

DOMINION TRANSMISSION, INC.

SUPPLY HEADER PROJECT

**SECTION 5 – POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN/SITE
RESTORATION (PCSM/SR) PLAN**

APPENDIXA - PCSM/SR PLAN DRAWINGS

- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W.
- CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 10-13-2014 TO 04-07-2015.
- AERIAL IMAGERY IS TAKEN FROM A SPRING 2015 FLIGHT BY KUCERA INTERNATIONAL INC..
- THE PROPERTY LINES SHOWN ARE BASED ON GIS & TAX ASSESSMENT RECORDS (PROVIDED BY OTHERS). GAI CONSULTANTS MAKE NO GUARANTEE EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE RECORDS AS SHOWN ON THESE DRAWINGS.
- STREAM AND WETLAND DATA SHOWN ON THE DRAWINGS WAS PROVIDED BY ERM.
- ALL STATIONING SHOWN IS SLOPE STATIONING.
- ERM AND J. LAWRENCE HOOSIER, PA P.E. NO. 25926-E (HEREAFTER COLLECTIVELY REFERRED TO AS ERM) HAVE DEPICTED POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) BEST MANAGEMENT PRACTICES (BMPs) ON THESE ALIGNMENT PLAN SHEETS PREPARED BY GAI CONSULTANTS, INC. FOR USE BY CONTRACTOR TO CONTROL POST-CONSTRUCTION STORMWATER FOR THIS PROJECT. ERM IS SOLELY RESPONSIBLE FOR THE NATURE AND LOCATION OF THE DEPICTED BMPs AS OF THE DATE SIGNED AND SEALED BASED ON THE SOURCE DATA PROVIDED AND AS DESCRIBED IN THE GENERAL NOTES SECTION OF THIS PLAN SET. NO RESPONSIBILITY IS ASSUMED FOR INACCURACIES OF SOURCE DATA PROVIDED BY OTHERS. ERM RETAINS NO RESPONSIBILITY OF LIABILITY FOR INFORMATION DEVELOPED, PREPARED OR OTHERWISE PROVIDED BY OTHER, OR FOR INACCURACIES OF SOURCE DATA PROVIDED BY OTHER. ERM ASSUMES NO RESPONSIBILITY OR LIABILITY FOR DESIGNS OR WORK PRODUCTS OF ANY TYPE TO THE EXTENT THAT THEY ARE BASED UPON OR DERIVED FROM SUCH INCORRECT INFORMATION OR DATA.



Dominion

DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD. BRIDGEPORT, WV 26330

LEGEND

- PROPERTY LINE
- FENCE
- STREAM
- EXISTING GAS PIPELINE
- OVERHEAD ELECTRIC LINES
- OVERHEAD TELEPHONE LINES
- PROPOSED GAS PIPELINE
- STORM SEWER
- WATER LINE
- SANITARY SEWER
- EDGE OF GRAVEL
- PROPOSED PERMANENT EASEMENT
- PROPOSED ACCESS ROAD
- UTILITY POLE
- METAL BALLARD
- EXTRA WORK SPACE
- WETLAND
- PROPOSED TEMPORARY R.O.W.
- TOPSOIL SEGREGATION AREA
- DO NOT DISTURB AREA

SUPPLY HEADER, (PENNSYLVANIA) DRAWING INDEX

SHEET NO.	REV.	SHEET TITLE
1		COVER SHEET
2		PCSM ALIGNMENT SHEET (STA. 0+00 TO 56+00)
3		PCSM ALIGNMENT SHEET (STA. 56+00 TO 112+00)
4		PCSM ALIGNMENT SHEET (STA. 112+00 TO 166+00)
5		PCSM ALIGNMENT SHEET (STA. 166+00 TO 203+55)
6		PCSM ACCESS ROAD DETAIL
7		PCSM ACCESS ROAD DETAIL
8		PCSM ACCESS ROAD DETAIL

CALL BEFORE YOU DIG!

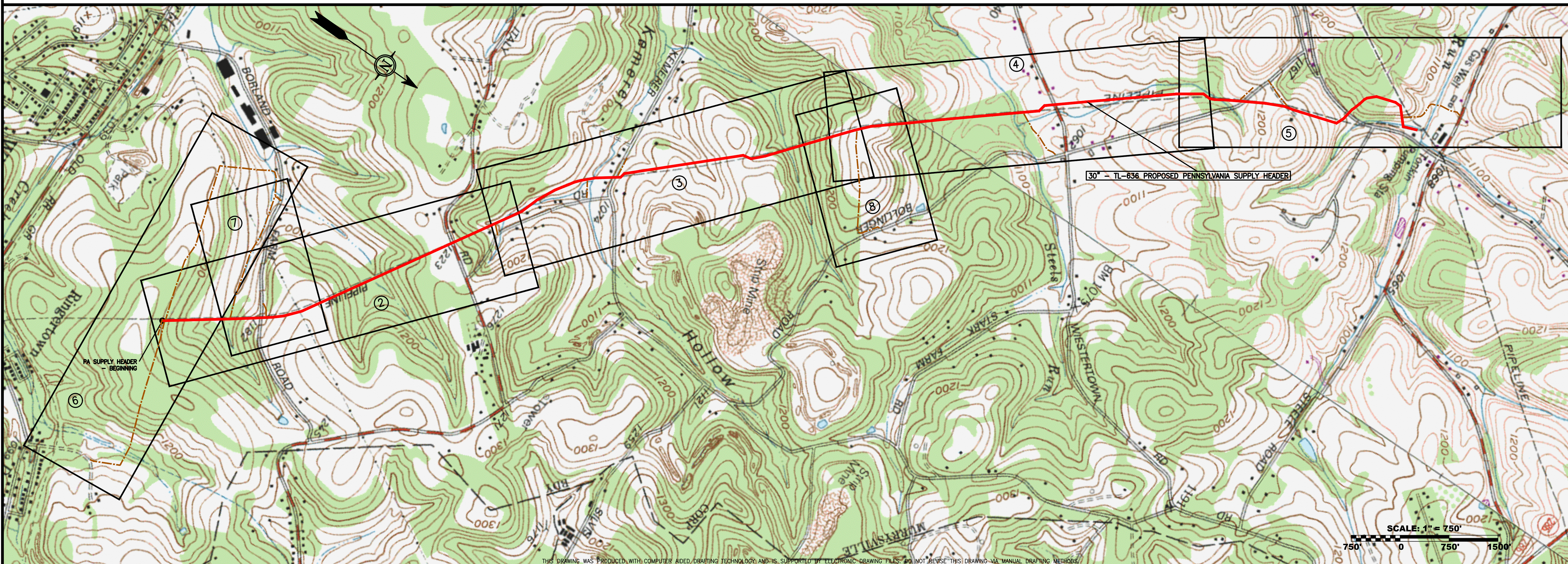
PENNSYLVANIA LAW REQUIRES 3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System, Inc.



1-800-242-1776

PENNSYLVANIA ACT 287 OF 1974, AS AMENDED BY PA ACT 181 OF 2006, REQUIRES NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE COMMONWEALTH, CALL PENNSYLVANIA ONE CALL SYSTEM, INC. AT 1-800-242-1776 BEFORE ANY DISTURBANCE.

PA SUPPLY HEADER PROJECT 30" TL-636 PIPELINE POST-CONSTRUCTION STORMWATER MANAGEMENT PLANS



NO.	DATE	BY	CHKD.	APPVD.	DESCRIPTION
1	06/09/17	CAF	DWH	NET	REVISED PER COMMENTS

PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
POST-CONSTRUCTION STORMWATER MANAGEMENT PLANS - COVER SHEET
MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA
DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

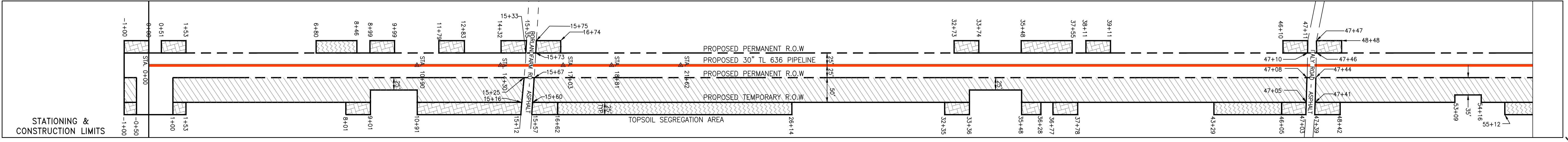
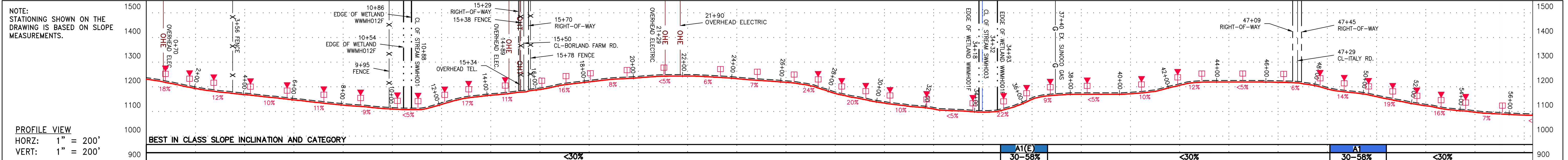
SCALE:	AS SHOWN
DATE:	06/09/17
DRAWN:	FORTNCJ
CHECKED:	HOOSIDL
APPROVED:	TYSONNE

gai consultants
SOUTHPOINTE OFFICE
8600 TOWN CENTER BLVD
SUITE 300 EAST
CANONSBURG, PA 15317
724-873-3545

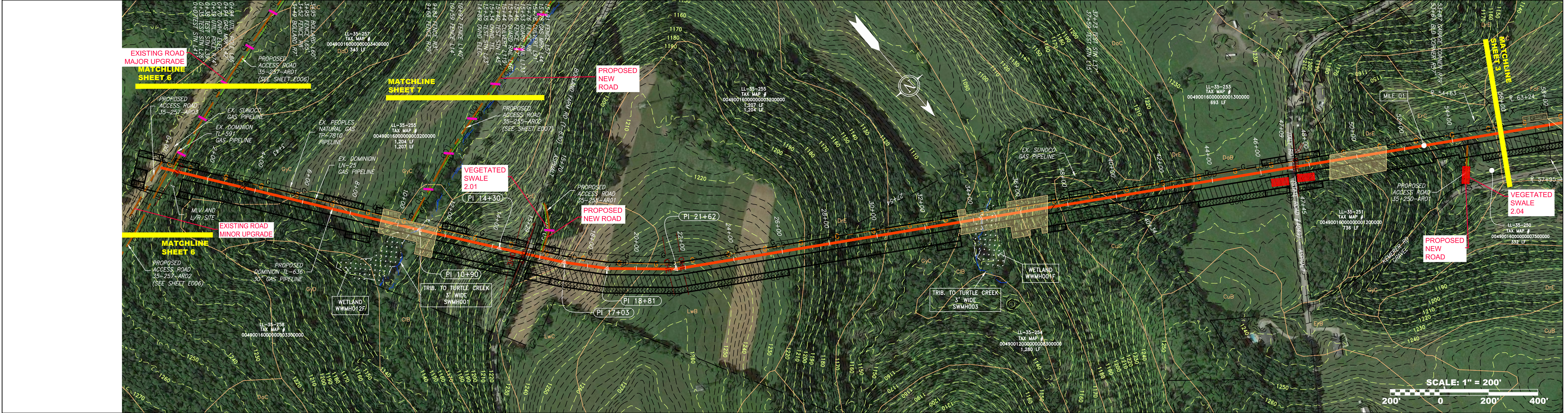
PROJECT NO./DASH NO.	C141330-01
TASK NO. SUB TASK NO.	005 00
GROUP ID DRAWING NO.	D E001
SHEET	1 OF 8

GAI CAD FILE NO. Z:\ENERGY\2014\C141330.01 - DTI - SUPPLY HEADER - SUR\CAD\SUR\C141330.01\CONSTRUCTION_ALIGNMENT - PA.DWG - PREVIOUS FERC FILING DWGS - ALIGNMENT SHEETS\C141330-01-000-00-E-002-EC08_PCSM.DWG

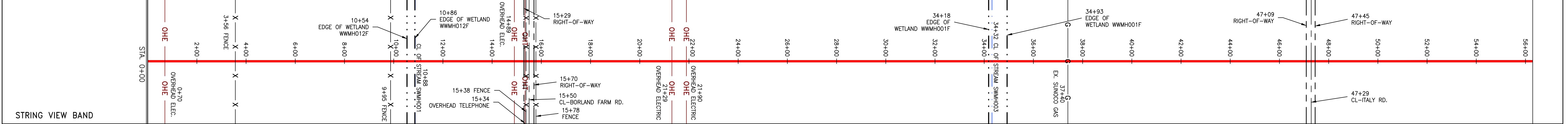
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PROPERTY OWNERSHIP	PROPERTY OWNERSHIP	PROPERTY OWNERSHIP	PROPERTY OWNERSHIP	PROPERTY OWNERSHIP	PROPERTY OWNERSHIP
LL-35-257 TAX MAP # 004900160000000340000 343 LF	LL-35-255 TAX MAP # 004900160000000320000 1,204 LF	LL-35-254 TAX MAP # 004900160000000320000 1,207 LF	LL-35-254 TAX MAP # 00490012000000000830000 1,280 LF	LL-35-253 TAX MAP # 00490012000000000130000 693 LF	LL-35-251 TAX MAP # 004900160000000120000 736 LF



PIPE SPECIFICATION



LEGEND

	PROPERTY LINE		PROPOSED GAS PIPELINE		EXTRA WORK SPACE		METAL BALLARD		PERMANENT WATERBAR/SLOPE BREAKER		LIMIT OF DISTURBANCE
	FENCE		PROPOSED ACCESS ROAD		WETLAND		UTILITY POLE		CONSTRUCTION ENTRANCE WITH WASH RACK		WATERSHED BOUNDARY
	STREAM		STORM SEWER		DO NOT DISTURB AREA		PROPOSED TEMPORARY R.O.W.		TYPICAL BIC SLOPE CATEGORY		ACCESS ROAD WATERBAR
	EXISTING DOMINION GAS PIPELINE		WATER LINE		TOPSOIL SEGREGATION AREA		EROSION CONTROL MATTING				
	EXISTING GAS PIPELINE (OTHER)		SANITARY SEWER								
	OVERHEAD ELECTRIC LINES		EDGE OF GRAVEL								
	OVERHEAD TELEPHONE LINES		PROPOSED PERMANENT EASEMENT								

NOTES

- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W, THRU 11-07-2014.
- CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 11-03-2014.
- IMAGERY TAKEN FROM GOOGLE EARTH.
- THE PROPERTY LINES SHOWN ARE BASED ON GIS & TAX ASSESSMENT RECORDS (PROVIDED BY OTHERS). GAI CONSULTANTS MAKE NO GUARANTEE EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE RECORDS AS SHOWN ON THESE DRAWINGS.
- STREAM AND WETLAND DATA SHOWN ON THE DRAWINGS WAS PROVIDED BY ERM.
- EROSION AND SEDIMENTATION CONTROL ELEMENTS MAY BE SHOWN OUTSIDE OF THE WORK AREAS FOR CLARITY ONLY. ACTUAL INSTALLATION SHALL BE WITHIN THE WORK AREAS.
- ALL STATIONING SHOWN IS SLOPE STATIONING.
- COMPOST FILTER SOCK SHALL BE INSTALLED PARALLEL TO CONTOUR TO EXTENT PRACTICABLE IN ACCORDANCE WITH STANDARD DETAIL. SEDIMENT BARRIER LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS WITH APPROVAL FROM THE PROJECT ENVIRONMENTAL INSPECTOR.
- BEST IN CLASS (BIC) STEEP SLOPE CATEGORY INFORMATION CAN BE FOUND IN THE EROSION AND SEDIMENT CONTROL PLAN.
- EROSION CONTROL MATTING SHALL BE PLACED IN AREAS OF 30% SLOPE AND GREATER, WHICH ARE INDICATED ON THE BEST IN CLASS STEEP SLOPES BAND.
- ACCESS ROADS HAVE BEEN GROUPED INTO FOUR CATEGORIES: 1) EXISTING ROADS NO IMPROVEMENTS, 2) EXISTING ROADS MINOR IMPROVEMENTS, 3) EXISTING ROADS MAJOR IMPROVEMENTS AND 4) NEW ROADS. APPROPRIATE EROSION AND SEDIMENTATION CONTROLS WILL BE PROVIDED FOR ROADS IN CATEGORIES 2, 3 AND 4. ROADS IN CATEGORIES 1 AND 2 HAVE ADEQUATE EXISTING DRAINAGE; DRAINAGE FEATURES WILL BE PROVIDED FOR ROADS IN CATEGORIES 3 AND 4.
- ERM IS SOLELY RESPONSIBLE FOR THE NATURE AND LOCATION OF THE DEPICED SHIPS OF THE DATE SIGNED AND SEALED BASED ON THE SOURCE DATA PROVIDED AND AS DESCRIBED IN THE NOTES SECTION OF THE INDEX SHEET OF THIS PLAN SET.
- THE CONSTRUCTION RIGHT-OF-WAY (ROW) WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH SECTION V.A.5 FEDERAL ENERGY REGULATORY COMMISSION (FERC) UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN, SECTION V.A.5. IN ADDITION, WETLAND AND WATERBODY CROSSINGS WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH NATIONWIDE PERMIT 12 (NWP) ISSUED BY THE U.S. CORPS OF ENGINEERS.

NOTE: THE PE SEAL AND SIGNATURE APPLIES ONLY TO THE E&S CONTROL DESIGN COMPLETED BY ERM (SEE NOTE 12).

REVISIONS

NO.	DATE	BY	CHKD.	APPD.	DESCRIPTION
1	04/08/16	CJF	NET		REVISED FERC FILING

PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE POST-CONSTRUCTION STORMWATER MANAGEMENT STA. 0+00 TO 56+00

DOMINION TRANSMISSION, INC.
 925 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330

SCALE: AS SHOWN
DATE: 06/09/17
DRAWN: FORTNCJ
CHECKED: HOOSIDL
APPROVED: TYSSONNE

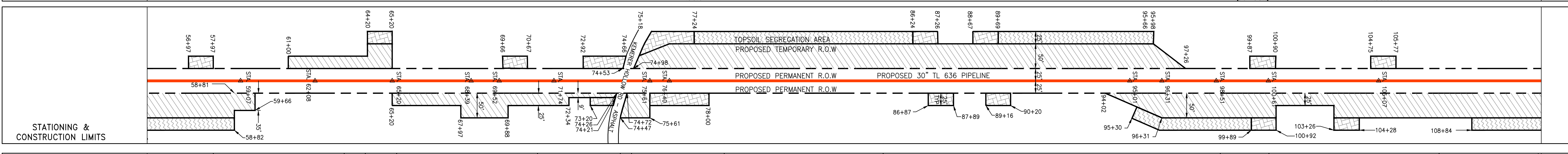
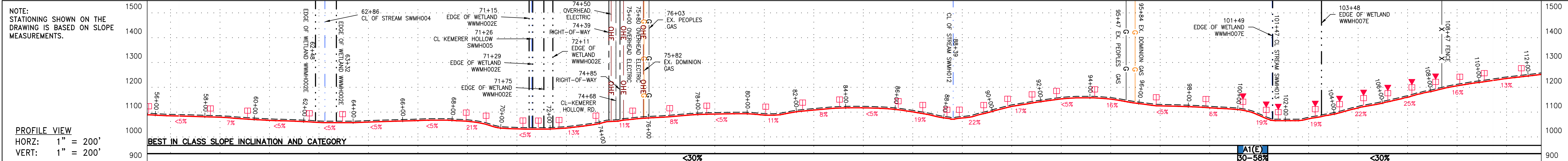
PROJECT NO./DASH NO. C141330-01
TASK NO. SUB TASK NO. 005 00
GROUP ID DRAWING NO. D E002
SHEET 2 OF 8

gai consultants
 SOUTHPOINTE OFFICE
 6000 TOWN CENTER BLVD
 SUITE 300 EAST
 CANONSBURG, PA 15317
 724-873-3545

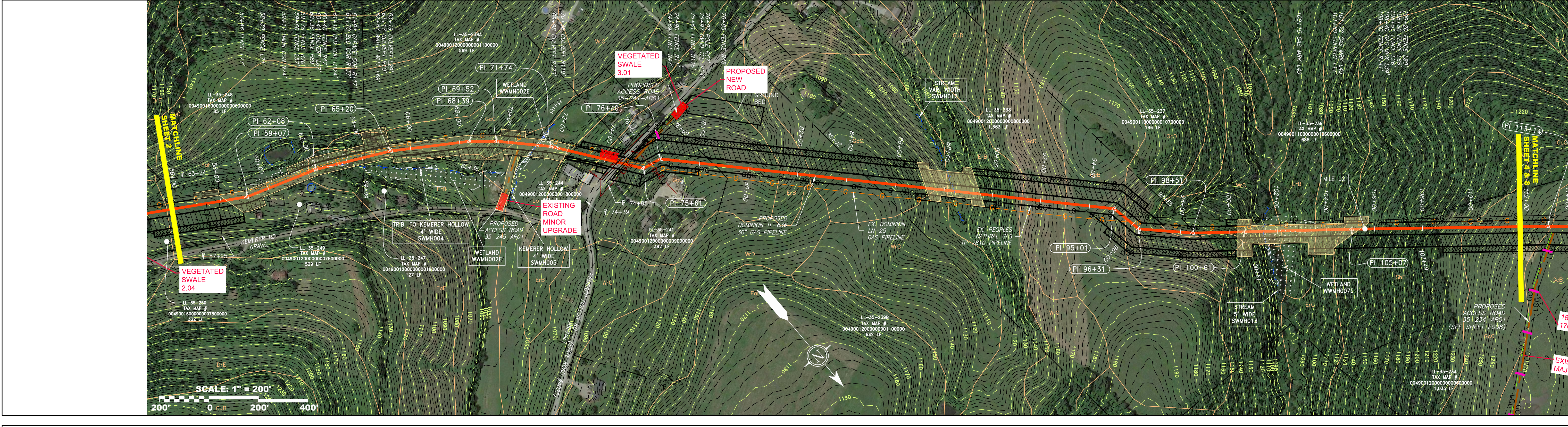
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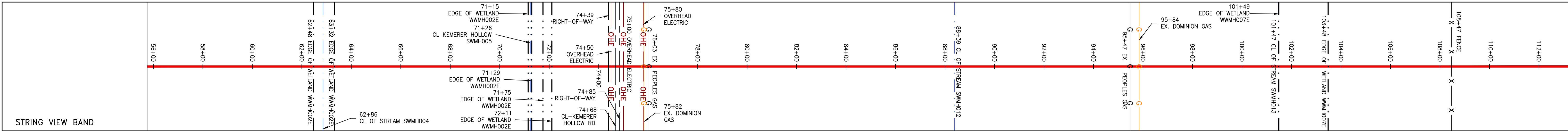
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PROPERTY OWNERSHIP table listing tax map numbers, acreage, and owner information for various parcels along the project alignment.



PIPE SPECIFICATION table detailing the technical specifications for the proposed 30-inch TL-636 pipeline.



LEGEND and NOTES section. The legend defines symbols for property lines, fences, streams, gas pipelines, overhead lines, wetlands, and various construction features. The notes provide technical details and regulatory references for the project.

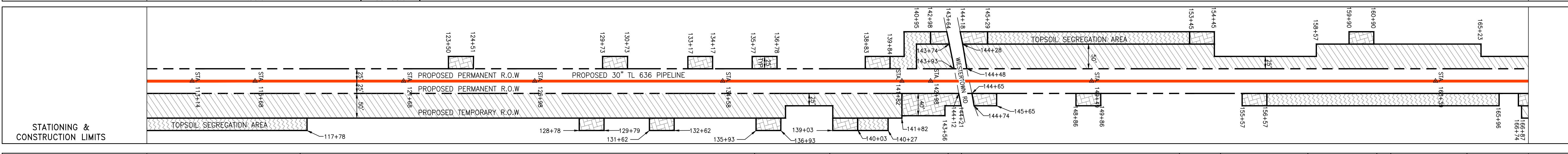
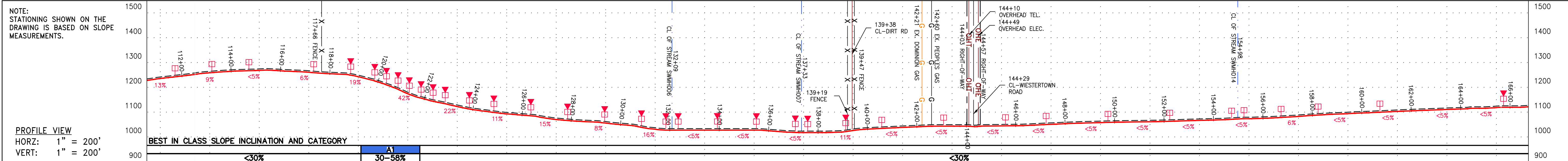
REVISIONS table and professional engineer seal for J. Lawrence Horkner, dated 07.31.2017.

PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
POST-CONSTRUCTION STORMWATER MANAGEMENT STA. 56+00 TO 112+00
DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

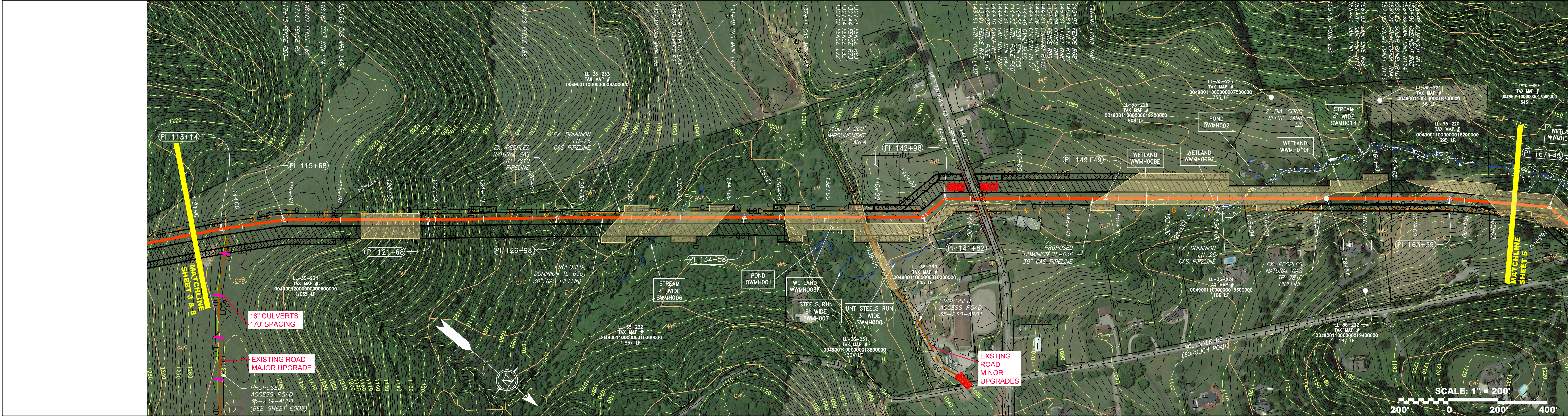
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Date: 06/09/17
Drawn: FORTNCJ
Checked: HOOSIDL
Approved: TYSONNE
PROJECT NO./DASH NO. C141330-01
TASK NO. SUB TASK NO. 005 00
GROUP ID DRAWING NO. D E003
SHEET 3 OF 8

GAI CAD FILE NO. Z:\ENERGY\2014\C141330-01\CONSTRUCTION_ALIGNMENT - PA.DWG - PREVIOUS FERC FILING DWGS - ALIGNMENT SHEETS\C141330-01-000-00-E-002-0008_PCSM.DWG

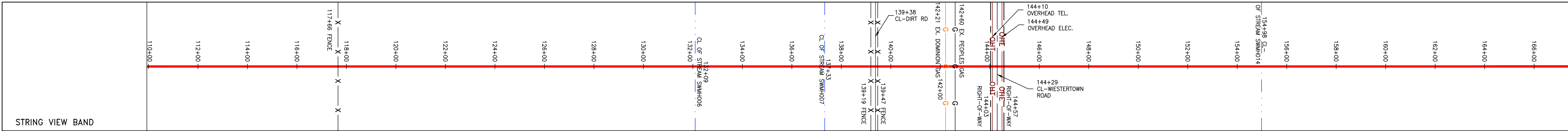
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Stationing	Property Ownership	Area (LF)
107+48	LL-35-234 TAX MAP # 0049001200000010300000 1,035 LF	1,035 LF
112+84	LL-35-232 TAX MAP # 0049001100000010300000 1,837 LF	1,837 LF
115+21	LL-35-231 TAX MAP # 0049001100000018800000 304 LF	304 LF
115+21	LL-35-230 TAX MAP # 0049001100000018200000 505 LF	505 LF
115+21	LL-35-225 TAX MAP # 0049001100000019200000 908 LF	908 LF
115+21	LL-35-224 TAX MAP # 0049001100000018300000 166 LF	166 LF
115+21	LL-35-222 TAX MAP # 0049001100000018400000 192 LF	192 LF
115+21	LL-35-220 TAX MAP # 0049001100000018200000 395 LF	395 LF
115+21	LL-35-221 TAX MAP # 0049001100000018700000 56 LF	56 LF



PIPE SPECIFICATION
30" TL 636 PIPELINE



<p>LEGEND</p> <p>— X — X — X — FENCE</p> <p>— G — G — G — EXISTING DOMINION GAS PIPELINE</p> <p>— G — G — G — EXISTING GAS PIPELINE (OTHER)</p> <p>— OHE — OHE — OHE — OVERHEAD ELECTRIC LINES</p> <p>— OHT — OHT — OHT — OVERHEAD TELEPHONE LINES</p> <p>— — — — PROPOSED GAS PIPELINE</p> <p>— — — — PROPOSED ACCESS ROAD</p> <p>— — — — STORM SEWER</p> <p>— — — — WATER LINE</p> <p>— — — — SANITARY SEWER</p> <p>— — — — EDGE OF GRAVEL</p> <p>— — — — PROPOSED PERMANENT EASEMENT</p>	<p>EXTRA WORK SPACE</p> <p>WETLAND</p> <p>DO NOT DISTURB AREA</p> <p>PROPOSED TEMPORARY R.O.W.</p> <p>TOPSOIL SEGREGATION AREA</p>	<p>PERMANENT WATERBAR/SLOPE BREAKER</p> <p>TRENCH BREAKER/PLUG</p> <p>CONSTRUCTION ENTRANCE WITH WASH RACK</p> <p>STEEPS RUN 3' WIDE SWMH008</p> <p>JUNT STEELS RUN 3' WIDE SWMH008</p> <p>STEELS RUN 6' WIDE SWMH007</p> <p>WETLAND WWMH003F</p> <p>WETLAND WWMH009F</p> <p>WETLAND WWMH010F</p> <p>WETLAND WWMH011F</p> <p>WETLAND WWMH012F</p> <p>WETLAND WWMH013F</p> <p>WETLAND WWMH014F</p> <p>WETLAND WWMH015F</p> <p>WETLAND WWMH016F</p> <p>WETLAND WWMH017F</p> <p>WETLAND WWMH018F</p> <p>WETLAND WWMH019F</p> <p>WETLAND WWMH020F</p> <p>WETLAND WWMH021F</p> <p>WETLAND WWMH022F</p> <p>WETLAND WWMH023F</p> <p>WETLAND WWMH024F</p> <p>WETLAND WWMH025F</p> <p>WETLAND WWMH026F</p> <p>WETLAND WWMH027F</p> <p>WETLAND WWMH028F</p> <p>WETLAND WWMH029F</p> <p>WETLAND WWMH030F</p> <p>WETLAND WWMH031F</p> <p>WETLAND WWMH032F</p> <p>WETLAND WWMH033F</p> <p>WETLAND WWMH034F</p> <p>WETLAND WWMH035F</p> <p>WETLAND WWMH036F</p> <p>WETLAND WWMH037F</p> <p>WETLAND WWMH038F</p> <p>WETLAND WWMH039F</p> <p>WETLAND WWMH040F</p> <p>WETLAND WWMH041F</p> <p>WETLAND WWMH042F</p> <p>WETLAND WWMH043F</p> <p>WETLAND WWMH044F</p> <p>WETLAND WWMH045F</p> <p>WETLAND WWMH046F</p> <p>WETLAND WWMH047F</p> <p>WETLAND WWMH048F</p> <p>WETLAND WWMH049F</p> <p>WETLAND WWMH050F</p> <p>WETLAND WWMH051F</p> <p>WETLAND WWMH052F</p> <p>WETLAND WWMH053F</p> <p>WETLAND WWMH054F</p> <p>WETLAND WWMH055F</p> <p>WETLAND WWMH056F</p> <p>WETLAND WWMH057F</p> <p>WETLAND WWMH058F</p> <p>WETLAND WWMH059F</p> <p>WETLAND WWMH060F</p> <p>WETLAND WWMH061F</p> <p>WETLAND WWMH062F</p> <p>WETLAND WWMH063F</p> <p>WETLAND WWMH064F</p> <p>WETLAND WWMH065F</p> <p>WETLAND WWMH066F</p> <p>WETLAND WWMH067F</p> <p>WETLAND WWMH068F</p> <p>WETLAND WWMH069F</p> <p>WETLAND WWMH070F</p> <p>WETLAND WWMH071F</p> <p>WETLAND WWMH072F</p> <p>WETLAND WWMH073F</p> <p>WETLAND WWMH074F</p> <p>WETLAND WWMH075F</p> <p>WETLAND WWMH076F</p> <p>WETLAND WWMH077F</p> <p>WETLAND WWMH078F</p> <p>WETLAND WWMH079F</p> <p>WETLAND WWMH080F</p> <p>WETLAND WWMH081F</p> <p>WETLAND WWMH082F</p> <p>WETLAND WWMH083F</p> <p>WETLAND WWMH084F</p> <p>WETLAND WWMH085F</p> <p>WETLAND WWMH086F</p> <p>WETLAND WWMH087F</p> <p>WETLAND WWMH088F</p> <p>WETLAND WWMH089F</p> <p>WETLAND WWMH090F</p> <p>WETLAND WWMH091F</p> <p>WETLAND WWMH092F</p> <p>WETLAND WWMH093F</p> <p>WETLAND WWMH094F</p> <p>WETLAND WWMH095F</p> <p>WETLAND WWMH096F</p> <p>WETLAND WWMH097F</p> <p>WETLAND WWMH098F</p> <p>WETLAND WWMH099F</p> <p>WETLAND WWMH100F</p> <p>WETLAND WWMH101F</p> <p>WETLAND WWMH102F</p> <p>WETLAND WWMH103F</p> <p>WETLAND WWMH104F</p> <p>WETLAND WWMH105F</p> <p>WETLAND WWMH106F</p> <p>WETLAND WWMH107F</p> <p>WETLAND WWMH108F</p> <p>WETLAND WWMH109F</p> <p>WETLAND WWMH110F</p> <p>WETLAND WWMH111F</p> <p>WETLAND WWMH112F</p> <p>WETLAND WWMH113F</p> <p>WETLAND WWMH114F</p> <p>WETLAND WWMH115F</p> <p>WETLAND WWMH116F</p> <p>WETLAND WWMH117F</p> <p>WETLAND WWMH118F</p> <p>WETLAND WWMH119F</p> <p>WETLAND WWMH120F</p> <p>WETLAND WWMH121F</p> <p>WETLAND WWMH122F</p> <p>WETLAND WWMH123F</p> <p>WETLAND WWMH124F</p> <p>WETLAND WWMH125F</p> <p>WETLAND WWMH126F</p> <p>WETLAND WWMH127F</p> <p>WETLAND WWMH128F</p> <p>WETLAND WWMH129F</p> <p>WETLAND WWMH130F</p> <p>WETLAND WWMH131F</p> <p>WETLAND WWMH132F</p> <p>WETLAND WWMH133F</p> <p>WETLAND WWMH134F</p> <p>WETLAND WWMH135F</p> <p>WETLAND WWMH136F</p> <p>WETLAND WWMH137F</p> <p>WETLAND WWMH138F</p> <p>WETLAND WWMH139F</p> <p>WETLAND WWMH140F</p> <p>WETLAND WWMH141F</p> <p>WETLAND WWMH142F</p> <p>WETLAND WWMH143F</p> <p>WETLAND WWMH144F</p> <p>WETLAND WWMH145F</p> <p>WETLAND WWMH146F</p> <p>WETLAND WWMH147F</p> <p>WETLAND WWMH148F</p> <p>WETLAND WWMH149F</p> <p>WETLAND WWMH150F</p> <p>WETLAND WWMH151F</p> <p>WETLAND WWMH152F</p> <p>WETLAND WWMH153F</p> <p>WETLAND WWMH154F</p> <p>WETLAND WWMH155F</p> <p>WETLAND WWMH156F</p> <p>WETLAND WWMH157F</p> <p>WETLAND WWMH158F</p> <p>WETLAND WWMH159F</p> <p>WETLAND WWMH160F</p> <p>WETLAND WWMH161F</p> <p>WETLAND WWMH162F</p> <p>WETLAND WWMH163F</p> <p>WETLAND WWMH164F</p> <p>WETLAND WWMH165F</p> <p>WETLAND WWMH166F</p> <p>WETLAND WWMH167F</p> <p>WETLAND WWMH168F</p> <p>WETLAND WWMH169F</p> <p>WETLAND WWMH170F</p>	<p>LIMIT OF DISTURBANCE</p> <p>ROADSIDE DITCH</p> <p>VEGETATED SWALE</p> <p>WATERSHED BOUNDARY</p> <p>CULVERT</p> <p>ACCESS ROAD WATERBAR</p> <p>SOIL TYPE</p> <p>EROSION CONTROL MATTING</p>	<p>NOTES</p> <p>1. COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W. CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 11-03-2014 THRU 11-07-2014.</p> <p>2. IMAGERY TAKEN FROM GOOGLE EARTH.</p> <p>3. THE PROPERTY LINES SHOWN ARE BASED ON GIS & TAX ASSESSMENT RECORDS (PROVIDED BY OTHERS). GAI CONSULTANTS MAKE NO GUARANTEE EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE RECORDS AS SHOWN ON THESE DRAWINGS.</p> <p>4. STREAM AND WETLAND DATA SHOWN ON THIS DRAWING WAS PROVIDED BY ERM.</p> <p>5. EROSION AND SEDIMENTATION CONTROL ELEMENTS MAY BE SHOWN OUTSIDE OF THE WORK AREAS FOR CLARITY ONLY. ACTUAL INSTALLATION SHALL BE WITHIN THE WORK AREAS.</p> <p>6. ALL STATIONING SHOWN IS SLOPE STATIONING.</p> <p>7. CONDUIT FILTER SOCK SHALL BE INSTALLED PARALLEL TO CONTOUR TO EXTENT PRACTICABLE IN ACCORDANCE WITH STANDARD DETAIL. SEDIMENT BARRIER LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS WITH APPROVAL FROM THE PROJECT ENVIRONMENTAL INSPECTOR.</p> <p>8. BEST IN CLASS (BIG) STEEP SLOPES CATEGORY INFORMATION CAN BE FOUND IN THE EROSION AND SEDIMENT CONTROL PLAN.</p> <p>9. EROSION CONTROL MATTING SHALL BE PLACED IN AREAS OF 30% SLOPE AND GREATER, WHICH ARE INDICATED ON THE BEST IN CLASS STEEP SLOPES BAND.</p> <p>10. ACCESS ROADS HAVE BEEN GROUPED INTO FOUR CATEGORIES - 1) EXISTING ROADS NO IMPROVEMENTS, 2) EXISTING ROADS MINOR IMPROVEMENTS, 3) EXISTING ROADS MAJOR IMPROVEMENTS AND 4) NEW ROADS. APPROPRIATE EROSION AND SEDIMENT CONTROLS WILL BE PROVIDED FOR ROADS IN CATEGORIES 3, 4, AND 4. ROADS IN CATEGORIES 1 AND 2 HAVE ADEQUATE EXISTING DRAINAGE; DRAINAGE FEATURES WILL BE PROVIDED FOR ROADS IN CATEGORIES 3 AND 4.</p> <p>11. ERM IS SOLELY RESPONSIBLE FOR THE NATURE AND LOCATION OF THE DEPICTED RUMPS AS OF THE DATE SIGNED AND SEALED BASED ON THE SOURCE DATA PROVIDED AND AS DESCRIBED IN THE NOTES SECTION OF THE INDEX SHEET OF THIS PLAN SET.</p> <p>12. THE CONSTRUCTION RIGHT-OF-WAY (ROW) WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH SECTION V.A.5. FEDERAL ENERGY REGULATORY COMMISSION (FERC) UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN, SECTION V.A.5. IN ADDITION, WETLAND AND WATERBODY CROSSINGS WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH NATIONWIDE PERMIT 12 (NWP) ISSUED BY THE U.S. CORPS OF ENGINEERS.</p>
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NO.	DATE	BY	CHKD.	APPD.	REVISIONS
1	06/09/17	CFJ	DLH	NET	REVISED FERC FILING DESCRIPTION

PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
POST-CONSTRUCTION STORMWATER MANAGEMENT STA. 112+00 TO 166+00

MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA

DOMINION TRANSMISSION, INC.
 925 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330

SCALE: AS SHOWN

DATE: 06/09/17

DRAWN: FORTNCJ

CHECKED: HOOSIDL

APPROVED: TYSSONNE

PROJECT NO./DASH NO.
C141330-01

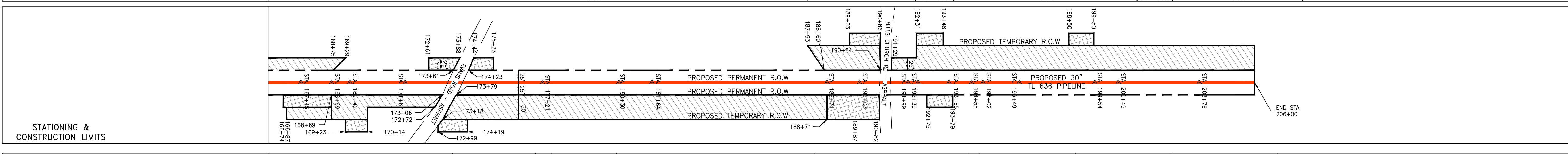
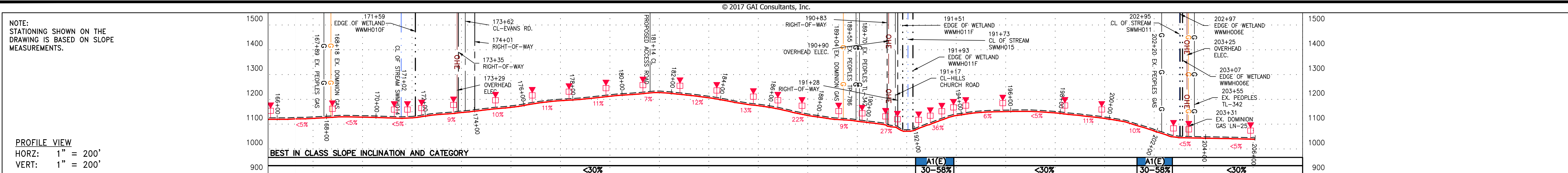
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005 00

GROUP ID DRAWING NO.
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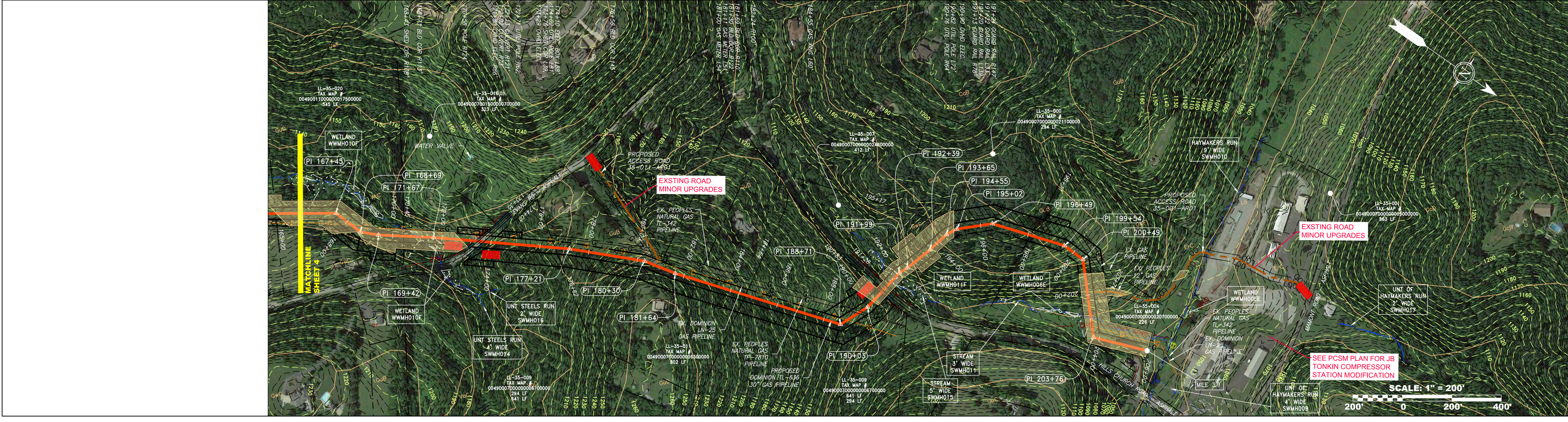
SHEET **4** OF **8**

6/8/2017 4:15 PM

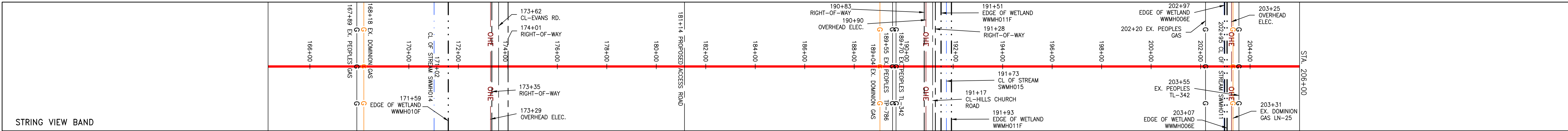
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PROPERTY OWNERSHIP	LL-35-020 TAX MAP # 004900110000001750000 545 LF	LL-35-016.01 TAX MAP # 0049000700500000700000 323 LF	LL-35-009 TAX MAP # 0049000700000006700000 294 LF	LL-35-011 TAX MAP # 0049000700000006300000 802 LF	LL-35-009 TAX MAP # 0049000700000006700000 541 LF	LL-35-007 TAX MAP # 0049000700000024600000 412 LF	LL-35-000 TAX MAP # 0049000700000021100000 294 LF	LL-35-001 TAX MAP # 0049000700000005500000 563 LF	LL-35-004 TAX MAP # 0049000700000002700000 226 LF
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PIPE SPECIFICATION



<p>LEGEND</p> <ul style="list-style-type: none"> --- PROPERTY LINE -X-X-X- FENCE --- STREAM G-G EXISTING DOMINION GAS PIPELINE G-G EXISTING GAS PIPELINE (OTHER) OHE OVERHEAD ELECTRIC LINES OHT OVERHEAD TELEPHONE LINES --- PROPOSED GAS PIPELINE --- PROPOSED ACCESS ROAD --- STORM SEWER --- WATER LINE --- SANITARY SEWER --- EDGE OF GRAVEL --- PROPOSED PERMANENT EASEMENT --- EXTRA WORK SPACE --- WETLAND --- DO NOT DISTURB AREA --- PROPOSED TEMPORARY R.O.W. --- TOPSOIL SEGREGATION AREA ○ METAL BALLARD ○ UTILITY POLE ▲ PERMANENT WATERBAR/SLOPE BREAKER ▲ TRENCH BREAKER/PLUG ▲ CONSTRUCTION ENTRANCE WITH WASH RACK ▲ TYPICAL BIC SLOPE CATEGORY SLOPE INCLINATION --- LIMIT OF DISTURBANCE --- ROADSIDE DITCH --- VEGETATED SWALE --- WATERSHED BOUNDARY --- CULVERT --- ACCESS ROAD WATERBAR --- SOIL TYPE --- EROSION CONTROL MATTING 	<p>NOTES</p> <ol style="list-style-type: none"> 1. COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W, THRU 11-07-2014. 2. CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 11-03-2014. 3. IMAGERY TAKEN FROM GOOGLE EARTH. 4. THE PROPERTY LINES SHOWN ARE BASED ON GIS & TAX ASSESSMENT RECORDS (PROVIDED BY OTHERS). GAI CONSULTANTS MAKE NO GUARANTEE EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE RECORDS AS SHOWN ON THESE DRAWINGS. 5. STREAM AND WETLAND DATA SHOWN ON THE DRAWING WAS PROVIDED BY ERM. 6. EROSION AND SEDIMENTATION CONTROL ELEMENTS MAY BE SHOWN OUTSIDE OF THE WORK AREAS FOR CLARITY ONLY. ACTUAL INSTALLATION SHALL BE WITHIN THE WORK AREAS. 7. ALL STATIONING SHOWN IS SLOPE STATIONING. 8. CONFOUR FILTER SOCK SHALL BE INSTALLED PARALLEL TO CONTOUR TO EXTENT PRACTICABLE IN ACCORDANCE WITH STANDARD DETAIL. SEDIMENT BARRIER LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS WITH APPROVAL FROM THE PROJECT ENVIRONMENTAL INSPECTOR. 9. BEST IN CLASS (BIC) STEEP SLOPE CATEGORY INFORMATION CAN BE FOUND IN THE EROSION AND SEDIMENT CONTROL PLAN. 10. EROSION CONTROL MATTING SHALL BE PLACED IN AREAS OF 30% SLOPE AND GREATER, WHICH ARE INDICATED ON THE BEST IN CLASS STEEP SLOPES BAND. 11. ACCESS ROADS HAVE BEEN GROUPED INTO FOUR CATEGORIES: 1) EXISTING ROADS NO IMPROVEMENTS, 2) EXISTING ROADS MINOR IMPROVEMENTS, 3) EXISTING ROADS MAJOR IMPROVEMENTS AND 4) NEW ROADS. APPROPRIATE EROSION AND SEDIMENT CONTROLS WILL BE PROVIDED FOR ROADS IN CATEGORIES 2, 3 AND 4. ROADS IN CATEGORIES 1 AND 2 HAVE ADEQUATE EXISTING DRAINAGE; DRAINAGE FEATURES WILL BE PROVIDED FOR ROADS IN CATEGORIES 3 AND 4. 12. ERM IS SOLELY RESPONSIBLE FOR THE NATURE AND LOCATION OF THE DEPICTED RUMPS AS OF THE DATE SIGNED AND SEALED BASED ON THE SOURCE DATA PROVIDED AND AS DESCRIBED IN THE NOTES SECTION OF THE INDEX SHEET OF THIS PLAN SET. 13. THE CONSTRUCTION RIGHT-OF-WAY (ROW) WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH SECTION V.A.5. FEDERAL ENERGY REGULATORY COMMISSION (FERC) UNDER EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN, SECTION V.A.5. IN ADDITION, WETLAND AND WATERBODY CROSSINGS WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH NATIONWIDE PERMIT 12 (NWP) ISSUED BY THE U.S. CORPS OF ENGINEERS.
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REVISIONS	
NO.	DESCRIPTION
1	04/08/16 CUF DCH NET
	DATE DWN. CHGD. APPVD.

DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
POST-CONSTRUCTION STORMWATER MANAGEMENT STA. 166+00 TO 203+55
MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA

SCALE: AS SHOWN
DATE: 06/09/17
DRAWN: FORTNCJ
CHECKED: HOOSIDL
APPROVED: TYSSONE

gai consultants
SOUTHPOINTE OFFICE
6000 TOWN CENTER BLVD
SUITE 300 EAST
CANONSBURG, PA 15317
724-873-3545

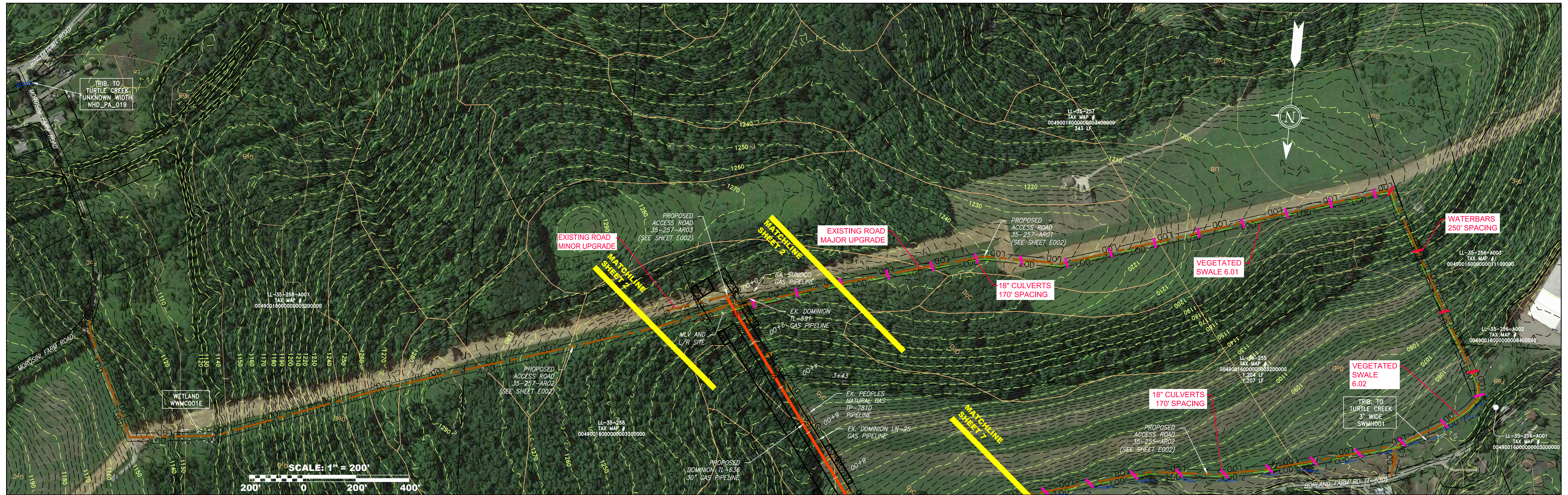
PROJECT NO./DASH NO.
C141330-01

TASK NO. SUB TASK NO.
005 00

GROUP ID DRAWING NO.
D E005

SHEET **5** OF **8**

GAI CAD FILE NO. Z:\ENERGY\2014\C141330.01\CONSTRUCTION_ALIGNMENT - PA.DWG - PREVIOUS FERC FILING DWGS - ALIGNMENT SHEETS\C141330-01-000-00-E-E002-E008-PCSM.DWG



ACCESS ROAD DETAIL



LEGEND	
	PROPERTY LINE
	FENCE
	STREAM
	EXISTING DOMINION GAS PIPELINE
	EXISTING GAS PIPELINE (OTHER)
	OVERHEAD ELECTRIC LINES
	OVERHEAD TELEPHONE LINES
	PROPOSED GAS PIPELINE
	PROPOSED ACCESS ROAD
	STORM SEWER
	WATER LINE
	SANITARY SEWER
	EDGE OF GRAVEL
	PROPOSED PERMANENT EASEMENT
	EXTRA WORK SPACE
	WETLAND
	DO NOT DISTURB AREA
	PROPOSED TEMPORARY R.O.W.
	TOPSOIL SEGREGATION AREA
	METAL BALLARD
	UTILITY POLE
	PERMANENT WATERBAR/SLOPE BREAKER
	TRENCH BREAKER/PLUG
	CONSTRUCTION ENTRANCE WITH WASH RACK
	TYPICAL BIC SLOPE CATEGORY SLOPE INCLINATION
	LIMIT OF DISTURBANCE
	ROADSIDE DITCH
	VEGETATED SWALE
	WATERSHED BOUNDARY
	CULVERT
	ACCESS ROAD WATERBAR
	SOIL TYPE
	EROSION CONTROL MATTING

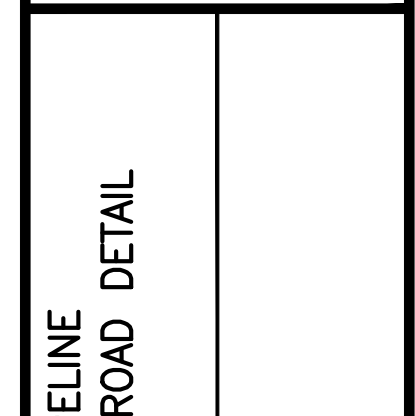
	PERMANENT WATERBAR/SLOPE BREAKER
	TRENCH BREAKER/PLUG
	CONSTRUCTION ENTRANCE WITH WASH RACK
	TYPICAL BIC SLOPE CATEGORY SLOPE INCLINATION
	LIMIT OF DISTURBANCE
	ROADSIDE DITCH
	VEGETATED SWALE
	WATERSHED BOUNDARY
	CULVERT
	ACCESS ROAD WATERBAR
	SOIL TYPE
	EROSION CONTROL MATTING

- NOTES**
- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W, THRU 11-07-2014.
 - CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 11-03-2014.
 - IMAGERY TAKEN FROM GOOGLE EARTH.
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 - STREAM AND WETLAND DATA SHOWN ON THE DRAWINGS WAS PROVIDED BY ERM.
 - EROSION AND SEDIMENTATION CONTROL ELEMENTS MAY BE SHOWN OUTSIDE OF THE WORK AREAS FOR CLARITY ONLY. ACTUAL INSTALLATION SHALL BE WITHIN THE WORK AREAS.
 - ALL STATIONING SHOWN IS SLOPE STATIONING.
 - COMPOST FILTER SOCK SHALL BE INSTALLED PARALLEL TO CONTOUR TO EXTENT PRACTICABLE IN ACCORDANCE WITH STANDARD DETAIL. SEDIMENT BARRIER LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS WITH APPROVAL FROM THE PROJECT ENVIRONMENTAL INSPECTOR.
 - BEST IN CLASS (BIC) STEEP SLOPE CATEGORY INFORMATION CAN BE FOUND IN THE EROSION AND SEDIMENT CONTROL PLAN.
 - EROSION CONTROL MATTING SHALL BE PLACED IN AREAS OF 30% SLOPE AND GREATER, WHICH ARE INDICATED ON THE BEST IN CLASS STEEP SLOPES BAND.
 - ACCESS ROADS HAVE BEEN GROUPED INTO FOUR CATEGORIES: 1) EXISTING ROADS NO IMPROVEMENTS, 2) EXISTING ROADS MINOR IMPROVEMENTS, 3) EXISTING ROADS MAJOR IMPROVEMENTS AND 4) NEW ROADS. APPROPRIATE EROSION AND SEDIMENT CONTROLS WILL BE PROVIDED FOR ROADS IN CATEGORIES 2, 3 AND 4. ROADS IN CATEGORIES 1 AND 2 HAVE ADEQUATE EXISTING DRAINAGE; DRAINAGE FEATURES WILL BE PROVIDED FOR ROADS IN CATEGORIES 3 AND 4.
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NOTE: THE PE SEAL AND SIGNATURE APPLIES ONLY TO THE E&S CONTROL DESIGN COMPLETED BY ERM (SEE NOTE 12).

THIS DRAWING WAS PRODUCED WITH COMPUTER AIDED DRAFTING TECHNOLOGY AND IS SUPPORTED BY ELECTRONIC DRAWING FILES. DO NOT REVISE THIS DRAWING VIA MANUAL DRAFTING METHODS.

REVISED FERC FILING		DESCRIPTION	
NO.	DATE	CHD.	APPD.
1	04/08/16	CF	NET



PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
 POST-CONSTRUCTION STORMWATER MANAGEMENT ACCESS ROAD DETAIL
 MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA
DOMINION TRANSMISSION, INC.
 925 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330

SCALE:	AS SHOWN
DATE:	06/09/17
DRAWN:	FORTNCJ
CHECKED:	HOOSIDL
APPROVED:	TYSSONE

gai consultants
 SOUTHPOINTE OFFICE
 6000 TOWN CENTER BLVD
 SUITE 300 EAST
 CANONSBURG, PA 15317
 724-873-3545

PROJECT NO./DASH NO.
C141330-01

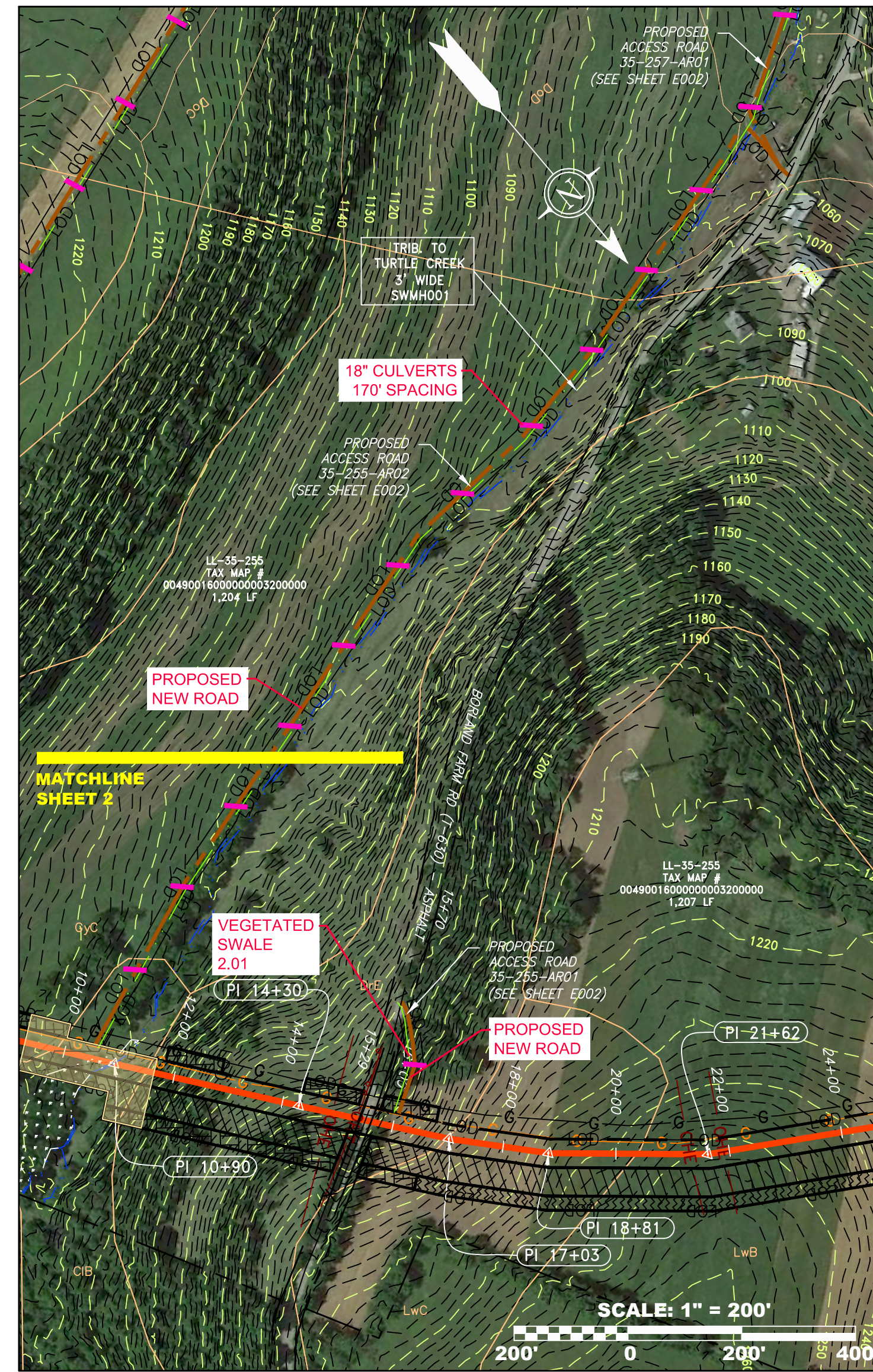
TASK NO. SUB TASK NO.
005 00

GROUP ID DRAWING NO.
D E006

SHEET **6** OF **8**

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ACCESS ROAD DETAIL

LEGEND

	PROPERTY LINE		PROPOSED GAS PIPELINE		EXTRA WORK SPACE		METAL BALLARD		PERMANENT WATERBAR/SLOPE BREAKER TRENCH BREAKER/PLUG		LIMIT OF DISTURBANCE
	FENCE		PROPOSED ACCESS ROAD		WETLAND		UTILITY POLE		CONSTRUCTION ENTRANCE WITH WASH RACK		ROADSIDE DITCH
	STREAM		STORM SEWER		DO NOT DISTURB AREA		AI (S) 30-58%		TYPICAL BIC SLOPE CATEGORY SLOPE INCLINATION		VEGETATED SWALE
	EXISTING DOMINION GAS PIPELINE		WATER LINE		PROPOSED TEMPORARY R.O.W.				SOIL TYPE		WATERSHED BOUNDARY
	EXISTING GAS PIPELINE (OTHER)		SANITARY SEWER		TOPSOIL SEGREGATION AREA				EROSION CONTROL MATTING		CULVERT
	OHE		EDGE OF GRAVEL								ACCESS ROAD WATERBAR
	OHT		PROPOSED PERMANENT EASEMENT								SOIL TYPE

NOTE: THE PE SEAL AND SIGNATURE APPLIES ONLY TO THE E&S CONTROL DESIGN COMPLETED BY ERM (SEE NOTE 12).

NOTES

- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY - UTM WITH NAD83 DATUM, ZONE 17, US SURVEY FOOT, CENTRAL MERIDIAN 81° W, THRU 11-07-2014.
- CONTOURS AND TOPOGRAPHIC FEATURES WERE DERIVED FROM LIDAR DATA AND GPS SUB-METER GROUND SURVEY PERFORMED BY GAI CONSULTANTS, INC FROM 11-03-2014.
- IMAGERY TAKEN FROM GOOGLE EARTH.
- THE PROPERTY LINES SHOWN ARE BASED ON GIS & TAX ASSESSMENT RECORDS (PROVIDED BY OTHERS). GAI CONSULTANTS MAKE NO GUARANTEE EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE RECORDS AS SHOWN ON THESE DRAWINGS.
- STREAM AND WETLAND DATA SHOWN ON THE DRAWINGS WAS PROVIDED BY ERM.
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- ALL STATIONING SHOWN IS SLOPE STATIONING.
- COMPOST FILTER SOCK SHALL BE INSTALLED PARALLEL TO CONTOUR TO EXTENT PRACTICABLE IN ACCORDANCE WITH STANDARD DETAIL. SEDIMENT BARRIER LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS WITH APPROVAL FROM THE PROJECT ENVIRONMENTAL INSPECTOR.
- BEST IN CLASS (BIC) STEEP SLOPE CATEGORY INFORMATION CAN BE FOUND IN THE EROSION AND SEDIMENT CONTROL PLAN.
- EROSION CONTROL MATTING SHALL BE PLACED IN AREAS OF 30% SLOPE AND GREATER, WHICH ARE INDICATED ON THE BEST IN CLASS STEEP SLOPES BAND.
- ACCESS ROADS HAVE BEEN GROUPED INTO FOUR CATEGORIES: 1) EXISTING ROADS NO IMPROVEMENTS, 2) EXISTING ROADS MINOR IMPROVEMENTS, 3) EXISTING ROADS MAJOR IMPROVEMENTS AND 4) NEW ROADS. APPROPRIATE EROSION AND SEDIMENT CONTROLS WILL BE PROVIDED FOR ROADS IN CATEGORIES 2, 3 AND 4. ROADS IN CATEGORIES 1 AND 2 HAVE ADEQUATE EXISTING DRAINAGE; DRAINAGE FEATURES WILL BE PROVIDED FOR ROADS IN CATEGORIES 3 AND 4.
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- THE CONSTRUCTION RIGHT-OF-WAY (ROW) WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH SECTION V.A.5 FEDERAL ENERGY REGULATORY COMMISSION (FERC) UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN, SECTION V.A.5. IN ADDITION, WETLAND AND WATERBODY CROSSINGS WILL BE RESTORED TO PRE-CONSTRUCTION CONTOURS IN ACCORDANCE WITH NATIONWIDE PERMIT 12 (NWP) ISSUED BY THE U.S. CORPS OF ENGINEERS.

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	04/08/16	CF	DLH	NET	REVISED FERC FILING



PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
 POST-CONSTRUCTION STORMWATER MANAGEMENT ACCESS ROAD DETAIL
 MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA
DOMINION TRANSMISSION, INC.
 925 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330

SCALE:	AS SHOWN
DATE:	06/09/17
DRAWN:	FORTNCJ
CHECKED:	HOOSIDL
APPROVED:	TYSONNE

gai consultants
 SOUTHPOINTE OFFICE
 6000 TOWN CENTER BLVD
 SUITE 300 EAST
 CANONSBURG, PA 15317
 724-873-3545

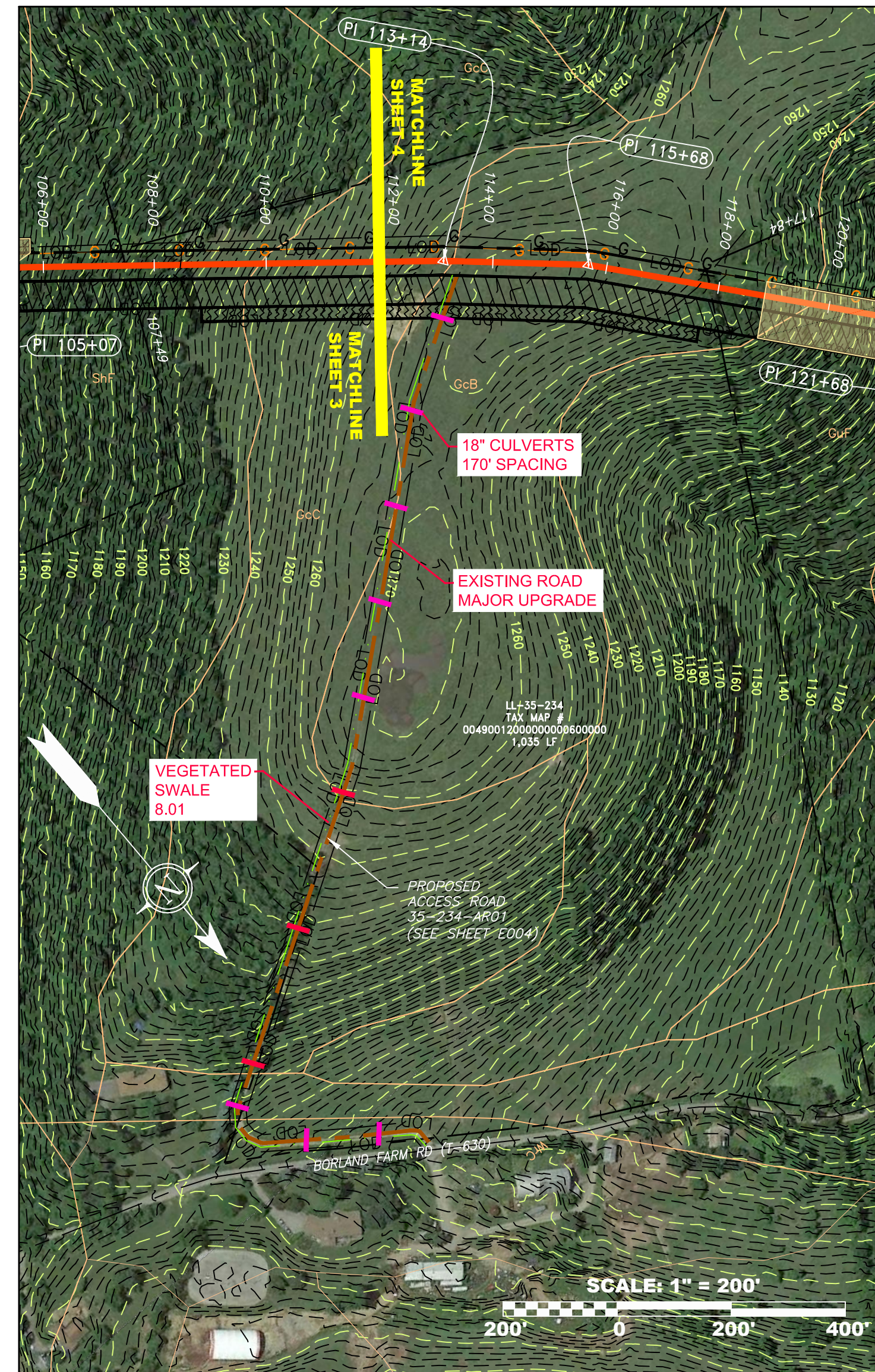
PROJECT NO./DASH NO.
C141330-01

TASK NO. SUB TASK NO.
005 00

GROUP ID DRAWING NO.
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SHEET **7** OF **8**

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ACCESS ROAD DETAIL

LEGEND

	PROPERTY LINE		PROPOSED GAS PIPELINE		EXTRA WORK SPACE		METAL BALLARD		PERMANENT WATERBAR/SLOPE BREAKER		LIMIT OF DISTURBANCE
	FENCE		PROPOSED ACCESS ROAD		WETLAND		UTILITY POLE		TRENCH BREAKER/PLUG		ROADSIDE DITCH
	STREAM		STORM SEWER		DO NOT DISTURB AREA		AI (S) 30-58%		CONSTRUCTION ENTRANCE WITH WASH RACK		VEGETATED SWALE
	EXISTING DOMINION GAS PIPELINE		WATER LINE		PROPOSED TEMPORARY R.O.W.		TYPICAL BIC SLOPE CATEGORY SLOPE INCLINATION		SOIL TYPE		WATERSHED BOUNDARY
	EXISTING GAS PIPELINE (OTHER)		SANITARY SEWER		TOPSOIL SEGREGATION AREA		NOTE: THE PE SEAL AND SIGNATURE APPLIES ONLY TO THE E&S CONTROL DESIGN COMPLETED BY ERM (SEE NOTE 12).		EROSION CONTROL MATTING		CULVERT
	OVERHEAD ELECTRIC LINES		EDGE OF GRAVEL						ACCESS ROAD WATERBAR		ACCESS ROAD WATERBAR
	OVERHEAD TELEPHONE LINES		PROPOSED PERMANENT EASEMENT						SOIL TYPE		EROSION CONTROL MATTING

NOTES

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REVISED FERC FILING		DESCRIPTION	
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		DWN.	

07.31.2017

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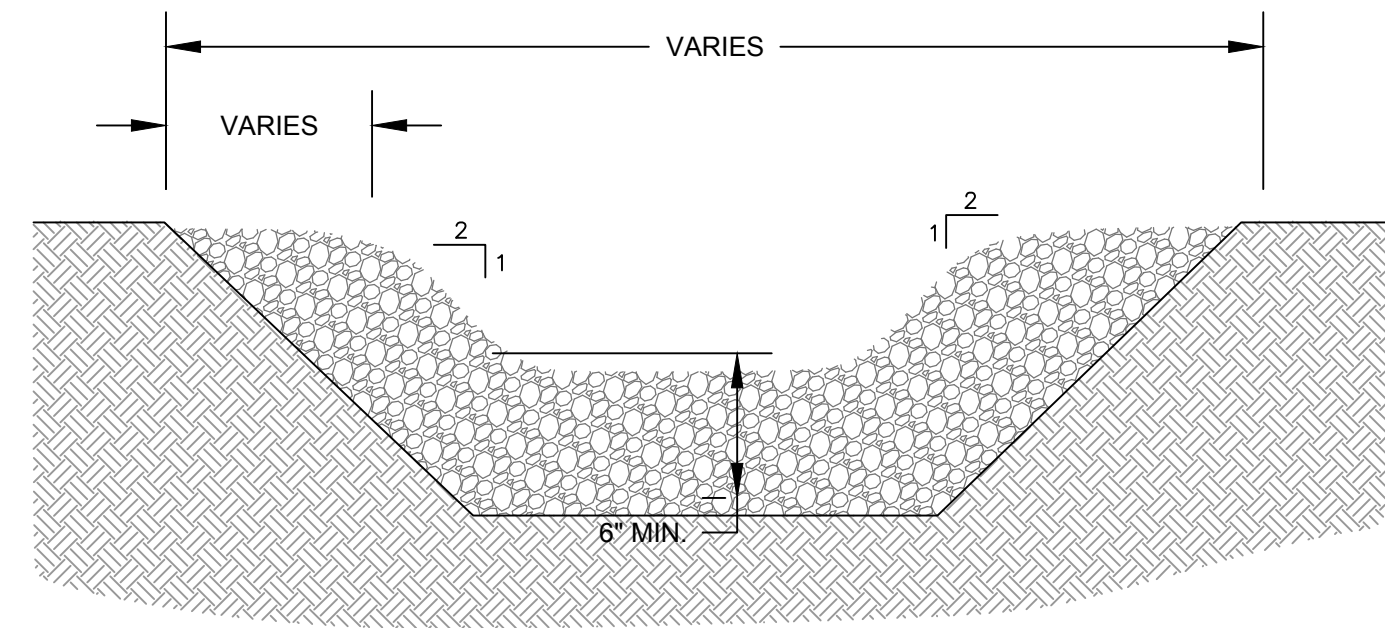
PA SUPPLY HEADER PROJECT - 30" TL-636 PIPELINE
POST-CONSTRUCTION STORMWATER MANAGEMENT ACCESS ROAD DETAIL
 MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA

DOMINION TRANSMISSION, INC.
 925 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330

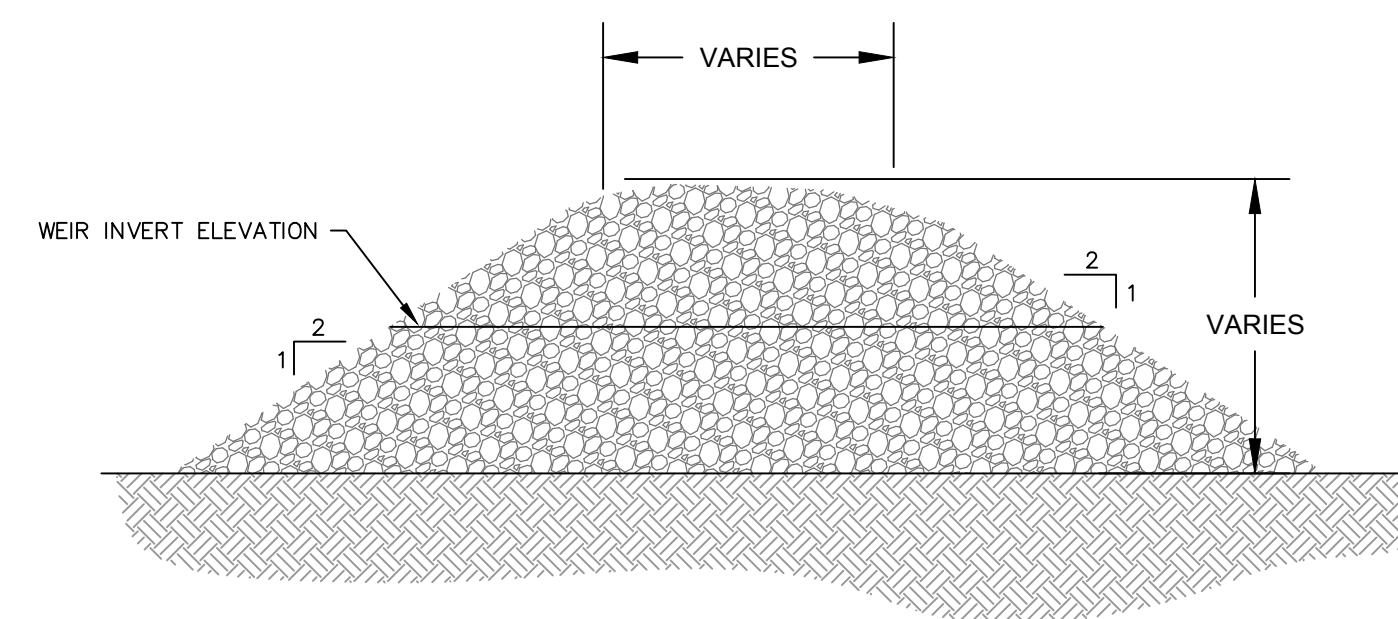
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APPROVED:	TYSONNE

SOUTHPOINTE OFFICE
 6000 TOWN CENTER BLVD
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 CANONSBURG, PA 15317
 724-873-3545

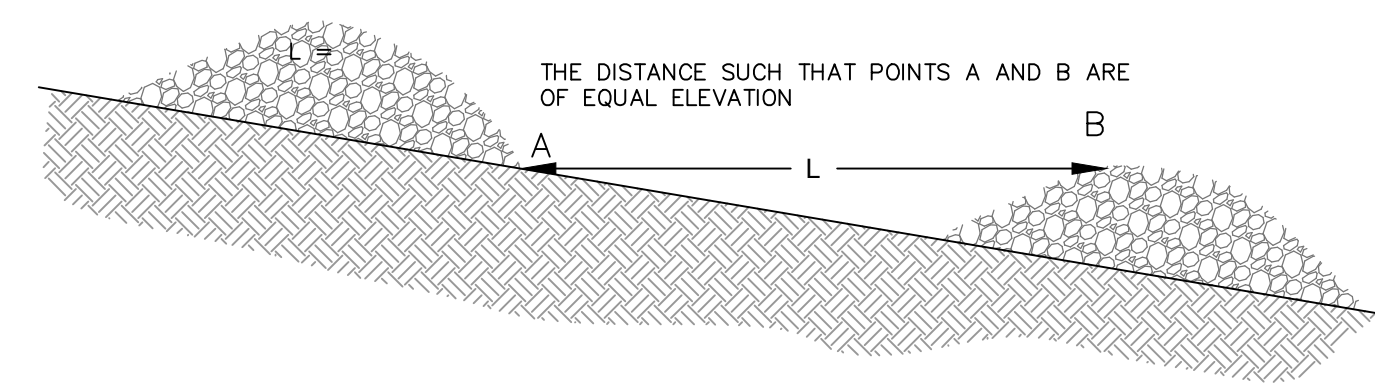
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ELEVATION

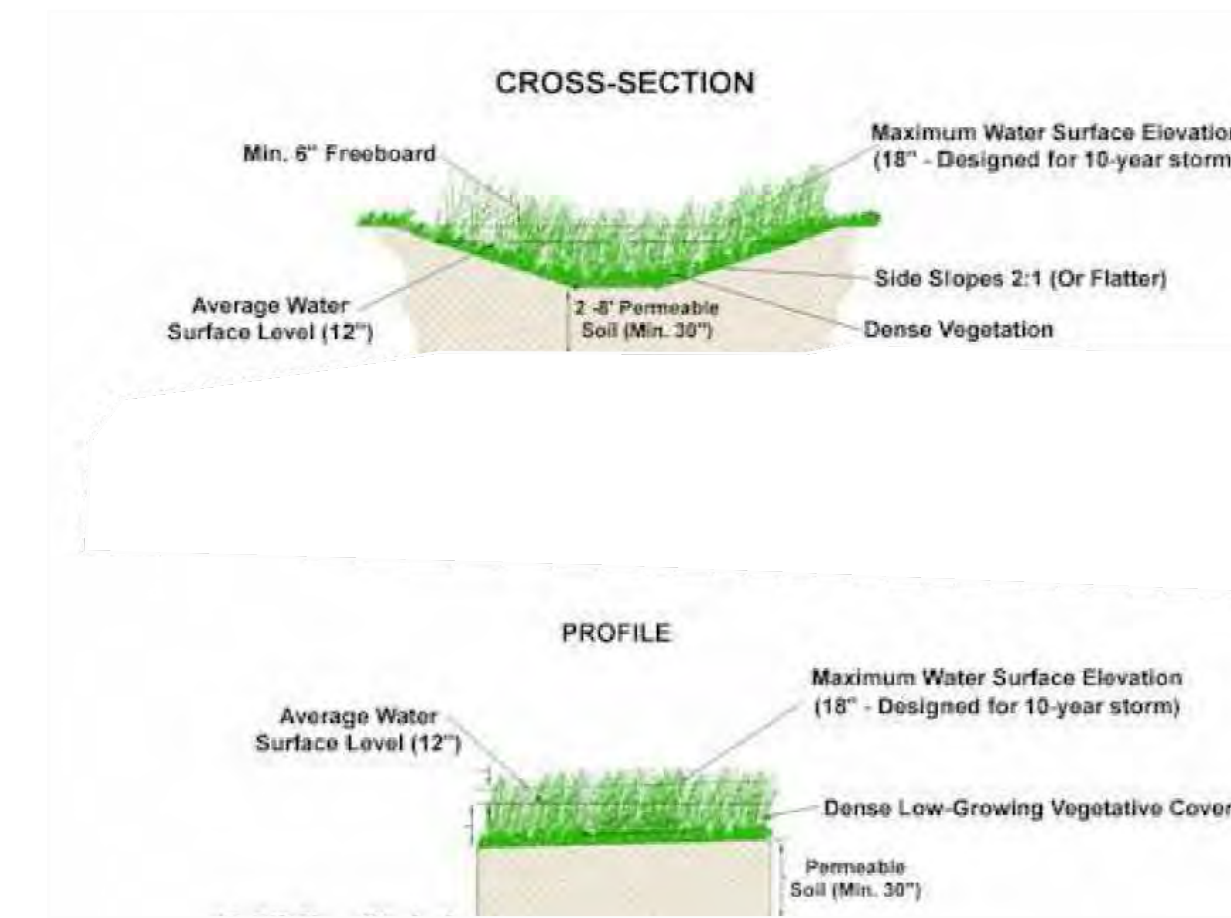


CROSS SECTION



CHECK DAM SPACING

ROCK CHECK DAM DETAIL
N.T.S.



VEGETATED SWALE DETAIL
N.T.S.

NOTES:
1. RIPRAP SWALES FOLLOW THE SAME DETAIL EXCEPT THAT THEY ARE LINED WITH RIPRAP, NOT VEGETATION.



MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA
 DOMINION TRANSMISSION, INC.
 445 WEST MAIN STREET
 CLARKSBURG, WV 26301

DETAILS

SCALE:	NTS
DATE:	8/28/15
DRAWN:	.
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APPROVED:	.



PROJECT NO./DASH NO.	.
TASK NO. / SUB TASK NO.	.
GROUP ID / DRAWING NO.	.
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JB TONKIN COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

*DOMINION TRANSMISSION, INC
CLARKSBURG, WEST VIRGINIA*

MARCH 2017

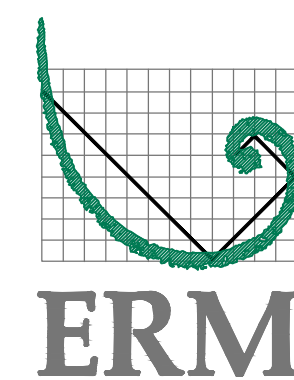
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PREPARED FOR
DOMINION TRANSMISSION, INC

DRAWING INDEX

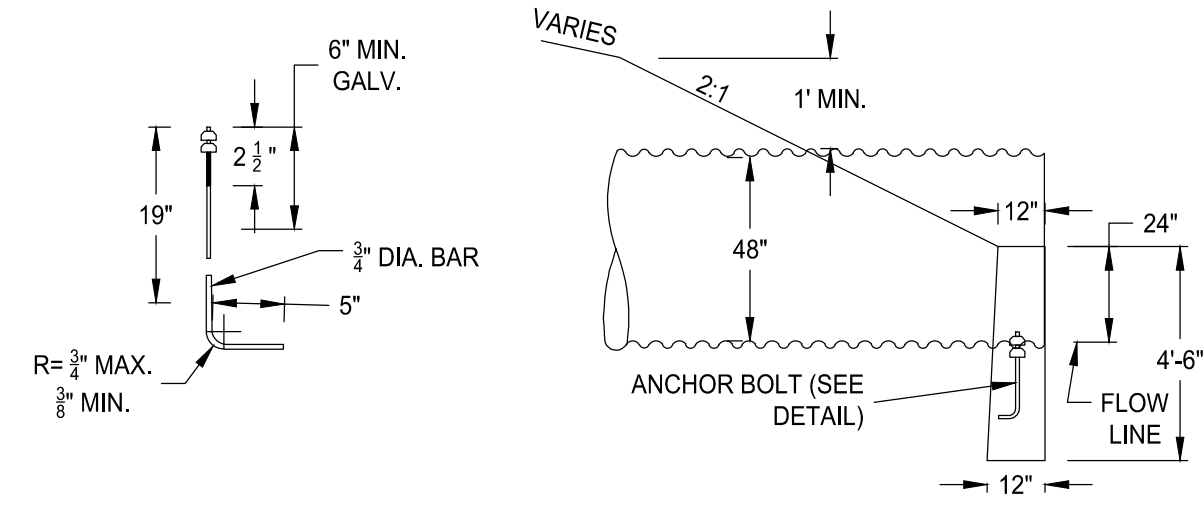
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02	DETAILS

PREPARED BY



ERM CONSULTING & ENGINEERING, INC.

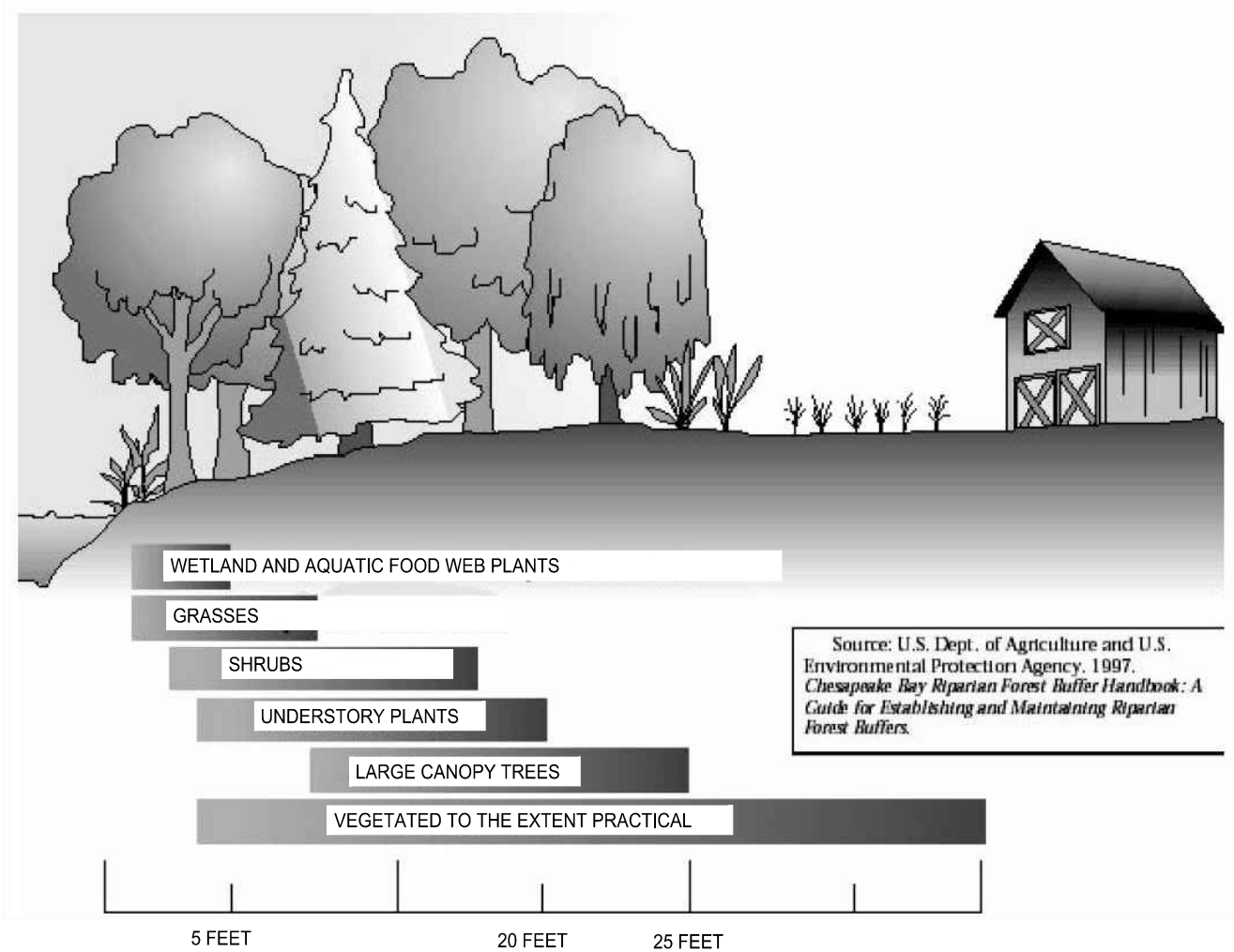
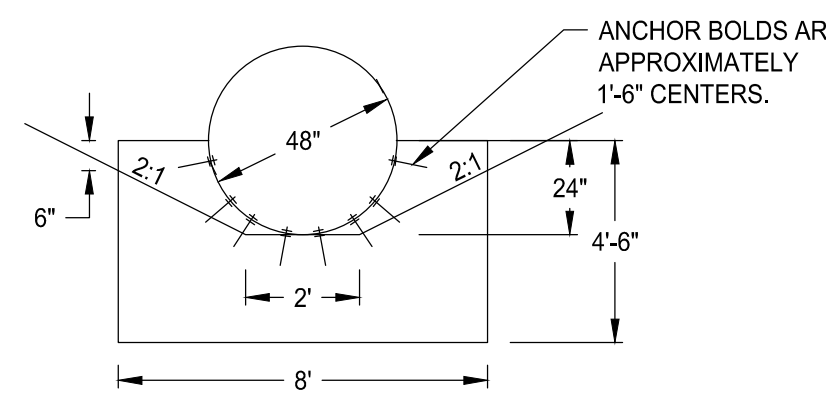
Hartford Office 860-466-8500



- NOTES:
1. PROVIDE A RIPRAP REINFORCED CONCRETE SLAB ACCORDING TO SCD DM-1.1.
 2. USE 4000 PSI COMPRESSIVE STRENGTH CONCRETE FOR HEADWALL. CONCRETE QUANTITIES ARE BASED ON HEADWALLS WITHOUT THE 6\"/>
 - 3. FURNISH BOLTS THAT MEET ASTM A 307 FOR ANCHORING BOTH ENDS OF METAL PIPE. THE TOP 6\"/>

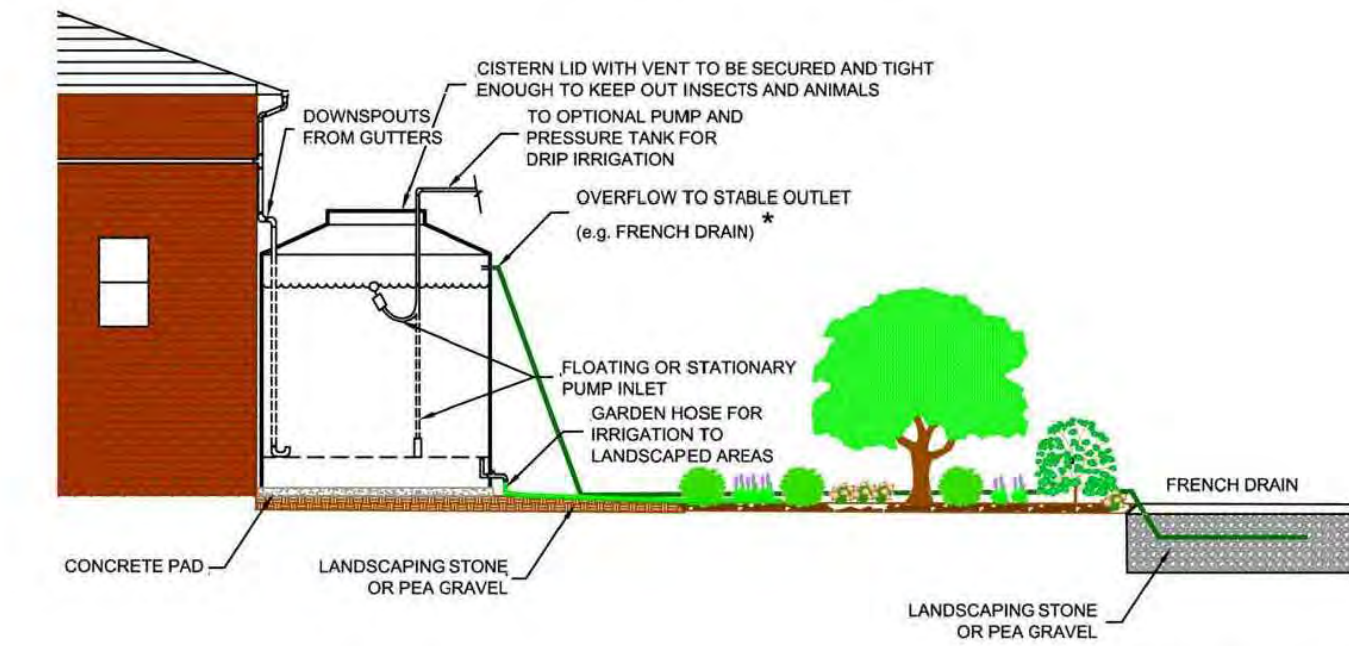
HALF HEIGHT HEADWALL DETAIL

N.T.S.



RIPARIAN BUFFER DETAIL

N.T.S.

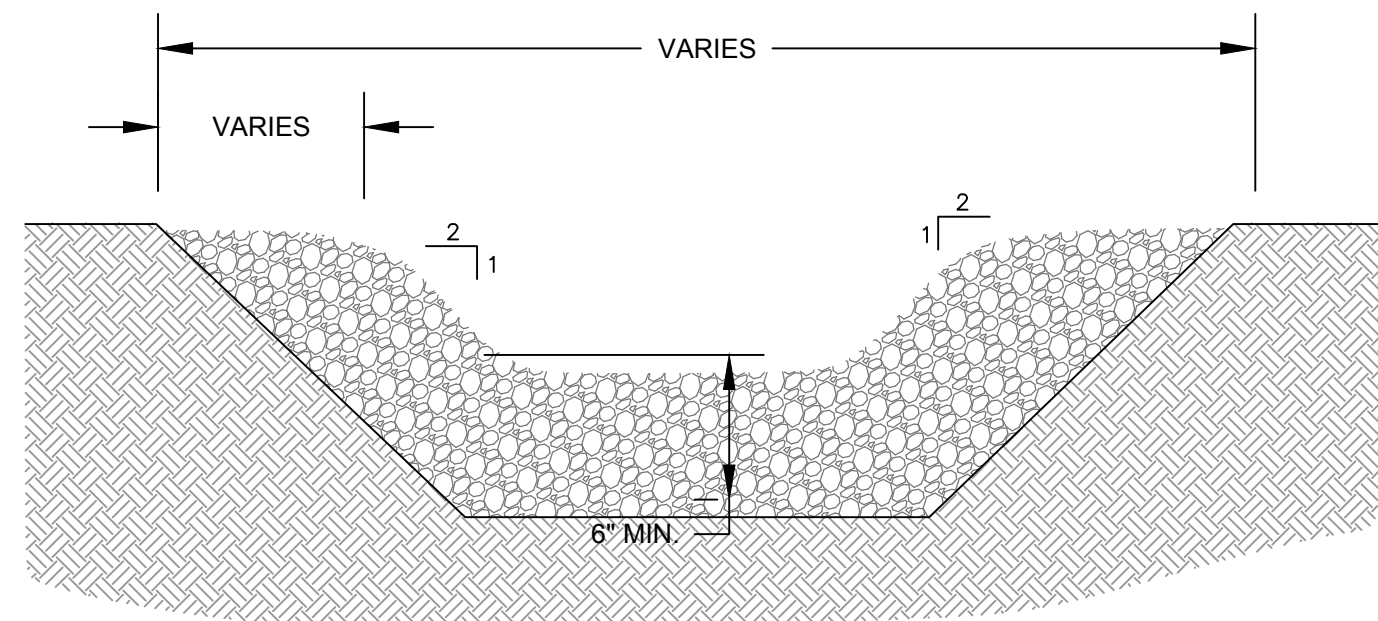


* FRENCH DRAIN IS SHOWN AS AN OPTION TO RECEIVE OVERFLOWS. OTHER OPTIONS MAY BE APPROVED BY LOCAL AUTHORITY.

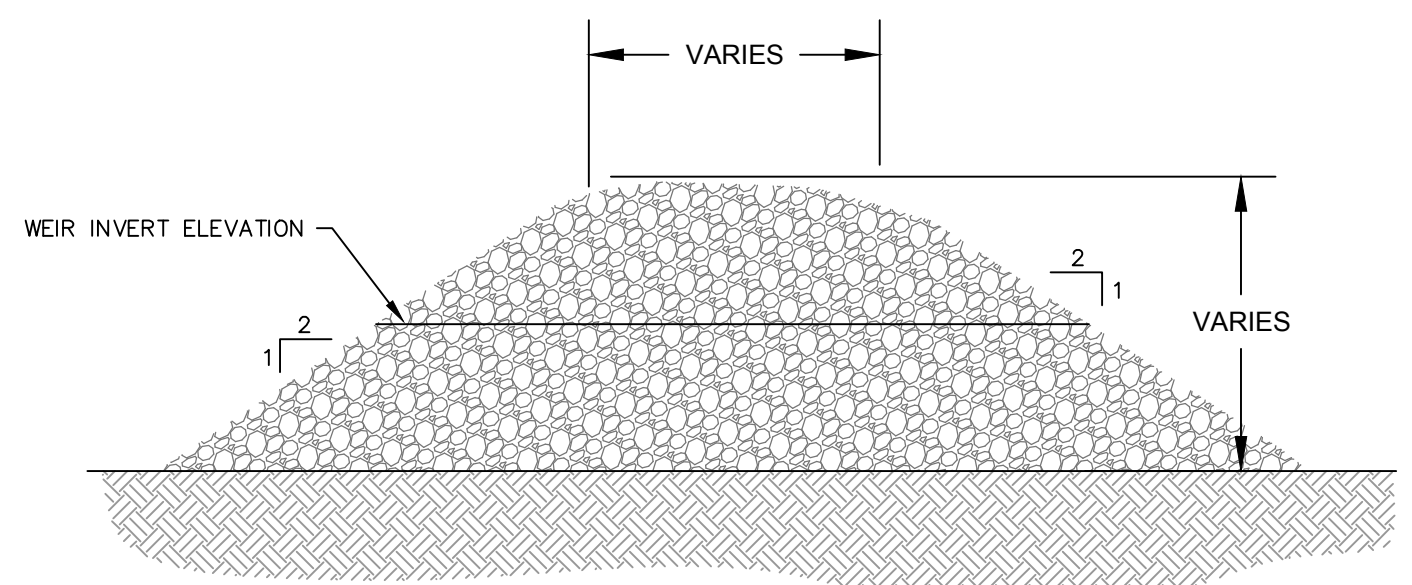
RAIN CISTERN DETAIL

N.T.S.

