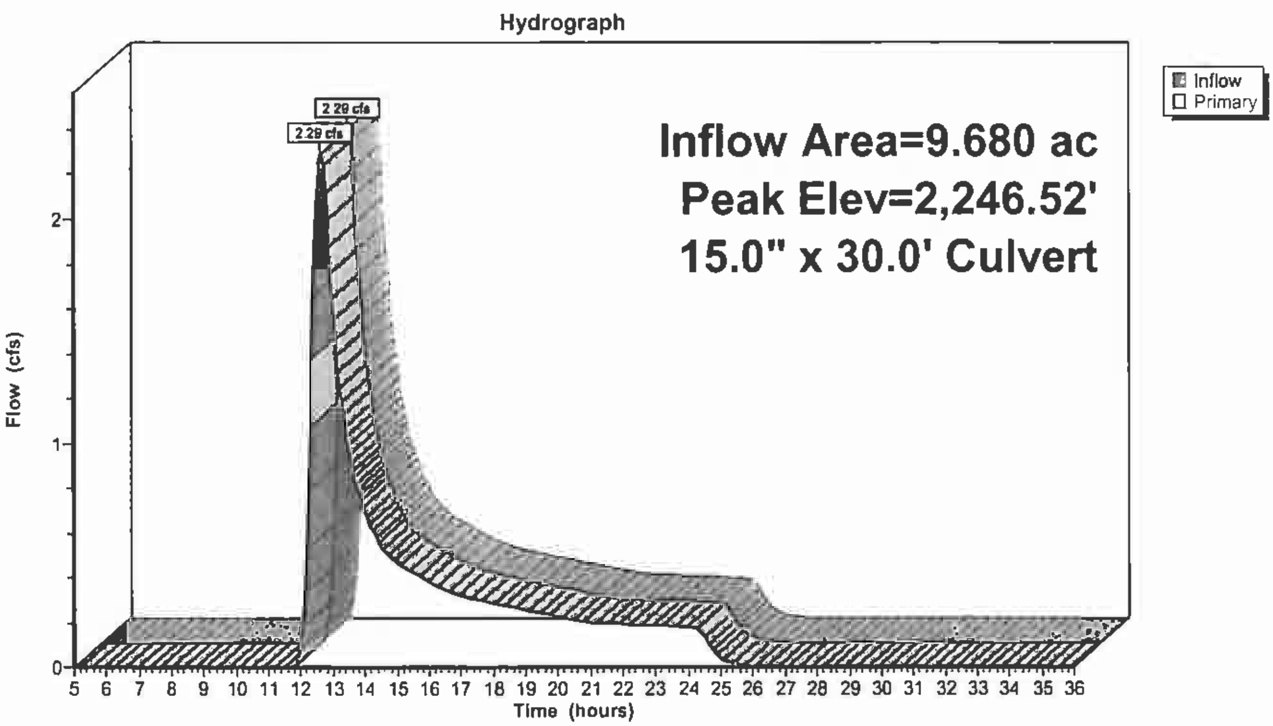
Inflow Area = 9.680 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 2.29 cfs @ 12.60 hrs, Volume= 0.464 af
Outflow = 2.29 cfs @ 12.60 hrs, Volume= 0.464 af, Atten= 0%, Lag= 0.0 min
Primary = 2.29 cfs @ 12.60 hrs, Volume= 0.464 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,246.52' @ 12.60 hrs
Flood Elev= 2,248.93'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,245.68'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,245.38' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.29 cfs @ 12.60 hrs HW=2,246.52' (Free Discharge)
└─1=**Culvert** (Barrel Controls 2.29 cfs @ 3.68 fps)

Pond CV503: CV503



Pond CV504: CV504

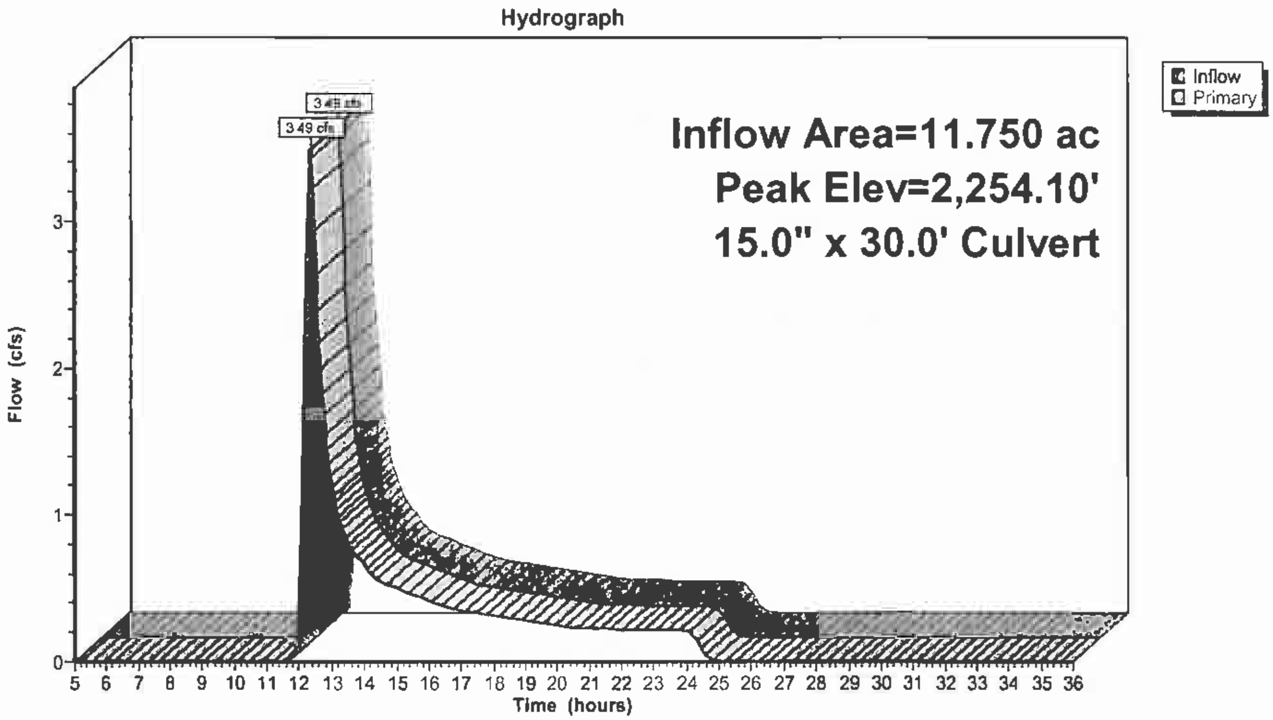
Inflow Area =	11.750 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	3.49 cfs @	12.31 hrs, Volume=	0.521 af	
Outflow =	3.49 cfs @	12.31 hrs, Volume=	0.521 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.49 cfs @	12.31 hrs, Volume=	0.521 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,254.10' @ 12.31 hrs
Flood Elev= 2,256.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,253.00'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,252.70' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.48 cfs @ 12.31 hrs HW=2,254.10' (Free Discharge)
└─1=**Culvert** (Barrel Controls 3.48 cfs @ 4.04 fps)

Pond CV504: CV504



Pond CV505: CV505

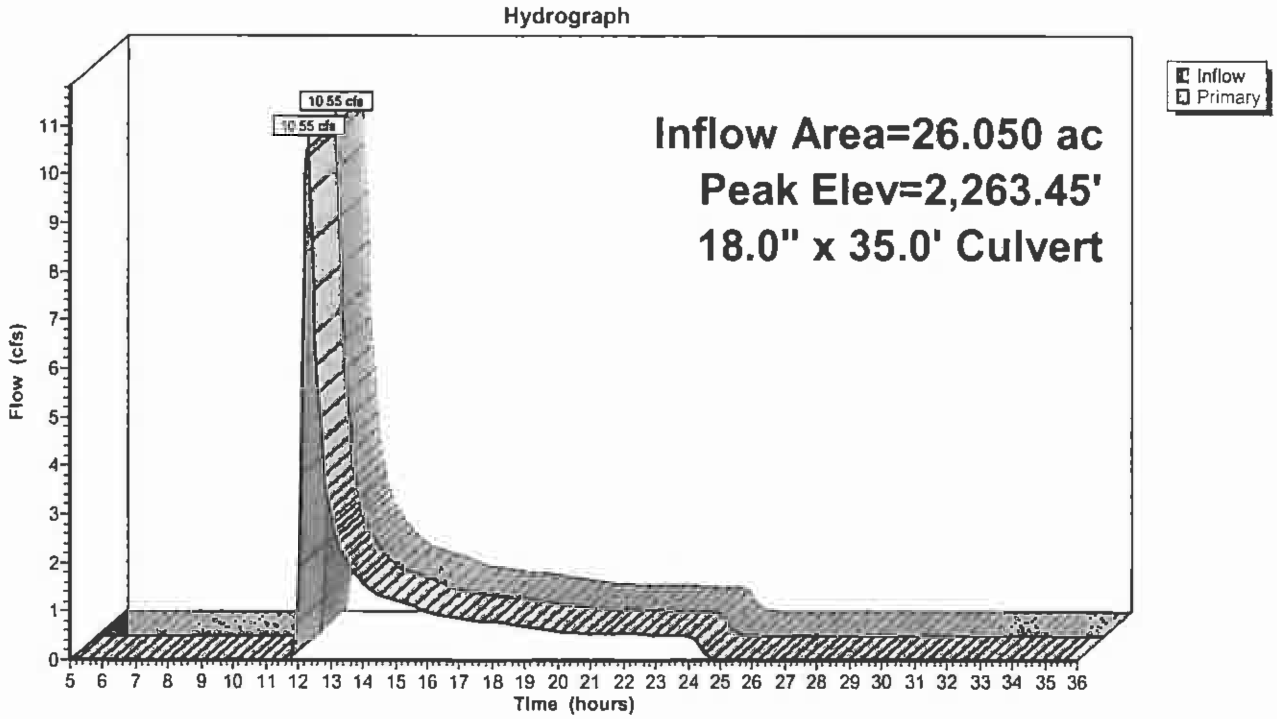
Inflow Area = 26.050 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 10.55 cfs @ 12.27 hrs, Volume= 1.346 af
Outflow = 10.55 cfs @ 12.27 hrs, Volume= 1.346 af, Atten= 0%, Lag= 0.0 min
Primary = 10.55 cfs @ 12.27 hrs, Volume= 1.346 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,263.45' @ 12.26 hrs
Flood Elev= 2,264.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,261.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,260.65' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=10.47 cfs @ 12.27 hrs HW=2,263.43' (Free Discharge)
└─**1=Culvert** (Barrel Controls 10.47 cfs @ 5.93 fps)

Pond CV505: CV505



Pond CV506: CV506

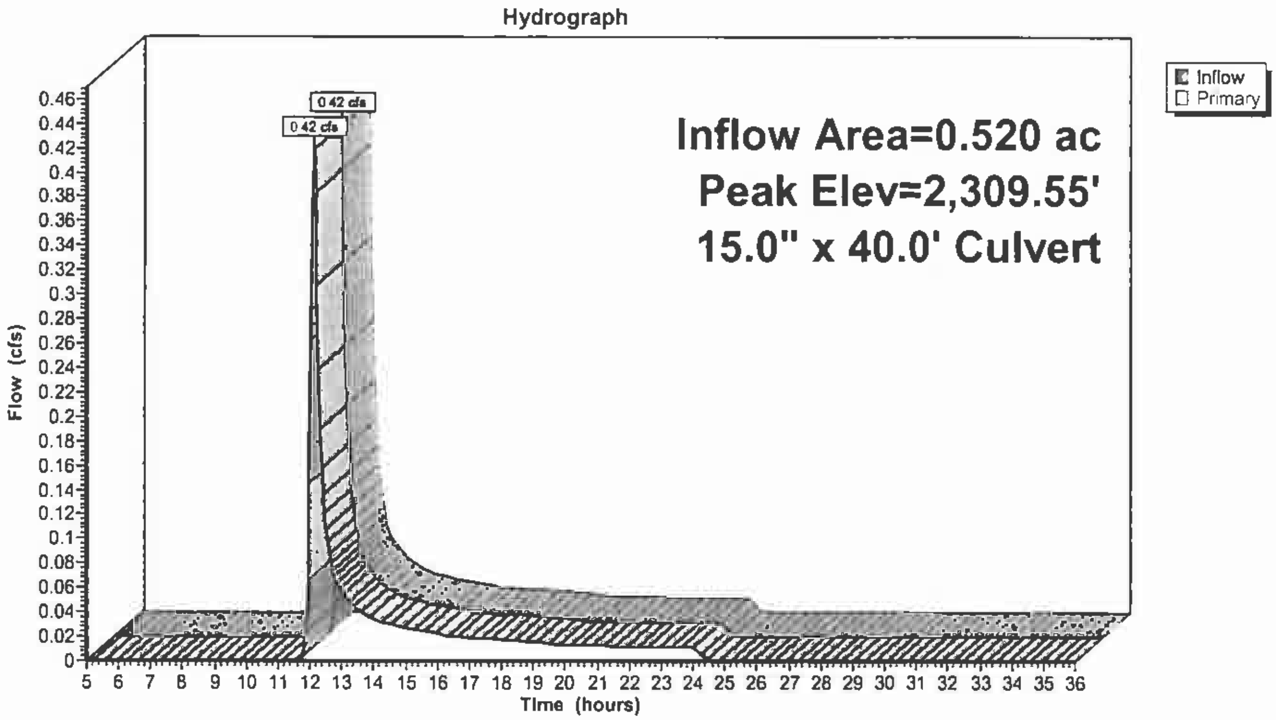
Inflow Area =	0.520 ac, Inflow Depth = 0.76"	for 10-YR event	
Inflow =	0.42 cfs @ 12.10 hrs, Volume=	0.033 af	
Outflow =	0.42 cfs @ 12.10 hrs, Volume=	0.033 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.42 cfs @ 12.10 hrs, Volume=	0.033 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,309.55' @ 12.10 hrs
Flood Elev= 2,312.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,309.25'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,308.00' S= 0.0313 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.42 cfs @ 12.10 hrs HW=2,309.55' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.42 cfs @ 1.86 fps)

Pond CV506: CV506



Pond CV507: CV507

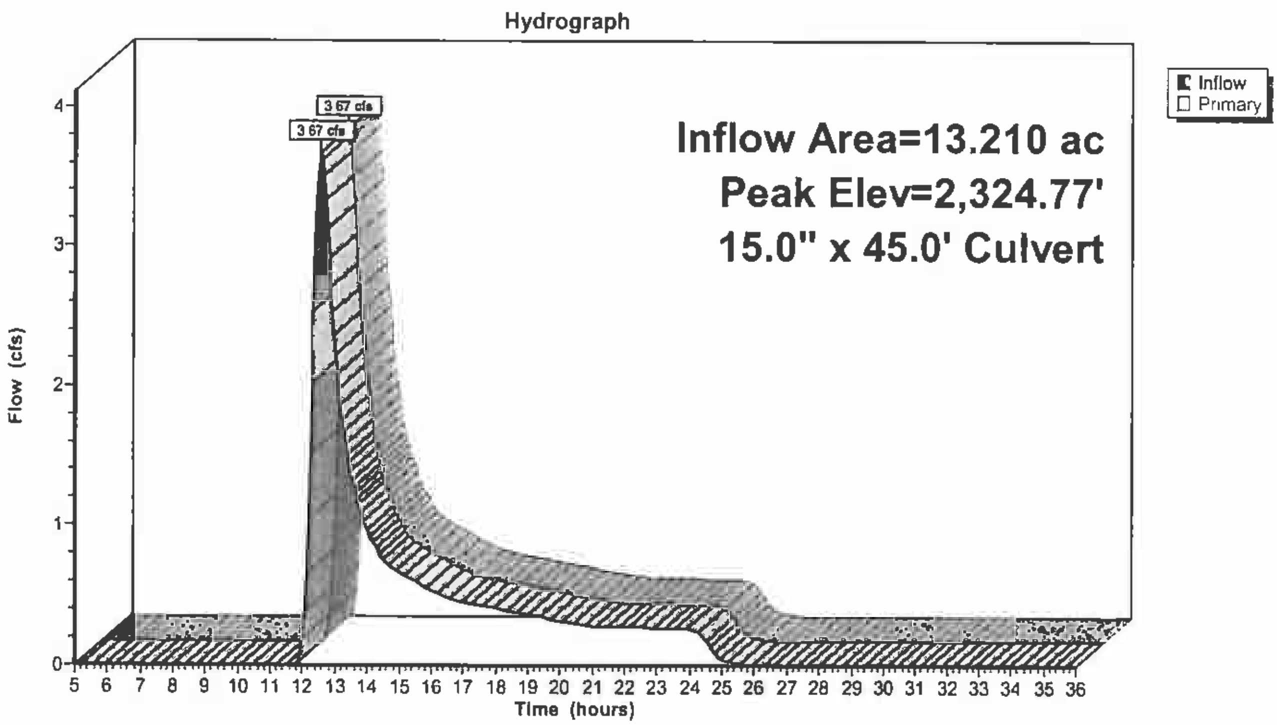
Inflow Area =	13.210 ac, Inflow Depth = 0.62"	for 10-YR event		
Inflow =	3.67 cfs @ 12.55 hrs, Volume=	0.683 af		
Outflow =	3.67 cfs @ 12.55 hrs, Volume=	0.683 af,	Atten= 0%,	Lag= 0.0 min
Primary =	3.67 cfs @ 12.55 hrs, Volume=	0.683 af		

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,324.77' @ 12.55 hrs
Flood Elev= 2,327.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,323.75'	**15.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,323.00' S= 0.0167 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.67 cfs @ 12.55 hrs HW=2,324.77' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 3.67 cfs @ 3.43 fps)

Pond CV507: CV507



Pond CV508: CV508

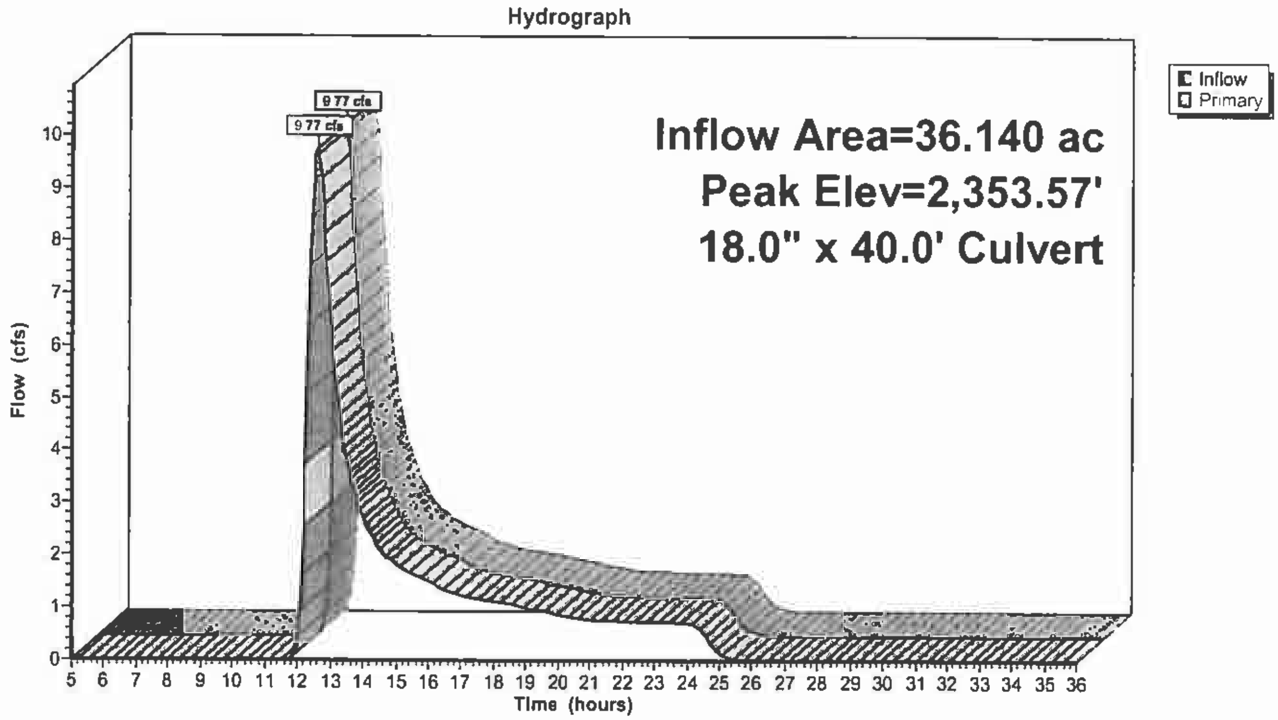
Inflow Area =	36.140 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	9.77 cfs @ 12.57 hrs, Volume=	1.868 af	
Outflow =	9.77 cfs @ 12.57 hrs, Volume=	1.868 af,	Atten= 0%, Lag= 0.0 min
Primary =	9.77 cfs @ 12.57 hrs, Volume=	1.868 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,353.57' @ 12.57 hrs
Flood Elev= 2,355.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,351.50'	**18.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,350.00' S= 0.0375 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=9.75 cfs @ 12.57 hrs HW=2,353.56' (Free Discharge)
└─1=**Culvert** (Inlet Controls 9.75 cfs @ 5.52 fps)

Pond CV508: CV508



Pond CV509: CV509

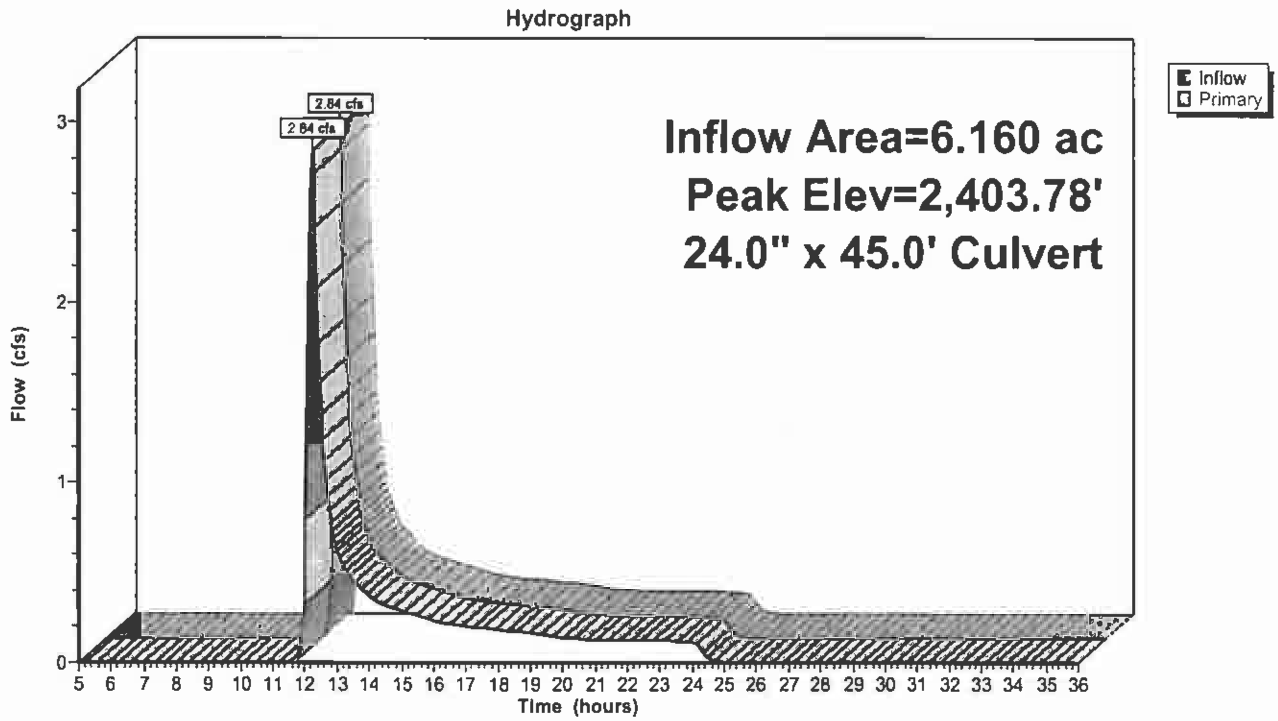
Inflow Area =	6.160 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	2.84 cfs @ 12.20 hrs, Volume=	0.318 af	
Outflow =	2.84 cfs @ 12.20 hrs, Volume=	0.318 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.84 cfs @ 12.20 hrs, Volume=	0.318 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,403.78' @ 12.20 hrs
Flood Elev= 2,407.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,403.00'	**24.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,402.60' S= 0.0089 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.83 cfs @ 12.20 hrs HW=2,403.78' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.83 cfs @ 3.71 fps)

Pond CV509: CV509



Pond CV510: CV510

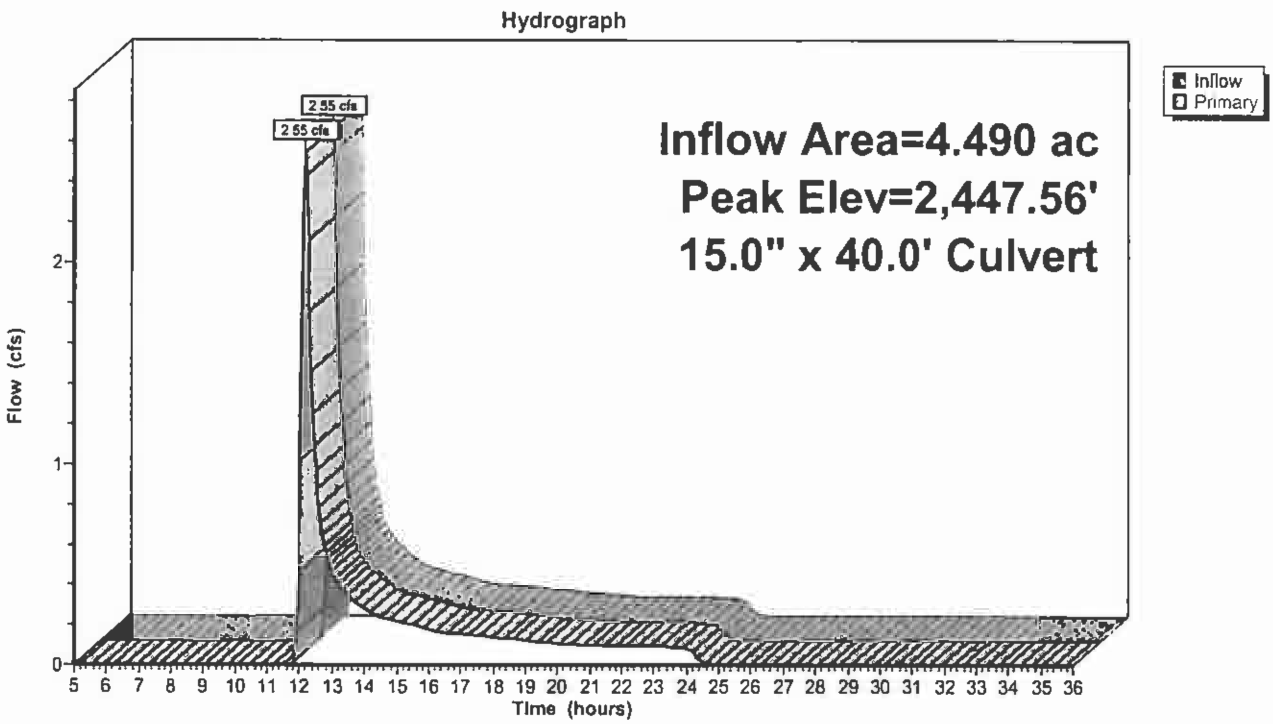
Inflow Area =	4.490 ac, Inflow Depth = 0.67"	for 10-YR event	
Inflow =	2.55 cfs @ 12.16 hrs, Volume=	0.249 af	
Outflow =	2.55 cfs @ 12.16 hrs, Volume=	0.249 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.55 cfs @ 12.16 hrs, Volume=	0.249 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,447.56' @ 12.16 hrs
Flood Elev= 2,450.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,446.75'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,442.00' S= 0.1187 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.53 cfs @ 12.16 hrs HW=2,447.55' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.53 cfs @ 3.05 fps)

Pond CV510: CV510



Pond CV511: CV511

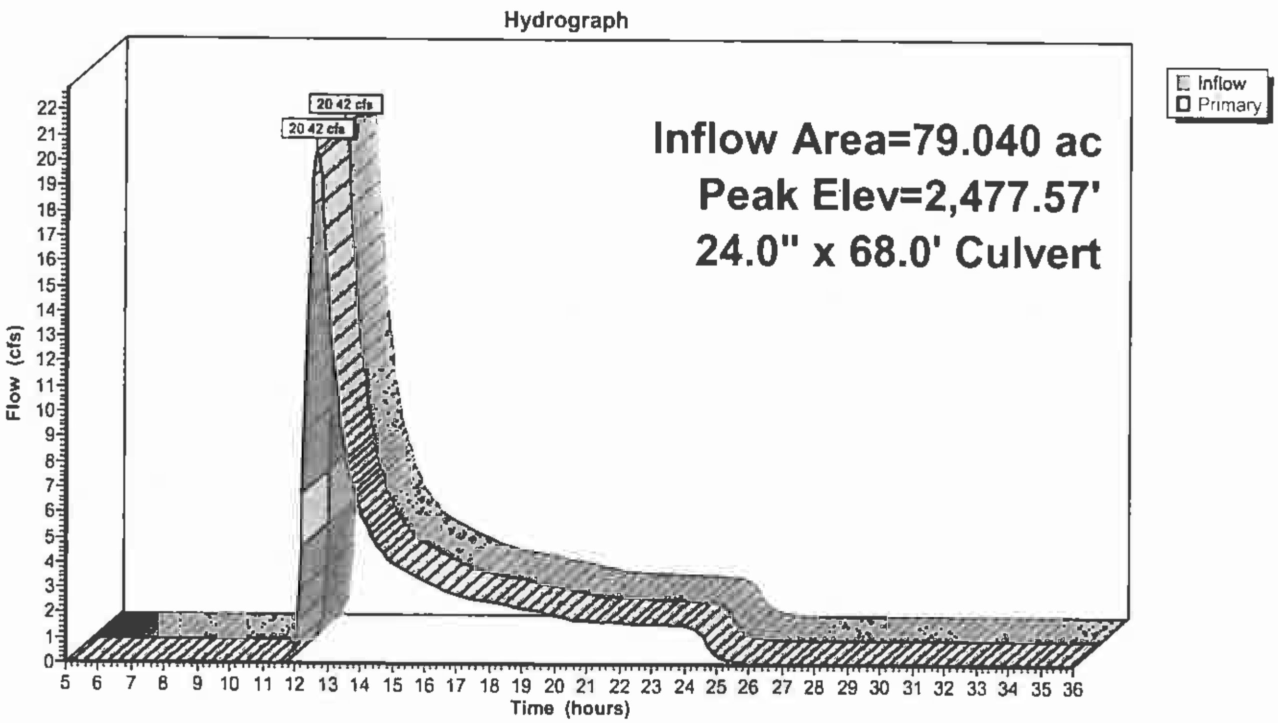
Inflow Area =	79.040 ac, Inflow Depth = 0.62"	for 10-YR event	
Inflow =	20.42 cfs @ 12.62 hrs, Volume=	4.085 af	
Outflow =	20.42 cfs @ 12.62 hrs, Volume=	4.085 af,	Atten= 0%, Lag= 0.0 min
Primary =	20.42 cfs @ 12.62 hrs, Volume=	4.085 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,477.57' @ 12.62 hrs
Flood Elev= 2,485.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,474.75'	**24.0" x 68.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,464.00' S= 0.1581 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=20.39 cfs @ 12.62 hrs HW=2,477.57' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 20.39 cfs @ 6.49 fps)

Pond CV511: CV511



Pond CV512: CV512

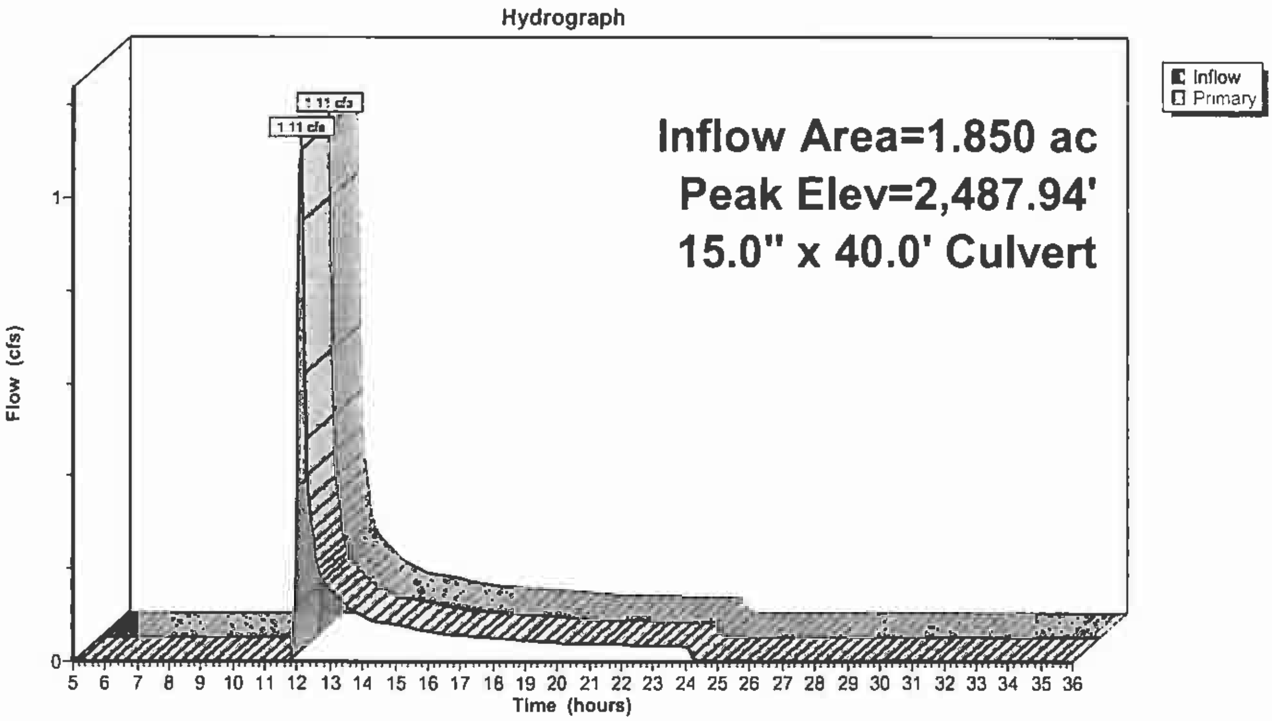
Inflow Area = 1.850 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 1.11 cfs @ 12.07 hrs, Volume= 0.089 af
Outflow = 1.11 cfs @ 12.07 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 1.11 cfs @ 12.07 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,487.94' @ 12.07 hrs
Flood Elev= 2,490.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,487.40'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,487.00' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.07 cfs @ 12.07 hrs HW=2,487.93' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.07 cfs @ 3.17 fps)

Pond CV512: CV512



Pond CV515: CV515

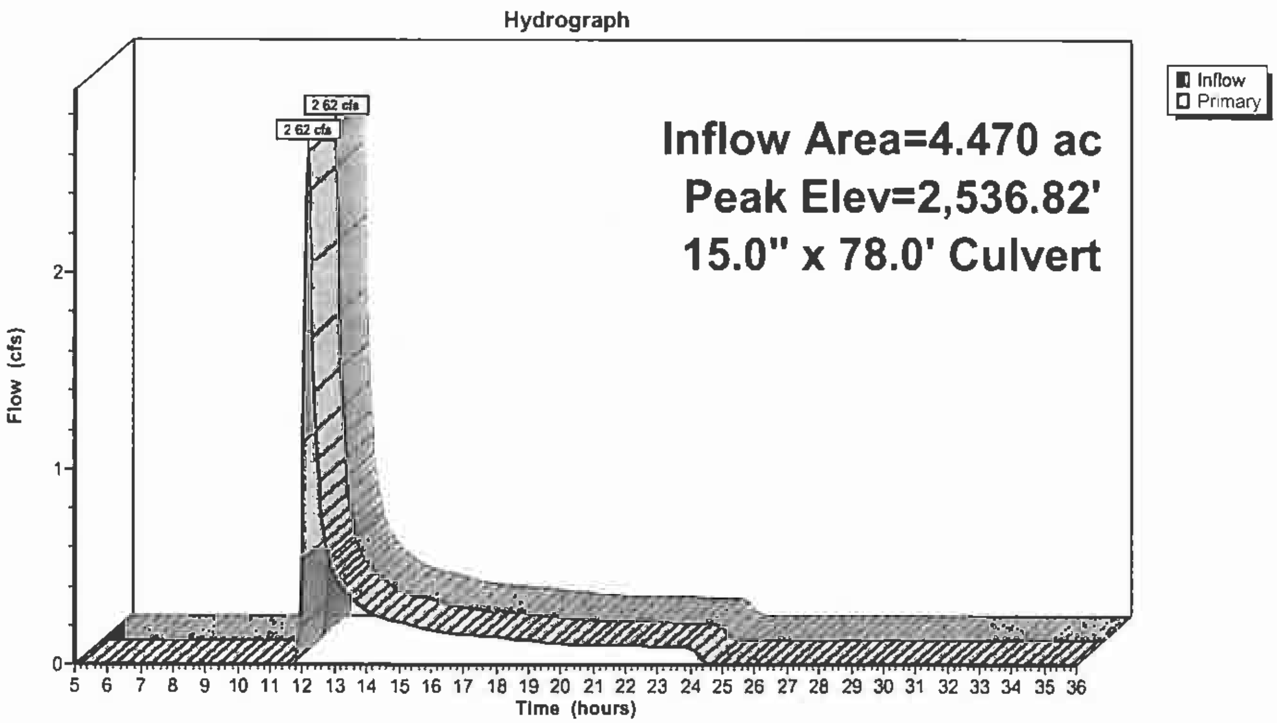
Inflow Area =	4.470 ac,	Inflow Depth = 0.67"	for 10-YR event	
Inflow =	2.62 cfs @	12.15 hrs, Volume=	0.248 af	
Outflow =	2.62 cfs @	12.15 hrs, Volume=	0.248 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.62 cfs @	12.15 hrs, Volume=	0.248 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,536.82' @ 12.15 hrs
Flood Elev= 2,539.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,536.00'	**15.0" x 78.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,530.00' S= 0.0769 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.61 cfs @ 12.15 hrs HW=2,536.82' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.61 cfs @ 3.08 fps)

Pond CV515: CV515



Pond CV516: CV516

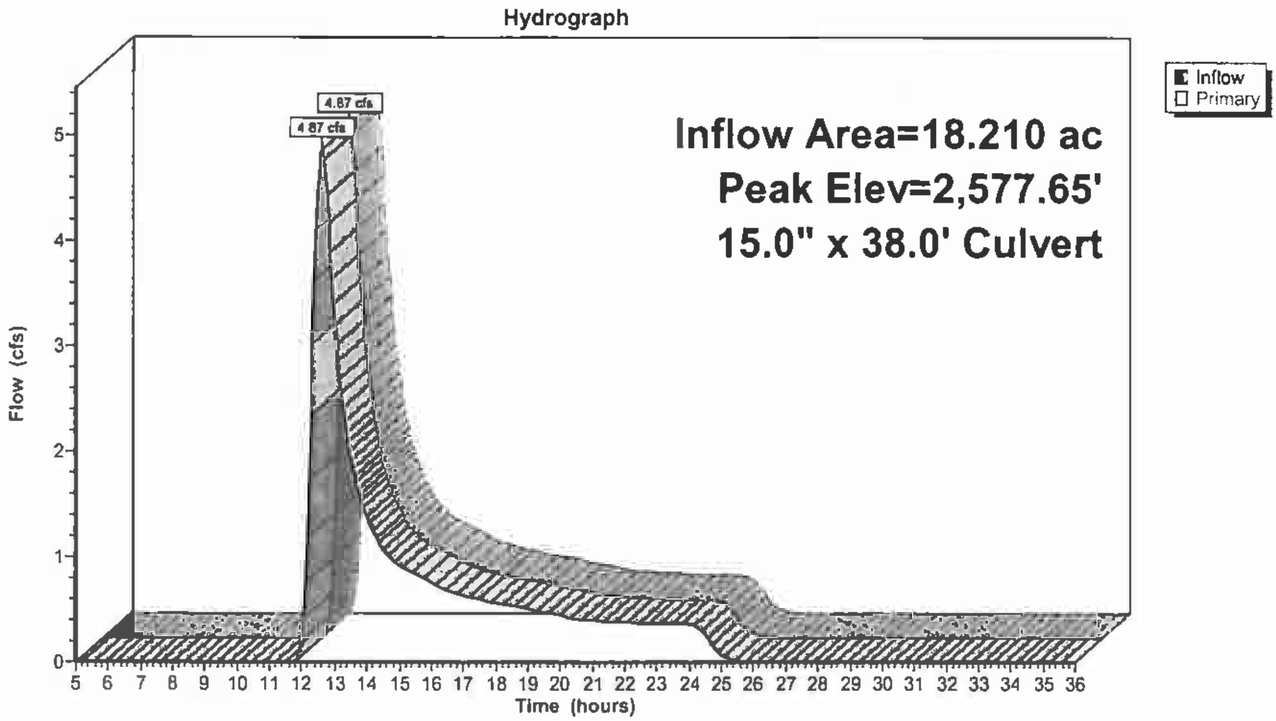
Inflow Area = 18.210 ac, Inflow Depth = 0.62" for 10-YR event
Inflow = 4.87 cfs @ 12.59 hrs, Volume= 0.941 af
Outflow = 4.87 cfs @ 12.59 hrs, Volume= 0.941 af, Atten= 0%, Lag= 0.0 min
Primary = 4.87 cfs @ 12.59 hrs, Volume= 0.941 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,577.65' @ 12.59 hrs
Flood Elev= 2,579.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,576.35'	**15.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,575.00' S= 0.0355 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.86 cfs @ 12.59 hrs HW=2,577.65' (Free Discharge)
└─1=**Culvert** (Inlet Controls 4.86 cfs @ 3.96 fps)

Pond CV516: CV516



Pond CV517: CV517

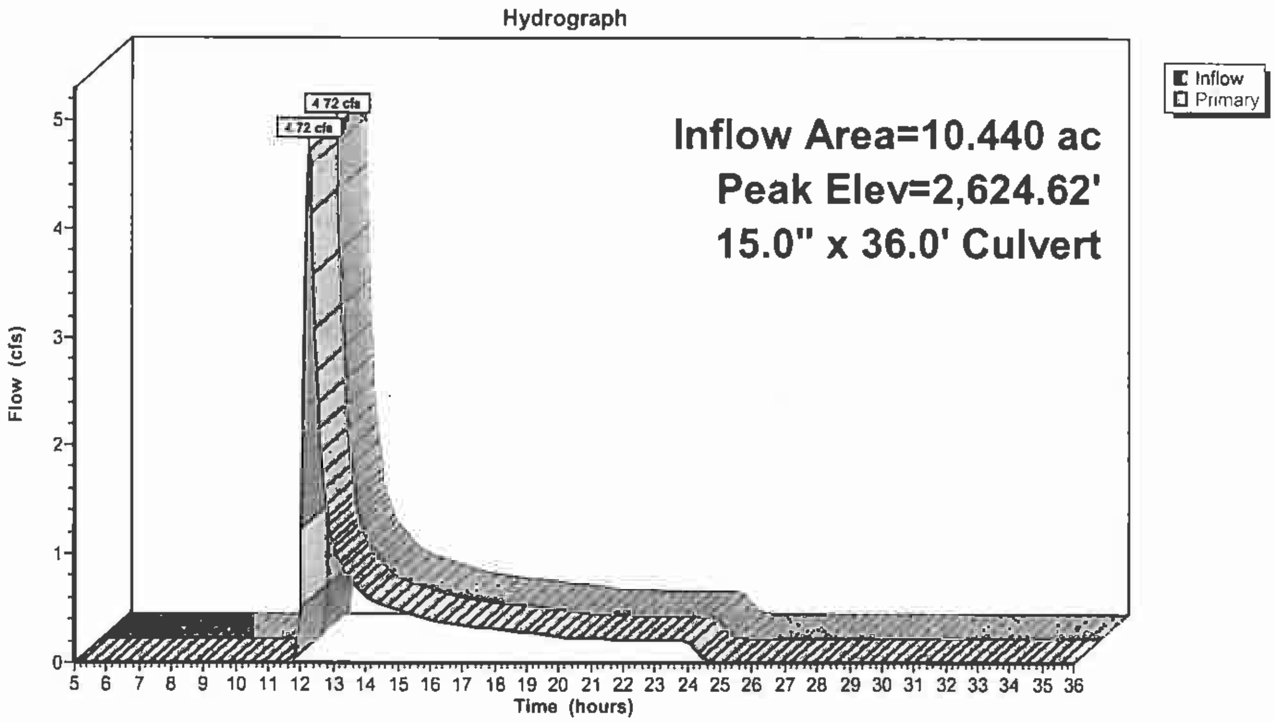
Inflow Area =	10.440 ac,	Inflow Depth = 0.62"	for 10-YR event		
Inflow =	4.72 cfs @	12.21 hrs,	Volume=	0.540 af	
Outflow =	4.72 cfs @	12.21 hrs,	Volume=	0.540 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.72 cfs @	12.21 hrs,	Volume=	0.540 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,624.62' @ 12.21 hrs
Flood Elev= 2,626.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,623.25'	**15.0" x 36.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,622.89' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=4.68 cfs @ 12.21 hrs HW=2,624.61' (Free Discharge)
└─1=**Culvert** (Barrel Controls 4.68 cfs @ 4.37 fps)

Pond CV517: CV517



Pond CV518: CV518

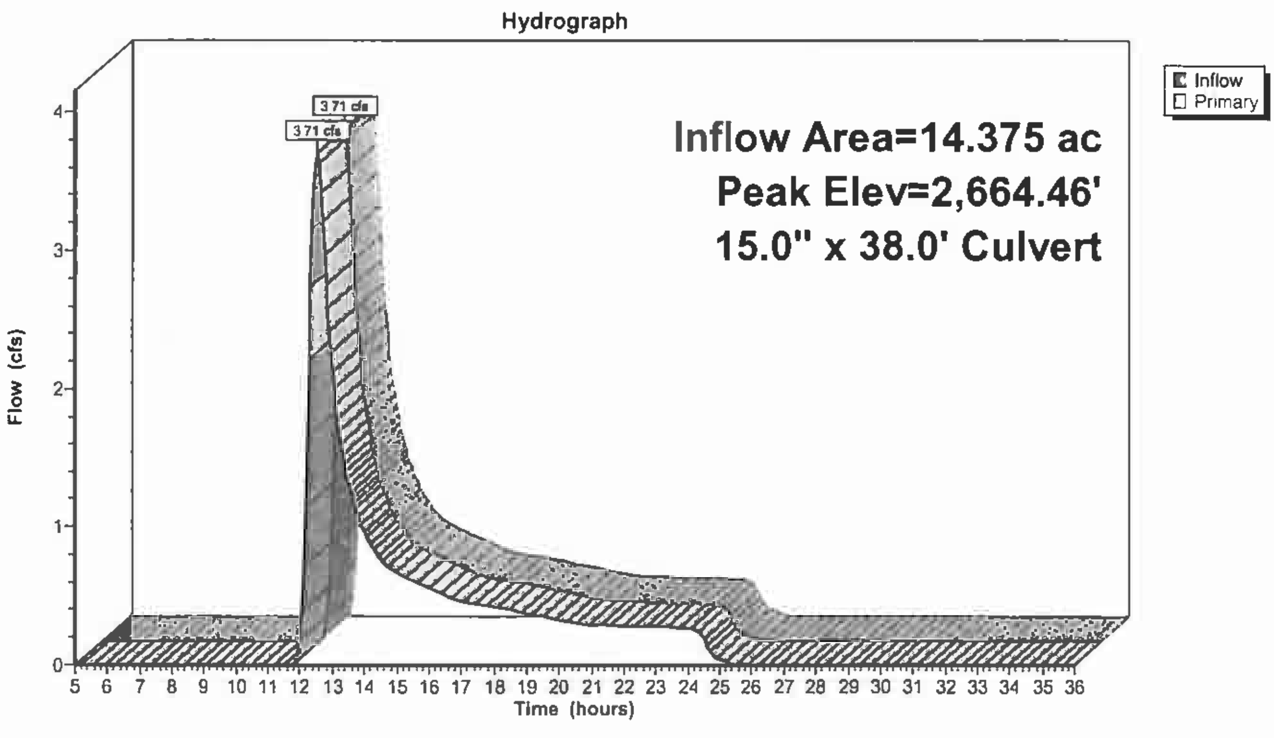
Inflow Area =	14.375 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	3.71 cfs @ 12.51 hrs, Volume=	0.689 af	
Outflow =	3.71 cfs @ 12.51 hrs, Volume=	0.689 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.71 cfs @ 12.51 hrs, Volume=	0.689 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,664.46' @ 12.51 hrs
Flood Elev= 2,666.58'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,663.33'	**15.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,662.95' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.70 cfs @ 12.51 hrs HW=2,664.46' (Free Discharge)
└─1=**Culvert** (Barrel Controls 3.70 cfs @ 4.17 fps)

Pond CV518: CV518



Pond CV519: CV519

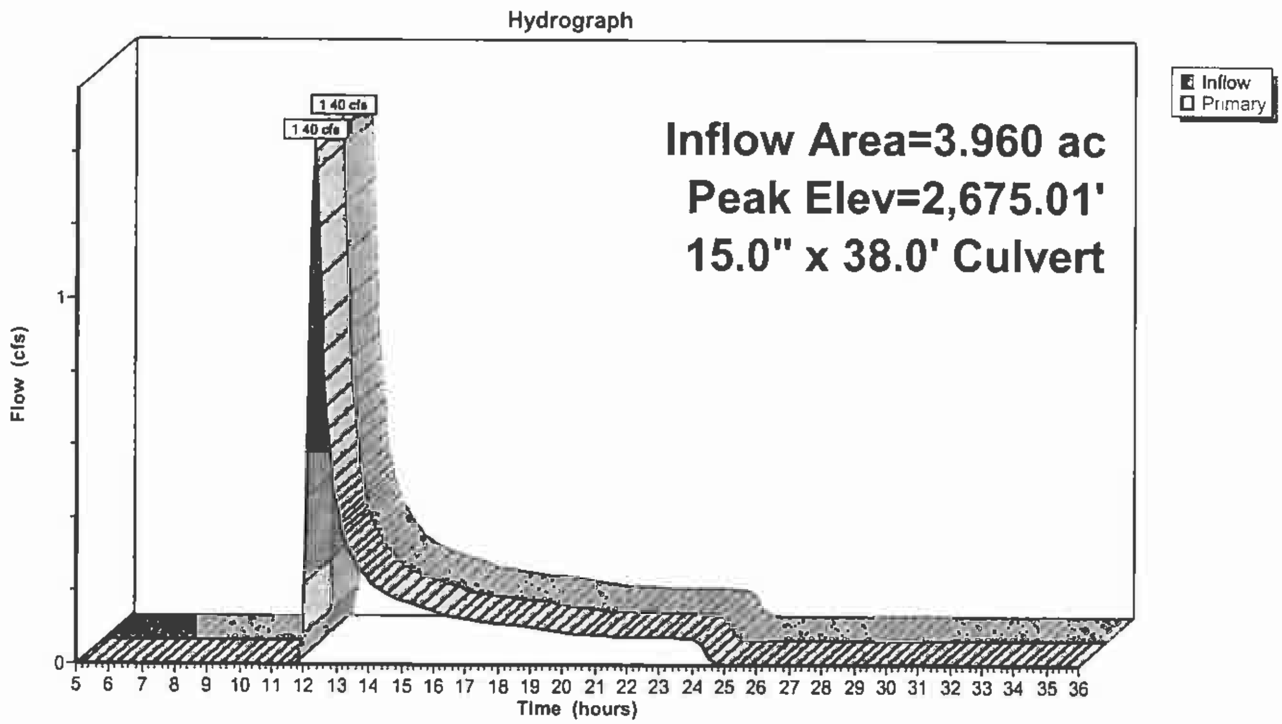
Inflow Area =	3.960 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	1.40 cfs @	12.28 hrs,	Volume=	0.190 af
Outflow =	1.40 cfs @	12.28 hrs,	Volume=	0.190 af, Atten= 0%, Lag= 0.0 min
Primary =	1.40 cfs @	12.28 hrs,	Volume=	0.190 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,675.01' @ 12.28 hrs
Flood Elev= 2,677.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,674.39'	**15.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,674.01' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.39 cfs @ 12.28 hrs HW=2,675.01' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.39 cfs @ 3.35 fps)

Pond CV519: CV519



Pond CV520: CV520

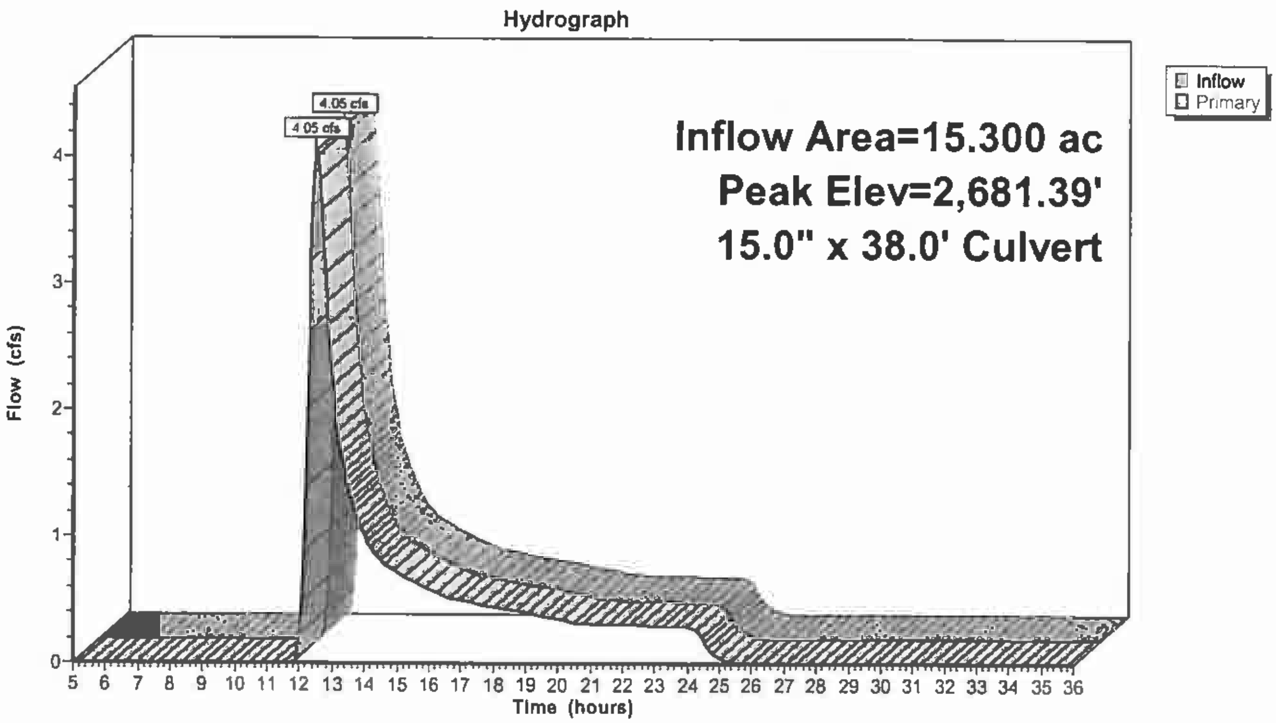
Inflow Area =	15.300 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	4.05 cfs @ 12.48 hrs, Volume=	0.734 af	
Outflow =	4.05 cfs @ 12.48 hrs, Volume=	0.734 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.05 cfs @ 12.48 hrs, Volume=	0.734 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,681.39' @ 12.48 hrs
Flood Elev= 2,683.43'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,680.18'	**15.0" x 38.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,679.80' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=4.04 cfs @ 12.48 hrs HW=2,681.39' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 4.04 cfs @ 4.25 fps)

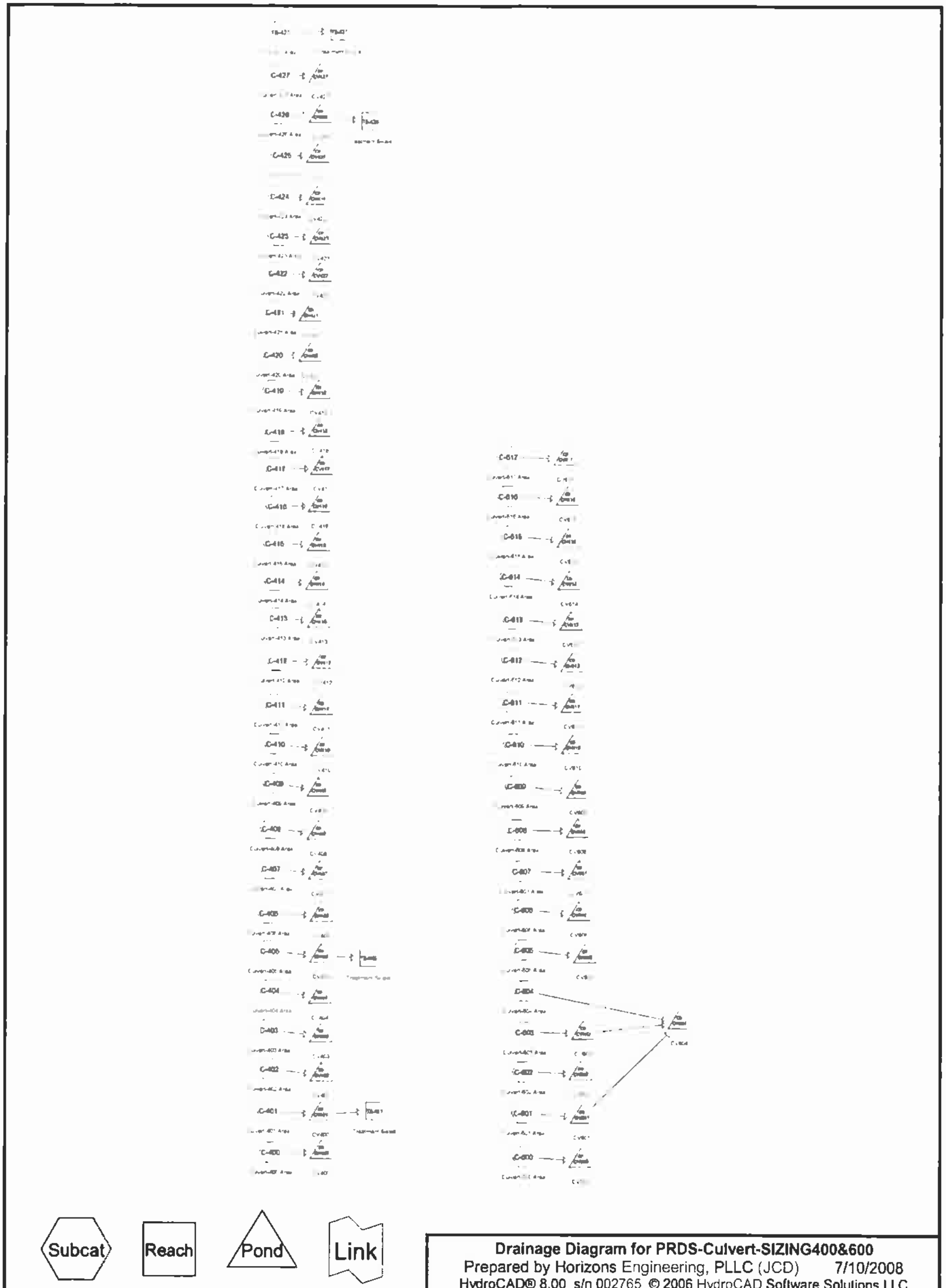
Pond CV520: CV520



Proposed Road Culverts (400 Series)
(Dixville Connector)

&

Proposed Road Culverts (600 Series)
(Owl Head)



Drainage Diagram for PRDS-Culvert-SIZING400&600
Prepared by Horizons Engineering, PLLC (JCD) 7/10/2008
HydroCAD® 8.00 s/n 002765 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.865	49	Brush, Good, HSG C (C-400,C-401,C-402,C-403,C-404,C-405,C-406,C-408,C-409,C-410,C-
158.480	53	Woods, Good, HSG C (C-400,C-401,C-402,C-403,C-404,C-405,C-406,C-407,C-408,C-409,(
6.487	55	Brush, Good, HSG D (C-402,C-403,C-407,C-411,C-412,C-413,C-414,C-415,C-416,C-417,C-
269.121	58	Woods, Good, HSG D (C-400,C-401,C-402,C-403,C-405,C-406,C-407,C-408,C-409,C-410,(
5.975	89	Gravel roads, HSG C (C-400,C-401,C-402,C-403,C-404,C-405,C-406,C-407,C-408,C-409,C
440.928		

Time span=5.00-36.00 hrs, dt=0.05 hrs, 621 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment C-400: Culvert-400 Area Runoff Area=16.850 ac Runoff Depth=0.49"
Flow Length=3,783' Tc=33.1 min CN=55 Runoff=3.96 cfs 0.689 af

Subcatchment C-401: Culvert-401 Area Runoff Area=2.010 ac Runoff Depth=0.58"
Flow Length=1,447' Tc=23.4 min CN=57 Runoff=0.79 cfs 0.096 af

Subcatchment C-402: Culvert-402 Area Runoff Area=5.195 ac Runoff Depth=0.53"
Flow Length=3,804' Tc=37.1 min CN=56 Runoff=1.30 cfs 0.230 af

Subcatchment C-403: Culvert-403 Area Runoff Area=8.290 ac Runoff Depth=0.49"
Flow Length=3,816' Tc=36.2 min CN=55 Runoff=1.84 cfs 0.339 af

Subcatchment C-404: Culvert-404 Area Runoff Area=1.650 ac Runoff Depth=0.45"
Flow Length=1,284' Tc=17.1 min CN=54 Runoff=0.52 cfs 0.062 af

Subcatchment C-405: Culvert-405 Area Runoff Area=4.450 ac Runoff Depth=0.45"
Flow Length=2,191' Tc=25.5 min CN=54 Runoff=1.07 cfs 0.167 af

Subcatchment C-406: Culvert-406 Area Runoff Area=4.320 ac Runoff Depth=0.45"
Flow Length=1,626' Tc=20.8 min CN=54 Runoff=1.20 cfs 0.162 af

Subcatchment C-407: Culvert-407 Area Runoff Area=4.070 ac Runoff Depth=0.45"
Flow Length=1,961' Tc=23.3 min CN=54 Runoff=1.04 cfs 0.153 af

Subcatchment C-408: Culvert-408 Area Runoff Area=8.600 ac Runoff Depth=0.49"
Flow Length=2,687' Tc=26.3 min CN=55 Runoff=2.37 cfs 0.352 af

Subcatchment C-409: Culvert-409 Area Runoff Area=16.650 ac Runoff Depth=0.53"
Flow Length=2,865' Tc=28.1 min CN=56 Runoff=5.04 cfs 0.739 af

Subcatchment C-410: Culvert-410 Area Runoff Area=5.880 ac Runoff Depth=0.45"
Flow Length=1,734' Tc=18.7 min CN=54 Runoff=1.76 cfs 0.221 af

Subcatchment C-411: Culvert-411 Area Runoff Area=5.000 ac Runoff Depth=0.45"
Flow Length=1,747' Tc=17.6 min CN=54 Runoff=1.56 cfs 0.188 af

Subcatchment C-412: Culvert-412 Area Runoff Area=17.610 ac Runoff Depth=0.53"
Flow Length=2,760' Tc=27.7 min CN=56 Runoff=5.39 cfs 0.781 af

Subcatchment C-413: Culvert-413 Area Runoff Area=1.620 ac Runoff Depth=0.49"
Flow Length=690' Tc=14.5 min CN=55 Runoff=0.67 cfs 0.066 af

Subcatchment C-414: Culvert-414 Area Runoff Area=6.760 ac Runoff Depth=0.45"
Flow Length=2,017' Tc=22.1 min CN=54 Runoff=1.80 cfs 0.254 af

Subcatchment C-415: Culvert-415 Area Runoff Area=13.110 ac Runoff Depth=0.49"
Flow Length=3,549' Tc=30.4 min CN=55 Runoff=3.27 cfs 0.536 af

Subcatchment C-416: Culvert-416 Area Runoff Area=2.820 ac Runoff Depth=0.58"
Flow Length=1,658' Tc=21.5 min CN=57 Runoff=1.18 cfs 0.135 af

Subcatchment C-417: Culvert-417 Area Runoff Area=6.560 ac Runoff Depth=0.49"
Flow Length=2,216' Tc=24.3 min CN=55 Runoff=1.91 cfs 0.268 af

Subcatchment C-418: Culvert-418 Area Runoff Area=11.940 ac Runoff Depth=0.53"
Flow Length=2,600' Tc=24.8 min CN=56 Runoff=3.95 cfs 0.530 af

Subcatchment C-419: Culvert-419 Area Runoff Area=31.540 ac Runoff Depth=0.58"
Flow Length=3,883' Tc=35.1 min CN=57 Runoff=9.30 cfs 1.513 af

Subcatchment C-420: Culvert-420 Area Runoff Area=15.930 ac Runoff Depth=0.58"
Flow Length=2,787' Tc=19.7 min CN=57 Runoff=7.08 cfs 0.764 af

Subcatchment C-421: Culvert-421 Area Runoff Area=80.110 ac Runoff Depth=0.58"
Flow Length=4,729' Tc=39.2 min CN=57 Runoff=21.88 cfs 3.842 af

Subcatchment C-422: Culvert-422 Area Runoff Area=33.660 ac Runoff Depth=0.53"
Flow Length=4,745' Tc=41.3 min CN=56 Runoff=7.81 cfs 1.493 af

Subcatchment C-423: Culvert-423 Area Runoff Area=35.290 ac Runoff Depth=0.58"
Flow Length=4,267' Tc=36.1 min CN=57 Runoff=10.23 cfs 1.693 af

Subcatchment C-424: Culvert-424 Area Runoff Area=39.030 ac Runoff Depth=0.58"
Flow Length=4,133' Tc=26.3 min CN=57 Runoff=14.14 cfs 1.872 af

Subcatchment C-425: Culvert-425 Area Runoff Area=11.840 ac Runoff Depth=0.53"
Flow Length=4,112' Tc=34.9 min CN=56 Runoff=3.09 cfs 0.525 af

Subcatchment C-426: Culvert-426 Area Runoff Area=0.360 ac Runoff Depth=0.81"
Flow Length=249' Tc=11.1 min CN=62 Runoff=0.38 cfs 0.024 af

Subcatchment C-427: Culvert-427 Area Runoff Area=19.690 ac Runoff Depth=0.58"
Flow Length=4,409' Tc=25.9 min CN=57 Runoff=7.20 cfs 0.944 af

Subcatchment C-600: Culvert-600 Area Runoff Area=0.727 ac Runoff Depth=1.81"
Flow Length=189' Tc=4.1 min CN=78 Runoff=2.47 cfs 0.110 af

Subcatchment C-601: Culvert-601 Area Runoff Area=0.540 ac Runoff Depth=1.03"
Flow Length=287' Tc=4.6 min CN=66 Runoff=0.98 cfs 0.046 af

Subcatchment C-602: Culvert-602 Area Runoff Area=0.303 ac Runoff Depth=1.26"
Flow Length=86' Tc=5.5 min CN=70 Runoff=0.66 cfs 0.032 af

Subcatchment C-603: Culvert-603 Area Runoff Area=0.287 ac Runoff Depth=0.86"
Flow Length=96' Slope=0.4000 '/' Tc=6.8 min CN=63 Runoff=0.39 cfs 0.021 af

Subcatchment C-604: Culvert-604 Area Runoff Area=0.554 ac Runoff Depth=0.97"
Flow Length=179' Tc=28.1 min CN=65 Runoff=0.42 cfs 0.045 af

Subcatchment C-605: Culvert-605 Area Runoff Area=0.586 ac Runoff Depth=0.86"
Flow Length=397' Tc=11.9 min CN=63 Runoff=0.64 cfs 0.042 af

Subcatchment C-606: Culvert-606 Area Runoff Area=1.382 ac Runoff Depth=0.86"
Flow Length=309' Tc=4.5 min CN=63 Runoff=2.06 cfs 0.099 af

Subcatchment C-607: Culvert-607 Area Runoff Area=1.244 ac Runoff Depth=0.81"
Flow Length=300' Tc=3.7 min CN=62 Runoff=1.79 cfs 0.084 af

Subcatchment C-608: Culvert-608 Area Runoff Area=1.239 ac Runoff Depth=1.14"
Flow Length=352' Tc=8.9 min CN=68 Runoff=2.16 cfs 0.118 af

Subcatchment C-609: Culvert-609 Area Runoff Area=0.859 ac Runoff Depth=0.97"
Flow Length=239' Tc=19.6 min CN=65 Runoff=0.83 cfs 0.070 af

Subcatchment C-610: Culvert-610 Area Runoff Area=2.194 ac Runoff Depth=0.97"
Flow Length=514' Tc=14.5 min CN=65 Runoff=2.52 cfs 0.178 af

Subcatchment C-611: Culvert-611 Area Runoff Area=1.240 ac Runoff Depth=0.86"
Flow Length=232' Tc=14.5 min CN=63 Runoff=1.22 cfs 0.089 af

Subcatchment C-612: Culvert-612 Area Runoff Area=0.421 ac Runoff Depth=1.46"
Flow Length=185' Tc=2.8 min CN=73 Runoff=1.20 cfs 0.051 af

Subcatchment C-613: Culvert-613 Area Runoff Area=0.425 ac Runoff Depth=0.97"
Flow Length=248' Tc=13.9 min CN=65 Runoff=0.50 cfs 0.034 af

Subcatchment C-614: Culvert-614 Area Runoff Area=0.273 ac Runoff Depth=1.81"
Flow Length=205' Tc=5.5 min CN=78 Runoff=0.87 cfs 0.041 af

Subcatchment C-615: Culvert-615 Area Runoff Area=2.148 ac Runoff Depth=0.67"
Flow Length=553' Tc=20.0 min CN=59 Runoff=1.19 cfs 0.119 af

Subcatchment C-616: Culvert-616 Area Runoff Area=0.511 ac Runoff Depth=1.03"
Flow Length=435' Tc=14.7 min CN=66 Runoff=0.63 cfs 0.044 af

Subcatchment C-617: Culvert-617 Area Runoff Area=0.210 ac Runoff Depth=0.86"
Flow Length=140' Tc=9.5 min CN=63 Runoff=0.25 cfs 0.015 af

Subcatchment TS-427: TS-427 Area Runoff Area=14.950 ac Runoff Depth=0.49"
Flow Length=3,048' Tc=25.5 min CN=55 Runoff=4.21 cfs 0.611 af

Reach TS401: Treatment Swale Avg. Depth=0.26' Max Vel=0.61 fps Inflow=0.79 cfs 0.096 af
n=0.040 L=100.0' S=0.0020 '/' Capacity=37.55 cfs Outflow=0.77 cfs 0.096 af

Reach TS405: Treatment Swale Avg. Depth=0.32' Max Vel=0.68 fps Inflow=1.07 cfs 0.167 af
n=0.040 L=100.0' S=0.0020 '/' Capacity=37.55 cfs Outflow=1.05 cfs 0.167 af

Reach TS426: Treatment Swale Avg. Depth=0.20' Max Vel=0.36 fps Inflow=0.38 cfs 0.024 af
n=0.040 L=100.0' S=0.0010 '/' Capacity=26.55 cfs Outflow=0.32 cfs 0.024 af

Reach TS427: Treatment Swale Avg. Depth=0.72' Max Vel=0.93 fps Inflow=4.21 cfs 0.611 af
n=0.040 L=100.0' S=0.0015 '/' Capacity=32.52 cfs Outflow=4.15 cfs 0.611 af

Pond CV400: CV400 Peak Elev=2,245.99' Inflow=3.96 cfs 0.689 af
15.0" x 30.0' Culvert Outflow=3.96 cfs 0.689 af

Pond CV401: CV400 Peak Elev=2,260.96' Inflow=0.79 cfs 0.096 af
15.0" x 30.0' Culvert Outflow=0.79 cfs 0.096 af

Pond CV402: CV402 Peak Elev=2,281.35' Inflow=1.30 cfs 0.230 af
15.0" x 35.0' Culvert Outflow=1.30 cfs 0.230 af

Pond CV403: CV403 Peak Elev=2,307.49' Inflow=1.84 cfs 0.339 af
15.0" x 30.0' Culvert Outflow=1.84 cfs 0.339 af

Pond CV404: CV404 Peak Elev=2,349.86' Inflow=0.52 cfs 0.062 af
15.0" x 35.0' Culvert Outflow=0.52 cfs 0.062 af

Pond CV405: CV405 Peak Elev=2,374.29' Inflow=1.07 cfs 0.167 af
15.0" x 30.0' Culvert Outflow=1.07 cfs 0.167 af

Pond CV406: CV406 Peak Elev=2,395.33' Inflow=1.20 cfs 0.162 af
15.0" x 30.0' Culvert Outflow=1.20 cfs 0.162 af

Pond CV407: CV407 Peak Elev=2,428.43' Inflow=1.04 cfs 0.153 af
15.0" x 30.0' Culvert Outflow=1.04 cfs 0.153 af

Pond CV408: CV408 Peak Elev=2,446.11' Inflow=2.37 cfs 0.352 af
15.0" x 30.0' Culvert Outflow=2.37 cfs 0.352 af

Pond CV409: CV409 Peak Elev=2,474.72' Inflow=5.04 cfs 0.739 af
15.0" x 30.0' Culvert Outflow=5.04 cfs 0.739 af

Pond CV410: CV410 Peak Elev=2,491.62' Inflow=1.76 cfs 0.221 af
15.0" x 30.0' Culvert Outflow=1.76 cfs 0.221 af

Pond CV411: CV411 Peak Elev=2,467.78' Inflow=1.56 cfs 0.188 af
15.0" x 35.0' Culvert Outflow=1.56 cfs 0.188 af

Pond CV412: CV412 Peak Elev=2,458.51' Inflow=5.39 cfs 0.781 af
15.0" x 30.0' Culvert Outflow=5.39 cfs 0.781 af

Pond CV413: CV413 Peak Elev=2,433.63' Inflow=0.67 cfs 0.066 af
15.0" x 30.0' Culvert Outflow=0.67 cfs 0.066 af

Pond CV414: CV414 Peak Elev=2,374.98' Inflow=1.80 cfs 0.254 af
15.0" x 30.0' Culvert Outflow=1.80 cfs 0.254 af

Pond CV415: CV415	Peak Elev=2,354.06'	Inflow=3.27 cfs	0.536 af
	15.0" x 30.0' Culvert	Outflow=3.27 cfs	0.536 af
Pond CV416: CV416	Peak Elev=2,341.37'	Inflow=1.18 cfs	0.135 af
	15.0" x 30.0' Culvert	Outflow=1.18 cfs	0.135 af
Pond CV417: CV417	Peak Elev=2,335.20'	Inflow=1.91 cfs	0.268 af
	15.0" x 30.0' Culvert	Outflow=1.91 cfs	0.268 af
Pond CV418: CV418	Peak Elev=2,318.32'	Inflow=3.95 cfs	0.530 af
	15.0" x 40.0' Culvert	Outflow=3.95 cfs	0.530 af
Pond CV419: CV419	Peak Elev=2,303.35'	Inflow=9.30 cfs	1.513 af
	18.0" x 35.0' Culvert	Outflow=9.30 cfs	1.513 af
Pond CV420: CV420	Peak Elev=2,283.20'	Inflow=7.08 cfs	0.764 af
	18.0" x 30.0' Culvert	Outflow=7.08 cfs	0.764 af
Pond CV421: CV421	Peak Elev=2,265.09'	Inflow=21.88 cfs	3.842 af
	24.0" x 40.0' Culvert	Outflow=21.88 cfs	3.842 af
Pond CV422: CV422	Peak Elev=2,263.59'	Inflow=7.81 cfs	1.493 af
	18.0" x 35.0' Culvert	Outflow=7.81 cfs	1.493 af
Pond CV423: CV423	Peak Elev=2,260.20'	Inflow=10.23 cfs	1.693 af
	18.0" x 45.0' Culvert	Outflow=10.23 cfs	1.693 af
Pond CV424: CV424	Peak Elev=2,255.86'	Inflow=14.14 cfs	1.872 af
	24.0" x 30.0' Culvert	Outflow=14.14 cfs	1.872 af
Pond CV425: CV425	Peak Elev=2,247.34'	Inflow=3.09 cfs	0.525 af
	15.0" x 30.0' Culvert	Outflow=3.09 cfs	0.525 af
Pond CV426: CV426	Peak Elev=2,239.03'	Inflow=0.38 cfs	0.024 af
	15.0" x 32.0' Culvert	Outflow=0.38 cfs	0.024 af
Pond CV427: CV427	Peak Elev=2,235.11'	Inflow=7.20 cfs	0.944 af
	15.0" x 40.0' Culvert	Outflow=7.20 cfs	0.944 af
Pond CV600: CV600	Peak Elev=2,802.00'	Inflow=2.47 cfs	0.110 af
	12.0" x 45.0' Culvert	Outflow=2.47 cfs	0.110 af
Pond CV601: CV601	Peak Elev=2,791.17'	Inflow=0.98 cfs	0.046 af
	12.0" x 45.0' Culvert	Outflow=0.98 cfs	0.046 af
Pond CV602: CV602	Peak Elev=2,829.03'	Inflow=0.66 cfs	0.032 af
	12.0" x 45.0' Culvert	Outflow=0.66 cfs	0.032 af
Pond CV603: CV603	Peak Elev=2,809.31'	Inflow=0.39 cfs	0.021 af
	12.0" x 45.0' Culvert	Outflow=0.39 cfs	0.021 af

Pond CV604: CV604	Peak Elev=2,790.64' Inflow=1.44 cfs 0.112 af	
	12.0" x 62.0' Culvert Outflow=1.44 cfs 0.112 af	
Pond CV605: CV605	Peak Elev=2,777.44' Inflow=0.64 cfs 0.042 af	
	12.0" x 45.0' Culvert Outflow=0.64 cfs 0.042 af	
Pond CV606: CV606	Peak Elev=2,754.88' Inflow=2.06 cfs 0.099 af	
	15.0" x 45.0' Culvert Outflow=2.06 cfs 0.099 af	
Pond CV607: CV607	Peak Elev=2,730.73' Inflow=1.79 cfs 0.084 af	
	12.0" x 60.0' Culvert Outflow=1.79 cfs 0.084 af	
Pond CV608: CV608	Peak Elev=2,744.12' Inflow=2.16 cfs 0.118 af	
	12.0" x 45.0' Culvert Outflow=2.16 cfs 0.118 af	
Pond CV609: CV609	Peak Elev=2,749.62' Inflow=0.83 cfs 0.070 af	
	12.0" x 48.0' Culvert Outflow=0.83 cfs 0.070 af	
Pond CV610: CV610	Peak Elev=2,718.15' Inflow=2.52 cfs 0.178 af	
	12.0" x 45.0' Culvert Outflow=2.52 cfs 0.178 af	
Pond CV611: CV611	Peak Elev=2,697.58' Inflow=1.22 cfs 0.089 af	
	12.0" x 55.0' Culvert Outflow=1.22 cfs 0.089 af	
Pond CV612: CV612	Peak Elev=2,702.89' Inflow=1.20 cfs 0.051 af	
	12.0" x 45.0' Culvert Outflow=1.20 cfs 0.051 af	
Pond CV613: CV613	Peak Elev=2,686.30' Inflow=0.50 cfs 0.034 af	
	12.0" x 36.0' Culvert Outflow=0.50 cfs 0.034 af	
Pond CV614: CV614	Peak Elev=2,707.36' Inflow=0.87 cfs 0.041 af	
	12.0" x 45.0' Culvert Outflow=0.87 cfs 0.041 af	
Pond CV615: CV615	Peak Elev=2,707.52' Inflow=1.19 cfs 0.119 af	
	12.0" x 48.0' Culvert Outflow=1.19 cfs 0.119 af	
Pond CV616: CV616	Peak Elev=2,731.60' Inflow=0.63 cfs 0.044 af	
	12.0" x 48.0' Culvert Outflow=0.63 cfs 0.044 af	
Pond CV617: CV617	Peak Elev=2,769.12' Inflow=0.25 cfs 0.015 af	
	12.0" x 45.0' Culvert Outflow=0.25 cfs 0.015 af	

Total Runoff Area = 440.928 ac Runoff Volume = 20.486 af Average Runoff Depth = 0.56"
100.00% Pervious Area = 440.928 ac 0.00% Impervious Area = 0.000 ac

Subcatchment C-400: Culvert-400 Area

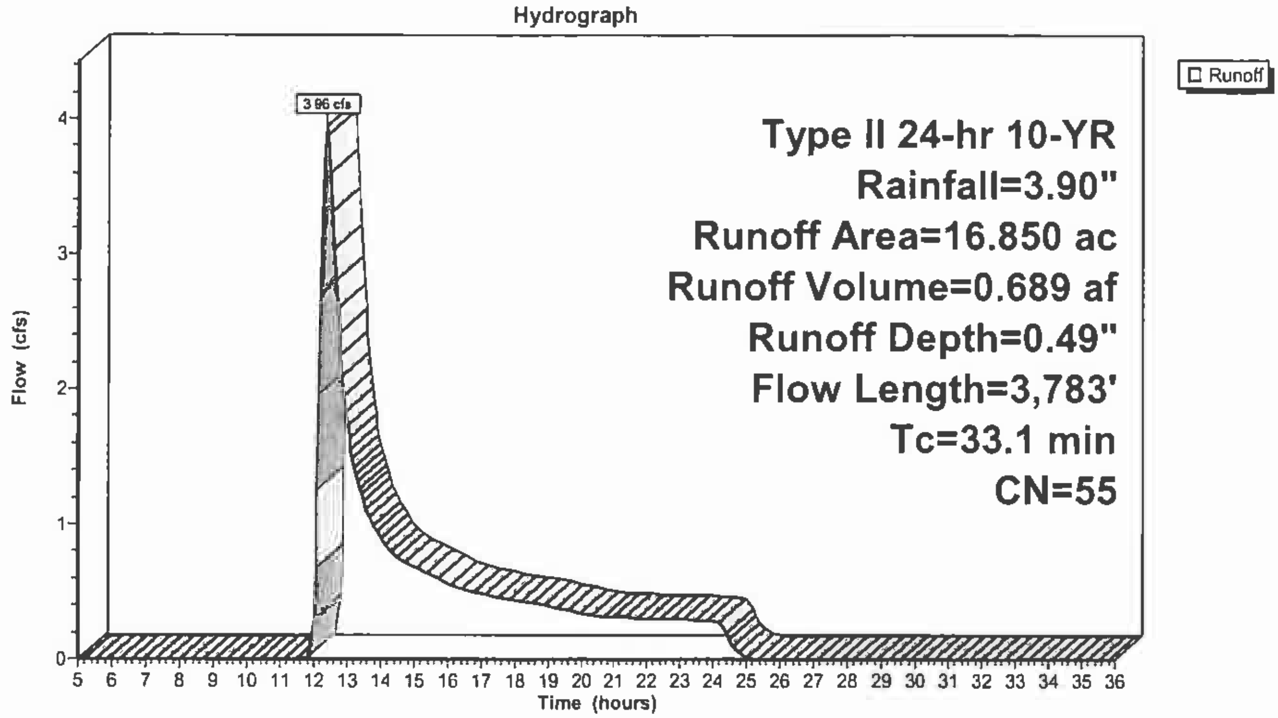
Runoff = 3.96 cfs @ 12.38 hrs, Volume= 0.689 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
10.310	53	Woods, Good, HSG C
6.470	58	Woods, Good, HSG D
16.850	55	Weighted Average
16.850		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
9.8	1,435	0.2380	2.44		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.1	221	0.2120	3.22		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
12.5	1,343	0.1290	1.80		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	684	0.1170	27.29	3,601.96	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=4.00' D=6.00' Z= 3.0 '/' Top.W=40.00' n= 0.040
33.1	3,783	Total			

Subcatchment C-400: Culvert-400 Area



Subcatchment C-401: Culvert-401 Area

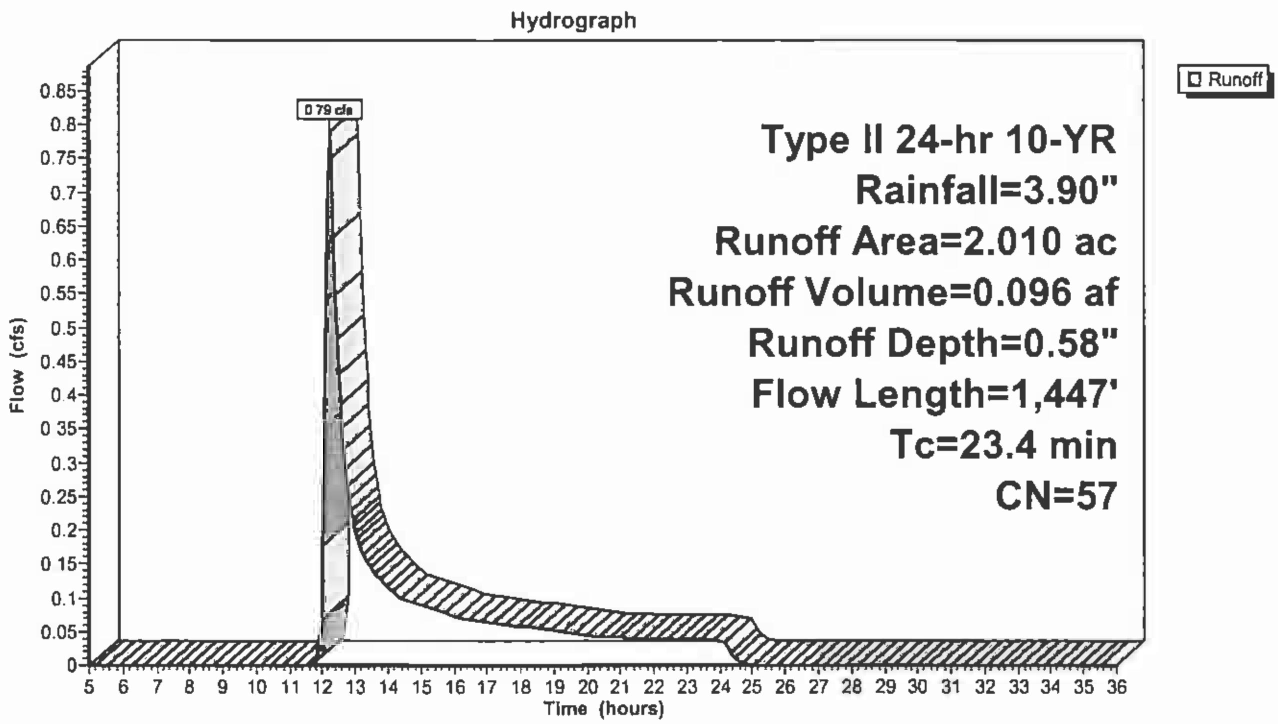
Runoff = 0.79 cfs @ 12.22 hrs, Volume= 0.096 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.080	49	Brush, Good, HSG C
0.810	53	Woods, Good, HSG C
1.060	58	Woods, Good, HSG D
2.010	57	Weighted Average
2.010		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1200	0.15		**Sheet Flow, sheet flow** Woods: Light underbrush n= 0.400 P2= 2.70"
11.6	1,207	0.1200	1.73		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	140	0.0850	6.33	12.67	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.040
23.4	1,447	Total			

Subcatchment C-401: Culvert-401 Area



Subcatchment C-402: Culvert-402 Area

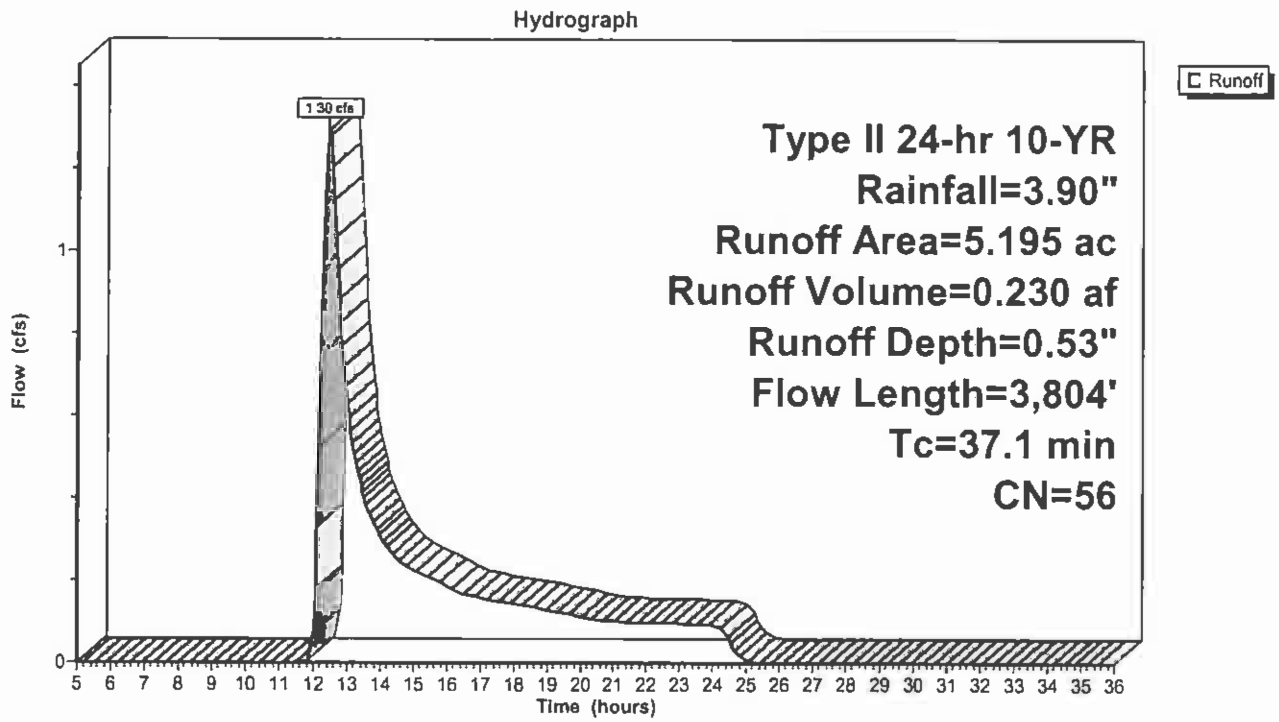
Runoff = 1.30 cfs @ 12.44 hrs, Volume= 0.230 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
0.005	49	Brush, Good, HSG C
2.440	53	Woods, Good, HSG C
0.080	55	Brush, Good, HSG D
2.600	58	Woods, Good, HSG D
5.195	56	Weighted Average
5.195		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.3800	0.23		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.0	1,616	0.2410	2.45		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.1	338	0.1420	2.64		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
16.8	1,750	0.1200	1.73		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
37.1	3,804	Total			

Subcatchment C-402: Culvert-402 Area



Subcatchment C-403: Culvert-403 Area

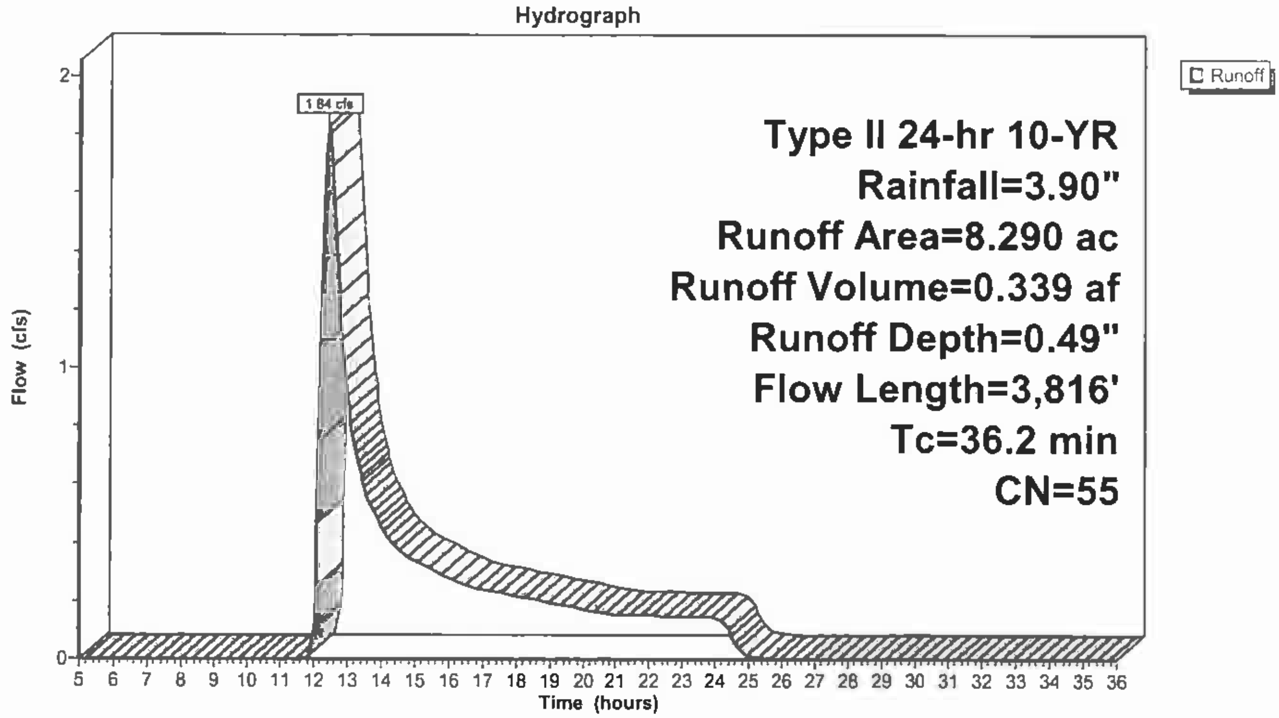
Runoff = 1.84 cfs @ 12.43 hrs, Volume= 0.339 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
5.890	53	Woods, Good, HSG C
0.060	55	Brush, Good, HSG D
2.220	58	Woods, Good, HSG D
8.290	55	Weighted Average
8.290		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.2300	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.5	1,894	0.2560	2.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
2.1	300	0.1170	2.39		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
12.5	1,328	0.1260	1.77		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	194	0.1030	12.68	152.13	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
36.2	3,816	Total			

