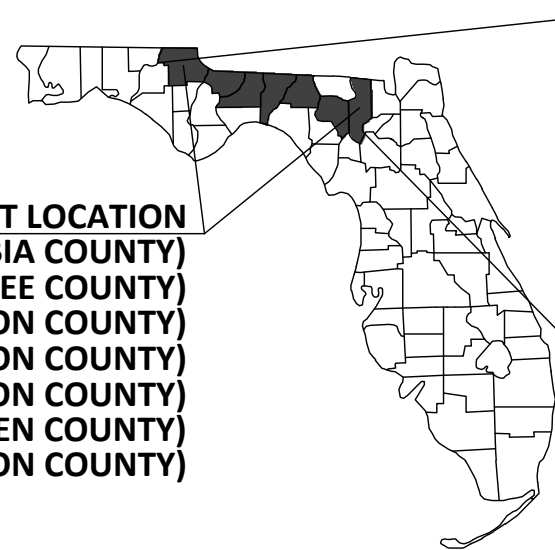
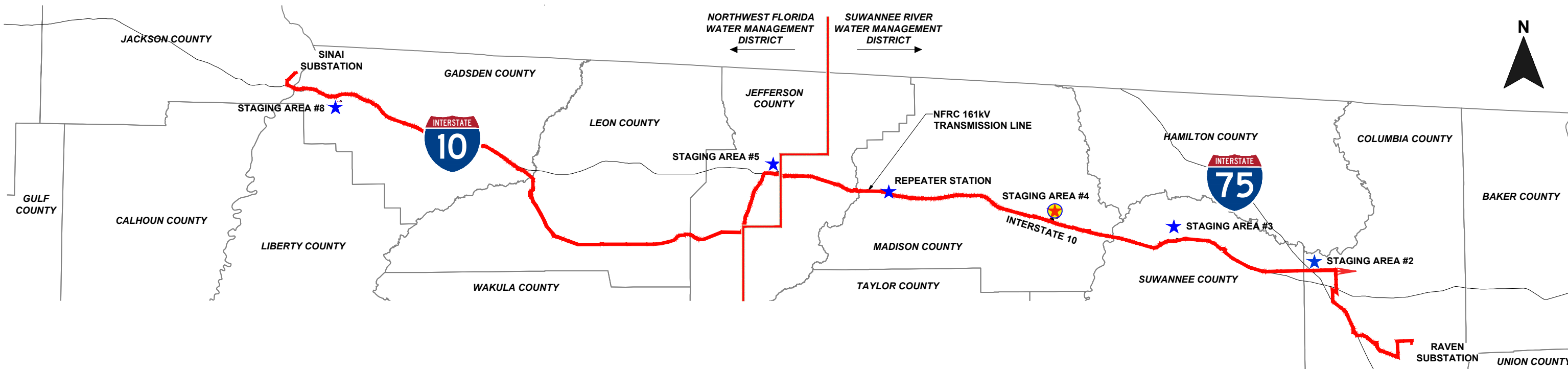


GULF POWER COMPANY

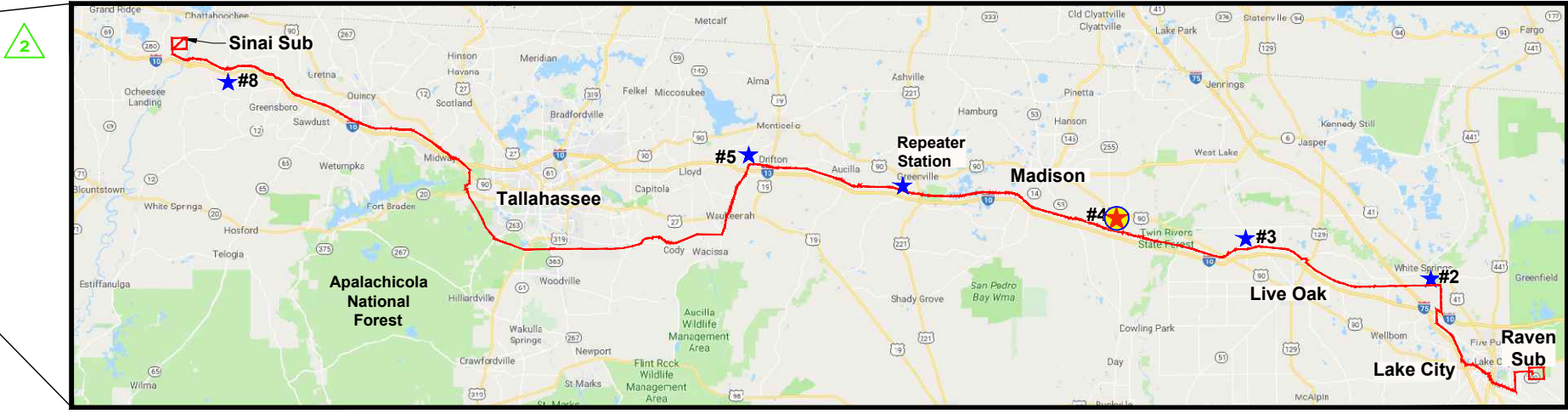
NFRC TRANSMISSION LINE PROJECT △2

TEMPORARY STAGING AREA NO. 4

SITE PLAN EXHIBIT



PROJECT LOCATION
 (COLUMBIA COUNTY)
 (SUWANNEE COUNTY)
 (MADISON COUNTY)
 (JEFFERSON COUNTY)
 (LEON COUNTY)
 (GADSDEN COUNTY)
 (JACKSON COUNTY)



LEGEND

- PROPOSED STAGING AREAS & REPEATER STATION
- ★ REPEATER STATION



Know what's below.
before you dig.

CONTENTS	
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PLAN VIEW AND CROSS SECTIONS	SHEETS 3 - 4
TYPICAL CONSTRUCTION DETAILS	SHEET 5
FENCE AND BMP DETAILS	SHEET 6

NOTICE:
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PICKETT SURVEYING • ENGINEERING
 PICKETT AND ASSOCIATES, INC
 5025 WEST GRACE STREET
 TAMPA, FLORIDA 33607
 PHONE: (813) 877-7770
 CA #31323 LB #364

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STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 MICHAEL LEAHY, P.E., P.S.M.
 LICENSE NO. 12287
 EXPIRES 12/31/2020

TRANSMISSION ENGINEERING DEPARTMENT

SCALE: N.T.S. ENGINEER: MKL SECTION: 21-1S-10E
 DRAFTER: GCC CHECKED: JJB COUNTY: MADISON
 SHEET: 1 OF 6 FILE NAME: NFRC_EXH_SA04_R02.dwg

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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY
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1	11/22/19	REVISIONS, CLARIFICATIONS FOR RAI RESPONSE 11-22-19	GCC JJB MKL

NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
 STAGING AREA NO. 4 SITE PLAN EXHIBIT
 FOR TEMPORARY USE AS LAYDOWN YARDS

Gulf Power

STAGING AREA NO. 4 SITE PLAN EXHIBIT

GULF POWER COMPANY

NFRC TRANSMISSION LINE PROJECT

TEMPORARY STAGING AREA NO. 4

SITE PLAN EXHIBIT

SURVEYOR'S NOTES:

1. NORTH, THE BEARINGS AND THE COORDINATES SHOWN HEREON ARE REFERENCE TO THE WEST ZONE OF THE FLORIDA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (NAD 83/ FLW-83) CORS 2011..
2. ELEVATIONS ARE TO NORTH AMERICAN VERTICAL DATUM OF 1988 AND ARE FOR REFERENCE AND GRAPHICAL DISPLAY PURPOSES ONLY. TEMPORARY BENCHMARKS WILL BE SET AT EACH CROSSING SITE LOCATION AS REQUIRED.
3. SURVEY INFORMATION SHOWN HEREON PERTAINING TO RIGHT-OF-WAY AND EASEMENTS IS BASED ON A SURVEYS PROVIDED BY GULF POWER.
4. NO UNDERGROUND UTILITIES AND/OR IMPROVEMENTS SHOWN HEREON A SUBSURFACE INVESTIGATION WAS NOT PERFORMED AS PART OF THIS SURVEY.
5. THE AERIAL IMAGERY SHOWN HEREIN ARE A COMBINATION OF 2015/2016/2017 ORTHOGRAPHIC IMAGES OBTAINED FROM THE FLORIDA DEPARTMENT OF TRANSPORTATION A+PLUS WEBSITE.
6. PROPERTY THE PROPOSED STAGING AREA IS LOCATED ON IS THERE BY GRANTED EASEMENT TO GULF POWER.

SITE DATA:

STAGING AREA #4 - MADISON COUNTY - SRWMD
 S. DALE LESLIE DR., MADISON, FL
 PID 21-1S-10-1290-001-000

PROJECT NARRATIVE:

TEMPORARY STAGING AREA NO. 4 IS REQUIRED TO STAGE AND STORE CONSTRUCTION MATERIALS (POLES, CONDUCTOR, INSULATORS, ETC.) AND EQUIPMENT (DRILL RIGS, LINE TRUCKS, CRANES, ETC.) FOR THE NORTH FLORIDA RESILIENCY CONNECTION (NFRC) PROJECT. THE NFRC PROJECT IS A 176 MILE LENGTH CORRIDOR THAT IS BROKEN UP INTO APPROXIMATELY 20 MILE SEGMENTS RESULTING IN THE NEED FOR FIVE (5) TOTAL TEMPORARY STAGING AREAS. EACH STAGING AREA IS SIZED TO BE ABLE TO STORE ITS PRO-RATA SHARE OF THE MATERIAL. THE AVERAGE SITE SELECTION CRITERIA IS FOR EACH STAGING AREA TO BE APPROXIMATELY 16.0 ACRES TOTAL WITH APPROXIMATELY 12.6 ACRES OF DEVELOPED AREA. THE DEVELOPED AREA WILL CONSIST OF AN AT GRADE #57 CRUSHED LIMEROCK SURFACE ON UNCOMPACTED SUBBASE TO FACILITATE THE STORAGE OF POLES AND EQUIPMENT ALONG WITH A GEOWEB SEDIMENT CONTAINMENT CELL PERIMETER ROAD OF #57 CRUSHED LIMEROCK FILL TO FACILITATE ACCESS.

TEMPORARY STAGING AREA NO. 4 SITE PLAN STORMWATER DESIGN HAS BEEN REVIEWED TO ENSURE THAT EXISTING SURFACE WATER FLOW WILL FLOW SIMILAR TO ITS PREDEVELOPED CONDITIION. THE DIFFERENCE BETWEEN PRE AND POST-DEVELOPED RUNOFF WILL BE STORED ON SITE WITH DRY RETENTION PONDS AND/OR THE ROCK VOIDS. DISCHARGE WILL NOT EXCEED THE PRE-DEVELOPED CONDITION FOR WATER TREATMENT AND RECOVERY. THIS SITE WILL USE A COMBINATION OF THE VOID SPACE BETWEEN THE #57 CRUSHED LIMEROCK AND A SERIES OF CHECK DAMN SYSTEMS MADE WITH WATER AND ROOT BARRIER SYSTEMS FOR STORAGE FOR THE FIRST 1" OR THE FIRST 1/2" OF RUNOFF, WHICH EVER IS GREATER, AS DIRECTED BY THE GOVERNING SUWANNEE RIVER WATER MANAGEMENT DISTRICT STORMWATER DESIGN MANUAL REQUIREMENTS. GULF POWER HAS DONE EXTENSIVE TESTING ON THIS VOID RATIO AND HAS DETERMINED THAT A 35% VOID RATIO PROVIDES A GOOD CONSERVATIVE VALUE. ANY TREATMENT VOLUMES NOT ABLE TO RECOVER IN THE ROCK VOIDS WILL UTILIZE DRY RETENTION PONDS FOR THE REMAINING VOLUME. THE TREATMENT VOLUMES ARE DESIGNED TO RECOVER WITHIN THE 72 HOUR REQUIREMENT. SOIL BORINGS AND DOUBLE RING INFILTRMETER TESTING WAS PERFORMED AT EACH SITE TO FACILITATE THE DESIGN OF EACH DRY POND AND ROCK VOID STORAGE AREA. REFER TO GEOGRAPHICAL REPORT FOR DETAILS.

TEMPORARY STAGING ARE NO. 4 WILL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT. AT THE CONCLUSION OF THE PROJECT, THIS SITE WILL BE RETURNED TO ITS PRE-CONSTRUCTION STATE BY THE CONTRACTOR. THE ANTICIPATED DURATION IS APPROXIMATELY 12 - 18 MONTHS.

GENERAL SITE NOTES:

1. CONSTRUCTION AND MAINTENANCE ACCESS TO TEMPORARY STAGING AREA NO. 4 WILL BE GAINED VIA EXISTING ROAD RIGHT-OF-WAY OF SE DALE LESLIE DRIVE. CONNECTOR APRONS WILL BE CONSTRUCTED IN ACCORDANCE WITH COUNTY / STATE REQUIREMENTS.
2. TEMPORARY STAGING AREA NO. 4 EXISTS ON EASEMENTS MADE THRU LAND NEGOTIATIONS WITH CURRENT LANDOWNERS. THIS SITE HAS UNDERGONE A FULL EVALUATION / VETTING RELATIVE TO AVOIDANCE OF ENVIRONMENTAL, CULTURAL, AND WILDLIFE HABITAT IMPACT. NO TREE REMOVAL WILL BE NECESSARY TO FACILITATE CONSTRUCTION OF THIS SITE.
3. TEMPORARY STAGING AREA NO. 4 WILL CONFORM WITH ALL FEDERAL, STATE, AND LOCAL ORDINANCES AND REGULATIONS FOR LONG TERM STORAGE MATERIALS.
4. DELIVERIES AND ACTIVE USE OF THIS SITE WILL BE CONSISTENT WITH CONSTRUCTION HOURS.
5. ALL PROPOSED SEMI-PERVIOUS MATERIAL WILL BE INSTALLED AT THE EXISTING NATURAL GROUND ELEVATION THROUGHOUT THE SITE TO MINIMIZE IMPEDANCE OF THE EXISTING WATERSHED.
6. WHEN THE PROPOSED ACTIVITIES OCCUR ADJACENT TO WETLANDS, APPROPRIATE SEDIMENT CONTROL METHODS WILL BE USED, AS REQUIRED. SEDIMENT CONTROLS INCLUDE THE INSTALLATION OF STAKED SILT FENCES ALONG PROPOSED FILL ADJACENT WETLANDS. NO FILL OR GRADING WORK WILL OCCUR IN WETLAND AREAS.

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL INSTALL AND MAINTAIN BMP'S PER THE APPROVED SWPPP (STORM WATER POLLUTION PREVENTION PLAN, I.E. SILT FENCE, TURBIDITY BARRIER) AND WWACCM MANUAL AROUND THE PERIMETER TO THE WORK ZONES DURING CONSTRUCTION. BMP'S SHALL ONLY BE REMOVED AFTER ALL CONSTRUCTION HAS BEEN COMPLETED AND ESTABLISHED.
2. CONTRACTOR SHALL CONSTRUCT PONDS AND/OR SWALES AS SHOWN IN THE DRAWINGS. CONTRACTOR SHALL SOD THE SIDE SLOPES AFTER GRADING TO STABILIZE THE DISTURBED SOIL AND EMBANKMENTS AND TO CONTROL EROSION. SEEDING AND SODDING SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. THE SIDES OF POND/SWALE AREAS SHALL BE SODDED AND THE BOTTOMS SHALL BE SEEDED AND MULCHED.CONTRACTOR SHALL DISC THE AREAS TO EMBED THE SEED AND MULCH AND SHALL THEN RE-COMPACT THE SURFACE.CONTRACTOR SHALL MAINTAIN THE SOD AND SEED UNTIL FINAL ACCEPTANCE OF THE WORK.
3. CONTRACTOR SHALL INSTALL CHECK DAMS ALONG THE EXISTING (1) ONE FOOT CONTOUR ELEVATIONS AS SHOWN ON THE PLANS AND ALONG THE INTERIOR OF THE ROADWAYS BETWEEN THE ROCK LAYDOWN AREAS AND THE EDGE OF GEOWEB ROAD. SEE DETAIL 3 ON SHEET 5.
4. CONTRACTOR SHALL REMOVE THE TOP LAYER OF VEGETATION ON THE SITE BEFORE BEGINNING ANY GRADING OR SITE WORK. SITE SHALL MAINTAIN EXISTING SLOPES AND GENERAL GRADING CHARACTERISTICS.
5. IF ANY OBSTRUCTIONS OR VARIANCES EXIST, CONTRACTOR MUST NOTIFY THE ENGINEER OF RECORD.

FLOOD ZONE NOTES:

1. FLOOD ZONE INFORMATION BASED ON THE COLUMBIA COUNTY, FLORIDA FLOOD INSURANCE RATE MAPS:

MAP NUMBER 12079C0314C (DATED 05-03-10)

2. APPLICABLE FLOOD ZONE DELINEATIONS PER THE ABOVE REFERENCED FLOOD INSURANCE RATE MAP ARE AS FOLLOWS:

ZONE A AREA SUBJECT TO THE 100-YEAR FLOOD PLAIN
ZONE X AREA OUTSIDE THE 100-YEAR FLOOD PLAIN

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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP

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STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 MICHAEL K. LEAHY
 LICENSE NO. 12079C0314C
 EXPIRES 03-18-20

TRANSMISSION ENGINEERING DEPARTMENT

SCALE: N.T.S.	ENGINEER: MKL	SECTION: 21-1S-10E
DRAFTER: GCC	CHECKED: JJB	COUNTY: MADISON
SHEET: 2 OF 6		FILE NAME: NFRC_EXH_SA04_R02.dwg

NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
 STAGING AREA NO. 4 SITE PLAN EXHIBIT
 FOR TEMPORARY LAYDOWN YARDS



STAGING AREA NO. 4
SITE PLAN EXHIBIT

CAD FILE: S:\Projects\108_Gulf Power\19-108-1002_Raven-Sinal_161kV Line Detailed Engineering\Drawings\Staging_Areas_Exhibit\NFRC_Exh_SA04_R02.dwg PLOT DATE/TIME: 3/18/2020 - 9:09am By: Josh Baker

Staging Area #4 - Madison County - SRWMD

S. Dale Leslie Dr., Madison, FL

PID 21-15-10-1290-001-000

Table 3: Pond Storage Data

Basin No.	Elevation (ft, NAVD 88)	Area (ac)	Provided Volume (acft)	Required Volume (acft)	Provided Discharge at Weir (cfs)
I	Top of Pond	90.0	0.51	0.90	0.50
	Peak Water Elev.	89.1			
	Weir Elev.	88.9			
II	Top of Pond	88.0	0.56	4.10	1.09
	Peak Water Elev.	87.1			
	Weir Elev.	86.9			
III	Top of Pond	84.5	1.58	5.53	4.87
	Peak Water Elev.	83.6			
	Weir Elev.	83.0			
IV	Top of Pond	85.3	2.34	10.96	10.66
	Peak Water Elev.	84.5			
	Weir Elev.	83.4			
V.1	Top of Pond	94.9	0.74	1.84	1.33
	Peak Water Elev.	93.9			
	Weir Elev.	93.9			
V.2	Top of Pond	94.3	1.60	4.25	2.97
	Peak Water Elev.	93.3			
	Weir Elev.	93.2			
	Bottom of Pond	91.3	1.42		

Table 4: Summary of Treatment Volume and Recovery

Basin No.	Treatment Volume Required (acft)	Treatment Volume Provided (acft)		Recovery Time (hrs)
		Rock Voids	Water Quality Basins	
I	0.08	0.06	Not Required for Treatment	36
II	0.14	0.29	Not Required for Treatment	12
III	0.56	1.39	Not Required for Treatment	12
IV	1.01	2.75	Not Required for Treatment	24
V	0.45	0.76	Not Required for Treatment	24

GENERAL NOTES:

- CHECK DAMS WILL BE INSTALLED ALONG EXISTING (1) ONE FOOT CONTOUR ELEVATIONS AS SHOWN, AND AS A BARRIER BETWEEN THE INTERIOR ROAD EDGE AND GRAVEL LAYDOWN AREA. SEE NOTES ON SHEET 2 AND DETAILS ON SHEET 5.
- INFORMATION OF WATER TABLE DEPTHS FOR SEASONAL HIGH WATER (SHW) ELEVATIONS IS BASED ON GEOTECHNICAL REPORTS PROVIDED BY B.J. ROCK.
- INTERIOR CRUSHED ROCK SHALL NOT BE COMPACTED (TYP.).
- FILL SHALL NOT BE PLACED IN WETLAND AREAS (TYP.).

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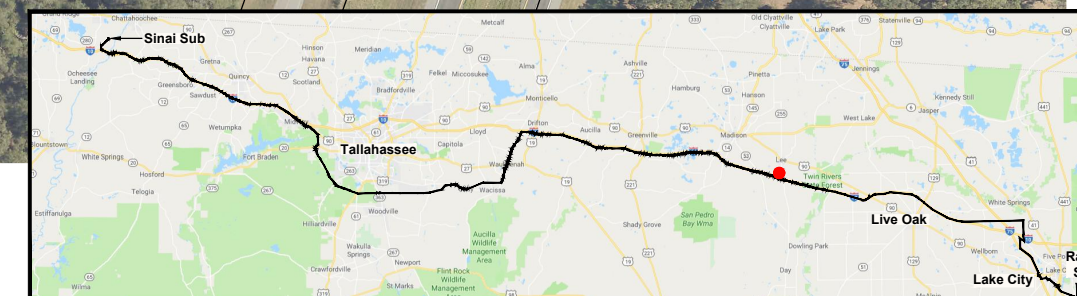
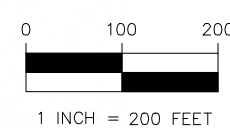
LEGEND

AT-GRADE ROCK LAYDOWN	WETLAND AREAS	FEMA 100-YEAR FLOOD PLAIN LINE
AT-GRADE GEOWEB ROAD	SURFACE WATER AREA	EASEMENT
CRUSHED ROCK APRON	EXISTING GRADE	PROPERTY LINE
PROPOSED GRADE	DRAINAGE BASIN AREA BOUNDARY	SECTION LINE
PROPOSED PONDS & DITCHES	PROPOSED FENCE & GATES	RIGHT-OF-WAY LINE
TOP OF BANK	PROPOSED GATE	EXISTING FENCE
GRADE BREAK	PROPOSED FENCE	PROPOSED SILT FENCE
TOE OF SLOPE		
P/D PROPOSED POND/DITCH		

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PROFESSIONAL SEAL
 STATE OF FLORIDA
 MICHAEL K. LEAHY
 FLORIDA LICENSED PROFESSIONAL ENGINEER No. 45287
 PROFESSIONAL SURVEYOR & MAPPER No. 5658

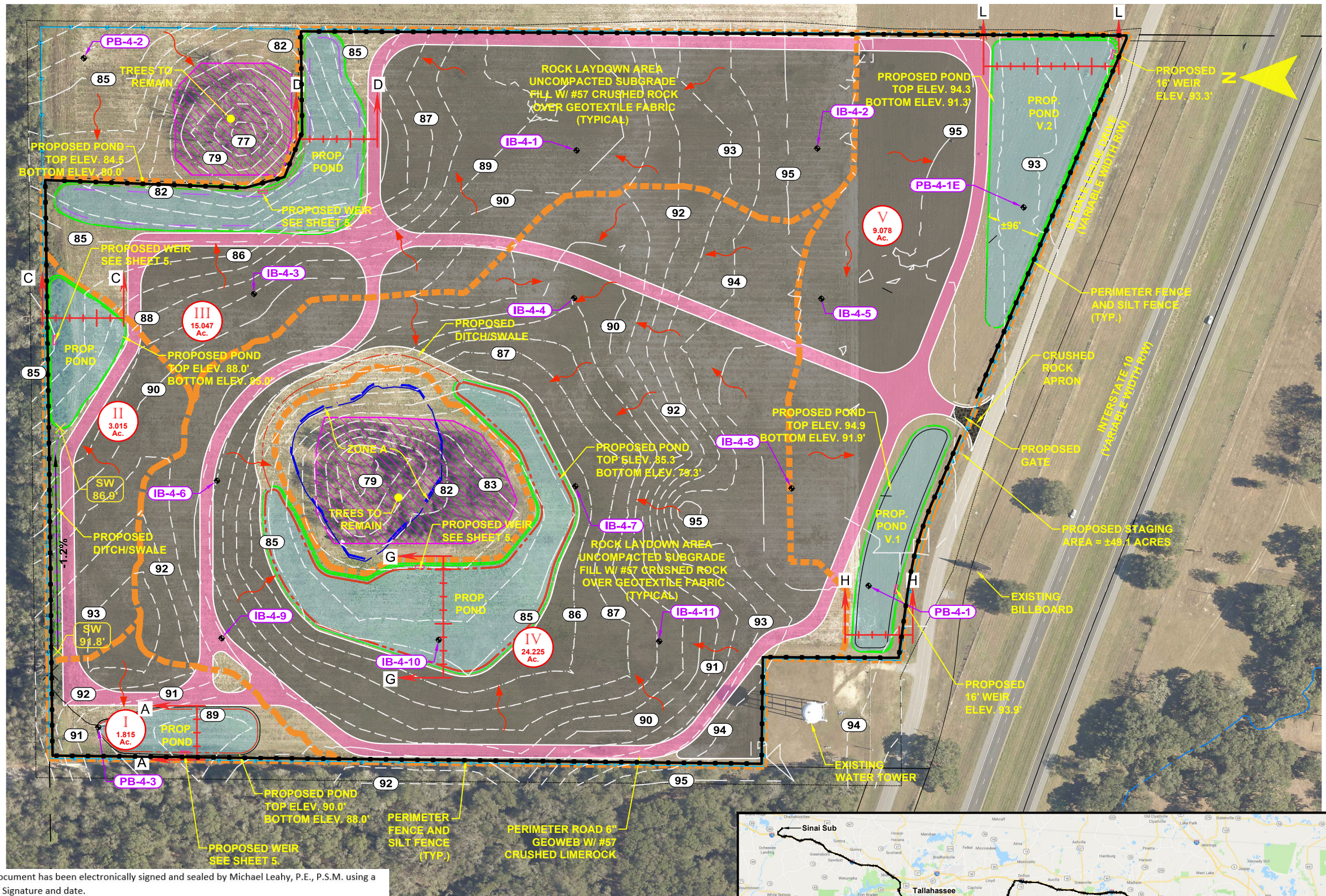


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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP

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NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
 STAGING AREA NO. 4 SITE PLAN EXHIBIT
 FOR TEMPORARY LAYDOWN YARDS

STAGING AREA NO. 4 SITE PLAN EXHIBIT



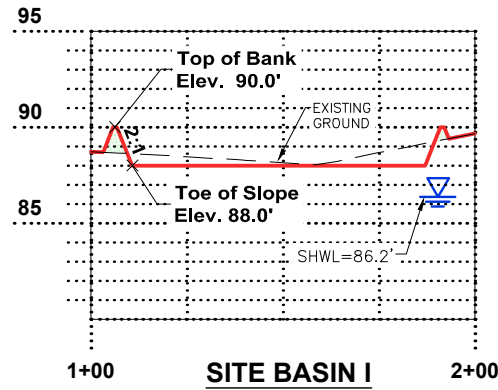
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Staging Area #4 - Madison County - SRWMD

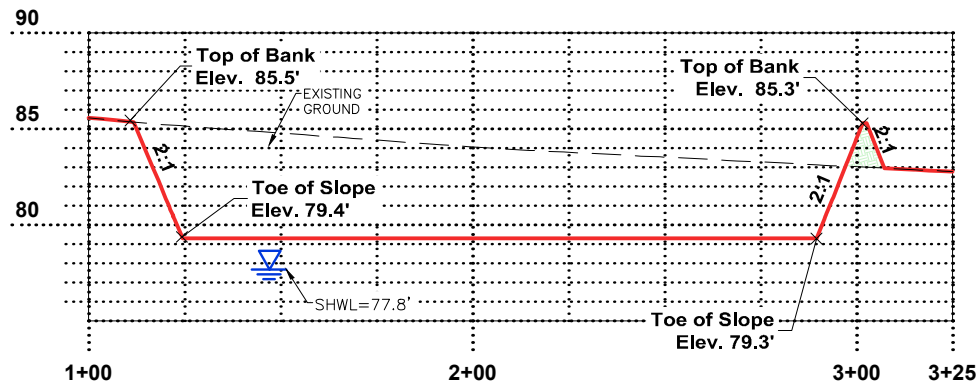
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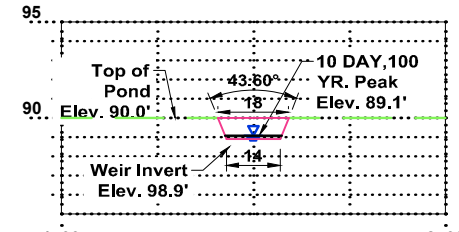
SEE SHEET 2 FOR NOTES & SITE DETAILS
SEE SHEET 13 FOR TYPICAL CONSTRUCTION DETAILS



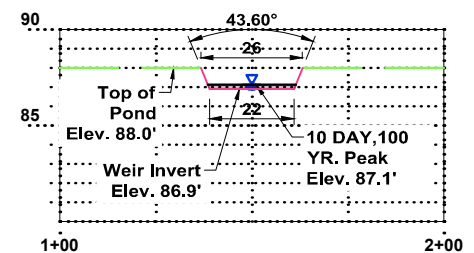
SITE BASIN I
CROSS SECTION VEIW A-A
LOOKING NORTH
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



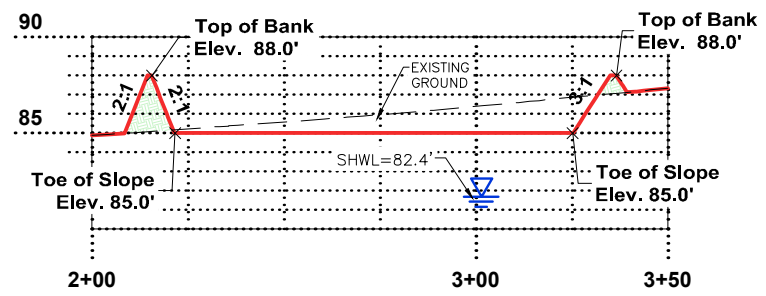
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LOOKING NORTH
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



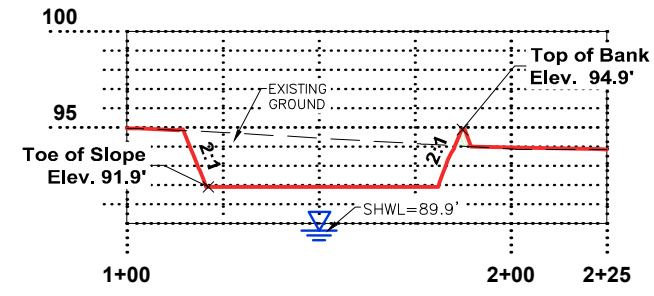
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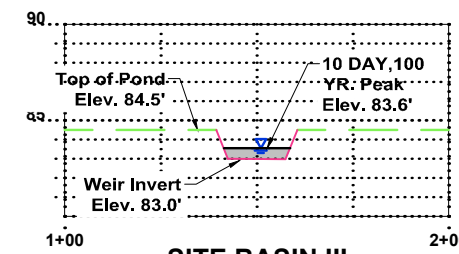
SITE BASIN II
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VERT. SCALE = 1" = 10'



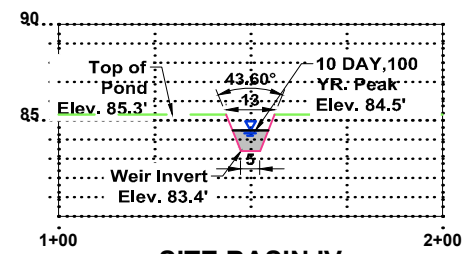
SITE BASIN II
CROSS SECTION VEIW C-C
LOOKING EAST
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



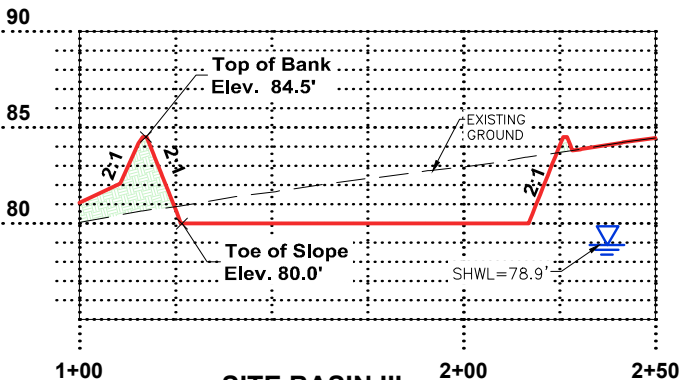
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LOOKING EAST
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



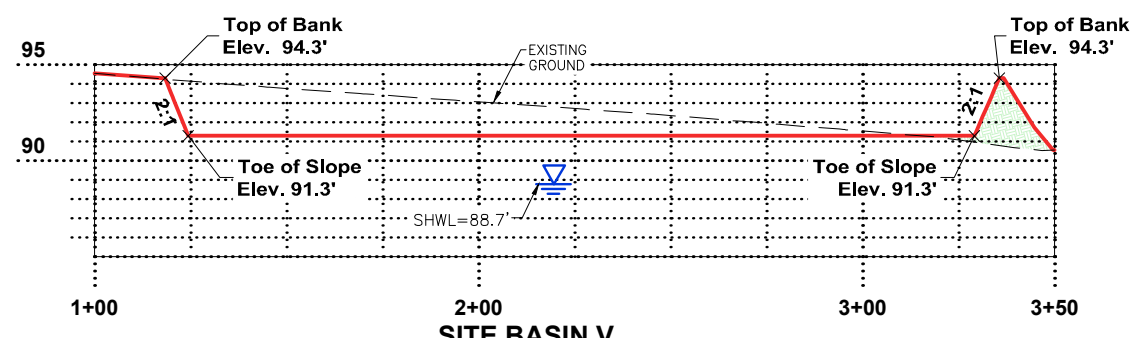
SITE BASIN III
CROSS SECTION VEIW
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



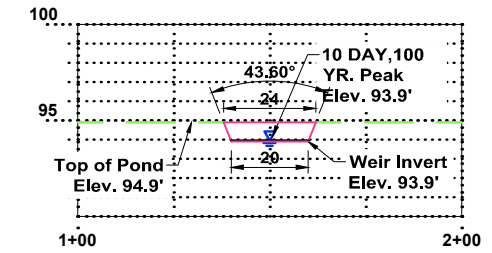
SITE BASIN IV
CROSS SECTION VEIW
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



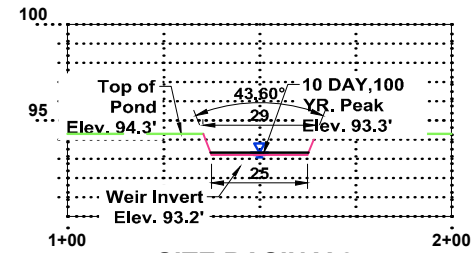
SITE BASIN III
CROSS SECTION VEIW D-D
LOOKING EAST
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



SITE BASIN V
CROSS SECTION VEIW L-L
LOOKING EAST
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



SITE BASIN V.1
CROSS SECTION VEIW
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'



SITE BASIN V.2
CROSS SECTION VEIW
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10'

LEGEND
--- EXISTING GROUND
--- PROPOSED GROUND

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STATE OF FLORIDA
MICHAEL LEAHY
FLORIDA LICENSED PROFESSIONAL ENGINEER NO. 45287
PROFESSIONAL SURVEYOR & MAPPER NO. 6658

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DRAFTER: GCC CHECKED: JJB COUNTY: MADISON
SHEET: 4 OF 6 FILE NAME: NFRC_EXH_SA04_R02.dwg

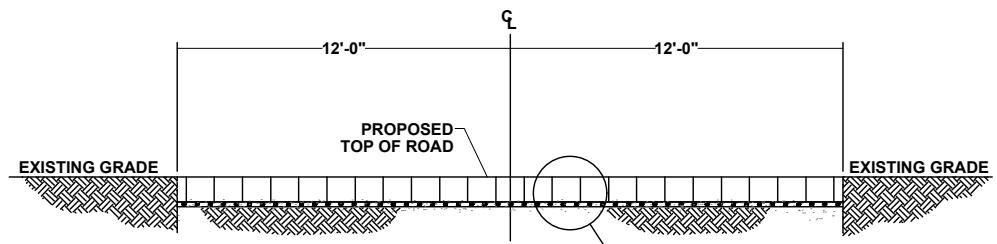
NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
STAGING AREA NO. 4 SITE PLAN EXHIBIT
FOR TEMPORARY LAYDOWN YARDS

Gulf Power

STAGING AREA NO. 4 SITE PLAN EXHIBIT

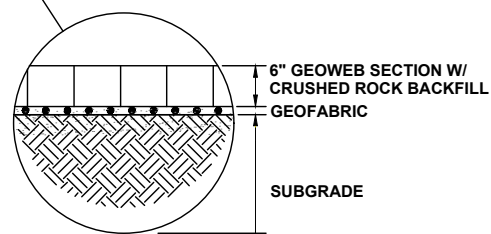
CAD FILE: S:\Projects\108_Gulf Power\19-108-1002_Raven-Sinal\161KV Line Detailed Engineering\Drawings\Staging Areas Exhibit\NFRC_Exh_SA04_R02.dwg PLOT DATE/TIME: 3/17/2020 4:20pm By: Josh Baker

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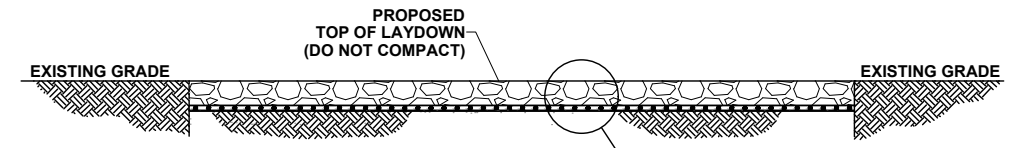
TEMPORARY ROADWAY IMPROVEMENTS - AT GRADE GEOWEB STABILIZATION

1. REMOVE THE TOP 6" OF EXISTING VEGETATED SURFACE MATERIAL BEFORE INSTALLING THE TEMPORARY ROADWAY IMPROVEMENTS.
2. SMOOTH SUBGRADE TO LEVEL ELEVATION ACROSS WIDTH OF 24' WIDE TEMPORARY ROAD.
3. PLACE ROAD BEDLINER, MIRAFI RS580i HIGH STRENGTH WOVEN GEOTEXTILE FABRIC, OR APPROVED EQUIVALENT. INSTALL GEOTEXTILE FABRIC PROVIDING MINIMUM LAP AS PER MANUFACTURER INSTALLATION INSTRUCTIONS AT THE LAP JOINT.
4. INSTALL 6" PERFORATED GEOWEB AND FILL WITH 4. NO 57 CRUSHED LIMEROCK.



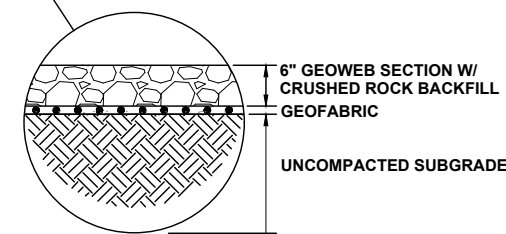
DETAIL 1

TEMPORARY ROADWAY IMPROVEMENT AT-GRADE GEOWEB STABILIZATION WITH CRUSHED ROCK BACKFILL



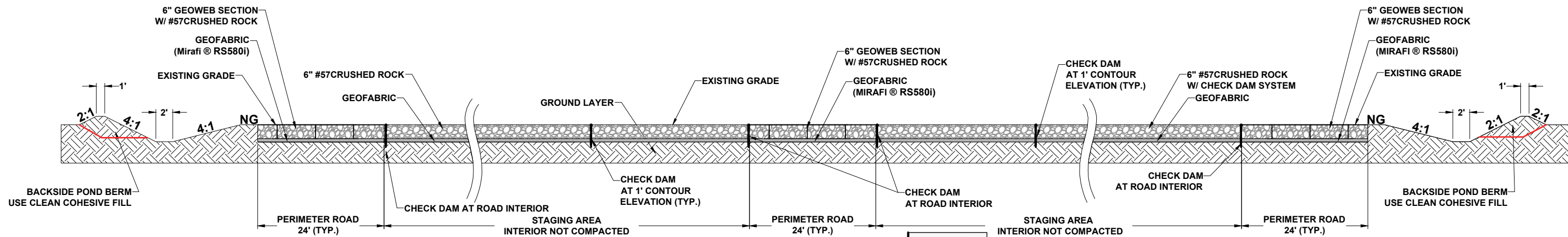
TEMPORARY - AT GRADE LAYDOWN STABILIZATION

1. REMOVE THE TOP 6" LAYER OF EXISTING VEGETATED SURFACE MATERIAL BEFORE INSTALLING THE TEMPORARY LAYDOWN STABILIZATION. DO NOT COMPACT SUBGRADE.
2. INSTALL CHECK DAM SYSTEM AT EXISTING 1 FOOT CONTOURS, USING 12" CR-PE MULTI PURPOSE ROOT & WATER BARRIER, OR EQUIVILANT (SEE TYPICAL PROFILE OF CHECK DAM SYSTEM). BURY 6" DEEP AND LEAVE TOP 6" EXPOSED AND PLUM.
3. PLACE ROAD BEDLINER, MIRAFI RS580i HIGH STRENGTH WOVEN GEOTEXTILE FABRIC, OR APPROVED EQUIVALENT. INSTALL GEOTEXTILE FABRIC PROVIDING MINIMUM LAP AS PER MANUFACTURER INSTALLATION INSTRUCTIONS AT THE LAP JOINT.
4. INSTALL 6" WASHED NO 57 CRUSHED ROCK BACKFILL.