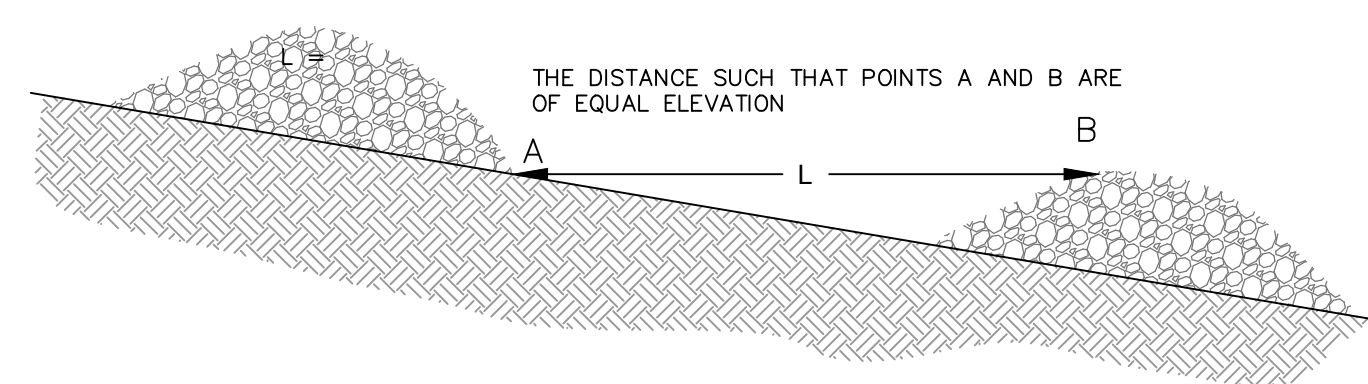
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02	3340
03	8005
04	4723
05	1688



ELEVATION



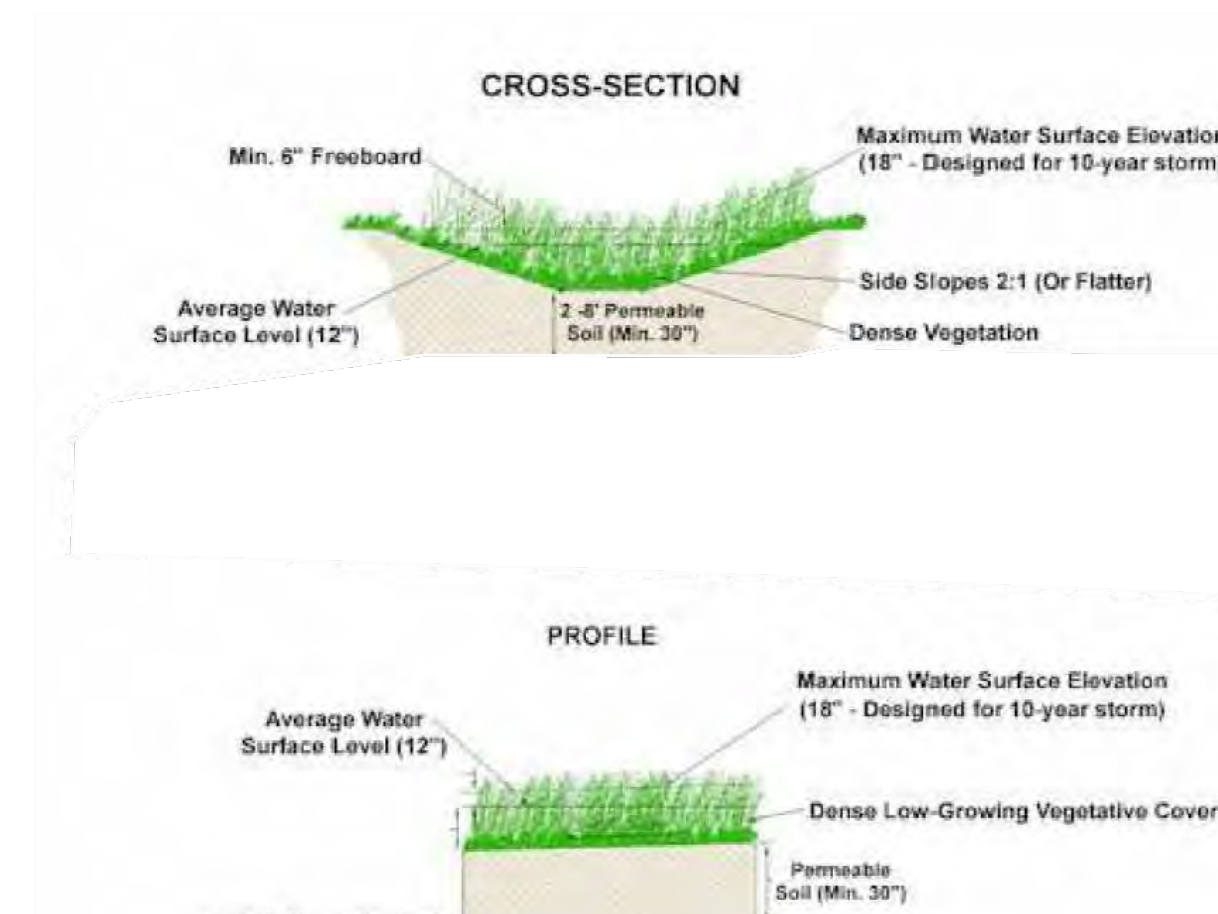
CROSS SECTION



CHECK DAM SPACING

ROCK CHECK DAM DETAIL

N.T.S.



VEGETATED SWALE DETAIL

N.T.S.

- NOTES:
1. RIPRAP SWALES FOLLOW THE SAME DETAIL EXCEPT THAT THEY ARE LINED WITH RIPRAP, NOT VEGETATION.

REVISIONS			
NO.	DATE	BY	DESCRIPTION



ERM

MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA
 DOMINION TRANSMISSION, INC.
 4445 WEST MAIN STREET
 CLARKSBURG, WV 26301

SCALE:	NTS
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LAUNCHER MP0-636

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

DOMINION TRANSMISSION, INC
CLARKSBURG, WEST VIRGINIA

MARCH 2017

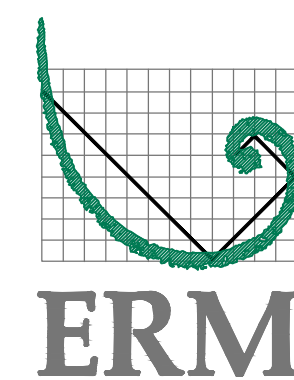
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PREPARED FOR
DOMINION TRANSMISSION, INC

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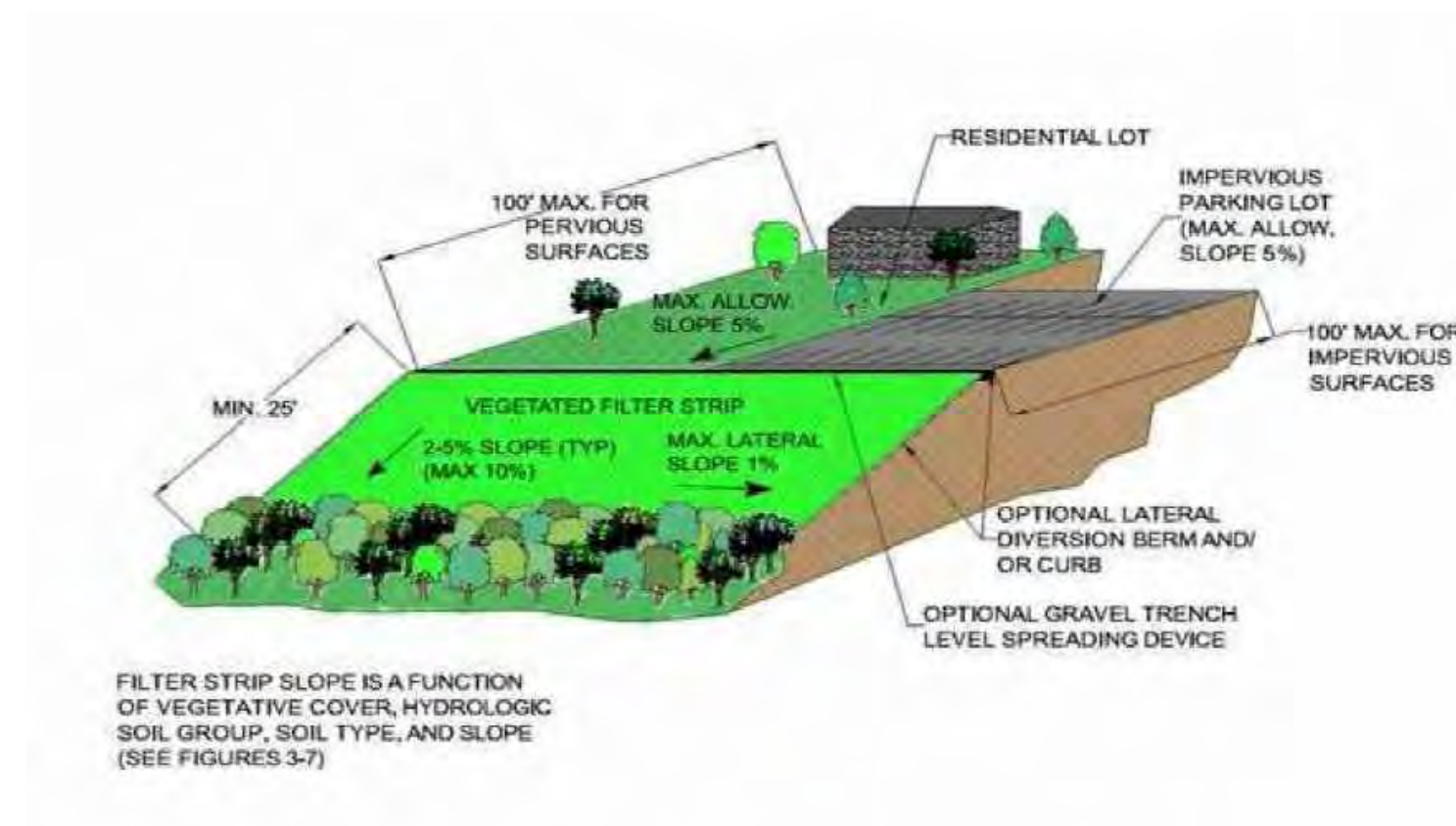
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01	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
02	DETAILS

PREPARED BY



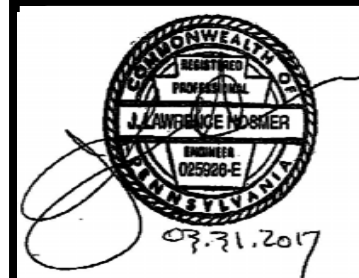
ERM CONSULTING & ENGINEERING, INC.

Hartford Office 860-466-8500



VEGETATED FILTER STRIP
N.T.S.

NO.	DATE	BY	CHKD.	APPROV.	DESCRIPTION



DETAILS

MURRYSVILLE BOROUGH, WESTMORELAND COUNTY, PENNSYLVANIA

DOMINION TRANSMISSION, INC.

445 WEST MAIN STREET
CLARKSBURG, WV 26301

SCALE:	NTS
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GROUP ID / DRAWING NO.	.
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DOMINION TRANSMISSION, INC.

SUPPLY HEADER PROJECT

**SECTION 5 – POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN/SITE
RESTORATION (PCSM/SR) PLAN**

APPENDIX B - PCSM/SR RUNOFF CALCUALTIONS

Pennsylvania Stormwater BMP Manual Worksheets

Worksheet 1. General Site Information

INSTRUCTIONS: Fill out Worksheet 1 for each watershed

Date: 3/28/2017

Project Name: Supply Header Project

Municipality: Murrsville

County: Westmoreland

Total Area (acres): 82.5

Major River Basin: Ohio

<http://www.dep.state.pa.us/dep/deputate/watermgt/wc/default.htm#newtopics>
Watershed: Haymakers Run - Turtle Creek

Sub-Basin: _____

Nearest Surface Water(s) to Receive Runoff: Varies

Chapter 93 - Designated Water Use: High-Quality Cold Water Fishes
<http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>

Impaired according to Chapter 303(d) List? Yes
 No
<http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/303d-Report.htm>

List Causes of Impairment:

Aquatic Life

Is project subject to, or part of:

Municipal Separate Storm Sewer System (MS4) Requirements? Yes
 No
<http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/StormwaterManagement/GeneralPermits/default.htm>

Existing or planned drinking water supply? Yes
 No

If yes, distance from proposed discharge (miles): _____

Approved Act 167 Plan? Yes
 No
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/StormwaterManagement/Approved_1.html

Existing River Conservation Plan? Yes
 No
<http://www.dcnr.state.pa.us/brc/rivers/riversconservation/planningprojects/>

Worksheet 3. Nonstructural BMP Credits																		
PROTECTED AREA																		
1.1 Area of Protected Sensitive/Special Value Features (see WS 2)			_____ Ac.															
1.2 Area of Riparian Forest Buffer Protection			_____ Ac.															
3.1 Area of Minimum Disturbance/Reduced Grading			_____ Ac.															
TOTAL			_____ Ac.															
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Site Area</td> <td style="padding: 5px;"><i>minus</i></td> <td style="padding: 5px;">Protected Area</td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">Stormwater Management Area</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input style="width: 100px; height: 20px;" type="text"/></td> <td style="text-align: center; padding: 5px;">-</td> <td style="text-align: center; padding: 5px;"><input style="width: 100px; height: 20px;" type="text"/></td> <td style="text-align: center; padding: 5px;">=</td> <td style="text-align: center; padding: 5px;"><input style="width: 200px; height: 20px;" type="text"/></td> </tr> <tr> <td colspan="4" style="text-align: center; padding: 5px;"><i>This is the area that requires stormwater management</i></td> <td style="text-align: center; padding: 5px;"></td> </tr> </table>				Site Area	<i>minus</i>	Protected Area	=	Stormwater Management Area	<input style="width: 100px; height: 20px;" type="text"/>	-	<input style="width: 100px; height: 20px;" type="text"/>	=	<input style="width: 200px; height: 20px;" type="text"/>	<i>This is the area that requires stormwater management</i>				
Site Area	<i>minus</i>	Protected Area	=	Stormwater Management Area														
<input style="width: 100px; height: 20px;" type="text"/>	-	<input style="width: 100px; height: 20px;" type="text"/>	=	<input style="width: 200px; height: 20px;" type="text"/>														
<i>This is the area that requires stormwater management</i>																		
VOLUME CREDITS																		
3.1 Minimum Soil Compaction																		
Lawn	_____ ft ²	x 1/4" x 1/12	= _____ ft ³															
Meadow	_____ ft ²	x 1/3" x 1/12	= _____ ft ³															
3.3 Protect Existing Trees																		
<i>For Trees within 100 feet of impervious area:</i>																		
Tree Canopy	_____ ft ²	x 1/2" x 1/12	= _____ ft ³															

5.1 Disconnect Roof Leaders to Vegetated Areas																		
<i>For runoff directed to areas protected under 5.8.1 and 5.8.2</i>																		
Roof Area	<u>19,711</u> ft ²	x 1/3" x 1/12	= <u>547.53</u> ft ³															
<i>For all other disconnected roof areas</i>																		
Roof Area	_____ ft ²	x 1/4" x 1/12	= _____ ft ³															
5.2 Disconnect Non-Roof impervious to Vegetated Areas																		
<i>For Runoff directed to areas protected under 5.8.1 and 5.8.2</i>																		
Impervious Area	_____ ft ²	x 1/3" x 1/12	= _____ ft ³															
<i>For all other disconnected roof areas</i>																		
Impervious Area	_____ ft ²	x 1/4" x 1/12	= _____ ft ³															
TOTAL NON-STRUCTURAL VOLUME CREDIT*			547.53 ft³															
<small>* For use on Worksheet 5</small>																		

WORKSHEET 4 . CHANGE IN RUNOFF VOLUME FOR 2-YR STORM EVENT

PROJECT: Supply Header Project
Drainage Area: Varies
2-Year Rainfall: 2.38 in

Total Site Area: 82.5 acres
Protected Site Area: 0 acres
Managed Area: 82.5 acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff ¹ (in)	Runoff Volume ² (ft ³)
Woodland	C	53,143.2	1.22	70	N/A used HydroCAD			
Meadow	C	568,022.4	13.04	74				
Impervious	C	146,767.2	3.37	98/89				
TOTAL:		767,962.8	17.63					38,594.2

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff ¹ (in)	Runoff Volume ² (ft ³)
Grass	C	267,022.8	6.13	74	N/A used HydroCAD			
Gravel	C	372,873.6	8.56	89				
Impervious	C	87,991.2	2.02	98				
Woodland	C	40,075.2	0.92	70				
TOTAL:		767,962.8	17.63					59,938.6

2-Year Volume Increase (ft3): 21,344.4

2-Year Volume Increase = Developed Conditions Runoff Volume - Existing Conditions Runoff Volume

1. Runoff (in) = Q = (P - 0.2S)² / (P+ 0.8S) where

P = 2-Year Rainfall (in)

S = (1000/ CN)-10

2. Runoff Volume (CF) = Q x Area x 1/12

Q = Runoff (in)

Area = Land use area (sq. ft)

Note: Runoff Volume must be calculated for EACH land use type/condition and HSGI. The use of a weighted CN value for volume calculations is not acceptable.

NOTE: The total site area of 82.5 acres includes 64.9 acres of linear utility right-of-way that is being restored to meadow condition. The remaining 17.6 acres include any above ground stations and permanent access roads that are receiving major upgrades that will significantly impact stormwater. Worksheets 4 and 5 refer to those 17.6 acres only.

WORKSHEET 5 . STRUCTURAL BMP VOLUME CREDITS

PROJECT: Supply Header Project
SUB-BASIN: Haymakers Run - Turtle Creek

Required Control Volume (ft³) - from Worksheet 4 :	21,344.4
Non-structural Volume Credit (ft³) - from Worksheet 3 :	- 547.53
Structural Volume Reqmt (ft³)	20,796.87
<i>(Required Control Volume minus Non-structural Credit)</i>	

Proposed BMP	Area (ft ²)	Storage Volume (ft ³)
6.4.1 Porous Pavement		
6.4.2 Infiltration Basin		
6.4.3 Infiltration Bed		
6.4.4 Infiltration Trench		
6.4.5 Rain Garden/Bioretenion		
6.4.6 Dry Well / Seepage Pit		
6.4.7 Constructed Filter		
6.4.8 Vegetated Swale	123,754	TBD
6.4.9 Vegetated Filter Strip	TBD	TBD
6.4.10 Berm		
6.5.1 Vegetated Roof		
6.5.2 Capture and Re-use	19,711	3,308
6.6.1 Constructed Wetlands		
6.6.2 Wet Pond / Retention Basin		
6.6.3 Dry Extended Detention Basin		
6.6.4 Water Quality Filters		
6.7.1 Riparian Buffer Restoration		
6.7.2 Landscape Restoration / Reforestation	16,000	882
6.7.3 Soil Amendment		
6.8.1 Level Spreader		
6.8.2 Special Storage Areas		
<i>Other</i> Riprap Lined Swale	34,298	545

Total Structural Volume (ft³):	TBD
Structural Volume Requirement (ft³):	20,796.87
DIFFERENCE	TBD

Note: The final design for some controls are pending infiltration testing. This includes the vegetated swales and filter strips.

WORKSHEET 10. WATER QUALITY COMPLIANCE FOR NITRATE

Does the site design incorporate the following BMPs to address nitrate pollution? A summary "yes" rating is achieved if at least 2 Primary BMPs for nitrate are provided across the site or 4 secondary BMPs for nitrate are provided across the site (or the

PRIMARY BMPs FOR NITRATE:

	YES	NO
NS BMP 5.4.2 - Protect / Conserve / Enhance Riparian Buffers	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.5.4 - Cluster Uses at Each Site	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.6.1 - Minimize Total Disturbed Area	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.6.3 - Re-Vegetate / Re-Forest Disturbed Areas (Native Species)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.9.1 - Street Sweeping / Vacuuming	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.1 - Riparian Buffer Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.2 - Landscape Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>

SECONDARY BMPs FOR NITRATE:

NS BMP 5.4.1 - Protect Sensitive / Special Value Features	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.4.3 - Protect / Utilize Natural Drainage Features	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.6.2 - Minimize Soil Compaction	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.4.5 - Rain Garden / Bioretention	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.4.8 - Vegetated Swale	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structural BMP 6.4.9 - Vegetated Filter Strip	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structural BMP 6.6.1 - Constructed Wetland	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.1 - Riparian Buffer Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.2 - Landscape Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.3 - Soils Amendment/Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>

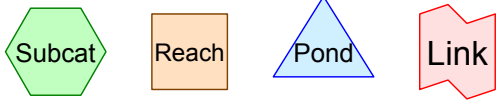
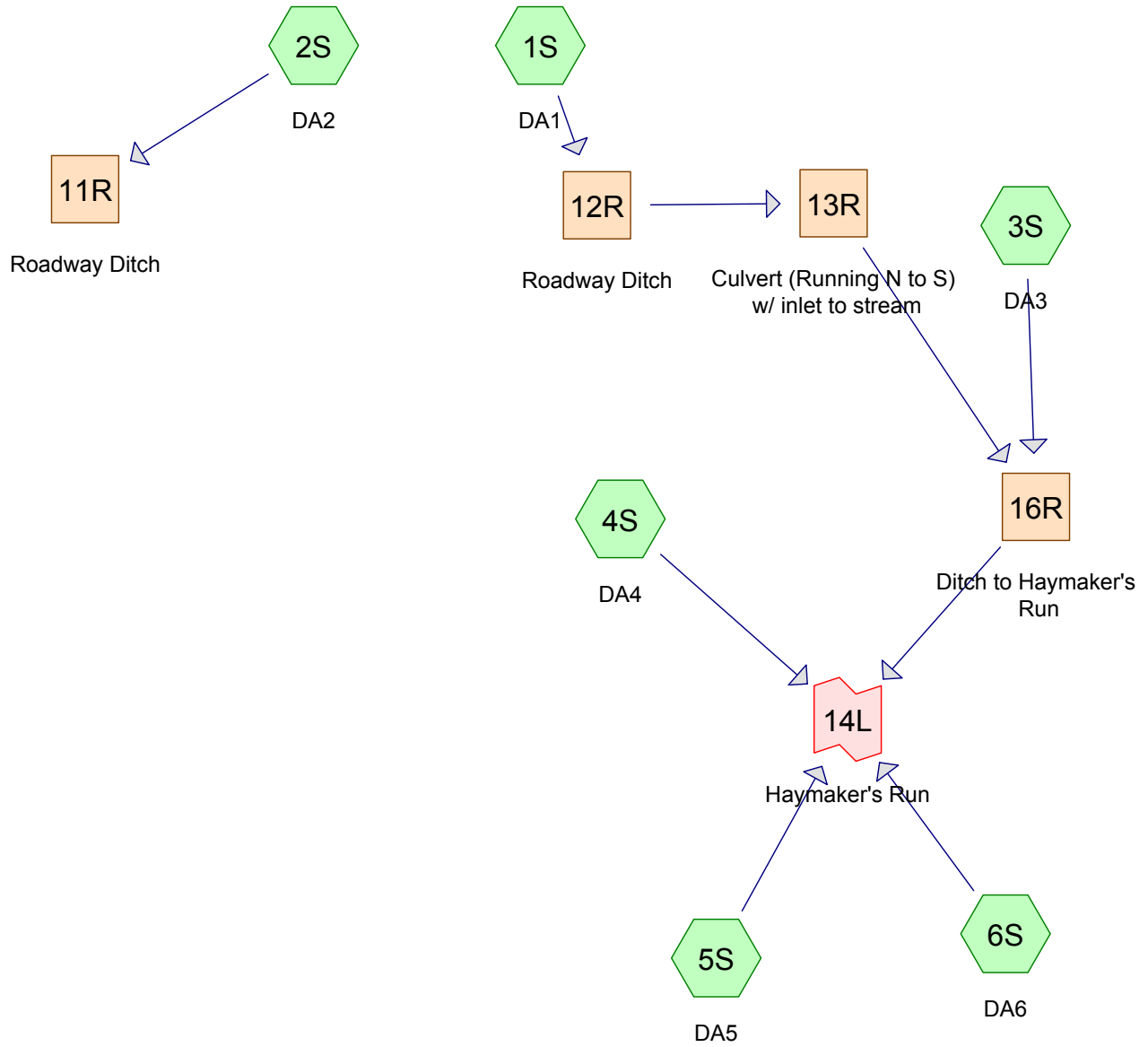
WORKSHEET 11. BMPS FOR POLLUTION PREVENTION

Does the site design incorporate the following BMPs to address nitrate pollution? A summary "yes" rating is achieved if at least 2 BMPs are provided across the site. "Provided across the site" is taken to mean that the specifications for that BMP set forward in Chapters 5 and 6 are satisfied.

BMPs FOR POLLUTANT PREVENTION:

	YES	NO
NS BMP 5.4.1 - Protect Sensitive / Special Value Features	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.4.2 - Protect / Conserve / Enhance Riparian Buffers	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.4.3 - Protect / Utilize Natural Flow Pathways in Overall Stormwater Planning and Design	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.5.1 - Cluster Uses at Each Site; Build on the Smallest Area Possible	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.6.1 - Minimize Total Disturbed Area - Grading	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.6.2 - Minimize Soil Compaction in Disturbed Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.6.3 - Re-Vegetate / Re-Forest Disturbed Areas (Native Species)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.7.1 - Reduce Street Imperviousness	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.7.2 - Reduce Parking Imperviousness	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.8.1 - Rooftop Disconnection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.8.2 - Disconnection from Storm Sewers	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NS BMP 5.9.1 - Street Sweeping	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.1 - Riparian Buffer Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.2- Landscape Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Structural BMP 6.7.3- Soils Amendment and Restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*JB Tonkin Compressor Station Pre-Construction Runoff
Calculations*



Routing Diagram for Pre Compressor Station SW Model (revised 20% increase)
 Prepared by ERM, Printed 2/16/2017
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Pre Compressor Station SW Model (revised 20% increase)

Prepared by ERM

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.428	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S)
2.244	89	Gravel roads, HSG C (3S, 4S)
0.042	98	Paved driveway and building (2S)
1.082	98	Paved parking & roofs (3S, 4S, 6S)
11.797	79	TOTAL AREA

Pre Compressor Station SW Model (revised 20% increase)

Prepared by ERM

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
10.672	HSG C	1S, 2S, 3S, 4S, 5S, 6S
0.000	HSG D	
1.125	Other	2S, 3S, 4S, 6S
11.797		TOTAL AREA

Pre Compressor Station SW Model (revised 20% increase)

Prepared by ERM

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	8.428	0.000	0.000	8.428	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S
0.000	0.000	2.244	0.000	0.000	2.244	Gravel roads	3S, 4S
0.000	0.000	0.000	0.000	0.042	0.042	Paved driveway and building	2S
0.000	0.000	0.000	0.000	1.082	1.082	Paved parking & roofs	3S, 4S, 6S
0.000	0.000	10.672	0.000	1.125	11.797	TOTAL AREA	

Pre Compressor Station SW Model (revised 20% increase)

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	13R	1,060.00	1,046.00	330.0	0.0424	0.011	36.0	0.0	0.0

Pre Compressor Station SW Model (revised 20% increase) Type II 24-hr 2-yr Rainfall=2.38"

Prepared by ERM

Printed 2/16/2017

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>0.48"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=74 Runoff=0.91 cfs 0.047 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 5.10% Impervious Runoff Depth>0.52"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=75 Runoff=0.70 cfs 0.036 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>0.73"
Flow Length=256' Tc=17.8 min CN=80 Runoff=1.07 cfs 0.071 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 15.80% Impervious Runoff Depth>0.82"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=82 Runoff=6.94 cfs 0.420 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>0.48"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=74 Runoff=0.90 cfs 0.060 af

Subcatchment 6S: DA6 Runoff Area=44,211 sf 5.22% Impervious Runoff Depth>0.52"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=75 Runoff=0.71 cfs 0.044 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.16' Max Vel=1.94 fps Inflow=0.70 cfs 0.036 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=0.66 cfs 0.035 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.14' Max Vel=3.02 fps Inflow=0.91 cfs 0.047 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=0.86 cfs 0.047 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.16' Max Vel=6.05 fps Inflow=0.86 cfs 0.047 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=0.83 cfs 0.047 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.11' Max Vel=2.78 fps Inflow=1.90 cfs 0.118 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=1.86 cfs 0.117 af

Link 14L: Haymaker's Run Inflow=10.34 cfs 0.640 af
Primary=10.34 cfs 0.640 af

Total Runoff Area = 11.797 ac Runoff Volume = 0.677 af Average Runoff Depth = 0.69"
90.47% Pervious = 10.672 ac 9.53% Impervious = 1.125 ac

Summary for Subcatchment 1S: DA1

Runoff = 0.91 cfs @ 12.02 hrs, Volume= 0.047 af, Depth> 0.48"

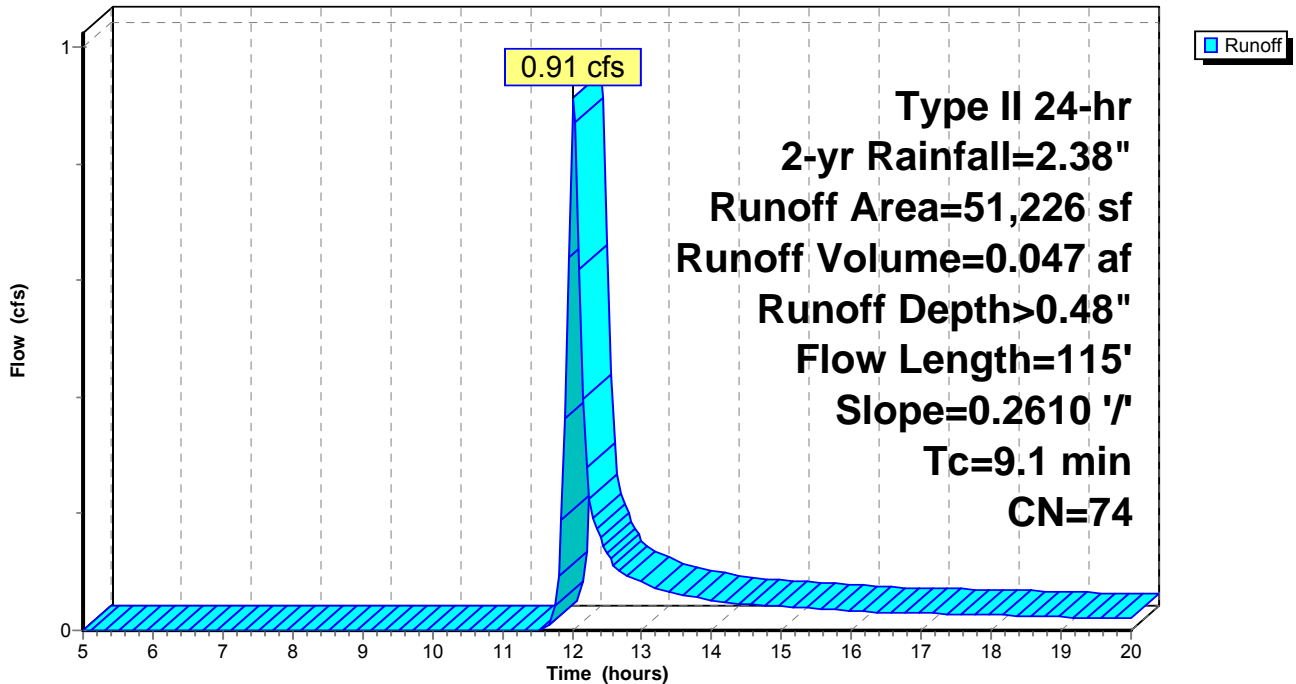
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
51,226	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
51,226	74	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



Summary for Subcatchment 2S: DA2

Runoff = 0.70 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 0.52"

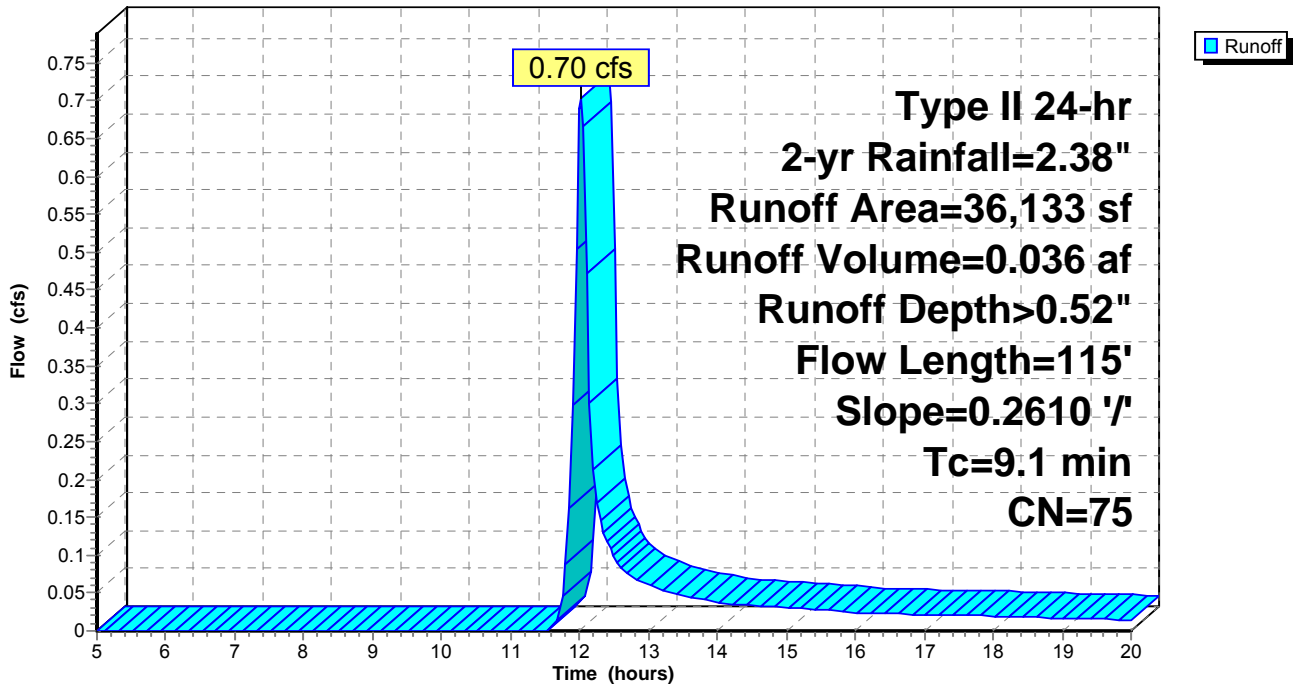
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
34,289	74	>75% Grass cover, Good, HSG C
* 1,844	98	Paved driveway and building
36,133	75	Weighted Average
34,289		94.90% Pervious Area
1,844		5.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

Hydrograph



Summary for Subcatchment 3S: DA3

Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.071 af, Depth> 0.73"

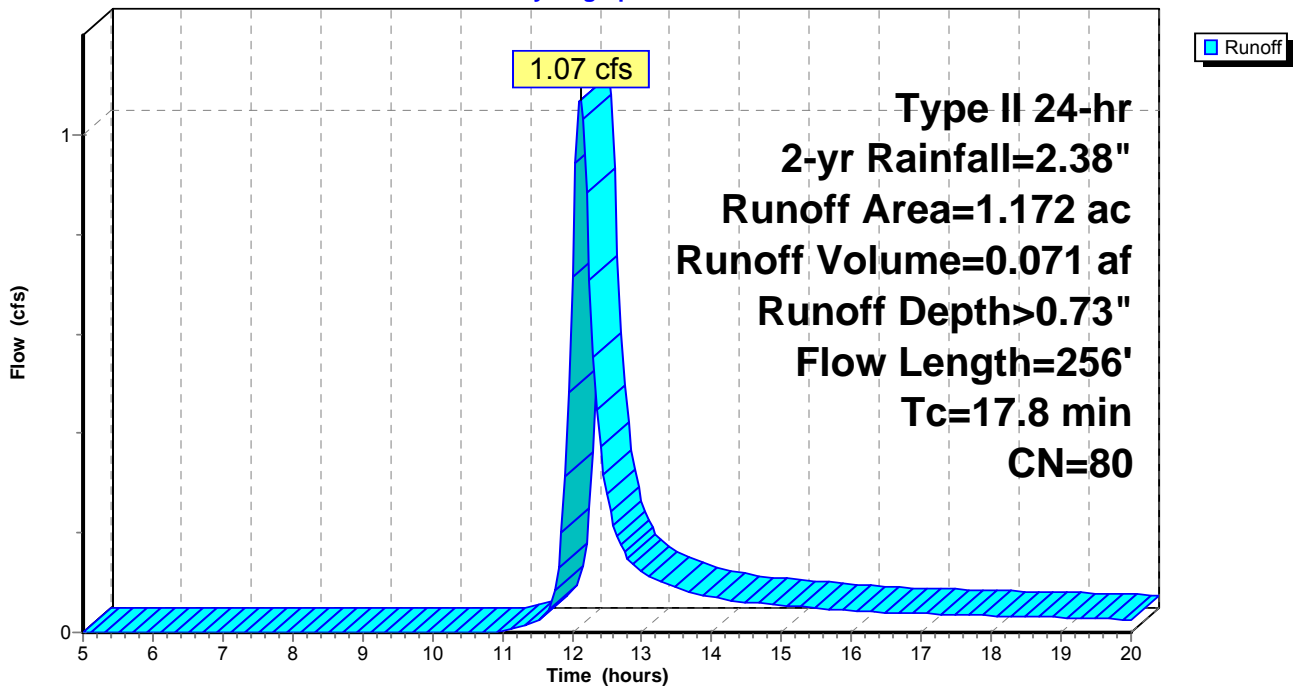
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

Hydrograph



Summary for Subcatchment 4S: DA4

Runoff = 6.94 cfs @ 12.08 hrs, Volume= 0.420 af, Depth> 0.82"

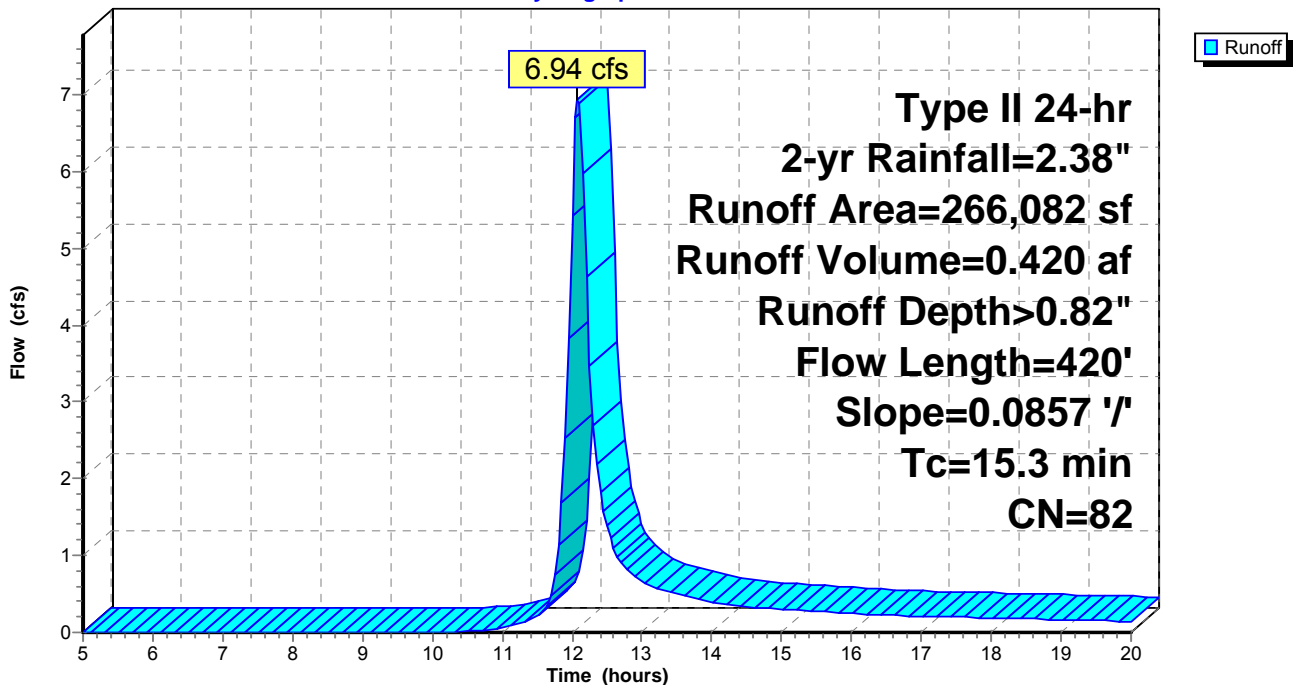
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
143,666	74	>75% Grass cover, Good, HSG C
80,369	89	Gravel roads, HSG C
42,047	98	Paved parking & roofs
266,082	82	Weighted Average
224,035		84.20% Pervious Area
42,047		15.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

Hydrograph



Summary for Subcatchment 5S: DA5

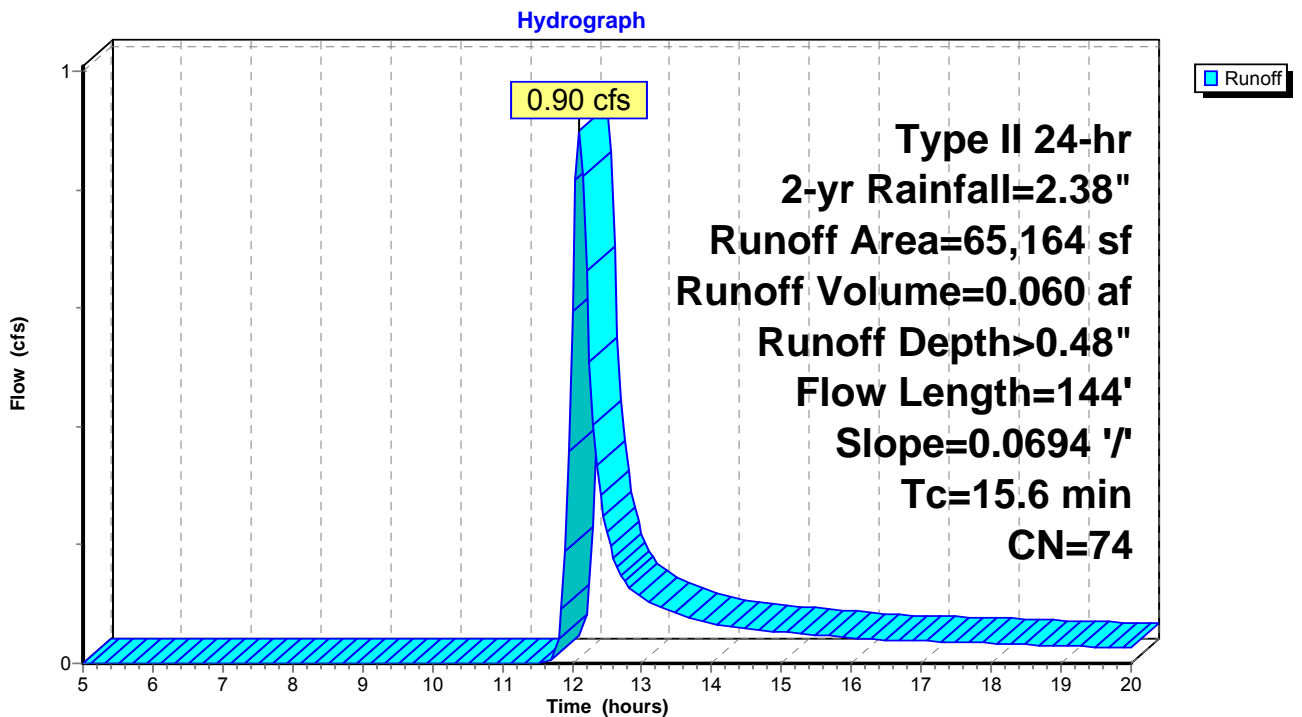
Runoff = 0.90 cfs @ 12.10 hrs, Volume= 0.060 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
65,164	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
65,164	74	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5



Summary for Subcatchment 6S: DA6

Runoff = 0.71 cfs @ 12.08 hrs, Volume= 0.044 af, Depth> 0.52"

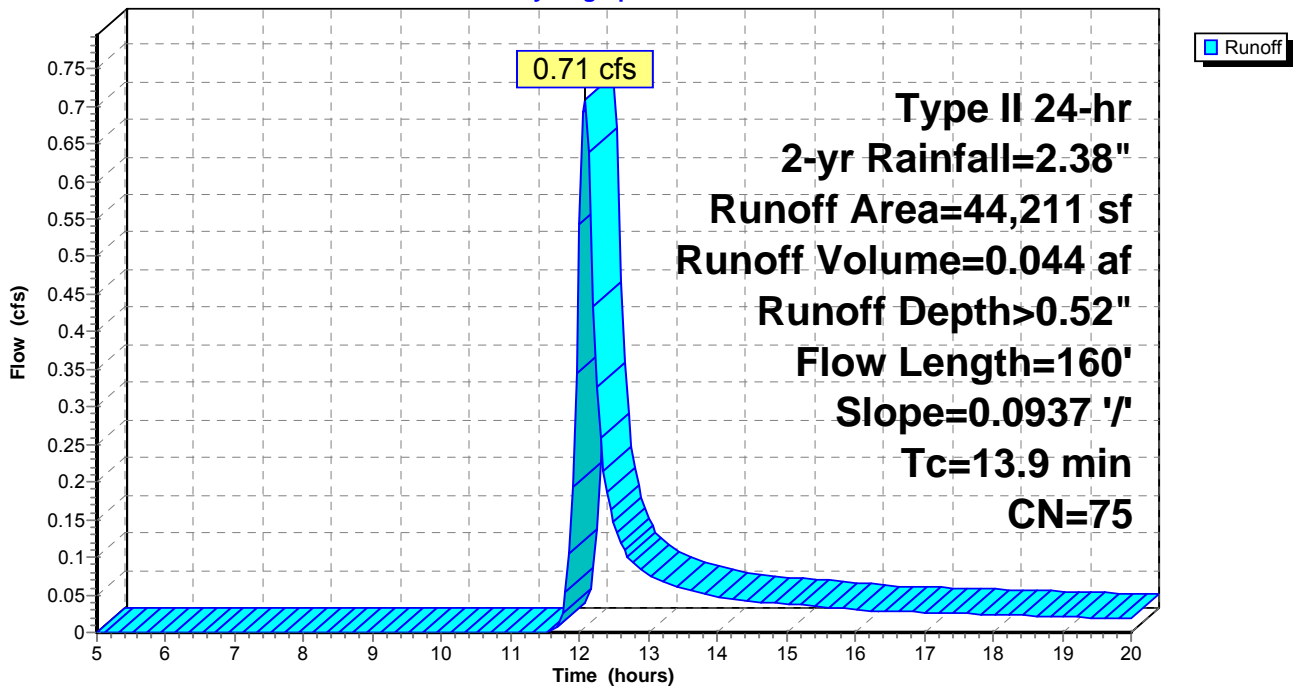
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
41,903	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
2,308	98	Paved parking & roofs
44,211	75	Weighted Average
41,903		94.78% Pervious Area
2,308		5.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

Hydrograph



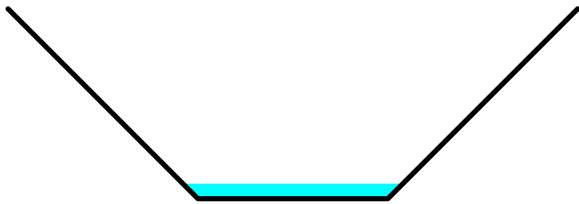
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 5.10% Impervious, Inflow Depth > 0.52" for 2-yr event
 Inflow = 0.70 cfs @ 12.02 hrs, Volume= 0.036 af
 Outflow = 0.66 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 6%, Lag= 4.9 min

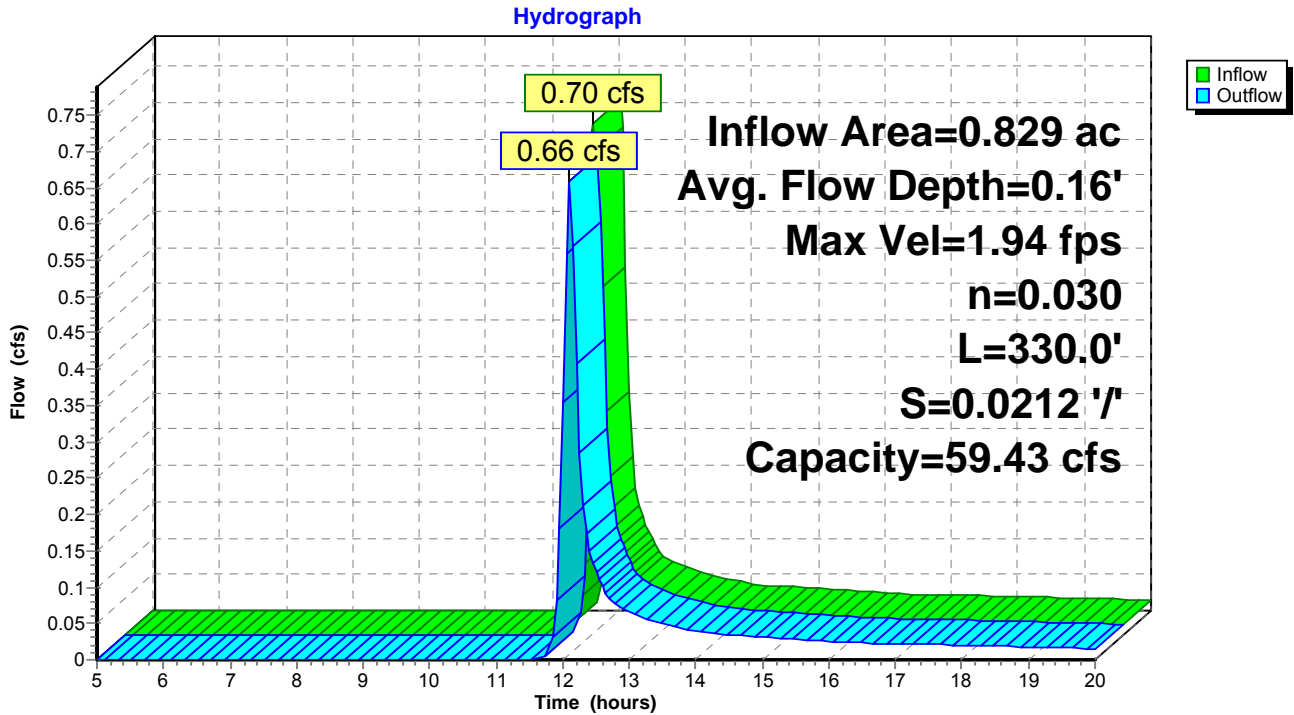
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.94 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 0.67 fps, Avg. Travel Time= 8.2 min

Peak Storage= 113 cf @ 12.05 hrs
 Average Depth at Peak Storage= 0.16'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 330.0' Slope= 0.0212 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch



Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 0.48" for 2-yr event
 Inflow = 0.91 cfs @ 12.02 hrs, Volume= 0.047 af
 Outflow = 0.86 cfs @ 12.07 hrs, Volume= 0.047 af, Atten= 6%, Lag= 2.9 min

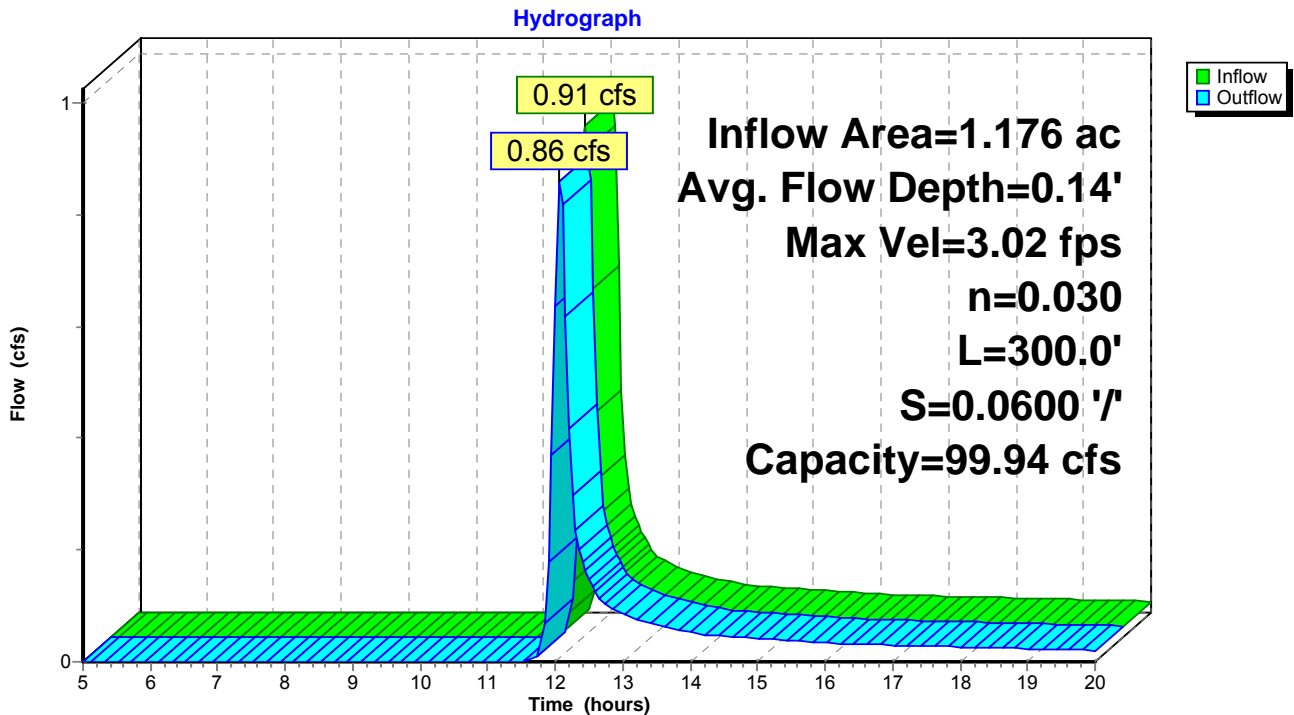
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.02 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 1.06 fps, Avg. Travel Time= 4.7 min

Peak Storage= 89 cf @ 12.04 hrs
 Average Depth at Peak Storage= 0.14'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/ Top Width= 6.00'
 Length= 300.0' Slope= 0.0600 '/
 Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

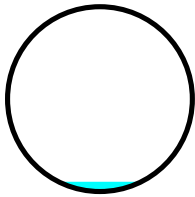
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 0.48" for 2-yr event
 Inflow = 0.86 cfs @ 12.07 hrs, Volume= 0.047 af
 Outflow = 0.83 cfs @ 12.10 hrs, Volume= 0.047 af, Atten= 3%, Lag= 1.7 min

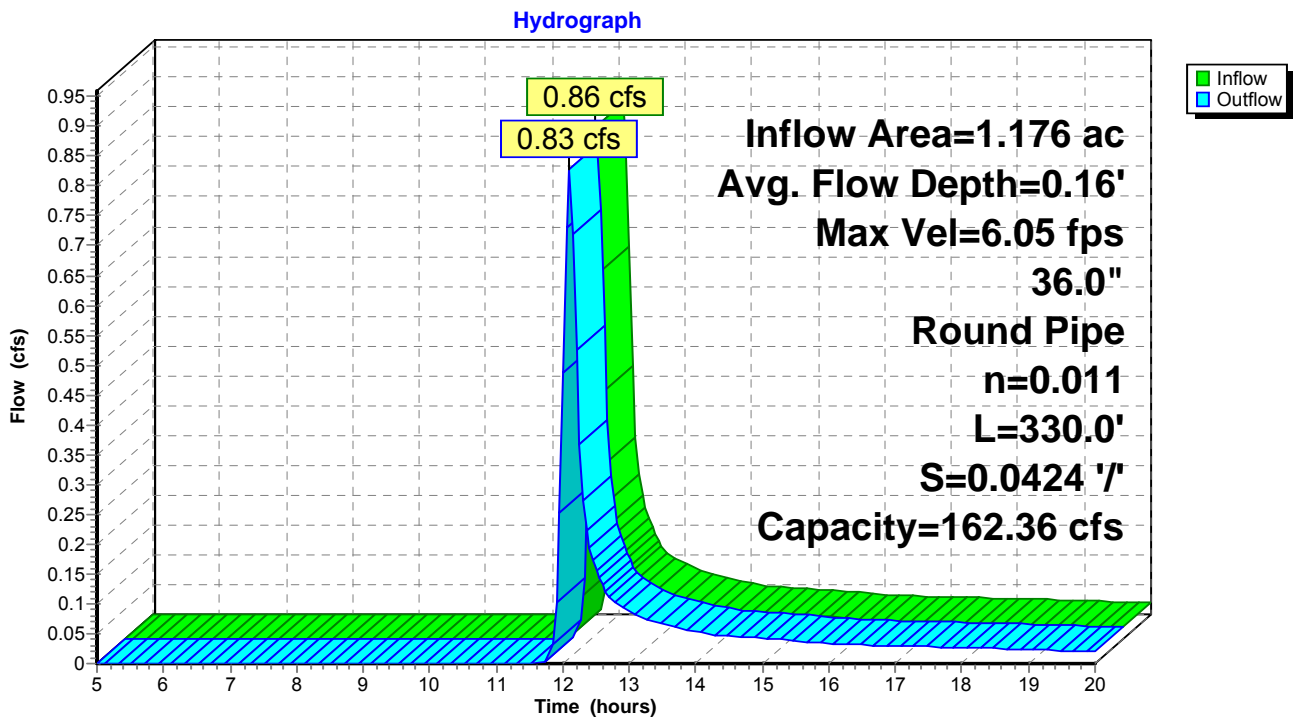
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.05 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 2.59 fps, Avg. Travel Time= 2.1 min

Peak Storage= 46 cf @ 12.08 hrs
 Average Depth at Peak Storage= 0.16'
 Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 330.0' Slope= 0.0424 '/'
 Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



Summary for Reach 16R: Ditch to Haymaker's Run

[62] Hint: Exceeded Reach 13R OUTLET depth by 0.01' @ 11.75 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 0.60" for 2-yr event
 Inflow = 1.90 cfs @ 12.11 hrs, Volume= 0.118 af
 Outflow = 1.86 cfs @ 12.12 hrs, Volume= 0.117 af, Atten= 2%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.78 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 1.04 fps, Avg. Travel Time= 1.5 min

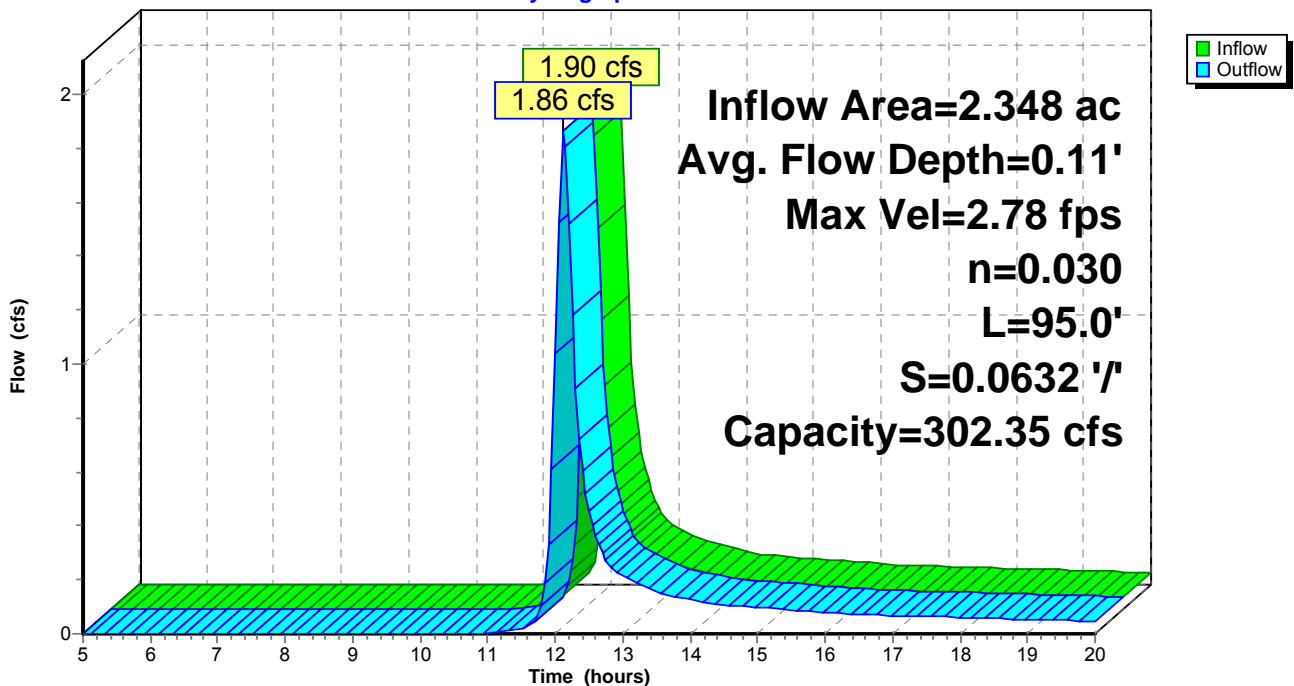
Peak Storage= 65 cf @ 12.11 hrs
 Average Depth at Peak Storage= 0.11'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 2.0 '/' Top Width= 14.00'
 Length= 95.0' Slope= 0.0632 '/'
 Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

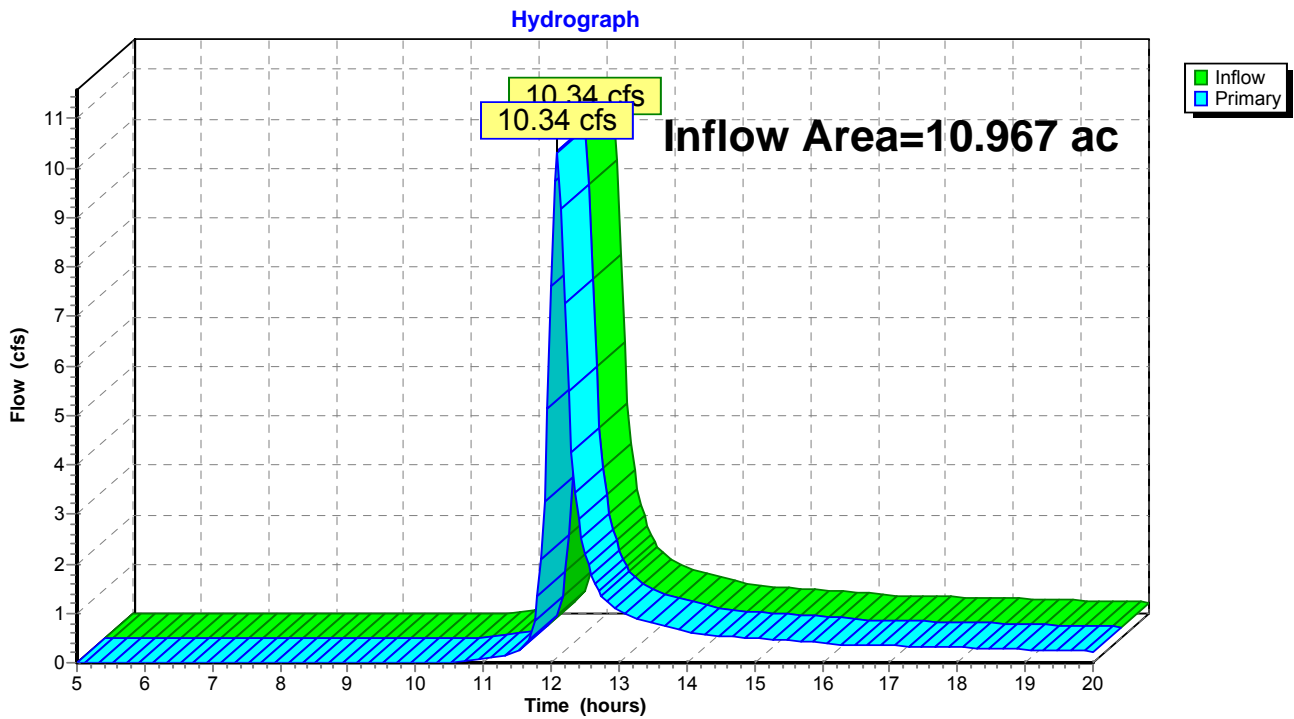


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.967 ac, 9.87% Impervious, Inflow Depth > 0.70" for 2-yr event
Inflow = 10.34 cfs @ 12.09 hrs, Volume= 0.640 af
Primary = 10.34 cfs @ 12.09 hrs, Volume= 0.640 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1	Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>1.03" Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=74 Runoff=2.06 cfs 0.101 af
Subcatchment 2S: DA2	Runoff Area=36,133 sf 5.10% Impervious Runoff Depth>1.08" Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=75 Runoff=1.54 cfs 0.075 af
Subcatchment 3S: DA3	Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>1.39" Flow Length=256' Tc=17.8 min CN=80 Runoff=2.09 cfs 0.135 af
Subcatchment 4S: DA4	Runoff Area=266,082 sf 15.80% Impervious Runoff Depth>1.52" Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=82 Runoff=12.86 cfs 0.775 af
Subcatchment 5S: DA5	Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>1.02" Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=74 Runoff=2.07 cfs 0.128 af
Subcatchment 6S: DA6	Runoff Area=44,211 sf 5.22% Impervious Runoff Depth>1.08" Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=75 Runoff=1.58 cfs 0.091 af
Reach 11R: Roadway Ditch	Avg. Flow Depth=0.26' Max Vel=2.56 fps Inflow=1.54 cfs 0.075 af n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=1.43 cfs 0.074 af
Reach 12R: Roadway Ditch	Avg. Flow Depth=0.23' Max Vel=4.00 fps Inflow=2.06 cfs 0.101 af n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=1.96 cfs 0.100 af
Reach 13R: Culvert (Running N to S) w/ 36.0" Round Pipe	Avg. Flow Depth=0.23' Max Vel=7.81 fps Inflow=1.96 cfs 0.100 af n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=1.90 cfs 0.100 af
Reach 16R: Ditch to Haymaker's Run	Avg. Flow Depth=0.17' Max Vel=3.66 fps Inflow=3.93 cfs 0.235 af n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=3.89 cfs 0.235 af
Link 14L: Haymaker's Run	Inflow=20.35 cfs 1.229 af Primary=20.35 cfs 1.229 af

Total Runoff Area = 11.797 ac Runoff Volume = 1.305 af Average Runoff Depth = 1.33"
90.47% Pervious = 10.672 ac 9.53% Impervious = 1.125 ac

Summary for Subcatchment 1S: DA1

Runoff = 2.06 cfs @ 12.01 hrs, Volume= 0.101 af, Depth> 1.03"

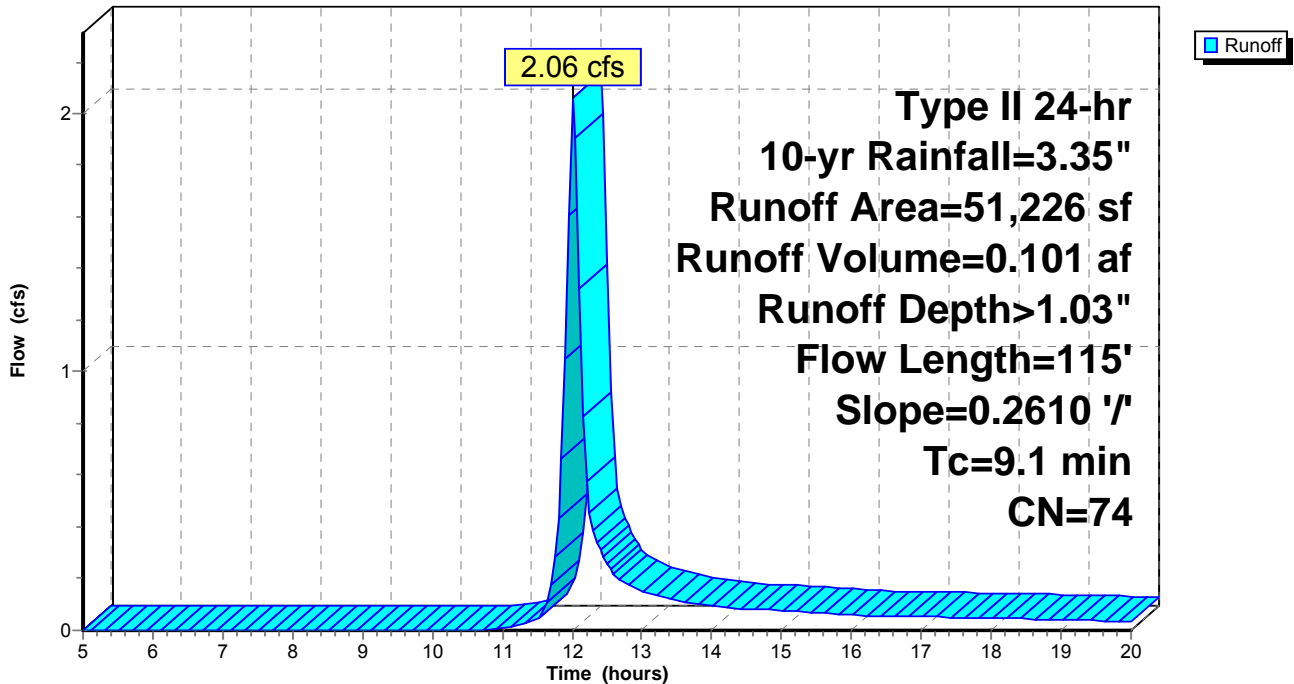
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
51,226	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
51,226	74	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



Summary for Subcatchment 2S: DA2

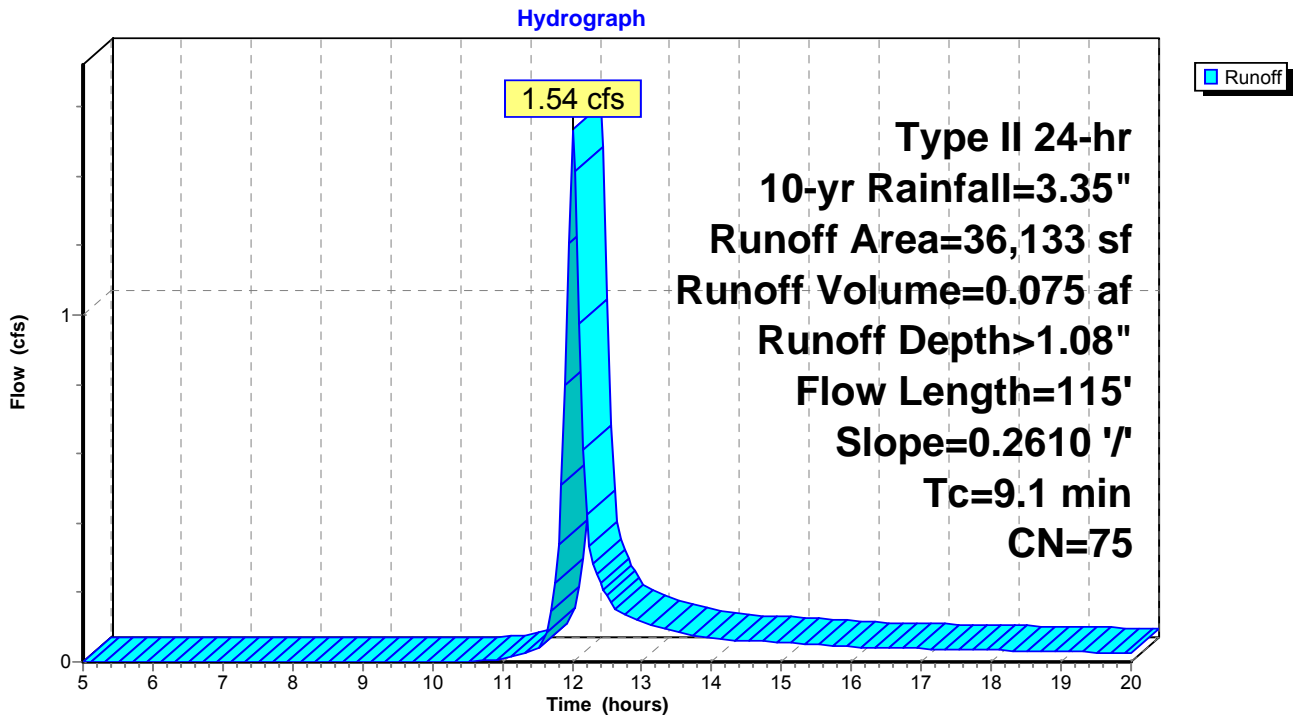
Runoff = 1.54 cfs @ 12.01 hrs, Volume= 0.075 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
34,289	74	>75% Grass cover, Good, HSG C
* 1,844	98	Paved driveway and building
36,133	75	Weighted Average
34,289		94.90% Pervious Area
1,844		5.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2



Summary for Subcatchment 3S: DA3

Runoff = 2.09 cfs @ 12.11 hrs, Volume= 0.135 af, Depth> 1.39"

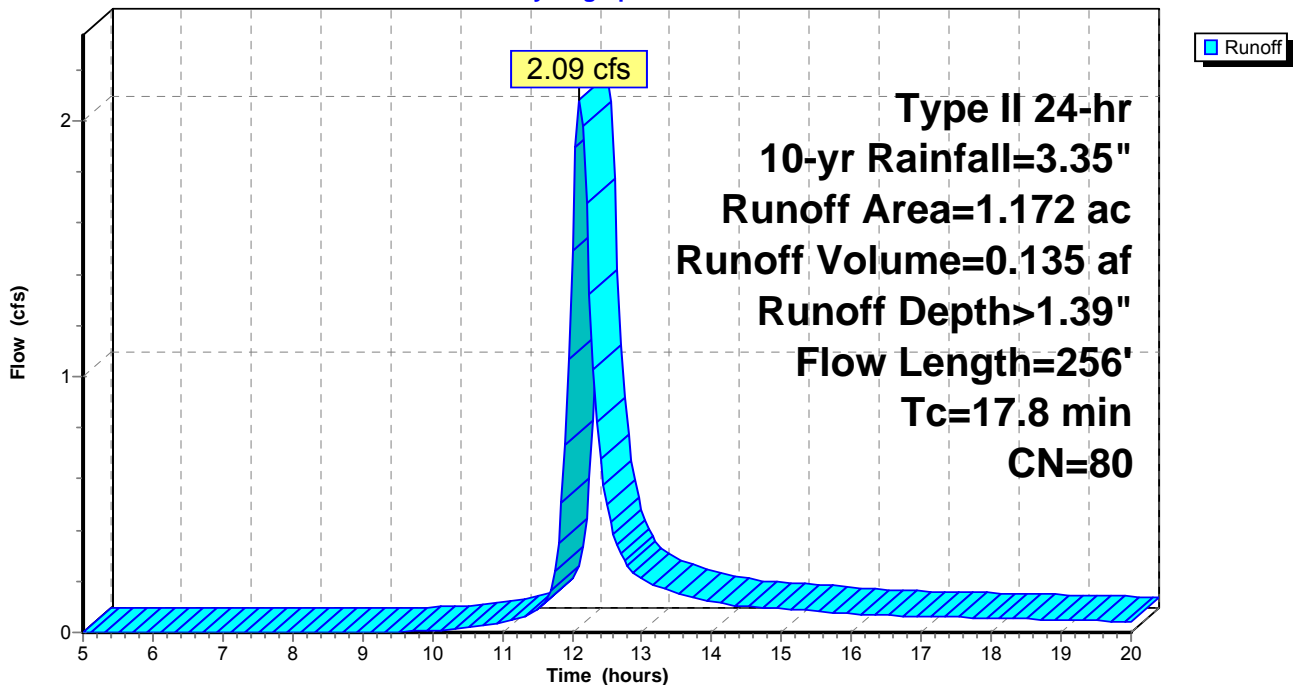
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

Hydrograph



Summary for Subcatchment 4S: DA4

Runoff = 12.86 cfs @ 12.08 hrs, Volume= 0.775 af, Depth> 1.52"

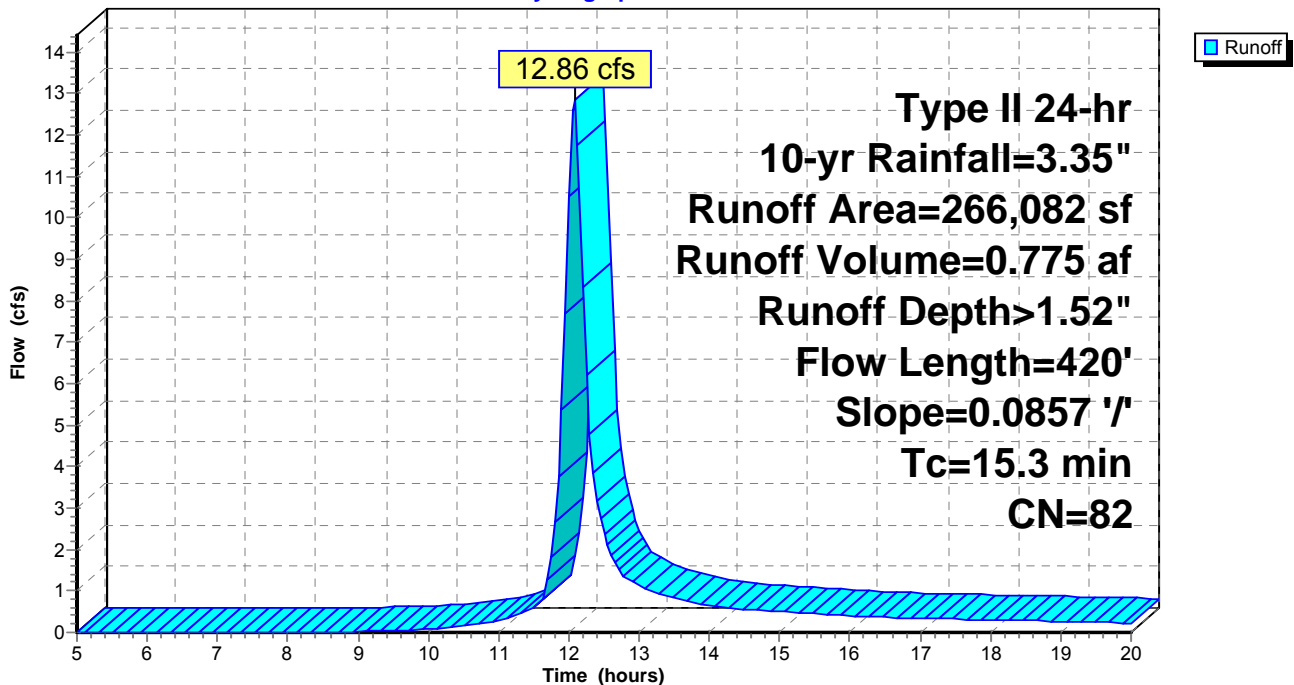
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
143,666	74	>75% Grass cover, Good, HSG C
80,369	89	Gravel roads, HSG C
42,047	98	Paved parking & roofs
266,082	82	Weighted Average
224,035		84.20% Pervious Area
42,047		15.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

Hydrograph



Summary for Subcatchment 5S: DA5

Runoff = 2.07 cfs @ 12.09 hrs, Volume= 0.128 af, Depth> 1.02"

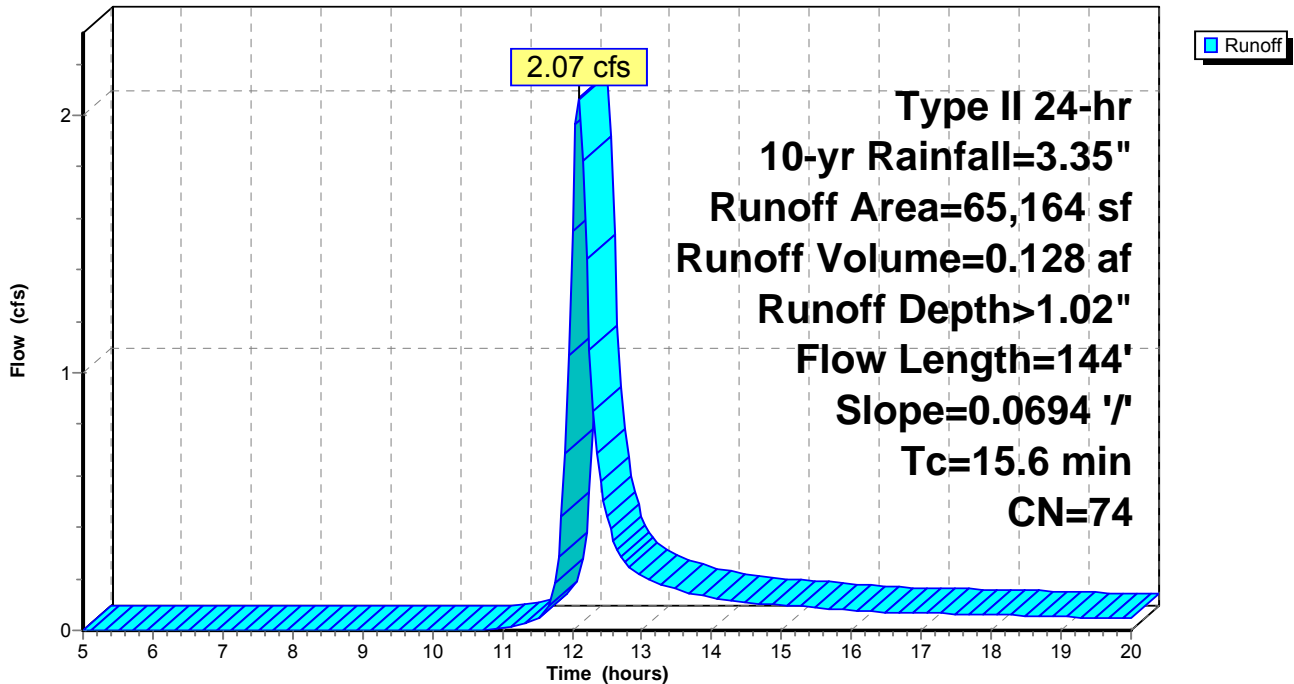
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
65,164	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
65,164	74	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

Hydrograph



Summary for Subcatchment 6S: DA6

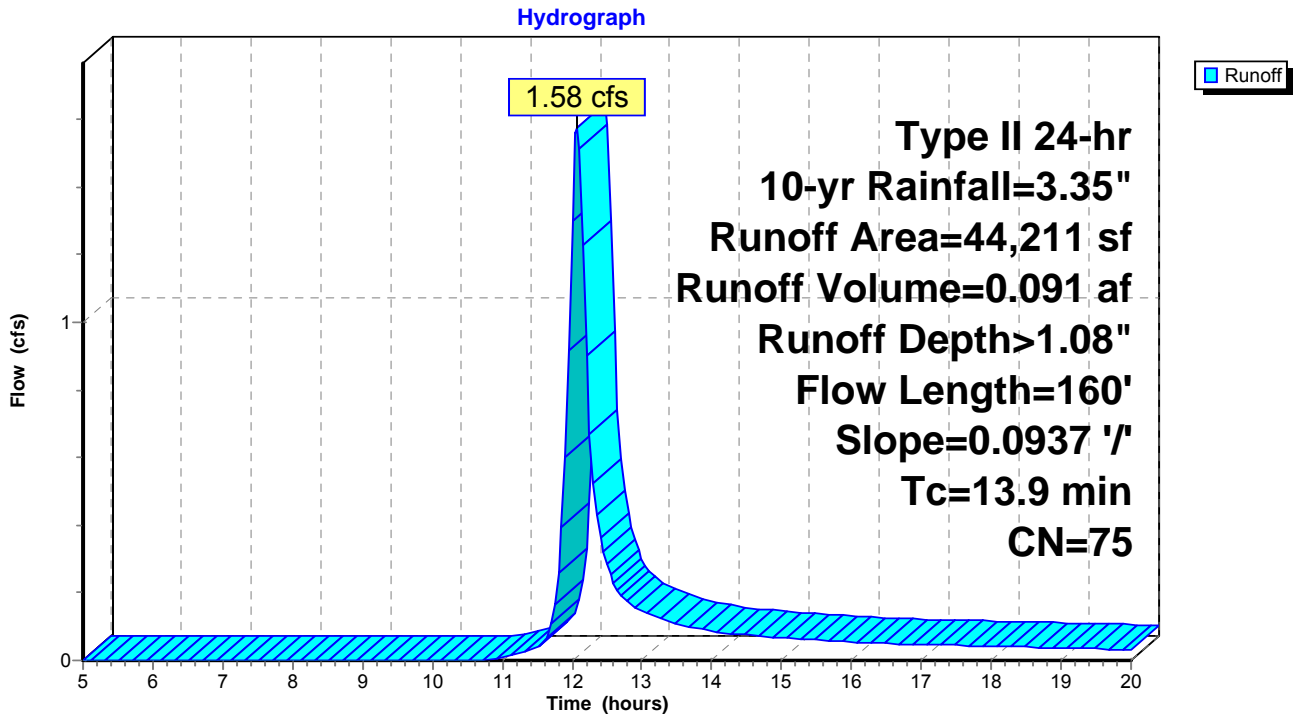
Runoff = 1.58 cfs @ 12.07 hrs, Volume= 0.091 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
41,903	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
2,308	98	Paved parking & roofs
44,211	75	Weighted Average
41,903		94.78% Pervious Area
2,308		5.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6



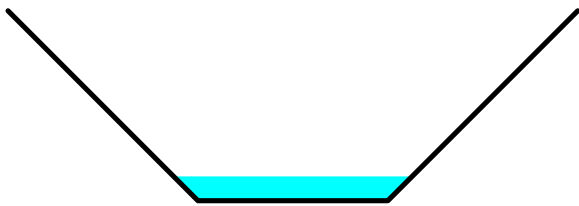
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 5.10% Impervious, Inflow Depth > 1.08" for 10-yr event
 Inflow = 1.54 cfs @ 12.01 hrs, Volume= 0.075 af
 Outflow = 1.43 cfs @ 12.07 hrs, Volume= 0.074 af, Atten= 7%, Lag= 3.8 min

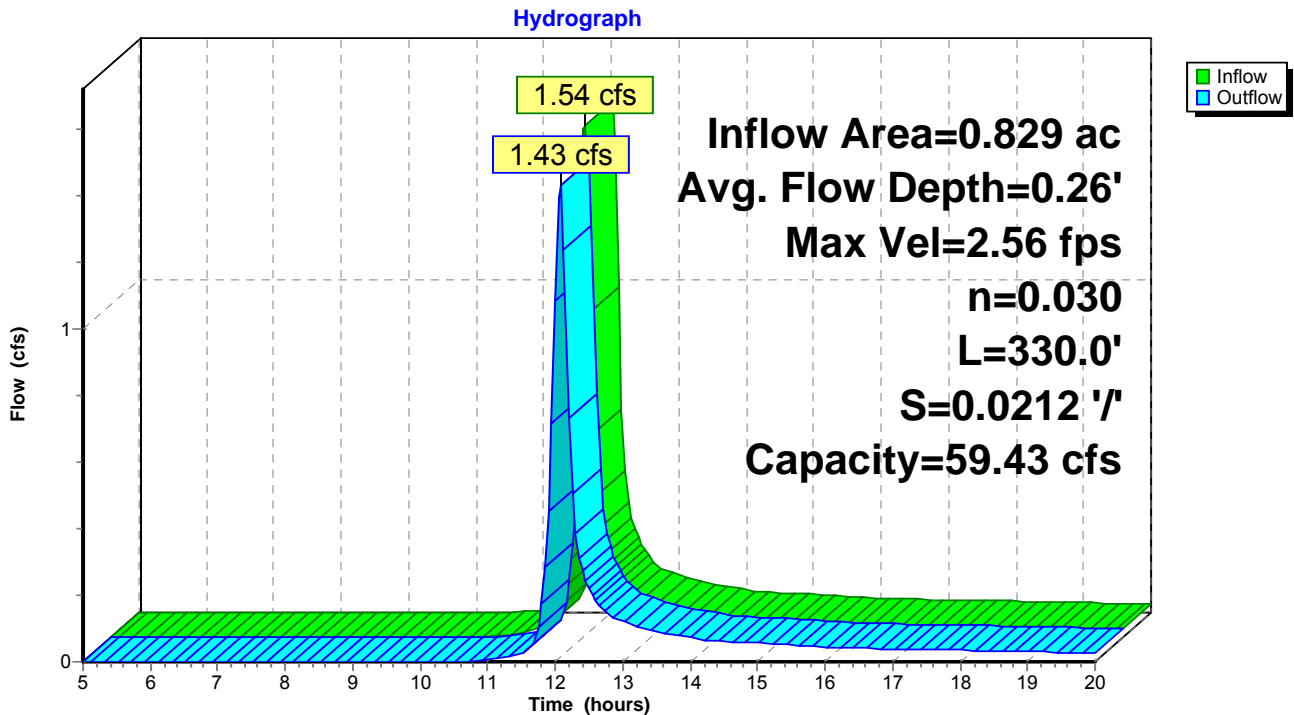
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.56 fps, Min. Travel Time= 2.1 min
 Avg. Velocity = 0.82 fps, Avg. Travel Time= 6.7 min

Peak Storage= 191 cf @ 12.04 hrs
 Average Depth at Peak Storage= 0.26'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 330.0' Slope= 0.0212 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch



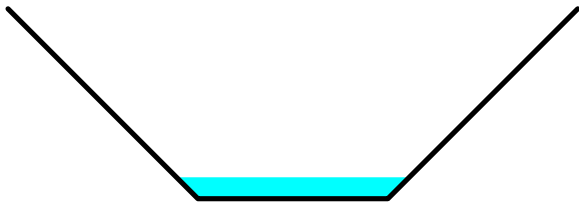
Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.03" for 10-yr event
 Inflow = 2.06 cfs @ 12.01 hrs, Volume= 0.101 af
 Outflow = 1.96 cfs @ 12.05 hrs, Volume= 0.100 af, Atten= 5%, Lag= 2.2 min

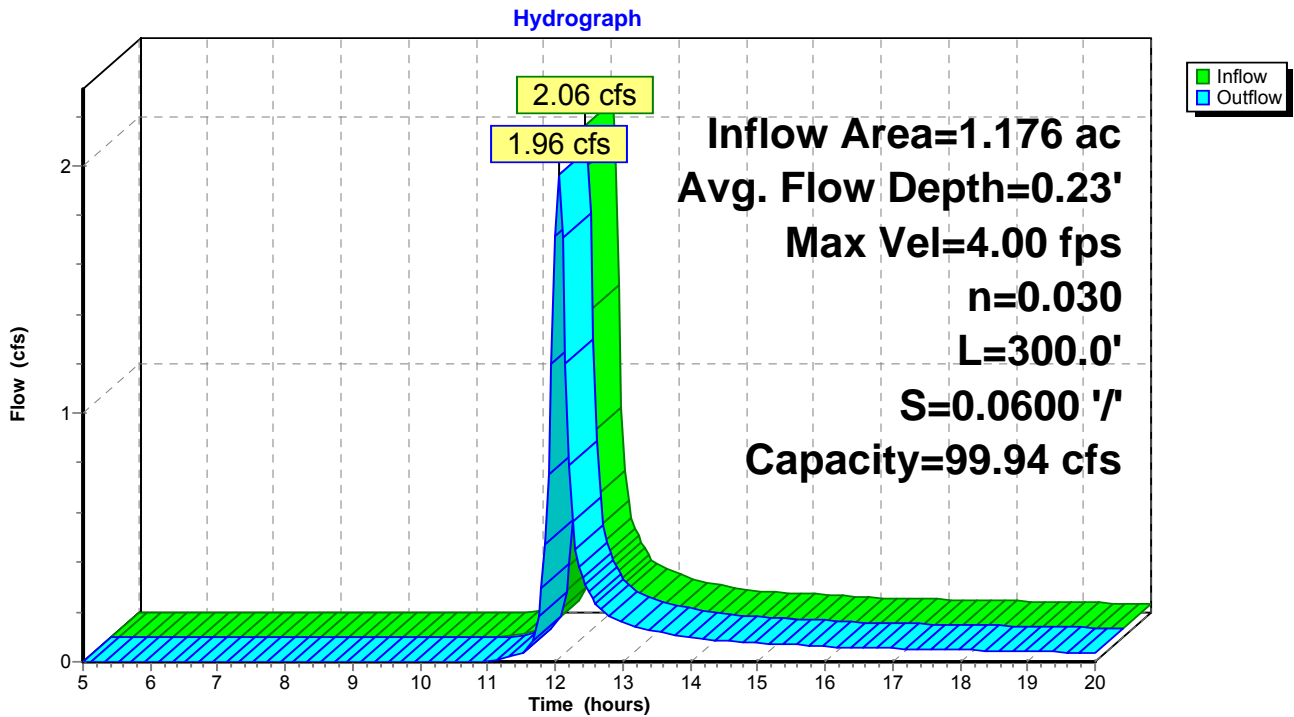
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.00 fps, Min. Travel Time= 1.3 min
 Avg. Velocity = 1.28 fps, Avg. Travel Time= 3.9 min

Peak Storage= 151 cf @ 12.03 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/ Top Width= 6.00'
 Length= 300.0' Slope= 0.0600 '/
 Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

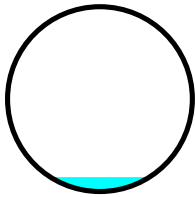
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.02" for 10-yr event
 Inflow = 1.96 cfs @ 12.05 hrs, Volume= 0.100 af
 Outflow = 1.90 cfs @ 12.07 hrs, Volume= 0.100 af, Atten= 3%, Lag= 1.2 min

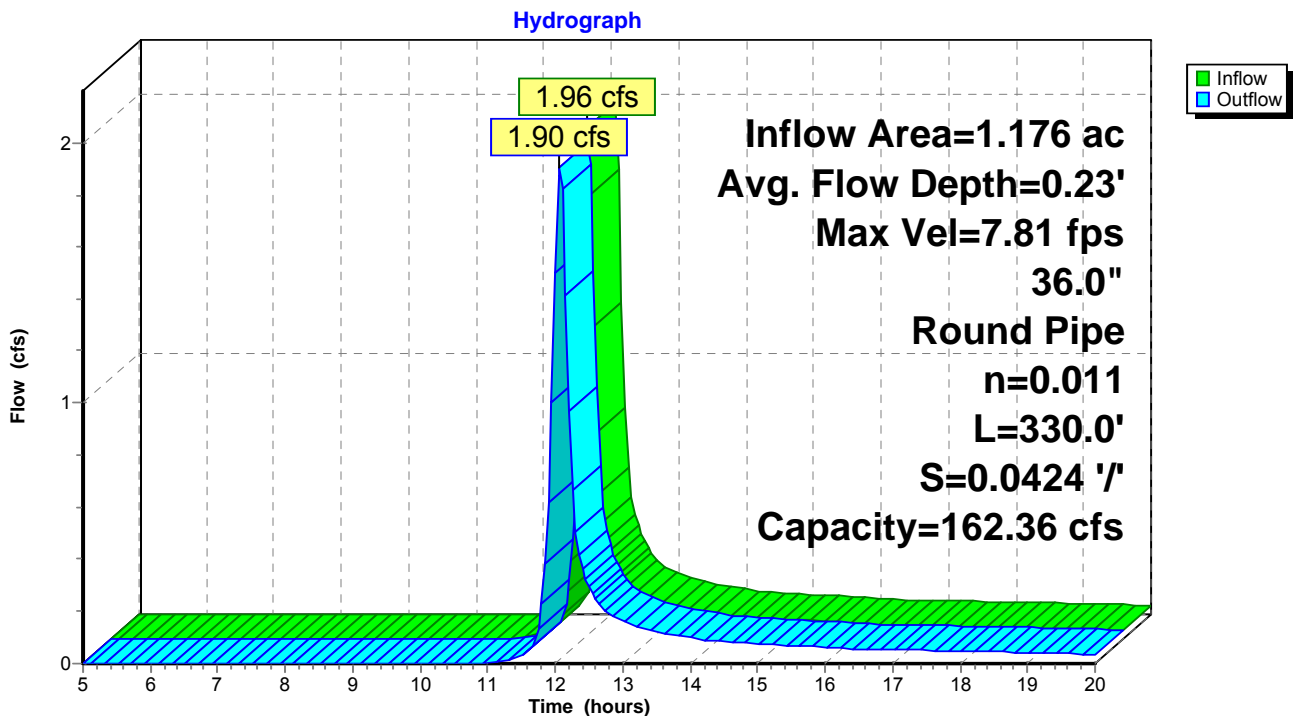
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 7.81 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 3.08 fps, Avg. Travel Time= 1.8 min

Peak Storage= 83 cf @ 12.06 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 330.0' Slope= 0.0424 '/'
 Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.17' @ 12.10 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 1.20" for 10-yr event
 Inflow = 3.93 cfs @ 12.09 hrs, Volume= 0.235 af
 Outflow = 3.89 cfs @ 12.10 hrs, Volume= 0.235 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.66 fps, Min. Travel Time= 0.4 min
 Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.4 min

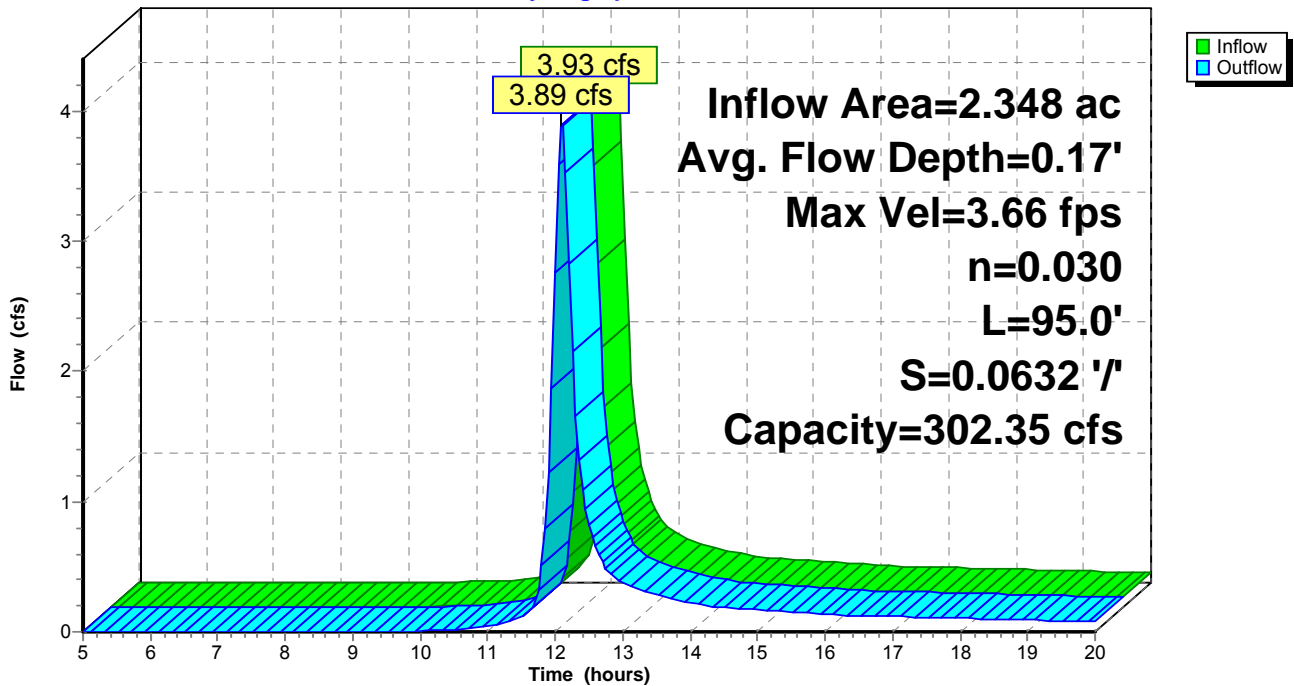
Peak Storage= 102 cf @ 12.09 hrs
 Average Depth at Peak Storage= 0.17'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 2.0 '/' Top Width= 14.00'
 Length= 95.0' Slope= 0.0632 '/'
 Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