Subcatchment C-403: Culvert-403 Area



Subcatchment C-404: Culvert-404 Area

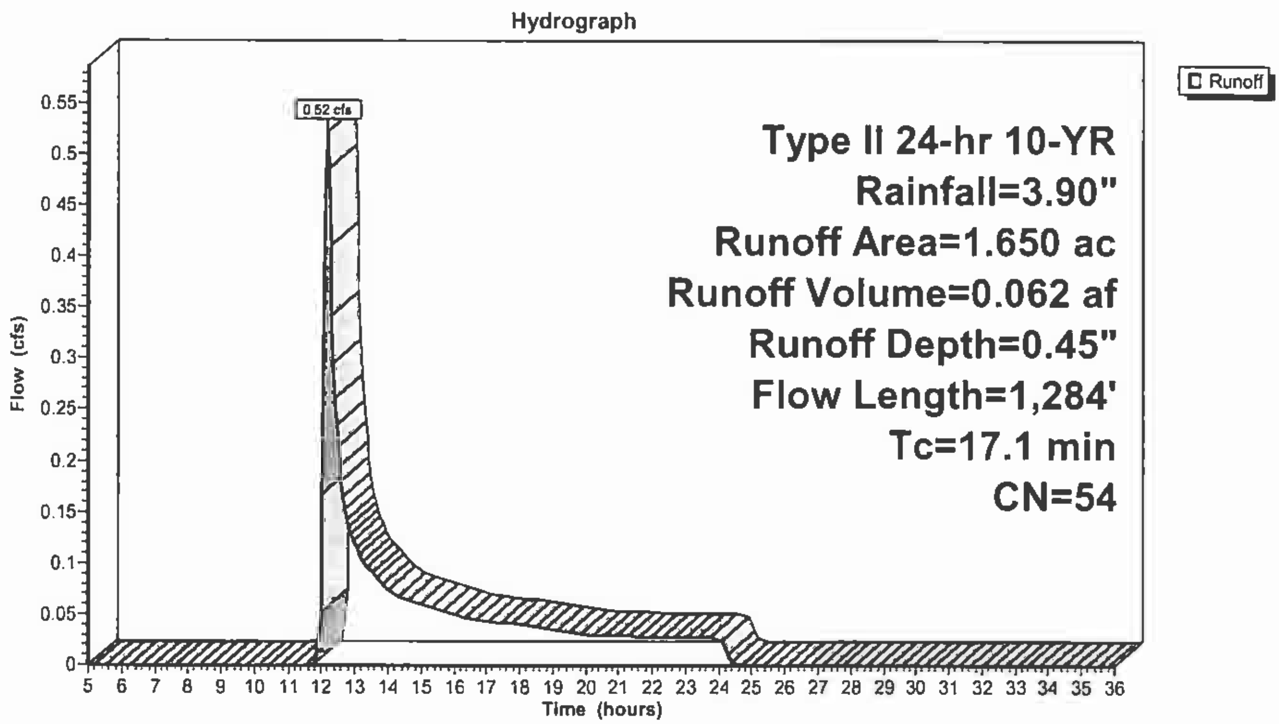
Runoff = 0.52 cfs @ 12.15 hrs, Volume= 0.062 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.050	49	Brush, Good, HSG C
1.550	53	Woods, Good, HSG C
1.650	54	Weighted Average
1.650		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0800	0.27		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 2.70"
11.0	1,184	0.1290	1.80		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
17.1	1,284	Total			

Subcatchment C-404: Culvert-404 Area



Subcatchment C-405: Culvert-405 Area

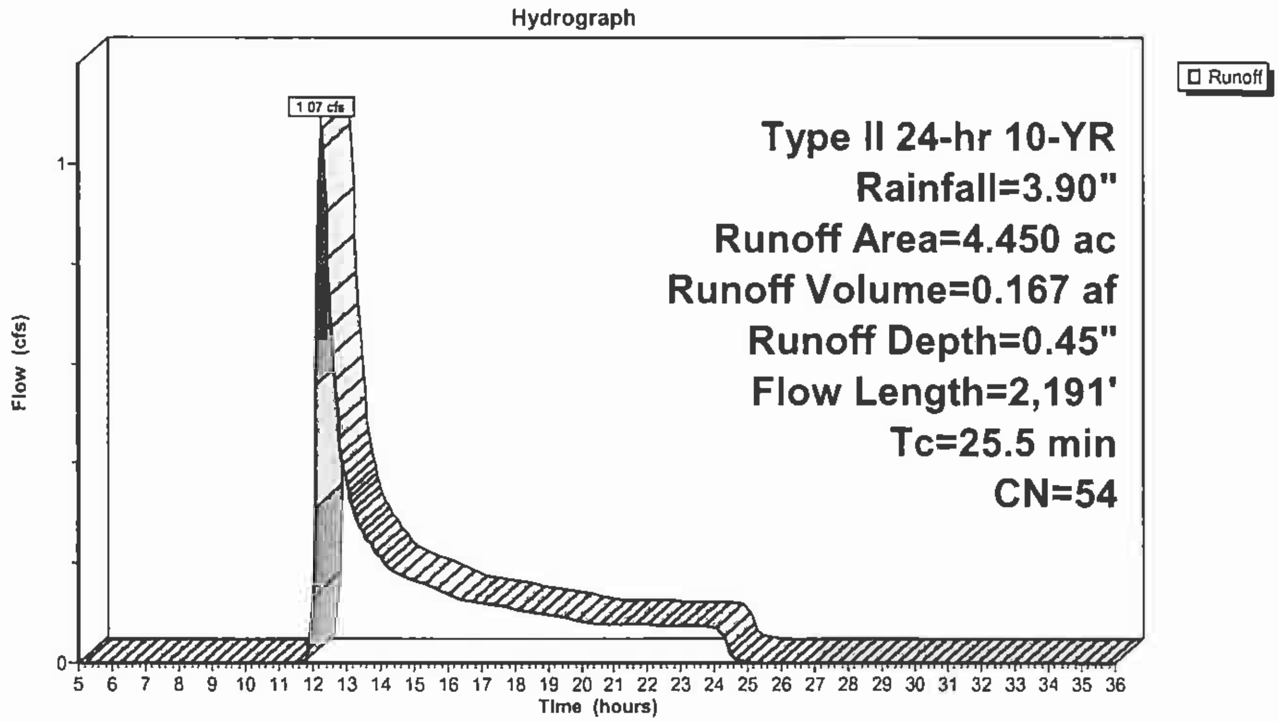
Runoff = 1.07 cfs @ 12.27 hrs, Volume= 0.167 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
0.070	49	Brush, Good, HSG C
4.210	53	Woods, Good, HSG C
0.110	58	Woods, Good, HSG D
4.450	54	Weighted Average
4.450		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2800	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
6.2	899	0.2330	2.41		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
1.4	185	0.0970	2.18		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
9.8	1,007	0.1170	1.71		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
25.5	2,191	Total			

Subcatchment C-405: Culvert-405 Area



Subcatchment C-406: Culvert-406 Area

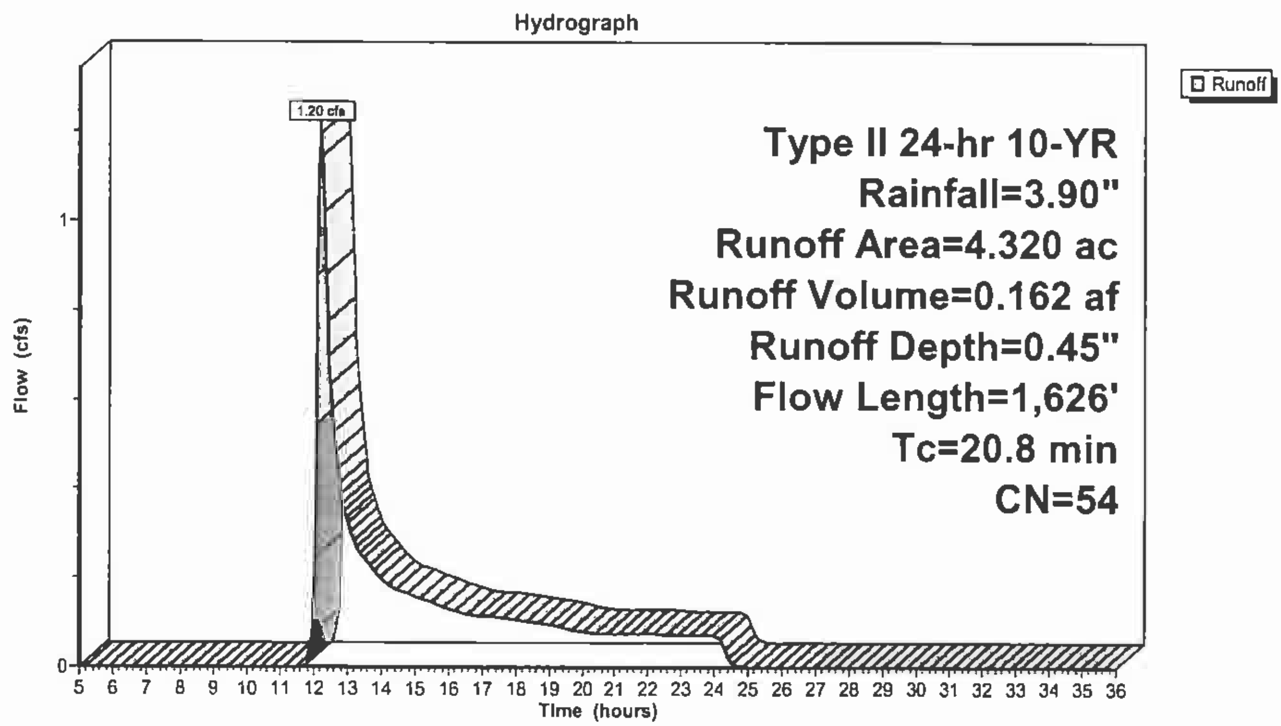
Runoff = 1.20 cfs @ 12.21 hrs, Volume= 0.162 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.050	49	Brush, Good, HSG C
4.030	53	Woods, Good, HSG C
0.130	58	Woods, Good, HSG D
4.320	54	Weighted Average
4.320		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1700	0.17		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
10.5	1,290	0.1670	2.04		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	236	0.0850	10.05	80.44	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
20.8	1,626	Total			

Subcatchment C-406: Culvert-406 Area



Subcatchment C-407: Culvert-407 Area

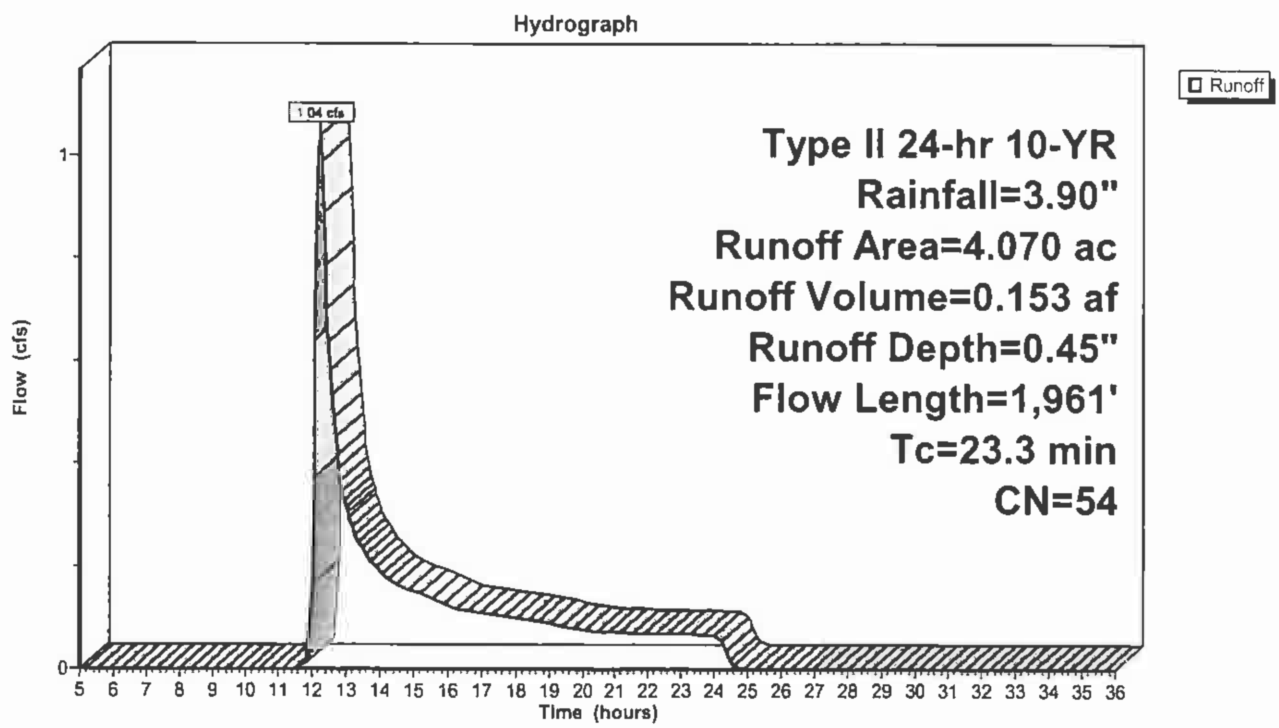
Runoff = 1.04 cfs @ 12.24 hrs, Volume= 0.153 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
3.520	53	Woods, Good, HSG C
0.050	55	Brush, Good, HSG D
0.450	58	Woods, Good, HSG D
4.070	54	Weighted Average
4.070		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.9	1,766	0.2080	2.28		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.2	95	0.0850	10.05	80.44	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
23.3	1,961	Total			

Subcatchment C-407: Culvert-407 Area



Subcatchment C-408: Culvert-408 Area

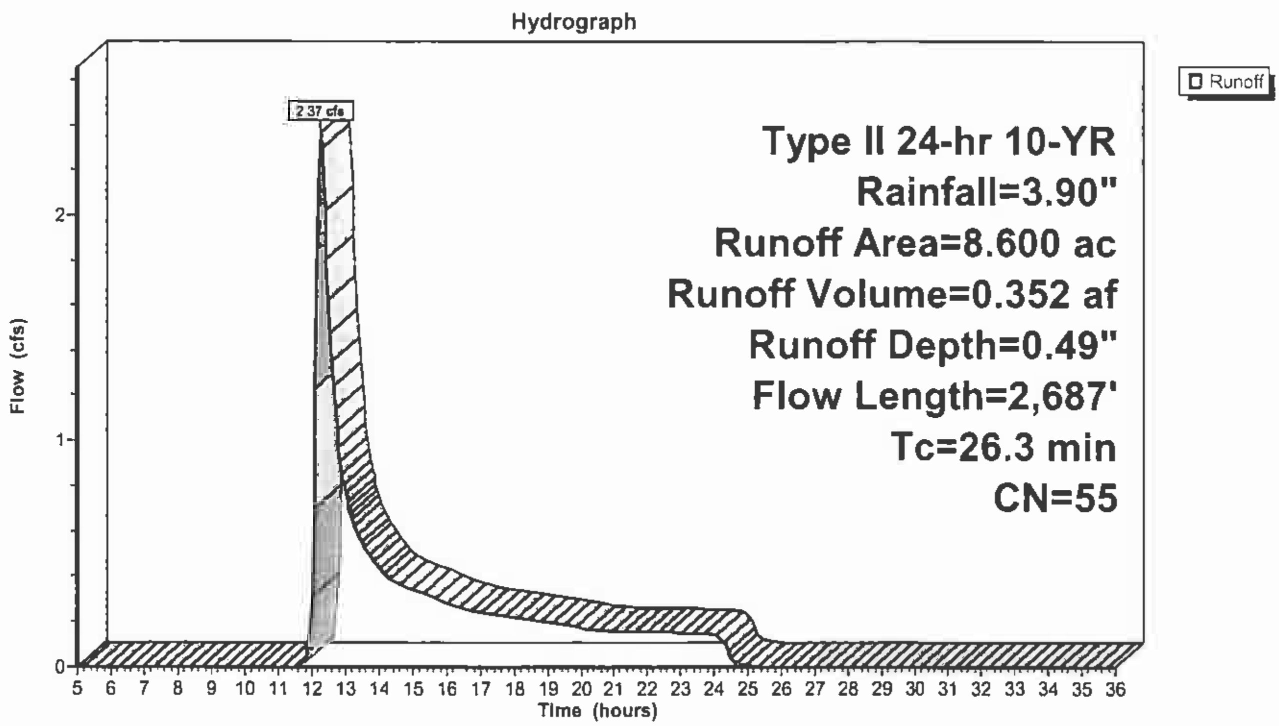
Runoff = 2.37 cfs @ 12.28 hrs, Volume= 0.352 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.100	49	Brush, Good, HSG C
5.890	53	Woods, Good, HSG C
2.530	58	Woods, Good, HSG D
8.600	55	Weighted Average
8.600		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
15.9	2,361	0.2450	2.47		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.9	226	0.0880	4.06	2.03	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=0.50' Z= 2.0 '/' Top.W=2.00' n= 0.040
26.3	2,687	Total			

Subcatchment C-408: Culvert-408 Area



Subcatchment C-409: Culvert-409 Area

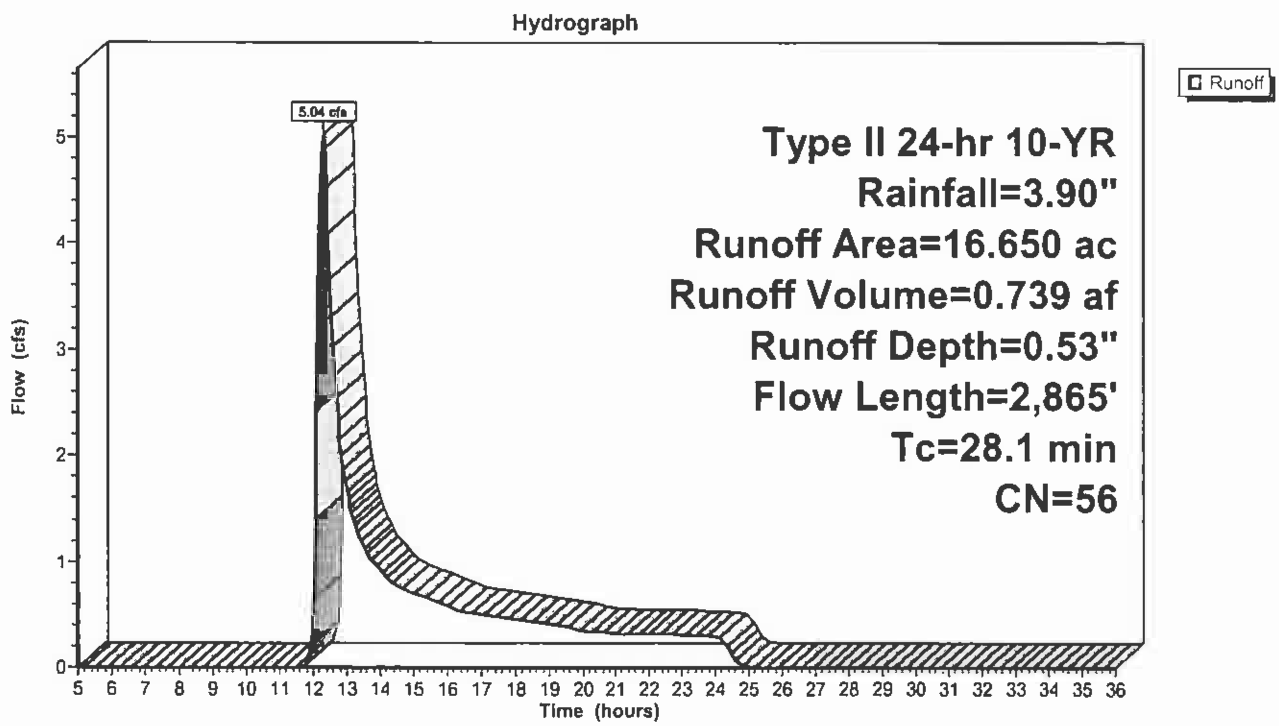
Runoff = 5.04 cfs @ 12.30 hrs, Volume= 0.739 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
0.120	49	Brush, Good, HSG C
8.200	53	Woods, Good, HSG C
8.240	58	Woods, Good, HSG D
16.650	56	Weighted Average
16.650		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
16.8	2,548	0.2570	2.53		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.9	217	0.0950	4.22	2.11	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=0.50' Z= 2.0 '/' Top.W=2.00' n= 0.040
28.1	2,865	Total			

Subcatchment C-409: Culvert-409 Area



Subcatchment C-410: Culvert-410 Area

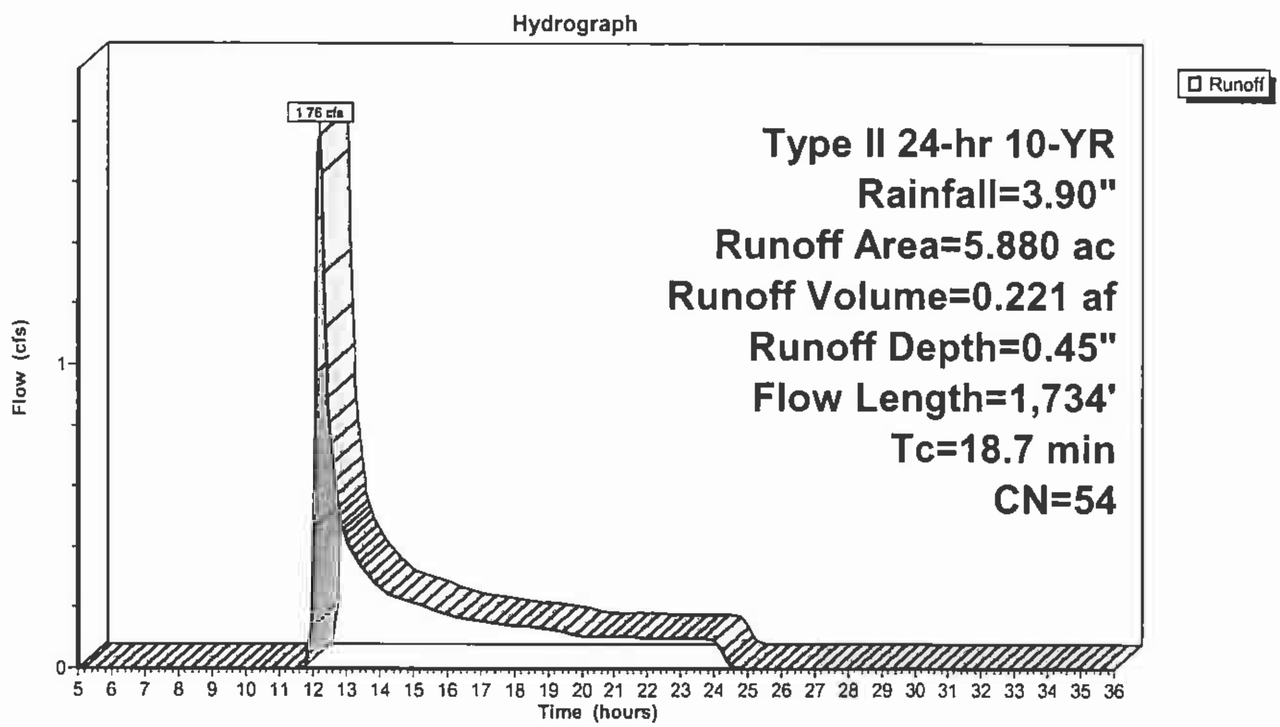
Runoff = 1.76 cfs @ 12.17 hrs, Volume= 0.221 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
4.530	53	Woods, Good, HSG C
1.210	58	Woods, Good, HSG D
5.880	54	Weighted Average
5.880		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2400	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.5	1,496	0.2780	2.64		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.5	138	0.0500	4.86	9.72	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.040
18.7	1,734	Total			

Subcatchment C-410: Culvert-410 Area



Subcatchment C-411: Culvert-411 Area

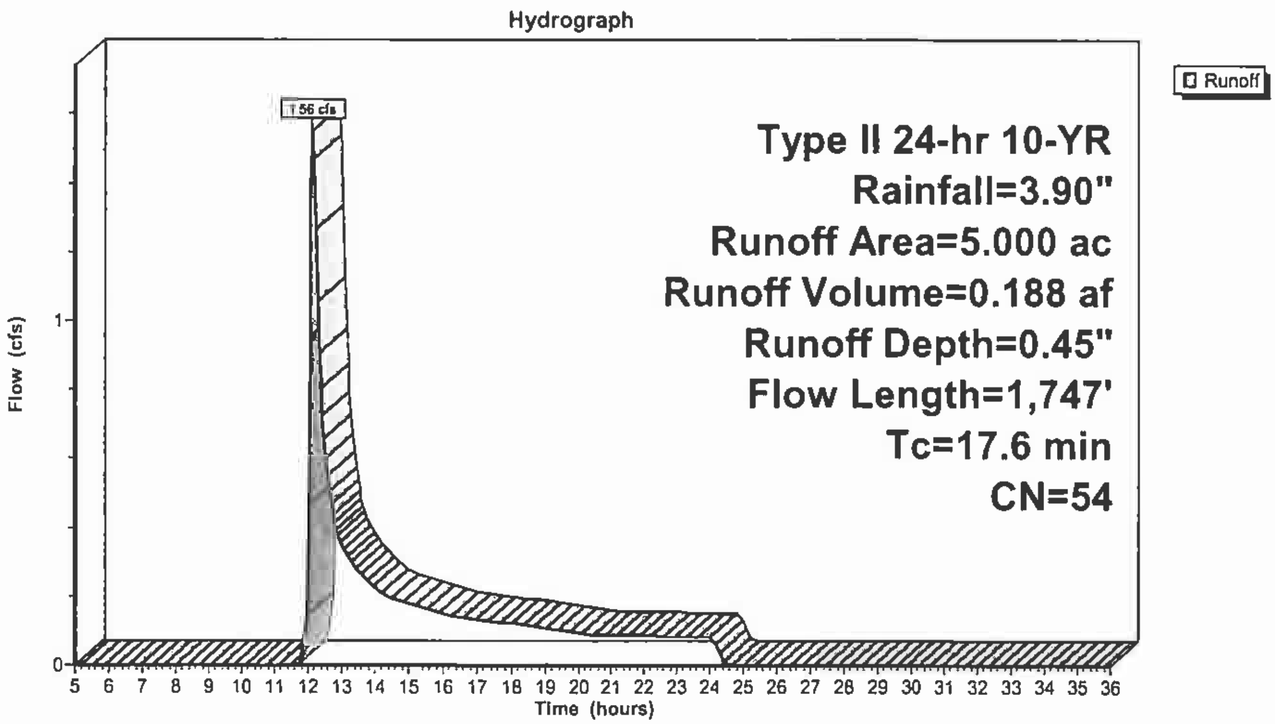
Runoff = 1.56 cfs @ 12.16 hrs, Volume= 0.188 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
4.240	53	Woods, Good, HSG C
0.120	55	Brush, Good, HSG D
0.470	58	Woods, Good, HSG D
5.000	54	Weighted Average
5.000		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.2800	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
9.2	1,452	0.2770	2.63		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	195	0.0770	9.57	76.56	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
17.6	1,747	Total			

Subcatchment C-411: Culvert-411 Area



Subcatchment C-412: Culvert-412 Area

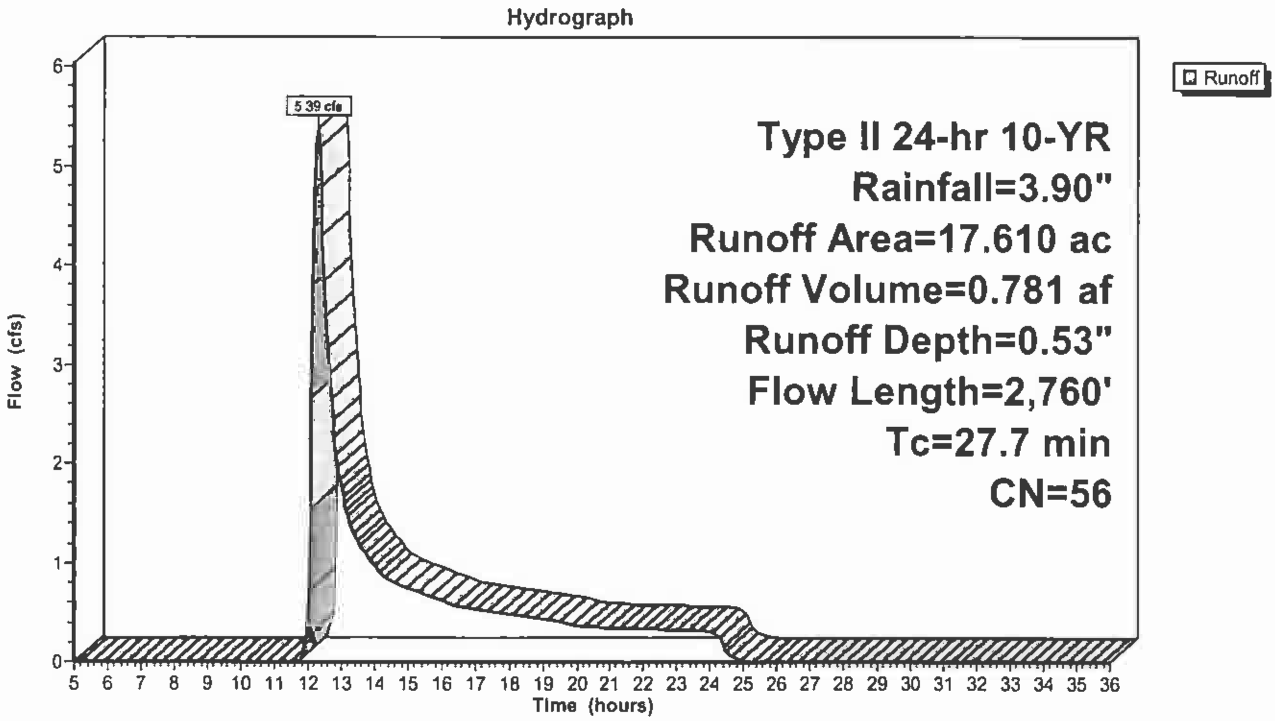
Runoff = 5.39 cfs @ 12.29 hrs, Volume= 0.781 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
8.880	53	Woods, Good, HSG C
0.060	55	Brush, Good, HSG D
8.620	58	Woods, Good, HSG D
17.610	56	Weighted Average
17.610		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.3	2,660	0.2620	2.56		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
27.7	2,760	Total			

Subcatchment C-412: Culvert-412 Area



Subcatchment C-413: Culvert-413 Area

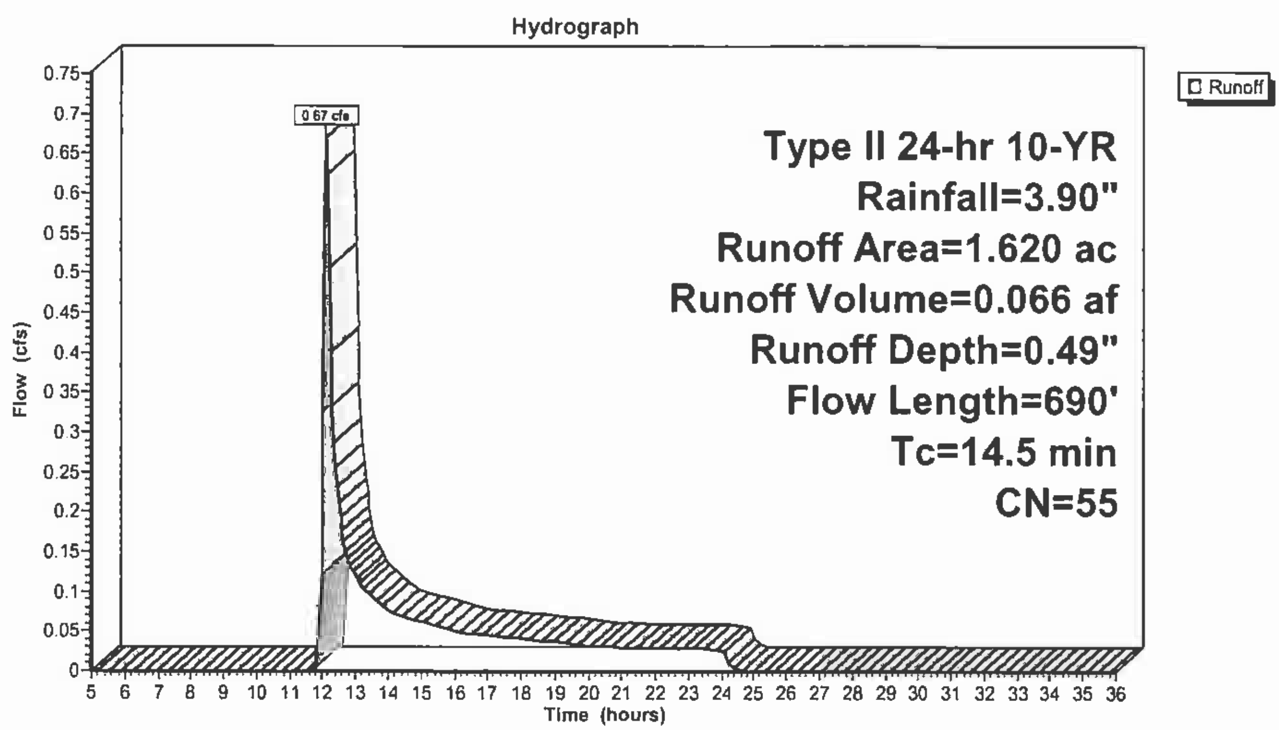
Runoff = 0.67 cfs @ 12.11 hrs, Volume= 0.066 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
0.040	49	Brush, Good, HSG C
1.260	53	Woods, Good, HSG C
0.050	55	Brush, Good, HSG D
0.190	58	Woods, Good, HSG D
1.620	55	Weighted Average
1.620		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
4.2	502	0.1590	1.99		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	88	0.1080	11.33	90.67	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
14.5	690	Total			

Subcatchment C-413: Culvert-413 Area



Subcatchment C-414: Culvert-414 Area

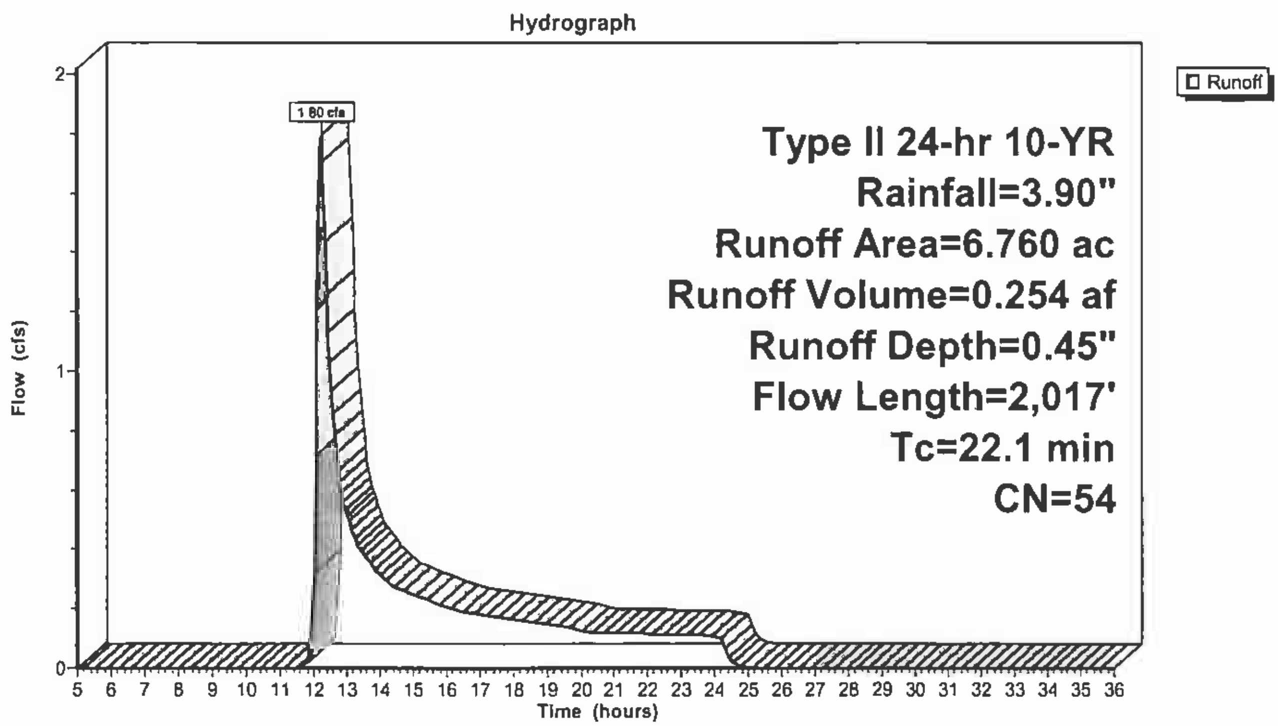
Runoff = 1.80 cfs @ 12.22 hrs, Volume= 0.254 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
0.090	49	Brush, Good, HSG C
6.250	53	Woods, Good, HSG C
0.090	55	Brush, Good, HSG D
0.210	58	Woods, Good, HSG D
6.760	54	Weighted Average
6.760		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.2	1,709	0.2180	2.33		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	208	0.0860	7.90	31.62	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=1.00' Z= 2.0 '/' Top.W=6.00' n= 0.040
22.1	2,017	Total			

Subcatchment C-414: Culvert-414 Area



Subcatchment C-415: Culvert-415 Area

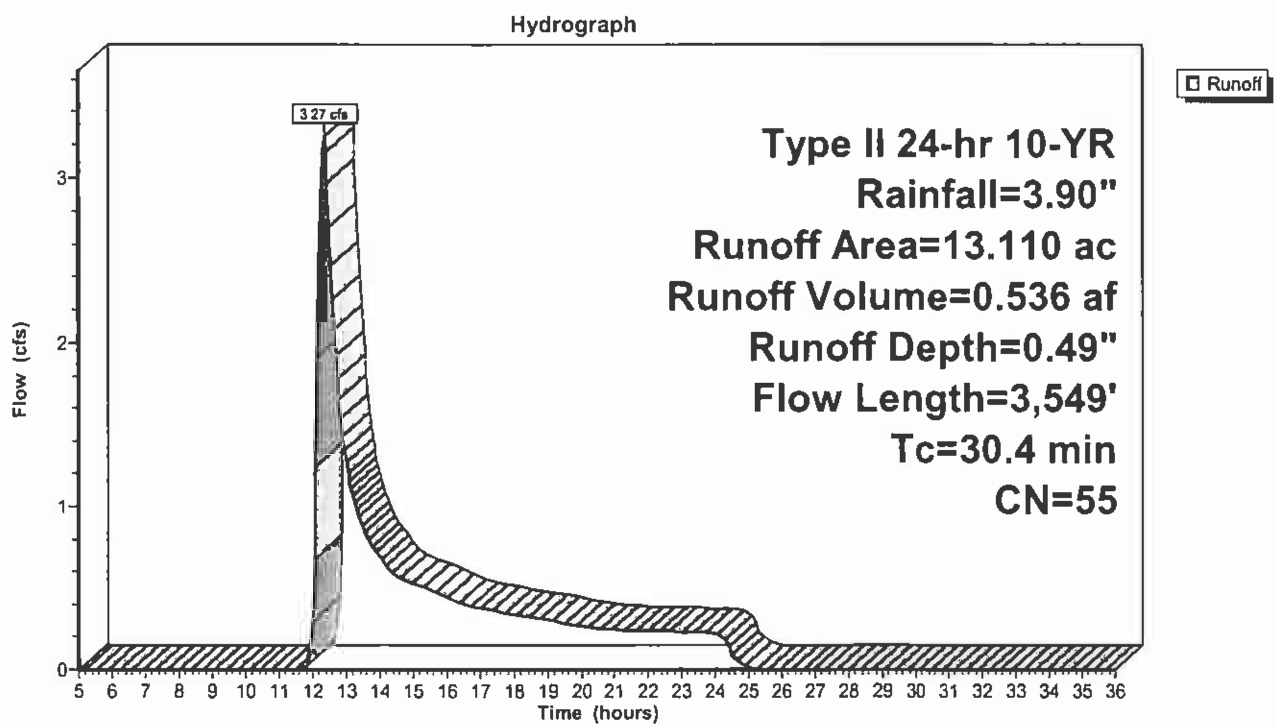
Runoff = 3.27 cfs @ 12.34 hrs, Volume= 0.536 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
7.550	53	Woods, Good, HSG C
0.120	55	Brush, Good, HSG D
5.350	58	Woods, Good, HSG D
13.110	55	Weighted Average
13.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.2400	0.19		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
21.0	3,117	0.2440	2.47		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	332	0.0540	8.01	64.11	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.040
30.4	3,549	Total			

Subcatchment C-415: Culvert-415 Area



Subcatchment C-416: Culvert-416 Area

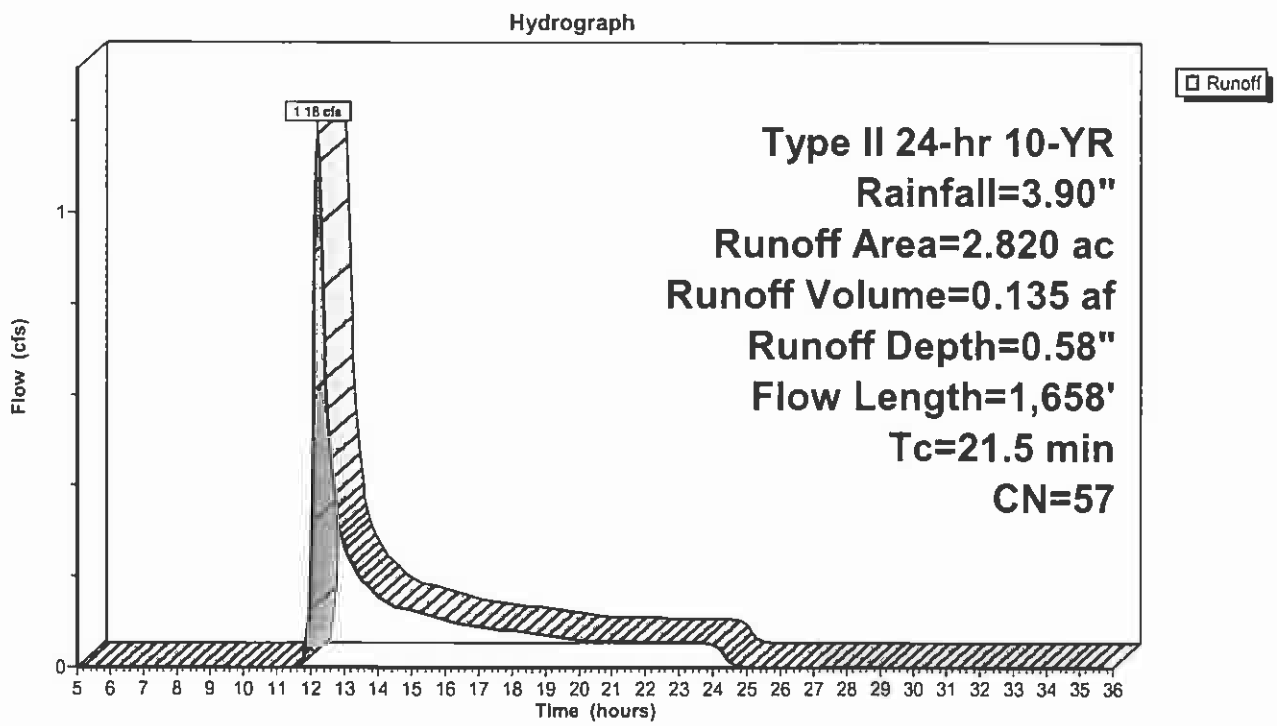
Runoff = 1.18 cfs @ 12.20 hrs, Volume= 0.135 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
1.000	53	Woods, Good, HSG C
0.080	55	Brush, Good, HSG D
1.680	58	Woods, Good, HSG D
2.820	57	Weighted Average
2.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
11.7	1,390	0.1580	1.99		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.3	168	0.0600	9.68	116.11	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
21.5	1,658	Total			

Subcatchment C-416: Culvert-416 Area



Subcatchment C-417: Culvert-417 Area

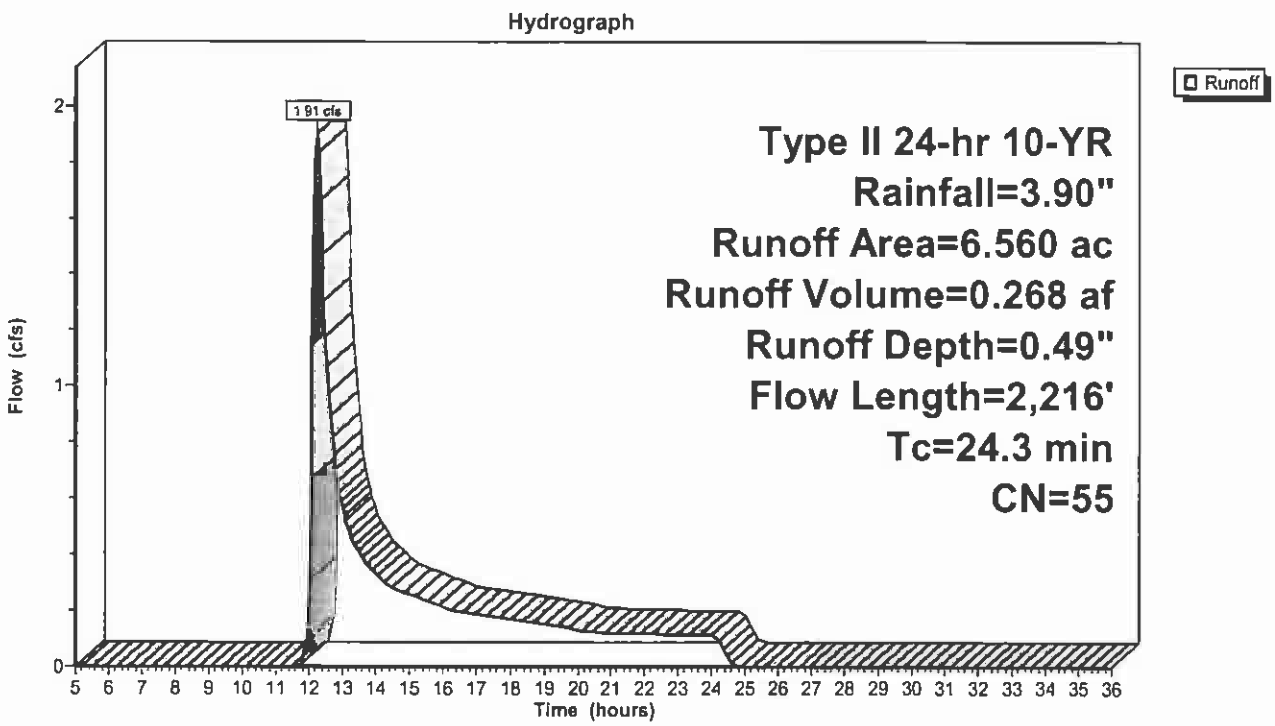
Runoff = 1.91 cfs @ 12.25 hrs, Volume= 0.268 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
4.070	53	Woods, Good, HSG C
0.040	55	Brush, Good, HSG D
2.420	58	Woods, Good, HSG D
6.560	55	Weighted Average
6.560		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.2500	0.20		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
15.7	2,038	0.1870	2.16		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	78	0.0770	10.96	131.54	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
24.3	2,216	Total			

Subcatchment C-417: Culvert-417 Area



Subcatchment C-418: Culvert-418 Area

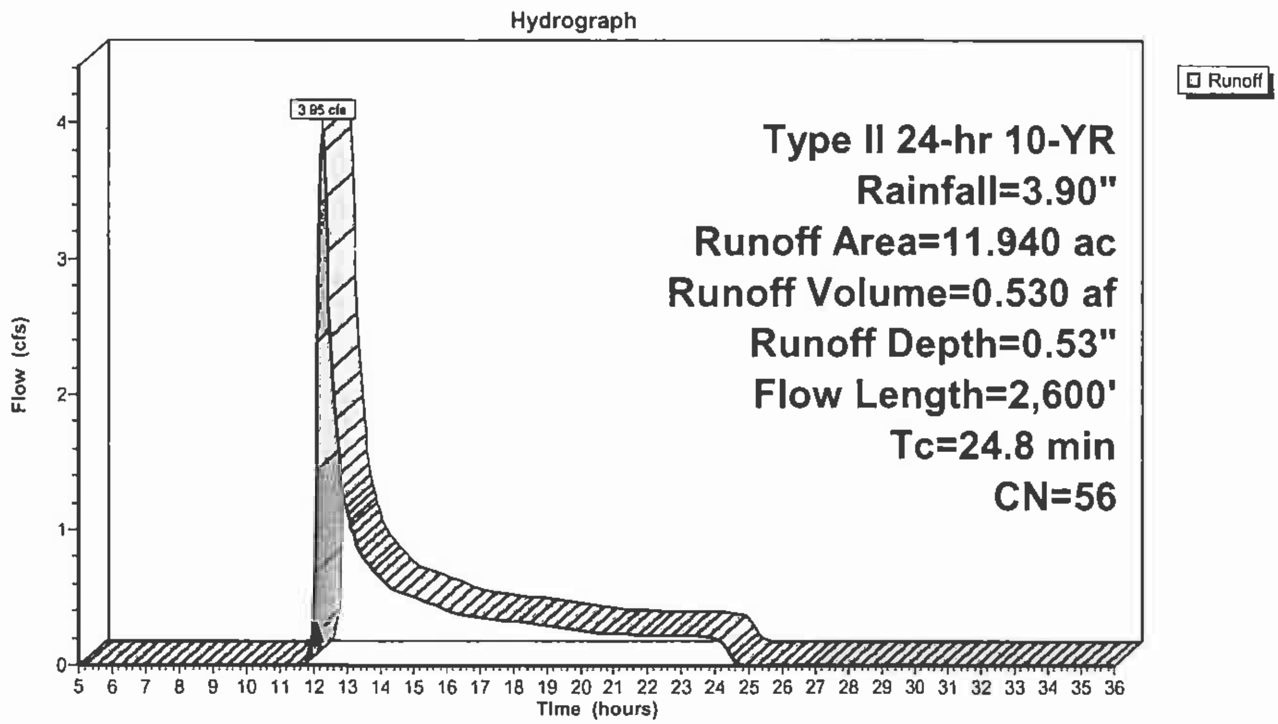
Runoff = 3.95 cfs @ 12.25 hrs, Volume= 0.530 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.080	89	Gravel roads, HSG C
5.250	53	Woods, Good, HSG C
0.120	55	Brush, Good, HSG D
6.490	58	Woods, Good, HSG D
11.940	56	Weighted Average
11.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.4000	0.24		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
17.7	2,500	0.2220	2.36		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
24.8	2,600	Total			

Subcatchment C-418: Culvert-418 Area



Subcatchment C-419: Culvert-419 Area

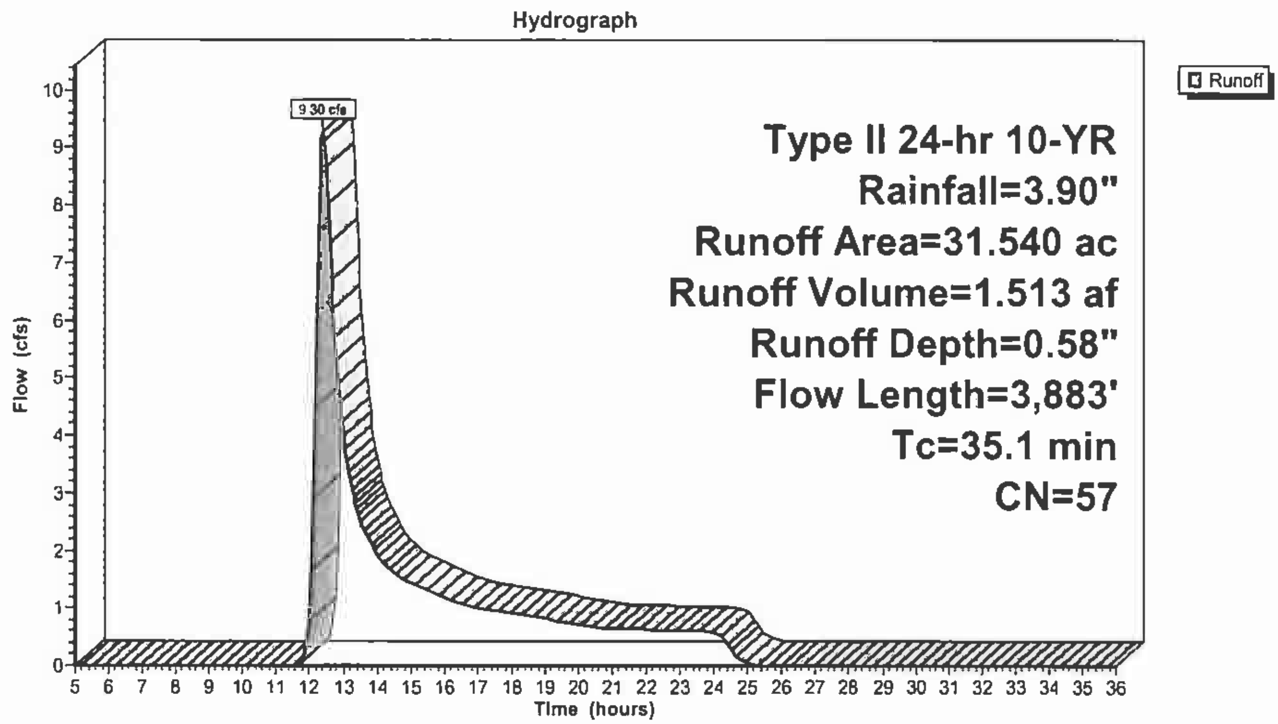
Runoff = 9.30 cfs @ 12.40 hrs, Volume= 1.513 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
8.600	53	Woods, Good, HSG C
0.080	55	Brush, Good, HSG D
22.790	58	Woods, Good, HSG D
31.540	57	Weighted Average
31.540		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0700	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
20.4	3,104	0.2580	2.54		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.5	679	0.1090	25.02	2,101.58	**Trap/Vee/Rect Channel Flow, natural ditch** Bot.W=2.00' D=6.00' Z= 2.0 '/' Top.W=26.00' n= 0.040
35.1	3,883	Total			

Subcatchment C-419: Culvert-419 Area



Subcatchment C-420: Culvert-420 Area

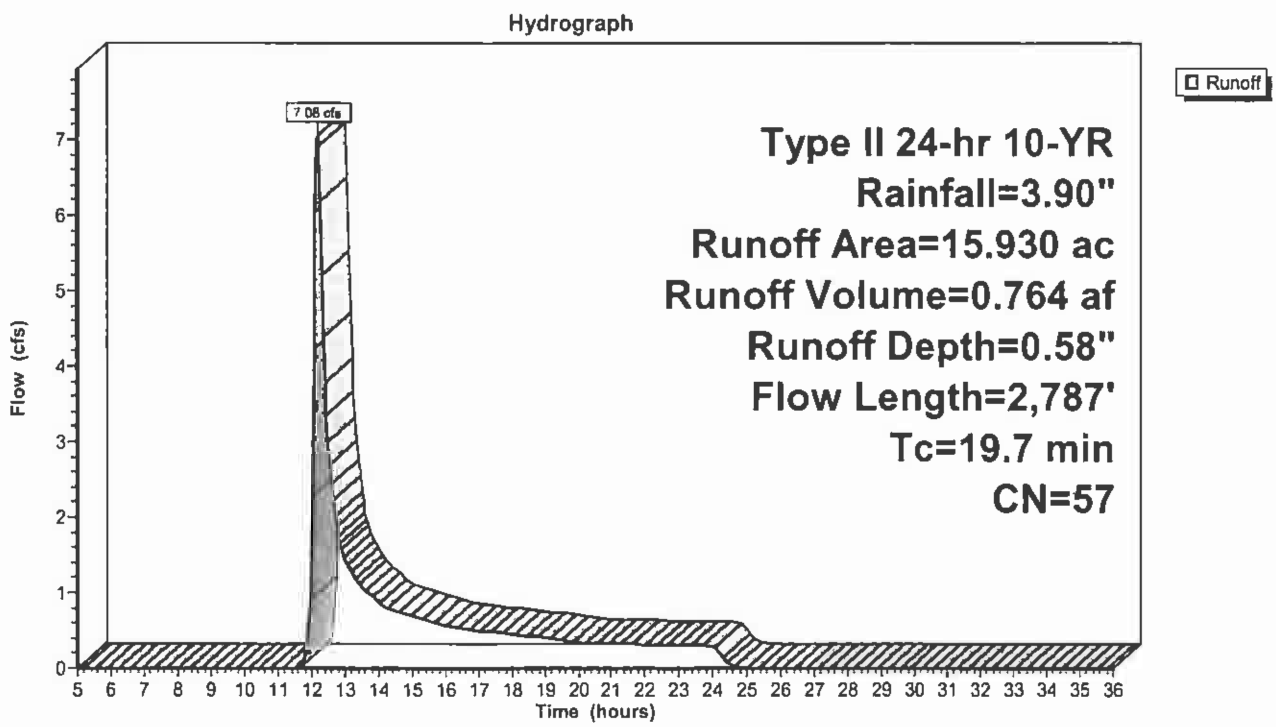
Runoff = 7.08 cfs @ 12.17 hrs, Volume= 0.764 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.070	89	Gravel roads, HSG C
2.620	53	Woods, Good, HSG C
0.100	55	Brush, Good, HSG D
13.140	58	Woods, Good, HSG D
15.930	57	Weighted Average
15.930		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.5600	0.27		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
12.8	1,985	0.2660	2.58		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	702	0.1200	17.41	574.50	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=2.00' D=3.00' Z= 3.0 '/' Top.W=20.00' n= 0.040
19.7	2,787	Total			

Subcatchment C-420: Culvert-420 Area



Subcatchment C-421: Culvert-421 Area

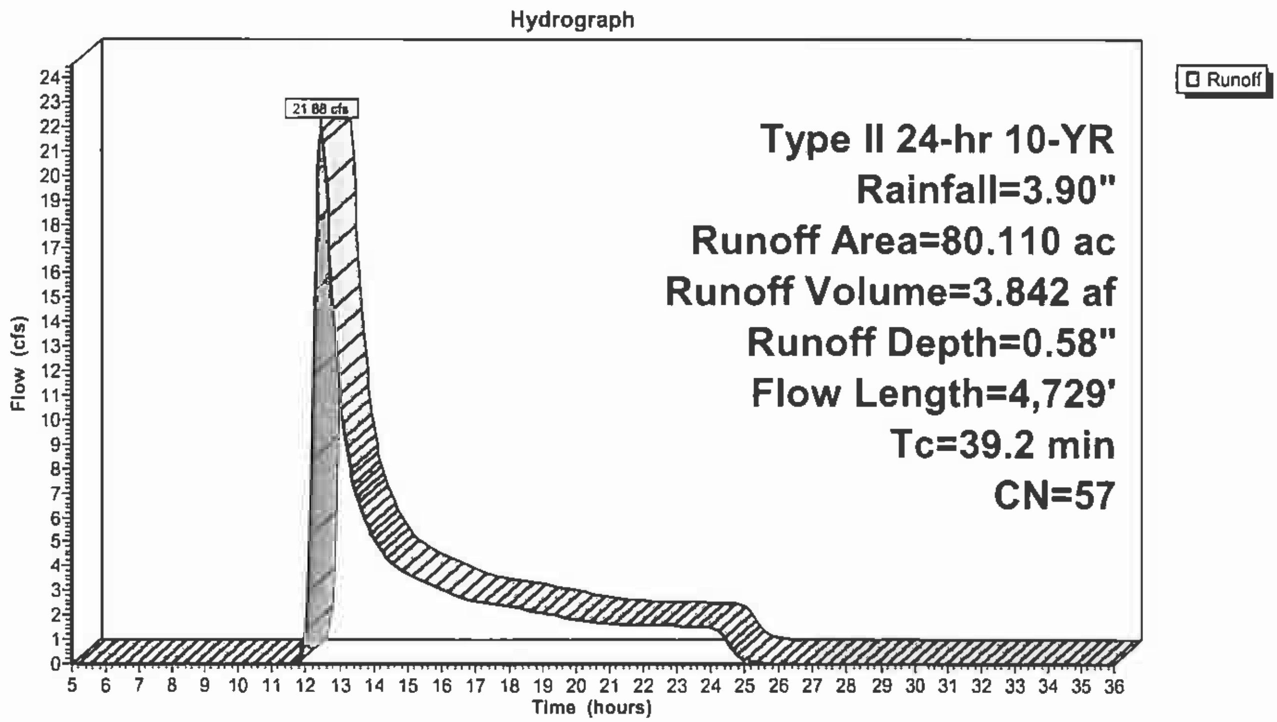
Runoff = 21.88 cfs @ 12.46 hrs, Volume= 3.842 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.140	89	Gravel roads, HSG C
12.460	53	Woods, Good, HSG C
0.200	55	Brush, Good, HSG D
67.310	58	Woods, Good, HSG D
80.110	57	Weighted Average
80.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.1000	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
26.5	4,117	0.2680	2.59		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	512	0.1100	19.63	785.27	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=2.00' D=4.00' Z= 2.0 '/' Top.W=18.00' n= 0.040
39.2	4,729	Total			

Subcatchment C-421: Culvert-421 Area



Subcatchment C-422: Culvert-422 Area

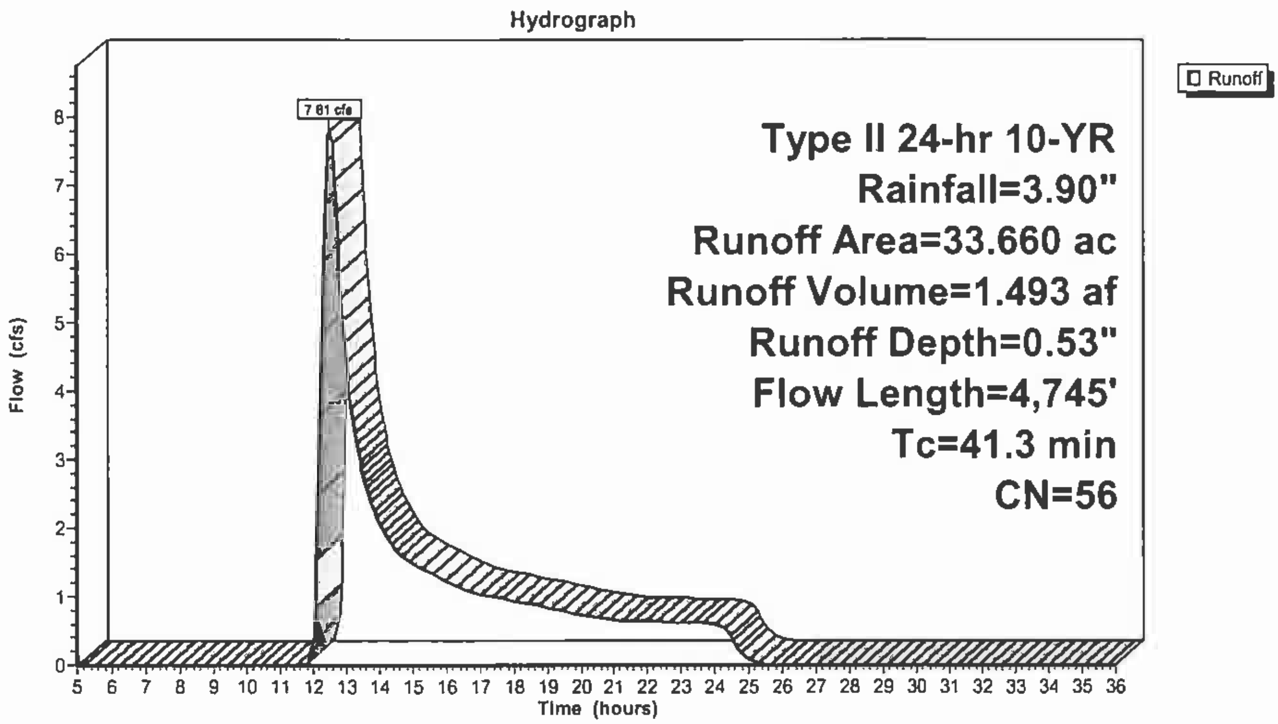
Runoff = 7.81 cfs @ 12.50 hrs, Volume= 1.493 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
10.800	53	Woods, Good, HSG C
0.130	55	Brush, Good, HSG D
22.630	58	Woods, Good, HSG D
33.660	56	Weighted Average
33.660		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.4	3,912	0.2860	2.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.7	733	0.0910	18.03	1,009.81	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=2.00' D=4.00' Z= 2.0 & 4.0 '/' Top.W=26.00' n= 0.040
41.3	4,745	Total			

Subcatchment C-422: Culvert-422 Area



Subcatchment C-423: Culvert-423 Area

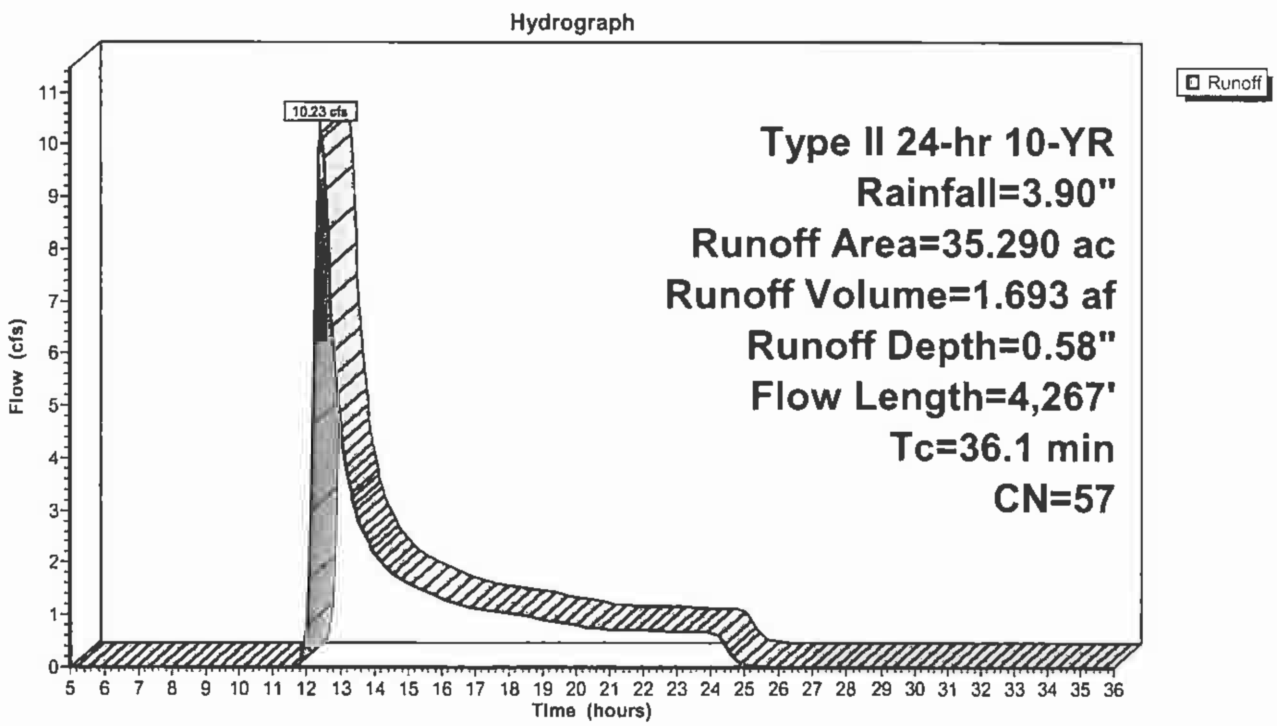
Runoff = 10.23 cfs @ 12.41 hrs, Volume= 1.693 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.090	89	Gravel roads, HSG C
6.600	53	Woods, Good, HSG C
0.130	55	Brush, Good, HSG D
28.470	58	Woods, Good, HSG D
35.290	57	Weighted Average
35.290		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1300	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
24.2	2,874	0.1570	1.98		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	1,293	0.1130	27.62	2,983.08	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=6.00' D=6.00' Z= 2.0 '/' Top.W=30.00' n= 0.040
36.1	4,267	Total			

Subcatchment C-423: Culvert-423 Area



Subcatchment C-424: Culvert-424 Area

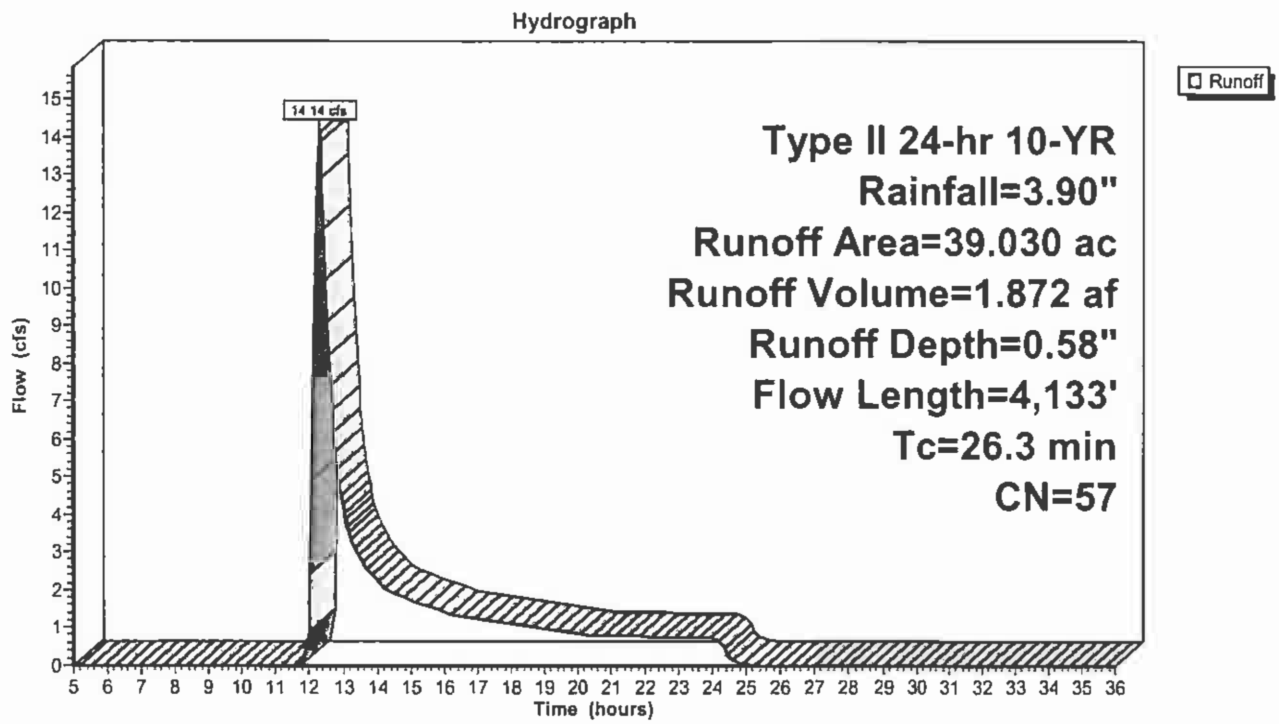
Runoff = 14.14 cfs @ 12.27 hrs, Volume= 1.872 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
7.840	53	Woods, Good, HSG C
0.080	55	Brush, Good, HSG D
31.060	58	Woods, Good, HSG D
39.030	57	Weighted Average
39.030		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.1100	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
13.7	2,562	0.3900	3.12		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.8	1,471	0.1240	28.93	3,124.91	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=6.00' D=6.00' Z= 2.0 '/' Top.W=30.00' n= 0.040
26.3	4,133	Total			

Subcatchment C-424: Culvert-424 Area



Subcatchment C-425: Culvert-425 Area

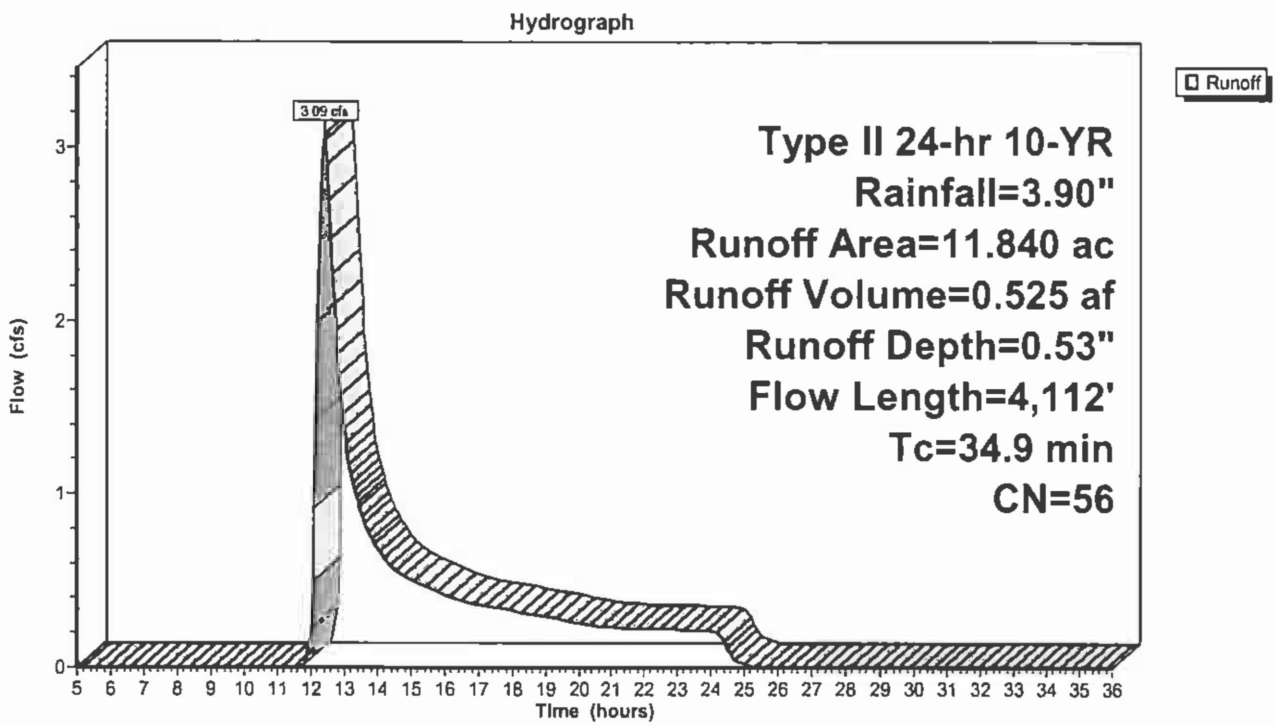
Runoff = 3.09 cfs @ 12.40 hrs, Volume= 0.525 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.060	89	Gravel roads, HSG C
5.030	53	Woods, Good, HSG C
0.090	55	Brush, Good, HSG D
6.660	58	Woods, Good, HSG D
11.840	56	Weighted Average
11.840		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1500	0.16		**Sheet Flow, sheet**
					Woods: Light underbrush n= 0.400 P2= 2.70"
24.5	4,012	0.2980	2.73		**Shallow Concentrated Flow, shallow**
					Woodland Kv= 5.0 fps
34.9	4,112	Total			

Subcatchment C-425: Culvert-425 Area



Subcatchment C-426: Culvert-426 Area

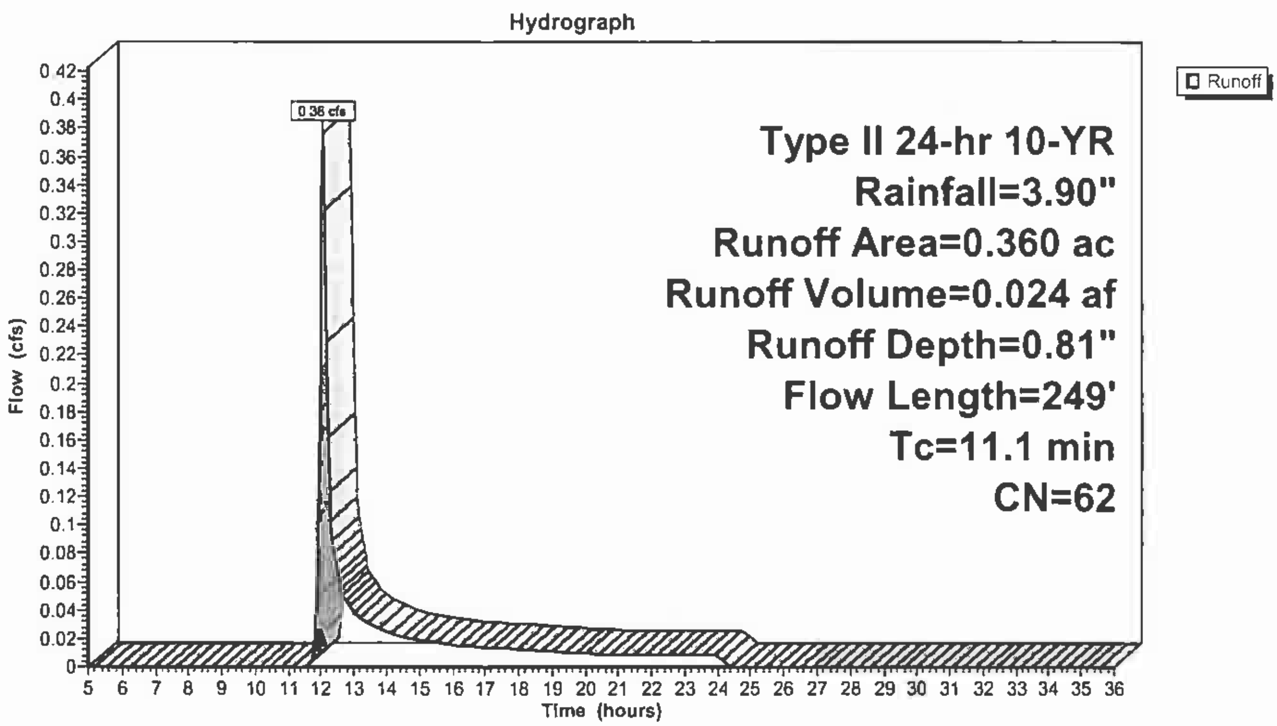
Runoff = 0.38 cfs @ 12.05 hrs, Volume= 0.024 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.050	89	Gravel roads, HSG C
0.090	55	Brush, Good, HSG D
0.220	58	Woods, Good, HSG D
0.360	62	Weighted Average
0.360		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	88	0.1140	0.14		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.6	161	0.0500	4.86	9.72	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=0.00' D=1.00' Z= 2.0 '/' Top.W=4.00' n= 0.040
11.1	249	Total			

Subcatchment C-426: Culvert-426 Area



Subcatchment C-427: Culvert-427 Area

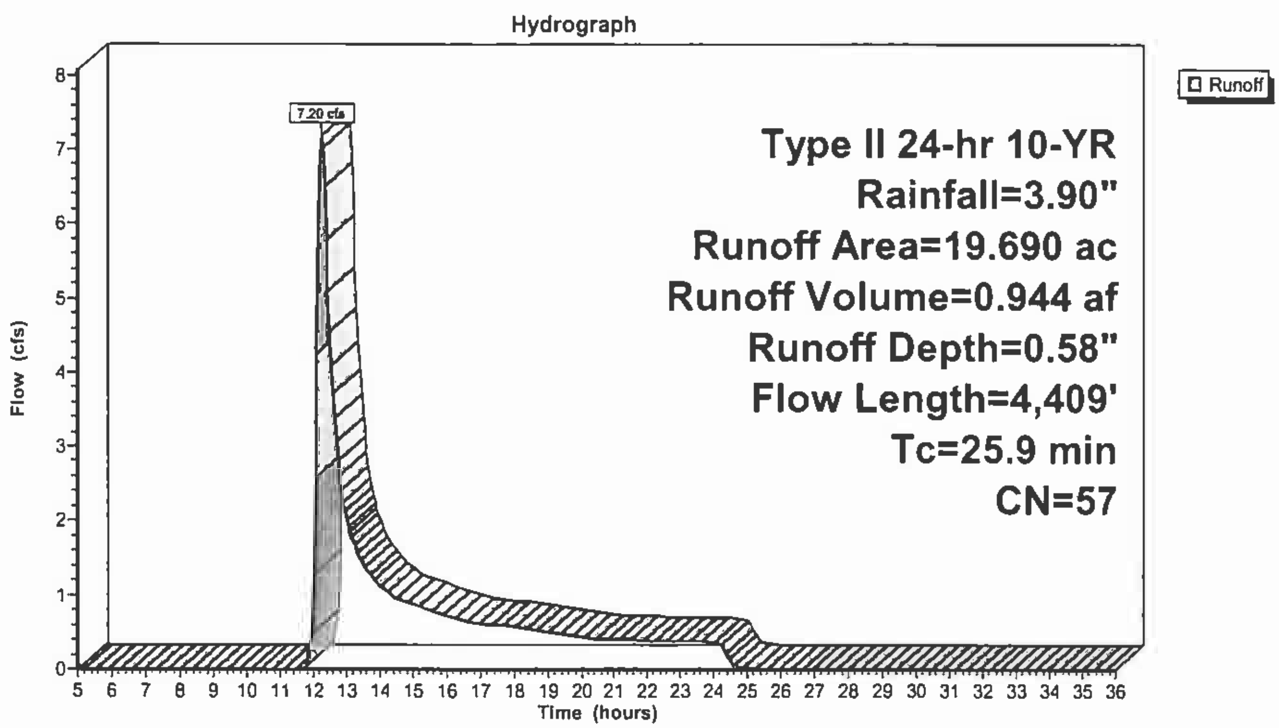
Runoff = 7.20 cfs @ 12.26 hrs, Volume= 0.944 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.030	89	Gravel roads, HSG C
6.000	53	Woods, Good, HSG C
0.040	55	Brush, Good, HSG D
13.620	58	Woods, Good, HSG D
19.690	57	Weighted Average
19.690		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1400	0.16		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
14.3	2,644	0.3800	3.08		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.9	1,665	0.1200	32.55	5,207.88	**Trap/Vee/Rect Channel Flow, natural channel** Bot.W=4.00' D=8.00' Z= 2.0 '/' Top.W=36.00' n= 0.040
25.9	4,409	Total			

Subcatchment C-427: Culvert-427 Area



Subcatchment C-600: Culvert-600 Area

[49] Hint: Tc<2dt may require smaller dt

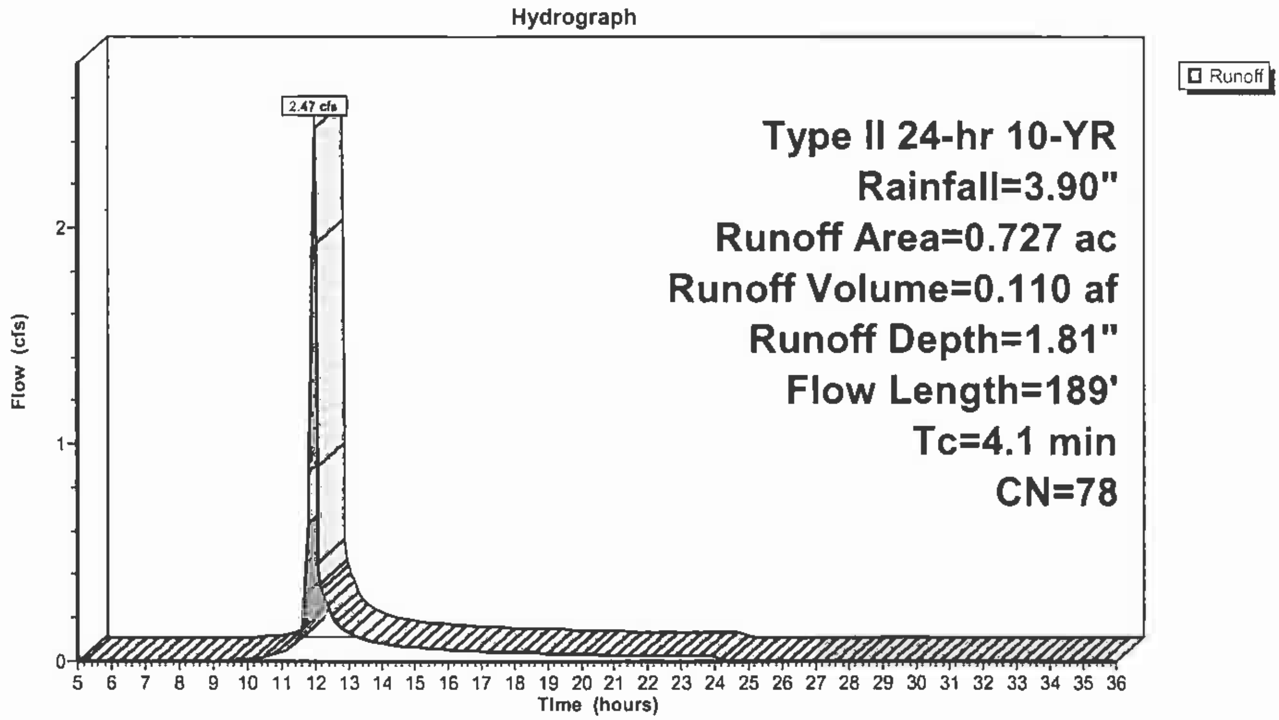
Runoff = 2.47 cfs @ 11.95 hrs, Volume= 0.110 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.482	89	Gravel roads, HSG C
0.245	55	Brush, Good, HSG D
0.727	78	Weighted Average
0.727		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
0.3	89	0.3800	4.32		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
4.1	189	Total			

Subcatchment C-600: Culvert-600 Area



Subcatchment C-601: Culvert-601 Area

[49] Hint: Tc<2dt may require smaller dt

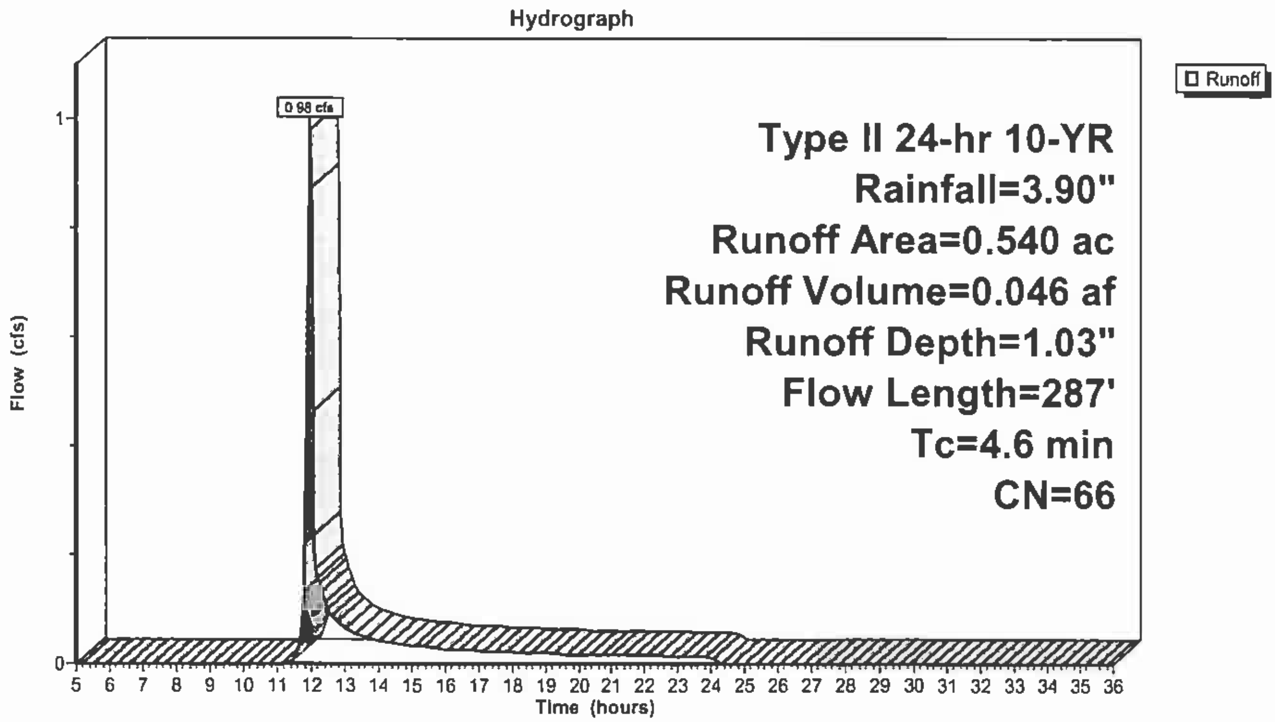
Runoff = 0.98 cfs @ 11.96 hrs, Volume= 0.046 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.153	89	Gravel roads, HSG C
0.200	55	Brush, Good, HSG D
0.187	58	Woods, Good, HSG D
0.540	66	Weighted Average
0.540		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
0.7	123	0.3410	2.92		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	64	0.0780	11.03	132.39	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
4.6	287	Total			

Subcatchment C-601: Culvert-601 Area



Subcatchment C-602: Culvert-602 Area

[49] Hint: Tc<2dt may require smaller dt

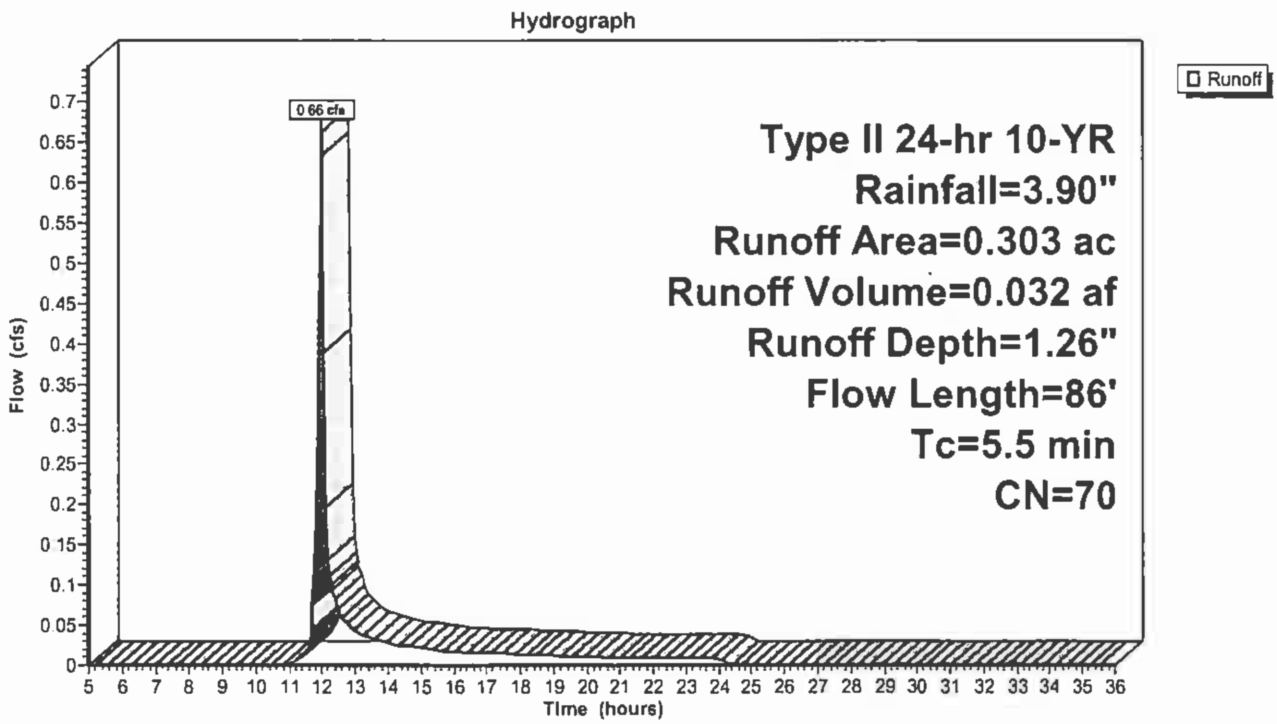
Runoff = 0.66 cfs @ 11.97 hrs, Volume= 0.032 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.129	89	Gravel roads, HSG C
0.091	55	Brush, Good, HSG D
0.083	58	Woods, Good, HSG D
0.303	70	Weighted Average
0.303		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	60	0.2660	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.0	26	0.1150	13.40	160.75	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
5.5	86	Total			