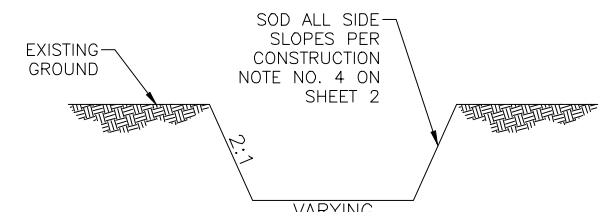
DETAIL 2

TEMPORARY LAYDOWN AREA IMPROVEMENT AT-GRADE WASHED CRUSHED ROCK BACKFILL



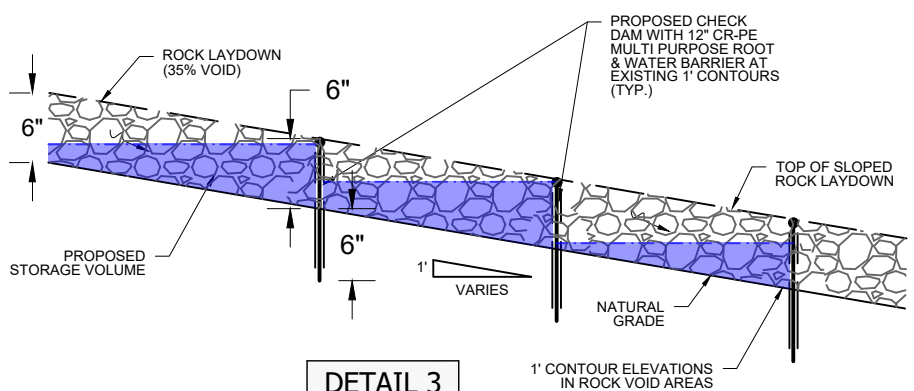
DETAIL 4

TYPICAL CROSS SECTION PLAN FOR TEMPORARY ROCK LAYDOWN YARDS



DETAIL 5

STANDARD SWALE CROSS SECTION N.T.S.



DETAIL 3

TYPICAL PROFILE OF CHECK DAM SYSTEM FOR TEMPORARY ROCK LAYDOWN YARDS

NOTICE:
 CONTRACTOR SHALL VERIFY ALL CONDITIONS ON JOB SITE & NOTIFY PROJECT MANAGER AND ENGINEER OF ANY VARIATIONS FROM DIMENSIONS SHOWN ON THESE DRAWINGS BEFORE PROCEEDING WITH ANY CONSTRUCTION.

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PICKETT AND ASSOCIATES, INC
 5025 WEST GRACE STREET
 TAMPA, FLORIDA 33607
 PHONE: (813) 877-7770
 CA #31323 LB #364

STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 MICHAEL LEAHY
 LICENSE NO. 15227
 EXPIRES 08/18/20

1. This document has been electronically signed and sealed by Michael Leahy, P.E., P.S.M. using a Digital Signature and date.
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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY
2	3/18/20	REVISIONS, CLARIFICATIONS FOR RAI#2 RESPONSE 12-20-19	GCC JJB MKL
1	11/22/19	REVISIONS, CLARIFICATIONS FOR RAI RESPONSE 11-22-19	GCC JJB MKL
			BY: CHK APP

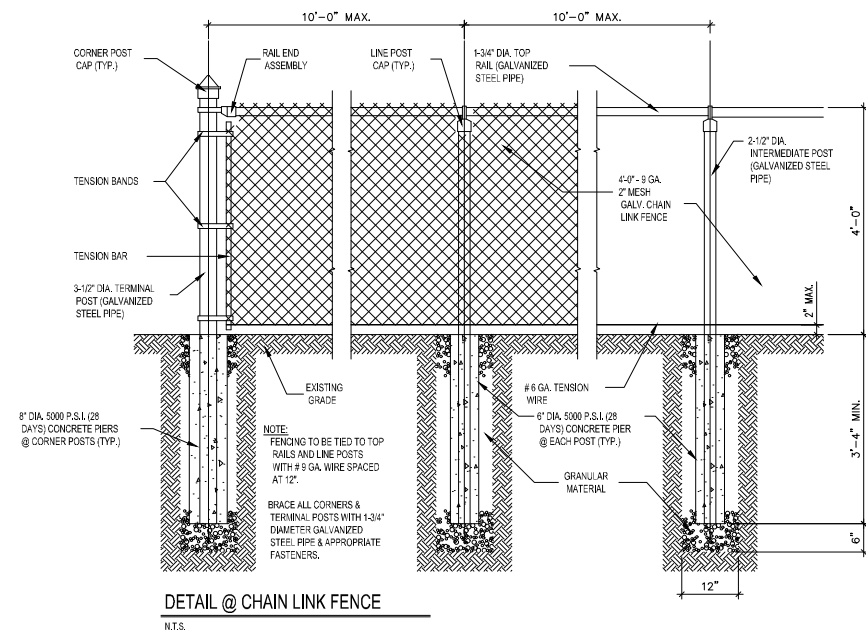
TRANSMISSION ENGINEERING DEPARTMENT
 NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
 STAGING AREA NO. 4 SITE PLAN EXHIBIT FOR TEMPORARY LAYDOWN YARDS

SCALE: N.T.S. ENGINEER: MKL SECTION: AS SHOWN
 DRAFTER: GCC CHECKED: JJB COUNTY: AS SHOWN
 SHEET: 5 OF 6 FILE NAME: NFRC_EXH_SA04_R02.dwg

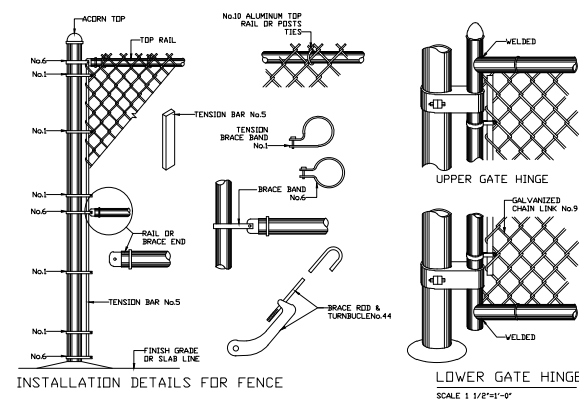
Gulf Power

STAGING AREA NO. 4 SITE PLAN EXHIBIT

PERIMETER FENCE DETAILS

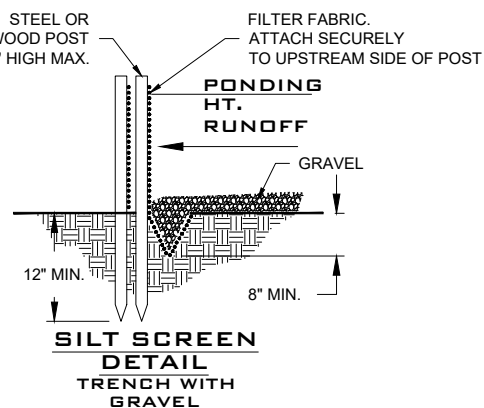


DETAIL @ CHAIN LINK FENCE
N.T.S.

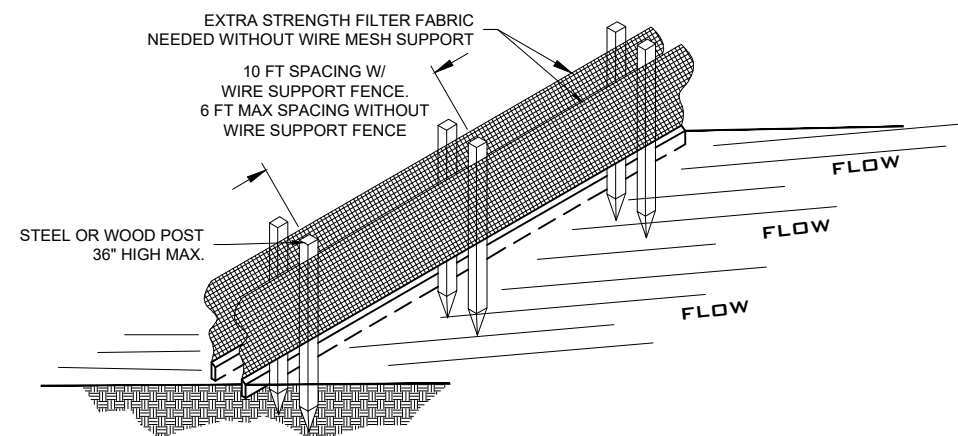


CHAIN LINK FENCE TYPICAL HARDWARE DETAILS

EROSION CONTROL DETAILS



SILT SCREEN
DETAIL
TRENCH WITH
GRAVEL



NOTICE:
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TAMPA, FLORIDA 33607
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CA #31323 LB #364

I HEREBY CERTIFY THAT THIS DRAWING WAS PREPARED UNDER MY DIRECT SUPERVISION AND I AM A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA. I AM NOT PROVIDING ANY DESIGN OR SPECIFICATIONS TO BE USED IN CONSTRUCTION OF ANY BUILDING OR STRUCTURE.

STATE OF FLORIDA
MICHAEL LEAHY
FLORIDA LICENSED PROFESSIONAL ENGINEER NO. 12287
PROFESSIONAL SEAL

- This document has been electronically signed and sealed by Michael Leahy, P.E., P.S.M. using a Digital Signature and date.
- Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

2	3/18/20	REVISIONS, CLARIFICATIONS FOR RAI#2 RESPONSE 12-20-19	GCC	JJB	MKL
1	11/22/19	REVISIONS, CLARIFICATIONS FOR RAI RESPONSE 11-22-19	GCC	JJB	MKL
NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP

TRANSMISSION ENGINEERING DEPARTMENT

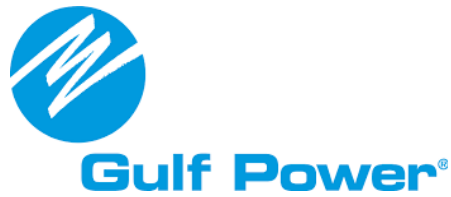
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NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
STAGING AREA NO. 4 SITE PLANS EXHIBIT
FOR TEMPORARY LAYDOWN YARDS



**STAGING AREA NO. 4
SITE PLAN EXHIBIT**

Temporary Staging Area #4
Stormwater Calculations
for the
North Florida Resiliency Connection Project



Gulf Power
15430 Endeavor Drive
Jupiter, FL 33478

Prepared by:



Pickett and Associates, Inc.
5025 W. Grace Street
Tampa, FL 33607

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Appendix D – SRWMD Rainfall Distribution Data	
Appendix E – SRWMD Boundary Map	

1.0 Site Data

Madison County – SRWMD

S. Dale Leslie Dr.

Madison, FL

PID 21-15-10-1290-001-000

Basin Area = 53.03 acres

Developed Area = 34.04 acres

Flood Zone X per FIRM Map 12079C0314C effective 05-03-10

Design Storm, Non Ag: 100 year, SCS Type II Distribution. 1-, 2-, 4-, 8-, 24-hour and 3-, 7-, and 10-day duration.

Recovery (Attenuation)

1. Provide treatment volumes within 72 hours following the end of the design storm event.

2.0 Project Narrative

Temporary Staging Area #4 will stage and store construction materials (poles, conductor, insulators, etc.) and equipment (drill rigs, line trucks, cranes, etc.). The developed area will consist of an at grade #57 crushed limerock surface to facilitate the storage of poles and equipment along with a perimeter road to facilitate access. The site has been reviewed to ensure that existing surface water flow will not be impeded and existing water quality will not be adversely impacted. All proposed semi-pervious material will be installed at the existing natural ground elevation throughout the site to prevent impedance of the existing watershed.

The staging area will use the void space between the #57 crushed limerock for storage for the first 1" of runoff. Gulf Power has done extensive testing on this void ratio and has determined that a 40% void ratio provides a good conservative value. In addition to utilizing the voids for storage, each site will have a swale / berm constructed on the low side(s) of each to ensure no stormwater runoff escapes to adjacent properties. Each site will also have a dry retention pond to account for attenuation. The ponds will be designed to recover within 72 hours. Soil Borings and Double Ring Infiltrometer Testing have been performed at each site to facilitate the design of each dry pond. The site will use the interior uncompacted gravel as additional area for recovery by incorporating the use of a check dam system. Since the site has a slight grade change, an impervious, flexible water barrier (CR-PE12-20) will be installed along each contour line to slow the progression of water over the site to allow recovery within 72 hours. This is detailed in the construction drawings.

The staging area will remain in place for the duration of the project. At the conclusion of the project, each staging area will be returned to its pre-construction state. The anticipated duration is approximately 12 – 18 months.

Construction and maintenance access to each staging area will be gained via existing road right-of-way. Connector aprons will be constructed in accordance with county / state requirements.

Deliveries and active use of staging areas will be consistent with construction hours.

No tree removal will be necessary to facilitate construction of staging area #4.

3.0 Stormwater Calculations

The SCS TR-20 method was used to calculate the pre and post-development peak runoff. The time of concentration was generated from the sheet, shallow concentrated flow and Lag/CN method. A complete list of the procedure follows.

Assumptions and Methodology

The SRWMD requires that the difference between the 100-year pre-developed and post-developed storm volume be stored on-site with the maximum release rate not exceed the pre-developed flow, Q. Per the SRWMD Handbook, the 100-year storm shall be evaluated for the greatest of the 1, 2, 4, 8, and 24 hour, 3, 7, and 10 days storms.

- Storm Frequency – Type II 100 Year, 1, 2, 4, 8, and 24 hour, 3, 7, and 10 day storms
- Runoff Curve Number – Weighted Curve Numbers were calculated for each area
 - Existing Conditions Curve Number Range: 30-35
 - Post-Developed Condition Curve Number Range: 30-76
- Calculation of Time of Concentrations
 - Lag/CN Method – Which is used for areas of 2000 acres or less. The formula is provided below:
 - $T_c = 0.00526 \times L^{0.8}(1000/CN-9)^{0.7} \times S^{-0.5}$
- Peak Flow Rate Calculations – HydroCAD Version 10.0
- Pond Recovery Calculations – PONDS Version 3.3

Pre-Development Summary

Staging Area 4 has mild slopes of up to 2-6% and generally consists of grasses. Table 1 below includes the results of the pre-development drainage area runoff calculations for the peak flow. These were developed using the topography which can be seen on the plan set and HydroCAD (Appendix B). Table 1 summarizes the peak flows for the various 100-year design storm in the pre-developed condition. The storm with the greatest runoff volume was used in the calculations. In this case, the 100-year, 10-day storm generated the greatest runoff and thus was used as the design storm.

Sub-Basin	Area (Acre)	Weighted CN	Time of Concentration (Min.)	Type II, 100-Year Storm, Q ₁₀₀ (CFS)							
				1 HR	2 HR	4 HR	8 HR	24 HR	3 DAY	7 DAY	10 DAY
				I	1.82	30	41.8	0.00	0.00	0.01	0.17
II	3.01	30	33.2	0.00	0.00	0.00	0.29	1.18	3.56	5.52	8.55
III	11.99	35	92.1	0.00	0.06	0.86	1.97	3.88	8.10	11.30	16.02
IV	21.25	30	110.3	0.00	0.02	0.69	1.61	3.57	8.94	13.32	20.08
V	9.08	30	138.0	0.00	0.01	0.23	0.55	1.16	2.82	4.17	6.24

Post-Development Summary

Upon completion of construction, Staging Area 4 will consist of uncompacted gravel laydown yard with compacted gravel drives. Water quality basins will be generally located at low points in each sub-basin within the site. Table 2 below includes the results of the post- development calculations for the 100-year, 1, 2, 4, 8, and 24 hour, 3, 7, and 10 day peak flows. These were developed using the topography

which can be seen on the plan set and HydroCAD (Appendix B). The difference between the pre-development and post-development storm will be contained within the pond, and anything greater will be conveyed through the outflow weir per the Suwannee River Management District Design Requirement. The storm with the greatest runoff volume was used in the calculations. Again, in this case, the 100-year, 10-day storm generated the greatest runoff and thus was used as the design storm.

Table 2: Post-Developed Peak Discharge											
Sub-Basin	Area (Acre)	Weighted CN	Time of Concentration (Min.)	Type II, 100-Year Storm, Q₁₀₀ (CFS)							
				1 HR	2 HR	4 HR	8 HR	24 HR	3 DAY	7 DAY	10 DAY
I	1.82	46	20.4	0.00	0.00	0.00	0.65	5.02	8.45	10.78	13.98
II	3.01	54	13.7	0.00	0.00	0.00	1.33	15.91	24.07	29.39	36.55
III	11.99	58	48.6	0.00	0.01	1.27	15.94	25.82	38.19	46.20	56.93
IV	21.25	57	42.7	0.00	0.01	1.92	27.97	50	75.66	92.43	115.02
V	9.08	59	65.9	0.00	0.21	2.10	6.81	10.19	16.01	19.88	25.14

Table 3 below summarizes the stormwater quality basin design and key pond elevations with required and provided volumes. It shows that each basin provides the required amount of freeboard (1-foot) and storage required to retain the peak runoff. Peak water surface elevation calculations for detention ponds were developed using HydroCAD (Appendix B).

Table 3: Pond Storage Data						
Basin No.	Elevation (ft, NAVD 88)		Area (ac)	Provided Volume (acft)	Required Volume (acft)	Provided Discharge at Weir (cfs)
I	Top of Pond	90.0	0.51	0.90	0.50	3.46
	Peak Water Elev.	89.1				
	Weir Elev.	88.9				
	Bottom of Pond	88.0	0.45			
II	Top of Pond	88.0	0.56	4.10	1.09	8.54
	Peak Water Elev.	87.1				
	Weir Elev.	86.9				
	Bottom of Pond	85.0	0.47			
III	Top of Pond	84.5	1.58	5.53	4.87	13.99
	Peak Water Elev.	83.6				
	Weir Elev.	83.0				
	Bottom of Pond	80.0	1.23			
IV	Top of Pond	85.3	2.34	10.96	10.66	18.82
	Peak Water Elev.	84.5				
	Weir Elev.	83.4				
	Bottom of Pond	79.3	1.83			
V.1	Top of Pond	94.9	0.74	1.84	1.33	0.38
	Peak Water Elev.	93.9				
	Weir Elev.	93.9				
	Bottom of Pond	91.9	0.61			
V.2	Top of Pond	94.3	1.60	4.25	2.97	2.84
	Peak Water Elev.	93.3				
	Weir Elev.	93.2				
	Bottom of Pond	91.3	1.42			

Water Quality/Treatment Methodology

The SRWMD Handbook requires that all stormwater management systems provide the minimum state water quality treatment requirements. The method utilized for this project consists of one or a combination of percolation in the existing soils within the rock voids of the laydown storage and/or percolation within the stormwater quality basin. To determine the treatment runoff volume, the first 1.0-inch of rainfall was used along with the composite runoff coefficient for each sub-basin. This was compared with the volume from the first 0.5-inch rainfall without the coefficient. The greater volume was used for treatment evaluation and recovery. The calculations can be found starting on Page 7.

Recovery was calculated utilizing the PONDS software, as approved by the district. The rate of recovery was calculated within both the rock voids and if needed, the water quality basins. To model the rock voids, we calculated the available void space within the laydown area using a 35% uncompacted void ratio. An adjusted stage-storage table was input into the PONDS model utilizing a one-half foot increment stage, which corresponds to the height of the check dam. All treatment volumes must recover within 72-hours. See Table 4 for a summary of treatment volumes and recovery times for each sub-basin within the staging area.

Table 4: Summary of Treatment Volume and Recovery				
Basin No.	Treatment Volume Required (acft)	Treatment Volume Provided (acft)		Recovery Time (hrs)
		Rock Voids	Water Quality Basins	
I	0.08	0.06	Not Required for Treatment	36
II	0.14	0.29	Not Required for Treatment	12
III	0.56	1.39	Not Required for Treatment	12
IV	1.01	2.75	Not Required for Treatment	24
V	0.45	0.76	Not Required for Treatment	24

Water Quality Recovery Volume Calculations

BASIN I:

Areas:

$$\text{Total Area} = (79,061 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 1.81 \text{ Ac.}$$

$$\text{Crushed Rock for Laydown Area} = (13,986 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 0.32 \text{ Ac.}$$

$$\text{Crushed Rock Road Area} = (14,362 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 0.33 \text{ Ac.}$$

$$\text{Pond Area} = (22,270 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 0.51 \text{ Ac.}$$

$$\text{Grass Area} = (79,061 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 1.81 \text{ Ac.} - 0.32 \text{ Ac.} - 0.33 \text{ Ac.} - 0.51 \text{ Ac.} = 0.65 \text{ Ac.}$$

Composite Runoff Coefficient:

$$C = \frac{[(C_{\text{rock laydown area}} \times \text{Area}) + (C_{\text{rock road area}} \times \text{Area}) + (C_{\text{pond area}} \times \text{Area}) + (C_{\text{grass area}} \times \text{Area})]}{\text{Total Project Area}}$$

$$C = \frac{[(0.5 \times 0.32 \text{ Ac.}) + (0.7 \times 0.33 \text{ Ac.}) + (1.0 \times 0.51 \text{ Ac.}) + (0.17 \times 0.65)]}{1.81} = 0.56$$

Total Treatment Volume from 1 inch of Rainfall:

$$\text{Treatment Volume} = (C) \times (1 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (.56) \times (1 \text{ in.}) \times (1.81 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = .084 \text{ Ac.}-\text{Ft.}$$

Total Treatment Volume from ½ inch of Rainfall:

$$\text{Treatment Volume} = (0.5 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (0.5 \text{ in.}) \times (1.81 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 0.076 \text{ Ac.}-\text{Ft.}$$

The treatment volume for the project is the larger value, **0.08 Ac.-Ft.**

BASIN II:

Areas:

$$\text{Total Area} = (131,302 \text{ S. F.}) \times \left(\frac{1\text{Ac.}}{43,560 \text{ S. F.}}\right) = 3.01 \text{ Ac.}$$

$$\text{Crushed Rock for Laydown Area} = (71,066 \text{ S. F.}) \times \left(\frac{1\text{Ac.}}{43,560 \text{ S. F.}}\right) = 1.63 \text{ Ac.}$$

$$\text{Crushed Rock Road Area} = (15,677 \text{ S. F.}) \times \left(\frac{1\text{Ac.}}{43,560 \text{ S. F.}}\right) = 0.36 \text{ Ac.}$$

$$\text{Pond Area} = (24,576 \text{ S. F.}) \times \left(\frac{1\text{Ac.}}{43,560 \text{ S. F.}}\right) = 0.56 \text{ Ac.}$$

$$\text{Grass Area} = 3.01 \text{ Ac.} - 1.63 \text{ Ac.} - 0.36 \text{ Ac.} - 0.56 \text{ Ac.} = 0.46 \text{ Ac.}$$

Composite Runoff Coefficient:

$$C = \frac{[(C_{\text{rock laydown area}} \times \text{Area}) + (C_{\text{rock road area}} \times \text{Area}) + (C_{\text{pond area}} \times \text{Area}) + (C_{\text{grass area}} \times \text{Area})]}{\text{Total Project Area}}$$

$$C = \frac{[(0.5 \times 1.63 \text{ Ac.}) + (0.7 \times 0.36 \text{ Ac.}) + (1.0 \times 0.56 \text{ Ac.}) + (0.17 \times 0.46)]}{3.01} = 0.57$$

Total Treatment Volume from 1 inch of Rainfall:

$$\text{Treatment Volume} = (C) \times (1 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (.57) \times (1 \text{ in.}) \times (3.01\text{Ac.}) \times \left(\frac{1\text{Ft.}}{12 \text{ in.}}\right) = 0.14 \text{ Ac.}-\text{Ft.}$$

Total Treatment Volume from ½ inch of Rainfall:

$$\text{Treatment Volume} = (0.5 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (0.5\text{in.}) \times (3.01\text{Ac.}) \times \left(\frac{1\text{Ft.}}{12 \text{ in.}}\right) = 0.13 \text{ Ac.}-\text{Ft.}$$

The treatment volume for the project is the larger value, **0.14 Ac.-Ft.**

BASIN III:

Areas:

$$\text{Total Area} = (522,562 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 12.0 \text{ Ac.}$$

$$\text{Crushed Rock for Laydown Area} = (346,393 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 7.95 \text{ Ac.}$$

$$\text{Crushed Rock Road Area} = (58,349 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 1.34 \text{ Ac.}$$

$$\text{Pond Area} = (68,671 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 1.58 \text{ Ac.}$$

$$\text{Grass Area} = 12.0 \text{ Ac.} - 7.95 \text{ Ac.} - 1.34 \text{ Ac.} - 1.58 \text{ Ac.} = 1.13 \text{ Ac.}$$

Composite Runoff Coefficient:

$$C = \frac{[(C_{\text{rock laydown area}} \times \text{Area}) + (C_{\text{rock road area}} \times \text{Area}) + (C_{\text{pond area}} \times \text{Area}) + (C_{\text{grass area}} \times \text{Area})]}{\text{Total Project Area}}$$

$$C = \frac{[(0.5 \times 7.95 \text{ Ac.}) + (0.7 \times 1.34 \text{ Ac.}) + (1.0 \times 1.58 \text{ Ac.}) + (0.17 \times 1.13)]}{12.0} = 0.56$$

Total Treatment Volume from 1 inch of Rainfall:

$$\text{Treatment Volume} = (C) \times (1 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (.56) \times (1 \text{ in.}) \times (12.0 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 0.56 \text{ Ac.-Ft.}$$

Total Treatment Volume from ½ inch of Rainfall:

$$\text{Treatment Volume} = (0.5 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (0.5 \text{ in.}) \times (12.0 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 0.50 \text{ Ac.-Ft.}$$

The treatment volume for the project is the larger value, **0.56 Ac.-Ft.**

BASIN IV:

Areas:

$$\text{Total Area} = (1,055,258 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 24.23 \text{ Ac.}$$

$$\text{Crushed Rock for Laydown Area} = (684,281 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 15.71 \text{ Ac.}$$

$$\text{Crushed Rock Road Area} = (70,385 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 1.62 \text{ Ac.}$$

$$\text{Pond Area} = (106,421 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 2.44 \text{ Ac.}$$

$$\text{Grass Area} = 24.23 \text{ Ac.} - 15.71 \text{ Ac.} - 1.62 \text{ Ac.} - 2.44 \text{ Ac.} = 4.46 \text{ Ac.}$$

Composite Runoff Coefficient:

$$C = \frac{[(C_{\text{rock laydown area}} \times \text{Area}) + (C_{\text{rock road area}} \times \text{Area}) + (C_{\text{pond area}} \times \text{Area}) + (C_{\text{grass area}} \times \text{Area})]}{\text{Total Project Area}}$$

$$C = \frac{[(0.5 \times 15.71 \text{ Ac.}) + (0.7 \times 1.62 \text{ Ac.}) + (1.0 \times 2.44 \text{ Ac.}) + (0.17 \times 4.46)]}{24.23} = 0.50$$

Total Treatment Volume from 1 inch of Rainfall:

$$\text{Treatment Volume} = (C) \times (1 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (.50) \times (1 \text{ in.}) \times (24.23 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 1.01 \text{ Ac.-Ft.}$$

Total Treatment Volume from ½ inch of Rainfall:

$$\text{Treatment Volume} = (0.5 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (0.5 \text{ in.}) \times (24.23 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 1.01 \text{ Ac.-Ft.}$$

The treatment volume for the project is the larger value, **1.01 Ac.-Ft.**

BASIN V:

Areas:

$$\text{Total Area} = (395,431 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 9.08 \text{ Ac.}$$

$$\text{Crushed Rock for Laydown Area} = (188,394 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 4.32 \text{ Ac.}$$

$$\text{Crushed Rock Road Area} = (43,169 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 0.99 \text{ Ac.}$$

$$\text{Pond Area} = (102,001 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 2.34 \text{ Ac.}$$

$$\text{Grass Area} = (395,438 \text{ S.F.}) \times \left(\frac{1 \text{ Ac.}}{43,560 \text{ S.F.}} \right) = 9.08 \text{ Ac.} - 4.32 \text{ Ac.} - 0.99 \text{ Ac.} - 2.34 \text{ Ac.} = 1.43 \text{ Ac.}$$

Composite Runoff Coefficient:

$$C = \frac{[(C_{\text{rock laydown area}} \times \text{Area}) + (C_{\text{rock road area}} \times \text{Area}) + (C_{\text{pond area}} \times \text{Area}) + (C_{\text{grass area}} \times \text{Area})]}{\text{Total Project Area}}$$

$$C = \frac{[(0.5 \times 4.32 \text{ Ac.}) + (0.7 \times 0.99 \text{ Ac.}) + (1.0 \times 2.34 \text{ Ac.}) + (0.17 \times 1.43)]}{9.08} = 0.60$$

Total Treatment Volume from 1 inch of Rainfall:

$$\text{Treatment Volume} = (C) \times (1 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (.60) \times (1 \text{ in.}) \times (9.08 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 0.45 \text{ Ac.} - \text{Ft.}$$

Total Treatment Volume from ½ inch of Rainfall:

$$\text{Treatment Volume} = (0.5 \text{ inch}) \times (\text{Project Contributing area})$$

$$\text{Treatment Volume} = (0.5 \text{ in.}) \times (9.08 \text{ Ac.}) \times \left(\frac{1 \text{ Ft.}}{12 \text{ in.}} \right) = 0.38 \text{ Ac.} - \text{Ft.}$$

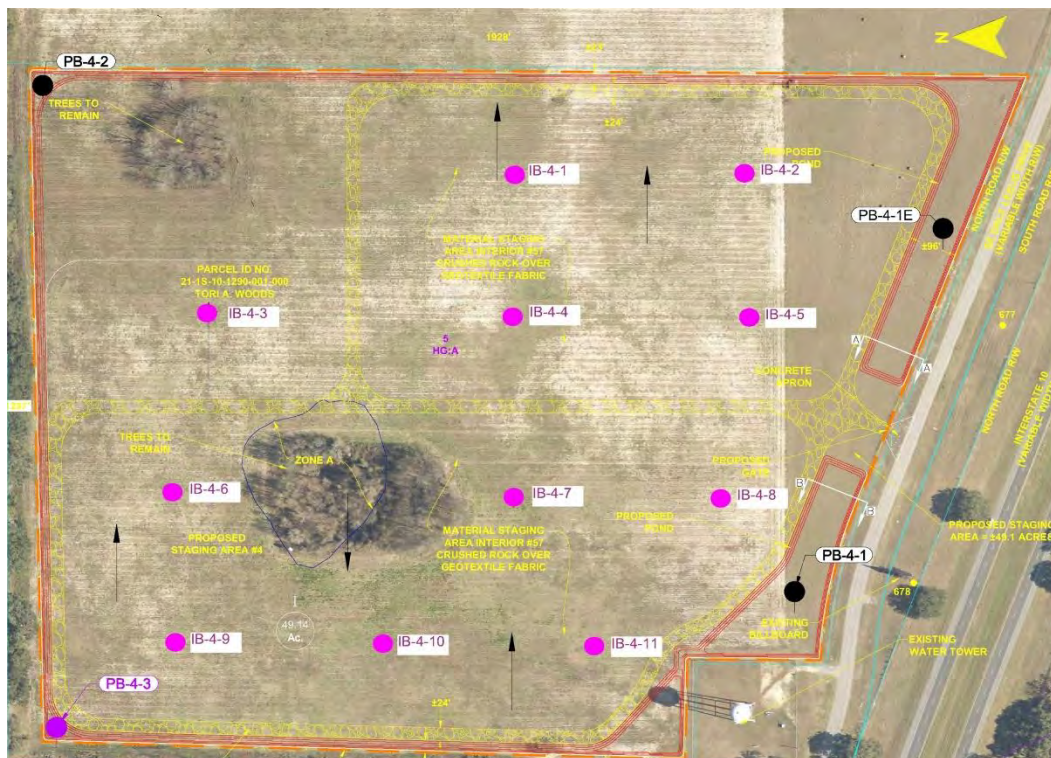
The treatment volume for the project is the larger value, **0.45 Ac.-Ft.**

Appendix A – Geotechnical Investigation

GEO TECHNICAL REPORT



NFRC STAGING AREA NO. 4



MADISON COUNTY, FLORIDA

MARCH 2020

BJR 19-198B





March 13, 2020

Mike Leahy, P.E.
Pickett & Associates
5025 W. Grace Street
Tampa, FL 33607

**Geotechnical Exploration Report
NFRC Staging Area No. 4
Madison County, Florida
BJR No. 19-198B**

Dear Mr. Leahy:

BJ Rock, LLC (BJR) has completed the geotechnical exploration for the referenced project as authorized by Pickett & Associates for Gulf Power. The purposes of this study were to explore general subsurface conditions for the proposed staging areas and to use the data obtained to develop engineering recommendations to guide the design of the planned ponds/swales. This report describes our exploration procedure, presents the data obtained, and presents our conclusions and recommendations regarding the geotechnical engineering aspects of the design.

BJR appreciates the opportunity to participate in this project and we trust that the information included in this report is sufficient for your design. If you have any questions or comments concerning the contents of this report, please contact us.

Sincerely,

BJ Rock, LLC

BJR FL Certificate of Authorization No. 29100



John C. Peak, P.E.
Sr. Geotechnical Engineer
FL P.E. License No. 57018

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ATTACHMENTS

Field Test Location Plan (Figure 1)
Soil Boring Logs (Figure 2)
Stormwater Pond Recovery Analysis Results
NRCS Soil Survey Data
Field Testing Standards and Procedures



PROJECT INFORMATION

Existing Site

Based on the information provided for our review from Pickett & Associates, we understand a staging area is planned off South Dale Leslie Drive in Madison, Madison County, Florida (Figure 1).

Project Approach

The objective of the geotechnical investigation for the proposed project was to obtain information concerning the subsurface conditions in order to make geotechnical engineering estimates and recommendations in each of the following areas:

- Soil stratigraphy at the boring locations and the development of the approximate soil profile.
- General location and description of potentially deleterious materials which may interfere with construction or new structure performance, including buried or surficial existing fills, organics, construction debris, etc.
- Identification of some critical design or construction details, including present groundwater levels, estimated wet season levels, and seasonal fluctuations in the specified areas.

Scope of Work

In order to address the above objectives, our scope of work for this project included the following:

- Reviewed available published information on the site, including the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) soil survey data for Madison County.
- Conducted a subsurface exploration program consisting of the advancement of auger borings with DRI / field permeability testing for the pond/swales, subsurface sampling, and field testing.
- Measured the stabilized groundwater levels at the boring locations.
- Reviewed and visually classified the recovered soils in the laboratory using the Unified Soil Classification System (ASTM D 2487). Developed the general soil stratigraphy at the boring locations.
- Performed geotechnical engineering studies and analyses in order to develop geotechnical engineering recommendations for each of the objectives previously discussed for the proposed project.
- Performed stormwater pond recovery analysis per referenced staging area. Analysis performed by our subconsultant, Native GeoSciences, Inc.
- Prepared a geotechnical report that summarizes the course of our study, the field and laboratory data generated, the subsurface conditions encountered, stormwater pond recovery analysis results and our geotechnical engineering recommendations for the proposed project.

Soil Survey Review

According to the USDA NRCS "Soil Survey of Madison County", the soil types generally present on the site are attached in the appendix and are generalized as follows: *Blanton sand*.



SUBSURFACE EXPLORATION

Field Exploration Procedures

The procedures used by BJ Rock, LLC for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practice. BJR performed 15 auger borings with CPT readings to approximate depths of up to 10 feet each with 15 field permeability tests at the proposed locations.

Our staff located the staked borings in the field per the plans and field information provided by Pickett & Associates. The approximate testing locations are noted on the provided Field Test Location Plan (Figure 1) in the Appendix. The standards and procedures for the Standard Penetration Test (SPT) Boring and soil sample handling and classification are described in our Field Testing Standards and Procedures in the Appendix.

Field Exploration Results

Subsurface Conditions

The auger borings generally encountered fine to slightly silty fine sands, clayey fine sands and sandy clays to an approximate depth of 10 feet below existing grade. The soil testing results are shown on the attached Soil Boring Logs (Figure 2) in the Appendix.

Field Permeability Test

The field permeability falling head tests were performed at the specified location on the site as shown on Figure 2 in the Appendix. The tests were performed at approximate depths of 1 to 4^{+/-} feet below existing grade. The tests were performed utilizing slotted casing seated in a uniform soil condition. The results of the tests are as follows:

Recommended Existing Groundwater Parameters for Pond Design				
STAGING AREA 4 - NFRC TRANSMISSION LINE FPL				
PB Test	Test Depth (ft)	Vertical Infiltration (ft/day)	Estimated Horizontal Infiltration (ft/day)*	Recommended SHGWL Depth (ft)
IB-4-1	2	0.6	1.2	5
IB-4-2	2.5	0.9	1.8	6
IB-4-3	2	0.6	1.2	4
IB-4-4	4	0.2	0.4	5
IB-4-5	1	0.2	0.4	5
IB-4-6	3	0.5	1	5
IB-4-7	1.5	0.05	0.1	5
IB-4-8	2.5	0.9	1.8	6
IB-4-9	3	0.5	1	5
IB-4-10	1	0.05	0.1	4
IB-4-11	2	0.05	0.1	4
PB 4-1	3	0.9	1.8	5
PB 4-2	3	0.6	1.2	5
PB-4-3	2.5	0.9	1.8	5
PB-4-1E	3	0.6	1.2	5
*	Estimated horizontal permeability rate is 2x the vertical permeability test result.			
Note:	Horizontal and vertical permeability rates do not include a factor of safety.			



Groundwater

Groundwater was not encountered to an approximate depth of 10 feet below existing ground surface in the soil test borings performed in November 2019 and March 2020. Based on our past site experience, the results of our investigation, and our review of the NRCS soil survey, it is our opinion that the seasonal high groundwater table will be encountered at an approximate depth of 4 to 6^{+/-} feet below existing ground surface in the areas of borings performed. Significant fluctuations in the groundwater levels should be expected due to seasonal variations in rainfall, runoff, and other site-specific factors across the site such as shallow perched conditions due to encountered clayey soils.

SITE PREPARATION RECOMMENDATIONS

Site Stripping

Prior to any construction, the site must be properly prepared. To prepare the site for construction, all existing topsoil, muck, debris, vegetation, and large roots down to finger-size should be removed, including a 5-foot margin in a horizontal direction away from the footprints of the structures. The resulting excavations should be backfilled with soils as discussed in the structural fill section of this report.

Proofrolling

Following site stripping and any related excavation activity, and prior to any fill placement, proofrolling of the on-site soils should be performed. We recommend using a vibratory roller having a static weight of at least ten tons. Placement of fill materials may then proceed. Compaction of the fill materials should continue until the roller has made at least ten passes over all areas of the site and the soils appear to be relatively firm and unyielding. Half of the roller passes should be perpendicular to the direction of travel of the other passes. Proofrolling should be closely monitored by our engineering technician to look for unusual deflection of the soils beneath the compacting equipment. If unusual or excessive deflection is observed, the areas should be undercut to firm soils and backfilled with structural fill placed in maximum one-foot thick lifts. Backfill soils should be of the same composition and should be compacted to the same criteria as structural fill soils.

Structural Fill

Definition

Soil used for structural fill can be defined as clean fine sand containing less than twelve percent material by weight that is finer than a number 200 sieve (fines) (material conforming to SP to SP-SM in the Unified Soil Classification System) and less than 5 percent organics by weight. However, materials containing up to 25 percent fines (materials conforming to SC or SM in the Unified Soil Classification System) may be utilized as structural fill, if their plasticity index is less than 20 and the working subgrade is at least 2 feet above water or groundwater level.

If fill material with higher fines content is used (< 25 percent fines), the material will require the use of compaction equipment designed for clayey soils. This includes a sheeps foot or vibratory pad foot roller. In addition, a disk could be required to assist with drying the clayey soils in order to place them at or near their optimum moisture content. These materials must be placed in 6-inch thick maximum lifts so that they can be effectively compacted with a vibratory pad foot roller.

Soil Suitability Recommendations

Based on the results of the auger borings in Figure 3, the soil materials encountered in the borings appear to be acceptable general and/or structural fill from ground surface to 1 to 8⁺ feet below existing grade excluding any organic material, clays and unsuitable rock/shell/limestone, etc. Stratum 1



(SP/SP-SM) can be utilized as structural fill material. Stratum 2 (SM/SC) can be utilized as general fill material.

Placement

Fill should be placed in lifts not to exceed one foot thick. The fill material should be compacted to at least 95 percent of its modified Proctor maximum dry density (ASTM D 1557). Confined areas, such as utility trenches, should be compacted with manually operated vibratory compaction equipment.

TESTING AND MONITORING

Construction monitoring and testing are essential to proper site construction and performance. Compliance with the recommended foundation specification must be verified by our engineering technician familiar with the project construction. Observation of site preparation work is an integral part of the engineering recommendations contained in this report.

Safe working conditions are necessary. Temporary excavations should be sloped and/or braced as required by applicable local, state, and federal safety regulations, as well as the current Occupational Safety and Health Organization (OSHA) Excavation and Trench Safety Standards. Generally, the grading contractor is responsible for constructing stable, temporary excavations that are dewatered, shored, sloped and/or benched to maintain stability of the sides and bottom of the trench.

LIMITATIONS

This report has been prepared for the exclusive use of **Pickett & Associates and Gulf Power** for the specific application to the project previously discussed. Our conclusions and recommendations have been rendered using generally accepted standards of geotechnical engineering geology practice in the state of Florida. No other warranty is expressed or implied.

Our conclusions and recommendations are based on the design information furnished to us, the data obtained from the previously described subsurface exploration, and our experience. They do not reflect variations in the subsurface conditions that are likely to exist in the region of our boring and in unexplored areas of the site. These variations are due to the inherent variability of the subsurface conditions in this geologic region. Should variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon our on-site observations of the conditions.