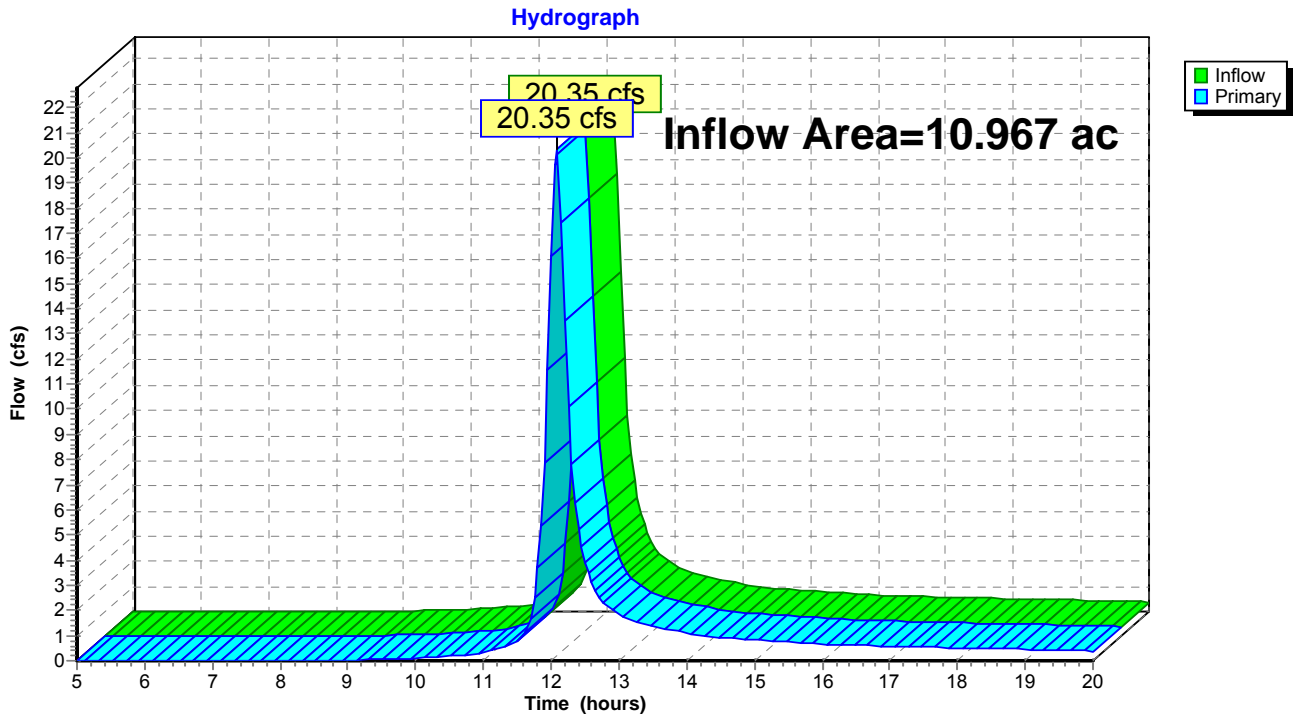


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.967 ac, 9.87% Impervious, Inflow Depth > 1.34" for 10-yr event
Inflow = 20.35 cfs @ 12.08 hrs, Volume= 1.229 af
Primary = 20.35 cfs @ 12.08 hrs, Volume= 1.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



Pre Compressor Station SW Model (revised 20% increase Type II 24-hr 50-yr Rainfall=4.46"

Prepared by ERM

Printed 3/24/2017

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>1.77"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=74 Runoff=3.58 cfs 0.174 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 5.10% Impervious Runoff Depth>1.85"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=75 Runoff=2.63 cfs 0.128 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>2.23"
Flow Length=256' Tc=17.8 min CN=80 Runoff=3.36 cfs 0.218 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 15.80% Impervious Runoff Depth>2.40"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=82 Runoff=20.16 cfs 1.224 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>1.77"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=74 Runoff=3.63 cfs 0.221 af

Subcatchment 6S: DA6 Runoff Area=44,211 sf 5.22% Impervious Runoff Depth>1.84"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=75 Runoff=2.72 cfs 0.156 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.35' Max Vel=3.05 fps Inflow=2.63 cfs 0.128 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=2.47 cfs 0.127 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.31' Max Vel=4.80 fps Inflow=3.58 cfs 0.174 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=3.43 cfs 0.173 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.30' Max Vel=9.24 fps Inflow=3.43 cfs 0.173 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=3.35 cfs 0.173 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.23' Max Vel=4.39 fps Inflow=6.56 cfs 0.391 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=6.49 cfs 0.391 af

Link 14L: Haymaker's Run Inflow=32.92 cfs 1.991 af
Primary=32.92 cfs 1.991 af

Total Runoff Area = 11.797 ac Runoff Volume = 2.120 af Average Runoff Depth = 2.16"
90.47% Pervious = 10.672 ac 9.53% Impervious = 1.125 ac

Summary for Subcatchment 1S: DA1

Runoff = 3.58 cfs @ 12.01 hrs, Volume= 0.174 af, Depth> 1.77"

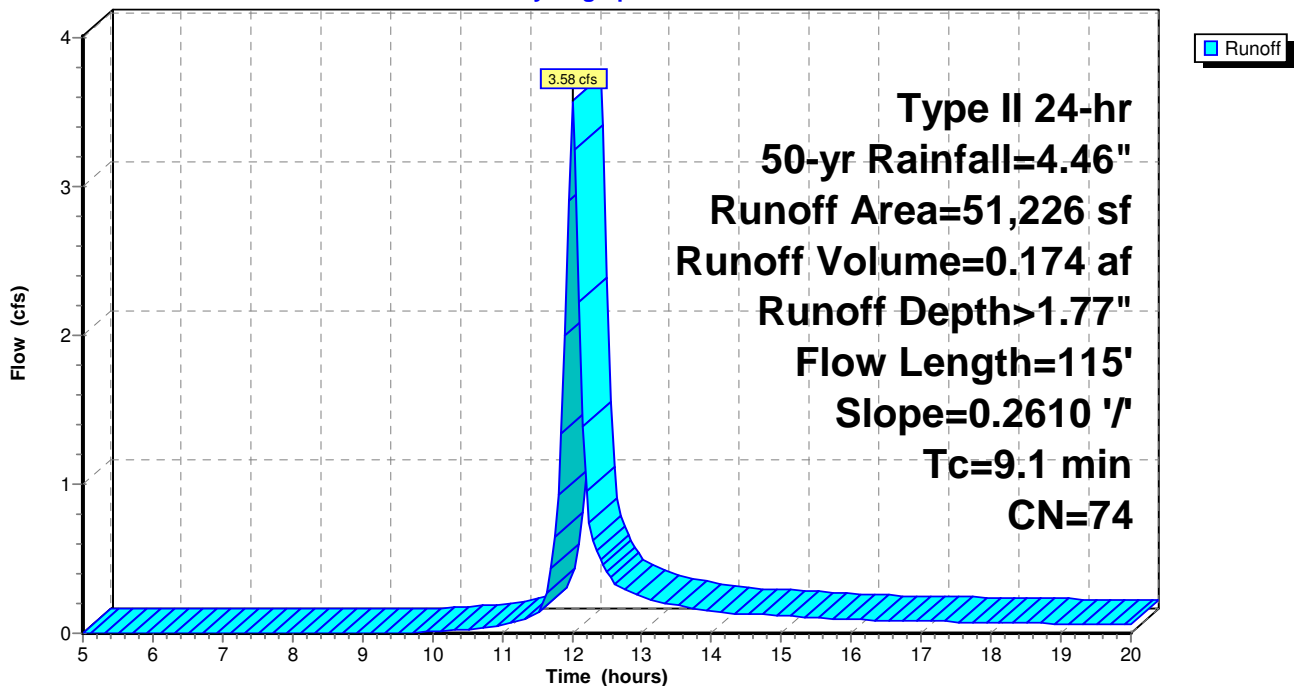
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
51,226	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
51,226	74	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



Summary for Subcatchment 2S: DA2

Runoff = 2.63 cfs @ 12.01 hrs, Volume= 0.128 af, Depth> 1.85"

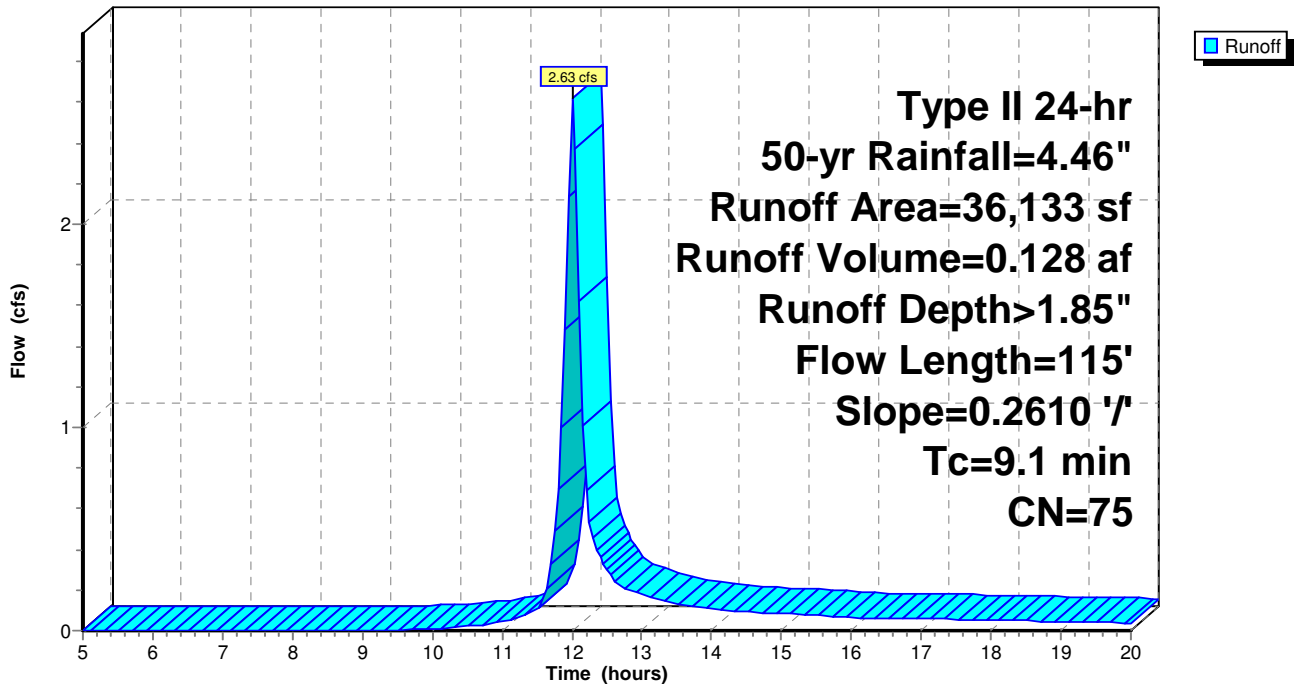
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
34,289	74	>75% Grass cover, Good, HSG C
* 1,844	98	Paved driveway and building
36,133	75	Weighted Average
34,289		94.90% Pervious Area
1,844		5.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

Hydrograph



Summary for Subcatchment 3S: DA3

Runoff = 3.36 cfs @ 12.10 hrs, Volume= 0.218 af, Depth> 2.23"

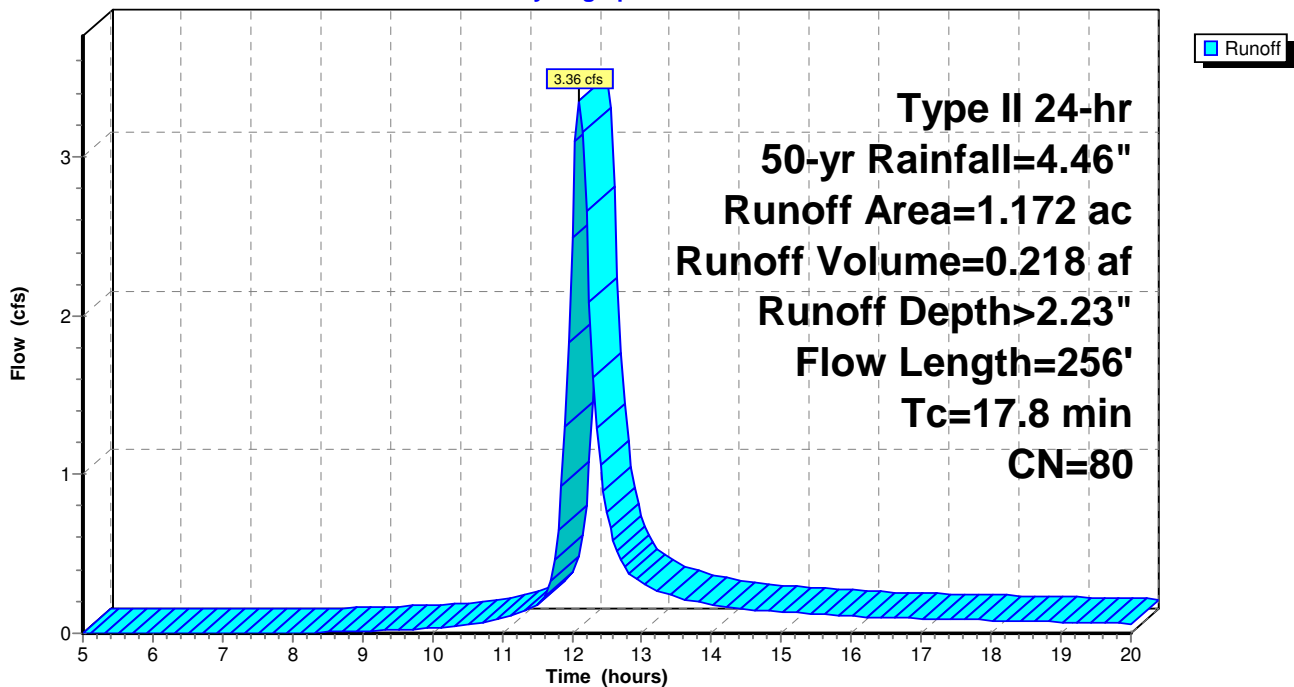
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

Hydrograph



Summary for Subcatchment 4S: DA4

Runoff = 20.16 cfs @ 12.07 hrs, Volume= 1.224 af, Depth> 2.40"

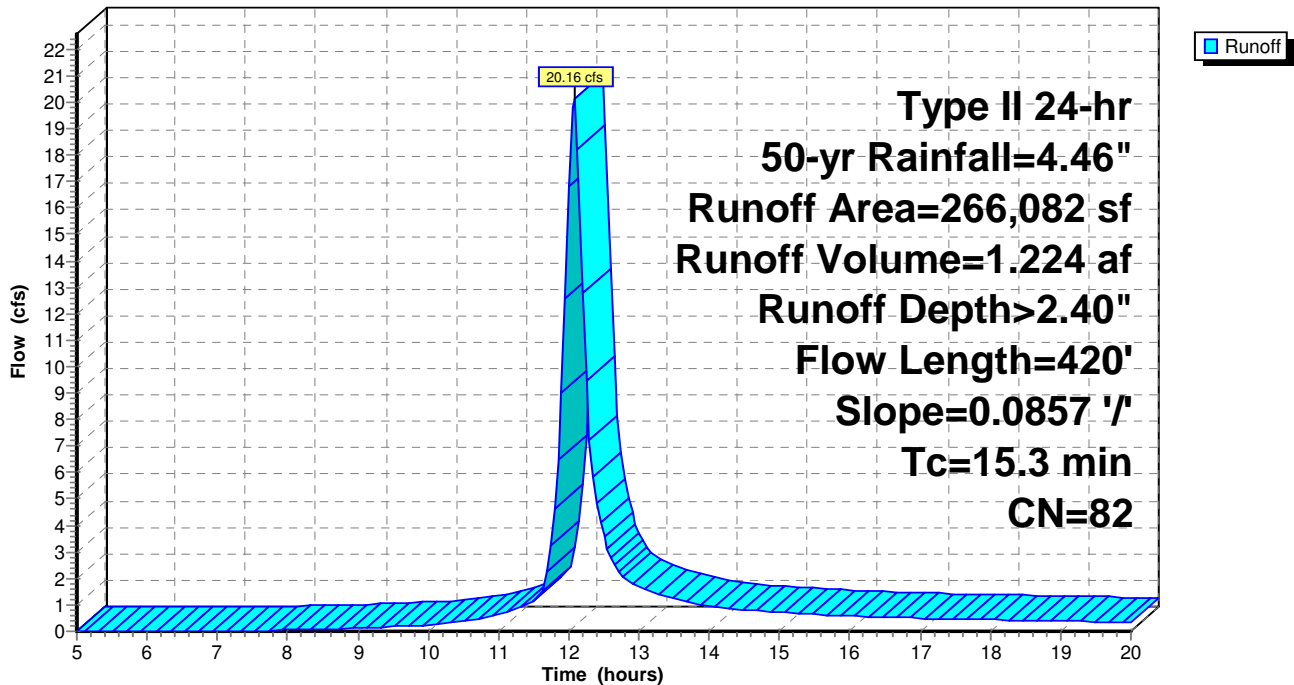
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
143,666	74	>75% Grass cover, Good, HSG C
80,369	89	Gravel roads, HSG C
42,047	98	Paved parking & roofs
266,082	82	Weighted Average
224,035		84.20% Pervious Area
42,047		15.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

Hydrograph



Summary for Subcatchment 5S: DA5

Runoff = 3.63 cfs @ 12.08 hrs, Volume= 0.221 af, Depth> 1.77"

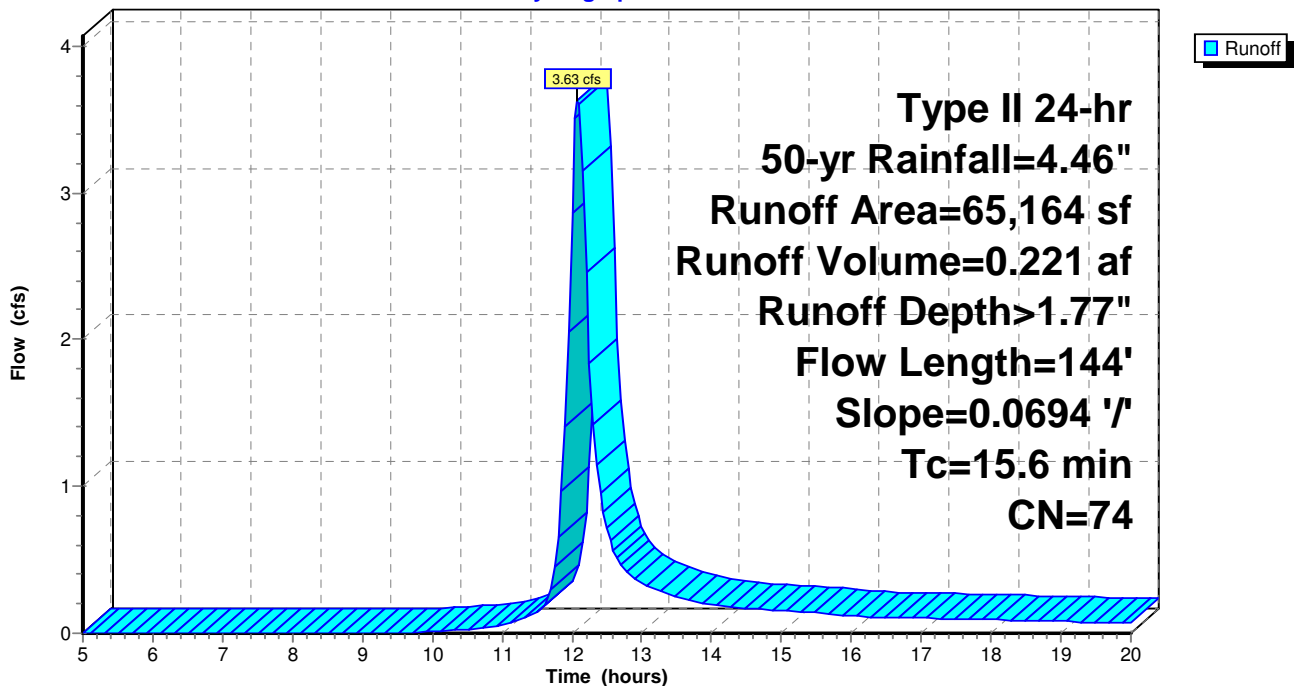
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
65,164	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
65,164	74	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

Hydrograph



Summary for Subcatchment 6S: DA6

Runoff = 2.72 cfs @ 12.06 hrs, Volume= 0.156 af, Depth> 1.84"

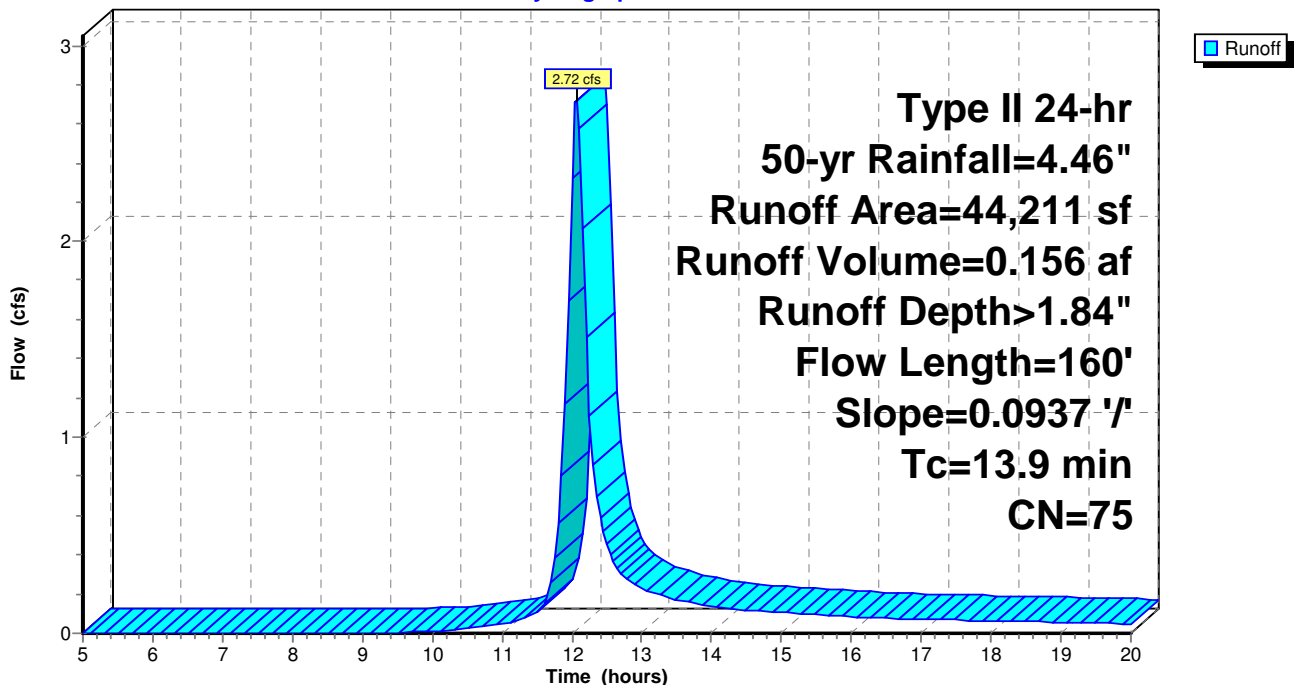
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
41,903	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
2,308	98	Paved parking & roofs
44,211	75	Weighted Average
41,903		94.78% Pervious Area
2,308		5.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

Hydrograph



Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 5.10% Impervious, Inflow Depth > 1.85" for 50-yr event
 Inflow = 2.63 cfs @ 12.01 hrs, Volume= 0.128 af
 Outflow = 2.47 cfs @ 12.06 hrs, Volume= 0.127 af, Atten= 6%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.05 fps, Min. Travel Time= 1.8 min
 Avg. Velocity = 0.92 fps, Avg. Travel Time= 6.0 min

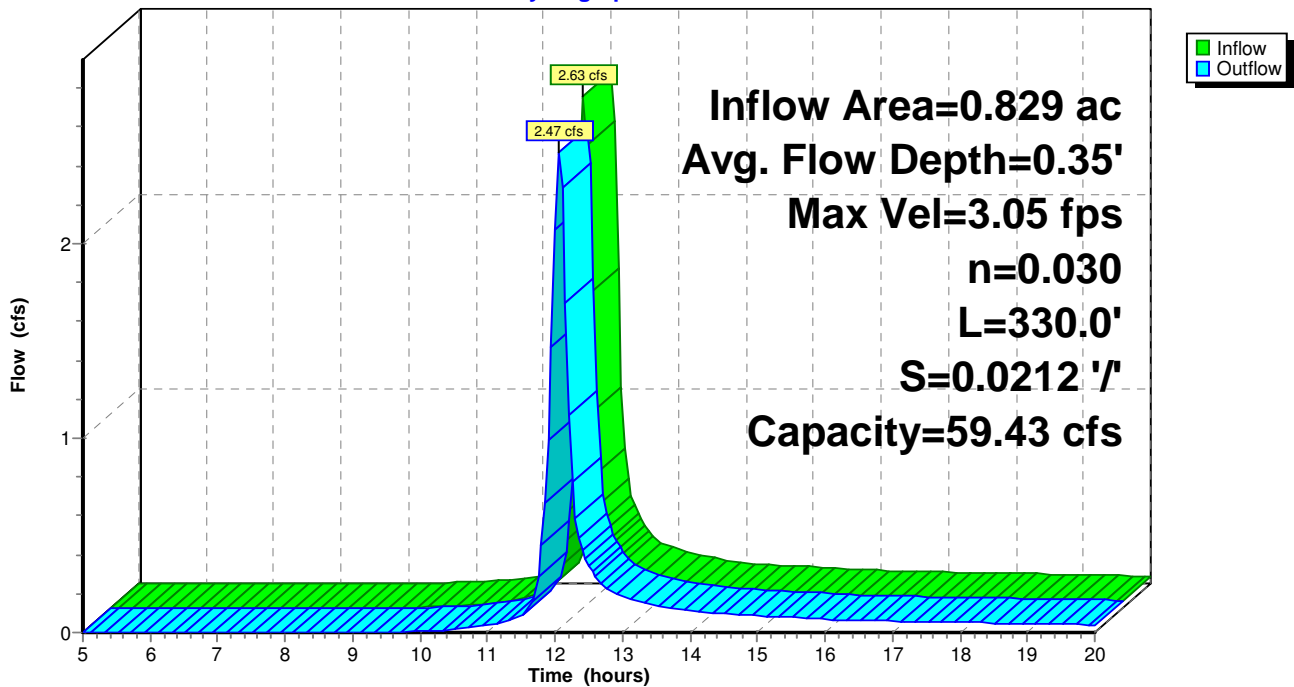
Peak Storage= 274 cf @ 12.03 hrs
 Average Depth at Peak Storage= 0.35'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 330.0' Slope= 0.0212 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch

Hydrograph



Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.77" for 50-yr event
 Inflow = 3.58 cfs @ 12.01 hrs, Volume= 0.174 af
 Outflow = 3.43 cfs @ 12.04 hrs, Volume= 0.173 af, Atten= 4%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.80 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 1.46 fps, Avg. Travel Time= 3.4 min

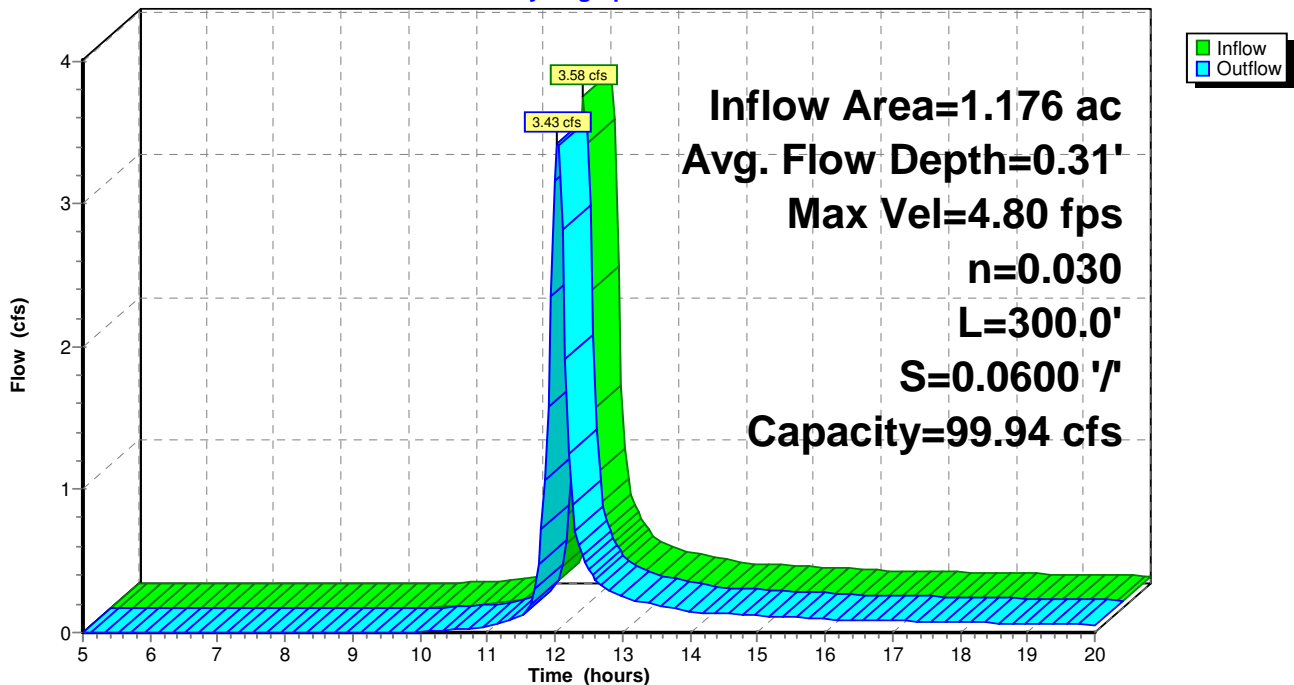
Peak Storage= 218 cf @ 12.02 hrs
 Average Depth at Peak Storage= 0.31'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 300.0' Slope= 0.0600 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch

Hydrograph



Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

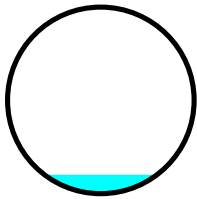
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.77" for 50-yr event
 Inflow = 3.43 cfs @ 12.04 hrs, Volume= 0.173 af
 Outflow = 3.35 cfs @ 12.05 hrs, Volume= 0.173 af, Atten= 2%, Lag= 0.9 min

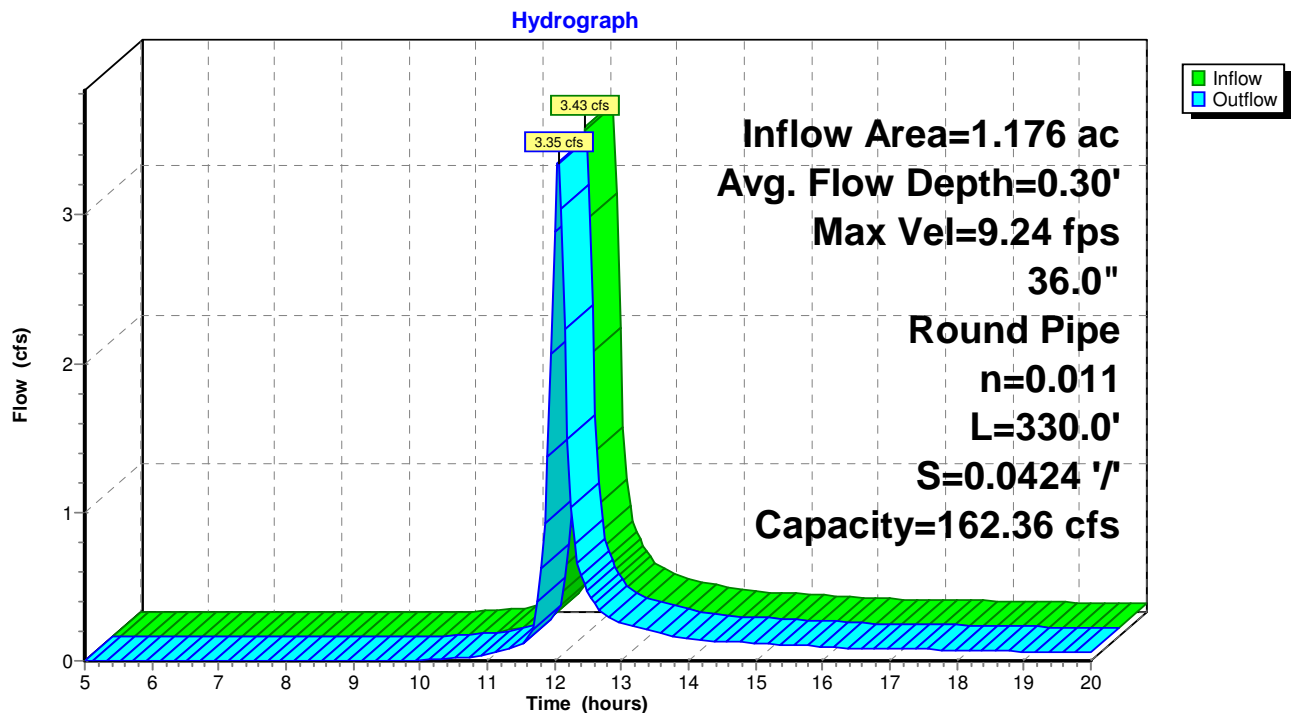
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 9.24 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 3.38 fps, Avg. Travel Time= 1.6 min

Peak Storage= 122 cf @ 12.05 hrs
 Average Depth at Peak Storage= 0.30'
 Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 330.0' Slope= 0.0424 '/'
 Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.23' @ 12.10 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 2.00" for 50-yr event
 Inflow = 6.56 cfs @ 12.07 hrs, Volume= 0.391 af
 Outflow = 6.49 cfs @ 12.08 hrs, Volume= 0.391 af, Atten= 1%, Lag= 0.7 min

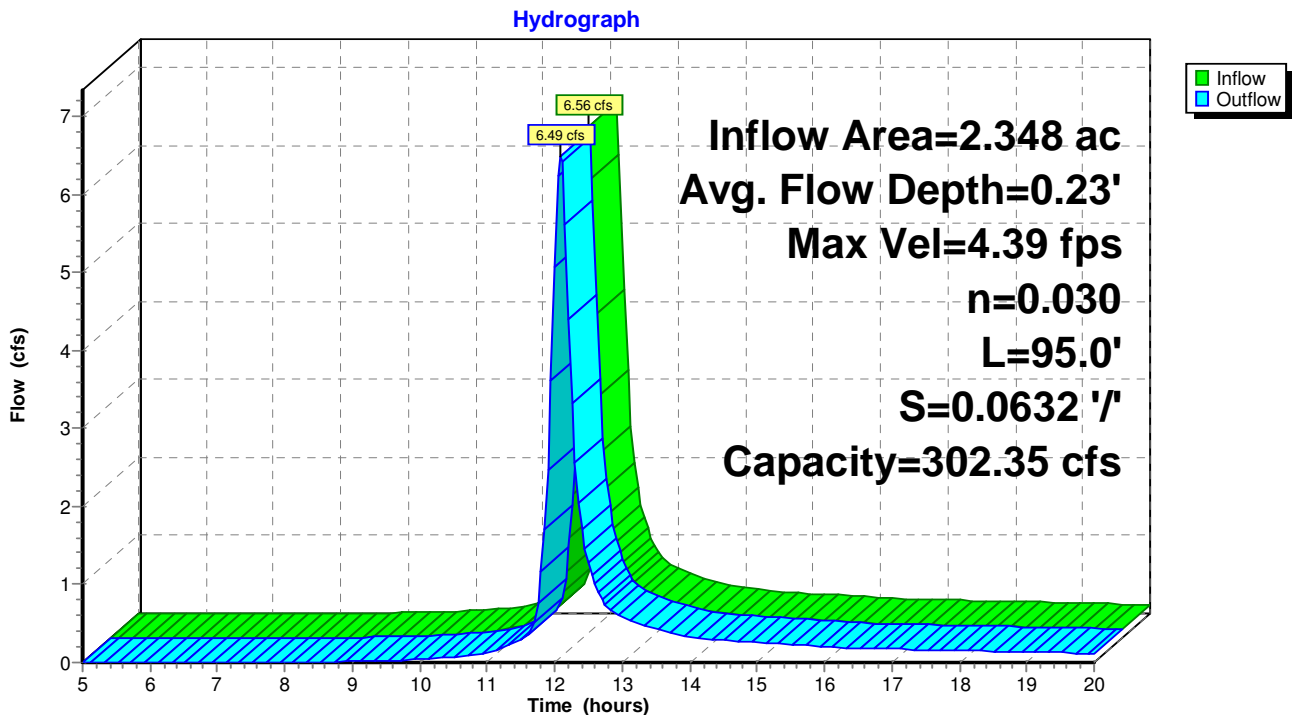
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.39 fps, Min. Travel Time= 0.4 min
 Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.2 min

Peak Storage= 141 cf @ 12.08 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 2.0 '/' Top Width= 14.00'
 Length= 95.0' Slope= 0.0632 '/'
 Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run



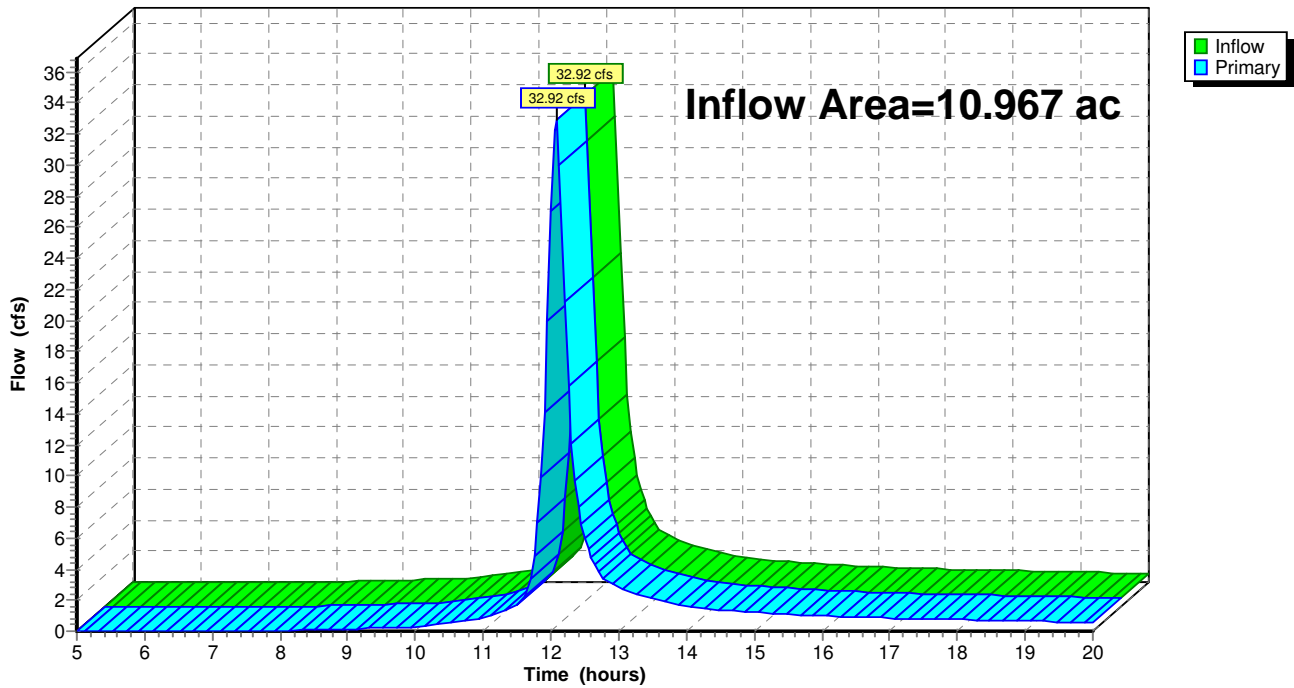
Summary for Link 14L: Haymaker's Run

Inflow Area = 10.967 ac, 9.87% Impervious, Inflow Depth > 2.18" for 50-yr event
Inflow = 32.92 cfs @ 12.08 hrs, Volume= 1.991 af
Primary = 32.92 cfs @ 12.08 hrs, Volume= 1.991 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run

Hydrograph



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1	Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>2.16" Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=74 Runoff=4.35 cfs 0.212 af
Subcatchment 2S: DA2	Runoff Area=36,133 sf 5.10% Impervious Runoff Depth>2.24" Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=75 Runoff=3.18 cfs 0.155 af
Subcatchment 3S: DA3	Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>2.66" Flow Length=256' Tc=17.8 min CN=80 Runoff=3.99 cfs 0.260 af
Subcatchment 4S: DA4	Runoff Area=266,082 sf 15.80% Impervious Runoff Depth>2.84" Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=82 Runoff=23.73 cfs 1.448 af
Subcatchment 5S: DA5	Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>2.16" Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=74 Runoff=4.43 cfs 0.269 af
Subcatchment 6S: DA6	Runoff Area=44,211 sf 5.22% Impervious Runoff Depth>2.24" Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=75 Runoff=3.30 cfs 0.189 af
Reach 11R: Roadway Ditch	Avg. Flow Depth=0.40' Max Vel=3.24 fps Inflow=3.18 cfs 0.155 af n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=2.99 cfs 0.154 af
Reach 12R: Roadway Ditch	Avg. Flow Depth=0.35' Max Vel=5.13 fps Inflow=4.35 cfs 0.212 af n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=4.17 cfs 0.211 af
Reach 13R: Culvert (Running N to S) w/ 36.0" Round Pipe	Avg. Flow Depth=0.33' Max Vel=9.80 fps Inflow=4.17 cfs 0.211 af n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=4.09 cfs 0.211 af
Reach 16R: Ditch to Haymaker's Run	Avg. Flow Depth=0.26' Max Vel=4.69 fps Inflow=7.88 cfs 0.471 af n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=7.79 cfs 0.471 af
Link 14L: Haymaker's Run	Inflow=39.22 cfs 2.377 af Primary=39.22 cfs 2.377 af

Total Runoff Area = 11.797 ac Runoff Volume = 2.533 af Average Runoff Depth = 2.58"
90.47% Pervious = 10.672 ac 9.53% Impervious = 1.125 ac

Summary for Subcatchment 1S: DA1

Runoff = 4.35 cfs @ 12.01 hrs, Volume= 0.212 af, Depth> 2.16"

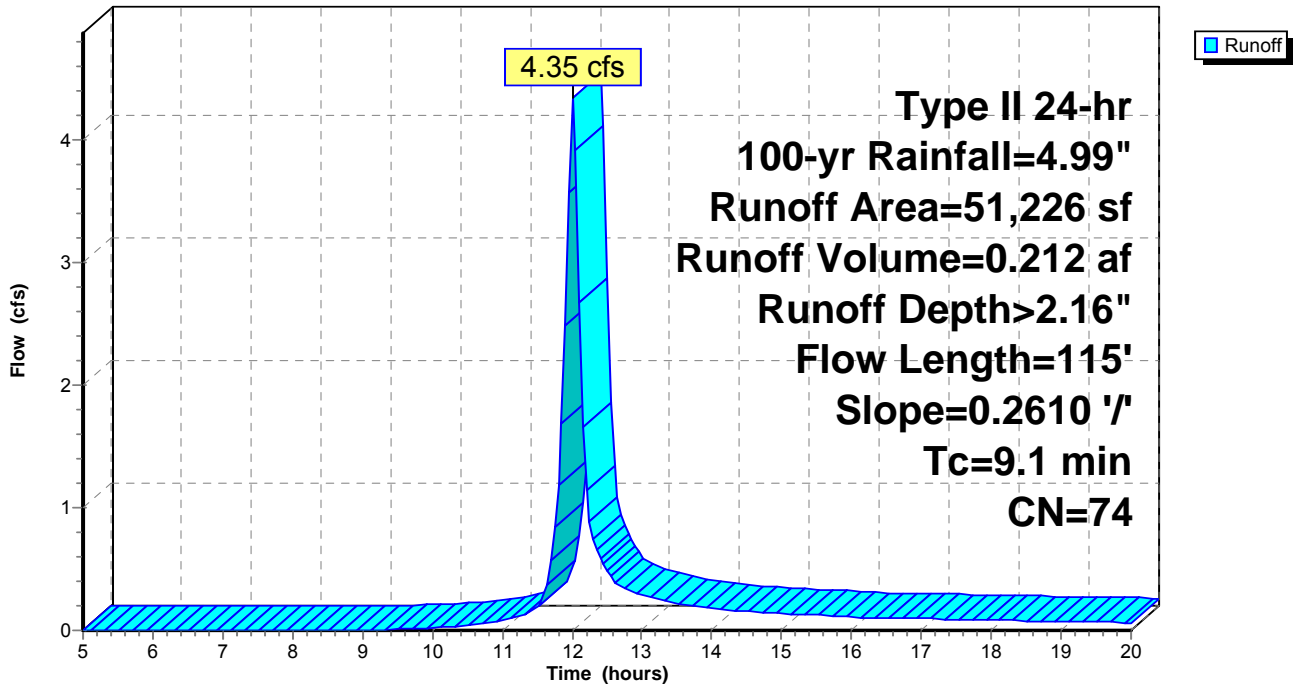
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
51,226	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
51,226	74	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



Summary for Subcatchment 2S: DA2

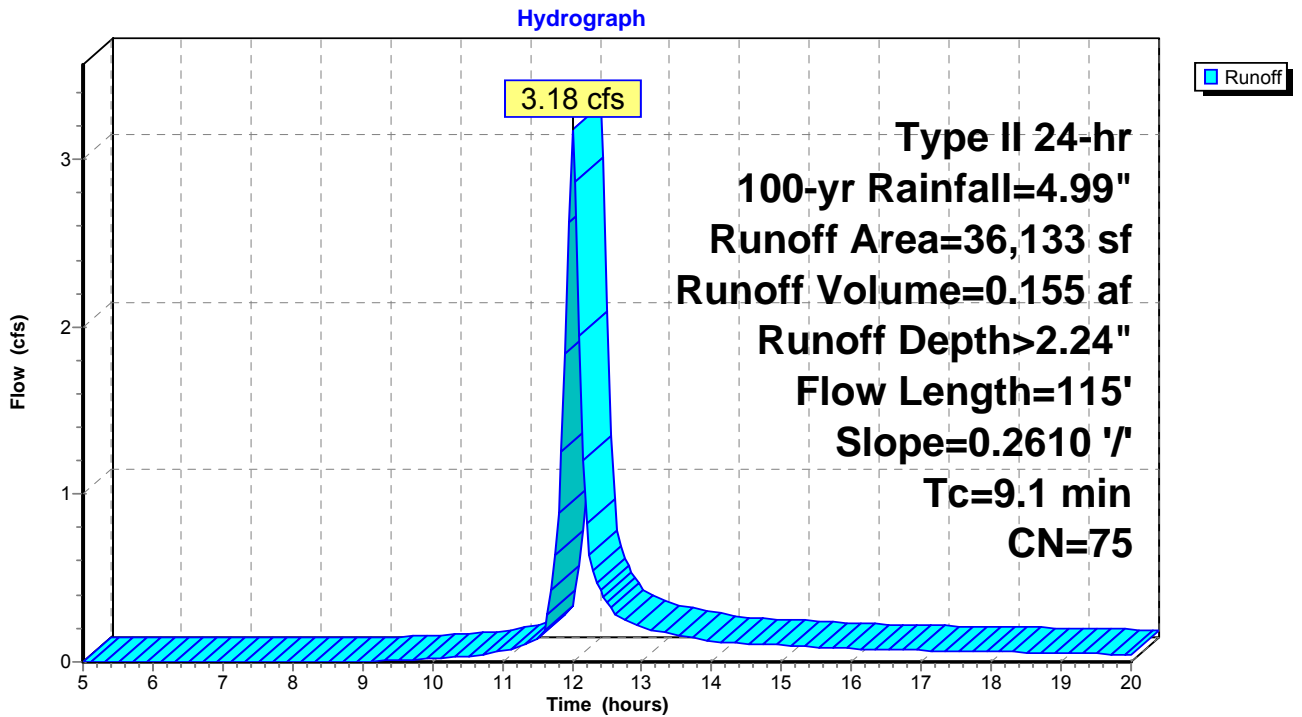
Runoff = 3.18 cfs @ 12.01 hrs, Volume= 0.155 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
34,289	74	>75% Grass cover, Good, HSG C
* 1,844	98	Paved driveway and building
36,133	75	Weighted Average
34,289		94.90% Pervious Area
1,844		5.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2



Summary for Subcatchment 3S: DA3

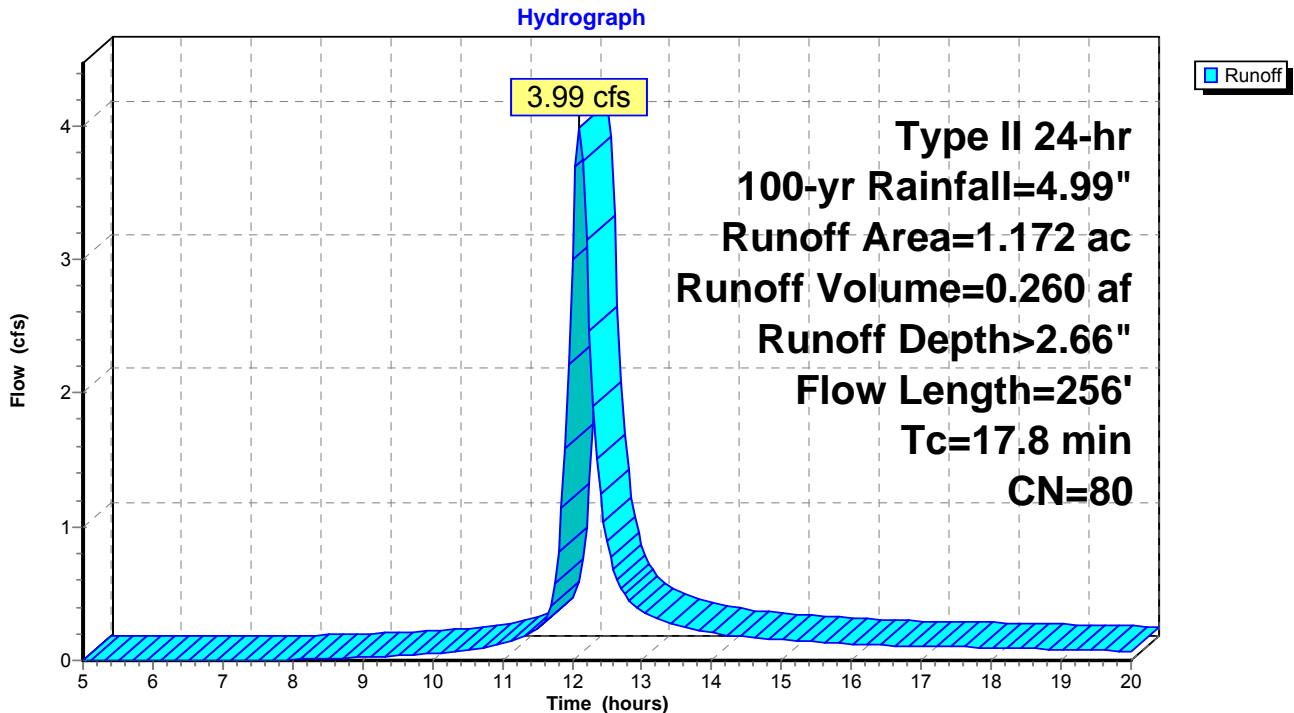
Runoff = 3.99 cfs @ 12.10 hrs, Volume= 0.260 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3



Summary for Subcatchment 4S: DA4

Runoff = 23.73 cfs @ 12.07 hrs, Volume= 1.448 af, Depth> 2.84"

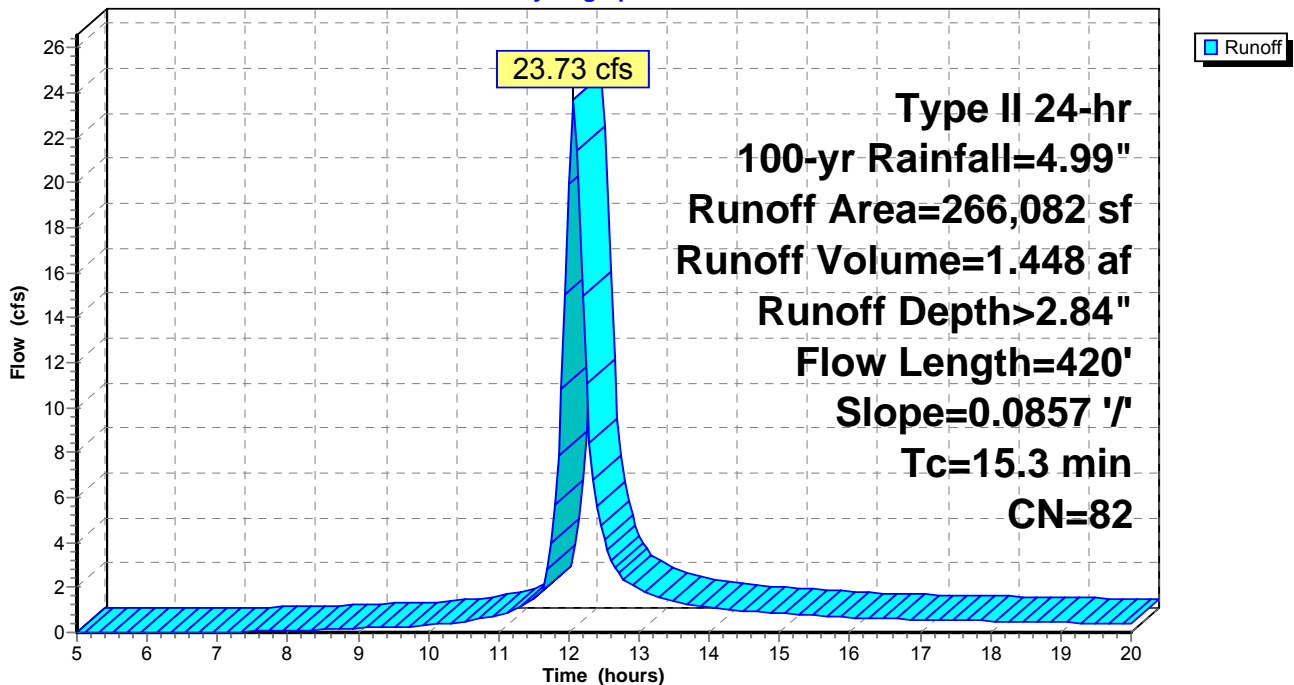
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
143,666	74	>75% Grass cover, Good, HSG C
80,369	89	Gravel roads, HSG C
42,047	98	Paved parking & roofs
266,082	82	Weighted Average
224,035		84.20% Pervious Area
42,047		15.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

Hydrograph



Summary for Subcatchment 5S: DA5

Runoff = 4.43 cfs @ 12.08 hrs, Volume= 0.269 af, Depth> 2.16"

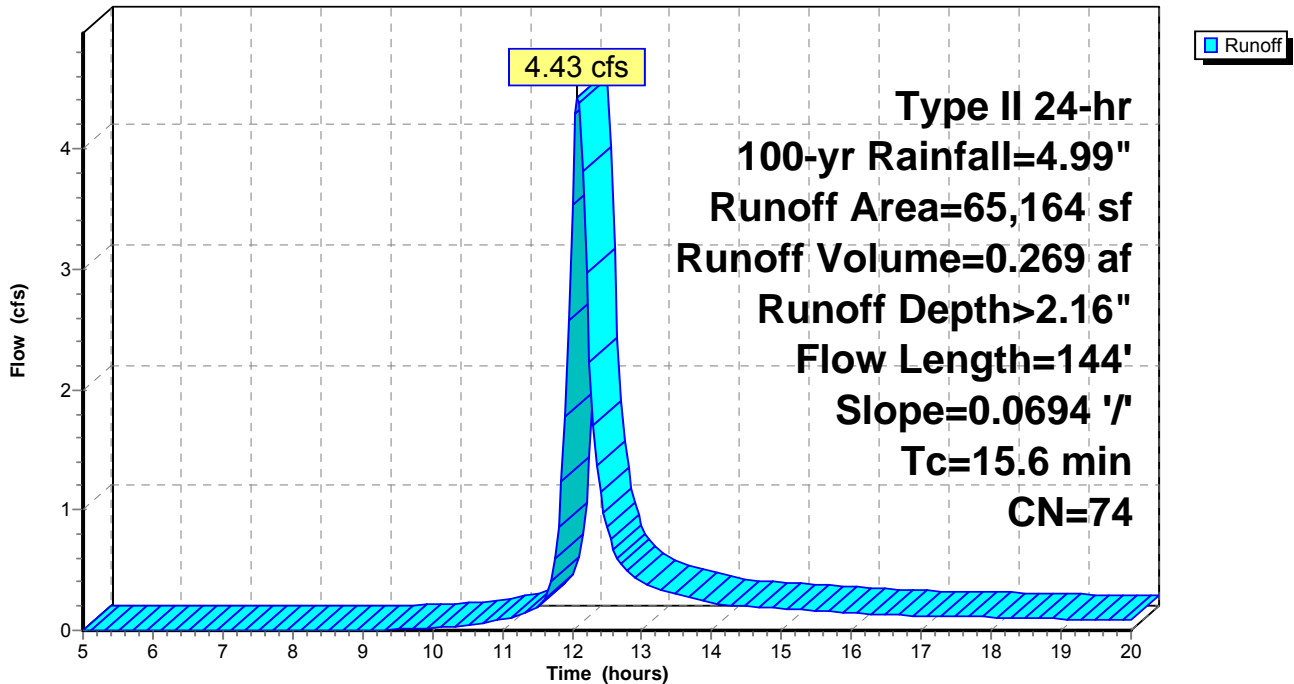
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
65,164	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
65,164	74	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

Hydrograph



Summary for Subcatchment 6S: DA6

Runoff = 3.30 cfs @ 12.06 hrs, Volume= 0.189 af, Depth> 2.24"

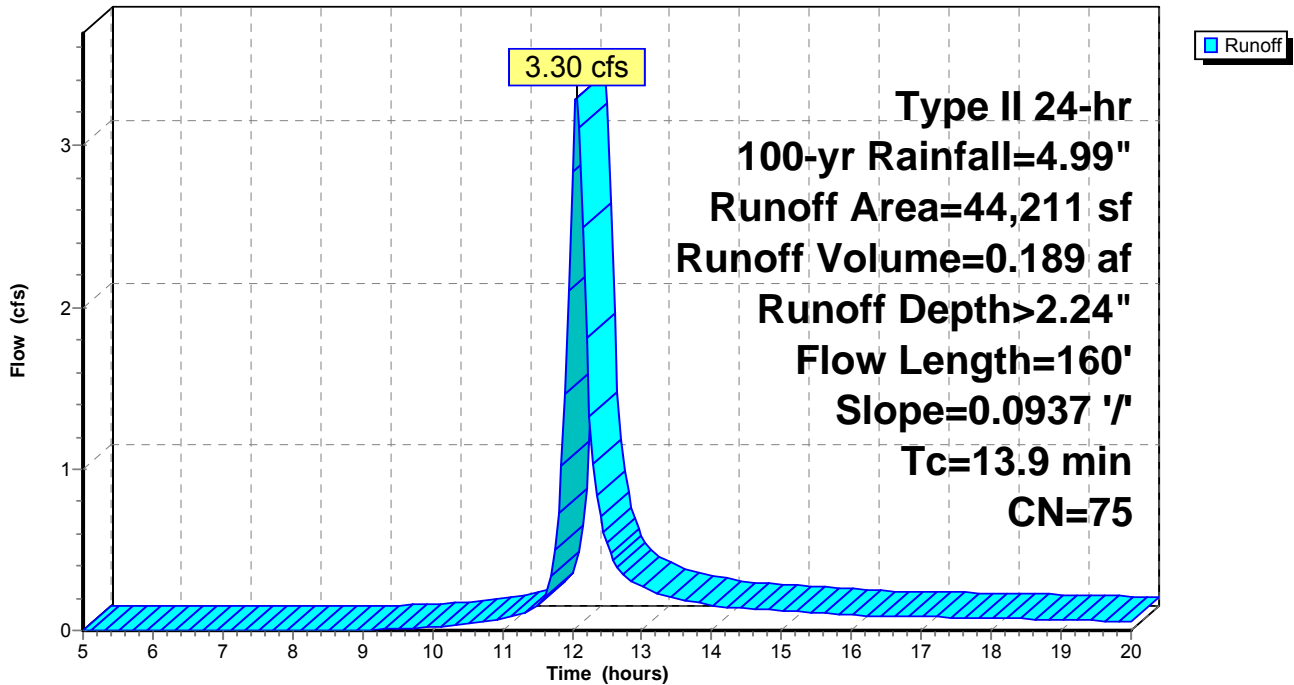
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
41,903	74	>75% Grass cover, Good, HSG C
0	89	Gravel roads, HSG C
2,308	98	Paved parking & roofs
44,211	75	Weighted Average
41,903		94.78% Pervious Area
2,308		5.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

Hydrograph



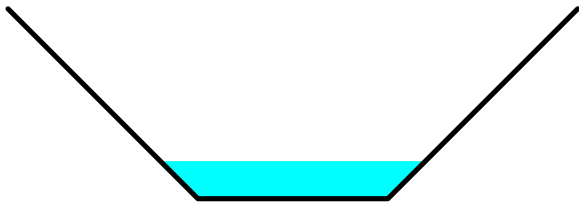
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 5.10% Impervious, Inflow Depth > 2.24" for 100-yr event
 Inflow = 3.18 cfs @ 12.01 hrs, Volume= 0.155 af
 Outflow = 2.99 cfs @ 12.06 hrs, Volume= 0.154 af, Atten= 6%, Lag= 2.9 min

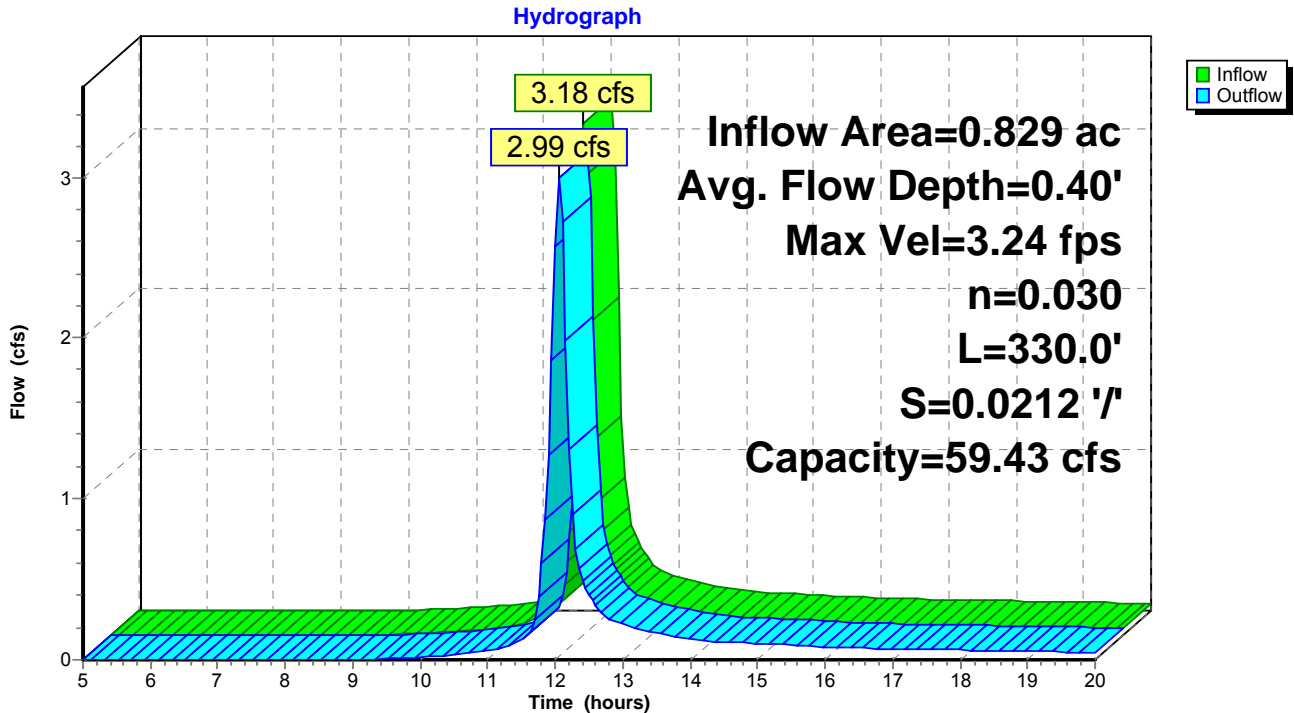
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.24 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 0.96 fps, Avg. Travel Time= 5.7 min

Peak Storage= 313 cf @ 12.03 hrs
 Average Depth at Peak Storage= 0.40'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 330.0' Slope= 0.0212 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch



Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.16" for 100-yr event
 Inflow = 4.35 cfs @ 12.01 hrs, Volume= 0.212 af
 Outflow = 4.17 cfs @ 12.04 hrs, Volume= 0.211 af, Atten= 4%, Lag= 1.7 min

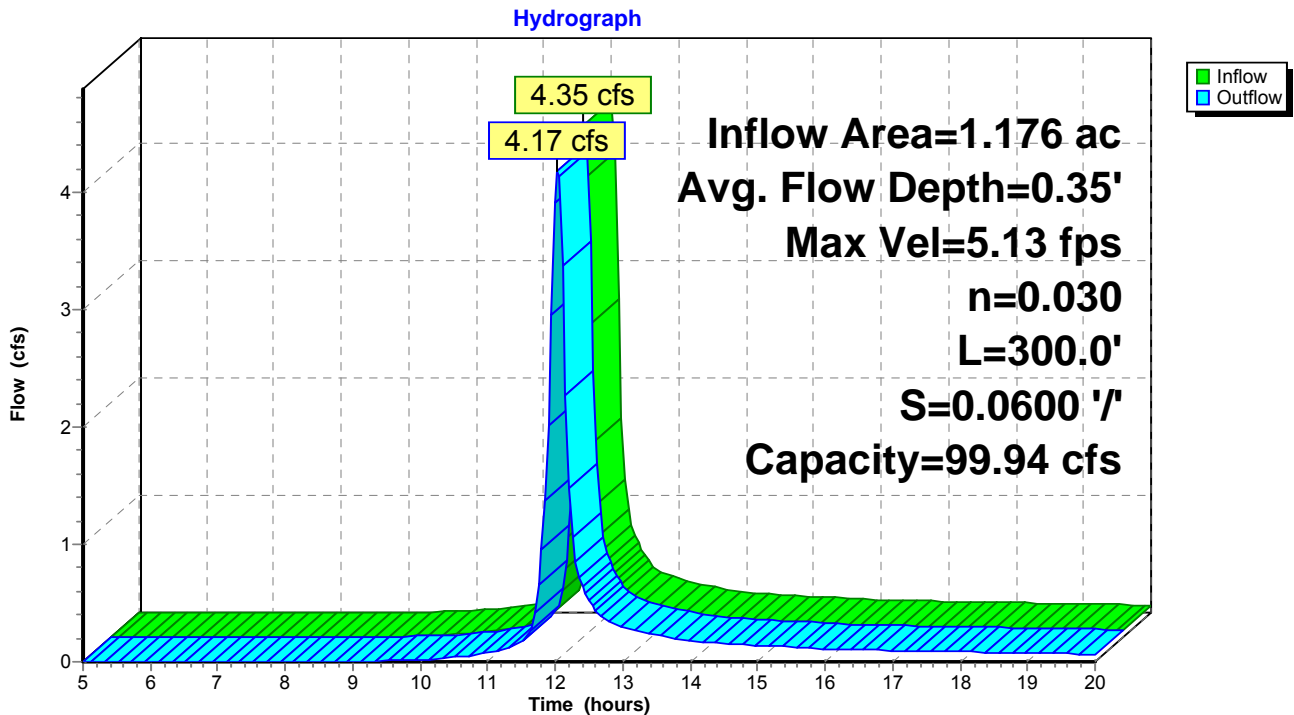
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 5.13 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 1.52 fps, Avg. Travel Time= 3.3 min

Peak Storage= 249 cf @ 12.02 hrs
 Average Depth at Peak Storage= 0.35'
 Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 1.0 '/' Top Width= 6.00'
 Length= 300.0' Slope= 0.0600 '/'
 Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

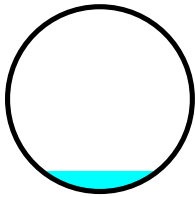
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.16" for 100-yr event
 Inflow = 4.17 cfs @ 12.04 hrs, Volume= 0.211 af
 Outflow = 4.09 cfs @ 12.05 hrs, Volume= 0.211 af, Atten= 2%, Lag= 0.9 min

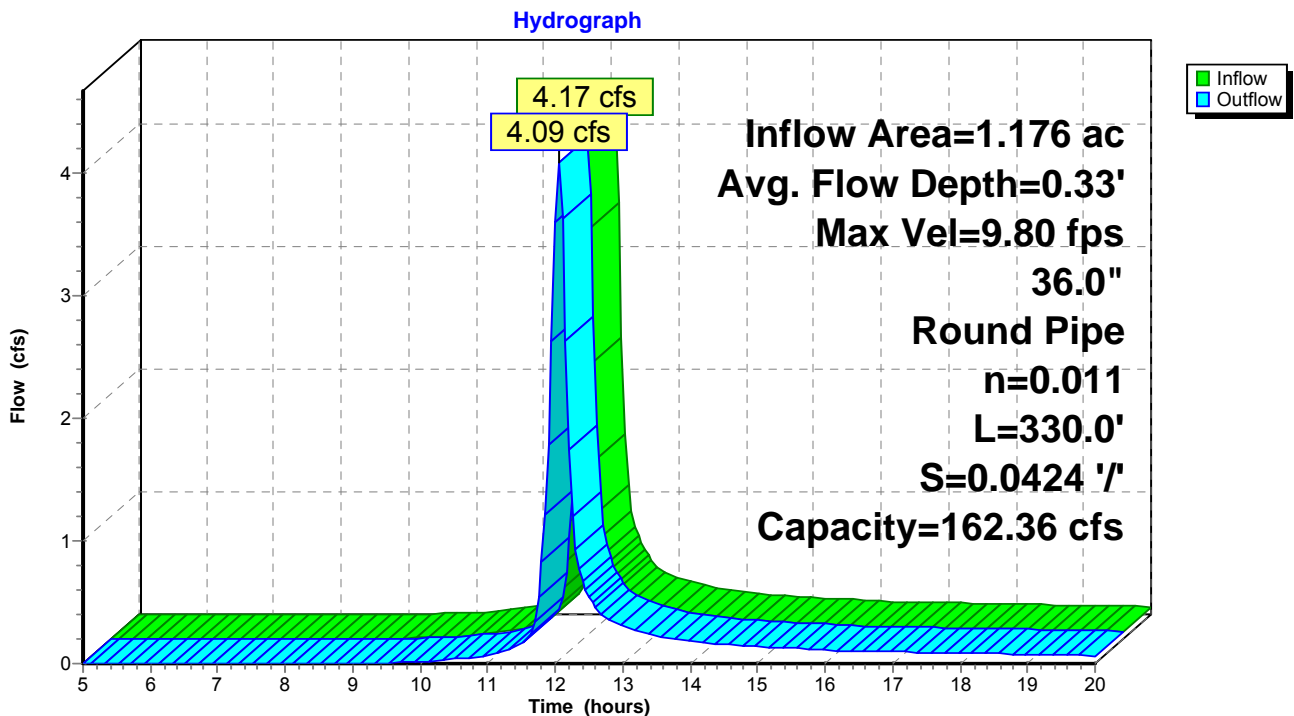
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 9.80 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 3.50 fps, Avg. Travel Time= 1.6 min

Peak Storage= 140 cf @ 12.04 hrs
 Average Depth at Peak Storage= 0.33'
 Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 330.0' Slope= 0.0424 '/'
 Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.25' @ 12.05 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 2.41" for 100-yr event
 Inflow = 7.88 cfs @ 12.07 hrs, Volume= 0.471 af
 Outflow = 7.79 cfs @ 12.08 hrs, Volume= 0.471 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.69 fps, Min. Travel Time= 0.3 min
 Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.2 min

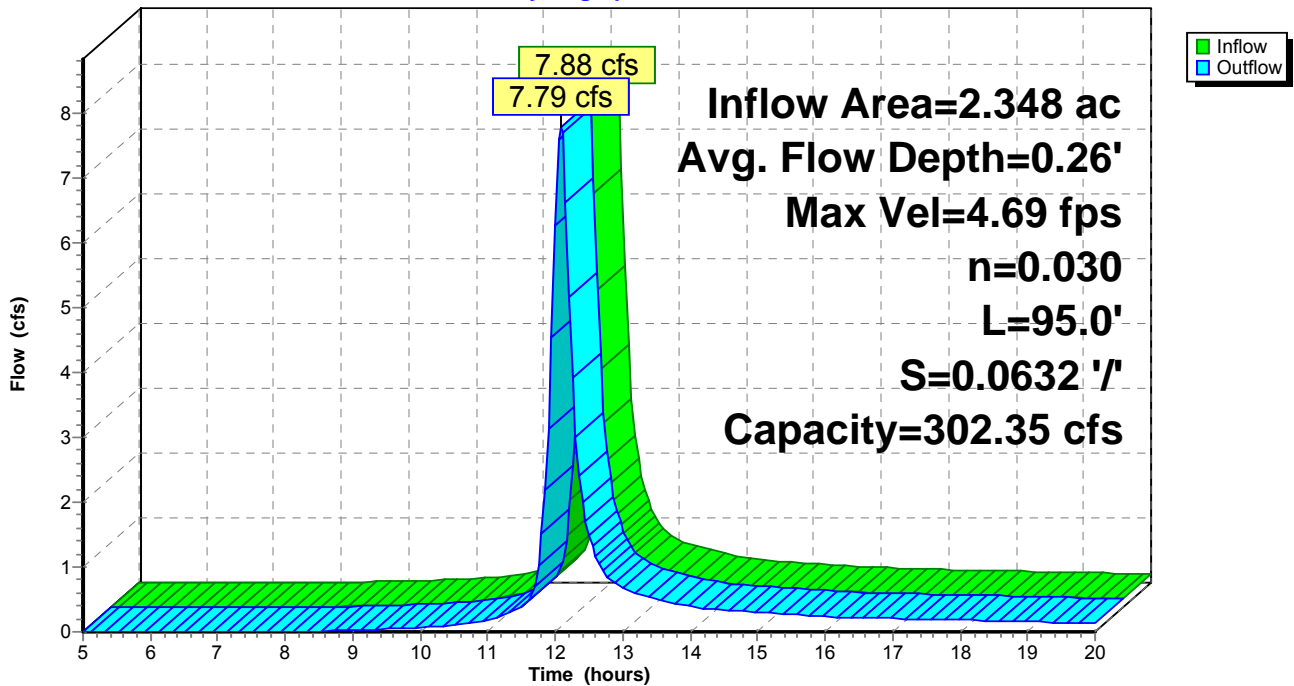
Peak Storage= 158 cf @ 12.07 hrs
 Average Depth at Peak Storage= 0.26'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 2.0 '/' Top Width= 14.00'
 Length= 95.0' Slope= 0.0632 '/'
 Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

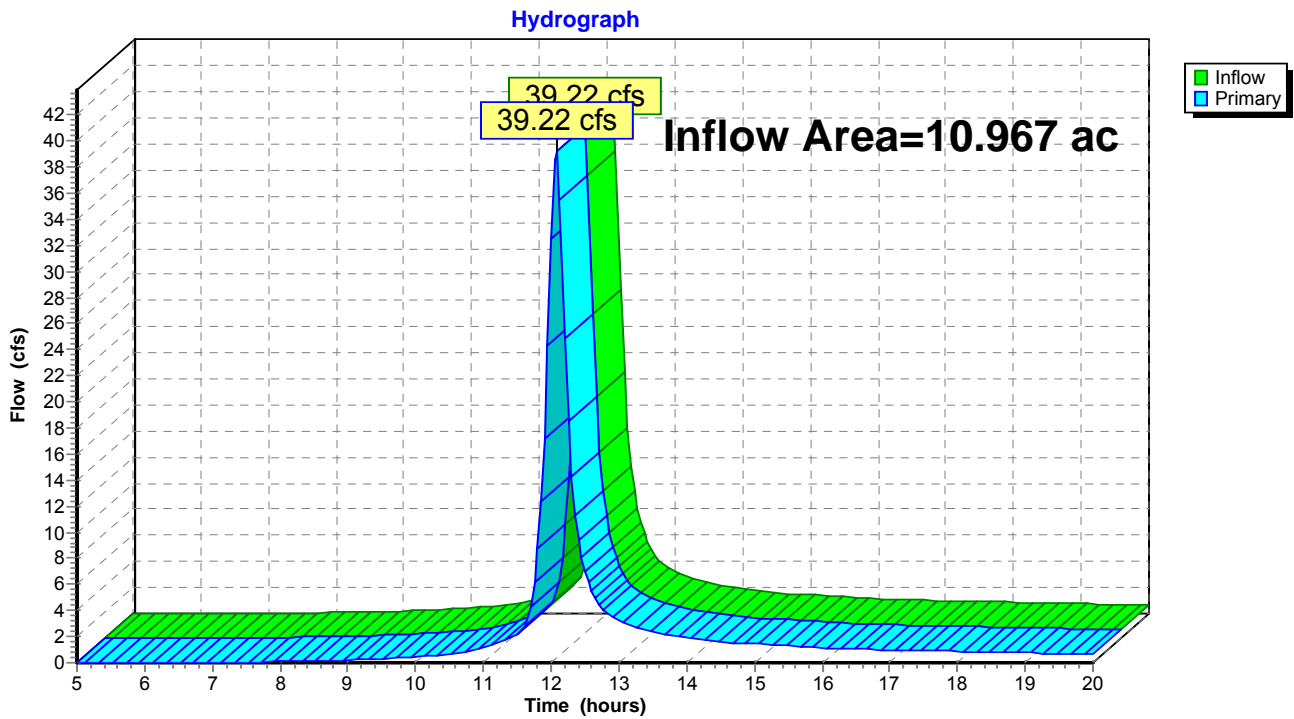


Summary for Link 14L: Haymaker's Run

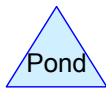
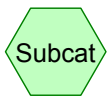
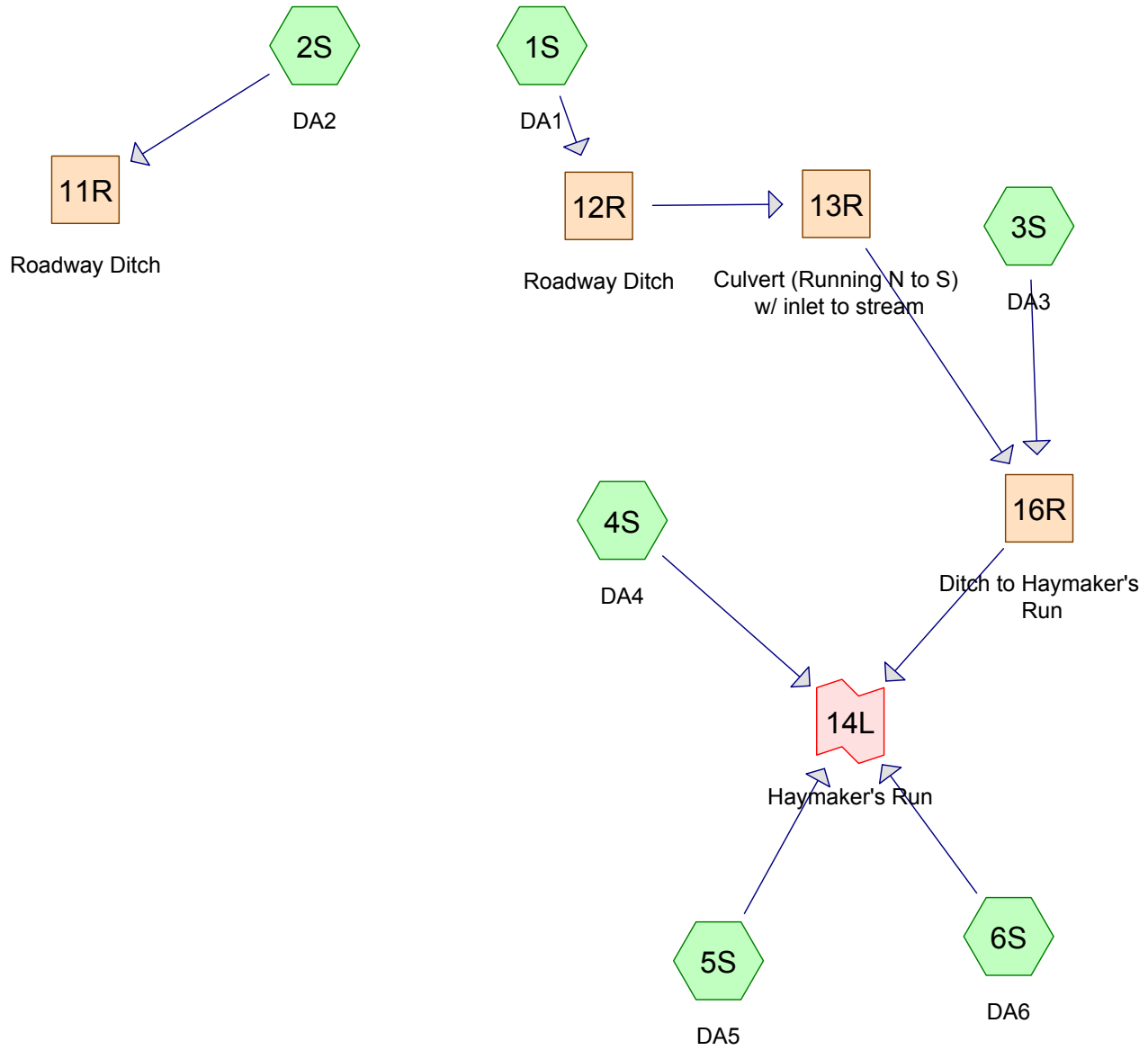
Inflow Area = 10.967 ac, 9.87% Impervious, Inflow Depth > 2.60" for 100-yr event
Inflow = 39.22 cfs @ 12.07 hrs, Volume= 2.377 af
Primary = 39.22 cfs @ 12.07 hrs, Volume= 2.377 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



*JB Tonkin Compressor Station Post-Construction Runoff
Calculations*



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.667	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S)
5.109	89	Gravel roads, HSG C (1S, 3S, 4S, 5S, 6S)
0.053	98	Paved driveway and building (2S)
1.967	98	Paved parking & roofs (3S, 4S, 6S)
11.797	85	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.777	HSG C	1S, 2S, 3S, 4S, 5S, 6S
0.000	HSG D	
2.020	Other	2S, 3S, 4S, 6S
11.797		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	4.667	0.000	0.000	4.667	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S
0.000	0.000	5.109	0.000	0.000	5.109	Gravel roads	1S, 3S, 4S, 5S, 6S
0.000	0.000	0.000	0.000	0.053	0.053	Paved driveway and building	2S
0.000	0.000	0.000	0.000	1.967	1.967	Paved parking & roofs	3S, 4S, 6S
0.000	0.000	9.777	0.000	2.020	11.797	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	13R	1,060.00	1,046.00	330.0	0.0424	0.011	36.0	0.0	0.0

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Type II 24-hr 2-yr Rainfall=2.38"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>0.60"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=77 Runoff=1.18 cfs 0.058 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 6.38% Impervious Runoff Depth>0.56"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=76 Runoff=0.77 cfs 0.038 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>0.73"
Flow Length=256' Tc=17.8 min CN=80 Runoff=1.07 cfs 0.071 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 30.08% Impervious Runoff Depth>1.18"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=88 Runoff=9.92 cfs 0.600 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>0.88"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=83 Runoff=1.80 cfs 0.109 af

Subcatchment 6S: DA6 Runoff Area=44,221 sf 6.52% Impervious Runoff Depth>0.99"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=85 Runoff=1.46 cfs 0.084 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.17' Max Vel=2.01 fps Inflow=0.77 cfs 0.038 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=0.72 cfs 0.038 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.16' Max Vel=3.29 fps Inflow=1.18 cfs 0.058 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=1.11 cfs 0.058 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.18' Max Vel=6.52 fps Inflow=1.11 cfs 0.058 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=1.07 cfs 0.058 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.12' Max Vel=2.90 fps Inflow=2.13 cfs 0.129 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=2.10 cfs 0.129 af

Link 14L: Haymaker's Run Inflow=15.17 cfs 0.921 af
Primary=15.17 cfs 0.921 af

Total Runoff Area = 11.797 ac Runoff Volume = 0.960 af Average Runoff Depth = 0.98"
82.87% Pervious = 9.777 ac 17.13% Impervious = 2.020 ac

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 1S: DA1

Runoff = 1.18 cfs @ 12.02 hrs, Volume= 0.058 af, Depth> 0.60"

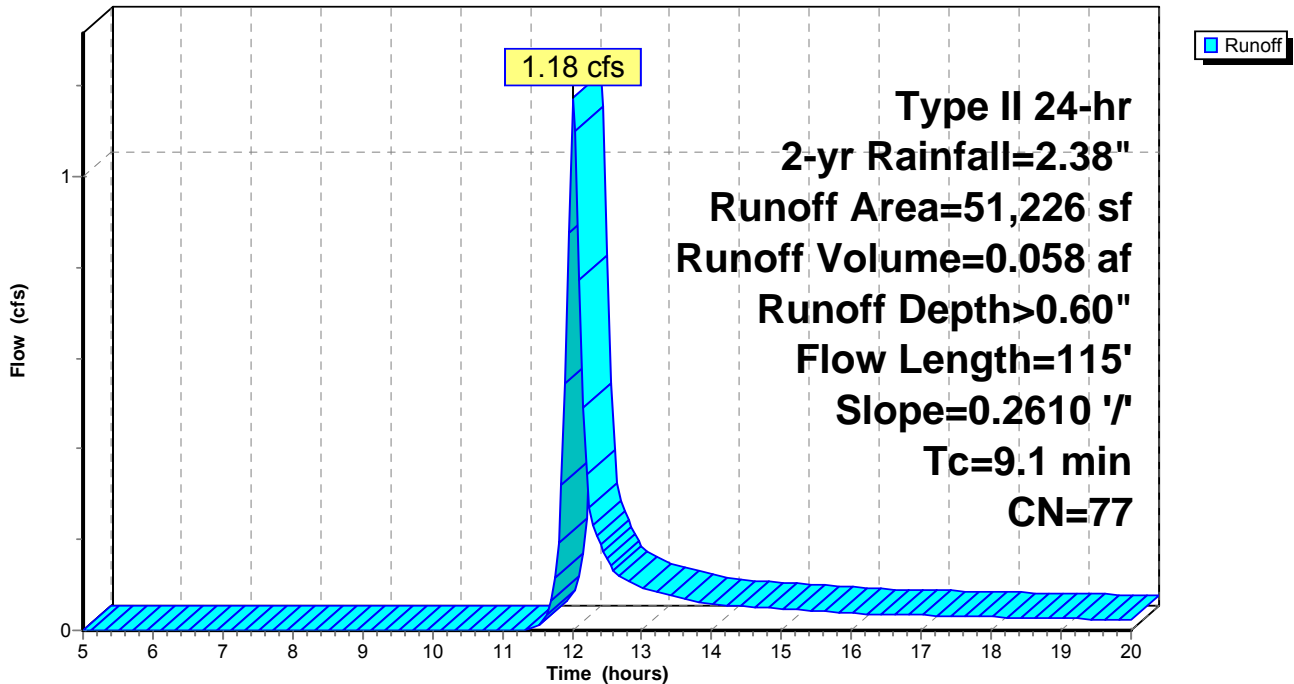
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
39,857	74	>75% Grass cover, Good, HSG C
11,369	89	Gravel roads, HSG C
51,226	77	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 2S: DA2

Runoff = 0.77 cfs @ 12.02 hrs, Volume= 0.038 af, Depth> 0.56"

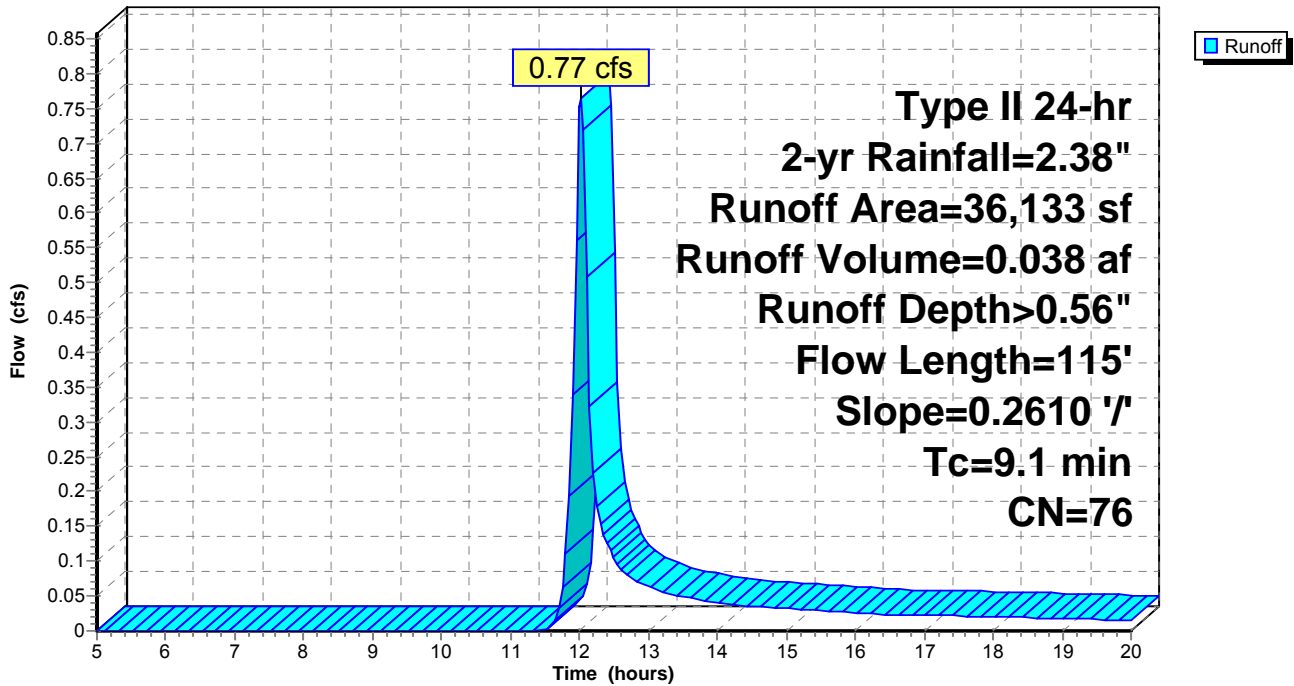
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
33,828	74	>75% Grass cover, Good, HSG C
* 2,305	98	Paved driveway and building
36,133	76	Weighted Average
33,828		93.62% Pervious Area
2,305		6.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 3S: DA3

Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.071 af, Depth> 0.73"

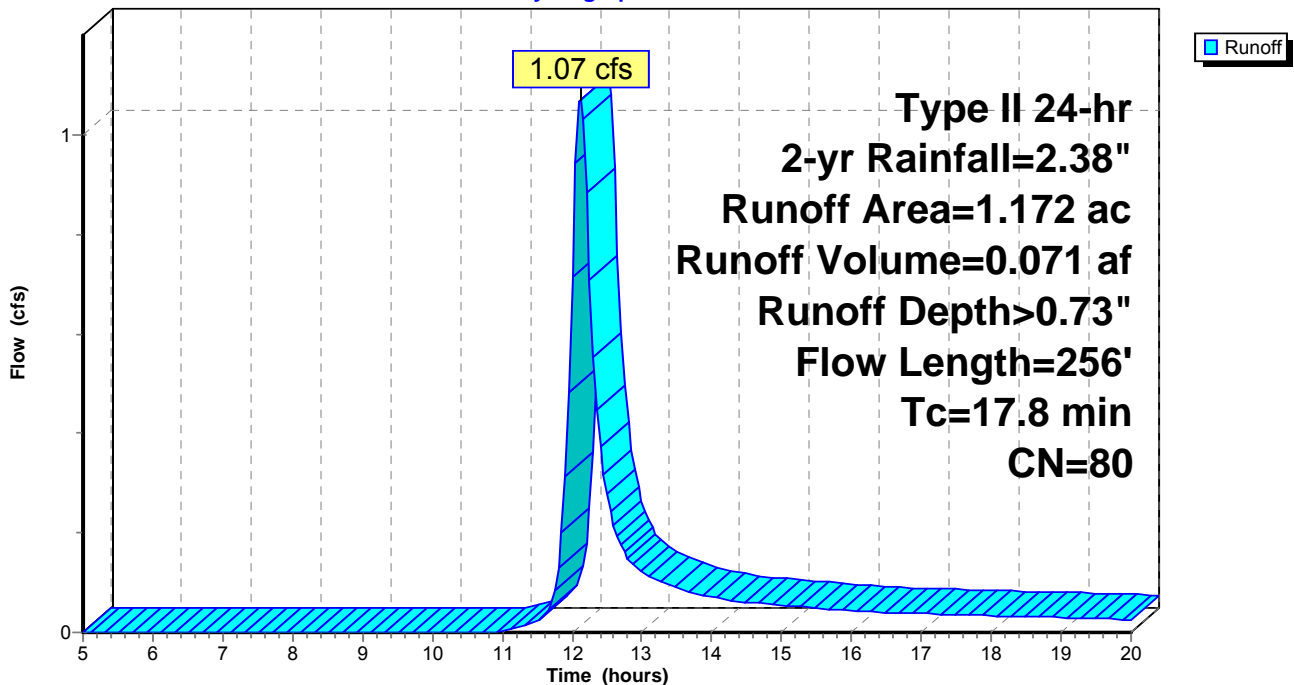
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

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Summary for Subcatchment 4S: DA4

Runoff = 9.92 cfs @ 12.08 hrs, Volume= 0.600 af, Depth> 1.18"

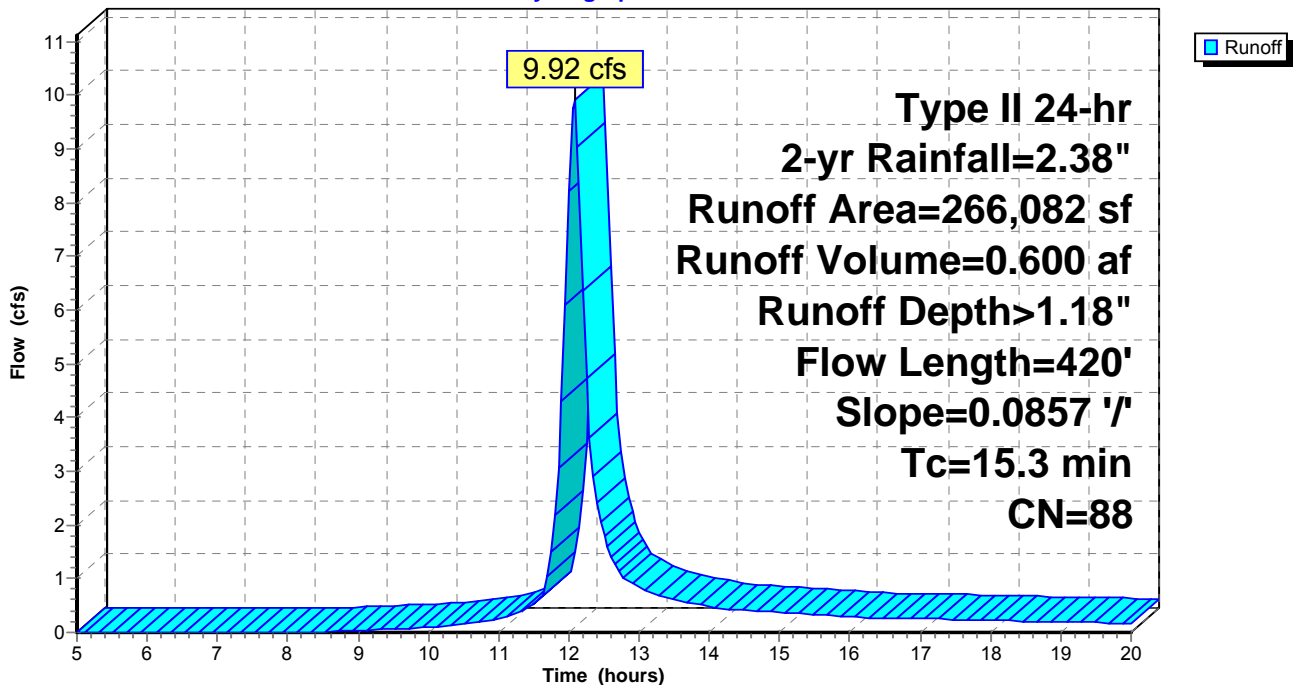
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
58,836	74	>75% Grass cover, Good, HSG C
127,217	89	Gravel roads, HSG C
80,029	98	Paved parking & roofs
266,082	88	Weighted Average
186,053		69.92% Pervious Area
80,029		30.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

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Summary for Subcatchment 5S: DA5

Runoff = 1.80 cfs @ 12.09 hrs, Volume= 0.109 af, Depth> 0.88"

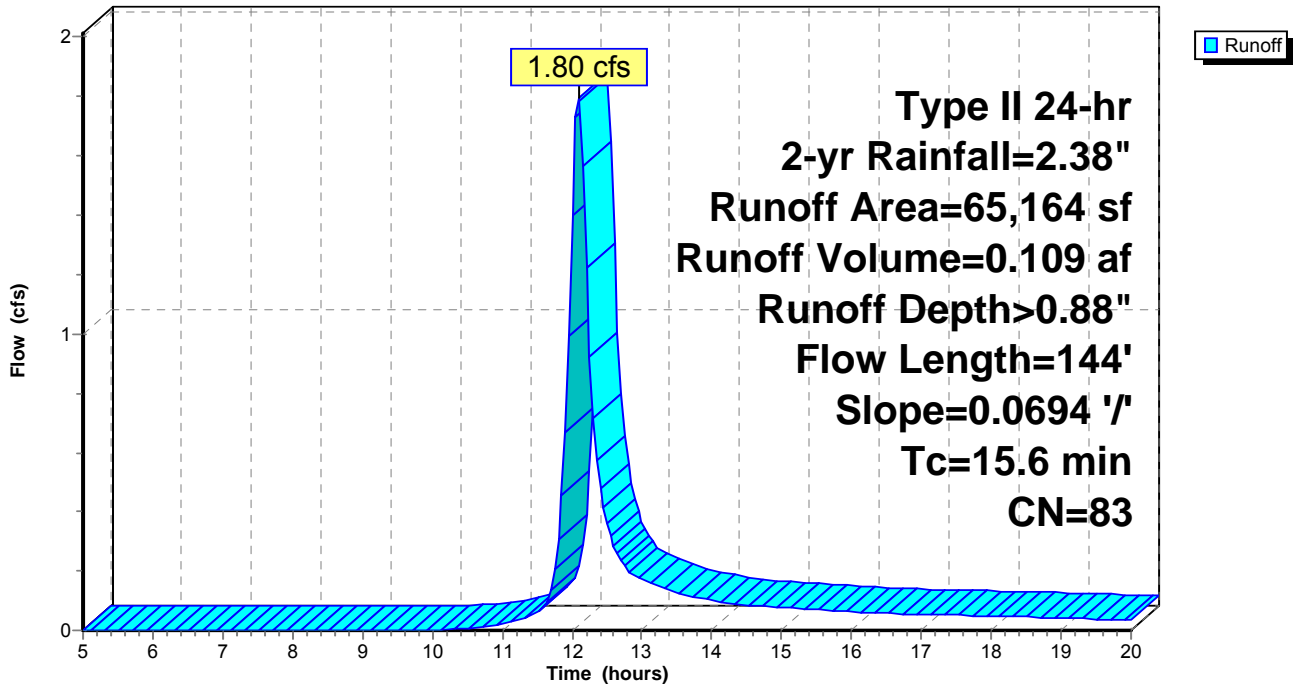
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
26,812	74	>75% Grass cover, Good, HSG C
38,352	89	Gravel roads, HSG C
65,164	83	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 6S: DA6

Runoff = 1.46 cfs @ 12.06 hrs, Volume= 0.084 af, Depth> 0.99"

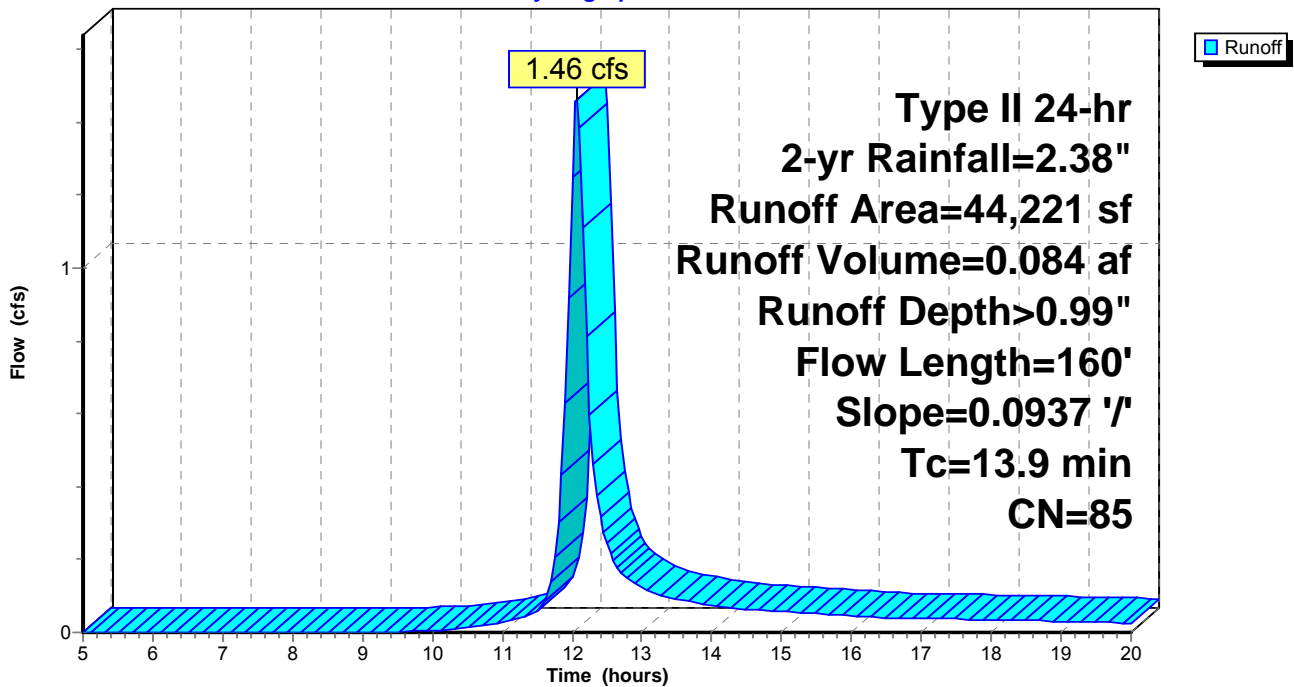
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (sf)	CN	Description
13,087	74	>75% Grass cover, Good, HSG C
28,249	89	Gravel roads, HSG C
2,885	98	Paved parking & roofs
44,221	85	Weighted Average
41,336		93.48% Pervious Area
2,885		6.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