Subcatchment C-602: Culvert-602 Area



Subcatchment C-603: Culvert-603 Area

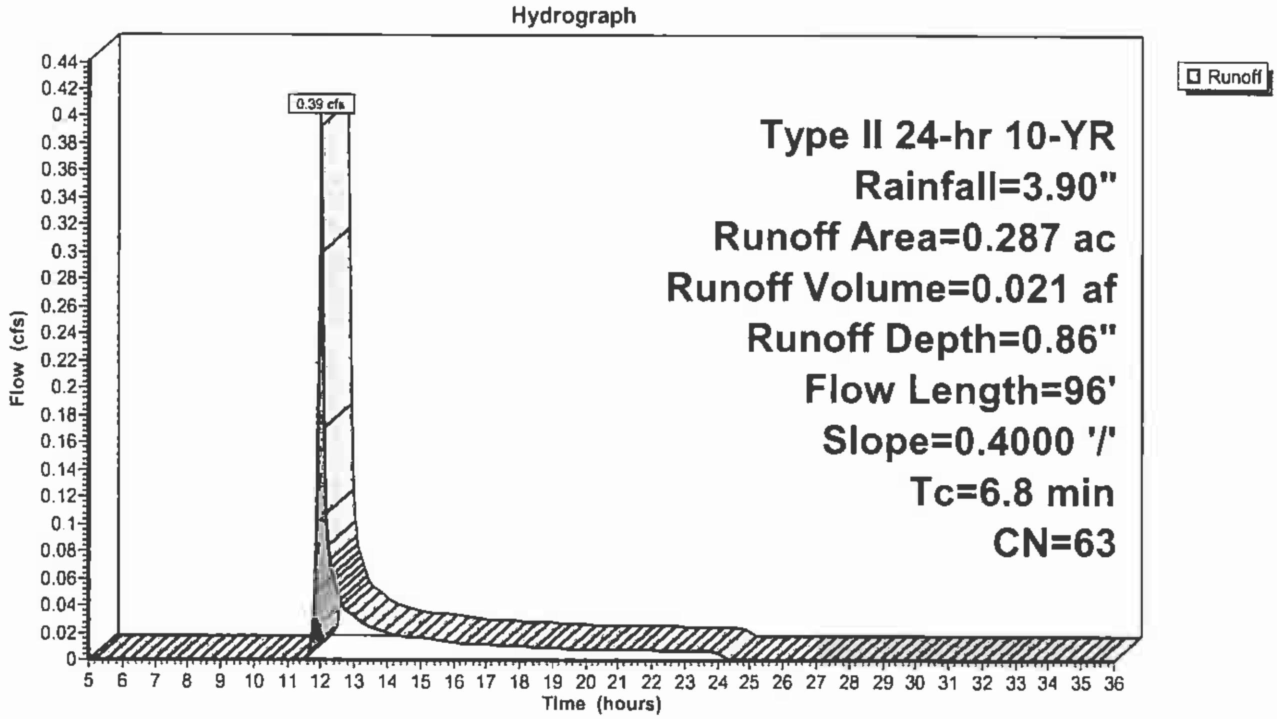
Runoff = 0.39 cfs @ 12.00 hrs, Volume= 0.021 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.058	89	Gravel roads, HSG C
0.140	55	Brush, Good, HSG D
0.089	58	Woods, Good, HSG D
0.287	63	Weighted Average
0.287		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	96	0.4000	0.23		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"

Subcatchment C-603: Culvert-603 Area



Subcatchment C-604: Culvert-604 Area

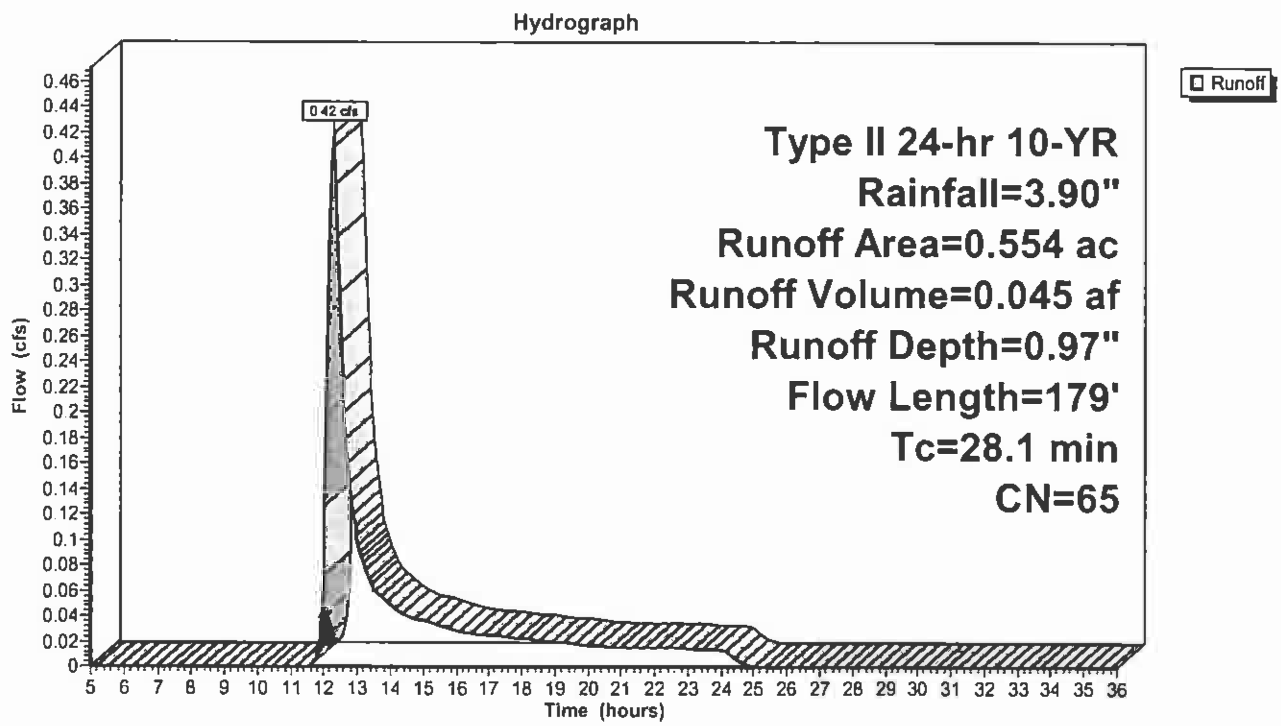
Runoff = 0.42 cfs @ 12.25 hrs, Volume= 0.045 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.148	89	Gravel roads, HSG C
0.207	55	Brush, Good, HSG D
0.199	58	Woods, Good, HSG D
0.554	65	Weighted Average
0.554		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.2	100	0.0150	0.06		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.9	79	0.0100	0.70		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
28.1	179	Total			

Subcatchment C-604: Culvert-604 Area



Subcatchment C-605: Culvert-605 Area

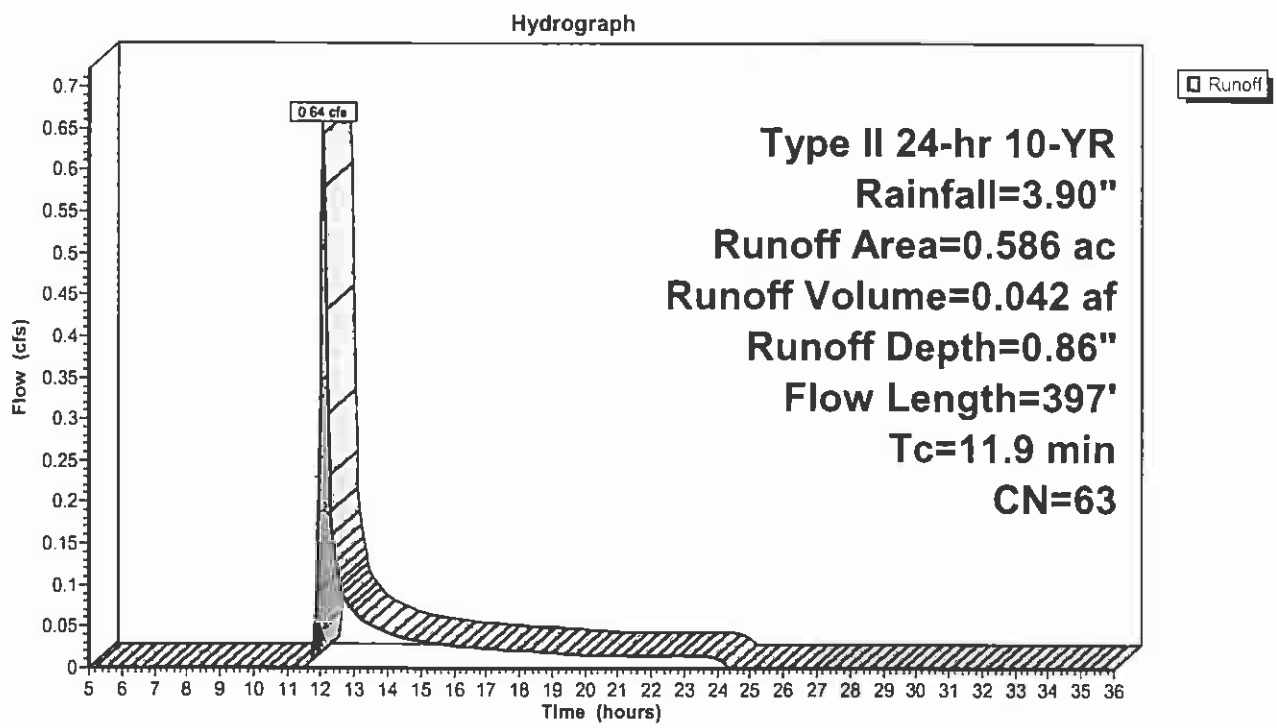
Runoff = 0.64 cfs @ 12.06 hrs, Volume= 0.042 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.251	55	Brush, Good, HSG D
0.225	58	Woods, Good, HSG D
0.586	63	Weighted Average
0.586		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.1300	0.15		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.4	89	0.5400	3.67		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	208	0.0520	9.01	108.09	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
11.9	397	Total			

Subcatchment C-605: Culvert-605 Area



Subcatchment C-606: Culvert-606 Area

[49] Hint: Tc<2dt may require smaller dt

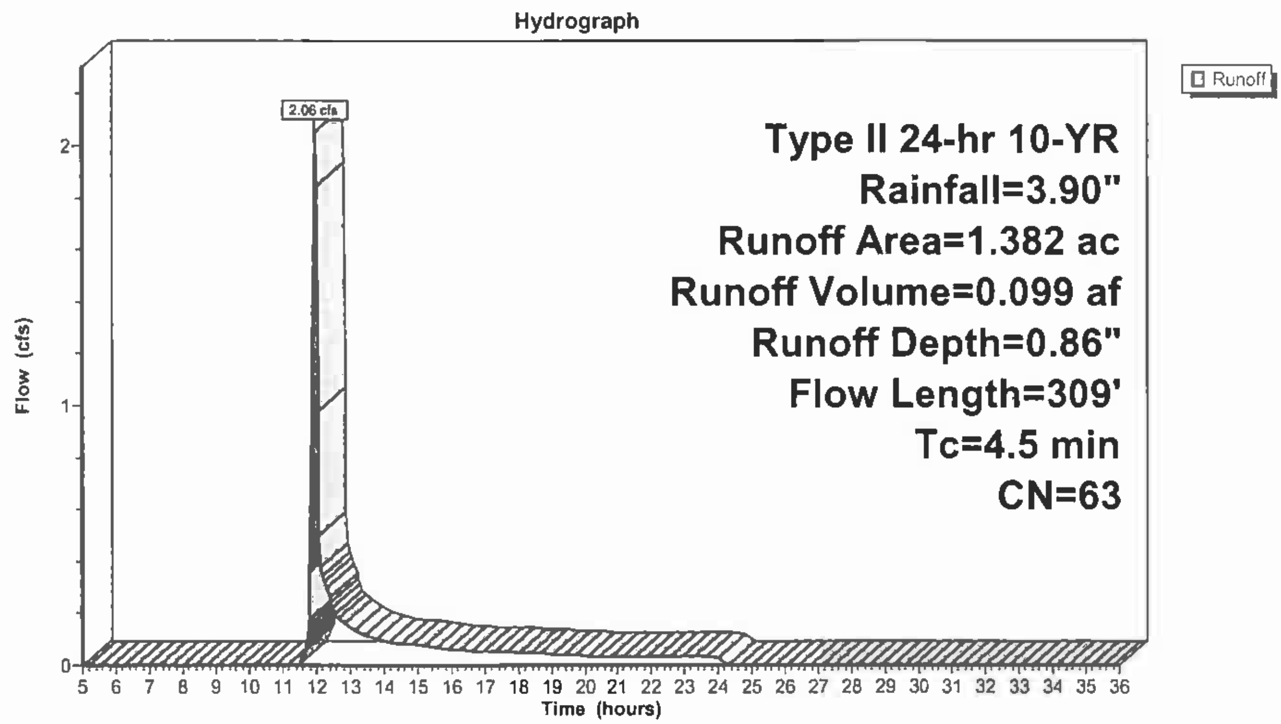
Runoff = 2.06 cfs @ 11.96 hrs, Volume= 0.099 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.264	89	Gravel roads, HSG C
0.389	55	Brush, Good, HSG D
0.729	58	Woods, Good, HSG D
1.382	63	Weighted Average
1.382		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	85	0.0300	0.43		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
1.2	224	0.3570	2.99		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.5	309	Total			

Subcatchment C-606: Culvert-606 Area



Subcatchment C-607: Culvert-607 Area

[49] Hint: Tc<2dt may require smaller dt

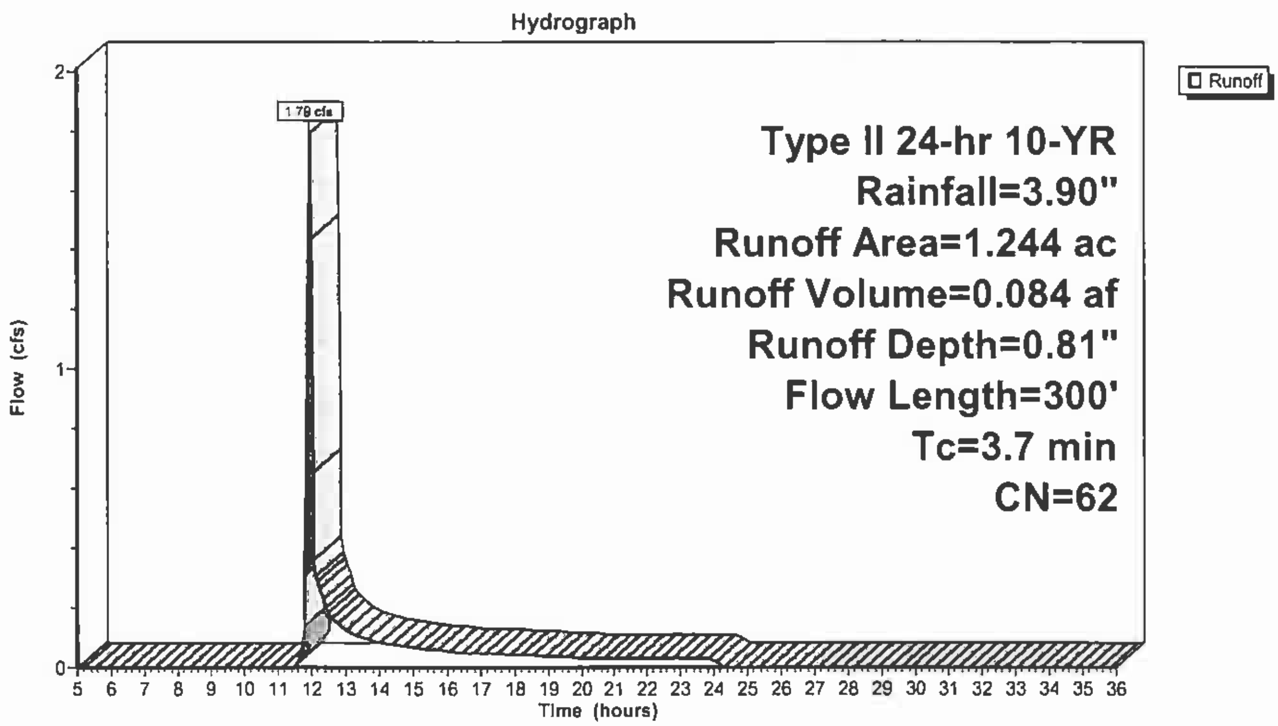
Runoff = 1.79 cfs @ 11.96 hrs, Volume= 0.084 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.220	89	Gravel roads, HSG C
0.459	55	Brush, Good, HSG D
0.565	58	Woods, Good, HSG D
1.244	62	Weighted Average
1.244		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.0100	0.22		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
0.2	45	0.2660	3.61		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
1.6	230	0.2170	2.33		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
3.7	300	Total			

Subcatchment C-607: Culvert-607 Area



Subcatchment C-608: Culvert-608 Area

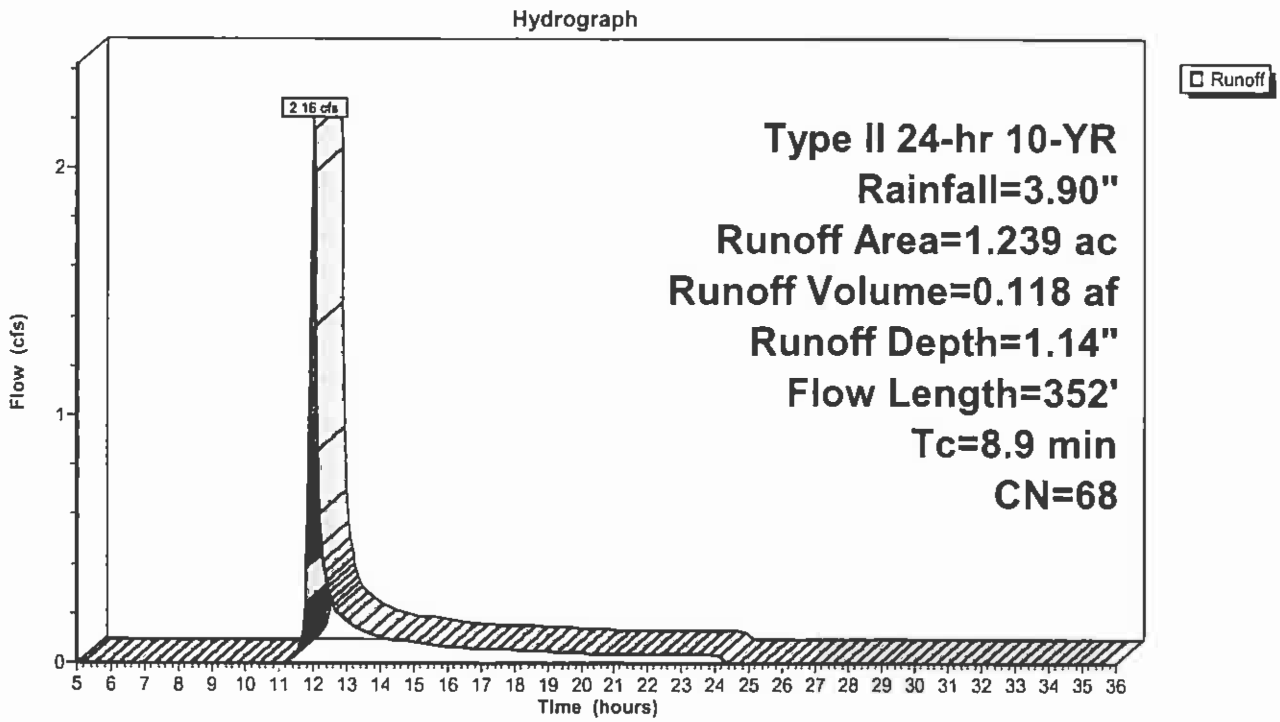
Runoff = 2.16 cfs @ 12.01 hrs, Volume= 0.118 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.440	89	Gravel roads, HSG C
0.445	55	Brush, Good, HSG D
0.354	58	Woods, Good, HSG D
1.239	68	Weighted Average
1.239		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	114	0.0100	0.29		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
2.4	238	0.1100	1.66		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
8.9	352	Total			

Subcatchment C-608: Culvert-608 Area



Subcatchment C-609: Culvert-609 Area

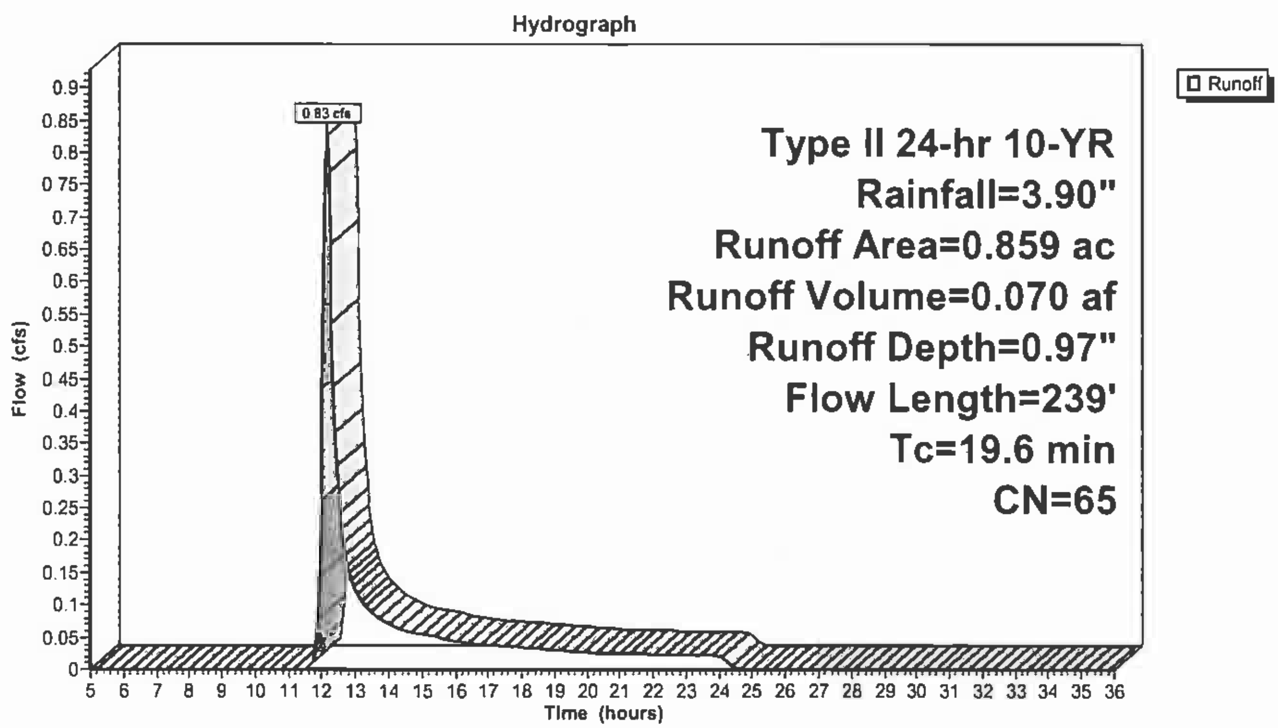
Runoff = 0.83 cfs @ 12.15 hrs, Volume= 0.070 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.222	89	Gravel roads, HSG C
0.211	55	Brush, Good, HSG D
0.426	58	Woods, Good, HSG D
0.859	65	Weighted Average
0.859		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	100	0.0400	0.09		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.9	139	0.0570	1.19		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
19.6	239	Total			

Subcatchment C-609: Culvert-609 Area



Subcatchment C-610: Culvert-610 Area

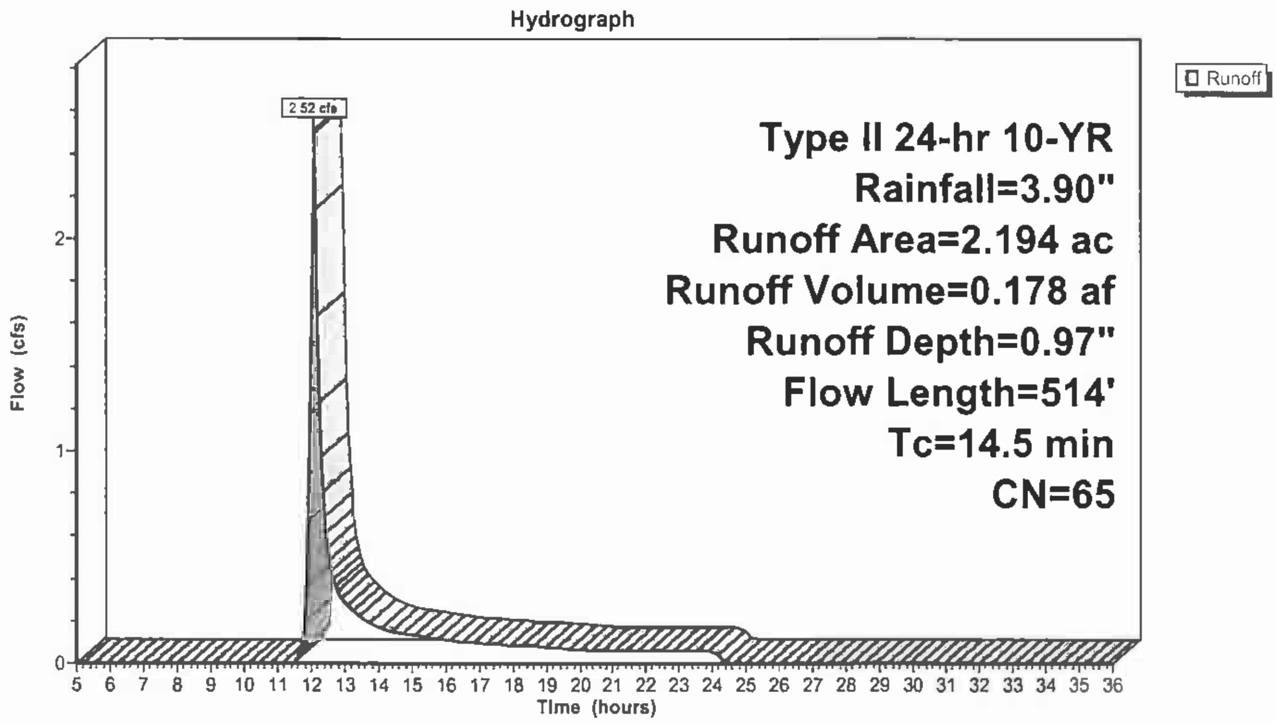
Runoff = 2.52 cfs @ 12.08 hrs, Volume= 0.178 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.585	89	Gravel roads, HSG C
0.591	55	Brush, Good, HSG D
1.018	58	Woods, Good, HSG D
2.194	65	Weighted Average
2.194		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.2000	0.18		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.1	128	0.1400	1.87		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
4.1	286	0.0270	1.15		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
14.5	514	Total			

Subcatchment C-610: Culvert-610 Area



Subcatchment C-611: Culvert-611 Area

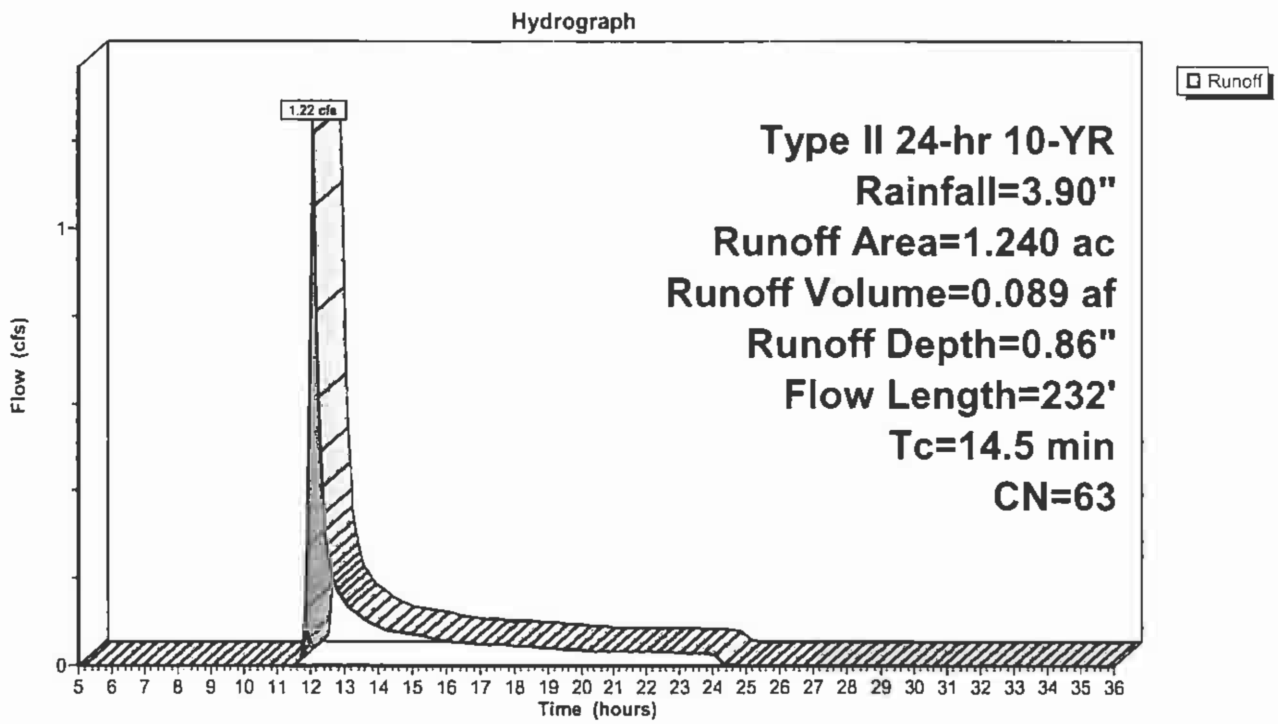
Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.089 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.240	89	Gravel roads, HSG C
0.351	55	Brush, Good, HSG D
0.649	58	Woods, Good, HSG D
1.240	63	Weighted Average
1.240		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
1.1	132	0.1740	2.09		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
14.5	232	Total			

Subcatchment C-611: Culvert-611 Area



Subcatchment C-612: Culvert-612 Area

[49] Hint: Tc<2dt may require smaller dt

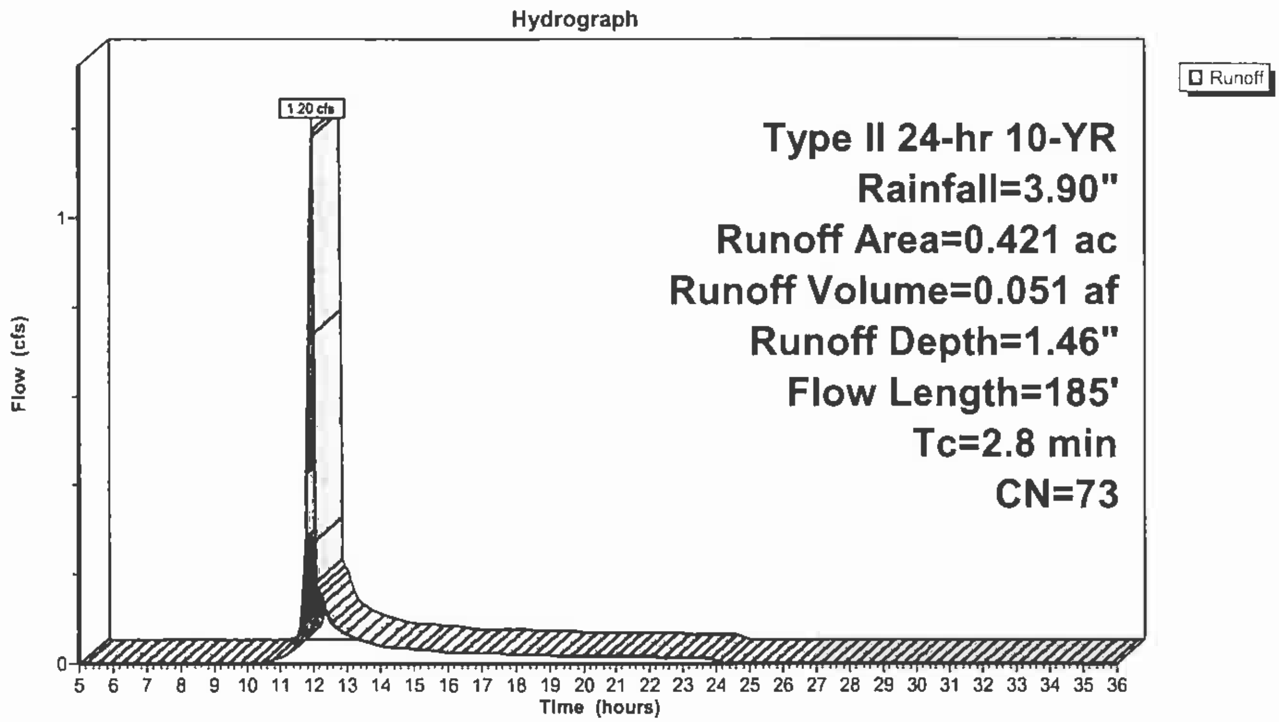
Runoff = 1.20 cfs @ 11.94 hrs, Volume= 0.051 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.226	89	Gravel roads, HSG C
0.185	55	Brush, Good, HSG D
0.010	58	Woods, Good, HSG D
0.421	73	Weighted Average
0.421		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	97	0.0700	0.62		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
0.2	88	0.0340	7.28	87.41	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
2.8	185	Total			

Subcatchment C-612: Culvert-612 Area



Subcatchment C-613: Culvert-613 Area

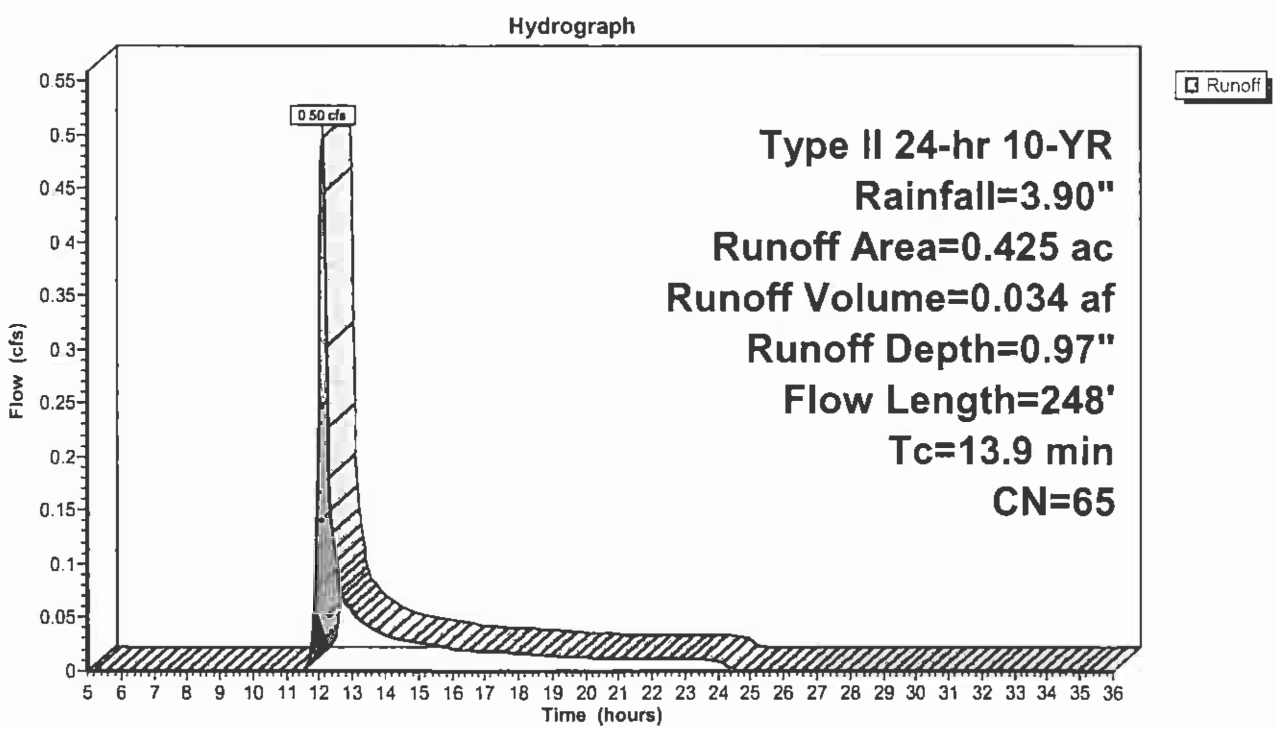
Runoff = 0.50 cfs @ 12.08 hrs, Volume= 0.034 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.106	89	Gravel roads, HSG C
0.150	55	Brush, Good, HSG D
0.169	58	Woods, Good, HSG D
0.425	65	Weighted Average
0.425		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.4	52	0.1920	2.19		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.1	96	0.1250	13.97	167.59	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
13.9	248	Total			

Subcatchment C-613: Culvert-613 Area



Subcatchment C-614: Culvert-614 Area

[49] Hint: Tc<2dt may require smaller dt

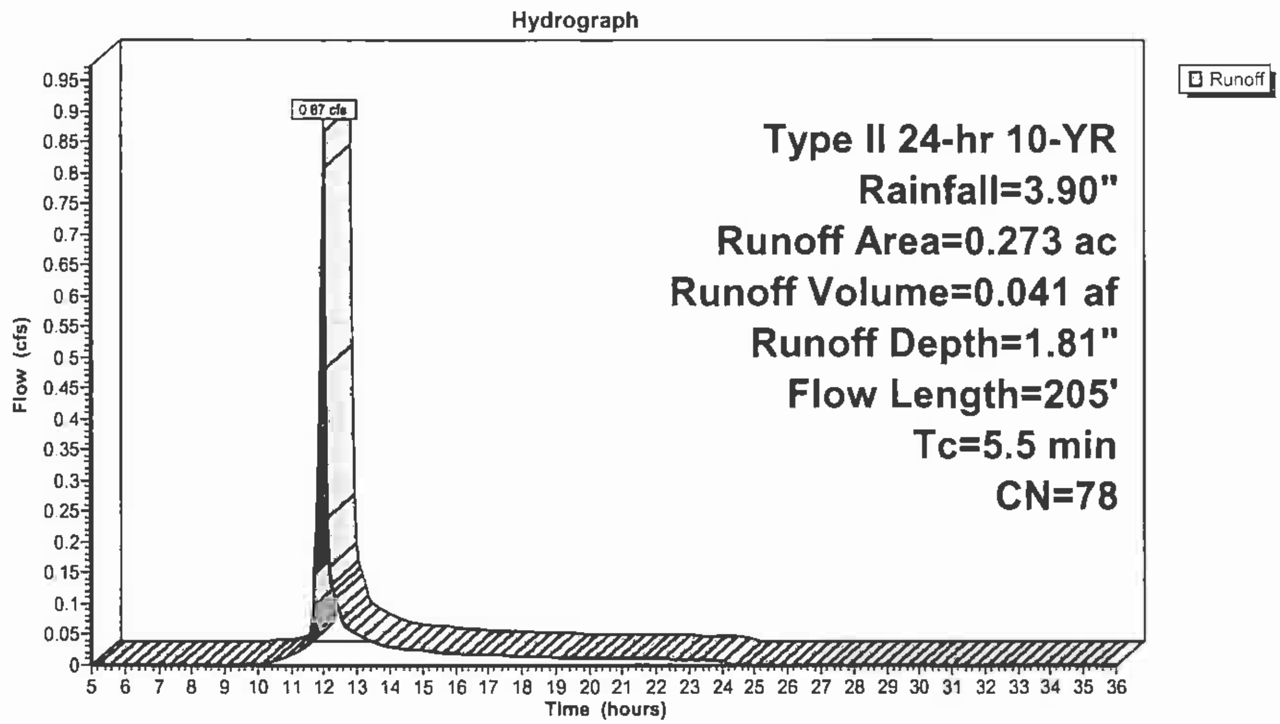
Runoff = 0.87 cfs @ 11.97 hrs, Volume= 0.041 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.183	89	Gravel roads, HSG C
0.056	55	Brush, Good, HSG D
0.034	58	Woods, Good, HSG D
0.273	78	Weighted Average
0.273		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0150	0.34		**Sheet Flow, sheet** Fallow n= 0.050 P2= 2.70"
0.5	105	0.0400	3.22		**Shallow Concentrated Flow, shallow** Unpaved Kv= 16.1 fps
5.5	205	Total			

Subcatchment C-614: Culvert-614 Area



Subcatchment C-615: Culvert-615 Area

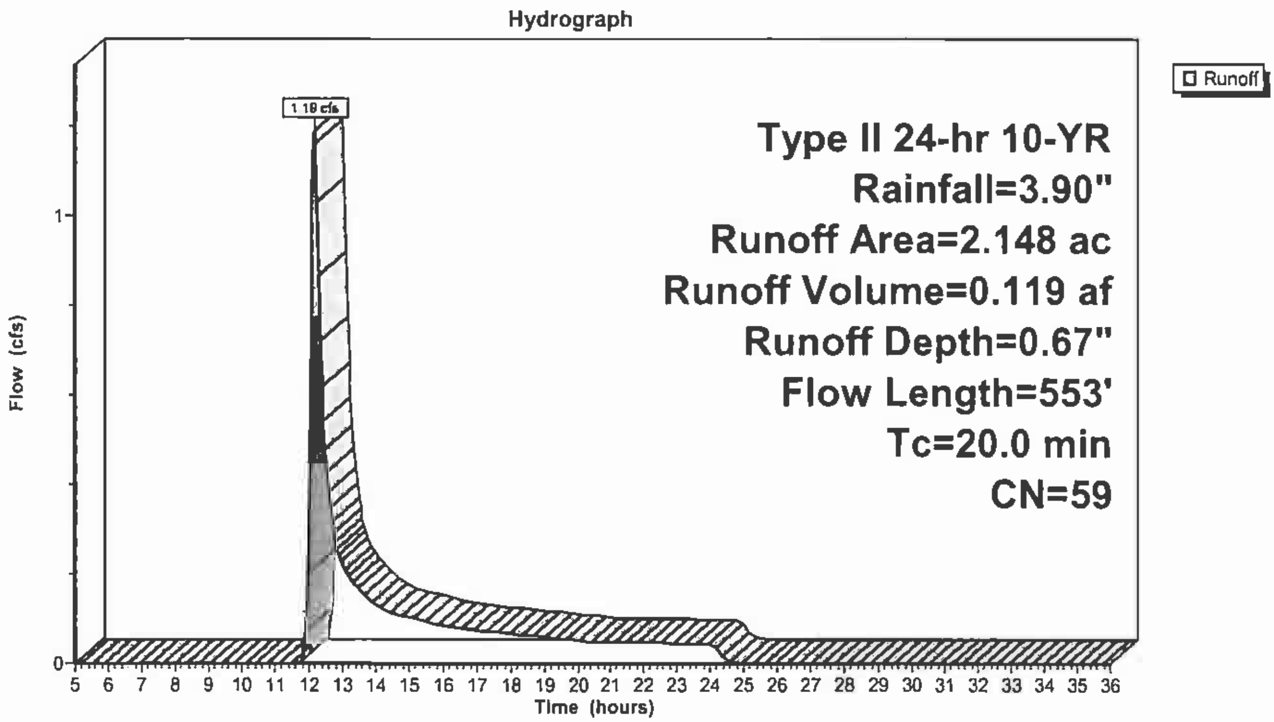
Runoff = 1.19 cfs @ 12.17 hrs, Volume= 0.119 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.125	89	Gravel roads, HSG C
0.259	55	Brush, Good, HSG D
1.764	58	Woods, Good, HSG D
2.148	59	Weighted Average
2.148		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0500	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
3.8	453	0.1570	1.98		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
20.0	553	Total			

Subcatchment C-615: Culvert-615 Area



Subcatchment C-616: Culvert-616 Area

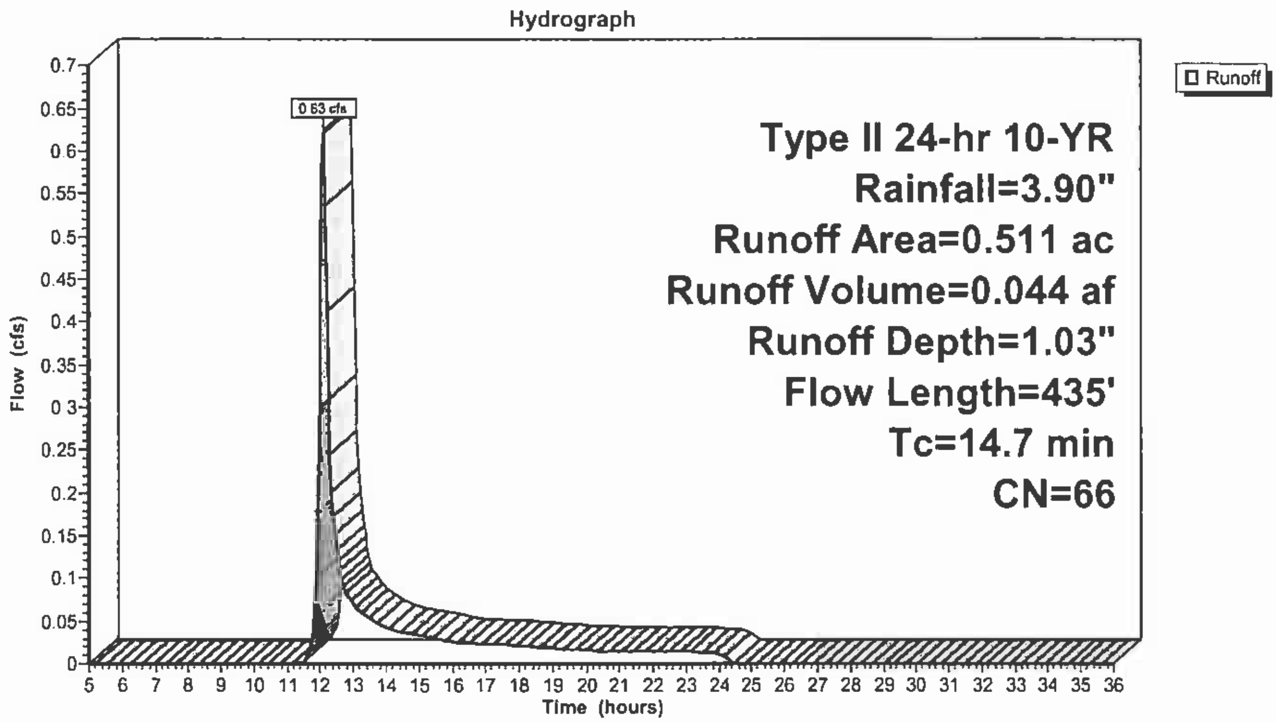
Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.044 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.143	89	Gravel roads, HSG C
0.192	55	Brush, Good, HSG D
0.176	58	Woods, Good, HSG D
0.511	66	Weighted Average
0.511		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	105	0.0760	0.12		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
0.4	330	0.1090	13.04	156.50	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
14.7	435	Total			

Subcatchment C-616: Culvert-616 Area



Subcatchment C-617: Culvert-617 Area

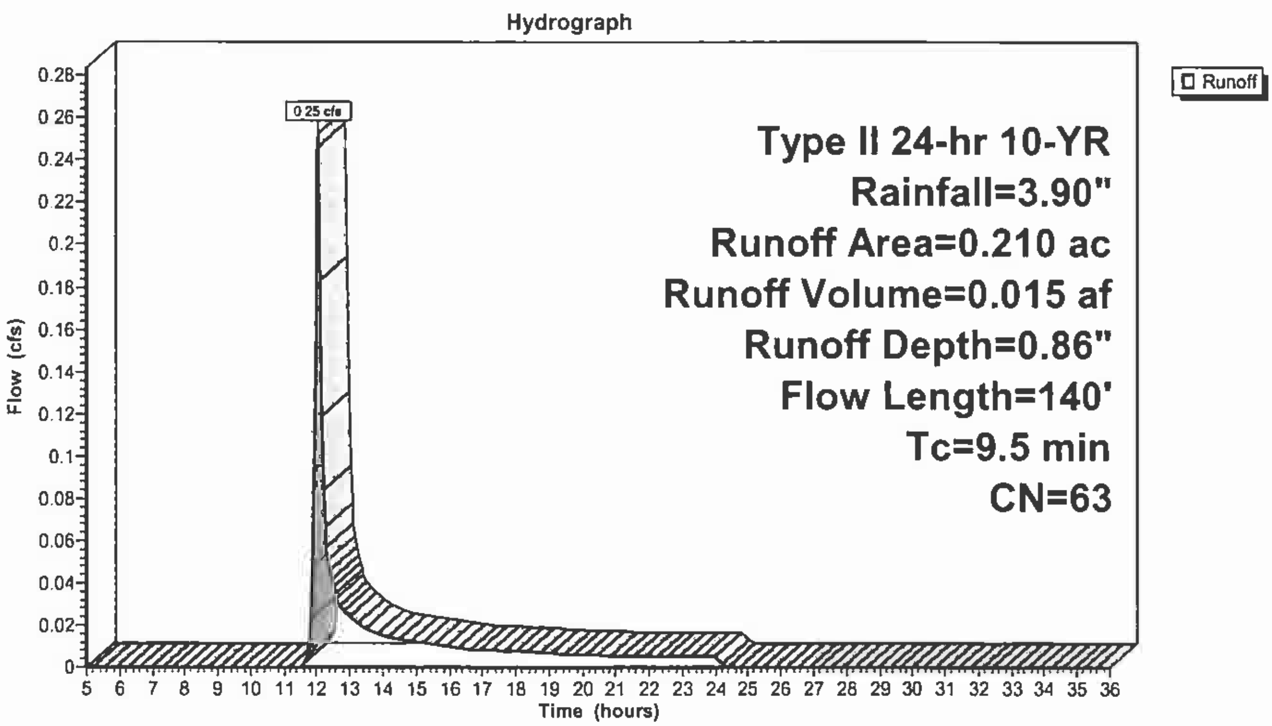
Runoff = 0.25 cfs @ 12.03 hrs, Volume= 0.015 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.041	89	Gravel roads, HSG C
0.075	55	Brush, Good, HSG D
0.094	58	Woods, Good, HSG D
0.210	63	Weighted Average
0.210		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	77	0.1160	0.14		**Sheet Flow, sheet**
					Woods: Light underbrush n= 0.400 P2= 2.70"
0.1	63	0.0470	8.56	102.77	**Trap/Vee/Rect Channel Flow, ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
9.5	140	Total			

Subcatchment C-617: Culvert-617 Area



Subcatchment TS-427: TS-427 Area

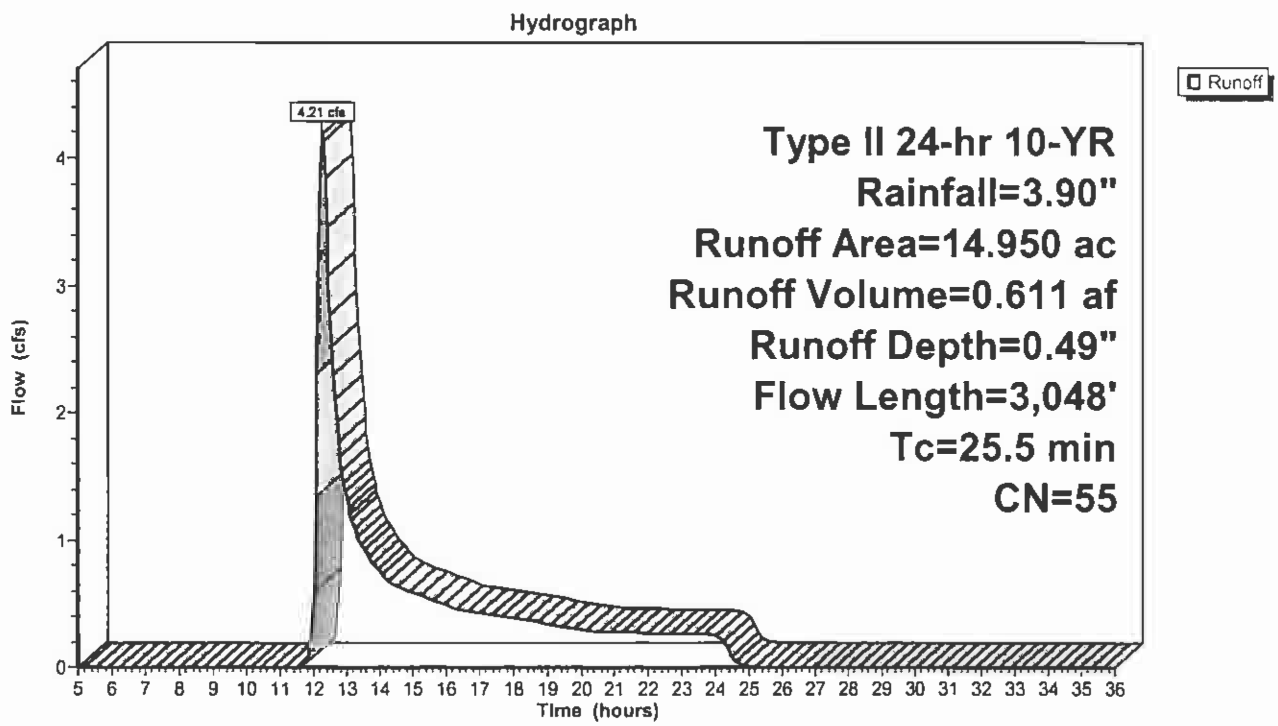
Runoff = 4.21 cfs @ 12.27 hrs, Volume= 0.611 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.90"

Area (ac)	CN	Description
0.120	89	Gravel roads, HSG C
8.650	53	Woods, Good, HSG C
0.180	55	Brush, Good, HSG D
6.000	58	Woods, Good, HSG D
14.950	55	Weighted Average
14.950		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.4000	0.24		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 2.70"
18.0	2,652	0.2400	2.45		**Shallow Concentrated Flow, shallow** Woodland Kv= 5.0 fps
0.4	296	0.0940	12.11	145.33	**Trap/Vee/Rect Channel Flow, ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.040
25.5	3,048	Total			

Subcatchment TS-427: TS-427 Area



Reach TS401: Treatment Swale

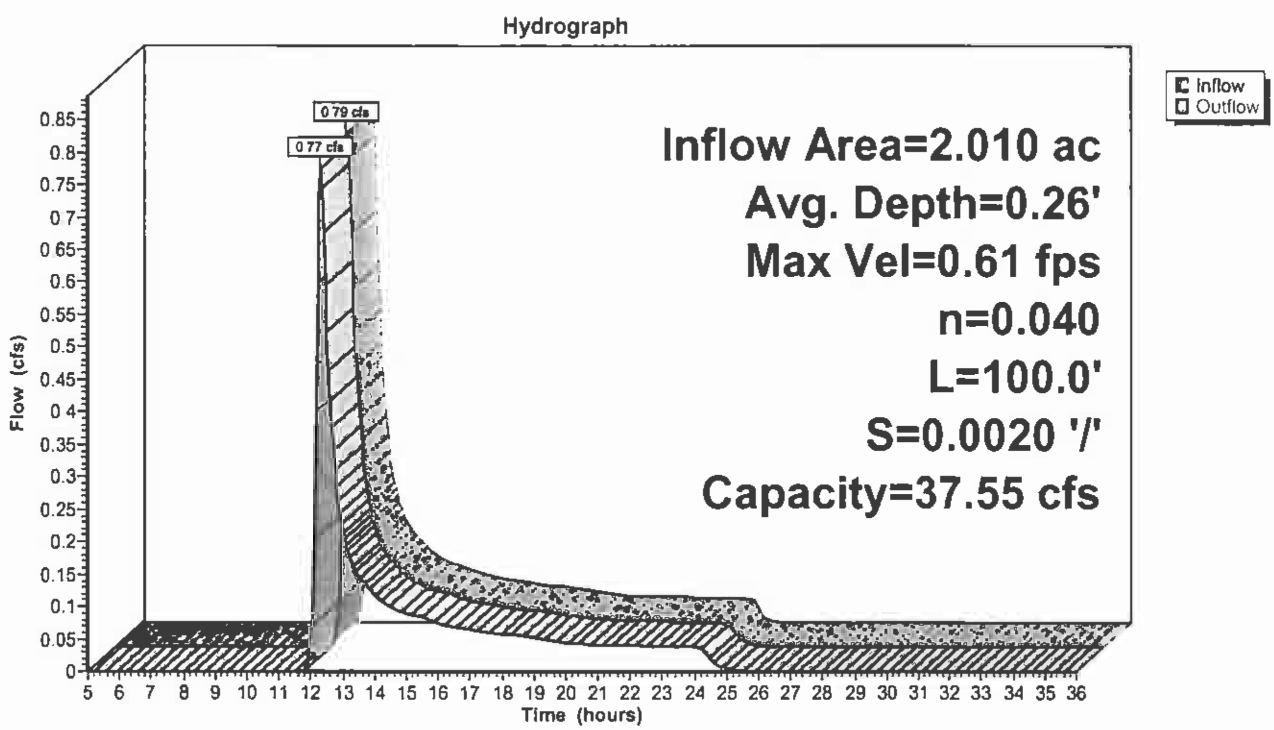
Inflow Area = 2.010 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 0.79 cfs @ 12.22 hrs, Volume= 0.096 af
Outflow = 0.77 cfs @ 12.31 hrs, Volume= 0.096 af, Atten= 2%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.61 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 6.8 min

Peak Storage= 127 cf @ 12.26 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 37.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0020 '/'
Inlet Invert= 2,259.90', Outlet Invert= 2,259.70'

Reach TS401: Treatment Swale



Reach TS405: Treatment Swale

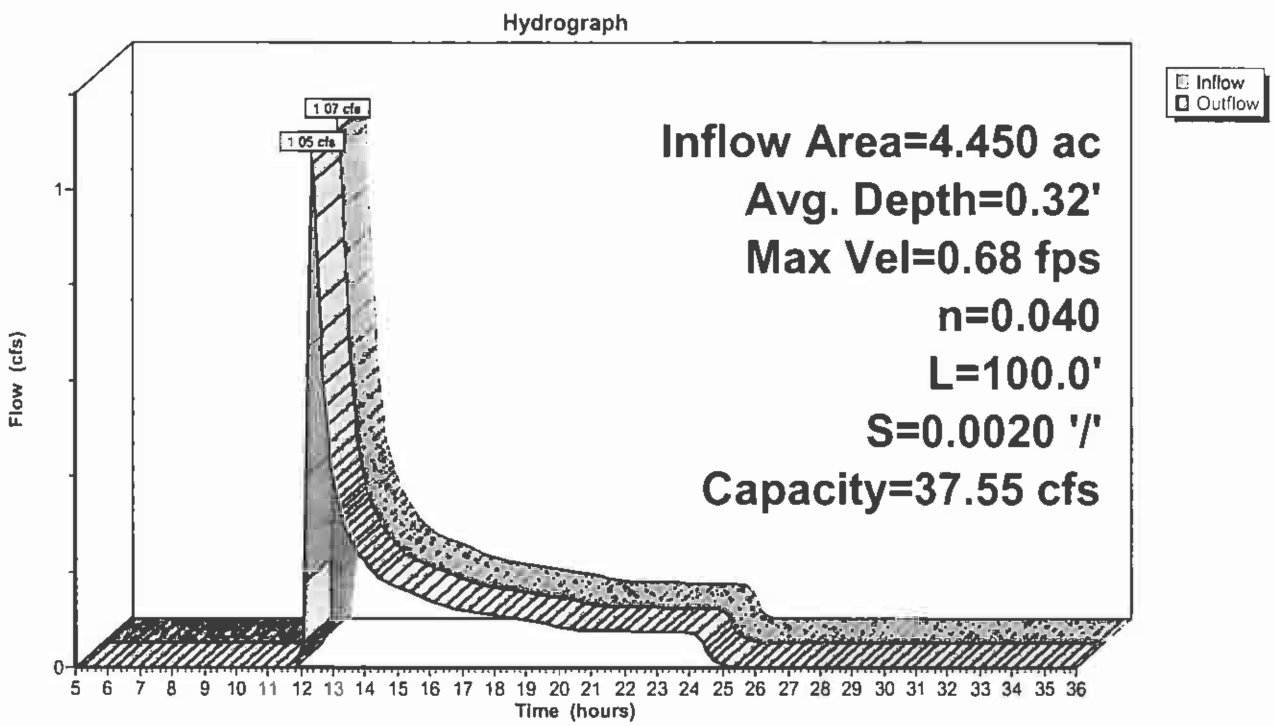
Inflow Area = 4.450 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.07 cfs @ 12.27 hrs, Volume= 0.167 af
Outflow = 1.05 cfs @ 12.35 hrs, Volume= 0.167 af, Atten= 2%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.68 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 5.5 min

Peak Storage= 156 cf @ 12.31 hrs, Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 37.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0020 '/'
Inlet Invert= 2,372.00', Outlet Invert= 2,371.80'

Reach TS405: Treatment Swale



Reach TS426: Treatment Swale

Inflow Area = 0.360 ac, Inflow Depth = 0.81" for 10-YR event
Inflow = 0.38 cfs @ 12.05 hrs, Volume= 0.024 af
Outflow = 0.32 cfs @ 12.18 hrs, Volume= 0.024 af, Atten= 16%, Lag= 7.9 min

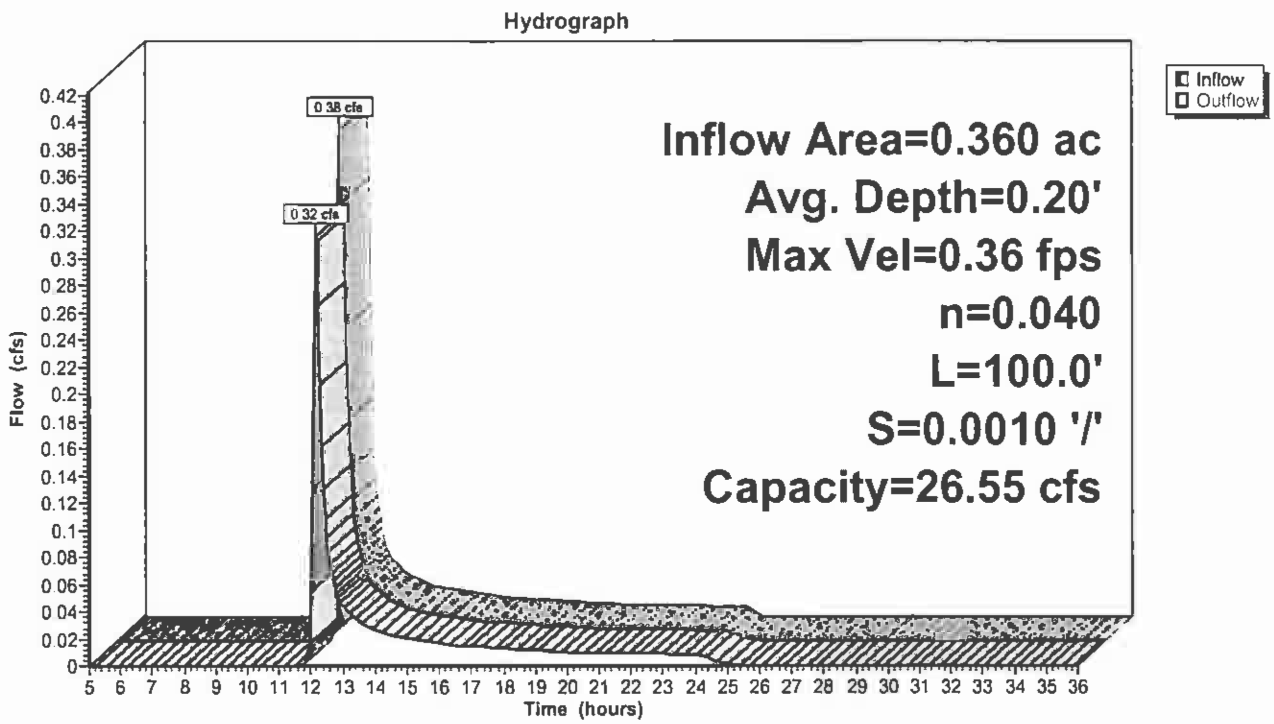
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.36 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 14.1 min

Peak Storage= 90 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.55 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0010 '/'
Inlet Invert= 2,234.00', Outlet Invert= 2,233.90'

‡

Reach TS426: Treatment Swale



Reach TS427: Treatment Swale

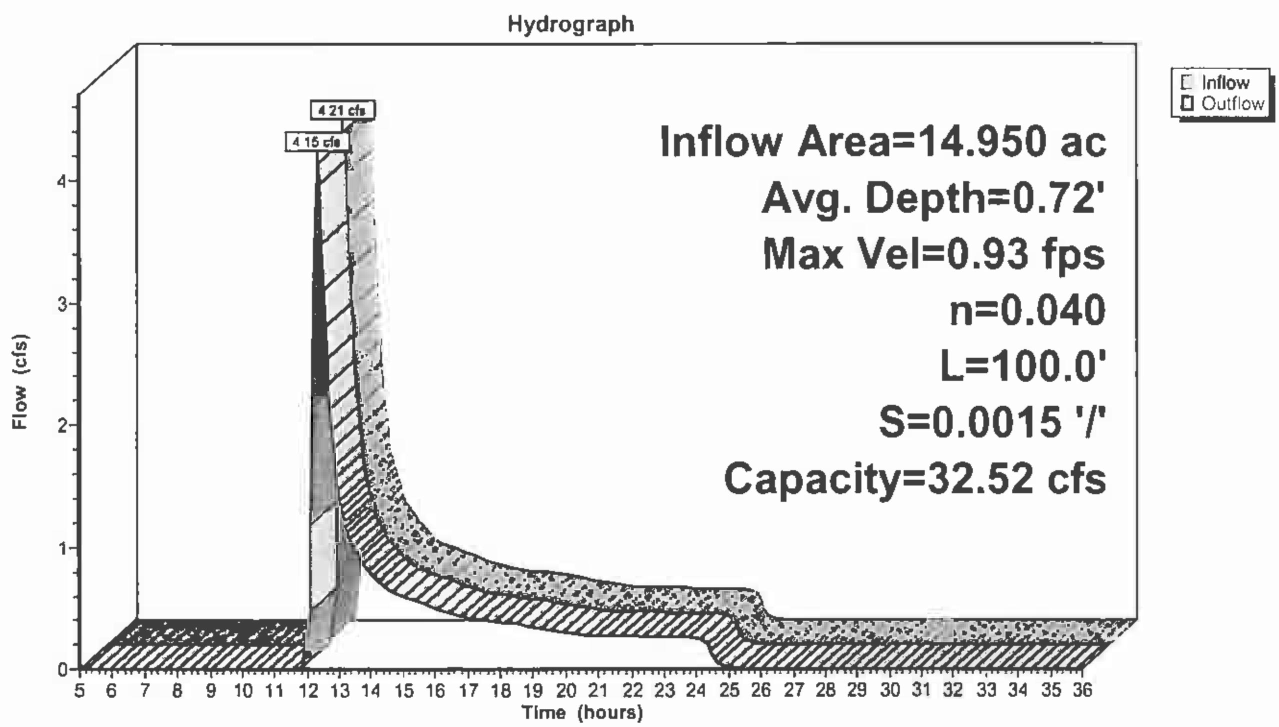
Inflow Area = 14.950 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 4.21 cfs @ 12.27 hrs, Volume= 0.611 af
Outflow = 4.15 cfs @ 12.32 hrs, Volume= 0.611 af, Atten= 1%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.93 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 4.0 min

Peak Storage= 448 cf @ 12.29 hrs, Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 32.52 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.0015 '/'
Inlet Invert= 2,192.00', Outlet Invert= 2,191.85'

Reach TS427: Treatment Swale



Pond CV400: CV400

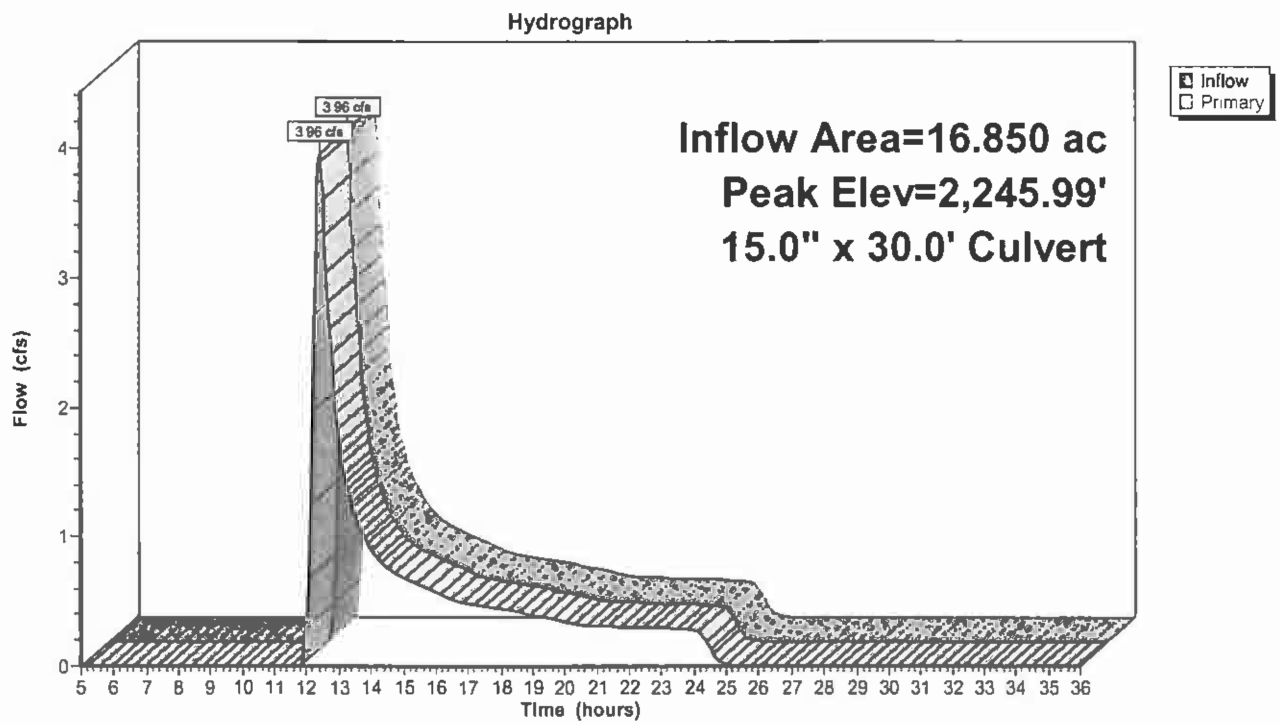
Inflow Area = 16.850 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 3.96 cfs @ 12.38 hrs, Volume= 0.689 af
Outflow = 3.96 cfs @ 12.38 hrs, Volume= 0.689 af, Atten= 0%, Lag= 0.0 min
Primary = 3.96 cfs @ 12.38 hrs, Volume= 0.689 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,245.99' @ 12.38 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,244.75'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,244.50' S= 0.0083 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.94 cfs @ 12.38 hrs HW=2,245.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 3.94 cfs @ 4.03 fps)

Pond CV400: CV400



Pond CV401: CV400

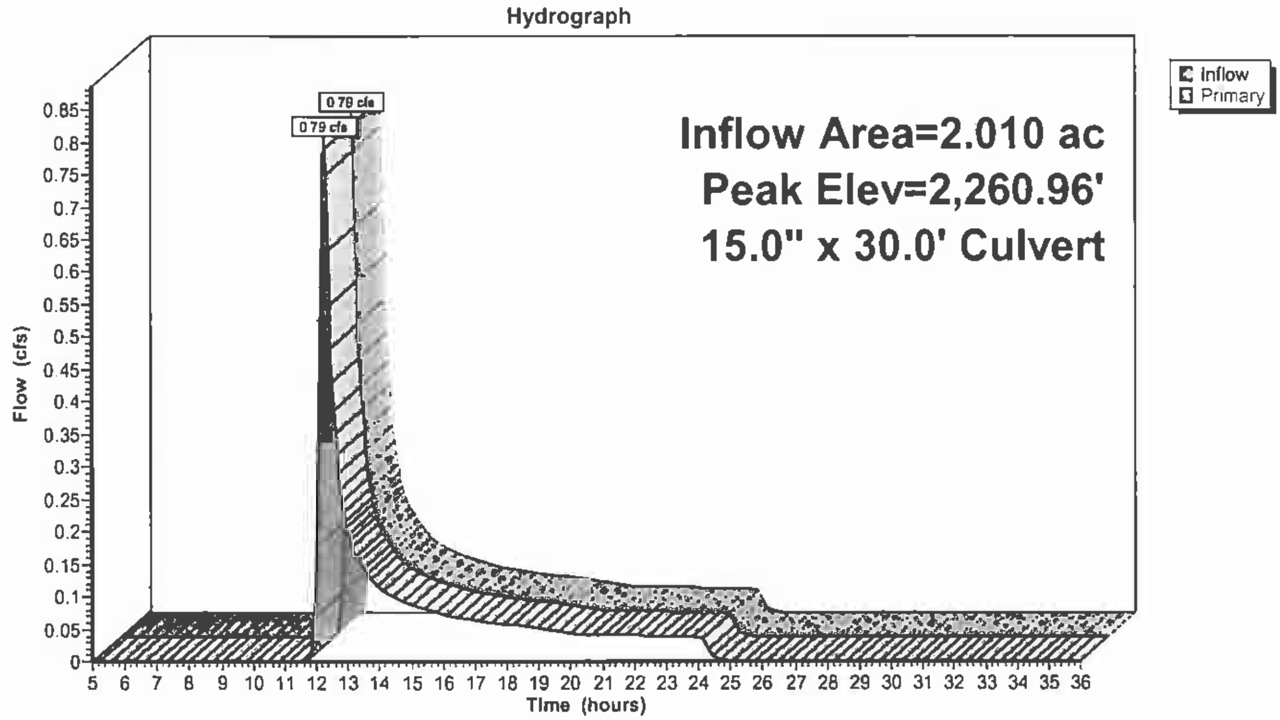
Inflow Area = 2.010 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 0.79 cfs @ 12.22 hrs, Volume= 0.096 af
Outflow = 0.79 cfs @ 12.22 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.22 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,260.96' @ 12.22 hrs
Flood Elev= 2,263.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,260.50'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,260.20' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.78 cfs @ 12.22 hrs HW=2,260.95' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.78 cfs @ 2.88 fps)

Pond CV401: CV400



Pond CV402: CV402

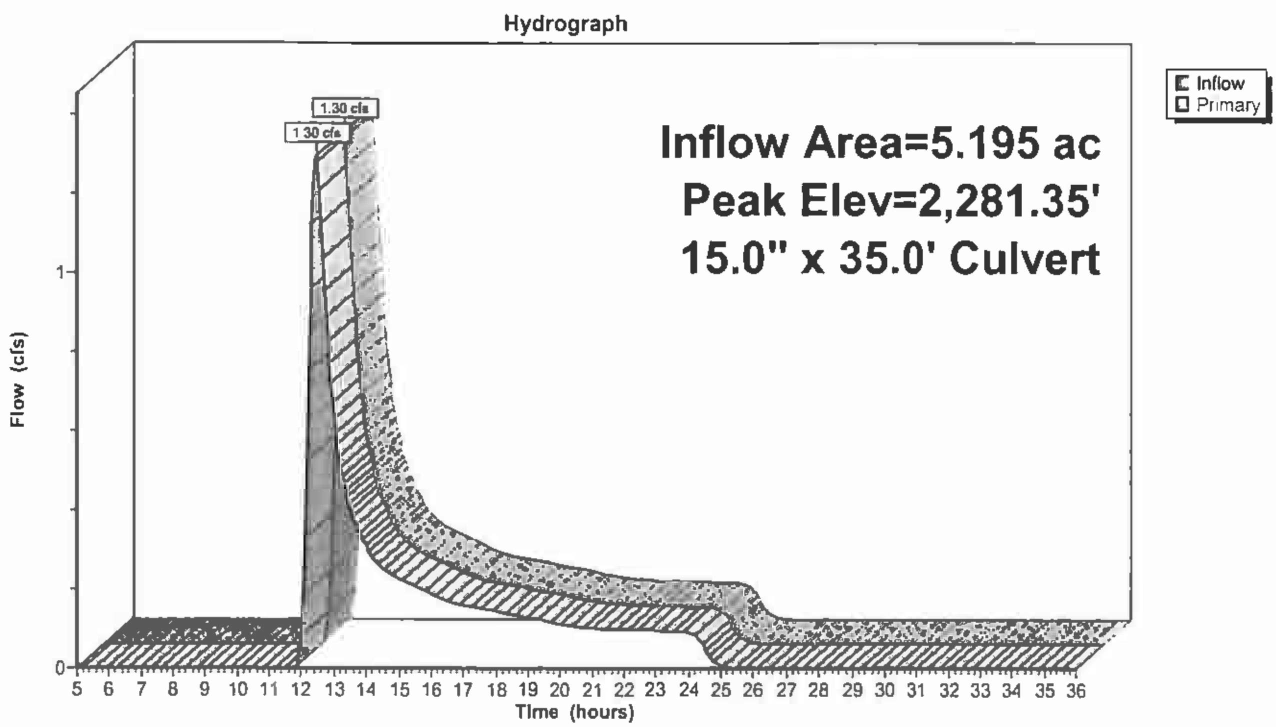
Inflow Area =	5.195 ac,	Inflow Depth = 0.53"	for 10-YR event
Inflow =	1.30 cfs @	12.44 hrs, Volume=	0.230 af
Outflow =	1.30 cfs @	12.44 hrs, Volume=	0.230 af, Atten= 0%, Lag= 0.0 min
Primary =	1.30 cfs @	12.44 hrs, Volume=	0.230 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,281.35' @ 12.44 hrs
Flood Elev= 2,284.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,280.75'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,280.40' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.29 cfs @ 12.44 hrs HW=2,281.35' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.29 cfs @ 3.28 fps)

Pond CV402: CV402



Pond CV403: CV403

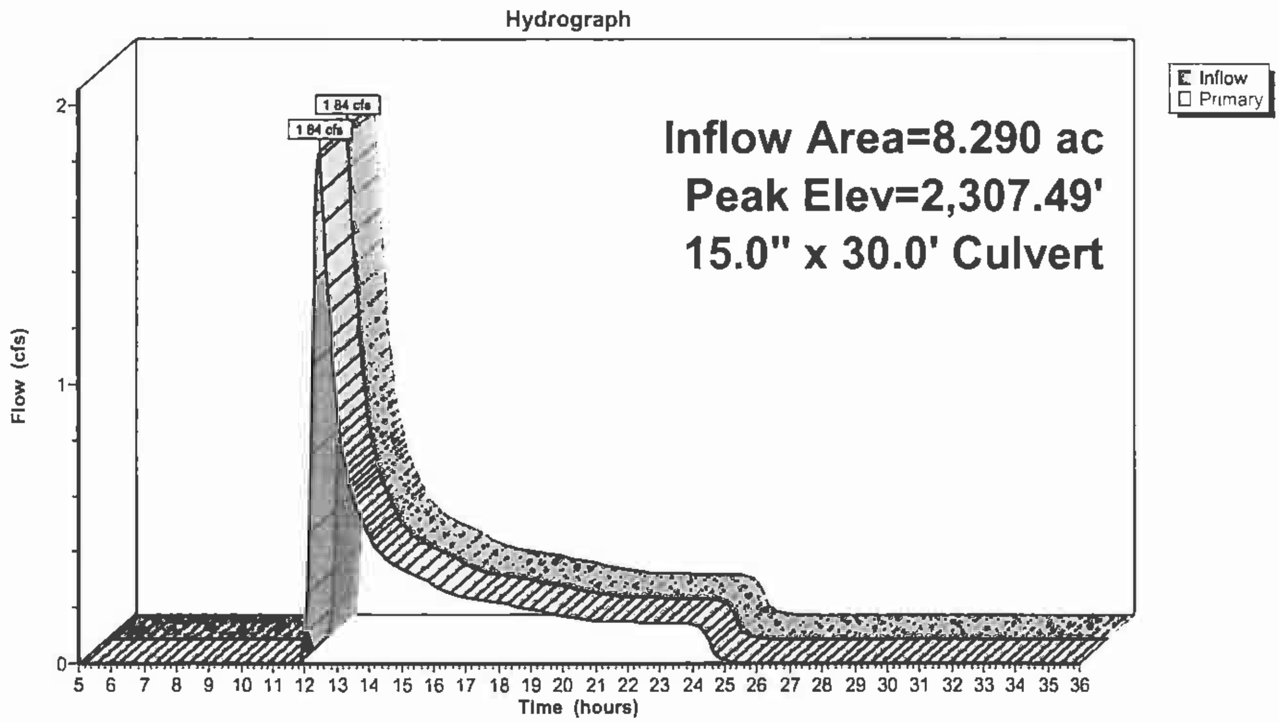
Inflow Area =	8.290 ac,	Inflow Depth = 0.49"	for 10-YR event	
Inflow =	1.84 cfs @	12.43 hrs, Volume=	0.339 af	
Outflow =	1.84 cfs @	12.43 hrs, Volume=	0.339 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.84 cfs @	12.43 hrs, Volume=	0.339 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,307.49' @ 12.43 hrs
Flood Elev= 2,310.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,306.75'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,306.45' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.83 cfs @ 12.43 hrs HW=2,307.49' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.83 cfs @ 3.50 fps)

Pond CV403: CV403



Pond CV404: CV404

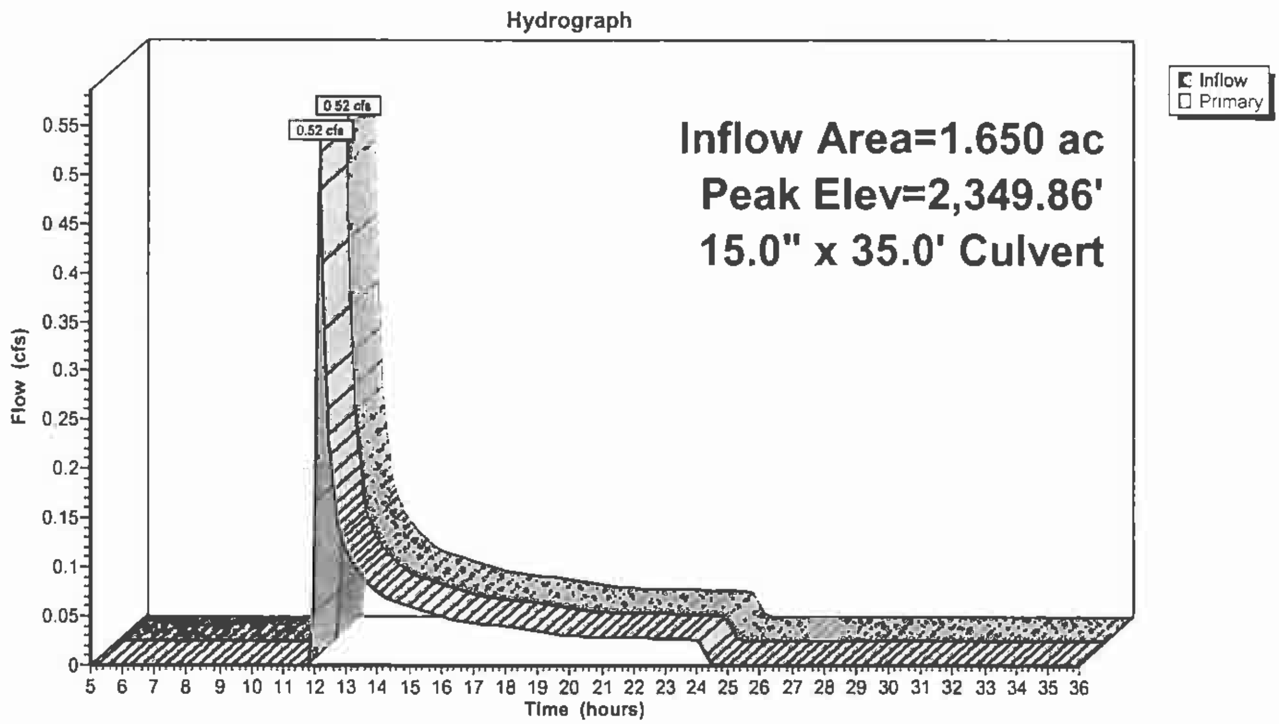
Inflow Area =	1.650 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	0.52 cfs @	12.15 hrs, Volume=	0.062 af	
Outflow =	0.52 cfs @	12.15 hrs, Volume=	0.062 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.15 hrs, Volume=	0.062 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,349.86' @ 12.15 hrs
Flood Elev= 2,352.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,349.50'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,349.15' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.52 cfs @ 12.15 hrs HW=2,349.86' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.52 cfs @ 2.63 fps)

Pond CV404: CV404



Pond CV405: CV405

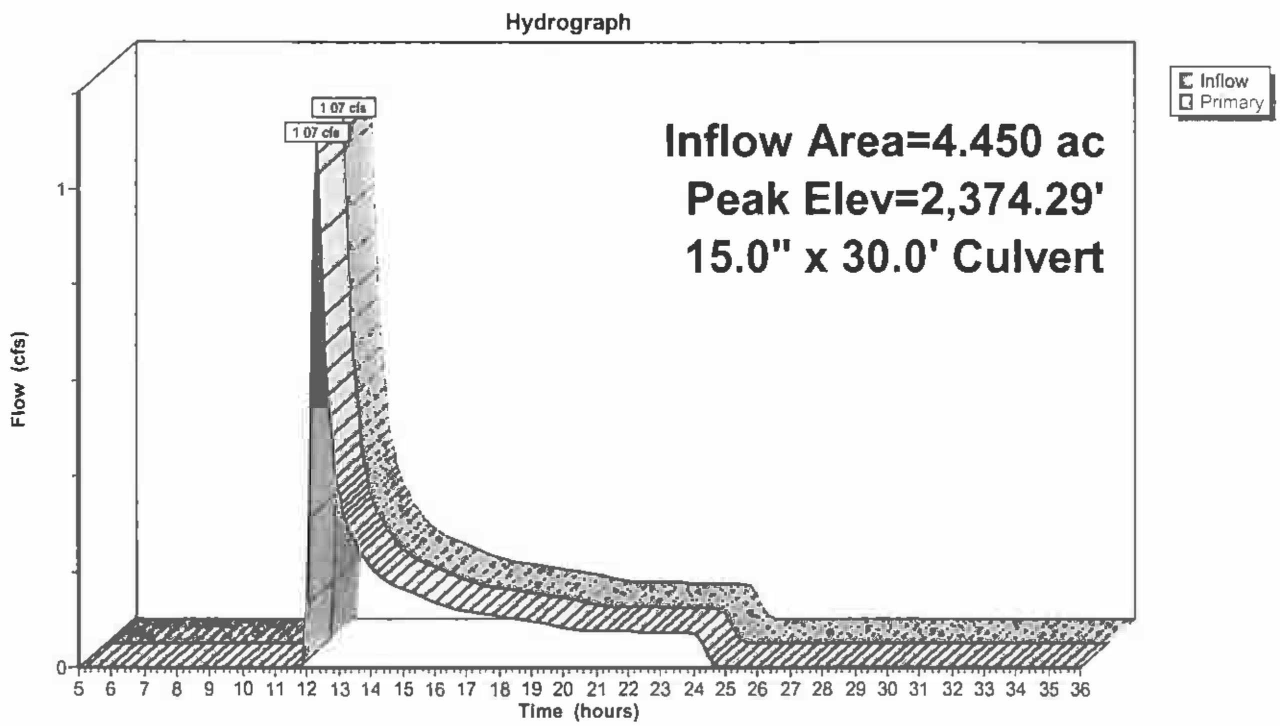
Inflow Area = 4.450 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.07 cfs @ 12.27 hrs, Volume= 0.167 af
Outflow = 1.07 cfs @ 12.27 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.27 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,374.29' @ 12.27 hrs
Flood Elev= 2,377.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,373.75'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,373.45' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.06 cfs @ 12.27 hrs HW=2,374.29' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.06 cfs @ 3.09 fps)

Pond CV405: CV405



Pond CV406: CV406

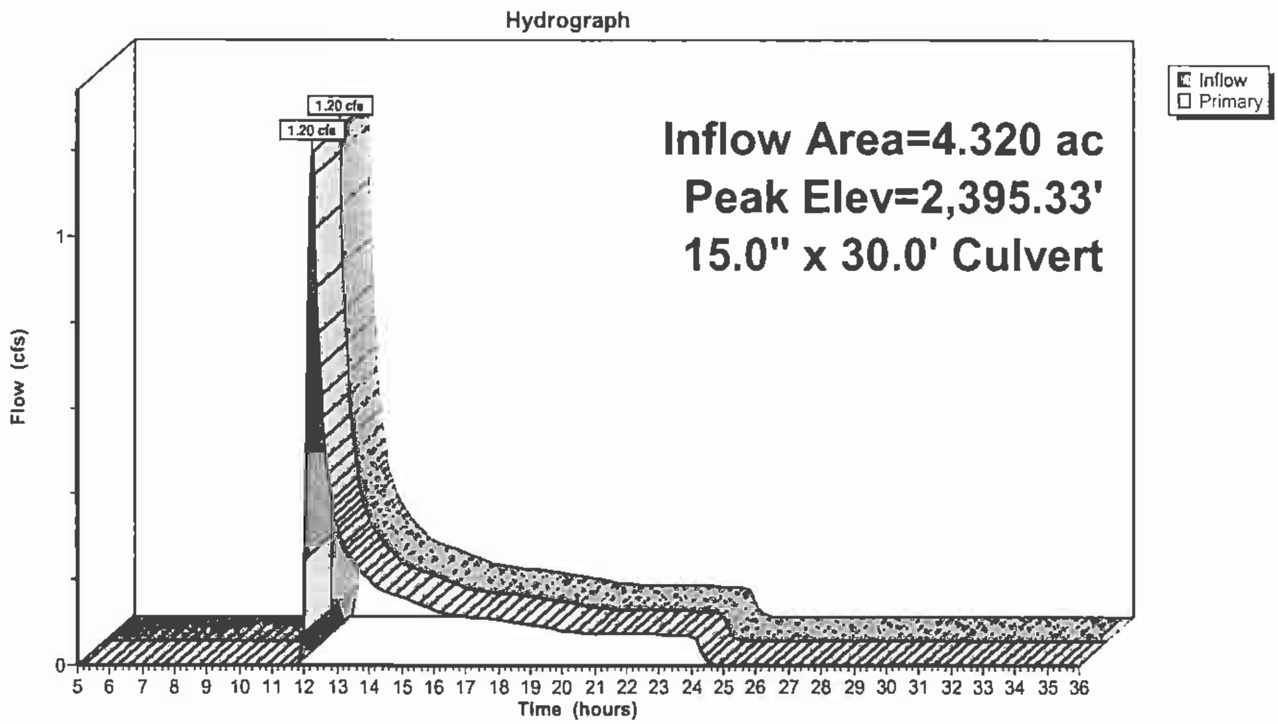
Inflow Area = 4.320 ac, Inflow Depth = 0.45" for 10-YR event
Inflow = 1.20 cfs @ 12.21 hrs, Volume= 0.162 af
Outflow = 1.20 cfs @ 12.21 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.21 hrs, Volume= 0.162 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,395.33' @ 12.21 hrs
Flood Elev= 2,398.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,394.75'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,394.45' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.19 cfs @ 12.21 hrs HW=2,395.32' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 1.19 cfs @ 3.18 fps)