The site is underlain by limestone bedrock that is susceptible to dissolution and the subsequent development of karst features such as voids and sinkholes in the natural soil overburden. Construction in a sinkhole prone area is therefore accompanied by some risk that internal soil erosion and ground subsidence could affect new structures in the future. It is not possible to investigate or design to completely eliminate the possibility of future sinkhole-related problems. In any event, the Owner must understand and accept this risk.

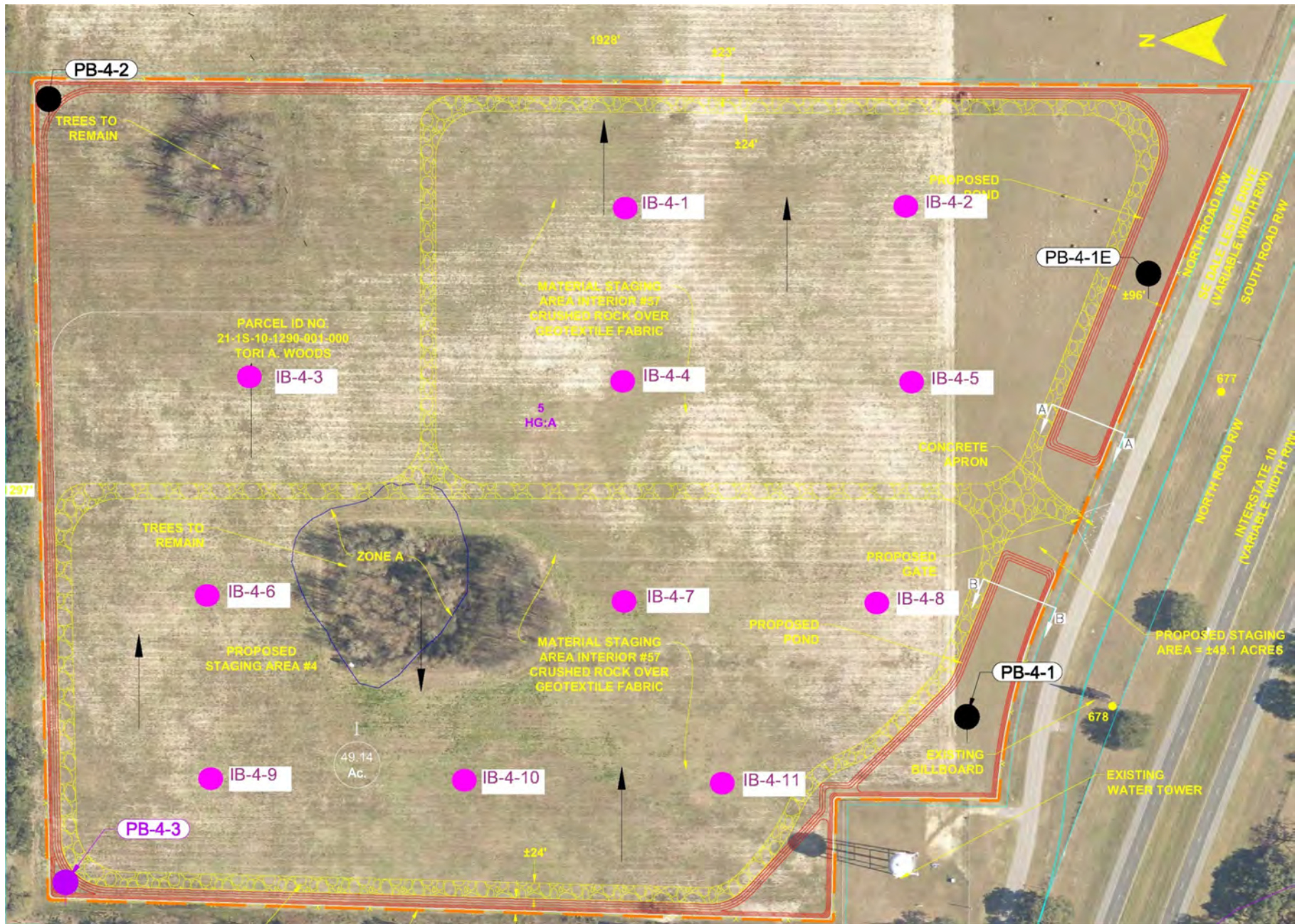
The scope of our services does not include any environmental assessments or investigations for the possible presence of hazardous or toxic substances in the soil, groundwater, or surface water within or in the general vicinity of the site studied. Any statements made in this report or shown on the test boring log regarding unusual subsurface conditions and/or composition, odor, staining, origin, or other characteristics of the surface and/or subsurface materials are strictly for the information of our client and may or may not be indicative of an environmental problem.

If changes are made in the overall design or the location of the proposed structure(s), the recommendations presented in this report must not be considered valid unless the changes are reviewed by our firm and recommendations modified or verified in writing. We should be given the



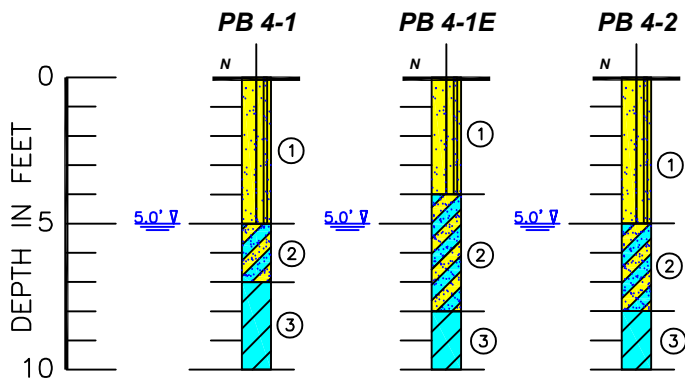
opportunity to review the foundation plan and the applicable portions of the project specifications when the design is finalized. This review will allow us to check whether these documents are consistent with the intent of our recommendations.

APPENDIX



**NFRC STAGING AREA NO. 4
FIELD TEST LOCATION PLAN
MADISON COUNTY, FLORIDA**

DATE: 02/17/20	SCALE: NOT TO SCALE	JOB NO. 19-198B
DRAWN BY: J. PEAK		FIGURE 1
CK'D BY: B. JORY		



LEGEND

① = GRAY, WHITE, TAN, BROWN FINE TO SLIGHTLY SILTY FINE SANDS (SP)/(SP-SM)

② = GRAY, ORANGE, BROWN CLAYEY FINE SAND (SC)

③ = GRAY, ORANGE, BROWN SANDY CLAY (CL)

(SP) = UNIFIED SOIL CLASSIFICATION GROUP SYMBOL


N = STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT

0.0' V = ESTIMATED SEASONAL HIGH GROUNDWATER LEVEL


NOTES: HAND AUGER BORINGS PERFORMED NOVEMBER 14, 2019.

EXISTING GROUNDWATER LEVEL NOT ENCOUNTERED TO 10

LEGEND

 ① = GRAY, WHITE, TAN, BROWN, DARK BROWN FINE TO SLIGHTLY SILTY FINE SANDS (SP)/(SP-SM)

 ② = GRAY, TAN, ORANGE, BROWN SILTY TO CLAYEY FINE SANDS (SM)/(SC)

 ③ = GRAY, ORANGE, BROWN SANDY CLAY (CL)

(SP) = UNIFIED SOIL CLASSIFICATION GROUP SYMBOL

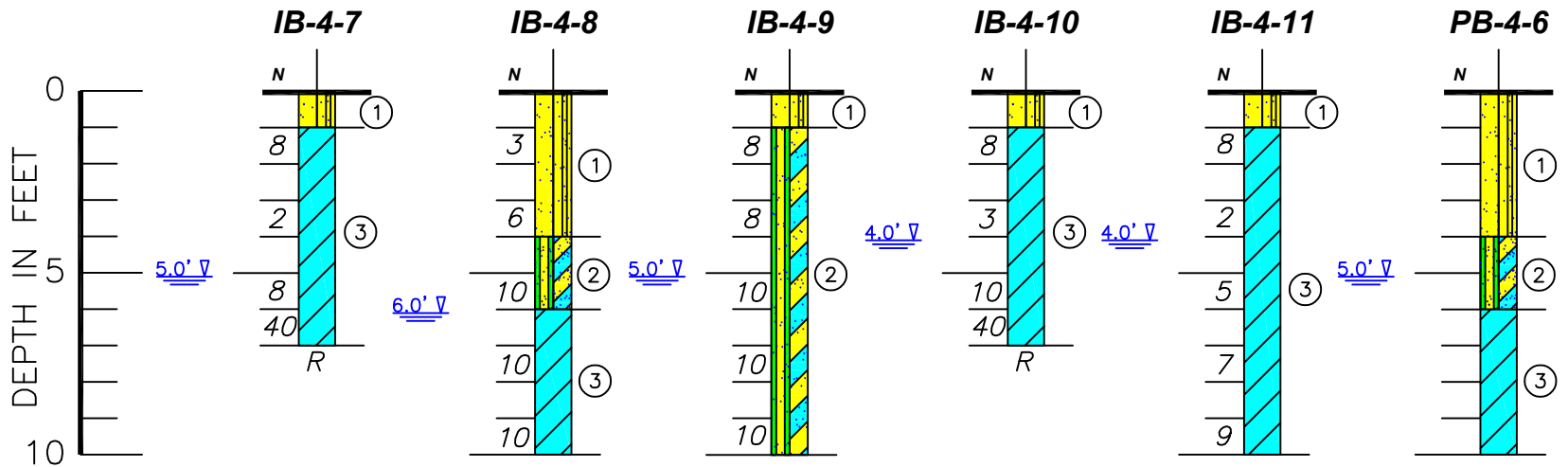
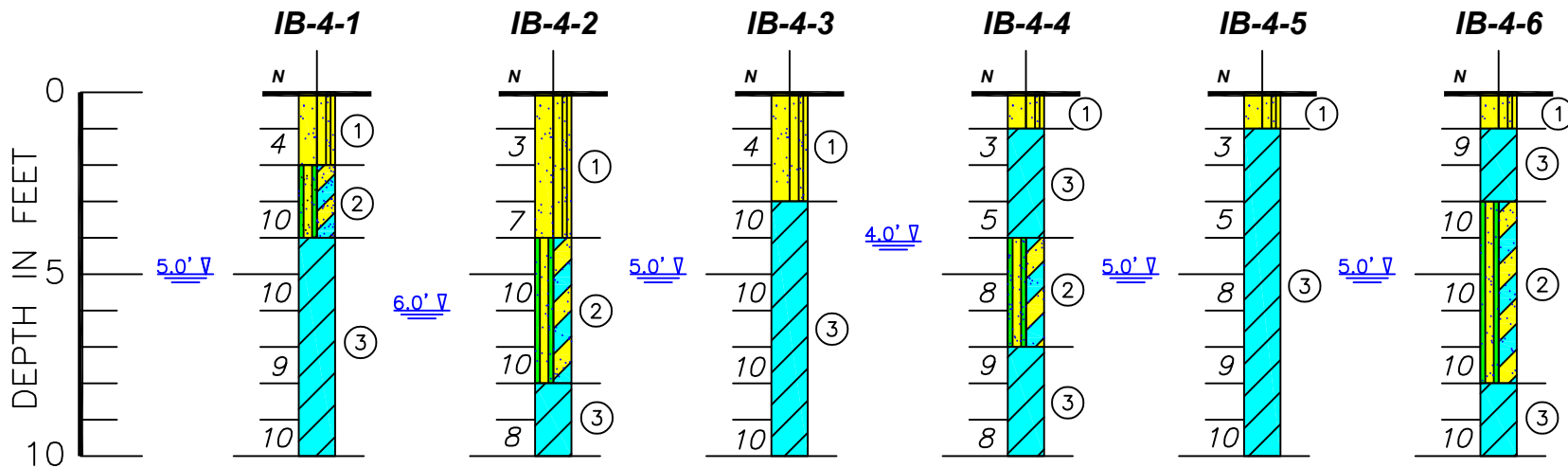
N = STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
CORRELATED FROM CPT READINGS

R = REFUSAL MATERIAL

0.0' ▽ = EXISTING GROUNDWATER LEVEL (IF ENCOUNTERED)

0.0' ▽ = ESTIMATED SEASONAL HIGH GROUNDWATER LEVEL

NOTE: TESTING PERFORMED FEBRUARY 10-11, 2020.



March 13, 2020

Re: Stormwater Pond Recovery Analysis
NFRC Staging Areas
Staging Area No. 4 – Basins I through V
Madison County, Florida
BJR Job No: 19-198(B)

As authorized, BJ Rock, LLC (BJR) has completed the stormwater pond recovery analysis for the above-referenced staging area. The project site is located on South Dale Leslie Drive in Madison, Madison County, Florida.

We understand that three crushed rock material laydown areas will be constructed along with five dry stormwater management ponds within the proposed project. The ponds will be constructed along the outer boundary of the project. The Staging Area is broken into five drainage basins (I through V).

We used soil and groundwater information collected during the geotechnical exploration on the site and provided in the BJR Geotechnical data. In addition, we used site survey data, crushed rock laydown area design, and stormwater pond design information provided by Pickett Surveying and Engineering. We utilized the commercially available software PONDS (version 3.3) to perform the stormwater pond recovery analysis. Copies of the PONDS software outputs are included in the Attachments.

The PONDS software is generally limited to analyzing flat bottom stormwater ponds. Since the rock laydown areas are planned to be constructed at existing grade and will be sloping, it was necessary to analyze each area as flat basins using average soil and groundwater parameters. We understand that you plan to utilize CR-PE Multi-Purpose Root & Water Barrier Molded Rolls by Century Products (or similar) to retain water within the laydown areas for recharge before discharging excess water to the ponds. Based on this plan, it is our opinion that using average soil and groundwater parameters for this analysis is appropriate. Please note that the treatment volume was recovered within each of the four rock laydown basin areas within 72 hours. Therefore, discharge and recovery within the stormwater ponds was not needed.

Below are Average Soil and Groundwater Calculations and Model Input Parameters for each basin. We assumed a Base of Aquifer depth below the Seasonal High Water Table (SHWT) of 2 feet or less. This depth is generally conservative based on our experience with similar projects in soils with relatively high silt/clay content. The actual Base of Aquifer is likely deeper.

Lastly, we assumed a porosity of 35% for the crushed rock for void space storage.

Stormwater Recovery Analysis – Staging Area No. 4 – Basin I

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Staging Area No. 4		
Basin I		
Rock Laydown Elevation		
Low El. (ft)	High El. (ft)	Average El. (ft.)
90	93	91.5
Boring	Horizontal Saturated Hydraulic Conductivity (ft/day)*	Depth to SHWT (ft)
PB-4-3	0.9	5
AVG.	0.90	5
Average SHWT Elevation (ft)		86.5
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	STAGING AREA NO. 4 - BASIN I
Base of Aquifer Elevation (feet)	85.5
Water Table Elevation (feet)	86.5
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.9
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*, **	0.45
Maximum Area for Unsaturated Infiltration (ft²)	4895.1
Equivalent Pond Length (ft)	130
Equivalent Pond Width (ft)	100
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical Infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for STAGING AREA 4 – BASIN I

Stage (ft)	Area (ft²)
91.5	4895.1
92	4895.1

Stormwater Input Data

STAGING AREA NO. 4 BASIN I	Hydrograph Type	slug load
	Treatment Volume (ft³)	3484.8

Stormwater Recovery Analysis – Staging Area No. 4 – Basin II

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Staging Area No. 4		
Basin II		
Rock Laydown Elevation		
Low El. (ft)	High El. (ft)	Average El. (ft.)
87	93	90
Boring	Horizontal Saturated Hydraulic Conductivity (ft/day)*	Depth to SHWT (ft)
IB-4-3	0.6	4
IB-4-6	0.5	5
AVG.	0.55	4.50
Average SHWT Elevation (ft)		85.50
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	STAGING AREA NO. 4 - BASIN II
Base of Aquifer Elevation (feet)	84.5
Water Table Elevation (feet)	85.5
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.55
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*, **	0.275
Maximum Area for Unsaturated Infiltration (ft²)	24873.1
Equivalent Pond Length (ft)	600
Equivalent Pond Width (ft)	118
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical Infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for STAGING AREA 4 – BASIN II

Stage (ft)	Area (ft ²)
90	24873.1
90.5	24873.1

Stormwater Input Data

STAGING AREA NO. 4	Hydrograph Type	slug load
BASIN II	Treatment Volume (ft ³)	6098.4

Stormwater Recovery Analysis – Staging Area No. 4 – Basin III

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Staging Area No. 4		
Basin III		
Rock Laydown Elevation		
Low El. (ft)	High El. (ft)	Average El. (ft.)
85	95	90
Boring	Horizontal Saturated Hydraulic Conductivity (ft/day)*	Depth to SHWT (ft)
PB-4-2	0.6	5
IB-4-1	0.6	5
IB-4-2	0.9	6
IB-4-3	0.6	4
AVG.	0.68	5.00
Average SHWT Elevation (ft)		85.00
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	STAGING AREA NO. 4 - BASIN III
Base of Aquifer Elevation (feet)	84
Water Table Elevation (feet)	85
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.68
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*, **	0.3375
Maximum Area for Unsaturated Infiltration (ft ²)	121237.5
Equivalent Pond Length (ft)	1000
Equivalent Pond Width (ft)	345
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical Infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for STAGING AREA 4 – BASIN III

Stage (ft)	Area (ft ²)
90	121237.5
90.5	121237.5

Stormwater Input Data

STAGING AREA NO. 4 BASIN III	Hydrograph Type	slug load
	Treatment Volume (ft ³)	24393.6

Stormwater Recovery Analysis – Staging Area No. 4 – Basin IV

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Staging Area No. 4		
Basin IV		
Rock Laydown Elevation		
Low El. (ft)	High El. (ft)	Average El. (ft.)
84	95	89.5
Boring	Horizontal Saturated Hydraulic Conductivity (ft/day)*	Depth to SHWT (ft)
IB-4-4	0.2	5
IB-4-6	0.5	5
IB-4-7	0.05	5
IB-4-8	0.9	6
IB-4-9	0.5	5
IB-4-10	0.05	4
IB-4-11	0.05	4
AVG.	0.32	4.86
Average SHWT Elevation (ft)		84.64
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	STAGING AREA NO. 4 - BASIN IV
Base of Aquifer Elevation (feet)	83.5
Water Table Elevation (feet)	84.64
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.32
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*, **	0.161
Maximum Area for Unsaturated Infiltration (ft ²)	239498.3
Equivalent Pond Length (ft)	900
Equivalent Pond Width (ft)	700
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical Infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for STAGING AREA 4 – BASIN IV

Stage (ft)	Area (ft ²)
89.5	239498.3
90	239498.3

Stormwater Input Data

STAGING AREA NO. 4 BASIN IV	Hydrograph Type	slug load
	Treatment Volume (ft³)	43995.6

Stormwater Recovery Analysis – Staging Area No. 4 – Basin V

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Staging Area No. 4		
Basin V		
Rock Laydown Elevation		
Low El. (ft)	High El. (ft)	Average El. (ft.)
93	95	94
Boring	Horizontal Saturated Hydraulic Conductivity (ft/day)*	Depth to SHWT (ft)
PB-4-1	0.9	5
IB-4-5	0.2	5
PB-1-E	0.6	5
AVG.	0.57	5.00
Average SHWT Elevation (ft)		89.00
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	STAGING AREA NO. 4 - BASIN V
Base of Aquifer Elevation (feet)	88
Water Table Elevation (feet)	89
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.57
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*,**	0.284
Maximum Area for Unsaturated Infiltration (ft²)	65937.9
Equivalent Pond Length (ft)	1000
Equivalent Pond Width (ft)	188
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for STAGING AREA 4 – BASIN V

Stage (ft)	Area (ft ²)
94	65937.9
94.5	65937.9

Stormwater Input Data

STAGING AREA NO. 4	Hydrograph Type	slug load
BASIN V	Treatment Volume (ft ³)	19602

Results

Based on the results of this analysis, the proposed crushed rock laydown areas recover their associated treatment volumes within 72 hours.

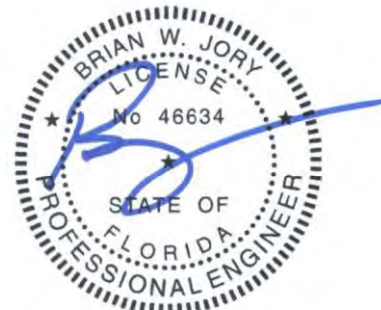
Closing

We appreciate the opportunity to be of service to you on this project and look forward to a continued relationship. Should you have any questions or concerns regarding this report, please feel free to call us at (407) 342-1443.

Sincerely,
Native Geoscience, Inc.
Certificate of Authorization No. 30474



John C. Diehl, P.G.
Principal Geologist
P.G. 2460



Brian W. Jory, P.E.
Principal Engineer
P.E. 46634
3/13/20

Attachments:

- PONDS Output – Staging Area No. 4 – Basin I – Rock Voids (7 pages)
- PONDS Output – Staging Area No. 4 – Basin II – Rock Voids (7 pages)
- PONDS Output – Staging Area No. 4 – Basin III – Rock Voids (7 pages)
- PONDS Output – Staging Area No. 4 – Basin IV – Rock Voids (7 pages)
- PONDS Output – Staging Area No. 4 – Basin V – Rock Voids (7 pages)

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Project Data

Project Name: NFRC Staging Areas
Simulation Description: Staging Area No. 4 - Basin I - Rock Voids
Project Number: BJR 19-198A
Engineer : CW
Supervising Engineer: JCD
Date: 03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 85.50
Water Table Elevation, [WT] (ft datum): 86.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.90
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 0.45
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 4895.1

Geometry Data

Equivalent Pond Length, [L] (ft): 130.0
Equivalent Pond Width, [W] (ft): 100.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
91.50	4895.1
92.00	4895.1

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive
Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive
Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

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Scenario Input Data

Scenario 1 :: 3484.8 ft³ slug load

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 3484.8

Initial ground water level (ft datum) 86.50 (default)

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	6.000	17.000	28.000	110.000
0.250	7.000	18.000	29.000	115.000
0.500	8.000	19.000	30.000	120.000
1.000	9.000	20.000	40.000	121.000
1.500	10.000	21.000	50.000	122.000
2.000	11.000	22.000	60.000	123.000
2.500	12.000	23.000	70.000	124.000
3.000	13.000	24.000	80.000	125.000
3.500	14.000	25.000	90.000	126.000
4.000	15.000	26.000	100.000	127.000
5.000	16.000	27.000	105.000	

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Detailed Results :: Scenario 1 :: 3484.8 ft³ slug load

Elapsed Time (hours)	Instantaneous Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Combined Instantaneous Discharge Rate (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Combined Cumulative Discharge (ft ³)	Flow Type
0.000	580.8000	0.00000	86.50000	0.00000	0	0.000	0.0	0	N.A.
0.002	580.8000	0.00000	92.21186	0.02550	0	3484.800	0.2	0	U/P
2.400	0.0000	0.00000	92.16689	0.02550	0	3484.800	220.3	0	U/P
6.000	0.0000	0.00000	92.09940	0.02550	0	3484.800	550.7	0	U/P
12.000	0.0000	0.00000	91.98689	0.02550	0	3484.800	1101.4	0	U/P
24.000	0.0000	0.00000	91.76189	0.02550	0	3484.800	2202.8	0	U/P
36.000	0.0000	0.00000	91.53690	0.01275	0	3484.800	3304.2	0	U/P
48.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
60.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
72.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
84.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
96.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
120.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
144.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
168.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
192.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
216.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
240.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
264.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
288.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
312.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
336.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
360.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
384.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
408.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
432.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
456.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
480.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
504.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
528.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
552.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
576.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
600.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
624.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
648.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
672.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
696.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
720.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
960.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
1200.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
1440.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
1680.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
1920.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2160.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2400.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2520.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2640.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2760.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2880.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2904.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2928.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2952.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
2976.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
3000.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
3024.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry
3048.000	0.0000	0.00000	----	----	----	3484.800	3484.8	0	dry

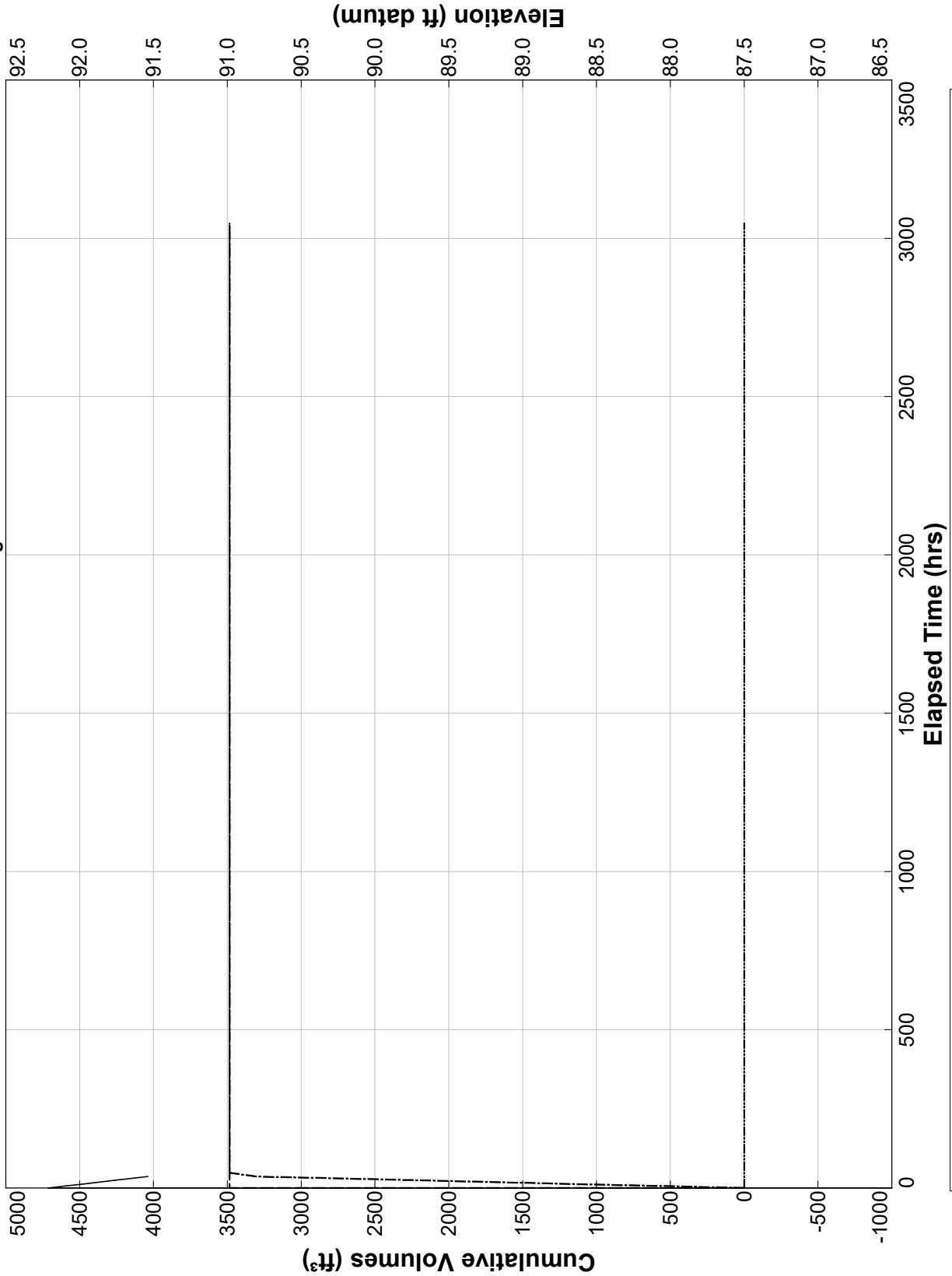
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Summary of Results :: Scenario 1 :: 3484.8 ft³ slug load

	Time (hours)	Stage (ft datum)	Rate (ft ³ /s)	Volume (ft ³)
Stage				
Minimum	0.000	86.50		
Maximum	0.002	92.21		
Inflow				
Rate - Maximum - Positive	0.002		580.8000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			3484.8
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			3484.8
Infiltration				
Rate - Maximum - Positive	0.002		0.0255	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	36.000			3304.2
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			3484.8
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	91.54		3304.2
72 Hour Stage and Infiltration Volume	72.000	Dry		3484.8

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time

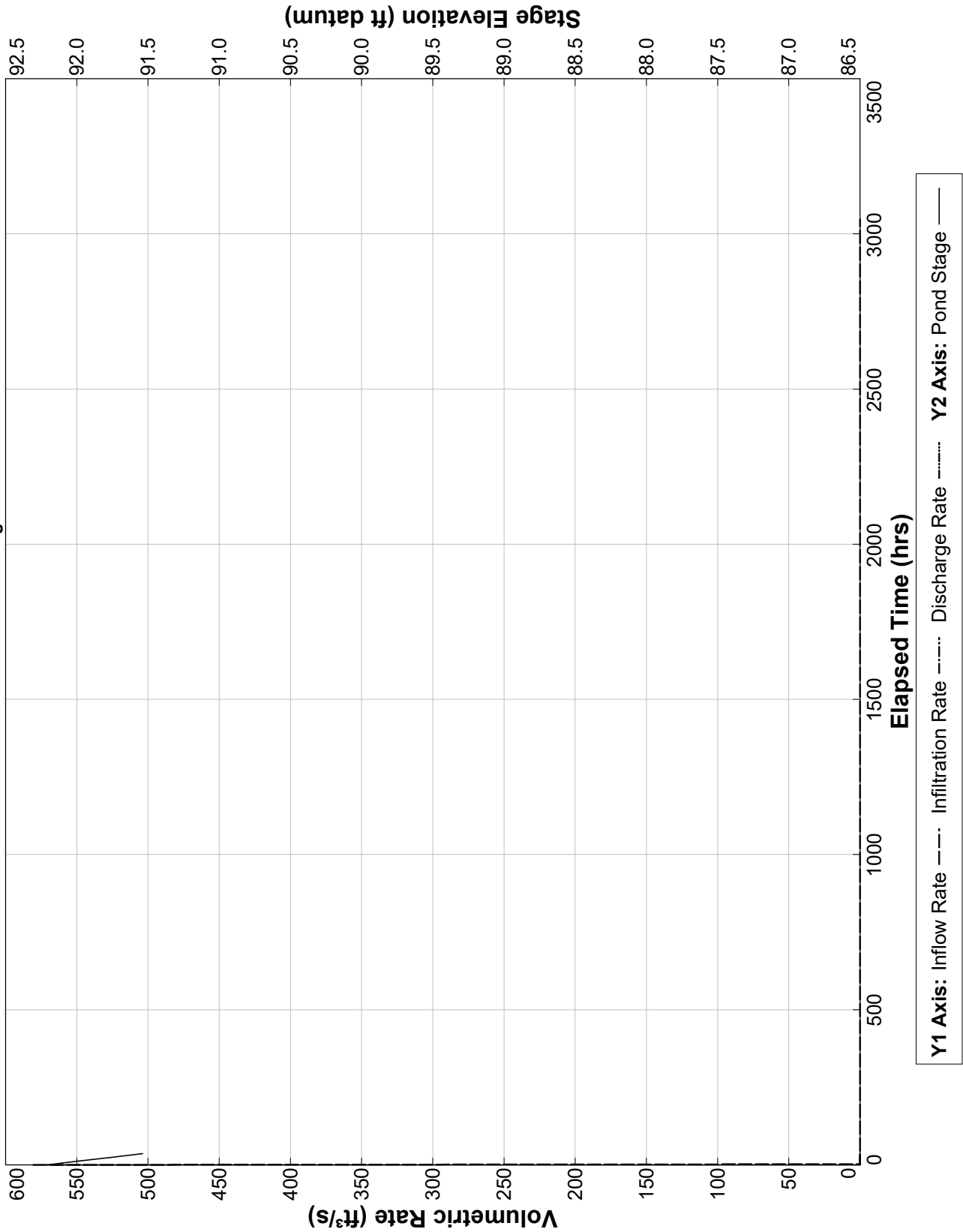
Scenario 1 :: 3484.8 ft³ slug load



Y1 Axis: Cumulative Inflow --- Cumulative Infiltration - - - - Cumulative Discharge Y2 Axis: Pond Stage —

Plot of Flow Rates and Pond Stage vs Elapsed Time

Scenario 1 :: 3484.8 ft³ slug load



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Project Data

Project Name: NFRC Staging Areas
Simulation Description: Staging Area No. 4 - Basin II - Rock Voids
Project Number: BJR 19-198A
Engineer : CW
Supervising Engineer: JCD
Date: 03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 84.50
Water Table Elevation, [WT] (ft datum): 85.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.55
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 0.275
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 24873.1

Geometry Data

Equivalent Pond Length, [L] (ft): 600.0
Equivalent Pond Width, [W] (ft): 118.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
90.00	24873.1
90.50	24873.1

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive
Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive
Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

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Scenario Input Data

Scenario 1 :: 6098.4 ft³ slug load

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 6098.4

Initial ground water level (ft datum) 85.50 (default)

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.100	6.000	17.000	28.000	110.000
0.250	7.000	18.000	29.000	115.000
0.500	8.000	19.000	30.000	120.000
1.000	9.000	20.000	40.000	121.000
1.500	10.000	21.000	50.000	122.000
2.000	11.000	22.000	60.000	123.000
2.500	12.000	23.000	70.000	124.000
3.000	13.000	24.000	80.000	125.000
3.500	14.000	25.000	90.000	126.000
4.000	15.000	26.000	100.000	127.000
5.000	16.000	27.000	105.000	

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Detailed Results :: Scenario 1 :: 6098.4 ft³ slug load

Elapsed Time (hours)	Instantaneous Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Combined Instantaneous Discharge Rate (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Combined Cumulative Discharge (ft ³)	Flow Type
0.000	1016.4000	0.00000	85.50000	0.00000	0	0.000	0.0	0	N.A.
0.002	1016.4000	0.00000	90.24516	0.07917	0	6098.400	0.5	0	U/P
2.400	0.0000	0.00000	90.21768	0.07917	0	6098.400	684.0	0	U/P
6.000	0.0000	0.00000	90.17643	0.07917	0	6098.400	1710.0	0	U/P
12.000	0.0000	0.00000	90.10768	0.05278	0	6098.400	3420.1	0	U/P
24.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
36.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
48.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
60.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
72.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
84.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
96.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
120.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
144.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
168.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
192.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
216.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
240.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
264.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
288.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
312.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
336.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
360.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
384.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
408.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
432.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
456.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
480.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
504.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
528.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
552.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
576.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
600.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
624.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
648.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
672.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
696.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
720.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
960.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
1200.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
1440.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
1680.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
1920.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2160.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2400.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2520.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2640.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2760.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2880.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2904.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2928.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2952.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
2976.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
3000.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
3024.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry
3048.000	0.0000	0.00000	---	---	---	6098.400	6098.4	0	dry

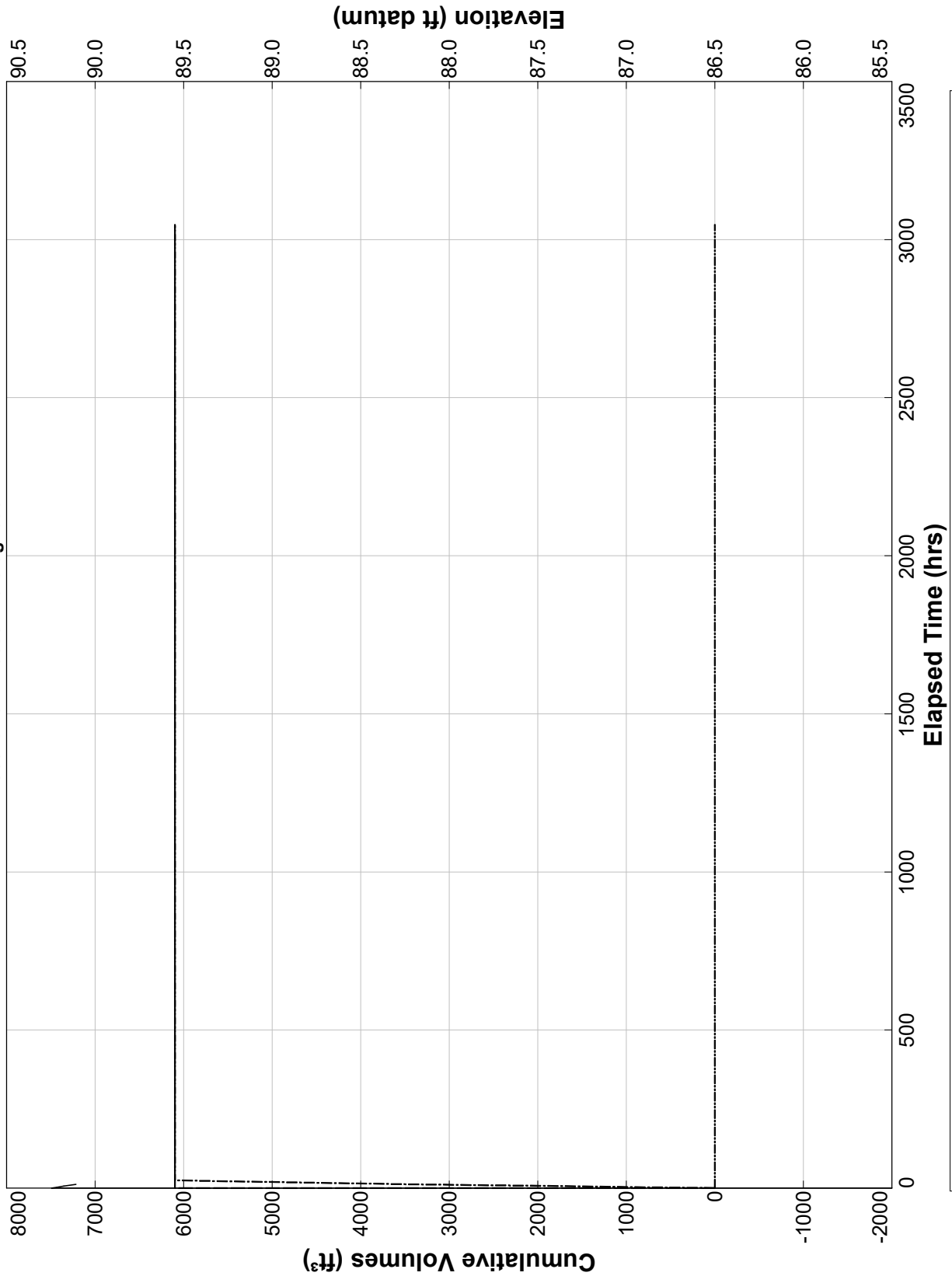
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Summary of Results :: Scenario 1 :: 6098.4 ft³ slug load

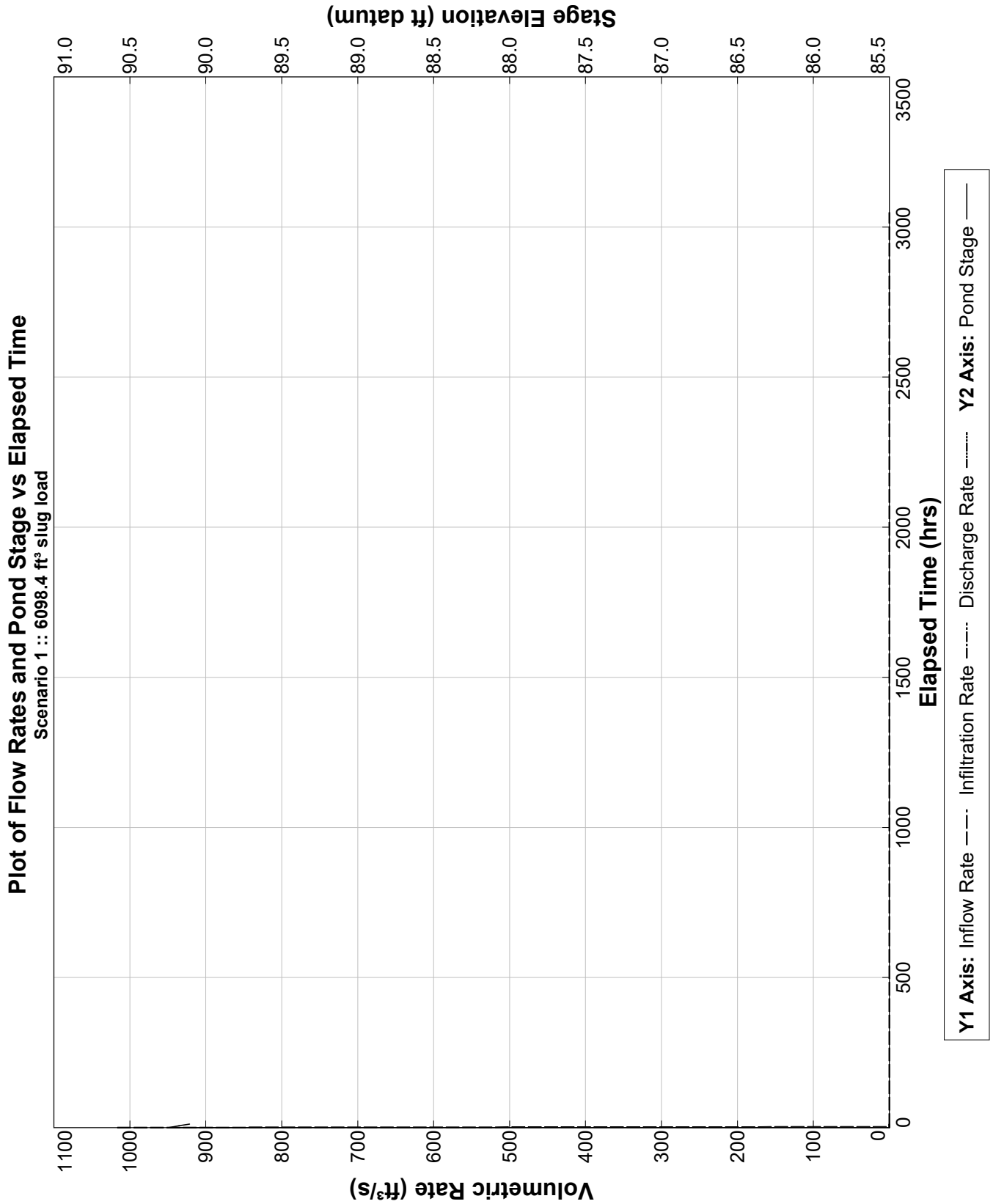
	Time (hours)	Stage (ft datum)	Rate (ft ³ /s)	Volume (ft ³)
Stage				
Minimum	0.000	85.50		
Maximum	0.002	90.25		
Inflow				
Rate - Maximum - Positive	0.002		1016.4000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			6098.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			6098.4
Infiltration				
Rate - Maximum - Positive	0.002		0.0792	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	12.000			3420.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			6098.4
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	Dry		6098.4
72 Hour Stage and Infiltration Volume	72.000	Dry		6098.4