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Type II 24-hr 2-yr Rainfall=2.38"

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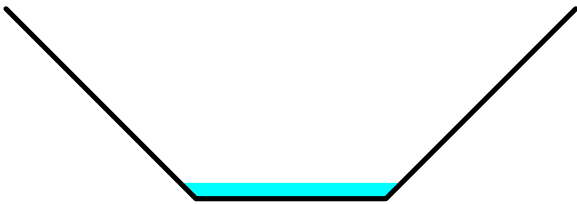
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 6.38% Impervious, Inflow Depth > 0.56" for 2-yr event
Inflow = 0.77 cfs @ 12.02 hrs, Volume= 0.038 af
Outflow = 0.72 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 6%, Lag= 4.8 min

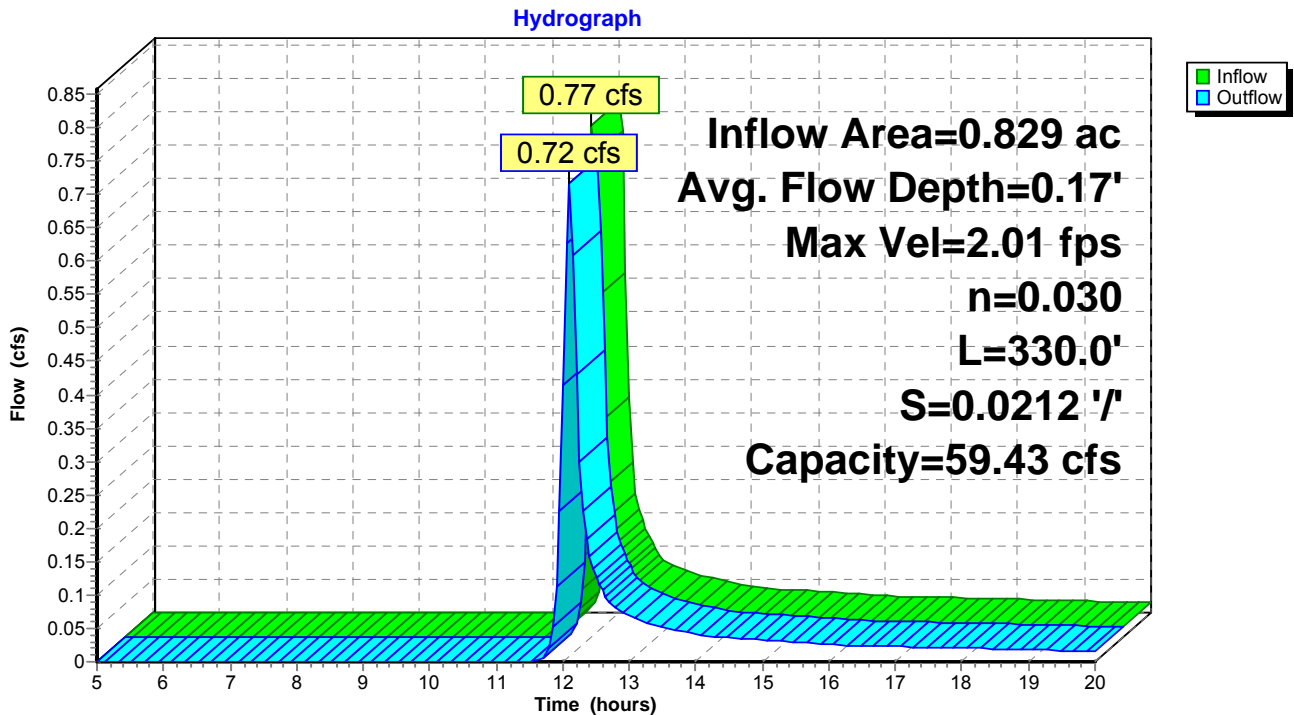
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.01 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 8.1 min

Peak Storage= 119 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0212 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch



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Type II 24-hr 2-yr Rainfall=2.38"

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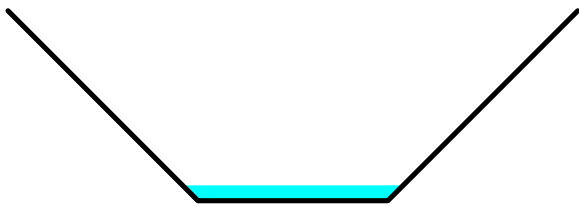
Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 0.60" for 2-yr event
Inflow = 1.18 cfs @ 12.02 hrs, Volume= 0.058 af
Outflow = 1.11 cfs @ 12.06 hrs, Volume= 0.058 af, Atten= 6%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 4.5 min

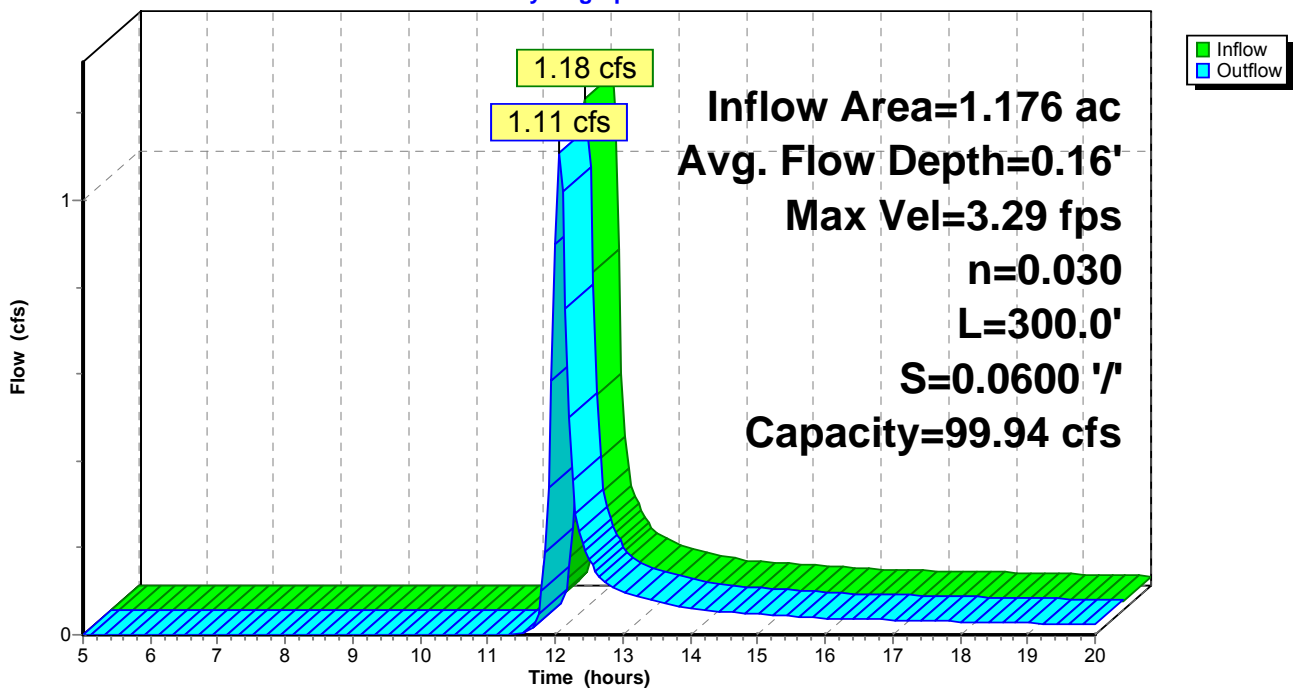
Peak Storage= 105 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

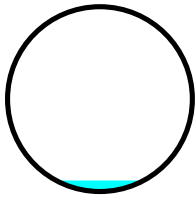
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 0.59" for 2-yr event
Inflow = 1.11 cfs @ 12.06 hrs, Volume= 0.058 af
Outflow = 1.07 cfs @ 12.09 hrs, Volume= 0.058 af, Atten= 4%, Lag= 1.6 min

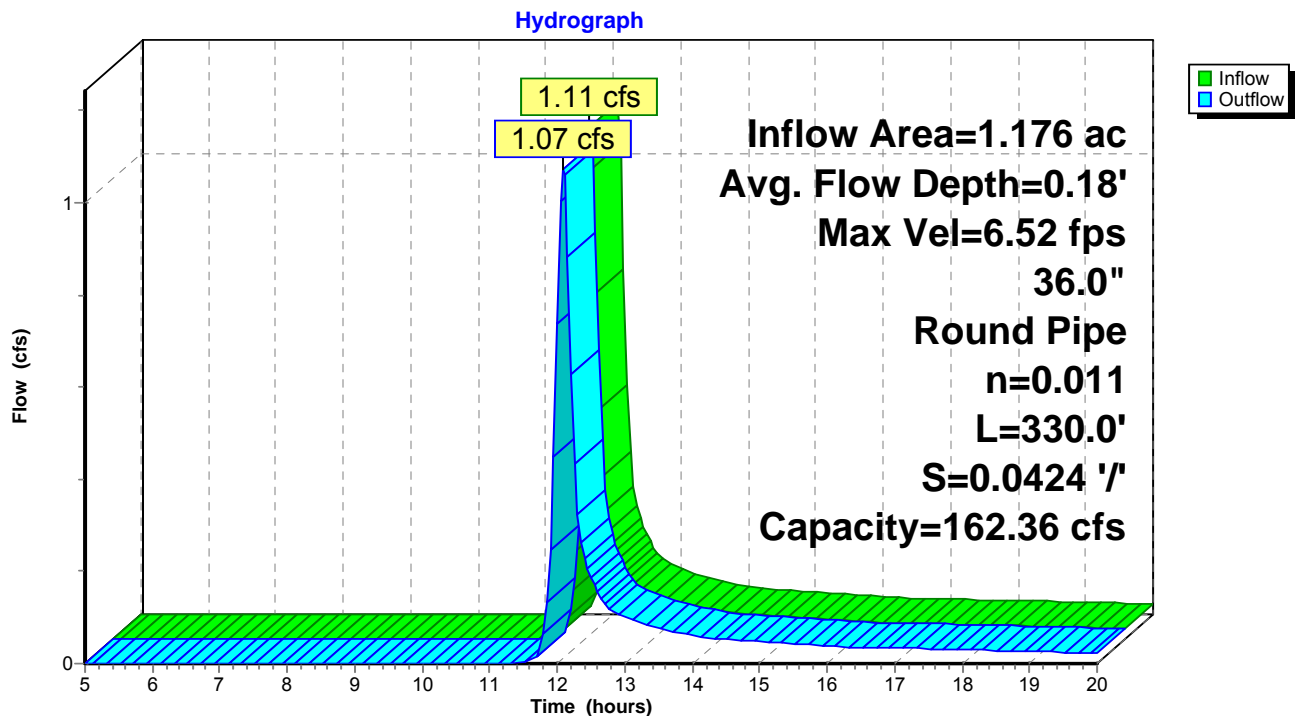
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.52 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 2.0 min

Peak Storage= 55 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 330.0' Slope= 0.0424 '/'
Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.12' @ 12.10 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 0.66" for 2-yr event
Inflow = 2.13 cfs @ 12.10 hrs, Volume= 0.129 af
Outflow = 2.10 cfs @ 12.11 hrs, Volume= 0.129 af, Atten= 2%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.90 fps, Min. Travel Time= 0.5 min

Avg. Velocity = 1.06 fps, Avg. Travel Time= 1.5 min

Peak Storage= 70 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.12'

Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 2.0 '/' Top Width= 14.00'

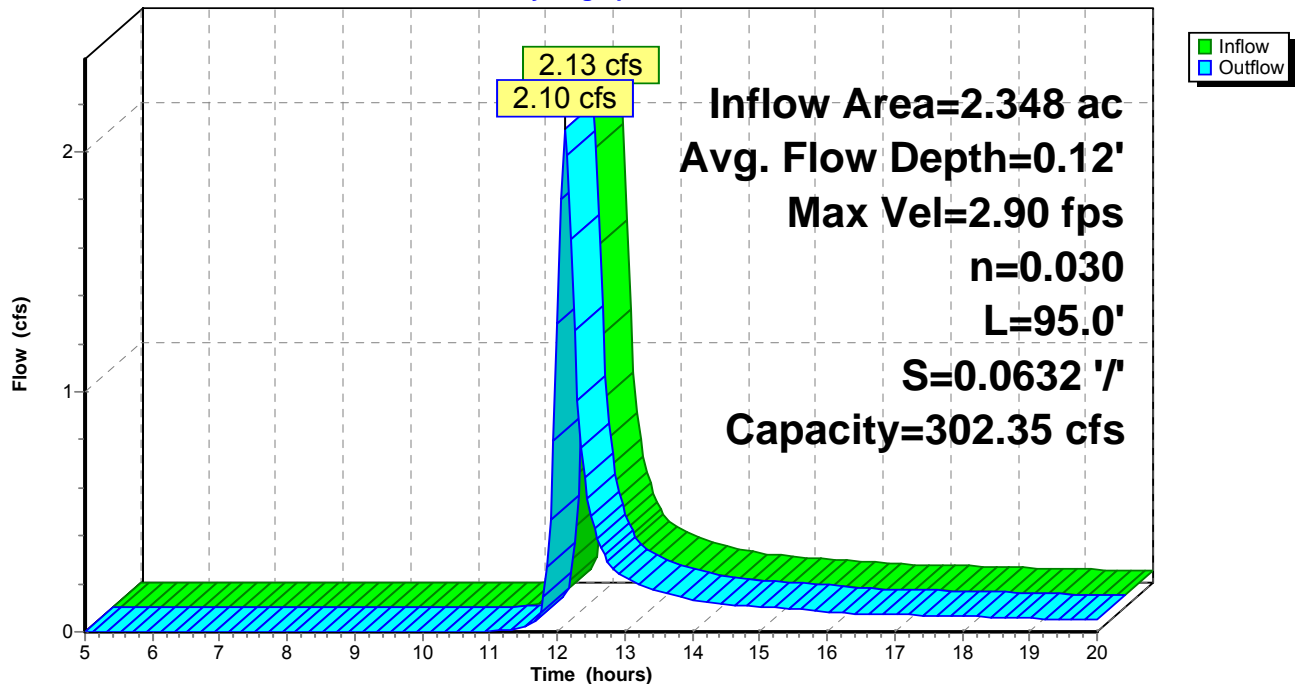
Length= 95.0' Slope= 0.0632 '/'

Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

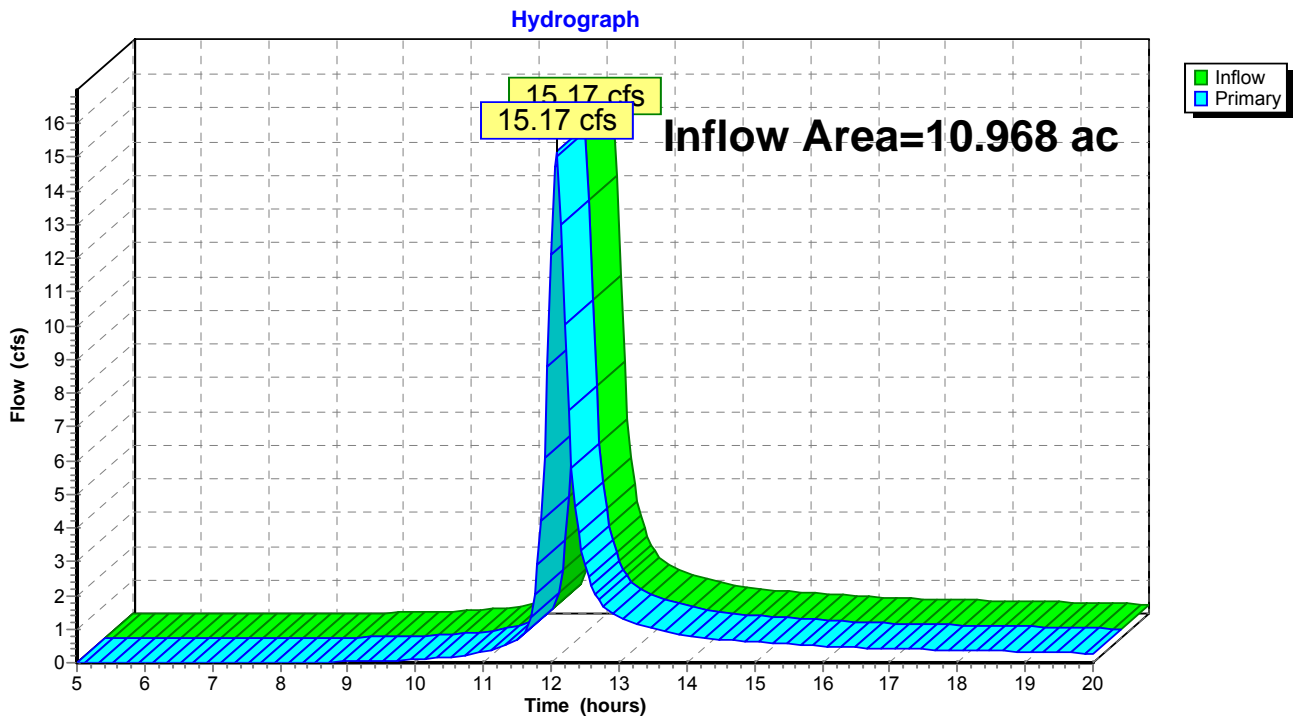


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.968 ac, 17.94% Impervious, Inflow Depth > 1.01" for 2-yr event
Inflow = 15.17 cfs @ 12.08 hrs, Volume= 0.921 af
Primary = 15.17 cfs @ 12.08 hrs, Volume= 0.921 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



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Type II 24-hr 10-yr Rainfall=3.35"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>1.20"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=77 Runoff=2.42 cfs 0.118 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 6.38% Impervious Runoff Depth>1.14"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=76 Runoff=1.62 cfs 0.079 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>1.39"
Flow Length=256' Tc=17.8 min CN=80 Runoff=2.09 cfs 0.135 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 30.08% Impervious Runoff Depth>1.98"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=88 Runoff=16.44 cfs 1.007 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>1.59"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=83 Runoff=3.26 cfs 0.199 af

Subcatchment 6S: DA6 Runoff Area=44,221 sf 6.52% Impervious Runoff Depth>1.74"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=85 Runoff=2.55 cfs 0.147 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.26' Max Vel=2.61 fps Inflow=1.62 cfs 0.079 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=1.51 cfs 0.078 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.25' Max Vel=4.21 fps Inflow=2.42 cfs 0.118 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=2.31 cfs 0.117 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.25' Max Vel=8.21 fps Inflow=2.31 cfs 0.117 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=2.25 cfs 0.117 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.18' Max Vel=3.75 fps Inflow=4.25 cfs 0.252 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=4.21 cfs 0.252 af

Link 14L: Haymaker's Run Inflow=26.37 cfs 1.605 af
Primary=26.37 cfs 1.605 af

Total Runoff Area = 11.797 ac Runoff Volume = 1.685 af Average Runoff Depth = 1.71"
82.87% Pervious = 9.777 ac 17.13% Impervious = 2.020 ac

Post Compressor Station SW Model

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 1S: DA1

Runoff = 2.42 cfs @ 12.01 hrs, Volume= 0.118 af, Depth> 1.20"

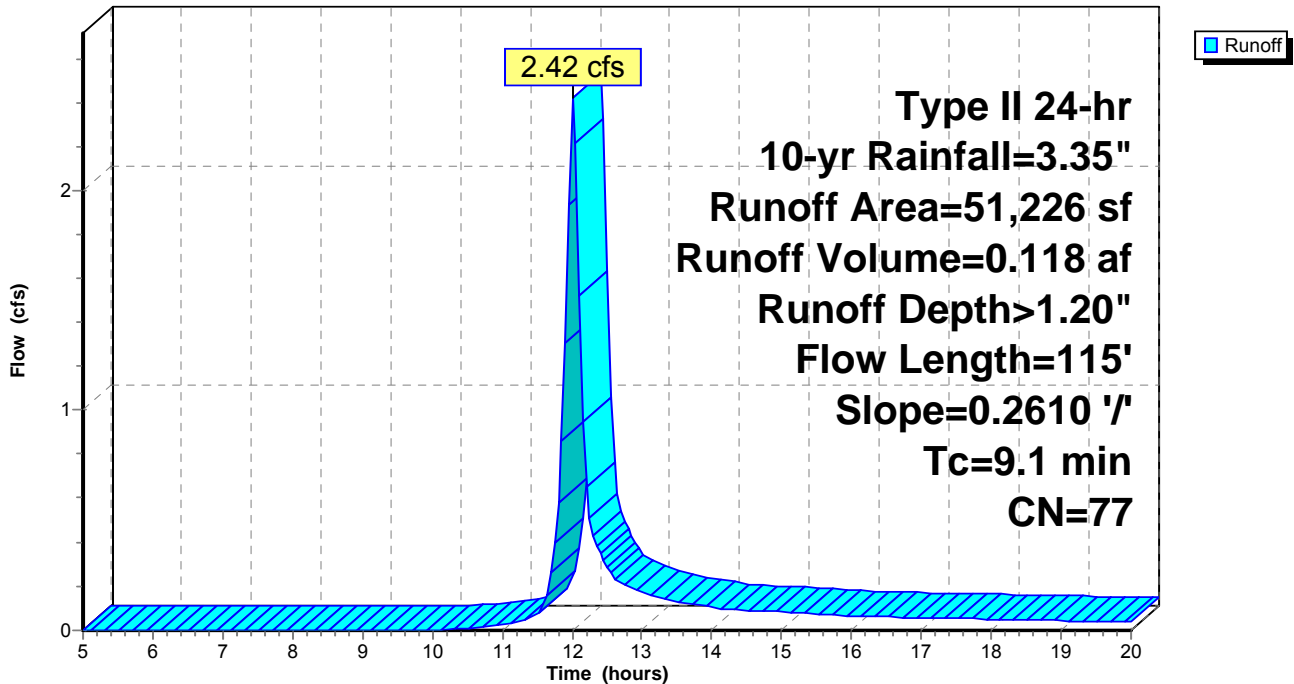
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
39,857	74	>75% Grass cover, Good, HSG C
11,369	89	Gravel roads, HSG C
51,226	77	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 2S: DA2

Runoff = 1.62 cfs @ 12.01 hrs, Volume= 0.079 af, Depth> 1.14"

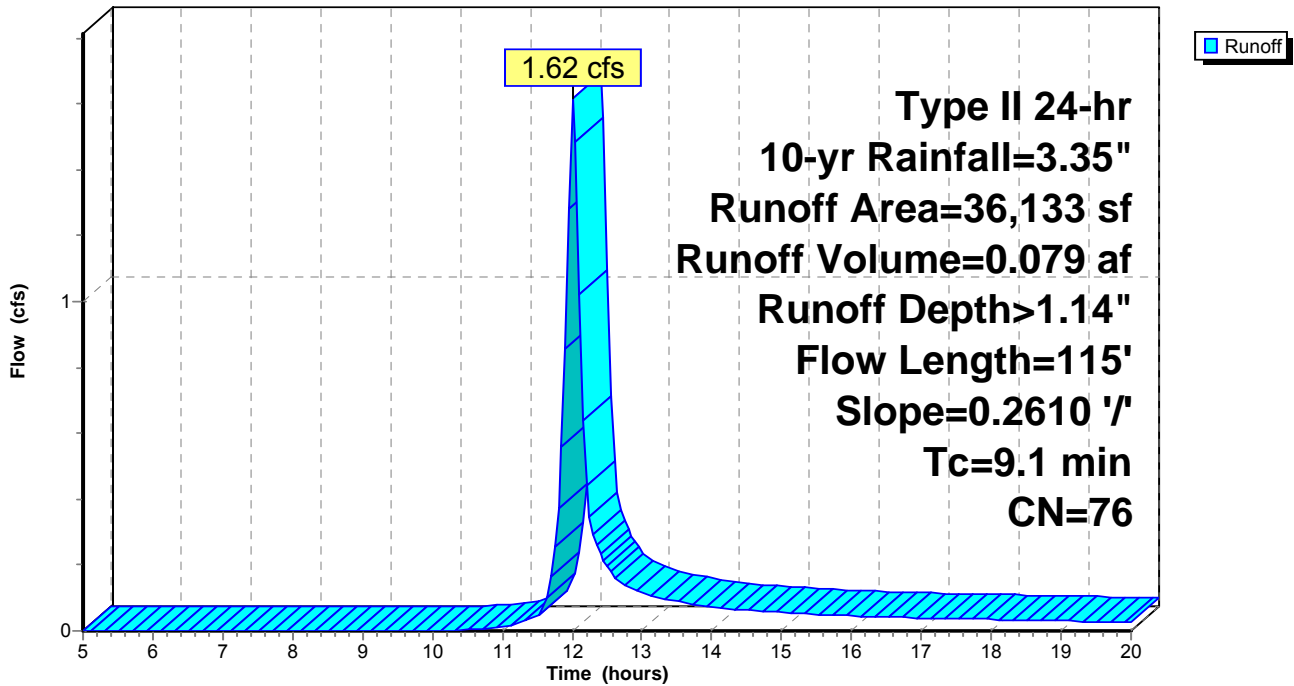
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
33,828	74	>75% Grass cover, Good, HSG C
* 2,305	98	Paved driveway and building
36,133	76	Weighted Average
33,828		93.62% Pervious Area
2,305		6.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 3S: DA3

Runoff = 2.09 cfs @ 12.11 hrs, Volume= 0.135 af, Depth> 1.39"

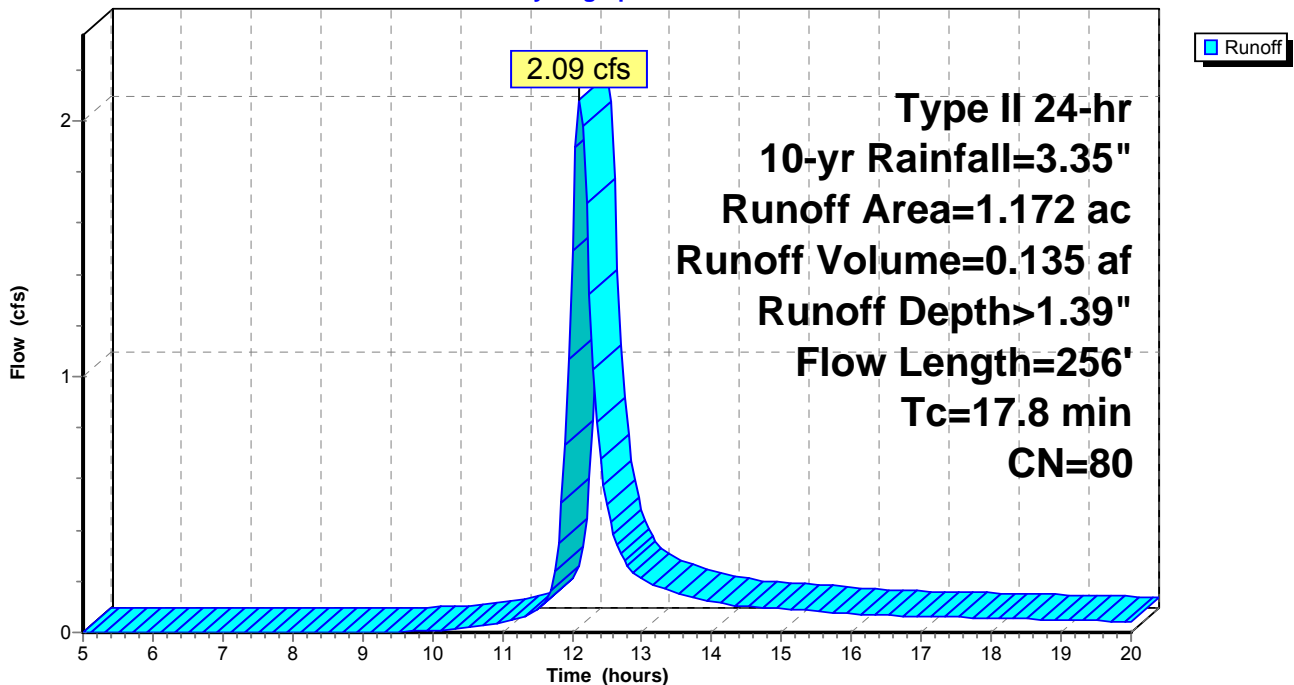
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 4S: DA4

Runoff = 16.44 cfs @ 12.07 hrs, Volume= 1.007 af, Depth> 1.98"

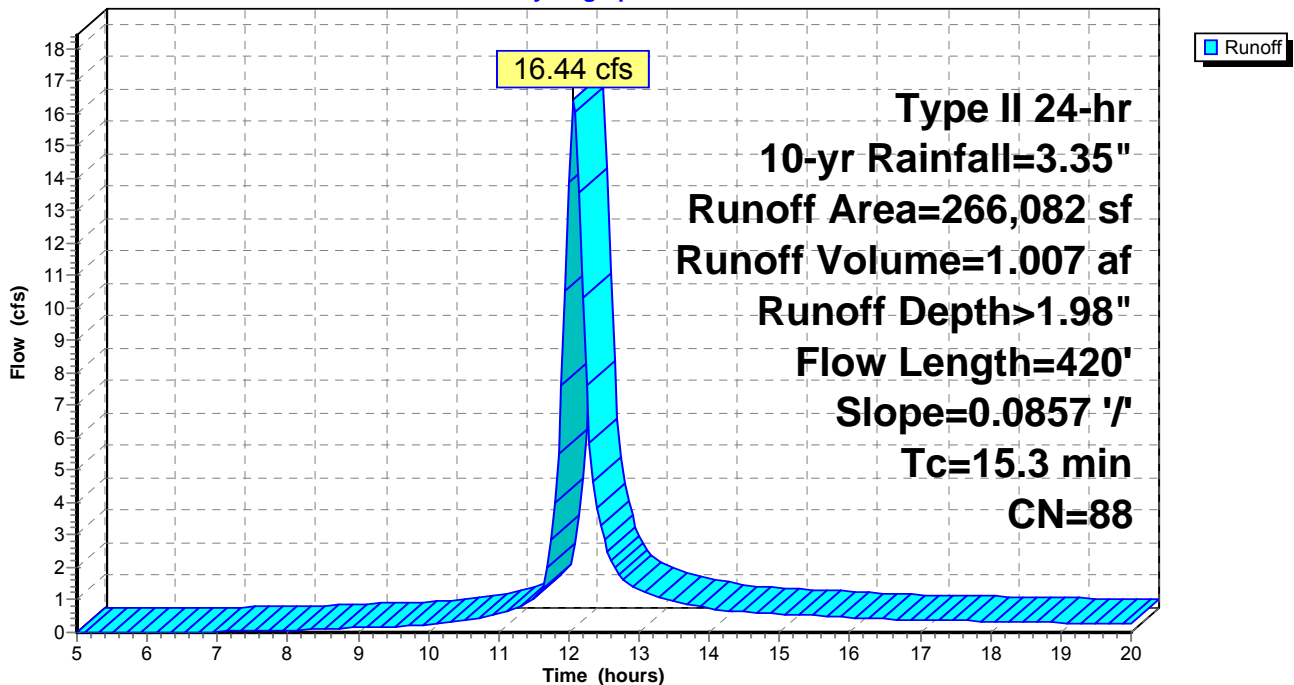
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
58,836	74	>75% Grass cover, Good, HSG C
127,217	89	Gravel roads, HSG C
80,029	98	Paved parking & roofs
266,082	88	Weighted Average
186,053		69.92% Pervious Area
80,029		30.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 5S: DA5

Runoff = 3.26 cfs @ 12.08 hrs, Volume= 0.199 af, Depth> 1.59"

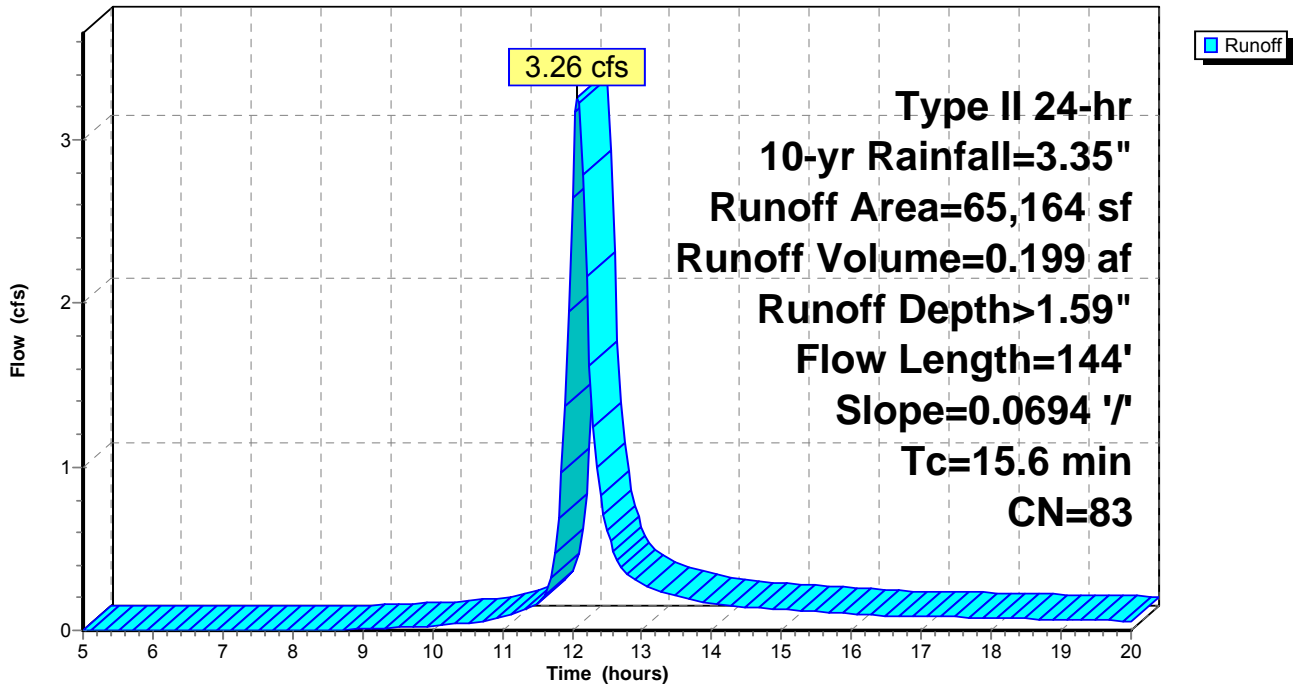
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
26,812	74	>75% Grass cover, Good, HSG C
38,352	89	Gravel roads, HSG C
65,164	83	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 6S: DA6

Runoff = 2.55 cfs @ 12.06 hrs, Volume= 0.147 af, Depth> 1.74"

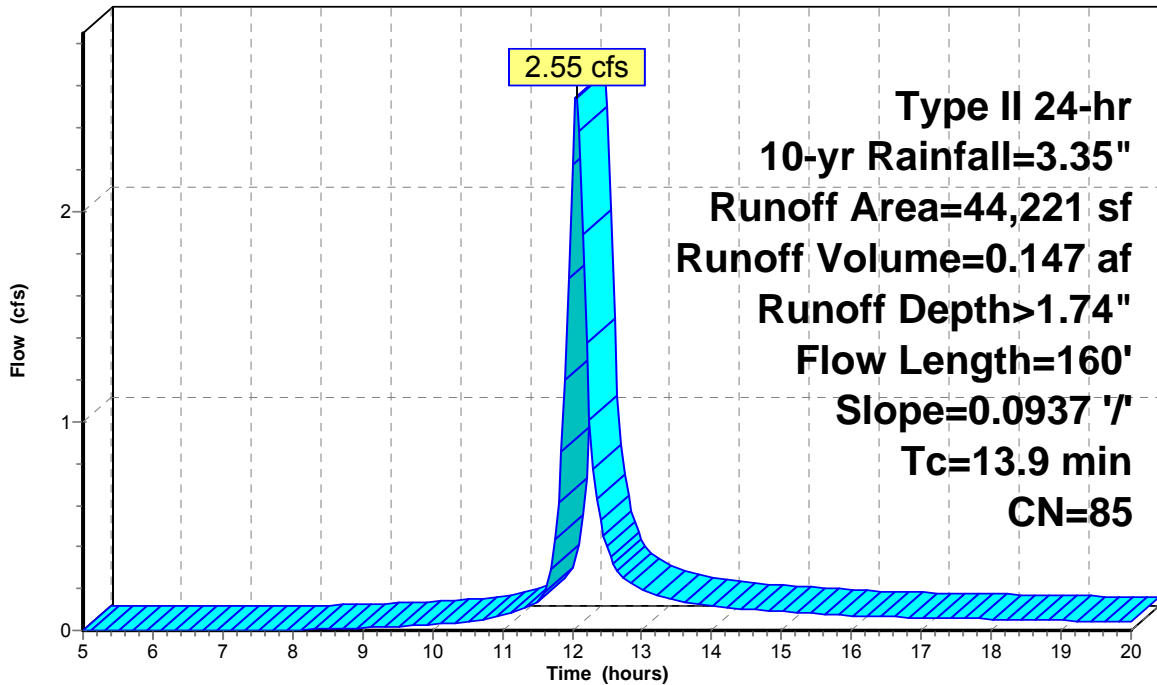
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (sf)	CN	Description
13,087	74	>75% Grass cover, Good, HSG C
28,249	89	Gravel roads, HSG C
2,885	98	Paved parking & roofs
44,221	85	Weighted Average
41,336		93.48% Pervious Area
2,885		6.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

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Type II 24-hr 10-yr Rainfall=3.35"

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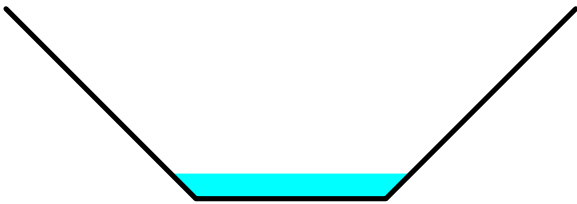
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 6.38% Impervious, Inflow Depth > 1.14" for 10-yr event
Inflow = 1.62 cfs @ 12.01 hrs, Volume= 0.079 af
Outflow = 1.51 cfs @ 12.07 hrs, Volume= 0.078 af, Atten= 7%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.61 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 6.7 min

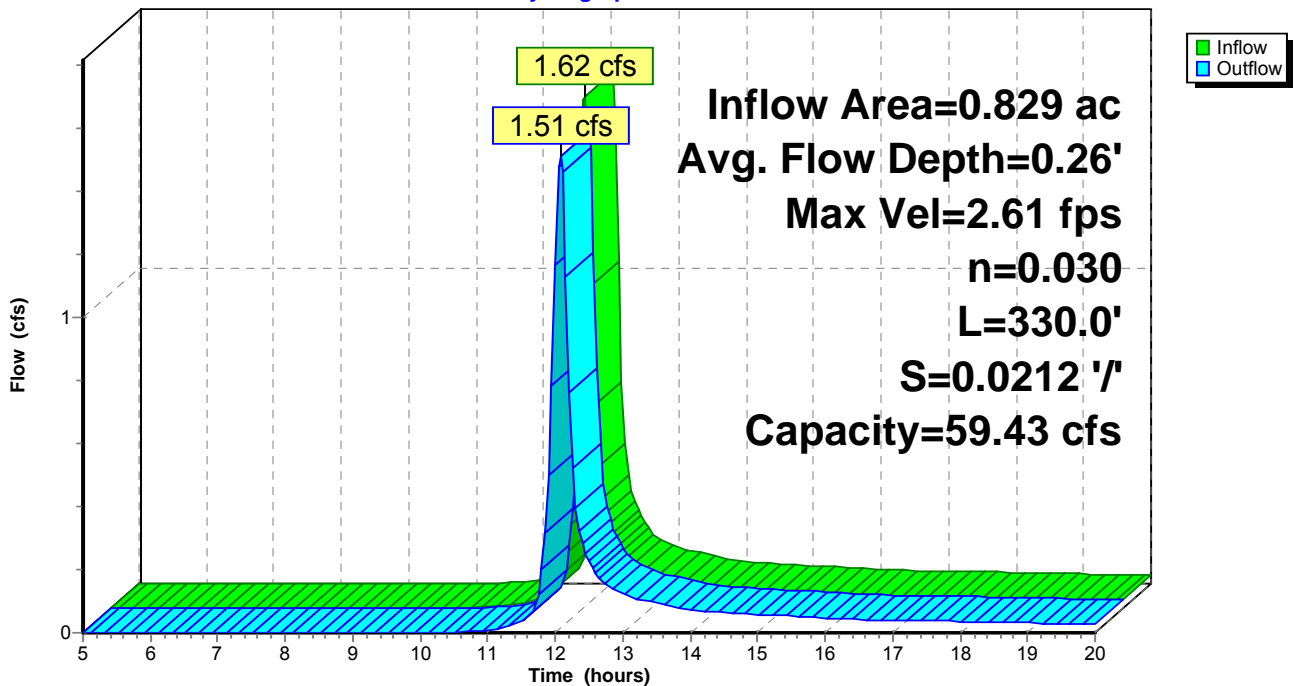
Peak Storage= 198 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0212 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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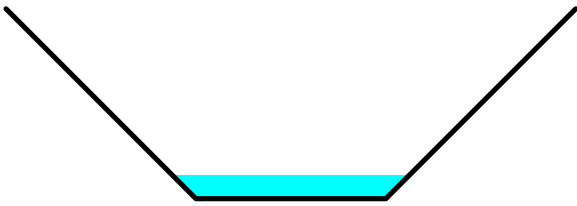
Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.20" for 10-yr event
Inflow = 2.42 cfs @ 12.01 hrs, Volume= 0.118 af
Outflow = 2.31 cfs @ 12.05 hrs, Volume= 0.117 af, Atten= 5%, Lag= 2.1 min

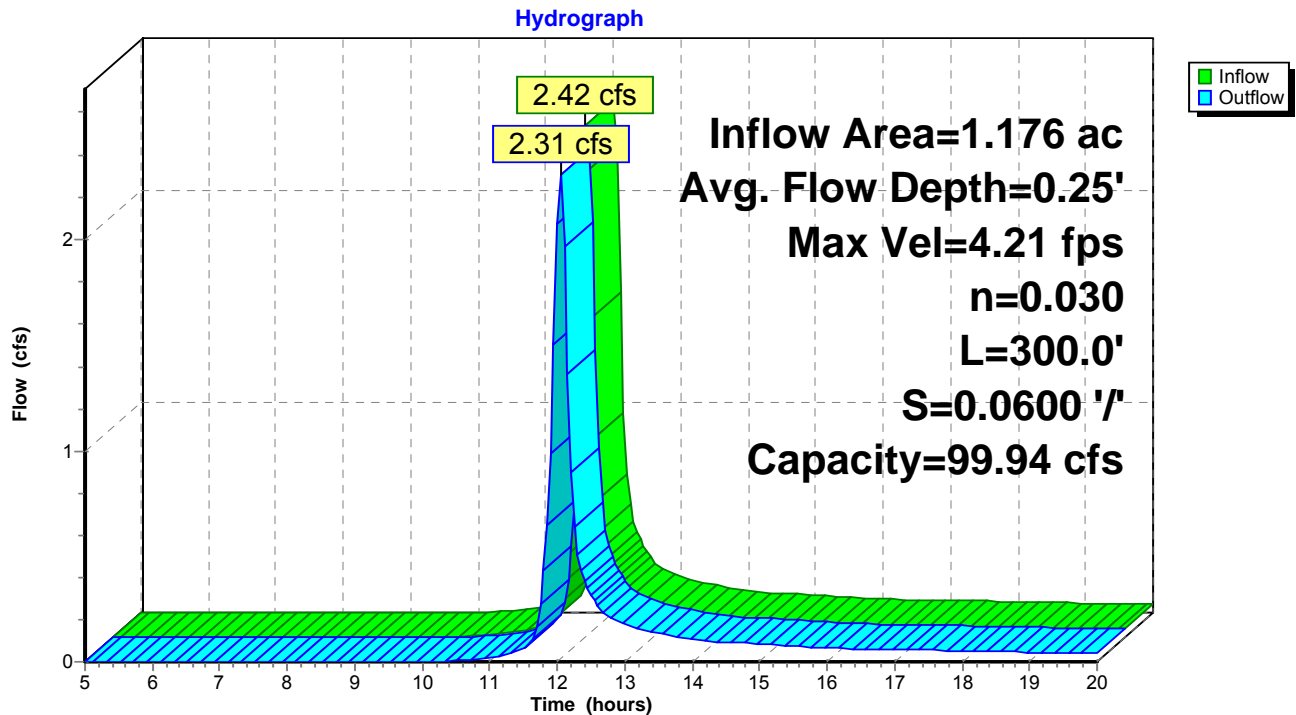
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 3.8 min

Peak Storage= 168 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

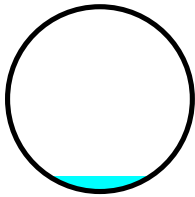
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 1.20" for 10-yr event
Inflow = 2.31 cfs @ 12.05 hrs, Volume= 0.117 af
Outflow = 2.25 cfs @ 12.06 hrs, Volume= 0.117 af, Atten= 3%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.21 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 1.8 min

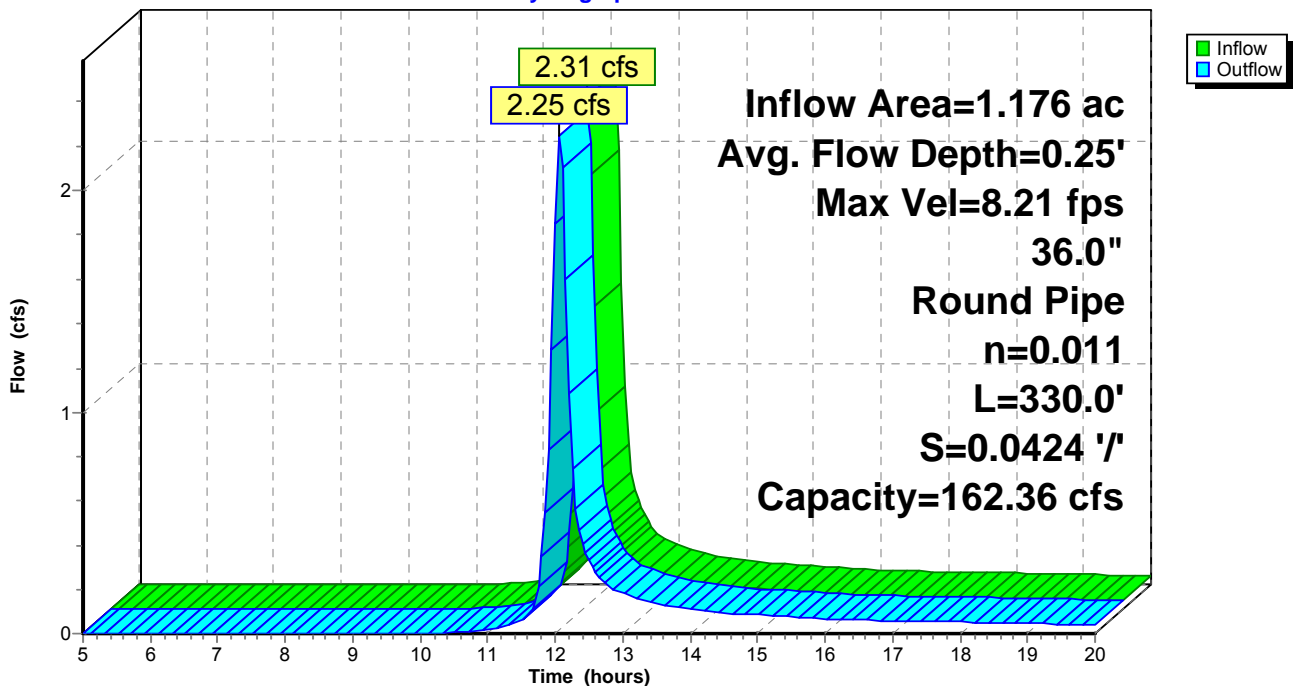
Peak Storage= 93 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 330.0' Slope= 0.0424 '/'
Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.18' @ 12.10 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 1.29" for 10-yr event
Inflow = 4.25 cfs @ 12.08 hrs, Volume= 0.252 af
Outflow = 4.21 cfs @ 12.09 hrs, Volume= 0.252 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 1.3 min

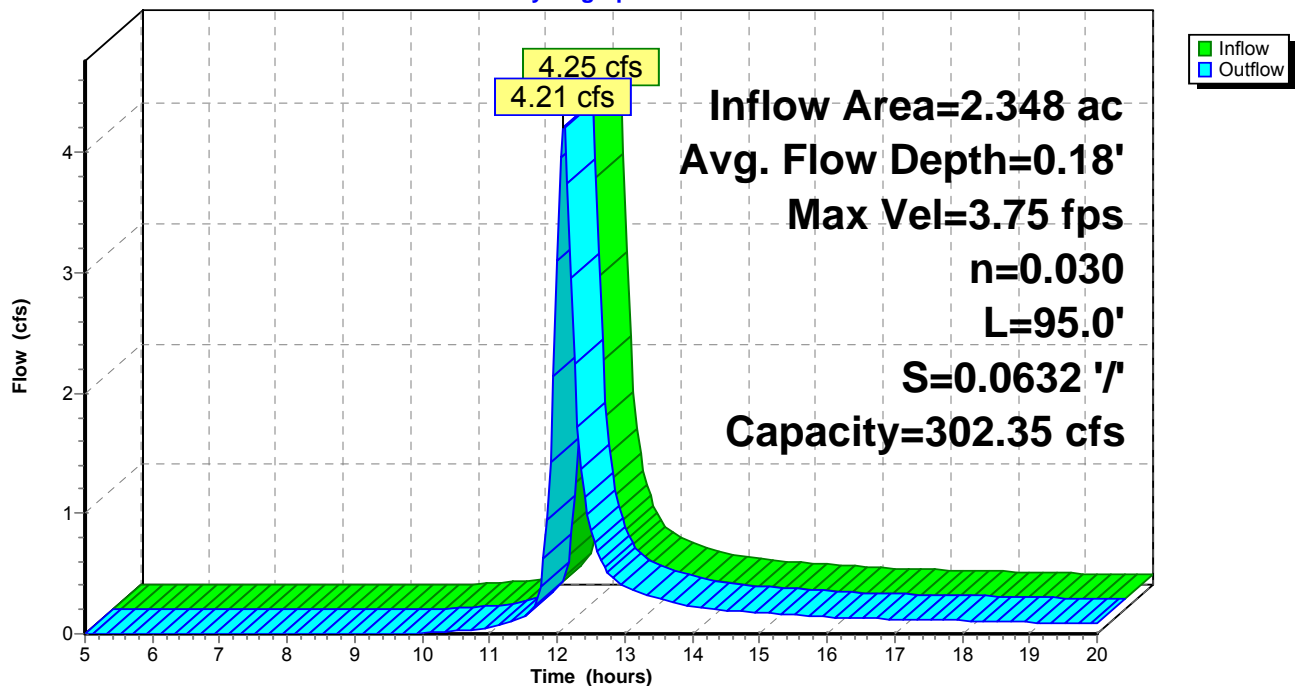
Peak Storage= 107 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 95.0' Slope= 0.0632 '/'
Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

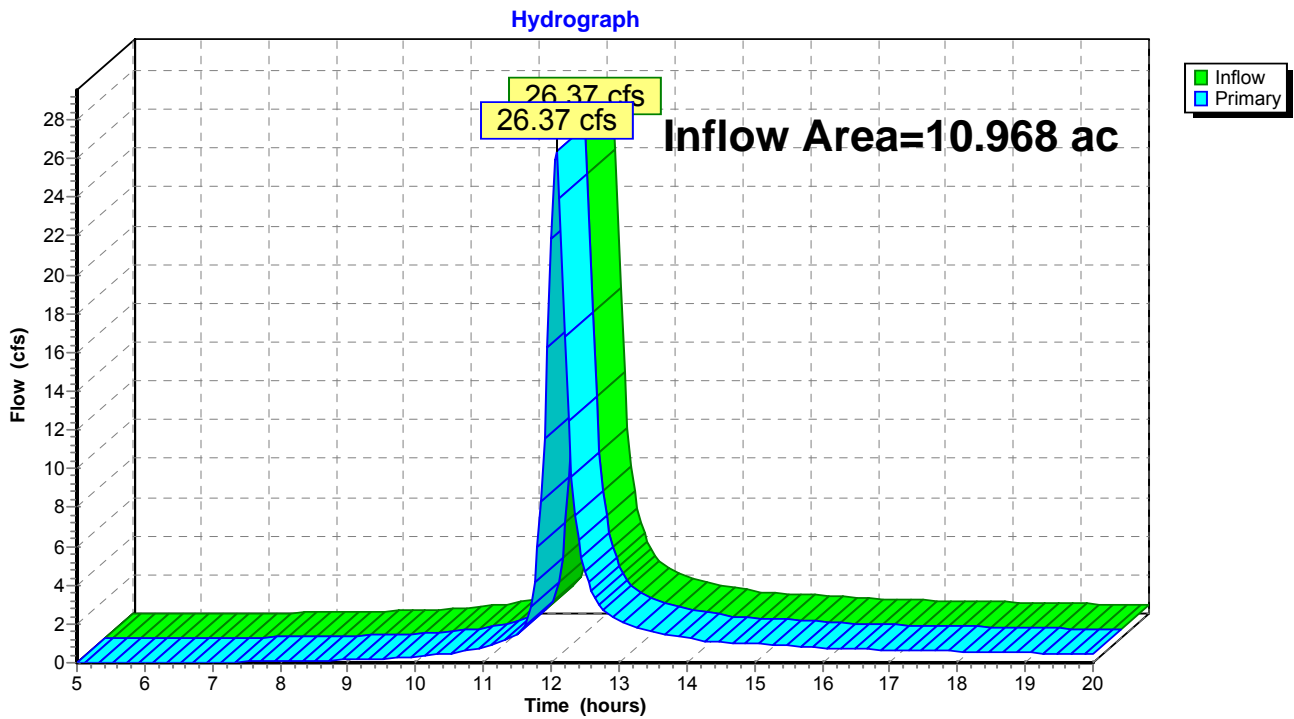


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.968 ac, 17.94% Impervious, Inflow Depth > 1.76" for 10-yr event
Inflow = 26.37 cfs @ 12.07 hrs, Volume= 1.605 af
Primary = 26.37 cfs @ 12.07 hrs, Volume= 1.605 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



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Type II 24-hr 50-yr Rainfall=4.46"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>2.00"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=77 Runoff=4.02 cfs 0.196 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 6.38% Impervious Runoff Depth>1.92"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=76 Runoff=2.73 cfs 0.133 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>2.23"
Flow Length=256' Tc=17.8 min CN=80 Runoff=3.36 cfs 0.218 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 30.08% Impervious Runoff Depth>2.95"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=88 Runoff=24.03 cfs 1.500 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>2.49"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=83 Runoff=5.05 cfs 0.310 af

Subcatchment 6S: DA6 Runoff Area=44,221 sf 6.52% Impervious Runoff Depth>2.67"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=85 Runoff=3.85 cfs 0.226 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.36' Max Vel=3.09 fps Inflow=2.73 cfs 0.133 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=2.57 cfs 0.132 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.34' Max Vel=5.00 fps Inflow=4.02 cfs 0.196 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=3.85 cfs 0.196 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.32' Max Vel=9.58 fps Inflow=3.85 cfs 0.196 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=3.77 cfs 0.195 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.24' Max Vel=4.48 fps Inflow=6.96 cfs 0.414 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=6.87 cfs 0.413 af

Link 14L: Haymaker's Run Inflow=39.76 cfs 2.449 af
Primary=39.76 cfs 2.449 af

Total Runoff Area = 11.797 ac Runoff Volume = 2.583 af Average Runoff Depth = 2.63"
82.87% Pervious = 9.777 ac 17.13% Impervious = 2.020 ac

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 1S: DA1

Runoff = 4.02 cfs @ 12.01 hrs, Volume= 0.196 af, Depth> 2.00"

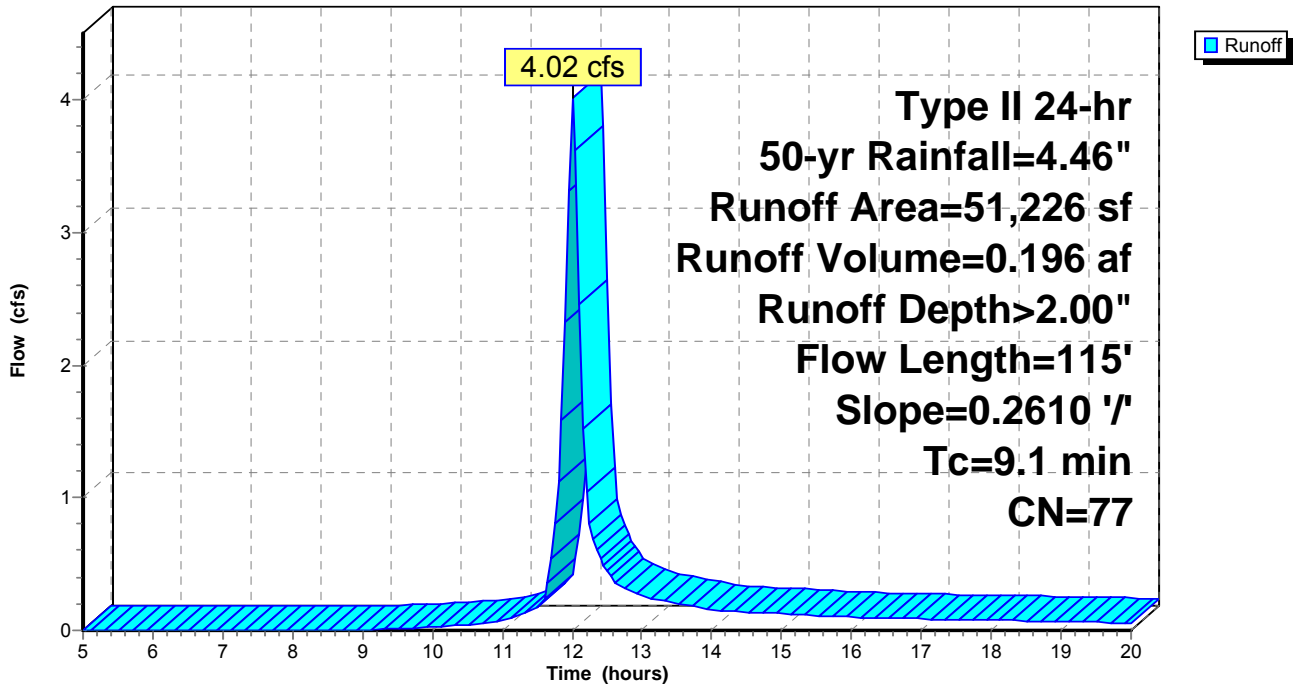
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
39,857	74	>75% Grass cover, Good, HSG C
11,369	89	Gravel roads, HSG C
51,226	77	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



Post Compressor Station SW Model

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 2S: DA2

Runoff = 2.73 cfs @ 12.01 hrs, Volume= 0.133 af, Depth> 1.92"

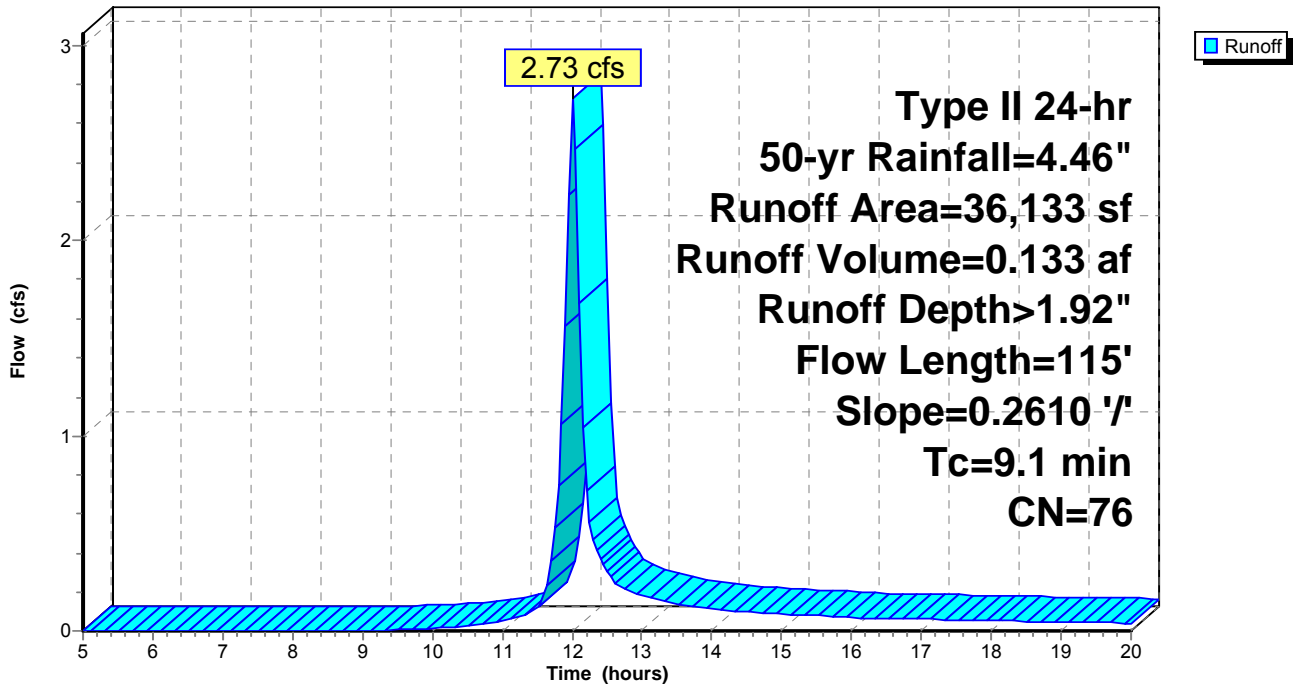
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
33,828	74	>75% Grass cover, Good, HSG C
* 2,305	98	Paved driveway and building
36,133	76	Weighted Average
33,828		93.62% Pervious Area
2,305		6.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 3S: DA3

Runoff = 3.36 cfs @ 12.10 hrs, Volume= 0.218 af, Depth> 2.23"

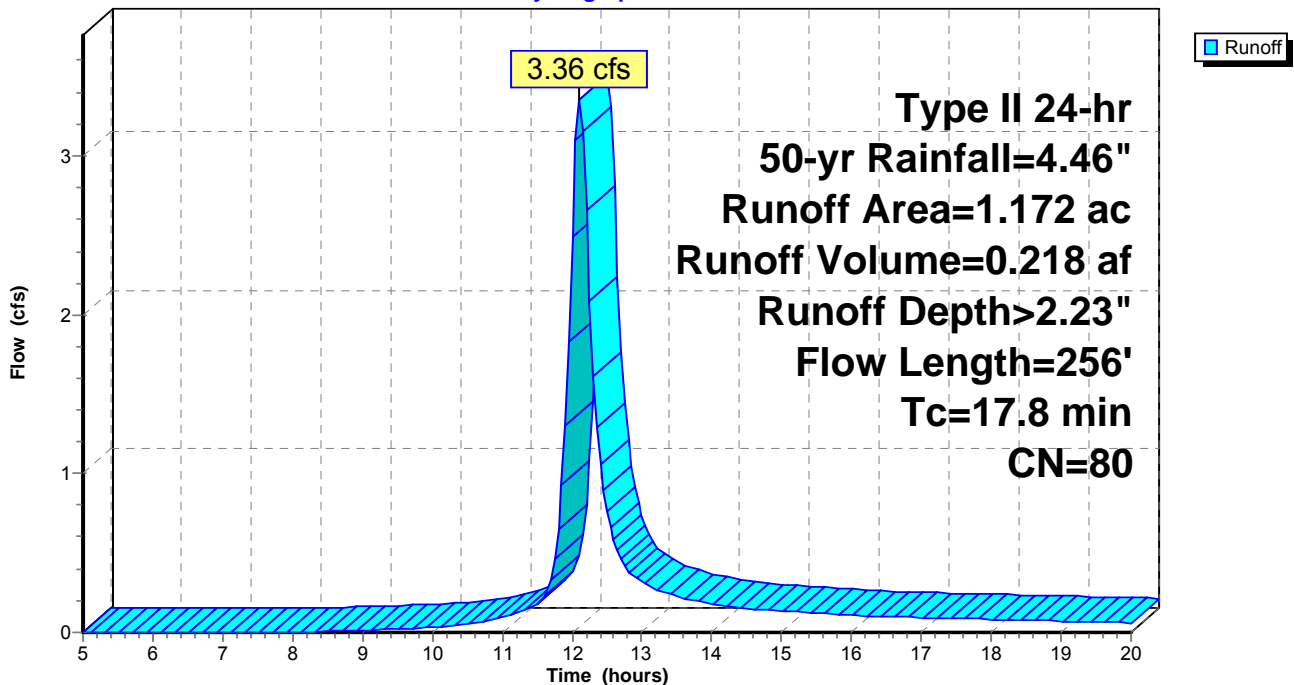
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 4S: DA4

Runoff = 24.03 cfs @ 12.07 hrs, Volume= 1.500 af, Depth> 2.95"

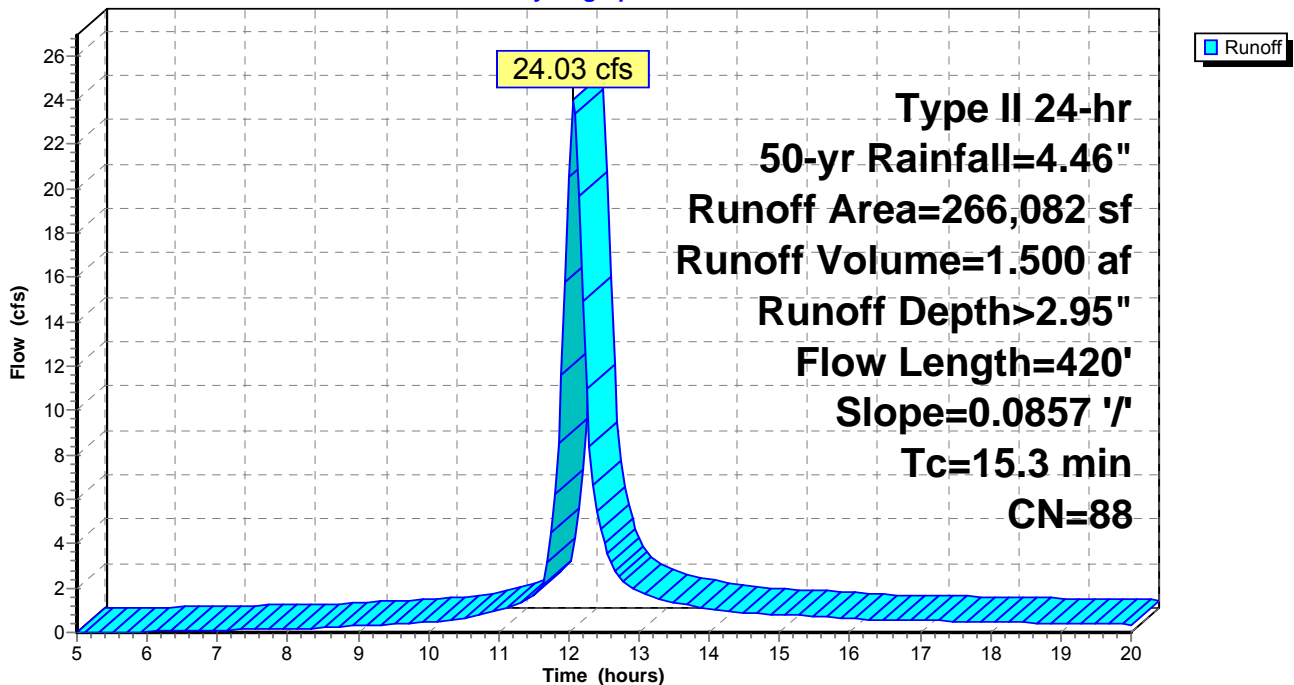
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
58,836	74	>75% Grass cover, Good, HSG C
127,217	89	Gravel roads, HSG C
80,029	98	Paved parking & roofs
266,082	88	Weighted Average
186,053		69.92% Pervious Area
80,029		30.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 5S: DA5

Runoff = 5.05 cfs @ 12.08 hrs, Volume= 0.310 af, Depth> 2.49"

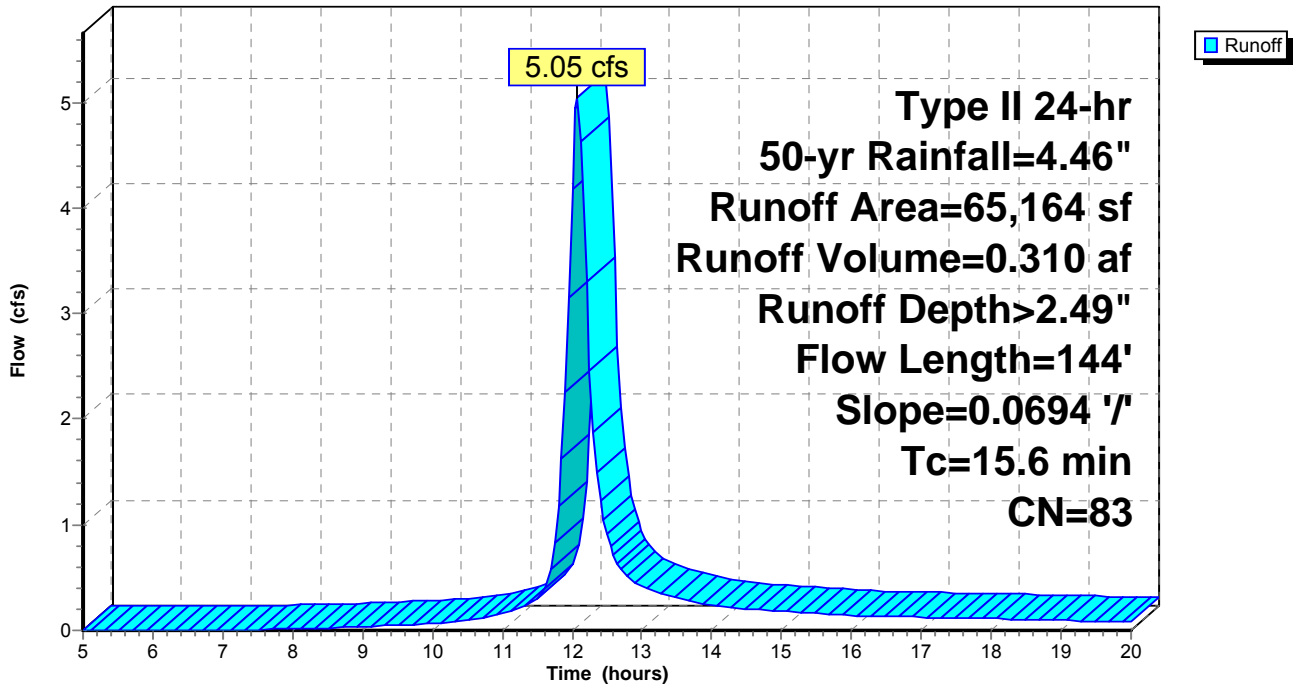
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
26,812	74	>75% Grass cover, Good, HSG C
38,352	89	Gravel roads, HSG C
65,164	83	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 6S: DA6

Runoff = 3.85 cfs @ 12.06 hrs, Volume= 0.226 af, Depth> 2.67"

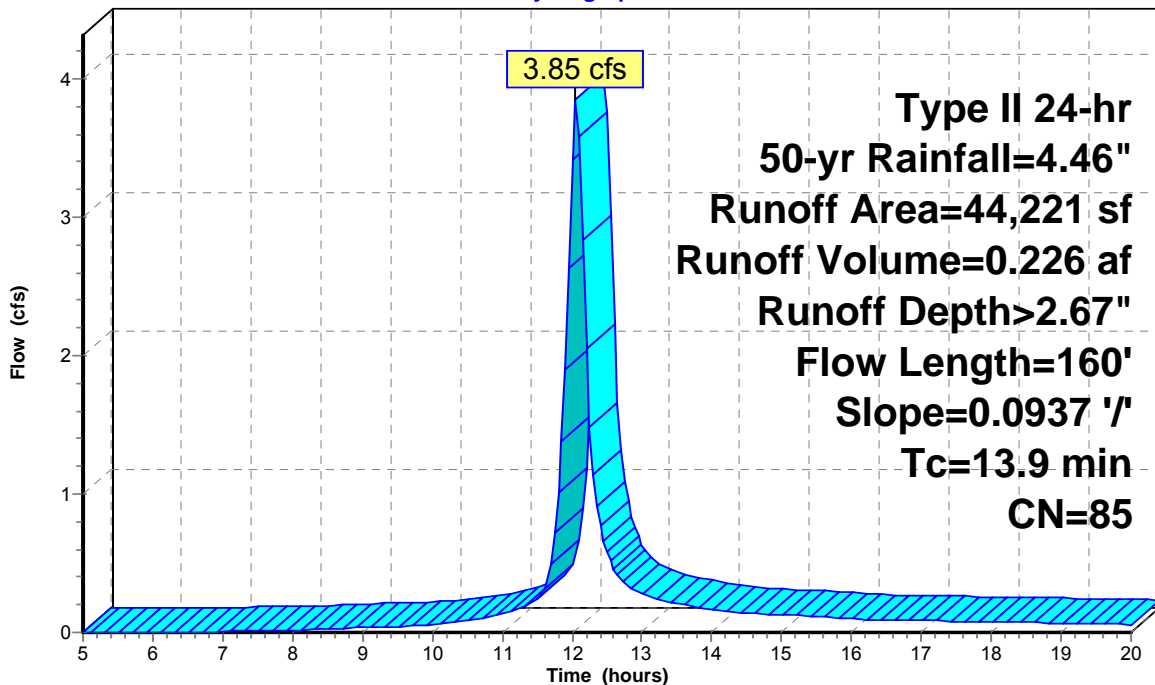
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (sf)	CN	Description
13,087	74	>75% Grass cover, Good, HSG C
28,249	89	Gravel roads, HSG C
2,885	98	Paved parking & roofs
44,221	85	Weighted Average
41,336		93.48% Pervious Area
2,885		6.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

Hydrograph



Runoff

**Type II 24-hr
50-yr Rainfall=4.46"
Runoff Area=44,221 sf
Runoff Volume=0.226 af
Runoff Depth>2.67"
Flow Length=160'
Slope=0.0937 '/
Tc=13.9 min
CN=85**

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Type II 24-hr 50-yr Rainfall=4.46"

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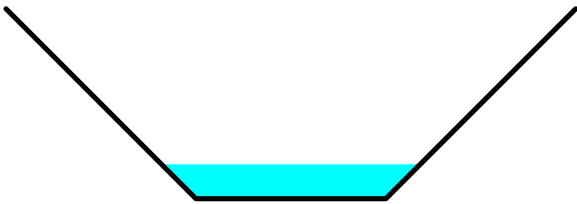
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 6.38% Impervious, Inflow Depth > 1.92" for 50-yr event
Inflow = 2.73 cfs @ 12.01 hrs, Volume= 0.133 af
Outflow = 2.57 cfs @ 12.06 hrs, Volume= 0.132 af, Atten= 6%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.09 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 6.0 min

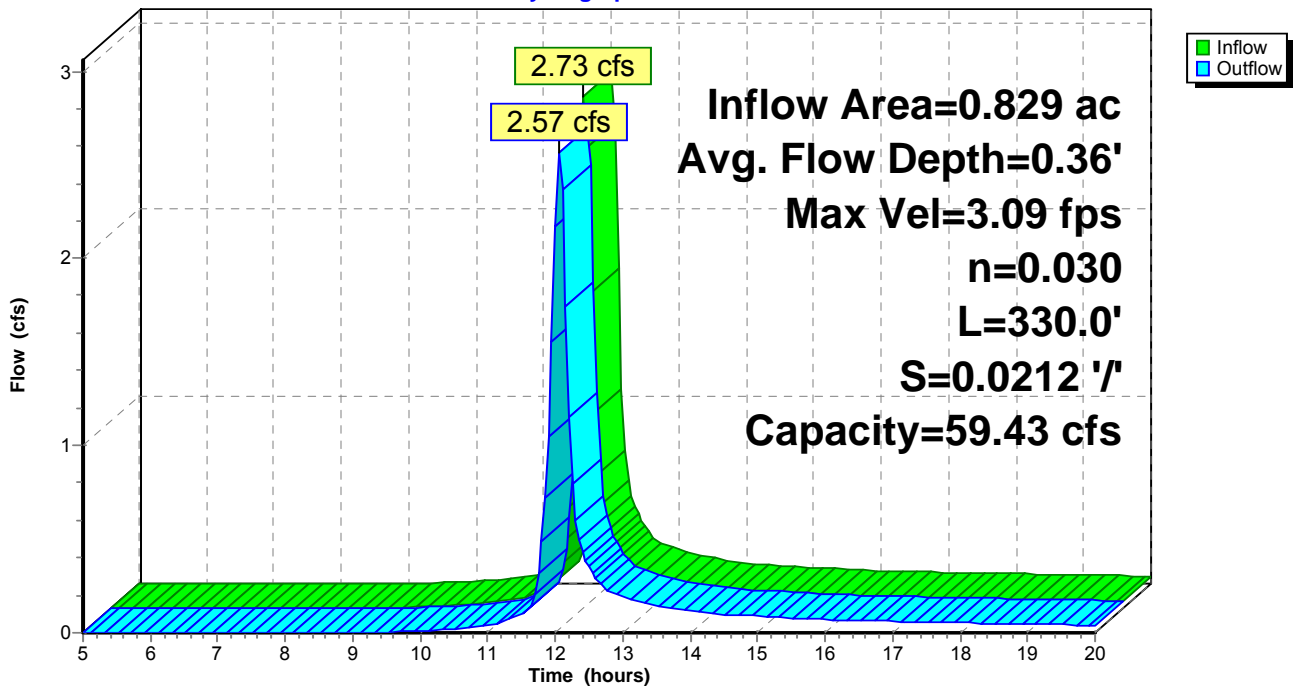
Peak Storage= 282 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0212 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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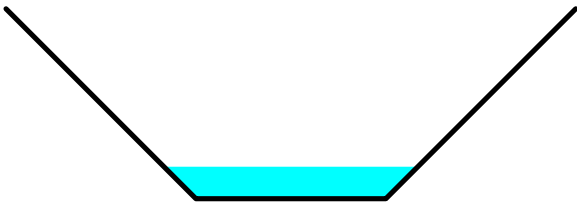
Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.00" for 50-yr event
Inflow = 4.02 cfs @ 12.01 hrs, Volume= 0.196 af
Outflow = 3.85 cfs @ 12.04 hrs, Volume= 0.196 af, Atten= 4%, Lag= 1.8 min

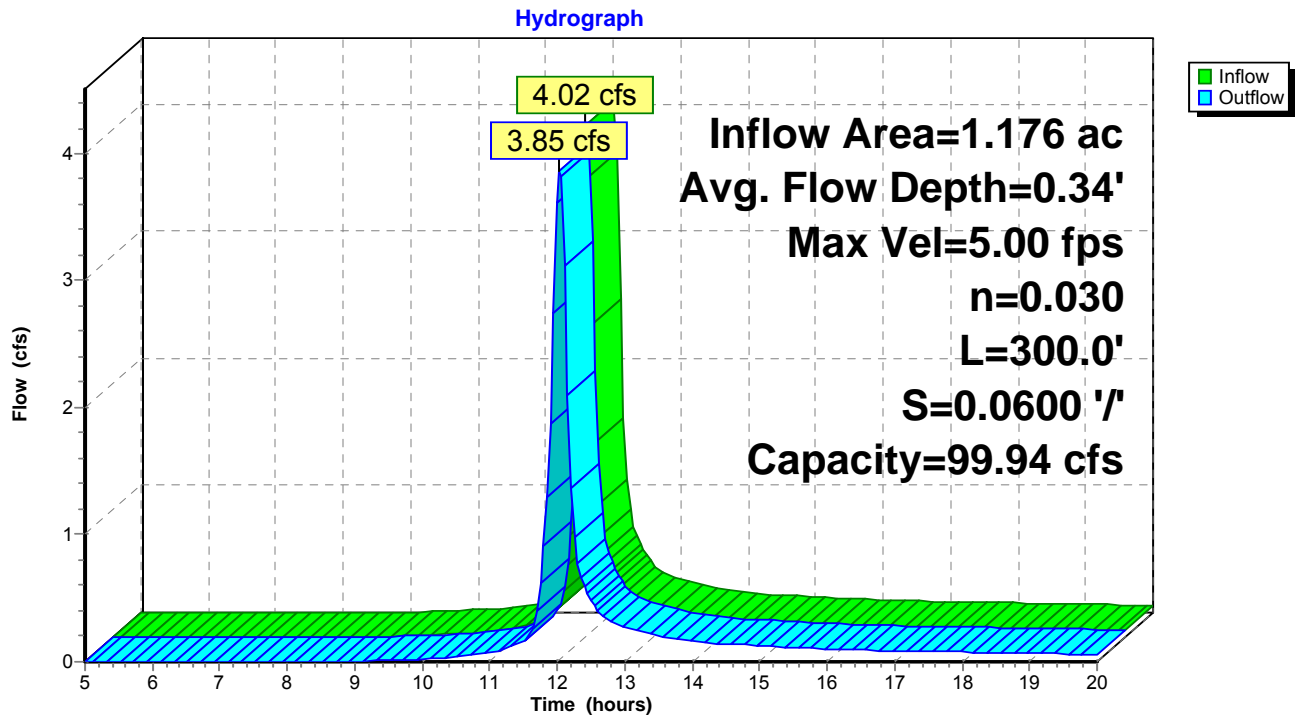
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.00 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 3.4 min

Peak Storage= 236 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

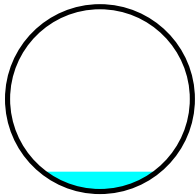
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.00" for 50-yr event
Inflow = 3.85 cfs @ 12.04 hrs, Volume= 0.196 af
Outflow = 3.77 cfs @ 12.05 hrs, Volume= 0.195 af, Atten= 2%, Lag= 0.9 min

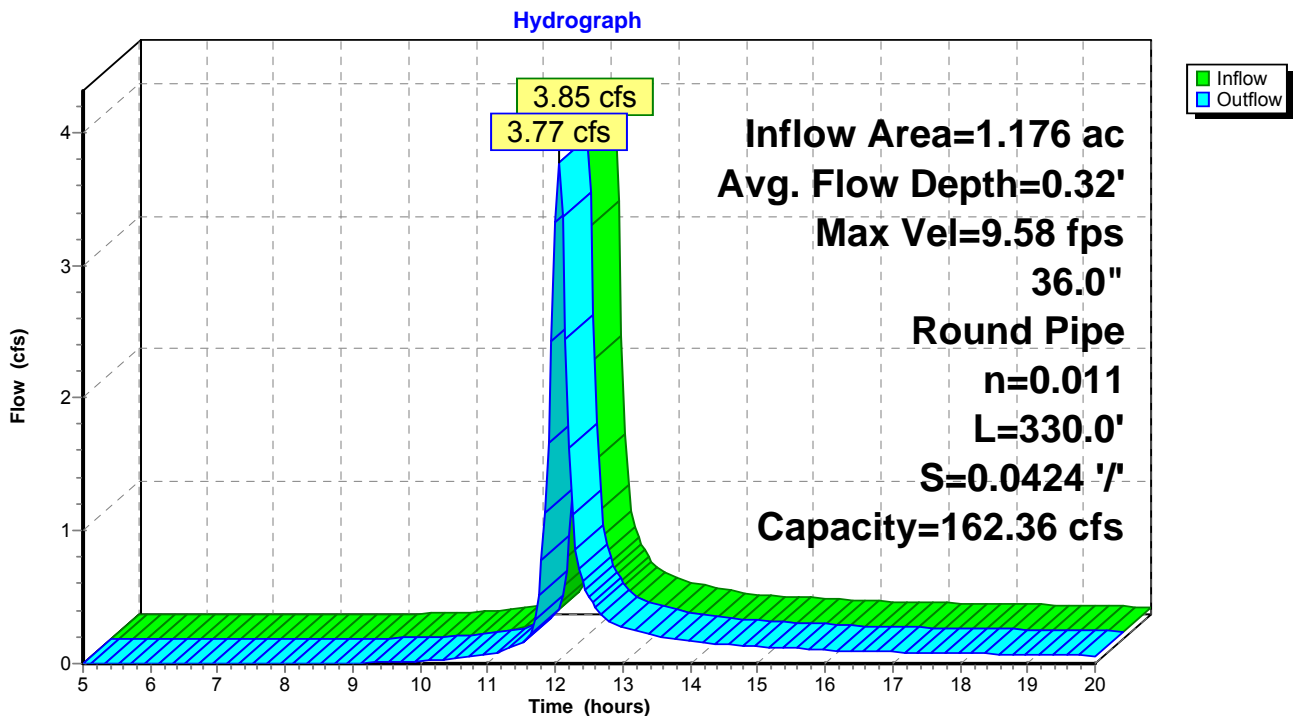
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.58 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 133 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 330.0' Slope= 0.0424 '/'
Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.24' @ 12.05 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 2.11" for 50-yr event
Inflow = 6.96 cfs @ 12.07 hrs, Volume= 0.414 af
Outflow = 6.87 cfs @ 12.08 hrs, Volume= 0.413 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.48 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.2 min

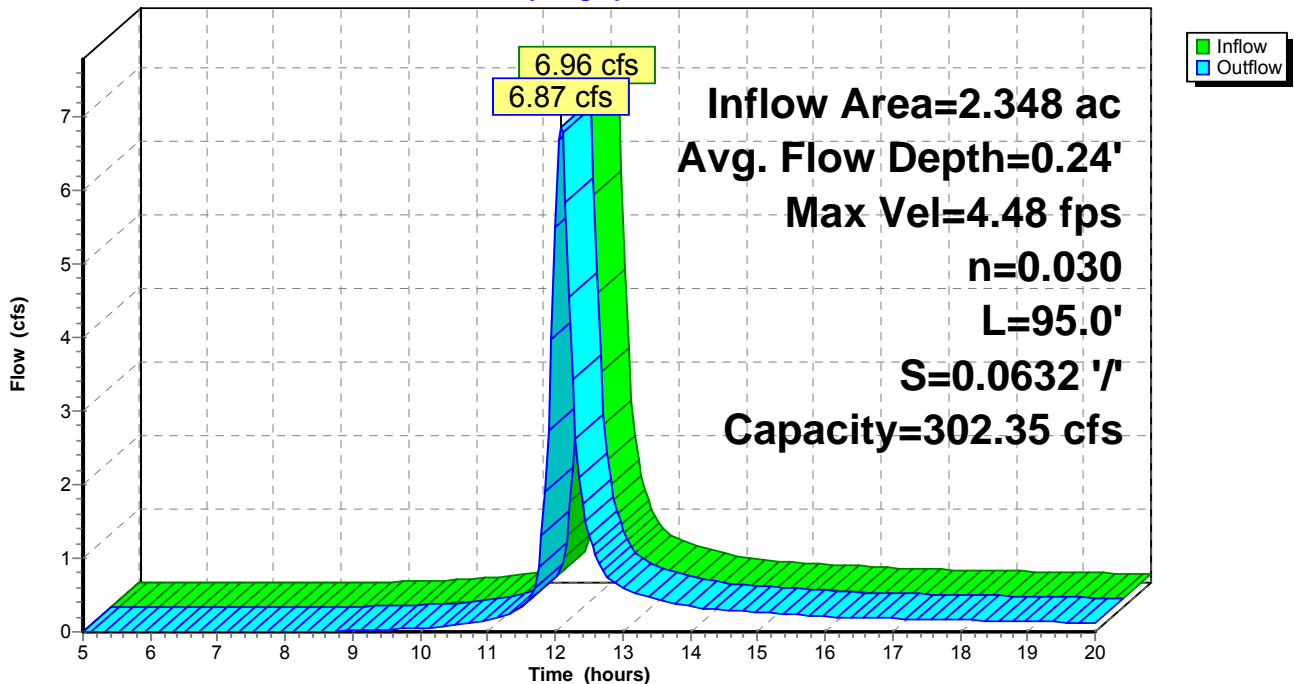
Peak Storage= 146 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 95.0' Slope= 0.0632 '/'
Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

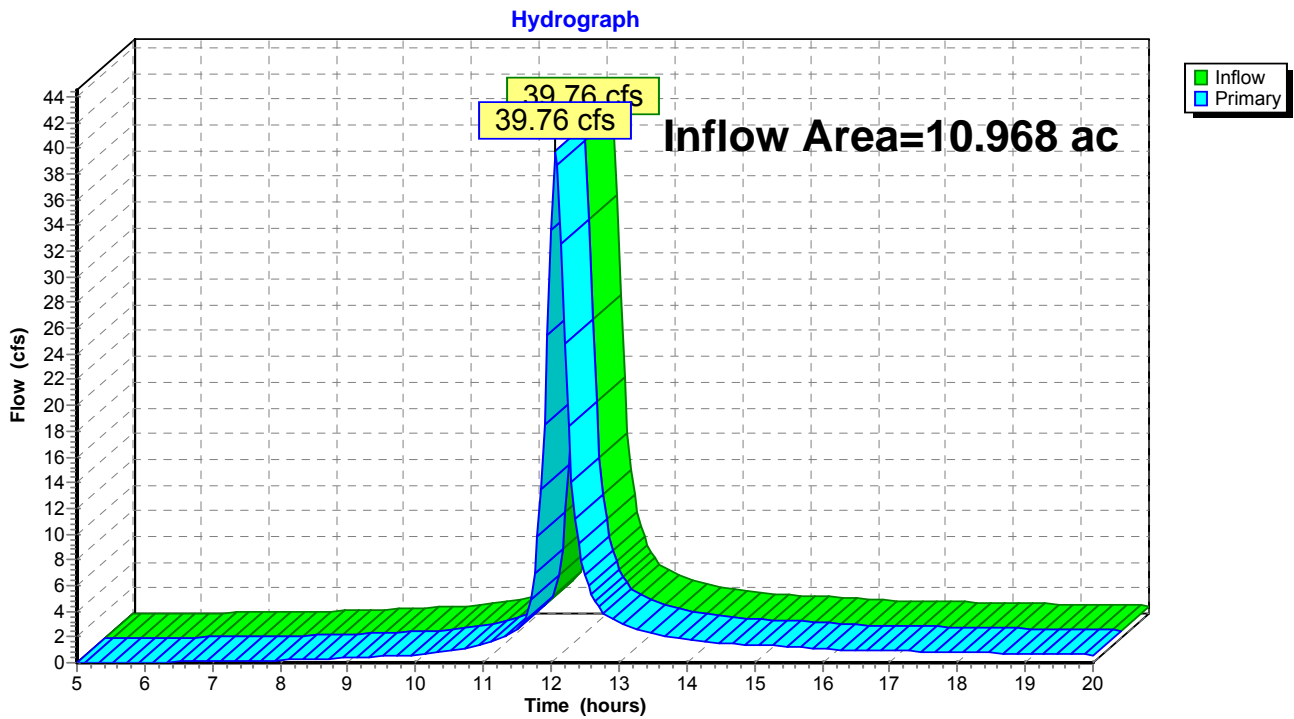


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.968 ac, 17.94% Impervious, Inflow Depth > 2.68" for 50-yr event
Inflow = 39.76 cfs @ 12.07 hrs, Volume= 2.449 af
Primary = 39.76 cfs @ 12.07 hrs, Volume= 2.449 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



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Type II 24-hr 100-yr Rainfall=4.99"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 Runoff Area=51,226 sf 0.00% Impervious Runoff Depth>2.41"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=77 Runoff=4.82 cfs 0.236 af

Subcatchment 2S: DA2 Runoff Area=36,133 sf 6.38% Impervious Runoff Depth>2.33"
Flow Length=115' Slope=0.2610 '/' Tc=9.1 min CN=76 Runoff=3.29 cfs 0.161 af

Subcatchment 3S: DA3 Runoff Area=1.172 ac 5.46% Impervious Runoff Depth>2.66"
Flow Length=256' Tc=17.8 min CN=80 Runoff=3.99 cfs 0.260 af

Subcatchment 4S: DA4 Runoff Area=266,082 sf 30.08% Impervious Runoff Depth>3.42"
Flow Length=420' Slope=0.0857 '/' Tc=15.3 min CN=88 Runoff=27.67 cfs 1.740 af

Subcatchment 5S: DA5 Runoff Area=65,164 sf 0.00% Impervious Runoff Depth>2.94"
Flow Length=144' Slope=0.0694 '/' Tc=15.6 min CN=83 Runoff=5.92 cfs 0.366 af

Subcatchment 6S: DA6 Runoff Area=44,221 sf 6.52% Impervious Runoff Depth>3.13"
Flow Length=160' Slope=0.0937 '/' Tc=13.9 min CN=85 Runoff=4.48 cfs 0.265 af

Reach 11R: Roadway Ditch Avg. Flow Depth=0.40' Max Vel=3.27 fps Inflow=3.29 cfs 0.161 af
n=0.030 L=330.0' S=0.0212 '/' Capacity=59.43 cfs Outflow=3.10 cfs 0.160 af

Reach 12R: Roadway Ditch Avg. Flow Depth=0.38' Max Vel=5.30 fps Inflow=4.82 cfs 0.236 af
n=0.030 L=300.0' S=0.0600 '/' Capacity=99.94 cfs Outflow=4.63 cfs 0.236 af

Reach 13R: Culvert (Running N to S) w/ Avg. Flow Depth=0.35' Max Vel=10.11 fps Inflow=4.63 cfs 0.236 af
36.0" Round Pipe n=0.011 L=330.0' S=0.0424 '/' Capacity=162.36 cfs Outflow=4.54 cfs 0.235 af

Reach 16R: Ditch to Haymaker's Run Avg. Flow Depth=0.26' Max Vel=4.79 fps Inflow=8.31 cfs 0.495 af
n=0.030 L=95.0' S=0.0632 '/' Capacity=302.35 cfs Outflow=8.22 cfs 0.495 af

Link 14L: Haymaker's Run Inflow=46.24 cfs 2.866 af
Primary=46.24 cfs 2.866 af

Total Runoff Area = 11.797 ac Runoff Volume = 3.028 af Average Runoff Depth = 3.08"
82.87% Pervious = 9.777 ac 17.13% Impervious = 2.020 ac

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Summary for Subcatchment 1S: DA1

Runoff = 4.82 cfs @ 12.01 hrs, Volume= 0.236 af, Depth> 2.41"

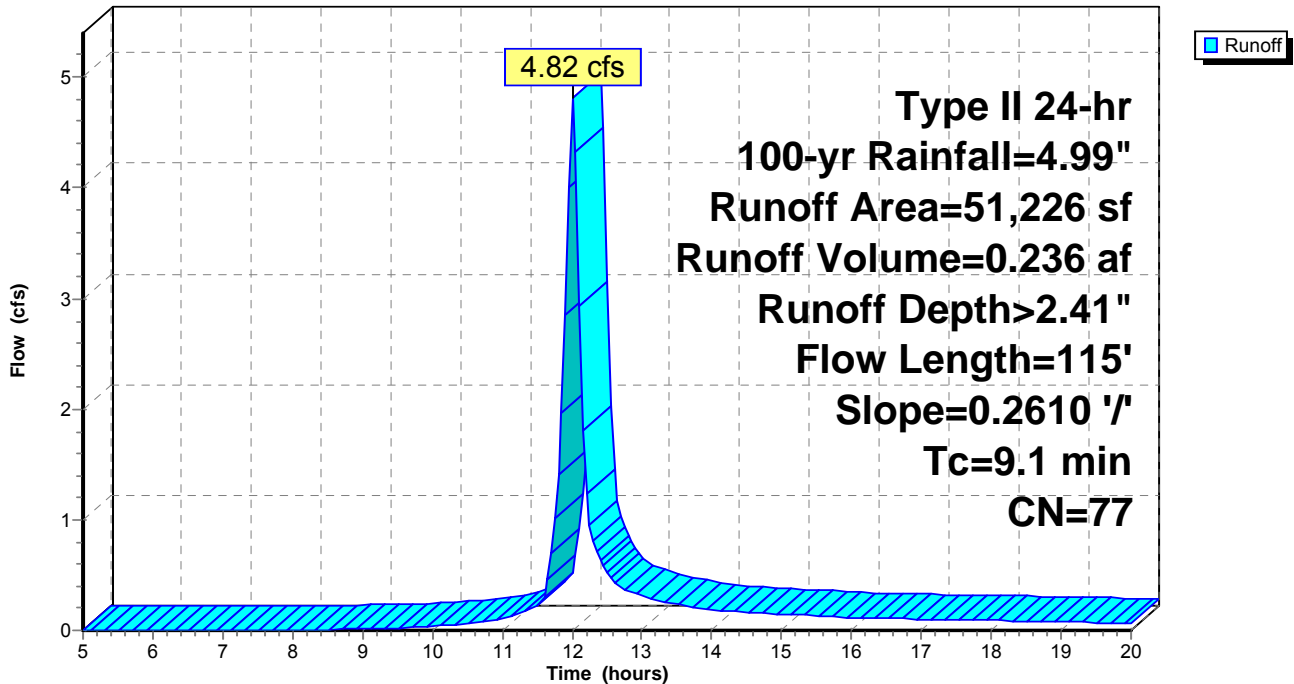
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
39,857	74	>75% Grass cover, Good, HSG C
11,369	89	Gravel roads, HSG C
51,226	77	Weighted Average
51,226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 1S: DA1

Hydrograph



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Summary for Subcatchment 2S: DA2

Runoff = 3.29 cfs @ 12.01 hrs, Volume= 0.161 af, Depth> 2.33"

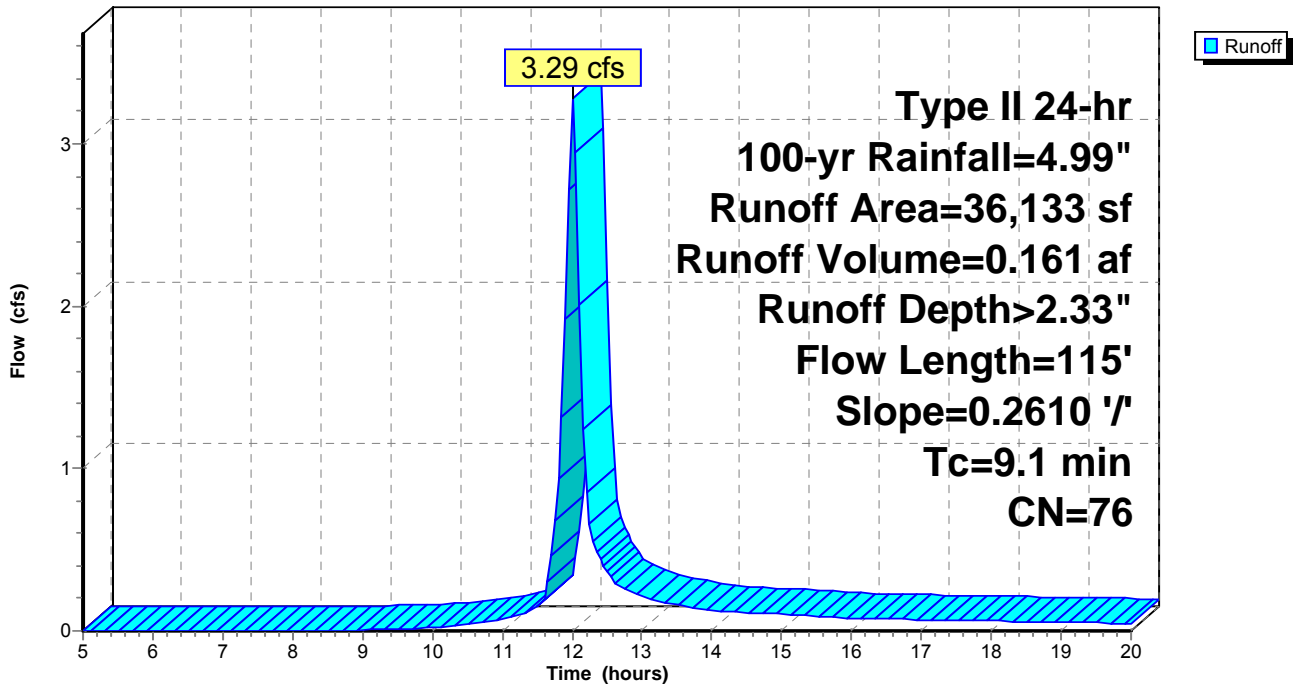
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
33,828	74	>75% Grass cover, Good, HSG C
* 2,305	98	Paved driveway and building
36,133	76	Weighted Average
33,828		93.62% Pervious Area
2,305		6.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.2610	0.18		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.0	15	0.2610	8.23		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
9.1	115	Total			