Pond CV406: CV406



Pond CV407: CV407

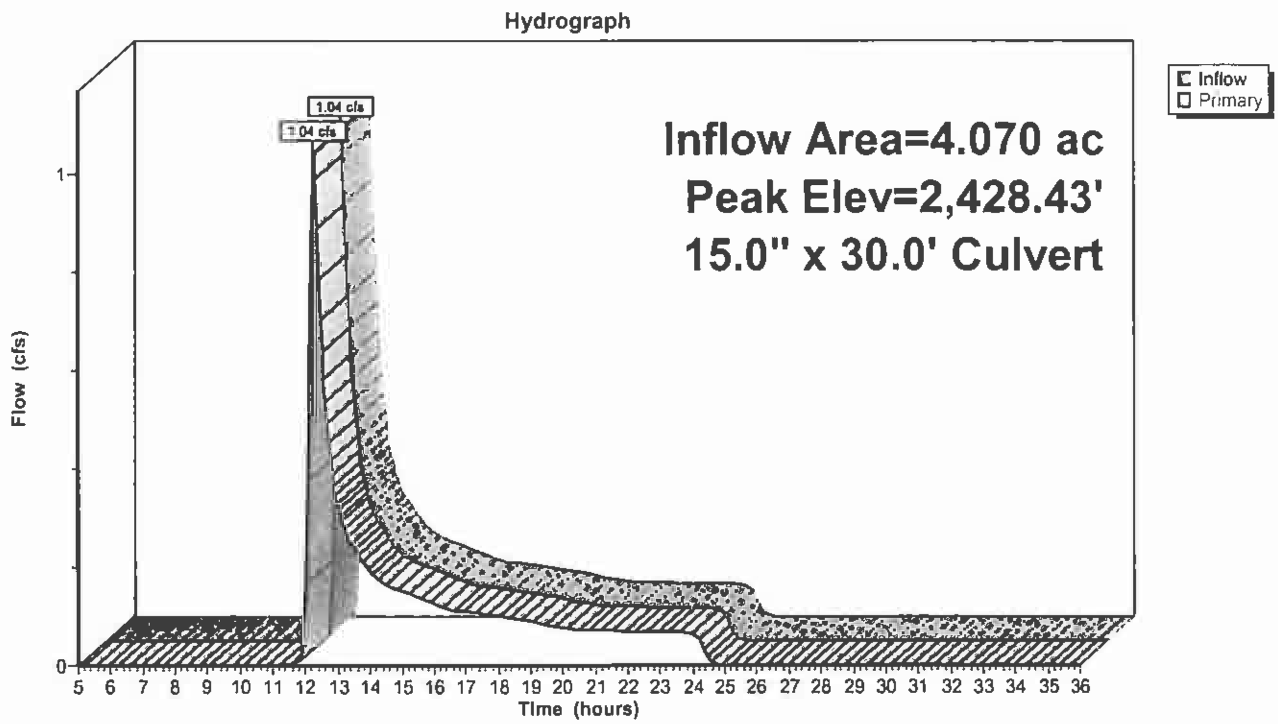
Inflow Area =	4.070 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.04 cfs @	12.24 hrs, Volume=	0.153 af	
Outflow =	1.04 cfs @	12.24 hrs, Volume=	0.153 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.04 cfs @	12.24 hrs, Volume=	0.153 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,428.43' @ 12.24 hrs
Flood Elev= 2,431.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,427.90'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,427.60' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.04 cfs @ 12.24 hrs HW=2,428.43' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.04 cfs @ 3.08 fps)

Pond CV407: CV407



Pond CV408: CV408

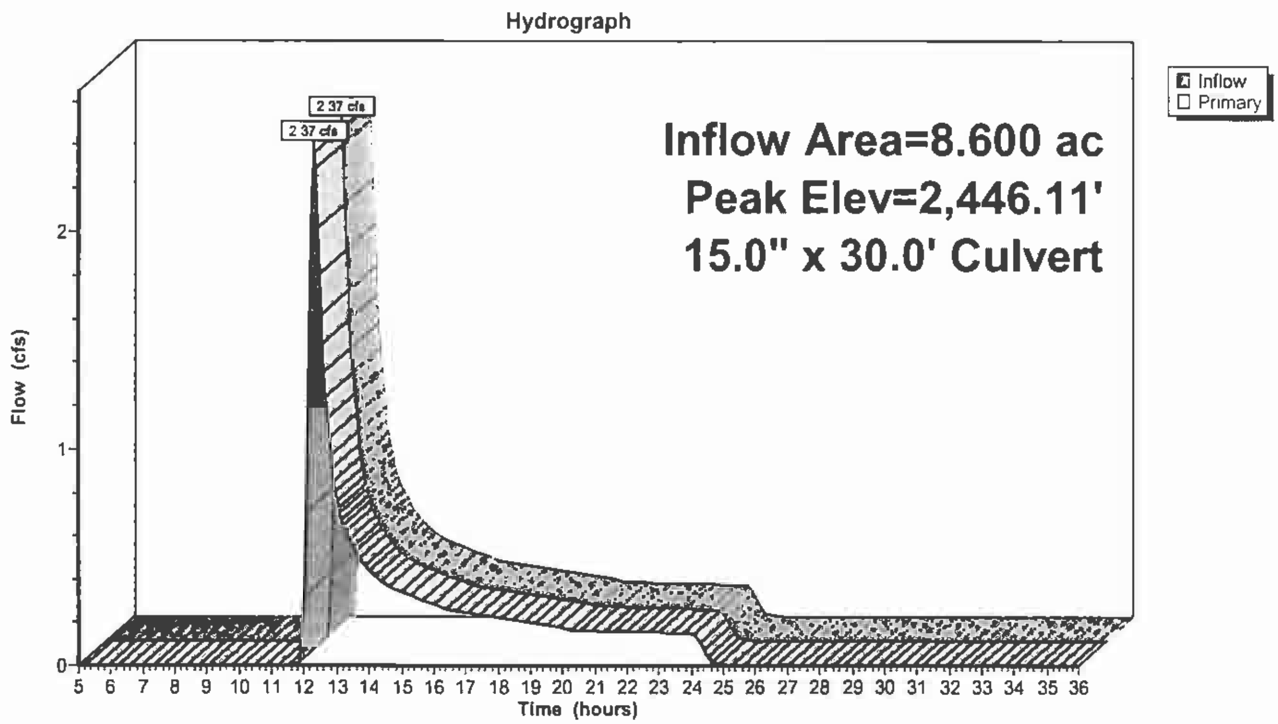
Inflow Area = 8.600 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 2.37 cfs @ 12.28 hrs, Volume= 0.352 af
Outflow = 2.37 cfs @ 12.28 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min
Primary = 2.37 cfs @ 12.28 hrs, Volume= 0.352 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,446.11' @ 12.28 hrs
Flood Elev= 2,448.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,445.25'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,444.95' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.35 cfs @ 12.28 hrs HW=2,446.11' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.35 cfs @ 3.70 fps)

Pond CV408: CV408



Pond CV409: CV409

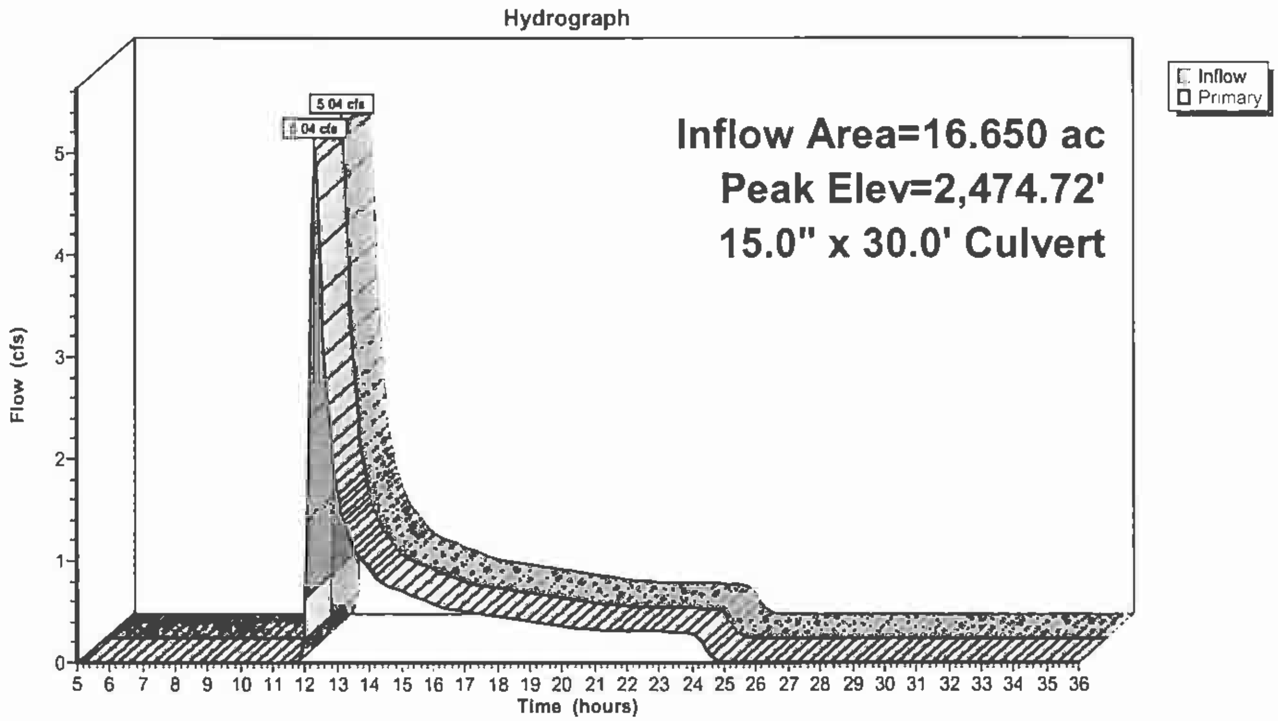
Inflow Area = 16.650 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 5.04 cfs @ 12.30 hrs, Volume= 0.739 af
Outflow = 5.04 cfs @ 12.30 hrs, Volume= 0.739 af, Atten= 0%, Lag= 0.0 min
Primary = 5.04 cfs @ 12.30 hrs, Volume= 0.739 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,474.72' @ 12.30 hrs
Flood Elev= 2,476.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,473.25'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,472.95' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=5.04 cfs @ 12.30 hrs HW=2,474.72' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 5.04 cfs @ 4.39 fps)

Pond CV409: CV409



Pond CV410: CV410

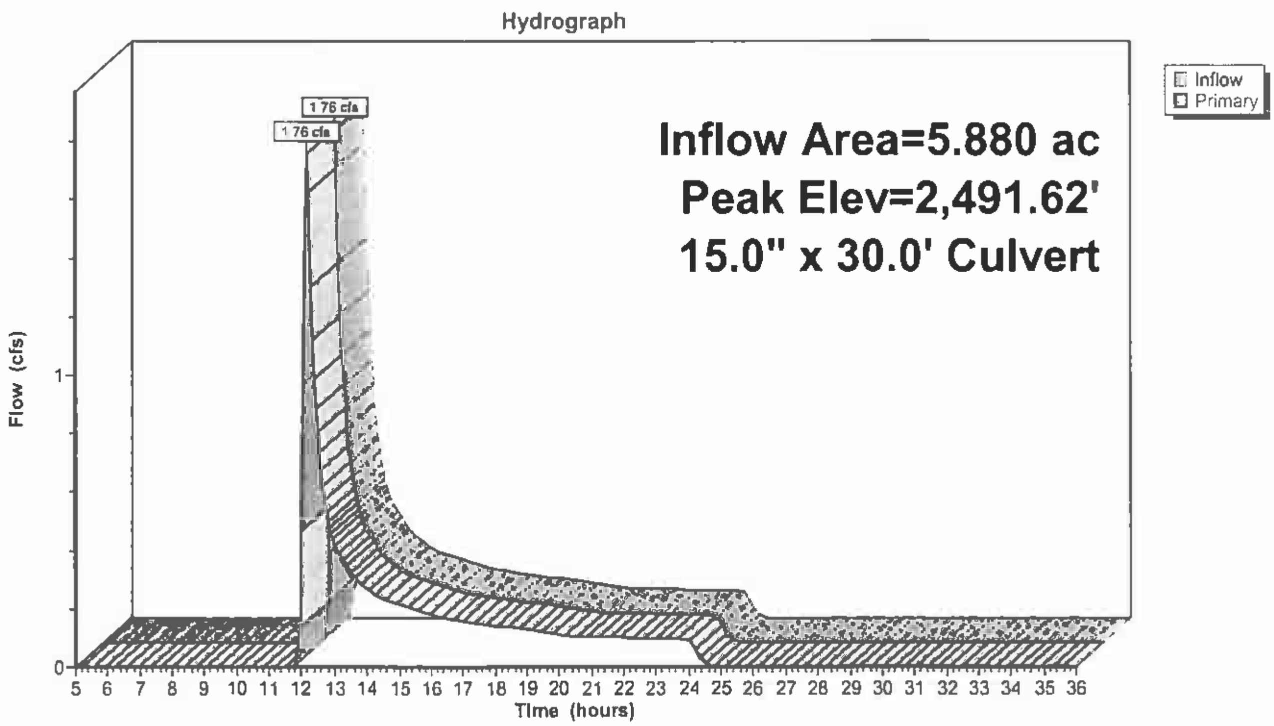
Inflow Area =	5.880 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.76 cfs @ 12.17 hrs, Volume=	0.221 af	
Outflow =	1.76 cfs @ 12.17 hrs, Volume=	0.221 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.76 cfs @ 12.17 hrs, Volume=	0.221 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,491.62' @ 12.17 hrs
Flood Elev= 2,494.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,490.90'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,490.60' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.72 cfs @ 12.17 hrs HW=2,491.61' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.72 cfs @ 3.45 fps)

Pond CV410: CV410



Pond CV411: CV411

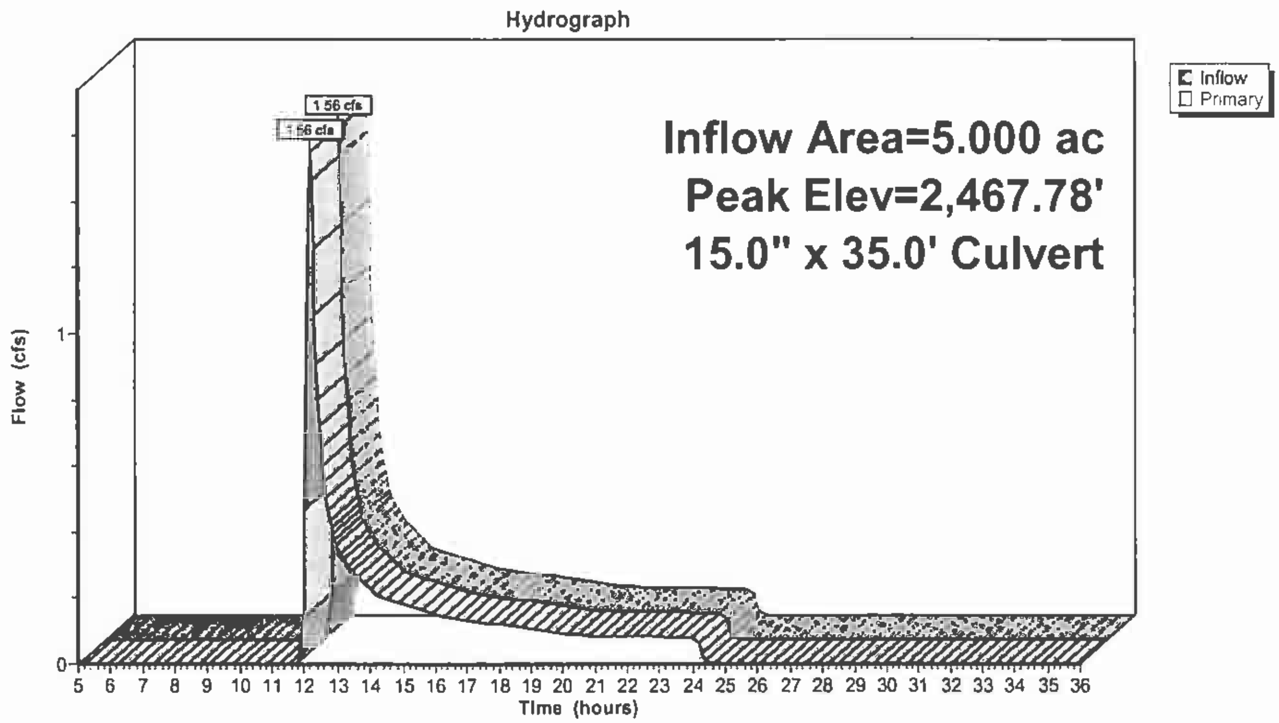
Inflow Area =	5.000 ac, Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.56 cfs @ 12.16 hrs, Volume=	0.188 af	
Outflow =	1.56 cfs @ 12.16 hrs, Volume=	0.188 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.56 cfs @ 12.16 hrs, Volume=	0.188 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,467.78' @ 12.16 hrs
Flood Elev= 2,470.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,467.12'	**15.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,466.77' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.54 cfs @ 12.16 hrs HW=2,467.78' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.54 cfs @ 3.41 fps)

Pond CV411: CV411



Pond CV412: CV412

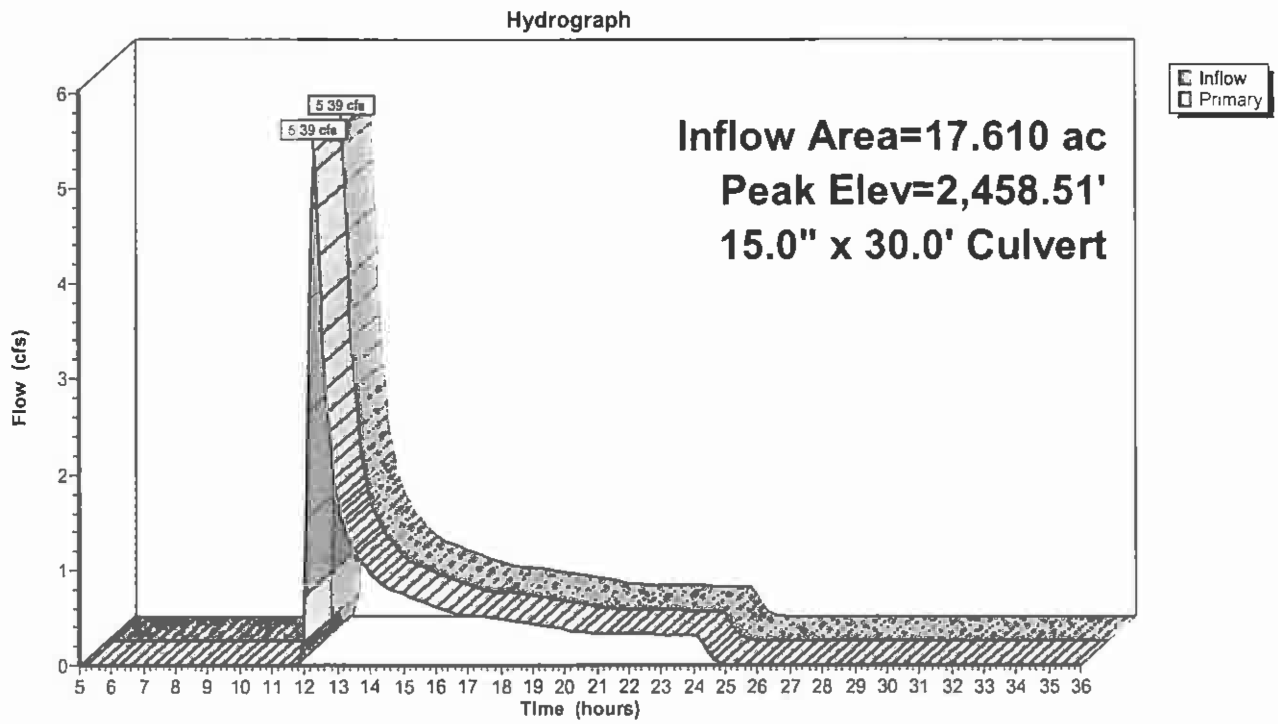
Inflow Area =	17.610 ac, Inflow Depth = 0.53" for 10-YR event	
Inflow =	5.39 cfs @ 12.29 hrs, Volume=	0.781 af
Outflow =	5.39 cfs @ 12.29 hrs, Volume=	0.781 af, Atten= 0%, Lag= 0.0 min
Primary =	5.39 cfs @ 12.29 hrs, Volume=	0.781 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,458.51' @ 12.30 hrs
Flood Elev= 2,460.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,456.90'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,456.60' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=5.38 cfs @ 12.29 hrs HW=2,458.51' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 5.38 cfs @ 4.44 fps)

Pond CV412: CV412



Pond CV413: CV413

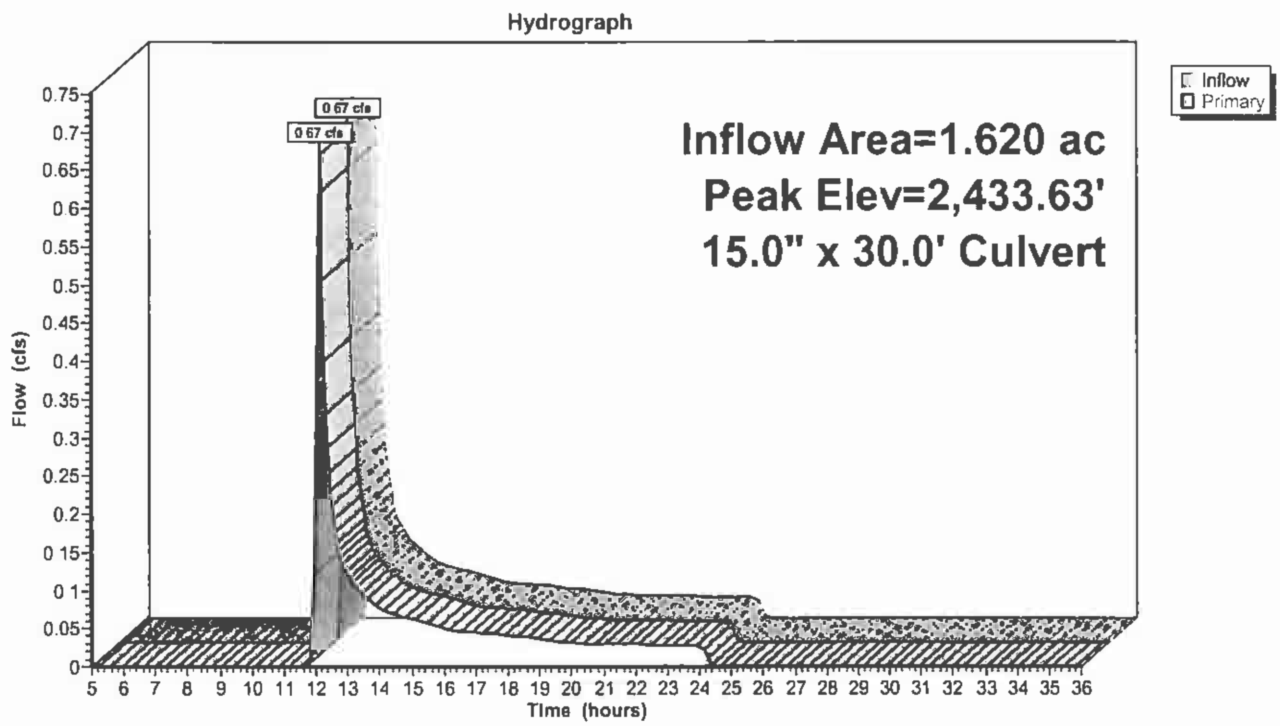
Inflow Area =	1.620 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	0.67 cfs @ 12.11 hrs, Volume=	0.066 af	
Outflow =	0.67 cfs @ 12.11 hrs, Volume=	0.066 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.67 cfs @ 12.11 hrs, Volume=	0.066 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,433.63' @ 12.11 hrs
Flood Elev= 2,436.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,433.25'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,432.00' S= 0.0417 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.66 cfs @ 12.11 hrs HW=2,433.63' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.66 cfs @ 2.09 fps)

Pond CV413: CV413



Pond CV414: CV414

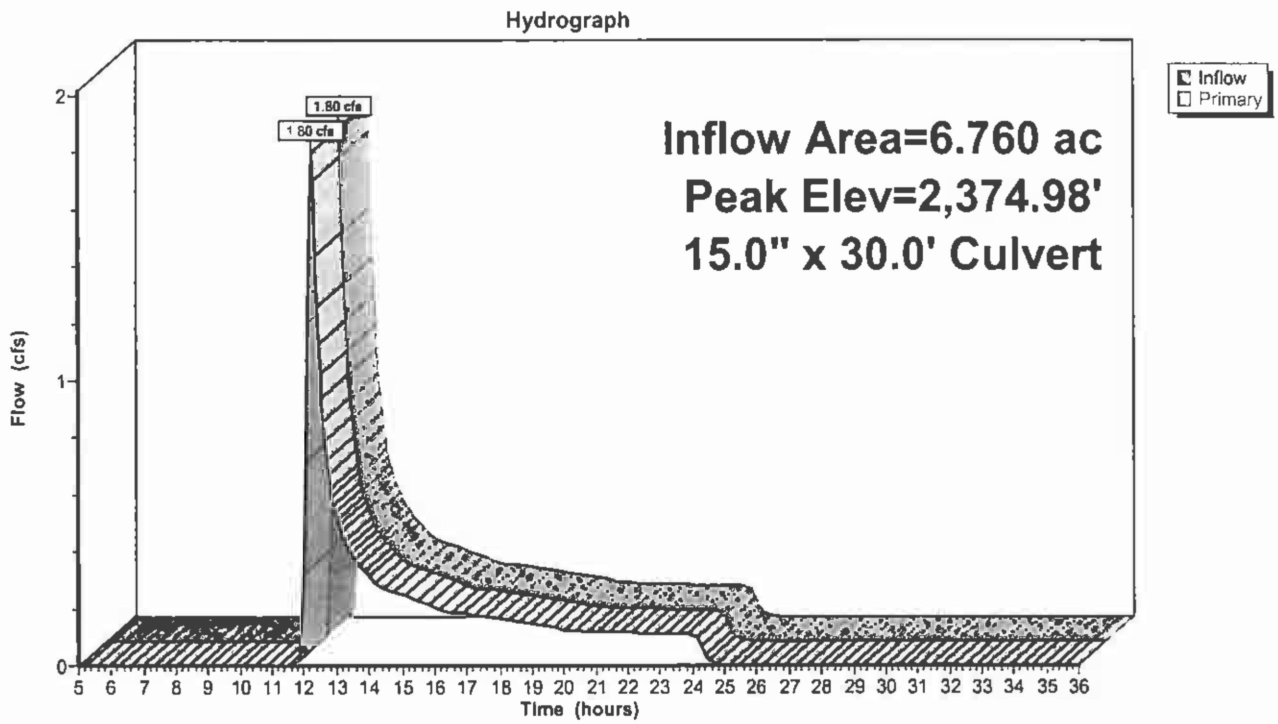
Inflow Area =	6.760 ac,	Inflow Depth = 0.45"	for 10-YR event	
Inflow =	1.80 cfs @	12.22 hrs, Volume=	0.254 af	
Outflow =	1.80 cfs @	12.22 hrs, Volume=	0.254 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.80 cfs @	12.22 hrs, Volume=	0.254 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,374.98' @ 12.22 hrs
Flood Elev= 2,377.54'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,374.25'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,373.95' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.78 cfs @ 12.22 hrs HW=2,374.97' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.78 cfs @ 3.48 fps)

Pond CV414: CV414



Pond CV415: CV415

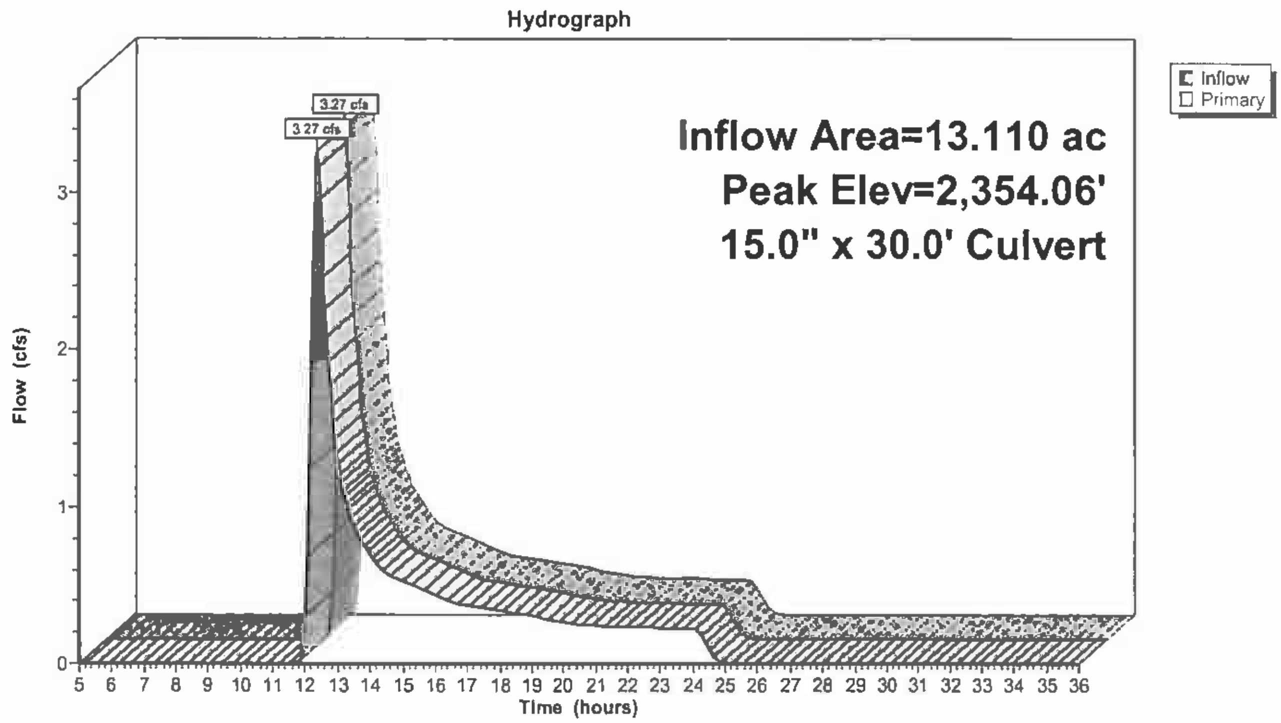
Inflow Area = 13.110 ac, Inflow Depth = 0.49" for 10-YR event
Inflow = 3.27 cfs @ 12.34 hrs, Volume= 0.536 af
Outflow = 3.27 cfs @ 12.34 hrs, Volume= 0.536 af, Atten= 0%, Lag= 0.0 min
Primary = 3.27 cfs @ 12.34 hrs, Volume= 0.536 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,354.06' @ 12.34 hrs
Flood Elev= 2,356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,353.00'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,352.70' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=3.26 cfs @ 12.34 hrs HW=2,354.05' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.26 cfs @ 3.99 fps)

Pond CV415: CV415



Pond CV416: CV416

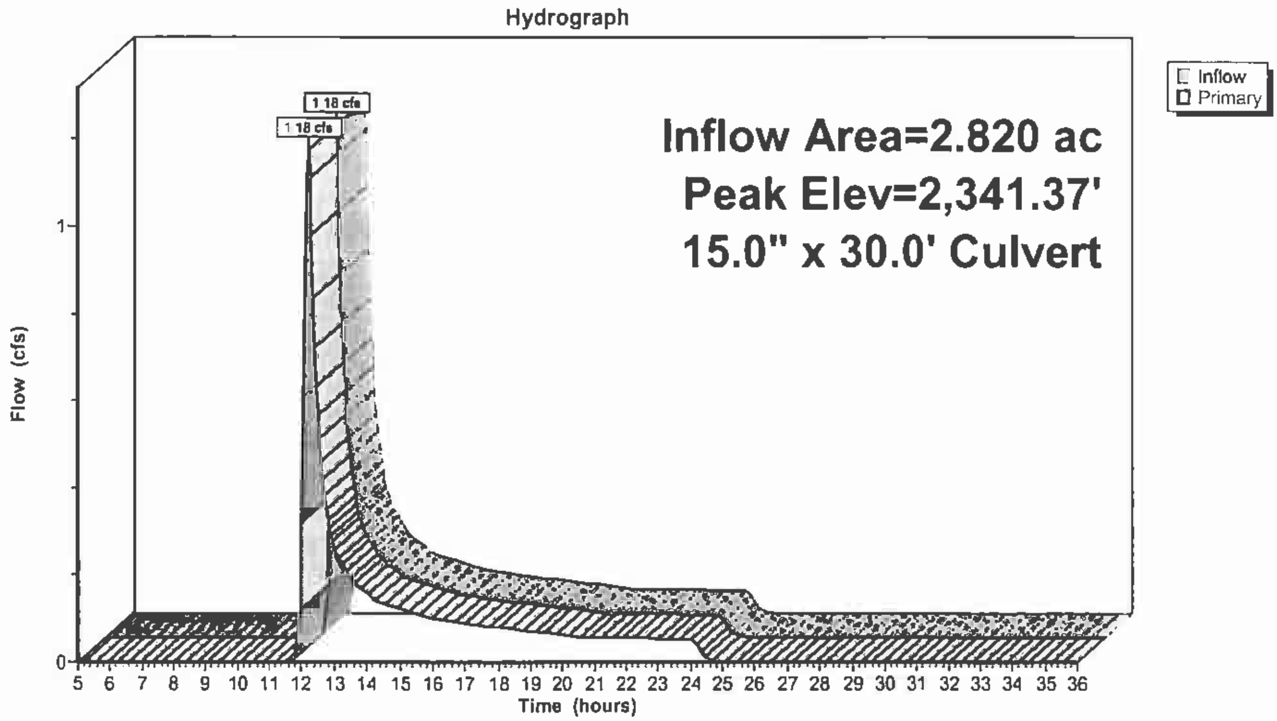
Inflow Area =	2.820 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	1.18 cfs @ 12.20 hrs, Volume=	0.135 af	
Outflow =	1.18 cfs @ 12.20 hrs, Volume=	0.135 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.18 cfs @ 12.20 hrs, Volume=	0.135 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,341.37' @ 12.20 hrs
Flood Elev= 2,344.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,340.85'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,340.00' S= 0.0283 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.17 cfs @ 12.20 hrs HW=2,341.37' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.17 cfs @ 2.45 fps)

Pond CV416: CV416



Pond CV417: CV417

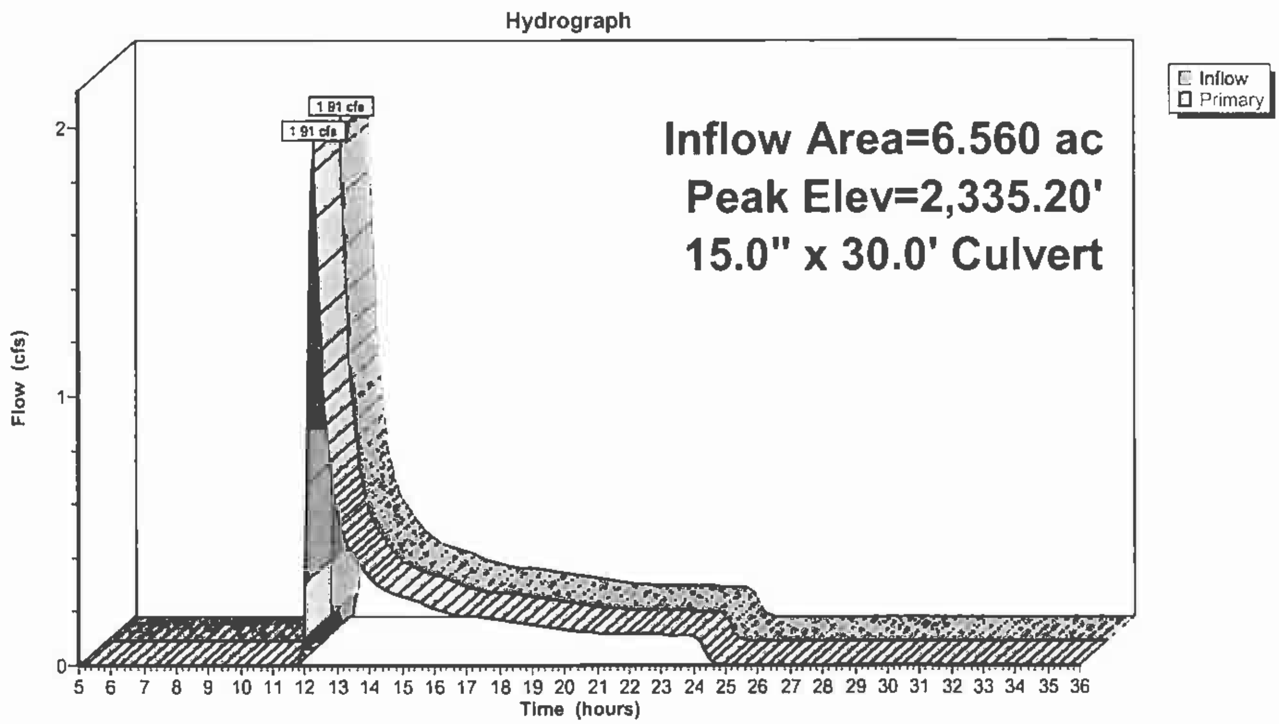
Inflow Area =	6.560 ac, Inflow Depth = 0.49"	for 10-YR event	
Inflow =	1.91 cfs @ 12.25 hrs, Volume=	0.268 af	
Outflow =	1.91 cfs @ 12.25 hrs, Volume=	0.268 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.91 cfs @ 12.25 hrs, Volume=	0.268 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,335.20' @ 12.25 hrs
Flood Elev= 2,337.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,334.45'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,334.15' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.91 cfs @ 12.25 hrs HW=2,335.20' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.91 cfs @ 3.54 fps)

Pond CV417: CV417



Pond CV418: CV418

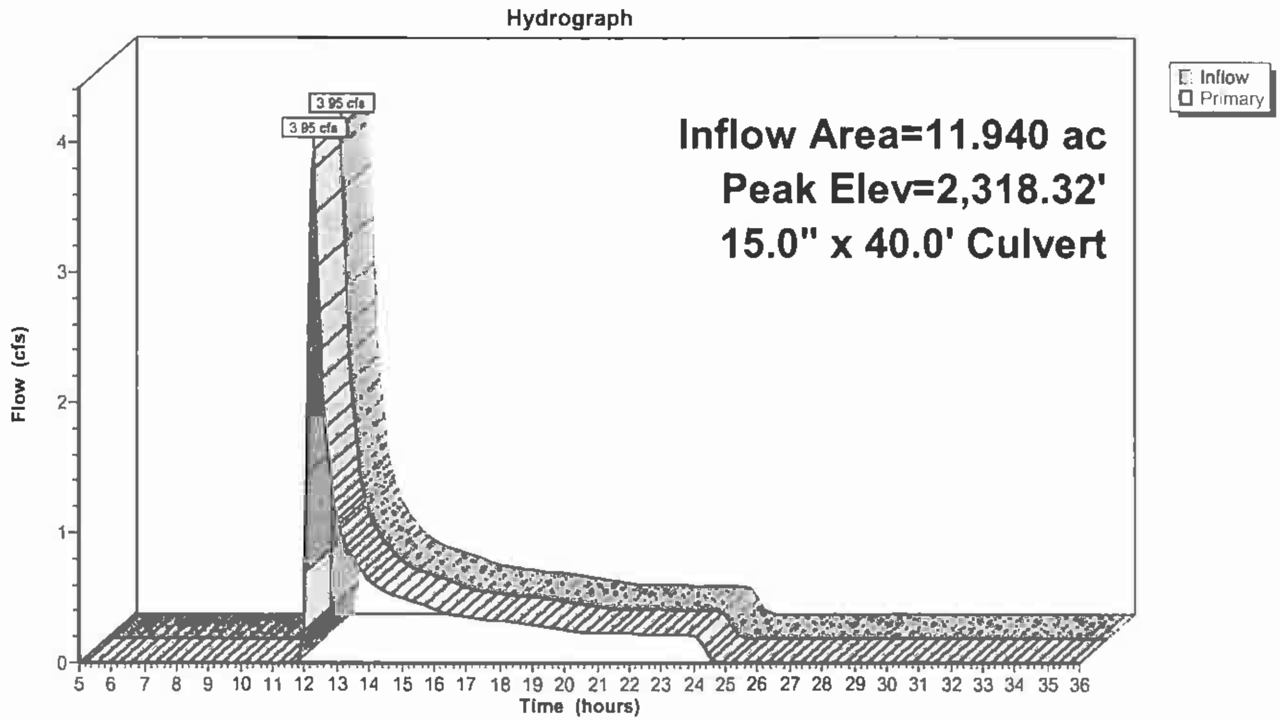
Inflow Area =	11.940 ac, Inflow Depth = 0.53"	for 10-YR event	
Inflow =	3.95 cfs @ 12.25 hrs, Volume=	0.530 af	
Outflow =	3.95 cfs @ 12.25 hrs, Volume=	0.530 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.95 cfs @ 12.25 hrs, Volume=	0.530 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,318.32' @ 12.25 hrs
Flood Elev= 2,320.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,317.25'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,316.00' S= 0.0313 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.94 cfs @ 12.25 hrs HW=2,318.32' (Free Discharge)
└─1=**Culvert** (Inlet Controls 3.94 cfs @ 3.52 fps)

Pond CV418: CV418



Pond CV419: CV419

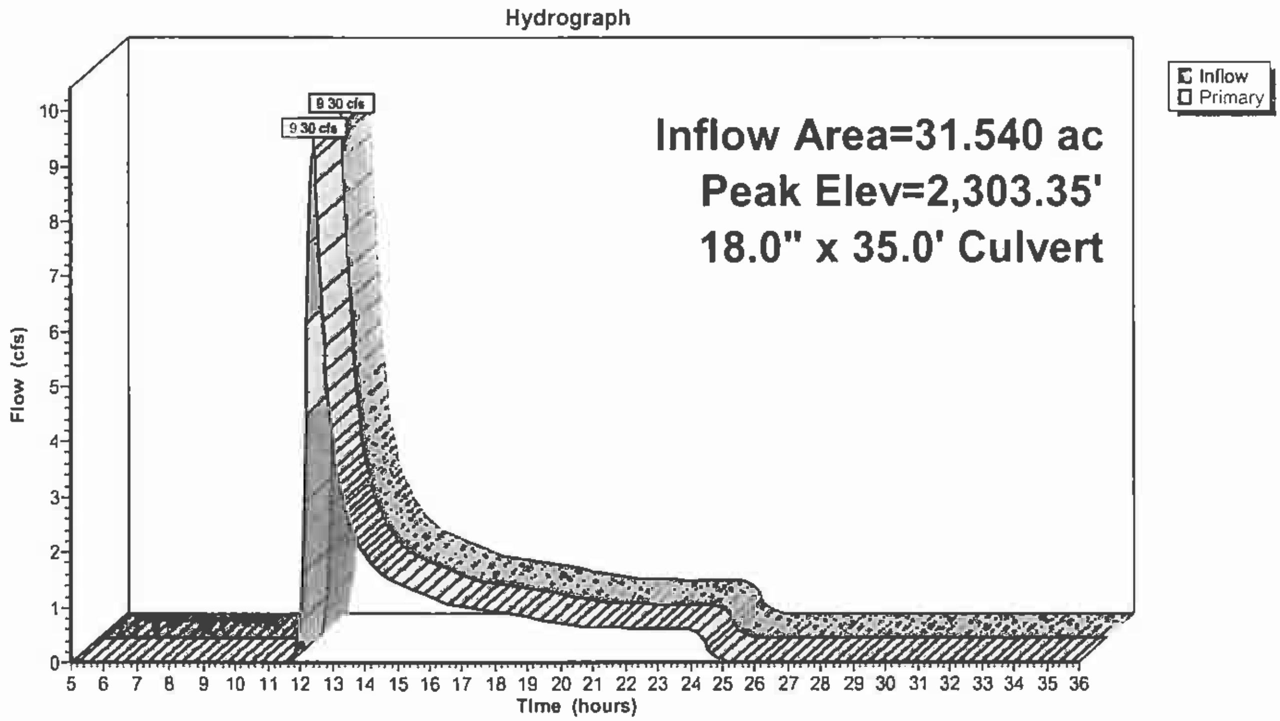
Inflow Area =	31.540 ac, Inflow Depth = 0.58"	for 10-YR event
Inflow =	9.30 cfs @ 12.40 hrs, Volume=	1.513 af
Outflow =	9.30 cfs @ 12.40 hrs, Volume=	1.513 af, Atten= 0%, Lag= 0.0 min
Primary =	9.30 cfs @ 12.40 hrs, Volume=	1.513 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,303.35' @ 12.40 hrs
Flood Elev= 2,304.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,301.19'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,300.84' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=9.30 cfs @ 12.40 hrs HW=2,303.35' (Free Discharge)
└─1=**Culvert** (Barrel Controls 9.30 cfs @ 5.26 fps)

Pond CV419: CV419



Pond CV420: CV420

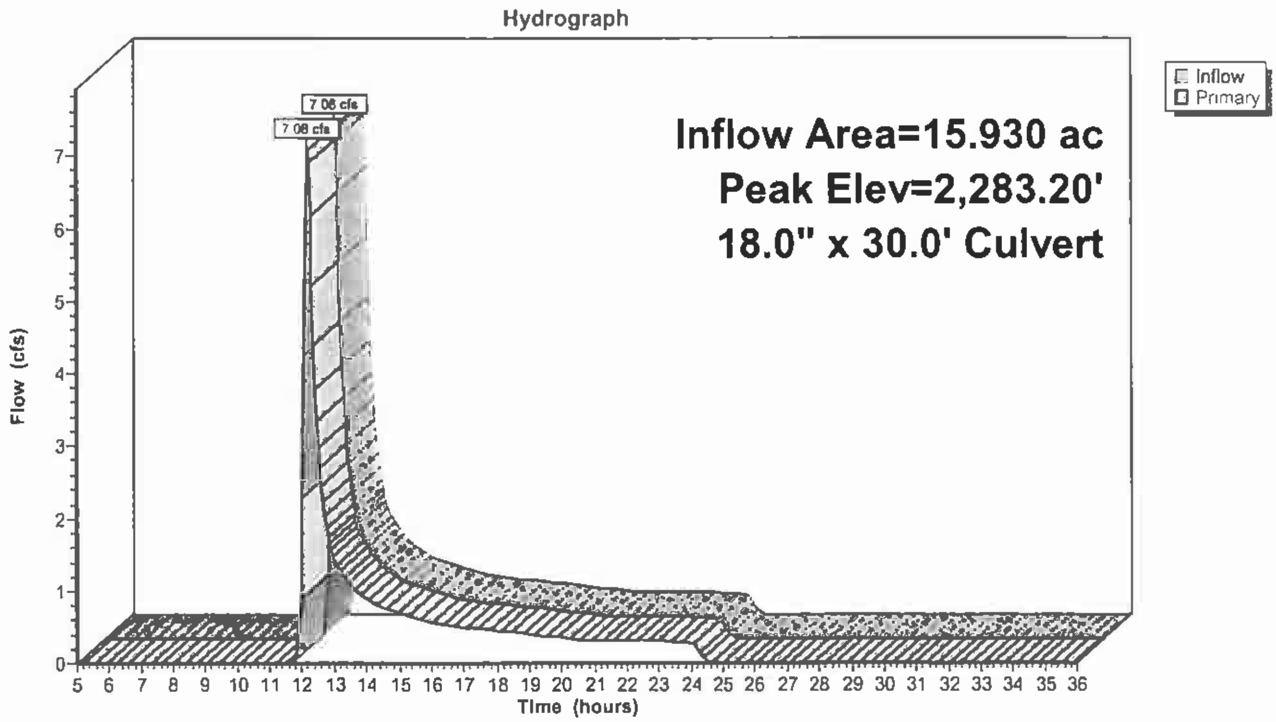
Inflow Area =	15.930 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	7.08 cfs @	12.17 hrs, Volume=	0.764 af	
Outflow =	7.08 cfs @	12.17 hrs, Volume=	0.764 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.08 cfs @	12.17 hrs, Volume=	0.764 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,283.20' @ 12.17 hrs
Flood Elev= 2,285.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,281.60'	**18.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,281.30' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=6.95 cfs @ 12.17 hrs HW=2,283.18' (Free Discharge)
└─1=**Culvert** (Barrel Controls 6.95 cfs @ 4.65 fps)

Pond CV420: CV420



Pond CV421: CV421

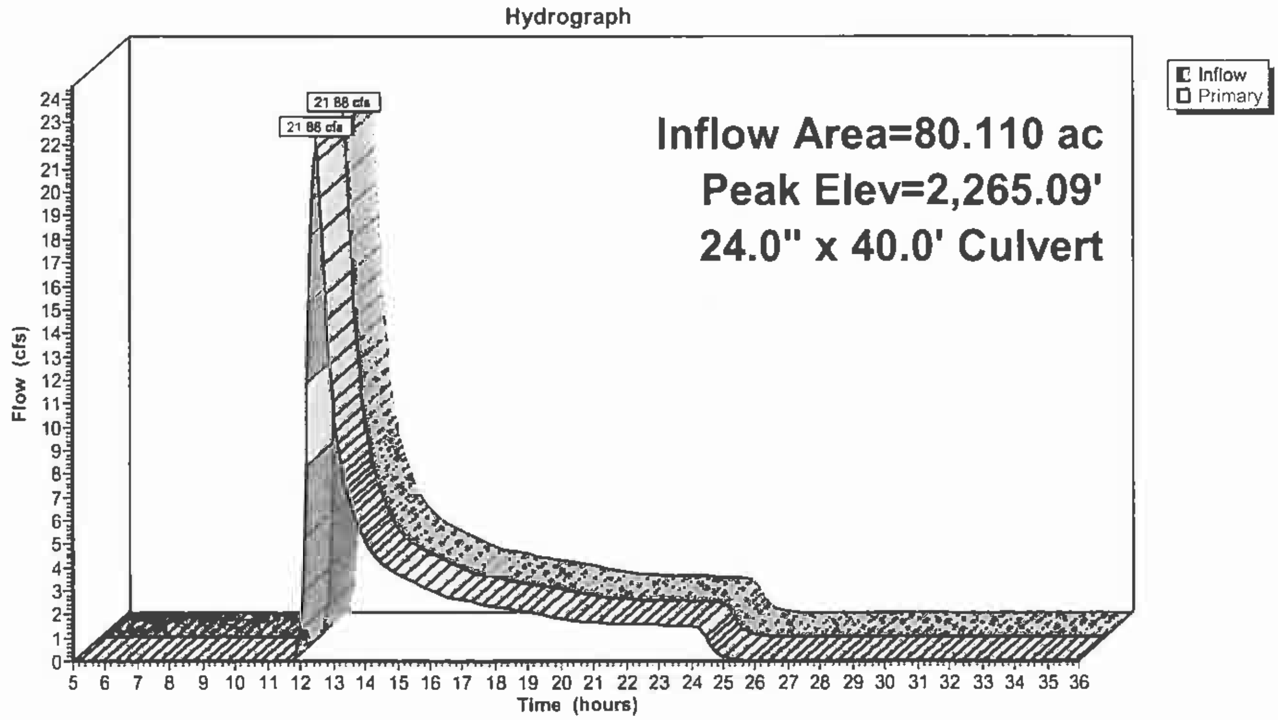
Inflow Area = 80.110 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 21.88 cfs @ 12.46 hrs, Volume= 3.842 af
Outflow = 21.88 cfs @ 12.46 hrs, Volume= 3.842 af, Atten= 0%, Lag= 0.0 min
Primary = 21.88 cfs @ 12.46 hrs, Volume= 3.842 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,265.09' @ 12.46 hrs
Flood Elev= 2,268.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,262.00'	**24.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,260.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=21.83 cfs @ 12.46 hrs HW=2,265.08' (Free Discharge)
└─**1=Culvert** (Inlet Controls 21.83 cfs @ 6.95 fps)

Pond CV421: CV421



Pond CV422: CV422

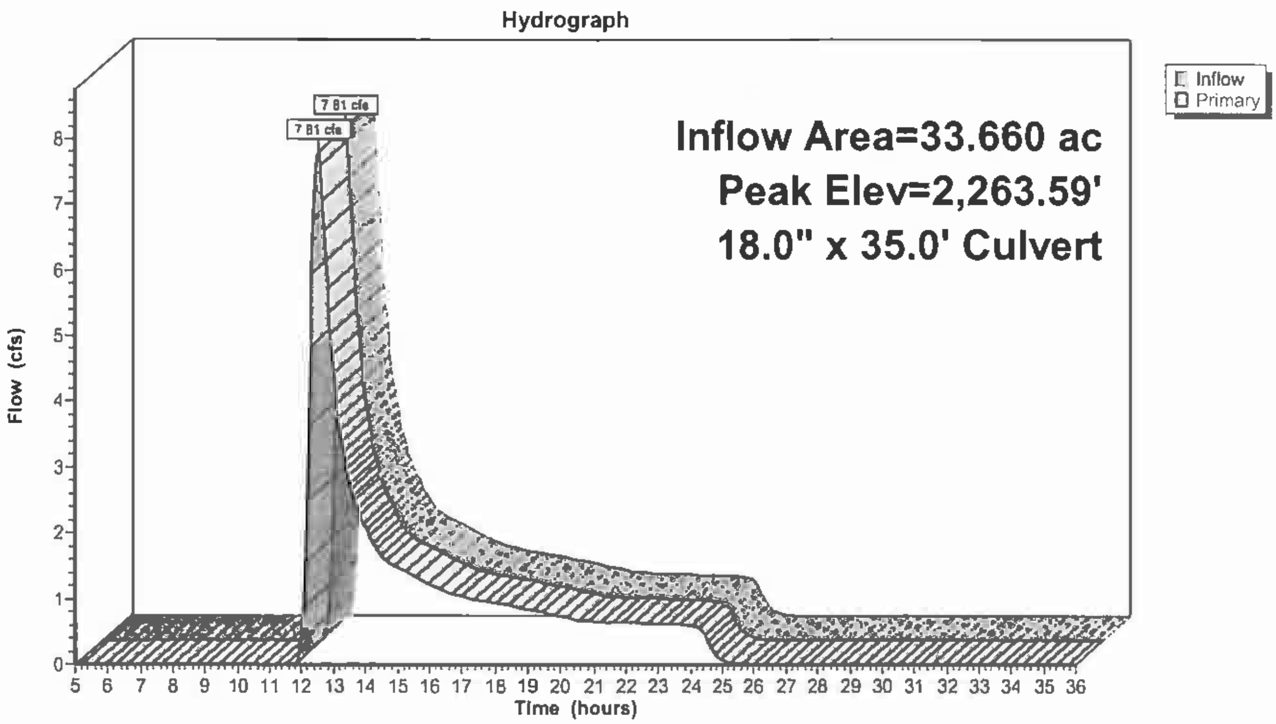
Inflow Area =	33.660 ac,	Inflow Depth = 0.53"	for 10-YR event	
Inflow =	7.81 cfs @	12.50 hrs, Volume=	1.493 af	
Outflow =	7.81 cfs @	12.50 hrs, Volume=	1.493 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.81 cfs @	12.50 hrs, Volume=	1.493 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,263.59' @ 12.50 hrs
Flood Elev= 2,266.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,262.00'	**18.0" x 35.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,260.00' S= 0.0571 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=7.80 cfs @ 12.50 hrs HW=2,263.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.80 cfs @ 4.42 fps)

Pond CV422: CV422



Pond CV423: CV423

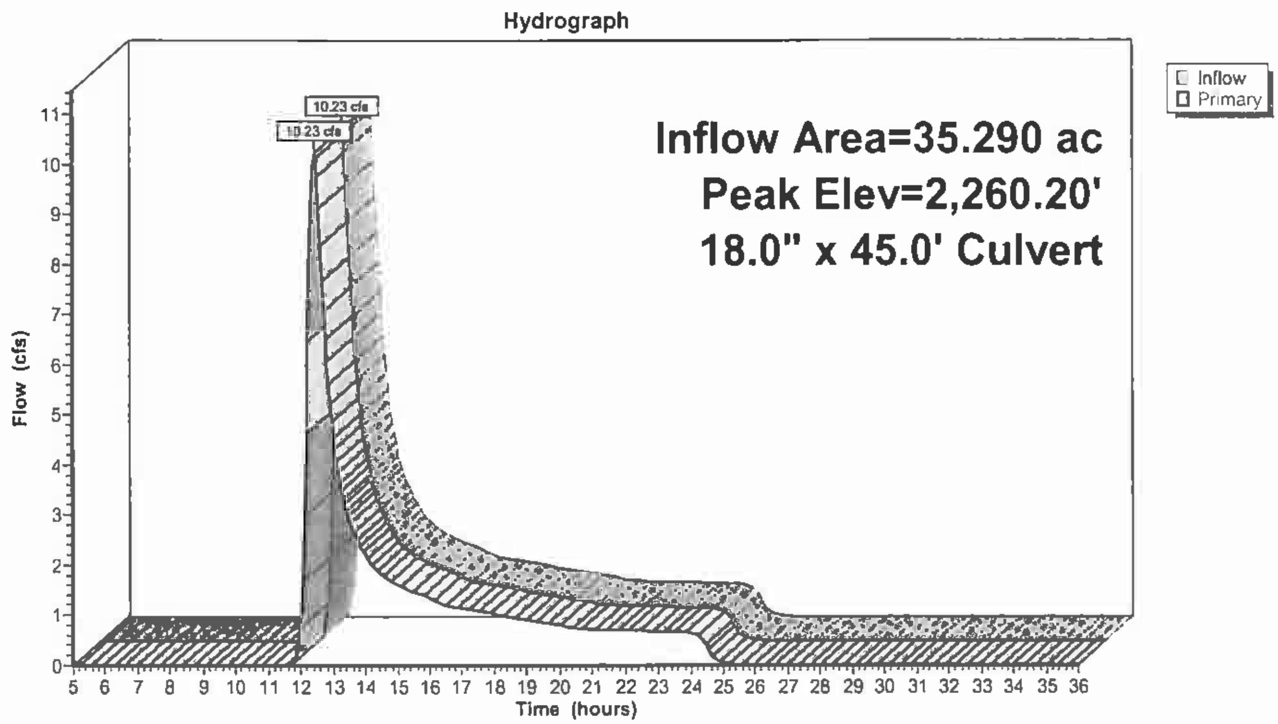
Inflow Area = 35.290 ac, Inflow Depth = 0.58" for 10-YR event
Inflow = 10.23 cfs @ 12.41 hrs, Volume= 1.693 af
Outflow = 10.23 cfs @ 12.41 hrs, Volume= 1.693 af, Atten= 0%, Lag= 0.0 min
Primary = 10.23 cfs @ 12.41 hrs, Volume= 1.693 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,260.20' @ 12.41 hrs
Flood Elev= 2,264.71'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,258.00'	**18.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,254.00' S= 0.0889 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=10.20 cfs @ 12.41 hrs HW=2,260.19' (Free Discharge)
1=Culvert (Inlet Controls 10.20 cfs @ 5.77 fps)

Pond CV423: CV423



Pond CV424: CV424

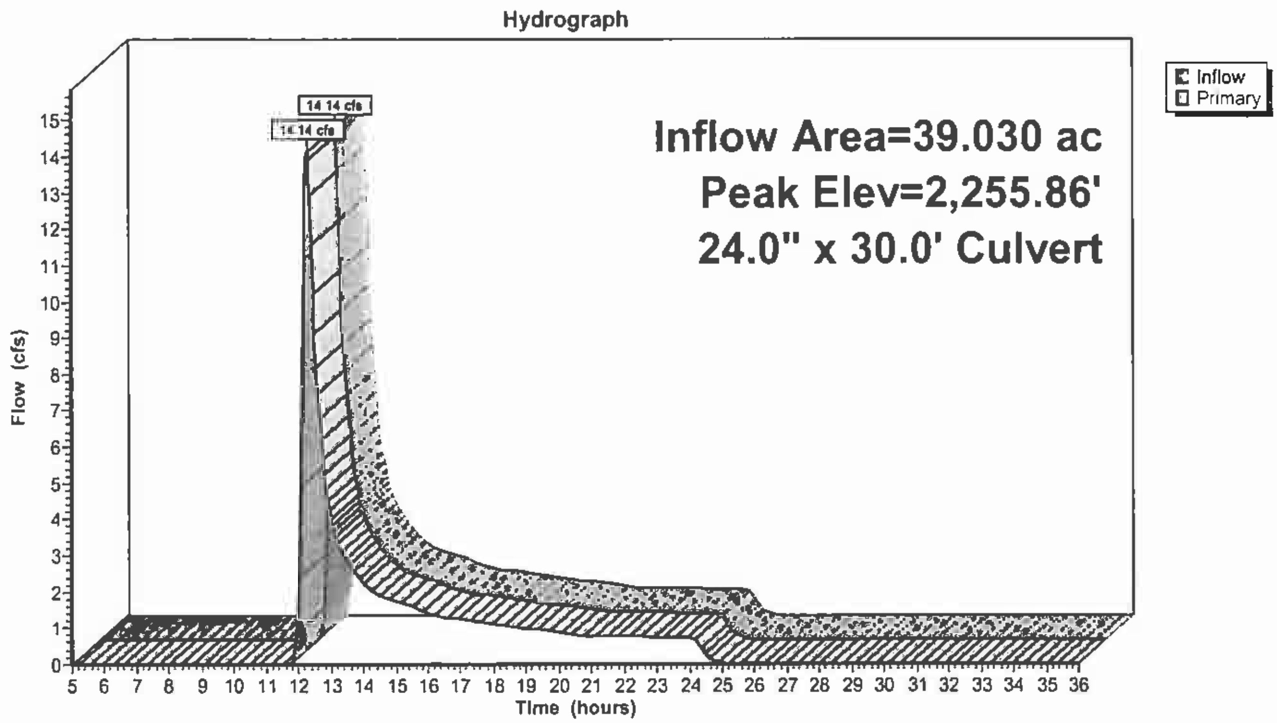
Inflow Area =	39.030 ac,	Inflow Depth = 0.58"	for 10-YR event	
Inflow =	14.14 cfs @	12.27 hrs, Volume=	1.872 af	
Outflow =	14.14 cfs @	12.27 hrs, Volume=	1.872 af,	Atten= 0%, Lag= 0.0 min
Primary =	14.14 cfs @	12.27 hrs, Volume=	1.872 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,255.86' @ 12.27 hrs
Flood Elev= 2,257.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,253.75'	**24.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,253.45' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=14.03 cfs @ 12.27 hrs HW=2,255.84' (Free Discharge)
└─1=**Culvert** (Barrel Controls 14.03 cfs @ 5.30 fps)

Pond CV424: CV424



Pond CV425: CV425

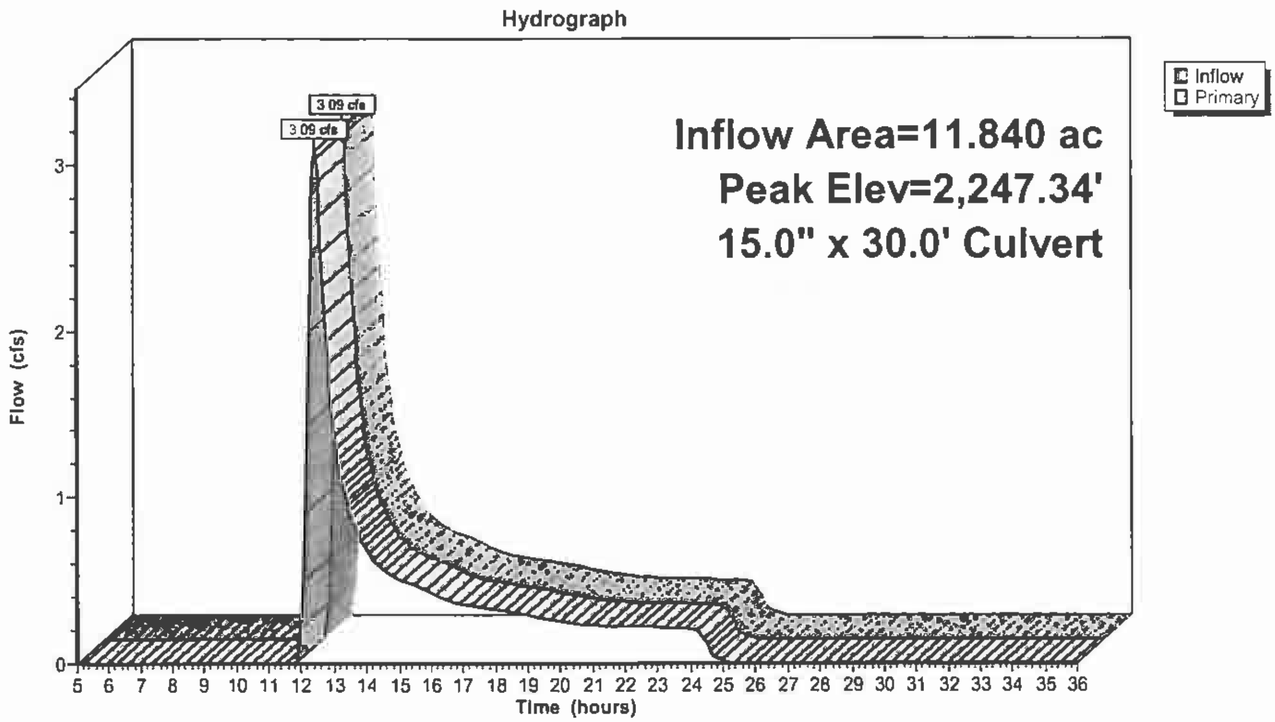
Inflow Area = 11.840 ac, Inflow Depth = 0.53" for 10-YR event
Inflow = 3.09 cfs @ 12.40 hrs, Volume= 0.525 af
Outflow = 3.09 cfs @ 12.40 hrs, Volume= 0.525 af, Atten= 0%, Lag= 0.0 min
Primary = 3.09 cfs @ 12.40 hrs, Volume= 0.525 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,247.34' @ 12.40 hrs
Flood Elev= 2,249.57'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,246.32'	**15.0" x 30.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,246.02' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=3.08 cfs @ 12.40 hrs HW=2,247.34' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.08 cfs @ 3.94 fps)

Pond CV425: CV425



Pond CV426: CV426

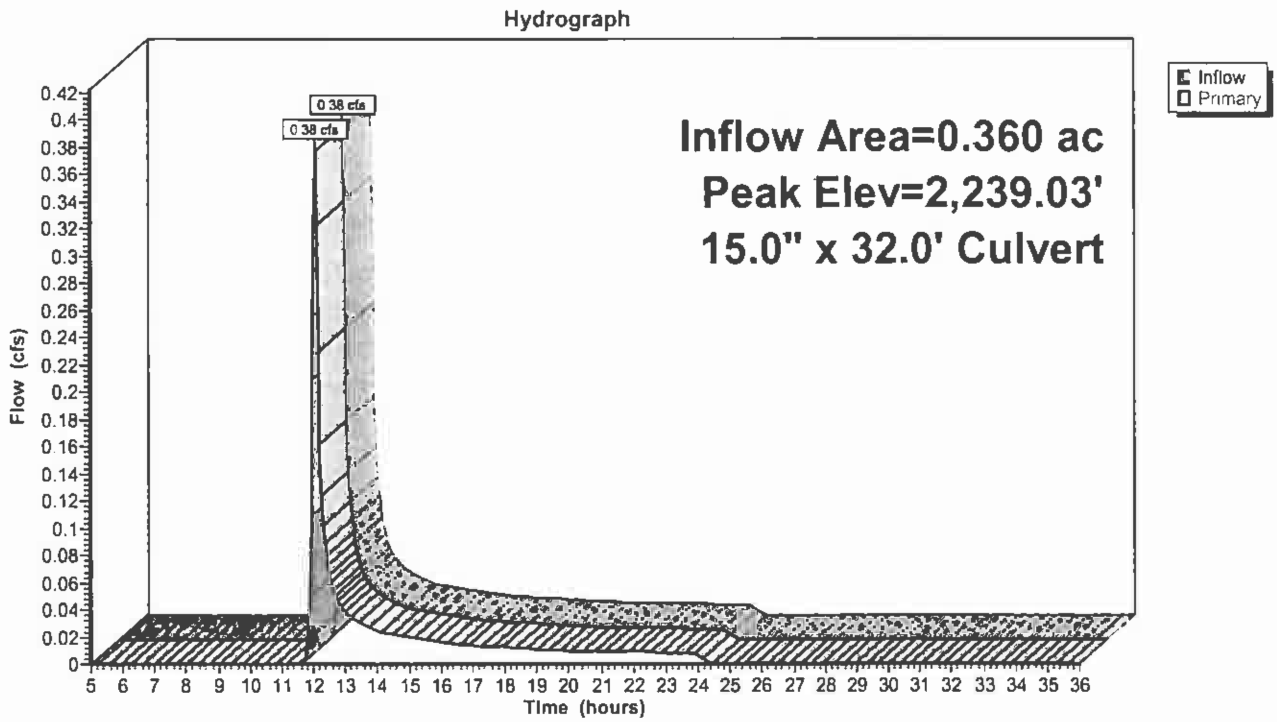
Inflow Area =	0.360 ac, Inflow Depth = 0.81"	for 10-YR event		
Inflow =	0.38 cfs @	12.05 hrs, Volume=	0.024 af	
Outflow =	0.38 cfs @	12.05 hrs, Volume=	0.024 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.38 cfs @	12.05 hrs, Volume=	0.024 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,239.03' @ 12.05 hrs
Flood Elev= 2,242.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,238.75'	**15.0" x 32.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,235.50' S= 0.1016 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.38 cfs @ 12.05 hrs HW=2,239.03' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 0.38 cfs @ 1.81 fps)

Pond CV426: CV426



Pond CV427: CV427

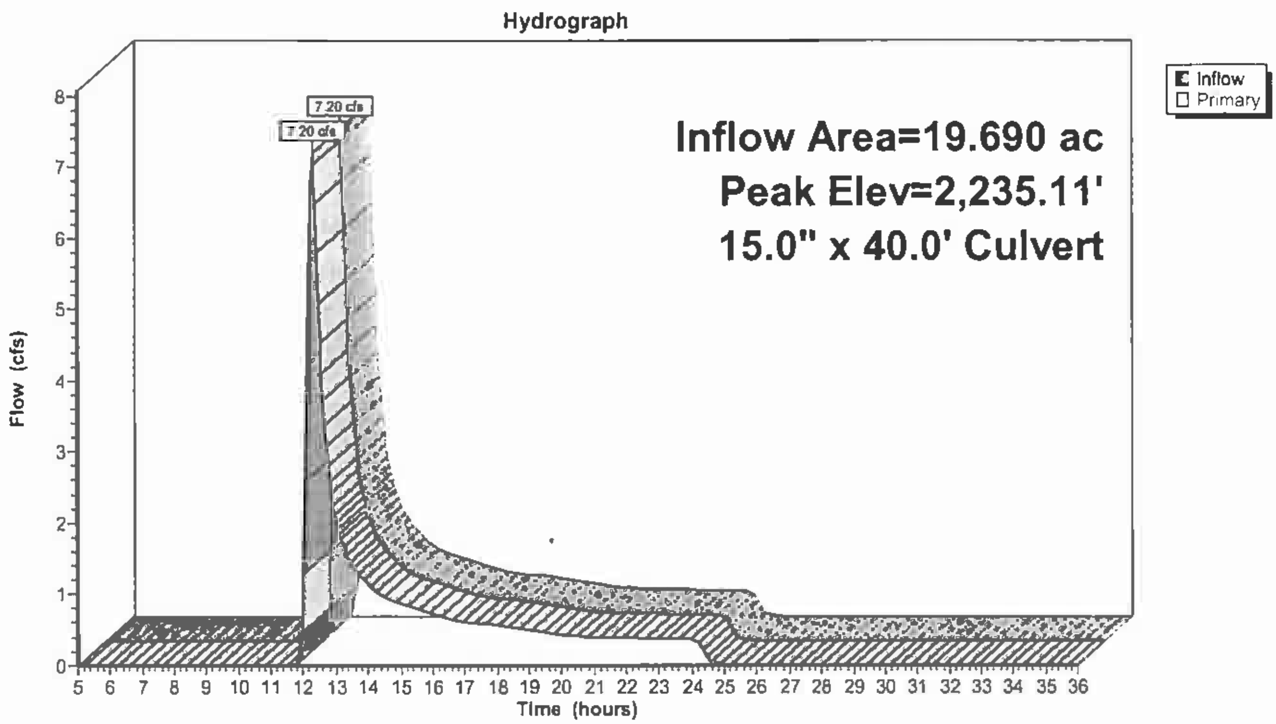
Inflow Area =	19.690 ac, Inflow Depth = 0.58"	for 10-YR event	
Inflow =	7.20 cfs @ 12.26 hrs, Volume=	0.944 af	
Outflow =	7.20 cfs @ 12.26 hrs, Volume=	0.944 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.20 cfs @ 12.26 hrs, Volume=	0.944 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,235.11' @ 12.26 hrs
Flood Elev= 2,236.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,233.00'	**15.0" x 40.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,231.00' S= 0.0500 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=7.16 cfs @ 12.26 hrs HW=2,235.09' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.16 cfs @ 5.83 fps)

Pond CV427: CV427



Pond CV600: CV600

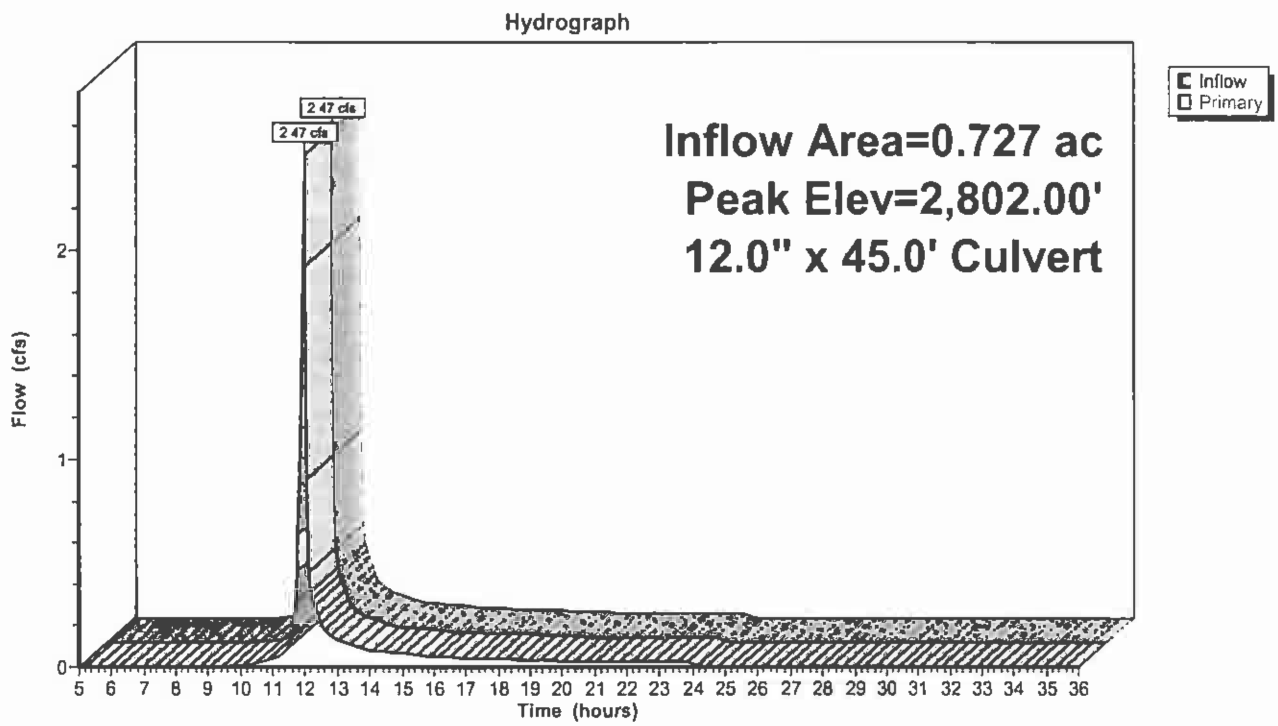
Inflow Area = 0.727 ac, Inflow Depth = 1.81" for 10-YR event
Inflow = 2.47 cfs @ 11.95 hrs, Volume= 0.110 af
Outflow = 2.47 cfs @ 11.95 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min
Primary = 2.47 cfs @ 11.95 hrs, Volume= 0.110 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,802.00' @ 11.95 hrs
Flood Elev= 2,803.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,801.00'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,800.55' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.46 cfs @ 11.95 hrs HW=2,802.00' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.46 cfs @ 3.90 fps)

Pond CV600: CV600



Pond CV601: CV601

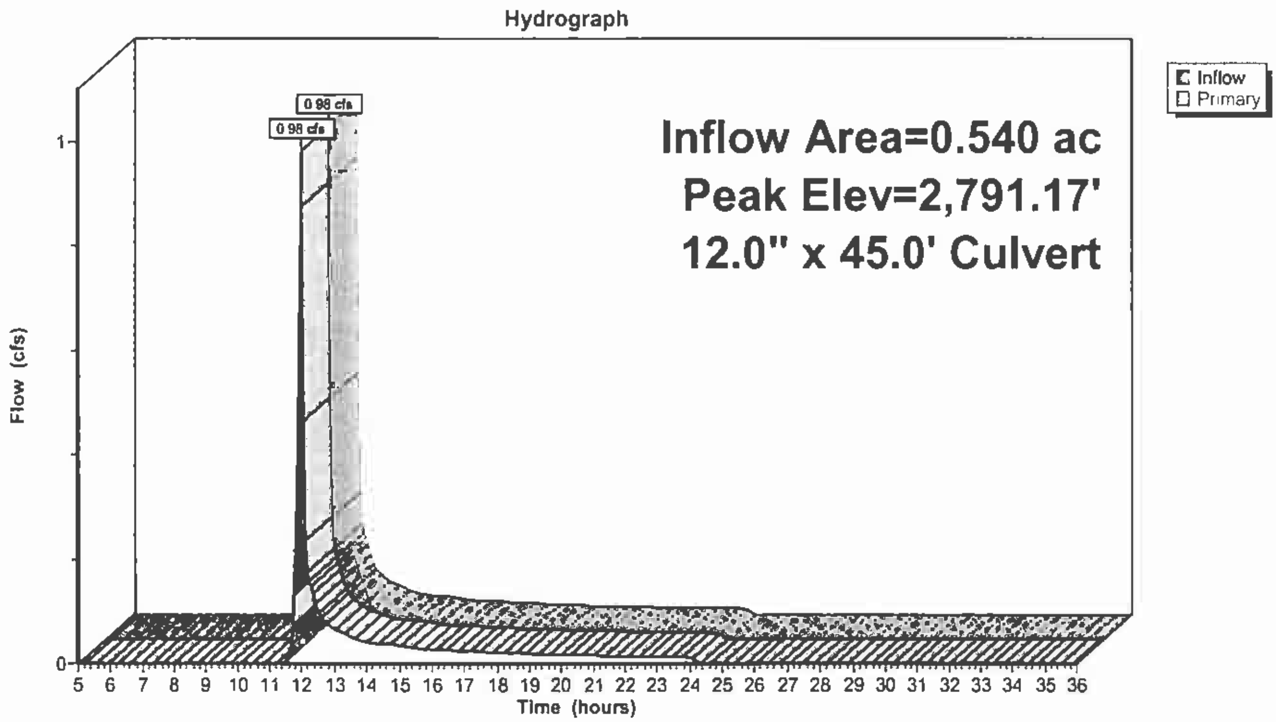
Inflow Area =	0.540 ac,	Inflow Depth = 1.03"	for 10-YR event	
Inflow =	0.98 cfs @	11.96 hrs, Volume=	0.046 af	
Outflow =	0.98 cfs @	11.96 hrs, Volume=	0.046 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.98 cfs @	11.96 hrs, Volume=	0.046 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,791.17' @ 11.96 hrs
Flood Elev= 2,793.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,790.62'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,790.17' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.94 cfs @ 11.96 hrs HW=2,791.16' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.94 cfs @ 3.16 fps)

Pond CV601: CV601



Pond CV602: CV602

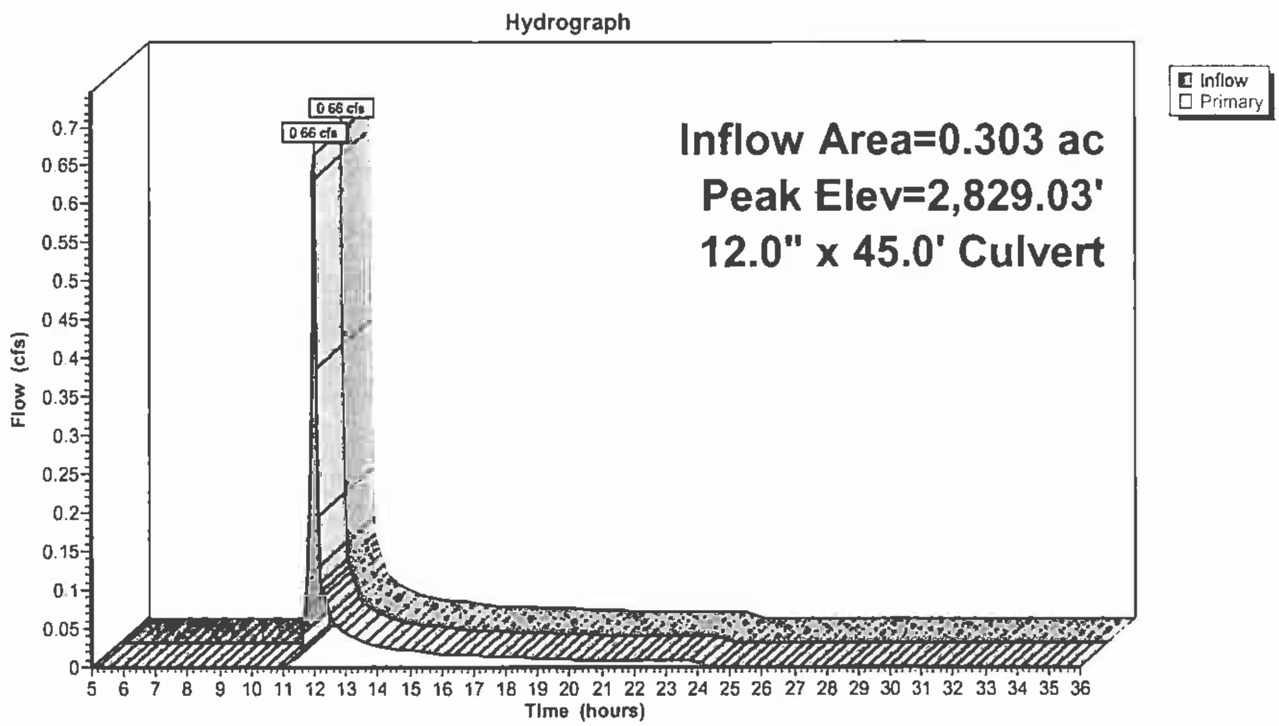
Inflow Area =	0.303 ac,	Inflow Depth = 1.26"	for 10-YR event	
Inflow =	0.66 cfs @	11.97 hrs, Volume=	0.032 af	
Outflow =	0.66 cfs @	11.97 hrs, Volume=	0.032 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.66 cfs @	11.97 hrs, Volume=	0.032 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,829.03' @ 11.97 hrs
Flood Elev= 2,831.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,828.62'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,828.00' S= 0.0138 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.64 cfs @ 11.97 hrs HW=2,829.02' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.64 cfs @ 3.18 fps)

Pond CV602: CV602



Pond CV603: CV603

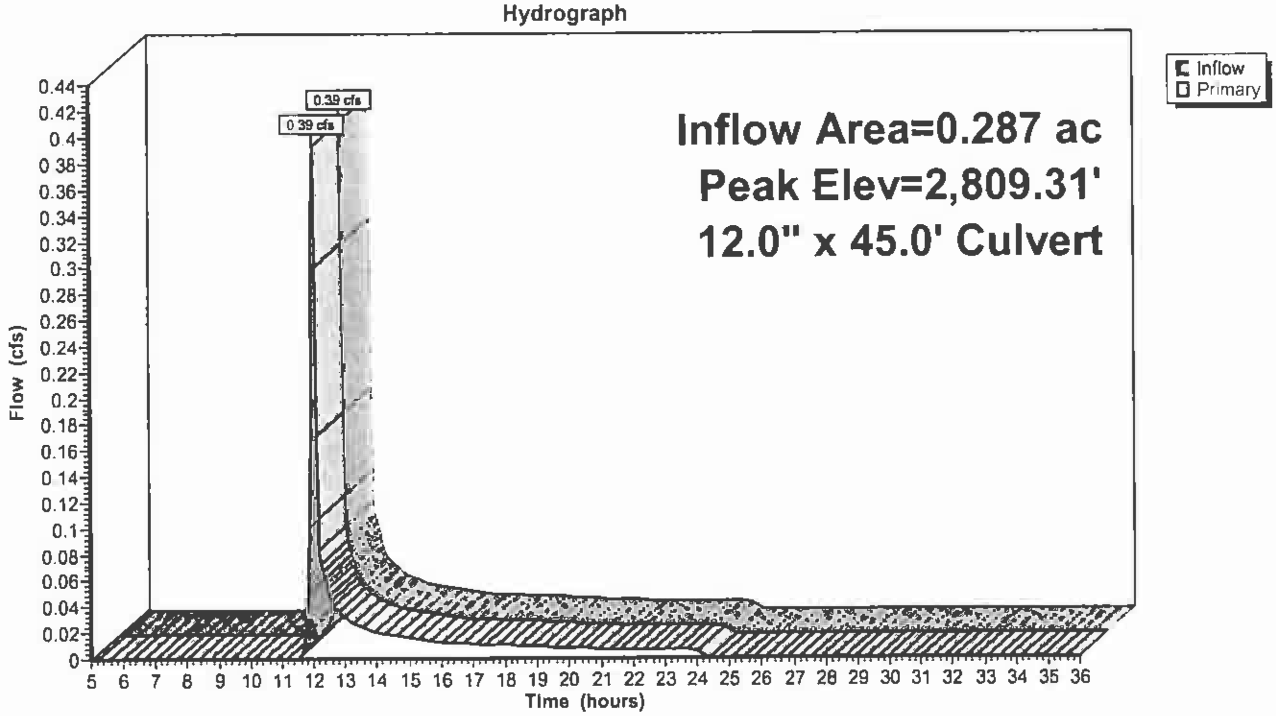
Inflow Area =	0.287 ac,	Inflow Depth = 0.86"	for 10-YR event	
Inflow =	0.39 cfs @	12.00 hrs, Volume=	0.021 af	
Outflow =	0.39 cfs @	12.00 hrs, Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.39 cfs @	12.00 hrs, Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,809.31' @ 12.00 hrs
Flood Elev= 2,812.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,809.00'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,808.00' S= 0.0222 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.39 cfs @ 12.00 hrs HW=2,809.31' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.39 cfs @ 1.89 fps)

Pond CV603: CV603



Pond CV604: CV604

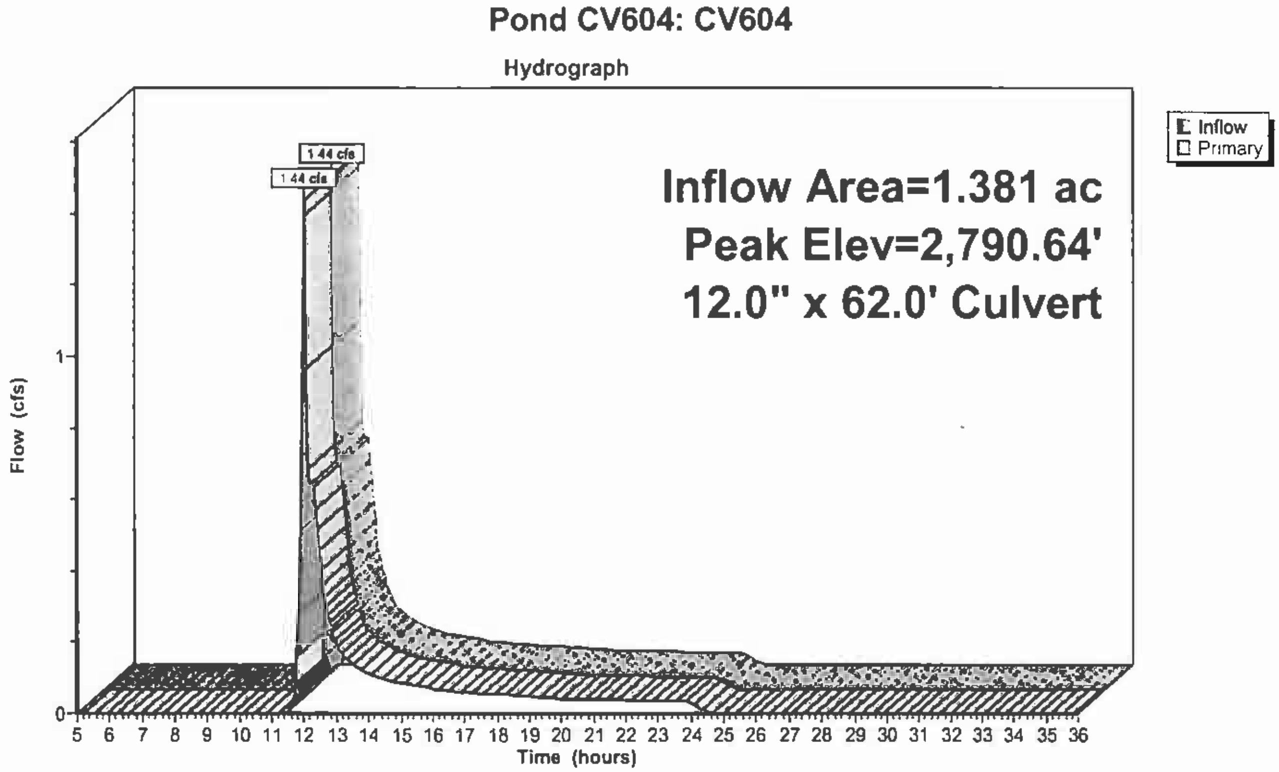
[79] Warning: Submerged Pond CV601 Primary device # 1 INLET by 0.01'

Inflow Area =	1.381 ac,	Inflow Depth = 0.97"	for 10-YR event	
Inflow =	1.44 cfs @	11.98 hrs, Volume=	0.112 af	
Outflow =	1.44 cfs @	11.98 hrs, Volume=	0.112 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.44 cfs @	11.98 hrs, Volume=	0.112 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,790.64' @ 11.98 hrs
Flood Elev= 2,795.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,790.00'	**12.0" x 62.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,788.00' S= 0.0323 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.38 cfs @ 11.98 hrs HW=2,790.62' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.38 cfs @ 2.69 fps)



Pond CV605: CV605

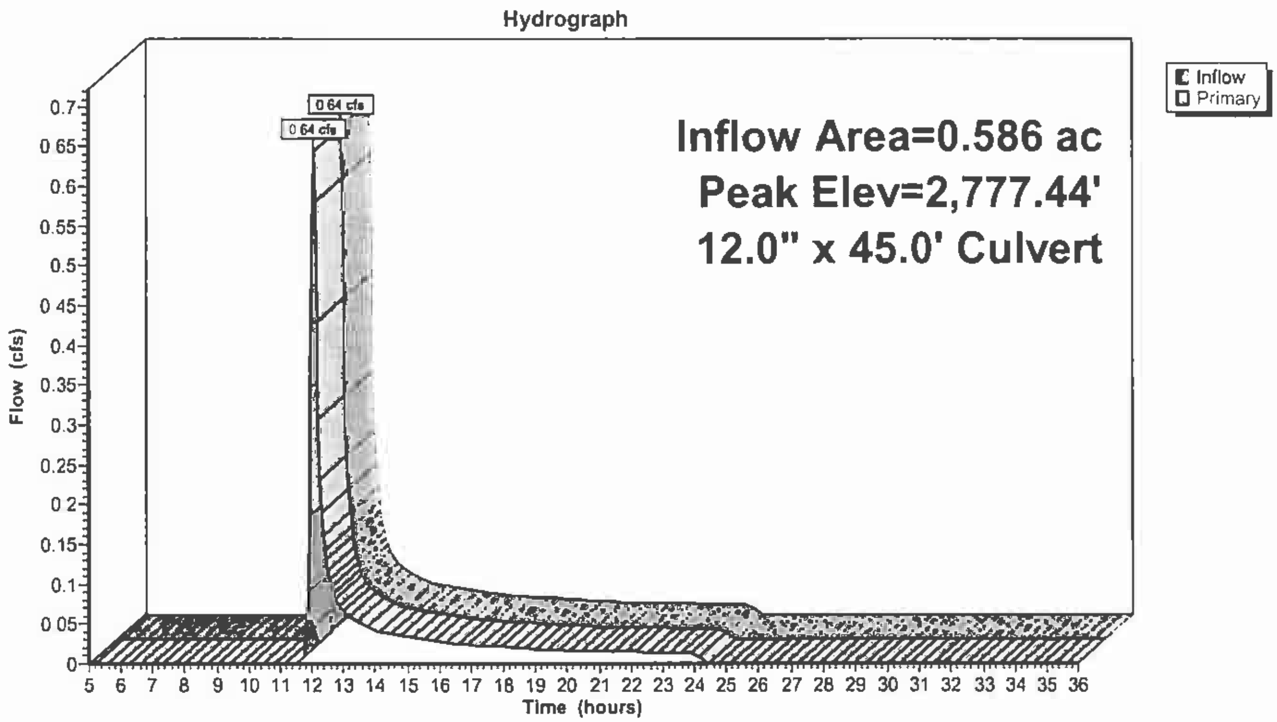
Inflow Area =	0.586 ac, Inflow Depth = 0.86"	for 10-YR event	
Inflow =	0.64 cfs @ 12.06 hrs, Volume=	0.042 af	
Outflow =	0.64 cfs @ 12.06 hrs, Volume=	0.042 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @ 12.06 hrs, Volume=	0.042 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,777.44' @ 12.06 hrs
Flood Elev= 2,780.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,777.00'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,776.55' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.63 cfs @ 12.06 hrs HW=2,777.43' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.63 cfs @ 2.87 fps)