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time

Scenario 1 :: 6098.4 ft³ slug load



Y1 Axis: Cumulative Inflow --- Cumulative Infiltration - - - - Cumulative Discharge -
 Y2 Axis: Pond Stage —



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Project Data

Project Name: NFRC Staging Areas
Simulation Description: Staging Area No. 4 - Basin III - Rock Voids
Project Number: BJR 19-198A
Engineer : CW
Supervising Engineer: JCD
Date: 03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 84.00
Water Table Elevation, [WT] (ft datum): 85.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.68
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 0.3375
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 121237.5

Geometry Data

Equivalent Pond Length, [L] (ft): 1000.0
Equivalent Pond Width, [W] (ft): 345.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> (ft datum)	<u>Area</u> (ft ²)
90.00	121237.5
90.50	121237.5

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive
Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive
Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

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Scenario Input Data

Scenario 1 :: 24393.6 ft³ slug load

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 24393.6

Initial ground water level (ft datum) 85.00 (default)

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.100	6.000	17.000	28.000	110.000
0.250	7.000	18.000	29.000	115.000
0.500	8.000	19.000	30.000	120.000
1.000	9.000	20.000	40.000	121.000
1.500	10.000	21.000	50.000	122.000
2.000	11.000	22.000	60.000	123.000
2.500	12.000	23.000	70.000	124.000
3.000	13.000	24.000	80.000	125.000
3.500	14.000	25.000	90.000	126.000
4.000	15.000	26.000	100.000	127.000
5.000	16.000	27.000	105.000	

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Detailed Results :: Scenario 1 :: 24393.6 ft³ slug load

Elapsed Time (hours)	Instantaneous Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Combined Instantaneous Discharge Rate (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Combined Cumulative Discharge (ft ³)	Flow Type
0.000	4065.6000	0.00000	85.00000	0.00000	0	0.000	0.0	0	N.A.
0.002	4065.6000	0.00000	90.20118	0.47358	0	24393.600	2.8	0	U/P
2.400	0.0000	0.00000	90.16746	0.47358	0	24393.600	4091.8	0	U/P
6.000	0.0000	0.00000	90.11683	0.47358	0	24393.600	10229.4	0	U/P
12.000	0.0000	0.00000	90.03246	0.31572	0	24393.600	20458.8	0	U/P
24.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
36.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
48.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
60.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
72.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
84.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
96.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
120.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
144.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
168.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
192.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
216.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
240.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
264.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
288.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
312.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
336.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
360.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
384.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
408.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
432.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
456.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
480.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
504.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
528.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
552.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
576.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
600.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
624.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
648.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
672.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
696.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
720.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
960.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
1200.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
1440.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
1680.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
1920.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2160.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2400.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2520.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2640.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2760.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2880.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2904.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2928.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2952.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
2976.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
3000.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
3024.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry
3048.000	0.0000	0.00000	---	---	---	24393.600	24393.6	0	dry

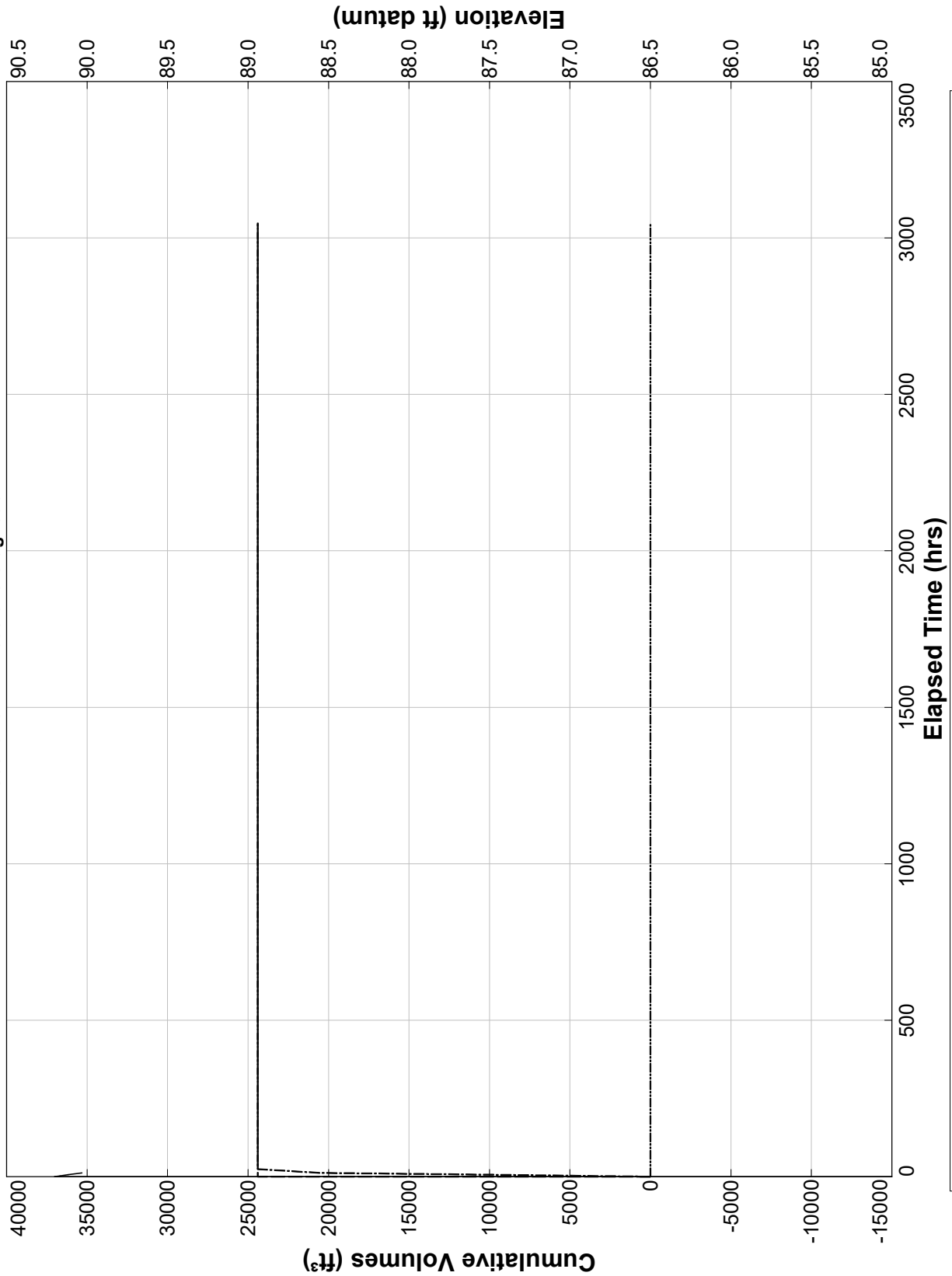
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Summary of Results :: Scenario 1 :: 24393.6 ft³ slug load

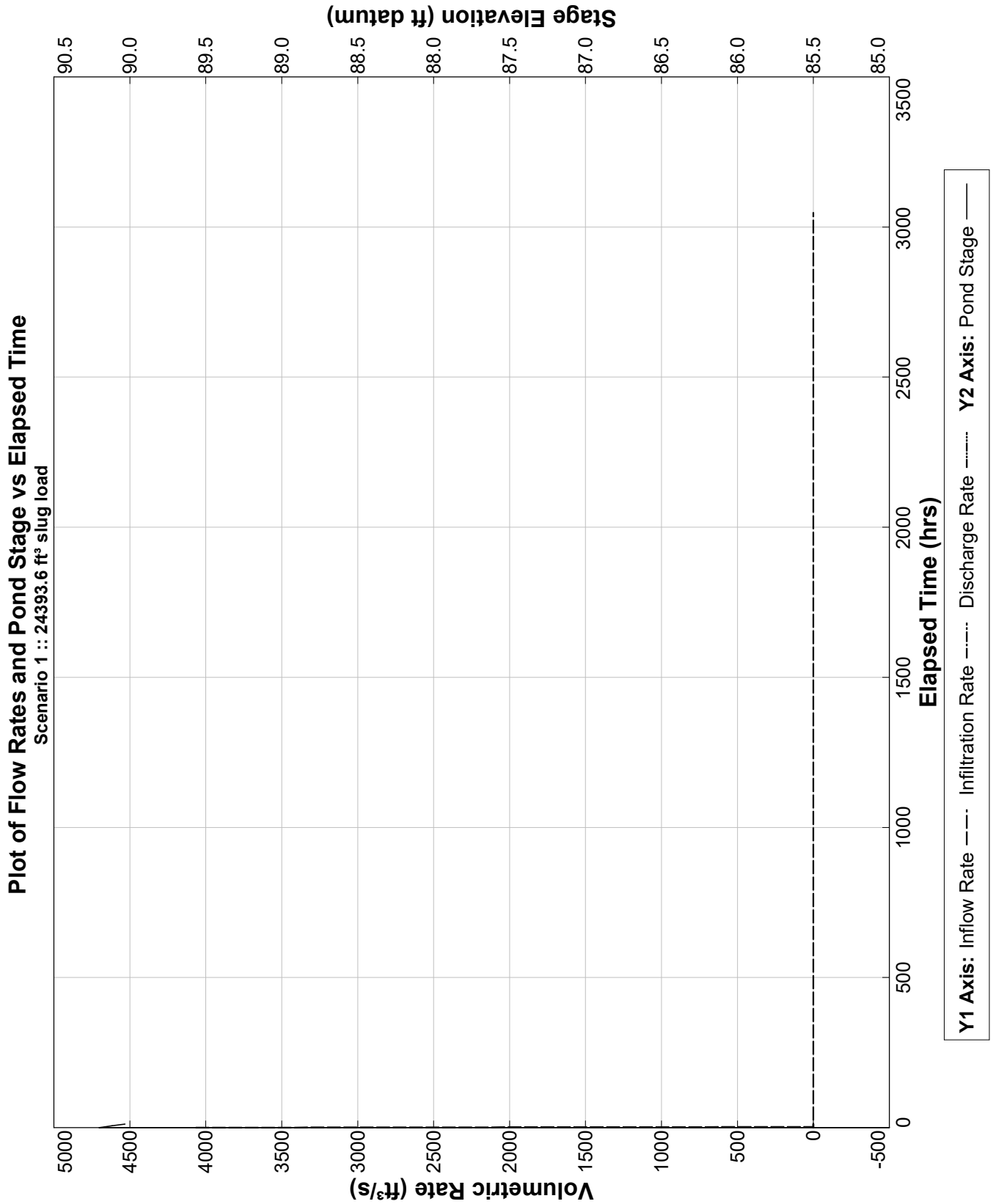
	Time (hours)	Stage (ft datum)	Rate (ft ³ /s)	Volume (ft ³)
Stage				
Minimum	0.000	85.00		
Maximum	0.002	90.20		
Inflow				
Rate - Maximum - Positive	0.002		4065.6000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			24393.6
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			24393.6
Infiltration				
Rate - Maximum - Positive	0.002		0.4736	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	12.000			20458.8
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			24393.6
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	Dry		24393.6
72 Hour Stage and Infiltration Volume	72.000	Dry		24393.6

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time

Scenario 1 :: 24393.6 ft³ slug load



Y1 Axis: Cumulative Inflow — Cumulative Infiltration - - - - Cumulative Discharge - - - - - Y2 Axis: Pond Stage —



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Project Data

Project Name: NFRC Staging Areas
Simulation Description: Staging Area No. 4 - Basin IV - Rock Voids
Project Number: BJR 19-198A
Engineer : CW
Supervising Engineer: JCD
Date: 03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 83.50
Water Table Elevation, [WT] (ft datum): 84.64
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.32
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 0.161
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 239498.3

Geometry Data

Equivalent Pond Length, [L] (ft): 900.0
Equivalent Pond Width, [W] (ft): 700.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> (ft datum)	<u>Area</u> (ft ²)
89.50	239498.3
90.00	239498.3

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive
Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive
Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

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Scenario Input Data

Scenario 1 :: 43995.6 ft³ slug load

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 43995.6

Initial ground water level (ft datum) 84.64 (default)

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	6.000	17.000	28.000	110.000
0.250	7.000	18.000	29.000	115.000
0.500	8.000	19.000	30.000	120.000
1.000	9.000	20.000	40.000	121.000
1.500	10.000	21.000	50.000	122.000
2.000	11.000	22.000	60.000	123.000
2.500	12.000	23.000	70.000	124.000
3.000	13.000	24.000	80.000	125.000
3.500	14.000	25.000	90.000	126.000
4.000	15.000	26.000	100.000	127.000
5.000	16.000	27.000	105.000	

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Detailed Results :: Scenario 1 :: 43995.6 ft³ slug load

Elapsed Time (hours)	Instantaneous Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Combined Instantaneous Discharge Rate (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Combined Cumulative Discharge (ft ³)	Flow Type
0.000	7332.6000	0.00000	84.64000	0.00000	0	0.000	0.0	0	N.A.
0.002	7332.6000	0.00000	89.68369	0.44629	0	43995.600	2.7	0	U/P
2.400	0.0000	0.00000	89.66760	0.44629	0	43995.600	3855.9	0	U/P
6.000	0.0000	0.00000	89.64345	0.44629	0	43995.600	9639.8	0	U/P
12.000	0.0000	0.00000	89.60320	0.44629	0	43995.600	19279.6	0	U/P
24.000	0.0000	0.00000	89.52270	0.22314	0	43995.600	38559.2	0	U/P
36.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
48.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
60.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
72.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
84.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
96.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
120.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
144.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
168.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
192.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
216.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
240.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
264.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
288.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
312.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
336.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
360.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
384.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
408.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
432.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
456.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
480.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
504.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
528.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
552.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
576.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
600.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
624.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
648.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
672.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
696.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
720.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
960.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
1200.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
1440.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
1680.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
1920.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2160.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2400.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2520.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2640.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2760.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2880.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2904.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2928.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2952.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
2976.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
3000.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
3024.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry
3048.000	0.0000	0.00000	----	----	----	43995.600	43995.6	0	dry

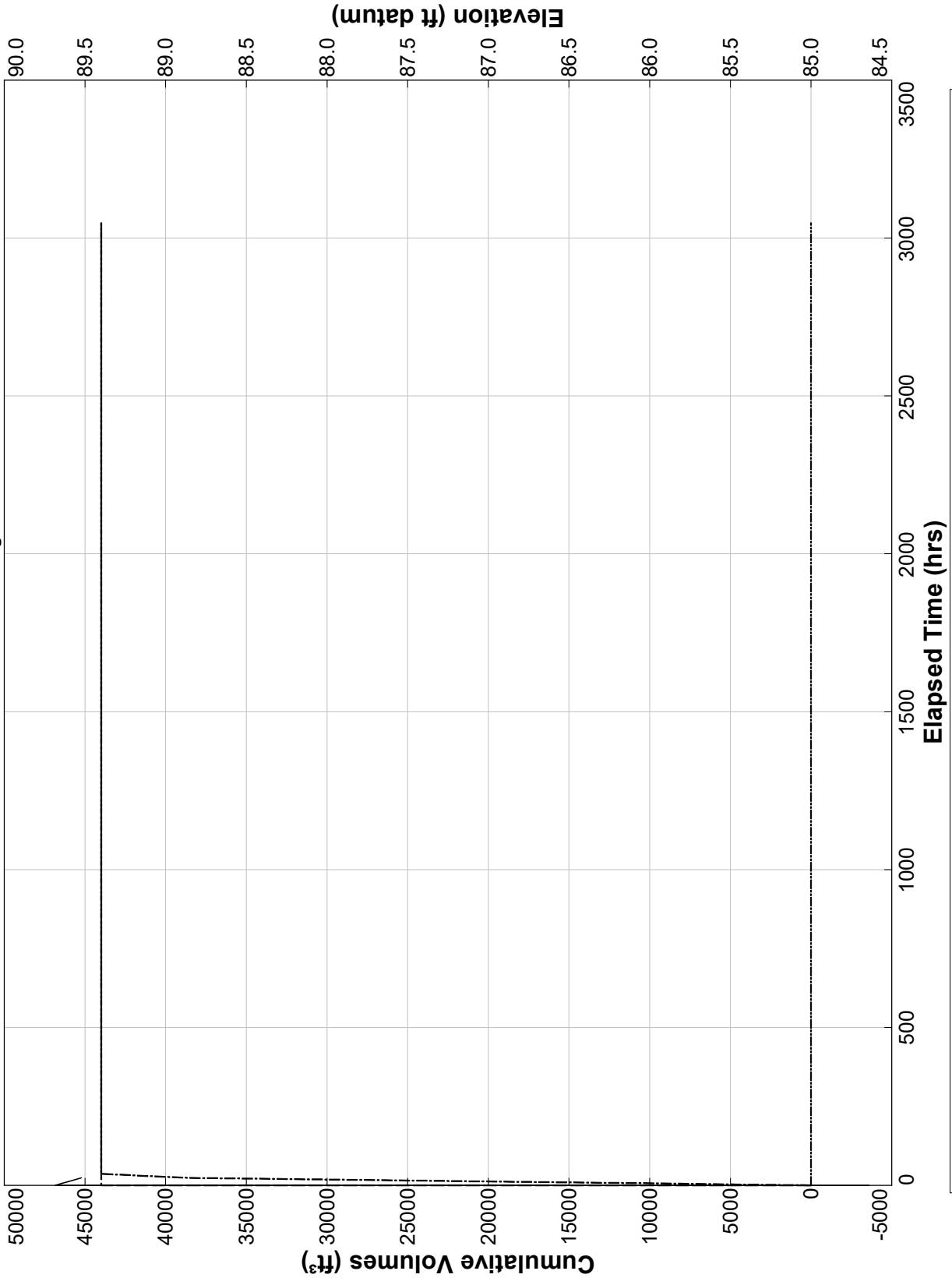
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Summary of Results :: Scenario 1 :: 43995.6 ft³ slug load

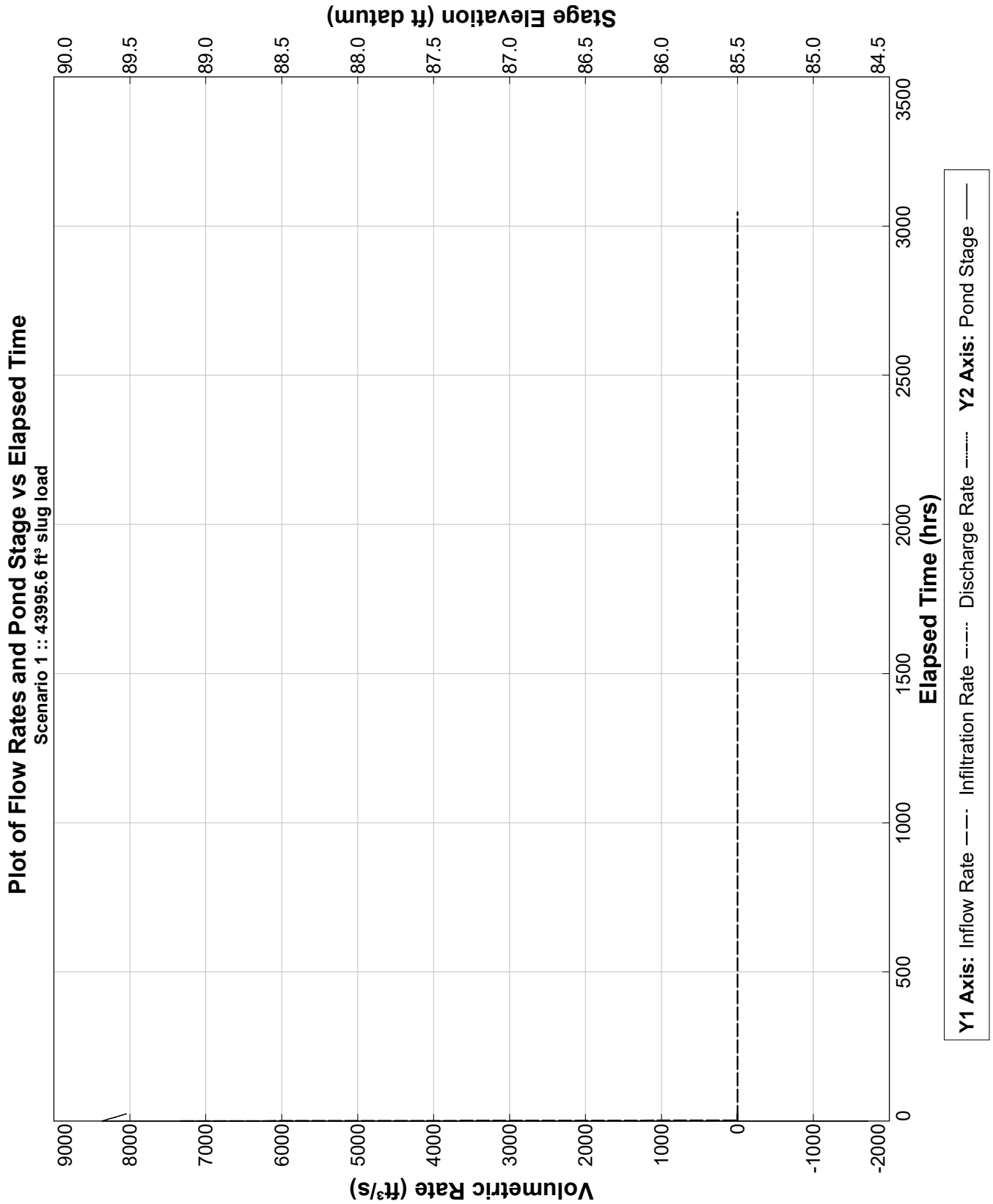
	Time (hours)	Stage (ft datum)	Rate (ft ³ /s)	Volume (ft ³)
Stage				
Minimum	0.000	84.64		
Maximum	0.002	89.68		
Inflow				
Rate - Maximum - Positive	0.002		7332.6000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			43995.6
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			43995.6
Infiltration				
Rate - Maximum - Positive	0.002		0.4463	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.000			38559.2
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			43995.6
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	Dry		43995.6
72 Hour Stage and Infiltration Volume	72.000	Dry		43995.6

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time

Scenario 1 :: 43995.6 ft³ slug load



Y1 Axis: Cumulative Inflow — Cumulative Infiltration - - - Cumulative Discharge Y2 Axis: Pond Stage —



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Project Data

Project Name: NFRC Staging Areas
Simulation Description: Staging Area No. 4 - Basin V - Rock Voids
Project Number: BJR 19-198A
Engineer : CW
Supervising Engineer: JCD
Date: 03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 88.00
Water Table Elevation, [WT] (ft datum): 89.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.57
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 0.284
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 65937.9

Geometry Data

Equivalent Pond Length, [L] (ft): 1000.0
Equivalent Pond Width, [W] (ft): 188.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> (ft datum)	<u>Area</u> (ft ²)
94.00	65937.9
94.50	65937.9

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive
Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive
Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

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Scenario Input Data

Scenario 1 :: 19602 ft³ slug load

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 19602

Initial ground water level (ft datum) 89.00 (default)

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	6.000	17.000	28.000	110.000
0.250	7.000	18.000	29.000	115.000
0.500	8.000	19.000	30.000	120.000
1.000	9.000	20.000	40.000	121.000
1.500	10.000	21.000	50.000	122.000
2.000	11.000	22.000	60.000	123.000
2.500	12.000	23.000	70.000	124.000
3.000	13.000	24.000	80.000	125.000
3.500	14.000	25.000	90.000	126.000
4.000	15.000	26.000	100.000	127.000
5.000	16.000	27.000	105.000	

PONDS Version 3.3.0278
Retention Pond Recovery - Refined Method
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Detailed Results :: Scenario 1 :: 19602 ft³ slug load

Elapsed Time (hours)	Instantaneous Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Combined Instantaneous Discharge Rate (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Combined Cumulative Discharge (ft ³)	Flow Type
0.000	3267.0000	0.00000	89.00000	0.00000	0	0.000	0.0	0	N.A.
0.002	3267.0000	0.00000	94.29726	0.21674	0	19602.000	1.3	0	U/P
2.400	0.0000	0.00000	94.26888	0.21674	0	19602.000	1872.6	0	U/P
6.000	0.0000	0.00000	94.22628	0.21674	0	19602.000	4681.6	0	U/P
12.000	0.0000	0.00000	94.15528	0.21674	0	19602.000	9363.2	0	U/P
24.000	0.0000	0.00000	94.01328	0.10837	0	19602.000	18726.4	0	U/P
36.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
48.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
60.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
72.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
84.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
96.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
120.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
144.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
168.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
192.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
216.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
240.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
264.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
288.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
312.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
336.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
360.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
384.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
408.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
432.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
456.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
480.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
504.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
528.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
552.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
576.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
600.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
624.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
648.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
672.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
696.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
720.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
960.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
1200.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
1440.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
1680.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
1920.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2160.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2400.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2520.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2640.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2760.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2880.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2904.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2928.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2952.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
2976.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
3000.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
3024.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry
3048.000	0.0000	0.00000	---	---	---	19602.000	19602.0	0	dry

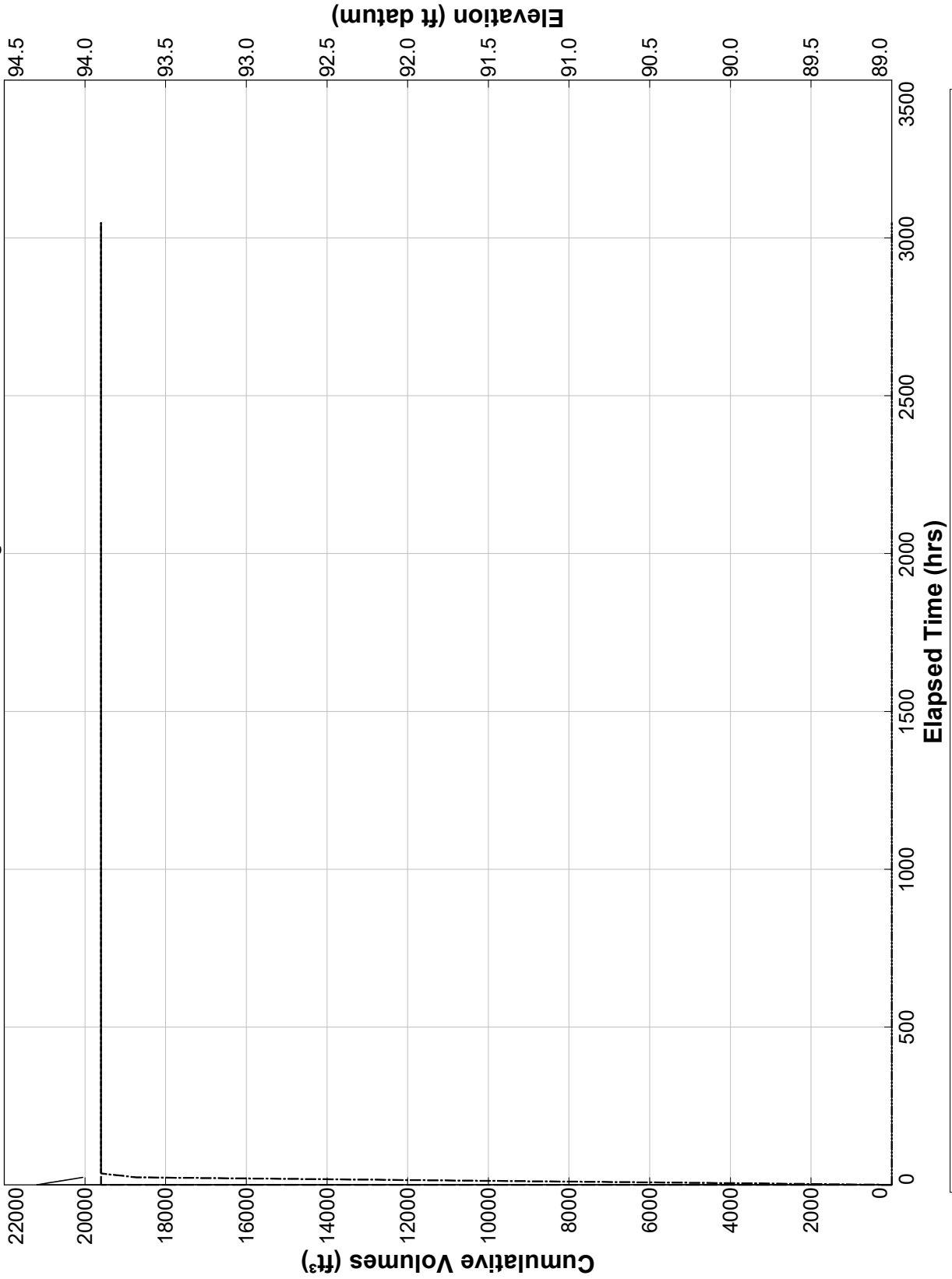
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Summary of Results :: Scenario 1 :: 19602 ft³ slug load

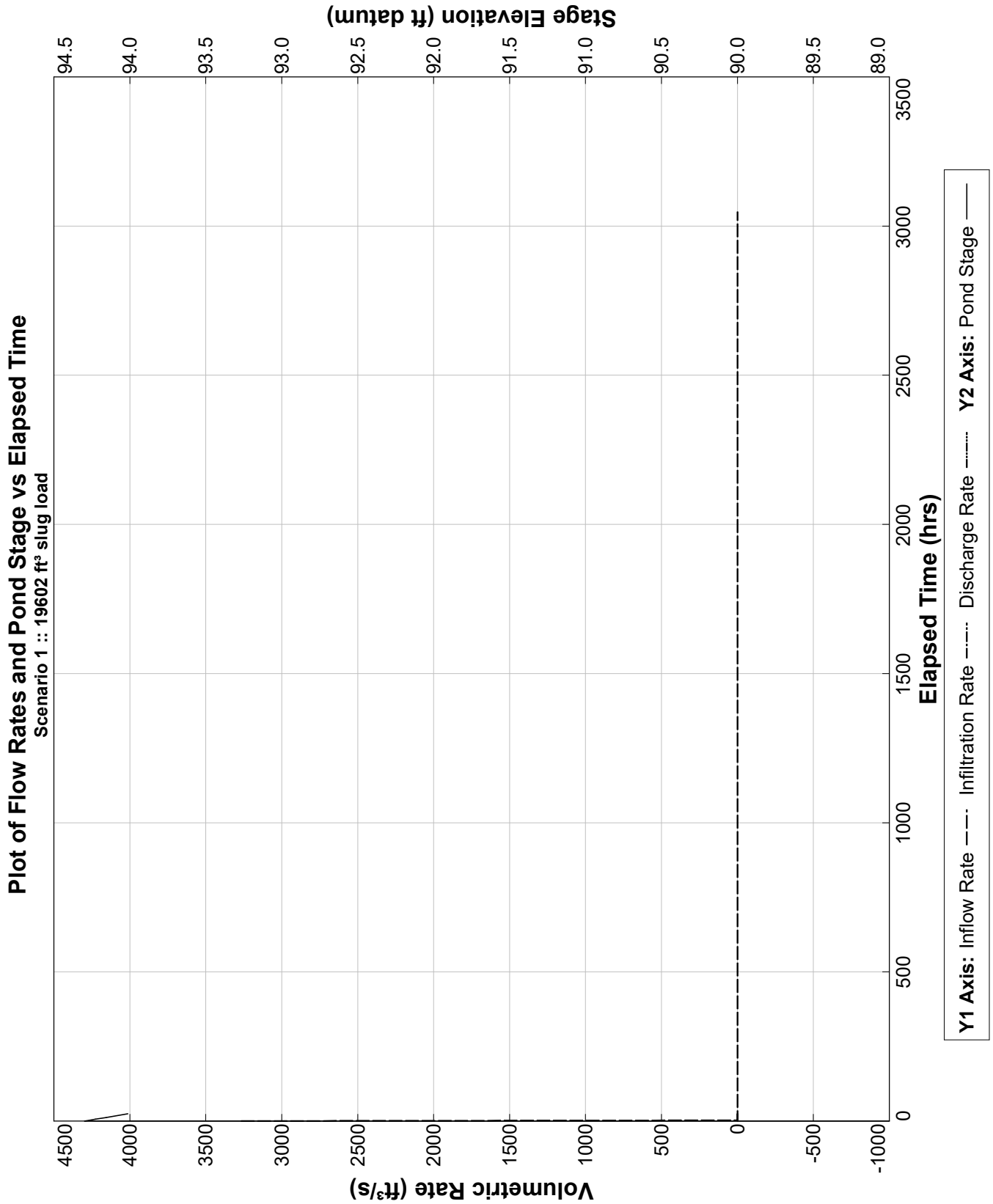
	Time (hours)	Stage (ft datum)	Rate (ft ³ /s)	Volume (ft ³)
Stage				
Minimum	0.000	89.00		
Maximum	0.002	94.30		
Inflow				
Rate - Maximum - Positive	0.002		3267.0000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			19602.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			19602.0
Infiltration				
Rate - Maximum - Positive	0.002		0.2167	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.000			18726.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			19602.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	3048.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	Dry		19602.0
72 Hour Stage and Infiltration Volume	72.000	Dry		19602.0

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time

Scenario 1 :: 19602 ft³ slug load



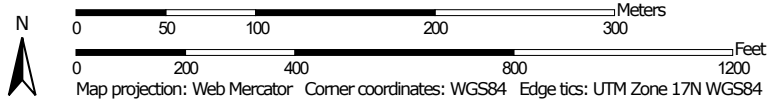
Y1 Axis: Cumulative Inflow --- Cumulative Infiltration -.-.- Cumulative Discharge Y2 Axis: Pond Stage ——



Soil Map—Madison County, Florida



Map Scale: 1:4,210 if printed on A portrait (8.5" x 11") sheet.



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

11/15/2019
Page 1 of 3


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Madison County, Florida

Survey Area Data: Version 14, Sep 17, 2019

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

Date(s) aerial images were photographed: Jun 5, 2006—Feb 16, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Blanton sand, 0 to 5 percent slopes	79.6	100.0%
Totals for Area of Interest		79.6	100.0%

Madison County, Florida

5—Blanton sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w4gr

Elevation: 100 to 400 feet

Mean annual precipitation: 40 to 69 inches

Mean annual air temperature: 52 to 72 degrees F

Frost-free period: 190 to 310 days

Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Knolls on marine terraces, interfluves, ridges on marine terraces

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

Ap - 0 to 12 inches: sand

E1 - 12 to 37 inches: sand

E2 - 37 to 53 inches: sand

E3 - 53 to 69 inches: sand

Bt - 69 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High
(1.98 to 5.95 in/hr)

Depth to water table: About 48 to 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 5 percent
Landform: Flats, interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Fuquay

Percent of map unit: 5 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Bonifay

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Alpin

Percent of map unit: 3 percent
Landform: Flats on marine terraces, knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ocilla

Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

Data Source Information

Soil Survey Area: Madison County, Florida

Survey Area Data: Version 14, Sep 17, 2019



FIELD TESTING STANDARDS AND PROCEDURES

Standard Penetration Test (SPT) Boring

The SPT borings were advanced by means of a truck or track mounted drill rig employing wet rotary drilling techniques. The SPT testing was performed continuously in the upper ten feet and at five-foot intervals thereafter. The soil samples were obtained at the depths where the SPT testing was performed. The soil samples were then classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation by a geotechnical engineer.

The SPT borings were performed in general compliance with standard field penetration test procedures (ASTM D 1586-99). After drilling to the sampling depth and flushing the borehole, the standard two-inch O.D. split-barrel sampler was seated by driving it six inches into the undisturbed soil at the bottom of the borehole. The sampler was then driven an additional 12 inches by a 140-pound hammer falling 30 inches. The number of blows required to produce the 12 inches of penetration is recorded as the standard penetration test value (N). These values are plotted on the left side of the boring log Figure 3.

In the upper ten feet sampling was performed by driving the split-barrel sampler 24 inches and the blows required to drive the sampler the middle two 6-inch increments were recorded as the “N” value. Through this technique, the upper ten feet of the soil was sampled continuously. Detailed descriptions of the soils encountered during the advancement of the SPT boring are presented in the Boring Logs.

Soil Sample Handling and Classification

The soil samples obtained from the SPT borings were placed in sealed containers to retain moisture and returned to our laboratory. The samples were then reviewed by a geotechnical engineer to confirm classifications, visually estimate the relative percentages of the soil’s constituents (sand, clay, etc.), and identify pertinent structural features. We visually classified the soils according to the Unified Soil Classification System (ASTM D 2487). The stratification lines shown on the boring logs in Figure 3 represent our interpretation of approximate boundaries between soil types. The transition between strata may be gradual. Our classifications are based on a visual estimation of the soil properties and our engineering experience with the soils found in this geologic area.

The SPT “N” values are presented adjacent along the left side of the boring logs. The correlation of the SPT “N” values with relative density, unconfined compressive strength, and consistency are provided in the following table:

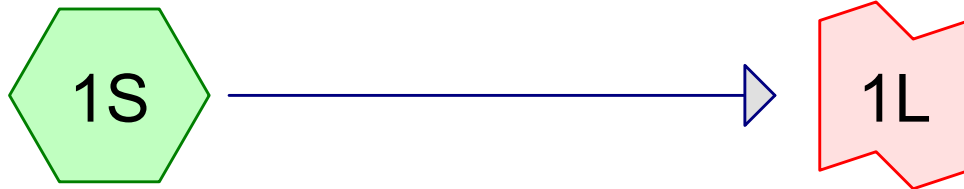
Coarse-Grained Soils		Fine Grained Soils		
Penetration Resistance N (blows/ft)	Relative Density of Sand	Penetration Resistance N (blows/ft)	Unconfined Compressive Strength of Clay (tons/ft ²)	Consistency of Clay
0-4	Very Loose	<2	<0.25	Very Soft
4-10	Loose	2-4	0.25-0.50	Soft
10-30	Medium-Dense	4-8	0.50-1.00	Medium
30-50	Dense	8-15	1.00-2.00	Stiff
>50	Very Dense	15-30	2.00-4.00	Very Stiff
		>30	>4.00	Hard

Hand Auger Borings

The auger borings were performed with a manually advanced hand auger. The auger was advanced by rotating it into the ground in approximate 6-inch increments. After each incremental penetration, the auger was retracted, and the soils collected in the auger bucket were placed in sealed containers. The samples were then reviewed by a geotechnical engineer and classified as described above. Detailed descriptions of the soils encountered in the auger borings are presented in the Auger Boring Logs.