Subcatchment 2S: DA2

Hydrograph



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Summary for Subcatchment 3S: DA3

Runoff = 3.99 cfs @ 12.10 hrs, Volume= 0.260 af, Depth> 2.66"

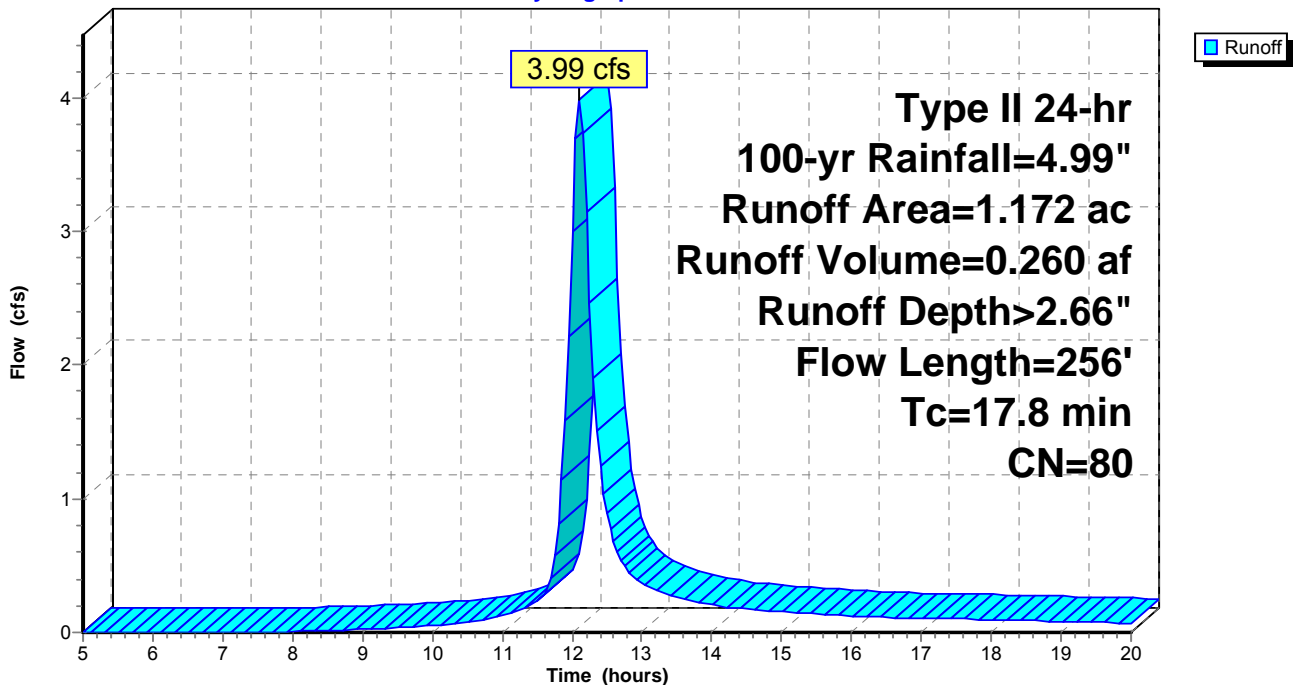
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.709	74	>75% Grass cover, Good, HSG C
0.399	89	Gravel roads, HSG C
0.064	98	Paved parking & roofs
1.172	80	Weighted Average
1.108		94.54% Pervious Area
0.064		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0510	0.10		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.3	156	0.2609	8.22		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
17.8	256	Total			

Subcatchment 3S: DA3

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Summary for Subcatchment 4S: DA4

Runoff = 27.67 cfs @ 12.07 hrs, Volume= 1.740 af, Depth> 3.42"

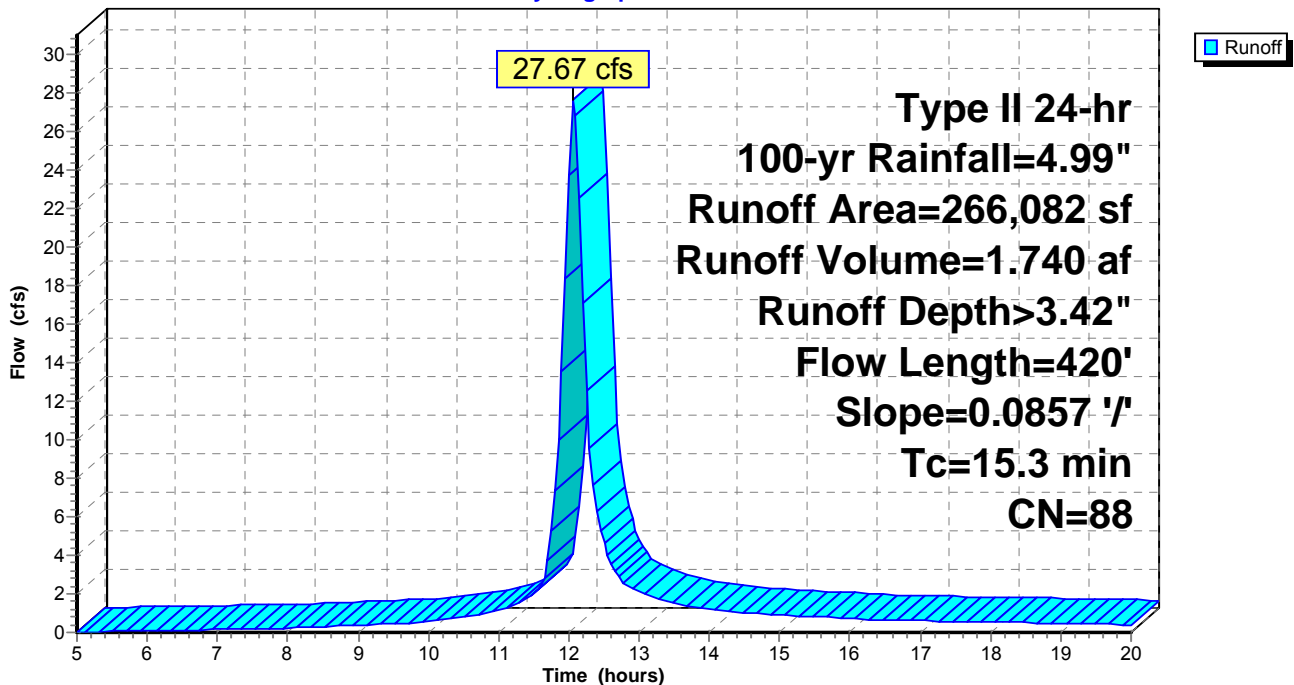
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
58,836	74	>75% Grass cover, Good, HSG C
127,217	89	Gravel roads, HSG C
80,029	98	Paved parking & roofs
266,082	88	Weighted Average
186,053		69.92% Pervious Area
80,029		30.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0857	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
1.1	320	0.0857	4.71		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.3	420	Total			

Subcatchment 4S: DA4

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 5S: DA5

Runoff = 5.92 cfs @ 12.08 hrs, Volume= 0.366 af, Depth> 2.94"

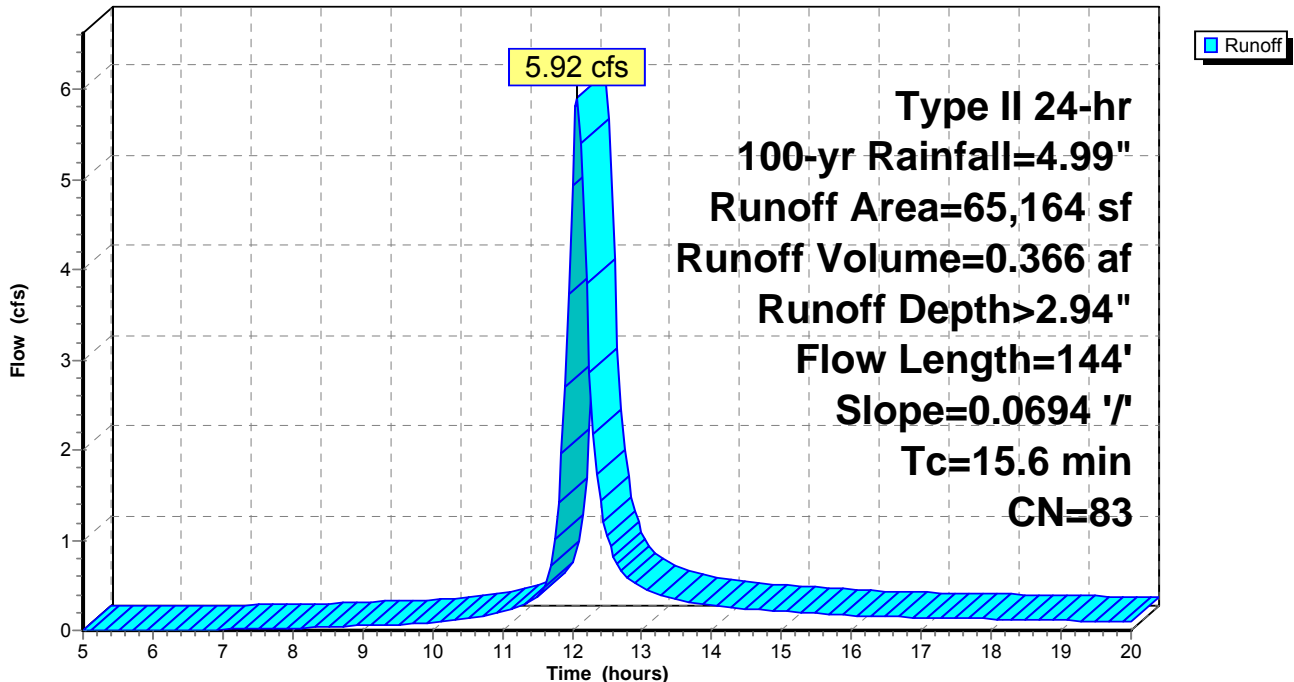
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
26,812	74	>75% Grass cover, Good, HSG C
38,352	89	Gravel roads, HSG C
65,164	83	Weighted Average
65,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0694	0.11		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	44	0.0694	4.24		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
15.6	144	Total			

Subcatchment 5S: DA5

Hydrograph



Post Compressor Station SW Model

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 6S: DA6

Runoff = 4.48 cfs @ 12.06 hrs, Volume= 0.265 af, Depth> 3.13"

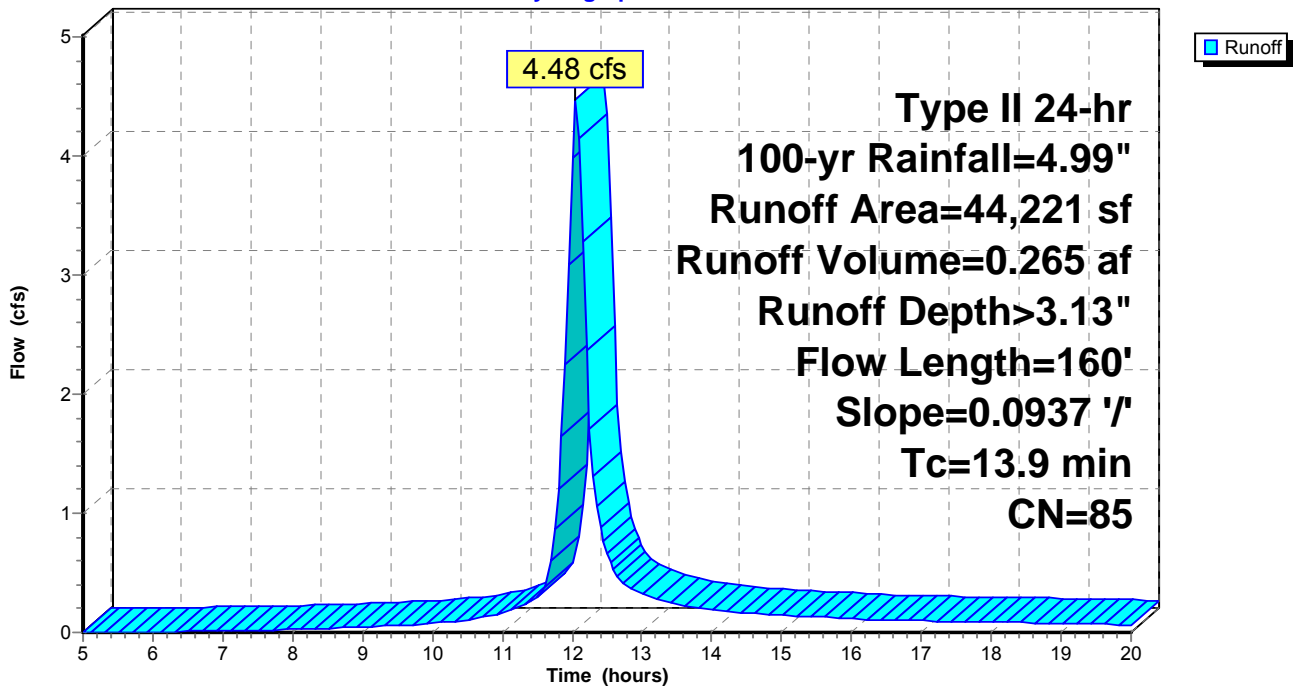
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (sf)	CN	Description
13,087	74	>75% Grass cover, Good, HSG C
28,249	89	Gravel roads, HSG C
2,885	98	Paved parking & roofs
44,221	85	Weighted Average
41,336		93.48% Pervious Area
2,885		6.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0937	0.12		Sheet Flow, sheet flow Grass: Bermuda n= 0.410 P2= 2.38"
0.2	60	0.0937	4.93		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
13.9	160	Total			

Subcatchment 6S: DA6

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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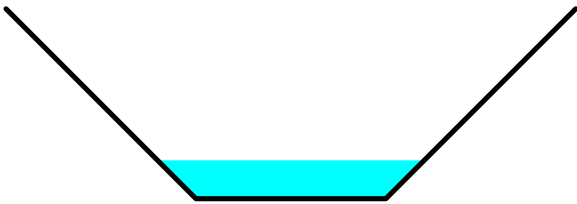
Summary for Reach 11R: Roadway Ditch

Inflow Area = 0.829 ac, 6.38% Impervious, Inflow Depth > 2.33" for 100-yr event
Inflow = 3.29 cfs @ 12.01 hrs, Volume= 0.161 af
Outflow = 3.10 cfs @ 12.05 hrs, Volume= 0.160 af, Atten= 6%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 5.7 min

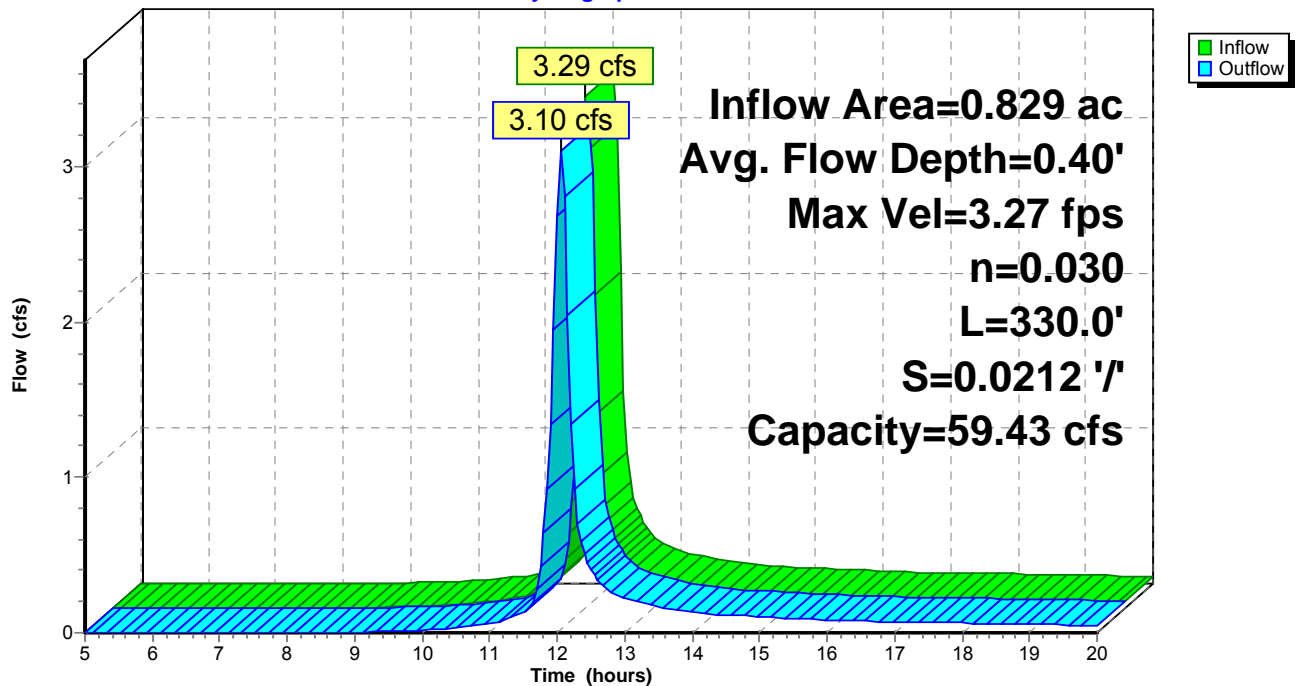
Peak Storage= 320 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 59.43 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0212 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,072.00'



Reach 11R: Roadway Ditch

Hydrograph



Post Compressor Station SW Model

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Type II 24-hr 100-yr Rainfall=4.99"

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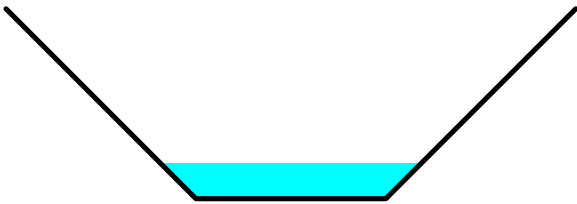
Summary for Reach 12R: Roadway Ditch

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.41" for 100-yr event
Inflow = 4.82 cfs @ 12.01 hrs, Volume= 0.236 af
Outflow = 4.63 cfs @ 12.03 hrs, Volume= 0.236 af, Atten= 4%, Lag= 1.7 min

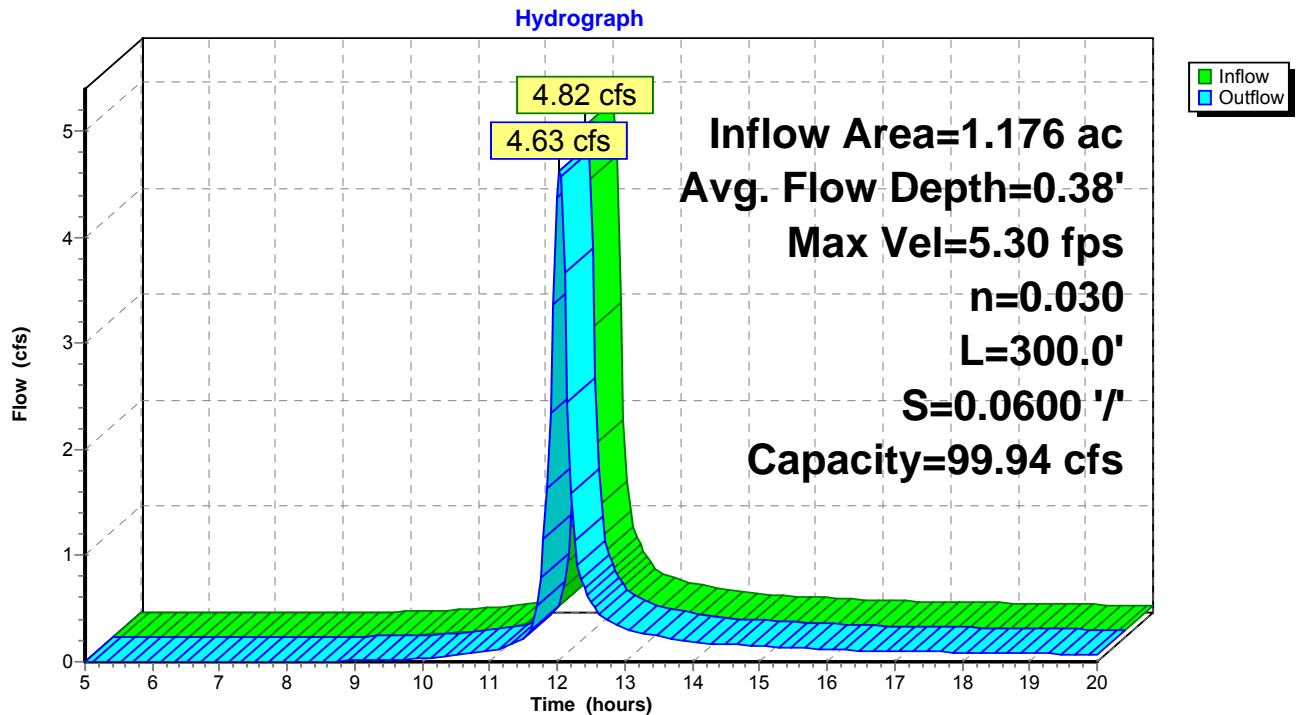
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.30 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 3.3 min

Peak Storage= 267 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 99.94 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 1,079.00', Outlet Invert= 1,061.00'



Reach 12R: Roadway Ditch



Post Compressor Station SW Model

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 13R: Culvert (Running N to S) w/ inlet to stream

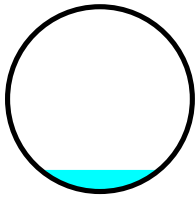
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.176 ac, 0.00% Impervious, Inflow Depth > 2.40" for 100-yr event
Inflow = 4.63 cfs @ 12.03 hrs, Volume= 0.236 af
Outflow = 4.54 cfs @ 12.05 hrs, Volume= 0.235 af, Atten= 2%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.11 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.50 fps, Avg. Travel Time= 1.6 min

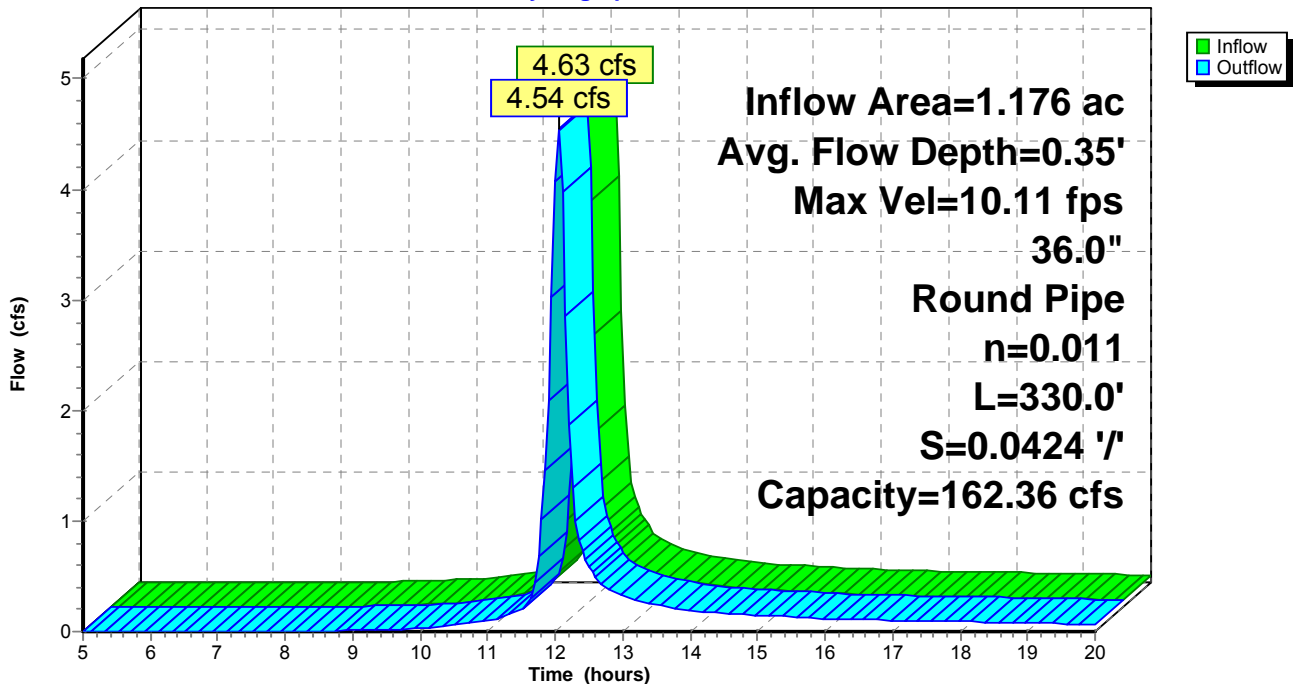
Peak Storage= 151 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 162.36 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 330.0' Slope= 0.0424 '/'
Inlet Invert= 1,060.00', Outlet Invert= 1,046.00'



Reach 13R: Culvert (Running N to S) w/ inlet to stream

Hydrograph



Post Compressor Station SW Model

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 16R: Ditch to Haymaker's Run

[61] Hint: Exceeded Reach 13R outlet invert by 0.26' @ 12.05 hrs

Inflow Area = 2.348 ac, 2.73% Impervious, Inflow Depth > 2.53" for 100-yr event
Inflow = 8.31 cfs @ 12.07 hrs, Volume= 0.495 af
Outflow = 8.22 cfs @ 12.07 hrs, Volume= 0.495 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 1.2 min

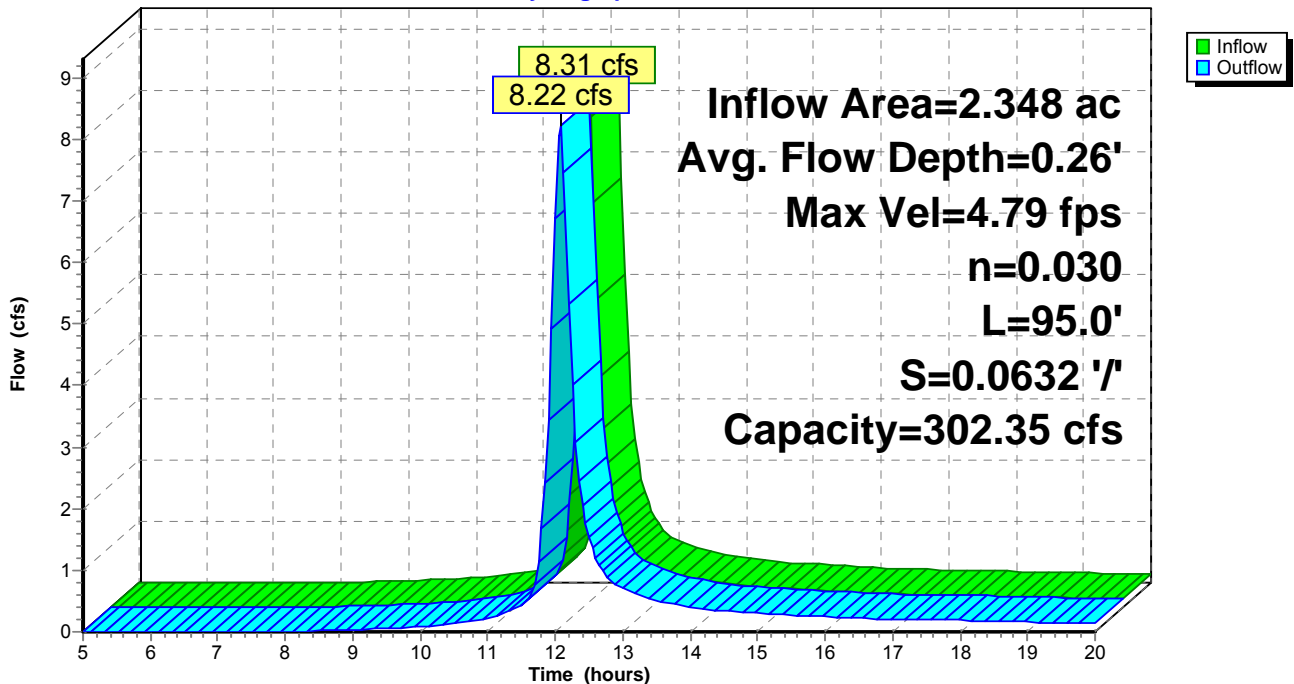
Peak Storage= 164 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 302.35 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 ' / ' Top Width= 14.00'
Length= 95.0' Slope= 0.0632 ' / '
Inlet Invert= 1,046.00', Outlet Invert= 1,040.00'



Reach 16R: Ditch to Haymaker's Run

Hydrograph

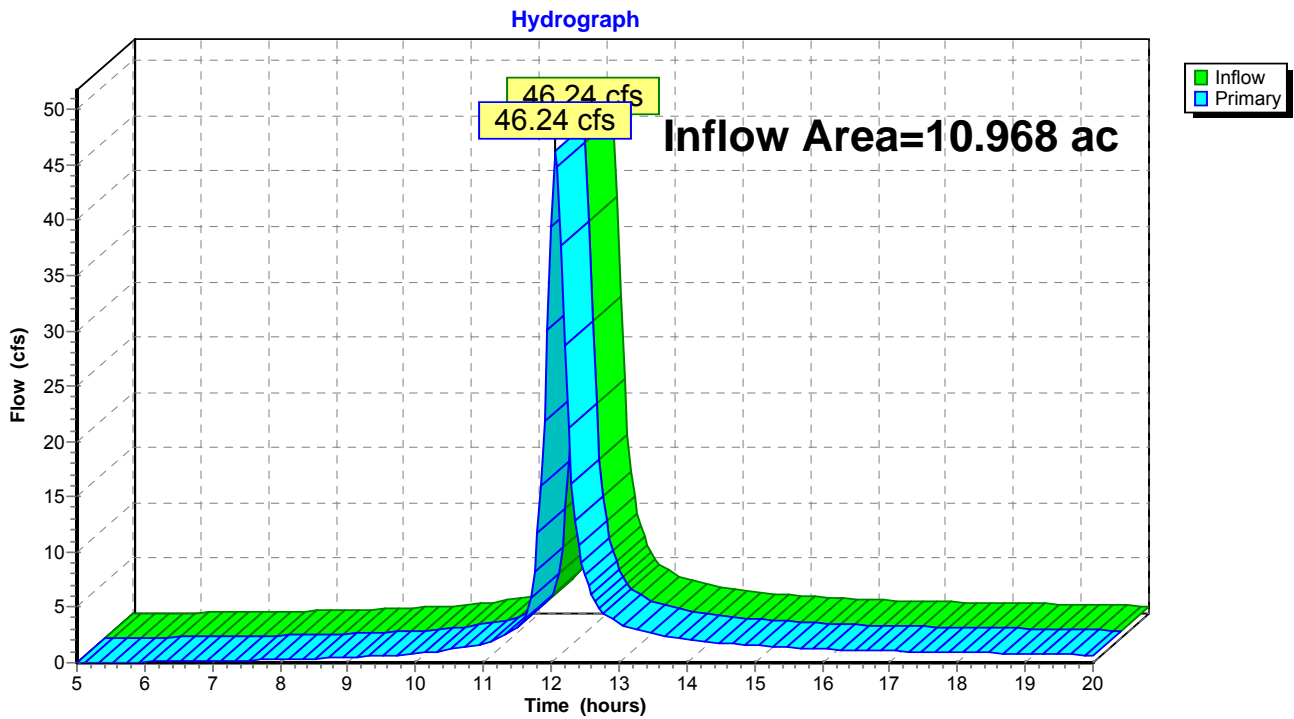


Summary for Link 14L: Haymaker's Run

Inflow Area = 10.968 ac, 17.94% Impervious, Inflow Depth > 3.14" for 100-yr event
Inflow = 46.24 cfs @ 12.07 hrs, Volume= 2.866 af
Primary = 46.24 cfs @ 12.07 hrs, Volume= 2.866 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 14L: Haymaker's Run



*JB Tonkin Compressor Station Post-Construction Stormwater
Management BMP Sizing Calculations*

Preliminary Sizing Calculations - Vegetated Swale
Dominion Transmission, Inc.
Tonkin Compressor Station
Murrysville, PA

Methodology: Use Pennsylvania Stormwater BMP Manual (2006) and HydroCAD 10.00-18

Riprap Lined Wet Swale Methodology: BMP 6.4.8: Vegetated Swale
Pennsylvania Stormwater BMP Manual (2006) and Hydraulic Toolbox 4.2

Sizing:

Proposed Access Road	
2-yr Storm Volume Difference=	392.04 ft ³
Total Depth=	1 ft
Bottom Width=	5 ft
Side Slopes=	3:1
Depth of Stored Water=	0.25 ft
Wet cross sectional area=	1.44 ft ²
Length of Swale=	220 ft
Slope=	0.08 ft/ft
Height of Check-dams=	6.00 inches
Check-dam spacing=	6.25 ft
Number of Check-dams=	35
Volume Reduction per Check-dam=	10 ft ³
Total Volume Reduction=	355 ft ³

Gravel Pad North of Mamont Road	
2-yr Storm Volume Difference=	87.12 ft ³
Total Depth=	1 ft
Bottom Width=	2 ft
Side Slopes=	3:1
Depth of Stored Water=	0.25 ft
Wet cross sectional area=	0.69 ft ²
Length of Swale=	280 ft
Slope=	0.04 ft/ft
Height of Check-dams=	6.00 inches
Check-dam spacing=	12.50 ft
Number of Check-dams=	22
Volume Reduction per Check-dam=	9 ft ³
Total Volume Reduction=	189 ft ³

Preliminary Sizing Calculations - Rain Cisterns
Dominion Transmission, Inc.
Tonkin Compressor Station
Murrysville, PA

Methodology: Use Pennsylvania Stormwater BMP Manual (2006) and the Rational Method using NOAA storm data.

Rain Barrel Methodology: BMP 6.5.2 Runoff Capture & Reuse

Sizing:

Compressor Building Area=	5680 ft ²
2-yr Storm Runoff=	1070 ft ³
Minium Rain Cistern 03 Capacity=	8005 gal

Auxiliary Building Area=	2370 ft ²
2-yr Storm Runoff=	447 ft ³
Minium Rain Cistern 02 Capacity=	3340 gal

North Building Area=	4959 ft ²
2-yr Storm Runoff=	934 ft ³
Minium Rain Cistern 01 Capacity=	6989 gal

South Building Area=	3351 ft ²
2-yr Storm Runoff=	631 ft ³
Minium Rain Cistern 04 Capacity=	4723 gal

DA6 Building Area=	3351 ft ²
2-yr Storm Runoff=	226 ft ³
Minium Rain Cistern 05 Capacity=	1688 gal

Riparian Buffer Irrigation Needs ¹ =	1333 ft ³
Front Lawn Irrigation Needs ² =	2198 ft ³
Total Irrigation Needs=	3531 ft ³
Min. Total Rainwater Storage Volume ³ =	3308 ft ³

Notes:

1. The Riparian Buffer Irrigation Needs a weekly irrigation needs assuming one inch per acre per week over the summer months. The rain cisterns will need to be slowly drained between storm events if the runoff volume exceeds the irrigation needs.
2. The Front Lawn Irrigation Needs a weekly irrigation needs assuming one inch per acre per week over the summer months. The rain cisterns will need to be slowly drained between storm events if the runoff volume exceeds the irrigation needs.
3. This value represents the minimum amount of storage provided by the rain cisterns. The actual storage volume will depend on the product chosen and will exceed this value.

Preliminary Sizing Calculations - Revegetation
Dominion Transmission, Inc.
Tonkin Compressor Station
Murrysville, PA

Methodology: Use Pennsylvania Stormwater BMP Manual (2006)
and the Rational Method using NOAA storm data.

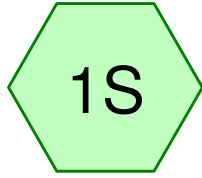
Riparian Buffer Methodology: BMP 5.6.3: Re-Vegetate and Re-Forest
Disturbed Areas, Using Native Species

Sizing:

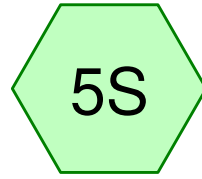
Northern Parcel:

Width of Buffer=	25 ft	
Reduction of Proposed Gravel Area=	11000 ft ²	
Runoff from Gravel=	1132.56 ft ³	
Runoff from Woods=	304.92 ft ³	
Volume Reduction=	827.64 ft ³	
Conversion of Grass to Woods=	5000 ft ²	
Runoff from Grass=	200 ft ³	
Runoff from Woods=	145.8333 ft ³	
Total Volume Reduction=	54.16667 ft ³	
Volume Reduction=	<table border="1"><tr><td>882</td></tr></table> ft ³	882
882		

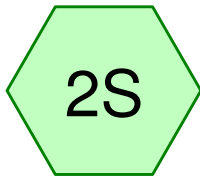
Access Roads Pre-Construction Runoff Calculations



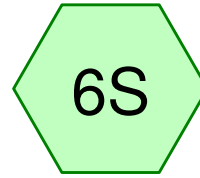
Pre_35-234-AR01



Pre_35-257-AR01_DA1



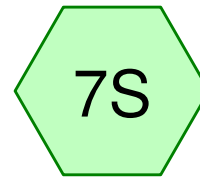
Pre_35-241-AR01



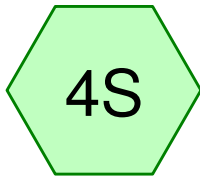
Pre_35-257-AR01_DA2



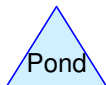
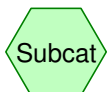
Pre_35-250-AR01



Pre_35-257-AR01_DA3



Pre_35-255-AR02



Routing Diagram for Pre_ACCESS ROADS

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Pre_ACCESS ROADS

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.841	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S)
2.841	74	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.841	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	HSG D	
0.000	Other	
2.841		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.841	0.000	0.000	2.841	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	0.000	2.841	0.000	0.000	2.841	TOTAL AREA	

Pre_ACCESS ROADS

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Type II 24-hr 2-yr Rainfall=2.38"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.67 cfs 0.026 af

Subcatchment 2S: Pre_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.10 cfs 0.004 af

Subcatchment 3S: Pre_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.05 cfs 0.002 af

Subcatchment 4S: Pre_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.74 cfs 0.029 af

Subcatchment 5S: Pre_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.18 cfs 0.007 af

Subcatchment 6S: Pre_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=1.06 cfs 0.041 af

Subcatchment 7S: Pre_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.11 cfs 0.004 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.114 af Average Runoff Depth = 0.48"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 1S: Pre_35-234-AR01

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

Runoff = 0.67 cfs @ 11.94 hrs, Volume= 0.026 af, Depth> 0.48"

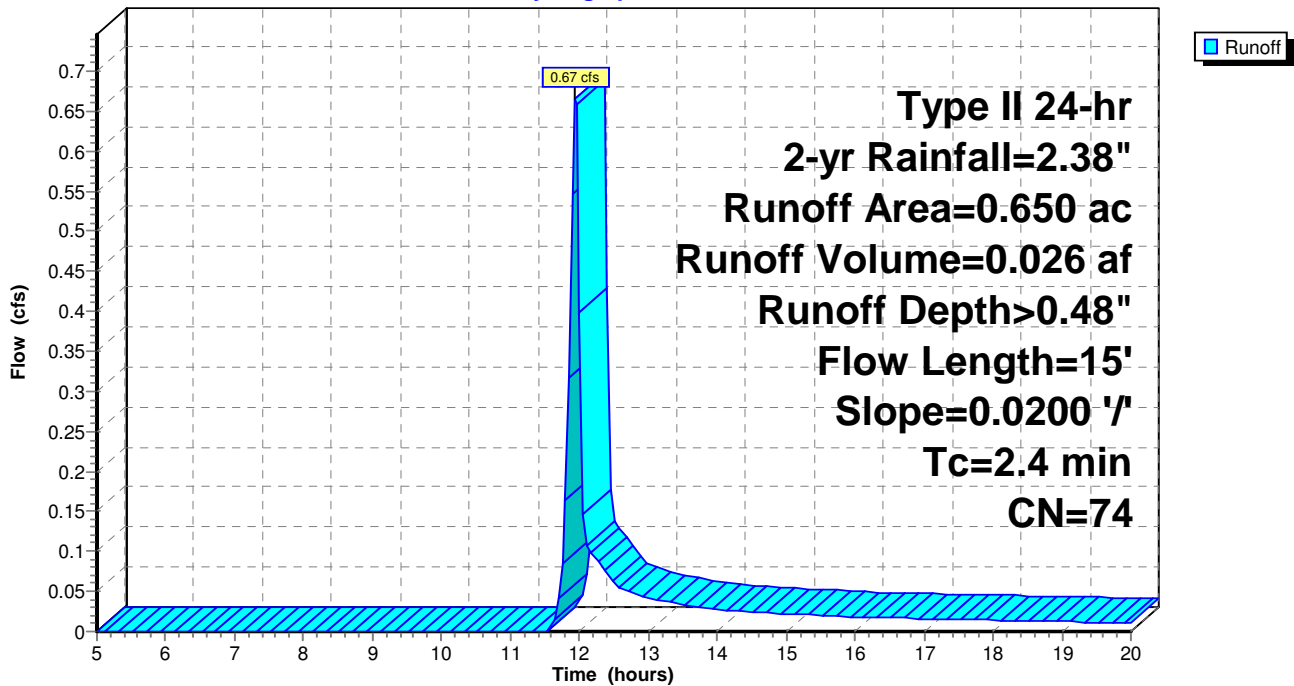
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.650	74	>75% Grass cover, Good, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Pre_35-234-AR01

Hydrograph



Pre_ACCESS ROADS

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 2S: Pre_35-241-AR01

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

Runoff = 0.10 cfs @ 11.94 hrs, Volume= 0.004 af, Depth> 0.48"

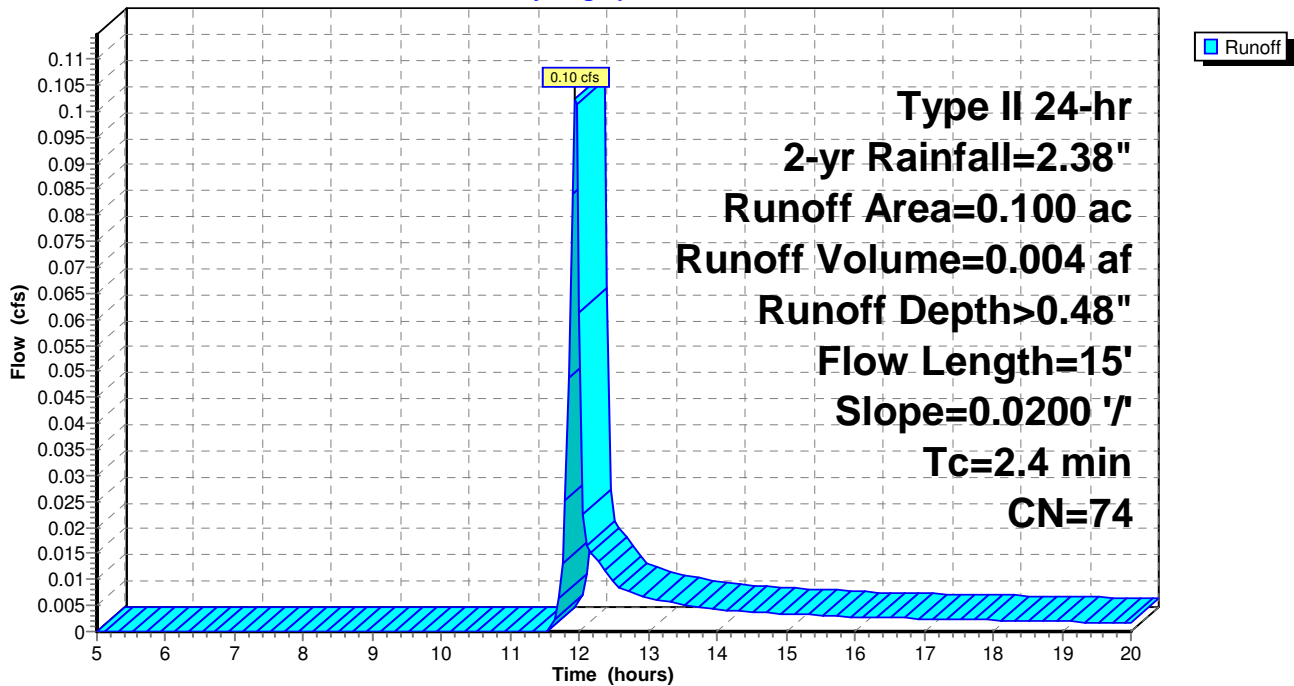
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Pre_35-241-AR01

Hydrograph



Pre_ACCESS ROADS

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 3S: Pre_35-250-AR01

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

Runoff = 0.05 cfs @ 11.94 hrs, Volume= 0.002 af, Depth> 0.48"

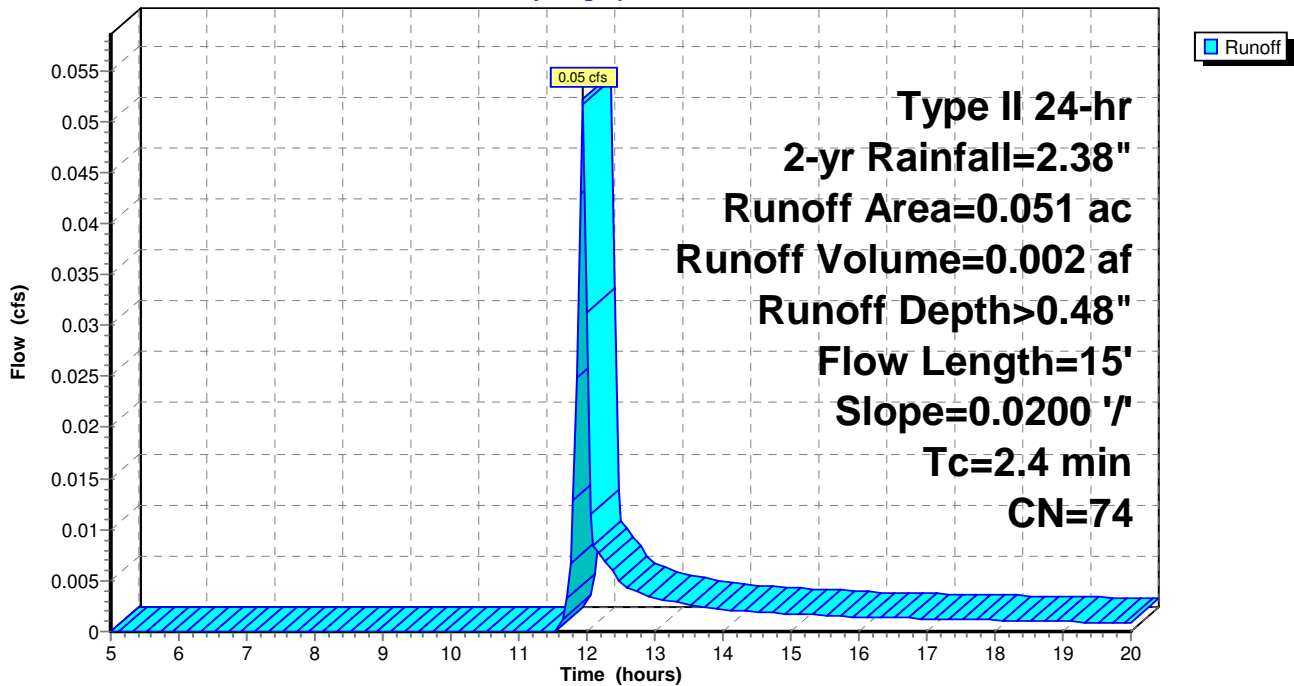
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.051	74	>75% Grass cover, Good, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Pre_35-250-AR01

Hydrograph



Pre_ACCESS ROADS

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 4S: Pre_35-255-AR02

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

Runoff = 0.74 cfs @ 11.94 hrs, Volume= 0.029 af, Depth> 0.48"

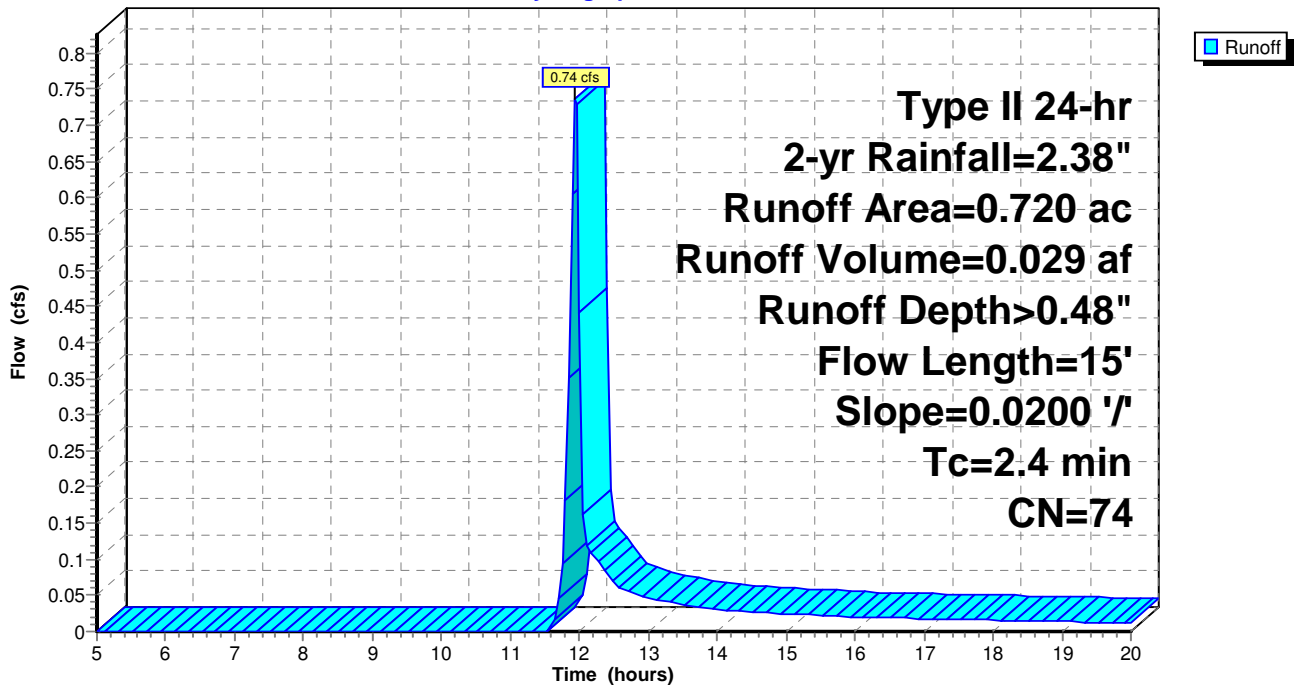
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.720	74	>75% Grass cover, Good, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Pre_35-255-AR02

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 5S: Pre_35-257-AR01_DA1

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

Runoff = 0.18 cfs @ 11.94 hrs, Volume= 0.007 af, Depth> 0.48"

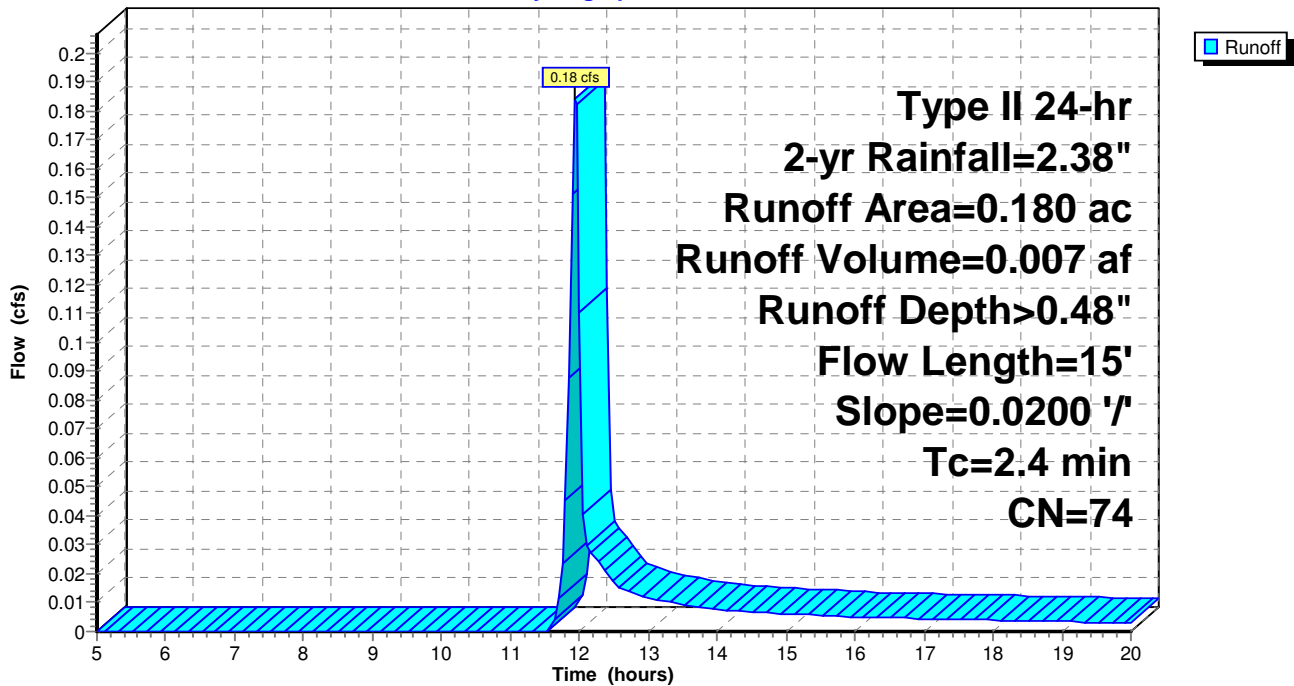
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.180	74	>75% Grass cover, Good, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Pre_35-257-AR01_DA1

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 6S: Pre_35-257-AR01_DA2

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

Runoff = 1.06 cfs @ 11.94 hrs, Volume= 0.041 af, Depth> 0.48"

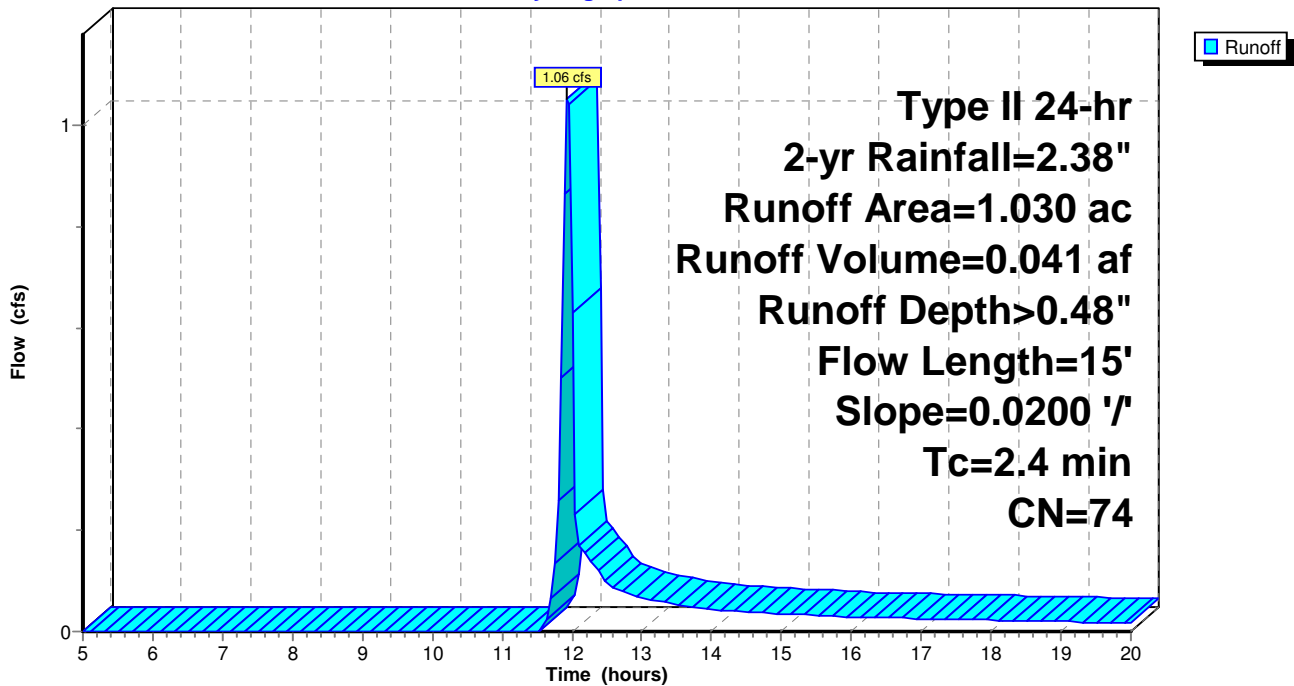
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
1.030	74	>75% Grass cover, Good, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Pre_35-257-AR01_DA2

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 7S: Pre_35-257-AR01_DA3

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

Runoff = 0.11 cfs @ 11.94 hrs, Volume= 0.004 af, Depth> 0.48"

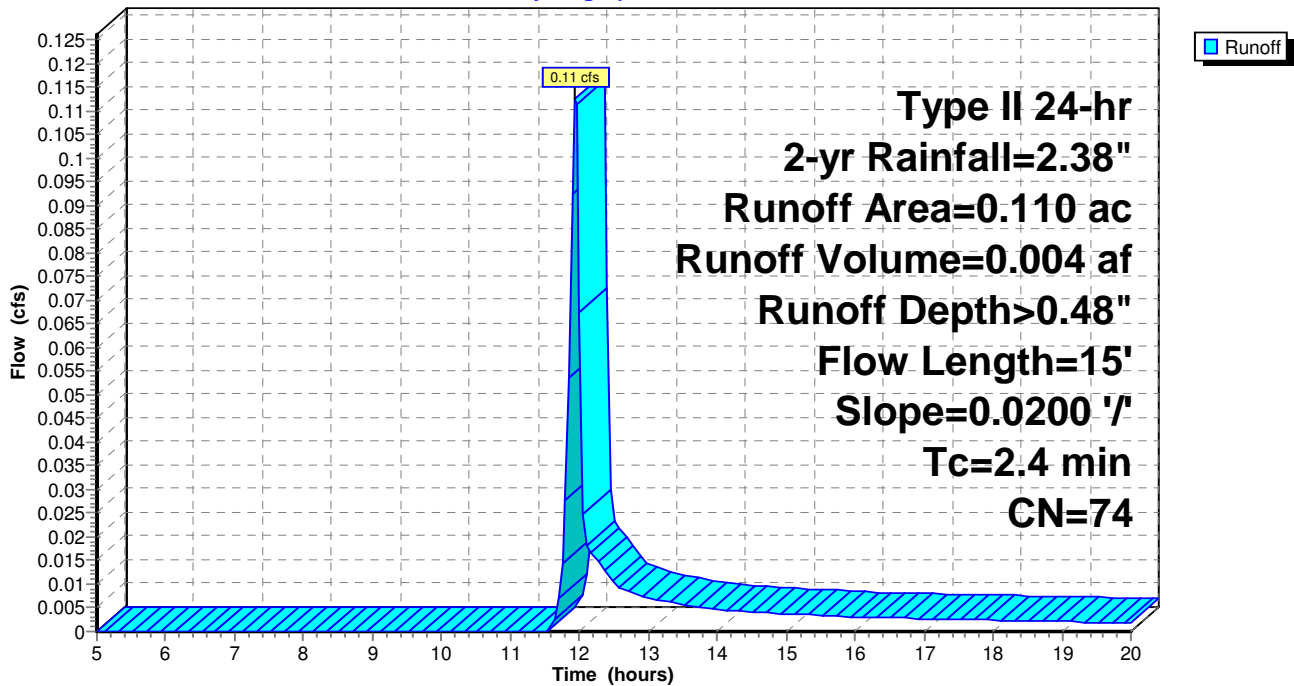
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.110	74	>75% Grass cover, Good, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Pre_35-257-AR01_DA3

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=1.45 cfs 0.056 af

Subcatchment 2S: Pre_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.22 cfs 0.009 af

Subcatchment 3S: Pre_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.11 cfs 0.004 af

Subcatchment 4S: Pre_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=1.60 cfs 0.062 af

Subcatchment 5S: Pre_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.40 cfs 0.015 af

Subcatchment 6S: Pre_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=2.29 cfs 0.088 af

Subcatchment 7S: Pre_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.24 cfs 0.009 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.244 af Average Runoff Depth = 1.03"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 1S: Pre_35-234-AR01

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

Runoff = 1.45 cfs @ 11.93 hrs, Volume= 0.056 af, Depth> 1.03"

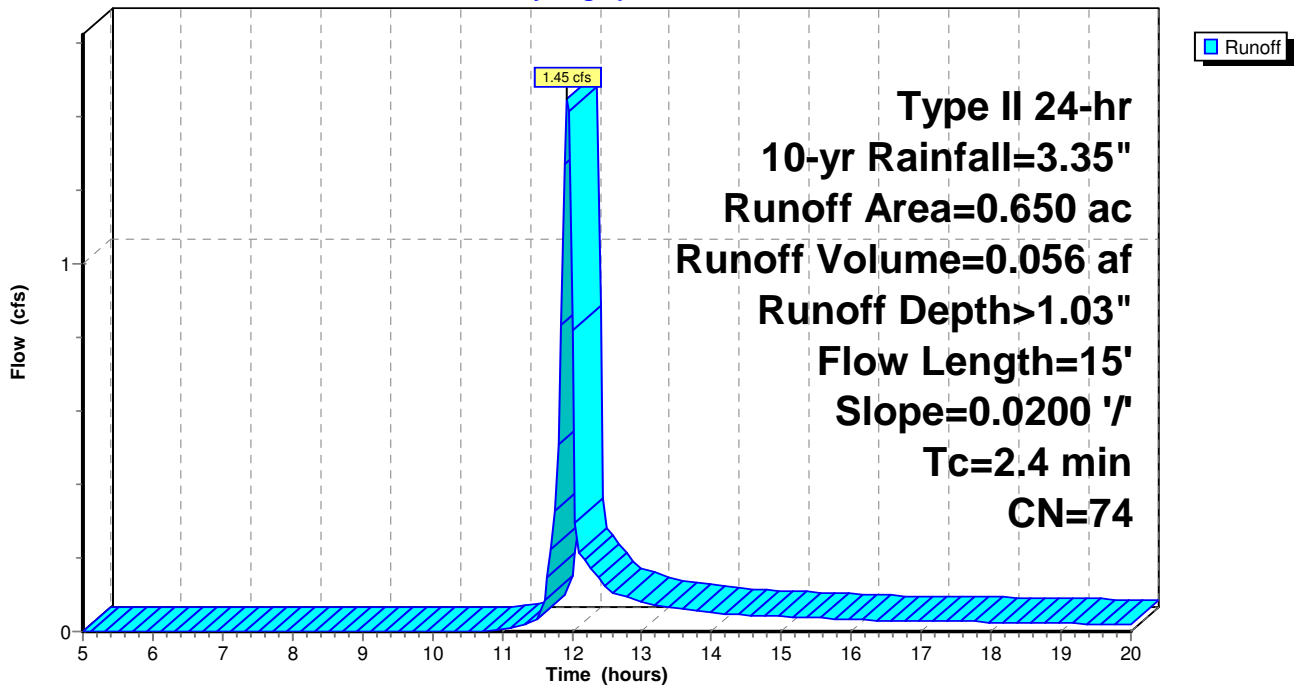
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.650	74	>75% Grass cover, Good, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Pre_35-234-AR01

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 2S: Pre_35-241-AR01

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

Runoff = 0.22 cfs @ 11.93 hrs, Volume= 0.009 af, Depth> 1.03"

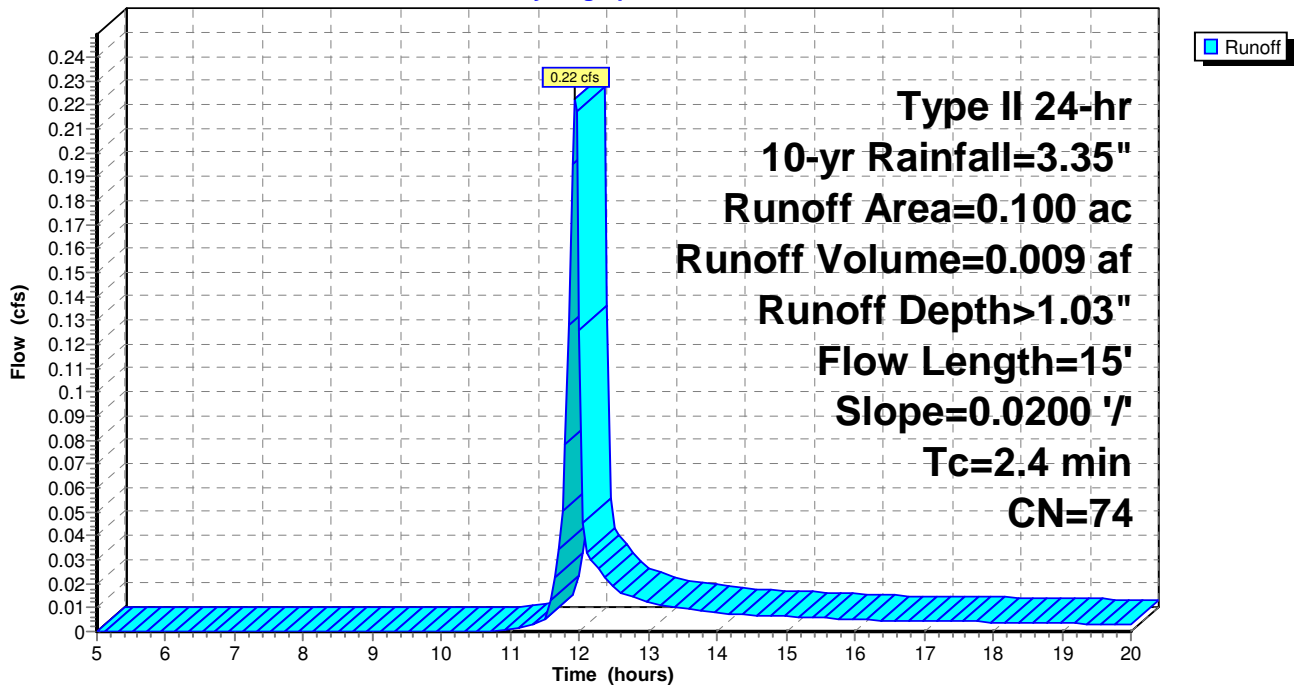
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Pre_35-241-AR01

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 3S: Pre_35-250-AR01

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

Runoff = 0.11 cfs @ 11.93 hrs, Volume= 0.004 af, Depth> 1.03"

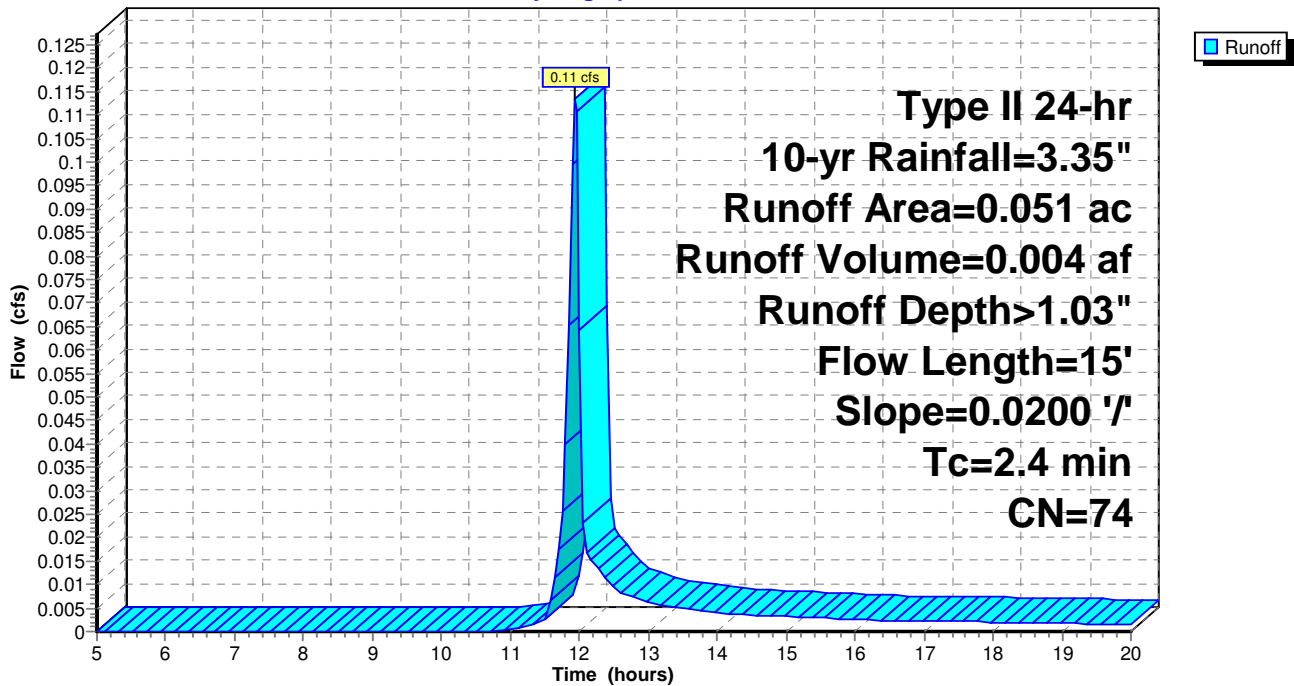
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.051	74	>75% Grass cover, Good, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Pre_35-250-AR01

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 4S: Pre_35-255-AR02

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

Runoff = 1.60 cfs @ 11.93 hrs, Volume= 0.062 af, Depth> 1.03"

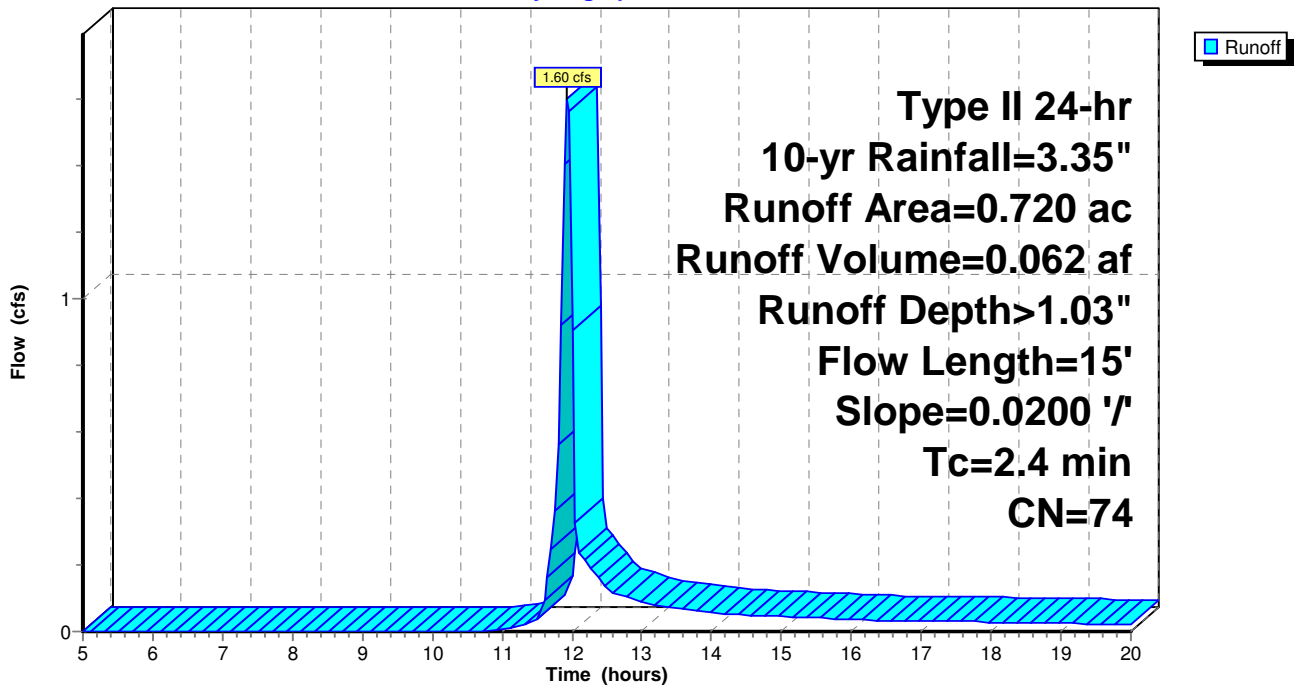
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.720	74	>75% Grass cover, Good, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Pre_35-255-AR02

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 5S: Pre_35-257-AR01_DA1

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

Runoff = 0.40 cfs @ 11.93 hrs, Volume= 0.015 af, Depth> 1.03"

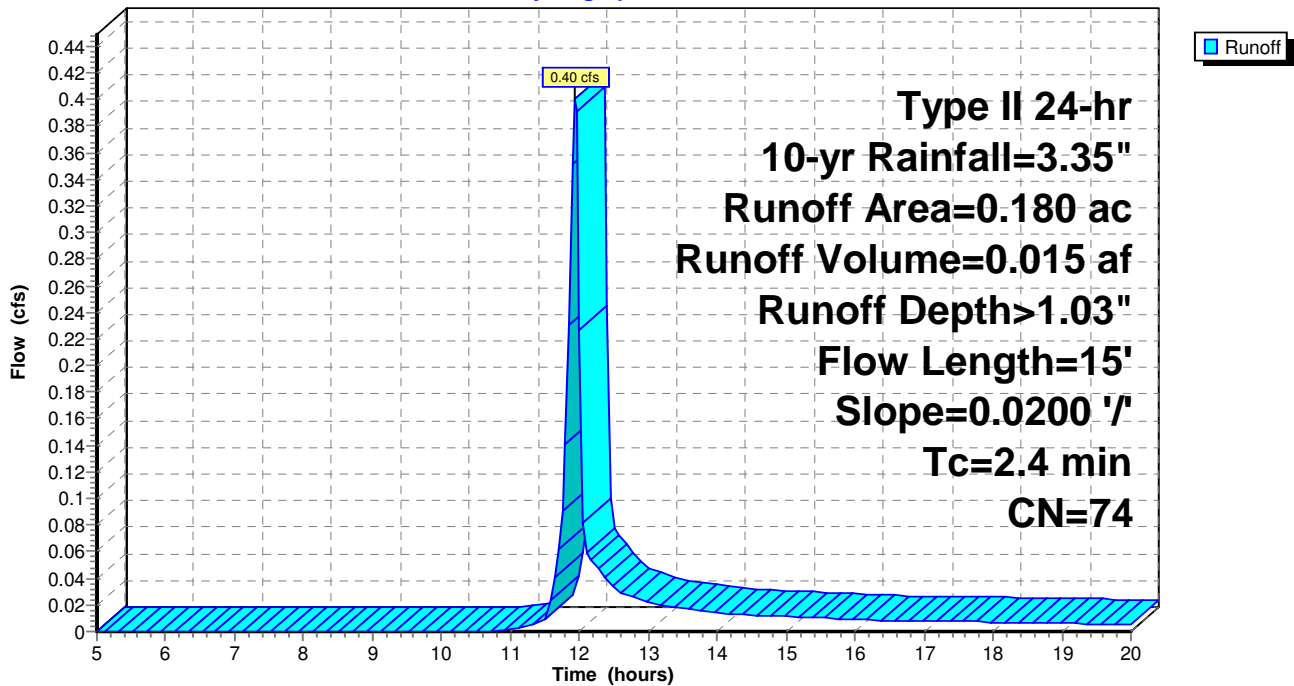
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.180	74	>75% Grass cover, Good, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Pre_35-257-AR01_DA1

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 6S: Pre_35-257-AR01_DA2

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.29 cfs @ 11.93 hrs, Volume= 0.088 af, Depth> 1.03"

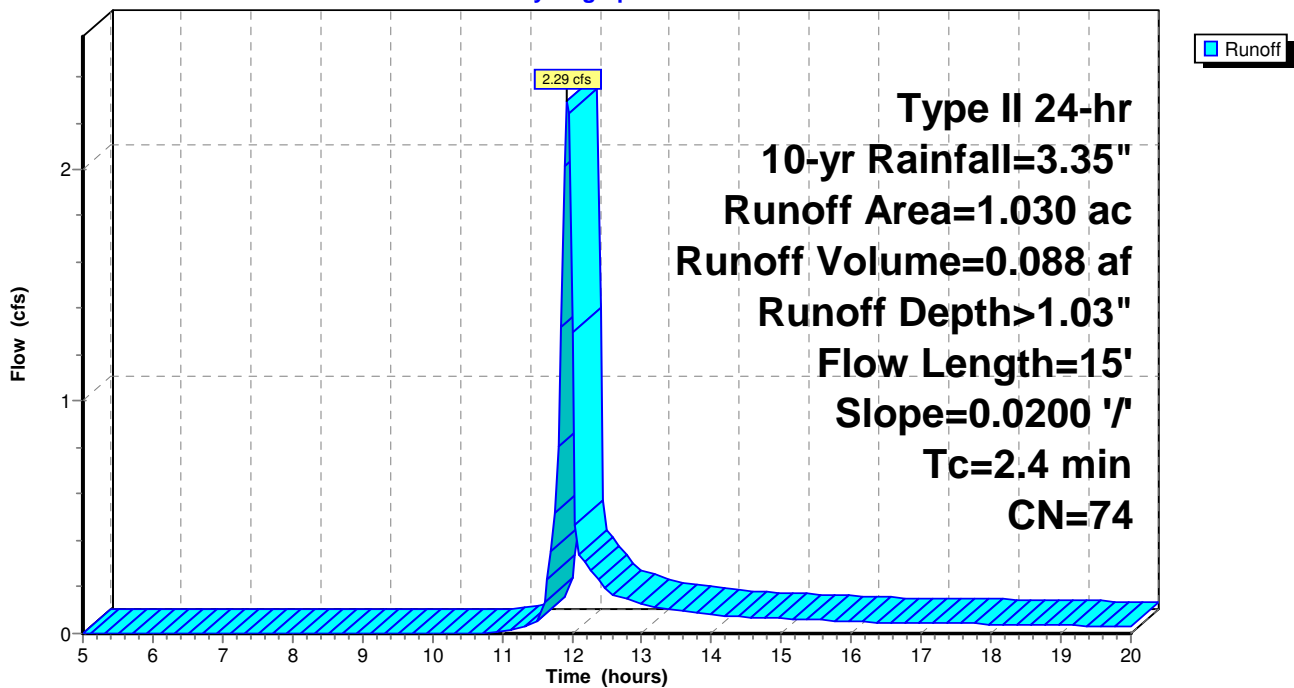
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
1.030	74	>75% Grass cover, Good, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Pre_35-257-AR01_DA2

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 7S: Pre_35-257-AR01_DA3

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

Runoff = 0.24 cfs @ 11.93 hrs, Volume= 0.009 af, Depth> 1.03"

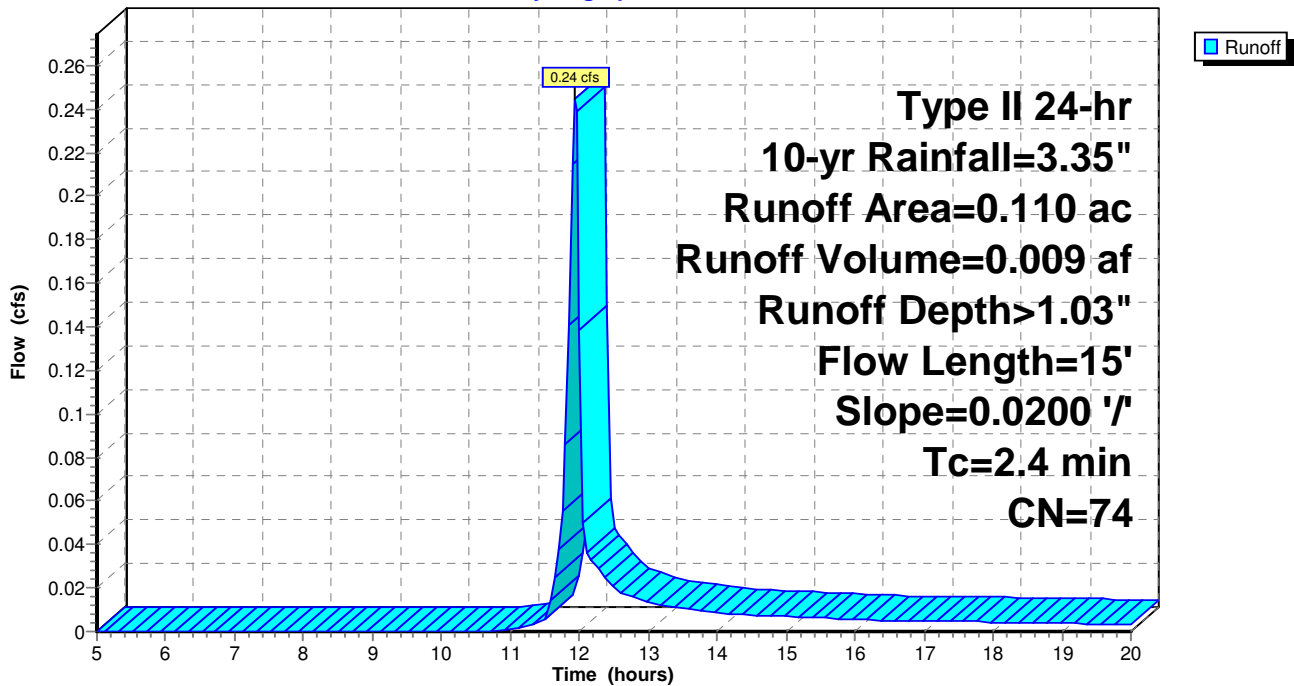
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.110	74	>75% Grass cover, Good, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Pre_35-257-AR01_DA3

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=2.47 cfs 0.096 af

Subcatchment 2S: Pre_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.38 cfs 0.015 af

Subcatchment 3S: Pre_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.19 cfs 0.008 af

Subcatchment 4S: Pre_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=2.73 cfs 0.107 af

Subcatchment 5S: Pre_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.68 cfs 0.027 af

Subcatchment 6S: Pre_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=3.91 cfs 0.153 af

Subcatchment 7S: Pre_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>1.78"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.42 cfs 0.016 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.421 af Average Runoff Depth = 1.78"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 1S: Pre_35-234-AR01

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

Runoff = 2.47 cfs @ 11.93 hrs, Volume= 0.096 af, Depth> 1.78"

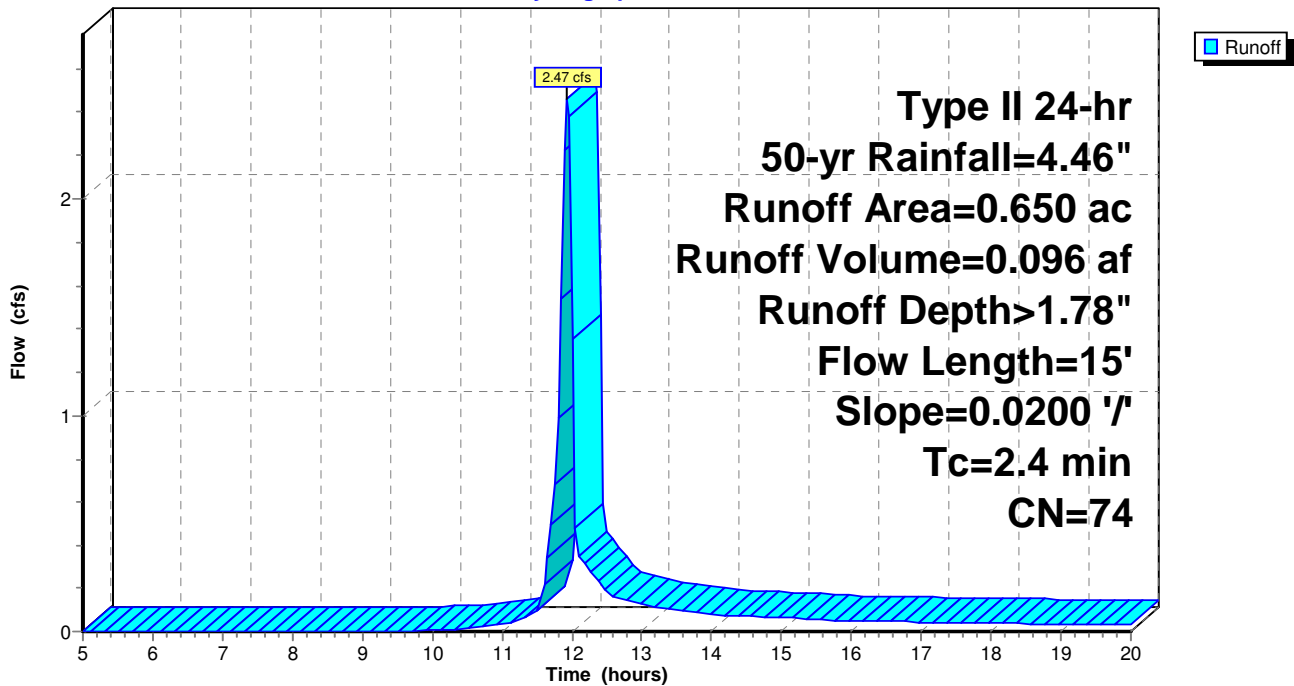
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.650	74	>75% Grass cover, Good, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Pre_35-234-AR01

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 2S: Pre_35-241-AR01

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

Runoff = 0.38 cfs @ 11.93 hrs, Volume= 0.015 af, Depth> 1.78"

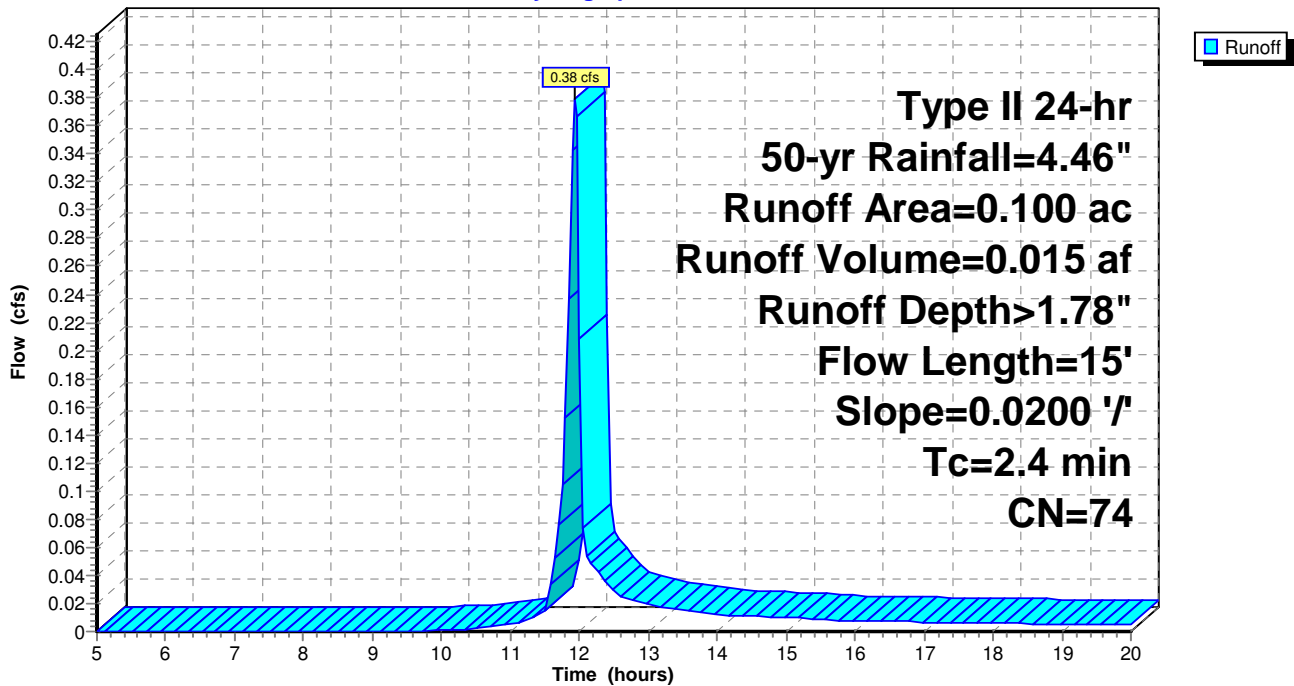
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Pre_35-241-AR01

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 3S: Pre_35-250-AR01

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

Runoff = 0.19 cfs @ 11.93 hrs, Volume= 0.008 af, Depth> 1.78"

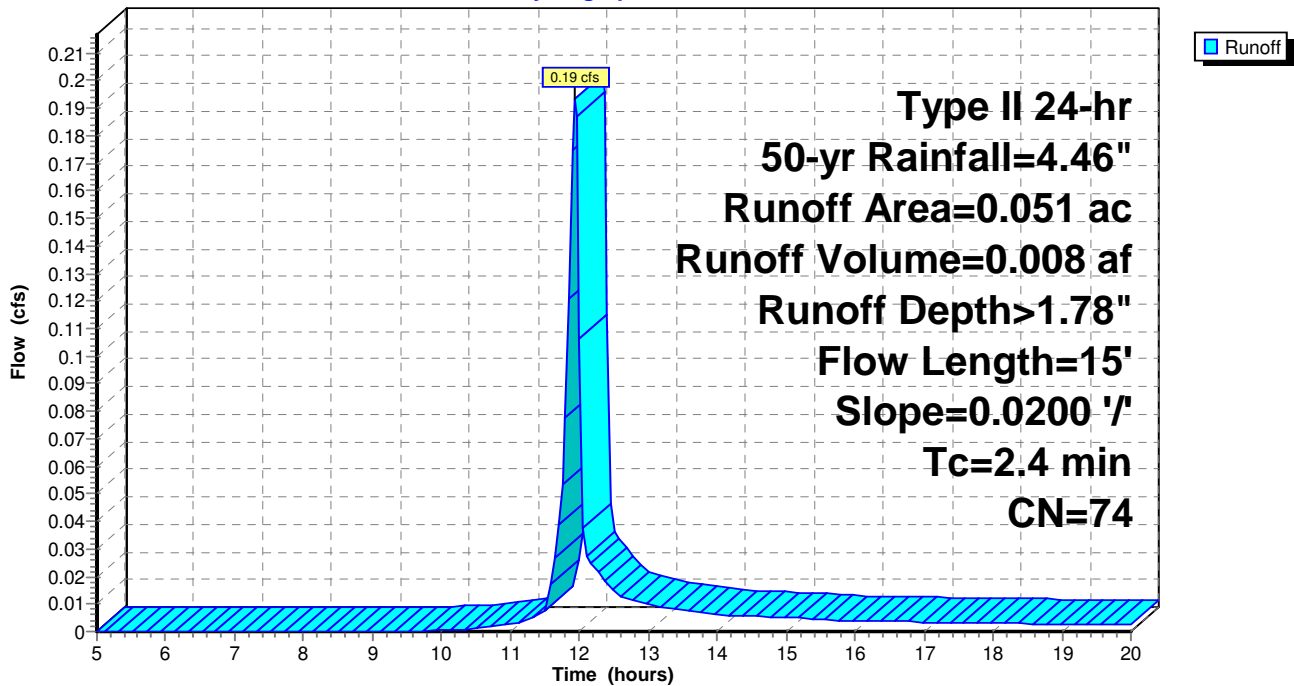
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.051	74	>75% Grass cover, Good, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Pre_35-250-AR01

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 4S: Pre_35-255-AR02

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.73 cfs @ 11.93 hrs, Volume= 0.107 af, Depth> 1.78"

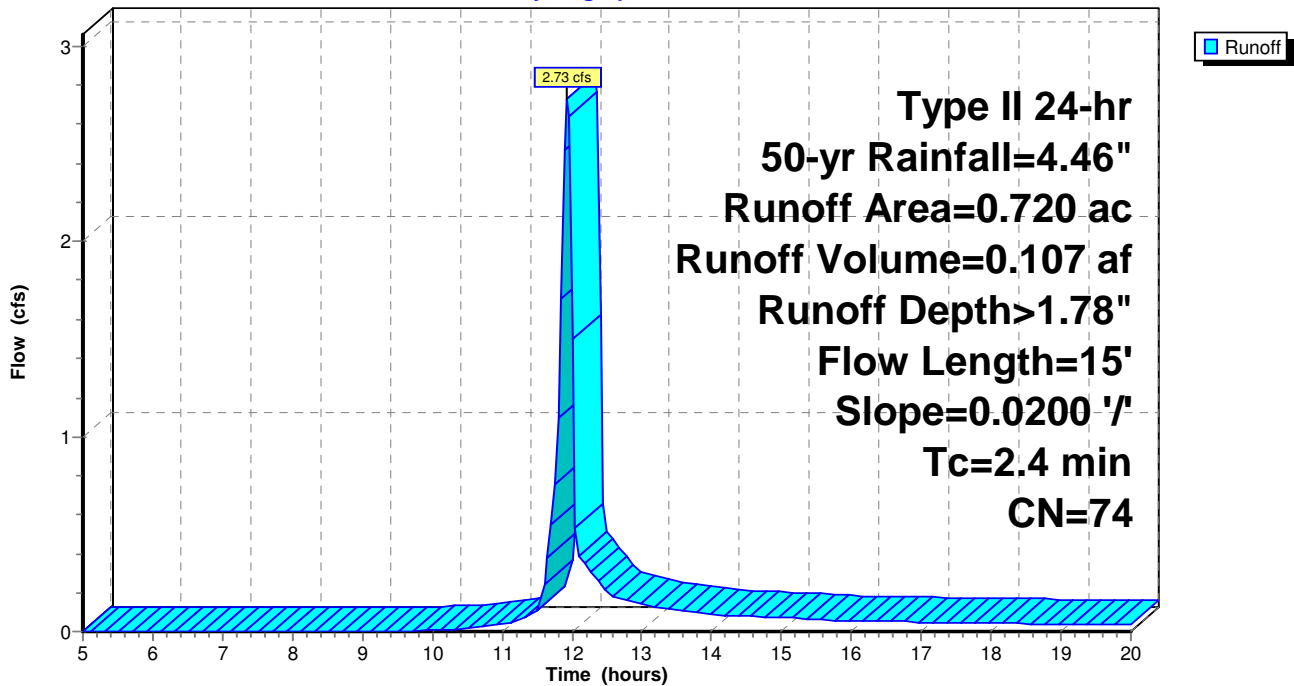
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.720	74	>75% Grass cover, Good, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Pre_35-255-AR02

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 5S: Pre_35-257-AR01_DA1

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

Runoff = 0.68 cfs @ 11.93 hrs, Volume= 0.027 af, Depth> 1.78"

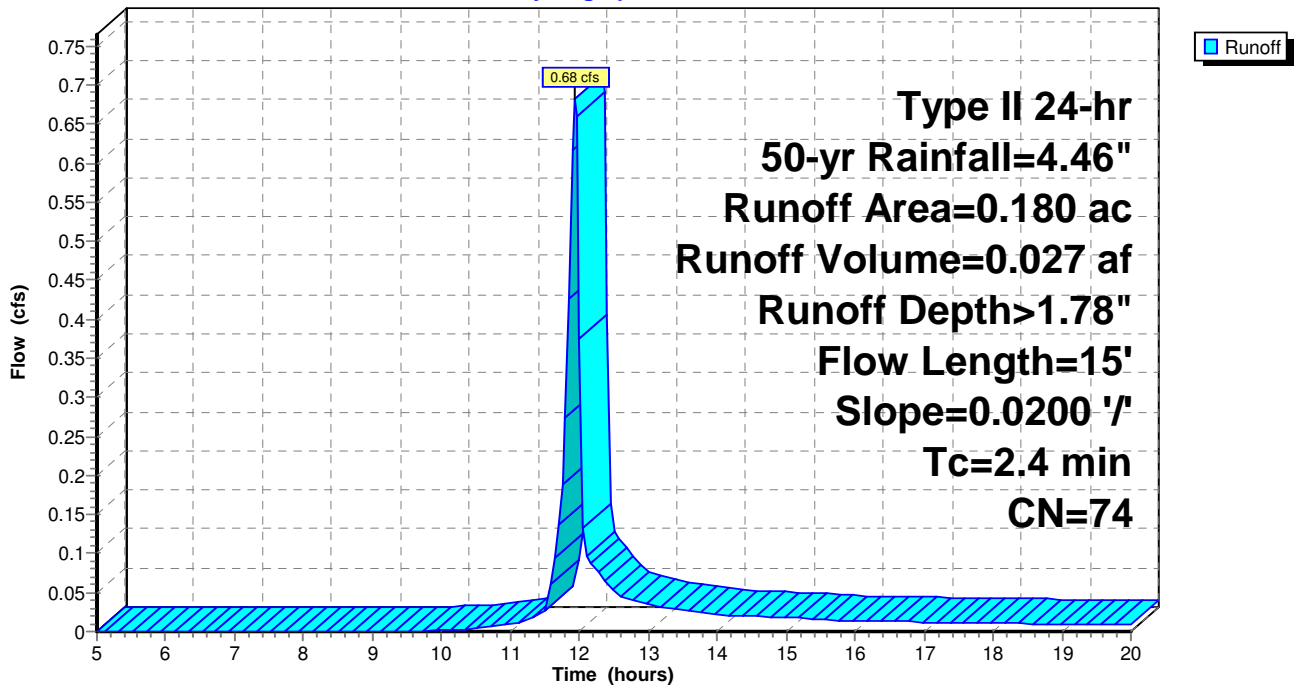
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.180	74	>75% Grass cover, Good, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Pre_35-257-AR01_DA1

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 6S: Pre_35-257-AR01_DA2

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

Runoff = 3.91 cfs @ 11.93 hrs, Volume= 0.153 af, Depth> 1.78"

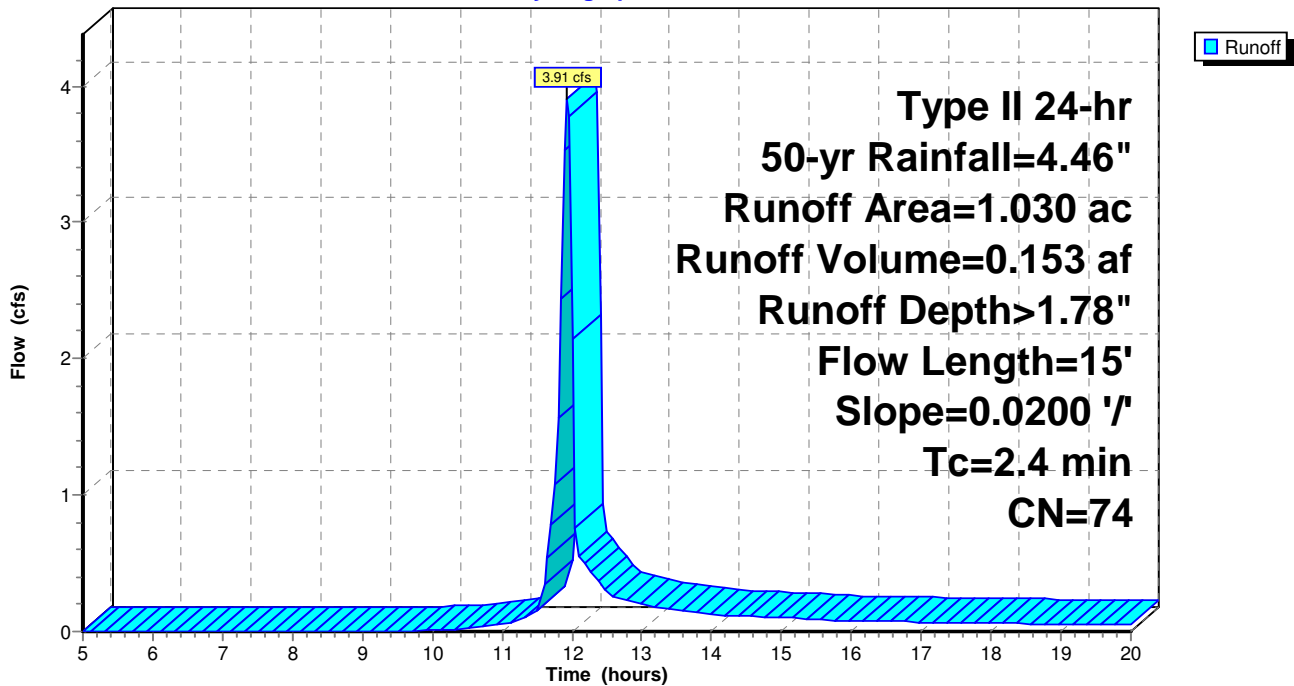
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
1.030	74	>75% Grass cover, Good, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Pre_35-257-AR01_DA2

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 7S: Pre_35-257-AR01_DA3

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

Runoff = 0.42 cfs @ 11.93 hrs, Volume= 0.016 af, Depth> 1.78"