Pond CV605: CV605



Pond CV606: CV606

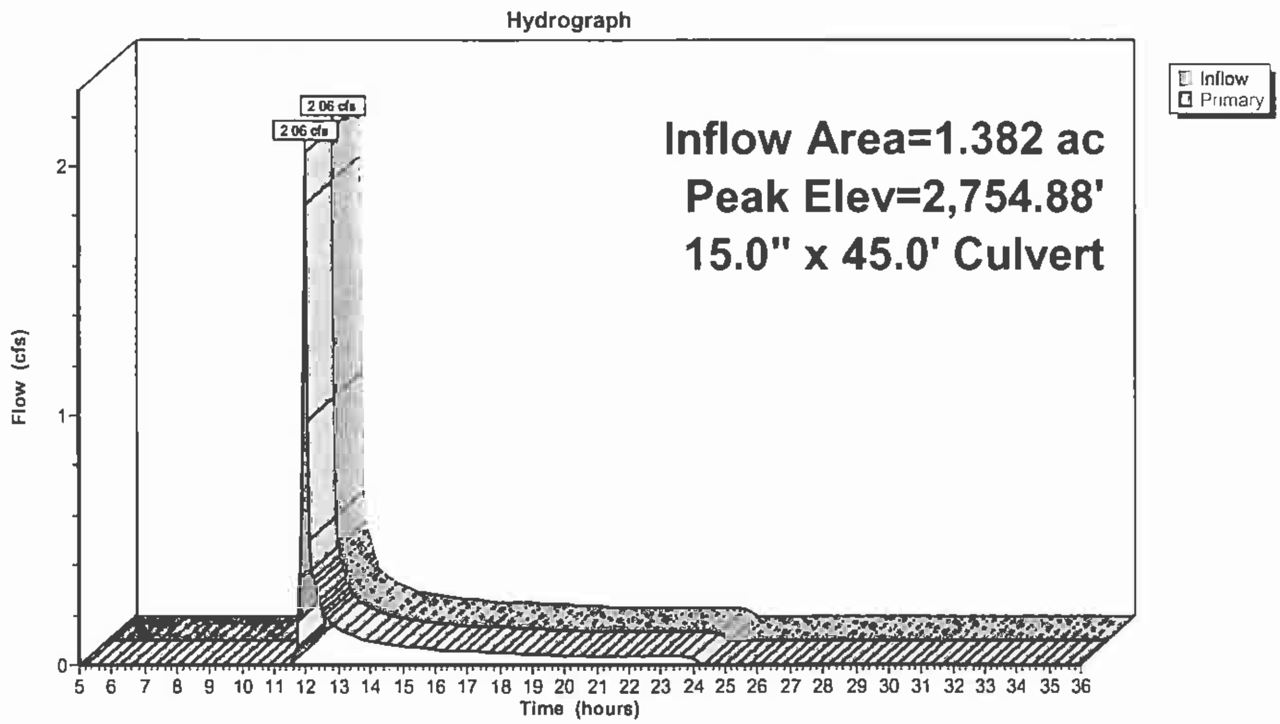
Inflow Area = 1.382 ac, Inflow Depth = 0.86" for 10-YR event
Inflow = 2.06 cfs @ 11.96 hrs, Volume= 0.099 af
Outflow = 2.06 cfs @ 11.96 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min
Primary = 2.06 cfs @ 11.96 hrs, Volume= 0.099 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,754.88' @ 11.97 hrs
Flood Elev= 2,757.17'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,754.17'	**15.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,753.00' S= 0.0260 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.97 cfs @ 11.96 hrs HW=2,754.86' (Free Discharge)
└─1=**Culvert** (Inlet Controls 1.97 cfs @ 2.83 fps)

Pond CV606: CV606



Pond CV607: CV607

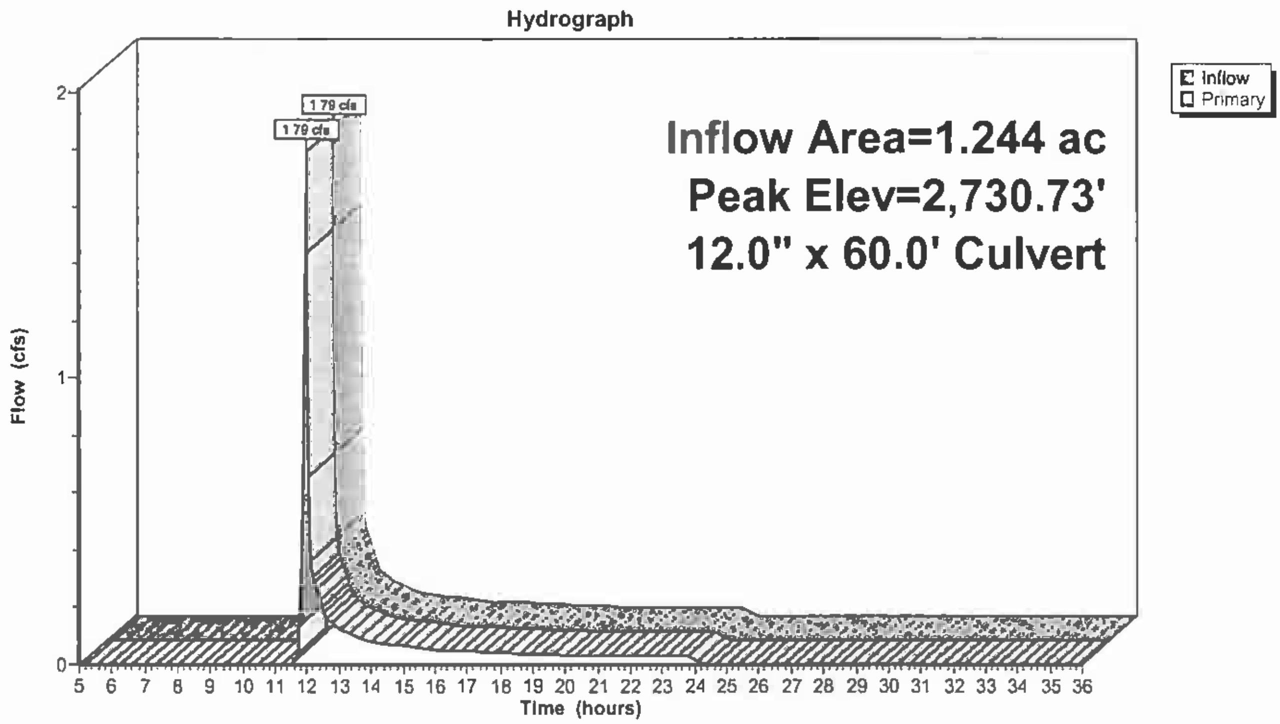
Inflow Area =	1.244 ac,	Inflow Depth = 0.81"	for 10-YR event	
Inflow =	1.79 cfs @	11.96 hrs, Volume=	0.084 af	
Outflow =	1.79 cfs @	11.96 hrs, Volume=	0.084 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.79 cfs @	11.96 hrs, Volume=	0.084 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,730.73' @ 11.96 hrs
Flood Elev= 2,735.66'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,730.00'	**12.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,726.00' S= 0.0667 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.75 cfs @ 11.96 hrs HW=2,730.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.75 cfs @ 2.89 fps)

Pond CV607: CV607



Pond CV608: CV608

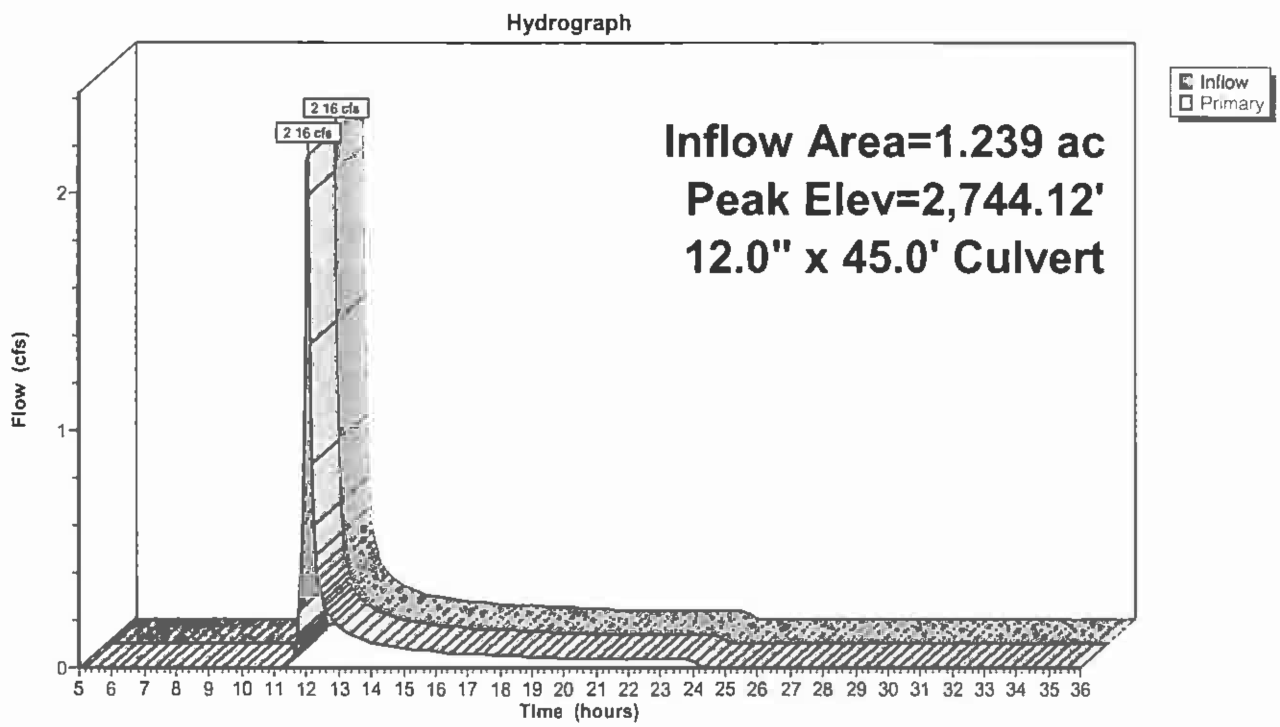
Inflow Area =	1.239 ac,	Inflow Depth = 1.14"	for 10-YR event	
Inflow =	2.16 cfs @	12.01 hrs, Volume=	0.118 af	
Outflow =	2.16 cfs @	12.01 hrs, Volume=	0.118 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.16 cfs @	12.01 hrs, Volume=	0.118 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,744.12' @ 12.01 hrs
Flood Elev= 2,746.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,743.21'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,742.76' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=2.10 cfs @ 12.01 hrs HW=2,744.10' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.10 cfs @ 3.78 fps)

Pond CV608: CV608



Pond CV609: CV609

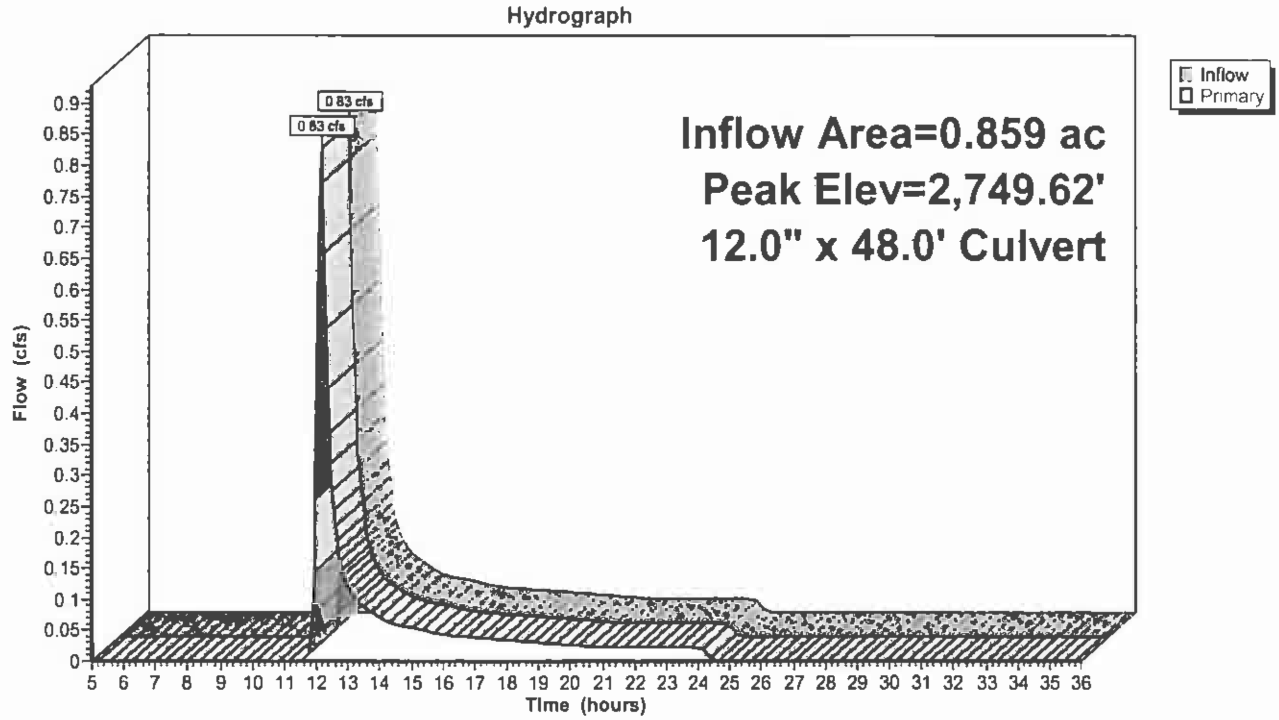
Inflow Area = 0.859 ac, Inflow Depth = 0.97" for 10-YR event
Inflow = 0.83 cfs @ 12.15 hrs, Volume= 0.070 af
Outflow = 0.83 cfs @ 12.15 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.15 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,749.62' @ 12.15 hrs
Flood Elev= 2,752.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,749.16'	**12.0" x 48.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,746.00' S= 0.0658 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.82 cfs @ 12.15 hrs HW=2,749.62' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.82 cfs @ 2.32 fps)

Pond CV609: CV609



Pond CV610: CV610

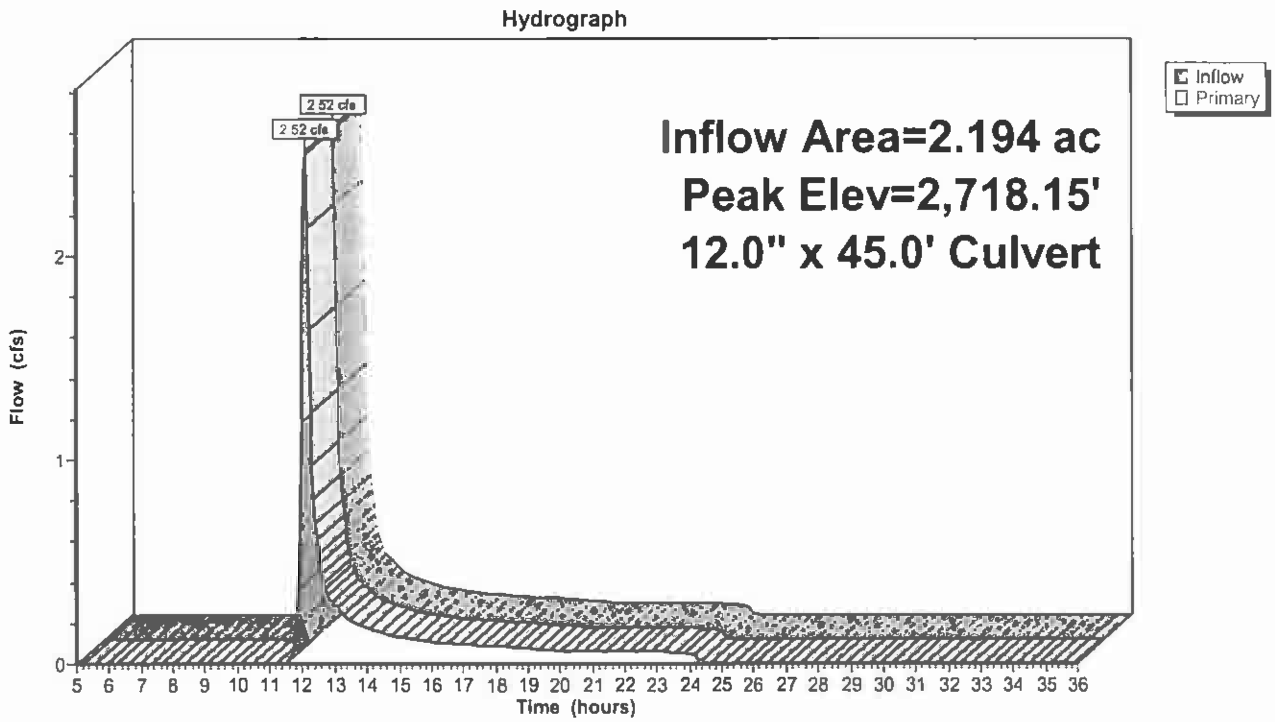
Inflow Area =	2.194 ac,	Inflow Depth = 0.97"	for 10-YR event	
Inflow =	2.52 cfs @	12.08 hrs, Volume=	0.178 af	
Outflow =	2.52 cfs @	12.08 hrs, Volume=	0.178 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.52 cfs @	12.08 hrs, Volume=	0.178 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,718.15' @ 12.08 hrs
Flood Elev= 2,720.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,717.13'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,716.68' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=2.47 cfs @ 12.08 hrs HW=2,718.13' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.47 cfs @ 3.90 fps)

Pond CV610: CV610



Pond CV611: CV611

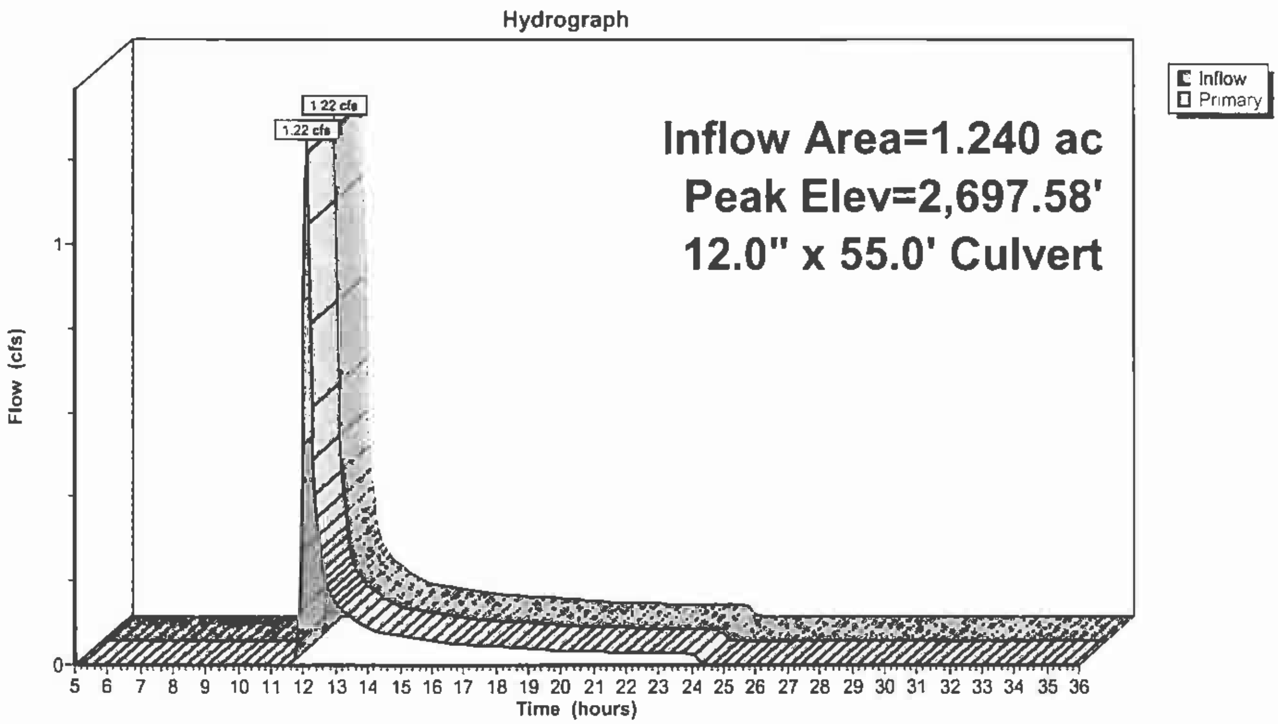
Inflow Area =	1.240 ac, Inflow Depth = 0.86"	for 10-YR event	
Inflow =	1.22 cfs @ 12.09 hrs, Volume=	0.089 af	
Outflow =	1.22 cfs @ 12.09 hrs, Volume=	0.089 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.22 cfs @ 12.09 hrs, Volume=	0.089 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,697.58' @ 12.09 hrs
Flood Elev= 2,704.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,697.00'	**12.0" x 55.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,694.75' S= 0.0409 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.20 cfs @ 12.09 hrs HW=2,697.57' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.20 cfs @ 2.58 fps)

Pond CV611: CV611



Pond CV612: CV612

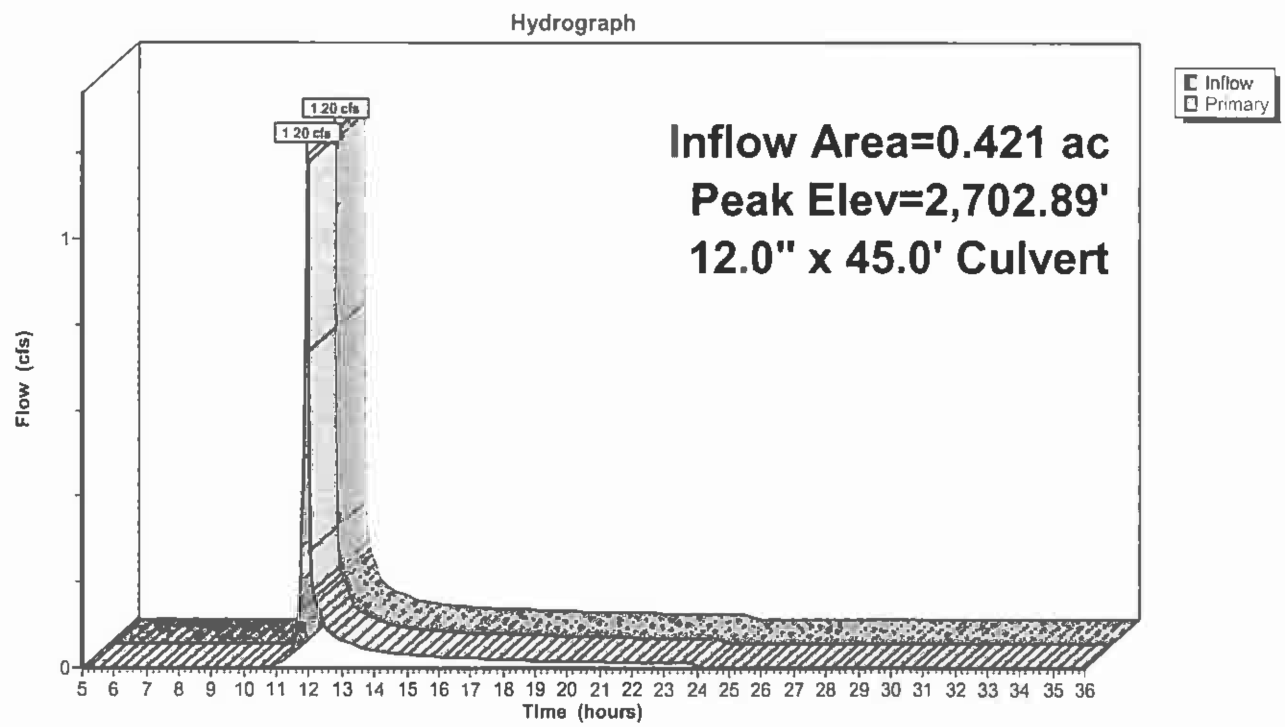
Inflow Area =	0.421 ac,	Inflow Depth = 1.46"	for 10-YR event	
Inflow =	1.20 cfs @	11.94 hrs, Volume=	0.051 af	
Outflow =	1.20 cfs @	11.94 hrs, Volume=	0.051 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.20 cfs @	11.94 hrs, Volume=	0.051 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,702.89' @ 11.94 hrs
Flood Elev= 2,705.27'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,702.27'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,701.82' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=1.14 cfs @ 11.94 hrs HW=2,702.87' (Free Discharge)
└─1=**Culvert** (Barrel Controls 1.14 cfs @ 3.30 fps)

Pond CV612: CV612



Pond CV613: CV613

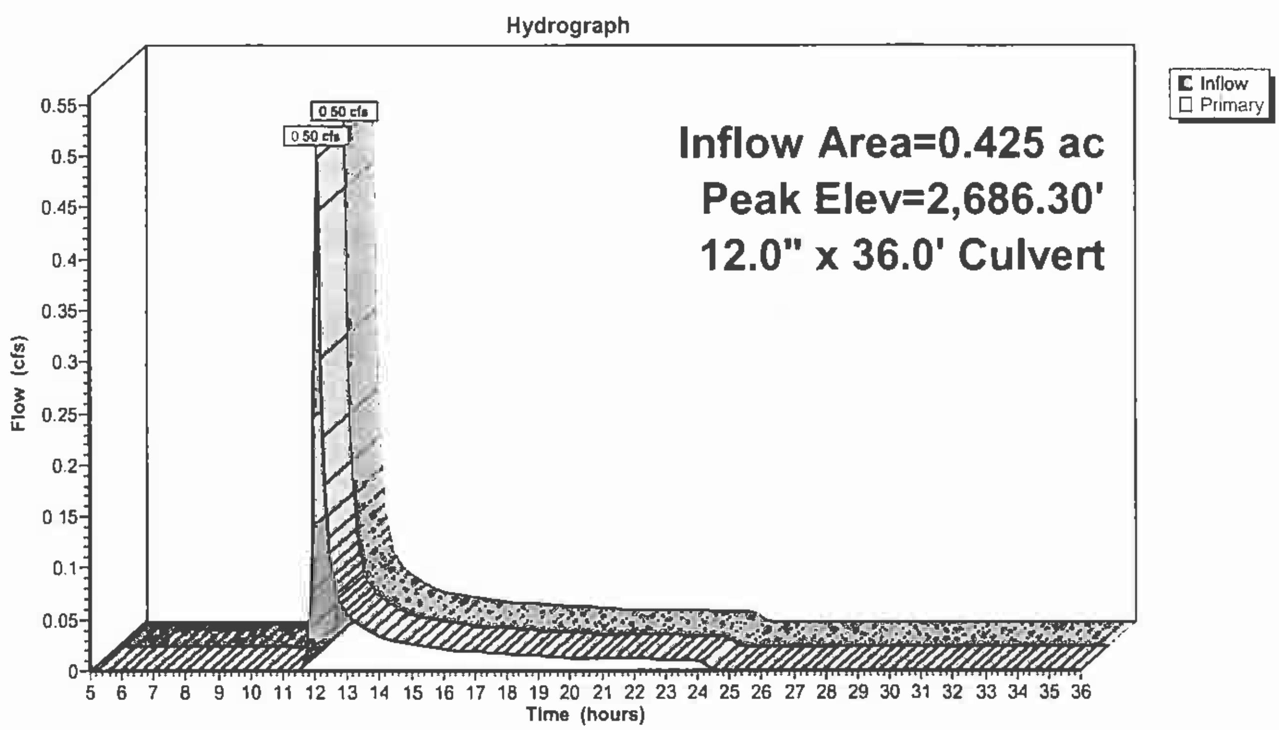
Inflow Area = 0.425 ac, Inflow Depth = 0.97" for 10-YR event
Inflow = 0.50 cfs @ 12.08 hrs, Volume= 0.034 af
Outflow = 0.50 cfs @ 12.08 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.08 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,686.30' @ 12.08 hrs
Flood Elev= 2,688.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,685.92'	**12.0" x 36.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,685.56' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.49 cfs @ 12.08 hrs HW=2,686.30' (Free Discharge)
└─1=**Culvert** (Barrel Controls 0.49 cfs @ 2.65 fps)

Pond CV613: CV613



Pond CV614: CV614

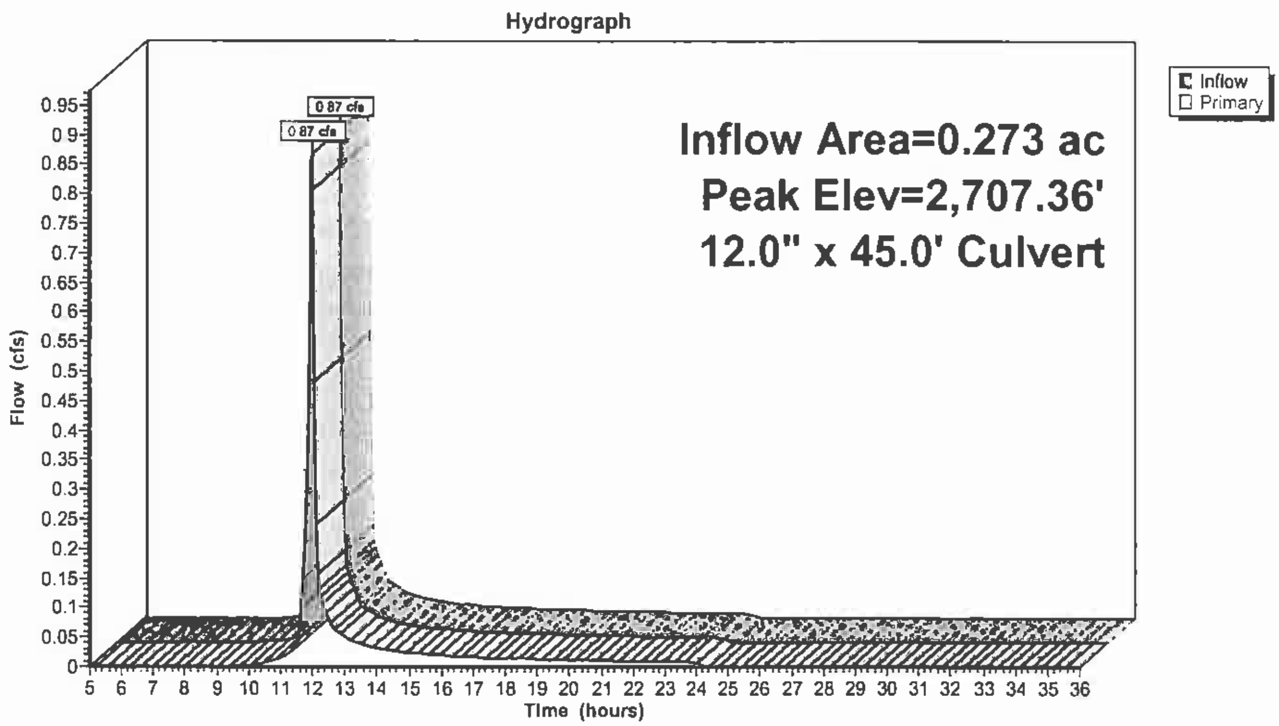
Inflow Area =	0.273 ac,	Inflow Depth = 1.81"	for 10-YR event	
Inflow =	0.87 cfs @	11.97 hrs, Volume=	0.041 af	
Outflow =	0.87 cfs @	11.97 hrs, Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.87 cfs @	11.97 hrs, Volume=	0.041 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,707.36' @ 11.97 hrs
Flood Elev= 2,709.84'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,706.84'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,706.39' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.84 cfs @ 11.97 hrs HW=2,707.35' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 0.84 cfs @ 3.07 fps)

Pond CV614: CV614



Pond CV615: CV615

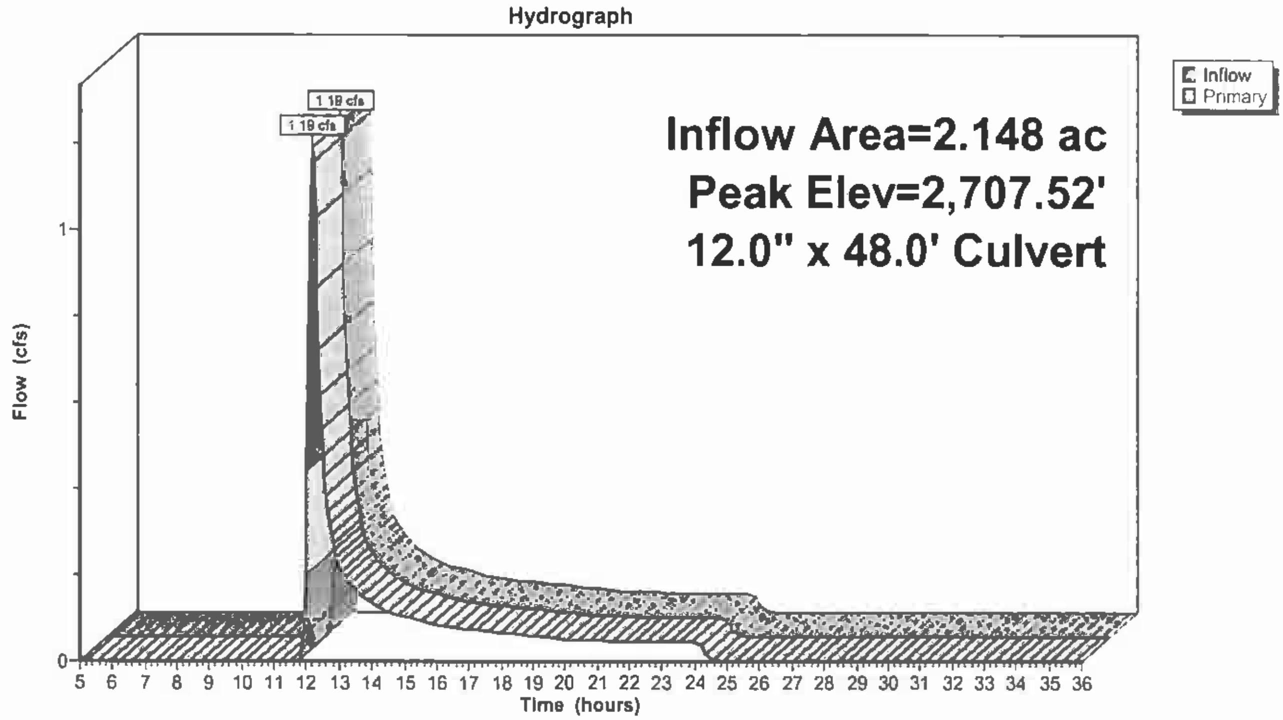
Inflow Area =	2.148 ac, Inflow Depth = 0.67"	for 10-YR event
Inflow =	1.19 cfs @ 12.17 hrs, Volume=	0.119 af
Outflow =	1.19 cfs @ 12.17 hrs, Volume=	0.119 af, Atten= 0%, Lag= 0.0 min
Primary =	1.19 cfs @ 12.17 hrs, Volume=	0.119 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,707.52' @ 12.17 hrs
Flood Elev= 2,709.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,706.90'	**12.0" x 48.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,706.42' S= 0.0100 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=1.17 cfs @ 12.17 hrs HW=2,707.51' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.17 cfs @ 3.34 fps)

Pond CV615: CV615



Pond CV616: CV616

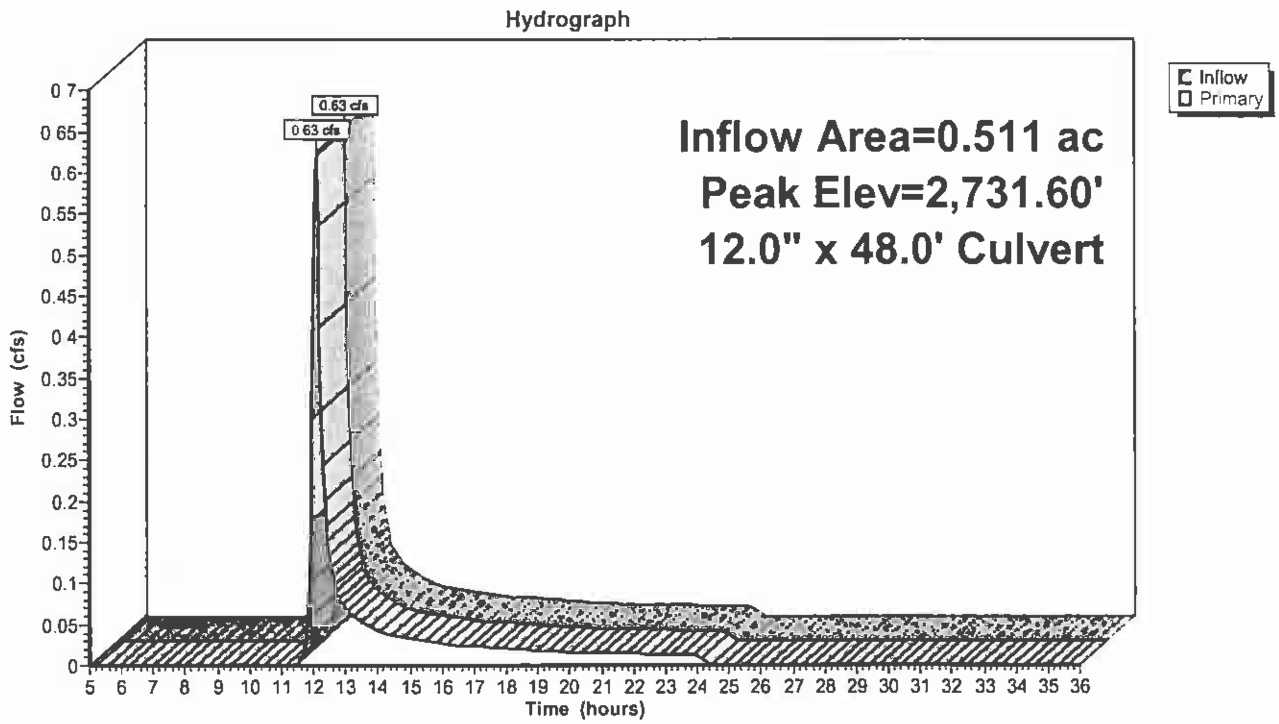
Inflow Area =	0.511 ac, Inflow Depth = 1.03"	for 10-YR event	
Inflow =	0.63 cfs @ 12.09 hrs, Volume=	0.044 af	
Outflow =	0.63 cfs @ 12.09 hrs, Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.63 cfs @ 12.09 hrs, Volume=	0.044 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,731.60' @ 12.09 hrs
Flood Elev= 2,734.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,731.20'	**12.0" x 48.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,730.00' S= 0.0250 '/' Cc= 0.900 n= 0.015

Primary OutFlow Max=0.61 cfs @ 12.09 hrs HW=2,731.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.61 cfs @ 2.14 fps)

Pond CV616: CV616



Pond CV617: CV617

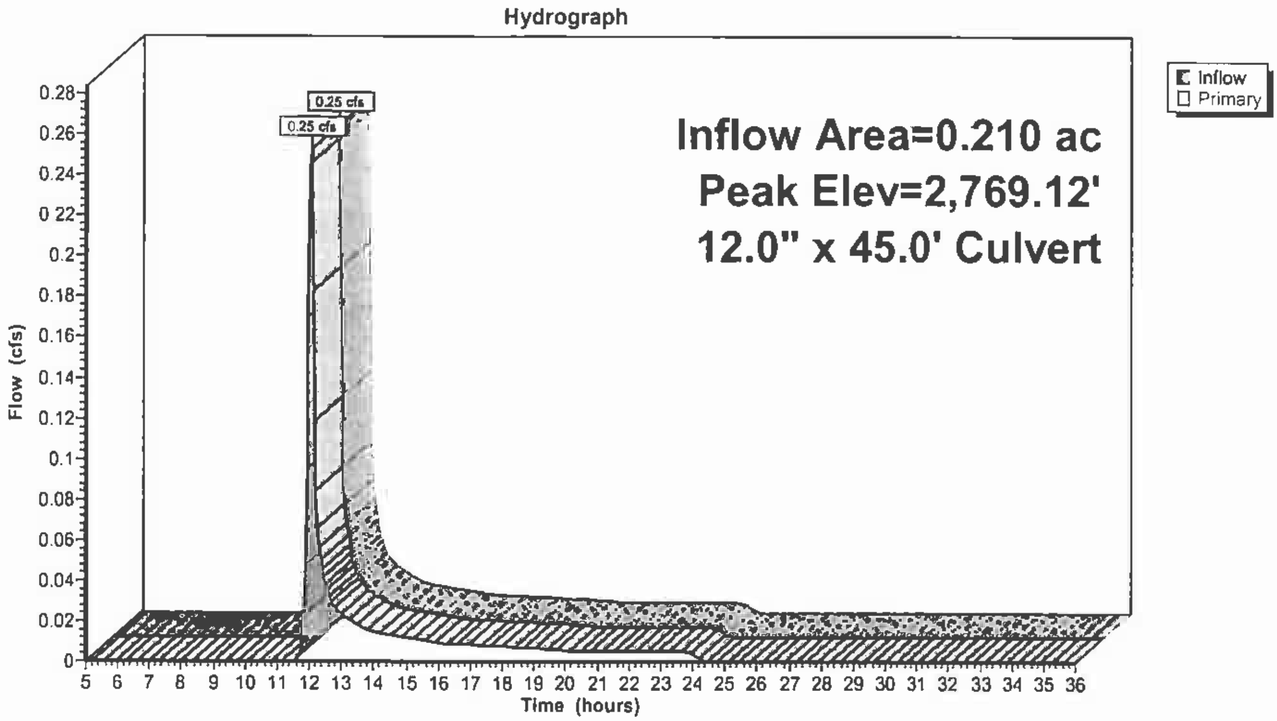
Inflow Area =	0.210 ac, Inflow Depth = 0.86"	for 10-YR event	
Inflow =	0.25 cfs @ 12.03 hrs, Volume=	0.015 af	
Outflow =	0.25 cfs @ 12.03 hrs, Volume=	0.015 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.25 cfs @ 12.03 hrs, Volume=	0.015 af	

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 2,769.12' @ 12.03 hrs
Flood Elev= 2,771.87'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,768.87'	**12.0" x 45.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 2,768.00' S= 0.0193 '/' Cc= 0.900 n= 0.015

Primary **OutFlow** Max=0.24 cfs @ 12.03 hrs HW=2,769.11' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.24 cfs @ 1.67 fps)

Pond CV617: CV617



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SECTION 5

Curve Number Calibration Calculations

Curve Number Calibration Computations
07090-Granite Reliable Power, LLC
Granite Reliable Power Wind Park - Coos County, NH
April 2008 - PLB

Stream Gage Station	Drainage Area (mi^2)	10-Yr Peak Flow[b] (cfs / mi^2)	10-Yr Peak Flow (cfs/ Acre)
Diamond River near Wentworth Location, NH	153.00	7,310.0	0.075
Big Brook near Pittsburg, NH	6.52	389.0	0 093
Black Brook at Averill, VT	0.88	46.3	0.082
Mohawk River near Colebrook, NH	35.30	4,360.0	0.193
Paul Stream Tributary near Brunswick, VT	1.48	72.2	0.076
Upper Ammonoosuc River near Groveton, NH	230.00	7,600.0	0.052
Ammonoosuc River at Bethlehem, NH	88.20	7,680.0	0.136
		Average=	**0.101**

Average 10-year peak flow = 0.101 cfs/acre
Use **0.19** cfs/acre for calibration

Calibrate Bridge-2 Area (829.77 acres)

Surface Description	Area (acres)	TR-55 CN	Calibrated CN
HSG C soils gravel Roads	1.51	89	89
HSG C soils clearcut	33.12	65	49
HSG C soils forested	399.01	70	53
HSG B soils clearcut	0.07	48	36
HSG B soils forested	2.06	55	42
HSG D soils clearcut	64.32	73	55
HSG D soils forested	329.68	77	58
	829.77	72.81	55
		Weighted CN	Approximated CN[a]

Calibrate Bridge-3 Area (407.02 acres)

Surface Description	Area (acres)	TR-55 CN	Calibrated CN
HSG C soils gravel Roads	0.06	89	89
HSG C soils clearcut	8.85	65	49
HSG C soils forested	103.11	70	53
HSG B soils clearcut	2.02	48	36
HSG B soils forested	66	55	42
HSG D soils clearcut	0.12	73	55
HSG D soils forested	226.86	77	58
	407.02	71.26	54
		Weighted CN	Approximated CN[a]

[a] - Weighted Curve Number calculated by trial and error
[b] - 10-year peak flow calculated by USGS in Table 2 of the "Flow-Frequency Characteristics of Vermont Streams" publication

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Box Culvert and Bridge Sizing Calculations

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Box Culvert and Bridge Sizing Computations
07090-Granite Reliable Power, LLC
Granite Reliable Power Wind Park - Coos County, NH
April 2008 - PLB

Structure	Drainage Area (acres)	Drainage Area (mi^2)	Calculated Bankfull Width[a] (ft)	Approx. Observed Bankfull Width (ft)	Required Structure Span[b] (ft)
Culvert-12	469.97	0.73	10.6	7.0	12.8
Culvert-23	84.25	0.13	4.6	4.5	5.6
Culvert-25	354.92	0.55	9.3	3.8	11.1
Culvert-43	53.34	0.08	3.7	3.7	4.5
Culvert-48	84.38	0.13	4.6	4.5	5.6
Culvert-70	204.98	0.32	7.1	3.5	8.5
Culvert-71	1.51	0.00	0.7	3.8	4.6
Culvert-72	11.32	0.02	1.8	3.3	3.9
Culvert-99	39.82	0.06	3.2	2.4	3.9
Culvert-102	93.25	0.15	4.9	2.4	5.8
Culvert-152	95.42	0.15	4.9	6.8	8.1
Culvert-187	35.64	0.06	3.1	2.4	3.7
Culvert-223	51.36	0.08	3.6	3.2	4.4
Culvert-227	157.65	0.25	6.3	6.0	7.5
Culvert-233	80.74	0.13	4.5	2.8	5.4
Culvert-241	11.33	0.02	1.8	2.5	3.0
Culvert-308	18.03	0.03	2.2	3.2	3.8
Bridge-1	759.25	1.19	13.4	10.0	16.1
Bridge-2	829.77	1.30	14.0	10.0	16.8
Bridge-3	407.03	0.64	9.9	9.3	11.9
Bridge-4	311	0.49	8.7	8.5	10.4
Bridge-5	1337.75	2.09	17.6	16.0	21.1
Bridge-6	345.52	0.54	9.2	3.0	11.0

[a] - Bankfull width calculated by using NH 2005 Regional Hydraulic Geometry Curves (provisional)
[b] - Required structure span calculated for 120% of bankfull width

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Proposed Culvert Sizing Calculations

CULVERT DESIGN DATA

Using Culverts Sized by HydroCAD to Determine Drainage Area to Flow Relationship

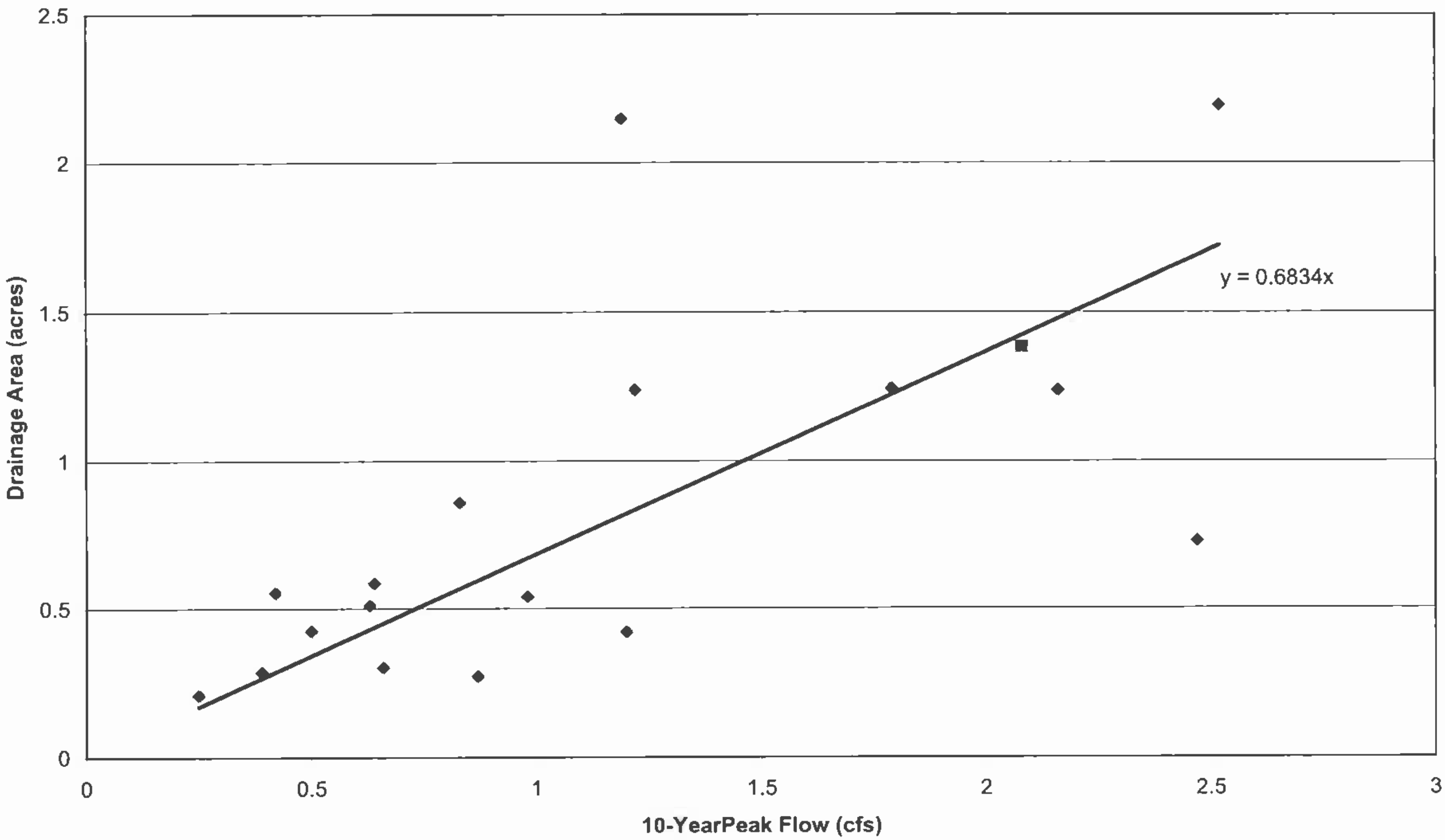
Owlhead Ridgeline Culverts Sized Using Hydrocad (600 Series)

Culvert ID	Drainage Area (acre)	10-Year Flow (cfs)	Culvert Size (inch)
600	0.727	2.47	12
601	0.54	0.98	12
602	0.303	0.66	12
603	0.287	0.39	12
604	0.554	0.42	12
605	0.586	0.64	12
606	1.382	2.08	15
607	1.244	1.79	12
608	1.239	2.16	12
609	0.859	0.83	12
610	2.194	2.52	12
611	1.24	1.22	12
612	0.421	1.2	12
613	0.425	0.5	12
614	0.273	0.87	12
615	2.148	1.19	12
616	0.511	0.63	12
617	0.21	0.25	12

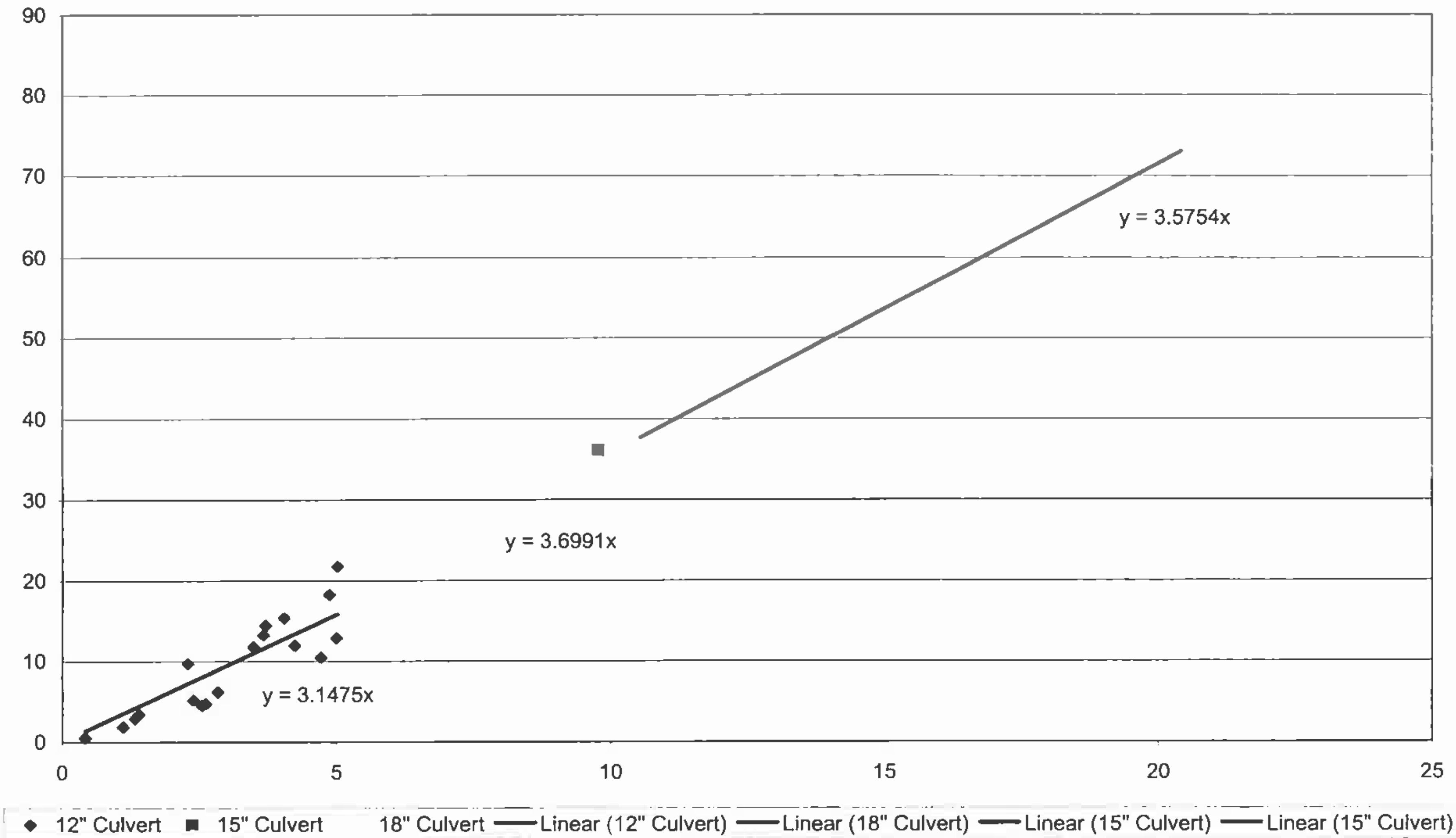
Dixville Road Sized Using HydroCAD (500 Series)

Culvert ID	Drainage Area (acre)	10-Year Flow (cfs)	Culvert Size (inch)
500	21.75	5.02	12
501	11.91	4.24	12
502	5.15	2.39	12
503	9.68	2.29	12
504	11.75	3.49	12
505	26.05	10.55	18
506	0.52	0.42	12
507	13.21	3.67	12
508	36.14	9.77	15
509	6.16	2.84	12
510	4.49	2.55	12
511	79.04	20.42	18
512	1.85	1.11	12
513	2.87	1.33	12
514	12.83	5	12
515	4.7	2.62	12
516	18.21	4.87	12
517	10.44	4.72	12
518	14.375	3.71	12
519	3.396	1.4	12
520	15.3	4.05	12

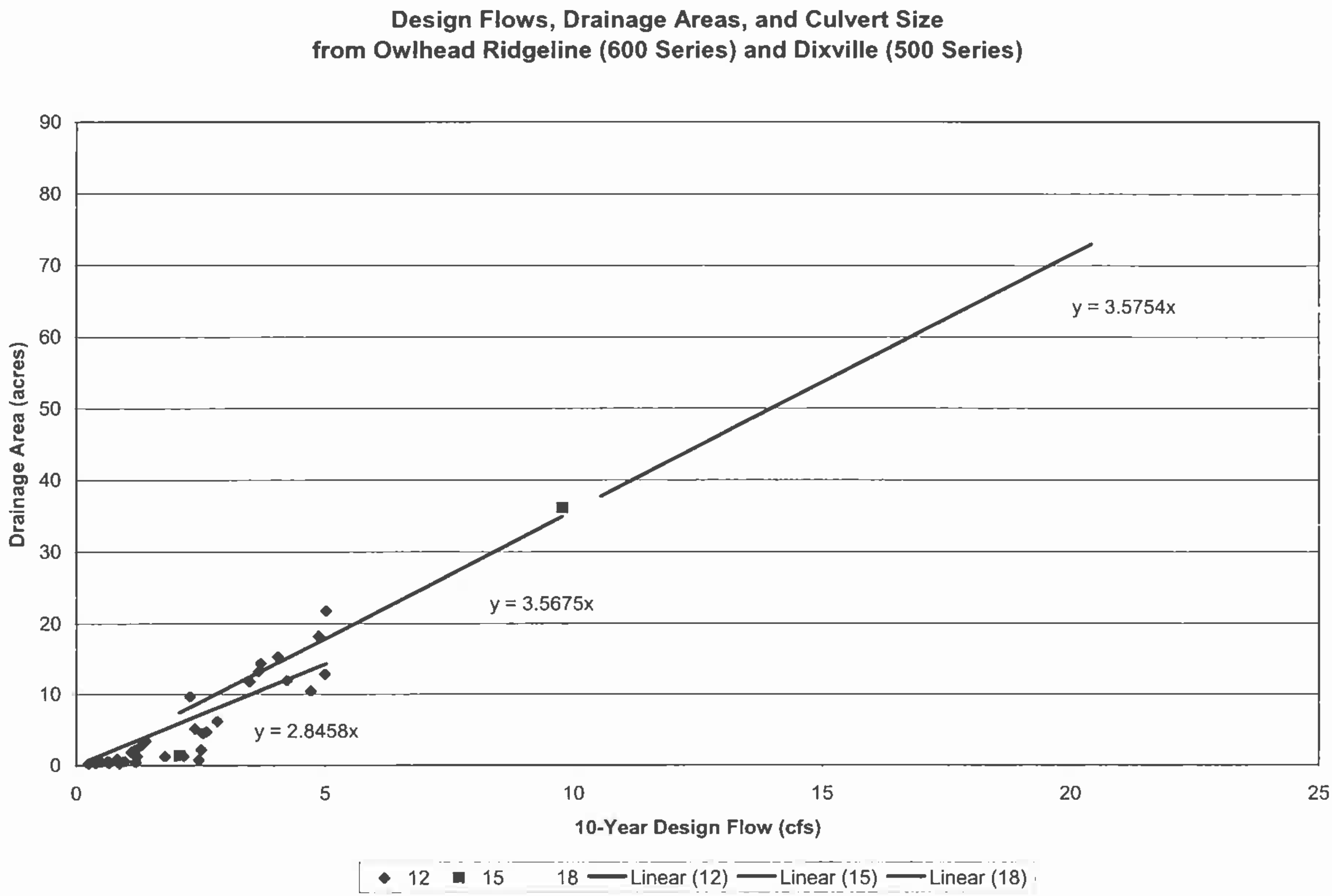
**Design Flows vs. Drainage Areas
from Owlhead Ridgeline (600 Series)**



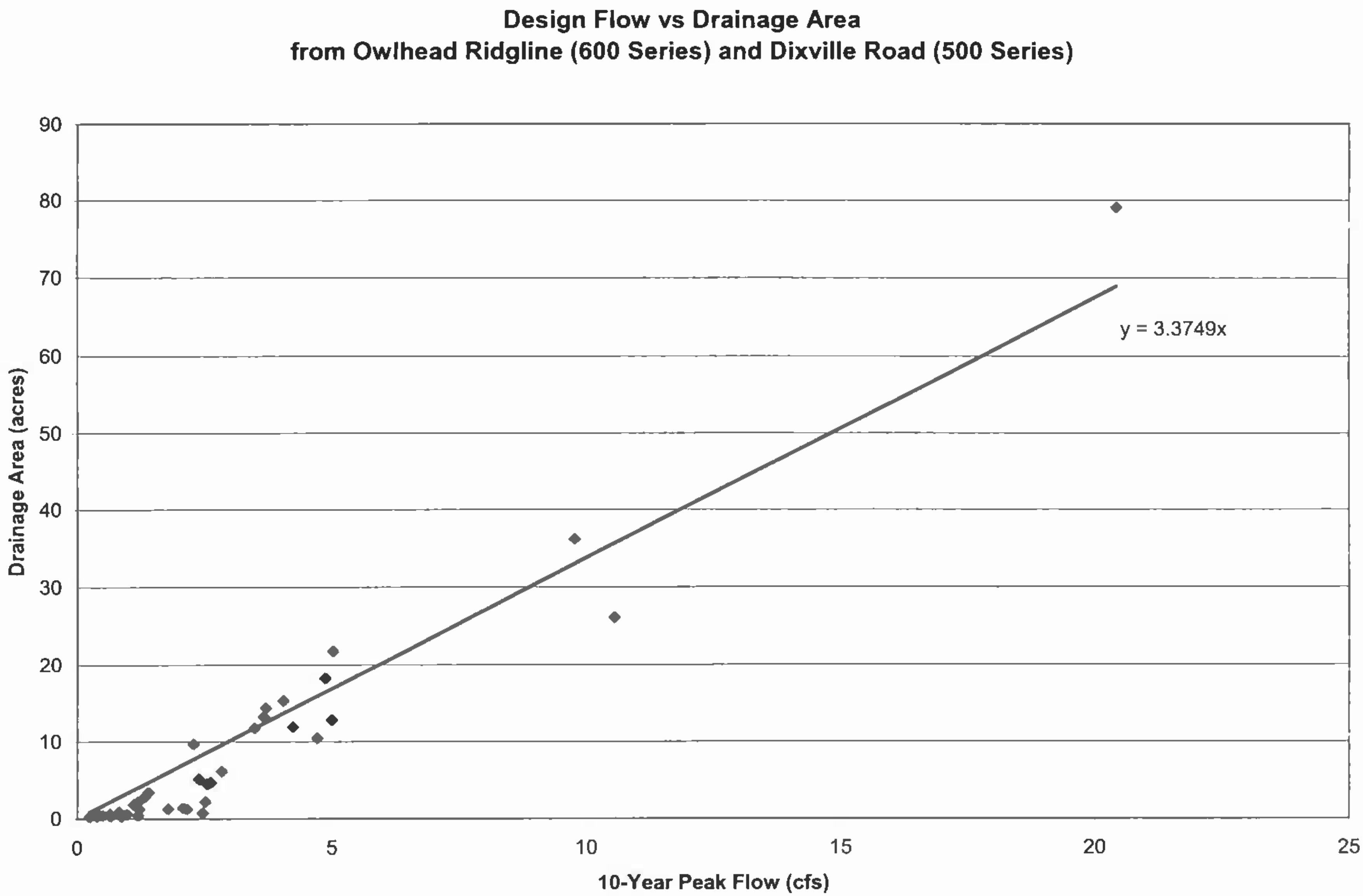
Design Flows, Drainage Areas, and Culvert Size from Dixville Road (500 Series)



Project# 07090
7/10/2008



T:\07090 NEP - Phillips Br Wind Turbines\DOCS\Comps\Culvert Sizing by Drainage Area Sizing Calculations.xls


Design Flow vs Drainage Area
from Owlhead Ridgline (600 Series) and Dixville Road (500 Series)
90
80
70
60
50
40
30
20
10
0
Drainage Area (acres)
0
5
10
15
20
25
10-Year Peak Flow (cfs)
y = 3.3749x

Approximate Culvert Sizing using Mannings Equation

FISHBROOK RIDGELINE (700 Series)

Assumptions

1. Culverts are flowing full and inlet and outlet are not submerged

Equation

Dmin = 1.335 (nQ/(S^(1/2))^(3/8)

Reference: Lindeburg, 2006

Q = Ad / 0.6834 — *For Ad < 2.5 acres* — Horizons, 2008

Q = Ad / 3.3749 — *For Ad > 2.5 acres* — Horizons, 2008

Culvert ID	Drainage Area (acre)	Calculated 10-Year Flow (cfs)	Invert In	Invert Out	Length	Slope S	Mannings n	Dmin	Culvert ID	Size
700	2.07	3.03	2555.14	2554.72	42	0.010	0.015	11.87	700	12
701	59.52	17.64	2469.72	2469.29	43	0.010	0.015	22.99	701	24
702	1.43	2.09	2545.71	2545.21	50	0.010	0.015	10.34	702	12
703	0.78	1.15	2530.59	2530.16	43	0.010	0.015	8.25	703	12
704	0.37	0.54	2565.26	2564.86	40	0.010	0.015	6.23	704	12
705	2.53	0.75	2523.52	2523.09	43	0.010	0.015	7.03	705	12
706	2.83	0.84	2508.75	2508.55	40	0.005	0.015	8.35	706	12
707	0.32	0.47	2565.26	2564.86	40	0.010	0.015	5.90	707	12
708	2.34	3.42	2492.20	2491.70	50	0.010	0.015	12.43	708	15
709	1.10	1.61	2482.95	2482.55	40	0.010	0.015	9.37	709	12
710	1.55	2.27	2469.11	2468.71	40	0.010	0.015	10.65	710	12
711	0.72	1.05	2473.39	2472.96	43	0.010	0.015	7.99	711	12
712	1.59	2.33	2481.26	2480.83	43	0.010	0.015	10.75	712	12
713	0.64	0.94	2488.62	2488.19	43	0.010	0.015	7.65	713	12
714	3.85	1.14	2493.44	2493.00	41	0.011	0.015	8.12	714	12
714A	0.90	1.32	2494.51	2494.11	40	0.010	0.015	8.69	714A	12
715	18.68	5.53	2489.39	2488.95	44	0.010	0.015	14.88	715	15
716	1.04	1.52	2492.32	2491.88	44	0.010	0.015	9.17	716	12
717	0.48	0.70	2504.89	2504.48	41	0.010	0.015	6.66	717	12
718	0.94	1.38	2515.49	2515.07	42	0.010	0.015	8.83	718	12
719	0.23	0.34	2534.25	2533.83	42	0.010	0.015	5.21	719	12
720	0.55	0.80	2541.00	2537.40	72	0.050	0.015	5.34	720	12
721	0.52	0.78	2541.00	2539.50	66	0.023	0.015	6.06	721	12
722	0.38	0.56	2498.84	2498.48	36	0.010	0.015	6.29	722	12
723	0.18	0.26	2530.32	2529.97	34	0.010	0.015	4.73	723	12
724	0.33	0.48	2514.61	2514.25	36	0.010	0.015	5.96	724	12
725	0.78	1.14	2474.95	2473.91	34	0.031	0.015	6.68	725	12
726	0.17	0.25	2560.07	2559.86	42	0.005	0.015	5.30	726	12
727	0.13	0.19	2582.19	2581.75	44	0.010	0.015	4.21	727	12
728	4.11	1.22	2584.14	2583.64	50	0.010	0.015	8.44	728	12
729	4.59	1.38	2588.98	2588.46	52	0.010	0.015	8.79	729	12
730	2.52	0.75	2609.28	2608.86	42	0.010	0.015	7.02	730	12
731	0.40	0.59	2630.28	2629.86	42	0.010	0.015	6.41	731	12
732	0.79	1.16	2647.51	2647.30	42	0.005	0.015	9.42	732	12
733	-	-	-	-	-	-	-	-	733	-
734	0.53	0.78	2704.00	2702.54	46	0.032	0.015	5.74	734	12

735	0.84	1.23	2714.52	2714.11	41	0.010	0.015	8.47	735	12
736	0.51	0.75	2733.00	2732.26	46	0.016	0.015	6.42	736	12
737	0.82	1.20	2734.52	2734.11	41	0.010	0.015	8.39	737	12
738	0.91	1.33	2725.74	2725.29	45	0.010	0.015	8.72	738	12
739	0.16	0.23	2720.09	2719.59	50	0.010	0.015	4.55	739	12
740	9.47	2.81	2715.37	2714.92	45	0.010	0.015	11.54	740	12
741	0.38	0.56	2738.85	2738.40	45	0.010	0.015	6.29	741	12
742	0.50	0.73	2754.14	2753.69	45	0.010	0.015	6.97	742	12
743	0.35	0.51	2775.45	2775.00	45	0.010	0.015	6.10	743	12
744	0.09	0.13	2785.95	2785.50	45	0.010	0.015	3.66	744	12
745	0.37	0.54	2798.06	2797.51	55	0.010	0.015	6.23	745	12
746	0.37	0.54	2802.16	2800.00	50	0.043	0.015	4.73	746	12
747	1.74	2.55	2811.25	2410.80	45	8.899	0.015	3.11	747	12
748	1.20	1.76	2815.58	2415.53	45	8.890	0.015	2.71	748	12
749	0.64	0.94	2822.31	2821.89	42	0.010	0.015	7.65	749	12
750	0.57	0.83	2838.24	2837.82	42	0.010	0.015	7.32	750	12
751	0.43	0.63	2853.29	2852.87	42	0.010	0.015	6.59	751	12
752	0.27	0.40	2871.26	2870.84	42	0.010	0.015	5.53	752	12
753	0.23	0.34	2863.19	2862.77	42	0.010	0.015	5.21	753	12
754	0.35	0.51	2850.55	2850.13	42	0.010	0.015	6.10	754	12
755	0.17	0.25	2822.48	2822.06	42	0.010	0.015	4.65	755	12
756	0.34	0.50	2817.75	2817.33	42	0.010	0.015	6.03	756	12
757	0.39	0.57	2830.03	2829.58	45	0.010	0.015	6.35	757	12
758	0.11	0.16	2841.80	2841.35	45	0.010	0.015	3.95	758	12
759	0.64	0.94	2830.43	2829.98	45	0.010	0.015	7.65	759	12
760	0.23	0.34	2819.41	2818.96	45	0.010	0.015	5.21	760	12
761	0.15	0.22	2796.82	2796.37	45	0.010	0.015	4.44	761	12
762	0.24	0.35	2770.01	2769.56	45	0.010	0.015	5.29	762	12
763	0.15	0.22	2703.51	2703.06	45	0.010	0.015	4.44	763	12
764	0.22	0.32	2688.34	2687.89	45	0.010	0.015	5.12	764	12
765	0.56	0.82	2686.13	2685.68	45	0.010	0.015	7.27	765	12
766	0.22	0.32	2691.63	2691.18	45	0.010	0.015	5.12	766	12
767	0.30	0.44	2693.90	2693.45	45	0.010	0.015	5.75	767	12
768	0.10	0.15	2720.38	2719.93	45	0.010	0.015	3.81	768	12
769	0.21	0.31	2737.47	2736.63	42	0.020	0.015	4.42	769	12
770	1.10	1.61	2734.75	2734.33	42	0.010	0.015	9.37	770	12
771	0.29	0.42	2778.50	2778.04	46	0.010	0.015	5.68	771	12
772	0.06	0.09	2791.08	2790.63	45	0.010	0.015	3.15	772	12
773	0.03	0.04	2791.08	2790.63	45	0.010	0.015	2.43	773	12
774	0.27	0.40	2793.28	2792.86	42	0.010	0.015	5.53	774	12
775	0.09	0.13	2799.27	2798.85	42	0.010	0.015	3.66	775	12
776	0.21	0.31	2806.10	2805.67	43	0.010	0.015	5.03	776	12
777	0.12	0.18	2826.75	2826.25	50	0.010	0.015	4.08	777	12

Culvert Sizing using Mannings Equation

KELSEY CONNECTOR (800 Series)

Assumptions

1. Culverts are flowing full; inlet and outlet unsubmerged

Equation	Reference
Dmin = 1.335 (nQ/(S^(1/2))^(3/8)	Lindeburg, 2006
Q = Ad / 3.3749	Horizons, 2008

Culvert ID	Drainage Area (acre)	Calculated 10-Year Flow (cfs)	Invert In	Invert Out	Length	Slope	Mannings	Dmin	Culvert ID	Size
	Ad					S	n			
800	12.02	3.56	2157.32	2156.97	35	0.010	0.015	12.62	800	15
801	3.82	1.13	2197.98	2197.62	36	0.010	0.015	8.21	801	12
802	0.53	0.16	2216.96	216.60	36	55.566	0.015	0.78	802	12
803	33.36	9.88	2229.48	2229.15	33	0.010	0.015	18.50	803	24
804	0.75	0.22	2240.76	2240.44	33	0.010	0.015	4.48	804	12
805	0.28	0.08	2257.32	2256.96	36	0.010	0.015	3.08	805	12
806	0.46	0.14	2319.04	2318.70	34	0.010	0.015	3.71	806	12
807	0.63	0.19	2335.95	2335.91	34	0.001	0.015	6.24	807	12
808	2.40	0.71	2350.07	2349.73	34	0.010	0.015	6.90	808	12
809	3.34	0.99	2359.48	2359.14	34	0.010	0.015	7.81	809	12
810	3.68	1.09	2364.28	2363.94	34	0.010	0.015	8.09	810	12
811	0.63	0.19	2370.65	2370.31	34	0.010	0.015	4.18	811	12
812	17.83	5.28	2376.81	2376.47	34	0.010	0.015	14.63	812	15
813	11.31	3.35	2383.32	2382.98	34	0.010	0.015	12.33	813	15
814	1.19	0.35	2399.67	2399.33	34	0.010	0.015	5.30	814	12
815	6.01	1.78	2413.87	2413.53	34	0.010	0.015	9.73	815	12
816	1.76	0.52	2423.48	2423.14	34	0.010	0.015	6.14	816	12
817	0.67	0.20	2450.62	2450.28	34	0.010	0.015	4.27	817	12
818	1.33	0.39	2474.00	2473.66	34	0.010	0.015	5.53	818	12
819	10.86	3.22	2493.53	2493.19	34	0.010	0.015	12.15	819	15
820	1.02	0.30	2515.39	2515.05	34	0.010	0.015	5.00	820	12
821	0.62	0.18	2528.38	2528.04	34	0.010	0.015	4.15	821	12
822	2.56	0.76	2540.93	2540.59	34	0.010	0.015	7.06	822	12
823	0.19	0.06	2565.72	2565.38	34	0.010	0.015	2.66	823	12
824	4.64	1.37	2588.78	2588.44	34	0.010	0.015	8.83	824	12
825	3.90	1.16	2626.47	2626.09	38	0.010	0.015	8.27	825	12

Culvert Sizing using Mannings Equation
KELSEY RIDGELINE (600 Series)

Assumptions

1. Culverts are flowing full; inlet and outlet unsubmerged

Equation			Reference
	Dmin = 1.335 (nQ/(S^(1/2))^(3/8)		Lindeburg, 2006
	Q = 0.6834 * Ad	*For Ad < 2.5 acres*	Horizons, 2008
	Q = 3.3749 * Ad	*For Ad > 2.5 acres*	Horizons, 2008

Culvert ID	Drainage Area (acre) Ad	Calculated 10-Year Flow (cfs)	Invert In	Invert Out	Length	Slope S	Mannings n	Dmin	Culvert ID	Size
618	1.78	2.60	2765.00	2763.00	62.00	0.032	0.015	9.01	618	12
619	0.08	0.12	2789.88	2789.47	41.00	0.010	0.015	3.51	619	12
620	3.97	1.18	2802.52	2802.00	52 00	0.010	0.015	8.33	620	12
621	1.26	1.84	2811.49	2811.09	40.00	0.010	0.015	9.86	621	12
622	1.30	1.90	2882.78	2882.36	42.00	0.010	0.015	9.97	622	12
623	1.92	2.81	2899.03	2898.61	42.00	0.010	0.015	11.54	623	12
624	0.56	0.82	3003.67	3003.27	40.00	0.010	0.015	7.27	624	12
625	1.67	2.44	3014.47	3014.05	42.00	0.010	0.015	10.95	625	12
626	1.12	1.64	3030.14	3029.70	44.00	0.010	0.015	9.43	626	12
627	0.16	0.23	3601.10	3060.68	42.00	12.867	0.015	1.19	627	12
628	0.81	1.19	3108.37	3107.93	44.00	0.010	0.015	8.35	628	12
629	1.95	2.85	3130.89	3030.49	40.00	2.510	0.015	4.12	629	12
630	1.77	2.59	3160.07	3159.65	42.00	0.010	0.015	11.20	630	12
631	2.65	0.79	3187.46	3187.04	42.00	0.010	0.015	7.16	631	12
632	4.21	1.25	3202.12	3201.72	40.00	0.010	0.015	8.51	632	12
633	2.34	3.42	3213.08	3212.68	40.00	0.010	0.015	12.43	633	15
634	0.66	0.97	3213.30	3212.90	40.00	0.010	0.015	7.73	634	12
635	0.68	1.00	3216.41	3216.01	40.00	0.010	0.015	7.82	635	12
636	2.39	3.50	3229.37	3228.97	40.00	0.010	0.015	12.53	636	15
637	0.49	0.72	3226.50	3219.00	65.00	0.115	0.015	4.37	637	12
638	0.59	0.86	3258.47	3258.07	40.00	0.010	0.015	7.42	638	12
639	0.72	1.05	3272.94	3272.54	40.00	0.010	0.015	7.99	639	12
640	1.28	1.87	3281.00	3275.00	62.00	0.097	0.015	6.48	640	12
641	0.38	0.56	3307.00	3301.00	52.00	0.115	0.015	3.97	641	12
642	0.28	0.41	3331.00	3329.00	45.00	0.044	0.015	4.24	642	12
643	0.22	0.32	3277.68	3277.26	42.00	0.010	0.015	5.12	643	12
644	0.63	0.92	3263.55	3263.15	40.00	0.010	0.015	7.60	644	12
645	0.60	0.88	3249.73	3249.31	42.00	0.010	0.015	7.46	645	12
646	0.79	1.16	3230.74	3230.32	42.00	0.010	0.015	8.27	646	12
647	0.43	0.63	3218.50	3214.50	80.00	0.050	0.015	4.87	647	12
648	0.45	0.66	3211.68	3211.28	40.00	0.010	0.015	6.70	648	12
649	0.21	0.31	3253.84	3253.42	42.00	0.010	0.015	5.03	649	12
650	0.77	1.13	3274.59	3274.19	40.00	0.010	0.015	8.19	650	12
651	0.38	0.56	3293.00	3292.00	42.00	0.024	0.015	5.34	651	12
652	0.11	0.16	3287.12	3286.72	40.00	0.010	0.015	3.95	652	12
653	0.29	0.42	3284.67	3284.22	45.00	0.010	0.015	5.68	653	12

654	0.29	0.42	3274.93	3274.48	45.00	0.010	0.015	5.68	654	12
655	0.33	0.48	3247.75	3239.00	70.00	0.125	0.015	3.71	655	12
656	0.35	0.51	3252.10	3251.62	48.00	0.010	0.015	6.10	656	12
657	0.28	0.41	3270.89	3270.41	48.00	0.010	0.015	5.61	657	12
658	0.10	0.15	3281.75	3280.10	65.00	0.025	0.015	3.20	658	12
659	0.35	0.51	3283.23	3282.73	50.00	0.010	0.015	6.10	659	12
660	0.12	0.18	3291.40	3290.95	45.00	0.010	0.015	4.08	660	12
661	0.09	0.13	3297.80	3297.38	42.00	0.010	0.015	3.68	661	12
662	0.11	0.16	3331.36	3330.94	42.00	0.010	0.015	3.95	662	12
663	0.11	0.16	3342.88	3342.46	42.00	0.010	0.015	3.95	663	12
664	0.45	0.66	3365.90	3365.48	42.00	0.010	0.015	6.70	664	12
665	0.15	0.22	3379.21	3378.79	42.00	0.010	0.015	4.44	665	12
666	0.16	0.23	3388.69	3388.29	40.00	0.010	0.015	4.55	666	12
667	0.13	0.19	3370.90	3370.48	42.00	0.010	0.015	4.21	667	12
668	0.23	0.34	3384.02	3383.60	42.00	0.010	0.015	5.21	668	12
669	0.11	0.16	3408.23	3407.77	46.00	0.010	0.015	3.95	669	12
670	0.42	0.61	3426.88	3426.46	42.00	0.010	0.015	6.53	670	12
671	0.18	0.26	3441.33	3440.89	44.00	0.010	0.015	4.75	671	12
672	0.86	1.26	3444.85	3444.41	44.00	0.010	0.015	8.54	672	12

From App. 19.C, $d/D = 0.66$ and $\mathrm{v}/\mathrm{v}_{\text{full}} = 0.92$.

$$\mathrm{v} = (0.92)\left(1.75\ \frac{\text{ft}}{\text{sec}}\right) = 1.61 \text{ ft/sec}$$

$$d = (0.66)(20 \text{ in}) = 13.2 \text{ in}$$

8. HAZEN-WILLIAMS VELOCITY

The empirical Hazen-Williams open channel velocity equation was developed in the early 1920s. It is still occasionally used in the United States for sizing gravity sewers. It is applicable to water flows at reasonably high Reynolds numbers and is based on sound dimensional analysis. However, the constants and exponents were developed experimentally.

The equation uses the Hazen-Williams constant, C, to characterize the roughness of the channel. Since the equation is used only for water within "normal" ambient conditions, the effects of temperature, pressure, and viscosity are disregarded. The primary advantage of this approach is that the constant, C, depends only on the roughness, not on the fluid characteristics. This is also the method's main disadvantage, since professional judgment is required in choosing the value of C.

$$\mathrm{v} = 0.85CR^{0.63}S_0^{0.54} \quad \text{[SI]} \qquad 19.14(a)$$

$$\mathrm{v} = 1.318CR^{0.63}S_0^{0.54} \quad \text{[U.S.]} \qquad 19.14(b)$$

9. NORMAL DEPTH

When the depth of flow is constant along the length of the channel (i.e., the depth is neither increasing nor decreasing), the flow is said to be *uniform*. The depth of flow in that case is known as the *normal depth*, d_n. If the normal depth is known, it can be compared with the actual depth of flow to determine if the flow is uniform.[6]

The difficulty with which the normal depth is calculated depends on the cross section of the channel. If the width is very large compared to the depth, the flow cross section will essentially be rectangular and the Manning equation can be used. (Equation 19.15 assumes that the hydraulic radius equals the normal depth.)

$$d_n = \left(\frac{nQ}{w\sqrt{S}}\right)^{3/5} \quad [w \gg d_n] \quad \text{[SI]} \qquad 19.15(a)$$

$$d_n = 0.788\left(\frac{nQ}{w\sqrt{S}}\right)^{3/5} \quad [w \gg d_n] \quad \text{[U.S.]} \qquad 19.15(b)$$

Normal depth in circular channels can be calculated directly only under limited conditions. If the circular channel is flowing full, the normal depth is the inside pipe diameter.

[6]Normal depth is a term that applies only to uniform flow. The two alternate depths that can occur in nonuniform flow are not normal depths.

$$D = d_n = 1.548\left(\frac{nQ}{\sqrt{S}}\right)^{3/8} \quad \text{[full]} \quad \text{[SI]} \qquad 19.16(a)$$

$$D = d_n = 1.335\left(\frac{nQ}{\sqrt{S}}\right)^{3/8} \quad \text{[full]} \quad \text{[U.S.]} \qquad 19.16(b)$$

If a circular channel is flowing half full, the normal depth is half of the inside pipe diameter.

$$D = 2d_n = 2.008\left(\frac{nQ}{\sqrt{S}}\right)^{3/8} \quad \text{[half full]} \quad \text{[SI]} \qquad 19.17(a)$$

$$D = 2d_n = 1.731\left(\frac{nQ}{\sqrt{S}}\right)^{3/8} \quad \text{[half full]} \quad \text{[U.S.]} \qquad 19.17(b)$$

For other cases of uniform flow (trapezoidal, triangular, etc.), it is more difficult to determine normal depth. Various researchers have prepared tables and figures to assist in the calculations. For example, Table 19.3 is derived from App. 19.C and can be used for circular channels flowing other than full or half full.

In the absence of tables or figures, trial-and-error solutions are required. The appropriate expressions for the flow area and hydraulic radius are used in the Manning equation. Trial values are used in conjunction with graphical techniques, linear interpolation, or extrapolation to determine the normal depth. The Manning equation is solved for flow rate with various assumed values of d_n. The calculated value is compared to the actual known flow quantity, and the normal depth is approached iteratively.