Appendix B – HydroCAD Report

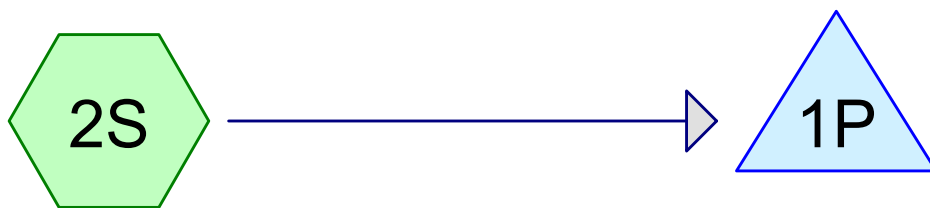
PRE-DEVELOPED SITE



PRE DEVELOPED
DRAINAGE AREA 1

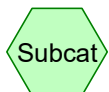
EXISTING OUTFALL
LOCATION

POST DEVELOPED SITE



POST DEVELOPED
DRAINAGE AREA 1

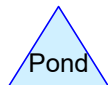
PROPOSED POND



Subcat



Reach



Pond



Link

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=1.64 cfs 0.246 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>4.03"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=8.45 cfs 0.609 af

Pond 1P: PROPOSED POND Peak Elev=88.95' Storage=19,169 cf Inflow=8.45 cfs 0.609 af
Outflow=0.48 cfs 0.178 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=1.64 cfs 0.246 af
Primary=1.64 cfs 0.246 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.64 cfs @ 12.49 hrs, Volume= 0.246 af, Depth> 1.63"

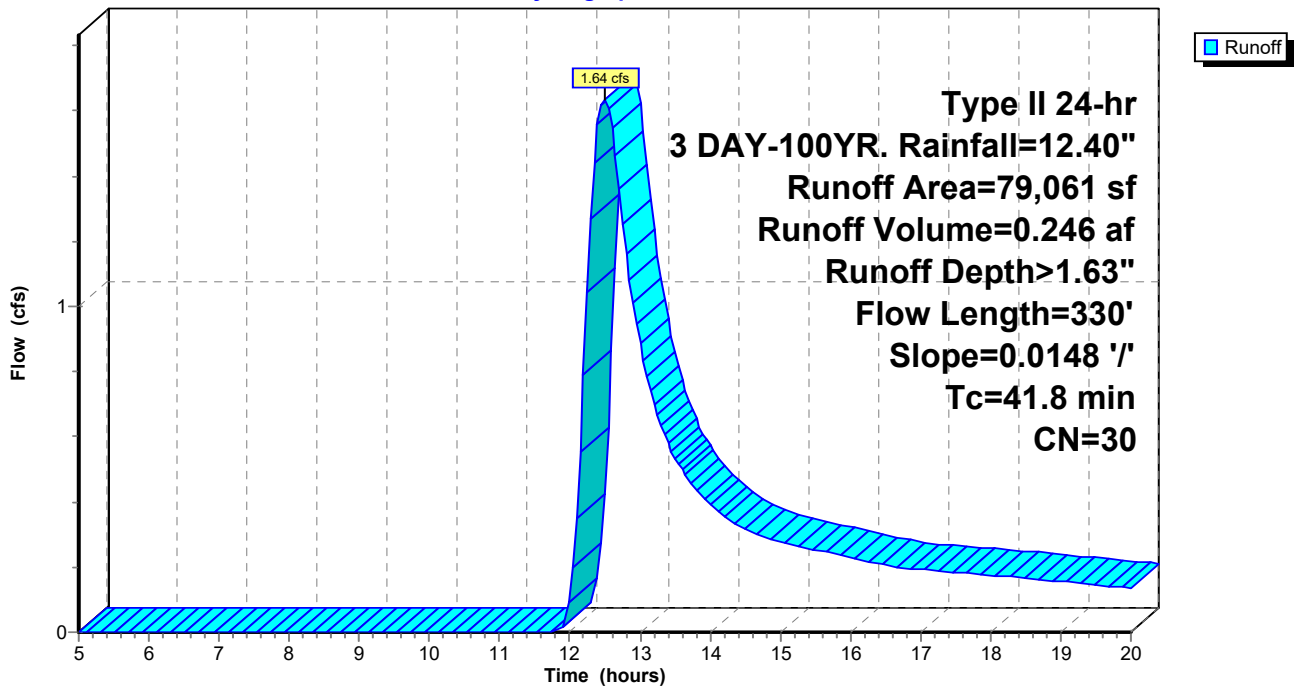
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 8.45 cfs @ 12.15 hrs, Volume= 0.609 af, Depth> 4.03"

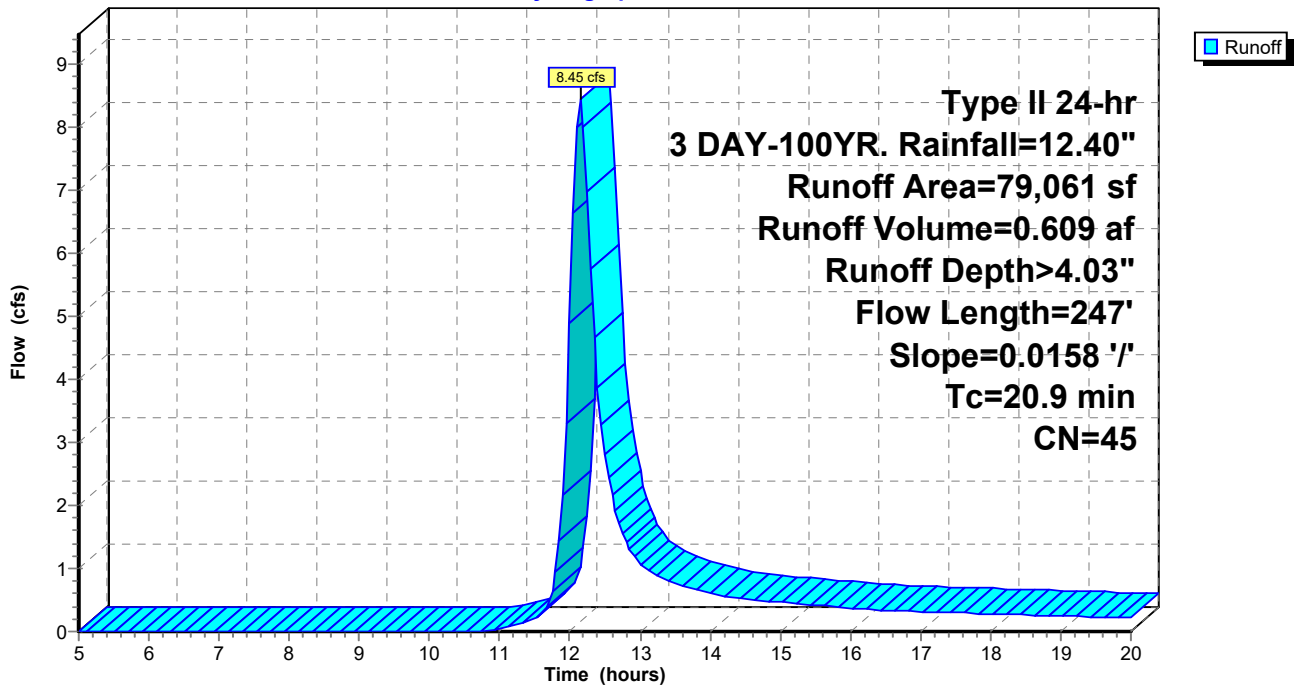
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 4.03" for 3 DAY-100YR. event
 Inflow = 8.45 cfs @ 12.15 hrs, Volume= 0.609 af
 Outflow = 0.48 cfs @ 14.83 hrs, Volume= 0.178 af, Atten= 94%, Lag= 160.7 min
 Primary = 0.48 cfs @ 14.83 hrs, Volume= 0.178 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.95' @ 14.83 hrs Surf.Area= 20,848 sf Storage= 19,169 cf

Plug-Flow detention time= 273.7 min calculated for 0.177 af (29% of inflow)
 Center-of-Mass det. time= 180.4 min (995.6 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

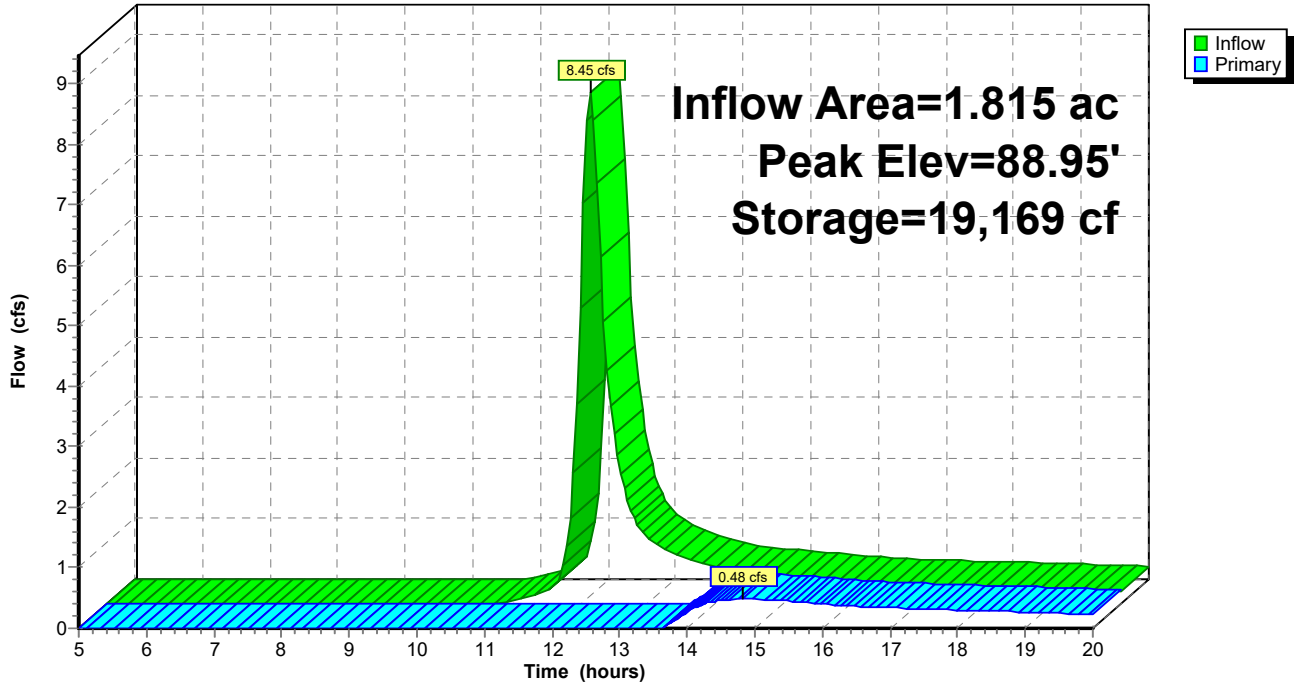
Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.47 cfs @ 14.83 hrs HW=88.95' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 0.47 cfs @ 0.70 fps)

Pond 1P: PROPOSED POND

Hydrograph

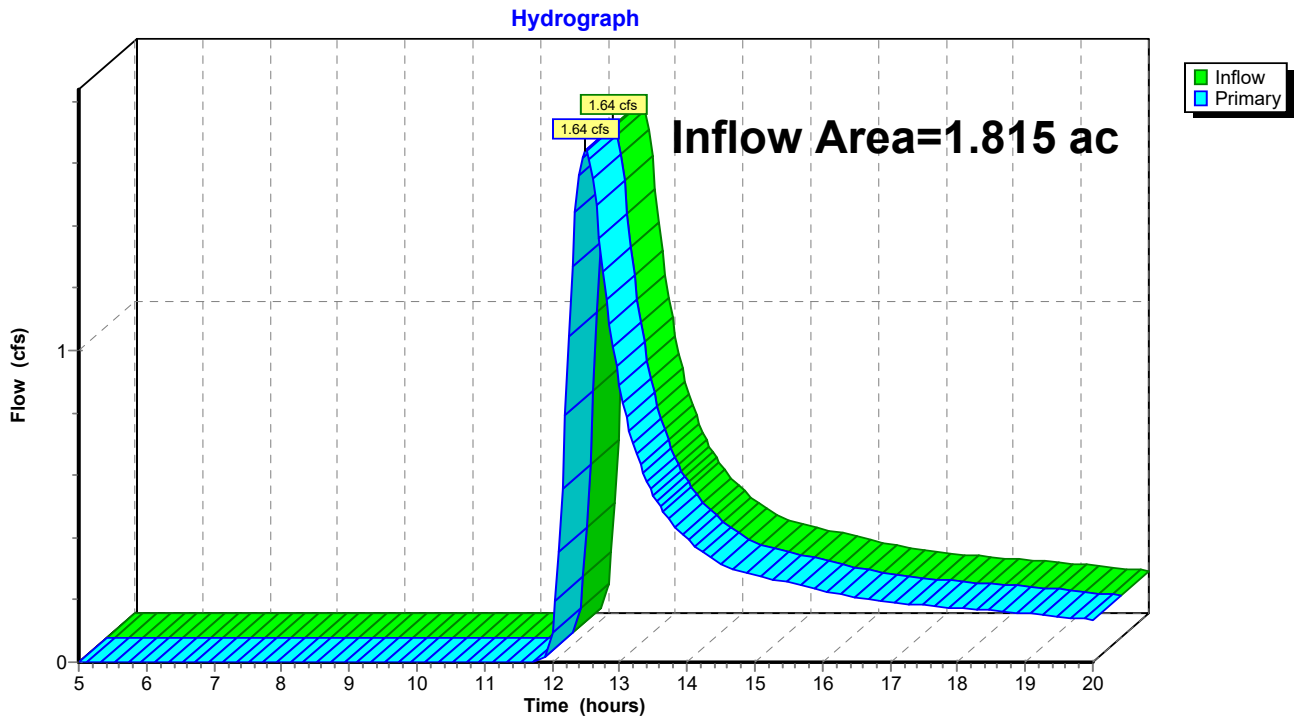


Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 1.63" for 3 DAY-100YR. event
Inflow = 1.64 cfs @ 12.49 hrs, Volume= 0.246 af
Primary = 1.64 cfs @ 12.49 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>2.29"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=2.53 cfs 0.346 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>5.09"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=10.78 cfs 0.769 af

Pond 1P: PROPOSED POND Peak Elev=88.99' Storage=20,000 cf Inflow=10.78 cfs 0.769 af
Outflow=1.18 cfs 0.337 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=2.53 cfs 0.346 af
Primary=2.53 cfs 0.346 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 2.53 cfs @ 12.47 hrs, Volume= 0.346 af, Depth> 2.29"

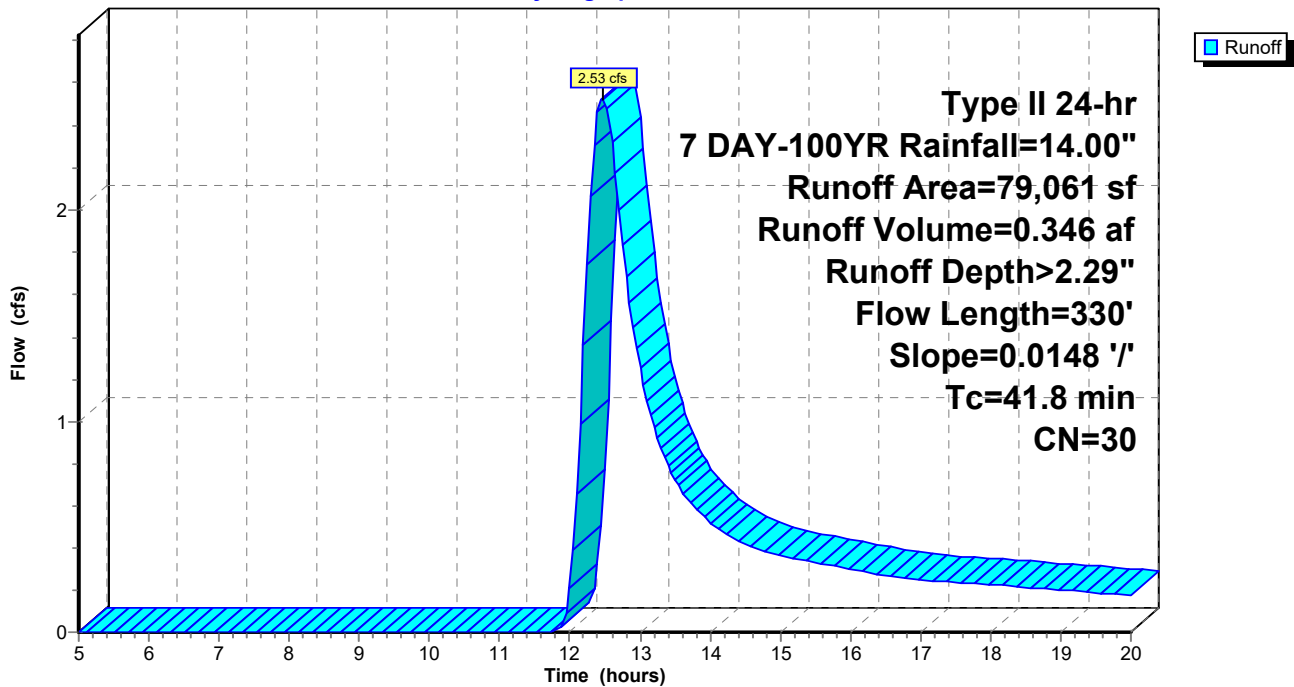
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 10.78 cfs @ 12.15 hrs, Volume= 0.769 af, Depth> 5.09"

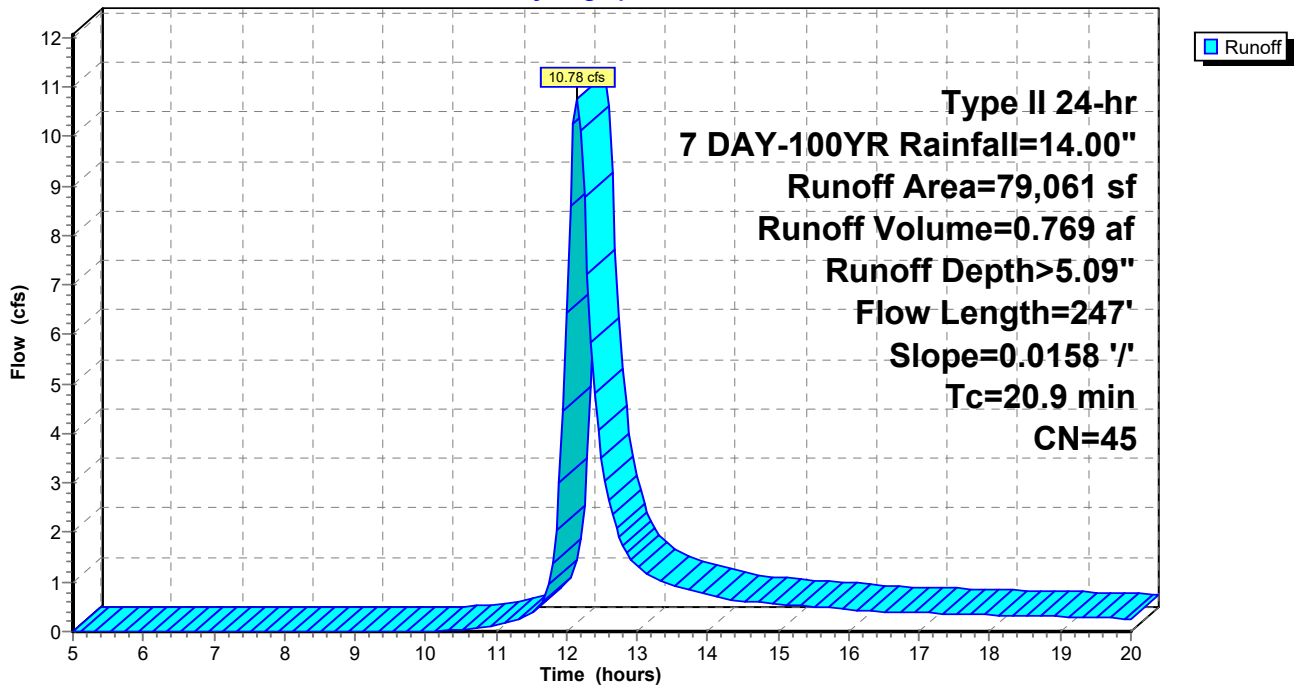
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 5.09" for 7 DAY-100YR event
Inflow = 10.78 cfs @ 12.15 hrs, Volume= 0.769 af
Outflow = 1.18 cfs @ 13.14 hrs, Volume= 0.337 af, Atten= 89%, Lag= 59.7 min
Primary = 1.18 cfs @ 13.14 hrs, Volume= 0.337 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 88.99' @ 13.14 hrs Surf.Area= 20,901 sf Storage= 20,000 cf

Plug-Flow detention time= 201.8 min calculated for 0.335 af (44% of inflow)
Center-of-Mass det. time= 116.3 min (926.7 - 810.4)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

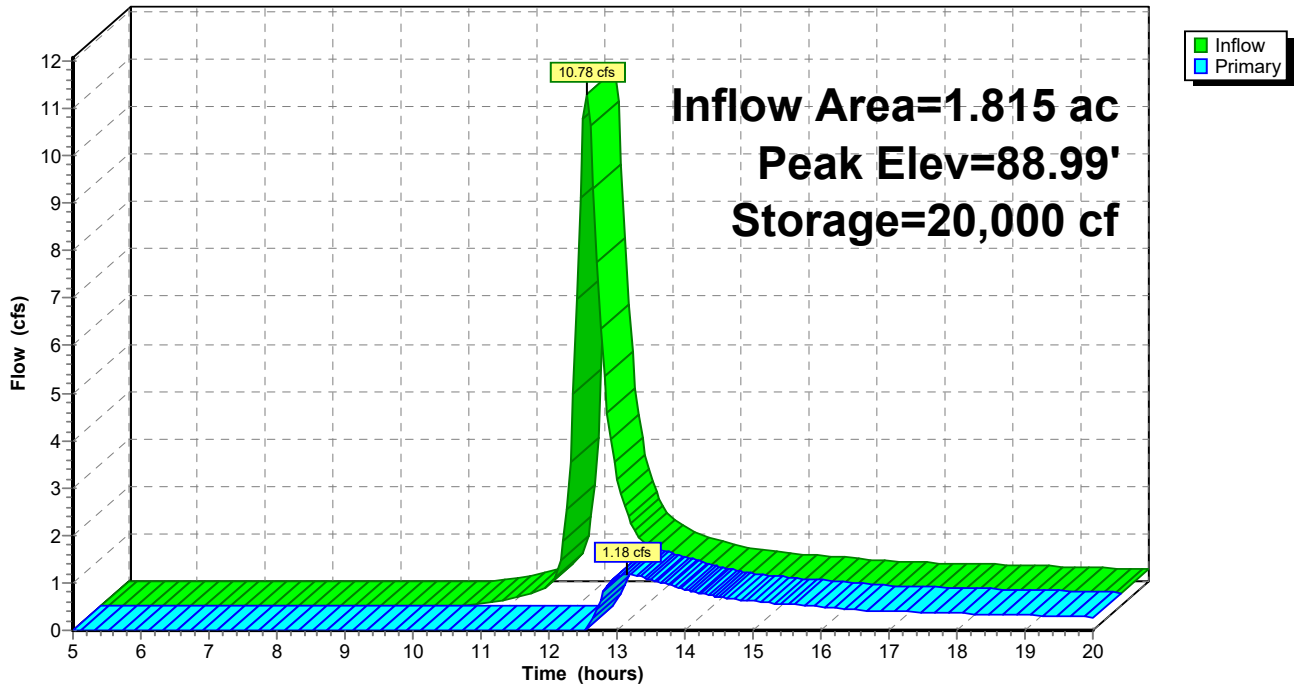
Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=1.17 cfs @ 13.14 hrs HW=88.99' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 1.17 cfs @ 0.95 fps)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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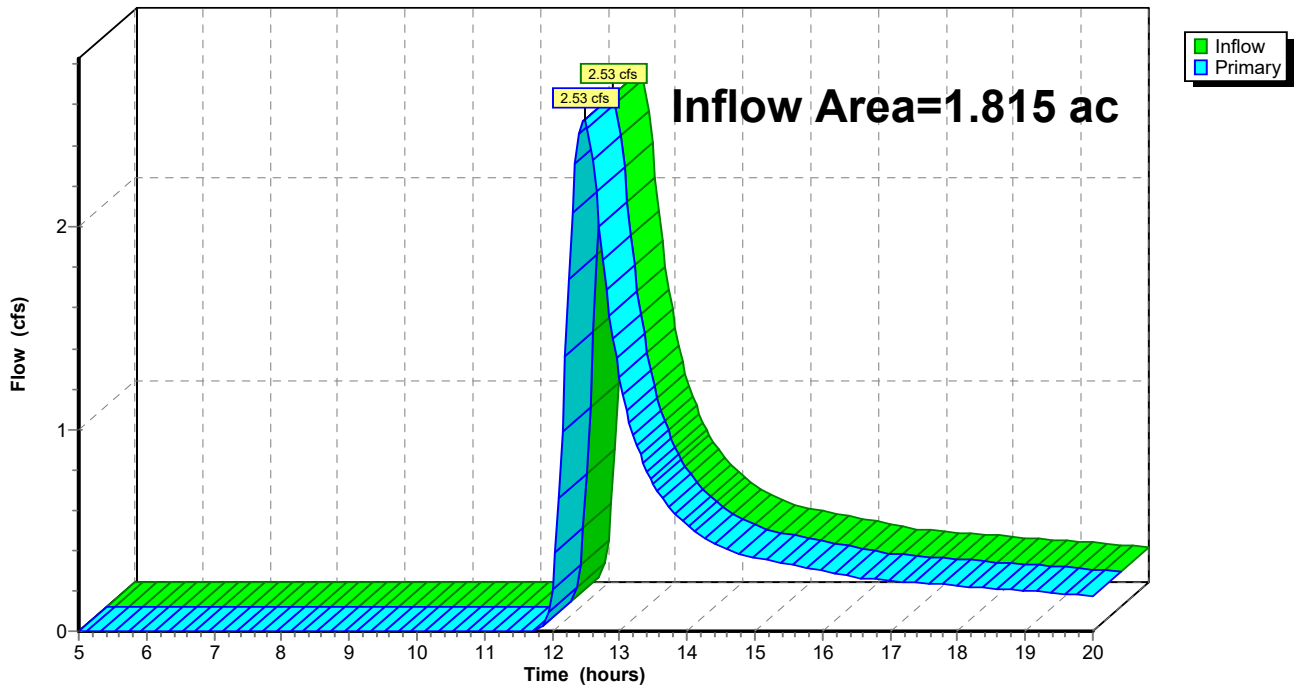
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 2.29" for 7 DAY-100YR event
Inflow = 2.53 cfs @ 12.47 hrs, Volume= 0.346 af
Primary = 2.53 cfs @ 12.47 hrs, Volume= 0.346 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>3.27"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=3.90 cfs 0.495 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>6.56"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=13.98 cfs 0.992 af

Pond 1P: PROPOSED POND Peak Elev=89.08' Storage=21,950 cf Inflow=13.98 cfs 0.992 af
Outflow=3.46 cfs 0.557 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=3.90 cfs 0.495 af
Primary=3.90 cfs 0.495 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 3.90 cfs @ 12.45 hrs, Volume= 0.495 af, Depth> 3.27"

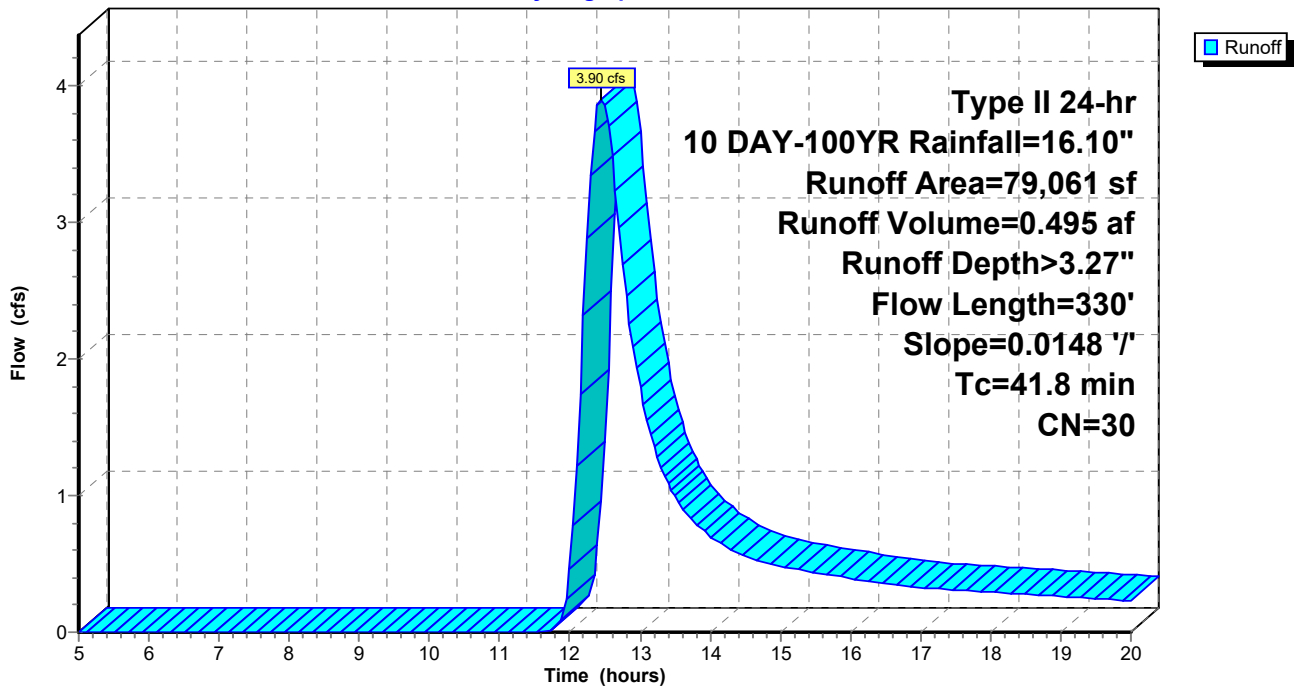
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 13.98 cfs @ 12.14 hrs, Volume= 0.992 af, Depth> 6.56"

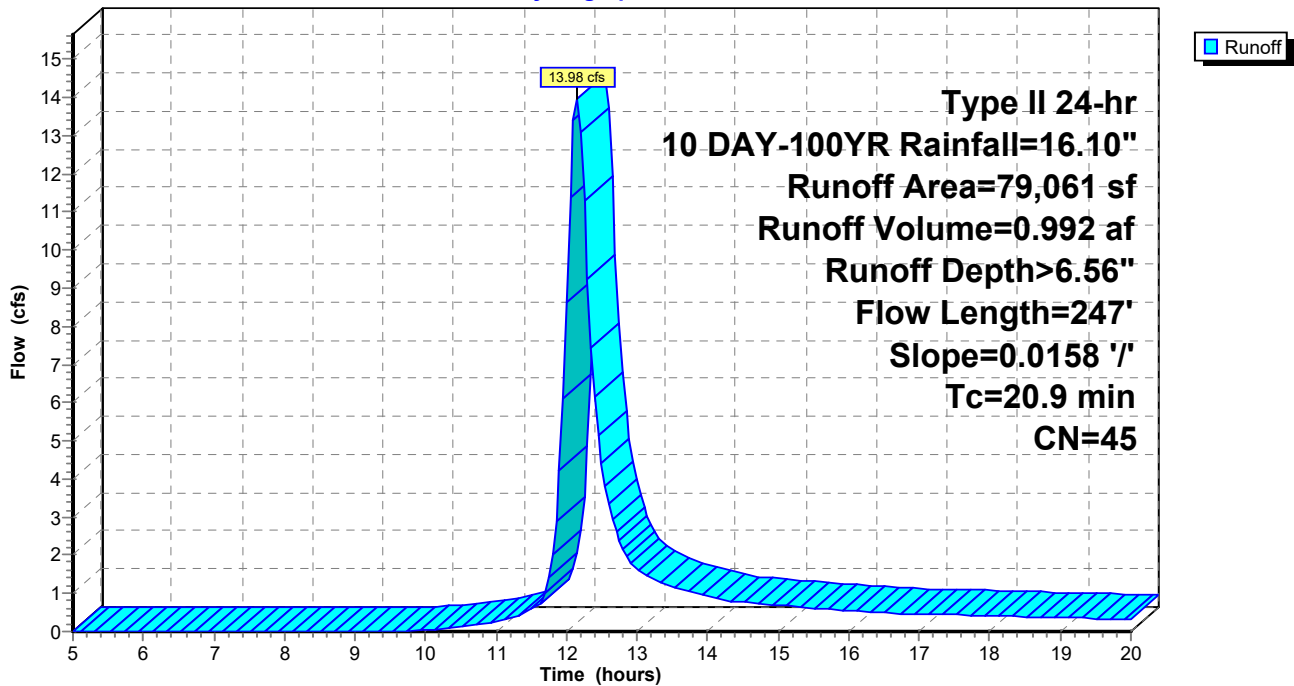
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 6.56" for 10 DAY-100YR event
 Inflow = 13.98 cfs @ 12.14 hrs, Volume= 0.992 af
 Outflow = 3.46 cfs @ 12.59 hrs, Volume= 0.557 af, Atten= 75%, Lag= 26.9 min
 Primary = 3.46 cfs @ 12.59 hrs, Volume= 0.557 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.08' @ 12.59 hrs Surf.Area= 21,026 sf Storage= 21,950 cf

Plug-Flow detention time= 156.8 min calculated for 0.557 af (56% of inflow)
 Center-of-Mass det. time= 78.0 min (883.2 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

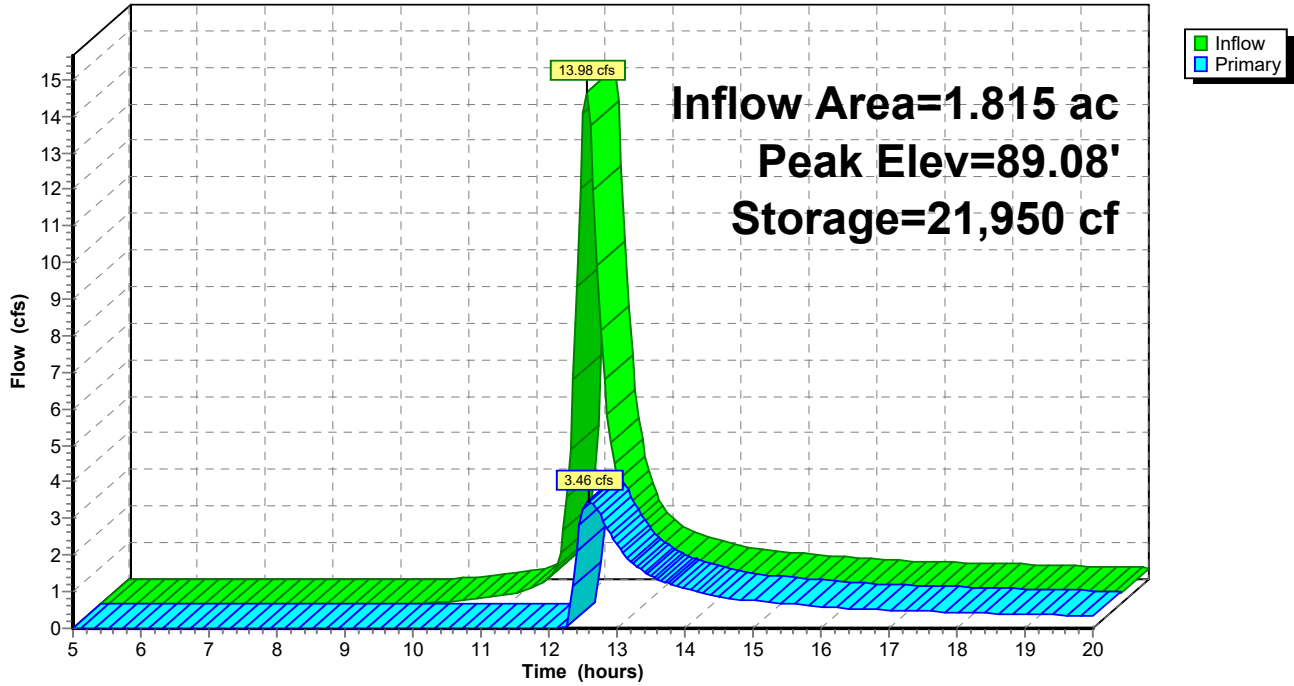
Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=3.46 cfs @ 12.59 hrs HW=89.08' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 3.46 cfs @ 1.36 fps)

Pond 1P: PROPOSED POND

Hydrograph



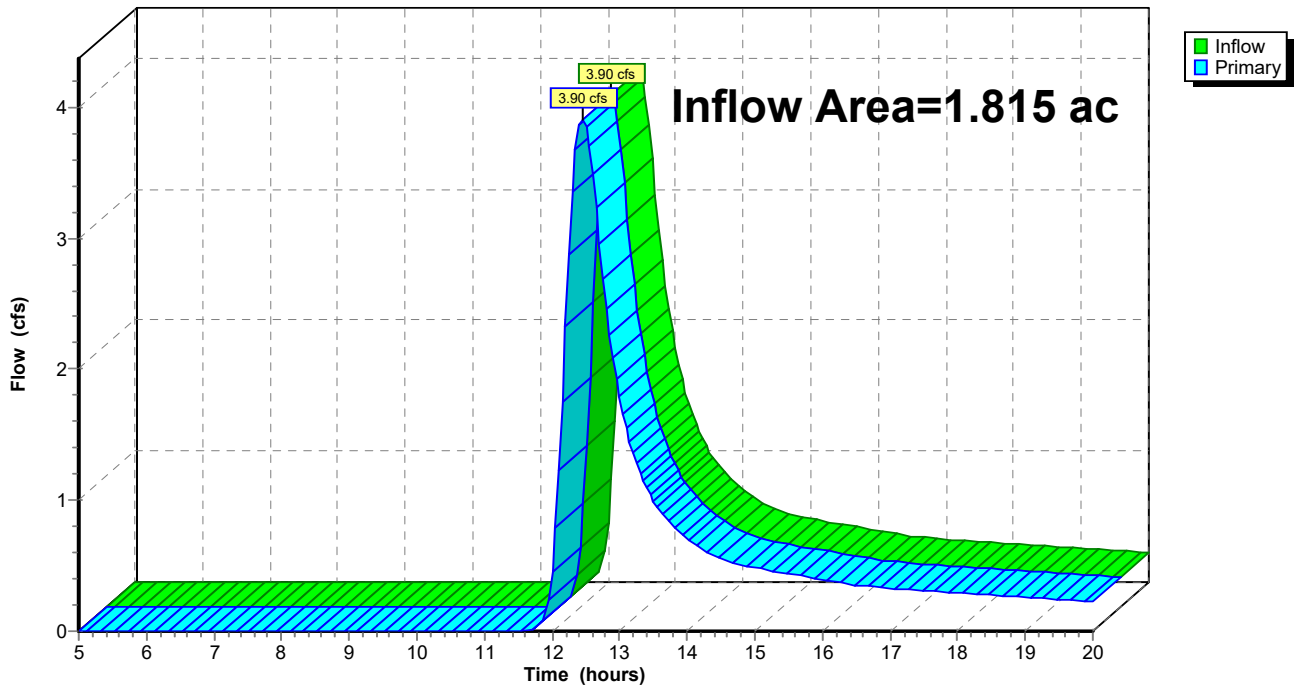
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 3.27" for 10 DAY-100YR event
Inflow = 3.90 cfs @ 12.45 hrs, Volume= 0.495 af
Primary = 3.90 cfs @ 12.45 hrs, Volume= 0.495 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.11"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.03 cfs 0.017 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.95"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=1.59 cfs 0.144 af

Pond 1P: PROPOSED POND Peak Elev=88.32' Storage=6,282 cf Inflow=1.59 cfs 0.144 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=0.03 cfs 0.017 af
Primary=0.03 cfs 0.017 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.03 cfs @ 14.07 hrs, Volume= 0.017 af, Depth> 0.11"

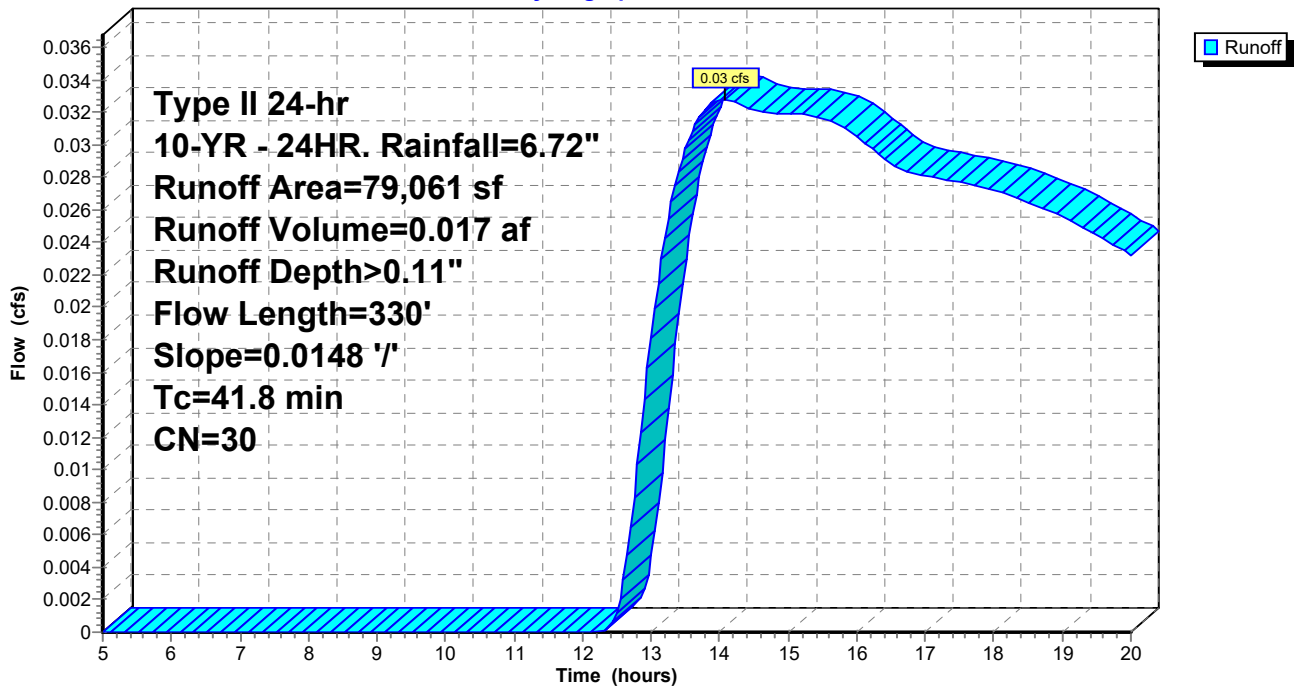
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 1.59 cfs @ 12.18 hrs, Volume= 0.144 af, Depth> 0.95"