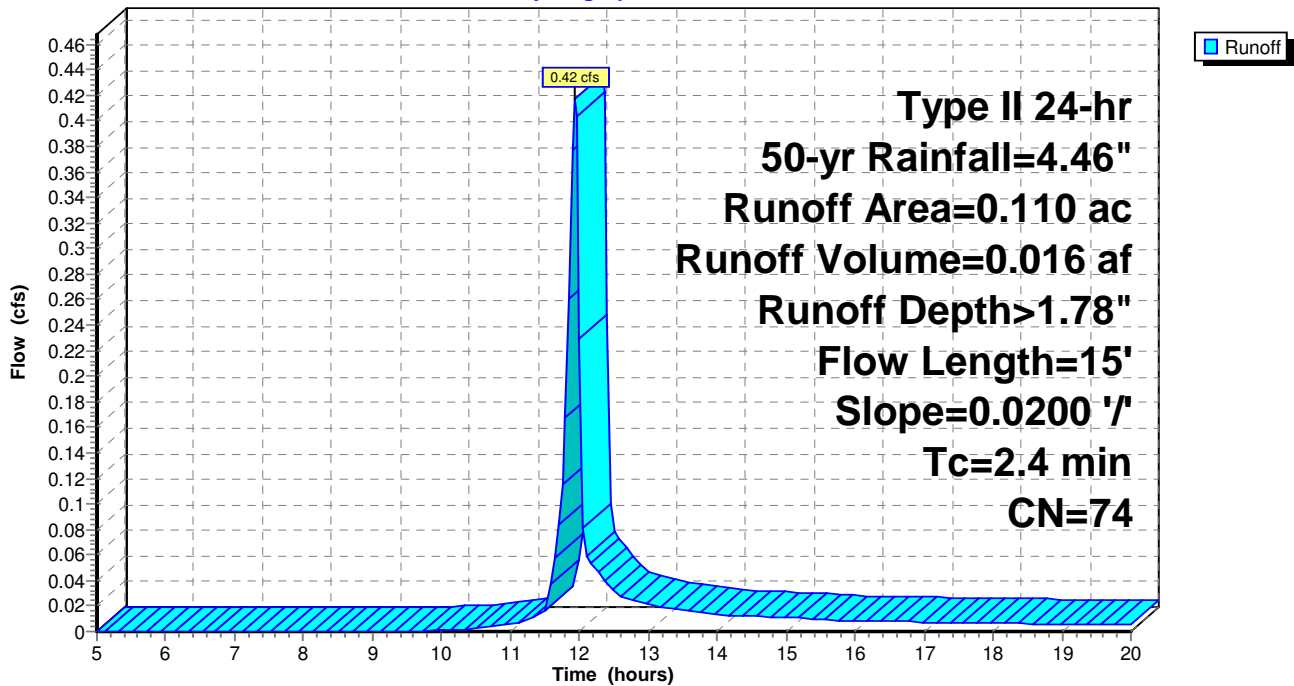
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.110	74	>75% Grass cover, Good, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Pre_35-257-AR01_DA3

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=2.98 cfs 0.117 af

Subcatchment 2S: Pre_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.46 cfs 0.018 af

Subcatchment 3S: Pre_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.23 cfs 0.009 af

Subcatchment 4S: Pre_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=3.30 cfs 0.130 af

Subcatchment 5S: Pre_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.83 cfs 0.032 af

Subcatchment 6S: Pre_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=4.73 cfs 0.186 af

Subcatchment 7S: Pre_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=74 Runoff=0.50 cfs 0.020 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.513 af Average Runoff Depth = 2.17"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 1S: Pre_35-234-AR01

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

Runoff = 2.98 cfs @ 11.93 hrs, Volume= 0.117 af, Depth> 2.17"

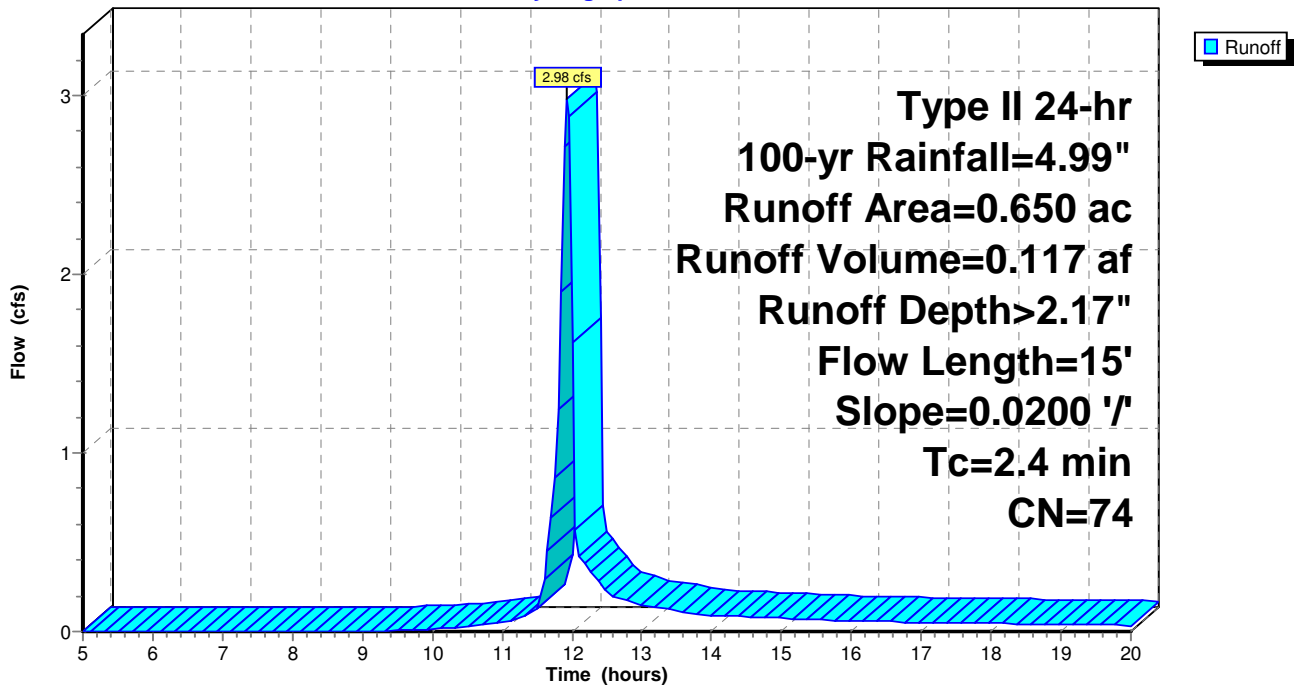
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.650	74	>75% Grass cover, Good, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Pre_35-234-AR01

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 2S: Pre_35-241-AR01

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

Runoff = 0.46 cfs @ 11.93 hrs, Volume= 0.018 af, Depth> 2.17"

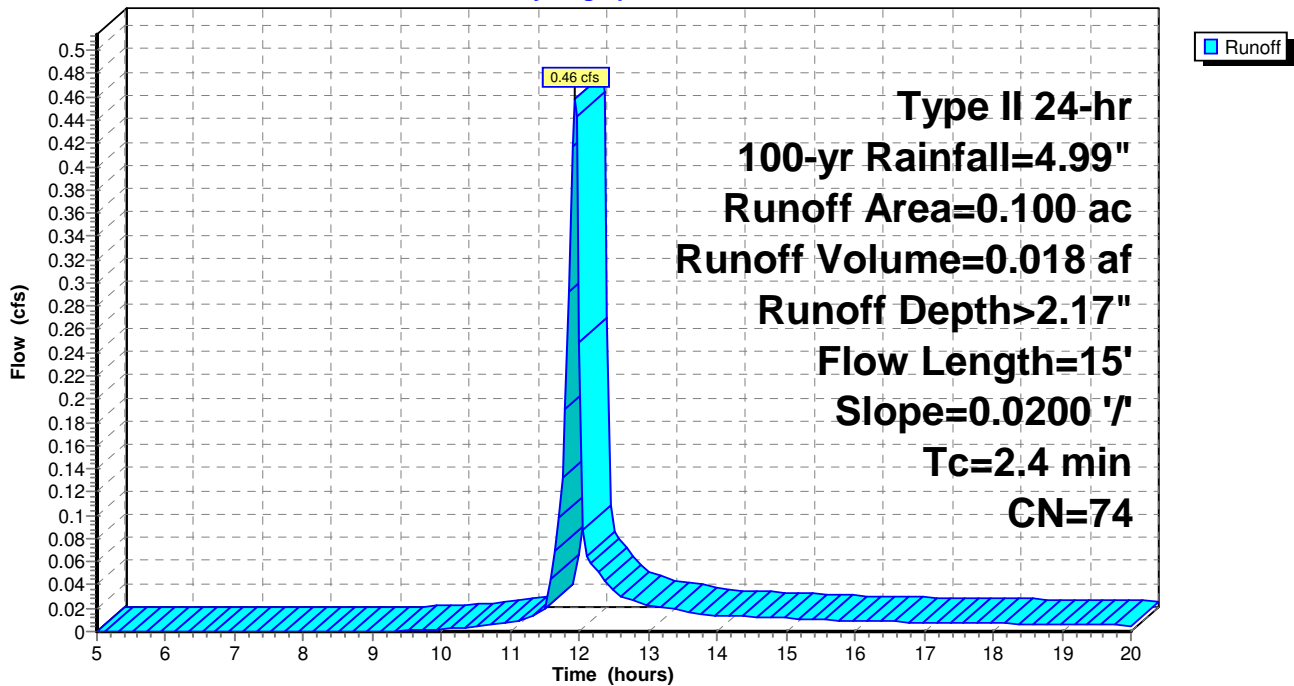
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Pre_35-241-AR01

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 3S: Pre_35-250-AR01

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

Runoff = 0.23 cfs @ 11.93 hrs, Volume= 0.009 af, Depth> 2.17"

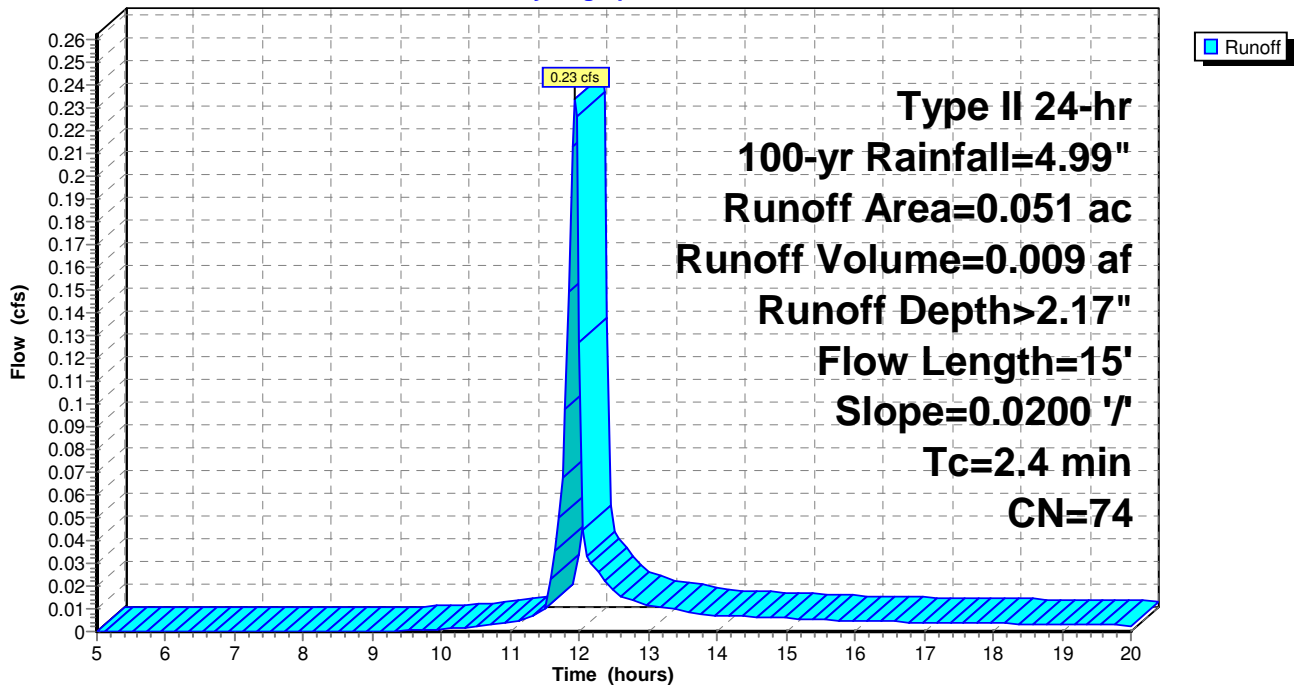
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.051	74	>75% Grass cover, Good, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Pre_35-250-AR01

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 4S: Pre_35-255-AR02

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

Runoff = 3.30 cfs @ 11.93 hrs, Volume= 0.130 af, Depth> 2.17"

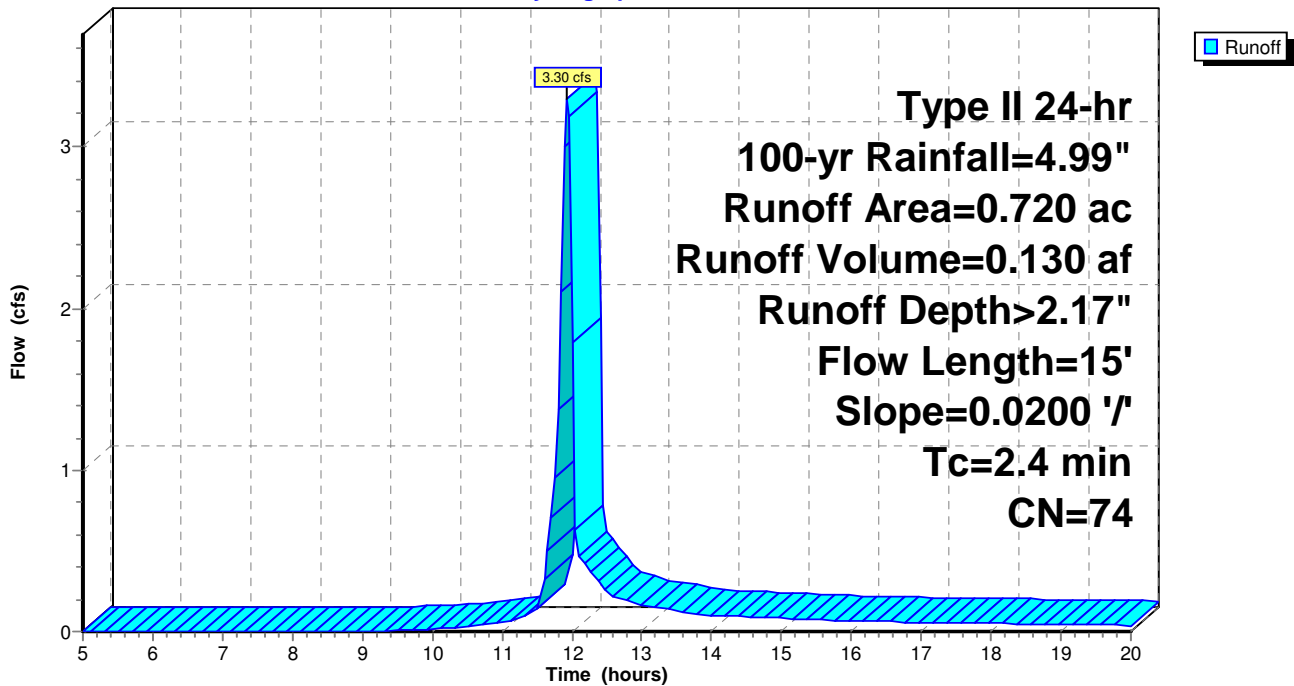
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.720	74	>75% Grass cover, Good, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Pre_35-255-AR02

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 5S: Pre_35-257-AR01_DA1

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

Runoff = 0.83 cfs @ 11.93 hrs, Volume= 0.032 af, Depth> 2.17"

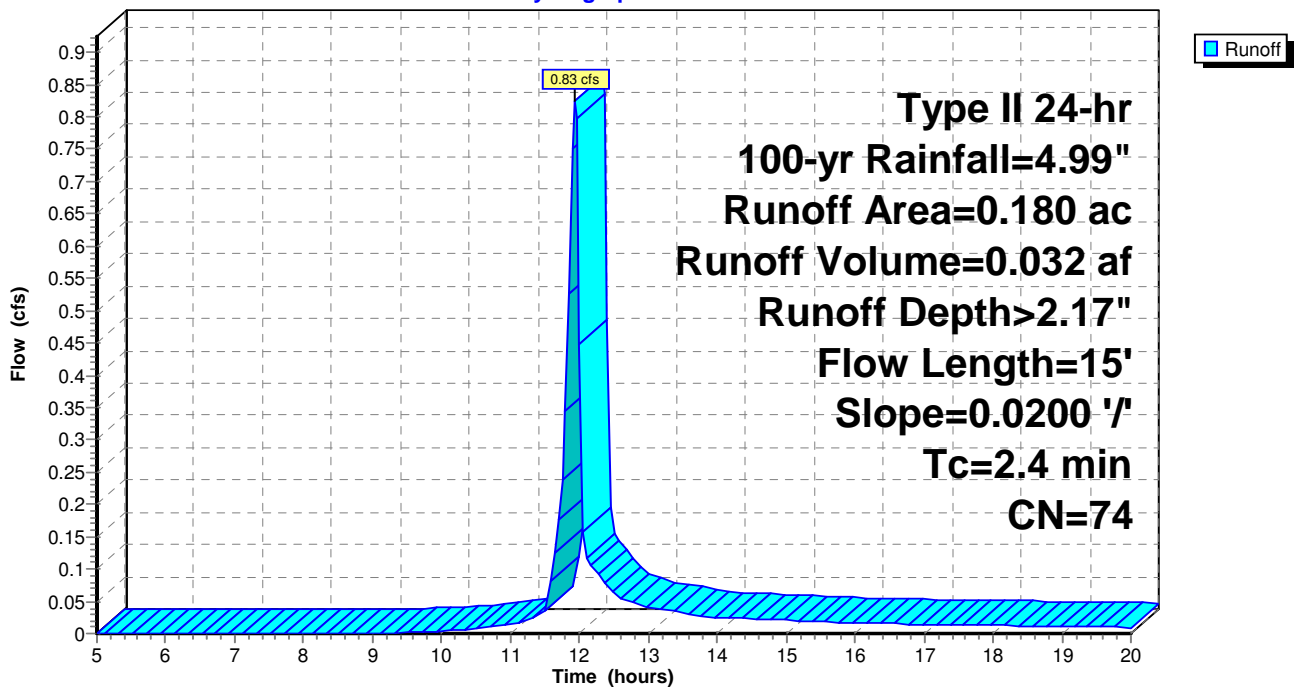
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.180	74	>75% Grass cover, Good, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Pre_35-257-AR01_DA1

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 6S: Pre_35-257-AR01_DA2

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

Runoff = 4.73 cfs @ 11.93 hrs, Volume= 0.186 af, Depth> 2.17"

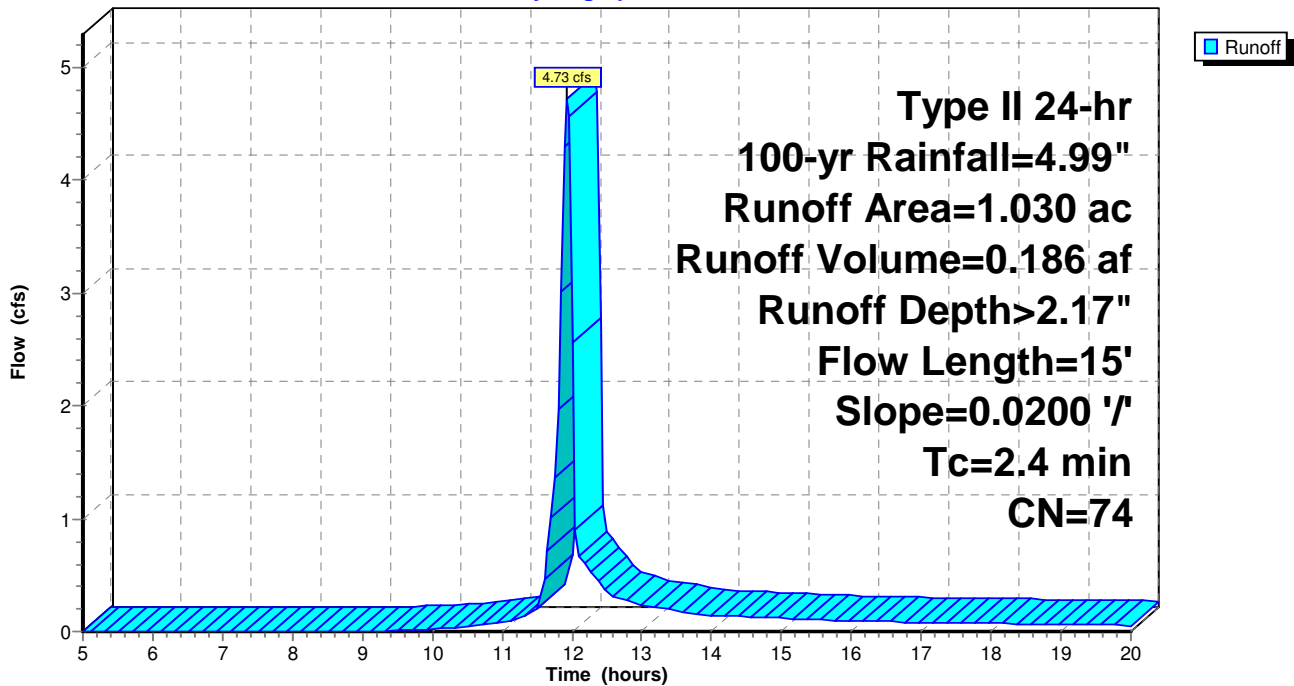
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
1.030	74	>75% Grass cover, Good, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Pre_35-257-AR01_DA2

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 7S: Pre_35-257-AR01_DA3

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.50 cfs @ 11.93 hrs, Volume= 0.020 af, Depth> 2.17"

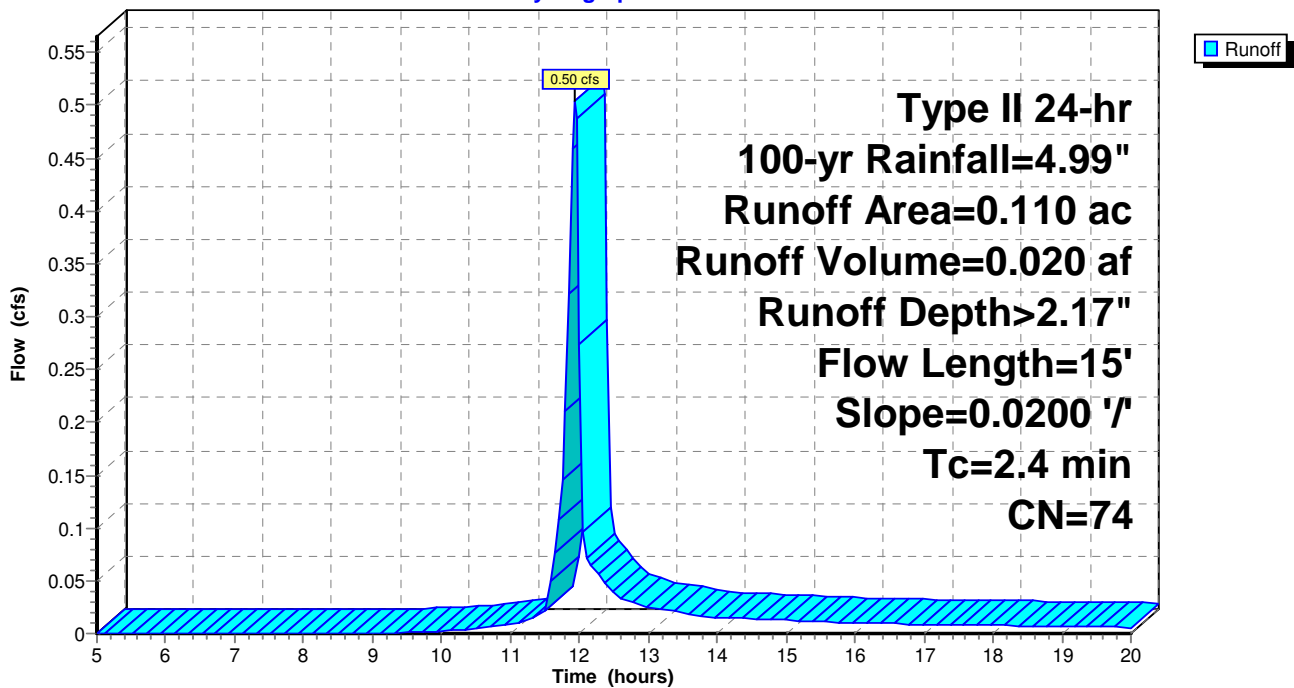
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.110	74	>75% Grass cover, Good, HSG C
0.110		100.00% Pervious Area

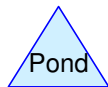
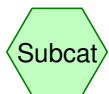
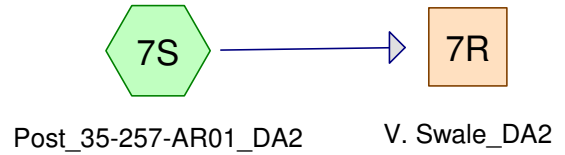
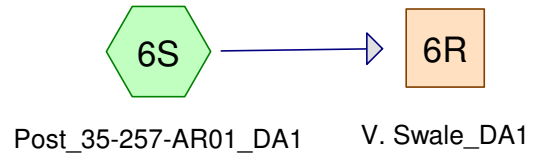
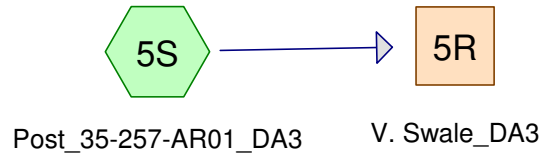
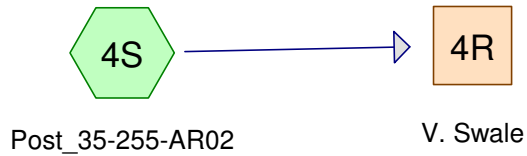
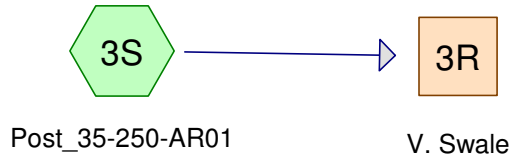
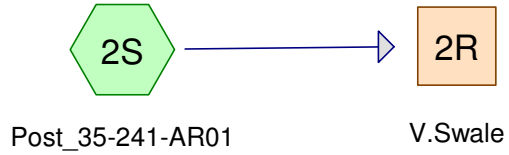
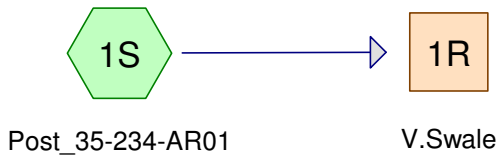
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Pre_35-257-AR01_DA3

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Access Roads Post-Construction Runoff Calculations



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.841	89	Gravel roads, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S)
2.841	89	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.841	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	HSG D	
0.000	Other	
2.841		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.841	0.000	0.000	2.841	Gravel roads	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	0.000	2.841	0.000	0.000	2.841	TOTAL AREA	

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Type II 24-hr 2-yr Rainfall=2.38"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=1.68 cfs 0.068 af

Subcatchment 2S: Post_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.26 cfs 0.010 af

Subcatchment 3S: Post_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.13 cfs 0.005 af

Subcatchment 4S: Post_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=1.86 cfs 0.075 af

Subcatchment 5S: Post_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.28 cfs 0.011 af

Subcatchment 6S: Post_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.47 cfs 0.019 af

Subcatchment 7S: Post_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>1.25"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=2.66 cfs 0.107 af

Reach 1R: V.Swale Avg. Flow Depth=0.22' Max Vel=1.41 fps Inflow=1.68 cfs 0.068 af
 n=0.080 L=1,900.0' S=0.0579 '/' Capacity=12.97 cfs Outflow=0.73 cfs 0.065 af

Reach 2R: V.Swale Avg. Flow Depth=0.11' Max Vel=0.89 fps Inflow=0.26 cfs 0.010 af
 n=0.080 L=300.0' S=0.0533 '/' Capacity=12.45 cfs Outflow=0.21 cfs 0.010 af

Reach 3R: V. Swale Avg. Flow Depth=0.08' Max Vel=0.71 fps Inflow=0.13 cfs 0.005 af
 n=0.080 L=160.0' S=0.0500 '/' Capacity=12.05 cfs Outflow=0.11 cfs 0.005 af

Reach 4R: V. Swale Avg. Flow Depth=0.24' Max Vel=1.06 fps Inflow=1.86 cfs 0.075 af
 n=0.080 L=2,090.0' S=0.0287 '/' Capacity=9.13 cfs Outflow=0.64 cfs 0.071 af

Reach 5R: V. Swale_DA3 Avg. Flow Depth=0.14' Max Vel=0.62 fps Inflow=0.28 cfs 0.011 af
 n=0.080 L=330.0' S=0.0182 '/' Capacity=7.27 cfs Outflow=0.20 cfs 0.011 af

Reach 6R: V. Swale_DA1 Avg. Flow Depth=0.17' Max Vel=0.72 fps Inflow=0.47 cfs 0.019 af
 n=0.080 L=515.0' S=0.0194 '/' Capacity=7.51 cfs Outflow=0.29 cfs 0.018 af

Reach 7R: V. Swale_DA2 Avg. Flow Depth=0.24' Max Vel=1.57 fps Inflow=2.66 cfs 0.107 af
 n=0.080 L=3,004.0' S=0.0639 '/' Capacity=13.63 cfs Outflow=0.93 cfs 0.101 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.296 af Average Runoff Depth = 1.25"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 1S: Post_35-234-AR01

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.68 cfs @ 11.93 hrs, Volume= 0.068 af, Depth > 1.25"

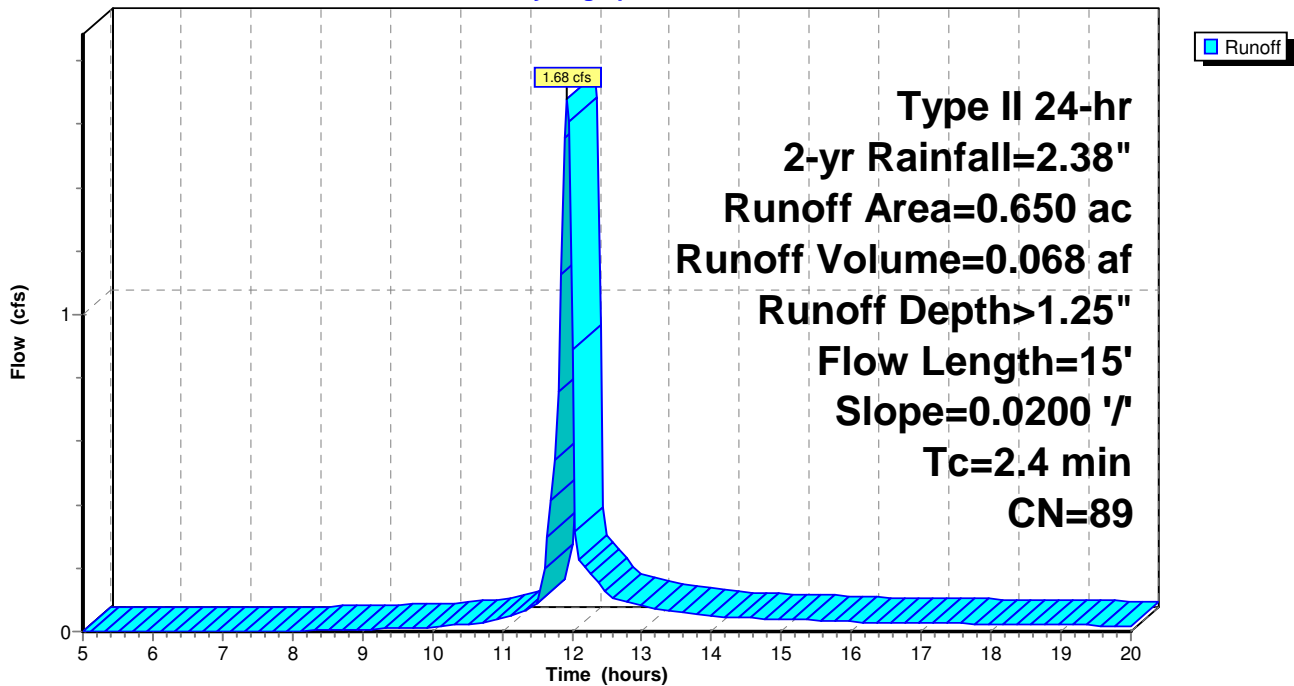
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.650	89	Gravel roads, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Post_35-234-AR01

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 2S: Post_35-241-AR01

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

Runoff = 0.26 cfs @ 11.93 hrs, Volume= 0.010 af, Depth> 1.25"

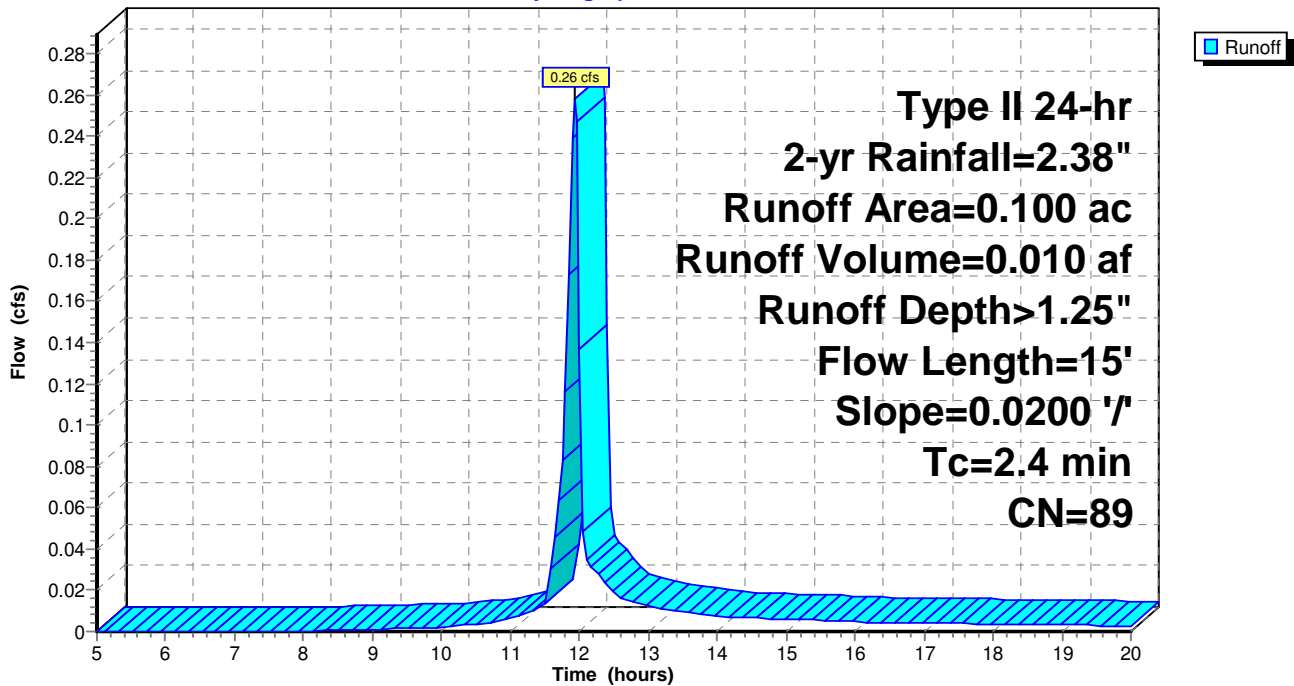
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Post_35-241-AR01

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 3S: Post_35-250-AR01

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

Runoff = 0.13 cfs @ 11.93 hrs, Volume= 0.005 af, Depth> 1.25"

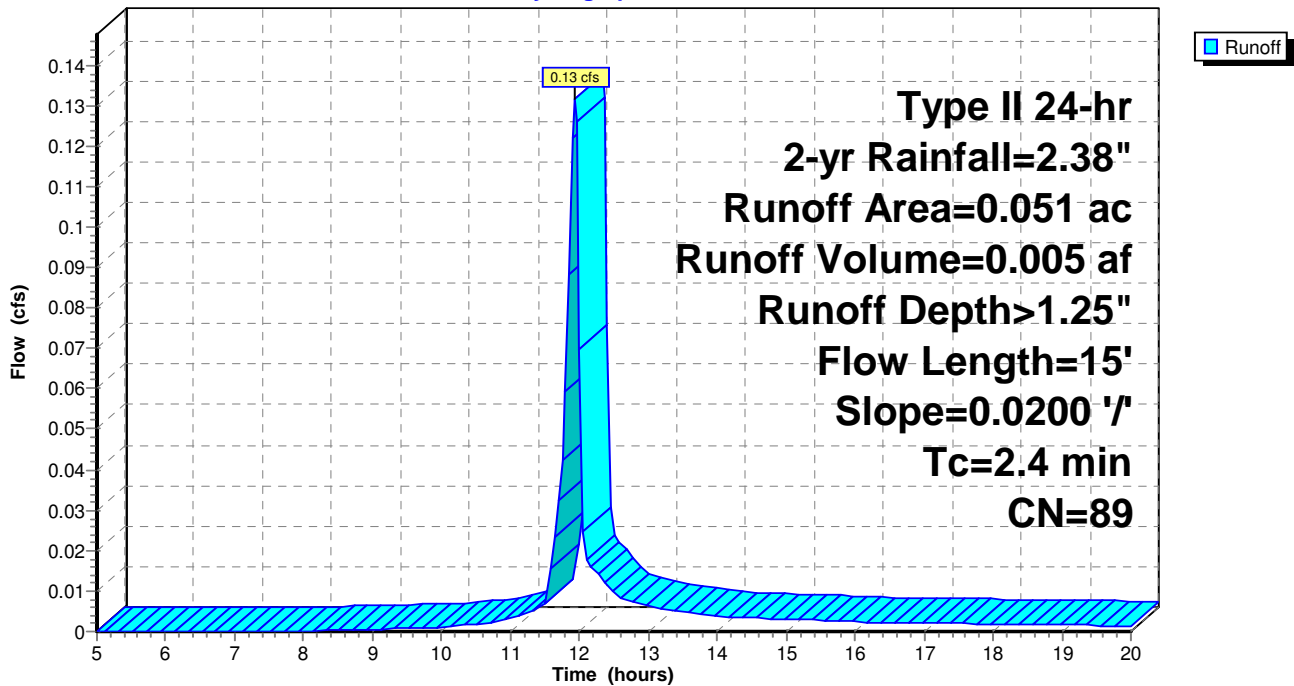
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.051	89	Gravel roads, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Post_35-250-AR01

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 4S: Post_35-255-AR02

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

Runoff = 1.86 cfs @ 11.93 hrs, Volume= 0.075 af, Depth> 1.25"

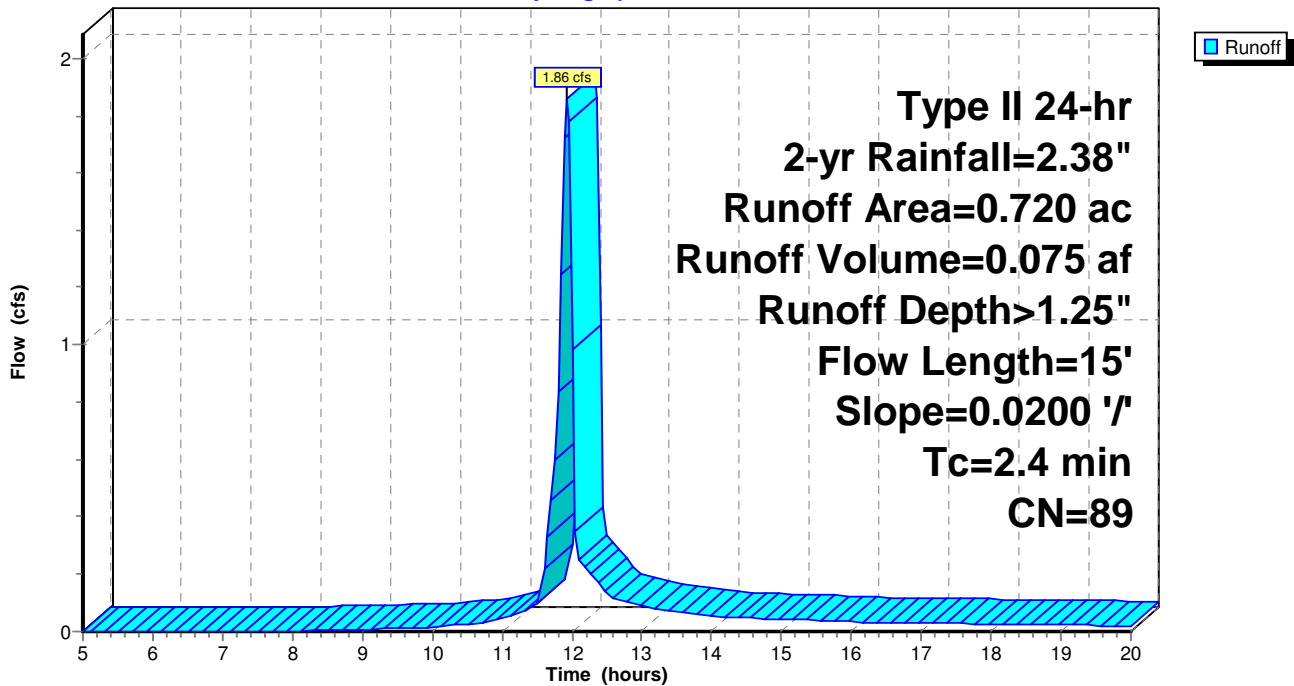
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.720	89	Gravel roads, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Post_35-255-AR02

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 5S: Post_35-257-AR01_DA3

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

Runoff = 0.28 cfs @ 11.93 hrs, Volume= 0.011 af, Depth> 1.25"

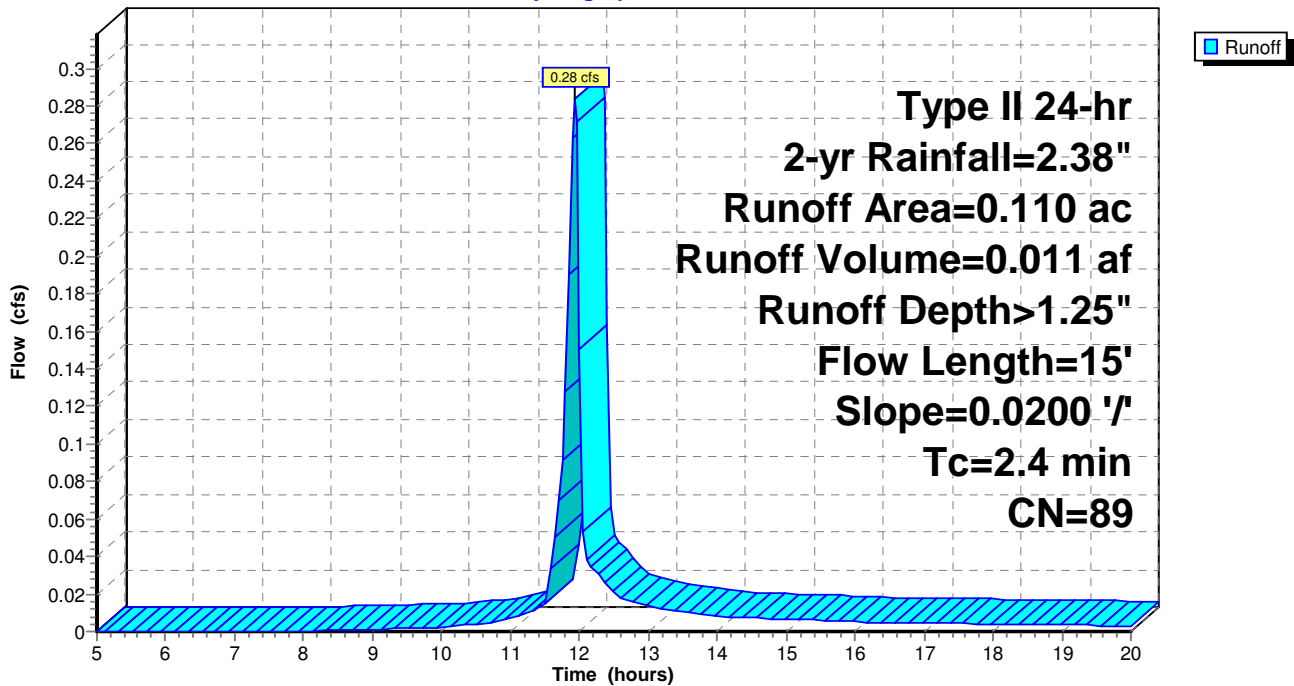
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Post_35-257-AR01_DA3

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 6S: Post_35-257-AR01_DA1

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.47 cfs @ 11.93 hrs, Volume= 0.019 af, Depth> 1.25"

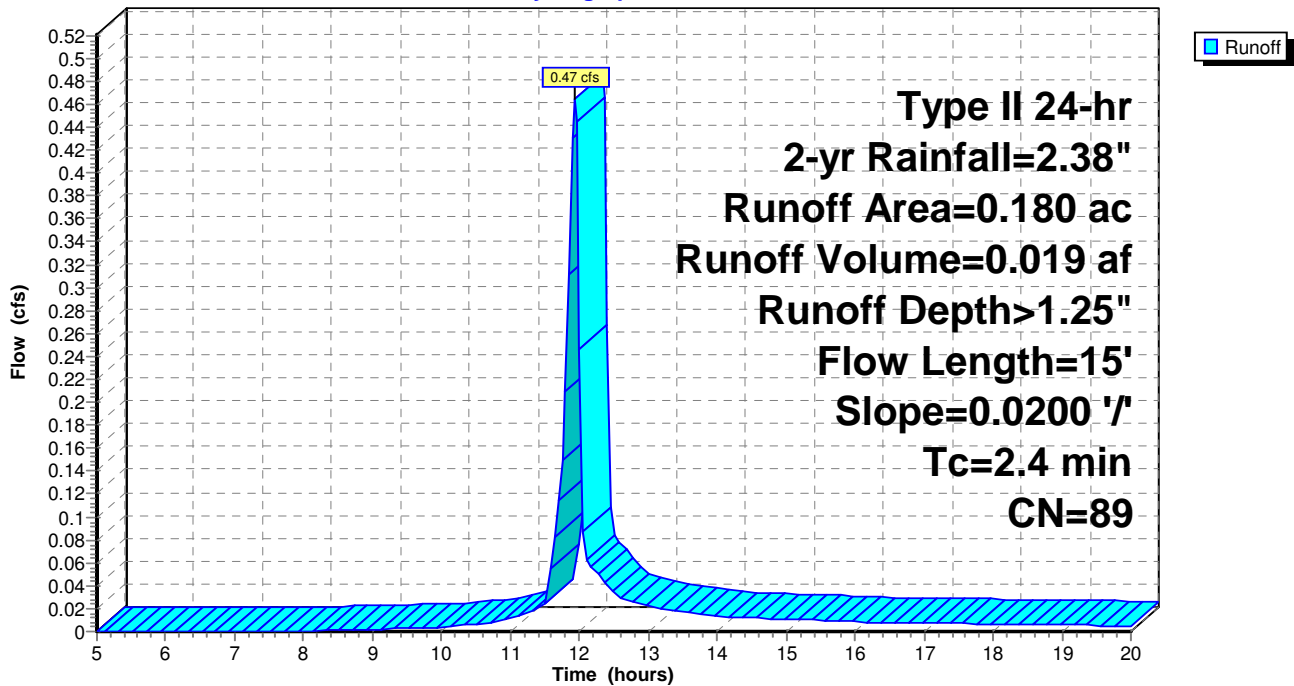
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
0.180	89	Gravel roads, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Post_35-257-AR01_DA1

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 7S: Post_35-257-AR01_DA2

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

Runoff = 2.66 cfs @ 11.93 hrs, Volume= 0.107 af, Depth> 1.25"

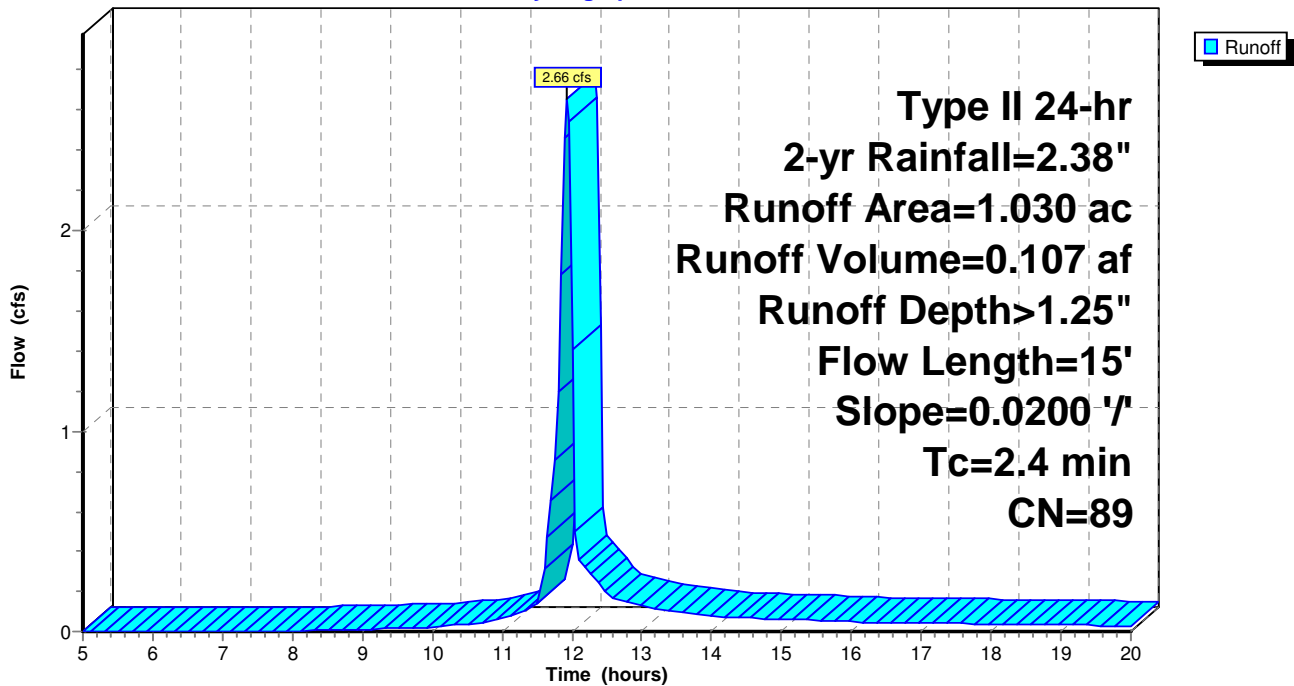
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

Area (ac)	CN	Description
1.030	89	Gravel roads, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Post_35-257-AR01_DA2

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 1R: V.Swale

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 1.68 cfs @ 11.93 hrs, Volume= 0.068 af
Outflow = 0.73 cfs @ 12.40 hrs, Volume= 0.065 af, Atten= 56%, Lag= 28.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.41 fps, Min. Travel Time= 22.4 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 66.3 min

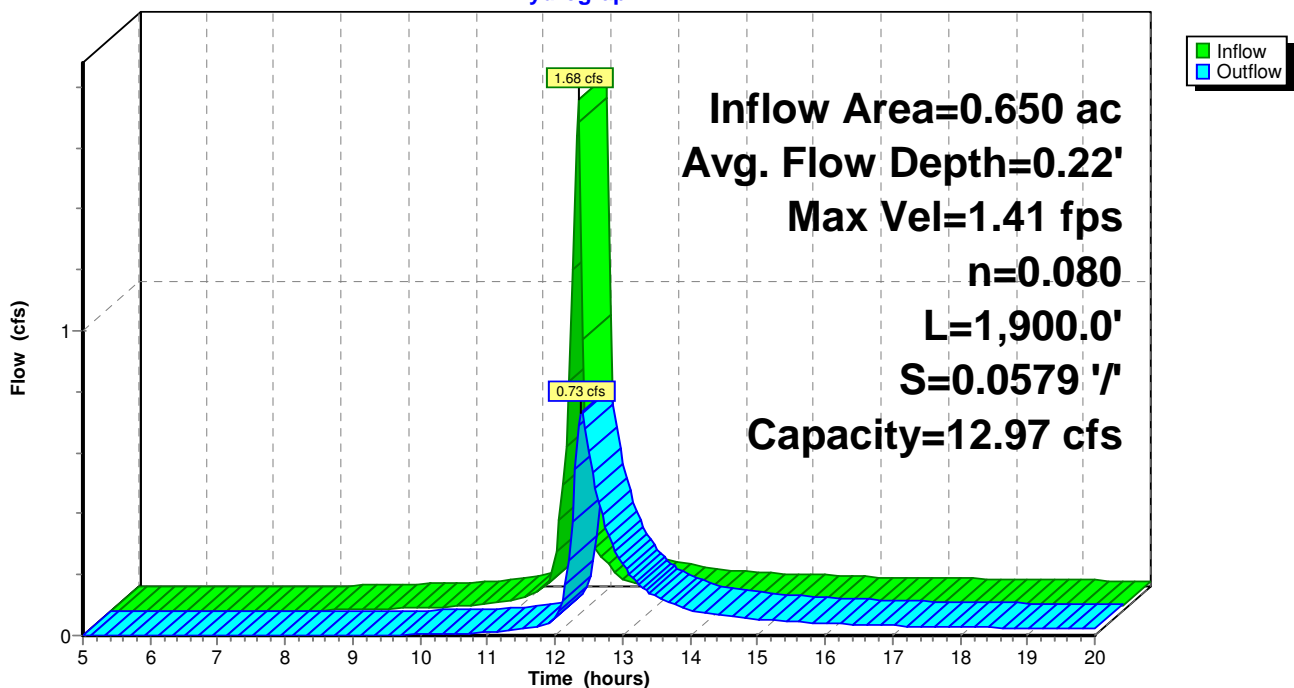
Peak Storage= 1,007 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.97 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 1,900.0' Slope= 0.0579 '/'
Inlet Invert= 1,270.00', Outlet Invert= 1,160.00'



Reach 1R: V.Swale

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 2R: V.Swale

Inflow Area = 0.100 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 0.26 cfs @ 11.93 hrs, Volume= 0.010 af
Outflow = 0.21 cfs @ 12.06 hrs, Volume= 0.010 af, Atten= 20%, Lag= 8.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.89 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 19.9 min

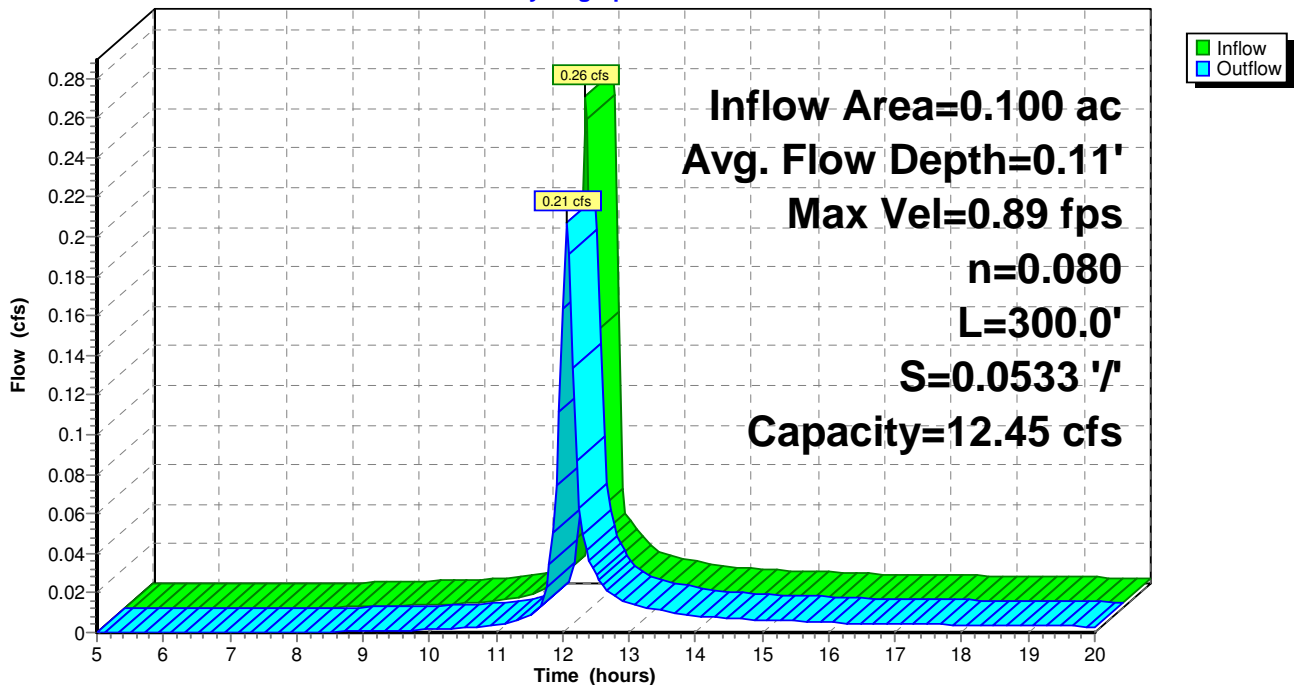
Peak Storage= 71 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.45 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0533 '/'
Inlet Invert= 1,076.00', Outlet Invert= 1,060.00'



Reach 2R: V.Swale

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 3R: V. Swale

Inflow Area = 0.051 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 0.13 cfs @ 11.93 hrs, Volume= 0.005 af
Outflow = 0.11 cfs @ 12.02 hrs, Volume= 0.005 af, Atten= 15%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.71 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 12.4 min

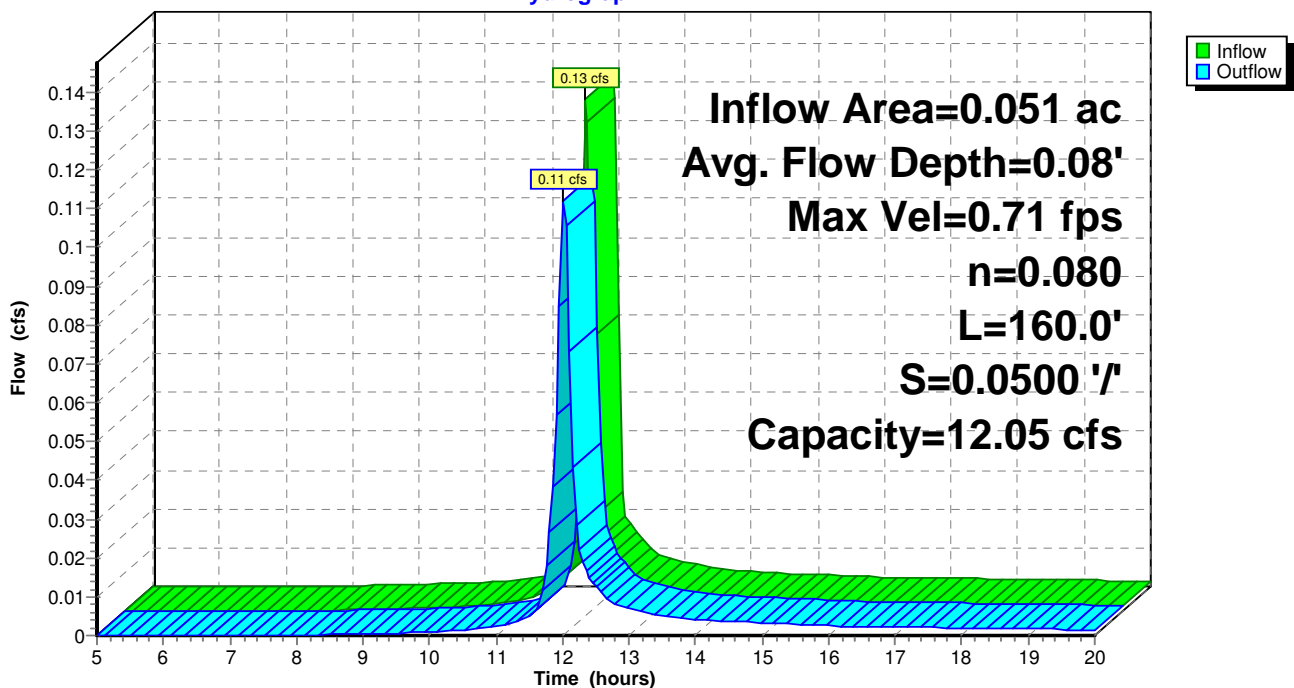
Peak Storage= 26 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.05 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 160.0' Slope= 0.0500 '/'
Inlet Invert= 1,116.00', Outlet Invert= 1,108.00'



Reach 3R: V. Swale

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 4R: V. Swale

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 1.86 cfs @ 11.93 hrs, Volume= 0.075 af
Outflow = 0.64 cfs @ 12.58 hrs, Volume= 0.071 af, Atten= 66%, Lag= 39.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.06 fps, Min. Travel Time= 32.9 min
Avg. Velocity = 0.39 fps, Avg. Travel Time= 88.2 min

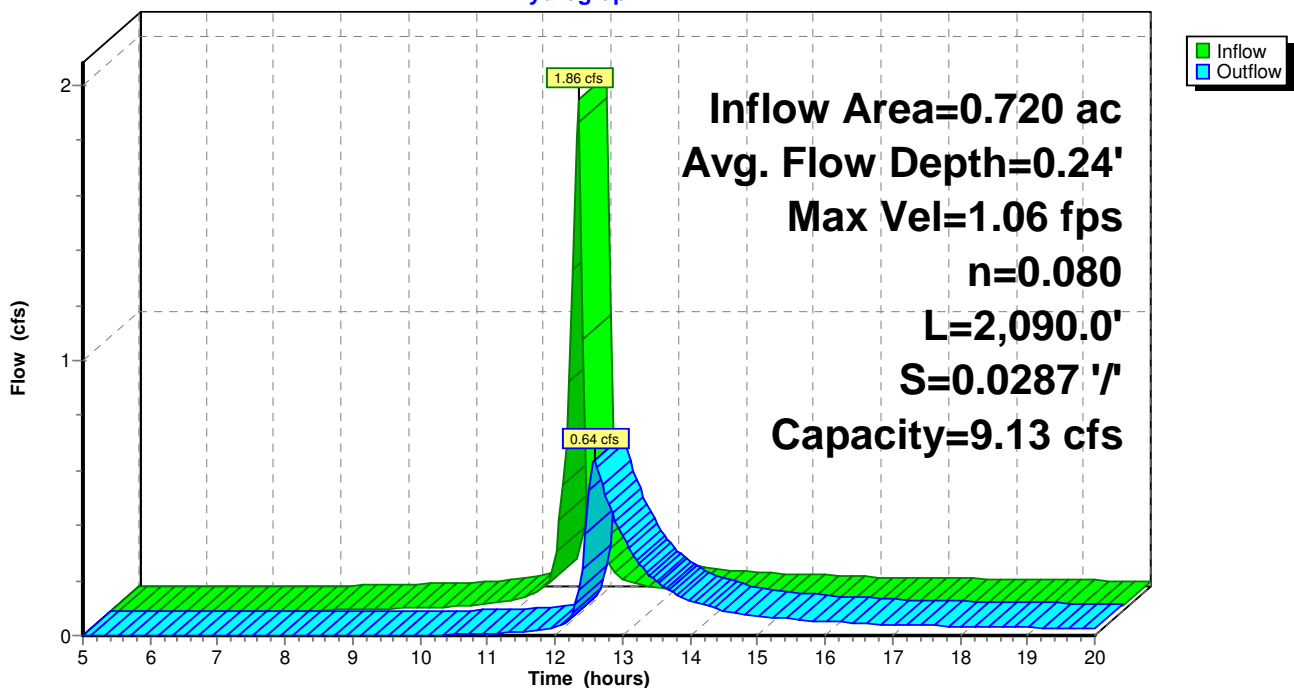
Peak Storage= 1,260 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 9.13 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 2,090.0' Slope= 0.0287 '/'
Inlet Invert= 1,114.00', Outlet Invert= 1,054.00'



Reach 4R: V. Swale

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 5R: V. Swale_DA3

Inflow Area = 0.110 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 0.28 cfs @ 11.93 hrs, Volume= 0.011 af
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 0.011 af, Atten= 30%, Lag= 12.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.62 fps, Min. Travel Time= 8.9 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 30.8 min

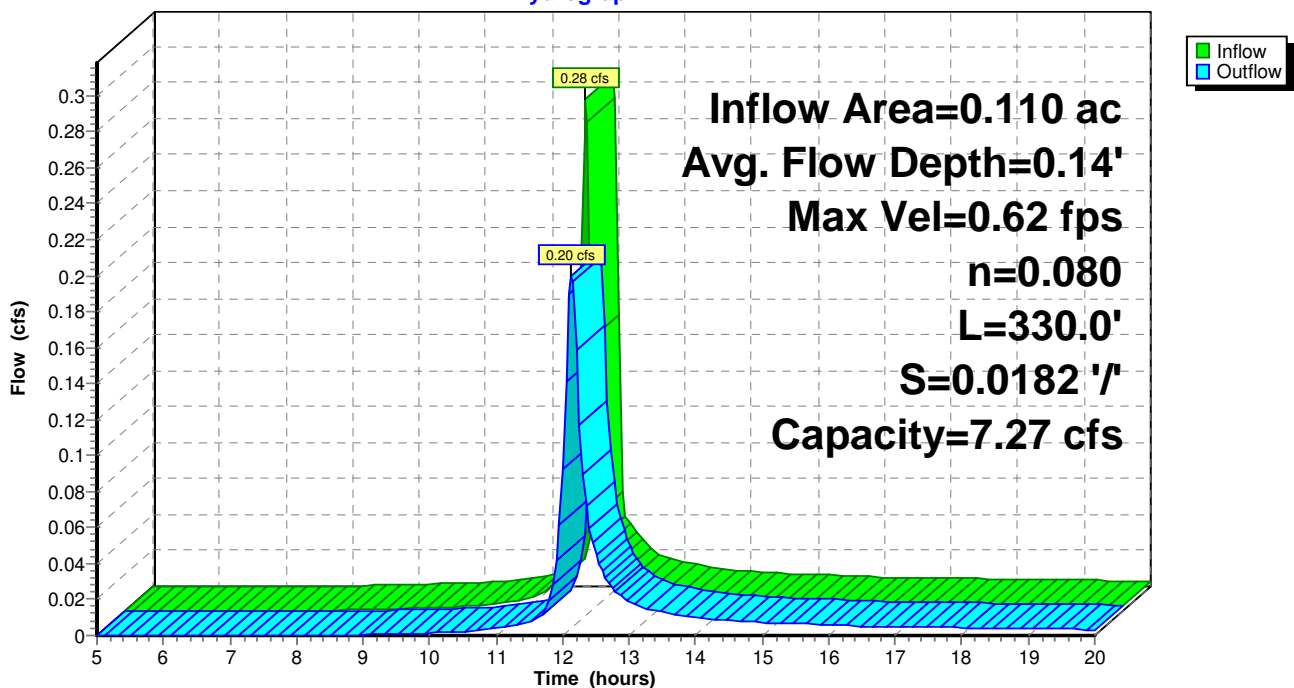
Peak Storage= 107 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.27 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0182 '/'
Inlet Invert= 1,054.00', Outlet Invert= 1,048.00'



Reach 5R: V. Swale_DA3

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 6R: V. Swale_DA1

Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 0.47 cfs @ 11.93 hrs, Volume= 0.019 af
Outflow = 0.29 cfs @ 12.19 hrs, Volume= 0.018 af, Atten= 38%, Lag= 16.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 12.0 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 40.0 min

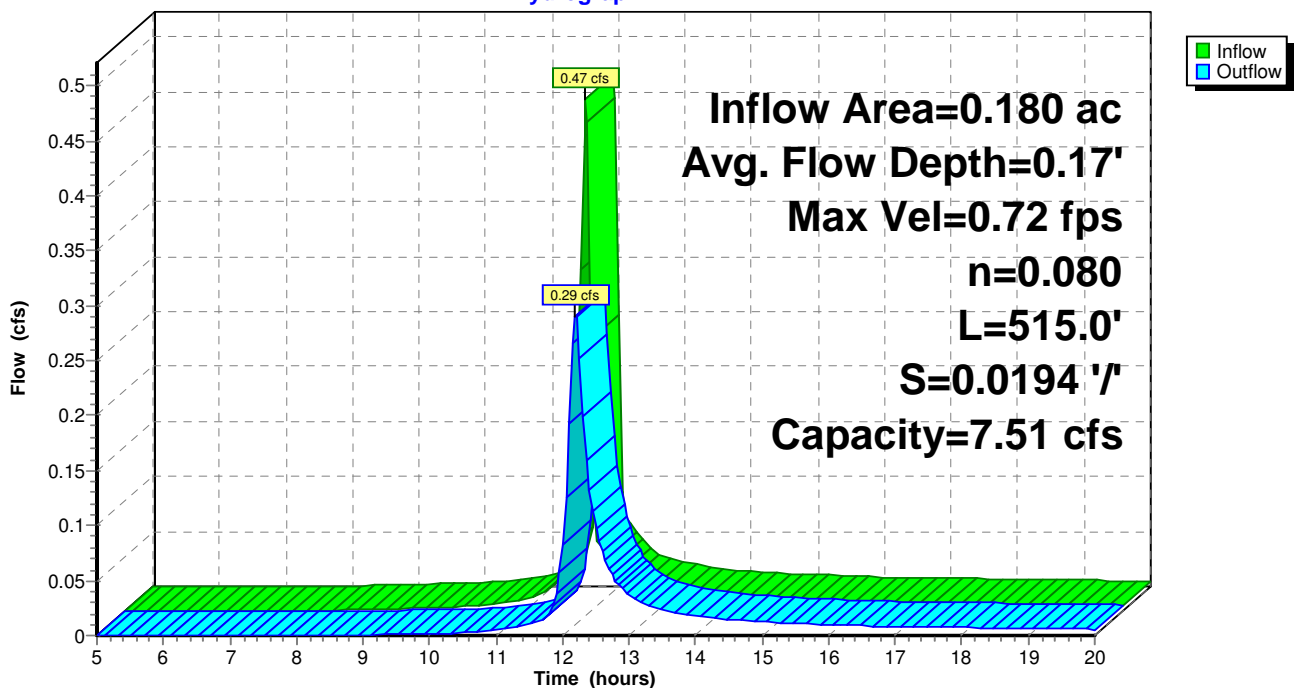
Peak Storage= 209 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.51 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 515.0' Slope= 0.0194 '/'
Inlet Invert= 1,240.00', Outlet Invert= 1,230.00'



Reach 6R: V. Swale_DA1

Hydrograph



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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Reach 7R: V. Swale_DA2

Inflow Area = 1.030 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-yr event
Inflow = 2.66 cfs @ 11.93 hrs, Volume= 0.107 af
Outflow = 0.93 cfs @ 12.57 hrs, Volume= 0.101 af, Atten= 65%, Lag= 38.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.57 fps, Min. Travel Time= 31.9 min
Avg. Velocity = 0.58 fps, Avg. Travel Time= 86.3 min

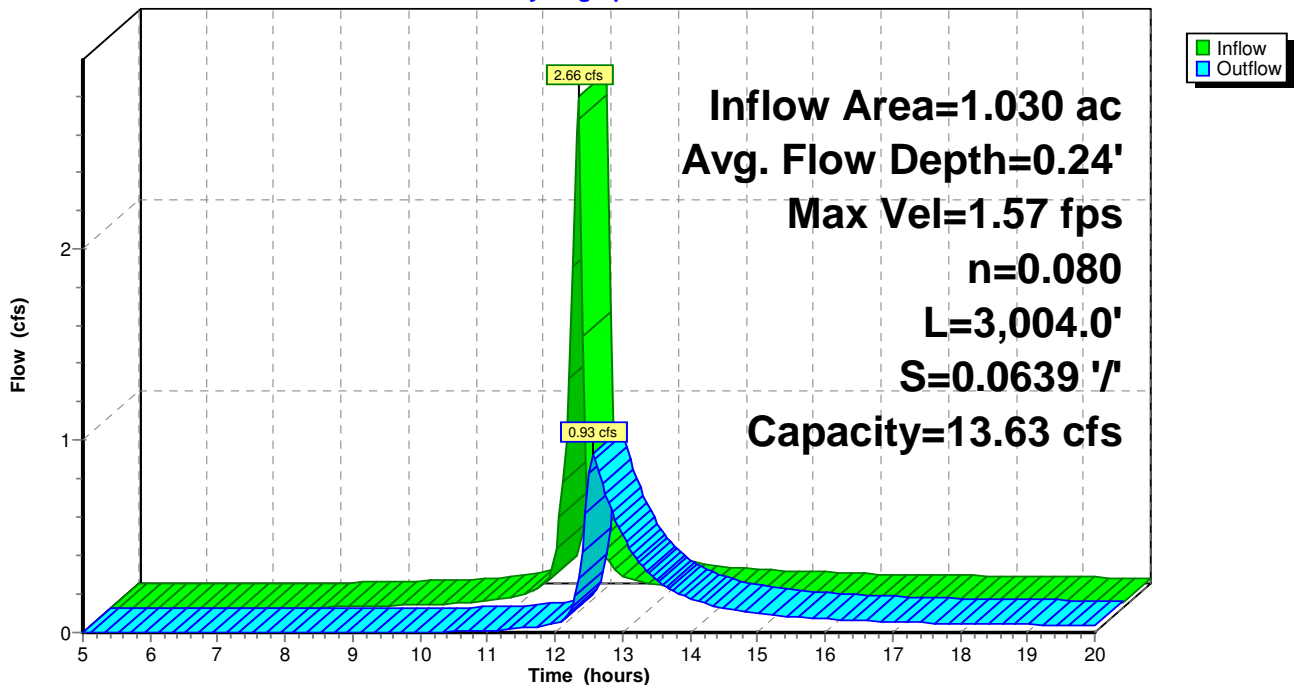
Peak Storage= 1,786 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 13.63 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 3,004.0' Slope= 0.0639 '/'
Inlet Invert= 1,240.00', Outlet Invert= 1,048.00'



Reach 7R: V. Swale_DA2

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=2.69 cfs 0.112 af

Subcatchment 2S: Post_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.41 cfs 0.017 af

Subcatchment 3S: Post_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.21 cfs 0.009 af

Subcatchment 4S: Post_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=2.98 cfs 0.124 af

Subcatchment 5S: Post_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.45 cfs 0.019 af

Subcatchment 6S: Post_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.74 cfs 0.031 af

Subcatchment 7S: Post_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>2.07"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=4.26 cfs 0.178 af

Reach 1R: V.Swale Avg. Flow Depth=0.31' Max Vel=1.71 fps Inflow=2.69 cfs 0.112 af
n=0.080 L=1,900.0' S=0.0579 '/' Capacity=12.97 cfs Outflow=1.36 cfs 0.109 af

Reach 2R: V.Swale Avg. Flow Depth=0.14' Max Vel=1.07 fps Inflow=0.41 cfs 0.017 af
n=0.080 L=300.0' S=0.0533 '/' Capacity=12.45 cfs Outflow=0.34 cfs 0.017 af

Reach 3R: V. Swale Avg. Flow Depth=0.10' Max Vel=0.85 fps Inflow=0.21 cfs 0.009 af
n=0.080 L=160.0' S=0.0500 '/' Capacity=12.05 cfs Outflow=0.19 cfs 0.009 af

Reach 4R: V. Swale Avg. Flow Depth=0.35' Max Vel=1.29 fps Inflow=2.98 cfs 0.124 af
n=0.080 L=2,090.0' S=0.0287 '/' Capacity=9.13 cfs Outflow=1.22 cfs 0.119 af

Reach 5R: V. Swale_DA3 Avg. Flow Depth=0.19' Max Vel=0.74 fps Inflow=0.45 cfs 0.019 af
n=0.080 L=330.0' S=0.0182 '/' Capacity=7.27 cfs Outflow=0.33 cfs 0.019 af

Reach 6R: V. Swale_DA1 Avg. Flow Depth=0.24' Max Vel=0.86 fps Inflow=0.74 cfs 0.031 af
n=0.080 L=515.0' S=0.0194 '/' Capacity=7.51 cfs Outflow=0.50 cfs 0.030 af

Reach 7R: V. Swale_DA2 Avg. Flow Depth=0.34' Max Vel=1.91 fps Inflow=4.26 cfs 0.178 af
n=0.080 L=3,004.0' S=0.0639 '/' Capacity=13.63 cfs Outflow=1.75 cfs 0.170 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.490 af Average Runoff Depth = 2.07"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 1S: Post_35-234-AR01

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.69 cfs @ 11.93 hrs, Volume= 0.112 af, Depth> 2.07"

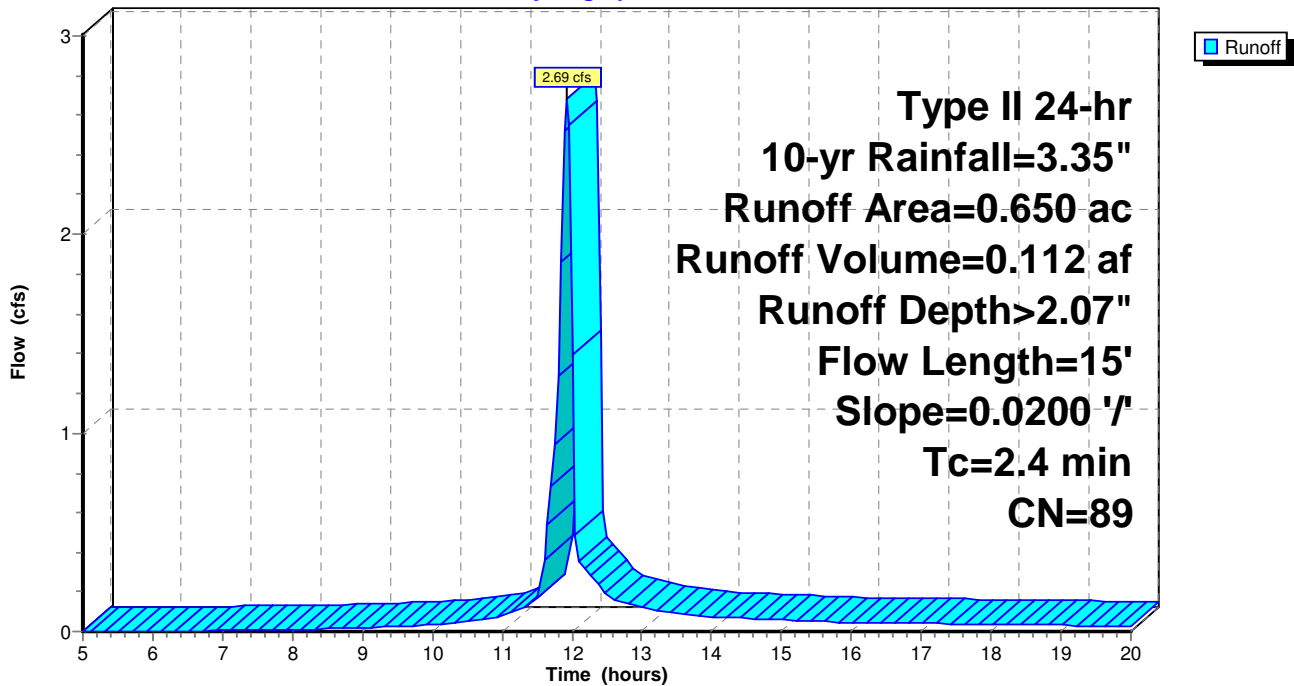
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.650	89	Gravel roads, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Post_35-234-AR01

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 2S: Post_35-241-AR01

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

Runoff = 0.41 cfs @ 11.93 hrs, Volume= 0.017 af, Depth> 2.07"

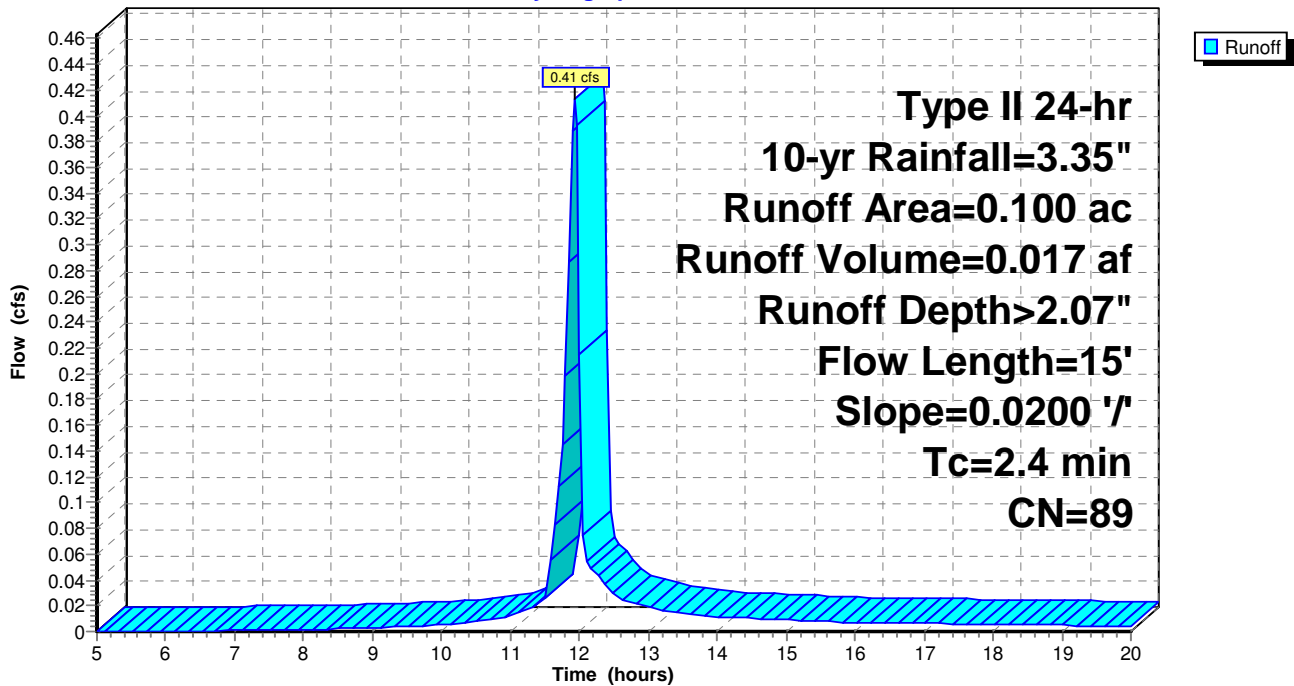
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Post_35-241-AR01

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 3S: Post_35-250-AR01

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

Runoff = 0.21 cfs @ 11.93 hrs, Volume= 0.009 af, Depth> 2.07"

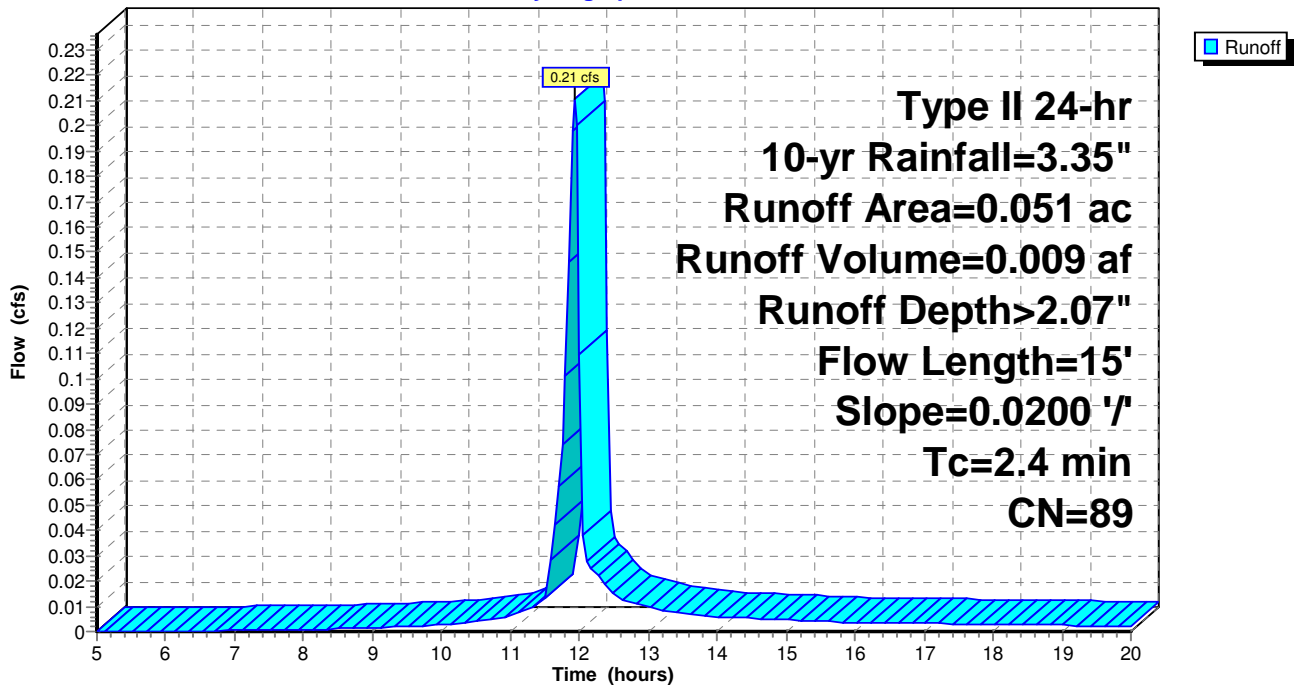
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.051	89	Gravel roads, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Post_35-250-AR01

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 4S: Post_35-255-AR02

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.98 cfs @ 11.93 hrs, Volume= 0.124 af, Depth> 2.07"

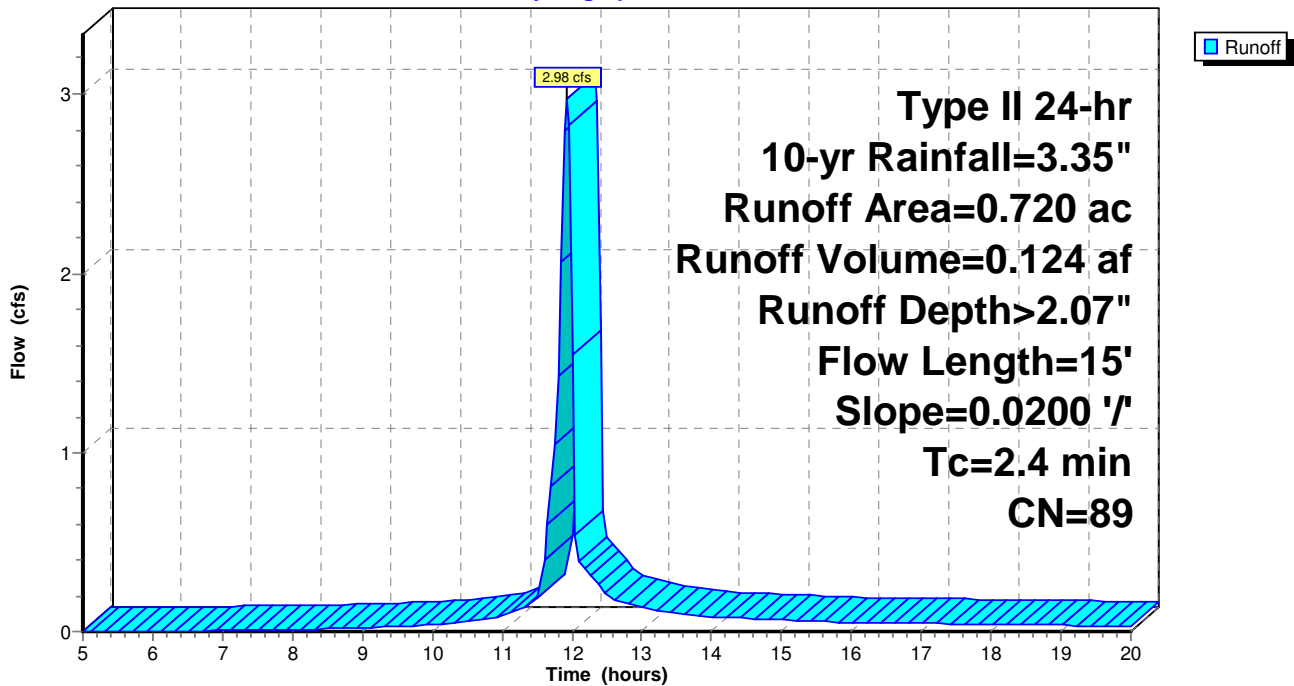
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.720	89	Gravel roads, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Post_35-255-AR02

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 5S: Post_35-257-AR01_DA3

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

Runoff = 0.45 cfs @ 11.93 hrs, Volume= 0.019 af, Depth> 2.07"

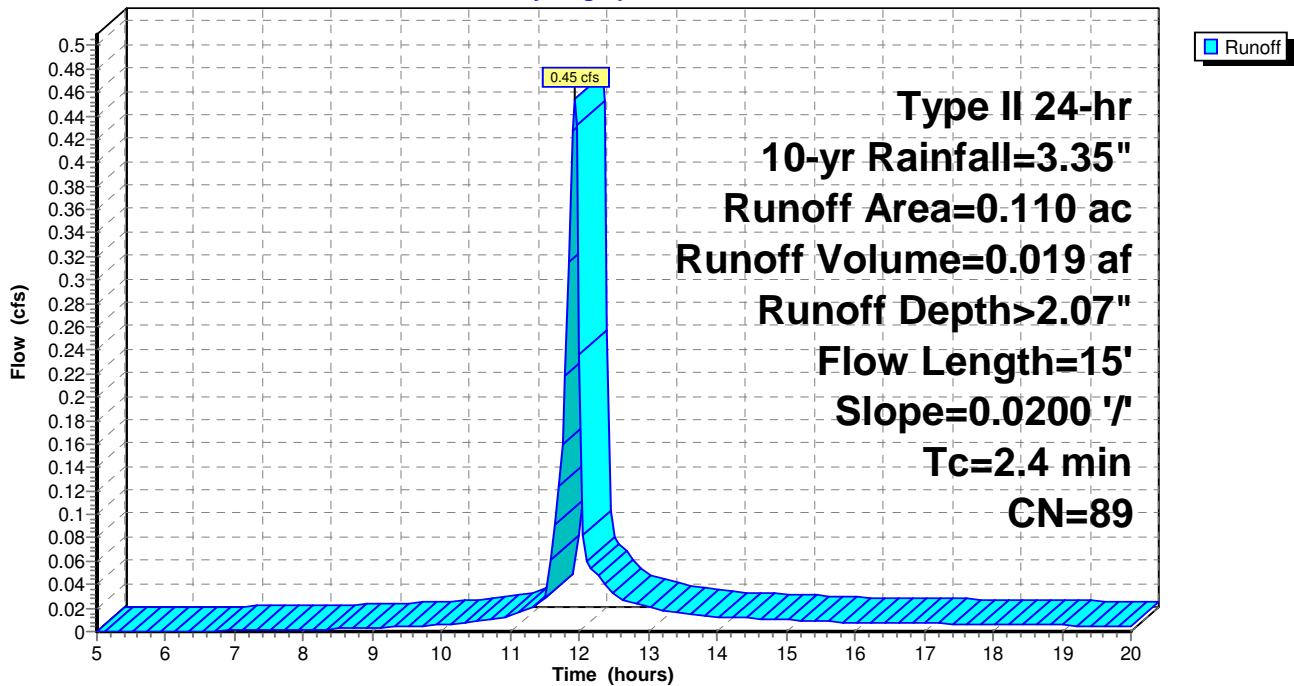
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Post_35-257-AR01_DA3

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 6S: Post_35-257-AR01_DA1

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

Runoff = 0.74 cfs @ 11.93 hrs, Volume= 0.031 af, Depth> 2.07"

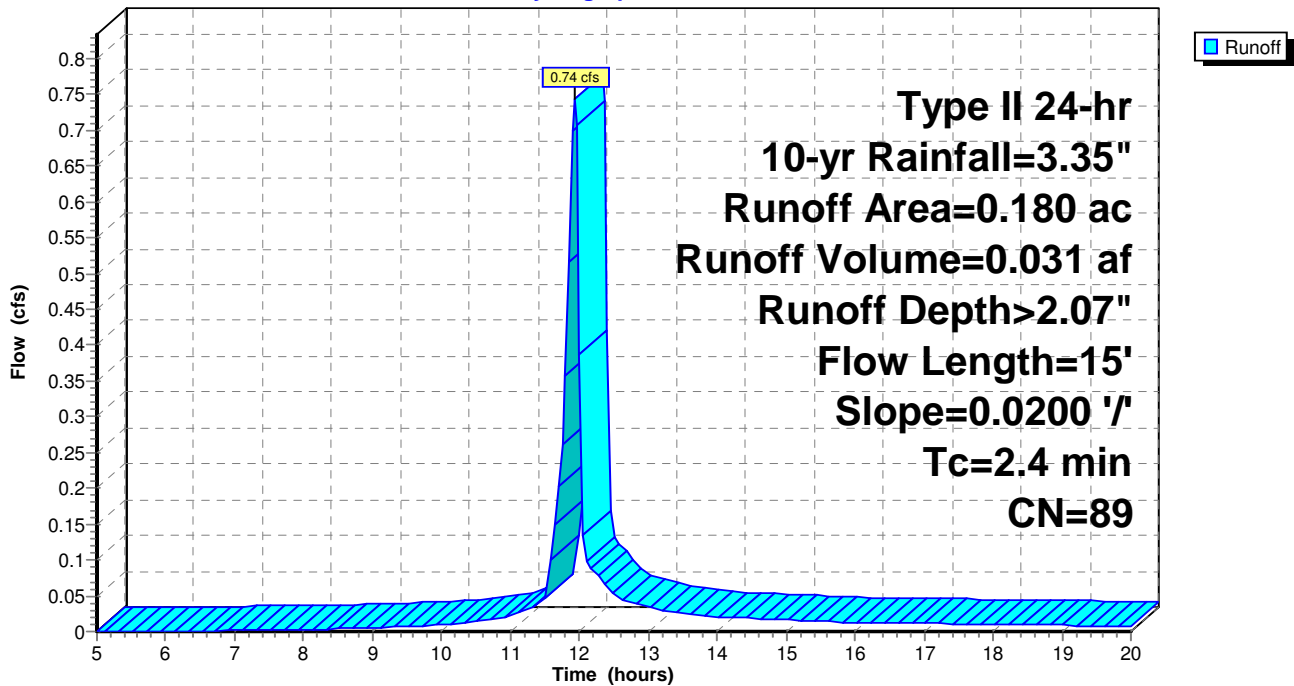
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
0.180	89	Gravel roads, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Post_35-257-AR01_DA1

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Subcatchment 7S: Post_35-257-AR01_DA2

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

Runoff = 4.26 cfs @ 11.93 hrs, Volume= 0.178 af, Depth> 2.07"

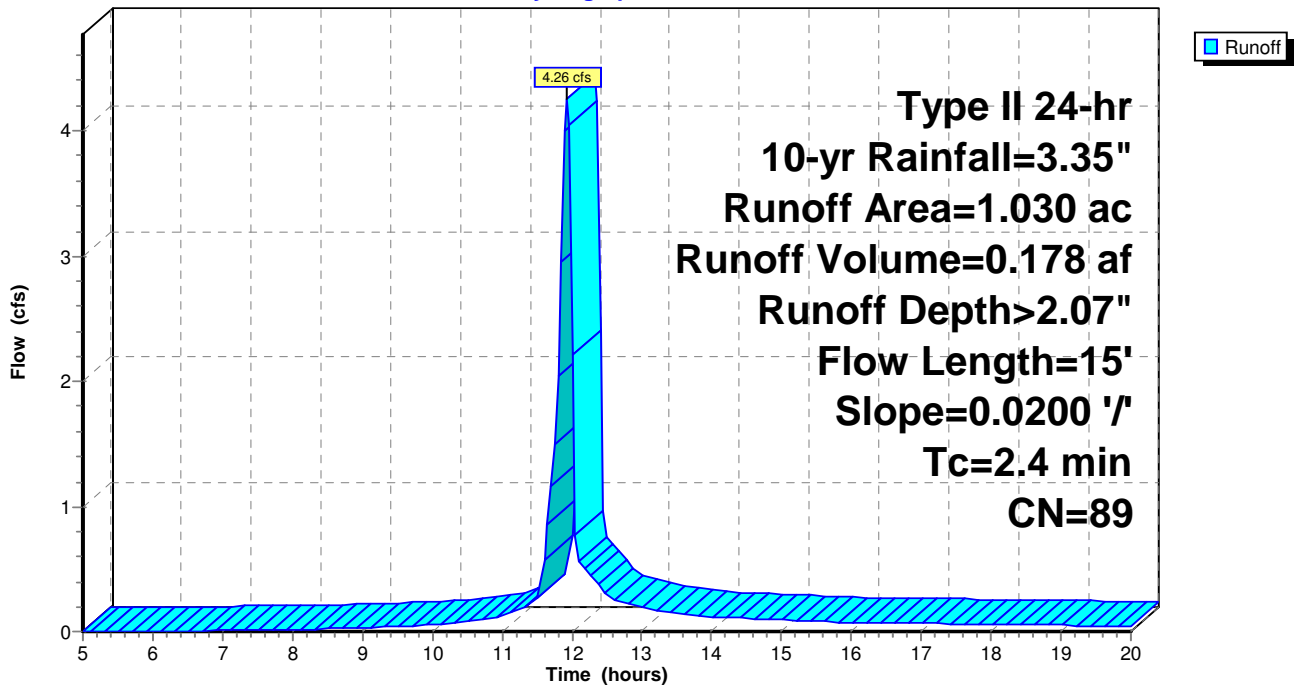
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

Area (ac)	CN	Description
1.030	89	Gravel roads, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Post_35-257-AR01_DA2

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 1R: V.Swale

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 2.69 cfs @ 11.93 hrs, Volume= 0.112 af
Outflow = 1.36 cfs @ 12.31 hrs, Volume= 0.109 af, Atten= 49%, Lag= 23.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.71 fps, Min. Travel Time= 18.5 min
Avg. Velocity = 0.54 fps, Avg. Travel Time= 59.1 min

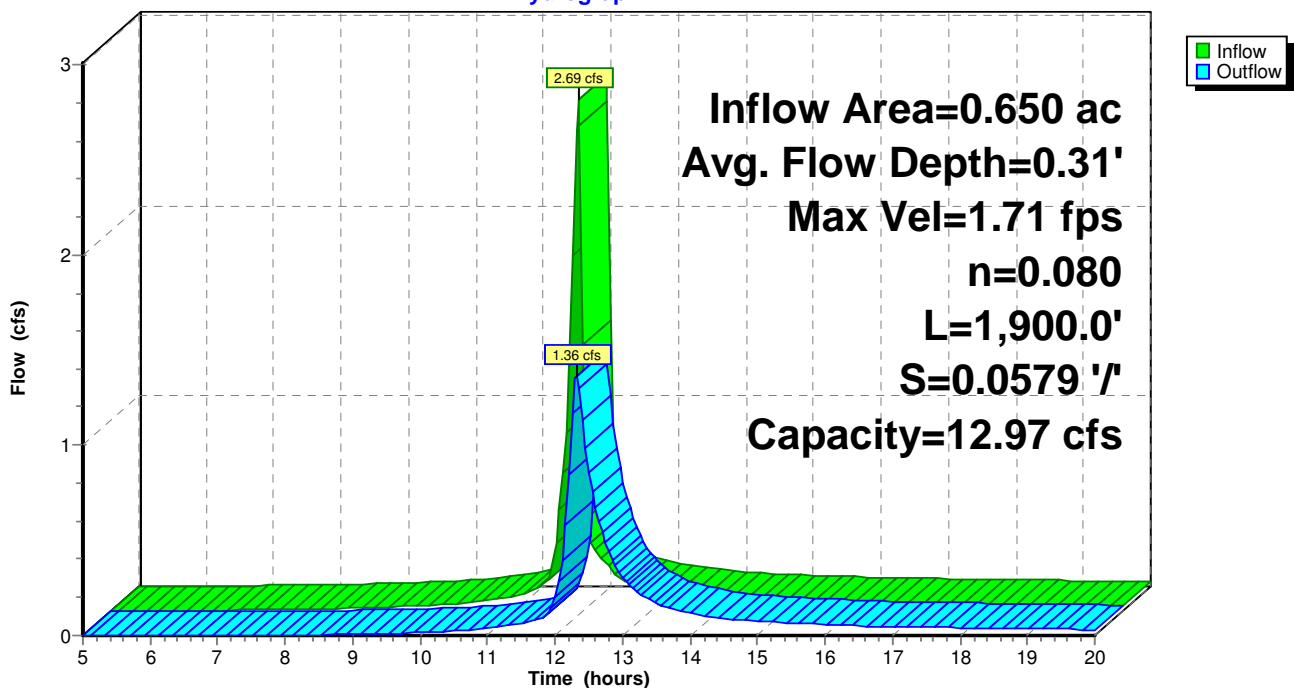
Peak Storage= 1,524 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.97 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 1,900.0' Slope= 0.0579 '/'
Inlet Invert= 1,270.00', Outlet Invert= 1,160.00'



Reach 1R: V.Swale

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 2R: V.Swale

Inflow Area = 0.100 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 0.41 cfs @ 11.93 hrs, Volume= 0.017 af
Outflow = 0.34 cfs @ 12.04 hrs, Volume= 0.017 af, Atten= 18%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.07 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 17.9 min