For a rectangular channel whose width is small compared to the depth, the hydraulic radius and area in flow are

$$R = \frac{wd_n}{w + 2d_n} \qquad 19.18$$

$$A = wd_n \qquad 19.19$$

$$Q = \left(\frac{1.00}{n}\right)(wd_n)\left(\frac{wd_n}{w + 2d_n}\right)^{2/3}\sqrt{S} \quad \text{[rectangular]} \quad \text{[SI]} \qquad 19.20(a)$$

$$Q = \left(\frac{1.49}{n}\right)(wd_n)\left(\frac{wd_n}{w + 2d_n}\right)^{2/3}\sqrt{S} \quad \text{[rectangular]} \quad \text{[U.S.]} \qquad 19.20(b)$$

For a trapezoidal channel with exposed surface width w, base width b, side length s, and normal depth of flow d_n, the hydraulic radius and area in flow are

$$R = \frac{d_n(b + w)}{2(b + 2s)} \quad \text{[trapezoidal]} \qquad 19.21$$

$$A = \frac{d_n(w + b)}{2} \quad \text{[trapezoidal]} \qquad 19.22$$

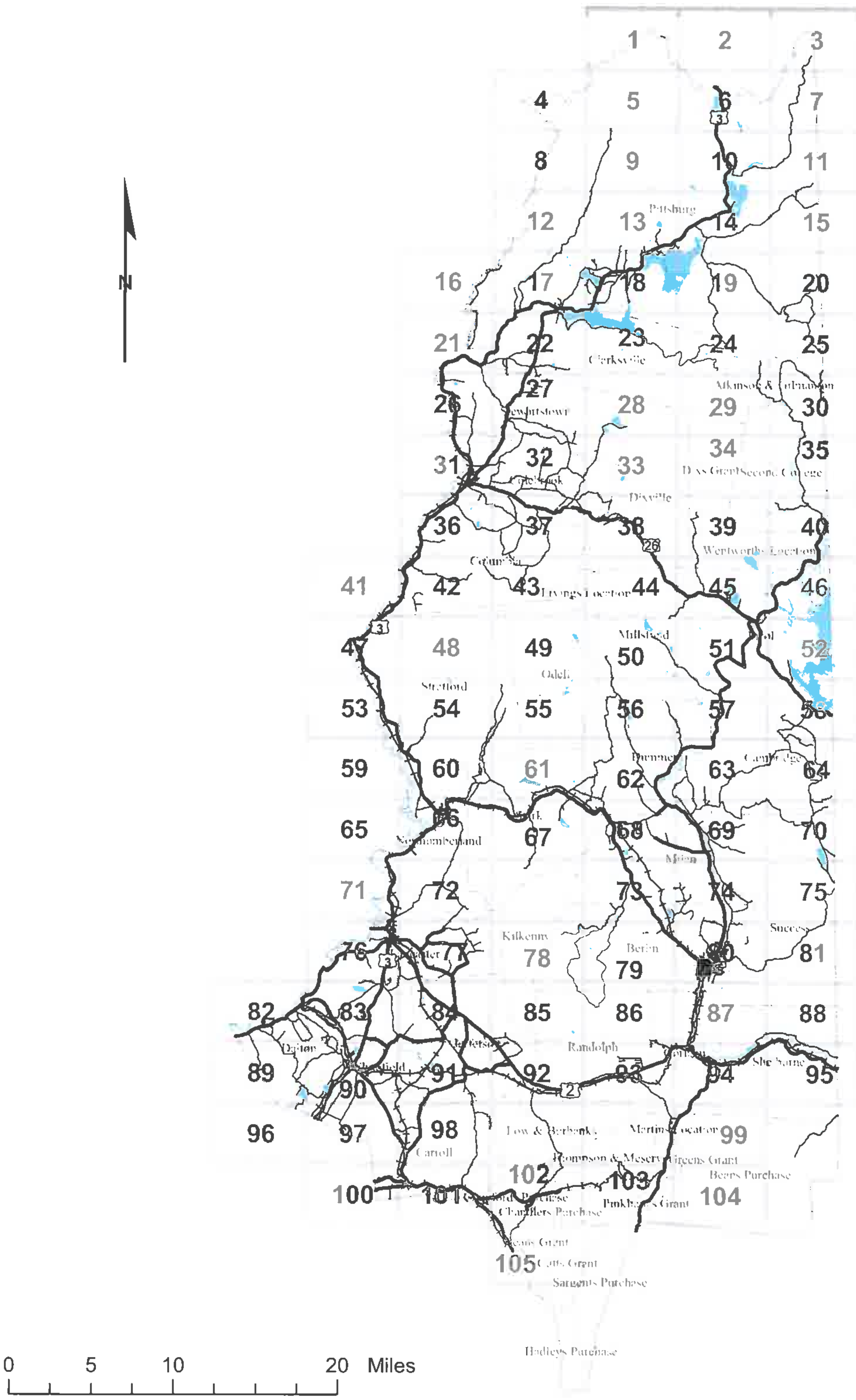
M. LINDEBURG, 2006.
"CIVIL ENGINEERING REFERENCE MANUAL FOR THE PE EXAM" 10TH EDITION

Soil Maps and Soil Descriptions

United States Department of Agriculture
Natural Resources Conservation Service

INDEX TO MAP SHEETS

COÖS COUNTY, NEW HAMPSHIRE



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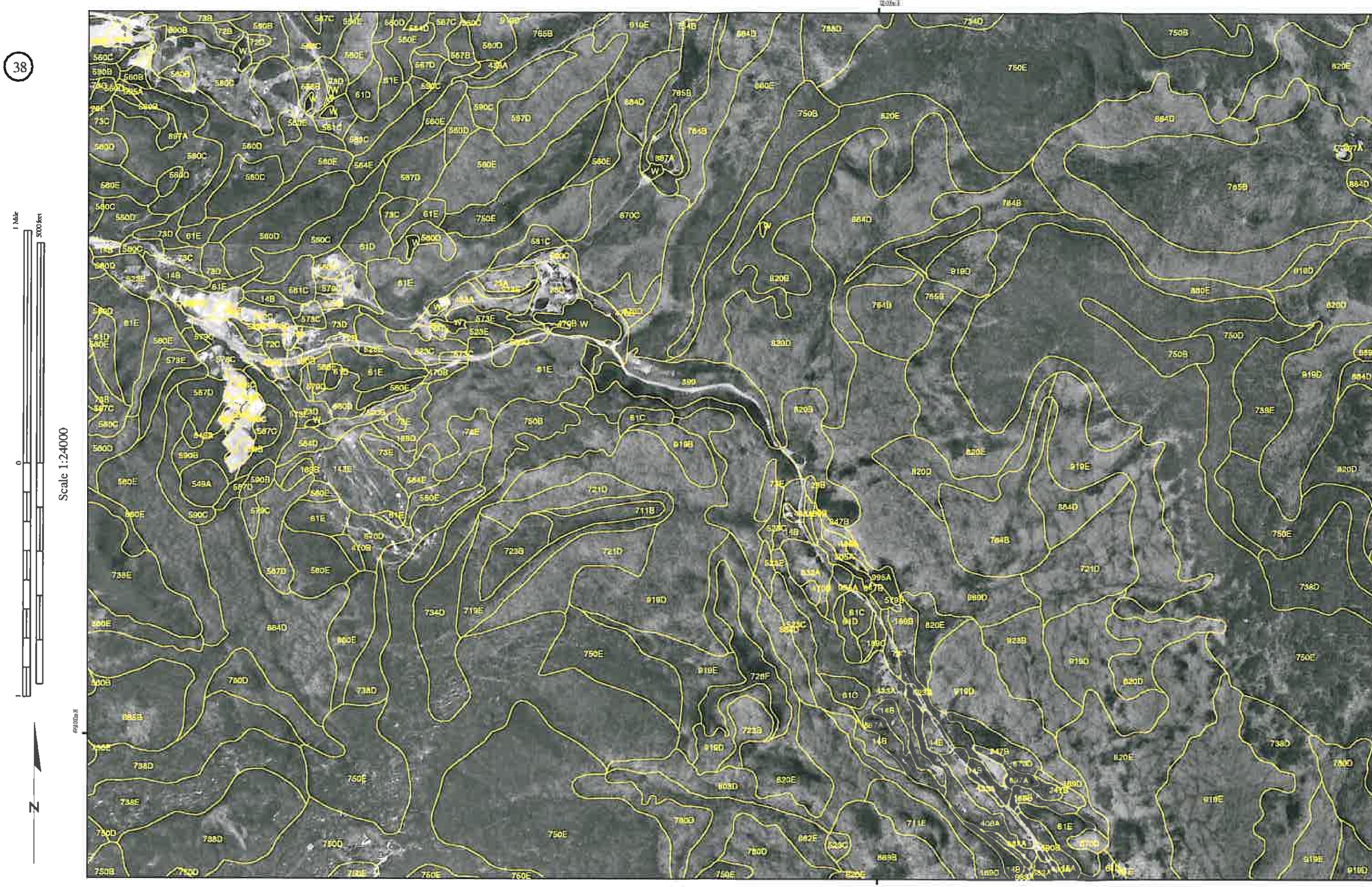

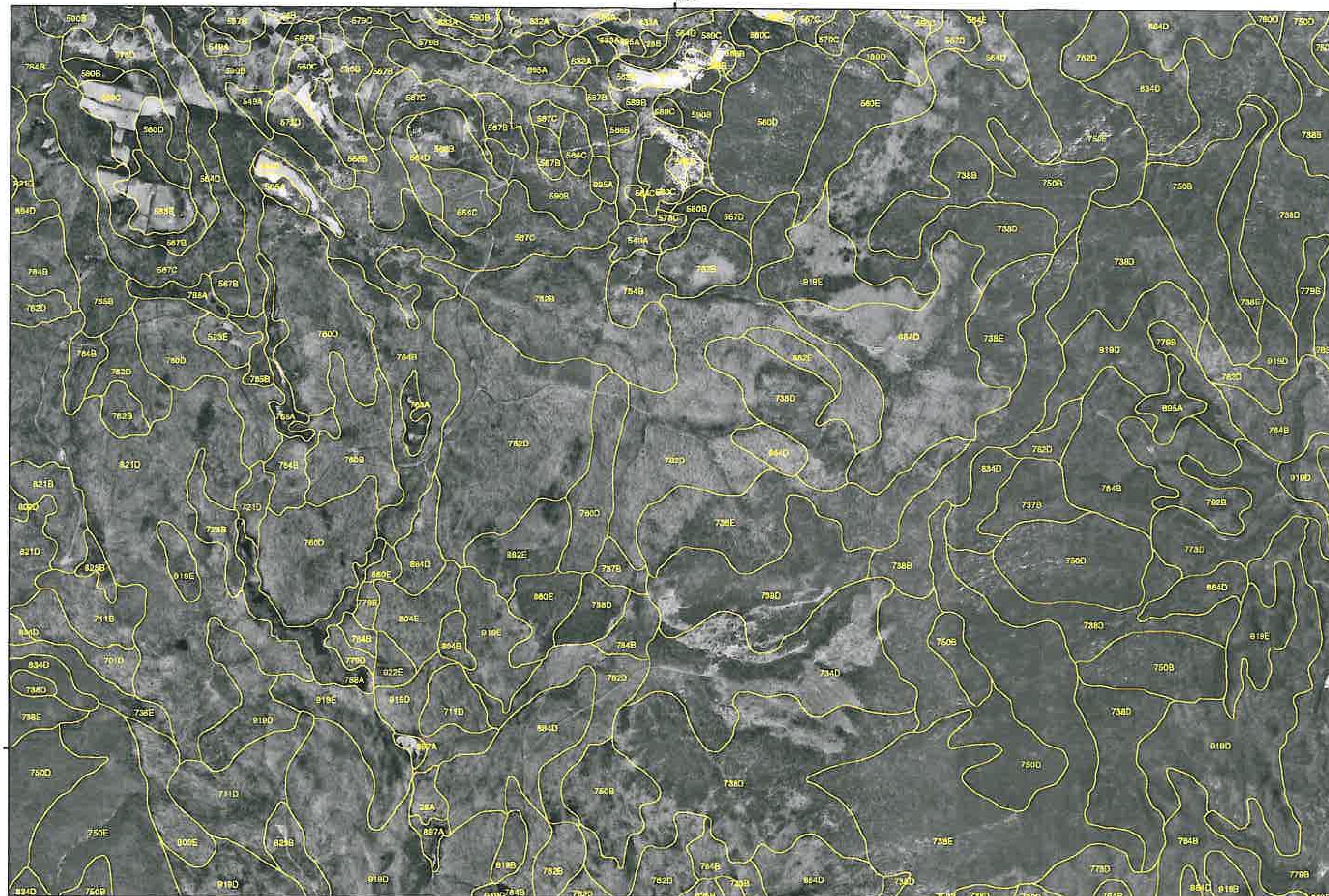

1 Mile

5000 feet

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N

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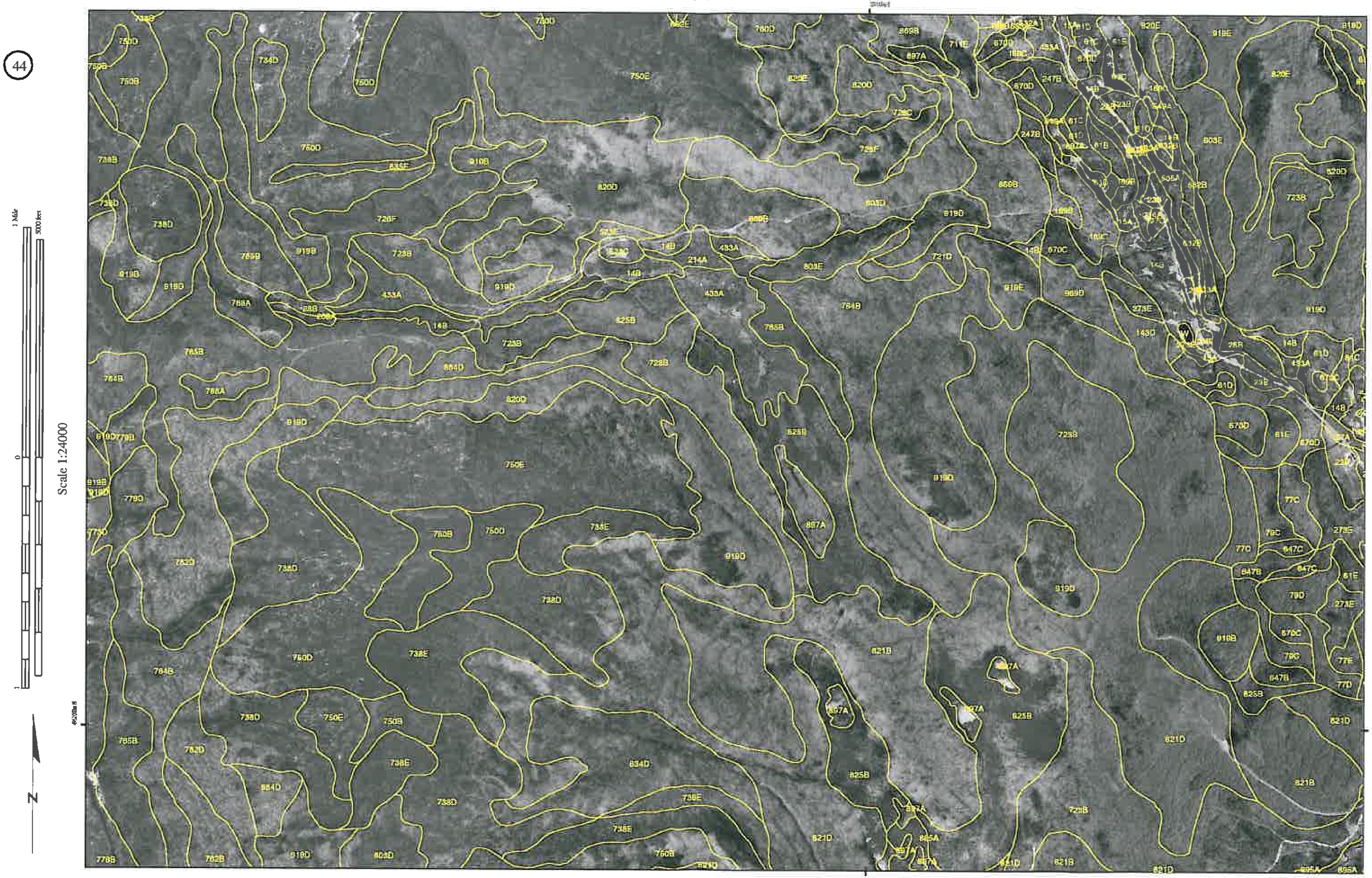

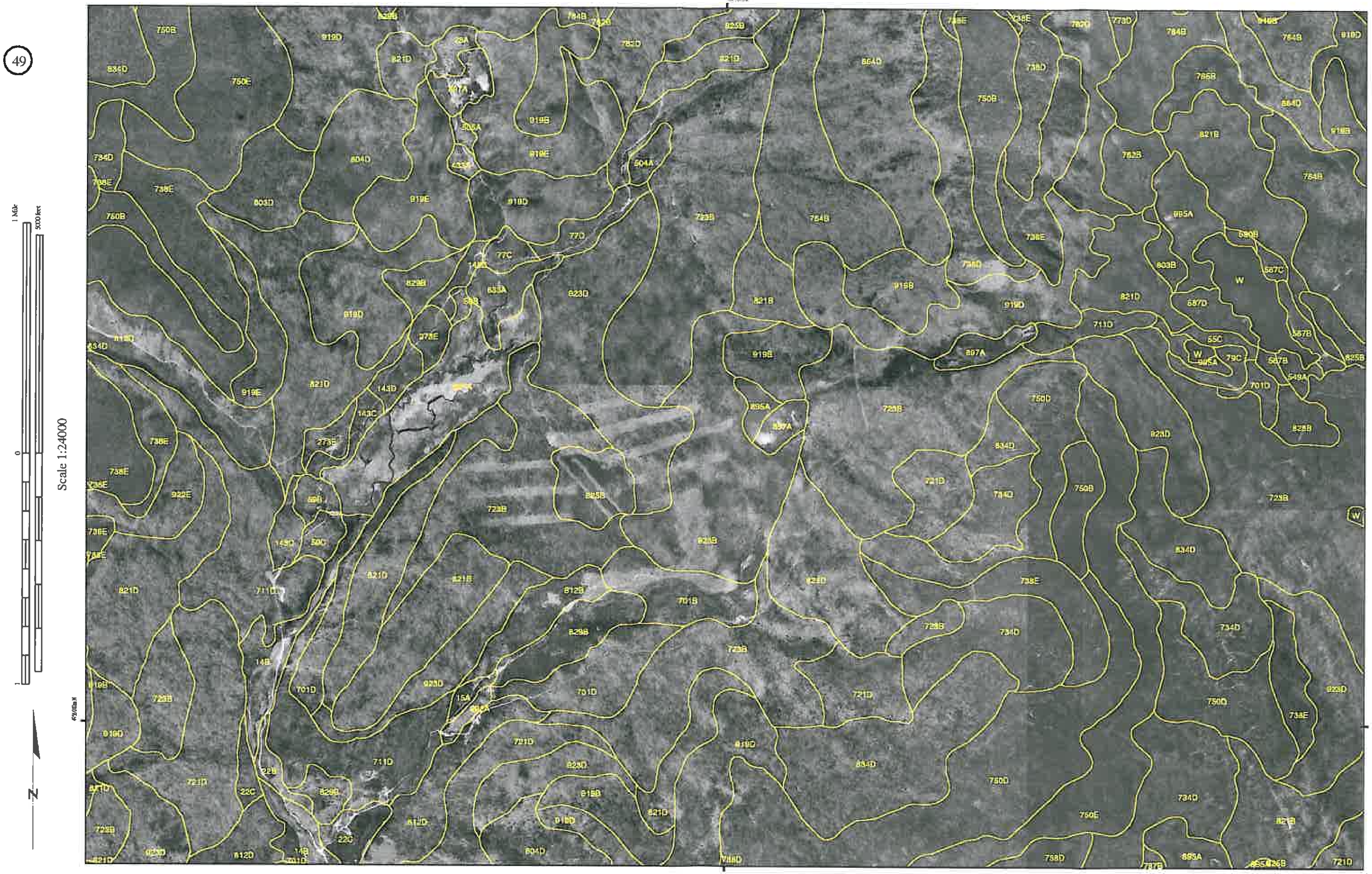
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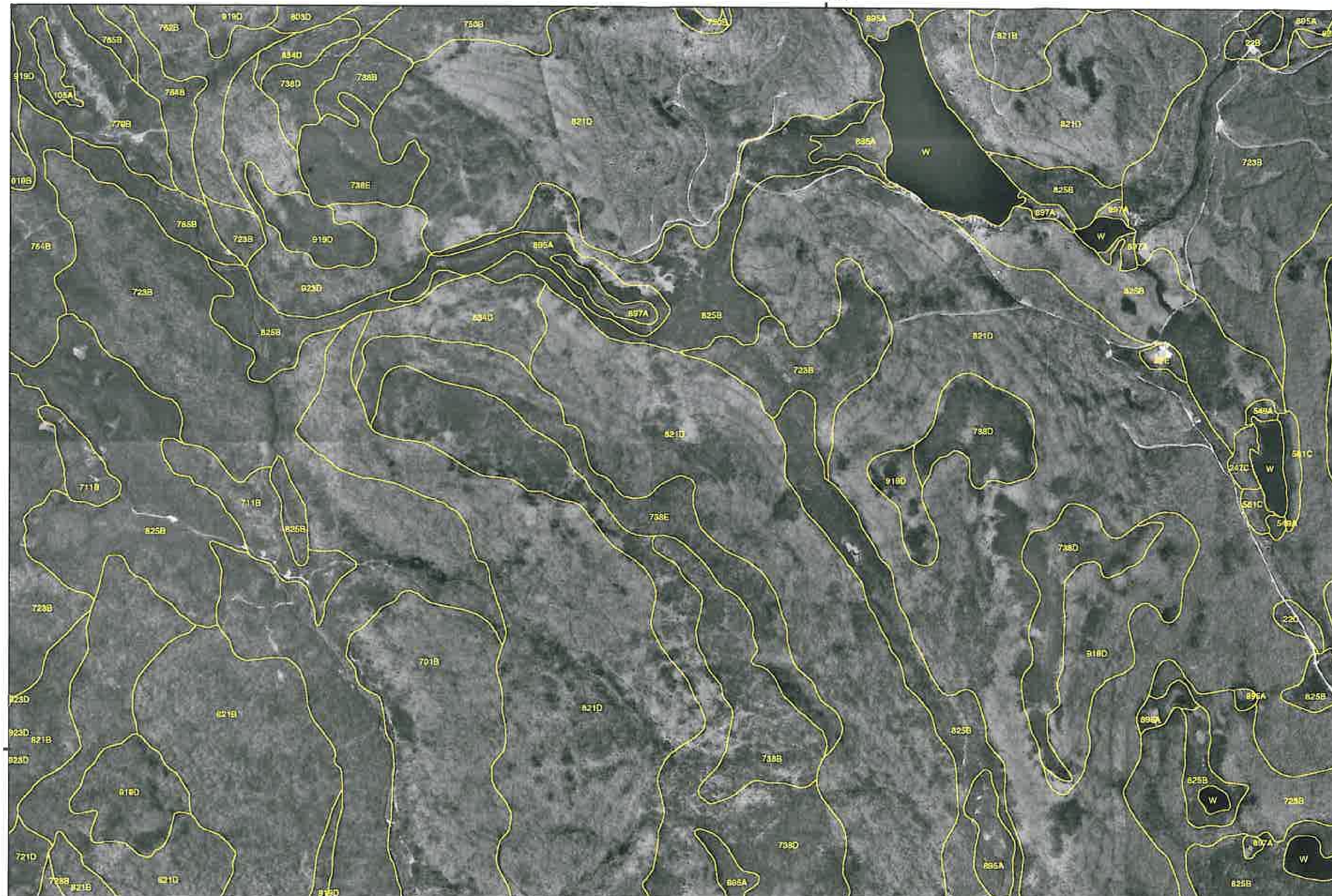

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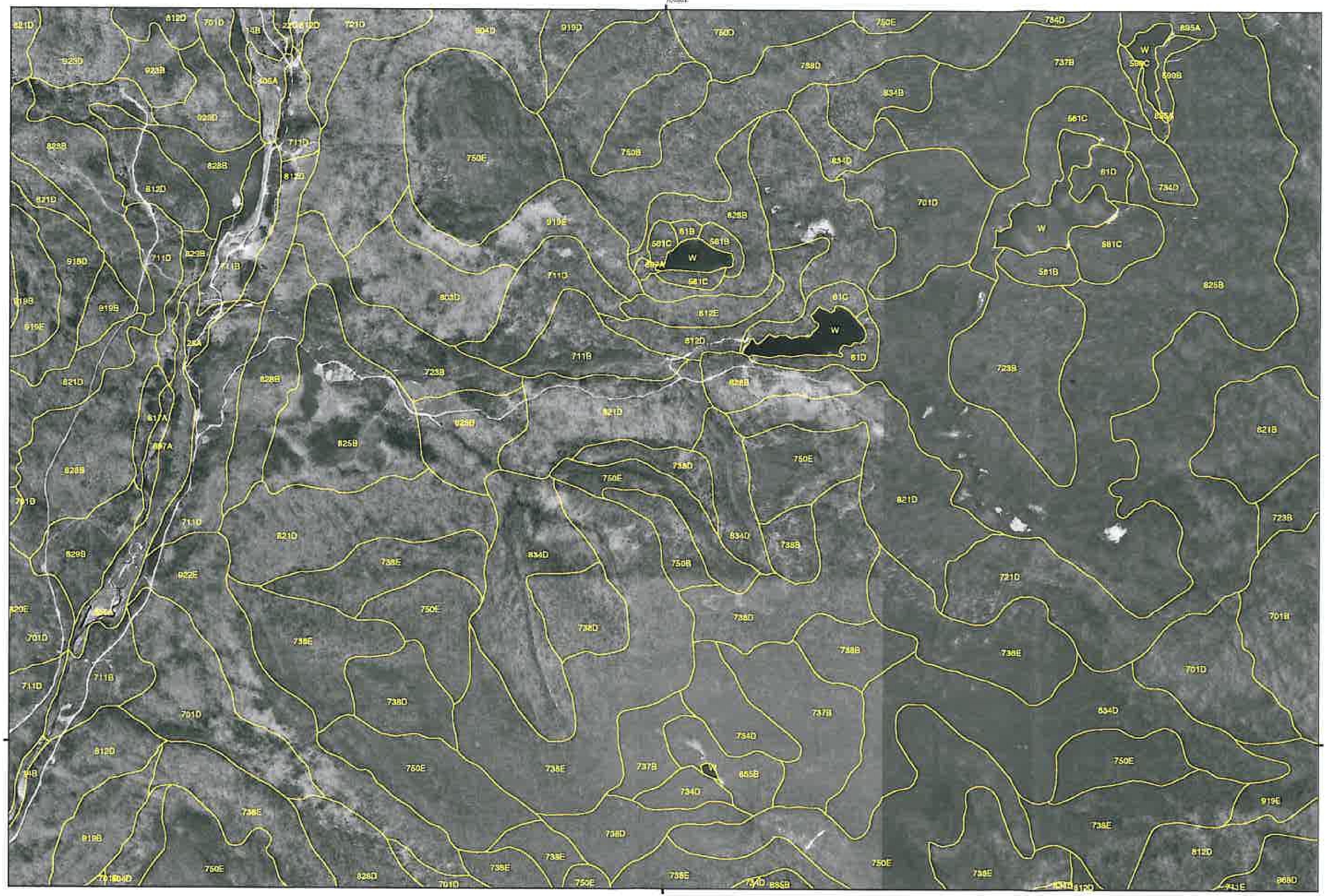

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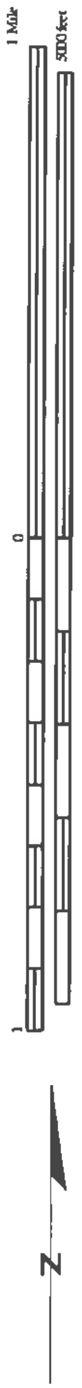
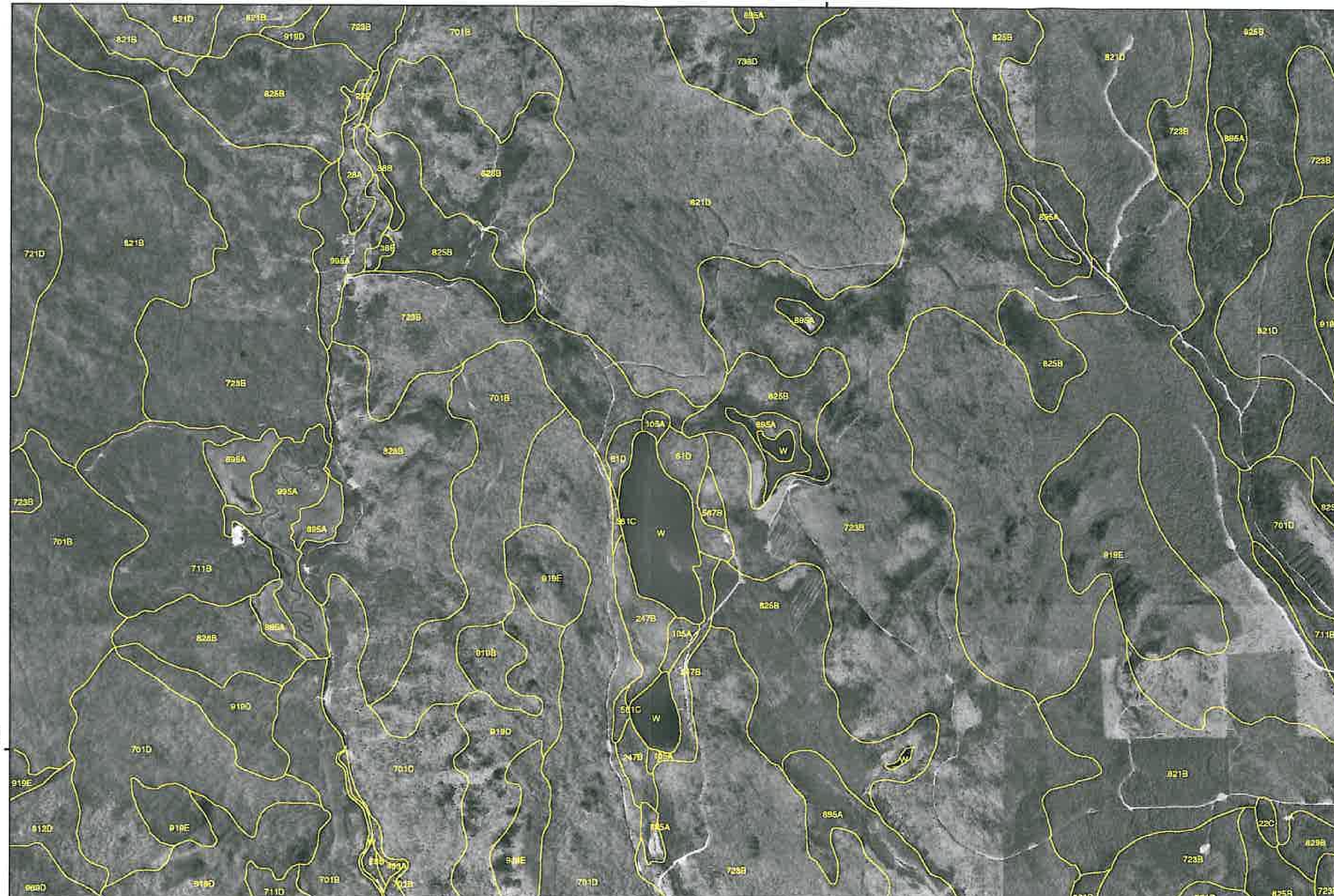


56



1 Mile

5000 feet

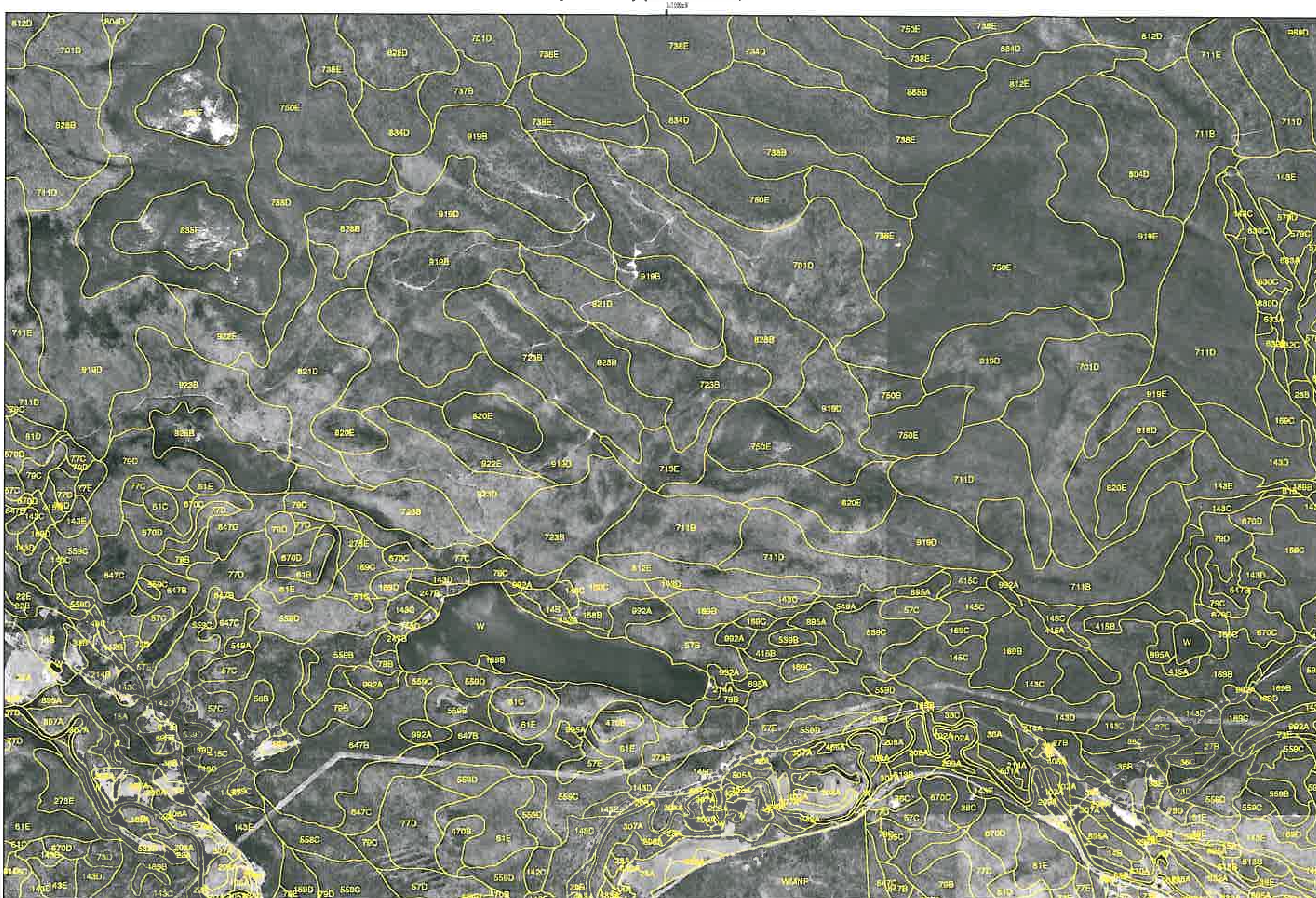
Scale 1:24000

N

Coos County Soil Survey (Interim Release)

61

Scale 1:24000



62

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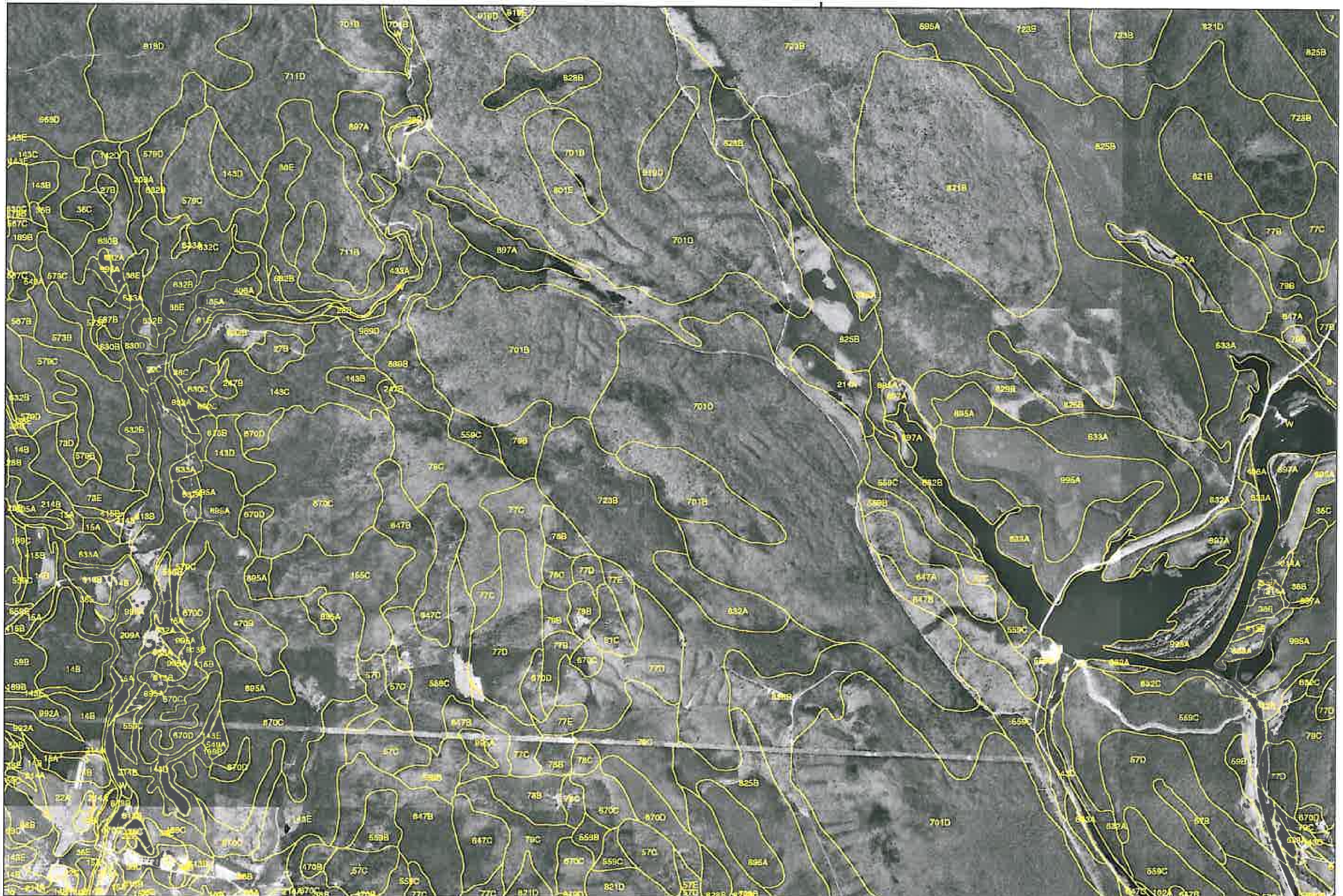


PROJECT SPECIFIC SOILS SUMMARY

Map Symbol	Soil Name	Hydrologic Soil Group
22	COLTON	A
36	ADAMS	A
55	HERMON	A
14	SHEEPSCOT	B
28	MADAWASKA	B
73	BERKSHIRE	B
169	SUNAPEE	B
523	STETSON	B
711	MONADNOCK-HERMON ASSOCIATION	B
803	BERKSHIRE-MONADNOCK ASSOCIATION	B
803	BERKSHIRE-MONADNOCK ASSOCIATION	B
143	MONADNOCK	B
61	TUNBRIDGE-LYMAN-ROCK OUTCROP COMPLEX	C
76	MARLOW	C
77	MARLOW	C
78	PERU	C
79	PERU	C
105	RUMNEY	C
209	CHARLES	C
214	NAUMBURG	C
247	LYME	C
433	GRANGE	C
559	SKERRY	C
561	TUNBRIDGE-PLAISTED-LYMAN COMPLEX	C
567	HOWLAND	C
632	NICHOLVILLE	C
633	PEMI	C
647	PILLSBURY	C
701	BECKET-SKERRY ASSOCIATION	C
719	MARLOW-TUNBRIDGE ASSOCIATION	C
721	PERU-MARLOW ASSOCIATION	C
734	SURPLUS-SISK ASSOCIATION	C
736	SISK-GLEBE ASSOCIATION	C
760	TUNBRIDGE-PLAISTED ASSOCIATION	C
762	PLAISTED-HOWLAND ASSOCIATION	C
773	BANGOR-DIXMONT ASSOCIATION	C
779	DIXMONT-BANGOR ASSOCIATION	C
801	BECKET-MARLOW ASSOCIATION	C
821	MARLOW-PERU ASSOCIATION	C
828	SKERRY-PERU ASSOCIATION	C
834	SISK-SURPLUS ASSOCIATION	C
862	PLAISTED-TUNBRIDGE ASSOCIATION	C
864	HOWLAND-PLAISTED ASSOCIATION	C
869	SUNAPEE-MOOSILAUKE-MONADNOCK ASSOCIATION	C
919	TUNBRIDGE-LYMAN-MARLOW ASSOCIATION	C
923	MARLOW-PERU ASSOCIATION	C
737	SURPLUS-BEMIS ASSOCIATION	C
560	TUNBRIDGE-PLAISTED-LYMAN COMPLEX	D
670	TUNBRIDGE-BERKSHIRE-LYMAN COMPLEX	D
723	PERU-PILLSBURY ASSOCIATION	D
726	ROCK OUTCROP-LYMAN COMPLEX	D
738	GLEBE-SADDLEBACK-SISK ASSOCIATION	D
750	SADDLEBACK-GLEBE-RICKER ASSOCIATION	D
764	HOWLAND-MONARDA ASSOCIATION	D
765	MONARDA-HOWLAND ASSOCIATION	D
768	PEACHAM-WONSQUEAK-CABOT ASSOCIATION	D
820	LYMAN-TUNBRIDGE-ROCK OUTCROP COMPLEX	D
825	PILLSBURY-PEACHAM-PERU ASSOCIATION	D
832	PEACHAM-WONSQUEAK-PILLSBURY ASSOCIATION	D
835	RICKER-ROCK OUTCROP COMPLEX	D
860	TUNBRIDGE-LYMAN-ROCK OUTCROP COMPLEX	D
895	BUCKSPORT MUCK	D
897	PEACHAM, BUCKSPORT, AND RUMNEY	D
995	WONSQUEAK MUCK	D
549	PEACHAM	D
590	CABOT	D

Note Soils Descriptions and Hydrologic Soil Groups taken from the "Soils Survey for Coos County, New Hampshire", USDA, NRCS

Colton Series

The Colton series consists of very deep excessively drained soils on glacial outwash plains, terraces, kames, and eskers. These soils formed in sandy and gravelly glacial outwash deposits. Slopes range from 0 percent to 60 percent. These soils are classified as sandy-skeletal, mixed, frigid Typic Haplorthods.

Colton soils occur on the landscape near moderately well drained Sheepscot soils. Colton soils are also near Adams, Masardis, Stetson, Abenaki, Success and Waumbek soils. Adams soils formed in sandy glacial outwash. Masardis and Stetson soils formed in phyllitic sand and gravel and have loamy caps. Abenaki soils are alluvial. Success and Waumbek soils formed in glacial ablation till.

Typical pedon of Colton soils from an area of Udorthents, sandy, a gravel pit wall, in the town of Milan, 600 feet east of East Side Road at a point 700 feet north of the intersection of Stearns Brook Road and East Side Road, 50 feet south of James River Corporation logging road at edge of gravel pit; latitude 44 degrees 32 minutes 54 seconds North, longitude 71 degrees 9 minutes 44 seconds West:

Ap — 0 to 6 inches; dark yellowish brown (10YR 3/4) gravelly fine sandy loam; weak fine granular structure; very friable; many fine and very fine and few medium roots; 30 percent rock fragments (25 percent gravel and 5 percent cobbles); strongly acid; abrupt smooth boundary.

Bs — 6 to 18 inches; yellowish red (5YR 4/6) very gravelly sandy loam; weak medium subangular blocky structure; very friable; many very fine and few fine roots; 50 percent rock fragments (35 percent gravel and 15 percent cobbles); very strongly acid; abrupt wavy boundary.

C1 — 18 to 23 inches; olive brown (2.5Y 4/4) very gravelly coarse sand; single grain; loose; many very fine roots; 60 percent rock fragments (45 percent gravel and 15 percent cobbles); very strongly acid; abrupt wavy boundary.

C2 — 23 to 29 inches; olive brown (2.5Y 4/4) very gravelly coarse sand; single grain; loose; few very fine roots; 55 percent rock fragments (50 percent gravel and 5 percent cobbles); strongly acid; abrupt smooth boundary.

C3 — 29 to 65 inches; light olive brown (2.5Y 5/4) extremely gravelly coarse sand; single grain; loose; few very fine roots; 70 percent rock fragments (25 percent gravel and 45 percent cobbles); strongly acid.

The solum ranges from 18 to 45 inches in thickness. Rock fragments, mainly gravel and cobbles, range from less than 5 percent to 55 percent in the A or E horizons, from 15 percent to 55 percent in the B horizons, and from 35 percent to 70 percent in the C horizons. Reaction ranges from extremely acid to moderately acid unless limed.

The O horizon, if present, is neutral or has hue of 5YR to 10YR, value of 2 to 3, and chroma of 0 to 2.

The Ap horizon has hue of 5YR to 10YR, value of 2 to 5, and chroma of 2 to 4. It has weak fine and medium granular structure. Texture in the fine earth fraction is sand or loamy coarse sand to fine sandy loam. Some pedons that are not plowed have a thin A horizon with chroma of 0 to 3. Consistence is very friable or friable.

The E horizon if present has a hue of 5YR to 10YR, value of 4 to 7 and chroma of 1 or 2. It has weak fine granular or weak medium platy structure. Texture in the fine earth fraction is coarse sand to loamy fine sand, with occasional horizons that range to fine sandy loam. Consistence is very friable or friable.

The Bh horizon if present has hue of 2.5YR to 10YR, value of 2 to 4, and chroma of 1 to 4. It has weak fine granular or weak fine subangular blocky structure. Texture in the fine earth fraction is coarse sand to loamy fine sand, with occasional horizons that range to loam. Some pedons have a Bhs horizon with value and chroma of 3 or less. Consistence is very friable, friable, or loose.

The Bs horizon has hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 3 to 8. It has weak fine granular or weak medium subangular blocky structure. Texture in the fine earth fraction is coarse sand to loamy fine sand, with occasional horizons of fine sandy loam or sandy loam. Consistence is very friable, friable, or loose.

The BC horizon if present has hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6. It has weak fine or medium subangular blocky structure or is single grain. Texture in the fine earth fraction is coarse sand to loamy fine sand. Consistence is friable or loose.

The C horizon has hue of 7.5YR to 5Y, value of 3 to 7, and chroma of 2 to 6. It has single grain structure. The C horizon is gravel, cobblestones, or stones with sand in the interstices and has varying degrees of stratification. Consistence is loose.

Adams Series

The Adams series consists of very deep, excessively drained soils on glacial outwash plains, terraces, and kames. These soils formed in sandy glacial outwash deposits. Slopes range from 0 percent to 60 percent. These soils are classified as sandy, mixed, frigid Typic Haplorthods.

Adams soils occur on the landscape near the Colton, Groveton, Masardis, Stetson, Croghan, Sheepscot, Nicholville, and Salmon soils. Colton soils formed in stratified sand and gravel. Groveton soils have a loamy cap over sandy outwash. Masardis and Stetson soils formed in phyllitic sand and gravel and have loamy caps. Croghan and Sheepscot soils are moderately well drained. Nicholville and Salmon soils formed in lacustrine materials.

Typical pedon of Adams soils, from an area of Adams loamy sand, 15 percent to 60 percent slopes, in the town of Stratford, 200 feet east of where Connary Brook crosses NH Route 3; in a stand of white pines; latitude 44 degrees 40 minutes 42 seconds North and longitude 71 degrees 34 minutes 30 seconds West:

A — 0 to 2 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; many fine and common medium roots; very strongly acid; abrupt wavy boundary.

E — 2 to 5 inches; light brownish gray (10YR 6/2) sand; single grain; loose; common fine and few medium roots; very strongly acid; abrupt wavy boundary.

Bhs — 5 to 7 inches; very dusky red (2.5YR 2.5/2) sand; single grain; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

Bs — 7 to 12 inches; dark brown (7.5YR 4/4) sand; single grain; loose; few fine and medium roots; very strongly acid; clear smooth boundary.

BC — 12 to 20 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; few fine and medium roots; strongly acid; 5 percent rock fragments (gravel); clear smooth boundary.

C1 — 20 to 43 inches; light yellowish brown (2.5Y 6/4) sand; single grain; loose; few fine roots; strongly acid; 5 percent rock fragments (gravel); clear smooth boundary.

C2 — 43 to 65 inches; light gray (2.5Y 7/2) sand; single grain; loose; very strongly acid.

The solum ranges from 13 to 32 inches in thickness. Rock fragments, mostly gravel, range from 0 to 5 percent in the surface and subsoil layers and from 0 to less than 20 percent in the substratum layers. Reaction ranges from extremely acid to strongly acid throughout.

The O horizon, where present, is neutral or has hue of 5YR to 10YR, value of 2 to 3, and chroma of 0 to 2.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4 and chroma of 2 or 3. It has weak fine granular or subangular blocky structure or is single grain. Texture is loamy fine sand or loamy sand. Consistence is very friable.

The E horizon has hue of 7.5YR or 10YR, value 6, and chroma of 1 or 2. It has weak medium or fine granular structure or is single grain. Texture is loamy fine sand or sand. Consistence is very friable or loose.

The Bh or Bhs horizon has hue of 2.5YR to 7.5YR, value of 2 or 3, and chroma of 1 to 3. It has weak fine or medium granular structure or is single grain or massive. Texture is loamy sand or sand. Consistence is very friable, friable, or loose. Massive, cemented bodies (ortstein) range from 0 to 30 percent of the exposed surface area of the horizon.

The Bs horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. Texture is sandy loam, loamy sand, fine sand, or sand. Consistence is friable, very friable, or loose. Massive, cemented bodies (ortstein) range from 0 percent to 30 percent of the exposed surface area of the horizon.

The BC horizon has hue of 7.5YR to 2.5Y, value 4 to 6, and chroma of 4 to 8. Texture is fine sand to coarse sand. It has weak fine subangular blocky or granular structure or is massive or single grain. Consistence is friable, very friable, or loose. Massive cemented bodies (ortstein) range up to 20 percent of the exposed surface area in some pedons.

The C horizons have hue of 2.5Y, value of 5 to 7, and chroma of 2 to 4. They have weak fine granular structure or are massive or are single grain. Texture in the fine earth fraction is fine sand to coarse sand. Consistence is very friable or loose.

Hermon Series

The Hermon series consists of very deep, somewhat excessively drained soils on glaciated uplands. These soils formed in sandy-skeletal ablation till. Slopes range from 0 percent to 60 percent. These soils are classified as sandy-skeletal, mixed, frigid Typic Haplorthods.

Hermon soils occur on the landscape near moderately well drained Waumbek soils. The Hermon soils are also near the Colton, Success, Monadnock, Lyman and Tunbridge soils. The Colton soils form in glacial outwash. The Success soils have a continuously cemented BC horizon. The Monadnock soils have a loamy cap and are non-skeletal. Lyman soils are underlain by bedrock at 10 inches to 20 inches. Tunbridge soils are underlain by bedrock at 20 inches to 40 inches.

Typical pedon of Hermon soils from an area of Waumbek-Hermon association, very stony, 0 percent to 15 percent slopes, in the town of Carroll, 3500 feet south of Whitefield-Carroll town line on US Route 3, and 150 feet northeast of US Route 3, in woodland; latitude 44 degrees 20 minutes 30 seconds North, longitude 71 degrees 34 minutes 24 seconds West:

Oe — 0 to 3 inches; moderately decomposed plant material (spruce and fir needles); many fine roots; abrupt smooth boundary.

E — 3 to 5 inches; light olive gray (2.5Y 6/2) sandy loam; weak fine granular structure; friable; common fine roots; 10 percent rock fragments (gravel); very strongly acid; abrupt wavy boundary.

Bs1 — 5 to 9 inches; yellowish red (5YR 4/6) fine sandy loam; weak fine granular structure; friable; common fine and medium roots; 10 percent rock fragments (gravel); very strongly acid; clear wavy boundary.

Bs2 — 9 to 16 inches; strong brown (7.5YR 5/8) gravelly sandy loam; weak fine granular structure; friable; common fine and medium roots; 20 percent rock fragments (fine gravel); very strongly acid; gradual wavy boundary.

Bs3– 16 to 28 inches; yellowish brown (10YR 5/6) very gravelly loamy sand; weak fine granular structure; friable; few fine and medium roots; 40 percent rock fragments (20 percent gravel and 20 percent cobbles); strongly acid; clear wavy boundary.

C1 — 28 to 43 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; massive; firm; 40 percent rock fragments (25 percent gravel and 15 percent cobbles); strongly acid.

C2 — 43 to 65 inches; light olive gray (5Y 6/2) gravelly loamy sand; massive; friable; 35 percent coarse fragments (25 percent gravel and 10 percent cobbles); strongly acid.

The solum ranges from 14 to 28 inches in thickness. Depth to the sandy layers ranges from 7 to 18 inches. Rock fragments range from 5 to 45 percent in the solum and 35 to 60 percent in the substratum layers. Reaction ranges from very strongly acid to strongly acid throughout the profile.

The O horizon is neutral or has hue of 2.5YR to 10YR, value of 2 to 3 and chroma of 0 to 2. It has weak very fine or fine granular structure. Consistence is very friable or friable. It is slightly, moderately, or highly decomposed plant material.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It has weak granular or subangular blocky structure. Texture in the fine earth fraction is fine sandy loam, sandy loam, or coarse sandy loam. Consistence is very friable or friable.

The E horizon has hue of 5YR to 2.5Y, value of 5 or 6, and chroma of 2. It has weak granular or platy structure. Texture in the fine earth fraction is fine sandy loam, sandy loam, or coarse sandy loam. Consistence is very friable or friable.

The Bhs horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 2 or 3. It has weak granular or subangular blocky structure. Texture in the fine earth fraction is sandy loam or fine sandy loam. Consistence is very friable or friable.

The Bs horizon has hue 2.5YR to 7.5YR, value of 3 to 5, and chroma of 4 to 8. It has weak or moderate, granular or subangular blocky structure. Texture in the fine earth fraction is sandy loam to loamy sand. Consistence is very friable or friable.

The BC horizon where present has hue 10YR or 2.5Y, value of 4 to 6 , and chroma of 3 to 6. It has weak granular structure. Texture in the fine earth fraction is sandy loam to loamy sand. Consistence is very friable or friable.

The C horizon has hue 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is massive or single grain. Texture in the fine earth fraction is loamy sand to coarse sand. Consistence is firm, friable, very friable, or loose.

14B--Sheepscot cobbly fine sandy loam, 1 to 8 percent slopes

This gently sloping, moderately well drained soil occurs on outwash terraces.

A typical Sheepscot soil has the following characteristics:

Surface layer:
0 to 2 inches, slightly decomposed plant material
2 to 3 inches, dark brown moderately decomposed plant material
3 to 7 inches, very dark brown cobbly fine sandy loam with 25 percent rock fragments
7 to 8 inches, gray cobbly fine sandy loam with 25 percent rock fragments
Subsoil:
8 to 12 inches, dark reddish brown to dark brown cobbly fine sandy loam with 25 to 35 percent rock fragments
12 to 21 inches, dark yellowish brown very stony fine sandy loam with 40 percent rock fragments
Substratum:
21 to 65 inches, yellowish brown extremely gravelly sand with 80 percent rock fragments

Sheepscot soils in Coos County may have a surface layer of fine sandy loam or sandy loam textures that is thicker than is typical in other counties. In the subsoil it is possible to find firm or very firm irregularly shaped cemented pieces between easily broken sandy or loamy soil.

Included with this soil are small areas of excessively drained Colton and Adams soils on higher landscape positions. Also included are moderately well drained Croghan, Madawaska, and Waumbek soils on similar landscape positions. Poorly drained Naumburg and Grange soils occur in low spots. In areas of northern Coos County dominated by phyllitic bedrock, there are inclusions of small areas of somewhat excessively drained Masardis and well-drained Stetson soils on higher landscape positions and Machias soils on similar landscape positions. Inclusions make up about 15 percent of the map unit.

Important properties of Sheepscot soils include:

Permeability: Moderately rapid in surface layer, and rapid below
Available water capacity: Low
Depth to seasonal high water table: 18 to 30 inches from November to May
Depth to bedrock: Greater than 60 inches
Potential frost action: Low

Use

Most areas of this unit are forested; but cleared areas are in pasture, hay, and row crops. Idle fields revegetate with brushy plants and trees.

Agriculture

This soil is well suited for pasture and cropland. Continuous row cropping may result in accelerated erosion. Row crops grown in rotation with grasses and legumes, contour tillage, and stripcropping will minimize soil loss. In some areas gravel and cobblestones in the surface layer limit cultivation.

The capability subclass for agriculture is 2e.

Forestry

Soil moisture is adequate for good softwood growth, especially eastern white pine, on this Sheepscot soil. There are few limitations on the types of forest management practices and equipment operations, although operating logging equipment during wet periods, especially spring break up or after heavy rains, may increase the hazard of erosion and equipment limitations. Seedling mortality may pose a moderate limitation on some drier sites; using planting stock that is larger than usual or containerized may help reduce this concern. Plant competition, a moderate limitation on some sites, can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species.

Successional trends on this coarse textured, somewhat droughty soil are toward stands of shade tolerant softwoods, i.e. red spruce and balsam fir. Balsam fir is a persistent component in many stands, but is shorter lived than red spruce. White pine, red maple, aspen, and paper birch are common in early and mid-successional stands.

Community Development

This soil has severe or moderate limitations for many types of building site developments due to wetness in late winter and spring. In general, installing footing drains can help reduce the wetness limitation.

For shallow excavations, small stones and loose sand can make cutbanks unstable and subject to caving in unless shored up or cut back to stable slopes. Dwellings without basements have moderate limitations due to wetness while dwellings with basements have severe limitations due to wetness. Again, footing drains may be of help. Footing drain outlets may be difficult to locate due to the nearly level slope. Sump pumps may be needed in basements.

There is a moderate limitation for constructing and maintaining local roads due to wetness. Using properly designed and installed drainage systems can reduce this limitation.

This soil has a severe limitation for on-site sewage disposal due to wetness. Raised sand mound systems for leachfields help to overcome the wetness limitation for septic systems.

This soil is a probable source of sand and gravel, but wetness may hinder excavations. Extensive test pitting is recommended before attempting a commercial operation.

Recreation and Wildlife

This soil has moderate limitations for development of paths and trails due to seasonal wetness. Locating paths and trails on higher landscape positions may help to overcome this limitation. In some areas, surface stones may pose a severe limitation for camping, picnic and playground areas. For these areas, stone removal may help overcome this limitation.

This soil has good suitability for openland wildlife but fair suitability for woodland habitat. It has very poor suitability for wetland habitat.

Madawaska Series

The Madawaska series consists of very deep, moderately well drained soils on glacial outwash plains and terraces. These soils form in loamy sediments underlain by sandy deposits. Slopes range from 0 percent to 8 percent. These soils are classified as coarse-loamy over sandy or sandy-skeletal, mixed, frigid Aquic Haplorthods.

Madawaska soils occur on the landscape near the well drained Groveton and poorly drained Grange soils. Madawaska soils are also near the Sheepscot, Croghan, Naumburg, Pemi and Nicholville soils. Sheepscot soils formed in stratified sand and gravel. Croghan and Naumburg soils formed in sandy outwash. Pemi and Nicholville soils formed in glaciolacustrine material.

Typical pedon of Madawaska soils from an area of Madawaska very fine sandy loam, 0 percent to 3 percent slopes, in the town of Lancaster, 3300 feet north and 200 feet east of intersection of US Route 3 and US Route 2 at the north end of Lancaster, in a hayfield by bend of Connecticut River; latitude 44 degrees 30 minutes 14 seconds North, longitude 71 degrees 34 minutes 33 seconds West:

Ap — 0 to 8 inches; brown (10YR 4/3) very fine sandy loam; pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; many fine and very fine and few medium roots; slightly acid; abrupt smooth boundary.

Bs1 — 8 to 14 inches; strong brown (7.5YR 5/6) very fine sandy loam; weak fine and medium granular structure; friable; many fine and very fine and few medium roots; neutral; gradual wavy boundary.

Bs2 — 14 to 21 inches; yellowish brown (10YR 5/6) very fine sandy loam; weak fine and medium granular structure; friable; common fine and very fine and few medium and coarse roots; common medium distinct olive brown (2.5Y 4/4) iron depletions in lower 3 inches; neutral; clear wavy boundary.

BC1 — 21 to 25 inches; olive brown (2.5Y 4/4) very fine sandy loam; weak fine and medium granular structure; friable; common fine and very fine and few medium and coarse roots; many medium faint olive (5Y 4/4) and few medium distinct light olive gray (5Y 6/2) iron depletions, and few medium distinct dark brown (7.5YR 4/4) masses of iron accumulation; slightly acid; abrupt smooth boundary.

BC2 — 25 to 30 inches; olive (5Y 5/3) very fine sandy loam; massive; loose; few fine, very fine, medium ,and coarse roots; old root channels with gray (N 5/) centers 2-5 mm in diameter, then a 15 to 25 mm thick rind of dark red (2.5YR 3/6) fading to olive brown (2.5Y 4/4), being pedotubules of sesqioxides; common medium distinct yellowish brown (10YR 5/8) and olive brown (2.5Y 4/4) masses of iron accumulation; neutral; abrupt smooth boundary.

2C1 — 30 to 45 inches; olive gray (5Y 5/2) fine sand; single grain; loose; common medium distinct light yellowish brown (2.5Y 6/4) and pale brown (10YR 6/3) masses of iron accumulation; neutral; abrupt smooth boundary.

2C2 — 45 to 65 inches; olive (5Y 4/3) fine sand; single grain; loose; common coarse faint (5Y 6/1) iron depletions; neutral.

The solum ranges from 14 to 32 inches. The depth to the lithologic discontinuity ranges from 11 to 35 inches. Rock fragments, often gravel, range from 0 percent to 10 percent above the discontinuity and 0 percent to 30 percent below it. Reaction ranges from strongly to slightly acid in the solum and strongly acid to neutral in the C horizons.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. It has weak or moderate fine granular structure. Texture is silt loam, very fine sandy loam, loam, fine sandy loam, or sandy loam. Consistence is friable.

The E horizon has hue of 7.5YR, 10YR, or neutral; value of 5 to 7, and chroma of 0 to 2. Texture is very fine sandy loam, fine sandy loam, or loamy very fine sand. Structure is weak fine granular. Consistence is friable.

Some pedons have a Bhs horizon that has hue 2.5YR to 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is silt loam, very fine sandy loam, loam, fine sandy loam, or sandy loam. It has weak fine or medium granular structure. Consistence is friable.

The Bs horizon has hue 2.5YR to 10YR, value of 2 to 6, and chroma of 3 to 8. It has the same structure, texture, and consistence range as the Bh horizon.

The BC horizon has hue 7.5YR to 5Y, value of 4 to 6, and chroma of 4 to 8. It has weak fine granular structure. Texture is very fine sandy loam, fine sandy loam, sandy loam, or loamy sand. Consistence is friable.

The 2C horizon has hue 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It is massive or single grain. Texture in the fine earth fraction ranges from loamy very fine sand to coarse sand. Consistence is friable to loose.

Berkshire Series

The Berkshire series consists of very deep, well drained soils on glaciated uplands. These soils formed in loamy ablation till. Slopes range from 3 percent to 60 percent. These soils are classified as coarse-loamy, mixed, frigid Typic Haplorthods.

Berkshire soils occur on the landscape near moderately well drained Sunapee soils. Berkshire soils are also near Bangor, Monadnock, Becket, Marlow, Tunbridge and Lyman soils. Bangor soils are finer textured. Monadnock soils are coarser textured. Becket and Marlow soils have firm substratums. Tunbridge soils are underlain by bedrock at 20 to 40 inches. Lyman soils are underlain by bedrock at 10 to 20 inches.

Typical pedon of Berkshire soils from an area of Berkshire very fine sandy loam, 15 percent to 25 percent slopes, very stony in Second College Grant, 200 feet northeast of a bend in the Swift Diamond River off the road that heads west to "The Hand", site is 2800 feet along the road first south then west from Sam's Cabin and the Management Center cabin, the site is just north of the road on top of a knob; latitude 44 degrees 53 minutes 0 seconds North and longitude 71 degrees 4 minutes 48 seconds West:

Oe — 0 to 4 inches; very dark brown (10YR 2/2) moderately decomposed plant material; moderate fine granular structure; friable; many fine and very fine roots; extremely acid; abrupt smooth boundary.

E — 4 to 5 inches; grayish brown (10YR 5/2) very fine sandy loam; moderate fine granular structure; friable; common fine roots; 10 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bs — 5 to 10 inches; dark brown (7.5YR 4/4) fine sandy loam; moderate fine granular structure; friable; common fine and few coarse roots; 10 percent rock fragments; very strongly acid; abrupt smooth boundary.

BC — 10 to 24 inches; olive brown (2.5Y 4/4) very fine sandy loam; weak fine granular structure; friable; common fine and very fine roots; 10 percent rock fragments; strongly acid; clear smooth boundary.

C — 24 to 65 inches; light olive brown (2.5Y 5/3) very fine sandy loam; massive breaking to weak fine platy; friable; 10 percent rock fragments; strongly acid.

The solum ranges from 17 to 33 inches in thickness. The A and E horizons contain 0 to 20 percent rock fragments. The B and C horizons contain 10 to 35 percent rock fragments. Reaction ranges from extremely acid to moderately acid unless limed.

The Oa horizon, if present, has hue of 5YR or 10YR or is neutral. Color value is 2 or 2.5 and chroma is 0 or 1.

The A or Ap horizon, if present, has hue of 10YR, value of 3 and chroma of 2 or 3. It has weak fine or medium granular structure. Texture in the fine earth fraction is loam, silt loam or very fine sandy loam. Consistence is friable.

The E horizon has hue of 7.5 YR to 5Y, value of 3 to 6 and chroma of 1 or 2. It has weak fine granular structure. Texture in the fine earth fraction is dominantly fine sandy loam but the range includes very fine sandy loam, sandy loam and loamy fine sand. Consistence is very friable or friable.

The Bhs horizon, if present, has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 2 to 6. The Bs horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 4 to 6. Bhs and Bs horizons have weak fine and medium granular or subangular blocky structure. Texture in the fine earth fraction of Bhs or Bs horizons is dominantly fine sandy loam but ranges to silt loam. Consistence is friable.

The BC horizon has hue of 10YR to 5Y, value of 3 to 6, and a chroma of 2 to 6. Texture in the fine earth fraction is loam, very fine sandy loam, fine sandy loam, or sandy loam. Consistence is friable.

The C horizon has hue of 2.5Y or 5Y, value of 3 to 6, and chroma of 2 to 6. It has weak granular structure or is single grain or massive. Texture in the fine earth fraction is very fine sandy loam, or sandy loam to loamy sand. Some pedons may have thin bands of very fine sand along with finer textures in the matrix. The C horizon is dominantly friable but some pedons may have firm masses within a friable horizon.

Sunapee Series

The Sunapee series consists of very deep, moderately well drained soils on glaciated uplands. These soils formed in loamy ablation till. Slopes range from 3 to 25 percent. These soils are classified as coarse-loamy, mixed, frigid Aquic Haplorthods.

Sunapee soils occur on the landscape near well drained Berkshire and poorly drained Lyme soils. Sunapee soils are also near Monadnock, Waumbek, and Moosilauke soils. Monadnock soils are well drained. Waumbek soils are sandy-skeletal in the substratum. Moosilauke soils are poorly drained.

Typical pedon of Sunapee soils from an area of Sunapee fine sandy loam, 3 to 8 percent slopes, in the town of Whitefield, 5,280 feet from the intersection of NH Route 116 and US Route 3, and 660 feet north of NH Route 116; description made in cellar hole; latitude 44 degrees 22 minutes 30 seconds North, longitude 71 degrees 35 minutes 19 seconds West:

A — 0 to 4 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine and medium granular structure; very friable, common very fine, fine, and medium roots and few coarse roots; 10 percent rock fragments; strongly acid; abrupt smooth boundary.

E — 4 to 6 inches; pinkish gray (7.5YR 7/2) sandy loam; weak fine granular structure; very friable; common fine and medium roots and few very fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bs1 — 6 to 14 inches; yellowish red (5YR 4/6) fine sandy loam; moderate medium granular structure; friable; common fine and medium and few very fine roots; 10 percent rock fragments; strongly acid; clear smooth boundary.

Bs2 — 14 to 24 inches; dark yellowish brown (10YR 4/6) fine sandy loam; moderate medium and coarse granular structure; friable; common fine and medium and few very fine roots; 10 percent rock fragments; strongly acid; abrupt smooth boundary.

BC — 24 to 35 inches; olive (5Y 5/3) gravelly fine sandy loam; weak medium and coarse granular structure; friable; common fine and medium and few very fine roots; common medium and coarse distinct olive gray (5Y 5/2) iron depletions and common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation; 15 percent rock fragments; strongly acid; clear smooth boundary.

C1 — 35 to 65 inches; olive gray (5Y 4/2) gravelly loamy fine sand; massive; friable; no roots observed; common medium and coarse distinct olive gray (5Y 5/2) and common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; 20 percent rock fragments; moderately acid.

The solum ranges from 19 to 38 inches in thickness. Rock fragments range from 5 to 35 percent in the solum and 5 to 40 percent in the substratum. Unless limed, reaction in the solum is very strongly acid and from strongly acid to moderately acid in the substratum.

The A horizon has hue of 10YR, value of 2 or 3 and chroma of 1 to 2. Ap horizons have hue of 10YR, value of 2 or 3, and chroma of 1 to 3. Texture in the fine earth fraction is sandy loam, fine sandy loam, or very fine sandy loam.

The E horizon has hue 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2. Texture in the fine earth fraction is fine sandy loam, sandy loam, or loamy sand.

The Bhs horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 3. The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5 and chroma of 3 to 6. Texture in the fine earth fraction is fine sandy loam, sandy loam, or loamy sand.

Some pedons have a BC horizon that has hue of 10YR to 5Y, value of 5, and chroma of 3 or 4. Texture in the fine earth fraction is fine sandy loam or sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 6. Texture in the fine earth fraction is fine sandy loam, or sandy loam. Texture in the fine earth fraction of loamy sand or loamy fine sand is below 30 inches in some pedons.

Stetson Series

The Stetson series consists of very deep, well drained soils on glaciated outwash plains and terraces. These soils formed in glacial outwash of stratified sand and gravel derived predominantly from phyllitic rocks. Most of these soils occur in northern Coos County. Slopes range from 0 to 60 percent. These soils are classified as sandy-skeletal, mixed, frigid Typic Haplorthods.

Stetson soils occur on the landscape near somewhat excessively drained Masardis soils and moderately well drained Sheepscot soils. Stetson soils are also near Groveton and Adams soils. Groveton and Adams soils both formed in sandy outwash deposits rather than stratified sand and gravel deposits.

Typical pedon of Stetson soils from an area of Stetson fine sandy loam, 3 to 8 percent slopes, in the town of Columbia, 2,300 feet on US Route 3 from the intersection of Cone Brook and US Route 3, 300 feet northwest of US Route 3, in pasture; latitude 44 degrees 49 minutes 18 seconds North, longitude 71 degrees 33 minutes 42 seconds West:

Ap — 0 to 8 inches; dark brown (10YR 3/3) fine sandy loam; weak medium and coarse granular structure; friable; many fine roots throughout; 11 percent rock fragments (10 percent gravel, 1 percent cobbles); slightly acid; abrupt smooth boundary.

E — 8 to 10 inches; gray (10YR 5/1) gravelly fine sandy loam; weak medium and coarse granular structure; friable; common fine and medium roots throughout; 16 percent rock fragments (15 percent gravel, 1 percent cobbles); moderately acid; abrupt broken boundary.

Bh — 10 to 12 inches; dark reddish brown (5YR 2.5/2) gravelly fine sandy loam; weak medium and coarse granular structure; friable; common fine and medium roots throughout; 16 percent rock fragments (15 percent gravel, 1 percent cobbles); moderately acid; clear wavy boundary.

Bhs — 12 to 18 inches; dark reddish brown (5YR 3/2) gravelly sandy loam; weak fine and medium granular structure; very friable; common fine and medium roots throughout; 31 percent rock fragments (30 percent gravel, 1 percent cobbles); slightly acid; clear wavy boundary.

Bs — 18 to 28 inches; dark brown (7.5YR 4/4) very gravelly sandy loam; weak fine and medium granular structure; very friable; common fine roots throughout; 37 percent rock fragments (35 percent gravel, 2 percent cobbles); slightly acid; abrupt smooth boundary.

C1 — 28 to 35 inches; olive (5Y 5/3) very gravelly sand; massive; loose; 42 percent rock fragments (40 percent gravel, 2 percent cobbles); neutral; abrupt smooth boundary.

C2 — 35 to 65 inches; olive (5Y 4/3) very gravelly sand; single grain; loose; 58 percent rock fragments (55 percent gravel, 3 percent cobbles); neutral.

The solum ranges from 18 to 31 inches in thickness. Gravel content ranges from 10 to 45 percent in the solum. Rock fragments in the substratum range from 35 to 80 percent by volume and consist mostly of gravel and cobbles. Reaction ranges from extremely acid to slightly acid in the solum and from very strongly acid to slightly acid in the substratum.

Where present the A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It has weak or moderate, fine to medium granular structure. Texture is fine sandy loam, sandy loam, or silt loam in the fine earth fraction. Consistence is friable or very friable.

The E horizon has hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 or 2. It has weak or moderate, fine or medium granular structure. Texture is fine sandy loam to silt loam in the fine earth fraction. Consistence is friable or very friable.

The Bhs horizon has hue of 2.5YR to 7.5YR with value and chroma of 3 or less. It has weak or moderate, fine to medium granular or weak medium subangular blocky structure. Texture is the same as E horizon. Consistence is friable to very friable.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 4 to 6. It is massive or has weak, fine granular structure or weak medium subangular blocky structure. Texture is sandy loam, fine sandy loam, very fine sandy loam or silt loam in the fine earth fraction. Consistence is friable to very friable.

The BC horizon is massive or single grain or has weak medium subangular blocky structure. Texture is loamy fine sand to sandy loam in the fine earth fraction. Consistence is loose or friable.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 6. It is single grain or massive. Texture is loamy sand to sand in the fine earth fraction with strata of sands and gravel.

711B--Monadnock-Hermon association, undulating, very stony

This map unit consists of soils on the sides of hills and mountains. The Monadnock and Hermon soils are intermingled in a regularly repeating pattern on a relatively choppy looking landscape. The landscape has a complex pattern of slopes, consisting of hills and knolls 1/2 to 10 acres in size and 5 to 30 feet higher than the valleys between. Monadnock soils are typically on sideslopes and higher landscape positions within the unit. Hermon soils are typically on knobs, mounds and lower sideslope positions within the unit. Surface stones are 5 to 80 feet apart. Slope ranges from 0 to 15 percent. This map unit consists of about 45 percent well drained Monadnock soils, 30 percent somewhat excessively drained Hermon soils and 25 percent other soils.

A typical Monadnock soil has the following characteristics:

Surface layers:
0 to 3 inches of partially decomposed forest litter
3 to 8 inches, light gray fine sandy loam with 9 percent rock fragments
Subsoil:
8 to 10 inches, dark reddish brown fine sandy loam with 9 percent rock fragments
10 to 12 inches, yellowish red fine sandy loam with 8 percent rock fragments
12 to 22 inches, strong brown gravelly fine sandy loam with 18 percent rock fragments
22 to 25 inches, yellowish brown gravelly fine sandy loam with 25 percent rock fragments
Substratum:
25 to 45 inches, light olive brown gravelly loamy sand with 25 percent rock fragments
45 to 65 inches, light brownish gray and light gray gravelly loamy sand with 25 percent rock fragments

Some areas of this map unit have sandy loam textures in the surface layers.

A typical Hermon soil has the following characteristics:

Surface layer:
0 to 3 inches, partially decomposed litter
3 to 5 inches, light olive gray sandy loam with 10 percent rock fragments
Subsoil:
5 to 9 inches, yellowish red fine sandy loam with 10 percent rock fragments
9 to 16 inches, strong brown gravelly sandy loam with 20 percent rock fragments
16 to 28 inches, yellowish brown very gravelly loamy sand with 40 percent rock fragments
Substratum:
28 to 43 inches, yellowish brown very gravelly loamy sand with 40 percent rock fragments
43 to 65 inches, light olive gray gravelly loamy sand with 35 percent rock fragments

Included with these soils are well drained Berkshire and Becket soils on mounds or ridges; moderately well drained Sunapee and Waumbek soils in concave or benched areas; poorly drained Moosilauke and Lyme soils in depressions; areas of shallow Lyman soils along slope breaks and ridges; and small areas with boulders on the surface or slopes greater than 15 percent. Total inclusions make up about 25 percent of this map unit.

Important properties of this Monadnock soil are:

Permeability: Moderate in the surface layers and subsoil, and moderately rapid in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Low

Important properties of this Hermon soil are:

Permeability: Rapid throughout
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Low

Forestry

Fertility and moisture are adequate on these Monadnock and Hermon soils for good tree growth. The successional trends on these soils are toward a climax of shade tolerant hardwoods, predominantly beech. Successional stands, especially those which are heavily cutover, are commonly composed of a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, sugar maple, and beech, in combinations with red spuce, balsam fir, and hemlock.

Woodland management has moderate limitations due to seedling mortality on areas of Hermon soil and plant competition on areas of Monadnock soil. Planting seedlings in the spring to obtain sufficient moisture from early rains can reduce seedling mortality. Plant competition can be reduced with careful site preparation following tree harvesting to reduce the invasion of undesirable species. Trails with severe disturbance of the surface cover can be protected with occasional waterbars and seeded with shade and drought tolerant grass. Woodland access roads through these areas can usually be constructed and maintained with few limitations.

Recreation and Wildlife

Large stones are a moderate concern for development of paths and trails. Siting paths and trails to minimize the need to move stones reduces the labor involved in path and trail development.

Monadnock and Hermon soils have poor suitability for the development of openland wildlife habitat and very poor suitability for wetland wildlife habitat development. Monadnock soil has good suitability for woodland wildlife habitat development. Hermon soil has fair suitability for woodland wildlife development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

803B--Berkshire-Monadnock association, undulating, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on hills and sideslopes of hills. The landscape often has a choppy appearance, consisting of knolls or hills about 1/2 acre to 10 acres in size. Slope ranges from 0 to 15 percent. Individual map units are 50 acres in size or greater. Surface stones are 5 to 80 feet apart. Berkshire soil is well drained, has a coarse loamy substratum, and makes up about 50 percent of this map unit. Monadnock soil is also well drained, has a sandy or very gravelly sandy substratum, and makes up about 30 percent of this map unit.

A typical Berkshire soil has the following characteristics:

Surface layer:
0 to 4 inches, very dark brown partially decomposed organic matter
4 to 5 inches, grayish brown very fine sandy loam with 10 percent rock fragments
Subsoil:
5 to 10 inches, dark brown fine sandy loam with 10 percent rock fragments
10 to 24 inches, olive brown very fine sandy loam with 10 percent rock fragments
Substratum:
24 to 65 inches, light olive brown very fine sandy loam with 10 percent rock fragments

A typical Monadnock soil has the following characteristics:

Surface layers:
0 to 3 inches of partially decomposed forest litter
3 to 8 inches, light gray fine sandy loam with 9 percent rock fragments
Subsoil:
8 to 10 inches, dark reddish brown fine sandy loam with 9 percent rock fragments
10 to 12 inches, yellowish red fine sandy loam with 8 percent rock fragments
12 to 22 inches, strong brown gravelly fine sandy loam with 18 percent rock fragments
22 to 25 inches, yellowish brown gravelly fine sandy loam with 25 percent rock fragments
Substratum:
25 to 45 inches, light olive brown gravelly loamy sand with 25 percent rock fragments
45 to 65 inches, light brownish gray and light gray gravelly loamy sand with 25 percent rock fragments

Some areas of this soil have sandy loam textures in the surface layers.

Included with these Berkshire and Monadnock soils are mounds or ridges of somewhat excessively drained Hermon soils. Moderately well drained Sunapee or Peru soils may also occur throughout the unit. Nearly level areas of poorly drained Lyme, Moosilauke or Pillsbury soils may occur in depressions and along drainageways. Soils with bedrock at 10 to 40 inches below the surface may occupy the top of some knolls. Small areas with slopes greater than 15 percent may be found. A few areas have surface stones more than 80 feet or less than 5 feet apart. These inclusions make up about 20 percent of this map unit.

Important properties of this Berkshire soil are:

Permeability: Moderate or moderately rapid
Available water capacity: High
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Important properties of this Monadnock soil are:

Permeability: Moderate in the surface layers and subsoil and moderately rapid in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Low

Most of these areas are forested.

Forestry

Fertility and moisture are favorable on Berkshire and Monadnock soils for the growth of high quality hardwoods. There are only slight limitations for erosion hazard, equipment use, seedling mortality, and windthrow hazard.

On the Monadnock component of this map unit plant competition can be a moderate limitation. Careful site preparation to reduce the invasion of undesirable species decreases plant competition.

The successional trend of unmanaged woodland on these soils is toward a climax stand of shade tolerant hardwoods, predominantly beech and sugar maple. Successional stands in heavily cut over areas commonly are composed of a variety of hardwood species such as aspen, red maple, paper birch, yellow birch, sugar maple and beech in combinations with red spruce and balsam fir.

Recreation and Wildlife

Hiking paths and trails can be developed and maintained with few limitations.

These Berkshire and Monadnock soils have poor potential for development of openland wildlife habitat. They have good potential for woodland wildlife habitat development and very poor potential for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

Monadnock Series

The Monadnock series consists of very deep, well drained soils on glaciated uplands. These soils form in loamy material underlain by sandy or sandy-skeletal ablation till. These soils are classified as coarse-loamy over sandy or sandy-skeletal, mixed, frigid Typic Haplorthods.

Monadnock soils occur on the landscape near somewhat excessively drained Herman and moderately well drained Waumbek soils. Monadnock soils are also near Berkshire, Sunapee, Becket, Skerry, Marlow, Peru and Success soils. Berkshire soils are finer textured. Sunapee soils are moderately well drained. Becket, Skerry, Marlow and Peru soils have a firm substratum. Success soils have a cemented horizon.

Typical pedon of Monadnock soils from an area of Monadnock-Hermon association, 15 to 35 percent slopes, in the township of Berlin, 1,050 feet south of NH Route 110 on Jericho Mountain Road, in a road cut on the west side of Jericho Mountain Road, in a wooded area; latitude 44 degrees 28 minutes 58 seconds North, longitude 71 degrees 12 minutes 35 seconds West:

Oe — 0 to 3 inches; moderately decomposed forest litter; many fine and common roots; very strongly acid; abrupt wavy boundary.

E — 3 to 8 inches; light gray (10YR 7/1) fine sandy loam; weak fine and medium granular structure; friable; common fine and medium roots; 9 percent rock fragments (5 percent gravel, 3 percent cobbles, and 1 percent stones); extremely acid; abrupt wavy boundary.

Bs1 — 8 to 10 inches; dark reddish brown (5YR 3/4) fine sandy loam; weak fine and medium granular structure; friable; common fine and medium roots; 9 percent rock fragments (5 percent gravel, 3 percent cobbles, and 1 percent stones); extremely acid; clear wavy boundary.

Bs2 — 10 to 12 inches; yellowish red (5YR 5/8) fine sandy loam; weak fine and medium granular structure; friable; common fine and medium roots; 8 percent rock fragments (5 percent gravel and 3 percent cobbles); very strongly acid; clear wavy boundary.

Bs3 — 12 to 22 inches; strong brown (7.5YR 5/8) gravelly fine sandy loam; weak fine granular structure; very friable; common fine and few medium roots; 18 percent rock fragments (15 percent gravel and 3 percent cobbles); very strongly acid; clear wavy boundary.

BC — 22 to 25 inches; yellowish brown (10YR 5/6) gravelly fine sandy loam; weak fine granular structure; very friable; few fine roots; 25 percent rock fragments (20 percent gravel and 5 percent cobbles); very strongly acid; clear wavy boundary.

C1 — 25 to 45 inches; light olive brown (2.5Y 5/4) gravelly loamy sand; massive; loose; few fine roots; 25 percent rock fragments (20 percent gravel and 5 percent cobbles); clear wavy boundary.

C2 — 45 to 65 inches; light brownish gray (2.5Y 6/2) and light gray (2.5Y 7/2) gravelly loamy sand; massive; loose; 25 percent rock fragments (20 percent gravel and 5 percent cobbles); very strongly acid.

The solum ranges from 18 to 27 inches thick and corresponds to the depth to the contrasting material. Rock fragment content ranges from 0 percent to 30 percent in the solum and from 5 percent to 60 percent in the substratum. Reaction ranges from extremely acid through neutral throughout. Consistence is very friable or friable in the solum and usually loose or very friable in substratum.

The O horizons where present range from 1 to 4 inches in thickness.

The A horizon where present has hue of 5YR or 7.5YR, value of 2.5 or 3, and chroma of 1 or 2. An Ap horizon has hue of 10YR with value and chroma of 2 to 4. It has weak fine or medium granular structure. Texture in the fine earth fraction is very fine sandy loam or fine sandy loam.

The E horizon where present has hue of 5YR to 10YR, value of 4 to 7, and chroma of 1 or 2. It has weak fine or medium granular structure. Texture in the fine earth fraction is very fine sandy loam, fine sandy loam, or sandy loam.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 8. The Bhs horizon where present has hue of 2.5YR or 5YR, value of 2.5 or 3, and chroma of 3 or less. It has weak fine or medium granular or weak very fine, fine, or medium subangular blocky structure. Texture in the fine earth fraction is very fine sandy loam to sandy loam.

The BC horizon has hue of 10YR or 2.5Y, value of 3 to 5, chroma of 4 or 6. It has weak fine to coarse granular or weak fine or medium subangular blocky structure. Texture in the fine earth fraction is very fine sandy loam to loamy fine sand.

The 2C or C horizons have hue of 10YR to 5Y, value of 3 to 7, chroma of 2 to 4. It is massive or single grain. Texture in the fine earth fraction is loamy fine sand to sand.

61C--Tunbridge-Lyman-Rock Outcrop complex, 8 to 15 percent slopes

This complex consists of two soils and exposures of bedrock intermingled in such an intricate pattern that it is not practical to map them separately. Tunbridge soil is well drained and 20 to 40 inches deep to bedrock. Lyman soil is somewhat excessively drained and 10 to 20 inches deep to bedrock. Tunbridge soil makes up about 40 percent, Lyman soil makes up about 30 percent, and rock outcrops make up about 15 percent of this complex. This complex occurs on footslopes, sideslopes, hills, and mountains of upland areas. Surface stones are generally 5 to 80 feet apart.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with 12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Lyman soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

Rock outcrops consist of exposures of bare bedrock with little or no vegetation.

Included with this complex are small scattered areas of deeper till soils and moderately well drained, poorly, or very poorly drained soils over bedrock. Also included are small scattered areas having slopes less than 8 percent and greater than 15 percent or with stones spaced more closely or further apart. These inclusions can make up about 15 percent of this complex.

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid throughout
Available water capacity: Moderate
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Use

Most areas are forested, though some areas are used for pasture.

Agriculture

The Tunbridge and Lyman soils are moderately well suited for pasture and not suited for cropland. Areas of Rock Outcrop are not suited for pasture or cropland.

The capability subclass for agriculture is 6s on Tunbridge and Lyman soils and 8s on Rock Outcrop.

Forestry

Fertility and moisture are adequate on this complex for good tree growth, however physical limitations affect forest management. Shallow depth to bedrock and low available water capacity of the Lyman soil are the main limitations for trees, affecting seedling mortality and windthrow hazard. Planting seedlings on raised beds can reduce seedling mortality. Leaving groups of trees to protect each other or cutting all the trees on the shallowest soils may be more effective than leaving a few trees.

Seedling mortality on shallow Lyman soil is a moderate management concern. Special site preparations such as raised bedding may be needed in some cases for successful seedling development. Plant competition is a moderate concern for Lyman soil; careful site preparation after logging will help reduce this concern.

Areas of exposed bedrock limit the use of equipment for logging and forest management, and restrict construction of woodland access roads.

Due to the diverse nature of this complex, is not possible to generalize about successional trends.

Community Development

This map complex has a severe limitation for all types of building site development due to the shallow depth of soil to bedrock. Locating sites with deeper soils within the unit is possible but these areas may be too limited in size to use.

In areas of Tunbridge soil, depth to bedrock is a moderate limitation for constructing dwellings without basements and local roads and streets. Depth to bedrock is a severe limitation for constructing shallow excavations and dwellings with basements. Locating sites with deeper soils can be done to reduce the need to add soil material above bedrock. In areas of Tunbridge soil frost action is a moderate limitation for local roads and streets as well as slope. Frost action on local roads and streets can be minimized by placing coarse grained base materials to frost depth and installing drainage. Cut and fill techniques can reduce slope limitations.

In areas of Lyman soil and rock outcrops the limitation is severe for all site development; locating sites on deeper soils within the map unit can reduce the need to add soil material above bedrock (or the need to blast rock).

This complex has a severe limitation for septic tank absorption field development due to bedrock. Locating sites with deeper soils within the unit is possible but these areas may be too limited in size to use.

Recreation and Wildlife

In areas of Tunbridge soils slope and small stones are a moderate limitation for camping areas and picnic areas. Cutting and shaping should facilitate development at individual sites. Stones can be picked off the surface. In areas of Lyman soils and rock outcrop depth to bedrock is a severe limitation for camping areas and picnic areas. This complex has severe limitations for playground development due to surface stones and slope. Sites can possibly be located on the least sloping areas of the map unit but these areas may be too limited in size to use. Paths and trails have few limitations for development.

The Tunbridge component of this complex has good suitability for woodland wildlife habitat and poor suitability for openland wildlife habitat development. The Lyman component has poor suitability for either. This complex has very poor suitability for wetland wildlife habitat development.

Marlow Series

The Marlow series consists of very deep, well drained soils on glaciated uplands. These soils formed in loamy material over dense basal till. Slopes range from 3 percent to 60 percent. These soils are classified as coarse-loamy, mixed, frigid Oxyaquic Haplorthods.

Marlow soils occur on the landscape near moderately well drained Peru soils. Marlow soils are also near Berkshire, Monadnock, Becket, Skerry, Lyman and Tunbridge soils. Berkshire and Monadnock soils have loose substratum. Lyman and Tunbridge soils are underlain by bedrock at less than 40 inches. Becket and Skerry soils have more lenses of sand in the substratum than Marlow soils.

Typical pedon of Marlow soils from an area of Marlow fine sandy loam, 8 to 15 percent slopes, very stony, in the town of Odell, 900 feet north and 100 feet west of the confluence of Nash Stream and Pike Brook; latitude 44 degrees 45 minutes 42 seconds North, longitude 71 degrees 25 minutes 17 seconds West:

Oa — 0 to 5 inches; black (N 2.5/0) highly decomposed plant material.

E — 5 to 9 inches; light gray (10YR 6/1) gravelly fine sandy loam; weak fine granular structure; friable; many very fine to coarse roots; 15 percent rock fragments (10 percent gravel and 5 percent cobbles); strongly acid; abrupt smooth boundary.

Bhs — 9 to 11 inches; dark reddish brown (5YR 2.5/2) fine sandy loam; weak fine granular structure; friable; many fine to coarse roots; 10 percent rock fragments (gravel); strongly acid; abrupt smooth boundary.

Bs1 — 11 to 16 inches; dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) fine sandy loam; weak fine granular structure; many fine to coarse roots, 10 percent rock fragments (gravel); strongly acid; abrupt smooth boundary.

Bs2 — 16 to 19 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate medium subangular blocky structure; friable; few medium and coarse roots; 10 percent rock fragments (gravel); strongly acid; abrupt smooth boundary.

Cd1 — 19 to 30 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam with thin lenses of loamy sand; weak medium platy structure; firm; few fine roots; 25 percent rock fragments (gravel); moderately acid, clear wavy boundary.

Cd2 — 30 to 47 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam with thin lenses of loamy sand; moderate medium platy structure; firm; few fine roots; 16 percent rock fragments (15 percent gravel and 1 percent cobbles); moderately acid; clear wavy boundary.

Cd3 — 47 to 65 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam; moderate medium platy structure; firm; 15 percent rock fragments (10 percent gravel and 5 percent cobbles); moderately acid.

The solum ranges from 14 to 27 inches in thickness. Rock fragments are dominantly angular gravel with some cobbles and stones and range from 5 to 30 percent throughout the pedon. Reaction ranges from very strongly acid to moderately acid in the solum and from very strongly acid to slightly acid the substratum.

The A or Ap horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 2. Texture in the fine earth fraction is loam, very fine sandy loam, or fine sandy loam.

The E horizon, when present, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 or 2. Texture in the fine earth fraction is fine sandy loam, loam or sandy loam.

Some pedons have a Bh or Bhs horizon with hue of 2.5YR to 5YR, value of 2.5 to 4, chroma of 1 to 3.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 4 to 6.

Texture of the Bh, Bhs, or Bs horizons is sandy loam, fine sandy loam, very fine sandy loam, or loam in the fine earth fraction. These horizons have weak fine granular structure or weak to moderate, fine to medium subangular blocky or platy structure.

Some pedons have BC horizons with hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. Texture is sandy loam or fine sandy loam in the fine earth fraction. It has weak granular structure or weak to moderate subangular blocky structure or moderate thin to medium platy structure.
Consistence is very friable to firm.

The Cd horizon has hue of 10YR to 5Y, value to 4 to 6, and chroma of 2 to 4. Texture is fine sandy loam to sandy loam in the fine earth fraction. It has weak to moderate, fine to medium platy structure or is massive. Consistence is firm or very firm. Some pedons have a friable C horizon with color and texture similar to the underlying Cd horizon.

Peru Series

The Peru series consists of very deep, moderately well drained soils on glaciated uplands. These soils formed in loamy material underlain by compact loamy basal till. Slopes range from 0 percent to 35 percent. These soils are classified as coarse-loamy, mixed, frigid Aquic Haplorthods.

Peru soils occur on the landscape near well drained Marlow soils, poorly drained Pillsbury soils and very poorly drained Peacham soils. Peru soils are also near Monadnock, Becket, Skerry and Tunbridge soils. Peru soils have more silt and very fine sand in the substratum than Becket and Skerry soils. Peru soils have a firm, compacted substratum, and Monadnock soils have a friable substratum. Tunbridge soils are underlain by bedrock at 20 to 40 inches.

Typical pedon of Peru soils from an area of Peru loam, very stony, 8 to 15 percent slopes, in the town of Milan, approximately 800 feet east from the intersection of NH Route 110A and the Milan-Dummer town line, in a wooded area; latitude 44 degrees 36 minutes 20 seconds North, longitude 71 degrees 14 minutes 44 seconds West:

Oe — 0 to 2 inches; partially decomposed leaves and twigs; many very fine and fine, common medium roots.

E — 2 to 4 inches; grayish brown (2.5Y 5/2) fine sandy loam; weak fine granular structure; friable; many very fine and fine, few medium roots; strongly acid; abrupt wavy boundary.

Bs1 — 4 to 8 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable; many very fine, common medium roots; 5 percent rock fragments (3 percent gravel and 2 percent cobbles)/; strongly acid; abrupt wavy boundary.

Bs2 — 8 to 15 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine granular structure; friable; few very fine, many fine, and common medium roots; 5 percent rock fragments (2 percent gravel and 3 percent cobbles); moderately acid; clear smooth boundary.

Bs3 — 15 to 18 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine and medium granular structure; friable; common very fine and fine, few medium roots; common fine and medium prominent yellowish red (5Y 4/6) masses of iron accumulation; 7 percent rock fragments (3 percent gravel and 4 percent cobbles); moderately acid; abrupt smooth boundary.

Cd1 — 18 to 25 inches; olive (5Y 4/3) fine sandy loam; moderate fine and medium platy structure; firm; few fine roots; many medium and coarse prominent dark reddish brown (5YR 3/4) masses of iron accumulation; 12 percent rock fragments (5 percent gravel, 5 percent cobbles, and 2 percent stones); moderately acid; abrupt smooth boundary.

Cd2 — 25 to 28 inches; olive gray (5Y 5/2) fine sandy loam; weak fine and medium platy structure; firm; many medium prominent yellowish red (5YR 4/6) masses of iron accumulation; 13 percent rock fragments (3 percent gravel, 5 percent cobbles, 5 percent stones); moderately acid; abrupt smooth boundary.

Cd3 — 28 to 46 inches; pale olive (5Y 6/3) fine sandy loam; massive; firm; common medium prominent dark brown (7.5YR 4/4) masses of iron accumulation and common medium prominent gray (10YR 5/1) iron depletions; 12 percent rock fragments (4 percent gravel, 5 percent cobbles, 3 percent stones); moderately acid; clear wavy boundary.

Cd4 — 46 to 65 inches; olive (5Y 5/3) fine sandy loam; massive; firm; common medium prominent dark brown (7.5YR 4/4) masses of iron accumulation and common medium prominent gray (10YR 5/1) iron depletions; 12 percent rock fragments (4 percent gravel, 5 percent cobbles, 3 percent stones); moderately acid.

1 inch of leaf litter covers the surface.

The solum ranges from 12 to 36 inches in thickness. Rock fragments are dominantly gravel with some cobbles and a few stones. Coarse fragment content ranges from 5 percent to 30 percent in the solum and 0 percent to 30 percent in the substratum. Reaction of the soil ranges from extremely acid to moderately acid.

The O horizon is neutral or has hue of 2.5YR to 7.5YR, value of 2 to 4, and chroma of 0 to 4.

The A or Ap horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 2 or 3. It has weak to moderate fine to medium granular structure. Texture in the fine earth fraction is loam, fine sandy loam, silt loam, very fine sandy loam, or sandy loam.

The E horizon is neutral or has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 0 to 2. It has weak, fine granular to weak fine subangular structure. Texture is the same as the A horizon.

The Bh or Bhs horizon has hue of 2.5YR to 10YR, value of 2 to 3 and chroma or 1 to 3. It has weak, fine granular structure to weak, fine subangular blocky structure. Texture in the fine earth fraction is loam, fine sandy loam, or very fine sandy loam.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 5 and chroma of 3 to 8. It has weak, fine to moderate granular structure to weak, medium subangular blocky structure. Texture in the fine earth fraction is silt loam, loam, very fine sandy loam, fine sandy loam, or sandy loam.

The BC horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 6. It has weak medium subangular, platy, or granular structure. Texture in the fine earth fraction is dominantly fine sandy loam or loam, but ranges to sandy loam.

The Cd horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It has platy structure or is massive. Texture in the fine earth fraction is fine sandy loam, sandy loam, or loam. Consistence is firm or very firm. Sandy lenses are layered within the loamy matrix and range from 0 to 20 percent of the firm substratum. The lenses are commonly coarse, medium and fine sand, ranging from 1/8 inch to 1 inch in thickness.

105A-- Rumney fine sandy loam, 0 to 3 percent slopes

This nearly level, poorly drained soil is on broad flat areas and in slight depressions on floodplains bordering rivers and brooks. The depressions are old stream channels or deep washed out channels that are filling in and wet.

A typical Rumney soil has the following characteristics:

Surface layer:
0 to 3 inches, dark brown fine sandy loam
Subsoil:
3 to 8 inches, dark brown loamy fine sand with mottles
8 to 20 inches, dark grayish brown loamy fine sand with mottles
Substratum:
20 to 65 inches, dark olive gray loamy sand with mottles

In many areas of northern Coos County, the soil surface layer and upper part of the subsoil have loam or silt loam texture. Gray is the dominant color in these layers.

Included with this soil are small areas of moderately well drained Lovewell and Metallak soils on slightly higher landscape positions; poorly drained Charles and Cohas soils in similar landscape positions; very poorly drained Medomak soils in lower areas; and small areas of very poorly drained organic Pondicherry or Wonsqueak soils in depressions. Inclusions make up about 15 percent of this soil map unit.

Important properties of this Rumney soil are:

Permeability: Moderate or moderately rapid in the surface layer, subsoil and substratum
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 12 inches from November to May
Flooding: Likely to occur between October and May in greater than 50 percent of the years; average duration is 2 to 7 days
Depth to bedrock: More than 60 inches
Potential frost action: High

Use

Cleared areas of this unit are in pasture. Wooded areas consist of water tolerant brush and trees.

Agriculture

This soil is moderately well suited for pasture and poorly suited for cropland. Wetness in the spring may limit tillage or delay cultivation. In some years, flooding can damage crops. Bare soil surfaces may be scoured by floodwater.

The capability subclass for agriculture is 4w.

Forestry

Alder is the most common woody species observed to grow on this soil. Other species include red maple, red spruce, and balsam fir.

The operation of equipment will usually be hampered by the seasonal high water table, frost action, and flooding. Operating equipment in the winter when the ground is frozen avoids stuck machinery as well as deep ruts. Other severe limitations for this soil include seedling mortality, windthrow hazard, and plant competition. Planting water tolerant species may reduce seedling mortality. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Plant competition may be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Erosion hazard is only slight.