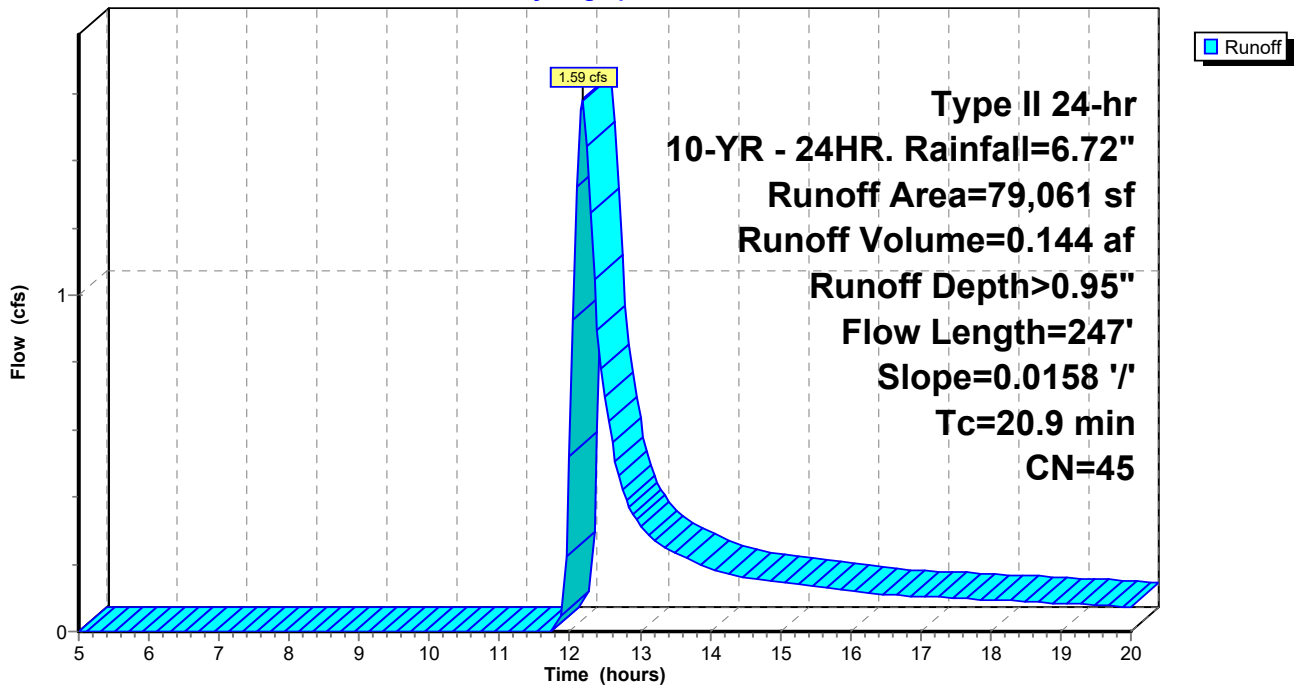
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.95" for 10-YR - 24HR. event
Inflow = 1.59 cfs @ 12.18 hrs, Volume= 0.144 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 88.32' @ 20.00 hrs Surf.Area= 20,010 sf Storage= 6,282 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

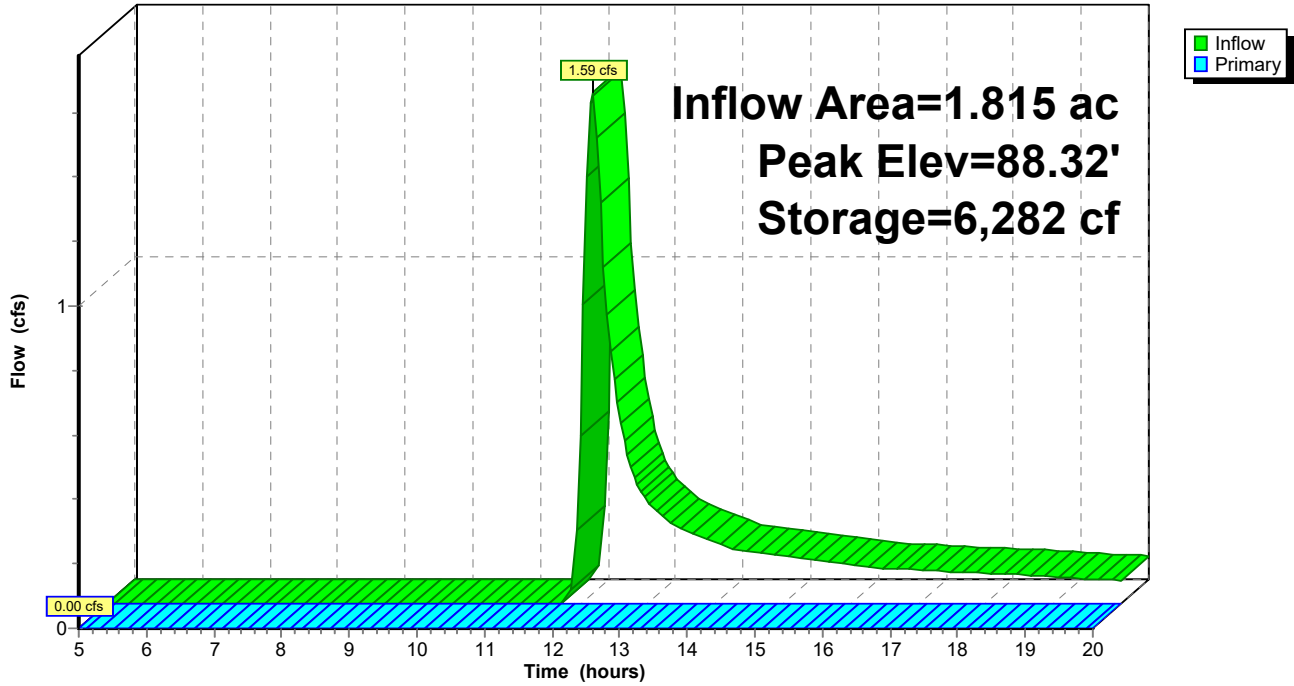
Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



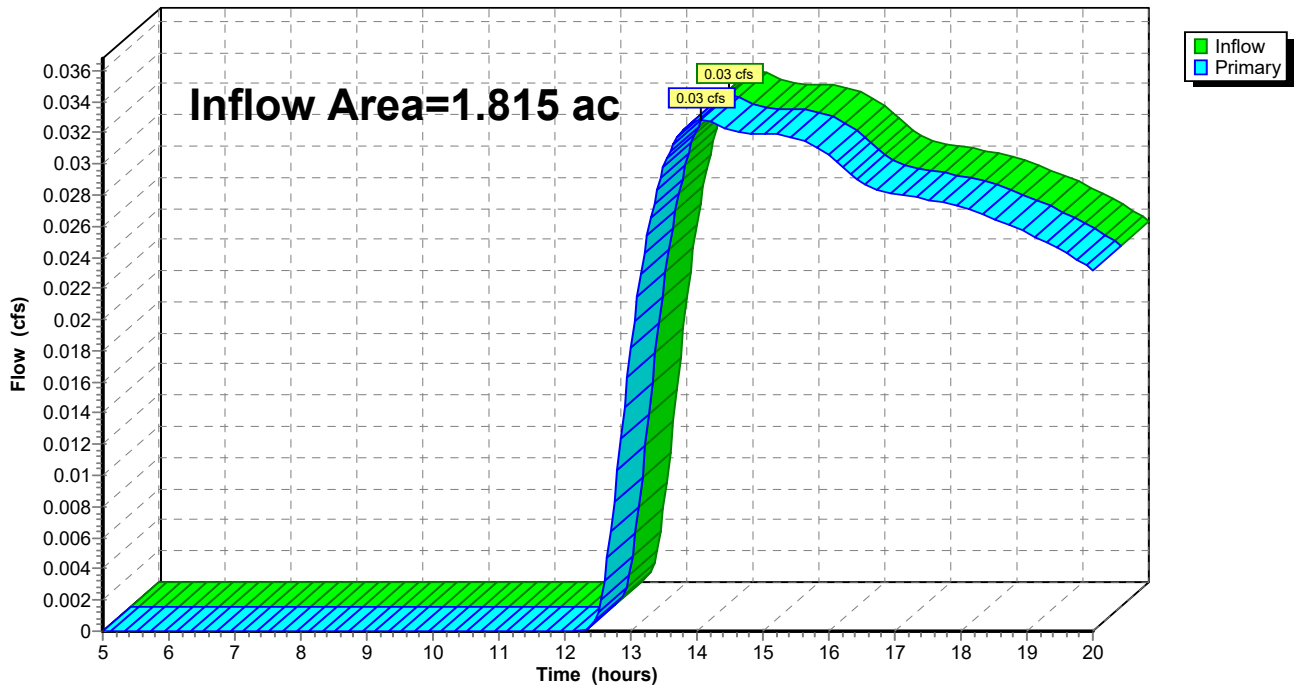
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.11" for 10-YR - 24HR. event
Inflow = 0.03 cfs @ 14.07 hrs, Volume= 0.017 af
Primary = 0.03 cfs @ 14.07 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.30"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.13 cfs 0.046 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>1.48"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=2.78 cfs 0.224 af

Pond 1P: PROPOSED POND Peak Elev=88.49' Storage=9,764 cf Inflow=2.78 cfs 0.224 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=0.13 cfs 0.046 af
Primary=0.13 cfs 0.046 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.13 cfs @ 12.84 hrs, Volume= 0.046 af, Depth> 0.30"

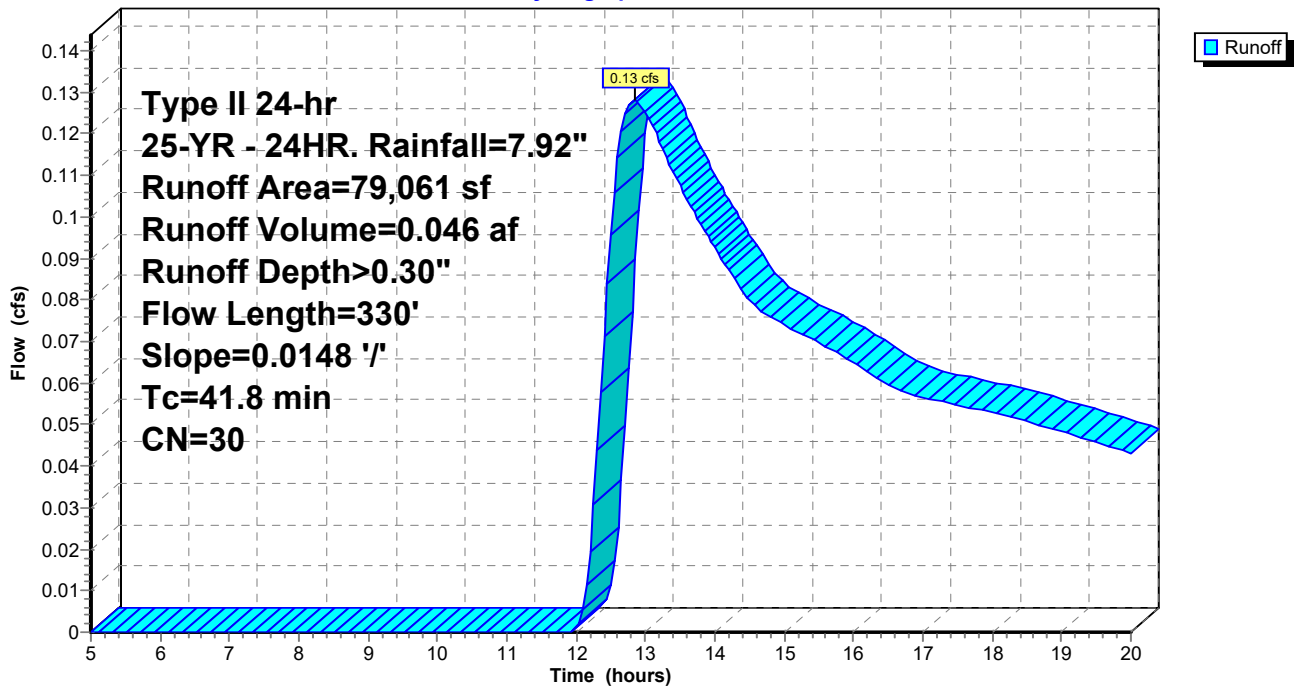
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 2.78 cfs @ 12.17 hrs, Volume= 0.224 af, Depth> 1.48"

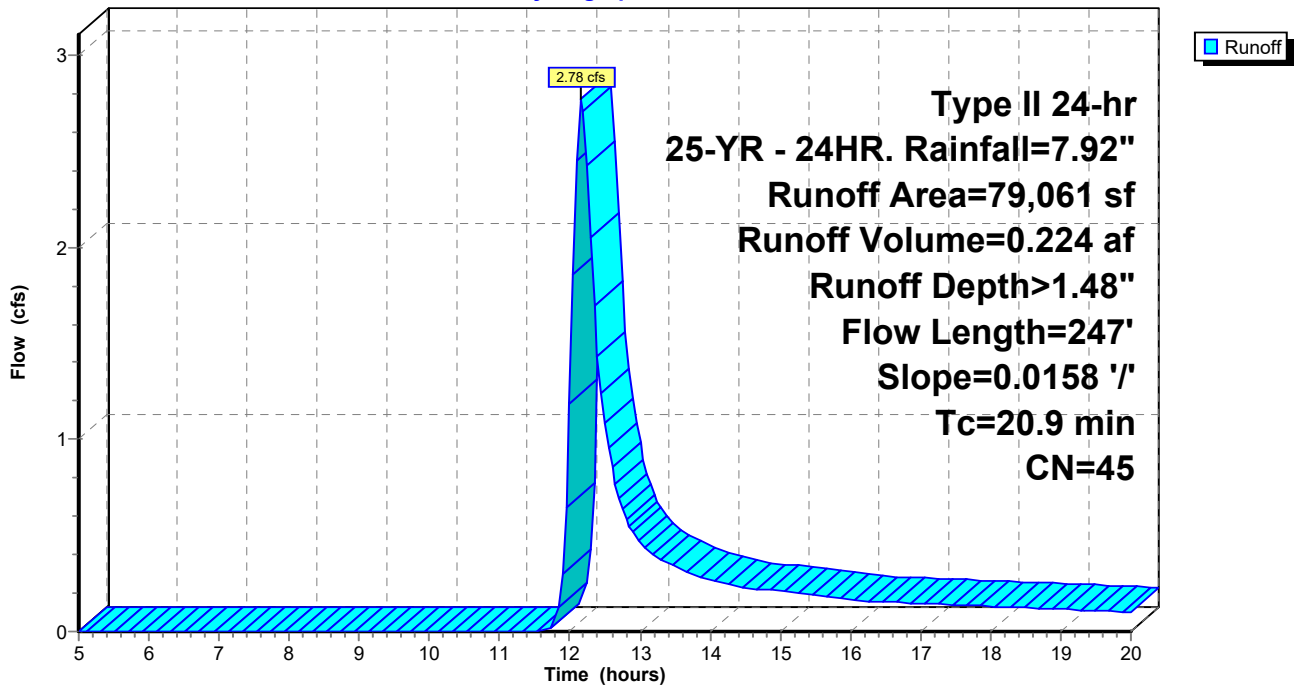
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 1.48" for 25-YR - 24HR. event
 Inflow = 2.78 cfs @ 12.17 hrs, Volume= 0.224 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.49' @ 20.00 hrs Surf.Area= 20,240 sf Storage= 9,764 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

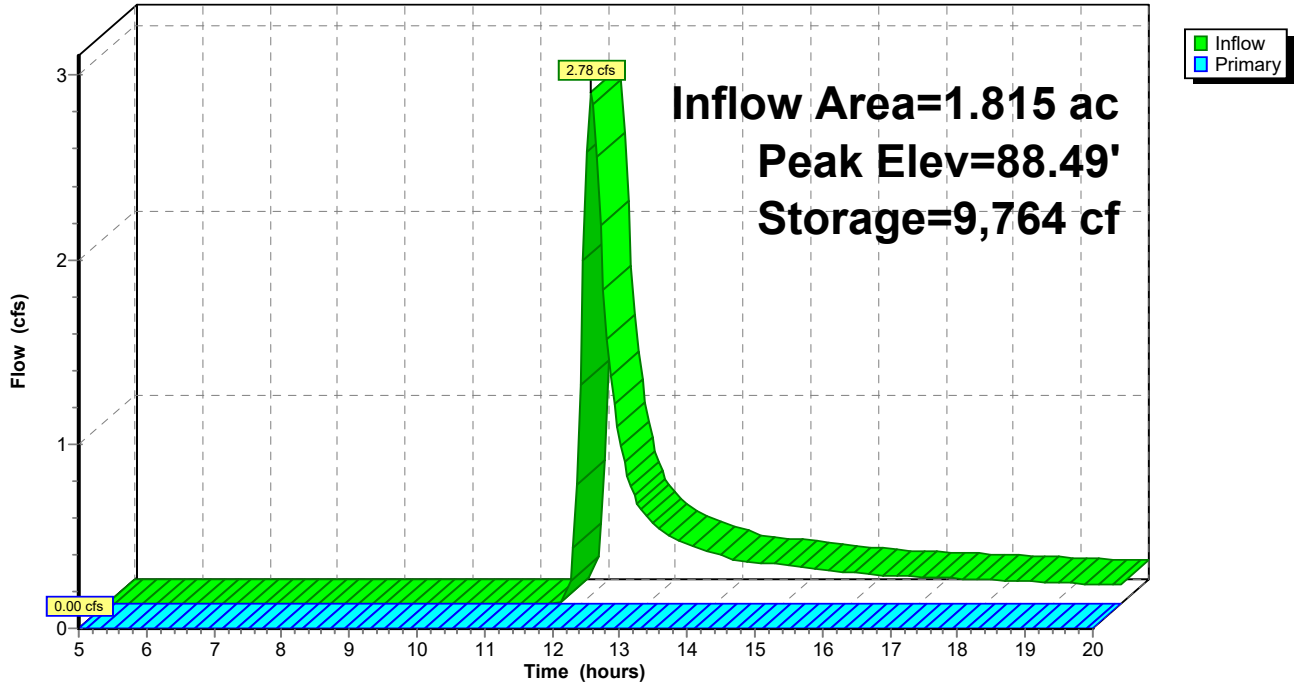
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



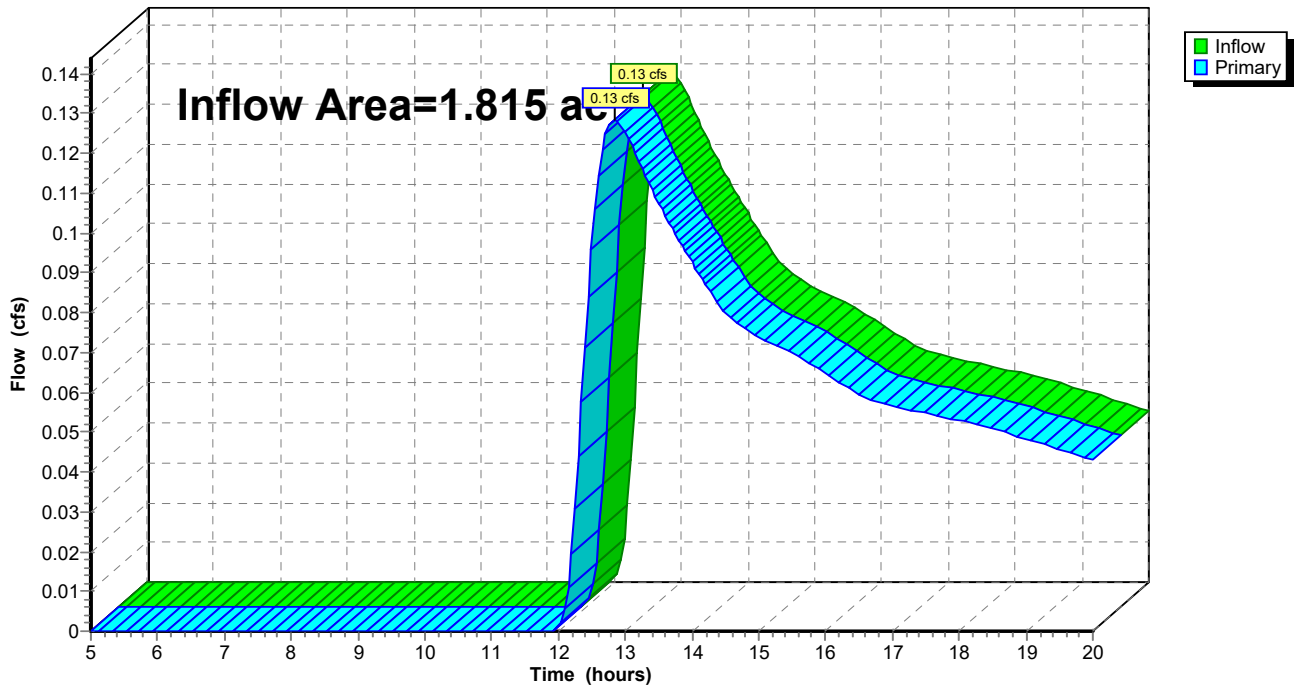
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.30" for 25-YR - 24HR. event
Inflow = 0.13 cfs @ 12.84 hrs, Volume= 0.046 af
Primary = 0.13 cfs @ 12.84 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=88.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

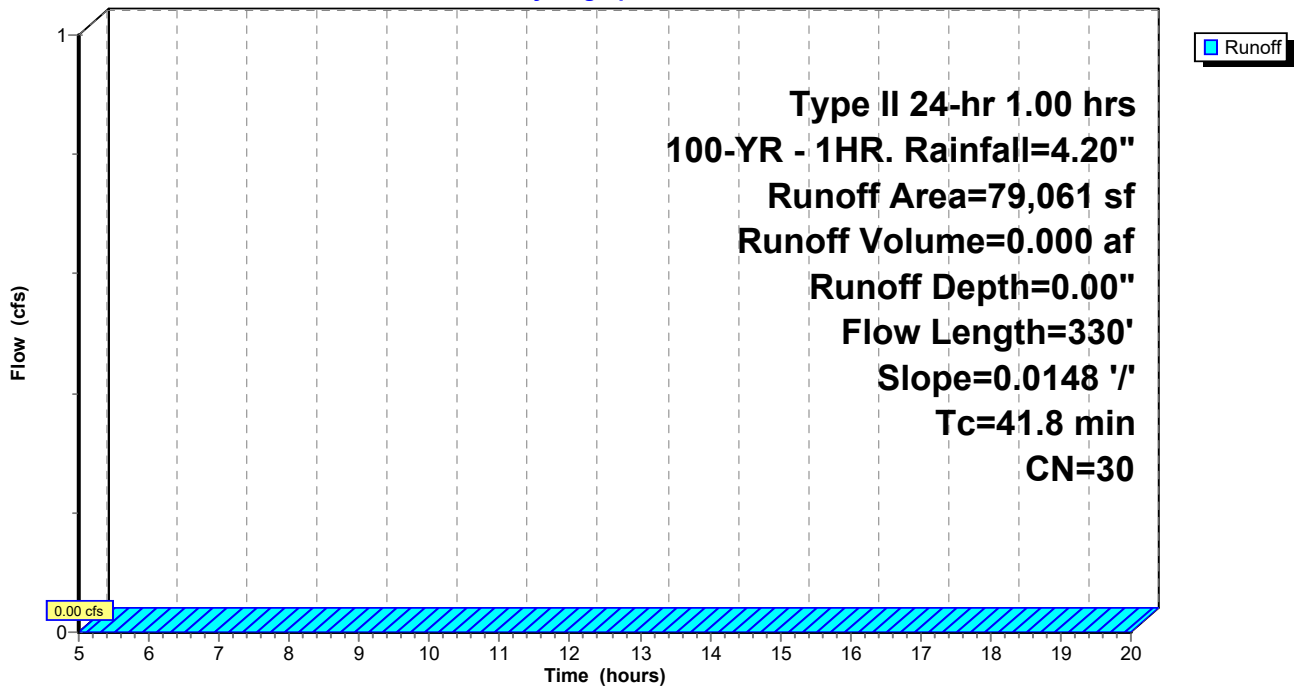
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

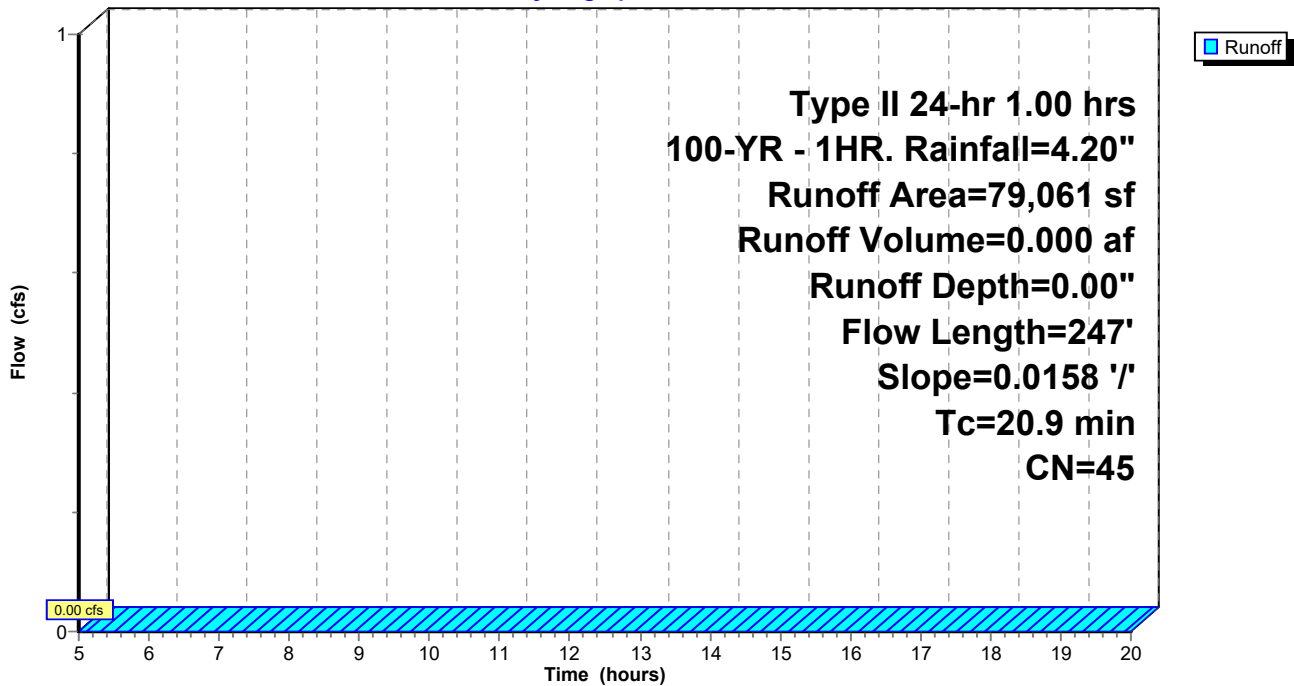
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.00' @ 5.00 hrs Surf.Area= 19,588 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

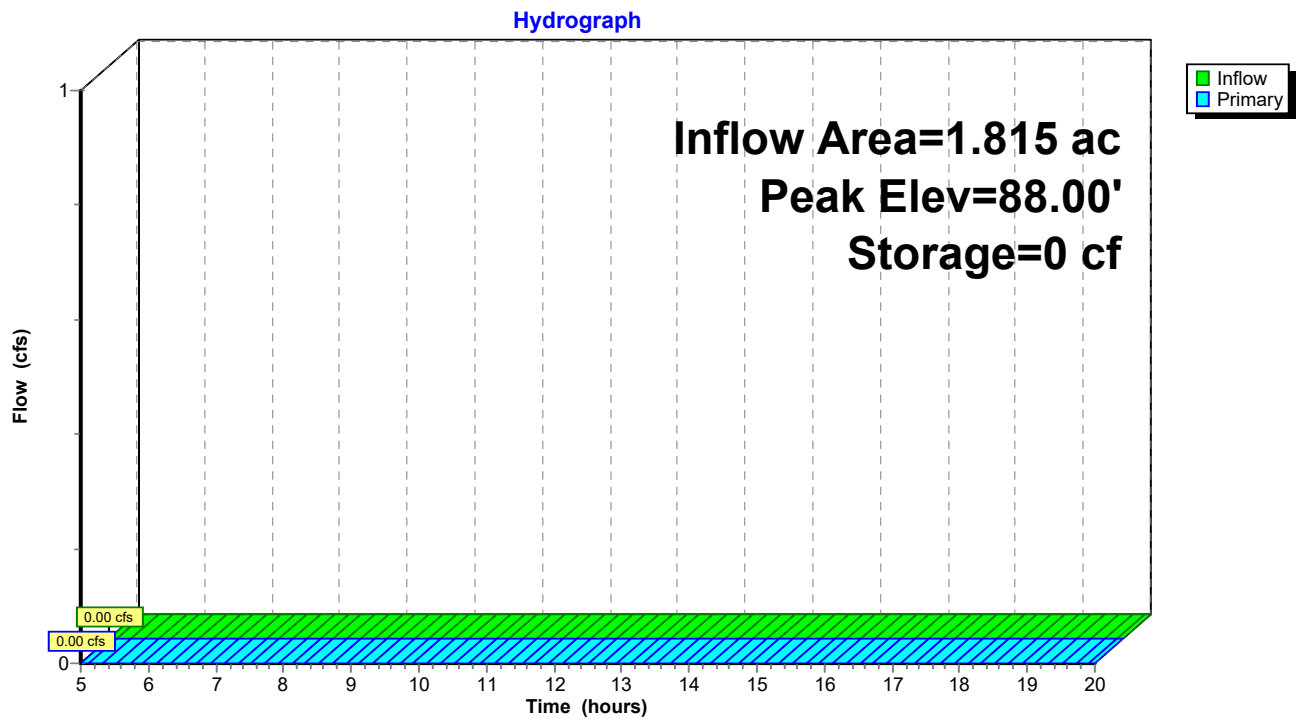
Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

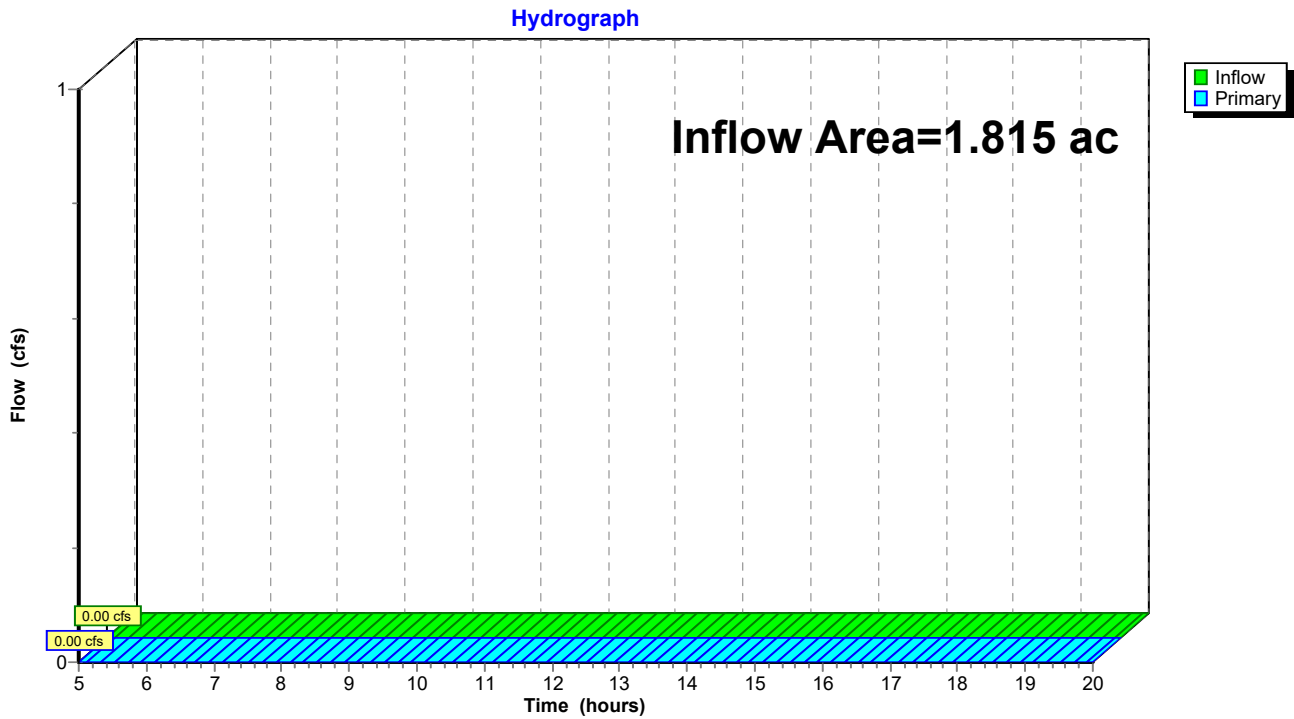


Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.76"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.57 cfs 0.115 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>2.48"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=5.02 cfs 0.375 af

Pond 1P: PROPOSED POND Peak Elev=88.81' Storage=16,327 cf Inflow=5.02 cfs 0.375 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=0.57 cfs 0.115 af
Primary=0.57 cfs 0.115 af

Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.57 cfs @ 12.57 hrs, Volume= 0.115 af, Depth> 0.76"

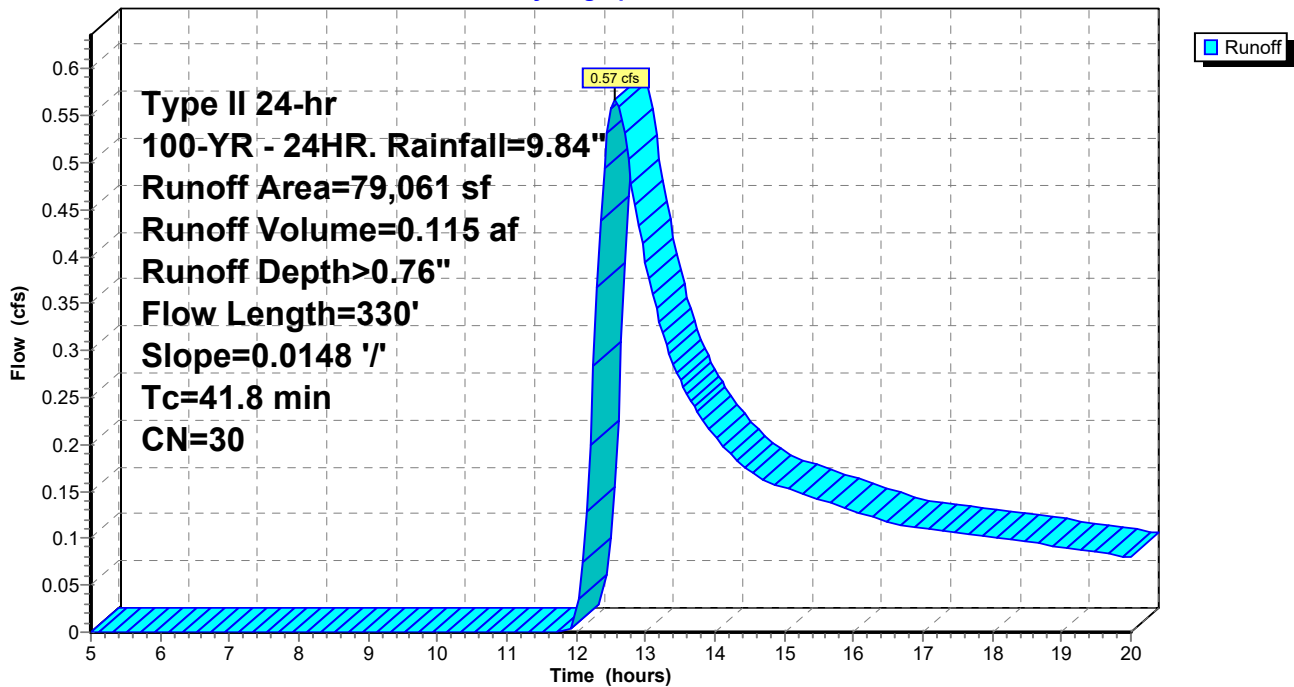
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 5.02 cfs @ 12.16 hrs, Volume= 0.375 af, Depth> 2.48"

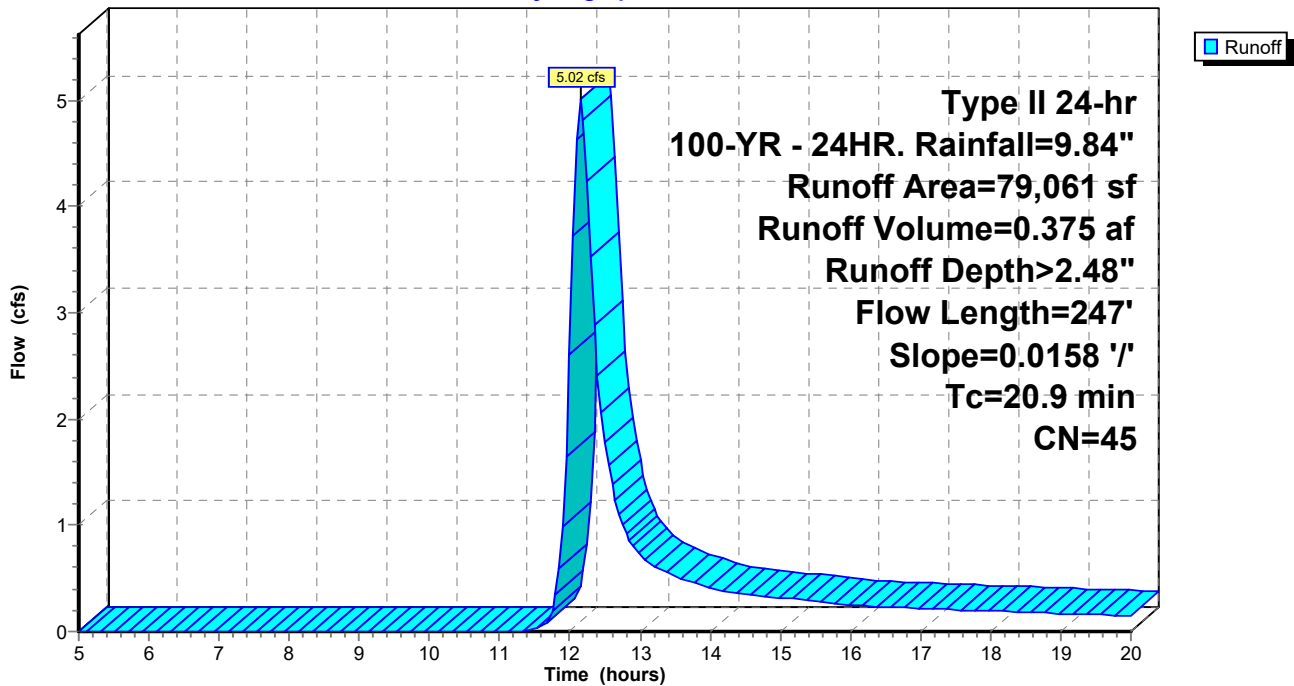
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 2.48" for 100-YR - 24HR. event
 Inflow = 5.02 cfs @ 12.16 hrs, Volume= 0.375 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.81' @ 20.00 hrs Surf.Area= 20,666 sf Storage= 16,327 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

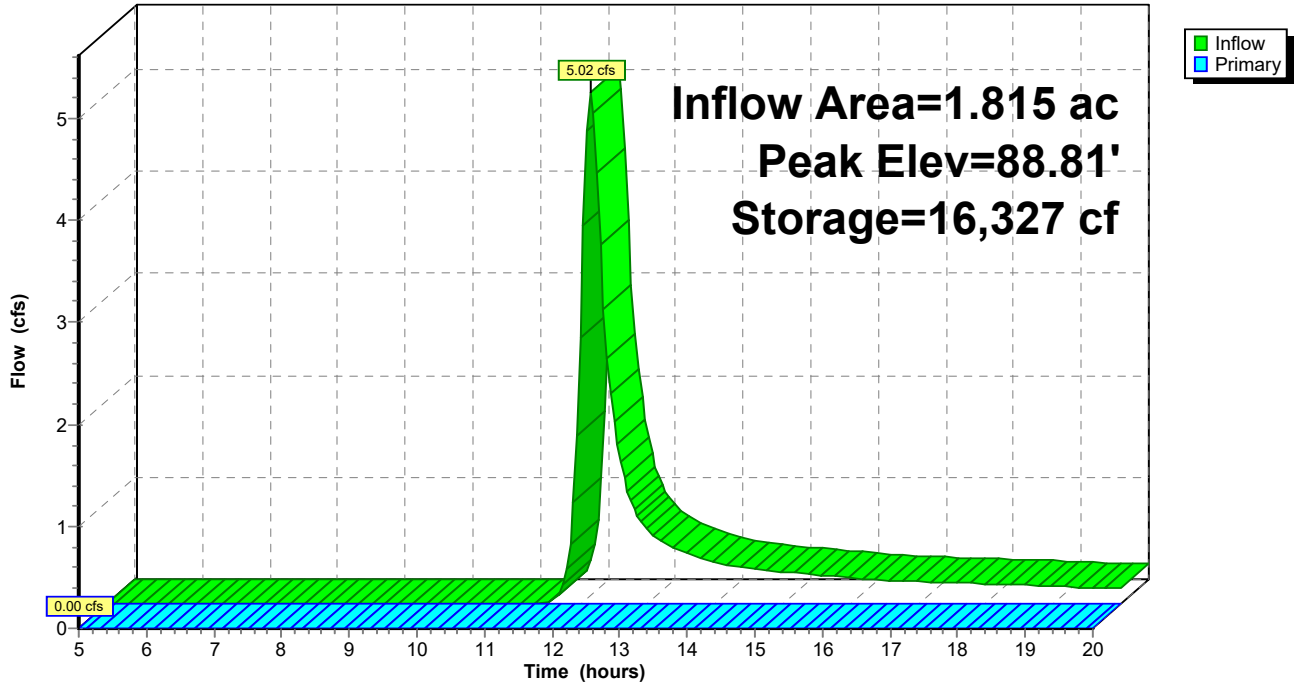
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