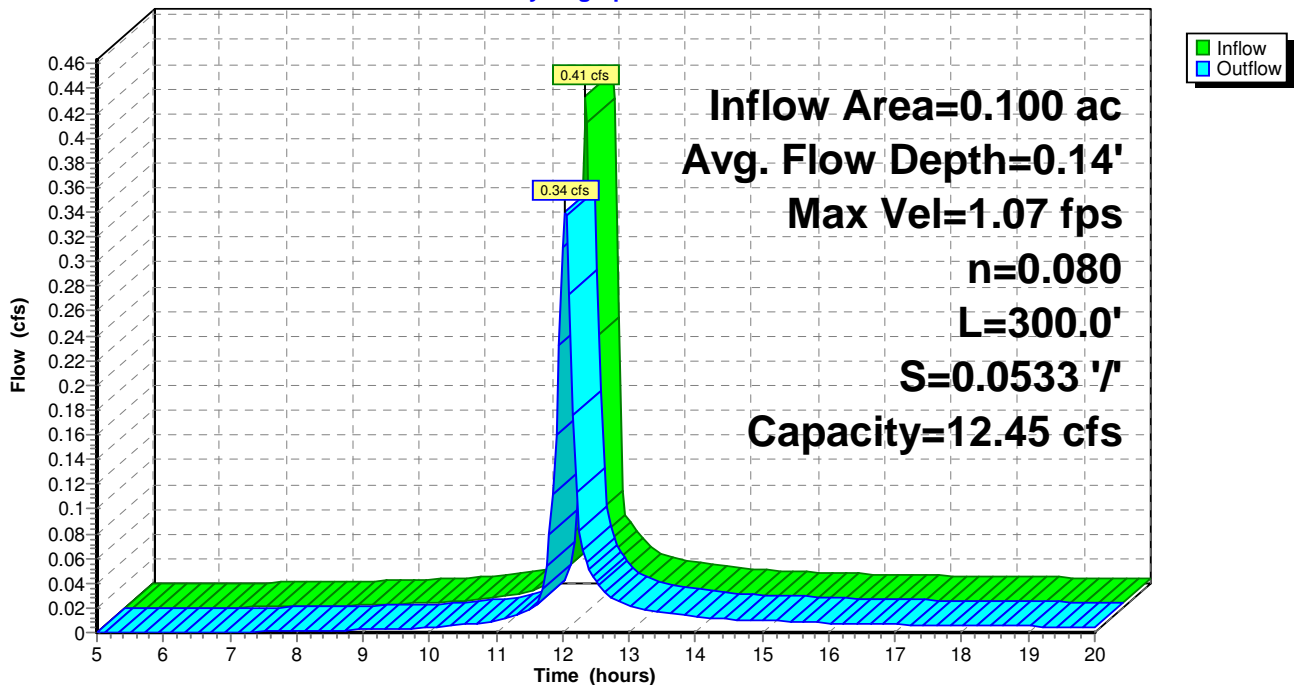
Peak Storage= 99 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.45 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0533 '/'
Inlet Invert= 1,076.00', Outlet Invert= 1,060.00'



Reach 2R: V.Swale

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 3R: V. Swale

Inflow Area = 0.051 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 0.21 cfs @ 11.93 hrs, Volume= 0.009 af
Outflow = 0.19 cfs @ 12.00 hrs, Volume= 0.009 af, Atten= 9%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.85 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 11.7 min

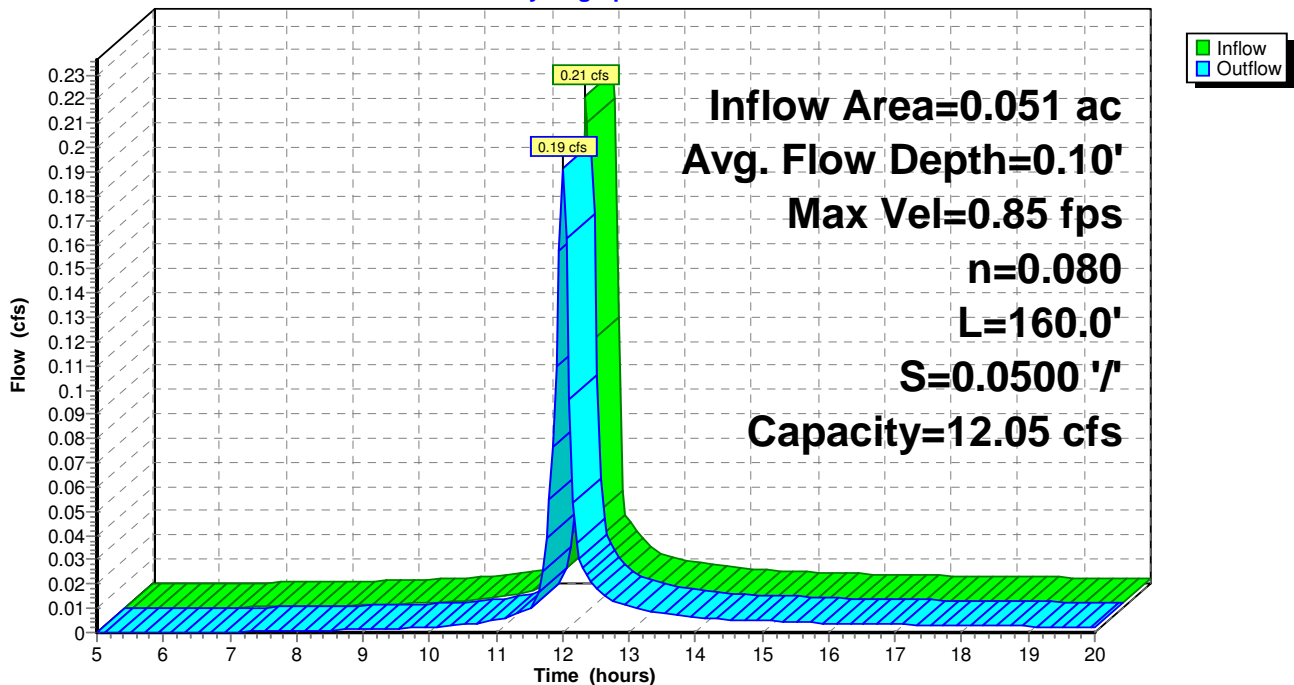
Peak Storage= 36 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.05 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 160.0' Slope= 0.0500 '/'
Inlet Invert= 1,116.00', Outlet Invert= 1,108.00'



Reach 3R: V. Swale

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 4R: V. Swale

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 2.98 cfs @ 11.93 hrs, Volume= 0.124 af
Outflow = 1.22 cfs @ 12.47 hrs, Volume= 0.119 af, Atten= 59%, Lag= 32.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 27.0 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 78.9 min

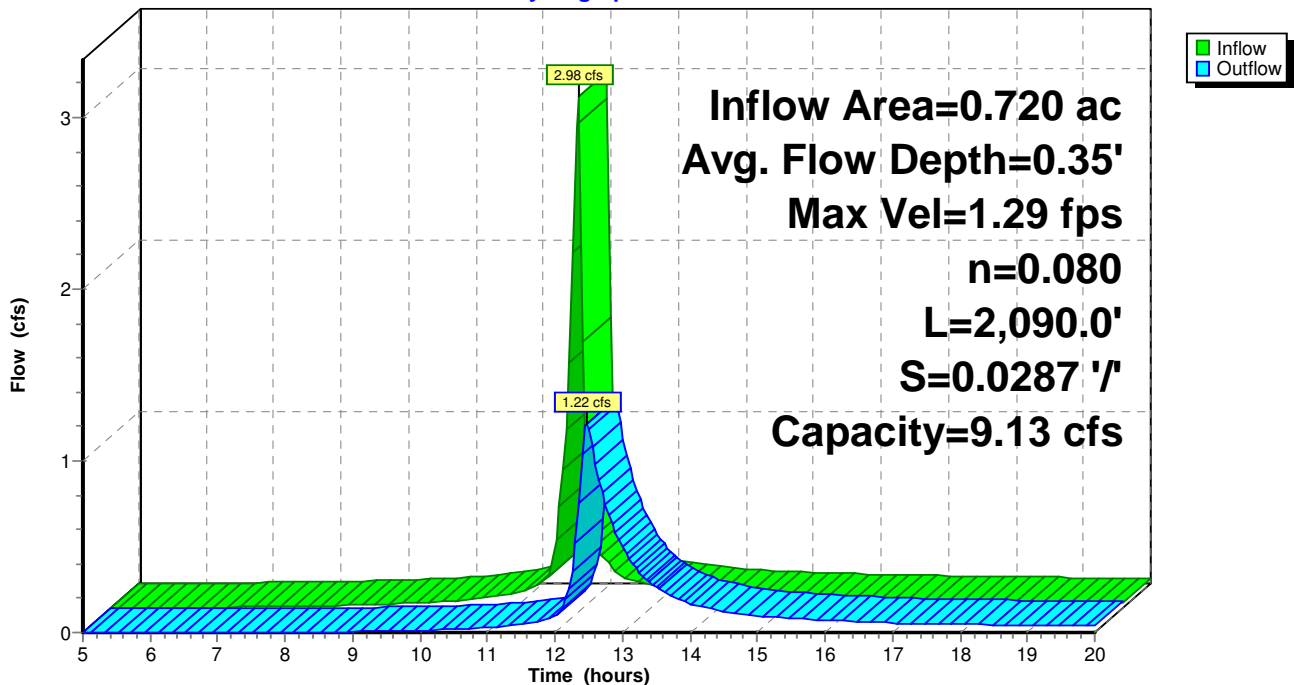
Peak Storage= 1,966 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 9.13 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 2,090.0' Slope= 0.0287 '/'
Inlet Invert= 1,114.00', Outlet Invert= 1,054.00'



Reach 4R: V. Swale

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 5R: V. Swale_DA3

Inflow Area = 0.110 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 0.45 cfs @ 11.93 hrs, Volume= 0.019 af
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 0.019 af, Atten= 26%, Lag= 10.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.74 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 0.20 fps, Avg. Travel Time= 27.5 min

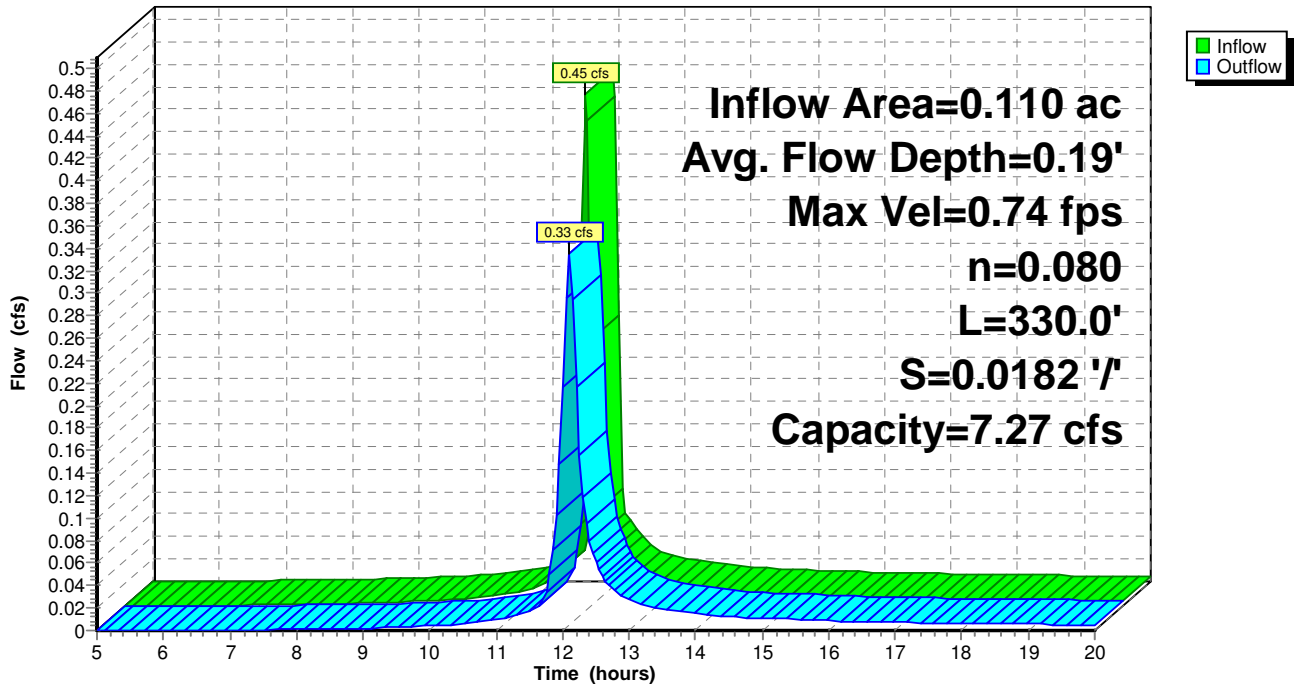
Peak Storage= 153 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.27 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0182 '/'
Inlet Invert= 1,054.00', Outlet Invert= 1,048.00'



Reach 5R: V. Swale_DA3

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 6R: V. Swale_DA1

Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
 Inflow = 0.74 cfs @ 11.93 hrs, Volume= 0.031 af
 Outflow = 0.50 cfs @ 12.15 hrs, Volume= 0.030 af, Atten= 33%, Lag= 13.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.86 fps, Min. Travel Time= 10.0 min
 Avg. Velocity = 0.24 fps, Avg. Travel Time= 35.7 min

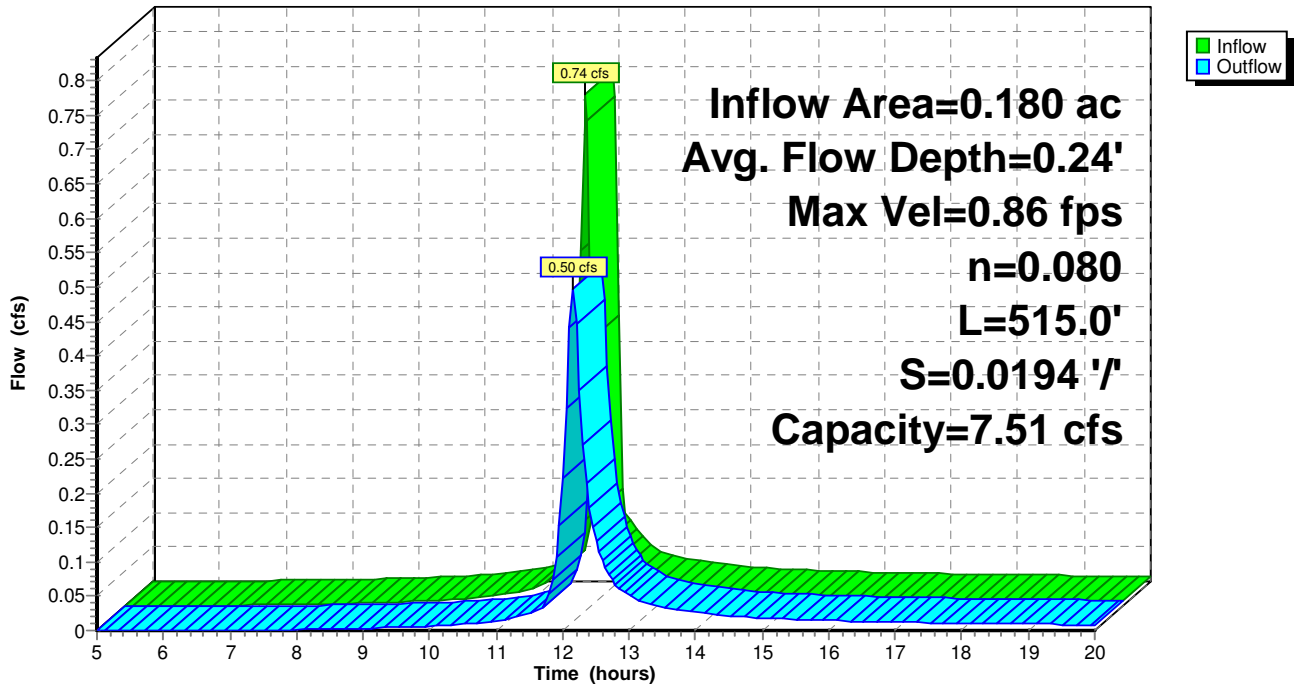
Peak Storage= 304 cf @ 11.99 hrs
 Average Depth at Peak Storage= 0.24'
 Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.51 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
 Side Slope Z-value= 2.0 '/' Top Width= 6.00'
 Length= 515.0' Slope= 0.0194 '/'
 Inlet Invert= 1,240.00', Outlet Invert= 1,230.00'



Reach 6R: V. Swale_DA1

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Type II 24-hr 10-yr Rainfall=3.35"

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Summary for Reach 7R: V. Swale_DA2

Inflow Area = 1.030 ac, 0.00% Impervious, Inflow Depth > 2.07" for 10-yr event
Inflow = 4.26 cfs @ 11.93 hrs, Volume= 0.178 af
Outflow = 1.75 cfs @ 12.46 hrs, Volume= 0.170 af, Atten= 59%, Lag= 32.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 26.2 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 77.1 min

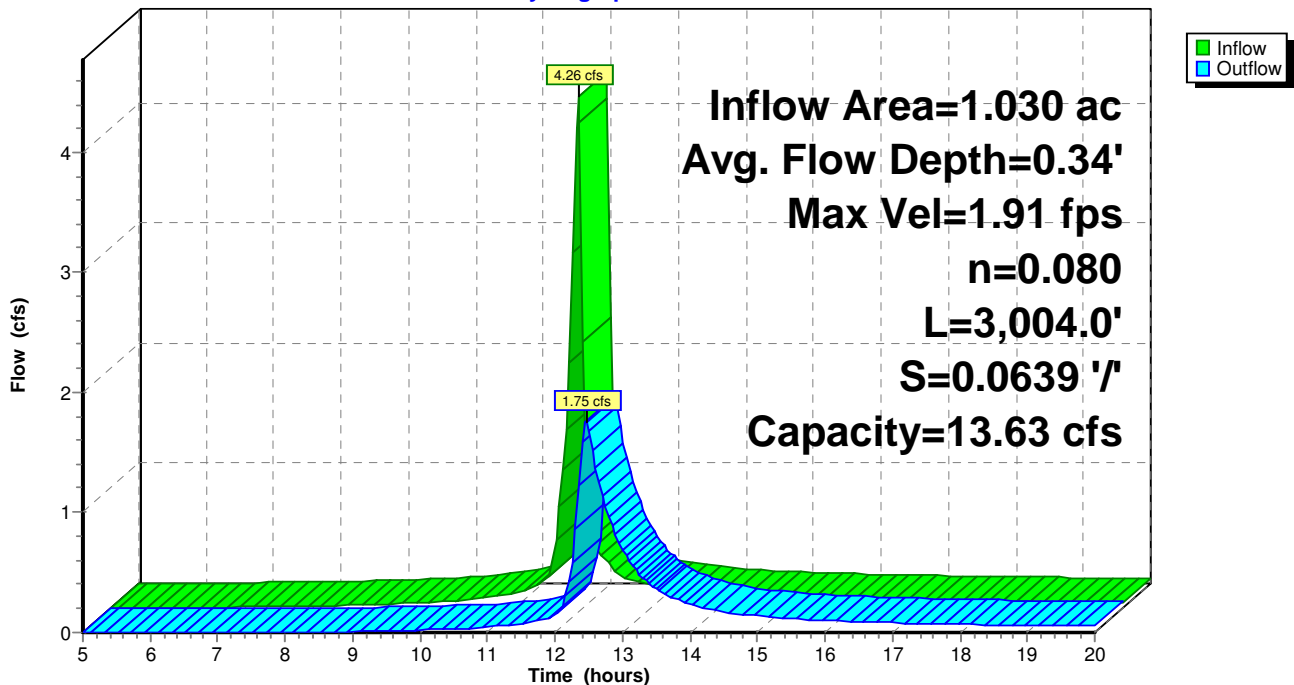
Peak Storage= 2,781 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 13.63 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 3,004.0' Slope= 0.0639 '/'
Inlet Invert= 1,240.00', Outlet Invert= 1,048.00'



Reach 7R: V. Swale_DA2

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Type II 24-hr 50-yr Rainfall=4.46"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=3.85 cfs 0.165 af

Subcatchment 2S: Post_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.59 cfs 0.025 af

Subcatchment 3S: Post_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.30 cfs 0.013 af

Subcatchment 4S: Post_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=4.26 cfs 0.183 af

Subcatchment 5S: Post_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.65 cfs 0.028 af

Subcatchment 6S: Post_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=1.07 cfs 0.046 af

Subcatchment 7S: Post_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>3.05"
 Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=6.10 cfs 0.262 af

Reach 1R: V.Swale Avg. Flow Depth=0.39' Max Vel=1.96 fps Inflow=3.85 cfs 0.165 af
 n=0.080 L=1,900.0' S=0.0579 '/' Capacity=12.97 cfs Outflow=2.09 cfs 0.161 af

Reach 2R: V.Swale Avg. Flow Depth=0.18' Max Vel=1.22 fps Inflow=0.59 cfs 0.025 af
 n=0.080 L=300.0' S=0.0533 '/' Capacity=12.45 cfs Outflow=0.50 cfs 0.025 af

Reach 3R: V. Swale Avg. Flow Depth=0.13' Max Vel=0.97 fps Inflow=0.30 cfs 0.013 af
 n=0.080 L=160.0' S=0.0500 '/' Capacity=12.05 cfs Outflow=0.28 cfs 0.013 af

Reach 4R: V. Swale Avg. Flow Depth=0.45' Max Vel=1.48 fps Inflow=4.26 cfs 0.183 af
 n=0.080 L=2,090.0' S=0.0287 '/' Capacity=9.13 cfs Outflow=1.91 cfs 0.176 af

Reach 5R: V. Swale_DA3 Avg. Flow Depth=0.24' Max Vel=0.84 fps Inflow=0.65 cfs 0.028 af
 n=0.080 L=330.0' S=0.0182 '/' Capacity=7.27 cfs Outflow=0.51 cfs 0.028 af

Reach 6R: V. Swale_DA1 Avg. Flow Depth=0.30' Max Vel=0.98 fps Inflow=1.07 cfs 0.046 af
 n=0.080 L=515.0' S=0.0194 '/' Capacity=7.51 cfs Outflow=0.76 cfs 0.045 af

Reach 7R: V. Swale_DA2 Avg. Flow Depth=0.44' Max Vel=2.20 fps Inflow=6.10 cfs 0.262 af
 n=0.080 L=3,004.0' S=0.0639 '/' Capacity=13.63 cfs Outflow=2.75 cfs 0.253 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.723 af Average Runoff Depth = 3.05"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 1S: Post_35-234-AR01

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

Runoff = 3.85 cfs @ 11.93 hrs, Volume= 0.165 af, Depth> 3.05"

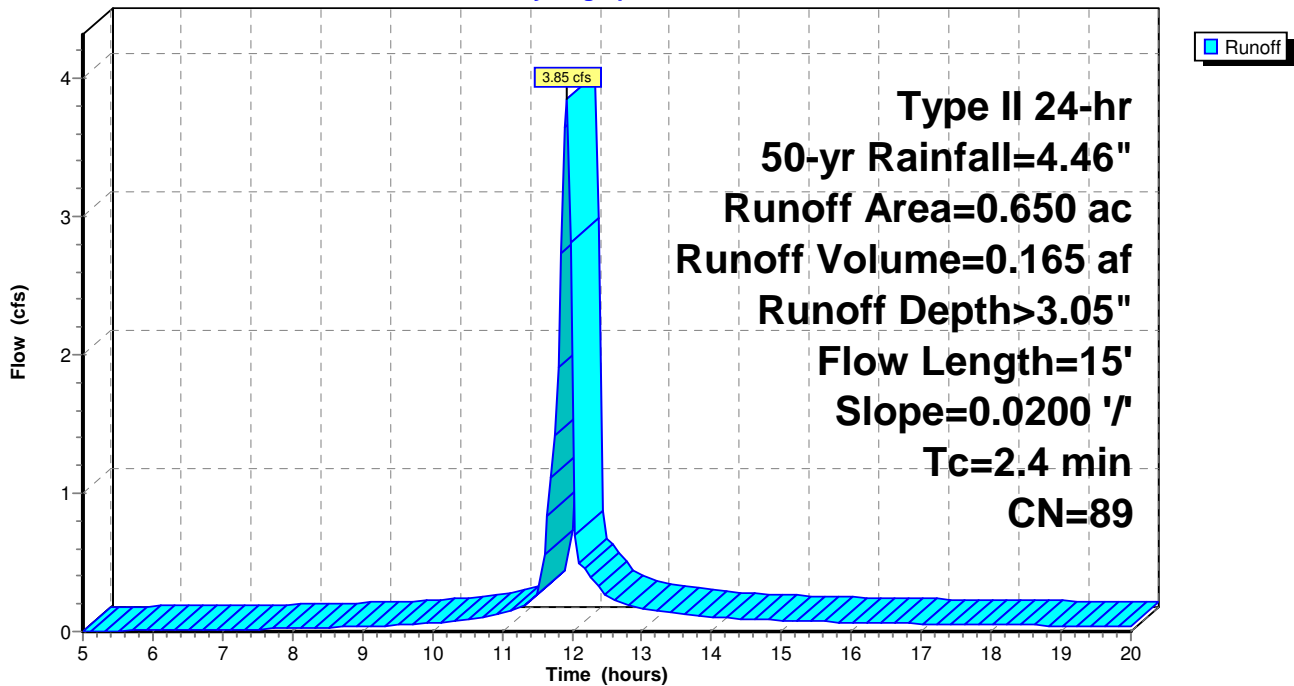
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.650	89	Gravel roads, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Post_35-234-AR01

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 2S: Post_35-241-AR01

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

Runoff = 0.59 cfs @ 11.93 hrs, Volume= 0.025 af, Depth> 3.05"

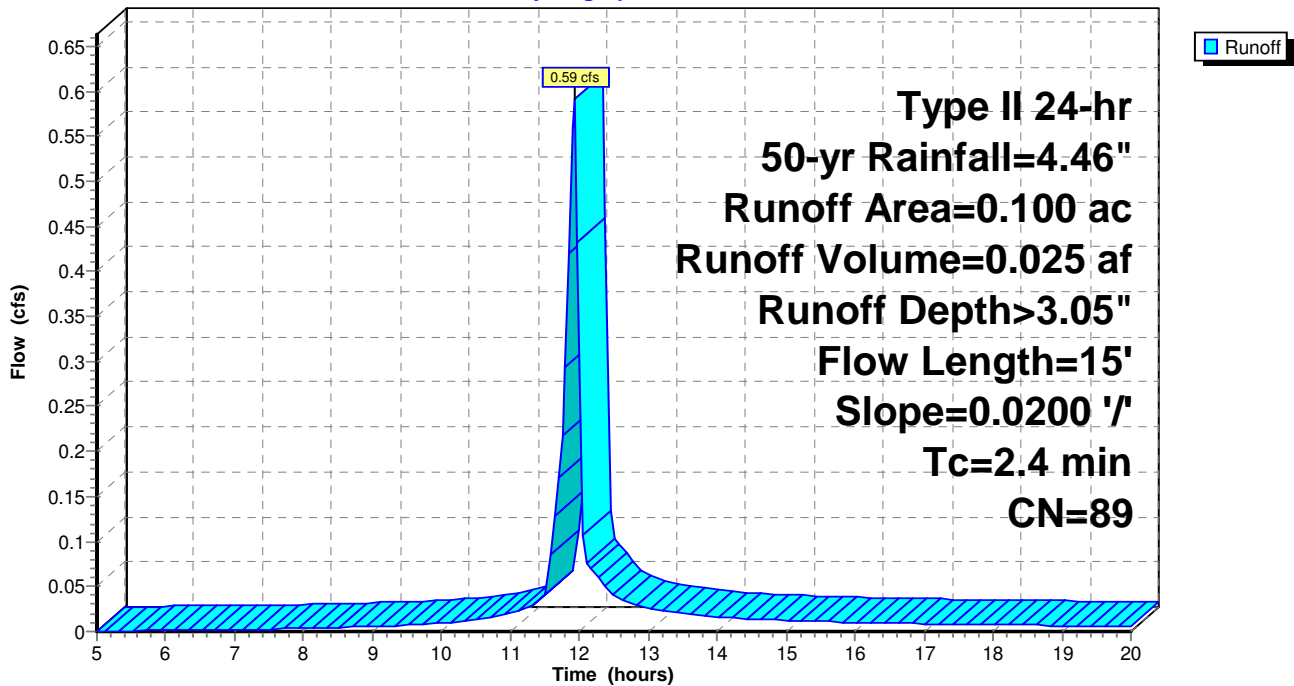
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Post_35-241-AR01

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 3S: Post_35-250-AR01

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.30 cfs @ 11.93 hrs, Volume= 0.013 af, Depth> 3.05"

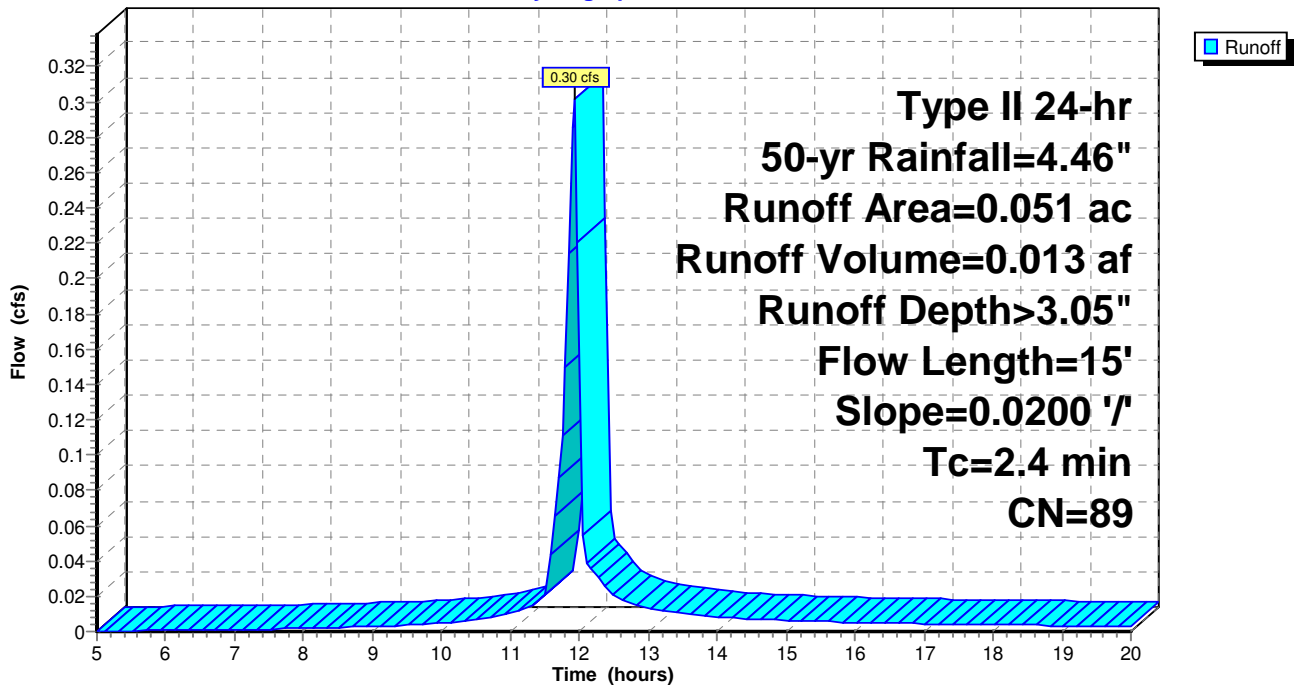
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.051	89	Gravel roads, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Post_35-250-AR01

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 4S: Post_35-255-AR02

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 4.26 cfs @ 11.93 hrs, Volume= 0.183 af, Depth> 3.05"

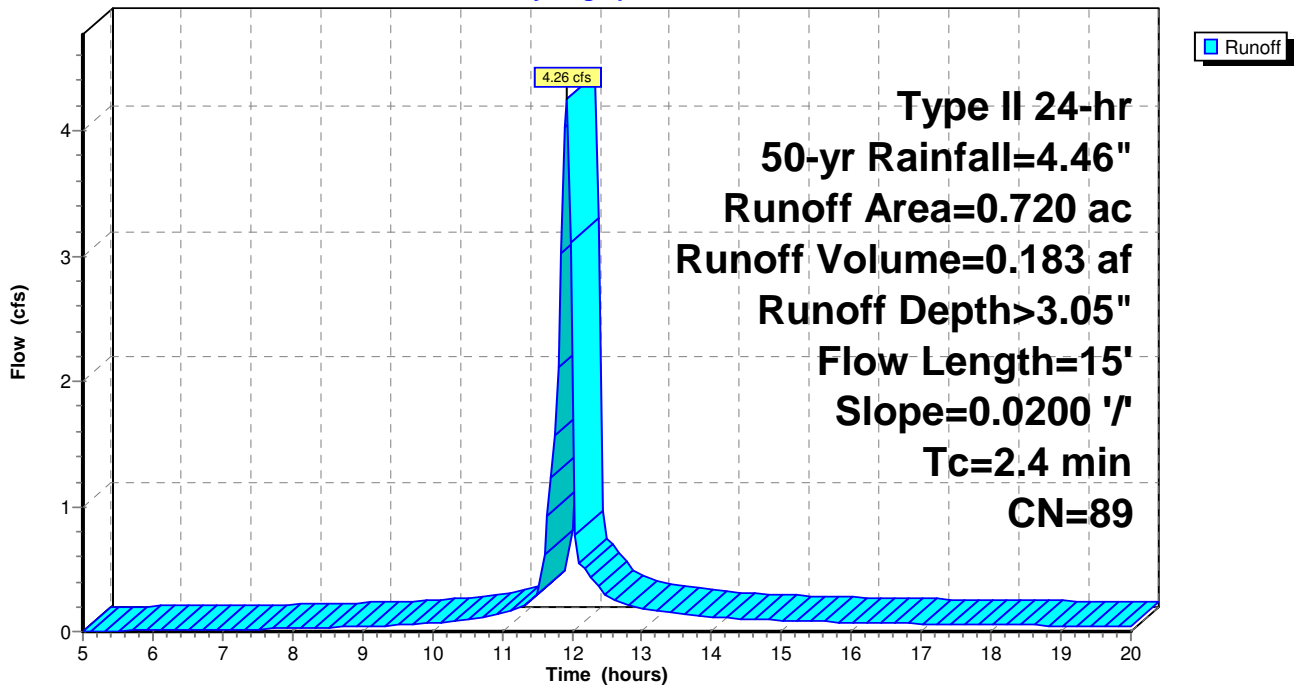
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.720	89	Gravel roads, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Post_35-255-AR02

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 5S: Post_35-257-AR01_DA3

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.65 cfs @ 11.93 hrs, Volume= 0.028 af, Depth> 3.05"

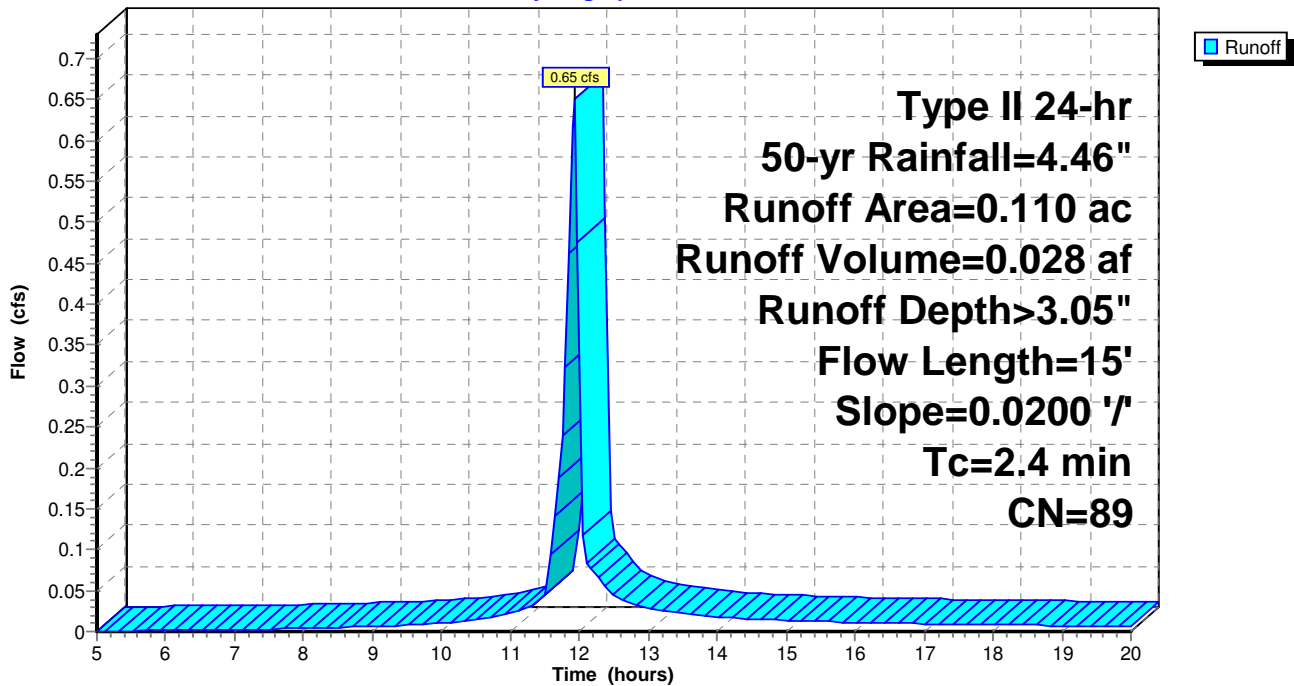
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Post_35-257-AR01_DA3

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 6S: Post_35-257-AR01_DA1

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.07 cfs @ 11.93 hrs, Volume= 0.046 af, Depth> 3.05"

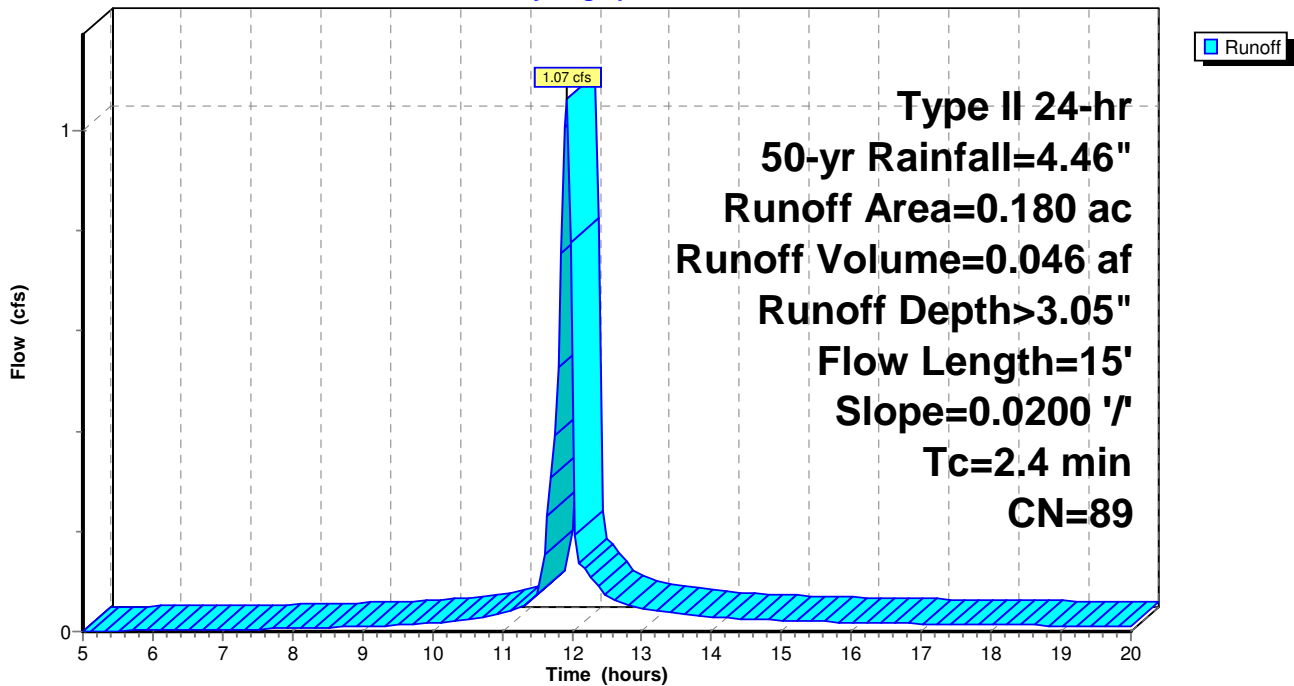
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
0.180	89	Gravel roads, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Post_35-257-AR01_DA1

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 7S: Post_35-257-AR01_DA2

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

Runoff = 6.10 cfs @ 11.93 hrs, Volume= 0.262 af, Depth> 3.05"

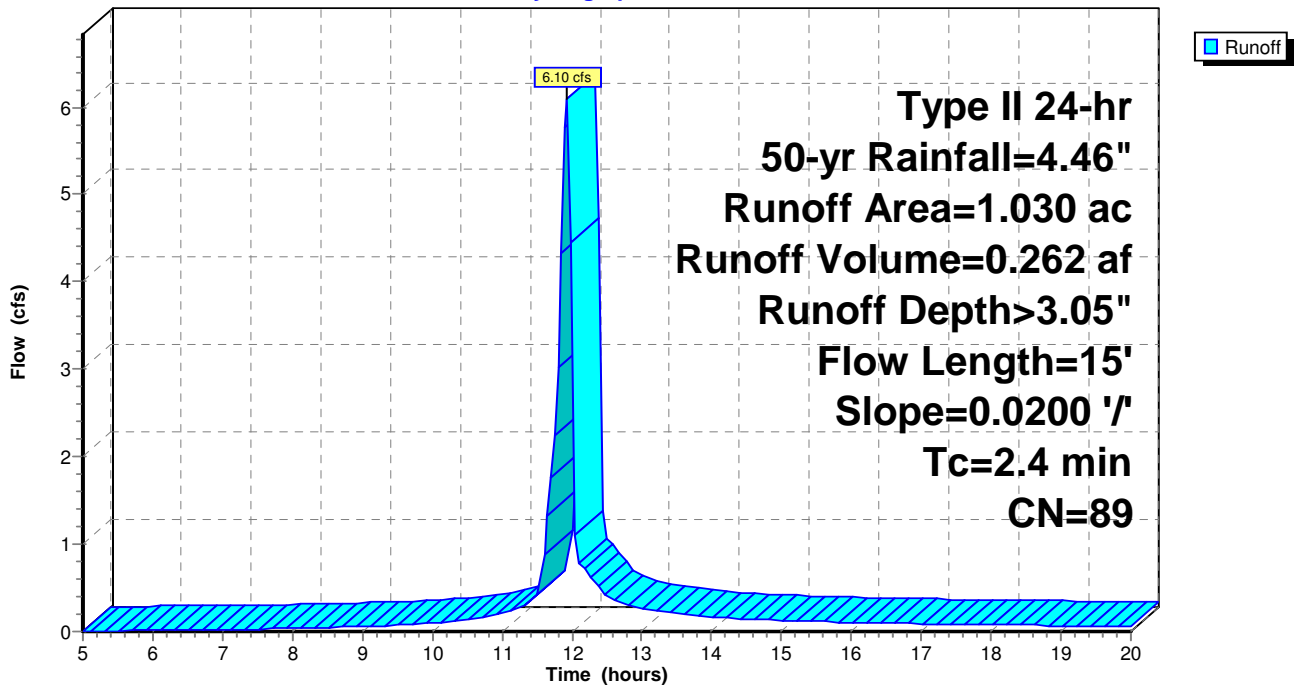
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

Area (ac)	CN	Description
1.030	89	Gravel roads, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Post_35-257-AR01_DA2

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 1R: V.Swale

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
Inflow = 3.85 cfs @ 11.93 hrs, Volume= 0.165 af
Outflow = 2.09 cfs @ 12.27 hrs, Volume= 0.161 af, Atten= 46%, Lag= 20.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.96 fps, Min. Travel Time= 16.1 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 52.6 min

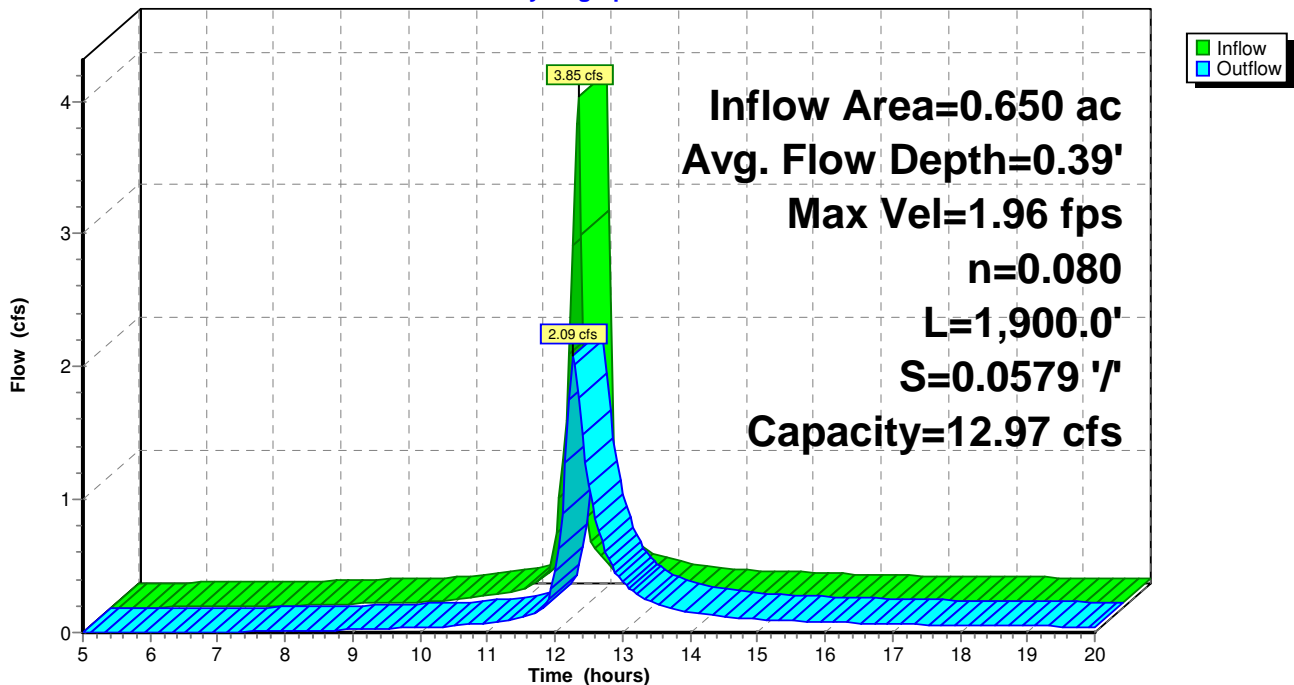
Peak Storage= 2,072 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.97 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 1,900.0' Slope= 0.0579 '/'
Inlet Invert= 1,270.00', Outlet Invert= 1,160.00'



Reach 1R: V.Swale

Hydrograph



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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 2R: V.Swale

Inflow Area = 0.100 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
Inflow = 0.59 cfs @ 11.93 hrs, Volume= 0.025 af
Outflow = 0.50 cfs @ 12.02 hrs, Volume= 0.025 af, Atten= 16%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.22 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 16.2 min

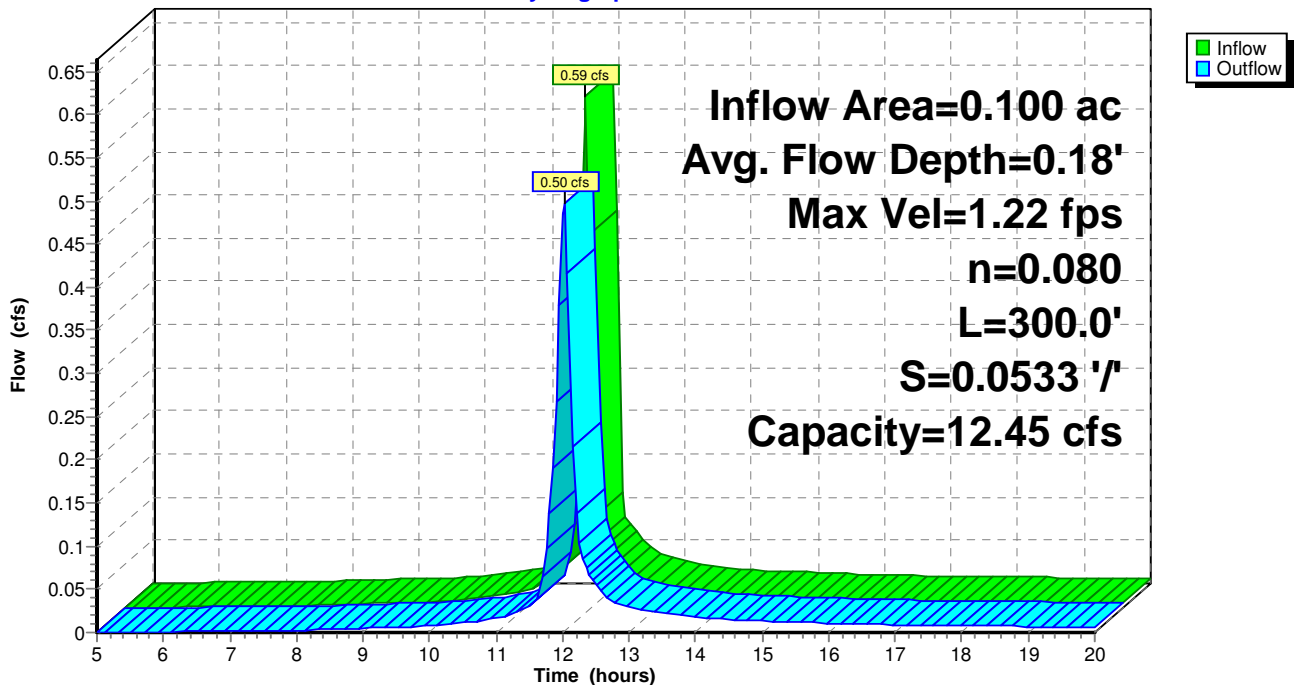
Peak Storage= 128 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.45 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 300.0' Slope= 0.0533 '/'
Inlet Invert= 1,076.00', Outlet Invert= 1,060.00'



Reach 2R: V.Swale

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 3R: V. Swale

Inflow Area = 0.051 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
Inflow = 0.30 cfs @ 11.93 hrs, Volume= 0.013 af
Outflow = 0.28 cfs @ 11.99 hrs, Volume= 0.013 af, Atten= 8%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.97 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 10.9 min

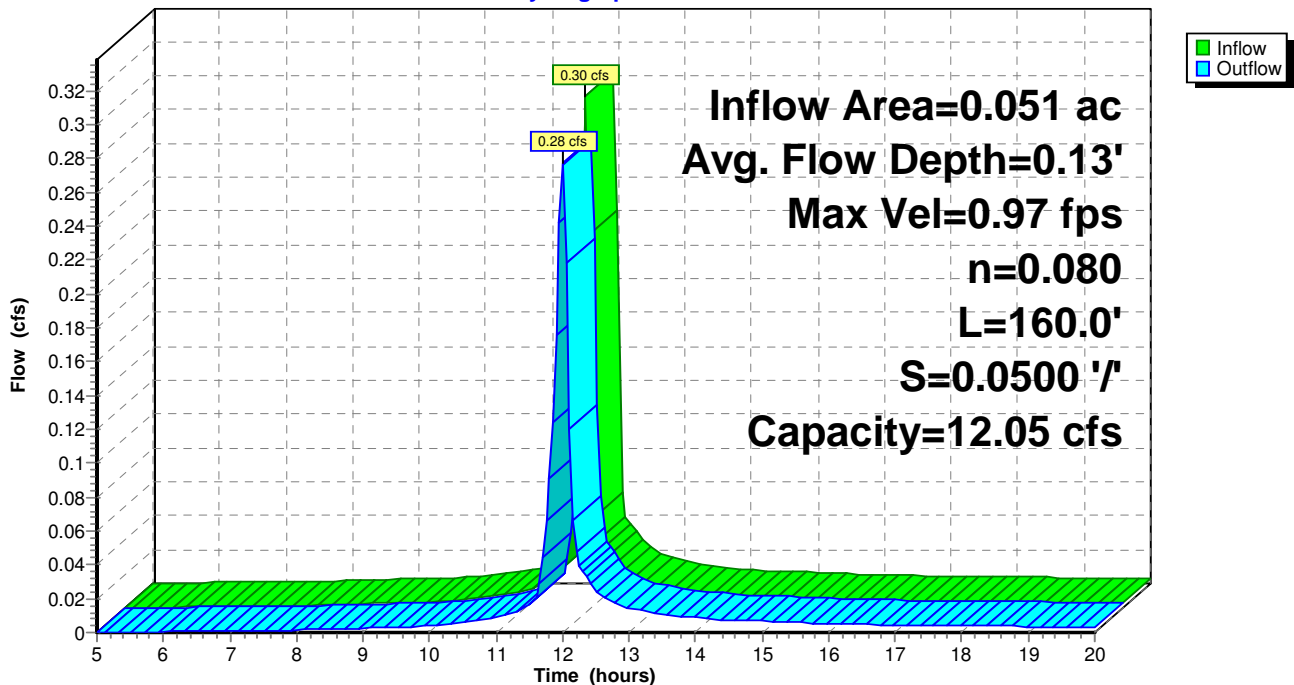
Peak Storage= 46 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.05 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 160.0' Slope= 0.0500 '/'
Inlet Invert= 1,116.00', Outlet Invert= 1,108.00'



Reach 3R: V. Swale

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 4R: V. Swale

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
Inflow = 4.26 cfs @ 11.93 hrs, Volume= 0.183 af
Outflow = 1.91 cfs @ 12.41 hrs, Volume= 0.176 af, Atten= 55%, Lag= 29.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.48 fps, Min. Travel Time= 23.5 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 70.3 min

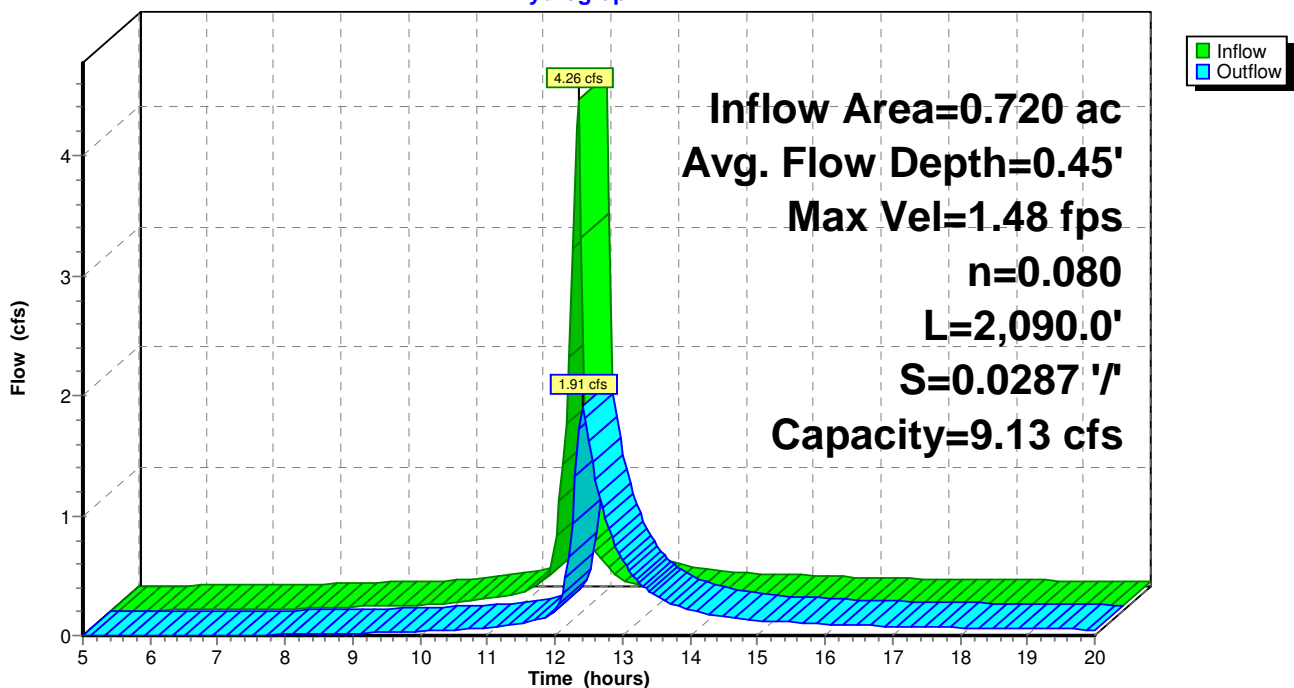
Peak Storage= 2,713 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 9.13 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 2,090.0' Slope= 0.0287 '/'
Inlet Invert= 1,114.00', Outlet Invert= 1,054.00'



Reach 4R: V. Swale

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 5R: V. Swale_DA3

Inflow Area = 0.110 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
Inflow = 0.65 cfs @ 11.93 hrs, Volume= 0.028 af
Outflow = 0.51 cfs @ 12.08 hrs, Volume= 0.028 af, Atten= 22%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.84 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 24.8 min

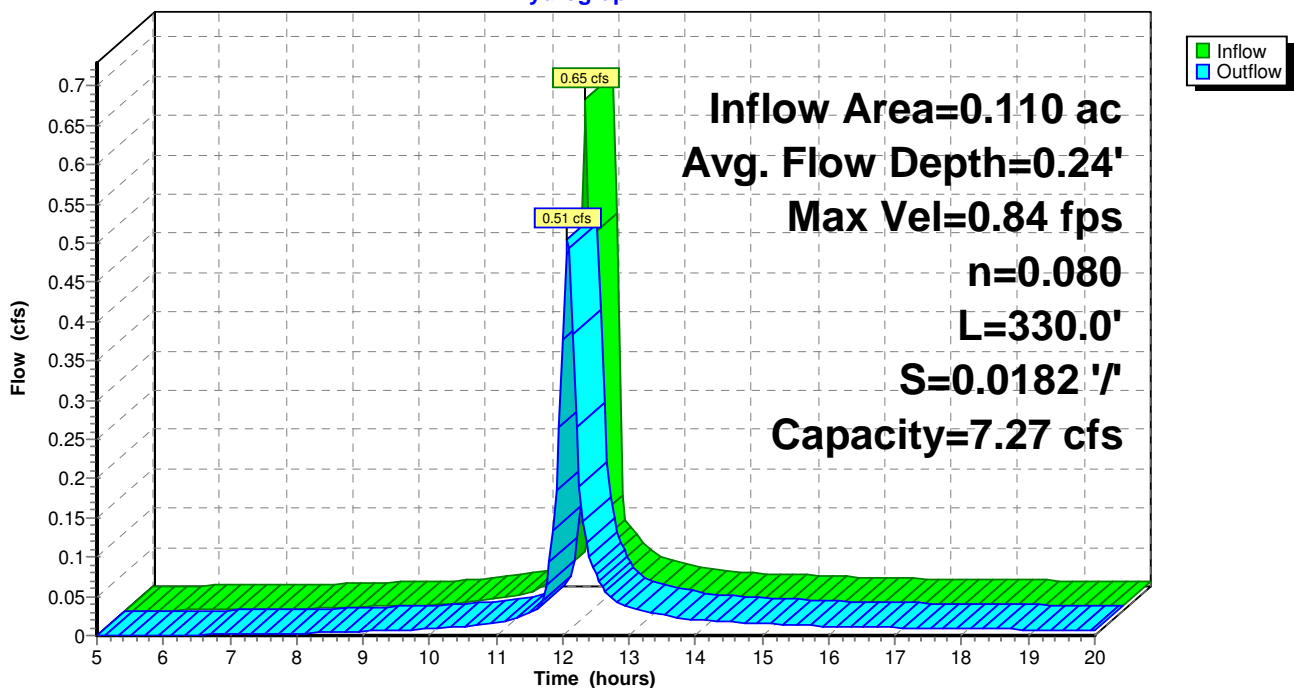
Peak Storage= 201 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.27 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 6.00'
Length= 330.0' Slope= 0.0182 '/'
Inlet Invert= 1,054.00', Outlet Invert= 1,048.00'



Reach 5R: V. Swale_DA3

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 6R: V. Swale_DA1

Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
 Inflow = 1.07 cfs @ 11.93 hrs, Volume= 0.046 af
 Outflow = 0.76 cfs @ 12.13 hrs, Volume= 0.045 af, Atten= 29%, Lag= 12.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.98 fps, Min. Travel Time= 8.8 min
 Avg. Velocity = 0.27 fps, Avg. Travel Time= 31.8 min

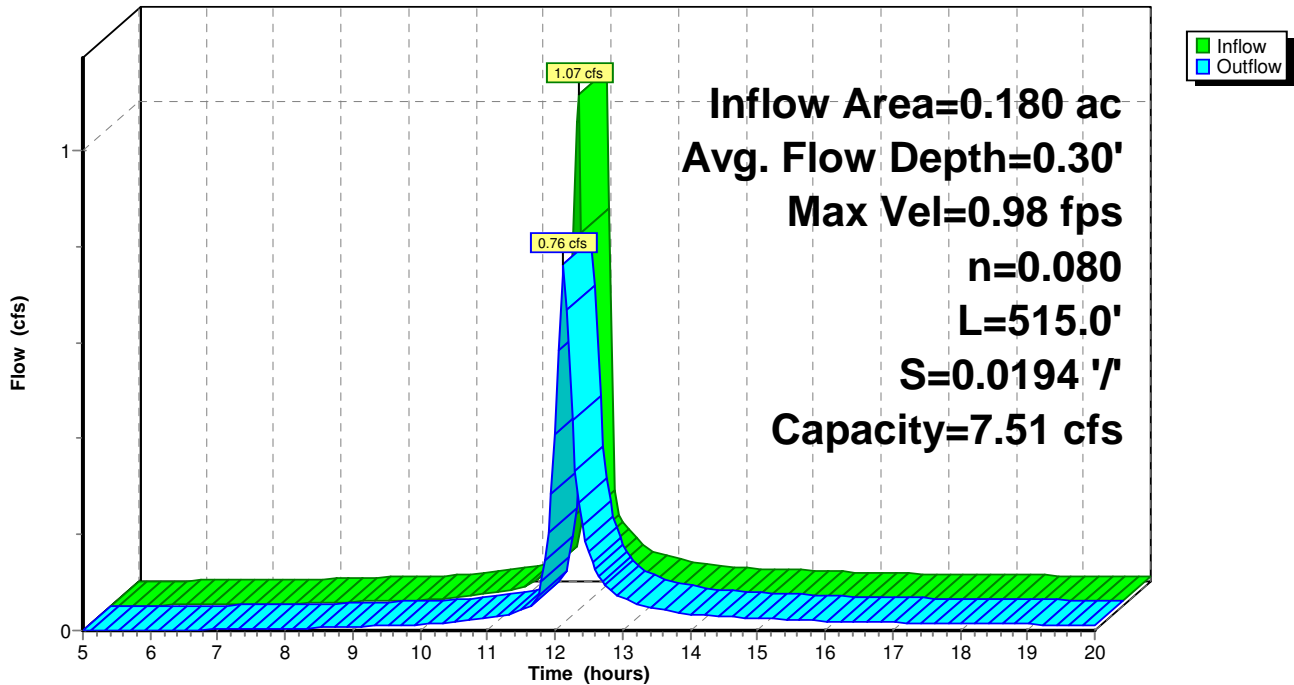
Peak Storage= 403 cf @ 11.98 hrs
 Average Depth at Peak Storage= 0.30'
 Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.51 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
 Side Slope Z-value= 2.0 '/' Top Width= 6.00'
 Length= 515.0' Slope= 0.0194 '/'
 Inlet Invert= 1,240.00', Outlet Invert= 1,230.00'



Reach 6R: V. Swale_DA1

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Reach 7R: V. Swale_DA2

Inflow Area = 1.030 ac, 0.00% Impervious, Inflow Depth > 3.05" for 50-yr event
 Inflow = 6.10 cfs @ 11.93 hrs, Volume= 0.262 af
 Outflow = 2.75 cfs @ 12.40 hrs, Volume= 0.253 af, Atten= 55%, Lag= 28.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.20 fps, Min. Travel Time= 22.8 min
 Avg. Velocity = 0.73 fps, Avg. Travel Time= 68.7 min

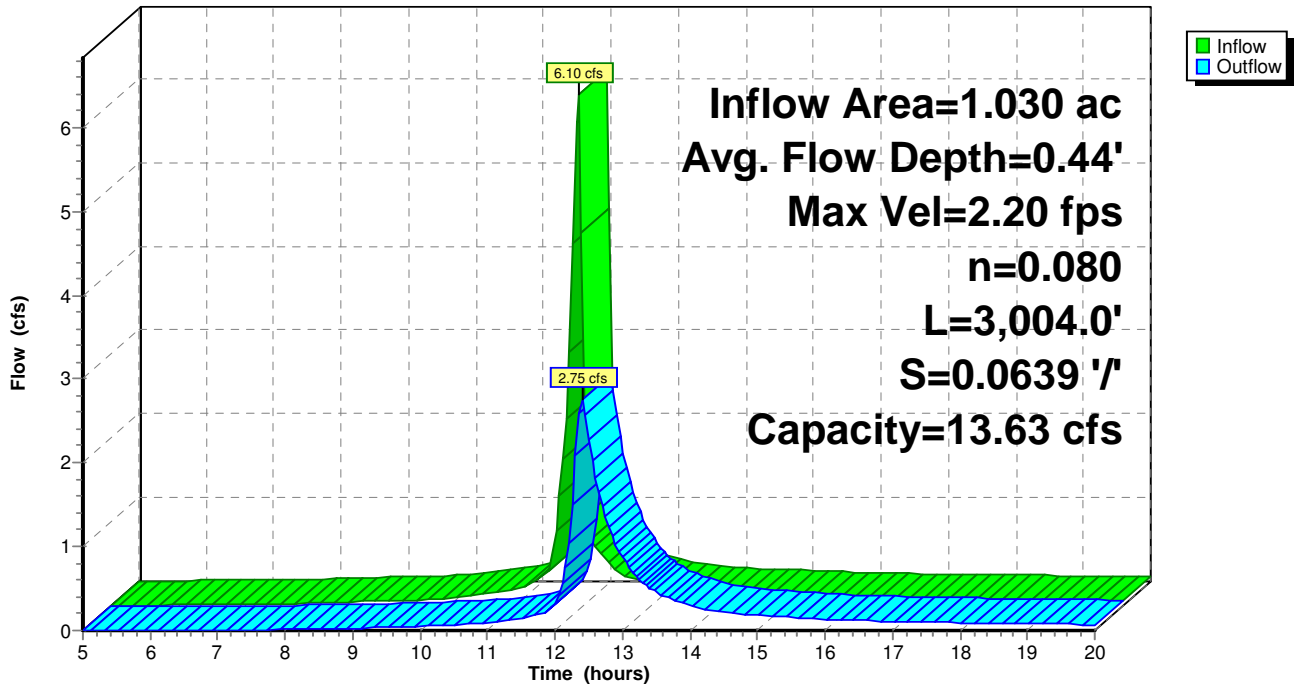
Peak Storage= 3,834 cf @ 12.01 hrs
 Average Depth at Peak Storage= 0.44'
 Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 13.63 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
 Side Slope Z-value= 2.0 '/' Top Width= 6.00'
 Length= 3,004.0' Slope= 0.0639 '/'
 Inlet Invert= 1,240.00', Outlet Invert= 1,048.00'



Reach 7R: V. Swale_DA2

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Type II 24-hr 100-yr Rainfall=4.99"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post_35-234-AR01 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=4.30 cfs 0.191 af

Subcatchment 2S: Post_35-241-AR01 Runoff Area=0.100 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.66 cfs 0.029 af

Subcatchment 3S: Post_35-250-AR01 Runoff Area=0.051 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.34 cfs 0.015 af

Subcatchment 4S: Post_35-255-AR02 Runoff Area=0.720 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=4.76 cfs 0.212 af

Subcatchment 5S: Post_35-257-AR01_DA3 Runoff Area=0.110 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=0.73 cfs 0.032 af

Subcatchment 6S: Post_35-257-AR01_DA1 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=1.19 cfs 0.053 af

Subcatchment 7S: Post_35-257-AR01_DA2 Runoff Area=1.030 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=15' Slope=0.0200 '/' Tc=2.4 min CN=89 Runoff=6.81 cfs 0.303 af

Reach 1R: V.Swale Avg. Flow Depth=0.43' Max Vel=2.06 fps Inflow=4.30 cfs 0.191 af
n=0.080 L=1,900.0' S=0.0579 '/' Capacity=12.97 cfs Outflow=2.48 cfs 0.186 af

Reach 2R: V.Swale Avg. Flow Depth=0.20' Max Vel=1.28 fps Inflow=0.66 cfs 0.029 af
n=0.080 L=300.0' S=0.0533 '/' Capacity=12.45 cfs Outflow=0.58 cfs 0.029 af

Reach 3R: V. Swale Avg. Flow Depth=0.14' Max Vel=1.02 fps Inflow=0.34 cfs 0.015 af
n=0.080 L=160.0' S=0.0500 '/' Capacity=12.05 cfs Outflow=0.32 cfs 0.015 af

Reach 4R: V. Swale Avg. Flow Depth=0.49' Max Vel=1.56 fps Inflow=4.76 cfs 0.212 af
n=0.080 L=2,090.0' S=0.0287 '/' Capacity=9.13 cfs Outflow=2.22 cfs 0.204 af

Reach 5R: V. Swale_DA3 Avg. Flow Depth=0.27' Max Vel=0.88 fps Inflow=0.73 cfs 0.032 af
n=0.080 L=330.0' S=0.0182 '/' Capacity=7.27 cfs Outflow=0.59 cfs 0.032 af

Reach 6R: V. Swale_DA1 Avg. Flow Depth=0.33' Max Vel=1.02 fps Inflow=1.19 cfs 0.053 af
n=0.080 L=515.0' S=0.0194 '/' Capacity=7.51 cfs Outflow=0.88 cfs 0.052 af

Reach 7R: V. Swale_DA2 Avg. Flow Depth=0.48' Max Vel=2.31 fps Inflow=6.81 cfs 0.303 af
n=0.080 L=3,004.0' S=0.0639 '/' Capacity=13.63 cfs Outflow=3.26 cfs 0.293 af

Total Runoff Area = 2.841 ac Runoff Volume = 0.836 af Average Runoff Depth = 3.53"
100.00% Pervious = 2.841 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 1S: Post_35-234-AR01

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 4.30 cfs @ 11.92 hrs, Volume= 0.191 af, Depth> 3.53"

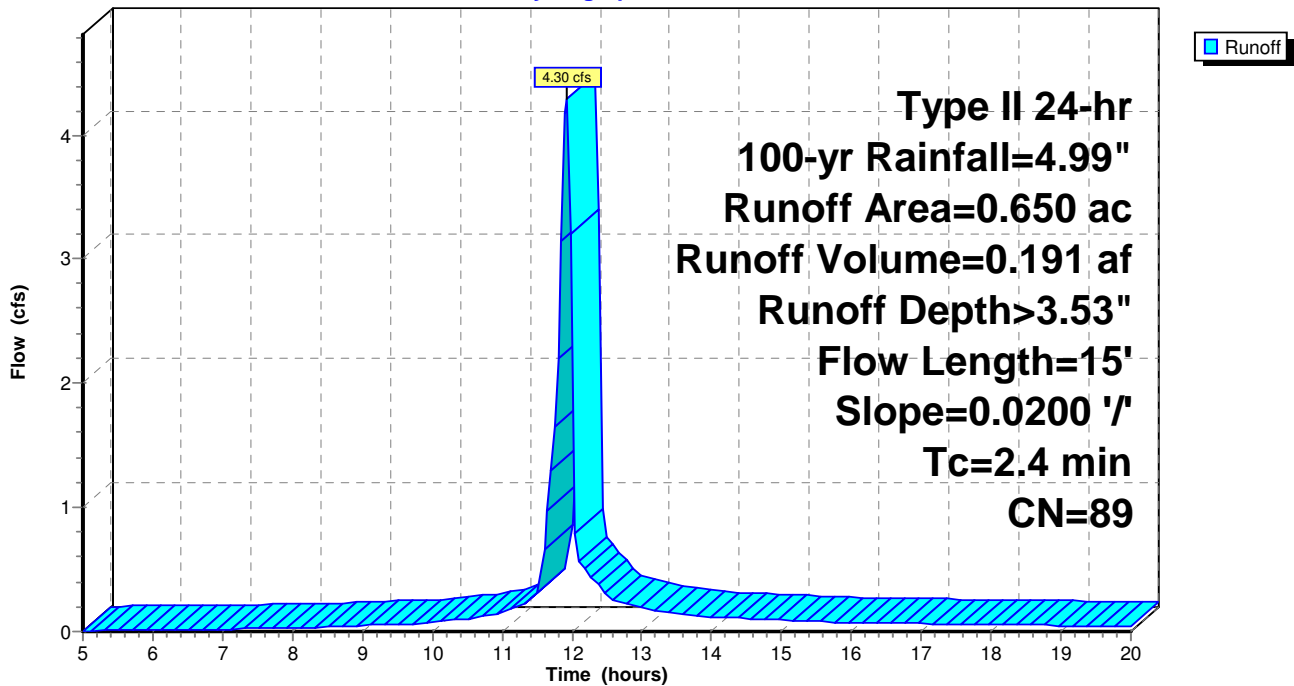
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.650	89	Gravel roads, HSG C
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 1S: Post_35-234-AR01

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Summary for Subcatchment 2S: Post_35-241-AR01

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

Runoff = 0.66 cfs @ 11.92 hrs, Volume= 0.029 af, Depth> 3.53"

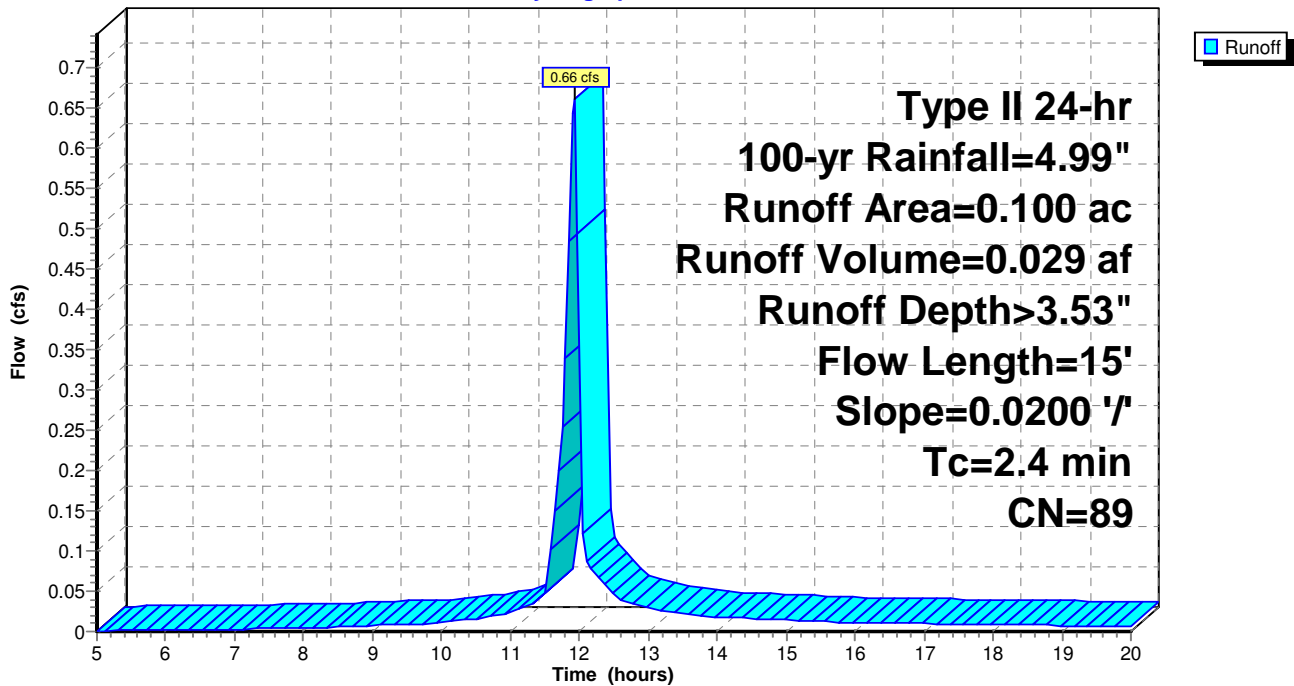
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.100	89	Gravel roads, HSG C
0.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 2S: Post_35-241-AR01

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 3S: Post_35-250-AR01

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

Runoff = 0.34 cfs @ 11.92 hrs, Volume= 0.015 af, Depth> 3.53"

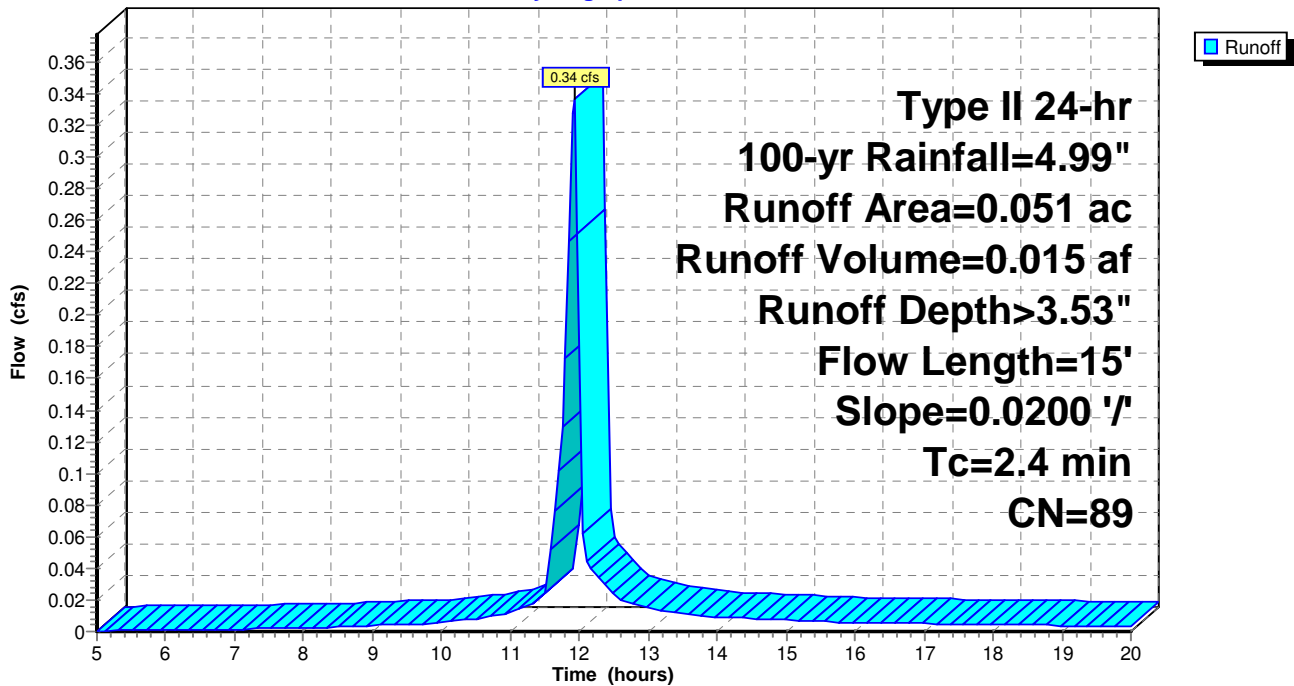
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.051	89	Gravel roads, HSG C
0.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 3S: Post_35-250-AR01

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 4S: Post_35-255-AR02

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

Runoff = 4.76 cfs @ 11.92 hrs, Volume= 0.212 af, Depth> 3.53"

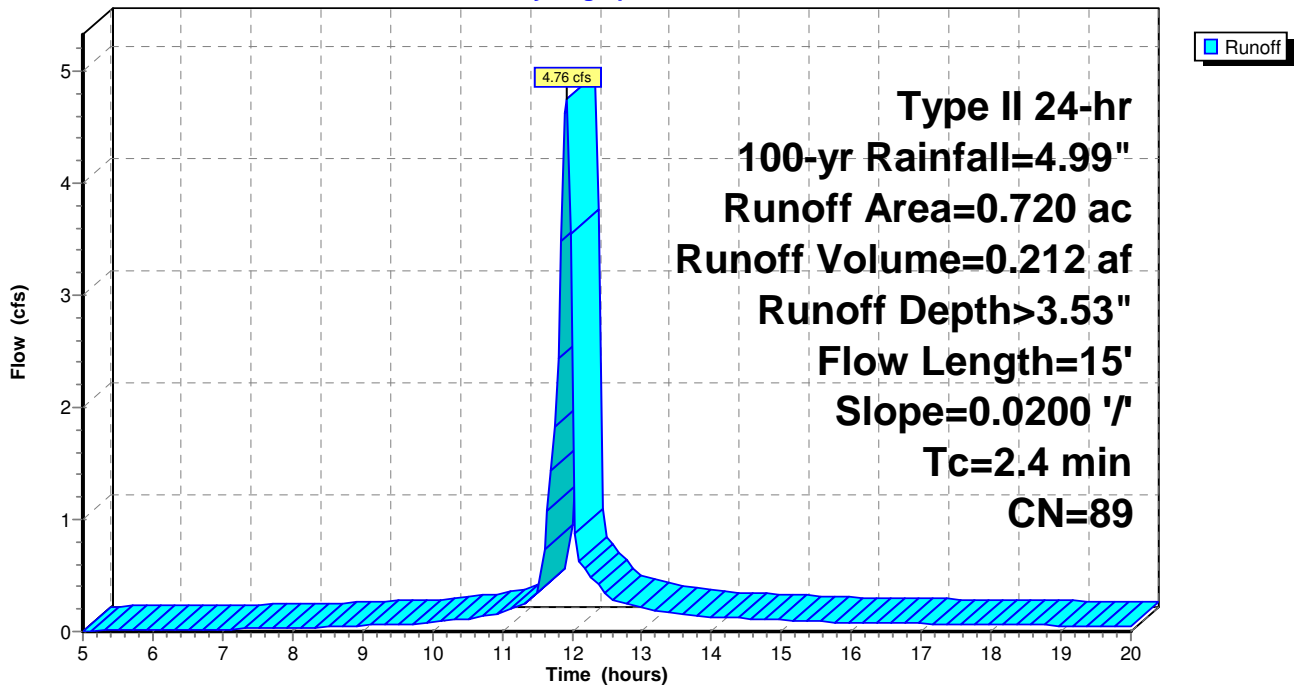
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.720	89	Gravel roads, HSG C
0.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 4S: Post_35-255-AR02

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Summary for Subcatchment 5S: Post_35-257-AR01_DA3

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.73 cfs @ 11.92 hrs, Volume= 0.032 af, Depth> 3.53"

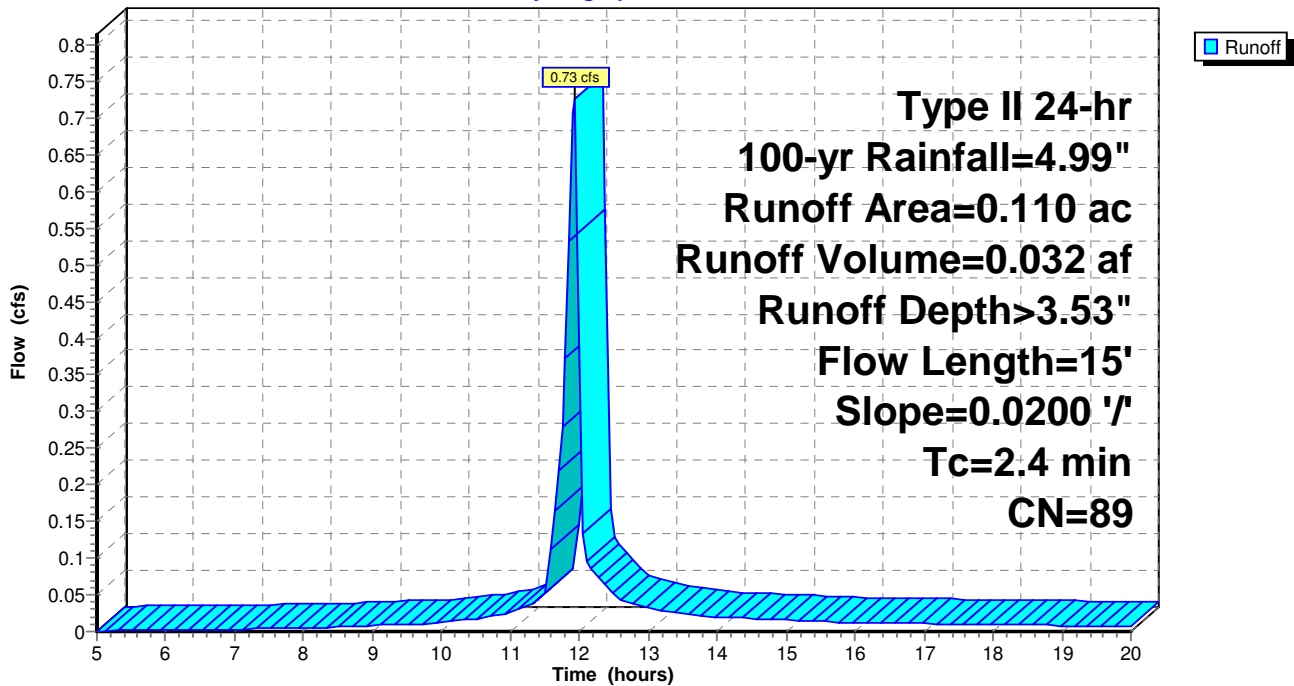
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.110	89	Gravel roads, HSG C
0.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 5S: Post_35-257-AR01_DA3

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 6S: Post_35-257-AR01_DA1

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.19 cfs @ 11.92 hrs, Volume= 0.053 af, Depth> 3.53"

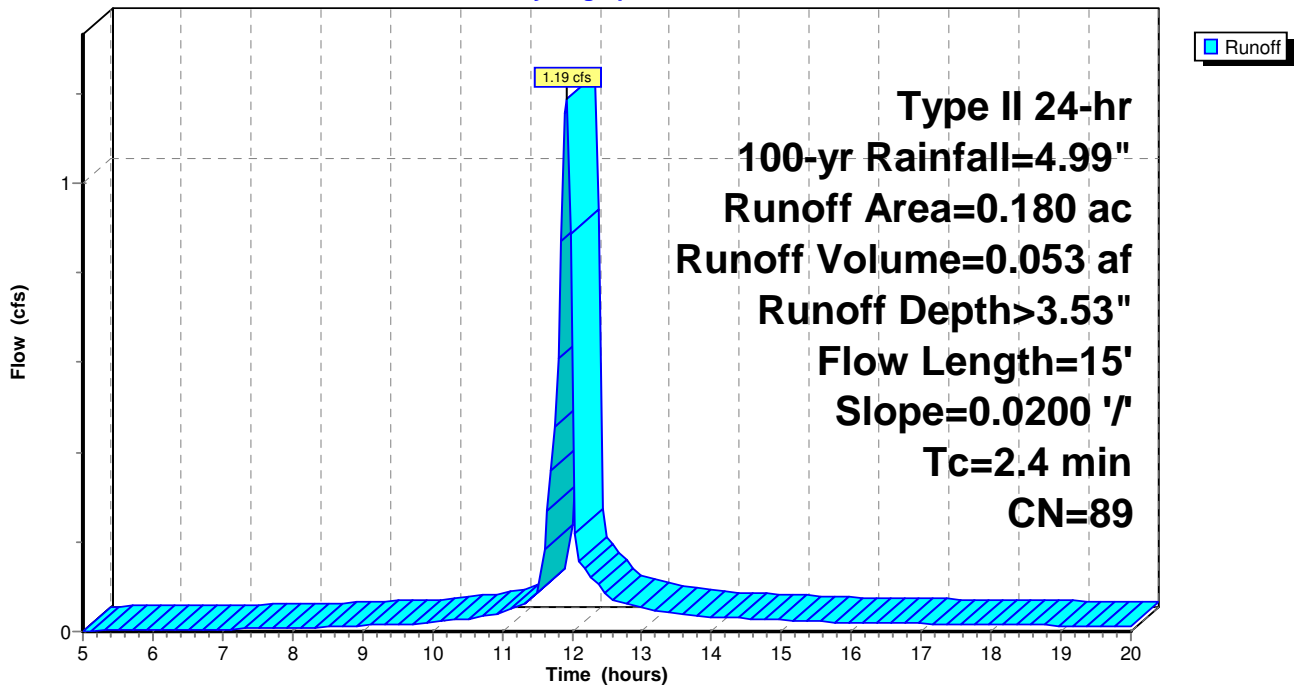
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
0.180	89	Gravel roads, HSG C
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 6S: Post_35-257-AR01_DA1

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 7S: Post_35-257-AR01_DA2

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

Runoff = 6.81 cfs @ 11.92 hrs, Volume= 0.303 af, Depth> 3.53"

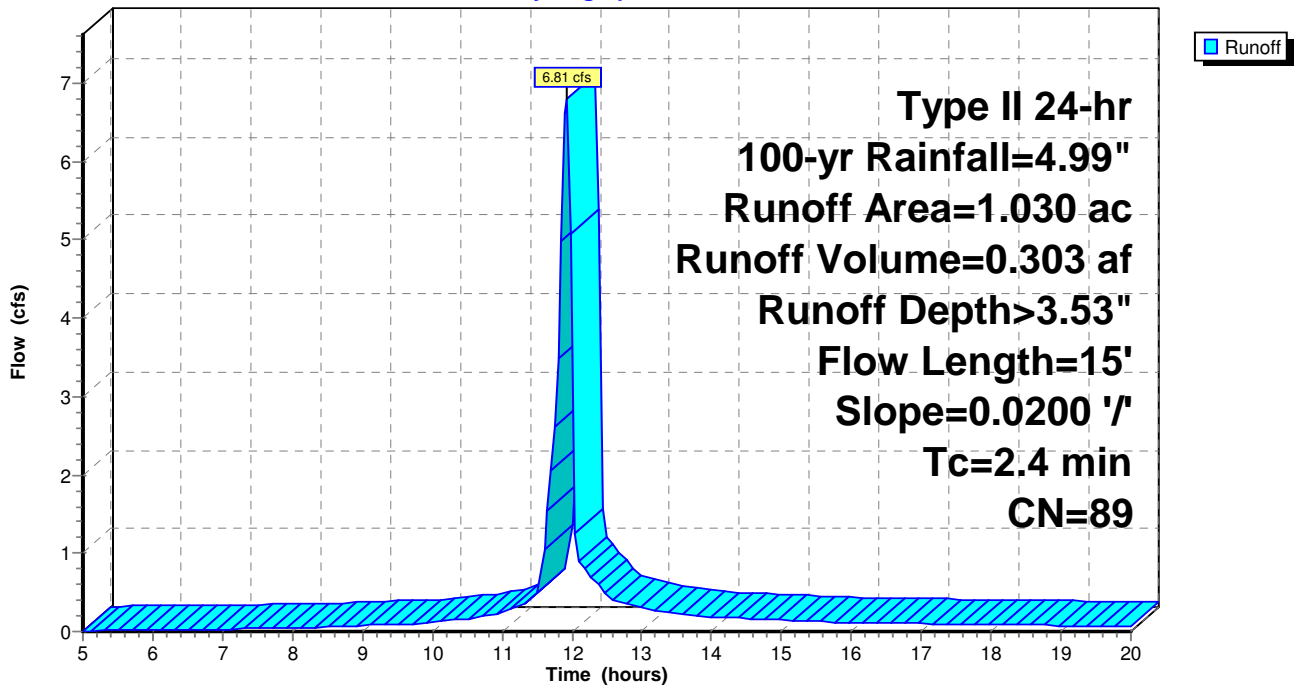
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

Area (ac)	CN	Description
1.030	89	Gravel roads, HSG C
1.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0200	0.10		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.60"

Subcatchment 7S: Post_35-257-AR01_DA2

Hydrograph



Post_ACCESS ROADS

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 1R: V.Swale

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 4.30 cfs @ 11.92 hrs, Volume= 0.191 af
Outflow = 2.48 cfs @ 12.25 hrs, Volume= 0.186 af, Atten= 42%, Lag= 19.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.06 fps, Min. Travel Time= 15.4 min

Avg. Velocity = 0.64 fps, Avg. Travel Time= 49.6 min

Peak Storage= 2,321 cf @ 12.00 hrs

Average Depth at Peak Storage= 0.43'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.97 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

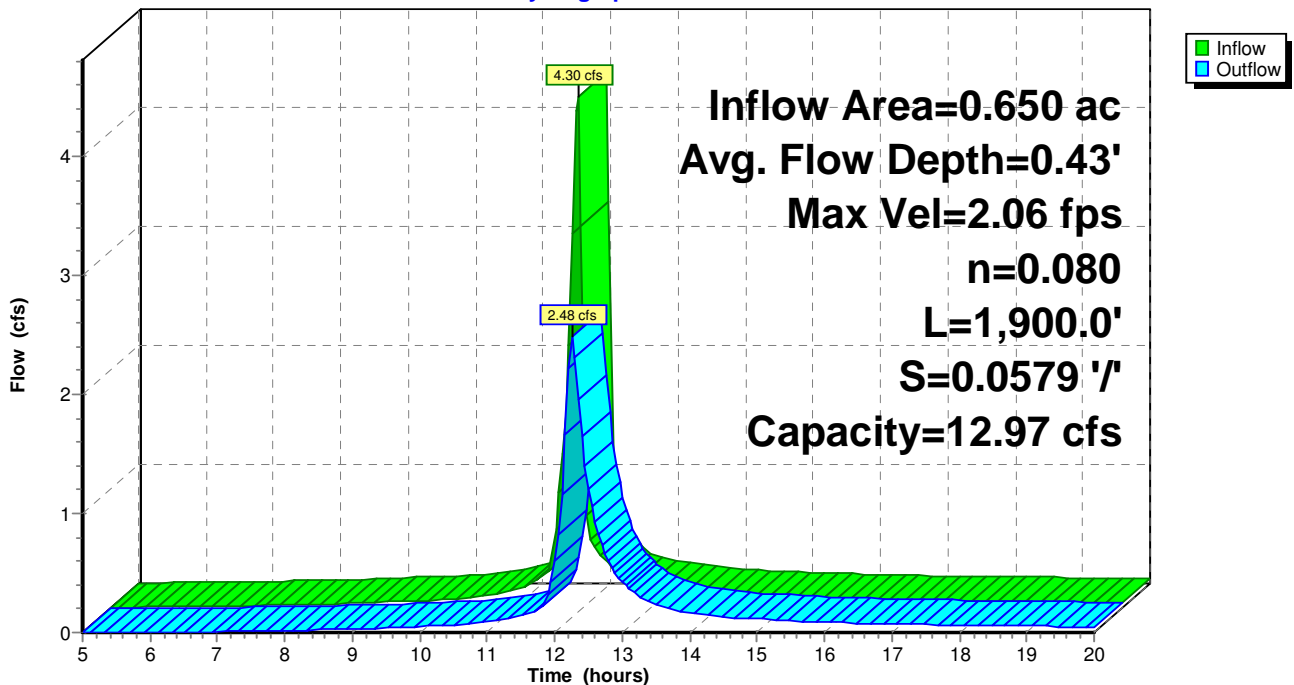
Length= 1,900.0' Slope= 0.0579 '/'

Inlet Invert= 1,270.00', Outlet Invert= 1,160.00'



Reach 1R: V.Swale

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 2R: V.Swale

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.100 ac, 0.00% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 0.66 cfs @ 11.92 hrs, Volume= 0.029 af
Outflow = 0.58 cfs @ 12.02 hrs, Volume= 0.029 af, Atten= 13%, Lag= 5.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.28 fps, Min. Travel Time= 3.9 min

Avg. Velocity = 0.32 fps, Avg. Travel Time= 15.4 min

Peak Storage= 141 cf @ 11.95 hrs

Average Depth at Peak Storage= 0.20'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.45 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

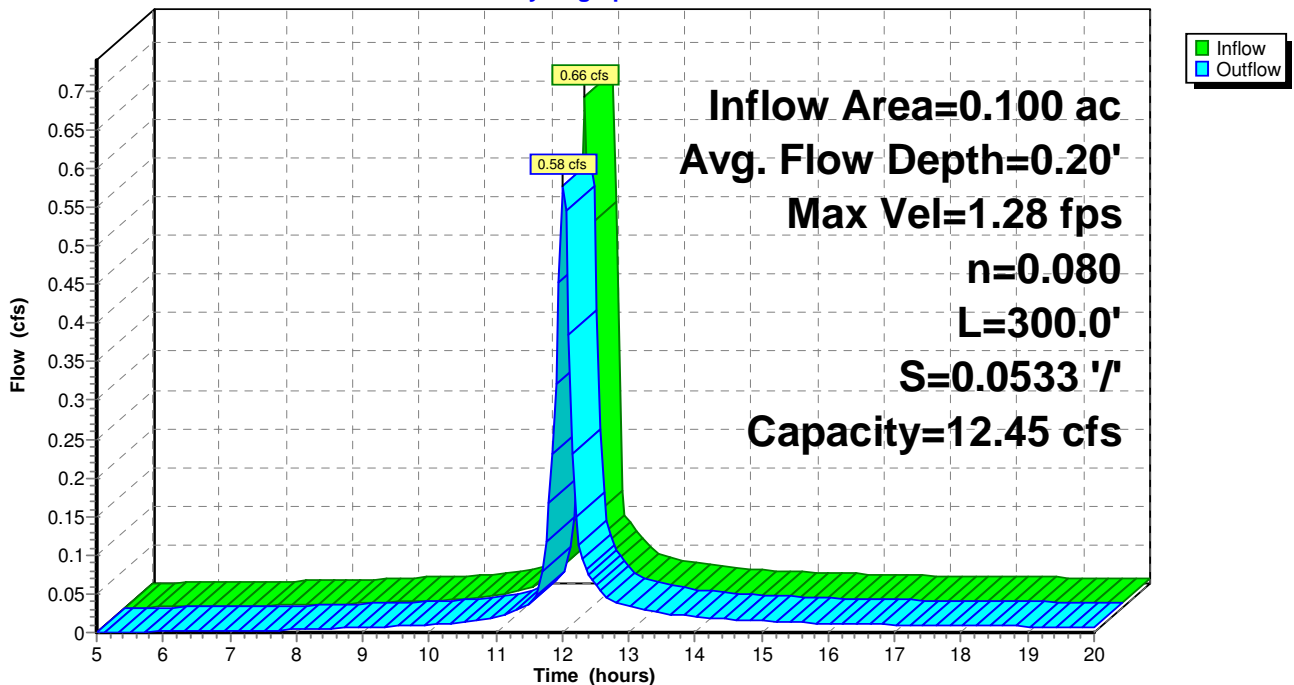
Length= 300.0' Slope= 0.0533 '/'

Inlet Invert= 1,076.00', Outlet Invert= 1,060.00'



Reach 2R: V.Swale

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 3R: V. Swale

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.051 ac, 0.00% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 0.34 cfs @ 11.92 hrs, Volume= 0.015 af
Outflow = 0.32 cfs @ 11.99 hrs, Volume= 0.015 af, Atten= 6%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.02 fps, Min. Travel Time= 2.6 min

Avg. Velocity = 0.26 fps, Avg. Travel Time= 10.4 min

Peak Storage= 51 cf @ 11.95 hrs

Average Depth at Peak Storage= 0.14'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 12.05 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

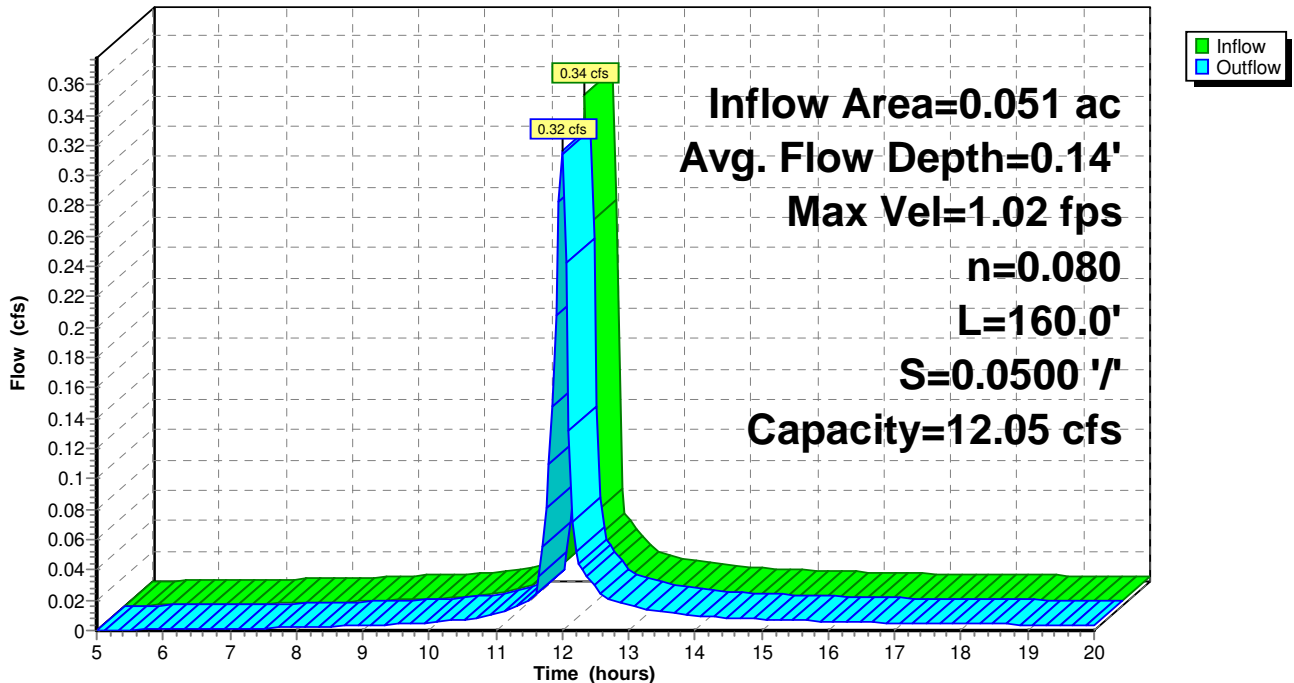
Length= 160.0' Slope= 0.0500 '/'