Community Development

This soil is unsuited for most building developments and sanitary facilities due to flooding and wetness.

This soil meets the criteria for hydric soils. Although it is unsuitable for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemical, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Recreation and Wildlife

This soil has severe limitations for recreation use due to the seasonal high water table and flooding. Timing recreational use for frozen ground or dry periods without flooding may be helpful.

This soil has fair suitability for development of openland and woodland wildlife habitat. At 0 to 1 percent slope, the suitability is good for wetland wildlife development. At greater slopes the suitability is fair for wetland wildlife habitat development.

209A--Charles silt loam, 0 to 3 percent slopes, frequently flooded

This nearly level, poorly drained soil is in slight or shallow depressions, old stream channels, and some broad flat areas on the floodplains of large and small streams. This soil is subject to flooding.

A typical Charles soil has the following characteristics:

Surface layers:
0 to 6 inches, very dark grayish brown silt loam
Subsoil:
None
Substratum:
6 to 18 inches, dark grayish brown silt loam with mottles
18 to 34 inches, olive gray silt loam with mottles
34 to 51 inches, gray silt loam with mottles
51 to 65 inches, olive gray and dark brown silt loam with mottles

Some substratum layers below 40 inches have gravel in them.

Included with this soil are small areas of moderately well drained Lovewell and Podunk soils on slightly higher parts of the floodplain, small scattered areas of Rumney soils and Cohas soils on similar landscapes, and very poorly drained Medomak soils on lower parts of the floodplain and in old stream channels. Also included are small areas of very poorly drained Wonsqueak soil in depressions. Inclusions make up about 15 percent of this map unit.

Important properties of this Charles soil are:

Permeability: Moderate or in the strata of gravel and silt permeability may be moderate to very rapid
Available water capacity: Very high
Depth to seasonal high water table: 0 to 12 inches from November to June
Flood hazard: From March to October in greater than 50 percent of the years; average duration is from 2 to 7 days
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Use

About half of the areas of this unit are used for pasture or hay; a few areas are in row crops. The balance is in woodland.

Agriculture

This soil is moderately well suited for pasture and poorly suited for cropland due to the seasonal high water table. Flooding during the growing season is an additional factor limiting the suitability for row crops. The water table restricts the choice of crops, hampers the use of machinery, and delays cultivation in the spring.

Restricting grazing to periods when the soil is not wet to the surface helps avoid rutting.

The capability subclass is 4w.

Forestry

This soil has limited suitability for use as woodland due to wetness. Seedling mortality is severe due to frequent flooding. Equipment limitation is severe due to wetness. Operating when the ground is frozen in winter may diminish the equipment limitation. Plant competition is severe. Windthrow hazard is moderate. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand.

Alder is the most common woody species observed to grow on this soil. Other species include red maple, red spruce, and balsam fir.

Community Development

This soil is unsuited for most building development and sanitary facilities due to flooding and wetness.

This soil meets the criteria for hydric soils. Although it is unsuitable for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemical, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Recreation and Wildlife

This soil has severe limitations for recreation uses due to flooding and high seasonal high water table (wetness). Sites can possibly be located on areas of higher ground of the map unit but these areas may be too limited in size to use.

This soil is fairly well suited for development of openland, woodland, and wetland wildlife habitats.

Naumburg Series

The Naumburg series consists of very deep, poorly drained soils on glacial outwash plains and terraces. These soils formed in sandy glacial outwash deposits. Slopes range from 0 percent to 8 percent. These soils are classified as sandy, mixed Typic Endoaquods.

Naumburg soils occur on the landscape near moderately well drained Croghan and very poorly drained Searsport soils. Naumburg soils are also near Pondicherry, Pemi, Grange and Madawaska soils. Pondicherry soils are organic. Pemi soils formed in glaciolacustrine material. Moderately well drained Madawaska soils and poorly drained Grange soils have loamy material over sandy outwash material.

Typical pedon of Naumburg soils from an area of Naumburg fine sandy loam, in the town of Dummer, 1,700 feet east of the Androscoggin River and 450 feet north of the Dummer-Milan town line; latitude 44 degrees 36 minutes 26 seconds North, longitude 71 degrees 12 minutes 3 seconds West:

Ap — 0 to 14 inches; dark brown (7.5YR 3/2) fine sandy loam; weak fine and medium granular structure; very friable; few very fine, common fine, common medium, and few coarse roots; common fine yellowish red (5Y 4/6) iron-manganese accumulations; moderately acid; abrupt smooth boundary.

E -- 14 to 16 inches; brown (7.5YR 5/2) loamy fine sand; weak very fine and fine granular structure; friable; few fine roots; common medium prominent light olive brown (2.5Y 5/4) and few fine prominent olive yellow (2.5Y 6/8) iron depletions; strongly acid; abrupt broken boundary.

Bhs1 — 16 to 18 inches; mixed 60 percent dark reddish brown (5YR 2.5/2) and 40 percent dusky red (2.5YR 3/2) loamy fine sand; weak very fine, fine, and medium granular structure; friable; few very fine and fine roots; few medium prominent light olive brown (2.5Y 5/4) iron depletions; strongly acid; clear wavy boundary.

Bhs2 — 18 to 21 inches; dark brown (7.5YR 3/3) fine sand; weak very fine, fine, and medium granular structure; friable; few very fine and fine roots; few medium prominent dark red (2.5YR 3/6) masses of iron accumulation; strongly acid; clear wavy boundary.

BC — 21 to 29 inches; brown (10YR 4/3) fine sand; massive; friable; few very fine roots; common coarse prominent grayish brown (2.5Y 5/2) iron depletions and common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid; gradual smooth boundary.

C1 — 29 to 42 inches; olive (5Y 4/3) fine sand; massive; friable; few medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) masses of iron accumulation and common coarse distinct olive gray (5Y 5/2) iron depletions; moderately acid; gradual smooth boundary.

C2 — 42 to 56 inches; olive (5Y 5/3) fine sand; massive; friable; many coarse prominent yellowish red (5YR 5/6) masses of iron accumulation and common medium faint gray (5Y 5/1) iron depletions; moderately acid; gradual smooth boundary.

C3 — 56 to 65 inches; gray (5Y 5/1) very fine sand; massive; friable; many coarse prominent red (2.5YR 5/6) masses of iron accumulation; moderately acid.

The solum ranges from 29 to 44 inches in thickness. Rock fragments are generally absent. Reaction ranges from extremely acid to strongly acid in the solum and from strongly acid to moderately acid in the substratum.

The A or Ap horizon has a hue of 7.5YR or 10YR, value of 3, and chroma of either 1 or 2. Texture is sandy loam or fine sandy loam.

The E horizon has hue of 7.5YR to 5Y, value of either 5 or 7, and chroma of 1 or 2. Texture ranges from loamy fine sand to very fine sandy loam.

The Bh horizon has hue of 10R to 5YR, value of 2.5, and chroma of 1 or 2. Texture ranges from loamy fine sand to very fine sand.

The Bhs horizon has hue of 10R to 7.5YR, value of 2.5 or 3, and chroma of 2 to 4. The Bs horizons have hues of 5YR to 10YR, values of 3 to 6, and chromas of 4 to 6. The BC horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. Textures of Bhs, Bs and BC horizons range from loamy sand to fine sand.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 6. Texture ranges from very fine sand to sand.

Lyme Series

The Lyme series consists of very deep, poorly drained soils on glaciated uplands. These soils formed in loamy ablation glacial till. Slopes range from 0 percent to 15 percent. These soils are classified as coarse-loamy, mixed, acid, frigid Aeric Endoaquepts.

Lyme soils occur on the landscape near the moderately well drained Sunapee and very poorly drained Peacham soils. Lyme soils are also near Moosilauke, Wonsqueak and Pillsbury soils. Moosilauke soils are coarser textured. Wonsqueak soils are very poorly drained organic soils. Pillsbury soils have a firm substratum.

Typical pedon of Lyme soils from an area of Lyme fine sandy loam, 0 percent to 3 percent slopes in the town of Whitefield, 1000 feet from junction of NH Route 116 and Forest Lake Road on Forest Lake Road, north of road by railroad crossing, in woodland; latitude 44 degrees 20 minutes 43 seconds North, longitude 71 degrees 38 minutes 51 seconds West:

Ap — 0 to 11 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak very fine to medium granular structure; friable; many very fine to coarse roots; few fine prominent gray (5Y 5/1) iron depletions; 10 percent rock fragments (stones); strongly acid; abrupt smooth boundary.

Bw — 11 to 19 inches; dark brown (10YR 4/3) stony fine sandy loam; weak medium subangular blocky structure; friable; few very fine to fine roots; common coarse prominent gray (5Y 5/1) iron depletions; 15 percent rock fragments (stones); strongly acid; abrupt smooth boundary.

Bg — 19 to 36 inches; gray (5Y 5/1) fine sandy loam; massive; friable; few very fine to fine roots; common coarse prominent dark yellow brown (10YR 4/4) masses of iron accumulation; 5 percent rock fragments (stones); strongly acid; abrupt smooth boundary.

C1 — 36 to 45 inches; dark yellowish brown (10YR 4/4) fine sandy loam; massive; friable; 10 percent rock fragments (gravel); common coarse prominent dark grayish brown (2.5Y 4/2) iron depletions; strongly acid; abrupt smooth boundary.

C2 — 45 to 52 inches; olive brown (2.5Y 4/3) fine sandy loam; massive; friable; common coarse distinct gray (10YR 5/1) iron depletions; 10 percent rock fragments (gravel); strongly acid; abrupt smooth boundary.

C3 — 52 to 65 inches; brown (10YR 4/3) gravelly sandy loam; massive; friable; common coarse distinct gray (10YR 5/1) iron depletions; 20 percent rock fragments (gravel); strongly acid.

An inch of needle and leaf litter is on surface.

The solum ranges from 23 to 36 inches in thickness. Rock fragments range from 5 percent to 20 percent throughout the soil. Unless limed, reaction is very strongly acid or stongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Texture in the fine earth fraction is sandy loam to very fine sandy loam. Consistence is friable or very friable.

The B horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 6. Texture in the fine earth fraction is sandy loam to very fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 6. Texture in the fine earth fraction is sandy loam or fine sandy loam. Below a depth of 30 inches, some pedons have loamy sand textures.

433A--Grange silt loam, 0 to 5 percent slopes

This nearly level to gently sloping, poorly drained soil is on broad flat areas, depressions, and concave areas on outwash plains. Some areas have microrelief consisting of small hills one to one and a half feet high, five to fifty feet apart and two to twenty-five square feet across.

A typical Grange soil has the following characteristics:

Surface layer:
0 to 6 inches, olive gray silt loam
Subsoil:
6 to 9 inches, olive silt loam with mottles
9 to 27 inches, olive gray silt loam with mottles
Substratum:
27 to 50 inches, dark gray fine and medium sand
50 to 65 inches, dark gray medium and coarse sand

Some soils may have a gravelly substratum.

Included with this soil are small areas of moderately well drained Madawaska soils on higher parts of the landscape; poorly drained Pemi soils; very poorly drained Wonsqueak soils; areas of soil with slopes greater than 5 percent; and other areas with a few surface stones. Inclusions make up about 15 percent of this map unit.

Important properties of this Grange soil are:

Permeability: Moderate in the surface layer and subsoil and moderately rapid to rapid in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches from November to May
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Use

About half of the areas of this unit are used for woodland; the balance is used for pasture and hay.

Agriculture

This soil is moderately well suited for pasture and poorly suited for cropland. The seasonal high water table restricts the choice of crops, hampers the use of machinery, and delays cultivation in the spring. This soil is suitable for moisture tolerant grasses and legumes. Restricting grazing to driest time helps reduce soil rutting.

The capability subclass for agriculture is 4w.

Forestry

Fertility and moisture for this soil are fair to poor for hardwood growth and fair to good for softwoods, especially red spruce and balsam fir. Management limitations due to wetness, such as equipment limitations, seedling mortality, windthrow hazard, and plant competition are severe. Operating when the ground is frozen in winter may diminish the severe equipment limitation. Planting water tolerant species can reduce seedling mortality. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species.

Successional trends are not clear, but seem to be toward stands of shade tolerant softwoods (red spruce and balsam fir). Hardwood competition is moderate to severe. Most successional stands contain a variety of hardwood species in various combinations with spruce, balsam fir, and occasionally white pine.

Community Development

Wetness is a severe limitation for all building site development; drainage systems may be difficult to establish on this nearly level soil due to lack of grade for the outlets. Sump pumps are an option for dwellings and shallow excavations. In addition to wetness, unstable cutbanks pose a hazard to shallow excavations. If slopes are cut back to stable slopes or shored up, the instability limitation can be reduced.

In addition to wetness, frost action is a limitation for this soil for local roads and streets. Installing drainage and providing coarser grained base material to below frost depth helps reduce frost action.

In areas requiring on-site sewage disposal, wetness is a severe limitation due to the seasonal high water table. In addition to wetness, the rapid permeability of substratum layers makes this soil a poor filter for septic tank effluent. Unfiltered effluent may pollute surface and ground water. Off-site sewage disposal systems to pump effluent to higher ground may be necessary.

This soil is a probable source of sand, but it is an unlikely choice for commercial operations due to wetness. Extensive test pitting is recommended before attempting a commercial operation.

This soil meets the criteria for hydric soil. Although it has severe limitations for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. These areas also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Recreation and Wildlife

This soil has severe limitations for development of camping areas, picnic areas, playgrounds, or paths and trails due to wetness. Sites can possibly be located on higher ground areas of the map unit but these areas may be too limited in size to use.

This soil has fair suitability for development of openland habitat, woodland wildlife habitat, and wetland wildlife habitat.

Skerry Series

The Skerry series consists of very deep, moderately well drained soils on glaciated uplands. These soils formed in loamy material over sandy dense basal till. Slopes range from 0 to 35 percent. These soils are classified as coarse-loamy, mixed, frigid Aquic Haplorthods.

Skerry soils occur on the landscape near well drained Becket and poorly drained Pillsbury soils. Skerry soils are also near Monadnock, Success, Marlow, and Peru soils. Monadnock and Success soils formed in friable ablation till although Success soils have developed a cemented ortstein layer in the solum. Skerry soils have a coarser textured substratum than Peru soils. Marlow soils are well drained.

Typical pedon of Skerry soils from an area of Skerry-Peru association, fine sandy loam, 8 to 15 percent slopes, very stony, in the town of Millsfield, 6,000 feet north of intersection of Phillip's Brook Road and Millsfield-Dummer town line, site is 100 feet east of Phillip's Brook Road, in a wooded area; latitude 44 degrees 42 minutes 49 seconds North, longitude 71 degrees 18 minutes 19 seconds West:

Oi — 0 to 2 inches; slightly decomposed forest litter, many very fine and fine roots, common medium roots; abrupt smooth boundary.

Oe — 2 to 4 inches; partially decomposed organic matter; weak fine granular structure; many very fine and fine roots, common medium roots; abrupt smooth boundary.

E — 4 to 6 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine granular structure; friable; common very fine, fine, and medium roots; 5 percent rock fragments (3 percent cobbles, 2 percent stones); very strongly acid; abrupt wavy boundary.

Bhs — 6 to 8 inches; dark brown (7.5YR 3/2) fine sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; 10 percent rock fragments (5 percent cobbles, 5 percent stones); strongly acid; abrupt wavy boundary.

Bs1 — 8 to 16 inches; strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine granular structure; friable; many fine, and medium, common very fine roots; 17 percent rock fragments (2 percent gravel, 5 percent cobbles, 10 percent stones); strongly acid; abrupt wavy boundary.

Bs2 — 16 to 26 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine, and medium roots; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; 14 percent rock fragments (2 percent gravel, 5 percent cobbles, 7 percent stones); strongly acid; abrupt smooth boundary.

BC — 26 to 31 inches; olive (5Y 5/4) gravelly loamy sand; weak fine granular structure; friable; few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; 17 percent rock fragments (5 percent gravel, 7 percent cobbles, 5 percent stones); strongly acid; abrupt smooth boundary.

Cd — 31 to 65 inches; olive gray (5Y 5/2) gravelly loamy sand; massive; firm; many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation; 18 percent rock fragments (8 percent gravel, 5 percent cobbles, 5 percent stones); moderately acid.

The solum ranges from 15 to 36 inches in thickness. Rock fragments range from 5 to 30 percent in the solum, and from 5 to 40 percent in the substratum. Reaction ranges from very strongly acid to moderately acid throughout. Weak cementation (ortstein) ranges from 0 to 50 percent in the spodic horizon.

The O horizon is neutral or has hue of 5YR to 10YR, value of 2 to 4, chroma of 0 to 4.

The A horizon where present is up to 4 inches thick, has a hue of 10YR with value of 2 to 3, and chroma of 1 or 2. Texture in fine earth fraction is fine sandy loam, or sandy loam.

The Ap horizon, where present, has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Texture in the fine earth fraction is fine sandy loam or sandy loam.

The E horizon, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 or 2. Texture in the fine earth fraction is fine sandy loam or sandy loam.

The Bhs or Bh horizon has hue of 2.5YR or 5YR, value of 2 or 3, and chroma of 1 to 3. Texture in the fine earth fraction is dominantly fine sandy loam, but ranges to sandy loam.

The Bs horizon has hue of 2.5YR to 10YR, value of 2 to 6, and chroma of 3 to 8. Some pedons have a Bw horizon that has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. Texture in the fine earth fraction of the Bs and Bw horizons is fine sandy loam, or sandy loam.

The BC horizon, where present has hue of 10YR to 5Y, value 3 to 6, and chroma of 2 to 6. Texture in the fine earth fraction is fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. Structure is platy; or the horizon is massive or single grain in lenses. Consistence is firm or very firm. Texture of sandy structural plates and massive horizons is loamy sand, loamy fine sand, or their gravelly analogues. Texture of the loamy structural plates is fine sandy loam, sandy loam, or their gravelly analogues. Texture of the lenses ranges from loamy fine sand to coarse sand.

561B--Tunbridge-Plaisted-Lyman complex, 3 to 8 percent slopes, very stony

This complex consists of three gently sloping soils intermingled in such an intricate pattern that it is not practical to map them separately. Tunbridge soils are well drained, 20 to 40 inches deep to ledge, and make up about 40 percent of this complex. Plaisted soils are also well drained, greater than 60 inches deep to ledge, have a hardpan, and make up about 20 percent of this complex. Lyman soils are somewhat excessively drained, 10 to 20 inches deep to ledge, and make up about 20 percent of this complex. Nearly all areas of this map unit are located in the northern third of Coos County, and these areas are underlain by ledge (the landscape is bedrock controlled) that has been glacially modified. The landscape consists of a complex series of small hills and knolls 1/4 to 3 acres in size and 1 to 5 vertical feet higher than the valleys and depressions in between. Slope patterns are complex. Stones 10 to 24 inches in diameter and 5 to 80 feet apart cover the surface.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum layer is a dense and firm hardpan.

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R – 16 inches, unweathered phyllite bedrock

Included with this complex are small areas in the depressions and valleys of moderately well drained Howland soil and poorly drained Cabot soils or very poorly drained Peacham soils. Bedrock geology maps show a softer bedrock that can be seen along parts of US Route 145 north of the hard bedrock that creates Beaver Brook Falls in Colebrook . Lombard soils may be inclusions in this area. Stratford, NH has areas of soft bedrock also. Also included are soils that are less than 10 inches deep to ledge, small areas of rock outcrop, and other areas having slopes less than 3 or greater than 8 percent. Total inclusions make up about 20 percent of this map unit.

Important properties of this Tunbridge soil are:

Permeability: Moderately rapid throughout
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface layer and subsoil, moderately slow in the substratum.
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan layer in April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

The hardpan substratum layer limits the rooting depth of plants.

Important properties of this Lyman soil are:

Permeability: Moderately rapid throughout
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

The ledge (bedrock) limits the rooting depth of plants.

Use

Many areas of this complex are forested. Some areas are in pasture. A few areas are in residential development.

Agriculture

The soils in this complex are moderately well suited for pasture and not suited for cropland due to the abundant numbers of stones on the surface. The ease with which these soils can be improved for pasture depends on the numbers of surface stones and outcroppings of ledge.

The capability subclass for agriculture is 6s.

Forestry

Fertility and moisture relationships are adequate for this complex for good tree growth. Management concerns, such as erosion hazard and equipment limitations are slight. However, erosion may become a problem during spring runoff and during unusually heavy periods of rainfall; designing drainage systems may help prevent and control potential erosion.

Additional management concerns are seedling mortalities, windthrow hazard, and plant competition. Seedling mortalities can be minimized on the Lyman soil by planting containerized stock or larger that normal seedlings; otherwise mortalities of 25 to 50 percent can be expected. Restricted rooting depths result in a moderate windthrow hazard on the Tunbridge and Plaisted soils and a severe hazard on the Lyman soil; small patch or narrow width clearcuts, or selective cuts may help keep tree throw losses to a minimum. Plant competition (severe on Plaisted soil and moderate on Lyman soil) can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species.

Successional trends are not clear on the soils in this map unit, but may be favoring hardwoods. However, most stands are made up of either softwoods or hardwoods; the mixed stand is not common. Softwood species observed doing well in this map unit include balsam fir, red spruce, white spruce, and northern white cedar. Most stands of hardwood generally include significant percentages of sugar maple and yellow birch; other hardwood species observed but not found in all stands include paper birch, quaking aspen, American beech, and black cherry.

Community Development

For building site developments, the bedrock (ledge) in the Tunbridge and Lyman soils is limiting for many uses. Locating development activities on the Plaisted soil in this complex will avoid bedrock concerns. The hardpan layer in the Plaisted soil can potentially interfere with digging shallow excavations, affecting the ease of construction.

Frost action on local roads and streets is a moderate concern for Plaisted and Tunbridge soils; frost action can be minimized by placing coarse grained base materials to frost depth and installing drainage.

For on-site sewage disposal, the bedrock in the Tunbridge and Lyman soils result in severe limitations for septic tank absorption fields. Locating absorption field sites on Plaisted soil in this complex will avoid bedrock concerns. Slow permeability in the hardpan of the Plaisted soil can also be a severe limitation for septic tank absorption fields in some areas. Constructing raised bed absorption fields can reduce this concern and allows effluent to be filtered before reaching the firm substratum.

Recreation and Wildlife

Tunbridge, Plaisted, and Lyman soils in this complex have slight limitations for development of paths and trails. For development of camping and picnic areas, large and small stones are moderate limitations for the Plaisted soil. Small stones are a moderate limitation for development of camping and picnic areas for the Tunbridge soil. Stones can be picked off the surface. Large and small stones are a severe limitation for development of playground areas for the Tunbridge and Plaisted soils. The ledge in the Lyman soil results in a severe limitation for development of camping, picnic, and playground areas. The presence of large stones is an additional severe limitation for development of playgrounds on Lyman soils. Careful design and layout of the individual camping and picnic sites to avoid ledge areas helps overcome this limitation.

The Tunbridge and Plaisted soils in this complex have good suitabilities for development of woodland wildlife habitats, poor suitabilities for openland wildlife habitat development, and very poor suitabilities for wetland wildlife habitat development. The Lyman soil has poor suitability for openland or woodland wildlife habitat development, and very poor suitability for wetland wildlife habitat development.

Howland Series

The Howland series consists of very deep, moderately well drained soils on glaciated uplands. These soils formed in dense basal till weathered from phyllite or other fine grained rock. Most of these soils occur in northern Coos County. Slopes range from 3 percent to 25 percent. These soils are classified as coarse-loamy, mixed, frigid Aquic Haplorthods.

Howland soils occur on the landscape near well drained Plaisted soils and poorly drained Cabot soils. Howland soils are also near Lyman, Tunbridge, and Dixmont soils. Lyman and Tunbridge soils are underlain by bedrock at less than 40 inches. Dixmont soils have a loose substratum.

Typical pedon of Howland soils from an area of Tunbridge-Plaisted-Lyman complex, 8 percent to 15 percent slopes, in the town of Pittsburg, 3,100 feet east of route 3 bridge on Perry Stream on Route 3 and 475 feet north of Route 3, in a stand of balsam fir and white spruce; latitude 45 degrees 5 minutes 23 seconds North, longitude 71 degrees 19 minutes 49 seconds West:

Oe — 0 to 1 inch; black (N 2/0) moderately decomposed plant material (needles); moderate fine and very fine granular structure; friable; common very fine, fine, and medium roots; very strongly acid; abrupt smooth boundary.

A — 1 to 3 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable; common very fine, fine, and medium roots; 14 percent rock fragments (10 percent channers and 4 percent flagstones); strongly acid; clear smooth boundary.

Bs1 — 3 to 8 inches; dark brown (7.5YR 3/4) gravelly silt loam; weak fine granular structure; friable; common very fine, fine, and medium roots; 15 percent rock fragments (10 percent channers and 5 percent flagstones); moderately acid; clear smooth boundary.

Bs2 — 8 to 14 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; weak fine granular structure; friable; common very fine and fine roots; 20 percent rock fragments (15 percent channers and 5 percent flagstones); slightly acid; abrupt smooth boundary.

BC — 14 to 24 inches; olive (5Y 4/3) gravelly silt loam; weak fine and medium platy structure; friable; few fine and very fine roots; few fine faint olive (5Y 4/4) masses of iron accumulation at 19 inches; 20 percent rock fragments (15 percent channers and 5 percent flagstones); slightly acid; abrupt smooth boundary.

Cd1 — 24 to 58 inches; olive gray (5Y 4/2) gravelly silt loam; moderate fine and medium platy structure; firm; few medium distinct dark yellowish brown (10YR 4/4), few fine distinct olive brown (2.5Y 4/4), and few medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation; 30 percent rock fragments (25 percent channers and 5 percent flagstones); moderately acid; abrupt smooth boundary.

Cd2 — 58 to 66 inches; olive (5Y 4/3) very gravelly very fine sandy loam; massive; firm; common coarse distinct dark yellowish brown (10YR 3/6), common medium distinct dark yellowish brown (10YR 4/6), and few medium distinct grayish brown (2.5Y 5/4) masses of iron accumulation; 35 percent rock fragments (25 percent channers and 10 percent flagstones); moderately acid.

The solum ranges from 14 to 26 inches in thickness. Coarse fragments range from 4 percent to 35 percent by volume throughout the soil. Reaction ranges from extremely acid to slightly acid in the solum and from very strongly acid to slightly acid in the substratum. Silt content in the solum and the substratum layers is greater than 45 percent.

The A or Ap horizon has hue of 10YR, value of 2 to 4 and chroma of 1 to 3. It has weak, fine to medium granular or weak fine subangular blocky structure. Texture in the fine earth fraction is silt loam or very fine sandy loam. Consistence is friable.

The E horizon has hue of 10YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has weak fine granular structure. Texture in the fine earth fraction is silt loam or very fine sandy loam. Consistence is friable.

The Bh horizon has hue of 2.5YR or 5YR, value of 2 or 3, and chroma of 2 or 3. It has weak, fine to coarse granular structure. Texture in the fine earth fraction is silt loam or loam. Consistence is friable. Organic matter content is greater than 2 percent.

The Bs horizon has hue of 5YR to 10YR, value of 2 to 5, and chroma of 3 to 8. It has weak to moderate, fine to medium granular structure and weak to medium, fine to medium subangular blocky structure. The texture is silt loam. Consistence is friable to very friable.

The Bw or BC horizon has hue of 10YR to 5Y, values of 4 to 6, and chroma of 2 to 6. It has weak to moderate, fine or medium granular, subangular blocky or platy structure. Texture of the fine earth fraction is silt loam or very fine sandy loam. Structure of the Bw horizon is weak to moderate, fine or medium granular or subangular blocky. Consistence is very friable or friable.

The Cd horizons have hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 4. They have weak to moderate, thin and medium to very thick platy structure or are massive. Texture in the fine earth fraction is silt loam or very fine sandy loam. Consistence is firm to very firm.

Nicholville Series

The Nicholville series consists of very deep, moderately well drained soils on glaciolacustrine plains and terraces. These soils formed in water deposited sediments of very fine sandy loams and silts. Slope ranges from 0 percent to 15 percent. These soils are classified as coarse-silty, mixed, frigid Aquic Haplorthods.

Nicholville soils occur on the landscape near the well drained Salmon and the poorly drained Pemi soils. Nicholville soils are also near Adams and Madawaska soils. Adams soils formed in sandy outwash materials. Madawaska soils formed in loamy sediments underlain by sandy deposits.

Typical pedon of Nicholville soils from an area of Nicholville very fine sandy loam, 3 to 8 percent slopes, in the town of Groveton, 2700 feet west of junction of Brown Road and US Route 3 on Brown Road, 1000 feet south of Brown Road in woodland; latitude 44 degrees 36 minutes 5 seconds North, longitude 71 degrees 32 minutes 8 seconds West:

Oe — 0 to 3 inches; moderately decomposed organic matter.

E — 3 to 6 inches; dark grayish brown (10YR 4/2) very fine sandy loam, very fine granular structure; friable; common very fine, fine and medium roots, few coarse roots; very strongly acid; abrupt wavy boundary.

Bs1 — 6 to 10 inches; dark brown (7.5YR 3/4) silt loam; weak fine and medium granular structure; friable; few very fine, common fine, and medium roots; strongly acid; clear wavy boundary.

Bs2 — 10 to 15 inches; dark brown (7.5YR 4/2) silt loam; weak fine granular structure; friable; few fine and medium roots; strongly acid; clear wavy boundary.

BC — 15 to 27 inches; olive brown (2.5Y 4/4), very fine sandy loam; weak fine granular structure; friable; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation and few fine prominent gray (10YR 5/1) iron depletions; strongly acid; clear wavy boundary.

2C1 — 27 to 43 inches; olive (5Y 4/3); loamy very fine sand; massive; friable; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid; clear wavy boundary.

2C2 — 43 to 65 inches; olive (5Y 4/3), loamy very fine sand; massive; friable; common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid.

The solum ranges from 16 to 30 inches in thickness. Rock fragments ranges from 0 to 10 percent by volume throughout soil. Reaction ranges from very strongly or strongly acid in the solum and strongly to slightly acid in the substratum.

The A horizon has hue of 10YR, value of 3 or 4 and chroma of 2 or 3. It has weak fine granular structure. Texture is silt loam or very fine sandy loam. Consistence is friable.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2. It has weak fine granular structure. Texture is very fine sandy loam. Consistence is friable.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 4 to 6. It has weak fine to medium granular structure. Texture is very fine sandy loam to silt loam. Consistence is friable.

The BC horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It has weak fine granular or subangular blocky structure. Texture is silt loam to very fine sandy loam. Consistence is friable.

The C horizon has hue of 2.5Y to 5Y, value of 4 or 5, and chroma of 2 to 6. It has massive structure to weak fine platy or subangular blocky structure. Texture is silt loam, very fine sandy loam, loamy very fine sand or loamy fine sand.

633A--Pemi silt loam, 0 to 5 percent slopes

This nearly level to gently sloping, poorly drained soil is in slight depressions, concave areas, and broad flat plains of old glacial lake beds. Typically the surface and soil is stone free.

A typical Pemi soil has the following characteristics:

Surface layers:
0 to 1 inch of slightly decomposed leaves and needles
1 to 3 inches, moderately decomposed forest litter
3 to 5 inches, black highly decomposed forest litter
5 to 10 inches, gray silt loam with mottles
Subsoil:
10 to 14 inches, olive gray silt loam with mottles
14 to 21 inches, olive gray very fine sandy loam with mottles
Substratum:
21 to 38 inches, dark gray varved (thinly layered) very fine sandy loam and silt loam with mottles
38 to 65 inches, olive silt loam with mottles

In a few areas, the substratum may have up to 35 percent gravel by volume.

Included with this soil are small areas of moderately well drained Nicholville soils on slightly higher parts of the landscape; small scattered areas of the poorly drained Grange soils; and very poorly drained Wonsqueak soils in bogs and swamps too small to map out separately. Also included are areas with slopes ranging up to 8 percent. In a few areas, the surface may be covered by stones 10 to 100 feet apart. Inclusions make up about 15 percent of this map unit.

Important properties of this Pemi soil are:

Permeability: Moderate in the surface layers and subsoil and moderately slow to slow in the substratum
Available water capacity: Very high
Depth to seasonal high water table: 6 to 18 inches from November to May
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Use

More than half of the area of this unit is in woodland; the balance is used for pasture or is idle.

Agriculture

This soil is moderately well suited for pasture and poorly suited for cropland. The seasonal high water table limits the suitability of this soil for row crops and hay. It restricts the choice of crops, hampers the use of machinery, and delays cultivation in the spring. Restricting grazing to the driest times of year helps reduce the impact of hooves churning wet soil. Drainage is not suggested because this is a hydric soil.

The capability subclass for agriculture is 4w.

Forestry

Fertility and moisture are fair to poor for hardwood growth and fair to good for softwoods, especially red spruce and balsam fir. Equipment limitations, windthrow hazard, and plant competition are severe concerns; seedling mortality has a moderate limitation. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Operating when the ground is frozen in winter may diminish the severe equipment limitation. Planting water tolerant species can reduce seedling mortalities. On some sites, plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. On other sites, there may be abundant regeneration of spruce-balsam fir for softwood production.

Successional trends on these poorly drained soils are toward stands of shade tolerant softwoods, i.e. red spruce and balsam fir. Balsam fir is a persistent component in nearly all stands. White and black spruce are sometimes present.

Community Development

Wetness is a severe limitation for all building site development; drainage systems may be difficult to establish on this nearly level soil due to lack of grade for the outlets. Sump pumps are an option for dwellings and shallow excavations.

In addition to wetness, frost action is a limitation for this soil for local roads and streets. Installing drainage and providing coarser grained base material to below frost depth helps reduce frost action.

In areas requiring on-site sewage disposal, wetness and slow perc rate are severe limitations due to the seasonal high water table. Off-site sewage disposal systems to pump effluent to higher ground may be necessary.

This soil meets the criteria for hydric soil. Although it has severe limitations for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. These areas also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Recreation and Wildlife

This soil has very limited suitability for recreation uses because of the seasonal high water table. Sites can possibly be located on higher ground areas of the map unit but these areas may be too limited in size to use.

This soil has fair suitability for development of openland and woodland wildlife habitat. Suitability is also fair for development of wetland wildlife habitat.

Pillsbury Series

The Pillsbury series consists of very deep, poorly drained soils in shallow depressions and along drainageways in glacial till uplands. These soils formed in loamy material underlain by compact loamy basil till. Slopes range from 0 percent to 15 percent. These soils are classified as coarse-loamy, mixed, acid, frigid Aeric Epiaquepts.

Pillsbury soils occur on the landscape near well drained Marlow soils, moderately well drained Peru soils, and very poorly drained Peacham soils. Pillsbury soils are also near Becket, Skerry, Lyme, and Moosilauke soils. Becket soils are well drained soils and Skerry soils are moderately well drained. Lyme and Moosilauke soils have a friable substratum.

Typical pedon of Pillsbury soils from an area of Pillsbury sandy loam, 3 percent to 8 percent slopes, very stony, in the town of Lancaster, 375 feet west of the junction of North Road and Flaherty Road, in a pasture; latitude 44 degrees 27 minutes 33 seconds North, longitude 71 degrees 30 minutes 6 seconds West:

Ap — 0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; very friable; common very fine, fine, medium, and coarse roots; common medium prominent reddish brown (5YR 5/4) masses of iron accumulation; 25 percent rock fragments (20 percent gravel, 5 percent cobbles); moderately acid; abrupt smooth boundary.

Bw — 7 to 15 inches; 60 percent light olive brown (2.5Y 5/4) with 40 percent dark grayish brown (2.5Y 4/2) gravelly sandy loam; moderate medium subangular blocky structure; friable; common very fine, fine, and medium roots; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation; 30 percent rock fragments (25 percent gravel, 5 percent cobbles); moderately acid; clear smooth boundary.

Bg — 15 to 23 inches; grayish brown (10YR 5/2) gravelly sandy loam; weak medium and coarse subangular blocky structure; friable; common very fine, fine, and medium roots; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; 30 percent rock fragments; moderately acid; abrupt smooth boundary.

Cd1 — 23 to 42 inches; light olive brown (2.5Y 5/4) gravelly fine sandy loam; moderate fine and medium platy structure; firm; common coarse prominent olive gray (5Y 5/2) iron depletions and common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation; 25 percent rock fragments (20 percent gravel, 5 percent cobbles); moderately acid; abrupt smooth boundary.

Cd2 — 42 to 65 inches; light olive brown (2.5Y 5/4) gravelly sandy loam; massive; firm; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation and common coarse prominent light olive gray (5Y 6/2) iron depletions; 23 percent rock fragments (20 percent gravel, 3 percent cobbles); moderately acid.

The solum ranges from 16 to 32 inches in thickness. Gravel content ranges from 2 percent to 25 percent in the solum and from 10 percent to 40 percent in the substratum. Cobblestone content ranges from 0 percent to 5 percent in the solum and 0 percent to 12 percent in the substratum. Reaction is very strongly acid to moderately acid throughout.

The A or Ap horizon has hue 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 3. Texture in the fine earth fraction is loam or sandy loam. Consistence is very friable or friable.

The Bw horizon has hue 10YR or 2.5Y, value of 3 to 5, and chroma of 3 or 4, and chroma of 1 or 2. Texture in the fine earth fraction is loam or sandy loam.

The Bg horizon has hue 10YR or 2.5Y, and value of 4 or 5. It has fine, medium, or coarse granular or subangular blocky structure. Texture in the fine earth fraction is loam, sandy loam, or fine sandy loam.

The BC horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It has fine platy structure. Texture in the fine earth fraction is loam or sandy loam. Consistence is friable.

The Cd horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 4. It has fine and medium platy structure or is massive. Texture in the fine earth fraction is sandy loam or fine sandy loam. Consistence is firm.

701B Becket-Skerry Association, gently sloping, very stony

This map unit consists of soils on hills, toeslopes, and lower sideslopes. The Becket and Skerry soils are intermingled in a regularly repeating pattern on a relatively smooth landscape. The Becket soils are typically on higher areas. The Skerry soils are typically on lower areas or in more concave positions. Becket soils are well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and makes up about 60 percent of this map unit. Skerry soils are moderately well drained, greater than 65 inches deep to bedrock, have a dense basal till substratum, and makes up about 20 percent of this map unit. Surface stones are 5 to 80 feet apart. Slope ranges from 0 to 15 percent. Map units are 50 acres or larger in size.

A typical Becket soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed leaf litter
2 to 4 inches, highly decomposed leaf litter
4 to 7 inches, grayish brown fine sandy loam with 10 percent rock fragments
Subsoil:
7 to 10 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
10 to 20 inches, yellowish red gravelly fine sandy loam with 15 percent rock fragments
20 to 26 inches, yellowish red fine sandy loam with 10 percent rock fragments
26 to 38 inches, yellowish brown gravelly sandy loam with 20 percent rock fragments
Substratum:
38 to 65 inches light olive brown gravelly loamy sand with 25 percent rock fragments

The substratum is a dense and firm hardpan with lenses of sand.

A typical Skerry soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed forest litter
2 to 4 inches, partially decomposed organic matter
4 to 6 inches, light brownish gray fine sandy loam with 5 percent rock fragments
Subsoil:
6 to 8 inches, dark brown fine sandy loam with 10 percent rock fragments
8 to 16 inches, strong brown gravelly fine sandy loam with 17 percent rock fragments
16 to 26 inches, yellowish brown fine sandy loam with mottles and 14 percent rock fragments
26 to 31 inches, olive gravelly loamy sand with mottles and 17 percent rock fragments
Substratum:
31 to 65 inches, olive gray gravelly loamy sand, with mottles and 18 percent rock fragments

The substratum is a dense and firm hardpan with lenses of sand.

Included with this association are small scattered areas of well drained Marlow, Tunbridge, and Monadnock soils. Marlow soil has a fine textured substratum. Tunbridge soils are shallow to bedrock. Monadnock soils are loose till (no hardpan). Poorly drained Pillsbury soils may occur in concave areas. A few areas with bedrock less than 60 inches deep are included. Also included are areas of soils having slopes greater than 15 percent. Most 701 map units southwest of Route 110 and North of Moose Brook State Park have a BC horizon with cementation above the hardpan. Cementation is also found above the pan in other parts of the city of Berlin and in the town of Randolph. Included soils make up about 20 percent of this association.

Important properties of this Becket soil are:

Permeability: Moderate in surface and subsoil and moderately slow or slow in substratum
Available water capacity: High
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 22 inches
Potential frost action: Moderate

Important properties of this Skerry soil are:

Permeability: Moderate in the surface and subsoil, slow or moderately slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 22 inches
Depth to seasonal high water table: Perched water at a depth of 18 to 30 inches from November to May
Depth to bedrock: More than 60 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on these Becket-Skerry soils for the growth of high quality hardwoods. The successional trends on these soils are toward stands of shade tolerant hardwoods such as beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, and occasionally white pine and hemlock.

Management concerns, such as erosion hazards, equipment limitations, and seedling mortality are slight. However, windthrow hazard and plant competition pose moderate limitations for both Becket and Skerry soils. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. On the Skerry soil, seasonal wetness may be a concern for the operation of equipment. Harvesting when the ground is frozen or during drier parts of the year may reduce this concern.

Recreation and Wildlife

On the Becket soil, hiking paths and trails can be planned and maintained with few concerns. On the Skerry soil, the seasonal wetness is a moderate consideration for developing hiking paths and trails. Waterbars and culverts can help direct water off the paths and trails.

The Becket and Skerry soils have poor suitability for openland wildlife habitat development, fair suitability for woodland wildlife habitat development, and very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

719E--Marlow-Tunbridge association, steep, very stony

This map unit consists of soils on sideslopes of hills and mountains. Marlow and Tunbridge soils are intermingled in a regularly repeating pattern and are typically on relatively smooth landscapes. Surface stones are 5 to 80 feet apart. Marlow soils are well drained, greater than 60 inches to bedrock, and have a dense basal till substratum. Tunbridge soils are well drained and 20 to 40 inches deep to bedrock. Marlow soils comprise about 70 percent, Tunbridge soils about 15 percent, and other soils about 15 percent of this map unit. Slopes range from 35 to 60 percent. Map units are 50 acres or larger in size.

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

Included with this association are small areas of well drained Becket, Monadnock, or Berkshire soils. Becket soils have a sandier substratum than Marlow while Monadnock and Berkshire soils have friable substratums. Shallow Lyman soils are often located near Tunbridge soils. Slopes in some areas may exceed 60 percent and in others be less than 35 percent. Stones may be less than 5 feet apart in some areas or greater than 80 feet apart in other areas. Inclusions comprise about 15 percent of this association.

Important properties of this Marlow soils are:

Permeability: Moderate in surface and subsoil and moderately slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: 24 to 42 inches perched water table from March to April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 23 inches
Potential frost action: moderate

Important properties of this Tunbridge soil are:

Permeability: Moderately rapid
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these soils for good tree growth, however physical limitations affect forest management. Slope severely limits equipment use for logging operations. Building roads and trails on the contour with installing waterbars and culverts helps reduce erosion hazards and permits safer operations. Windthrow hazard has moderate limitations for Marlow and Tunbridge soils. Plant competition has moderate limitations for Marlow soils and slight limitations for Tunbridge soils. Careful site preparation reduces the invasion of undesirable species. In areas where road beds are cut into hardpan layers or down to the ledge, drainage ditches can remove water during wet times of the year.

Common trees with production potential include Eastern white pine, balsam fir, red spruce, sugar maple, yellow birch, paper birch, white spruce, and white ash. Productivity is good. Hardwoods are more productive than softwoods on the Marlow soils. The Tunbridge soils are highly productive for either hardwood or softwood species.

Recreation and Wildlife

Steep slope is a severe concern for development of hiking paths and trails. From an erosion and hiker use standpoint, winding hiking paths and trails across the slope and through the least steep areas is desirable. Use of waterbars and culverts reduces erosion.

Marlow and Tunbridge soils have poor suitability for development of openland wildlife habitat and very poor suitability for development of wetland wildlife habitat. Marlow soil has good suitability and Tunbridge soil has fair suitability for development of woodland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

721D--Peru-Marlow Association, moderately steep, very stony

This map unit consists of soils on the sides of hills and mountains. The Peru and Marlow soils are intermingled in a regular repeating pattern. Peru soils are typically on lower or more concave area. Marlow soils are typically on higher parts of the landscape. Surface stones are 5 to 80 feet apart. Peru soils are moderately well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and make up about 65 percent of this association. Marlow soils are well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and make up about 20 percent of this association. Slopes range from 15 to 35 percent. Map units are 50 acres or larger in size.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum layers are a firm and dense hardpan.

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

Included with this association are small scattered areas of moderately well drained Skerry soils, and shallow to bedrock Lyman soils. Skerry soils have a sandier substratum than Peru soil. Poorly drained Pillsbury soils may occur in concave areas. Also included are areas of soils having slopes less than 15 percent or greater than 35 percent. Included soils make up about 15 percent of this association.

Important properties of this Peru soil are:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of this Marlow soil are:

Permeability: Moderate in surface and subsoil and moderately slow in substratum.
Available water capacity: Moderate
Depth to hardpan: 19 to 29 inches
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these Peru and Marlow soils for the growth of high quality hardwoods. The successional trends on these soils are toward stands of shade tolerant hardwoods such as beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, and occasionally white pine and hemlock.

The slope is a moderate limitation for the operation of logging equipment. Seasonal wetness also presents a moderate limitation for the operation of logging equipment. Additionally, erosion may be a hazard on logging roads and skid trails, especially during wetter times of the year. Constructing logging roads and skid trails along the contour helps to control erosion and permits easier and safer operation of equipment. Harvesting when the ground is frozen or during drier parts of the year circumvents wetness concerns.

In addition, windthrow hazard and plant competition are moderate limitations on these soils. Plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Windthrow hazard can be reduced with careful thinning and by avoiding damage to surficial root systems caused by harvesting equipment.

Recreation and Wildlife

The slope is a severe concern for hiking path and trail development. Use of switch backs and other erosion control practices minimizes the erosion hazard caused by path or trail construction. On the Peru soils, the seasonal wetness may be a moderate concern for hiking path and trail development. Waterbars and culverts can help direct water off the paths and trails.

Areas of these soils have fair suitability for the development of habitat areas for openland wildlife and good suitability for woodland wildlife. These soils are very poorly suited for the development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

734D--Surplus-Sisk association, moderately steep, very stony

This map unit is mostly located at elevations of 2500 feet or higher. This map unit may occur at lower elevations on north facing slopes, in the northern most part of Coos County, or in pockets where cold air settles. Sugar maple trees are absent or are of small diameter and scraggly in these cold areas. This map unit consists of soils on sideslopes of hills and mountains. The Surplus and Sisk soils are intermingled in a regularly repeating pattern. Surplus soils are typically throughout the map unit. Sisk soils are often on the 25 to 35 percent slope gradient in this map unit or on high spots. Surface stones are 5 to 80 feet apart. Surplus soils are moderately well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and make up about 60 percent of this map unit. Sisk soils are well drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up 20 percent of this map unit. Slope ranges from 15 to 35 percent. Map units are 50 acres or larger in size.

A typical Surplus soil has the following characteristics:

Surface layers:
0 to 1 inch, slightly decomposed needles
1 to 3 inches, highly decomposed organic matter
3 to 5 inches, pinkish gray gravelly silt loam with 16 percent rock fragments
Subsoil:
5 to 9 inches dark reddish brown gravelly silt loam with 15 percent rock fragments
9 to 16 inches brown silt loam with mottles and 10 percent rock fragments
16 to 24 inches dark yellowish brown gravelly silt loam with mottles and 15 percent rock fragments
Substratum:
24 to 65 inches olive gravelly fine sandy loam with mottles and 28 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Sisk soil has the following characteristics:

Surface layers:
0 to 2 inches, moderately decomposed plant material
2 to 6 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
6 to 9 inches, brown gravelly silt loam with 15 percent rock fragments
9 to 14 inches, dark yellowish brown gravelly silt loam with 17 percent rock fragments
14 to 20 inches, light olive brown gravelly silt loam with 23 percent rock fragments
Substratum:
20 to 54 inches, olive gravelly silt loam with 34 percent rock fragments
54 to 65 inches, olive gravelly silt loam with mottles and 34 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these Surplus and Sisk soils are small areas of poorly drained Bemis soils, moderately deep Glebe soils, areas of soils having stones less than 5 feet or greater than 80 feet apart, and areas with slopes less than 15 percent or greater than 35 percent. Inclusions make up about 15 percent of this map unit.

Important properties of this Surplus soil are:

Permeability: Moderate in surface layers and subsoil and slow or moderately slow in the substratum
Available water capacity: High
Average depth to hardpan: 20 inches
Depth to seasonal high water table: Perched water at 12 to 24 inches from October to May
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of this Sisk soil are:

Permeability: Moderate in the surface layers and subsoil, very slow or slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 27 inches
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these soils for good tree growth, however physical limitations affect forest management. Trees grow under the stress of cold soil temperature and climate. Due to the cold, tree growth is slow. The dominant tree species on this association are yellow birch, balsam fir, mountain paper birch, red spruce, and American mountain ash. Sugar maple seldom grows on this map unit.

Erosion hazard, equipment limitations, and windthrow hazard are moderate. Building roads and trails on the contour and avoiding the steepest areas helps reduce erosion hazards and permits safer operations. The operation of equipment may be hampered in the spring by water tables and frost action. Timing operations to avoid wettest time reduces these concerns. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand.

Plant competition is severe on Surplus soil. Careful site preparation helps reduce plant competition.

Recreation and Wildlife

Slope is a severe limitation for development of hiking paths and trails. Careful planning to avoid steepest areas and proper placement of waterbars and switchbacks will help decrease erosion if paths and trails are constructed.

Surplus soils have fair suitability for development of openland and woodland wildlife habitat. Sisk soils have poor suitability for development of openland wildlife habitat and fair suitability for woodland wildlife habitat development. Both soils have very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

736E --Sisk-Glebe association, steep, very stony

This map unit is mostly located at elevations of 2500 feet or higher. This map unit may occur at lower elevations on north facing slopes, in the northern most part of Coos County, or in pockets where cold air settles. Sugar maple trees are absent or of small diameter and scraggly in these cold areas. This map unit consists of soils on sides of mountains and hills. The soils are intermingled in a regularly repeating pattern. Sisk soils are typically on lower parts of landscape or throughout. Glebe soils are typically on higher or steeper parts of landscape. Surface stones are 5 to 80 feet apart. Sisk soils are well drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up about 60 percent of this map unit. Glebe soils are well drained, 20 to 40 inches deep to bedrock, and make up about 20 percent of this map unit. Slopes range from 35 to 60 percent. Map units are 50 acres or larger in size.

A typical Sisk soil has the following characteristics:

Surface layers:
0 to 2 inches, moderately decomposed plant material
2 to 6 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
6 to 9 inches, brown gravelly silt loam with 15 percent rock fragments
9 to 14 inches, dark yellowish brown gravelly silt loam with 17 percent rock fragments
14 to 20 inches, light olive brown gravelly silt loam with 23 percent rock fragments
Substratum:
20 to 54 inches, olive gravelly silt loam with 34 percent rock fragments
54 to 65 inches, olive gravelly silt loam with mottles and 34 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Glebe soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed needles and leaves
2 to 5 inches, grayish brown silt loam with 5 percent rock fragments
Subsoil:
5 to 8 inches, dark reddish brown silt loom with 5 percent rock fragments
8 to 14 inches, dark brown silt loam with 10 percent rock fragments
14 to 25 inches, dark yellowish brown silt loam with 10 percent rock fragments
Substratum:
25 to 39 inches, olive brown cobbly silt loam 20 percent rock fragments
39 inches, phyllitic bedrock

Included with this map unit are areas of shallow Saddleback soils, areas of, moderately deep Glebe soils, and areas of rock outcrop. Also included are small areas of soils having stones less than 5 feet or greater than 80 feet apart, and other areas with slopes less than 35 or greater than 60 percent. Inclusions make up about 15 percent of this map unit.

Important properties of this Sisk soil are:

Permeability: Moderate in the surface layers and subsoil, and very slow or slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 27 inches
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Important properties of this Glebe soil are:

Permeability: Moderately rapid
Available water capacity: High
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on these Sisk and Glebe soils for good tree growth, but cold soil temperature and climate stress trees. Due to the cold, tree growth is slow. The dominant tree species on this map unit are yellow birch, balsam fir, mountain paper birch, red spruce, and American mountain ash. Sugar maple seldom grows on this map unit.

The steep slopes are a severe limitation for equipment operation and for erosion hazard. Constructing log roads and skid trails on the contour can control erosion and permit easier and safer operation of equipment. Using diversion ditches to control runoff and revegetating disturbed areas after logging can help control erosion. Additionally, the operation of equipment may be hampered in the spring by water tables and frost action.

The presence of hardpan or bedrock near the soil surface is a moderate limitation for windthrow of trees. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand.

Recreation and Wildlife

Steep slope is a severe concern for development of hiking paths and trails. Also the Glebe soil erodes easily and is fragile. From an erosion and hiker use standpoint, winding paths and trails across the slope and through the least steep areas is desirable. Use of waterbars and culverts reduces erosion.

Sisk and Glebe soils have poor suitability for development of openland wildlife habitat and very poor suitability for development of wetland wildlife habitat. Sisk soils have fair suitability for development of woodland wildlife habitat. Glebe soils have good suitability for development of woodland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

760B--Tunbridge-Plaisted association, gently sloping, very stony

This map unit consists of soils on mountaintops, hilltops, ridges, and upper sideslopes, with a few areas on lower slopes. The Tunbridge and Plaisted soils are intermingled in a regularly repeating pattern. Tunbridge soils are throughout and Plaisted soils are often on sideslopes or between streams. Tunbridge soils are well drained, 20 to 40 inches deep to bedrock, and make up about 45 percent of this map unit. Plaisted soils are well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and make up about 25 percent of this map unit. Surface stones are 5 feet to 80 feet apart. Slopes range from 0 percent to 15 percent. Map units are 50 acres or larger in size.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these Tunbridge and Plaisted soils are areas of moderately well drained Howland and Dixmont soils, poorly drained Cabot soils, and well drained Bangor soils. Some areas have softer bedrock than typical for Tunbridge soil. A few areas have rock outcrop, and areas of soils 0 to 10 inches deep to bedrock. Also included are small areas with surface stones less than 5 feet or greater than 80 feet apart, and areas with slopes greater than 15 percent. Inclusions make up about 20 percent of this map unit. Moderately well drained soils are the most common inclusion.

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface and subsoil layers, moderately slow in the substratum layer
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan layer in April
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these Tunbridge and Plaisted soils for the growth of high quality hardwoods. The successional trends on these soils are toward stands of shade tolerant hardwoods such as beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, and occasionally white pine and hemlock.

Management concerns, such as erosion hazard, equipment limitations, and seedling mortality are slight. Windthrow hazard is moderate. Leaving groups of trees to protect each other or cutting all the trees on the shallowest soils may be more effective than leaving a few trees. Avoiding surficial root damage to trees that are left can help reduce windthrow. The operation of equipment may be hampered in the spring by the high water table and frost action. Plant competition is slight on Tunbridge soils but severe on Plaisted soils.

Recreation and Wildlife

These Tunbridge and Plaisted soils have slight limitations for development of hiking paths and trails. Constructing paths and trails on the contour and use of waterbars to divert water from the trail can be helpful.

The Tunbridge and Plaisted soils have poor suitability for openland wildlife habitat development, good suitability for woodland wildlife habitat development, and very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation.

762B--Plaisted-Howland association, gently sloping, very stony

This map unit consists of soils on sideslopes and hilltops. The Plaisted and Howland soils are intermingled in a regularly repeating pattern. Plaisted soils are typically throughout the map unit and Howland soils are on lower slopes or in concave areas. Surface stones are 5 feet to 80 feet apart. Plaisted soils are well drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up about 60 percent of this map unit. Howland soils are moderately well drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up about 20 percent of this map unit. Slope ranges from 0 percent to 15 percent. Map units are 50 acres or larger in size.

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Howland soil has the following characteristics:

Surface layers:
0 to 1 inch, black moderately decomposed needles
1 to 3 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
3 to 8 inches, dark brown gravelly silt loam with 15 percent rock fragments
8 to 14 inches, dark yellowish brown gravelly silt loam with 20 percent rock fragments
14 to 24 inches, olive gravelly silt loam with 20 percent coarse fragments
Substratum:
24 to 58 inches, olive gray gravelly silt loam with mottles and 30 percent rock fragments
58 to 66 inches, olive very gravelly very fine sandy loam with mottles and 35 percent rock fragments

The substratum layers are a dense and firm hardpan.

Included with these Plaisted and Howland soils are poorly drained Cabot soils in low areas, well drained Bangor soils with loose substratum, Tunbridge soils with bedrock at 20 to 40 inches, and areas of soil having stones less than 5 feet or greater than 80 feet apart. Also included are small areas with slopes greater than 15 percent. Inclusions make up about 20 percent of this map unit.

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface layer and subsoil, moderately slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan layer in April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Important properties of this Howland soil are:

Permeability: Moderate in the surface and subsoil layers, slow in the substratum layer
Available water capacity: High
Depth to seasonal high water table: 18 inches to 30 inches perched water table from November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these Plaisted and Howland soils for the growth of high quality hardwoods. The successional trends on these soils are toward stands of shade tolerant hardwoods such as beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, and occasionally white pine and hemlock.

Management concerns, such as erosion hazard, equipment limitations, and seedling mortality are slight. Windthrow hazard is moderate. Leaving groups of trees to protect each other and avoiding damaging surficial roots can help reduce windthrow after a cut.
Plant competition is severe for Plaisted soils and moderate for Howland soils. Careful site preparation reduces impact of plant competition. Constructing logging roads on the contour, using diversion ditches to control runoff and revegetating disturbed areas after logging reduces risk of accelerated erosion. The operation of equipment may be hampered in the spring by the water table and frost action.

Recreation and Wildlife

On Plaisted soil, hiking paths and trails can be developed with few concerns. On the Howland soil, the seasonal wetness is a moderate concern for developing hiking paths and trails. Constructing waterbars can help direct water off the paths and trails.

These Plaisted and Howland soils have poor suitability for openland wildlife habitat development and very poor suitability for wetland wildlife habitat development. Plaisted soil has good suitability for development of woodland wildlife habitat. Howland soil has fair suitability for development of woodland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation.

773B--Bangor-Dixmont association, undulating, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on lower sideslopes and footslopes, and in valleys between hills and mountains in upland areas. The landscape is oftentimes "choppy" in appearance, consisting of knolls and small hills 1/2 to 10 acres in size and 5 to 30 feet tall. Generally Bangor soil occupies the higher part of the landscape whereas Dixmont soil occupies lower areas. Bangor soil is well drained, greater than 60 inches deep to bedrock, and makes up about 60 percent of this map unit. Dixmont soil is moderately well drained, greater than 60 inches deep to bedrock, and makes up about 20 percent of this map unit. Slope ranges from 0 to 15 percent. Mapping units are 50 acres or larger in size. Surface stones are 5 to 80 feet apart.

A typical Bangor soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed forest litter
2 to 5 inches, pinkish gray silt loam with 12 percent rock fragments
Subsoil:
5 to 9 inches, yellowish red silt loam with 12 percent rock fragments
9 to 12 inches, dark yellowish brown silt loam with 12 percent rock fragments
12 to 17 inches, light olive brown gravelly silt loam with 17 percent rock fragments
17 to 23 inches, olive brown gravelly silt loam with 17 percent rock fragments
Substratum layer:
23 to 65 inches, olive gravelly silt loam with 27 percent rock fragments

Some areas of this map unit have sandy loam or very fine sandy loam textures in the substratum.

A typical Dixmont soil has the following characteristics:

Surface layer:
0 to 1 inch, slightly decomposed leaf litter
1 to 3 inches, dark olive gray very fine sandy loam with 5 percent rock fragments
3 to 6 inches, gray to light gray very fine sandy loam with 5 percent rock fragments
Subsoil:
6 to 12 inches, dark reddish brown very fine sandy loam with 5 percent rock fragments
12 to 19 inches, olive brown very fine sandy loam with 5 percent rock fragments
Substratum:
19 to 22 inches, olive silt loam with 5 percent rock fragments
22 to 38 inches, olive silt loam with mottles and 10 percent rock fragments
38 to 62 inches, olive gravelly silt loam with mottles and 15 percent rock fragments
62 to 78 inches, olive silt loam with mottles and 10 percent rock fragments

Included with these Bangor and Dixmont soils are small scattered areas of well drained Plaisted, Tunbridge, and Groveton soils. Plaisted soil has dense hardpan and may occupy higher edges of the map unit. Tunbridge soil is 20 to 40 inches over bedrock. Groveton soil occurs at the lower edges of the map unit on adjacent outwash plains. Other areas included may have stones greater than 80 feet or less than 5 feet apart. Also included are small areas with slopes greater than 15 percent. Inclusions make up about 20 percent of this map unit.

Important properties of this Bangor soil are:

Permeability: Moderate
Available water capacity: Very high
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 65 inches
Potential frost action: Moderate

Important properties of this Dixmont soil are:

Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: 12 to 24 inches from November through June
Depth to bedrock: More than 65 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on these Bangor and Dixmont soils for the growth of high quality hardwoods. There are few limitations to logging operations for areas of Bangor soil. Skid trails constructed on the contour help reduce erosion. Trails with severe disturbance of the surface cover can be protected with occasional waterbars and seeded with shade tolerant grasses after use. Woodland access roads through these areas can usually be constructed and maintained with few problems. However, frost action on these soils may be a problem in the spring.

Woodland management for areas of Dixmont soil is affected by windthrow hazard and plant competition. Windthrow hazard due to shallow rooting depth on moderately well drained Dixmont soil can be reduced by leaving groups of trees to protect each other and avoiding damage to surficial root systems caused by harvesting equipment. Plant competition can be reduced with careful site preparation following tree harvesting to reduce the invasion of undesirable species. Access roads through these areas may require some drainage for year round use and occasional waterbars or culverts for both drainage and erosion control.

The successional trend of unmanaged woodland on these soils is toward a climax stand of shade tolerant hardwoods, predominantly beech and sugar maple.

Successional stands in abandoned fields and heavily cut over areas commonly are composed of a variety of hardwood species such as aspen, red maple, paper birch, yellow birch, sugar maple and beech in combinations with red spruce and balsam fir.

Recreation and Wildlife

Hiking paths and trails are sited on Bangor soil with few concerns. Wetness is a moderate limitation for hiking path and trail developments on Dixmont soils. Siting paths and trails on Bangor soils avoids wetness concerns. Waterbars and drainage can be helpful if the paths or trails are sited on Dixmont soil.

These soils are poorly suited to the development of habitat areas for openland wildlife; they are very poorly suited for wetland wildlife habitat development as well. However, these Bangor and Dixmont soils are well suited for development of woodland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation.

779B--Dixmont-Bangor association, undulating, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on lower sideslopes and footslopes, and in valleys between hills and mountains in upland areas. Generally Dixmont soil occupies the lower parts of the landscape whereas Bangor soil occupies the higher parts. Dixmont soil is moderately well drained, greater than 60 inches deep to bedrock, and makes up about 65 percent of this association. Bangor soil is well drained, greater than 60 inches deep to bedrock, and makes up about 15 percent of this association. Slope ranges from are 0 to 15 percent. Mapping units are 50 acres or larger in size. Surface stones are 5 to 80 feet apart.

A typical Dixmont soil has the following characteristics:

Surface layer:
0 to 1 inch, slightly decomposed leaf litter
1 to 3 inches, dark olive gray very fine sandy loam with 5 percent rock fragments
3 to 6 inches, gray to light gray very fine sandy loam with 5 percent rock fragments
Subsoil:
6 to 12 inches, dark reddish brown very fine sandy loam with 5 percent rock fragments
12 to 19 inches, olive brown very fine sandy loam with 5 percent rock fragments
Substratum:
19 to 22 inches, olive silt loam with 5 percent rock fragments
22 to 38 inches, olive silt loam with mottles and 10 percent rock fragments
38 to 62 inches, olive gravelly silt loam with mottles and 15 percent rock fragments
62 to 78 inches, olive silt loam with mottles and 10 percent rock fragments

A typical Bangor soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed forest litter
2 to 5 inches, pinkish gray silt loam with 12 percent rock fragments
Subsoil:
5 to 9 inches, yellowish red silt loam with 12 percent rock fragments
9 to 12 inches, dark yellowish brown silt loam with 12 percent rock fragments
12 to 17 inches, light olive brown gravelly silt loam with 17 percent rock fragments
17 to 23 inches, olive brown gravelly silt loam with 17 percent rock fragments
Substratum layer:
23 to 65 inches, olive gravelly silt loam with 27 percent rock fragments

Some areas of this map unit have sandy loam or very fine sandy loam textures in the substratum.

Included with these Dixmont and Bangor soils are small scattered areas of moderately well drained Howland and Madawaska soils, poorly drained Cabot soil, and well drained Tunbridge soil. Howland and Cabot soils have dense hardpans. Tunbridge soil is 20 to 40 inches over bedrock. Madawaska soil may be found along the lower edges of the map unit on adjacent outwash plains. Other areas included may have surface stones greater than 80 feet or less than 5 feet apart. Also included are areas with slopes greater than 15 percent. Inclusions make up about 20 percent of this map unit.

Important properties of this Dixmont soil are:

Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: 12 to 24 inches from November through June
Depth to bedrock: More than 65 inches
Potential frost action: High

Important properties of this Bangor soil are:

Permeability: Moderate
Available water capacity: Very high
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 65 inches
Potential frost action: Moderate

Most areas of this map unit are used for woodland, wildlife, and recreation.

Forestry

Fertility and moisture are favorable on these Dixmont-Bangor soils for the growth of high quality hardwoods and conifers. Windthrow hazard due to shallow rooting depth on moderately well drained Dixmont soil and plant competition are concerns. Careful thinning to avoid damage to surficial root systems caused by harvesting equipment or leaving groups of trees can be helpful in reducing windthrow. Hardwood competition can be moderate on Dixmont soil. Competition can be reduced with careful site preparation following tree harvesting to reduce the invasion of undesirable species.

Erosion is normally not a concern on undisturbed areas, but skid trails constructed on the contour whenever possible reduce erosion. Trails with severe disturbance of the surface cover can be protected with occasional waterbars and seeded with shade tolerant grasses after use. Access roads through these areas may require some drainage for year round use and occasional waterbars or culverts for both drainage and erosion control. Equipment limitation and seedling mortality are slight.

Successional trends are not clear on these fine textured soils. Some indications are that shade tolerant softwoods may have an advantage. Successional stands frequently contain a variety of hardwoods in varying combinations with spruce and balsam fir. White ash and yellow birch seem to compete well on these soils.

Recreation and Wildlife

Dixmont soils have moderate limitations for paths and trails development due to wetness. Bangor soils have slight limitations for paths and trails development. Siting paths and trails on Bangor soils reduce wetness concerns. Waterbars and drainage helps direct water off trails.

These soils are poorly suited to the development of habitat areas for openland wildlife; they are very poorly suited for wetland wildlife habitat development as well. However, these Bangor and Dixmont soils are well suited for development of woodland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

801E--Becket-Marlow association, steep, very stony

This association consists of two soils intermingled in a regular repeating pattern on the sides of hills and mountains. Becket soil is well drained, greater than 60 inches deep to bedrock, has a loamy sand hardpan substratum, and makes up about 60 percent of this map unit. Marlow soil is also well drained, greater than 60 inches deep to bedrock, has a fine sandy loam hardpan substratum, and makes up about 20 percent of this association. Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart. Slopes range from 35 to 60 percent.

A typical Becket soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed leaf litter
2 to 4 inches, highly decomposed leaf litter
4 to 7 inches, grayish brown fine sandy loam with 10 percent rock fragments
Subsoil:
7 to 10 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
10 to 20 inches, yellowish red gravelly fine sandy loam with 15 percent rock fragments
20 to 26 inches, yellowish red fine sandy loam with 10 percent rock fragments
26 to 38 inches, yellowish brown gravelly sandy loam with 20 percent rock fragments
Substratum:
38 to 65 inches light olive brown gravelly loamy sand with 25 percent rock fragments

The substratum is a dense and firm hardpan with sandy lenses.

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

Included with these Becket and Marlow soils are small scattered areas of shallow to bedrock Lyman soil; and moderately well drained Skerry and Peru soils in concave areas. Also included are areas having slopes less than 35 percent or greater than 60 percent. Other areas may include surface stones less than 5 feet or greater than 80 feet apart. Inclusions make up about 20 percent of this map unit.

Soil physical properties of Becket soils are:

Permeability: Moderate in surface and subsoil and moderately slow or slow in substratum
Available water capacity: High
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 22 inches
Potential frost action: Moderate

Soil physical properties of Marlow soils are:

Permeability: Moderate in surface and subsoil and moderately slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 23 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these soils for the growth of high quality hardwoods. Slope is a severe limitation for the operation of conventional logging equipment. Locating roads and skid trails on the contour and avoiding the steepest areas helps reduce erosion hazards and makes equipment use easier. In areas where road beds are cut into the firm substratum, drainage helps to remove water which moves on top of it during wet times of the year. Windthrow hazard, a moderate management concern, can be reduced by leaving groups of trees to protect each other and avoiding damaging surficial roots of trees. Plant competition, a moderate management concern, can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Seedling mortality is a slight concern.

The successional trend of unmanaged woodland on these soils is toward a climax of shade tolerant hardwoods, predominantly beech and sugar maple. Successional stands in heavily cutover forests commonly are comprised of a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, sugar maple, and beech in combinations with red spruce, balsam fir, and hemlock. Successful softwood regeneration usually depends upon intensive hardwood control efforts.

Recreation and Wildlife

The slope is a severe concern for hiking path and trail development on all soils. Switchbacks are helpful.

This map unit is suitable for the development of woodland wildlife habitat but poorly suited for the development of openland wildlife habitat. This map unit is very poorly suited for wetland wildlife habitat development.

Community Development and Agriculture

If interpretations for other uses are needed, they can be provided but only after an on-site investigation.

821B Marlow-Peru association, gently sloping, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on the side slopes and tops of upland hills. Slope ranges from 0 to 15 percent. Landscapes have a relatively smooth appearance and are underlain by dense basal till (hardpan). The well drained Marlow soil occupies the higher parts of the landscape while the moderately well drained Peru soil occupies the lower parts of the landscape and concave areas. Marlow soil comprises about 55 percent of this map unit and Peru soil comprises about 25 percent of this map unit. Individual map units are 50 acres or greater in size. Generally stones are between 5 feet and 80 feet apart on the surface.

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these Marlow and Peru soils are well drained Becket and moderately well drained Skerry soils throughout; well drained Berkshire and Monadnock soils throughout; moderately well drained Sunapee soil throughout; a few rock outcrops or well drained moderately deep to bedrock Tunbridge soils might occur on ridges or as spines of ledge; small areas of Pillsbury or Peacham soils may occur in concave areas; and small areas with slopes greater than 15 percent. Areas with stones less than 5 feet apart or greater than 80 feet apart may also occur. Inclusions may make up about 20 percent of this map unit.

Important properties of Marlow soils include:

Permeability: Moderate in surface and subsoil and moderately slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 23 inches
Potential frost action: Moderate

Important properties of Peru soil include:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches
Depth to bedrock: More than 60 inches
Potential frost action: High

A water table may also perch on the hardpan for brief periods of time after prolonged rains.

Forestry

Fertility and moisture are favorable on these soils for the growth of quality hardwoods.

Erosion hazard, equipment use, and seedling mortality have only slight limitations. Otherwise woodland management has moderate limitations for plant competition and windthrow hazard. Careful site preparation to reduce the invasion of undesirable species decreases plant competition. Windthrow hazard can be reduced by leaving trees together in groups to protect each other and by avoiding damage to surficial root systems caused by harvesting equipment.

Avoiding equipment use in wet periods particularly during spring thaw or after heavy rains minimizes erosion potential. In areas where road beds are cut into hardpan layers, drainage helps remove water which moves on top of the hardpan during wet times of the year.

The successional trend of unmanaged woodland on these soils is toward a climax of shade tolerant hardwoods, predominantly yellow birch and sugar maple on the Marlow soils. In the Peru soils successional trend may be towards softwoods or hardwoods. Successional stands in heavily cut over areas commonly include a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, and sugar maple in combination with red spruce, balsam fir, and hemlock.

Recreation and Wildlife

Paths and trails are sited on Marlow soil with few concerns. Wetness is moderate limitation for development of paths and trails on Peru soils. Waterbars and drainage can direct water off the paths and trails.

Areas of these Marlow and Peru soils have fair potential for the development of habitat areas for openland wildlife and good potential for woodland wildlife. These soils have very poor potential for the development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

828B--Skerry-Peru association, gently sloping, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on lower sideslopes of hills and mountains. Individual map units are 50 acres or greater in size. Stones 5 to 80 feet apart cover the surface. Slopes range from 0 to 15 percent.

Skerry soil is moderately well drained, greater than 60 inches deep to bedrock, has a dense loamy sand basal till substratum (hardpan), and makes up about 55 percent of this map unit. Peru soil is moderately well drained, greater than 60 inches deep to bedrock, has a dense fine sandy loam basal till substratum (hardpan), and makes up about 15 percent of this map unit.

A typical Skerry soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed forest litter
2 to 4 inches, partially decomposed organic matter
4 to 6 inches, light brownish gray fine sandy loam with 5 percent rock fragments
Subsoil:
6 to 8 inches, dark brown fine sandy loam with 10 percent rock fragments
8 to 16 inches, strong brown gravelly fine sandy loam with 17 percent rock fragments
16 to 26 inches, yellowish brown fine sandy loam with mottles and 14 percent rock fragments
26 to 31 inches, olive gravelly loamy sand with mottles and 17 percent rock fragments
Substratum:
31 to 65 inches, olive gray gravelly loamy sand, with mottles and 18 percent rock fragments

The substratum is a hardpan with sandy lenses.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum layers are a firm and dense hardpan.

Included with these soils are small scattered areas of well drained Becket and Marlow soils, usually on slightly higher landscape positions; poorly drained Moosilauke and Pillsbury soils on concave and lower slope positions; and the 10 to 20 inches deep Lyman soil over bedrock on ridges. Also included are areas of soils having slopes greater than 15 percent. These inclusions can make up about 20 percent of this map unit.

Important properties of this Skerry soil are:

Permeability: Moderate in the solum, slow or moderately slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 22 inches
Depth to seasonal high water table: Perched water at 18 to 30 inches from November to May
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of Peru soil include:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on this map unit for the growth of high quality hardwoods. Erosion hazard, equipment limitations, and seedling mortality are slight. Plant competition and windthrow hazard are moderate. Mechanical control of hardwoods may be necessary to successfully regenerate softwoods. Leaving groups of trees together to protect each other and avoiding damaging surficial roots with harvesting equipment helps reduce windthrow.

Water may flow over the hardpan rather than into it. This is particularly noticeable during spring thaw or other wet times of year. Considering the hardpan prior to constructing roads can be very helpful.

Natural successional trends are not clear on these soils, but there are indications that shade tolerant hardwoods may have the advantage, particularly on the Skerry soil. Succession on areas that have been cut over can result in a variety of species, the major ones being sugar maple and American beech on Skerry soil and sugar maple and yellow birch on Peru soil. Other species resulting from cut over areas include paper birch, red maple, aspen, pin cherry, red spruce, and balsam fir, with Eastern white pine, hemlock, and white ash occurring in some map units.

Recreation and Wildlife

There is a moderate limitation for developing hiking trails and paths due to wetness. Water bars and drainage directs water off paths and trails.

This map unit is suitable for the development of woodland wildlife habitat. Skerry soil is poorly suited for openland wildlife habitat development while Peru soil is fairly suitable for openland wildlife habitat development. Both soils are very poorly suited for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

834B Sisk-Surplus association, gently sloping, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on sideslopes and hill tops in upland areas. This map unit is located at elevations higher than about 2200 feet on north facing slopes and somewhat higher on south facing slopes. Sisk soil is well drained, greater than 60 inches deep to bedrock, has a dense hardpan (basal till), and makes up about 50 percent of this map unit. Surplus soil is moderately well drained, greater than 60 inches deep to bedrock, has a dense hardpan (basal till), and makes up about 20 percent of this association. Slopes range from 0 to 15 percent. Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart.

A typical Sisk soil has the following characteristics:

Surface layers:
0 to 2 inches, moderately decomposed plant material
2 to 6 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
6 to 9 inches, brown gravelly silt loam with 15 percent rock fragments
9 to 14 inches, dark yellowish brown gravelly silt loam with 17 percent rock fragments
14 to 20 inches, light olive brown gravelly silt loam with 23 percent rock fragments
Substratum:
20 to 54 inches, olive gravelly silt loam with 34 percent rock fragments
54 to 65 inches, olive gravelly silt loam with mottles and 34 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Surplus soil has the following characteristics:

Surface layers:
0 to 1 inch, slightly decomposed needles
1 to 3 inches, highly decomposed organic matter
3 to 5 inches, pinkish gray gravelly silt loam with 16 percent rock fragments
Subsoil:
5 to 9 inches dark reddish brown gravelly silt loam with 15 percent rock fragments
9 to 16 inches brown silt loam with mottles and 10 percent rock fragments
16 to 24 inches dark yellowish brown gravelly silt loam with mottles and 15 percent rock fragments
Substratum:
24 to 65 inches olive gravelly fine sandy loam with mottles and 28 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these soils are small inclusions of somewhat excessively drained Ricker soil or well drained Glebe soil on hill tops; poorly drained Bemis soil in depressions; and areas with slopes greater than 15 percent. Some areas have stones less than 5 feet or greater than 80 feet apart, These included soils make up about 20 percent of this map unit.

Important properties of this Sisk soil are:

Permeability: Moderate in the surface and subsoil layers, very slow or slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 27 inches
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Important properties of this Surplus soil are:

Permeability: Moderate in surface layers and subsoil and slow or moderately slow in the substratum
Available Water Capacity: High
Average depth to hardpan: 20 inches
Depth to seasonal high water table: Perched water table at 12 to 24 inches from October to May
Depth to bedrock: More than 60 inches
Potential frost action: High

Forestry

These Sisk-Surplus soils have limited suitability for use as woodland due to the relatively severe (cold) soil temperature and climate. Trees grow is slow in these higher elevation areas. The operation of equipment may be hampered in the spring by high water tables and frost action on Surplus soil. Operating equipment during the drier parts of the year can reduce this equipment concern. The hazard of erosion on log roads and skid trails may be severe when the soil is disturbed. Using diversion ditches to control runoff and revegetating disturbed areas after logging can control the hazard.

The windthrow hazard for these soils is moderate due to the restrictive rooting depths of hardpans. Leaving groups of trees to protect each other or cutting all the trees on a site may be more effective than leaving a few trees which are susceptible to blow-downs. Plant competition on Surplus soil may be severe in some areas; careful site preparation after harvesting can reduce the regeneration of undesirable species.

Productivity for hardwoods and conifers is poor. The dominant tree species on these soils are yellow birch, balsam fir, mountain paper birch, red spruce, and American mountain ash. Sugar maple seldom grows on these soils.

Recreation and Wildlife

Slope, wetness (for areas of Surplus soil) and occasional large stones are moderate limitations for hiking path and trail developments. Siting trails on gentlest slope and along the contour when possible is helpful.

Surplus soil has fair suitability for development of openland and woodland wildlife habitat. Sisk soil has poor suitability for development of openland wildlife habitat and fair suitability for woodland wildlife habitat development. Both soils have very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

862E--Plaisted-Tunbridge association, steep, very stony

This association consists of two soils intermingled in a regularly repeating pattern on mountainsides of uplands; many of the areas of this association are on north or west facing slopes. Plaisted soil is well drained, greater than 60 inches deep to bedrock, has a dense hardpan (basal till), and makes up about 65 percent of this association. Tunbridge soil is well drained, 20 to 40 inches deep to bedrock, and makes up about 15 percent of this association. Slope ranges from 35 to 60 percent. Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart.

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Tunbridge soil has the following characteristics:

Surface layers:
2 inches of leaf litter
0 to 2 inches, very dark grayish brown silt loam with 5 percent coarse fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent coarse fragments
5 to 8 inches, dark brown silt loam with 5 percent coarse fragments
8 to 25 inches, very dark grayish brown silt loam with 10 percent coarse fragments
Substratum:
25 to 34 inches, olive brown gravelly fine sandy loam with 20 percent coarse fragments
34 inches, unweathered bedrock

Included with these soils are small areas of well drained Bangor, moderately well drained Howland, somewhat excessively drained Lyman soils, and areas having stones less than 5 feet or greater than 80 feet apart. Also included are small areas with slopes less than 35 percent. These inclusions may make up about 20 percent of this map unit.

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface layer and subsoil, moderately slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan layer in April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Important properties of this Tunbridge soil are:

Permeability: Moderate to moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these soils for good tree growth, however physical limitations affect forest management. The very steep slopes are a severe limitation for equipment operation and erosion hazard. Erosion can be controlled by constructing logging roads on the contour, using diversion ditches to control runoff, and revegetating disturbed areas after logging. Additionally, the operation of equipment may be hampered in the spring by the seasonal high water table in some areas. Operating equipment in these areas when the ground is frozen or during the drier parts of the year may reduce this concern.

Windthrow potential is moderate on both Plaisted and Tunbridge soils due to the restrictive hardpan or bedrock that limits root growth. Harvesting by stripcutting will expose fewer trees to the prevailing wind and help to prevent windthrow. Care should be taken in harvesting to reduce trees exposed to the prevailing winds.

Hardwood competition can be severe for areas of Plaisted soil. Successful softwood regeneration is dependent upon hardwood control; careful site preparation can reduce undesirable species.

Successional trends on these soils are toward stands of shade tolerant hardwoods, i.e., beech and sugar maple. Most successional stands contain a variety of hardwood species in varying combinations with spruce and balsam fir.

Recreation and Wildlife

Steep slopes are a severe limitation for constructing hiking paths and trails on this map unit. Laying out paths and trails on gentlest relief and using switchbacks will be helpful.

These soils are suitable for development of woodland wildlife habitat, poorly suited for the development of openland wildlife habitat and very poorly suited for the development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

864D--Howland-Plaisted association, moderately steep, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on lower sideslope of hills and mountains. Howland soil is moderately well drained, greater than 60 inches deep to bedrock, has a dense hardpan (basal till), and makes up about 65 percent of this association. Surface stones are 5 feet to 80 feet apart. Plaisted soil is well drained, greater than 60 inches deep to bedrock, has a dense hardpan (basal till), and makes up about 20 percent of this association. Plaisted soils are generally located on the 25 to 35 percent slope gradients of this map unit. Slope ranges from 15 percent to 35 percent. Mapping units are 50 acres or larger in size.

A typical Howland soil has the following characteristics:

Surface layers:
0 to 1 inch, black moderately decomposed needles
1 to 3 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
3 to 8 inches, dark brown gravelly silt loam with 15 percent rock fragments
8 to 14 inches, dark yellowish brown gravelly silt loam with 20 percent rock fragments
14 to 24 inches, olive gravelly silt loam with 20 percent coarse fragments
Substratum:
24 to 58 inches, olive gray gravelly silt loam with mottles and 30 percent rock fragments
58 to 66 inches, olive very gravelly very fine sandy loam with mottles and 35 percent rock fragments

The substratum layers are a dense and firm hardpan.

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these Howland and Plaisted soils are areas of poorly drained Cabot soils, well drained Tunbridge soils, and moderately well drained Dixmont soils. Also included are areas with stones less than 5 feet or greater than 80 feet apart. Also included are areas with slopes less than 15 percent or greater than 35 percent. Inclusions may make up about 15 percent of the map unit.

Important properties of this Howland soil are:

Permeability: Moderate in the surface and subsoil layers, slow in the substratum layer
Available water capacity: High
Depth to seasonal high water table: 18 inches to 30 inches perched water table from November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface layer and subsoil, moderately slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan layer in April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these soils for the growth of high quality hardwoods. Erosion hazard, equipment limitation, and windthrow hazard are moderate. Seedling mortality is slight. Plant competition is moderate for Howland soils and severe for Plaisted soils.

Laying roads out on least sloping areas helps reduce erosion and makes for safer equipment use. Constructing logging roads on the contour, using diversion ditches to control runoff, and revegetating disturbed areas after logging helps reduce erosion. The operation of equipment may be hampered in the Spring or other wet times by water flowing over the hardpan. Considering the hardpan and potential frost action prior to constructing roads can be very useful.

Leaving groups of trees together to protect each other can help reduce windthrow. Plant competition can be reduced with careful site preparation.

Successional trends are not clear on these fine textured soils. Some indications are that shade tolerant softwoods may have an advantage. Growth is good for both hardwoods and softwoods. Hardwood competition is severe on these soils and can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Successional stands frequently contain a variety of hardwoods in varying combinations with spruce and balsam fir. White ash and yellow birch seem to compete well on these soils.

Recreation and Wildlife

On areas of Howland soil, wetness is a moderate concern for development of hiking paths and trails. Slope of 15 to 25 percent is a moderate concern for hiking path and trail development, but greater than 25 percent slope becomes a severe limitation. Layout of hiking paths and trails on the least steep slope and use of switchbacks minimizes the erosion hazard. Waterbars and culverts can help direct water off the paths and trails.

These soils are suitable for development of woodland wildlife habitat, poorly suited for openland wildlife habitat development, and very poorly suited for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

869B Sunapee-Moosilauke-Monadnock association, gently sloping, very stony

This map unit consists of three soils intermingled in a regularly repeating pattern on upland valleys and hills. Sunapee soil is moderately well drained, greater than 60 inches to bedrock, and makes up about 50 percent of the map unit. Moosilauke soil is poorly drained, greater than 60 inches to bedrock, occurs along drainage ways and on nearly level or concave areas, and make up about 15 percent of the map unit. Monadnock soil is well drained, greater than 60 inches to bedrock, occurs on ridges and mounds throughout the unit, and make up about 10 percent of the map unit.

Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart. Slopes range from 0 to 15 percent.

A typical Sunapee soil has the following characteristics:

Surface layer:
0 to 4 inches, very dark brown fine sandy loam with 10 percent rock fragments
4 to 6 inches, pinkish gray sandy loam with 5 percent rock fragments
Subsoil:
6 to 14 inches, yellowish red fine sandy loam with 10 percent rock fragments
14 to 24 inches, dark yellowish brown fine sandy loam with 10 percent rock fragments
24 to 35 inches, olive gravelly fine sandy loam with mottles and 15 percent rock fragments
Substratum:
35 to 65 inches of olive gray gravelly loamy fine sand with mottles and 20 percent rock fragments

Some areas of Sunapee soil have fine sandy loam textures in the substratum. Two inches of slightly decomposed needles, leaves cover the surface.

A typical Moosilauke soil has the following characteristics:

Surface layers:
0 to 7 inches, very dark brown loam with 5 percent rock fragments
Subsoil:
7 to 10 inches, brown sandy loam with 10 percent rock fragments
10 to 18 inches, dark grayish brown gravelly sandy loam with mottles and 25 percent rock fragments
Substratum:
18 to 30 inches, dark grayish brown gravelly sand with mottles and 30 percent rock fragments
30 to 65 inches, dark grayish brown very gravelly sand with mottles and 45 percent rock fragments

A typical Monadnock soil has the following characteristics:

Surface layers:
0 to 3 inches of partially decomposed forest litter
3 to 8 inches, light gray fine sandy loam with 9 percent rock fragments
Subsoil:
8 to 10 inches, dark reddish brown fine sandy loam with 9 percent rock fragments
10 to 12 inches, yellowish red fine sandy loam with 8 percent rock fragments
12 to 22 inches, strong brown gravelly fine sandy loam with 18 percent rock fragments
22 to 25 inches, yellowish brown gravelly fine sandy loam with 25 percent rock fragments
Substratum:
25 to 45 inches, light olive brown gravelly loamy sand with 25 percent rock fragments
45 to 65 inches, light brownish gray and light gray gravelly loamy sand with 25 percent rock fragments

Included with these soils are moderately well drained Waumbek soil near Sunapee soil, low mounds or ridges of well drained Berkshire soil near the Monadnock soil, nearly level areas of poorly drained Lyme soil in concave areas and along drainageways where Moosilauke soil is also located. Small areas of ledge outcrops or moderately deep Tunbridge soil may occur on ridges. In a few spots moderately well drained Peru soil or poorly drained Pillsbury soil occur; these soils have hardpans. Very poorly drained Peacham soil might occur in depressions. Small areas may have slopes greater than 15 percent while other areas have stones or boulders less than 5 or more than 80 feet apart. These inclusions can make up about 25 percent of this map unit.

Important properties of this Sunapee soil are:

Permeability: Moderate throughout
Available water capacity: Moderate
Depth to seasonal high water table: 18 to 36 inches from November through May
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Important properties of this Moosilauke soils are:

Permeability: Moderately rapid in surface and subsoil layer and rapid in substratum layers
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches from November to May
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Important properties of this Monadnock soil are:

Permeability: Moderate in the surface and subsoil

layers and moderately rapid in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Low

Forestry

Sunapee and Monadnock soils are well suited to the production of high quality hardwood species and productivity is high. Poorly drained Moosilauke soil has fair productivity for tree growth with eastern white pine, balsam fir and red spruce as common trees.

There are few management limitations for Sunapee or Monadnock soils other than a moderate limitation due to plant competition. Plant competition can be reduced with careful site preparation following tree harvesting to reduce the invasion of undesirable species. Access roads through these areas may require some drainage construction for year round use and culverts.

Moosilauke soil rates as a hydric soil. Hydric soil is one criteria used to designate wetlands. Alteration of a wetland may require local, state, and/or federal permits. Areas of Moosilauke soil have severe limitations for equipment use, windthrow hazard, and plant competition due to wetness. Seedling mortality is a moderate limitation. Use of equipment when the ground is frozen reduces limitations posed by wetness. Narrow width or patch clearcuts or selective cuts minimize windthrow hazards. Use of larger stock and water tolerant trees for revegetation may decrease seedling mortality.

Walking an area may be helpful in figuring out how to lay out roads to stay on drier areas away from the Moosilauke soils.

The successional trend of unmanaged woodland on these soils is toward a climax stand of shade tolerant hardwoods, predominantly beech and sugar maple. Successional stands in heavily cut over areas commonly are composed of a variety of hardwood species such as aspen, red maple, paper birch, yellow birch, sugar maple and beech in combinations with red spruce and balsam fir.

Recreation and Wildlife

Sunapee soils have moderate and Moosilauke severe limitations for paths and trails development due to wetness. Monadnock soils have slight limitations. Laying out trails to avoid Moosilauke soils is helpful. Waterbars and drainage can direct water off Sunapee soils.

This map unit is well to fairly well suited for woodland wildlife habitat development but poorly suited for openland wildlife habitat development. This map unit is also very poorly suited to wetland wildlife habitat development. However, for areas less than 3 percent slope, Moosilauke soil may have some potential for wetland habitat development.

Areas of Moosilauke soil improve and maintain water quality by acting as a natural filter to remove chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water which lessons flood damage downstream.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

919B--Tunbridge-Lyman-Marlow association, gently sloping, very stony

This map unit consists of three soils intermingled in a regularly repeating pattern on hills, ridges, low mountains, and on occasional footslopes. Tunbridge soil is well drained, 20 to 40 inches deep to bedrock, and makes up about 35 percent of this map unit. Lyman soil is somewhat excessively drained, 8 to 20 inches to bedrock, and makes up about 20 percent of this association. Marlow soil is well drained, greater than 60 inches to bedrock, has a dense basal till substratum at about 20 inches, and makes up about 20 percent of this association. Individual map units are 50 acres or greater in size. Stones are 5 to 80 feet apart. Slopes range from 0 to 15 percent.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

Included with these soils are small scattered areas of well drained Becket and Berkshire soils; somewhat excessively drained Hermon soil; areas of soils 0 to 10 inches deep to bedrock; rock outcrops; and areas of soils having slopes greater than 15 percent. Also included are areas of moderately well drained Peru soil in slight depressions and drainageways. These inclusions can make up about 25 percent of this map unit.

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Important properties of Marlow soils are:

Permeability: Moderate in surface and subsoil and moderately slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 23 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are adequate on these soils for good tree growth. The successional trends are toward a climax of tolerant hardwoods, predominately beech. Successional stands, especially those which are heavily cutover, are commonly composed of a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, sugar maple, and beech, in combinations with red spruce balsam fir and hemlock.

Hardwood competition is moderate to severe for this map unit. Successful softwood regeneration is dependent upon hardwood control; careful site preparation can reduce undesirable species.

There are few limitations for most forest management practices on the Tunbridge and Marlow soils; however windthrow can be a moderate limitation for both these soils. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Marlow and Lyman soils have an additional moderate limitation of plant competition; careful site preparation can reduce the spread of undesirable species. The shallow Lyman soil has severe windthrow hazard and seedling mortality greater than 50 percent can be expected. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Planting seedlings on raised beds may reduce seedling mortality.

There are few limitations for equipment operations. Erosion may become a hazard during wet periods, but can be controlled by harvesting during drier parts of the year or when the ground is frozen.

Recreation and Wildlife

Limitations for development of paths and trails are slight.