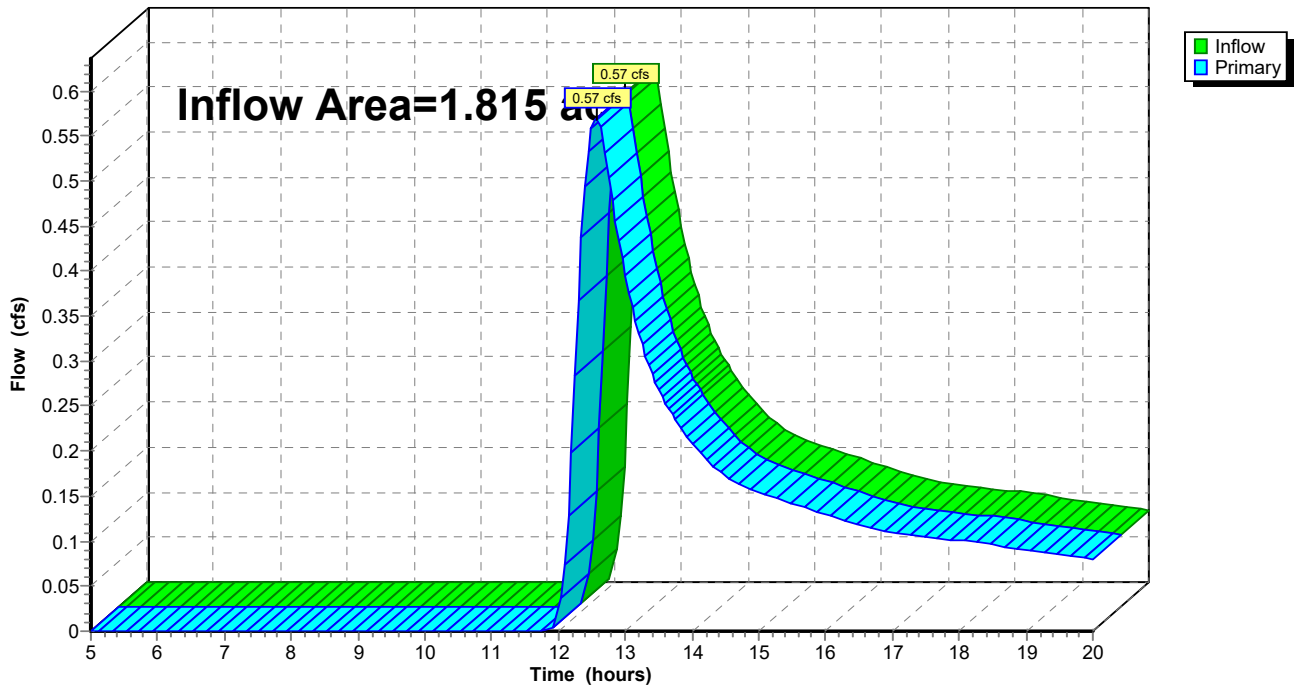
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.76" for 100-YR - 24HR. event
Inflow = 0.57 cfs @ 12.57 hrs, Volume= 0.115 af
Primary = 0.57 cfs @ 12.57 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=88.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

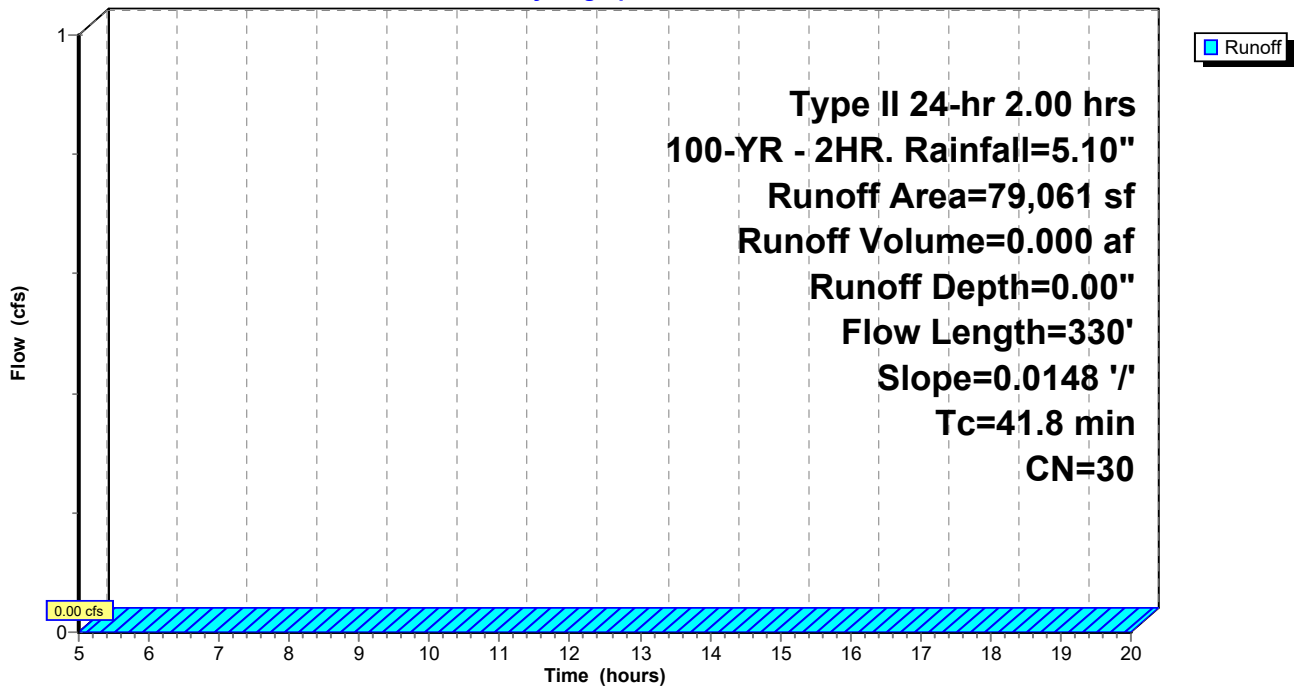
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

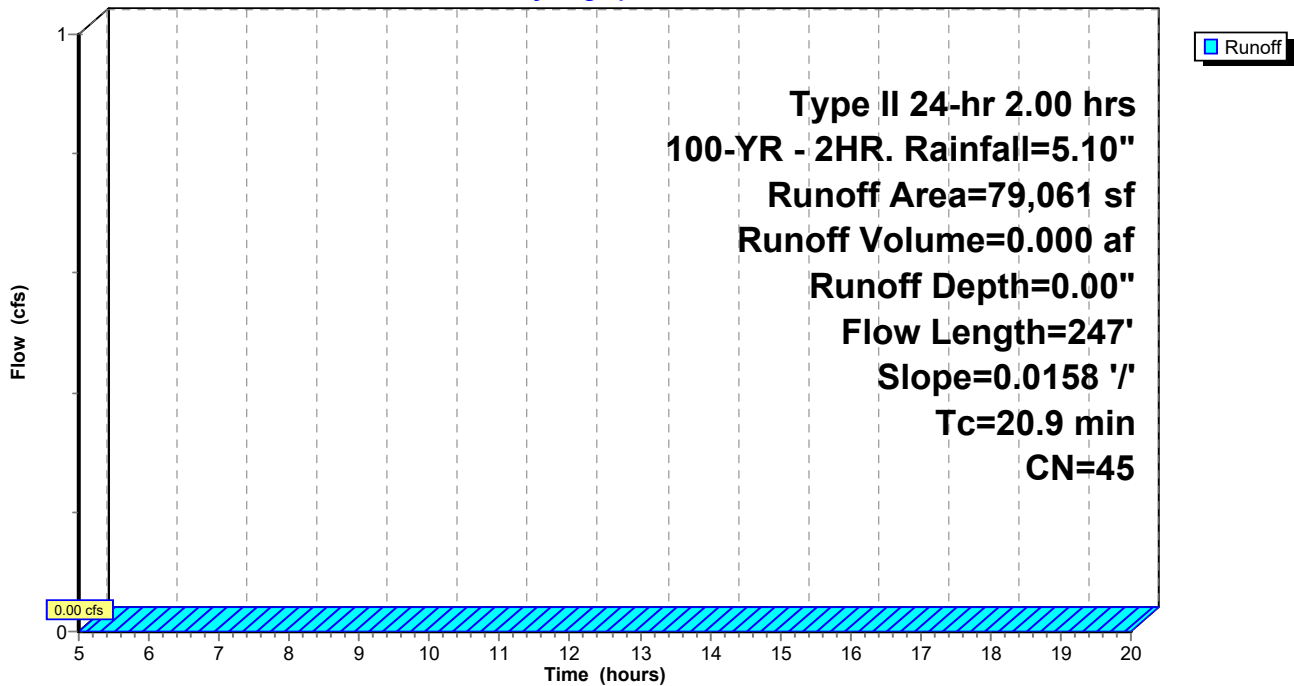
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.00' @ 5.00 hrs Surf.Area= 19,588 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

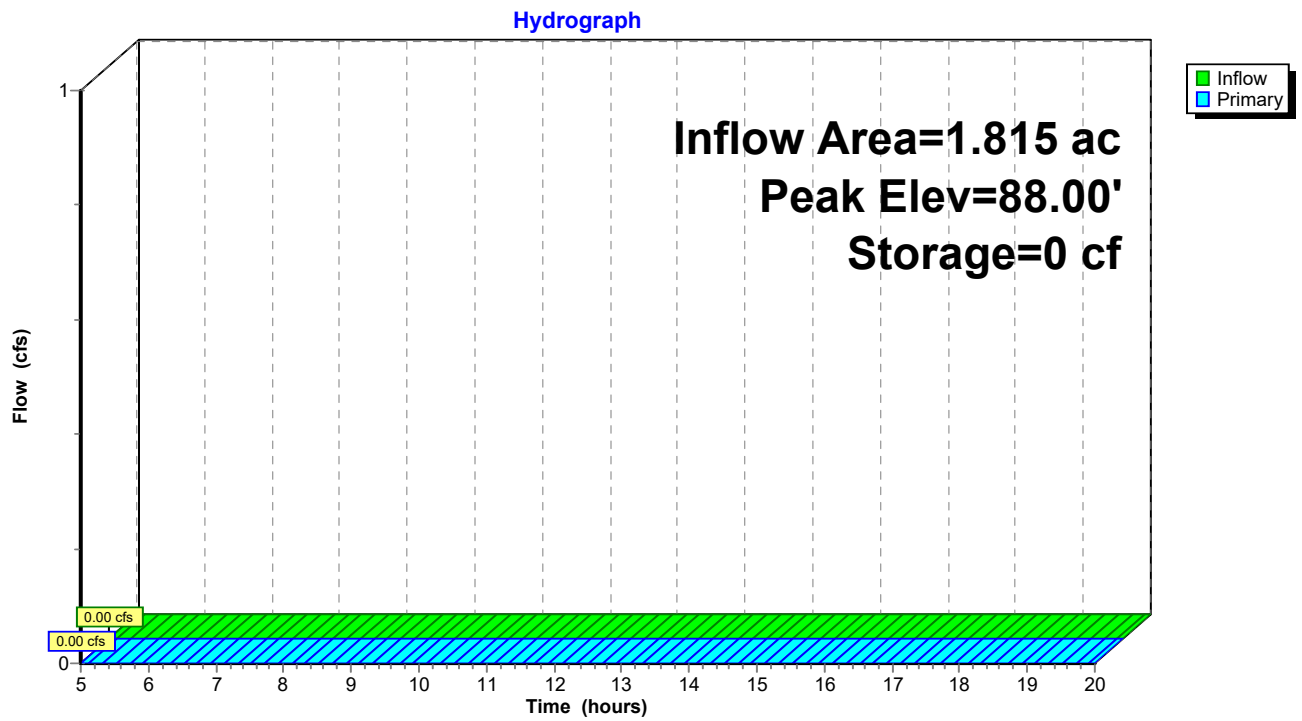
Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



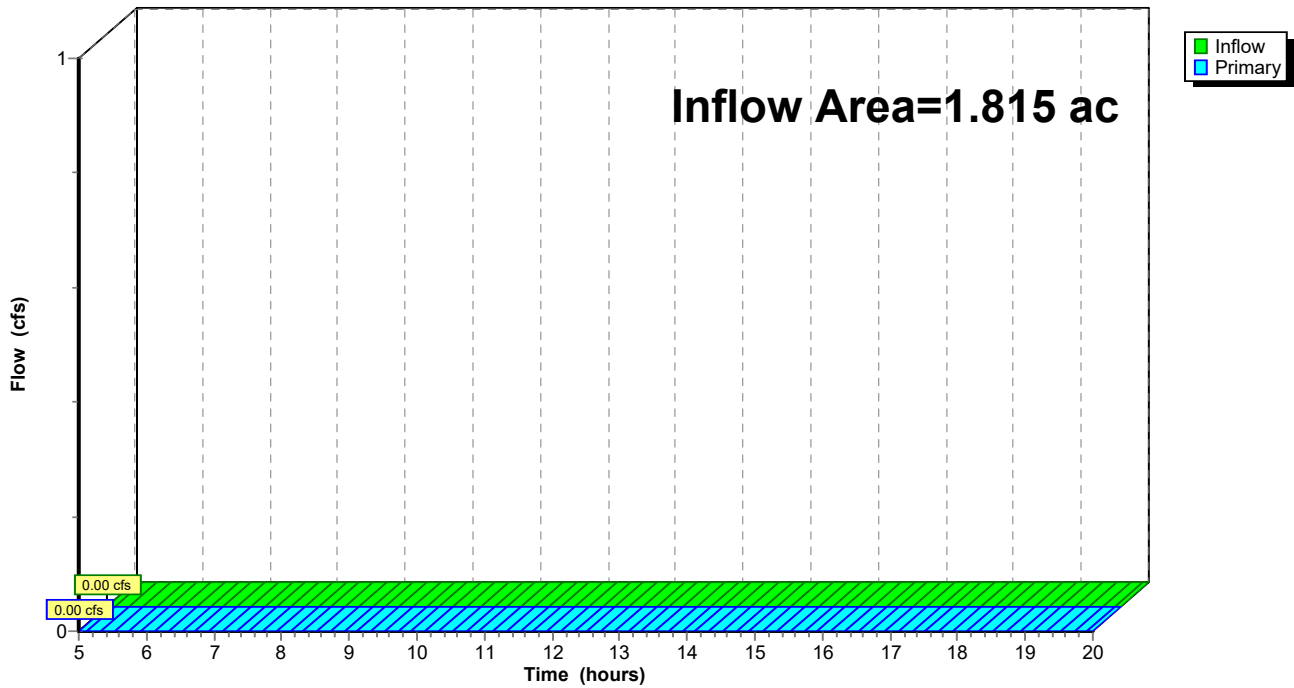
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.01 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=88.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.01 cfs 0.000 af
Primary=0.01 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

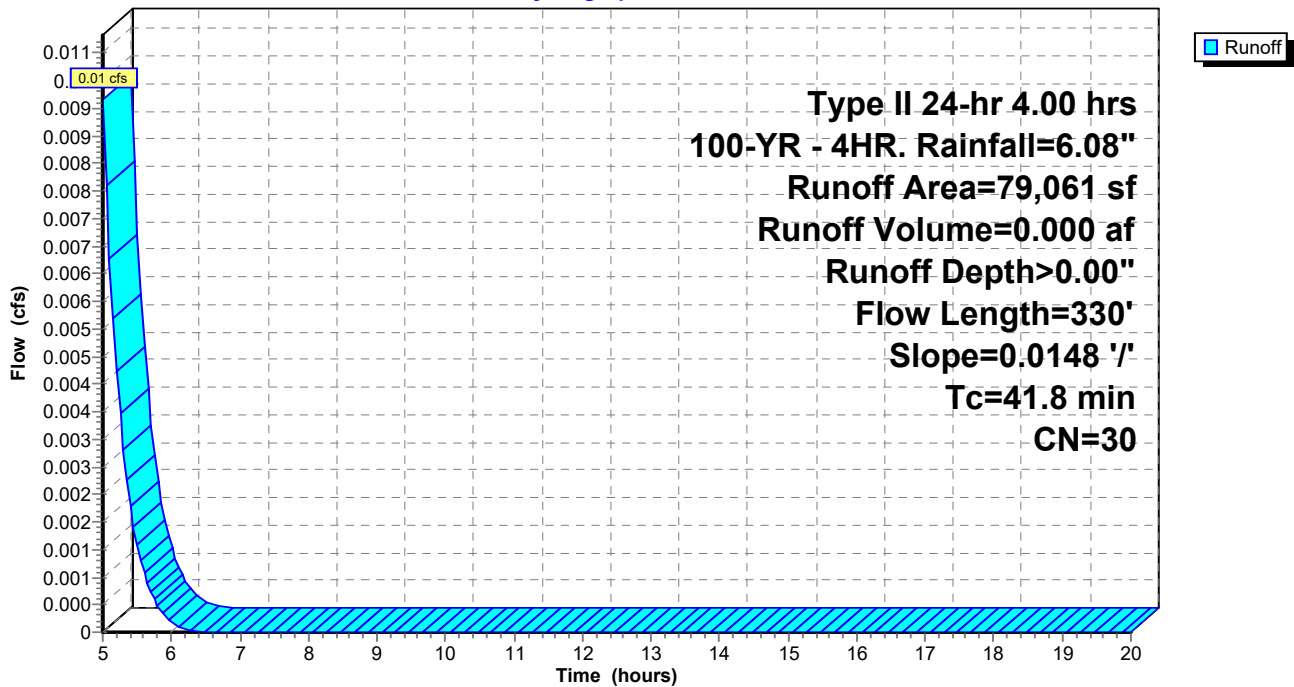
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

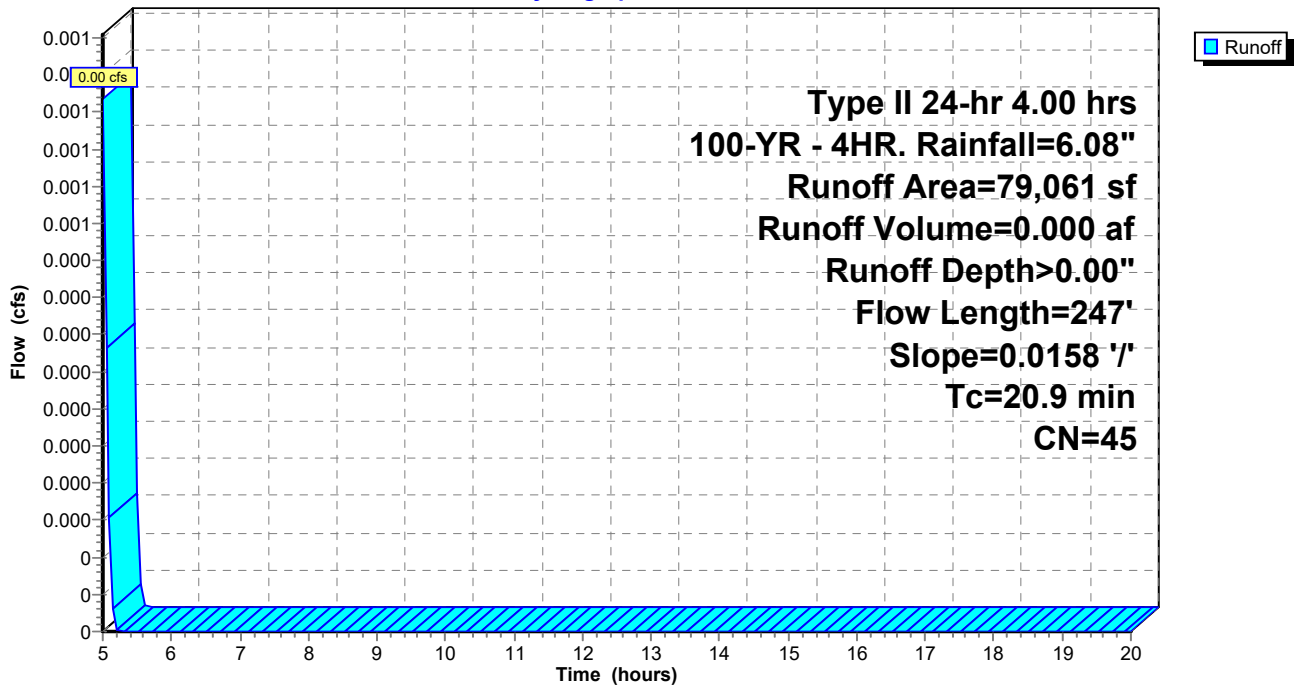
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.00' @ 5.25 hrs Surf.Area= 19,588 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

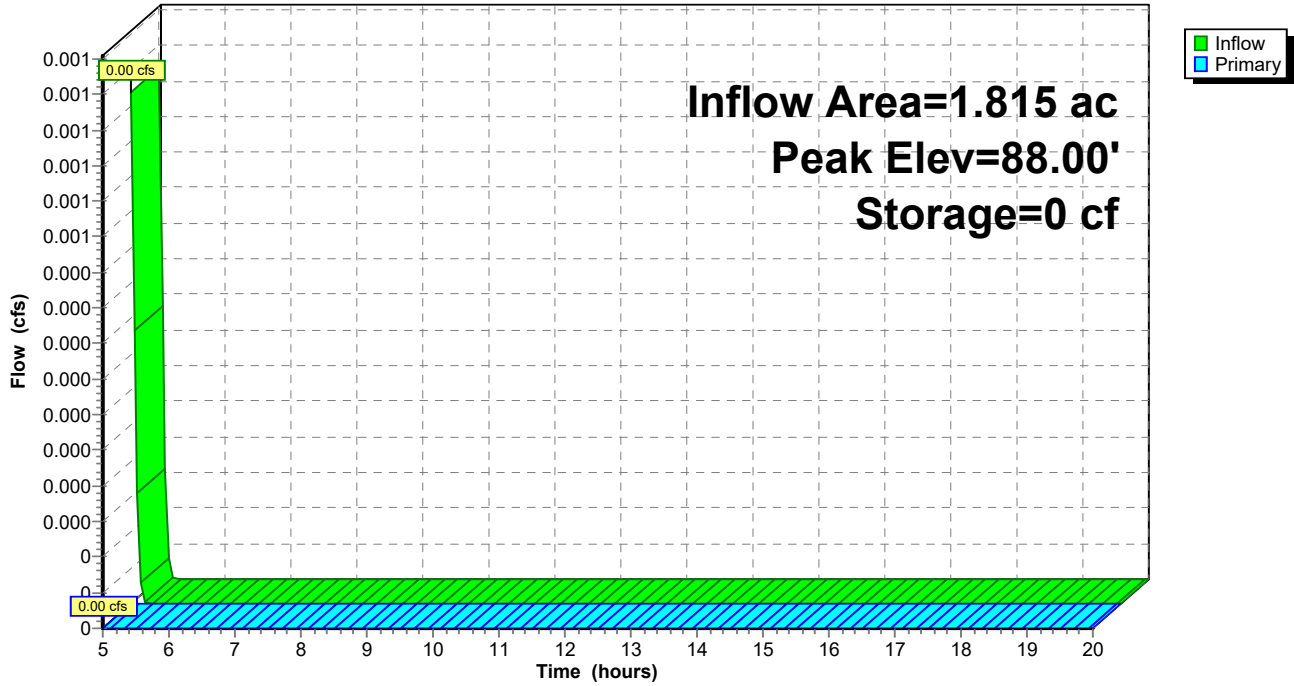
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



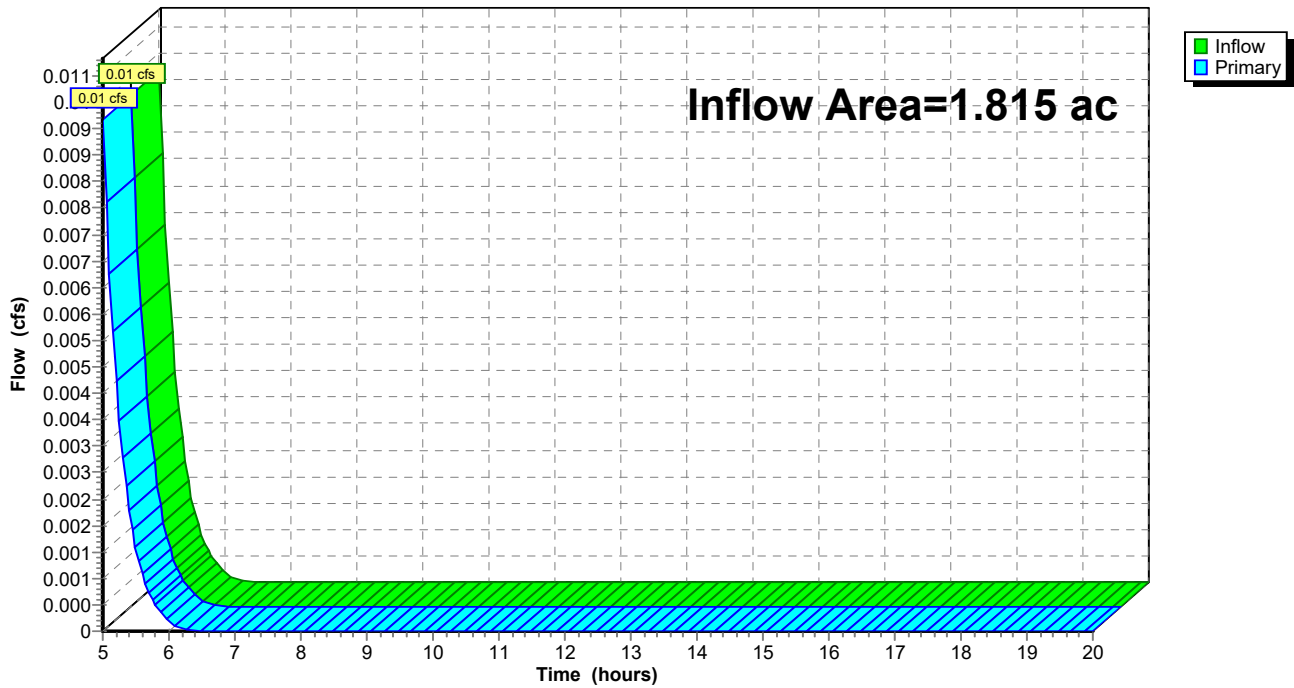
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 4HR. event
 Inflow = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 1 HydroCAD Report Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.23"
Flow Length=330' Slope=0.0148 '/' Tc=41.8 min CN=30 Runoff=0.17 cfs 0.036 af

Subcatchment2S: POST DEVELOPED Runoff Area=79,061 sf 0.00% Impervious Runoff Depth>0.61"
Flow Length=247' Slope=0.0158 '/' Tc=20.9 min CN=45 Runoff=0.65 cfs 0.092 af

Pond 1P: PROPOSED POND Peak Elev=88.20' Storage=3,989 cf Inflow=0.65 cfs 0.092 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.17 cfs 0.036 af
Primary=0.17 cfs 0.036 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.17 cfs @ 5.00 hrs, Volume= 0.036 af, Depth> 0.23"

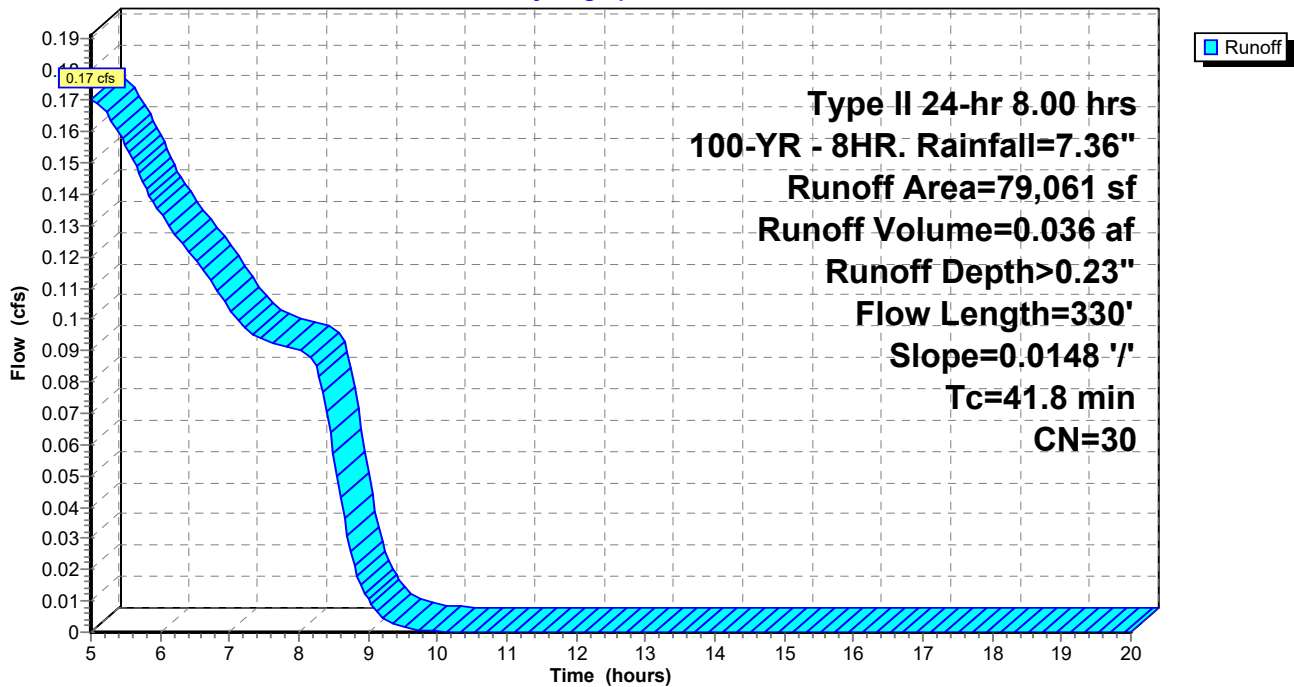
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
79,061	30	Meadow, non-grazed, HSG A
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.8	330	0.0148	0.13		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.65 cfs @ 5.00 hrs, Volume= 0.092 af, Depth> 0.61"

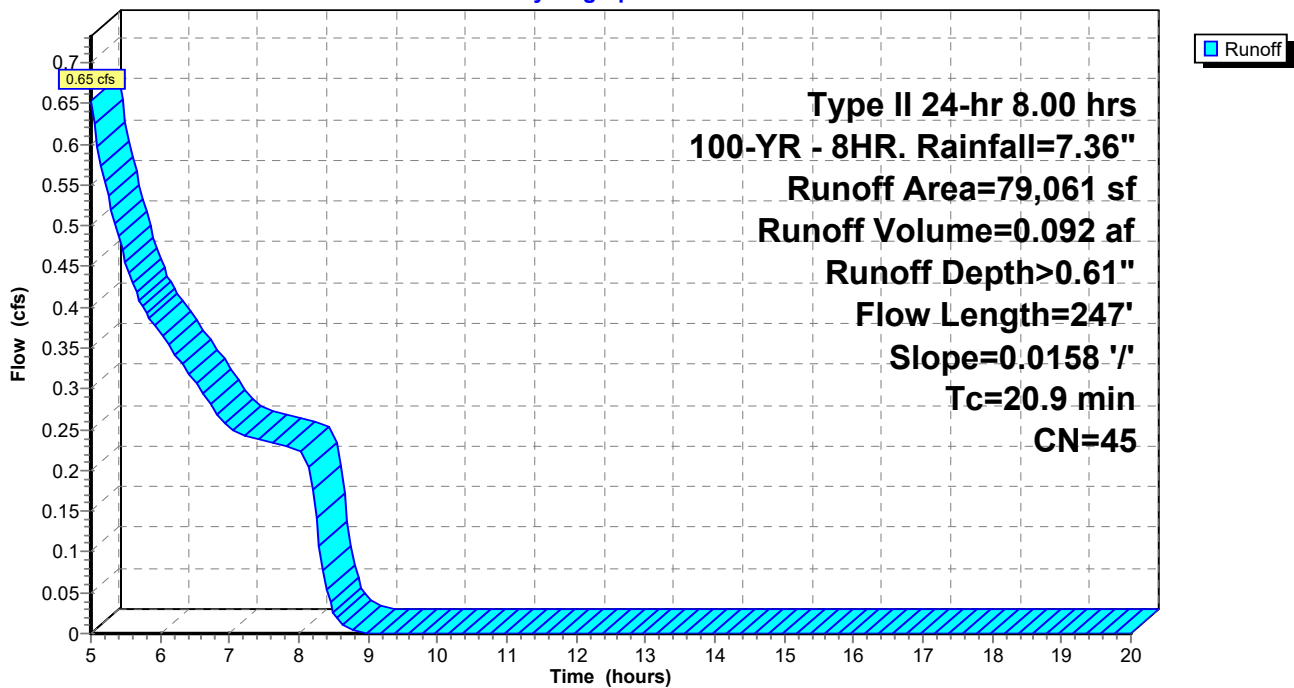
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
14,362	76	Gravel roads, HSG A
* 13,986	65	Gravel Laydown (35% Void)
50,713	30	Meadow, non-grazed, HSG A
79,061	45	Weighted Average
79,061		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	247	0.0158	0.20		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.61" for 100-YR - 8HR. event
 Inflow = 0.65 cfs @ 5.00 hrs, Volume= 0.092 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.20' @ 9.25 hrs Surf.Area= 19,857 sf Storage= 3,989 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	41,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

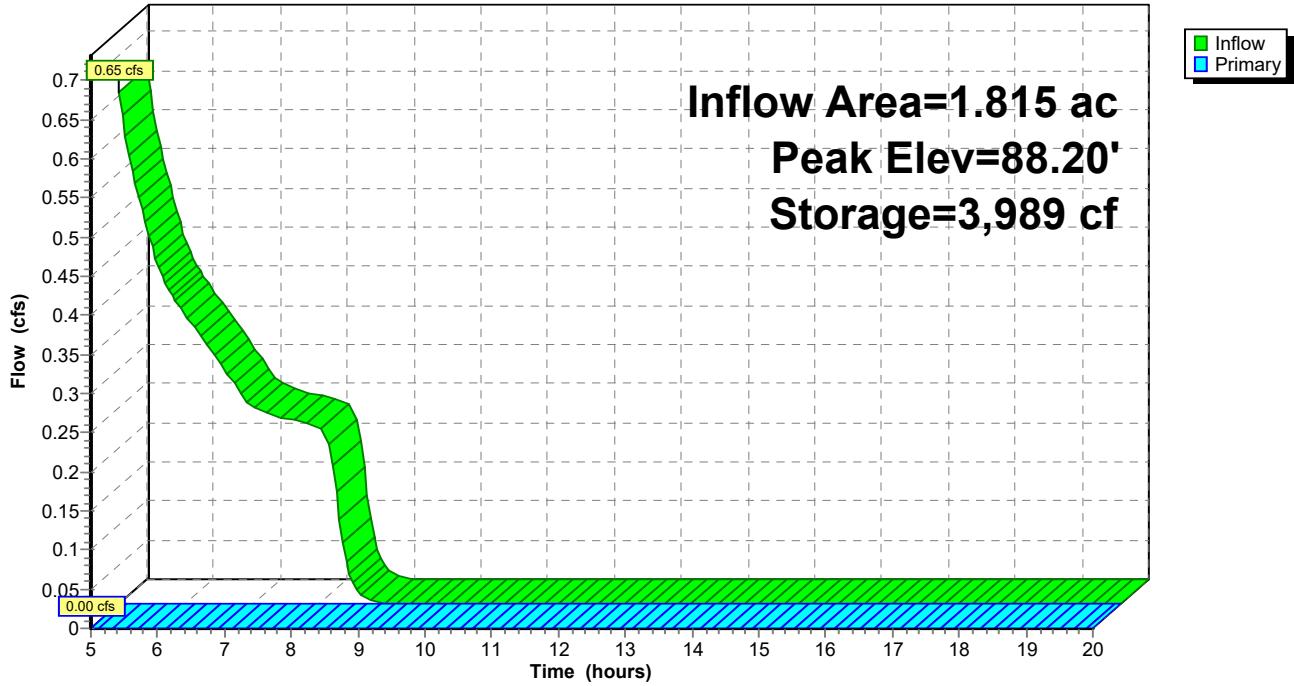
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	19,588	0	0
89.00	20,917	20,253	20,253
90.00	22,270	21,594	41,846

Device	Routing	Invert	Outlet Devices
#1	Primary	88.90'	43.6 deg x 14.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



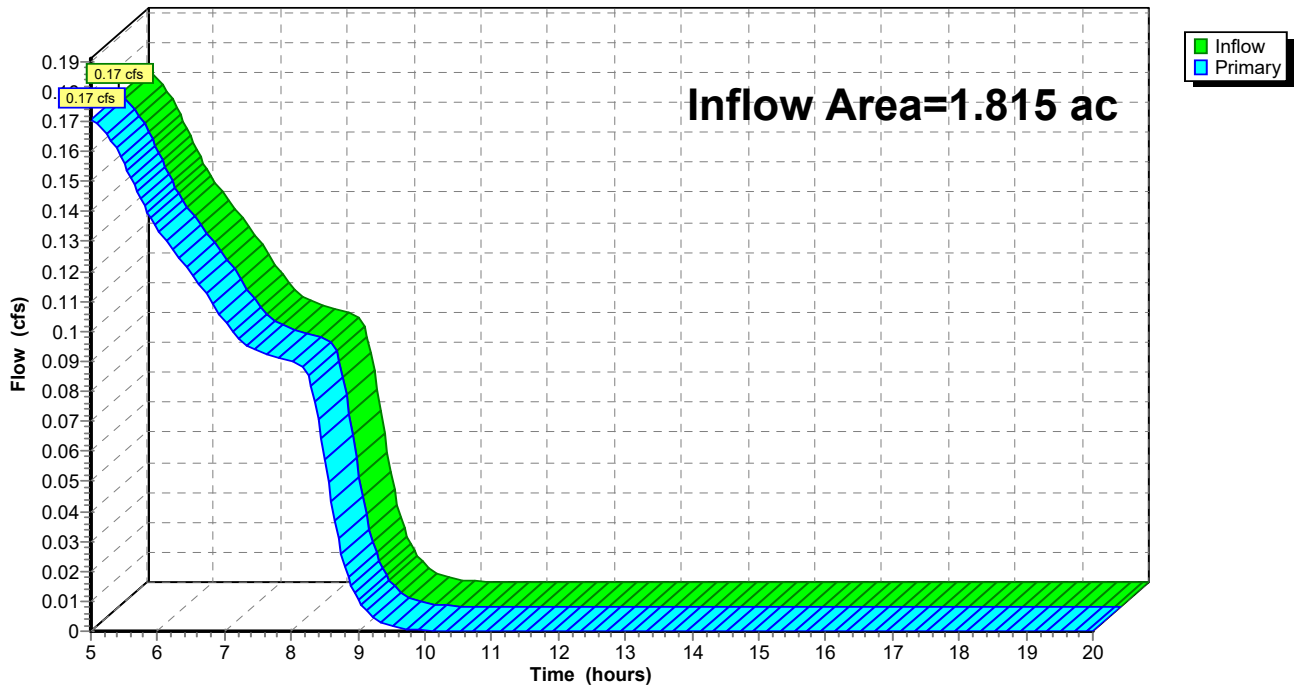
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 1.815 ac, 0.00% Impervious, Inflow Depth > 0.23" for 100-YR - 8HR. event
 Inflow = 0.17 cfs @ 5.00 hrs, Volume= 0.036 af
 Primary = 0.17 cfs @ 5.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

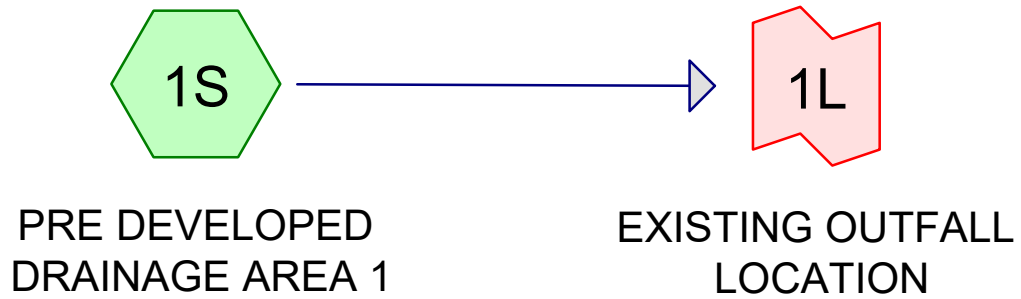
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EXISTING OUTFALL LOCATION

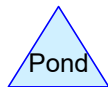
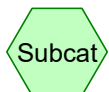
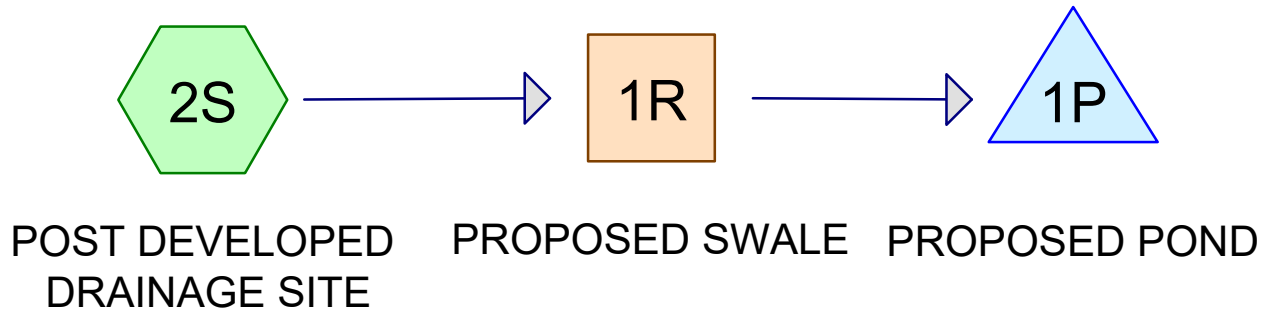
Hydrograph



PRE-DEVELOPED SITE



POST DEVELOPED SITE



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>1.64"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=3.56 cfs 0.413 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>5.46"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=24.07 cfs 1.370 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=3.85' Max Vel=0.56 fps Inflow=24.07 cfs 1.370 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=15.85 cfs 1.346 af

Pond 1P: PROPOSED POND Peak Elev=86.96' Storage=43,048 cf Inflow=15.85 cfs 1.346 af
Outflow=1.14 cfs 0.374 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=3.56 cfs 0.413 af
Primary=3.56 cfs 0.413 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Prepared by HP Inc.