Inlet Invert= 1,116.00', Outlet Invert= 1,108.00'



Reach 3R: V. Swale

Hydrograph



Post_ACCESS ROADS

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 4R: V. Swale

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 4.76 cfs @ 11.92 hrs, Volume= 0.212 af
Outflow = 2.22 cfs @ 12.39 hrs, Volume= 0.204 af, Atten= 53%, Lag= 27.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.56 fps, Min. Travel Time= 22.4 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 66.3 min

Peak Storage= 3,055 cf @ 12.01 hrs

Average Depth at Peak Storage= 0.49'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 9.13 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

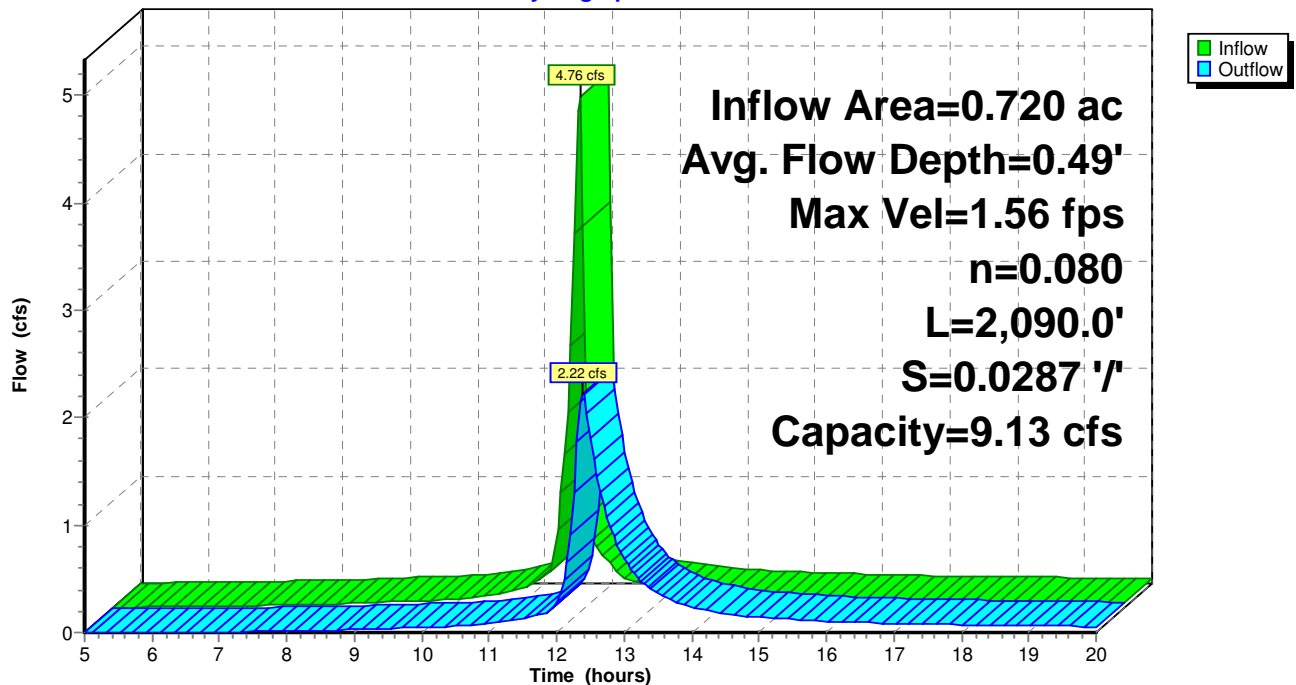
Length= 2,090.0' Slope= 0.0287 '/'

Inlet Invert= 1,114.00', Outlet Invert= 1,054.00'



Reach 4R: V. Swale

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 5R: V. Swale_DA3

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.110 ac, 0.00% Impervious, Inflow Depth > 3.53" for 100-yr event
Inflow = 0.73 cfs @ 11.92 hrs, Volume= 0.032 af
Outflow = 0.59 cfs @ 12.07 hrs, Volume= 0.032 af, Atten= 19%, Lag= 8.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.88 fps, Min. Travel Time= 6.2 min

Avg. Velocity = 0.23 fps, Avg. Travel Time= 23.4 min

Peak Storage= 222 cf @ 11.97 hrs

Average Depth at Peak Storage= 0.27'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.27 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

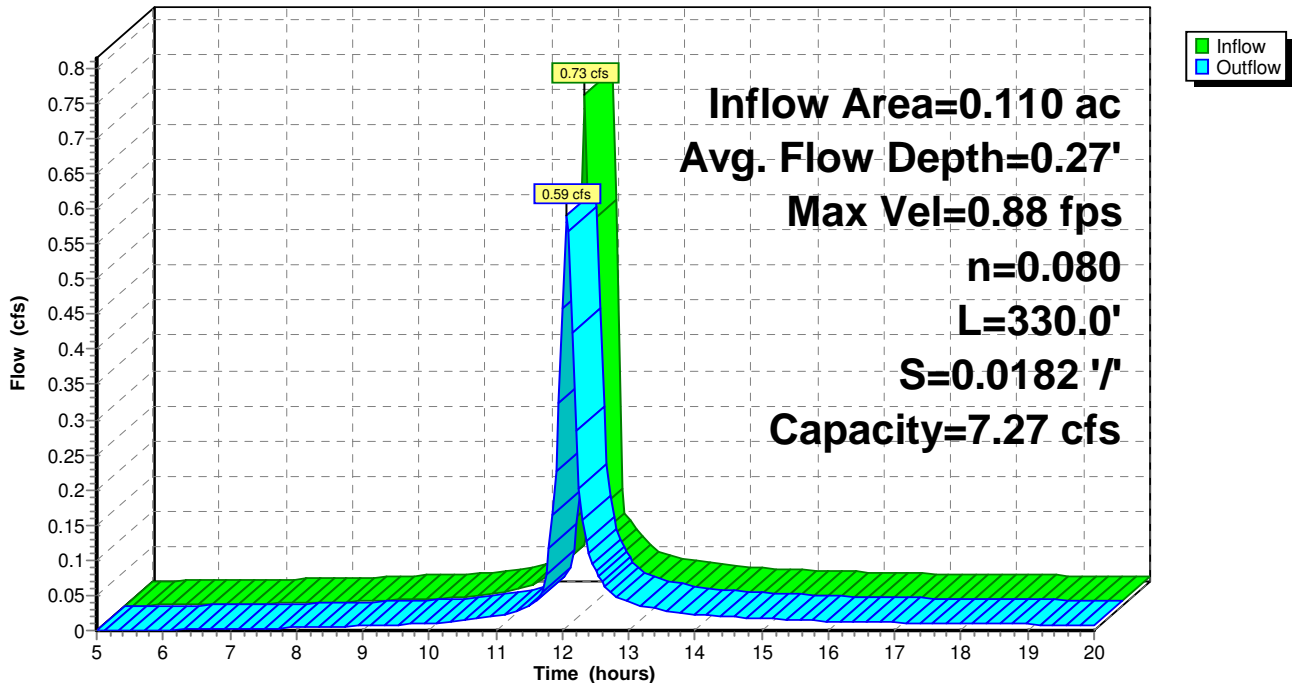
Length= 330.0' Slope= 0.0182 '/'

Inlet Invert= 1,054.00', Outlet Invert= 1,048.00'



Reach 5R: V. Swale_DA3

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 6R: V. Swale_DA1

[82] Warning: Early inflow requires earlier time span

Inflow Area =	0.180 ac,	0.00% Impervious,	Inflow Depth > 3.53"	for 100-yr event
Inflow =	1.19 cfs @	11.92 hrs,	Volume=	0.053 af
Outflow =	0.88 cfs @	12.12 hrs,	Volume=	0.052 af, Atten= 26%, Lag= 11.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.02 fps, Min. Travel Time= 8.4 min

Avg. Velocity = 0.29 fps, Avg. Travel Time= 30.1 min

Peak Storage= 447 cf @ 11.98 hrs

Average Depth at Peak Storage= 0.33'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 7.51 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 2.0 '/' Top Width= 6.00'

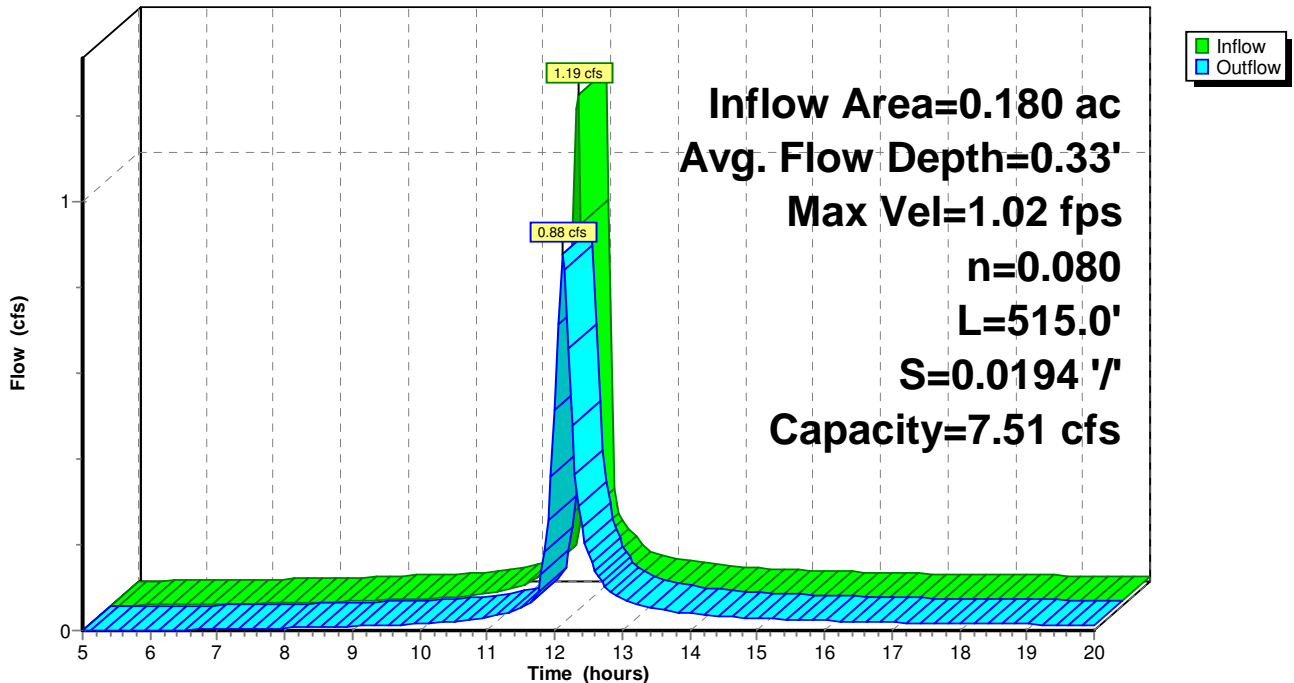
Length= 515.0' Slope= 0.0194 '/'

Inlet Invert= 1,240.00', Outlet Invert= 1,230.00'



Reach 6R: V. Swale_DA1

Hydrograph



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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Reach 7R: V. Swale_DA2

[82] Warning: Early inflow requires earlier time span

Inflow Area =	1.030 ac,	0.00% Impervious,	Inflow Depth > 3.53"	for 100-yr event
Inflow =	6.81 cfs @	11.92 hrs,	Volume=	0.303 af
Outflow =	3.26 cfs @	12.37 hrs,	Volume=	0.293 af, Atten= 52%, Lag= 26.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.31 fps, Min. Travel Time= 21.7 min
 Avg. Velocity = 0.77 fps, Avg. Travel Time= 64.8 min

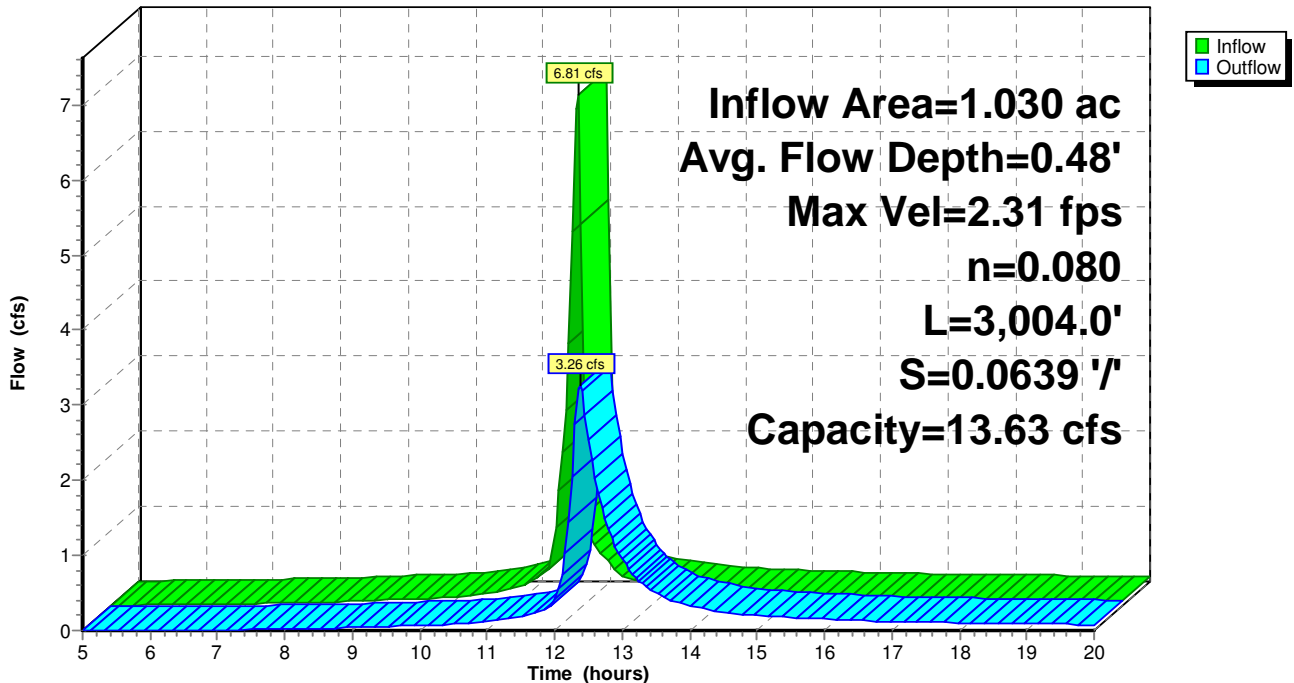
Peak Storage= 4,314 cf @ 12.01 hrs
 Average Depth at Peak Storage= 0.48'
 Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 13.63 cfs

2.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
 Side Slope Z-value= 2.0 '/' Top Width= 6.00'
 Length= 3,004.0' Slope= 0.0639 '/'
 Inlet Invert= 1,240.00', Outlet Invert= 1,048.00'

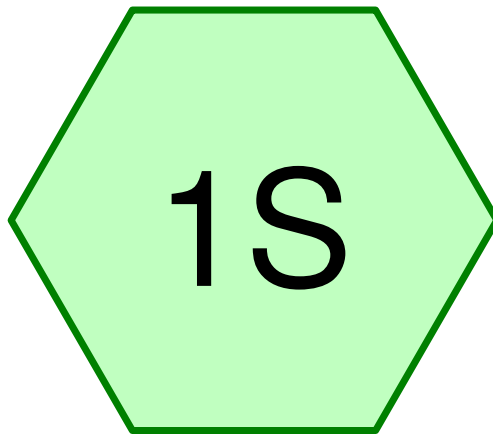


Reach 7R: V. Swale_DA2

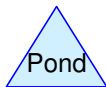
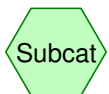
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Launcher MP0-636 Pre-Construction Runoff Calculations



DA1



Pre-construction Launcher

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.770	71	Meadow (1S)
1.220	70	Woodland (1S)
2.990	71	TOTAL AREA

Pre-construction Launcher

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
2.990	Other	1S
2.990		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.770	1.770	Meadow	1S
0.000	0.000	0.000	0.000	1.220	1.220	Woodland	1S
0.000	0.000	0.000	0.000	2.990	2.990	TOTAL AREA	

Pre-construction Launcher

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Type II 24-hr 2-yr Rainfall=2.38"

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Page 5

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>0.38"
Tc=0.0 min CN=71 Runoff=2.44 cfs 0.095 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.095 af Average Runoff Depth = 0.38"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 1S: DA1

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

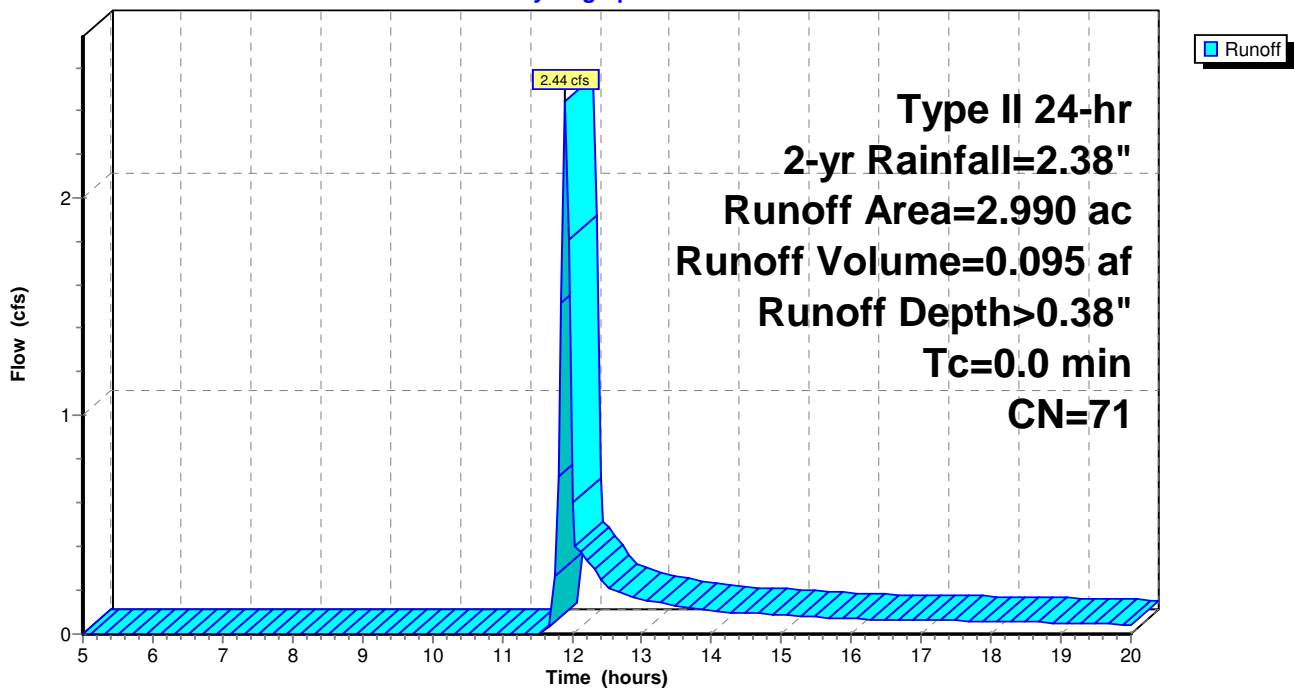
Runoff = 2.44 cfs @ 11.90 hrs, Volume= 0.095 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

	Area (ac)	CN	Description
*	1.220	70	Woodland
*	1.770	71	Meadow
	2.990	71	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Pre-construction Launcher

Type II 24-hr 10-yr Rainfall=3.35"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>0.87"
Tc=0.0 min CN=71 Runoff=5.93 cfs 0.217 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.217 af Average Runoff Depth = 0.87"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: DA1

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

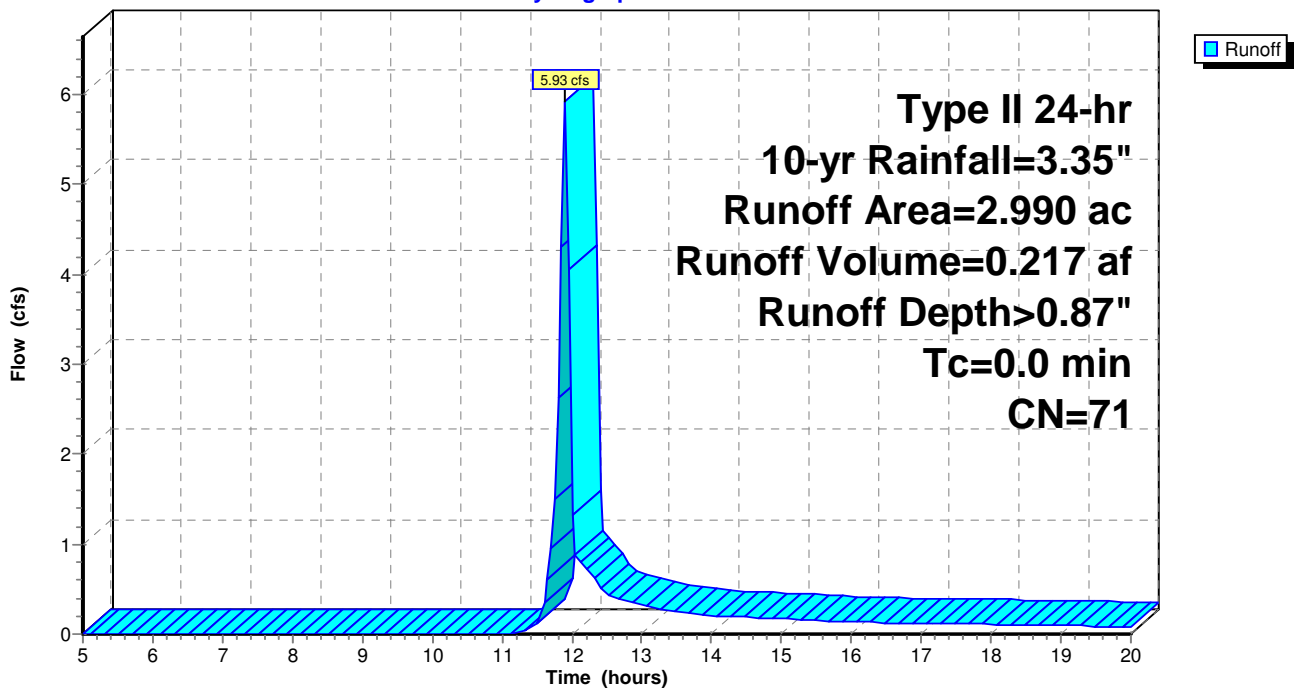
Runoff = 5.93 cfs @ 11.90 hrs, Volume= 0.217 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.35"

	Area (ac)	CN	Description
*	1.220	70	Woodland
*	1.770	71	Meadow
	2.990	71	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Pre-construction Launcher

Type II 24-hr 50-yr Rainfall=4.46"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>1.57"
Tc=0.0 min CN=71 Runoff=10.62 cfs 0.390 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.390 af Average Runoff Depth = 1.57"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: DA1

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

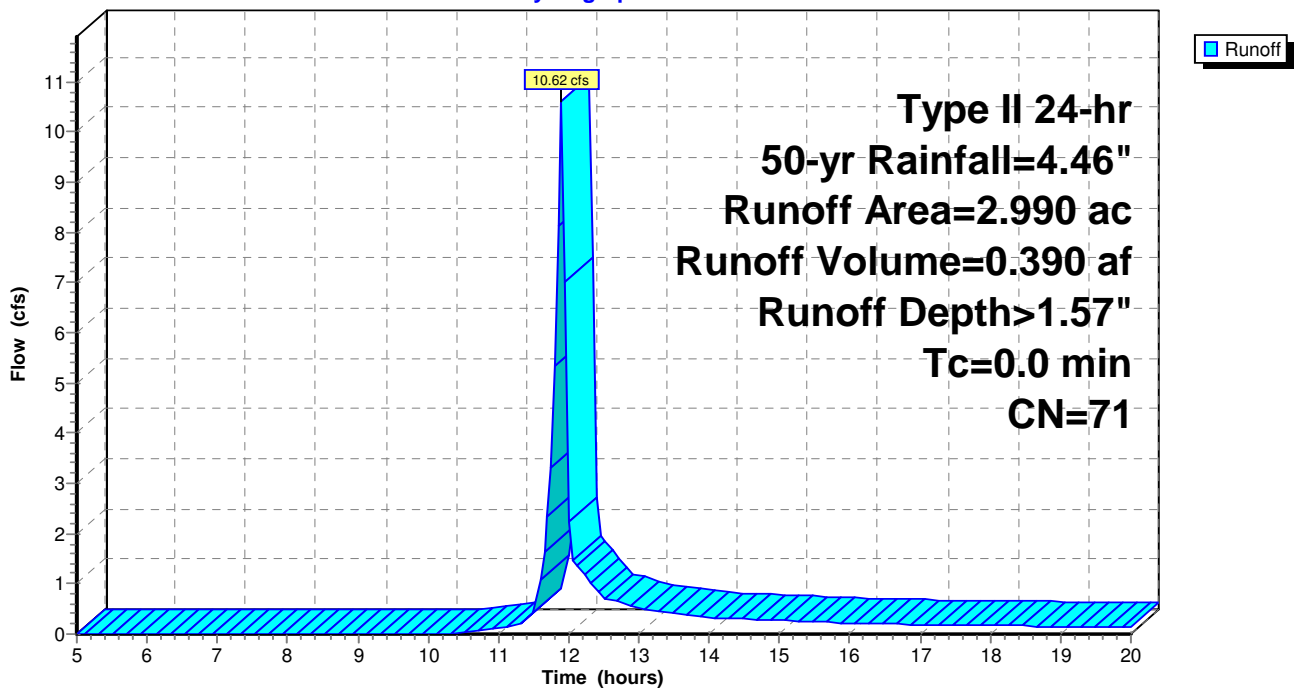
Runoff = 10.62 cfs @ 11.90 hrs, Volume= 0.390 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 50-yr Rainfall=4.46"

	Area (ac)	CN	Description
*	1.220	70	Woodland
*	1.770	71	Meadow
	2.990	71	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Pre-construction Launcher

Type II 24-hr 100-yr Rainfall=4.99"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>1.93"
Tc=0.0 min CN=71 Runoff=13.02 cfs 0.481 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.481 af Average Runoff Depth = 1.93"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Pre-construction Launcher

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Type II 24-hr 100-yr Rainfall=4.99"

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Summary for Subcatchment 1S: DA1

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

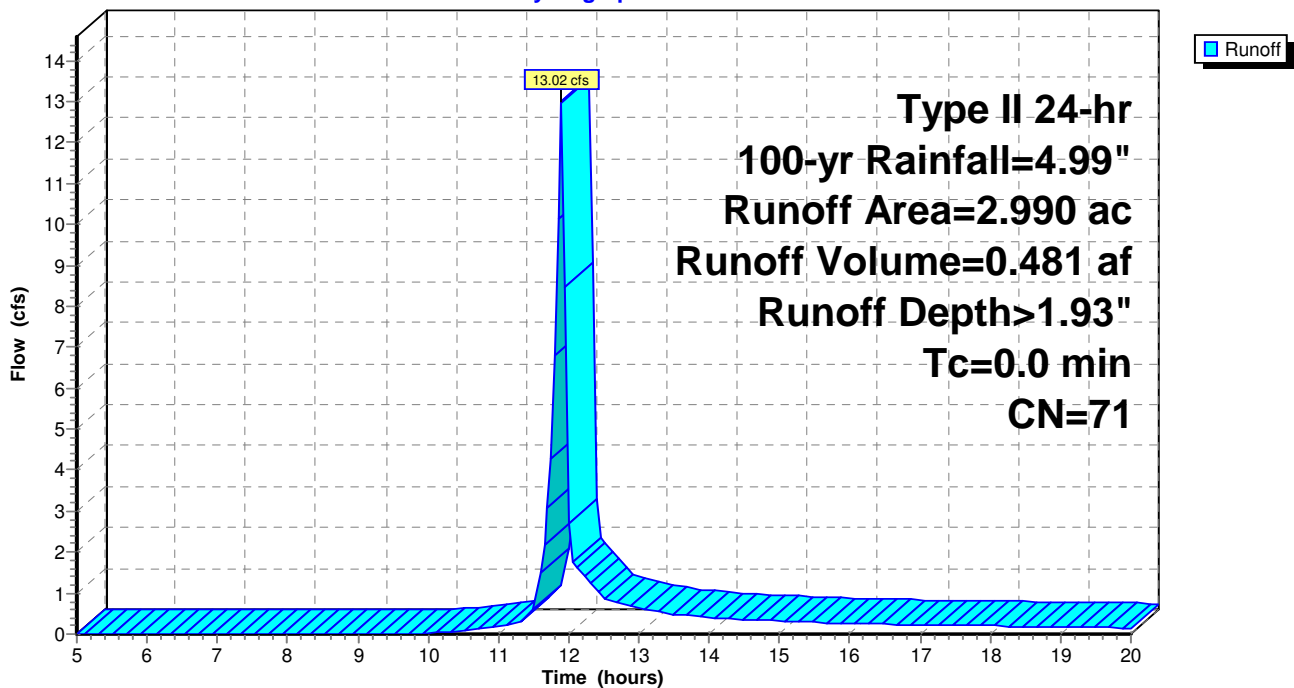
Runoff = 13.02 cfs @ 11.89 hrs, Volume= 0.481 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

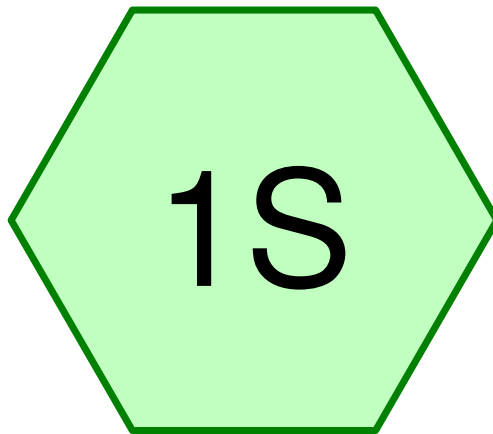
	Area (ac)	CN	Description
*	1.220	70	Woodland
*	1.770	71	Meadow
	2.990	71	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

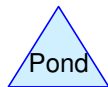
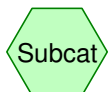
Hydrograph



Launcher MP0-636 Post-Construction Runoff Calculations



DA1



Post-construction Launcher

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.610	89	Gravel (1S)
1.460	71	Meadow (1S)
0.920	70	Woodland (1S)
2.990	74	TOTAL AREA

Post-construction Launcher

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
2.990	Other	1S
2.990		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.610	0.610	Gravel	1S
0.000	0.000	0.000	0.000	1.460	1.460	Meadow	1S
0.000	0.000	0.000	0.000	0.920	0.920	Woodland	1S
0.000	0.000	0.000	0.000	2.990	2.990	TOTAL AREA	

Post-construction Launcher

Type II 24-hr 2-yr Rainfall=2.38"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>0.48"
Tc=0.0 min CN=74 Runoff=3.22 cfs 0.120 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.120 af Average Runoff Depth = 0.48"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Post-construction Launcher

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Type II 24-hr 2-yr Rainfall=2.38"

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Summary for Subcatchment 1S: DA1

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

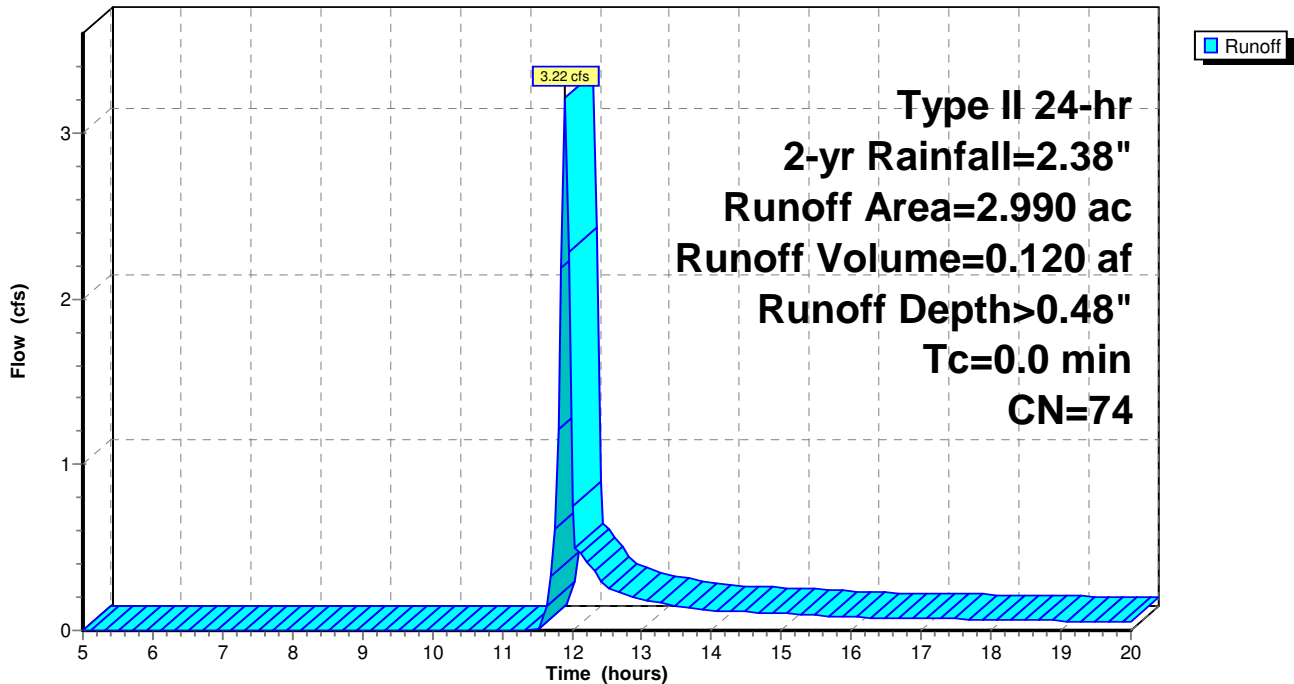
Runoff = 3.22 cfs @ 11.90 hrs, Volume= 0.120 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=2.38"

	Area (ac)	CN	Description
*	0.920	70	Woodland
*	1.460	71	Meadow
*	0.610	89	Gravel
	2.990	74	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Post-construction Launcher

Type II 24-hr 10-yr Rainfall=3.35"

Prepared by ERM

Printed 3/24/2017

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>1.03"
Tc=0.0 min CN=74 Runoff=7.02 cfs 0.257 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.257 af Average Runoff Depth = 1.03"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Post-construction Launcher

Prepared by ERM

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Type II 24-hr 10-yr Rainfall=3.35"

Printed 3/24/2017

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Summary for Subcatchment 1S: DA1

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

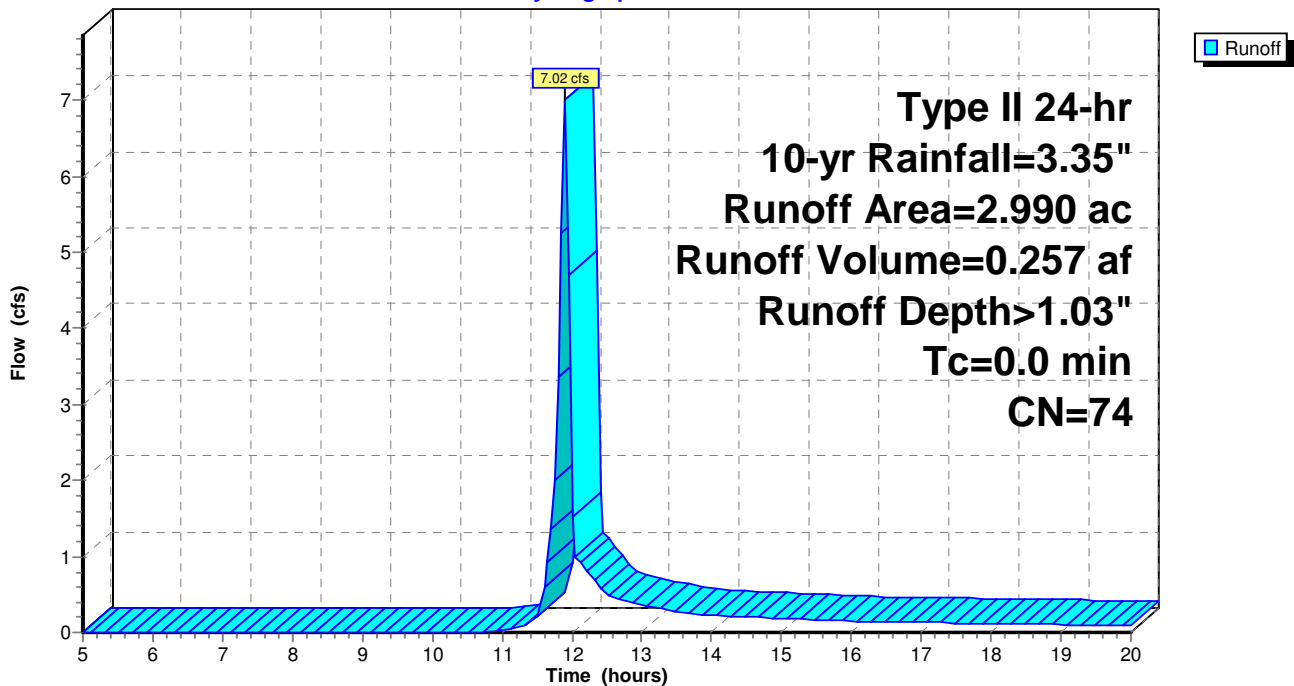
Runoff = 7.02 cfs @ 11.90 hrs, Volume= 0.257 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.35"

	Area (ac)	CN	Description
*	0.920	70	Woodland
*	1.460	71	Meadow
*	0.610	89	Gravel
	2.990	74	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Post-construction Launcher

Type II 24-hr 50-yr Rainfall=4.46"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>1.78"
Tc=0.0 min CN=74 Runoff=11.98 cfs 0.444 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.444 af Average Runoff Depth = 1.78"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Post-construction Launcher

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Type II 24-hr 50-yr Rainfall=4.46"

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Summary for Subcatchment 1S: DA1

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

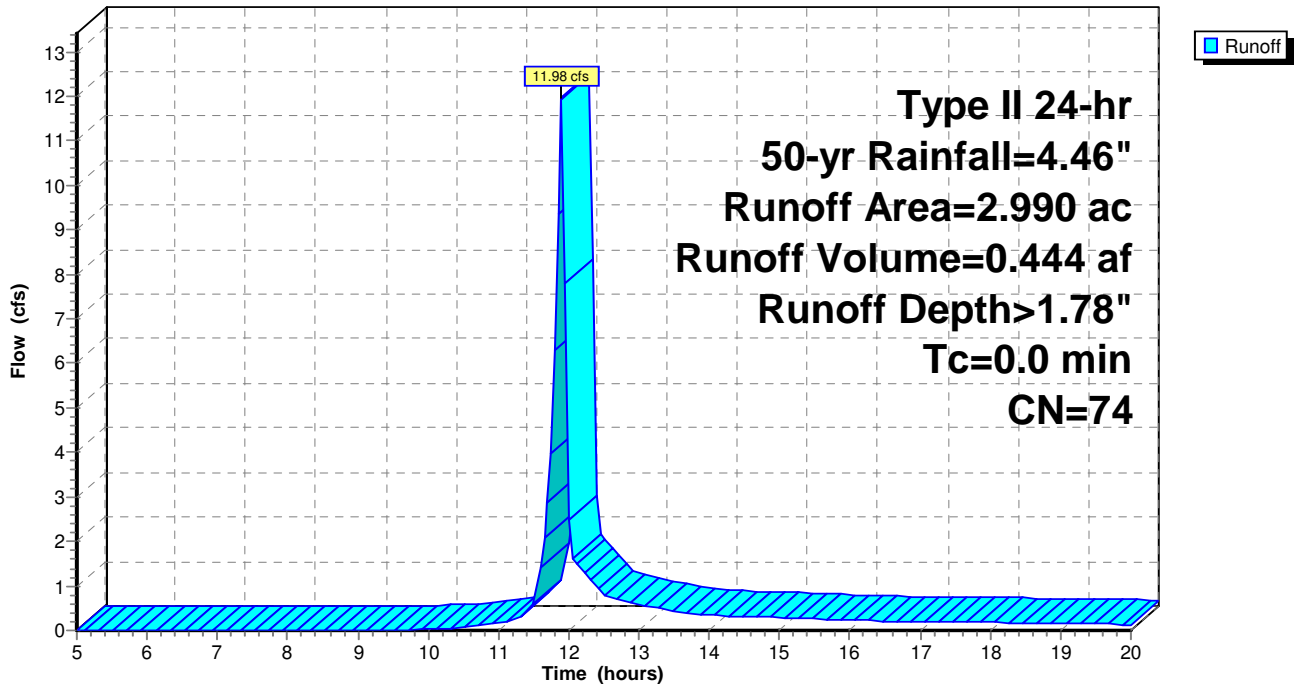
Runoff = 11.98 cfs @ 11.89 hrs, Volume= 0.444 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-yr Rainfall=4.46"

	Area (ac)	CN	Description
*	0.920	70	Woodland
*	1.460	71	Meadow
*	0.610	89	Gravel
	2.990	74	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



Post-construction Launcher

Type II 24-hr 100-yr Rainfall=4.99"

Prepared by ERM

Printed 3/24/2017

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1

Runoff Area=2.990 ac 0.00% Impervious Runoff Depth>2.17"
Tc=0.0 min CN=74 Runoff=14.48 cfs 0.540 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.540 af Average Runoff Depth = 2.17"
100.00% Pervious = 2.990 ac 0.00% Impervious = 0.000 ac

Post-construction Launcher

Prepared by ERM

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Type II 24-hr 100-yr Rainfall=4.99"

Printed 3/24/2017

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Summary for Subcatchment 1S: DA1

[46] Hint: $T_c=0$ (Instant runoff peak depends on dt)

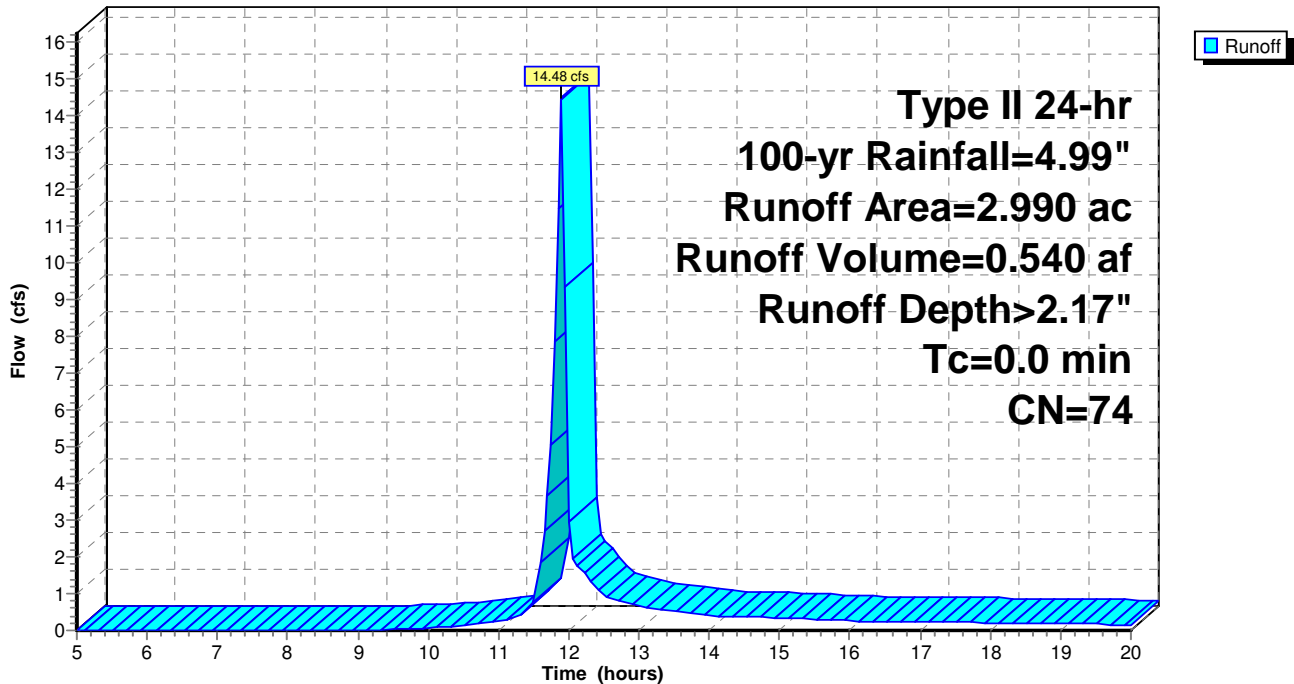
Runoff = 14.48 cfs @ 11.89 hrs, Volume= 0.540 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.99"

	Area (ac)	CN	Description
*	0.920	70	Woodland
*	1.460	71	Meadow
*	0.610	89	Gravel
	2.990	74	Weighted Average
	2.990		100.00% Pervious Area

Subcatchment 1S: DA1

Hydrograph



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SUPPLY HEADER PROJECT

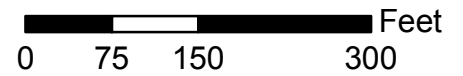
**SECTION 5 – POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN/SITE
RESTORATION (PCSM/SR) PLAN**

APPENDIX C – DRAINAGE AREA MAP



Legend

- Drainage Area
- Gravel
- Pavement or Building






Tonkin Drainage Area Map

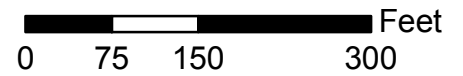
Pre-Construction Condition





Legend

-  Drainage Area
-  Gravel
-  Pavement or Building



Tonkin Drainage Area Map

Post-Construction Condition



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SUPPLY HEADER PROJECT

**SECTION 5 – POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN/SITE
RESTORATION (PCSM/SR) PLAN**

APPENDIX D – INFILTRATION TESTING RESULTS

Test Pit Location Map Contains Critical Energy Infrastructure Information - Filed Separately



Photo Number: 1
Description: Soil Test Pit 1 Profile
Date Taken: 8/8/2016



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160-958
IT-1



Photo Number: 1
Description: Soil Test Pit 2 Profile
Date Taken: 8/8/2016



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JB Tonkin Compressor Station
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IT-2

INFILTRATION TESTING DAILY FIELD REPORT

Project Name: JB Tonkin Compressor Station
 Client: Dominion Transmission, Inc.
 Test Designation: IT-4
 Latitude: 40.462885°N
 Longitude: 79.641531°W

Job No.: 160-958
 Site Location: Murrysville, Westmoreland County, PA
 Weather Conditions: Sunny, Humid
 Temperature: 75-88°F
 Date: 8/8/2016

DOUBLE-RING INFILTRMETER TEST RESULTS

Test ID (Depth, in bgs): IT-4A (12)

Reading Interval (min)*: 30

Reading	Drop (in)	Rate (in/hr)
1 hr Presoak in 30-minute Increments	2.38	--
	1.75	--
1	1.38	2.76
2	1.00	2.00
3	1.06	2.12
4	0.88	1.76
5	0.88	1.76
6		
7		
8		

Stabilized Rate of Drop? **Yes**

Lowest Drop (in)	0.88
Highest Drop (in)	1.06
Difference (in)	0.19

Infiltration Rate (in/hr)***: **1.91**

Test ID (Depth, in bgs): IT-4B (12)

Reading Interval (min)*: 30

Reading	Drop (in)	Rate (in/hr)
1 hr Presoak in 30-minute Increments	4.63	--
	1.88	--
1	1.56	3.12
2	1.31	2.62
3	1.38	2.76
4	1.31	2.62
5	1.44	2.88
6		
7		
8		

Stabilized Rate of Drop? **Yes**

Lowest Drop (in)	1.31
Highest Drop (in)	1.44
Difference (in)	0.13

Infiltration Rate (in/hr)***: **2.72**

Design Infiltration Rate (in/hr)** = 1.14**

Assumed Safety Factor = 2

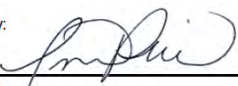
Legend

* If the drop during the second 30-minute presoak interval is less than 2 inches, use 30 minute intervals for the testing. If the drop during the second 30-minute presoak interval is 2 inches or greater, use 10 minute intervals.

**A stabilized rate of drop is defined as a difference of ¼ inch or less of drop between the highest and lowest interval readings of four consecutive interval readings.

***The Infiltration Rate is the average drop between the four appropriate consecutive readings.

****The Design Infiltration Rate is the geometric mean of the tested Infiltration Rates reduced by the assumed factor of safety.

Completed By: 
X
 Ingrid Reiland
 Project Scientist

Reviewed By: 
X
 Michael P. Krepsik, P.E.
 Project Manager





Photo Number: 1
Description: IT-4A
Date Taken: 8/8/2016



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IT-4



Photo Number: 2
Description: IT-4B
Date Taken: 8/8/2016



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JB Tonkin Compressor Station
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IT-4

INFILTRATION TESTING DAILY FIELD REPORT

Project Name: JB Tonkin Compressor Station
 Client: Dominion Transmission, Inc.
 Test Designation: IT-5
 Latitude: 40.463067°N
 Longitude: 79.641061°W

Job No.: 160-958
 Site Location: Murrysville, Westmoreland County, PA
 Weather Conditions: Sunny, Humid
 Temperature: 75-90°F
 Date: 8/9/2016

DOUBLE-RING INFILTRMETER TEST RESULTS

NOTE: Testing abandoned due to slow infiltration rate and inability to move testing location.

Test ID (Depth, in bgs): IT-5A (10)

Reading Interval (min)*: 30

Reading	Drop (in)	Rate (in/hr)
1 hr Presoak in 30-minute Increments	0.06	--
	0.06	--
1	0.00	0.00
2	0.00	0.00
3		
4		
5		
6		
7		
8		

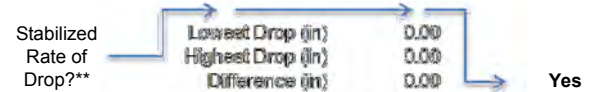
Test ID (Depth, in bgs): IT-5B (10)

Reading Interval (min)*: 30

Reading	Drop (in)	Rate (in/hr)
1 hr Presoak in 30-minute Increments	0.38	--
	0.06	--
1	0.06	0.12
2	0.00	0.00
3		
4		
5		
6		
7		
8		



Infiltration Rate (in/hr)***: **0.00**



Infiltration Rate (in/hr)***: **0.00**

Design Infiltration Rate (in/hr)** = 0.00**

Assumed Safety Factor = 2

Legend

* If the drop during the second 30-minute presoak interval is less than 2 inches, use 30 minute intervals for the testing. If the drop during the second 30-minute presoak interval is 2 inches or greater, use 10 minute intervals.

**A stabilized rate of drop is defined as a difference of ¼ inch or less of drop between the highest and lowest interval readings of four consecutive interval readings.

***The Infiltration Rate is the average drop between the four appropriate consecutive readings.

****The Design Infiltration Rate is the geometric mean of the tested Infiltration Rates reduced by the assumed factor of safety.

Completed By:
X
 Ingrid Reiland
 Project Scientist

Reviewed By:
X
 Michael P. Krepsik, P.E.
 Project Manager





Photo Number: 1
Description: IT-5A
Date Taken: 8/9/2016



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IT-5



Photo Number: 2
Description: IT-5B
Date Taken: 8/9/2016



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160-958
IT-5



Photo Number: 1
Description: Soil Test Pit 7 Profile
Date Taken: 8/9/2016



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IT-7



Photo Number: 1
Description: Soil Test Pit 8 Profile
Date Taken: 8/9/2016



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IT-8

DOMINION TRANSMISSION, INC.

SUPPLY HEADER PROJECT

**SECTION 5 – POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN/SITE
RESTORATION (PCSM/SR) PLAN**

APPENDIX E – PCSM INSPECTION FORM

Environmental Construction Permitting FIELD REVIEW FORM: Post-construction Evaluation

This form will be completed by the ECP Field Reviewer to assess the status of project areas following in-service & final cleanup.

Company Name: Dominion Transmission, Inc. Project Name & Location: Supply Header Project, Westmoreland County, PA EP Database Project ID:	Time & Date of Field Review: Name of ECP Field Reviewer: ECP Project Lead:
Facility Description: Location of Inspection (MP, Line No.): Type of Inspection: Weather Conditions: NOTE TODAY'S WEATHER AND ANY OTHER WEATHER OBSERVATIONS HERE.	
Future Follow-up Inspection Recommended: (Yes / No)	
Immediate response needed for repairs or work recommendations: (Yes / No – if yes identify Item Nos. from tables below)	

Section 1: Narrative

		Yes	No
1. Are the approved (Stamped) E&S Plan and PCSM Plan present on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Site Conditions			
a. Sediment discharge is occurring to waters or wetlands from earth disturbance activity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Stabilization of disturbed areas or stockpiles at final grade?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Are slopes 3:1 and greater reaching final stabilization?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are there areas observed where restoration is limited by soil compaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. PCSM BMPs (List and note if maintained as per the plan)			
If yes, describe: _____			

6. Department/Conservation District has been notified within 24 hours of non-compliance, including discharge to waters or wetlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Identify any additional measures/actions to be taken on site: _____			

---- Part A: EROSION / SOIL CONDITIONS

Item No.	Compliance Review Item and Comment	Work / Repair Needed? (Yes/No)
1)	Silt fence - erosion control devices [Identify location and amount of all silt fence left in place for permanent restoration measures following completion of final grade and seeding].	<input type="checkbox"/>

2)	Compaction of topsoil?	
3)	Rock distribution (if applicable) within actively cultivated or rotated cropland and pastures, hay fields, and residential areas.	
4)	Confirm topographic contours are maintained by permanent erosion control measures (no gullies, erosion, subsidence, etc.).	
5)	Confirm contours restored to preconstruction conditions (compare to adjacent undisturbed off-ROW areas).	
6)	Construction debris removed from all construction work areas (unless the approved otherwise)?	
7)	Are additional permanent measures necessary to prevent erosion and migration of sediment?	

---- Part B: VEGETATION

Item No.	Compliance Review Item and Comment	Work / Repair Needed? (Yes/No)
8)	Provide the current status of reseeding/revegetation (germination or growth of seeded areas within construction work spaces):	
9)	Density and cover of restored areas compared to adjacent undisturbed areas:	
10)	Weed invasion issues (including reed canary grass):	
11)	Identify any areas which have achieved final stabilization, include recommendations for removal of temporary erosion control devices; including silt fence:	

---- Part C: Wetland

Item No.	Compliance Review Item and Comment	Work / Repair Needed? (Yes/No)
12)	Wetlands: Inspect adjacent wetlands	
13)	Confirm BMPs around wetland are in place and functioning.	
14)	Problem areas at wetlands: Identify and describe each problem area, including weed invasion issues (such as reed canary grass) within wetlands adjacent to project area.	

---- Part D: OTHER RECOMMENDATIONS

Item No.	Compliance Review Item and Comment	Work / Repair Needed? (Yes/No)
20)	List any additional problem areas not identified above, including any actions to be taken to maintain compliance with Company plans or environmental permits and regulations, including those referenced in the Environmental Clearance Memo for this project:	
21)	Landowner issues (Identify the issue, who was contacted and where/when the notice occurred):	

DOMINION TRANSMISSION, INC.

SUPPLY HEADER PROJECT

SECTION 6 – PENNSYLVANIA NATURAL HERITAGE PROGRAM

Updated Pennsylvania Natural Diversity Inventory (PNDI Results)

March 16, 2017

1. PROJECT INFORMATION

Project Name: **Supply Header Project - Westmoreland County**

Date of Review: **3/16/2017 09:49:01 AM**

Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**

Project Area: **86.52 acres**

County(s): **Westmoreland**

Township/Municipality(s): **MURRYSVILLE; SALEM**

ZIP Code: **15632; 15668**

Quadrangle Name(s): **MURRYSVILLE; SLICKVILLE**

Watersheds HUC 8: **Kiskiminetas; Lower Monongahela**

Watersheds HUC 12: **Beaver Run Reservoir-Beaver Run; Haymakers Run-Turtle Creek**

Decimal Degrees: **40.435648, -79.613446**

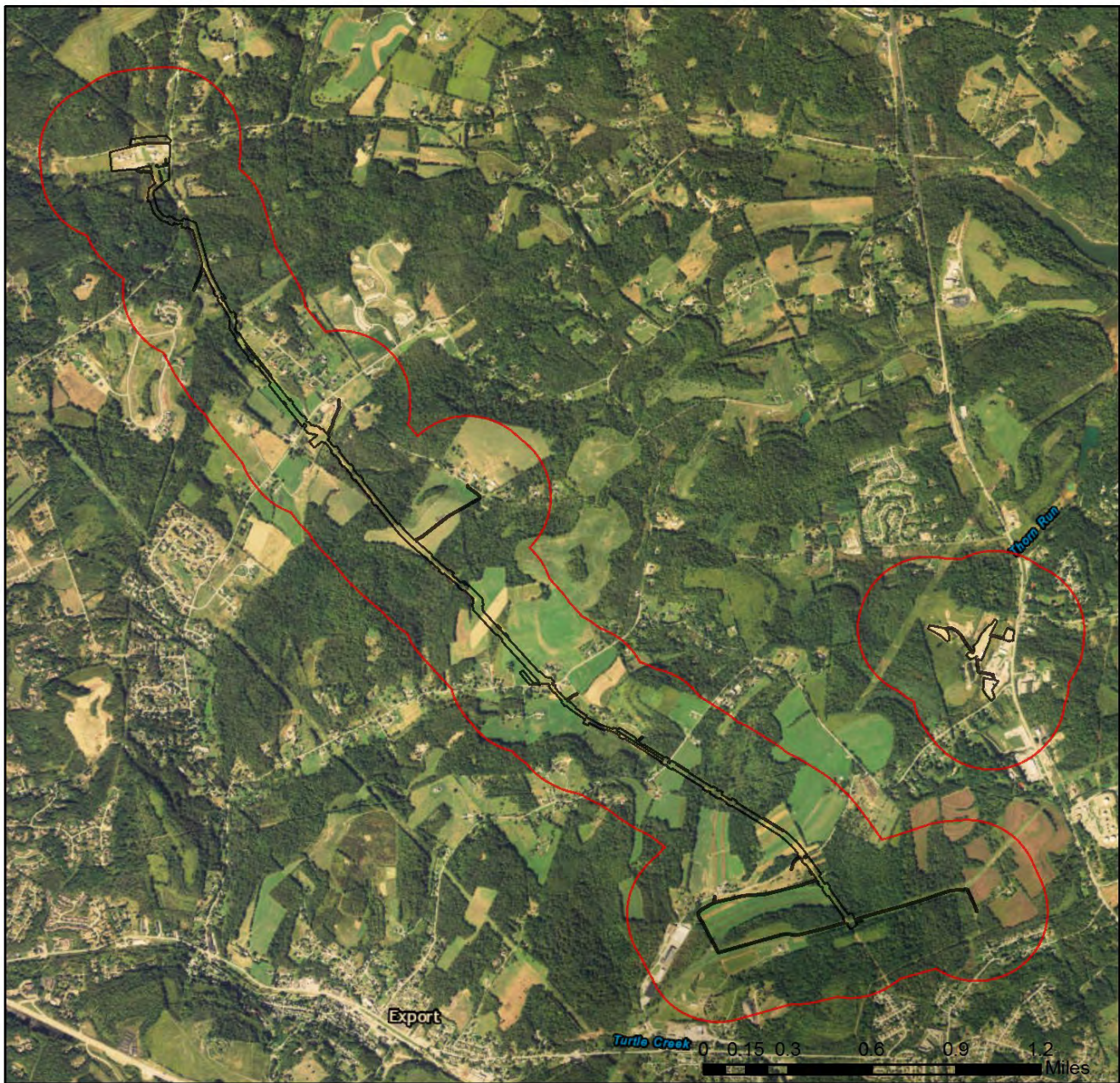
Degrees Minutes Seconds: **40° 26' 8.3344" N, 79° 36' 48.4039" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Supply Header Project - Westmoreland County

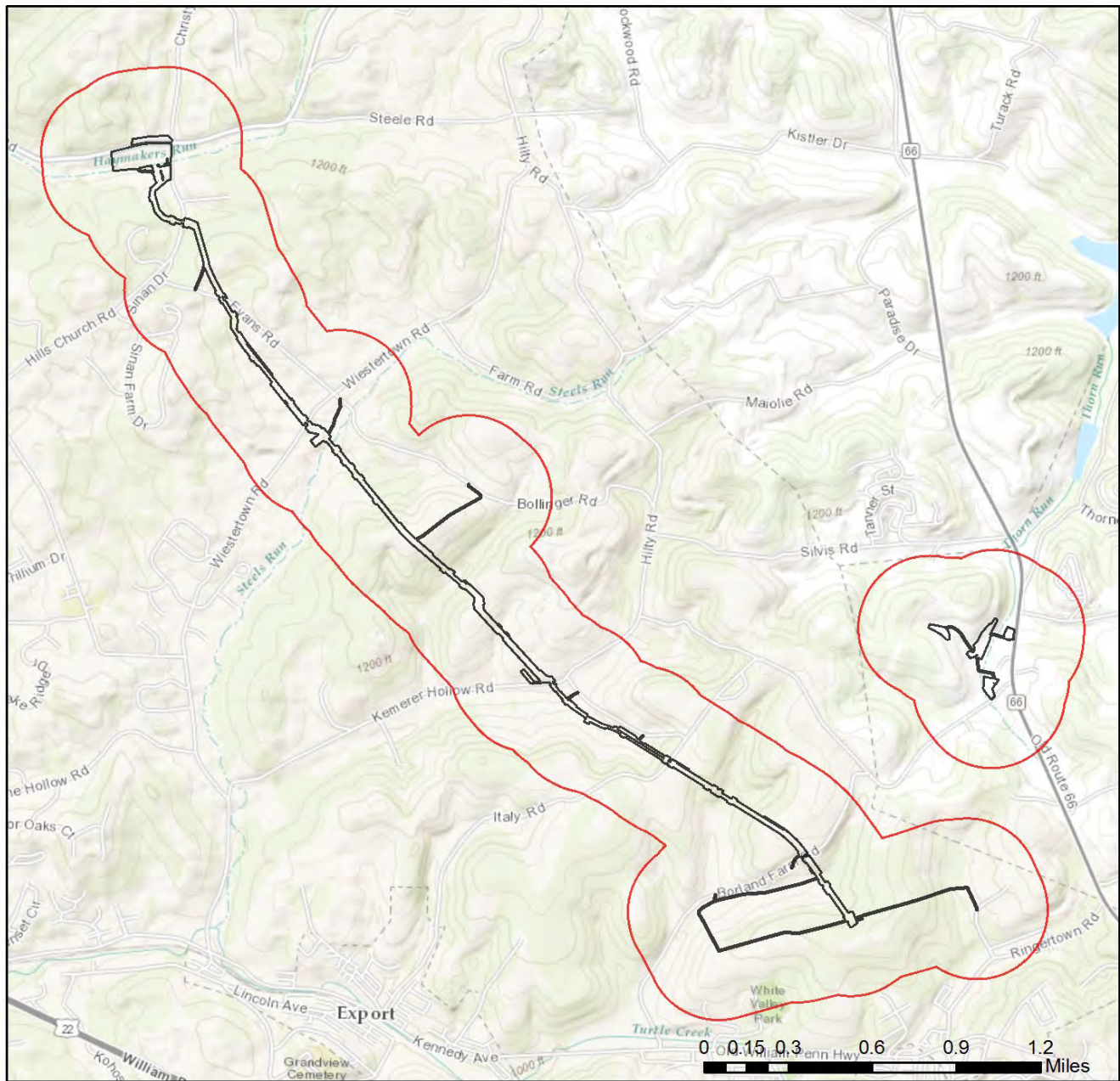


- Project Boundary
- Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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Supply Header Project - Westmoreland County



- Project Boundary
- Buffered Project Boundary

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RESPONSE TO QUESTION(S) ASKED

Q1: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).

Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q2: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?

Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <https://conservationexplorer.dcnr.pa.gov/content/resources>.



5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov
Fax:(717) 772-0271

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service

Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Steve Holden
Company/Business Name: Environmental Resources Management, Inc.
Address: 15 Park Row W #104,
City, State, Zip: Providence, RI 02903
Phone:(401)278-4308 Fax:()
Email: steve.holden@erm.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.



applicant/project proponent signature

03/16/2017

date

Initial PNDI Results

May 1, 2015

1. PROJECT INFORMATION

Project Name: **JB Tonkin CS**

Date of review: **3/20/2015 11:11:26 AM**

Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**

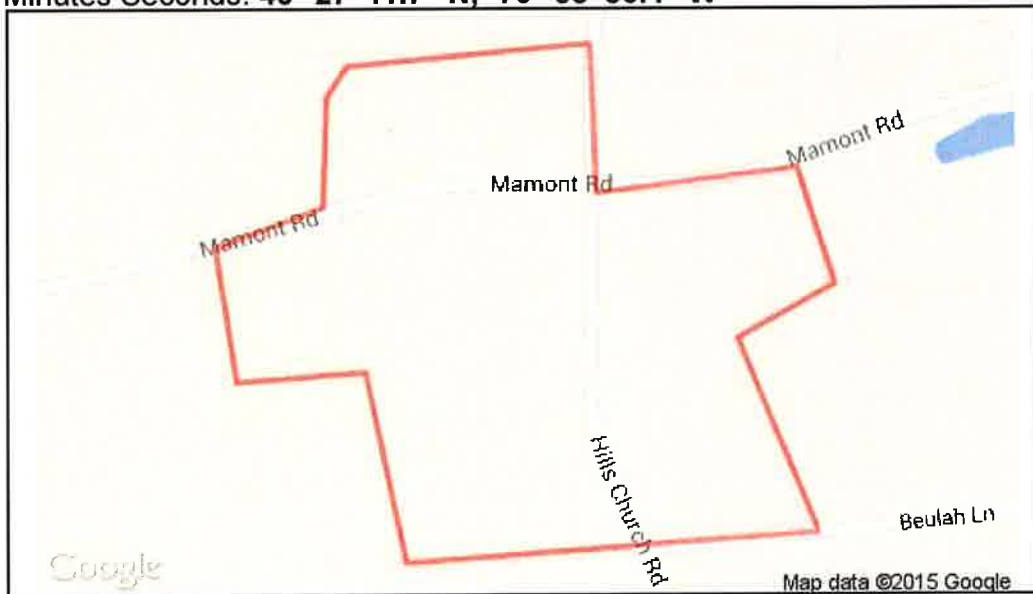
Project Area: **44.5 acres**

County: **Westmoreland** Township/Municipality: **Murrysville**

Quadrangle Name: **MURRYSVILLE** ~ ZIP Code: **15668**

Decimal Degrees: **40.461583 N, -79.641773 W**

Degrees Minutes Seconds: **40° 27' 41.7" N, -79° 38' 30.4" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

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PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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1. PROJECT INFORMATION

Project Name: **TL-636 Pipeline Loop**

Date of review: **3/16/2015 12:38:10 PM**

Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**

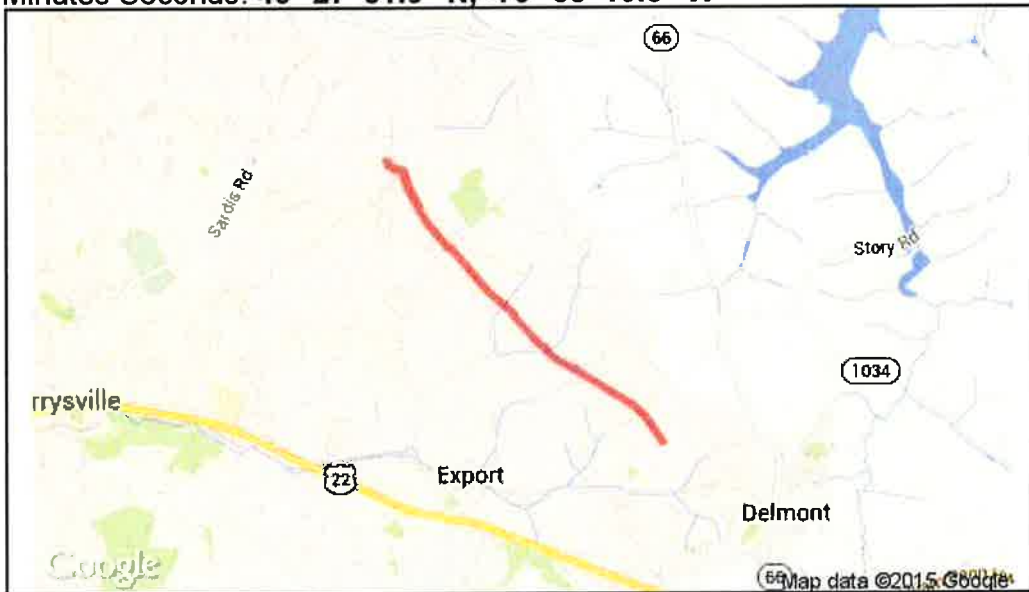
Project Area: **56.9 acres**

County: **Westmoreland** Township/Municipality: **Murrysville**

Quadrangle Name: **SLICKVILLE** ~ ZIP Code: **15668, 15632**

Decimal Degrees: **40.458865 N, -79.638840 W**

Degrees Minutes Seconds: **40° 27' 31.9" N, -79° 38' 19.8" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

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5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
 Bureau of Forestry, Ecological Services Section
 400 Market Street, PO Box 8552, Harrisburg, PA.
 17105-8552
 Fax:(717) 772-0271

U.S. Fish and Wildlife Service
 Pennsylvania Field Office
 110 Radnor Rd; Suite 101, State College, PA 16801
 NO Faxes Please.

PA Fish and Boat Commission
 Division of Environmental Services
 450 Robinson Lane, Bellefonte, PA. 16823-7437
 NO Faxes Please

PA Game Commission
 Bureau of Wildlife Habitat Management
 Division of Environmental Planning and Habitat Protection
 2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
 Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: Steve Holden
 Company/Business Name: Natural Resource Group, LLC
 Address: One Financial Plaza, Suite 1515
 City, State, Zip: Providence, RI 02903
 Phone: (401) 278-4308 Fax: (401) 278-4310
 Email: Steve.holden@NRG-LLC.com

8. CERTIFICATION

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 3/20/15
 applicant/project proponent signature date

Updated PNDI Results

May 6, 2015

Steve Holden

From: Steve Holden
Sent: Wednesday, May 13, 2015 12:23 PM
To: 'garys@pa.gov'; 'mdimatteo@pa.gov'; 'c-jryndock@pa.gov'
Subject: RE: Dominion Supply Header Project
Attachments: SHP_PNDI Results_Signed_5-06-2015.pdf; SHP_Crayne_Study_Area.prj; SHP_Crayne_Study_Area.sbn; SHP_Crayne_Study_Area.sbx; SHP_Crayne_Study_Area.shp; SHP_Crayne_Study_Area.shx; SHP_Crayne_Study_Area.CPG; SHP_Crayne_Study_Area.dbf; SHP_TL_636_Study_Area.CPG; SHP_TL_636_Study_Area.dbf; SHP_TL_636_Study_Area.prj; SHP_TL_636_Study_Area.sbn; SHP_TL_636_Study_Area.sbx; SHP_TL_636_Study_Area.shp; SHP_TL_636_Study_Area.shp.xml; SHP_TL_636_Study_Area.shx; SHP_TL_636_Centerline.CPG; SHP_TL_636_Centerline.dbf; SHP_TL_636_Centerline.prj; SHP_TL_636_Centerline.sbn; SHP_TL_636_Centerline.sbx; SHP_TL_636_Centerline.shp; SHP_TL_636_Centerline.shx

As a follow-up to the letters sent to you on May 1, 2015 by Dominion Transmission, Inc., please find the attached shapefiles for the study areas along the proposed pipeline route and at the two compressor station modification sites.

Also attached are the results of a PNDI review we reran on May 6th to ensure coverage after the recent changes related to the northern long-eared bat.

Please let me know if you have any questions.

Thank you,
Steve



an ERM Group company

Steve Holden, CPSS; CPESC

steve.holden@nrg-llc.com

(401) 278-4308 Direct

(401) 528-7299 Cell

(401) 278-4310 Fax

1. PROJECT INFORMATION

Project Name: **TL-636 Pipeline Loop**

Date of review: **5/6/2015 1:31:46 PM**

Project Category: **Energy Storage, Production, and Transfer,Energy Transfer,Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**

Project Area: **218.2 acres**

County: **Westmoreland Township/Municipality: Murrysville**

Quadrangle Name: **SLICKVILLE ~ ZIP Code: 15668,15632**

Decimal Degrees: **40.423639 N, -79.592866 W**

Degrees Minutes Seconds: **40° 25' 25.1" N, -79° 35' 34.3" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
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As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

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6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA.
17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Rd; Suite 101, State College, PA 16801
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
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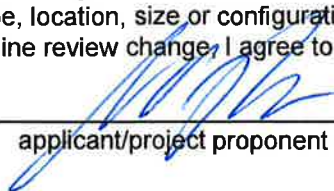
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Company/Business Name: Natural Resource Group, LLC
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applicant/project proponent signature

5/06/15

date

1. PROJECT INFORMATION

Project Name: **JB Tonkin CS**

Date of review: **5/6/2015 1:19:11 PM**

Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**

Project Area: **42.0 acres**

County: **Westmoreland** Township/Municipality: **Murrysville**

Quadrangle Name: **MURRYSVILLE** ~ ZIP Code: **15668**

Decimal Degrees: **40.462897 N, -79.639809 W**

Degrees Minutes Seconds: **40° 27' 46.4" N, -79° 38' 23.3" W**



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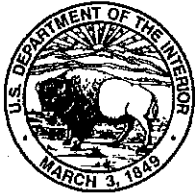
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 5/06/15
applicant/project proponent signature date

Non-PNDI Initiated United States Fish and Wildlife Service Response

January 28, 2016



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

January 28, 2016

William Scarpinato
Dominion Resources Services, Inc.
5000 Dominion Blvd.
Glen Allen, Virginia 23060

RE: USFWS Project #2015-0481

Dear Mr. Scarpinato:

This responds to your letter of November 12, 2015, requesting our review of acoustic survey results for the proposed Dominion Transmission's Supply Header project located in Westmoreland County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The proposed project is located within the range of the federally endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*). On May 4, 2015, the northern long-eared bat became federally listed; more information on the new listing of this species can be found at: <http://www.fws.gov/midwest/endangered/mammals/nlba/index.html>.

Due to proposed forest clearing associated with construction of the project, acoustic surveys were conducted to determine the presence/probable absence of the Indiana bat and northern long-eared bat within the project area. According the survey report, surveys were conducted at 7 sites within the project area between June 3 and June 5, 2015, in accordance with the Fish and Wildlife Service's 2015 *Indiana Bat Summer Survey Guidelines*. During these surveys, seven bat species were recorded, but this did not include any Indiana bats or northern long-eared bats.

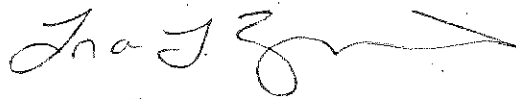
Based on these survey results, we have concluded that Indiana bats and northern long-eared bats are either not present in the project area, or are present in such low densities that they were not detected. In addition, the project is not within an area that is known to be occupied by a maternity colony, or within the fall swarming habitat associated with any known Indiana bat or northern long-eared bat hibernacula. Consequently, we have determined that tree-clearing related to this project is not likely to adversely affect the Indiana bat or northern long-eared bat.

This response relates only to endangered or threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have any questions regarding this matter, please contact Brian Scofield of my staff at 814-234-4090.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lora L. Zimmerman". The signature is written in black ink and is positioned above the printed name.

Lora L. Zimmerman
Field Office Supervisor

DOMINION TRANSMISSION, INC.

SUPPLY HEADER PROJECT

SECTION 7 –ACT 14 LETTERS



April 27, 2016

Westmoreland County Planning Division
Attn: Jason Rigone
40 North Pennsylvania Avenue
Fifth Floor, Suite 520
Greensburg, PA 15601

**Re: Dominion Transmission, Inc., Supply Header Project
PADEP Chapter 105 GP-5, 7, 8 and ESCGP-2 Act 14 Notification
Greene and Westmoreland Counties, Pennsylvania
*CERTIFIED MAIL – RETURN RECEIPT REQUESTED***

Dear Mr. Rigone:

The purpose of this notice is to inform you that Dominion Transmission, Inc. (DTI) proposes to submit updated permit applications to the Pennsylvania Department of Environmental Protection (DEP) for the Supply Header Project (SHP). This letter provides project notification in accordance with the provisions of Act 14, 97 P.S. § 510-5. The letter serves as an update to the Act 14 Notification Letter dated September 8, 2015.

Acts 67 and 68 of 2000, which amended the Municipalities Planning Code to direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code.

Permit Application Type:

Chapter 105 General Permits for Utility Line Crossings (GP-5), Minor Road Crossings (GP-7), Temporary Road Crossings (GP-8), and Erosion and Sediment Control General Permit (ESCGP-2).

Applicant Contact:

William Scarpinato
Dominion Environmental Services
5000 Dominion Boulevard
Glen Allen, Virginia 23060
(804) 273-3019
william.a.scarpinato@dom.com

Project Location:

JB Tonkin Compressor Station, Murrysville, Westmoreland County
3.9 miles of pipeline through Murrysville, Westmoreland County

Crayne Compressor Station, Franklin Township, Greene County

Project Description:

The SHP includes 36.5 miles of pipeline loop and modify existing compression facilities in Pennsylvania and West Virginia. The Pennsylvania segment of the Project includes:


- 3.9 miles of 30-inch diameter natural gas pipeline loop adjacent to DTI's existing pipeline in Westmoreland County.
- Modifications at DTI's existing JB Tonkin and Crayne Compressor Stations in Westmoreland and Greene Counties, respectively.

The Project will enable DTI to provide firm transportation service to various customers, including Atlantic Coast Pipeline, LLC, which is proposing to construct the Atlantic Coast Pipeline.

Enclosed is a U.S. Geological Survey topographic map showing the SHP location in Westmoreland and Green Counties, Pennsylvania. SHP invites you to comment on the land use aspects of this project; please be specific and focus on the relationship to zoning ordinances. If you wish to submit comments to DEP, you must respond within 30 days of this letter. If there are no land use comments received by the end of the comment period, DEP will assume that there are no substantive land use conflicts and proceed with the normal application review process.

If you have any questions or concerns, please contact William A. Scarpinato at (804) 273-3019 or by email at William.A.Scarpinato@dom.com.

Sincerely,




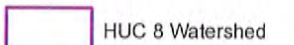


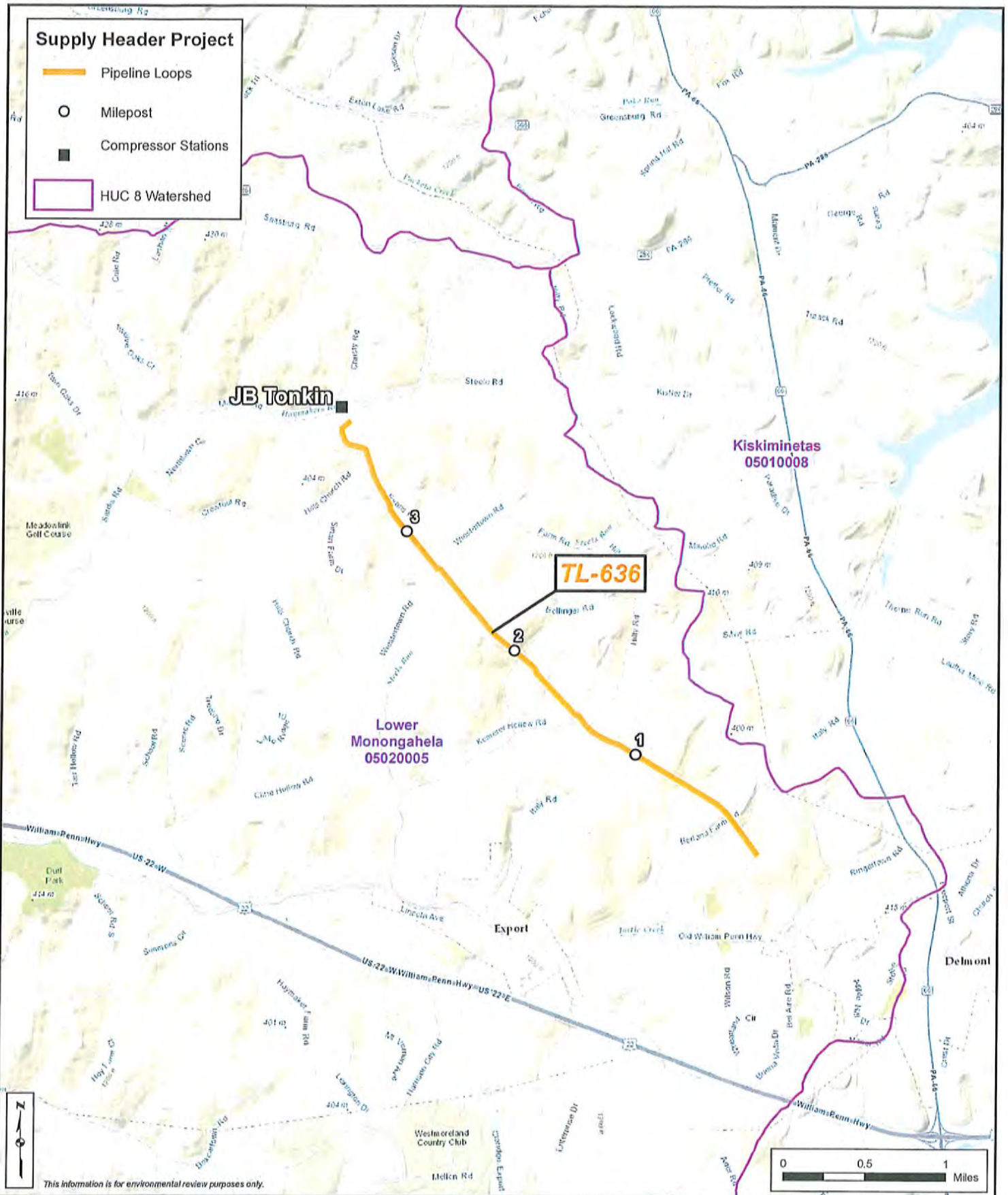
Robert M. Bisha
Technical Advisor, Supply Header Project

Enclosures: U.S. Geological Survey Topographic Map

cc: William A. Scarpinato

Supply Header Project

-  Pipeline Loops
-  Milepost
-  Compressor Stations
-  HUC 8 Watershed



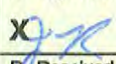


This information is for environmental review purposes only.



Supply Header Project General Location Map



an ERM Group company

SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY																
<ul style="list-style-type: none"> Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 	<p>A. Signature  <input checked="" type="checkbox"/> Agent <input type="checkbox"/> Addressee</p> <p>B. Received by (Printed Name) C. Date of Delivery  5-2-16</p>																
<p>1. Article Addressed to:</p> <p>Westmoreland County Planning Division Attn: Jason Rigone 40 North Pennsylvania Avenue 5th Floor, Suite 520 Greensburg, PA 15601</p>  <p>9590 9402 1587 5362 9574 66</p>	<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No</p> <p>3. Service Type</p> <table border="0"> <tr> <td><input type="checkbox"/> Adult Signature</td> <td><input type="checkbox"/> Priority Mail Express®</td> </tr> <tr> <td><input type="checkbox"/> Adult Signature Restricted Delivery</td> <td><input type="checkbox"/> Registered Mail™</td> </tr> <tr> <td><input type="checkbox"/> Certified Mail®</td> <td><input type="checkbox"/> Registered Mail Restricted Delivery</td> </tr> <tr> <td><input type="checkbox"/> Certified Mail Restricted Delivery</td> <td><input type="checkbox"/> Return Receipt for Merchandise</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery</td> <td><input type="checkbox"/> Signature Confirmation™</td> </tr> <tr> <td><input type="checkbox"/> Collect on Delivery Restricted Delivery</td> <td><input type="checkbox"/> Signature Confirmation Restricted Delivery</td> </tr> <tr> <td><input type="checkbox"/> Insured Mail</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)</td> <td></td> </tr> </table>	<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®	<input type="checkbox"/> Adult Signature Restricted Delivery	<input type="checkbox"/> Registered Mail™	<input type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery	<input type="checkbox"/> Certified Mail Restricted Delivery	<input type="checkbox"/> Return Receipt for Merchandise	<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation™	<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery	<input type="checkbox"/> Insured Mail		<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)	
<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®																
<input type="checkbox"/> Adult Signature Restricted Delivery	<input type="checkbox"/> Registered Mail™																
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<input type="checkbox"/> Insured Mail																	
<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)																	
<p>2. Article Number (Transfer from carrier label)</p> <p>7016 0340 0000 7419 5263</p>																	

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

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GREENSBURG, PA 15601

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Certified Mail Fee	\$3.30
Extra Services & Fees (check box, add fee as appropriate)	\$2.70
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.47
Total Postage and Fees	\$6.47

Sent To
 Westmoreland County Planning Division Attn: Jason Rigone
 Street and Apt. No., or PO Box No.
 40 North Pennsylvania Ave., 5th Floor, Suite 520
 City, State, ZIP+4®
 Greensburg, PA 15601

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0340 0000 7419 5263





April 27, 2016

Municipality of Murrysville Supervisors
4100 Sardis Road
Murrysville, PA 15668

**Re: Dominion Transmission, Inc., Supply Header Project
PADEP Chapter 105 GP-5, 7, 8 and ESCGP-2 Act 14 Notification
Greene and Westmoreland Counties, Pennsylvania
*CERTIFIED MAIL – RETURN RECEIPT REQUESTED***

Dear Supervisors:

The purpose of this notice is to inform you that Dominion Transmission, Inc. (DTI) proposes to submit updated permit applications to the Pennsylvania Department of Environmental Protection (DEP) for the Supply Header Project (SHP). This letter provides project notification in accordance with the provisions of Act 14, 97 P.S. § 510-5. The letter serves as an update to the Act 14 Notification Letter dated September 8, 2015.

Acts 67 and 68 of 2000, which amended the Municipalities Planning Code to direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code.

Permit Application Type:

Chapter 105 General Permits for Utility Line Crossings (GP-5), Minor Road Crossings (GP-7), Temporary Road Crossings (GP-8), and Erosion and Sediment Control General Permit (ESCGP-2).

Applicant Contact:

William Scarpinato
Dominion Environmental Services
5000 Dominion Boulevard
Glen Allen, Virginia 23060
(804) 273-3019
william.a.scarpinato@dom.com

Project Location:

JB Tonkin Compressor Station, Murrysville, Westmoreland County
3.9 miles of pipeline through Murrysville, Westmoreland County
Crayne Compressor Station, Franklin Township, Greene County

Project Description:

The SHP includes 36.5 miles of pipeline loop and modify existing compression facilities in Pennsylvania and West Virginia. The Pennsylvania segment of the Project includes:

- 3.9 miles of 30-inch diameter natural gas pipeline loop adjacent to DTI's existing pipeline in Westmoreland County.
- Modifications at DTI's existing JB Tonkin and Crayne Compressor Stations in Westmoreland and Greene Counties, respectively.

The Project will enable DTI to provide firm transportation service to various customers, including Atlantic Coast Pipeline, LLC, which is proposing to construct the Atlantic Coast Pipeline.

Enclosed is a U.S. Geological Survey topographic map showing the SHP location in Westmoreland and Green Counties, Pennsylvania. SHP invites you to comment on the land use aspects of this project; please be specific and focus on the relationship to zoning ordinances. If you wish to submit comments to DEP, you must respond within 30 days of this letter. If there are no land use comments received by the end of the comment period, DEP will assume that there are no substantive land use conflicts and proceed with the normal application review process.

If you have any questions or concerns, please contact William A. Scarpinato at (804) 273-3019 or by email at William.A.Scarpinato@dom.com.

Sincerely,







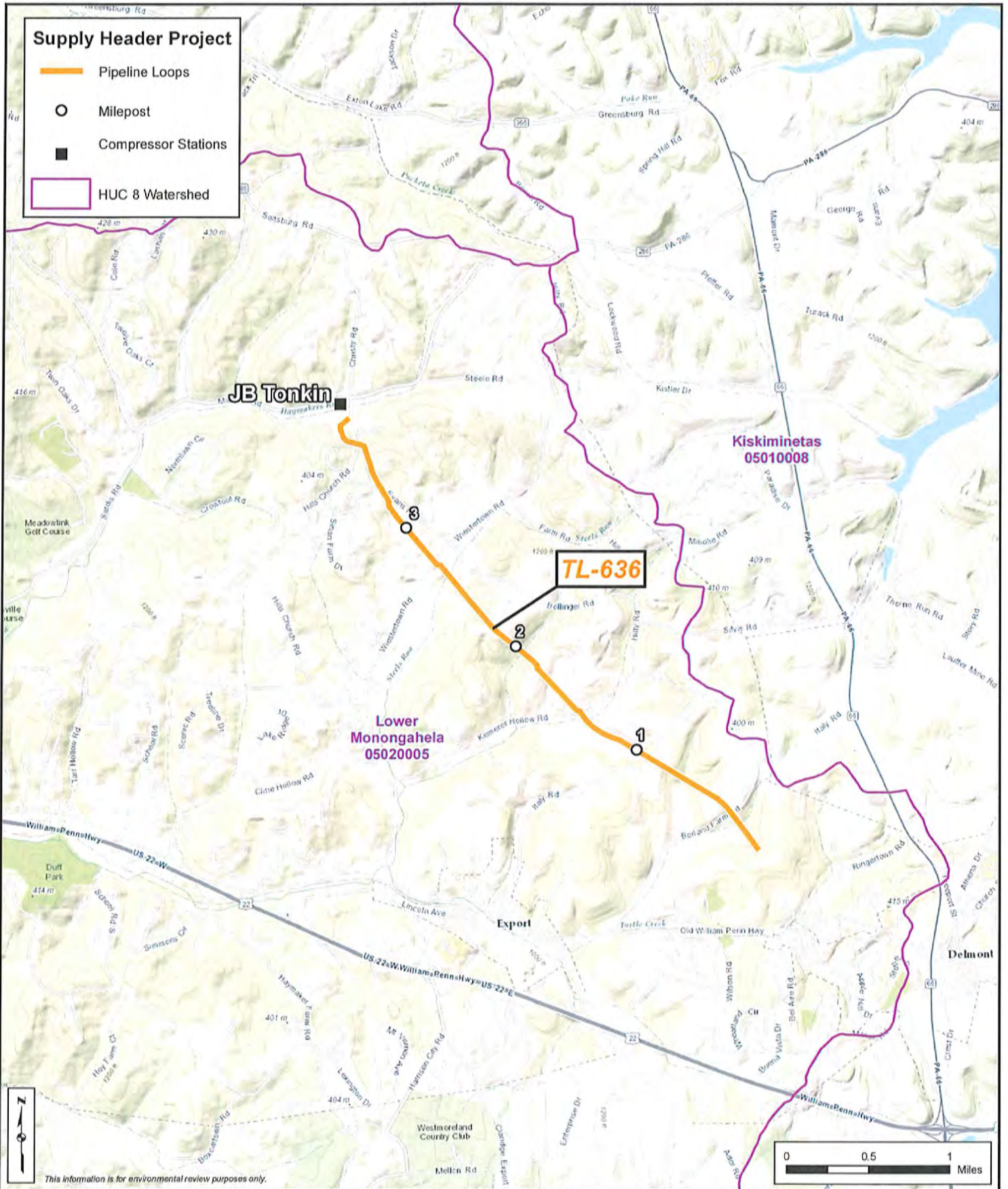
Robert M. Bisha
Technical Advisor, Supply Header Project

Enclosures: U.S. Geological Survey Topographic Map

cc: William A. Scarpinato

Supply Header Project

-  Pipeline Loops
-  Milepost
-  Compressor Stations
-  HUC 8 Watershed



This information is for environmental review purposes only.



**Supply Header Project
General Location Map**



an ERM Group company

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MURRYSVILLE PA 15668

OFFICIAL USE

Certified Mail Fee	\$3.30
Extra Services & Fees (check box, add fee as appropriate)	\$7.70
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.47
Total Postage and Fees	\$6.47



Sent To
 Municipality of Murrysville Supervisors
 Street and Apt. No., or PO Box No.
 4100 Sardis Road
 City, State, ZIP+4®
 Murrysville, PA 15668

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 0340 0000 7419 5249

SENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3.
 Print your name and address on the reverse so that we can return the card to you.
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Article Addressed to:
 Municipality of Murrysville Supervisors
 4100 Sardis Road
 Murrysville, PA 15668

COMPLETE THIS SECTION ON DELIVERY

A. Signature
 Penny Fox Agent
 Addressee

B. Received by (Printed Name)
 Penny Fox

C. Date of Delivery
 5-2-16

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No



9590 9402 1587 5362 9574 80

7016 0340 0000 7419 5249

3. Service Type.
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 - Certified Mail Restricted Delivery
 - Collect on Delivery
 - Collect on Delivery Restricted Delivery
 - Registered Mail™
 - Registered Mail Restricted Delivery
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Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt



February 3, 2017

Jack Dunaway, Chairperson
Salem Township Municipal Building
244 Congruity Road
Greensburg, PA 15601

**Re: Dominion Transmission, Inc., Supply Header Project
PADEP Chapter 105 GP-5, 7, 8 and ESCGP-2 Act 14 Notification
Greene and Westmoreland Counties, Pennsylvania
*CERTIFIED MAIL – RETURN RECEIPT REQUESTED***

Dear Mr. Dunaway:

The purpose of this notice is to inform you that Dominion Transmission, Inc. (DTI) proposes to submit permit applications to the Pennsylvania Department of Environmental Protection (DEP) for the Supply Header Project (SHP). This letter provides project notification in accordance with the provisions of Act 14, 97 P.S. § 510-5.

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Permit Application Type:

Chapter 105 General Permits for Utility Line Crossings (GP-5), Minor Road Crossings (GP-7), Temporary Road Crossings (GP-8), and Erosion and Sediment Control General Permit (ESCGP-2).

Applicant Contact:

Richard Gangle
Dominion Environmental Services
5000 Dominion Boulevard
Glen Allen, Virginia 23060
(804) 273-2814
richard.b.gangle@dom.com

Project Location:

JB Tonkin Compressor Station, Murrysville, Westmoreland County
Temporary Contractor Yard, Salem Township, Westmoreland County
3.9 miles of pipeline through Murrysville, Westmoreland County
Crayne Compressor Station, Franklin & Morgan Townships, Greene County

Project Description:

The SHP includes 37.5 miles of pipeline loop and modifications to existing compression facilities in Pennsylvania and West Virginia. The Pennsylvania segment of the Project includes:

- 3.9 miles of 30-inch diameter natural gas pipeline loop adjacent to DTI's existing pipeline in Westmoreland County.
- Modifications at DTI's existing JB Tonkin and Crayne Compressor Stations in Westmoreland and Greene Counties, respectively.
- Access roads and temporary contractor yards in Westmoreland and Greene Counties.

The Project will enable DTI to provide firm transportation service to various customers, including Atlantic Coast Pipeline, LLC, which is proposing to construct the Atlantic Coast Pipeline in West Virginia, Virginia, and North Carolina.

Enclosed is a U.S. Geological Survey topographic map showing the SHP location in Westmoreland and Green Counties, Pennsylvania. SHP invites you to comment on the land use aspects of this project; please be specific and focus on the relationship to zoning ordinances. If you wish to submit comments to DEP, you must respond within 30 days of this letter. If there are no land use comments received by the end of that period, DEP will assume that there are no substantive land use conflicts and proceed with the normal application review process.

If you have any questions or concerns, please contact Richard B. Gangle at (804) 273-2814 or by email at Richard.B.Gangle@dom.com.

Sincerely,



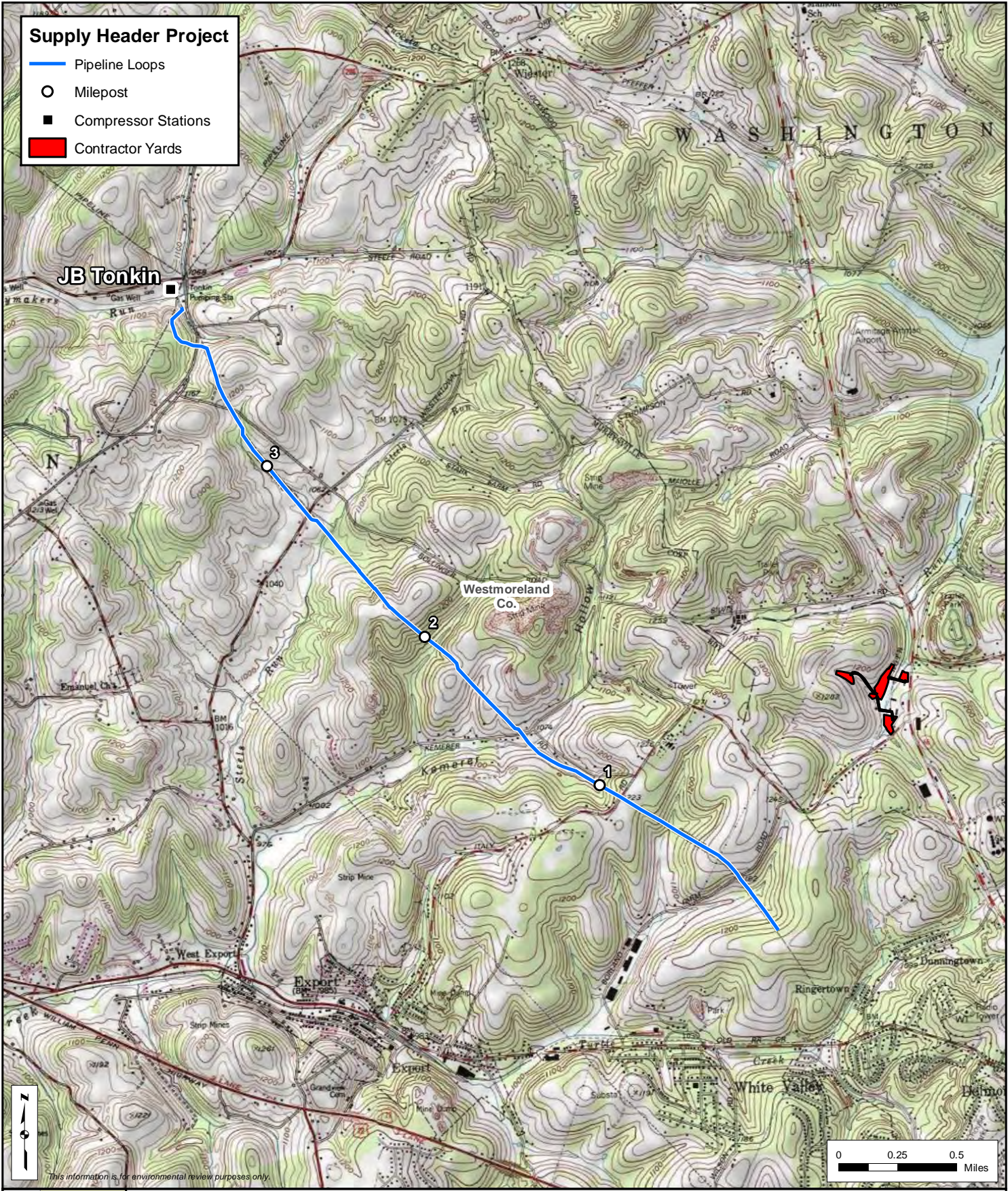
Robert M. Bisha
Technical Advisor, Supply Header Project

Enclosures: U.S. Geological Survey Topographic Map

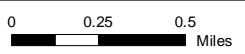
cc: Richard B. Gangle

Supply Header Project

- Pipeline Loops
- Milepost
- Compressor Stations
- Contractor Yards



This information is for environmental review purposes only.



Supply Header Project General Location Map



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GREENSBURG, PA 15601

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\$	\$2.75
Extra Services & Fees (check box, add fee as appropriate)	\$4.80
<input type="checkbox"/> Return Receipt (hardcopy)	\$
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$



Postage	\$1.19
\$	
Total Postage and Fees	\$7.29
\$	

Sent To Jack Dunaway, Salem Twp
244 Congruity Road
 City, State, ZIP+4® Greensburg, PA 15601

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Jack Dunaway, Chairperson
Salem Twp. Municipal Bldg
244 Congruity Rd.
Greensburg, PA 15601



9590 9402 1633 6053 9751 32

2. Article Number (Transfer from service label)

7016 0750 0000 4348 4773

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent
 Addressee

B. Received by (Printed Name) Len C. Date of Delivery

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
- | | |
|---|---|
| <input type="checkbox"/> Adult Signature | <input type="checkbox"/> Priority Mail Express® |
| <input type="checkbox"/> Adult Signature Restricted Delivery | <input type="checkbox"/> Registered Mail™ |
| <input type="checkbox"/> Certified Mail® | <input type="checkbox"/> Registered Mail Restricted Delivery |
| <input type="checkbox"/> Certified Mail Restricted Delivery | <input type="checkbox"/> Return Receipt for Merchandise |
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| <input type="checkbox"/> Collect on Delivery Restricted Delivery | <input type="checkbox"/> Signature Confirmation Restricted Delivery |
| <input type="checkbox"/> Collect on Delivery Restricted Delivery (over \$500) | |