The Tunbridge and Marlow soils in this map unit are suitable for development of woodland wildlife habitat. Tunbridge soil is poorly suited for openland wildlife habitat development while Marlow soil is fairly suited. The shallow depth to bedrock limits the suitability of the Lyman soil for woodland and openland wildlife habitat development. This map unit is very poorly suited for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

923B--Marlow-Peru association, gently sloping, extremely bouldery

This map unit consists of two soils intermingled in a regularly repeating pattern on the side slopes and tops of upland hills. Slope ranges from 0 to 15 percent. Landscapes have a relatively smooth appearance and are underlain by dense basal till (hardpan). The well drained Marlow soil occupies the higher parts of the landscape while the moderately well drained Peru soil occupies the lower parts of the landscape and concave areas. Marlow soil comprises about 55 percent of this map unit and Peru soil comprises about 25 percent of this map unit. Individual map units are 50 acres or greater in size. Generally boulders are between 3 feet and 10 feet apart on the surface.

A typical Marlow soil has the following characteristics:

Surface layers:
0 to 5 inches, highly decomposed forest litter.
5 to 9 inches, light gray gravelly fine sandy loam with 15 percent rock fragments
Subsoil:
9 to 11 inches, dark reddish brown fine sandy loam with 10 percent rock fragments
11 to 16 inches, dark brown and strong brown fine sandy loam with 10 percent rock fragments
16 to 19 inches, yellowish brown fine sandy loam with 10 percent rock fragments
Substratum:
19 to 30 inches, olive brown gravelly fine sandy loam with 25 percent rock fragments
30 to 65 inches, olive brown gravelly fine sandy loam with 16 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum layers are a firm and dense hardpan.

Included with these soils are small areas with slopes greater than 15 percent. Areas with boulders greater than 10 feet apart may also occur. Also included are areas of moderately well drained Skerry soils. Scattered areas of well drained Berkshire and Monadnock soils and moderately well drained Sunapee soil also may occur. A few rock outcrops or Tunbridge soil might occur. Small areas of Pillsbury or Peacham soils may occur along drainage ways and in concave areas. Inclusions may make up about 20 percent of this map unit.

Important properties of Marlow soils include:

Permeability: Moderate in surface and subsoil and moderately slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched water table at 24 to 42 inches in March and April
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 23 inches
Potential frost action: Moderate

A water table may also perch on the hardpan for brief periods of time after prolonged rains.

Important properties of Peru soil include:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on these soils for the growth of quality hardwoods.

The abundant number of boulders and stones may cause severe limitations for the operation of logging equipment in some areas. Boulders may be moved with heavy equipment but will depend on the number and size of boulders.

Other management concerns, such as erosion hazard, equipment use, and seedling mortality have only slight limitations. Otherwise woodland management has moderate limitations for plant competition and windthrow hazard. Careful site preparation to reduce the invasion of undesirable species decreases plant competition. Windthrow hazard can be reduced with careful thinning and by avoiding damage to surficial root systems caused by harvesting equipment.

Avoiding equipment use in wet periods particularly during spring thaw or after heavy rains minimizes erosion potential especially on moderately drained Peru soil. In areas where road beds are cut into hardpan layers, drainage may be needed to remove water which moves on top of the hardpan during wet times of the year.

The successional trend of unmanaged woodland on these soils is toward a climax of shade tolerant hardwoods, predominantly yellow birch and sugar maple on the Marlow soils. In the Peru soils successional trend may be towards softwoods or hardwoods. Successional stands in heavily cut over areas commonly include a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, and sugar maple in combination with red spruce, balsam fir, and hemlock.

Recreation and Wildlife

Extremely bouldery surfaces are a moderate concern for development of paths and trails. Siting paths and trails to minimize the need to move boulders reduces the labor involved in path and trail development.

Otherwise, hiking paths and trails are sited on Marlow soil with few concerns. Wetness is a moderate limitation for paths and trails development on Peru soils. Waterbars and drainage can direct water off paths and trails.

Areas of these Marlow and Peru soils have fair to good potential for the development of habitat areas for woodland wildlife. These soils have very poor potential for the development of wetland wildlife habitat and poor potential for openland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

737B--Surplus-Bemis association, very stony, gently sloping

This map unit is mostly located at elevations of 2500 feet or higher. This map unit may occur at lower elevations on north facing slopes, in the northern most part of Coos County, or in pockets where cold air settles. Sugar maple trees are absent or of small diameter and scraggly in these cold areas. This map unit consists of soils on concave lower sideslopes of hills and mountains, and heads of broad drainageways. The Surplus and Bemis soils are intermingled in a regularly repeating pattern. Surplus soils are typically on higher part of landscape. Bemis soils are on lower part of landscape or in concave pockets. Surface stones are 5 to 80 feet apart. Surplus soils are very deep, moderately well drained, have a dense basal till substratum, and make up about 50 percent of this map unit. Bemis soils are very deep, poorly drained, have a dense basal till substratum, and make up about 35 percent of this map unit. Slopes range from 8 to 15 percent. Map units are 50 acres or larger in size.

A typical Surplus soil has the following characteristics:

Surface layers:
0 to 1 inch, slightly decomposed needles
1 to 3 inches, highly decomposed organic matter
3 to 5 inches, pinkish gray gravelly silt loam with 16 percent rock fragments
Subsoil:
5 to 9 inches dark reddish brown gravelly silt loam with 15 percent rock fragments
9 to 16 inches brown silt loam with mottles and 10 percent rock fragments
16 to 24 inches dark yellowish brown gravelly silt loam with mottles and 15 percent rock fragments
Substratum:
24 to 65 inches olive gravelly fine sandy loam with mottles and 28 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Bemis soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed forest litter with 5 percent rock fragments
2 to 5 inches, highly decomposed forest litter with 10 percent rock fragments
Subsoil:
5 to 11 inches, dark grayish brown silt loam with mottles with 10 percent rock fragments
11 to 18 inches, dark gray channery silt loam with mottles and 15 percent rock fragments
Substratum:
18 to 65 inches, dark gray channery silt loam with mottles and 15 percent rock fragments

The substratum is a firm and dense hardpan.

Included with these Surplus and Bemis soils are areas of well drained Sisk and moderately deep Glebe soils, and areas of soils with stones less than 5 feet or greater than 80 feet apart, and areas with slopes greater than 15 percent. Inclusions make up about 15 percent of this association.

Important properties of this Surplus soil are:

Permeability: Moderate in surface layers and subsoil and slow or moderately slow in the substratum
Available water capacity: High
Average depth to hardpan: 20 inches
Depth to seasonal high water table: Perched water table at 12 to 24 inches from October to May
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of this Bemis soil are:

Permeabillty: Moderately slow to moderately rapid in organic surface layers; moderate in mineral surface and subsoil layers; slow or very slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 17 inches
Depth to seasonal high water table: Perched, 0 to 12 inches from September through June
Depth to bedrock: Greater than 60 inches
Potential frost action: High

The hardpan and seasonal high water table limit the rooting depth of plants. Water may pond on the surface during the spring or after periods of heavy rainfall in areas having less than 5 percent slopes.

Forestry

Fertility and moisture are fair to poor for hardwood growth and fair to good for softwoods, especially red spruce and balsam fir. Trees grow under stress of cold soil temperature and climate. Due to the cold, tree growth is slow. The dominant tree species on this map unit are yellow birch, balsam fir, mountain paper birch, red spruce, and American mountain ash. Sugar maple seldom grows on this map unit.

For the Surplus soil, equipment limitations and windthrow hazard are moderate, while plant competition can be severe. For the poorly drained Bemis soil, equipment limitations, windthrow hazard and plant competition are all severe. Constructing log roads and skid trails on the contour, using diversion ditches to control runoff, and revegetating disturbed areas after logging can control erosion. The operation of equipment is hampered in the spring by high water tables and frost action. Operating equipment when the ground is frozen can help reduce erosion on fragile surface areas of these soils.

Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Careful site preparation helps reduce plant competition.

Recreation and Wildlife

For development of hiking paths and trails, wetness is a moderate concern on Surplus soils and a severe concern on Bemis soils. Using paths and trails when ground is frozen reduces the wetness concern.

Surplus soil has fair suitability for development of openland and woodland wildlife habitat. Bemis soil has poor suitability for openland wildlife habitat and fair suitability for woodland wildlife habitat development. Both soils have very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

560B--Tunbridge-Plaisted-Lyman complex, 3 to 8 percent slopes

This complex consists of three gently sloping soils intermingled in such an intricate pattern that it is not practical to map them separately. Tunbridge soils are well drained, 20 to 40 inches deep to ledge (bedrock), and make up about 40 percent of this complex. Plaisted soils are also well drained, greater than 60 inches deep to ledge, have a hardpan, and make up about 30 percent of this complex. Lyman soils are somewhat excessively drained, 10 to 20 inches deep to ledge, and make up about 15 percent of this complex. Nearly all areas of this map unit are located in the northern third of Coos County, and these areas are underlain by ledge (the landscape is bedrock controlled) that has been glacially modified. The landscape consists of a complex series of small hills and knolls 1/4 to 3 acres in size and 1 to 5 vertical feet higher than the valleys and depressions in between; slope patterns are complex. A few areas have surface stones.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

In areas that have been cultivated the surface has been mixed by plows. An eight inch thick very dark brown silt loam layer is common.

A typical Plaisted soil has the following characteristics:

Surface layer:
0 to 2 inches, partially decomposed leaf litter
2 to 4 inches, light brownish gray very fine sandy loam with 3 percent rock fragments
Subsoil:
4 to 7 inches, reddish brown silt loam with 3 percent rock fragments
7 to 14 inches, dark yellowish brown silt loam with 5 percent rock fragments
14 to 23 inches, light olive brown silt loam with 14 percent rock fragments
23 to 29 inches, olive very fine sandy loam with 14 percent rock fragments
Substratum:
29 to 65 inches, olive very fine sandy loam with 10 and 14 percent rock fragments

The substratum layer is a dense and firm hardpan. In areas that have been cultivated, the top 8 inches is mixed into a plow layer.

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

In areas that have been cultivated, the top 8 inches is mixed into a plow layer.

Included with this complex are small areas of moderately well drained Howland soils, poorly drained Cabot soils, and very poorly drained Peacham soils. On the hills and knolls, small scattered areas of the well drained Lombard soils are included. Also included are soils that are less than 10 inches deep to ledge, very small areas of rock outcrop, and other areas having slopes less than 3 or greater than 8 percent. Total inclusions make up about 15 percent of this map unit.

Important properties of this Tunbridge soil are:

Permeability: Moderately rapid throughout
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of this Plaisted soil are:

Permeability: Moderate in the surface layer and subsoil, moderately slow in the substratum.
Available water capacity: High
Depth to seasonal high water table: 18 to 30 inches, perched on the hardpan in April
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

The hardpan substratum layer limits the rooting depth of plants.

Important properties of this Lyman soil are:

Permeability: Moderately rapid throughout
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches

Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

The ledge (bedrock) limits the rooting depth of plants.

Use

Many areas of this complex are used for the production of grass hay or are in pasture. Most of the remaining areas are wooded. A few areas are in residential development.

Agriculture

The soils in this complex are well suited for use as pasture and well or moderately well suited for use as cropland. However, erosion may be a hazard if the soils are cultivated and left bare of vegetation or plant residues. Strip cropping, rotation cropping, cover cropping, or contour cultivation may minimize erosion.

The capability subclass for agriculture is 2e for Tunbridge and Plaisted soils and 3e for Lyman soils.

Forestry

Fertility and moisture are adequate on this complex for good tree growth. Management concerns, such as erosion hazard and equipment limitations are slight. However, erosion may become a problem during spring runoff and during unusually heavy periods of rainfall. Constructing roads and skid trails on the contour will help prevent and control this erosion. Additional management concerns are seedling mortality, windthrow hazard and plant competition. Seedling mortality can be minimized on the Lyman soil by planting containerize stock or larger that normal seedlings; otherwise mortalities of 25 to 50 percent may result. Restricted rooting depths result in a moderate windthrow hazard on the Tunbridge and Plaisted soils and a severe hazard on the Lyman soil; small patch or narrow width clearcuts, or selective cuts may be necessary to keep tree throw losses to a minimum. Plant competition, a severe management concern for Plaisted soil, can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species.

Successional trends are not clear on the soils in this map unit, but may be favoring hardwoods. However, most stands are made up of either softwoods or hardwoods; the mixed stand is not common. Softwood species observed doing well in this map unit include balsam fir, red spruce, white spruce, and northern white cedar. Most stands of hardwood generally include significant percentages of sugar maple and yellow birch; other hardwood species observed but not found in all stands include paper birch, quaking aspen, American beech, and black cherry.

Community Development

For building site developments, the bedrock (ledge) in the Tunbridge and Lyman soils is limiting for many uses. Locating development activities on the Plaisted soil in this complex will avoid bedrock concerns. The hardpan layer in the Plaisted soil can potentially interfere with digging shallow excavations, affecting the ease of construction.

Frost action on local roads and streets is a moderate concern for Plaisted and Tunbridge soils; frost action can be minimized by placing coarse grained base materials to frost depth and installing drainage.

For on-site sewage disposal, the bedrock in the Tunbridge and Lyman soils result in severe limitations for septic tank absorption fields. Locating absorption field sites on Plaisted soil in this complex will avoid bedrock concerns. Slow permeability in the hardpan of the Plaisted soil can also be a severe limitation for septic tank absorption fields in some areas. Constructing raised bed absorption fields can reduce this concern and allows effluent to be filtered before reaching the firm substratum.

Recreation and Wildlife

The Tunbridge, Plaisted, and Lyman soils in this complex have slight limitations for paths and trails development. For camping and picnic areas, the ledge in the Lyman soil results in a severe limitation; the hardpan layer in the Plaisted soil results in a moderate limitation. On some sites it may be possible to develop the individual camping and picnic sites on the Tunbridge soil. For development of playgrounds, the presence of small stones in the surface layer, the slope, wetness in the Plaisted soil, and depth to ledge in the Tunbridge and Lyman soils are limitations. Small stones can be picked off the surface and playgrounds can be sited on least sloping areas with effort made to avoid the shallow Lyman soils.

The Tunbridge and Plaisted soils in this complex are suitable for development of openland and woodland wildlife habitats. The Lyman soil has poor suitability for development of openland and woodland wildlife habitats. Tunbridge, Plaisted, and Lyman soils have very poor suitability for development of wetland wildlife habitat.

670C--Tunbridge-Berkshire-Lyman Complex, 8 to 15 percent slopes

These Tunbridge, Berkshire, and Lyman soils are on footslopes and sideslopes of low mountains and hills where bedrock is close to the surface. This complex consists of three sloping soils intermingled in such an intricate pattern that it was not practical to map them separately. Tunbridge soils are well drained, 20 to 40 inches to bedrock, and make up about 45 percent of this complex. Berkshire soils are also well drained, deeper than 60 inches to bedrock, and make up about 20 percent of this complex. Lyman soils are somewhat excessively drained 8 to 20 inches deep to bedrock, and make up about 15 percent of the complex. Surface stones, if any, are generally greater than 30 feet apart.

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Berkshire soil has the following characteristics:

Surface layer:
0 to 4 inches, very dark brown partially decomposed organic matter
4 to 5 inches, grayish brown very fine sandy loam with 10 percent rock fragments
Subsoil:
5 to 10 inches, dark brown fine sandy loam with 10 percent rock fragments
10 to 24 inches, olive brown very fine sandy loam with 10 percent rock fragments
Substratum:
24 to 65 inches, light olive brown very fine sandy loam with 10 percent rock fragments

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments

Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments

Substratum:
R – 16 inches, unweathered phyllite bedrock

Included with this complex are small scattered areas of well drained Marlow and Monadnock soils. These soils are deeper than 40 inches to bedrock. Also included are small areas of moderately well drained Peru, Skerry, and Sunapee soils in slight depressions, and areas of soils having slopes less than 8 percent and greater than 15 percent. Soils with bedrock between 40 to 60 inches are common inclusions. A few pieces of bedrock may show. Included soils make up about 20 percent of this map unit.

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available water capacity: Moderate
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of this Berkshire soil are:

Permeability: Moderate or moderately rapid
Available Water Capacity: High
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Use

Most of the acreage of this complex is forested, though some areas are used for unimproved pasture.

Agriculture

The Tunbridge and Berkshire soils are well suited for pasture and moderately well suited for cropland. Lyman soil is moderately well suited for pasture and poorly suited for cropland. If the soil is cultivated, erosion may be a hazard. Cover crops, planting on the contour, strip cropping or other erosion control measures help reduce erosion.

The capability subclass for agriculture is 3e for Tunbridge and Berkshire soils and 4e for the shallow Lyman soil.

Forestry

Fertility and moisture are favorable on this complex for good tree growth. Seedling mortality is a moderate concern on shallow Lyman soil. Seedling mortality can be reduced by planting containerized seedlings or by making specialized site preparations such as raised beddings. Windthrow hazard is a moderate concern on Tunbridge soil and a severe concern on Lyman soil due to depth to bedrock. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Plant competition is a moderate concern on Lyman soil. Plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Constructing logging roads and skid trails on the contour will help reduce erosion and permit easier and safer operation of equipment.

Due to the diverse nature of this complex, it is not possible to generalize about successional trends.

Community Development

For building site developments, the bedrock and slope on the Tunbridge and Lyman soils are limitations for many uses. To overcome the slope limitation, additional cutting and shaping may be needed to prepare a less sloping site, but bedrock may be encountered in areas of Lyman and Tunbridge soils. Locating development activities on Berkshire soil in this complex will avoid the bedrock limitation.

Slope is a moderate limitation on the Berkshire soil for dwellings and shallow excavation. Using cut and fill techniques to level these sloping areas can reduce slope limitations.

Frost action on local roads and streets is a moderate concern and can be minimized by placing coarse grained base materials to frost depth and installing drainage. Slope is also a moderate concern for the layout of roads; constructing roads along the contour and installing drainage systems can help reduce erosion caused by roads cutting into slopes.

For on-site sewage disposal, the bedrock in the Tunbridge and Lyman soils result in severe limitations for septic tank absorption fields. If a large enough area of Berkshire soil can be found, siting the septic absorption field on these deeper soils is helpful. Slope is an additional moderate limitation for absorption field sites. Cutting and shaping can level the slope on potential sites.

Recreation and Wildlife

On Tunbridge and Berkshire soils, slope is a moderate concern for picnic areas and camp area development. Small stones are a concern on the Berkshire soils as well. Slope is a severe concern for playground development. Cutting and shaping the slope at individual sites will help reduce this limitation.

On Lyman soil, the shallow depth to bedrock is a severe limitation for developing camp, picnic areas and playgrounds. Locating sites on deeper Tunbridge and Berkshire soils can help reduce this concern.
Paths and trails can be developed with only slight limitations, if any.

Tunbridge and Berkshire soils are well suited for development of woodland and openland wildlife habitats. Lyman soil is poorly suited for development of woodland and openland wildlife habitats. This map unit is very poorly suited for wetland wildlife habitat development.

723B--Peru-Pillsbury association, gently sloping, very stony

This map unit consists of two soils intermingled in a regularly repeating pattern on mountain slopes and rolling uplands. Stones 5 to 80 feet apart cover the surface. Slopes range from 0 to 15 percent. The landscape consists of long smooth slopes, up to 1500 feet in length. The moderately well drained Peru soil occupies the higher parts of the landscape while the poorly drained Pillsbury soil occupies the lower parts of the landscape and concave areas. Peru soil is greater than 60 inches to bedrock, has a dense hardpan, and makes up about 60 percent of this map unit. Pillsbury soil is greater than 60 inches to bedrock, has a dense hardpan, and makes up about 20 percent of this map unit. Individual map units are 50 acres or greater in size.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Pillsbury soil has the following characteristics:

Surface layer:
0 to 7 inches, dark brown gravelly sandy loam with mottles and 25 percent rock fragments
Subsoil:
7 to 15 inches, light olive brown and dark grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
15 to 23 inches, grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
Substratum:
23 to 42 inches, light olive brown gravelly fine sandy loam with mottles and 25 percent rock fragments
42 to 65 inches, light olive brown gravelly sandy loam with mottles and 23 percent rock fragments

The substratum is a firm and dense hardpan.

Included with these Peru and Pillsbury soils are small scattered areas of moderately well drained Skerry soils, well drained Marlow soils, and the 8 to 20 inch deep Lyman soil over bedrock on ridges. Skerry soils have a sandier substratum than Peru soil. Also included are areas having slopes greater than 15 percent. These inclusions may make up about 20 percent of this map unit.

Important properties of this Peru soil include:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Important properties of this Pillsbury soil include:

Permeability: Moderate in surface and subsoil layers, slow in substratum layers
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches perched November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on Peru soil for the growth of high quality hardwoods. On the Pillsbury soil, fertility and moisture are fair to poor for hardwood growth and fair to good for softwoods such as red spruce and balsam fir.

Windthrow hazard and plant competition are moderate forest management concerns on Peru soil and severe management concerns on Pillsbury soil. Plant competition can be reduced through careful site preparation following tree harvesting to reduce the invasion of undesirable species. Windthrow hazard can be reduced with careful thinning and by avoiding damage to surficial root systems caused by harvesting equipment.

Equipment operation, erosion hazard, and seedling mortality are of slight concern on Peru soil. On Pillsbury soil, due to wetness, equipment operation is a severe concern and seedling mortality is a moderate concern. Harvesting when the ground is frozen or during drier parts of the year helps reduce the wetness concern. Constructing logging roads and skid trails along the contour with waterbars or culverts also help to reduce erosion. Planting water tolerant species can reduce seedling mortality.

Natural successional trends are not clear on these soils, but there are some indications that shade tolerant hardwoods may have an advantage. Successional trends on areas that have been cutover can result in a variety of species on the soils in this map unit, the major ones being sugar maple and yellow birch, with minor occurrences of American beech, white birch, red maple, aspen, pin cherry, white ash, red spruce, and balsam fir.

Recreation and Wildlife

Wetness is a concern for development of hiking paths and trails on Peru soil and a severe concern on Pillsbury soil. Siting paths and trails on Peru soil or a well drained inclusion rather than on Pillsbury soil is reduces this wetness concern.

Peru soil is fairly suitable for openland wildlife habitat and well suited for woodland wildlife habitat development. Pillsbury soil is poorly suited for openland wildlife habitat and fairly suited for woodland wildlife habitat development. Both soils are very poorly suited for wetland wildlife habitat although, in flat areas, there may be some potential for wetland wildlife habitat development on Pillsbury soil.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

726C--Rock outcrop - Lyman complex, strongly sloping

These rock outcrops and shallow to bedrock (ledge), somewhat excessively drained Lyman soils are on hills and lower slopes of mountains. Rock outcrops make up 50 percent of this map unit. Lyman soils make up 35 percent of this map unit. The slope ranges from 0 to 35 percent. Map units are 50 acres or larger in size.

Rock outcrops consist of exposures of bare bedrock with little or no vegetation.

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

Included with these rock outcrops and Lyman soils are a few scattered areas of moderately deep Tunbridge soils or soils that are less than 10 inches deep over ledge. Also included are a few areas with greater than 35 percent slope. Inclusions make up less than 15 percent of this map unit.

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: Greater than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

These areas are mostly bare or lichen covered rock with a few shrubs, grasses, or trees growing.

Forestry

There is low potential for commercial forestry in these areas. Production potential is low. Windthrow is a severe hazard on Lyman soil. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. For Lyman soil, erosion hazard and equipment use limitations may be moderate; avoiding steeper slopes can reduce erosion concerns. Seedling mortality is a moderate limitation on Lyman soil. Planting seedlings on raised beds may reduce seedling mortality. Rock outcrops may interfere with equipment use.

Recreation and Wildlife

These areas may be good sites for hiking trails although the rock outcrops can be very slippery when wet. These areas may be valued for the vistas they provide. Slope is a moderate limitation for trails on the steeper areas of the map unit; designing switchbacks and installing waterbars (where there is soil) can help reduce erosion of these shallow soils.

Wildlife habitat suitability for habitat areas for openland and woodland wildlife is poor; suitability for wetland wildlife habitat development is very poor.

Community Development and Agriculture

Determination of the suitability for any use requires an onsite investigation.

738B--Glebe-Saddleback-Sisk association, extremely stony, sloping

This map unit is mostly located at elevations of 2500 feet or higher. This map unit may occur at lower elevations on north facing slopes, in the northern most part of Coos County, or in pockets where cold air settles. Sugar maple trees are absent or are of small diameter and scraggly in these cold areas. This map unit consists of soils on the sideslopes and tops of mountains. The Glebe, Saddleback and Sisk soils are intermingled in a regularly repeating pattern. Glebe soils are typically throughout. Saddleback soils are on high spots. Sisk soils are on lower slopes or throughout. Glebe soils are well drained, 20 to 40 inches deep to bedrock, and make up about 35 percent of this association. Saddleback soils are well drained, 10 to 20 inches deep to bedrock, and make up about 20 percent of this association. Sisk soils are well drained, greater than 60 inches deep to bedrock, have a dense basal till substratum, and make up about 20 percent of the map unit. Vegetation on the Glebe and Saddleback soils is usually softwood trees. Hardwoods are dominant on the Sisk soils. Slope ranges from 8 to 15 percent. Map units are 50 acres or larger in size.

A typical Glebe soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed needles and leaves
2 to 5 inches, grayish brown silt loam with 5 percent rock fragments
Subsoil:
5 to 8 inches, dark reddish brown silt loom with 5 percent rock fragments
8 to 14 inches, dark brown silt loam with 10 percent rock fragments
14 to 25 inches, dark yellowish brown silt loam with 10 percent rock fragments
Substratum:
25 to 39 inches, olive brown cobbly silt loam 20 percent rock fragments
39 inches, phyllitic bedrock

A typical Saddleback soil has the following characteristics:

Surface layers:
0 to 2 inches, black slightly decomposed needles and leaves
2 to 3 inches, dark reddish brown highly decomposed organic matter
3 to 4 inches, dark gray fine sandy loam with 5 percent rock fragments
Subsoil:
4 to 5 inches, very dusky red silt loam with 5 percent rock fragments
5 to 9 inches, dark reddish brown silt loam with 5 percent rock fragments
9 to 17 inches, dark yellowish brown very fine sandy loam with 20 percent rock fragments
17 inches, phyllite bedrock

A typical Sisk soil has the following characteristics:

Surface layers:
0 to 2 inches, moderately decomposed plant material
2 to 6 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
6 to 9 inches, brown gravelly silt loam with 15 percent rock fragments
9 to 14 inches, dark yellowish brown gravelly silt loam with 17 percent rock fragments
14 to 20 inches, light olive brown gravelly silt loam with 23 percent rock fragments
Substratum:
20 to 54 inches, olive gravelly silt loam with 34 percent rock fragments
54 to 65 inches, olive gravelly silt loam with mottles and 34 percent rock fragments

The substratum is a firm and dense hardpan.

Included with this map unit are small scattered areas of soils that are 0 to 10 inches deep to bedrock throughout; somewhat excessively drained organic very shallow to moderately deep Ricker soils throughout; areas of moderately well drained Surplus soils throughout; and poorly drained Bemis soils in depressions. Also included are areas of soils with surface stones greater than 80 feet apart, and other areas having slopes greater than 15 percent. Fifty five percent of the area of this association is underlain by bedrock within 60 inches of the surface. Inclusions make up about 20 percent of this map unit.

Important properties of this Glebe soil are:

Permeability: Moderately rapid in the surface layers and subsoil and very slow to rapid in the substratum
Available water capacity: High
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: High

Important properties of this Saddleback soil are:

Permeability: Moderate in the surface layers and subsoil, and very slow to rapid in substratum
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: High

Important properties of this Sisk soil are:

Permeability: Moderate in the surface and subsoil

layers, very slow or slow in the substratum
Available water capacity: Moderate
Average depth to hardpan: 27 inches
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: More than 60 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are favorable on these Glebe, Saddleback, and Sisk soils for good tree growth, however physical limitations affect forest management. Trees grow under stress of cold soil temperature and climate. Due to the cold, tree growth is slow. Limitations for the use of logging equipment are slight on Saddleback and Sisk soils and moderate on Glebe soil. Equipment use may be hampered by water perching on the bedrock and hardpan. Operation of equipment during the drier parts of the year helps alleviate mud concern. Windthrow hazard is moderate on the Glebe and Sisk soil and severe on the Saddleback soil due to shallow rooting depth. Leaving groups of trees to protect each other or cutting all the trees on the shallowest soils may be more effective than leaving a few trees. Seedling mortality is a moderate concern on the shallow Saddleback soil. Raising seed beds may help reduce this concern.

Erosion hazard is moderate on Glebe soils and slight on Saddleback and Sisk soils. Constructing roads and skid trails on the contour reduces risk of erosion.

The dominant tree species on this association are balsam fir, red spruce, yellow birch, mountain paper birch, and American mountain ash. Red maple, striped maple, and paper birch are present to some extent in many stands. Sugar maple seldom grows on these soils. Of the three soils in this association, Sisk soil seems to favor the growth of yellow birch; Glebe soil, balsam fir and red spruce; and Saddleback soil, balsam fir or a balsam fir-mountain paper birch mix.

Recreation and Wildlife

There are slight limitations for constructing paths and trails on Saddleback and Sisk soils, but there may be severe limitations for areas of Glebe soil with fragile topsoil that erodes easily.

Suitability for openland wildlife habitat development is poor on all three soils. For woodland wildlife habitat development, the suitability is good on Glebe soil and fair on Saddleback and Sisk soils. The suitability for wetland wildlife habitat is very poor for all three soils.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

750B Saddleback-Glebe-Ricker association, gently sloping, very stony

This map unit is mostly located at elevations of 2500 feet or higher. This map unit may occur at lower elevations on north facing slopes, in the northern most part of Coos County, or in pockets where cold air settles. Sugar maple trees are absent or of small diameter and scraggly in these cold areas. Saddleback soils are well drained, 10 to 20 inches deep to bedrock, and make up about 40 percent of this association. Glebe soils are well drained, 20 to 40 inches deep to bedrock, and make up about 25 percent of this association. Ricker soils are well drained, 2 to 26 inches deep to bedrock, and make up about 15 percent of the association. Slopes range from 0 to 15 percent. Surface stones are 5 to 80 feet apart. Map units are 50 acres or larger in size.

A typical Saddleback soil has the following characteristics:

Surface layers:
0 to 2 inches, black slightly decomposed needles and leaves
2 to 3 inches, dark reddish brown highly decomposed organic matter
3 to 4 inches, dark gray fine sandy loam with 5 percent rock fragments
Subsoil:
4 to 5 inches, very dusky red silt loam with 5 percent rock fragments
5 to 9 inches, dark reddish brown silt loam with 5 percent rock fragments
9 to 17 inches, dark yellowish brown very fine sandy loam with 20 percent rock fragments
17 inches, phyllite bedrock

A typical Glebe soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed needles and leaves
2 to 5 inches, grayish brown silt loam with 5 percent rock fragments
Subsoil:
5 to 8 inches, dark reddish brown silt loom with 5 percent rock fragments
8 to 14 inches, dark brown silt loam with 10 percent rock fragments
14 to 25 inches, dark yellowish brown silt loam with 10 percent rock fragments
Substratum:
25 to 39 inches, olive brown cobbly silt loam 20 percent rock fragments
39 inches, phyllitic bedrock

A typical Ricker soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed leaves
2 to 8 inches, black partially decomposed leaves and needles
8 to 12 inches, dark reddish brown and black partially decomposed leaves and needles
12 to 16 inches, dark brown gravelly loamy sand with 25 percent rock fragments
16 inches, granite bedrock

Included with these soils are scattered areas of soils 0 to 2 inches deep to bedrock and areas of rock outcrop. Other inclusions are small areas of deep Sisk and Surplus soils, usually on north and west facing slopes; and deep, poorly drained Bemis soils in depressions. Also included are areas with surface stones less than 5 feet or greater than 80 feet apart, and areas with slopes greater than 15 percent. Most of the areas are underlain by bedrock within 60 inches. Inclusions make up about 20 percent of this association.

Important properties of this Saddleback soil are:

Permeability: Moderate in the surface layers and subsoil, and very slow to rapid in substratum
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Important properties of this Glebe soil are:

Permeability: Moderately rapid in the surface layers and subsoil, and very slow to rapid in the substratum
Available water capacity: High
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: High

Important properties of this Ricker soil are:

Permeability: Moderately rapid in organic material and moderate or moderately rapid in mineral soil and very slow to rapid near bedrock
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 2 to 26 inches
Potential frost action: Low

Forestry

Fertility and moisture are favorable on these soils for good tree growth, however physical limitations affect forest management. Trees grow under the stress of cold soil temperature and climate. Due to the cold, tree growth is slow. Shallow rooting depth is a stress as well on the Saddleback and Ricker soils. The dominant tree species on this map unit are stands of balsam fir or a balsam fir-mountain paper birch mix. Red spruce and mountain ash are also present to some extent in many stands.

Limitations for use of logging equipment and erosion hazard are slight on Saddleback and Ricker soils and moderate on Glebe soils. Getting equipment to areas of this association may often be difficult due to surrounding steep, very steep or extremely steep slopes. Erosion may accelerate during wet periods. Constructing roads and skid trails on the contour, and harvesting during the drier parts of the year, and revegetating the roads and trails after use helps control erosion.

Also, operation of the equipment may be hampered by water perching on the bedrock during the springtime and after prolonged rainy periods. Operation of the equipment during the drier parts of the year will help reduce wetness concerns.

Windthrow hazard is severe on the Saddleback and Ricker soils and moderate on the Glebe soils. Leaving groups of trees to protect each other or cutting all the trees on the shallowest soils may be more effective than leaving a few trees. Plant competition is a moderate concern for Saddleback and Ricker soil; careful site preparation after logging will help reduce this concern. Seedling mortality is also a moderate concern for both Saddleback and Ricker soils. Planting seedlings on raised beds may help reduce this concern.

Recreation and Wildlife

The thick organic surface of the Ricker soils, the erodibility of the Glebe soils, and the fragile nature of both are severe concerns for hiking path and trail development. Saddleback soils have few limitations for hiking path and trail development.

Siting paths and trails on Saddleback soils whenever possible helps reduce impact of trail development. The thick organic mat on Ricker soils may be slick to walk on. Repeated footsteps of people or horses or use of bicycles or other vehicles may destroy the organic mat on the Ricker soils and damage surface layer on Glebe soils.

Saddleback soil has fair suitability, Glebe soil has good suitability, and Ricker soil has poor suitability for development of woodland wildlife habitat. Saddleback and Glebe soils have poor suitability and Ricker soil has very poor suitability for development of openland wildlife habitat. All three soils have very poor suitability for development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation.

764B--Howland-Monarda association, gently sloping, very stony

This map unit consists of soils on the tops, lower slopes, or benches of long or rolling smooth hills in northern Coos County. Generally Howland soils occupy the higher part of the landscape whereas Monarda soils occupy low areas. Howland soils comprise about 55 percent and Monarda soils 30 percent of the map unit. Other soils comprise about 15 percent of this map unit. Slope ranges from 0 to 15 percent. Surface stones of 10 to 24 inches in diameter are 5 to 80 feet apart. Mapping units are 50 acres or larger in size.

A typical Howland soil has the following characteristics:

Surface layers:
0 to 1 inch, black moderately decomposed needles
1 to 3 inches, dark brown silt loam with 14 percent rock fragments
Subsoil:
3 to 8 inches, dark brown gravelly silt loam with 15 percent rock fragments
8 to 14 inches, dark yellowish brown gravelly silt loam with 20 percent rock fragments
14 to 24 inches, olive gravelly silt loam with 20 percent coarse fragments
Substratum:
24 to 58 inches, olive gray gravelly silt loam with mottles and 30 percent rock fragments
58 to 66 inches, olive very gravelly very fine sandy loam with mottles and 35 percent rock fragment

The substratum layers are a dense and firm hardpan.

A typical Monarda soil has the following characteristics:

Surface layers:
0 to 3 inches, black partially decomposed organic material
3 to 6 inches, light gray silt loam with 5 percent rock fragments
Subsoil:
6 to 11 inches, light brownish gray silt loam with mottles and 10 percent rock fragments
11 to 16 inches, light olive gray silt loam with mottles and 10 percent rock fragments
16 to 20 inches, olive silt loam with mottles and 10 percent rock fragments
Substratum:
20 to 65 inches, olive gravelly silt loam with mottles and 15 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these Howland and Monarda soils are small areas of very poorly drained Peacham soils in concave areas and near streams. Well drained Bangor soils are found on convex areas and moderately well drained Dixmont soils are found on the same landscape as Howland soils. Areas with slopes greater than 15 percent are scattered throughout. Also included are areas with stones less than 5 feet or greater than 80 feet apart. Inclusions make up 15 percent of this map unit.

Important properties of this Howland soil are:

Permeability: Moderate in the surface and subsoil layers, slow in the substratum layer
Available water capacity: High
Depth to seasonal high water table: 18 inches to 30 inches perched water table from November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Important properties of this Monarda soil are:

Permeability: Moderately rapid in the surface layer, moderate in the subsoil, and slow or very slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 0 to 18 inches from October through June
Depth to bedrock: More than 60 inches
Depth to hardpan: 12 to 30 inches
Potential frost action: High

Forestry

Fertility and moisture are favorable on these Howland soils for the growth of high quality hardwoods. Erosion hazard is slight on these gently sloping Howland and Monarda soils. Equipment limitation is slight on these Howland soils and severe on these poorly drained Monarda soils. Seedling mortality is slight on these Howland soils and moderate on these Monarda soils. Windthrow hazard is moderate on these Howland soils and severe on these Monarda soils. Plant competition is moderate on these Howland soils and severe on these Monarda soils.

Seasonal wetness hampers equipment use. Logging in the summer or when the ground is frozen reduces this limitation. Operations are hampered by heavy rains, high water table in spring, and frost action. Seedling mortality can be reduced by planting large stock. Leaving groups of trees to protect each other can reduce windthrow hazard. Cutting all the trees rather than leaving a few trees is another consideration. Avoiding damaging surficial root systems with machinery can help reduce windthrow. Site preparation after logging can reduce plant competition. Also hardwood competition is not usually a major limitation on poorly drained soils such as Monarda.

Roads built along the contour help minimize erosion. Site skid trails and roads on areas of Howland soils with gentlest relief whenever possible to reduce risk of erosion. Monarda soils are best avoided if possible when siting roads and skid trails. Monarda soils fall into the hydric soil category. Hydric soil is one of several criteria used to determine wetlands. Alteration of wetlands may require permits.

Successional trends on the Howland soil component of this map unit are toward stands of shade tolerant hardwoods such as beech and sugar maple or towards softwood such as balsam fir and spruce. Most successional stands contain a variety of hardwood species (sugar maple, American beech, yellow birch, black cherry, and paper birch) in varying combinations with spruce and balsam fir. Whether softwoods or hardwoods dominate a site depends to an extent on the seed source of surrounding tree stands. All of the more valuable hardwoods and softwoods make good growth on Howland soil.

Successional trends on the Monarda component of this map unit is towards softwoods.

Recreation and Wildlife

Development of paths and trails on Howland soils has moderate limitations due to wetness. The Monarda component has a severe limitation due to wetness. Siting paths and trails away from Monarda soils or using trails during drier times of the year or when frozen is helpful.

These Howland and Monarda soils have poor suitability for the development of openland wildlife habitat. They have fair suitability for woodland wildlife habitat development. For 0 to 3 percent slope range the Monarda component has fair suitability for wetland wildlife habitat development. Otherwise these two soils have very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation.

765B-- Monarda-Howland association, gently sloping, very stony

This map unit consists of soils in depressions, adjacent to drainageways, and on the lower slopes of hills and mountains of northern Coos County. The Monarda and Howland soils are intermingled in a regularly repeating pattern. Monarda soils are typically on lower areas and Howland soils are typically on higher areas. Monarda soils are poorly drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up about 75 percent of this map unit. Howland soils are moderately well drained, greater than 60 inches deep to bedrock, have dense basal till substratum, and make up about 15 percent of this map unit. Slope ranges from 0 to 15 percent. Surface stones are 5 to 80 feet apart. Mapping units are 50 acres or larger in size.

A typical Monarda soil has the following characteristics:

Surface layer:
0 to 3 inches, black partially decomposed organic material
3 to 6 inches, light gray silt loam with 5 percent rock fragments
Subsoil:
6 to 11 inches, light brownish gray silt loam with mottles and 10 percent rock fragments
11 to 16 inches, light olive gray silt loam with mottles and 10 percent rock fragments
16 to 20 inches, olive silt loam with mottles and 10 percent fragments
Substratum:
20 to 65 inches, olive gravelly silt loam with mottles and 15 percent rock fragments

The substratum is a dense and firm hardpan.

A typical Howland soil has the following characteristics:

Surface layers:
0 to 1 inch, black moderately decomposed needles
1 to 3 inches, dark brown silt loam with 10 percent rock fragments
Subsoil:
3 to 8 inches, dark brown gravelly silt loam with 10 percent rock fragments
8 to 14 inches, dark yellowish brown gravelly silt loam with 20 percent rock fragments
14 to 24 inches, olive gravelly silt loam with 20 percent rock fragments
Substratum:
24 to 58 inches, olive gray gravelly silt loam with mottles and 30 percent rock fragments
58 to 66 inches, olive very gravelly very fine sandy loam with mottles and 35 percent rock fragments

The substratum layers are a dense and firm hardpan.

Included with these Monarda and Howland soils are areas of Peacham soil, Wonsqueak soil, and areas having surface stones less than 5 feet apart. Also included are areas with slopes greater than 15 percent. Inclusions make up about 10 percent of this map unit.

Important properties of this Monarda soil are:

Permeability: Moderately rapid in the surface layer, moderate in the subsoil, and slow or very slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 0 to 18 inches from October through June
Depth to bedrock: More than 60 inches
Depth to hardpan: 12 to 30 inches
Potential frost action: High

Important properties of this Howland soil are:

Permeability: Moderate in the surface and subsoil layers, slow in the substratum layer
Available water capacity: High
Depth to seasonal high water table: 18 inches to 30 inches perched water table from November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan: 21 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are fair to poor for hardwood growth and fair to good for softwoods, especially red spruce and balsam fir. Successional trends on these soils are toward stands of shade tolerant softwoods, i.e., red spruce and hemlock. Balsam fir is a persistent component in nearly all stands. White and black spruce are sometimes present. Although productivity is reduced by the influence of poor drainage, these soils are well suited to spruce-balsam fir production due to the unusually abundant advance regeneration.

On these Monarda soils, management concerns such as equipment limitations, windthrow hazard, and plant competition are severe. Seedling mortality is moderate on these Monarda soils and slight on these Howland soils. Equipment limitation is slight on these Howland soils. Wind throw hazard and plant competition is moderate on these Howland soils. Erosion hazard is slight on both soils. Operating when the ground is frozen in winter may diminish the severe equipment limitation. Leaving groups of trees to protect each other or cutting all the trees may be useful in terms of windthrow hazard. If replanting, using larger stock on Monarda soils may improve seedling mortality. The severe plant competition on Monarda soils may be spruce and fir competing against themselves. Monarda soils fall into the hydric soil category. Hydric soil is one of several criteria used to determine wetlands. Alteration of wetlands may require permits.

Recreation and Wildlife

These Monarda soils have a severe limitation for development of paths and trails due to wetness. These Howland soils have a moderate limitation for development of paths and trails due to wetness. Use of these soils when the ground is frozen helps reduce concerns.

These Monarda and Howland soils have poor suitability for development of openland wildlife habitat and fair suitability for development of woodland wildlife habitat. At 0 to 3 percent slopes, these Monarda soils have fair suitability for development of wetland wildlife habitat. At greater slopes both these soils have very poor suitability for development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation. These areas of Monarda soil improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

768A--Peacham-Wonsqueak-Cabot association, nearly level, extremely stony

This map unit consists of three soils intermingled in a regularly repeating pattern in depressions and areas adjacent to drainageways of hills and mountains. Generally, the Cabot soil occurs on slightly higher landscape positions than Peacham and Wonsqueak soils. Peacham is a very poorly drained mineral soil. Peacham soil is greater than 60 inches deep to bedrock, may have a hardpan (dense basal till), and makes up about 60 percent of this map unit. Wonsqueak is a very poorly drained organic soil. Wonsqueak soil is greater than 60 inches deep to bedrock, and makes up about 15 percent of this map unit. Cabot soil is poorly drained, greater than 60 inches deep to bedrock, has a hardpan (dense basal till), and makes up about 15 percent of this map unit. Slope ranges from 0 percent to 8 percent. Surface stones are 1 foot to 5 feet apart. Mapping units are 50 acres or larger in size.

A typical Peacham soil has the following characteristics:

Surface layers:
0 to 2 inches, dark reddish brown partially decayed organic material with 15 percent rock fragments
2 to 11 inches, very dark brown highly decomposed organic material with 7 percent rock fragments
Subsoil:
11 to 16 inches, olive gray silt loam with mottles and 5 percent rock fragments
16 to 23 inches, olive gray silt loam with mottles and 5 percent rock fragments
Substratum:
23 to 65 inches, gray and greenish gray silt loam with mottles and 5 percent rock fragments

The substratum is a dense hardpan.

A typical Wonsqueak soil has the following characteristics:

Surface layers:
0 to 4 inches, dark brown slightly decomposed organic material
4 to 14 inches, dark brown moderately decomposed organic material
14 to 28 inches, very dark grayish brown moderately decomposed organic material
Substratum layers:
28 to 36 inches, gray sandy loam with 1 percent rock fragments
36 to 65 inches, dark gray sandy loam with 6 percent rock fragments

A typical Cabot soil has the following characteristics:

Surface layer:
0 to 9 inches, very dark gray gravelly silt loam with 19 percent rock fragments
Subsoil:
9 to 14 inches, olive gravelly loam with mottles and 18 percent rock fragments
Substratum:
14 to 20 inches, olive gray gravelly silt loam with mottles and 15 percent rock fragments
20 to 65 inches, olive gray gravelly silt loam with mottles and 16 percent rock fragments

The substratum is a dense and firm hardpan.

Included with these soils are small scattered areas of moderately well drained Howland soils, and very poorly drained Bucksport soils. Also included are areas having stones less than 5 feet or greater than 80 feet apart, and other areas with slopes greater than 8 percent. Inclusions make up about 10 percent of this association.

Important properties of this Peacham soil include:

Permeability: Moderately slow or moderately rapid in the surface layers, moderate in the subsoil, and very slow or slow in the substratum
Available water capacity: High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface from October to June
Depth to bedrock: More than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Important properties of this Wonsqueak soil are:

Permeability: Moderately rapid over moderate or moderately slow
Available water capacity: Very high
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of this Cabot soil are:

Permeability: Moderately in the surface and subsoil layer, slow in the substratum
Available water capacity: High
Depth to seasonal high water table: 0 to 18 inches from October through June
Depth to bedrock: More than 60 inches
Average depth to hardpan: 20 inches
Potential frost action: High

Use

Most areas of this association are used for woodland and wildlife habitat.

Forestry

This map unit has limited suitability for use as woodland. Management limitations, such as equipment limitations, seedling mortality, windthrow hazard, and plant competition are severe. Erosion hazard is slight. Productivity for hardwoods and conifers is poor. Common trees include tamarack, Northern white cedar, black spruce, and alders, with balsam fir, yellow birch, and black ash around the edges of the map unit. Peacham, Wonsqueak, and Cabot soils fall into the hydric soils category. Hydric soil is one of several criteria used to determine wetlands. Alteration of wetlands may require permits.

Recreation and Wildlife

This map unit has severe limitations for development of hiking paths and trails. Wetness in Cabot soils and excess humus and ponding in Peacham and Wonsqueak soils are the limitations. For narrow sections of this map unit crossing with boardwalks may be an option.

This map unit is poorly suited for woodland or openland wildlife habitat development. However, areas of this map unit with less than 3 percent slope are suitable for development of wetland wildlife habitat.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigation. These areas improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

820B--Lyman-Tunbridge-Rock Outcrop complex, gently sloping

This map unit consists of two soils and exposures of bedrock intermingled in a regular repeating pattern. Lyman soil is somewhat excessively drained, 10 to 20 inches to bedrock, and makes up about 40 percent of this map unit. Tunbridge soil is well drained, 20 to 40 inches to bedrock, and makes up about 25 percent of this map unit. Rock outcrops make up about 15 percent of this map unit. Areas of this map unit are on the tops of ridges, hilltops, and mountaintops, with a few areas on lower sideslopes. Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart. Occasional boulders are also on the surface. Slopes range from 0 to 15 percent.

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

A typical Tunbridge soil has the following characteristics:

Surface layer:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, dark brown silt loam with12 percent rock fragments
15 to 25 inches, dark brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown stony fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

Rock outcrops consist of exposures of bare bedrock with little or no vegetation.

Included with Lyman and Tunbridge soils and Rock Outcrop are small scattered areas of soils 0 to 10 inches and 40 to 60 inches deep to bedrock; areas of poorly drained soils in depressions; moderately well drained Sunapee soils throughout; and areas of soils having slopes greater than 15 percent. These inclusions make up about 20 percent of this map unit.

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Use

Most areas of this map unit are forested with softwood tree species.

Forestry

Fertility and moisture are adequate on this complex for good tree growth, however physical limitations affect forest management. On the areas of Lyman soil or rock outcrop windthrow hazard is severe. Windthrow hazard is moderate on the Tunbridge soil. Windthrow hazard may be reduced by leaving groups of trees together to protect each other and by avoiding damaging surficial roots. Cutting all the trees to avoid losing them to windthrow later is a consideration.

Seedling mortality on shallow Lyman soil is a moderate management concern. Special site preparations such as raised bedding may be needed in some cases for successful seedling development.

Plant competition is moderate on Lyman soil. Careful site preparation will help reduce unwelcome plant competition. Erosion hazard and equipment limitations are slight.

Due to the diverse nature of this map unit, it is not possible to generalize about successional trends.

Recreation and Wildlife

This map unit has few limitations for developing paths and trails.

The Tunbridge soil in this map unit is suitable for the development of woodland wildlife habitat but poorly suited for openland wildlife habitat development and very poorly suited for wetland wildlife habitat development. The shallow depth to bedrock of the Lyman soil and Rock Outcrops limits their suitability for the development of wildlife habitats.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

825B--Pillsbury-Peacham-Peru association, gently sloping, very stony

This map unit consists of three soils intermingled in a regularly repeating pattern on broad gently sloping, concave areas and along drainageways of upland areas. Slope ranges from 0 to 15 percent. Stones 5 to 80 feet apart cover the surface. Generally, poorly drained Pillsbury soil occupies about 45 percent of this map unit, very poorly drained Peacham soil occupies about 20 percent of this map unit, and moderately well drained Peru soil occupies 15 percent of this map unit. All three soils have substratums that are dense hardpans. Peacham soil occupies the low areas of the map unit while Peru soil occupies the higher areas, with Pillsbury soil occupying the remainder of the map unit. Individual map units are 50 acres or greater in size.

A typical Pillsbury soil has the following characteristics:

Surface layer:
0 to 7 inches, dark brown gravelly sandy loam with mottles and 25 percent rock fragments
Subsoil:
7 to 15 inches, light olive brown and dark grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
15 to 23 inches, grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
Substratum:
23 to 42 inches, light olive brown gravelly fine sandy loam with mottles and 25 percent rock fragments
42 to 65 inches, light olive brown gravelly sandy loam with mottles and 23 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Peacham soil has the following characteristics:

Surface layers:
0 to 2 inches, dark reddish brown partially decayed organic material with 15 percent rock fragments
2 to 11 inches, very dark brown highly decomposed organic material with 7 percent rock fragments
Subsoil:
11 to 16 inches, olive gray silt loam with mottles and 5 percent rock fragments
16 to 23 inches, olive gray silt loam with mottles and 5 percent rock fragments
Substratum:
23 to 65 inches, gray and greenish gray silt loam with mottles and 5 percent rock fragments

The hardpan is firm and dense.

A typical Peru soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves and twigs
2 to 4 inches, grayish brown fine sandy loam
Subsoil:
4 to 8 inches, dark brown fine sandy loam with 5 percent rock fragments
8 to 15 inches, strong brown fine sandy loam with 5 percent rock fragments
15 to 18 inches, yellowish brown fine sandy loam with mottles and 7 percent rock fragments
Substratum:
18 to 25 inches, olive fine sandy loam with mottles and 12 percent rock fragments
25 to 28 inches, olive gray fine sandy loam with mottles and 13 percent rock fragments
28 to 65 inches, pale olive and olive fine sandy loam with mottles and 12 percent rock fragments

The substratum layers are a firm and dense hardpan.

Included with these soils are small areas of poorly drained Lyme soil that occur on similar landscapes as Pillsbury soil. Areas of very poorly drained Wonsqueak, Searsport, Pondicherry and Bucksport soils are in depressions near Peacham soil. Moderately well drained Skerry soil are on the same landscape positon as Peru soil. Well drained Marlow or Tunbridge soils are on mounds and ridges. Small areas, less than 50 acres, ponded by beavers may also be included. Also included are areas with greater than 15 percent slope or with surface stones or boulders less than 5 feet apart. Inclusions may make up about 20 percent of this map unit.

Important properties of this Pillsbury soil are:

Permeability: Moderate in surface layers and subsoil, slow in substratum
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches perched November to May
Depth to bedrock: More than 60 inches
Average depth to hardpan : 19 inches
Potential frost action: High

Important properties of this Peacham soil include:

Permeability: Moderately slow or moderately rapid in the surface layers, moderate in the subsoil, and very slow or slow in the substratum
Available water capacity: High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface from October to June
Depth to bedrock: More than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Important properties of Peru soil include:

Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate
Depth to seasonal high water table: Perched at 18 to 30 inches from November to May
Average depth to hardpan: 23 inches

Depth to bedrock: Greater than 60 inches
Potential frost action: High

Forestry

Fertility and moisture are fair to poor for hardwood growth and fair to good for softwoods, especially red spruce and balsam fir.

Wetness is a management concern. The Pillsbury and Peacham components of this association have severe limitations for equipment use, windthrow hazard, and plant competition. The Peru component of this map unit has moderate limitations for windthrow hazard and plant competition. Small patch or narrow width clearcuts, or selective cuts may be needed to minimize tree throw losses. Cutting all the trees to avoid windthrow loss later is another consideration. Seedling mortality is a severe limitation for Peacham soils, a moderate limitation for Pillsbury soils, and of only slight concern for Peru soils. Operating logging equipment when the ground is frozen circumvents some equipment use limitations. The hazard of erosion is slight for these gently sloping soils. Poorly drained Pillsbury soils and very poorly drained Peacham soils rate as hydric soils. Hydric soil is one criteria used to determine wetlands. Permits may be required by local, state, or federal agencies for alteration.

The successional trends on poorly drained Pillsbury soil are towards stands of shade tolerant softwoods such as red spruce and balsam fir. The successional trends on moderately well drained Peru soil are towards shade tolerant hardwoods such as yellow birch and sugar maple or shade tolerant softwoods such as balsam fir. Common trees on the very poorly drained Peacham soil include black spruce, tamarack, Northern white cedar, red maple, and alder.

Recreation and Wildlife

This map unit has severe limitations for developing hiking trails and paths because of wetness in Pillsbury soils and excess humus and ponding in Peacham soils. Peru soils have only moderate limitations for paths and trails development due to wetness. Timing use to frozen ground or dry times of year can be helpful. Boardwalks to bridge the wet areas may be an option to consider.

Areas of Pillsbury soil have fair potential for development of woodland wildlife habitat, but poor potential for development of openland wildlife habitat and very poor potential for development of wetland wildlife habitat. However, for areas of less than 3 percent slope, there might be some potential for wetland wildlife habitat development.

Peacham soil has poor suitability for woodland or openland wildlife habitat development. Very poorly drained Peacham soil has fair suitability for the development of wetland wildlife habitat on less than 3 percent slopes; on steeper slopes, the suitability is very poor.

Peru soil has fair suitability for openland wildlife habitat development, good suitability for woodland wildlife habitat development and very poor suitability for wetland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

832A--Peacham-Wonsqueak-Pillsbury association, nearly level, extremely stony

This map unit consists of three soils intermingled in a regular repeating pattern along drainage ways and in lower, concave areas of upland hills. Individual map units are 50 acres or greater in size. Slopes range from 0 to 8 percent. Surface stones are 1 to 3 feet apart.

Peacham soil is very poorly drained, greater than 60 inches to bedrock, and makes up about 40 percent of this map unit. Wonsqueak soil is very poorly drained, with organic material of 16 inches or greater over a mineral substratum, and makes up 20 percent of this map unit. Pillsbury soil is poorly drained, greater than 60 inches to bedrock, and makes up 20 percent of this map unit. Pillsbury soil generally occupies the higher areas of the landscape whereas Peacham and Wonsqueak soils occupy lower, concave areas.

A typical Peacham soil has the following characteristics:

Surface layers:
0 to 2 inches, dark reddish brown partially decayed organic material with 15 percent rock fragments
2 to 11 inches, very dark brown highly decomposed organic material with 7 percent rock fragments
Subsoil:
11 to 16 inches, olive gray silt loam with mottles and 5 percent rock fragments
16 to 23 inches, olive gray silt loam with mottles and 5 percent rock fragments
Substratum:
23 to 65 inches, gray and greenish gray silt loam with mottles and 5 percent rock fragments

The substratum is a firm and dense hardpan.

A typical Wonsqueak soil has the following characteristics:

Surface layers:
0 to 4 inches, dark brown slightly decomposed organic material
4 to 14 inches, dark brown moderately decomposed organic material
14 to 28 inches, very dark grayish brown moderately decomposed organic material
Substratum layers:
28 to 36 inches, gray sandy loam with 1 percent rock fragments
36 to 65 inches, dark gray sandy loam with 6 percent rock fragments

A typical Pillsbury soil has the following characteristics:

Surface layer:
0 to 7 inches, dark brown gravelly sandy loam with mottles and 25 percent rock fragments
Subsoil:
7 to 15 inches, light olive brown and dark grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
15 to 23 inches, grayish brown gravelly sandy loam with mottles and 30 percent rock fragments
Substratum:
23 to 42 inches, light olive brown gravelly fine sandy loam with mottles and 25 percent rock fragments
42 to 65 inches, light olive brown gravelly sandy loam with mottles and 23 percent rock fragments

The substratum is a firm and dense hardpan.

Included within these Peacham, Wonsqueak, and Pillsbury soils are areas of very poorly drained Bucksport soil in depressions near Wonsqueak soil; and areas of Lyme soil near the Pillsbury soil. Occasionally within this map unit, there are small scattered mounds of moderately well drained Peru, Skerry, or Sunapee soils, or well drained Marlow or Monadnock soils. A few areas may have surface stones more than 3 feet apart. These inclusions can make up about 20 percent of this map unit.

Important soil properties of this Peacham soil include:

Permeability: Moderately slow or moderately rapid in the surface layers, moderate in the subsoil, and very slow or slow in the substratum
Available water capacity: High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface from October to June
Depth to bedrock: More than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Important properties of this Wonsqueak soil include:

Permeability: Moderately rapid over moderate or moderately slow
Available water capacity: Very high
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of this Pillsbury soil include:

Permeability: Moderate in surface and subsoil layers, slow in substratum layers
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches perched November to May
Depth to bedrock: Greater than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Most areas of this are wooded with spruce, fir and cedar, but some areas, particularly the Wonsqueak component, may be in grass and sedges with scattered cedars.

Forestry

Peacham and Wonsqueak soils are unsuited for commercial forestry. The Pillsbury component of this map unit has potential for production of spruce and balsam fir. Overall the wetness is a severe limitation for forestry practices. Management concerns, such as equipment limitations, windthrow hazard, and plant competition are severe due to wetness and, in some areas, ponding of water. Seedling mortality is severe for Peacham and Wonsqueak soils and moderate for Pillsbury soils. Harvesting activities limited to the winter season when the ground is frozen may reduce the equipment limitation. Harvesting outside of frozen ground time may prove impractical. If planting, planting water tolerant species may reduce seedling mortality. Leaving groups of trees together to protect each other or cutting all the trees is a consideration in terms of windthrow hazard. Erosion hazard is slight on these nearly level soils.

Common trees for areas of Peacham soil include black spruce, tamarack, Northern white cedar, red maple, and alder.

Successional trends on Pillsbury soil are toward climax stands of shade tolerant softwoods, i.e. spruce and balsam fir.

These soils all rate as hydric soils, one criterion used to define wetlands. Local, state, and federal regulations on wetlands may apply to alterations of these areas.

Recreation and Wildlife

Ponding and excess humus severely limit construction and maintenance of paths and trails on Peacham and Wonsqueak soils. Large stones are also a severe limitation for Peacham soils. Wetness is a severe limitation for development of paths and trails on Pillsbury soils. Boardwalks may be an option to bridge narrow sections of this map unit.

These soils have poor suitability for openland wildlife habitat development. Peacham soil may have areas of suitability for the development of wetland wildlife habitat on slopes less than 3 percent; on steeper slopes, the suitability is very poor.

Wonsqueak soil has good suitability for the development of wetland wildlife habitat; wetland plants are easy to establish and maintain. Wonsqueak soil is very poorly suited for woodland wildlife habitat development.

Areas of Pillsbury soil may be fairly suitable for woodland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after on-site investigations.

These areas improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

835C--Ricker - Rock outcrop complex, strongly sloping

This complex of well drained, organic Ricker soil and Rock outcrop occurs on upland plains and hills and on mountains. Generally, this complex is located at elevations above 2200 feet in northern Coos County and above 2500 feet in southern Coos county. This complex may occur at lower elevations on north facing slopes than on south facing slopes. Slope ranges from 0 to 35 percent. Individual map units are 50 acres or greater in size.

Ricker comprises about 50 percent, Rock outcrop 30 percent, and other soils 20 percent of this complex.

A typical Ricker soil has the following characteristics:

Surface layers:
0 to 2 inches, slightly decomposed leaves
2 to 8 inches, black partially decomposed leaves and needles
8 to 12 inches, dark reddish brown and black partially decomposed leaves and needles
12 to 16 inches, dark brown gravelly loamy sand with 25 percent rock fragments
16 inches, granite bedrock

Rock outcrop is bedrock (ledge) that pops out above the soil surface.

Included with this Ricker-Rock outcrop complex are small areas of deep Glebe or shallow Saddleback soils. Deeper pockets of well drained Sisk or moderately well drained Surplus soils may be found. Small areas with greater than 35 percent slope may occur. Inclusions comprise about 20 percent of this complex.

Important properties of this Ricker soil are:

Permeability: Moderately rapid in organic material and moderate to moderately rapid in mineral soil and very slow to rapid near bedrock
Available water capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 2 to 26 inches
Potential frost action: low

Forestry

These wooded areas typically support small, close growing Red spruce and Balsam fir. Yellow birch, Mountain paper birch, and Mountain ash are also common. Production potential is low.

The organic material of Ricker soil is fragile and easily destroyed. Windthrow is a severe hazard on this map unit. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. For Ricker soil, erosion hazard and equipment use limitations are slight on 0 to 15 percent slopes. On 15 to 35 percent slopes erosion hazard and equipment use limitations may be moderate on Ricker soil; avoiding steeper slopes can reduce erosion concerns. Seedling mortality is a moderate limitation on Ricker soil. Planting seedlings on raised beds may reduce seedling mortality. Rock outcrops may interfere with equipment use.

Recreation and Wildlife

Since the organic material of Ricker soil is fragile and easily destroyed, laying out hiking trails and paths on rock outcrops helps reduce erosion hazards.

Potential for development of openland wildlife habitat and wetland wildlife habitat is very poor. Potential for development of woodland wildlife habitat is poor to very poor.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

860E--Tunbridge-Lyman-Rock outcrop complex, steep

This map unit consists of two soils and areas of Rock outcrop (ledge) intermingled in a regularly repeating pattern on mountainsides and ridges in the northern half of Coos County. Tunbridge soil is well drained, 20 to 40 inches deep to bedrock, and makes up about 40 percent of this map unit. Lyman soil is somewhat excessively drained, 10 to 20 inches deep to bedrock, and makes up about 35 percent of this map unit. Rock outcrop is exposures of bare ledge, and makes up about 15 percent of this map unit. Slope ranges from 35 to 60 percent. Individual map units are 50 acres or greater in size. Surface stones are 5 to 80 feet apart.

A typical Tunbridge soil has the following characteristics:

Surface layers:
0 to 2 inches, very dark grayish brown silt loam with 5 percent rock fragments
Subsoil:
2 to 5 inches, dark reddish brown silt loam with 5 percent rock fragments
5 to 8 inches, dark brown silt loam with 5 percent rock fragments
8 to 15 inches, very dark grayish brown silt loam with 12 percent rock fragments
15 to 25 inches, very dark grayish brown silt loam with 12 percent rock fragments
Substratum:
25 to 34 inches, olive brown cobbly fine sandy loam with 17 percent rock fragments
34 inches, unweathered bedrock

A typical Lyman soil has the following characteristics:

Surface layers:
0 to 2 inches, partially decomposed leaves
2 to 4 inches, dark gray channery very fine sandy loam with 20 percent rock fragments
Subsoil:
4 to 10 inches, dark brown channery silt loam with 20 percent rock fragments
10 to 16 inches, olive brown channery silt loam with 20 percent rock fragments
Substratum:
R -- 16 inches, unweathered phyllite bedrock

Rock Outcrop consists of exposures of bare bedrock with little or no vegetation.

Included with map unit are small areas of well drained Plaisted soil (usually on north and west facing slopes), well drained Bangor soil (usually on south and east facing slopes), and areas of soils less than 10 inches deep to bedrock. Also included are small areas with surface stones less than 5 feet apart, areas with a few boulders (usually on south and east facing slopes), and areas with slopes less than 35 percent or greater than 60 percent. These inclusions can make up about 10 percent of this map unit.

Important properties of this Tunbridge soil are:

Permeability: Moderate or moderately rapid in surface and subsoil layers and slow to rapid in substratum
Available Water Capacity: Moderate
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 20 to 40 inches
Potential frost action: Moderate

Important properties of Lyman soil are:

Permeability: Moderately rapid
Available Water Capacity: Low
Depth to seasonal high water table: More than 72 inches
Depth to bedrock: 10 to 20 inches
Potential frost action: Moderate

Forestry

Fertility and moisture are adequate on these soils, however physical limitations affect forest management. The very steep slopes are a severe limitation for equipment operation and a moderate limitation for erosion hazard. The hazard of erosion can become severe if the soil is disturbed by logging operations; erosion can be controlled by constructing logging roads on the contour, using diversion ditches and water bars to control runoff, and revegetating disturbed areas after logging. Additionally, some areas with high water table and frost action may hamper the operation of equipment in the spring. Operating equipment during the drier parts of the year or when the ground is frozen can help reduce mudding up equipment.

Hardwood competition is moderate for areas of Lyman soil. Successful softwood regeneration is dependent upon hardwood control; careful site preparation can reduce undesirable species.

The shallow Lyman soil has severe windthrow hazard and seedling mortality greater than 50 percent can be expected. Tunbridge soil has moderate windthrow hazard. Narrow width clearcuts or selected cutting reduces potential for windthrow on the remaining stand. Planting seedlings on raised beds may reduce seedling mortality.

Due to the diverse nature of this map unit, it is not possible to generalize about successional trends.

Recreation and Wildlife

Slope is a severe limitation for hiking paths and trails on this map unit. Careful layout of trails with switchbacks can be helpful.

The Tunbridge soil in this association is suitable for development of woodland wildlife habitat. This map unit is very poorly suited for wetland wildlife habitat development and poorly to very poorly suited to openland wildlife habitat development.

Community Development and Agriculture

Interpretations for other uses can be provided, but only after an on-site investigation.

895A-- Bucksport muck, 0 to 1 percent slopes

This nearly level, very poorly drained soil is in depressions on terraces, glacial till uplands, and along the edges of lakes, ponds, and marshes. It has formed in 51 inches or more of organic material. Vegetation on many areas consists of an overstory of black spruce, white cedar, or tamarack, with a ground cover of sphagnum moss. Slopes range from 0 to 2 percent.

A typical Bucksport soil has the following characteristics:

Surface layer:
2 inches of sphagnum roots and litter
2 to 14 inches, black highly decomposed organic matter (muck)
Subsurface layers:
14 to 54 inches, very dark brown highly decomposed organic material (muck)
Bottom layer:
54 to 72 inches, dark reddish brown highly decomposed organic matter (muck)

Included within this soil are small areas of the very poorly drained Peacham, Searsport, Wonsqueak, Vassalboro and Pondicherry soils, all usually found around the edges of this map unit. Areas of open water are included in many map units. In some units the poorly drained Rumney soil occurs adjacent to the open water or at the edge of the map unit. Inclusions make up about 25 percent of this map unit.

Important Properties of this Bucksport soil are:

Permeability: Moderately slow to moderately rapid
Available water capacity: Very High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 12 inches below the surface year round
Depth to bedrock: Greater than 60 inches
Potential frost action: High

Use

Nearly all areas of this soil are wooded.

Agriculture

This soil is not suited for pasture or cropland. The capability subclass is 7w.

Forestry

An on-site visit is required to assess the potential of this soil for forest harvesting. Equipment limitation, seedling mortality, windthrow hazard, and plant competition are severe. Limiting harvesting activities to the winter season, when the ground is frozen can reduce the risk of losing equipment into the muck.

Bucksport soil rates as hydric soil. Hydric soil is one criterion for designation of a wetland. Permits may be required from local, state, or federal agencies prior to altering the land.

Common trees include tamarack, Northern white cedar, and black spruce, with balsam fir, yellow birch, and black ash around the edges of the map unit.

Community Development

This soil is unsuited for building site development and sanitary facilities because of wetness, low bearing strength, high shrink-swell properties, and high potential frost action.

Although Bucksport is rated as a hydric soil and consequently has severe limitations for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water which lessons flood damage downstream.

Recreation and Wildlife

This soil has severe limitations for the development of camp areas, picnic areas, playgrounds, and paths and trails due to ponding and the organic layers. It might be possible to construct boardwalks for trails but the pilings may have to be very deep to reach mineral soil.

This soil has good suitability for the development of wetland wildlife habitat. Shallow water areas and wetland plants are easy to establish and maintain. This soil is very poorly suited for woodland and openland wildlife habitat development.

897A--Peacham, Bucksport, and Rumney soils, 0 to 2 percent slopes, ponded

This map unit consists of Peacham, Bucksport, and Rumney soils that are mapped together because they are similar in use and management and because it is not practical to extensively explore areas of open water in the course of mapping. These nearly level soils are very poorly drained glacial till, very poorly drained organic soils, and poorly drained alluvial soils respectively. They occur in boggy areas. Often beaver dams help to create ponded conditions associated with this map unit. Most areas of this unit are covered by grasses, reeds, cattails, or open water. Some map units have all three soils others have just one or two of the three soils. Slopes are 0 to 2 percent.

A typical Peacham soil has the following characteristics:

Surface layers:
0 to 2 inches, dark reddish brown partially decayed organic material with 15 percent rock fragments
2 to 11 inches, very dark brown highly decomposed organic material with 7 percent rock fragments
Subsoil:
11 to 16 inches, olive gray silt loam with mottles and 5 percent rock fragments
16 to 23 inches, olive gray silt loam with mottles and 5 percent rock fragments
Substratum:
23 to 65 inches, gray and greenish gray silt loam with mottles and 5 percent rock fragments

The substratum layer is a firm and dense hardpan.

A typical Bucksport soil has the following characteristics:

Surface layer:
2 inches of sphagnum roots and litter
2 to 14 inches, black highly decomposed organic matter (muck)
Subsurface layers:
14 to 54 inches, very dark brown highly decomposed organic material (muck)
Bottom layer:
54 to 72 inches, dark reddish brown highly decomposed organic matter (muck)

A typical Rumney soil has the following characteristics:

Surface layer:
0 to 3 inches, dark brown fine sandy loam
Subsoil:
3 to 8 inches, dark brown loamy fine sand with mottles
8 to 20 inches, dark grayish brown loamy fine sand with mottles
Substratum:
20 to 65 inches, dark olive gray loamy sand with mottles

In many areas of northern Coos County, the soil surface layer and upper part of the subsoil have loam or silt loam textures, and gray is the dominant color in these layers.

Included with these soils are scattered areas of very poorly drained Searsport, Pondicherry, and Wonsqueak soils as well as poorly drained Naumburg soils on the edges of the map unit. Areas of water are also included. Inclusions make up 15 percent of the map unit.

Important properties of this Peacham soil include:

Permeability: Moderately slow or moderately rapid in the surface layers, moderate in the subsoil, and very slow or slow in the substratum
Available water capacity: High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface from October to June
Depth to bedrock: More than 60 inches
Average Depth to hardpan: 19 inches
Potential frost action: High

Important properties of these Bucksport soils are:

Permeability: Moderately slow to moderately rapid
Available water capacity: Very High
Depth to seasonal high water table: 12 inches above the surface to 12 inches below the surface through the year
Depth to bedrock: More than 60 inches
Potential frost action: High

Important properties of these Rumney soils are:

Permeability: Moderate or moderately rapid in the surface layer, subsoil, and substratum
Available water capacity: Moderate
Depth to seasonal high water table: 0 to 18 inches from November to May
Flooding: Likely to occur between October and May in greater than 50 percent of the years; average duration is 2 to 7 days
Depth to bedrock: More than 60 inches
Potential frost action: High

Use

Most of these areas are grassland swamps or areas with beaver dams and dead or dying white cedar, black spruce, balsam fir, tamarack, and red maple. These areas might commonly be referred to as fresh water marshes.

Agriculture

This map unit is poorly suited for pasture and not suited for cropland. Beavers often build dams that pond water in these areas. Capability subclass is 5w on Peacham soils, 7w on Bucksport soils, and 4w on Rumney soils.

Forestry

Ponding caused by beaver dams creates a major limitation for woodland management. These areas are not used for commercial forest operations in Coos County.

Peacham, Bucksport, and Rumney soils all rate as hydric soils. Permits may be required from local, state, or federal agencies prior to altering the land.

Community Development

Urban development has severe limitations due to wetness. Ponding caused by beaver dams also creates problems. Excess humus and low bearing strength are additional problems on the Bucksport soils and flooding is a concern on Rumney soils.

Peacham, Bucksport, and Rumney soils all rate as hydric soils and consequently have severe limitations for most phases of community development. Areas of these soils improve and maintain water quality by acting as natural filters to remove chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water which lessons flood damage downstream.

Recreation and Wildlife

The Peacham and Bucksport soils have severe limitations for developing camps, picnic areas, playgrounds, or paths and trails due to ponding and excess humus. Peacham soils also perc slowly which is a severe limitation for developing camps, picnic areas or playgrounds. Wetness and flooding are severe limitations for developing camp areas and playgrounds on Rumney soils. It might be possible to construct boardwalks for trails but the pilings may have to be very deep to reach mineral soil in some areas.

The Peacham and Rumney soils have fair suitability for wetland wildlife habitat development. Bucksport soil has good potential for wetland wildlife habitat. Peacham and Bucksport soils are poorly to very poorly suited for development of openland and woodland wildlife habitat. Rumney soils have fair suitability for the development of openland and woodland wildlife habitat.

These areas improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

995A -- Wonsqueak mucky peat, 0 to 2 percent slopes

This nearly level, very poorly drained soil is in depressions in upland areas and along the edges of lakes, ponds, and marshes. It has formed in greater than 16 but less than 51 inches of organic material. Vegetation on many areas consists of an overstory of black spruce, white cedar, tamarack, or alders with a ground cover of sphagnum moss. Sedges, grasses and other non-woody plants vegetate some areas.

A typical Wonsqueak soil has the following characteristics:

Surface layers:
0 to 4 inches, dark brown slightly decomposed organic material (peat)
4 to 14 inches, dark brown moderately decomposed organic material (mucky peat)
14 to 28 inches, very dark grayish brown moderately decomposed organic material (mucky peat)
Substratum layers:
28 to 36 inches, gray sandy loam with 1 percent rock fragments
36 to 65 inches, dark gray sandy loam with 6 percent rock fragments

Included within this soil are small areas of the very poorly drained Peacham or Searsport soils usually found around the edges of the map unit. Other inclusions found throughout some map units are small areas of open water; the poorly drained Rumney soils; and the very poorly drained Bucksport, Pondicherry, and Medomak soils. Generally inclusions make up less than 30 percent of this map unit, but for a few map units inclusions of other very poorly drained soils may be as great as 50 percent.

Important properties of this Wonsqueak soil are:

Permeability: Moderately rapid over moderate or moderately slow
Available water capacity: Very high
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface
Depth to bedrock: More than 60 inches
Potential frost action: High

Use

Many areas of this soil are wooded, but some are in grass.

Vegetation on many areas consists of an overstory of black spruce, white cedar, tamarack, or alders with a ground cover of sphagnum moss. Sedges, grasses and other non-woody plants vegetate some areas.

Areas of this soil improve and maintain water quality by acting as natural filters to remove chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water which lessons flood damage downstream.

Agriculture

This soil is unsuited for agriculture. Its capability subclass is 7w.

Forestry

This soil is not well suited for woodland. Management problems, such as the operation of equipment, seedling mortalities, and windthrow hazard are severe. Harvesting activities are limited to the winter season, when the ground is frozen. Common trees include tamarack, Northern white cedar, black spruce, and alders, with balsam fir, yellow birch, and black ash around the edges of the map unit.

Wonsqueak soil rates as a hydric soil. Hydric soil is one criteria used to designate wetlands. Permits may be required before altering a wetland.

Community Development

This soil is unsuited for building site development or sanitary facilities, because of wetness, ponding, its low bearing strength, high shrink-swell properties, and high potential frost action.

Wonsqueak soil rates as a hydric soil. Although it has severe limitations for most phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediment. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Recreation and Wildlife

Ponding and excess humus severely limits construction and maintenance of camp areas, picnic areas, playgrounds or paths and trails. It might be possible to construct boardwalks for trails but the pilings may have to be very deep to reach mineral soil in some areas.

Wonsqueak soil has good suitability for the development of wetland wildlife habitat. Shallow water areas and wetland plants are easy to establish and maintain. Wonsqueak soil is poorly suited for openland wildlife habitat development and very poorly suited for woodland wildlife habitat development.

549A--Peacham muck, 0 to 5 percent slopes, very stony

This nearly level, very poorly drained soil is in depressions on the uplands, and along the edges of streams, lakes, ponds, and marshes. It has formed in layers of muck up to 16 inches in thickness with a hardpan underneath. Surface stones are 5 to 80 feet apart.

A typical Peacham soil has the following characteristics:

Surface layers:
0 to 2 inches, dark reddish brown partially decayed organic material (mucky peat) with 15 percent rock fragments
2 to 11 inches, very dark brown highly decomposed organic material (muck) with 7 percent rock fragments
Subsoil:
11 to 16 inches, olive gray silt loam with mottles and 5 percent rock fragments
16 to 23 inches, olive gray silt loam with mottles and 5 percent rock fragments
Substratum:
23 to 65 inches, gray and greenish gray silt loam with mottles and 5 percent rock fragments

The hardpan is firm and dense.

Included with this Peacham soil are small scattered areas of very poorly drained Wonsqueak and Bucksport soils; and the poorly drained Cabot or Pillsbury soils often along the edges of the map unit. Also included are small scattered areas with surface stones less than 5 feet apart, and other areas having slopes greater than 5 percent. Wonsqueak soils make up 10 to 15 percent of the area in many map units. Total included soils make up about 25 percent of this map unit.

Important properties of this Peacham soil include:

Permeability: Moderately slow or moderately rapid in the surface layers, moderate in the subsoil, and very slow or slow in the substratum
Available water capacity: High
Depth to seasonal high water table: Ranges from 12 inches above the surface to 6 inches below the surface from October to June
Depth to bedrock: More than 60 inches
Average depth to hardpan: 19 inches
Potential frost action: High

Use

Almost all areas of this unit are wooded. A few areas are pastured.

Agriculture

This soil is poorly suited for pasture and not suited for cropland. The seasonal high water table and surface stones are the major limitations.

The agriculture capability subclass is 7w.

Forestry

This soil is poorly suited for use as woodland. Management limitations, such as equipment limitations, seedling mortalities, windthrow hazard, and plant competition are severe due to wetness and, in some areas, ponding of water. Harvesting activities limited to the winter season when the ground is frozen may reduce the equipment limitation. Planting water tolerant species may reduce seedling mortality. Small patch or selective cutting may reduce windthrow hazard. Plant competition can be reduced through careful site preparation.

Peacham soil rates as a hydric soil. Hydric soil is one criteria used in designating wetlands. Permits may be required before altering wetlands.

Common trees include black spruce, tamarack, Northern white cedar, red maple, and alder.

Community Development

The seasonal high water table with water ponding on the surface severely limits all phases of community development, rendering this soil unsuitable for most developments.

This soil meets the criteria for hydric soils. Although it has severe limitations for all phases of community development, areas of this soil improve and maintain water quality by acting as natural filters to remove harmful chemicals, nutrients, and sediments. They also recharge groundwater aquifers and store runoff water, which lessens flood damage.

Wildlife and Recreation

This soil has severe limitations for all recreation development to wetness and excessive humus. It might be possible to construct boardwalks for trails in some areas.

This soil has poor suitability for woodland or openland wildlife habitat development. Peacham soil is fairly suitable for the development of wetland wildlife habitat.

Cabot Series

The Cabot series consists of very deep, poorly drained soils on glaciated uplands. These soils formed in dense basal till weathered from phyllite or other fine grained rocks. Most of these soils occur in northern Coos County. These soils are classified as coarse-loamy, mixed, nonacid, frigid Typic Humaquepts.

Cabot soils occur on the landscape near moderately well drained Howland soils and very poorly drained Peacham soils. Cabot soils are also near Wonsqueak soils. Wonsqueak soils are organic.

Typical pedon of Cabot soils from an area of Cabot silt loam, 8 percent to 15 percent slopes, in the town of Stewartstown, 3,000 feet west of the junction of Old County Road and Creampoke Road and 250 feet north of Creampoke Road, area is in pasture; latitude 44 degrees 58 minutes 36 seconds North and longitude 71 degrees 24 minutes and 24 seconds West:

Ap — 0 to 9 inches; very dark gray (10YR 3/1) gravelly silt loam; weak fine granular structure; very friable; many very fine and few fine roots; 19 percent rock fragments (10 percent gravel, 7 percent cobbles, and 2 percent stones); slightly acid; abrupt smooth boundary.

Bw — 9 to 14 inches; olive (5Y 4/3) gravelly loam; redoximorphic features; weak medium and coarse granular structure; friable; few very fine roots; common medium distinct olive gray (5Y 5/2) and dark grayish brown (2.5Y 4/2) iron depletions; 18 percent rock fragments (15 percent gravel and 3 percent cobbles); slightly acid; abrupt wavy boundary.

Cdg1 — 14 to 20 inches; olive gray (5Y 4/2) gravelly silt loam; strong medium platy structure; firm, brittle; common medium faint dark gray (5Y 4/1) iron depletions and few fine distinct light olive brown (2.5Y 5/4) masses of iron accumulations; 15 percent rock fragments (gravel); neutral; clear wavy boundary.

Cdg2 — 20 to 32 inches; olive gray (5Y 4/2) gravelly silt loam; weak medium and coarse platy structure; firm, brittle; common medium distinct dark gray (5Y 4/1) masses of iron depletions, few medium faint olive (5Y 4/3) and few fine distinct light olive brown (2.5Y 5/4) masses of iron accumulations; 16 percent rock fragments (15 percent gravel and 1 percent cobbles); neutral; abrupt wavy boundary.

Cdg3 — 32 to 65 inches; olive gray (5Y 4/2) gravelly silt loam; massive; firm; common medium distinct gray (5Y 5/1) iron depletions, common fine distinct olive brown (2.5Y 4/4) and olive (5Y 4/4) masses of iron accumulations: 16 percent rock fragments (15 percent gravel and 1 percent cobbles); slightly acid.

Solum thickness and depth to the dense basal till range from 14 to 22 inches. Rock fragments range from 5 percent to 35 percent in the solum and from 5 percent to 50 percent in the substratum. Reaction ranges from strongly acid to neutral above the dense basal till, and is moderately acid to neutral in the dense basal till.

The O horizons, when present, have hues of 5YR through 2.5Y, values of 2 through 4, and chromas of 0 through 2 (moist soil color). Thickness ranges from 1 to 6 inches.

The A and Ap horizons have hues of 10YR or 2.5Y, values of 2 through 4, and chromas of 1 through 3. Texture in the fine earth fraction is silt loam or loam.

The Bhs and Bs horizons have hues of 5YR through 2.5Y, values of 3 or 4, and chromas of 2 through 4. Texture in the fine earth fraction is silt loam. Structure is fine, medium, or coarse granular.

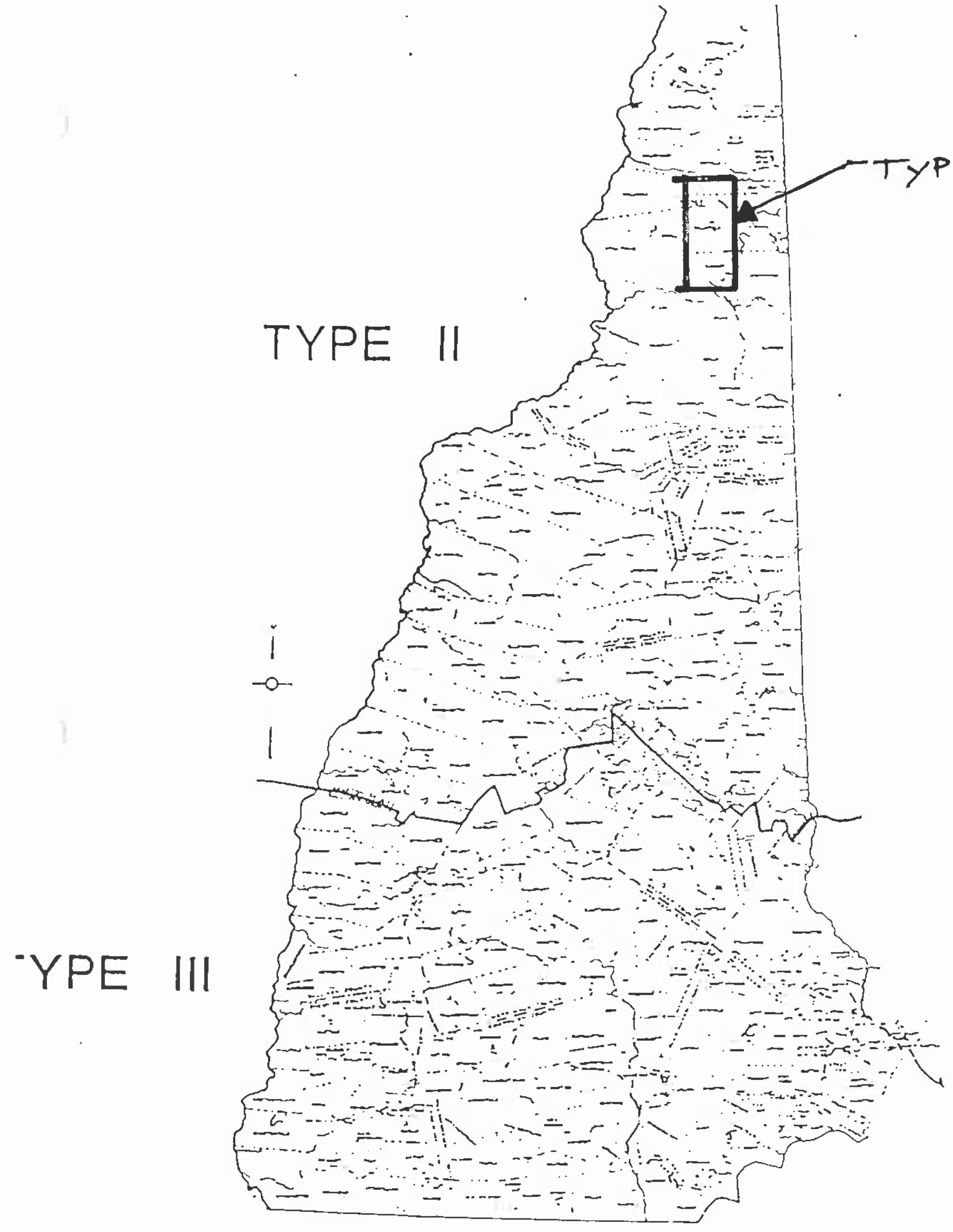
The Bw horizons have hue of 2.5Y, values of 4 or 5, and chromas of 2 through 6. Texture in the fine earth fraction is silt loam or loam. Structure is weak fine, medium, or coarse granular or weak thin platy.

The Bg horizons have hues of 10YR or 2.5Y, values of 4 or 5, and chromas of 2 or 3. Texture in the fine earth fraction is silt loam. Structure is weak fine, medium, or coarse granular or weak medium subangular blocky.

The Cd horizons have hues of 10YR through 5Y, values of 3 through 6, and chromas of 1 through 4. Texture in the fine earth fraction is silt loam or very fine sandy loam. The Cd horizons have weak or moderate thin, medium, or thick platy structure or are massive.

The Cdg horizons have hue of 5Y, values of 3 or 4, and chroma of 2.

Rainfall Distribution Maps



BOUNDARIES FOR SCS RAINFALL DISTRIBUTIONS

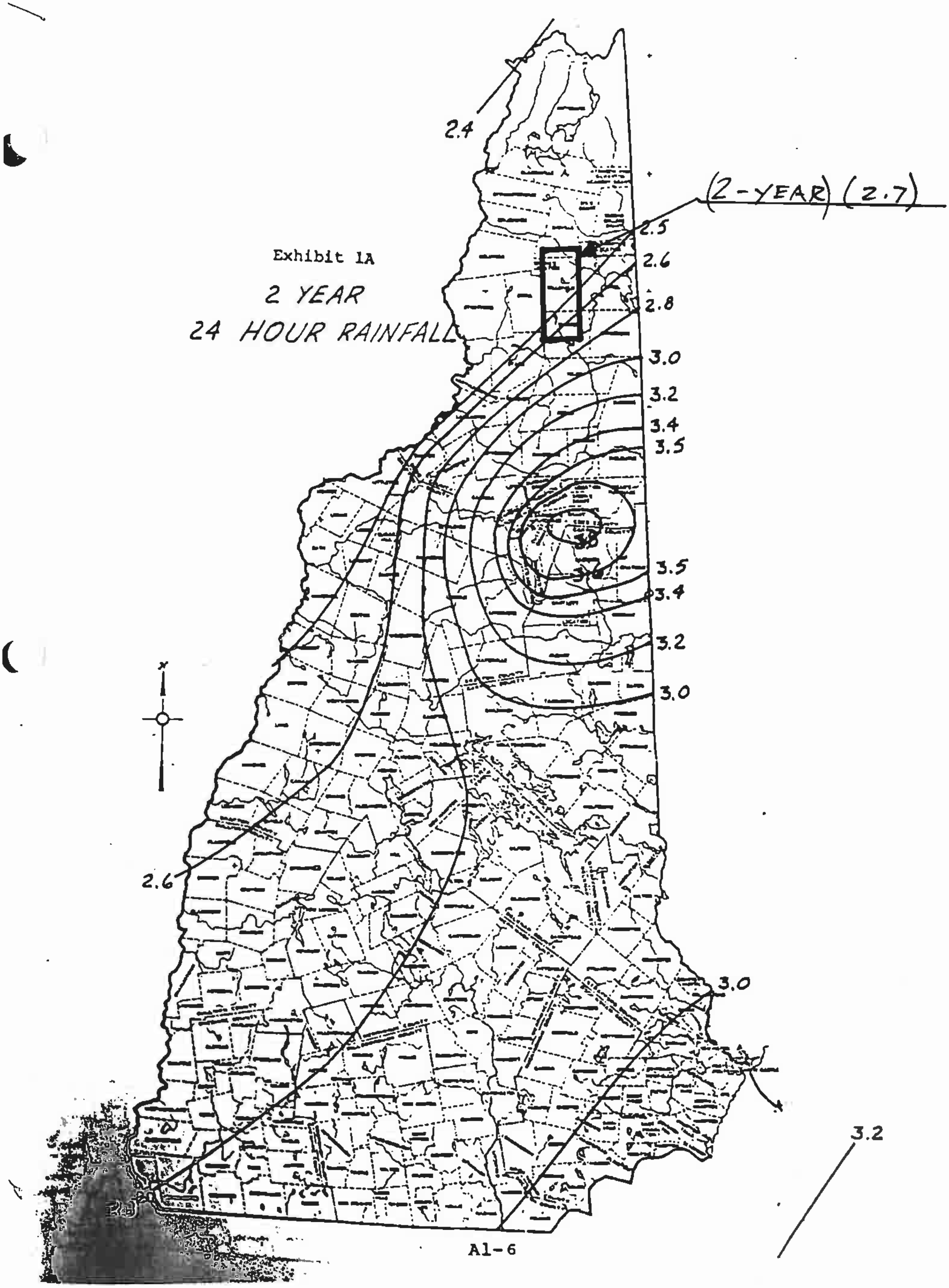


Exhibit 1A
2 YEAR
24 HOUR RAINFALL
(2-YEAR) (2.7)
2.4
2.5
2.6
2.8
3.0
3.2
3.4
3.5
3.8
3.6
3.5
3.4
3.2
3.0
2.6
3.0
3.2

Exhibit 1C

10 YEAR
24 HOUR RAINFALL