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 3.56 cfs @ 12.29 hrs, Volume= 0.413 af, Depth> 1.64"

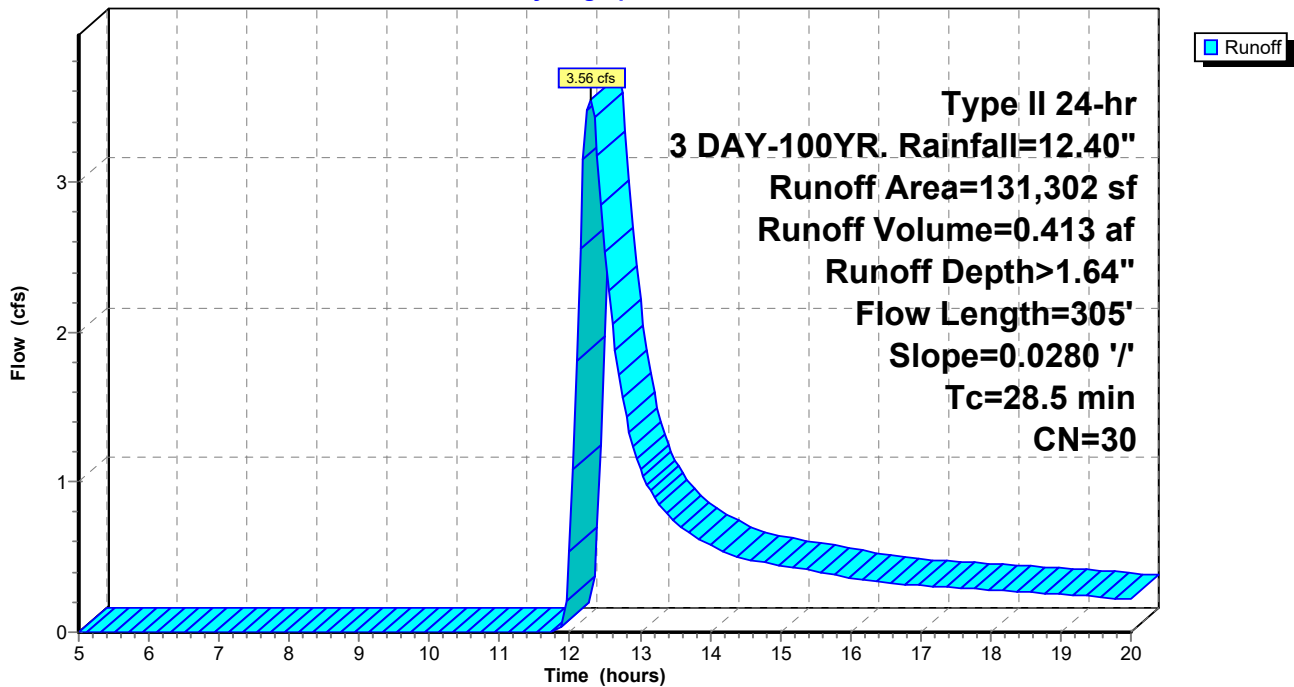
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 24.07 cfs @ 12.06 hrs, Volume= 1.370 af, Depth> 5.46"

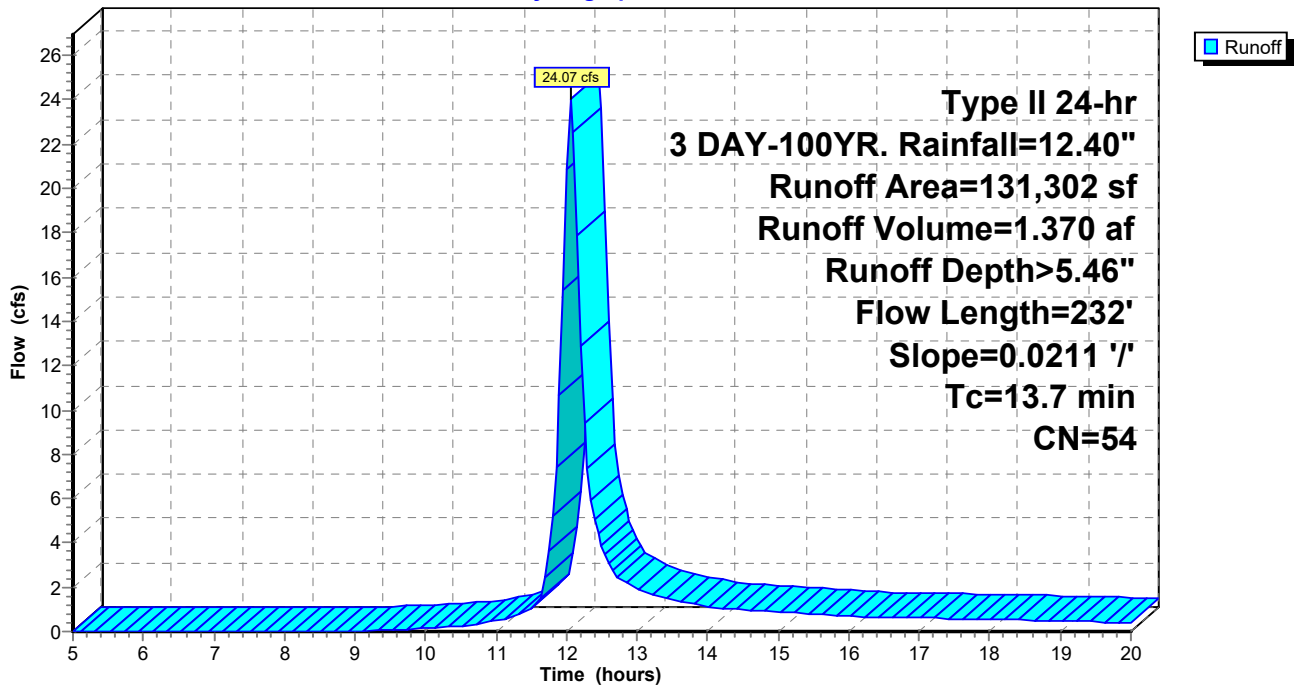
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 5.46" for 3 DAY-100YR. event
Inflow = 24.07 cfs @ 12.06 hrs, Volume= 1.370 af
Outflow = 15.85 cfs @ 12.38 hrs, Volume= 1.346 af, Atten= 34%, Lag= 19.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.56 fps, Min. Travel Time= 12.5 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 24.8 min

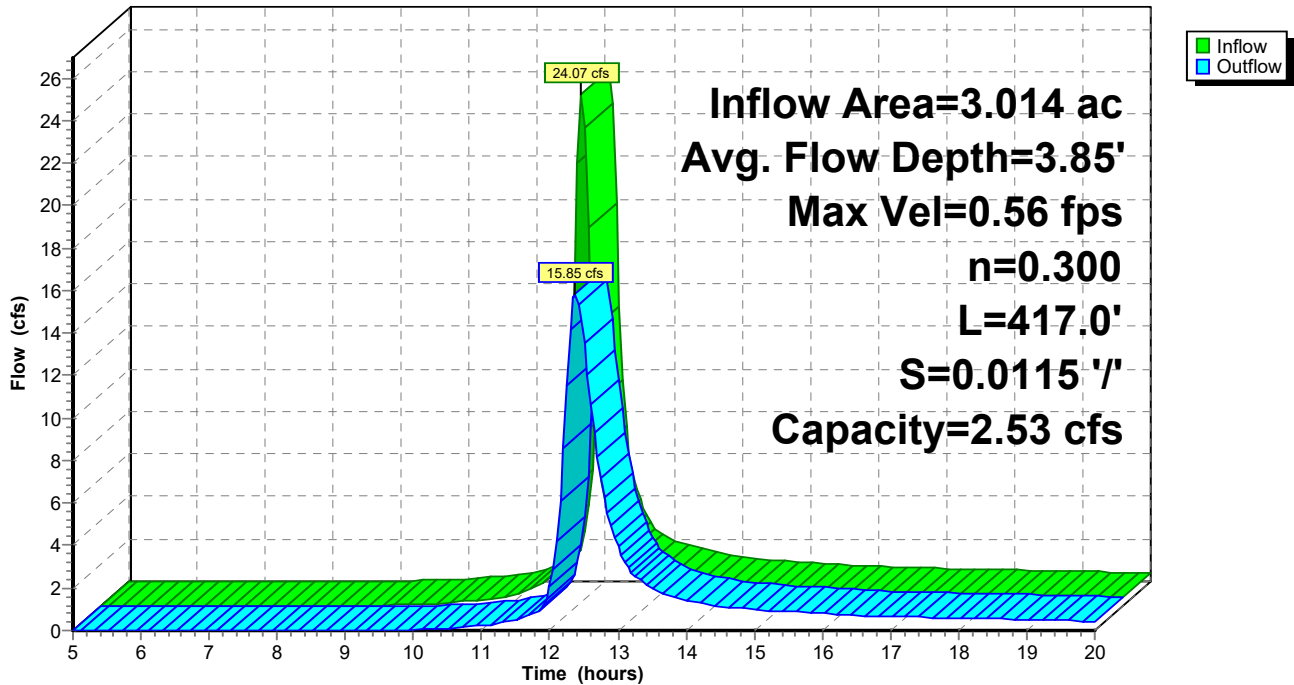
Peak Storage= 11,999 cf @ 12.17 hrs
Average Depth at Peak Storage= 3.85'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 ' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 '
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 5.36" for 3 DAY-100YR. event
 Inflow = 15.85 cfs @ 12.38 hrs, Volume= 1.346 af
 Outflow = 1.14 cfs @ 14.50 hrs, Volume= 0.374 af, Atten= 93%, Lag= 127.2 min
 Primary = 1.14 cfs @ 14.50 hrs, Volume= 0.374 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 86.96' @ 14.50 hrs Surf.Area= 23,209 sf Storage= 43,048 cf

Plug-Flow detention time= 262.0 min calculated for 0.373 af (28% of inflow)
 Center-of-Mass det. time= 172.8 min (991.5 - 818.7)

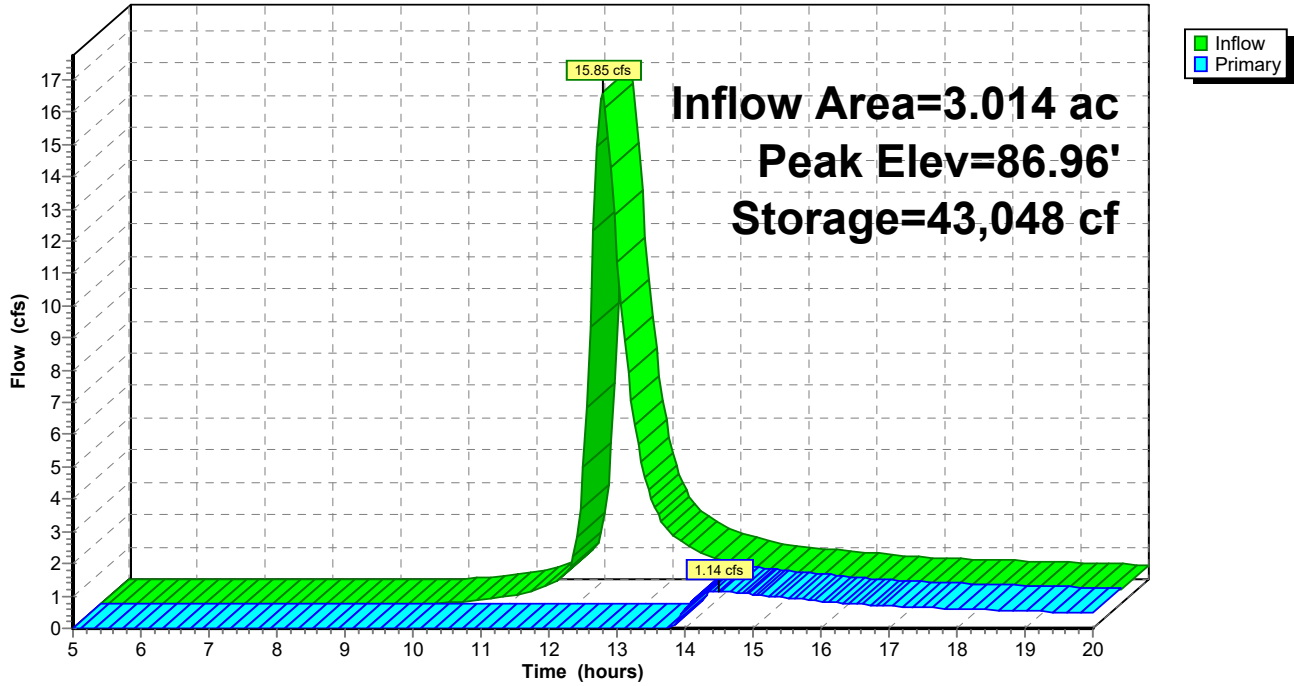
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=1.12 cfs @ 14.50 hrs HW=86.96' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 1.12 cfs @ 0.80 fps)

Pond 1P: PROPOSED POND

Hydrograph



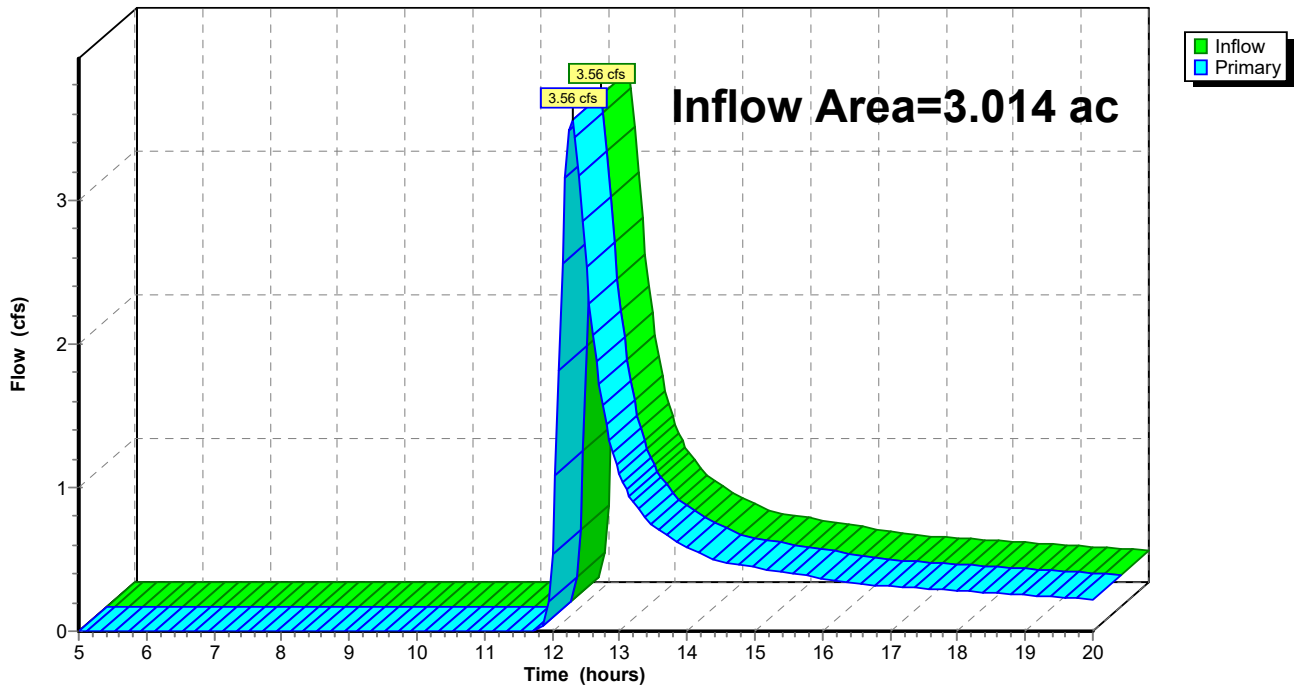
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 1.64" for 3 DAY-100YR. event
Inflow = 3.56 cfs @ 12.29 hrs, Volume= 0.413 af
Primary = 3.56 cfs @ 12.29 hrs, Volume= 0.413 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>2.31"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=5.52 cfs 0.580 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>6.68"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=29.39 cfs 1.678 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=4.63' Max Vel=0.56 fps Inflow=29.39 cfs 1.678 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=19.49 cfs 1.651 af

Pond 1P: PROPOSED POND Peak Elev=87.02' Storage=44,472 cf Inflow=19.49 cfs 1.651 af
Outflow=3.11 cfs 0.676 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=5.52 cfs 0.580 af
Primary=5.52 cfs 0.580 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 5.52 cfs @ 12.28 hrs, Volume= 0.580 af, Depth> 2.31"

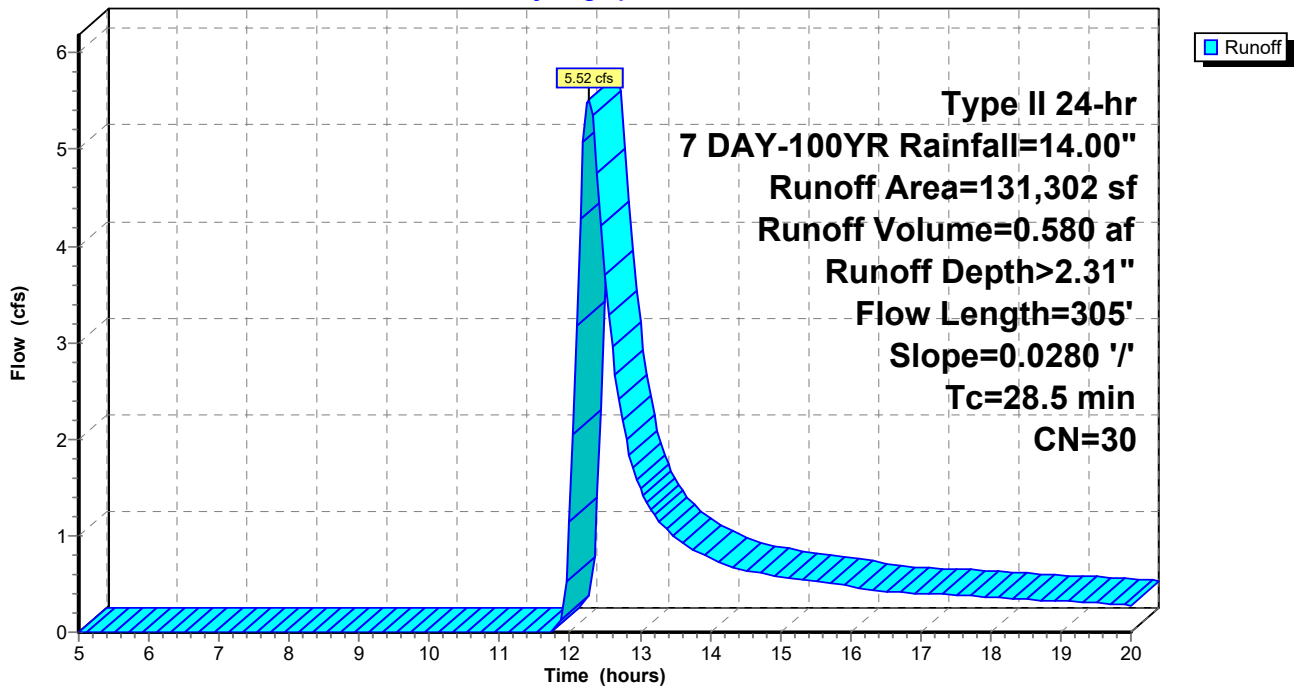
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 29.39 cfs @ 12.06 hrs, Volume= 1.678 af, Depth> 6.68"

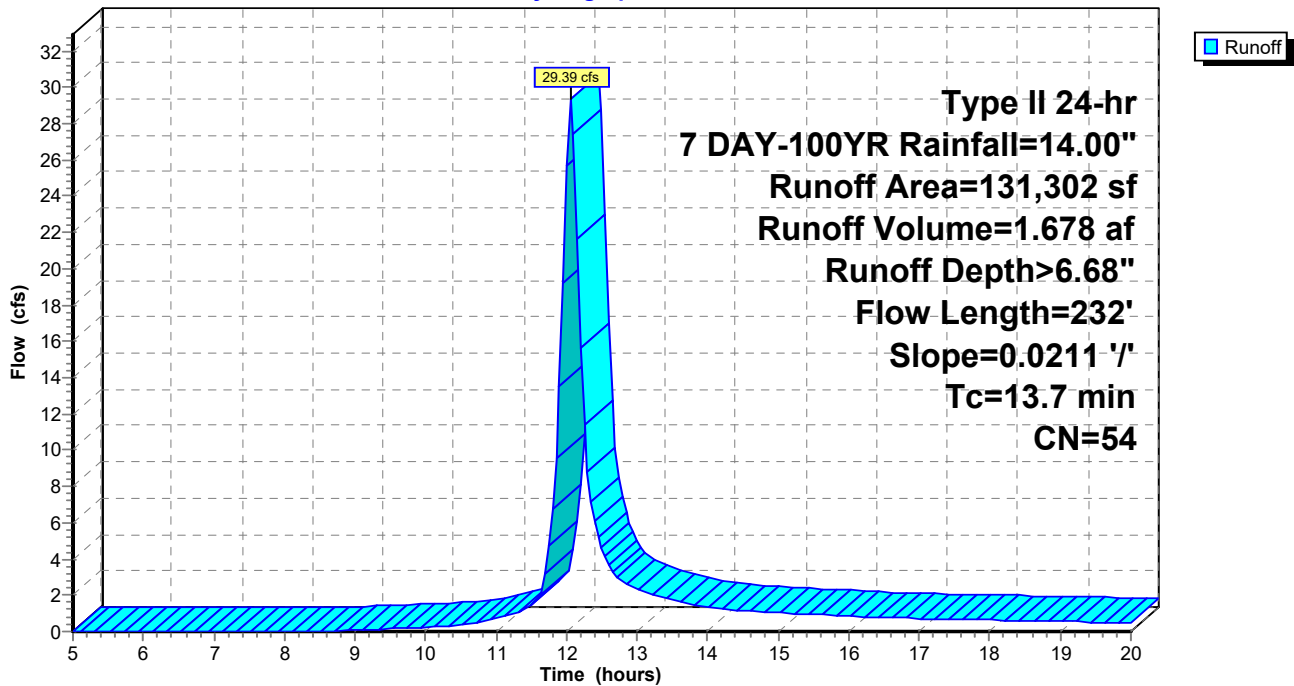
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 6.68" for 7 DAY-100YR event
Inflow = 29.39 cfs @ 12.06 hrs, Volume= 1.678 af
Outflow = 19.49 cfs @ 12.38 hrs, Volume= 1.651 af, Atten= 34%, Lag= 19.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.56 fps, Min. Travel Time= 12.4 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 24.0 min

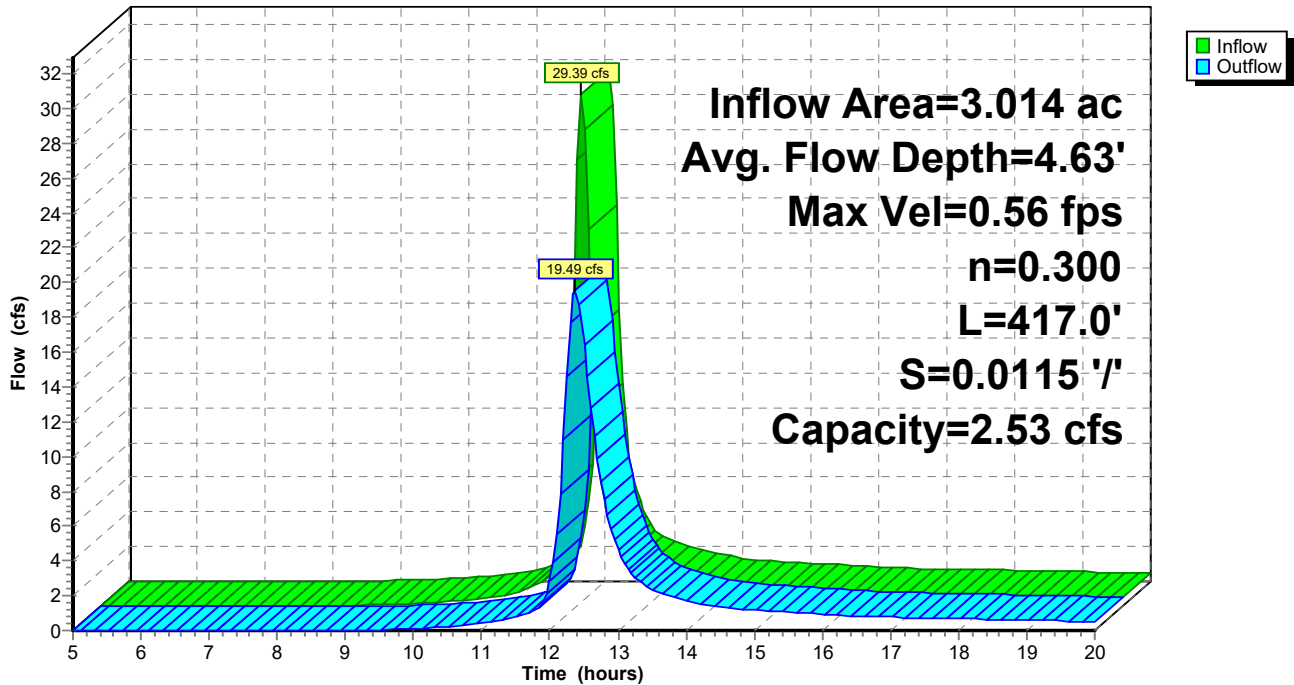
Peak Storage= 14,575 cf @ 12.17 hrs
Average Depth at Peak Storage= 4.63'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 '/'
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 6.57" for 7 DAY-100YR event
 Inflow = 19.49 cfs @ 12.38 hrs, Volume= 1.651 af
 Outflow = 3.11 cfs @ 13.24 hrs, Volume= 0.676 af, Atten= 84%, Lag= 52.1 min
 Primary = 3.11 cfs @ 13.24 hrs, Volume= 0.676 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.02' @ 13.24 hrs Surf.Area= 23,290 sf Storage= 44,472 cf

Plug-Flow detention time= 196.0 min calculated for 0.676 af (41% of inflow)
 Center-of-Mass det. time= 113.8 min (927.9 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

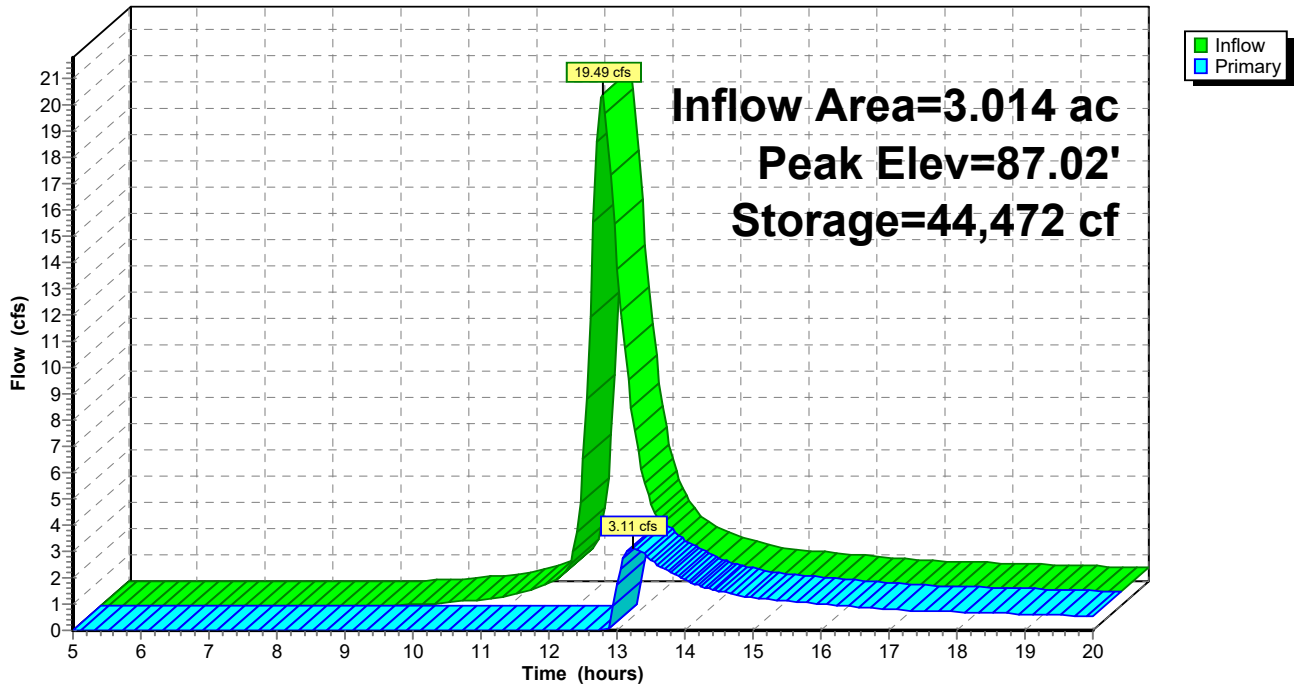
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=3.09 cfs @ 13.24 hrs HW=87.02' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 3.09 cfs @ 1.13 fps)

Pond 1P: PROPOSED POND

Hydrograph



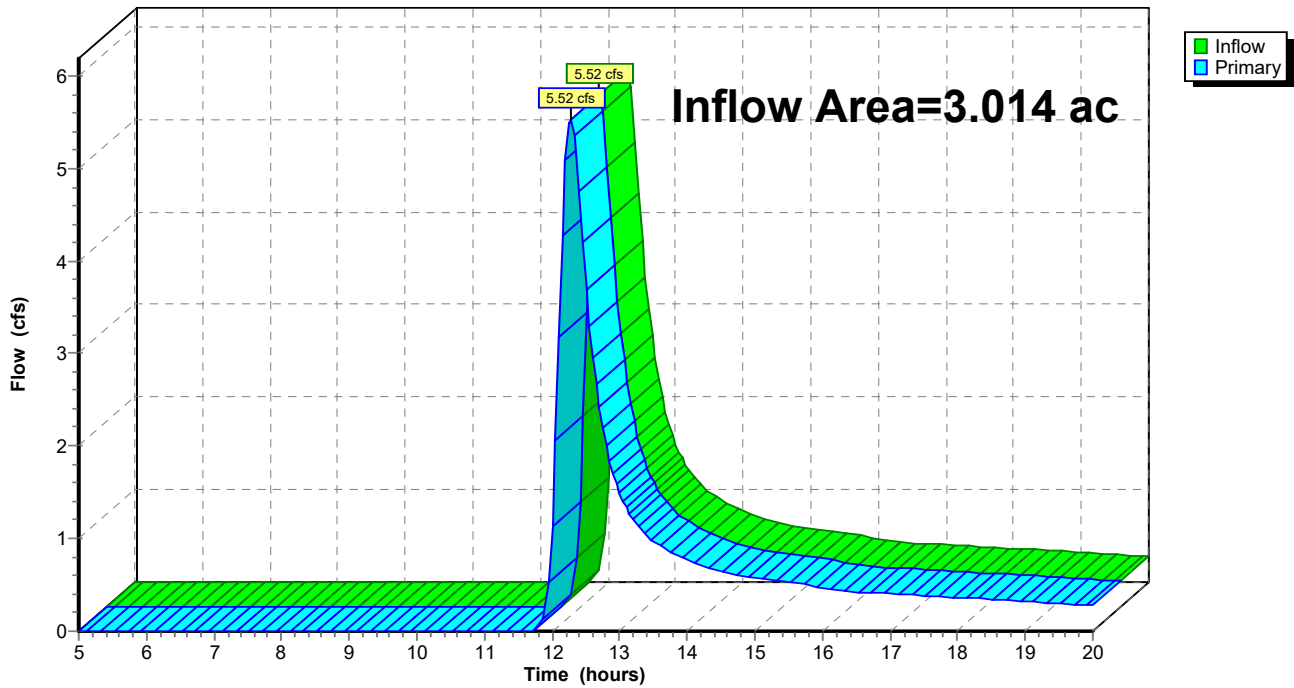
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 2.31" for 7 DAY-100YR event
Inflow = 5.52 cfs @ 12.28 hrs, Volume= 0.580 af
Primary = 5.52 cfs @ 12.28 hrs, Volume= 0.580 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>3.30"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=8.55 cfs 0.828 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>8.35"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=36.55 cfs 2.097 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=5.67' Max Vel=0.57 fps Inflow=36.55 cfs 2.097 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=24.47 cfs 2.066 af

Pond 1P: PROPOSED POND Peak Elev=87.14' Storage=47,271 cf Inflow=24.47 cfs 2.066 af
Outflow=8.54 cfs 1.089 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=8.55 cfs 0.828 af
Primary=8.55 cfs 0.828 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 8.55 cfs @ 12.26 hrs, Volume= 0.828 af, Depth> 3.30"

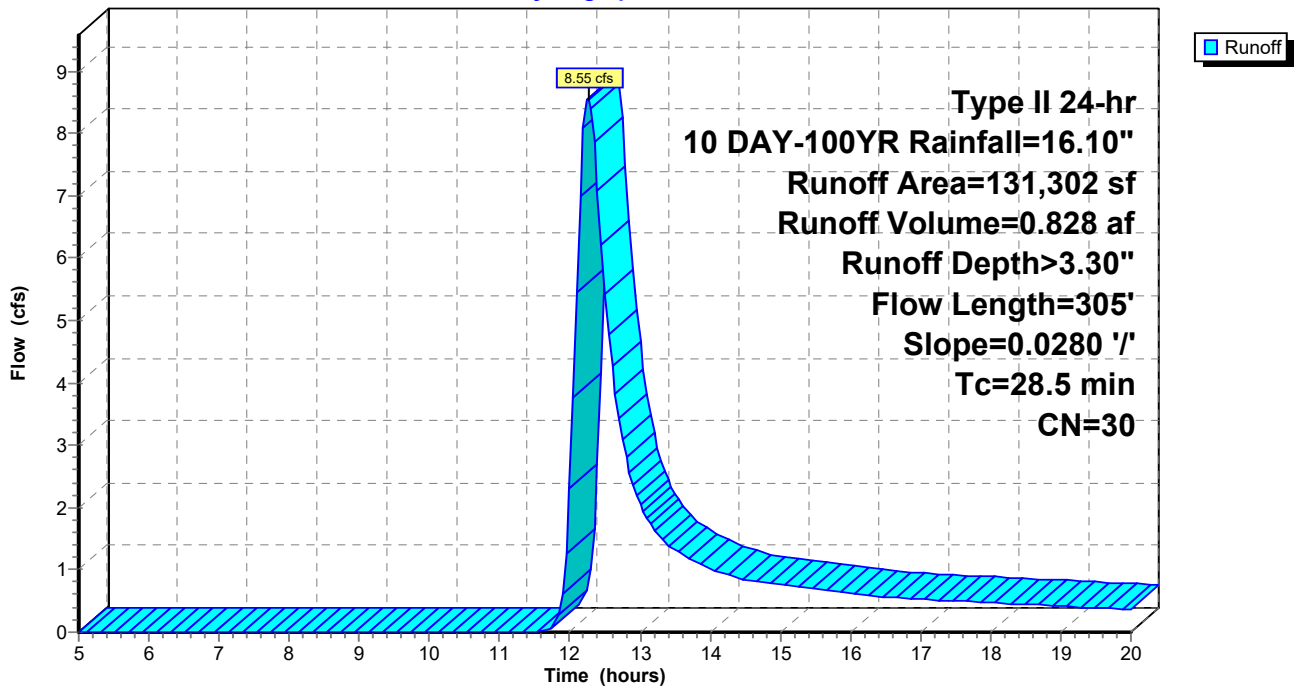
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 36.55 cfs @ 12.06 hrs, Volume= 2.097 af, Depth> 8.35"

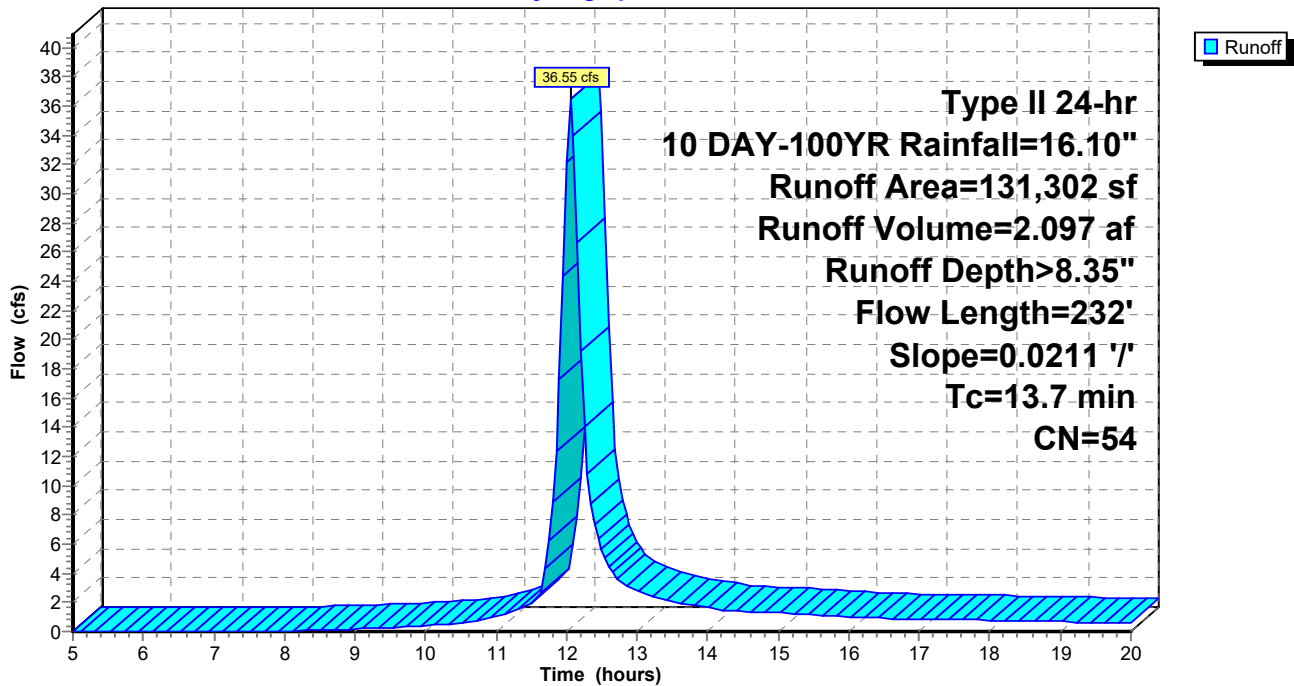
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 8.35" for 10 DAY-100YR event
Inflow = 36.55 cfs @ 12.06 hrs, Volume= 2.097 af
Outflow = 24.47 cfs @ 12.37 hrs, Volume= 2.066 af, Atten= 33%, Lag= 18.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.57 fps, Min. Travel Time= 12.2 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 23.1 min

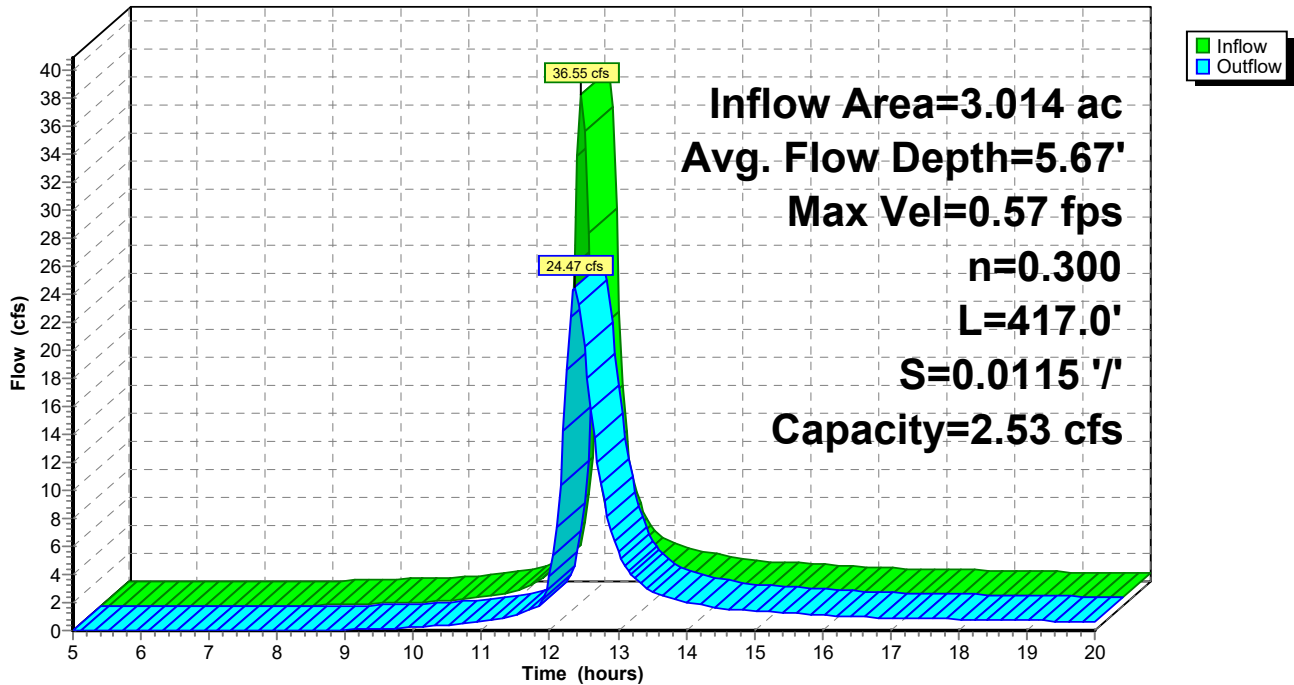
Peak Storage= 18,043 cf @ 12.17 hrs
Average Depth at Peak Storage= 5.67'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 '/'
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 8.22" for 10 DAY-100YR event
 Inflow = 24.47 cfs @ 12.37 hrs, Volume= 2.066 af
 Outflow = 8.54 cfs @ 12.84 hrs, Volume= 1.089 af, Atten= 65%, Lag= 27.9 min
 Primary = 8.54 cfs @ 12.84 hrs, Volume= 1.089 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.14' @ 12.84 hrs Surf.Area= 23,450 sf Storage= 47,271 cf

Plug-Flow detention time= 153.0 min calculated for 1.085 af (53% of inflow)
 Center-of-Mass det. time= 78.7 min (887.8 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

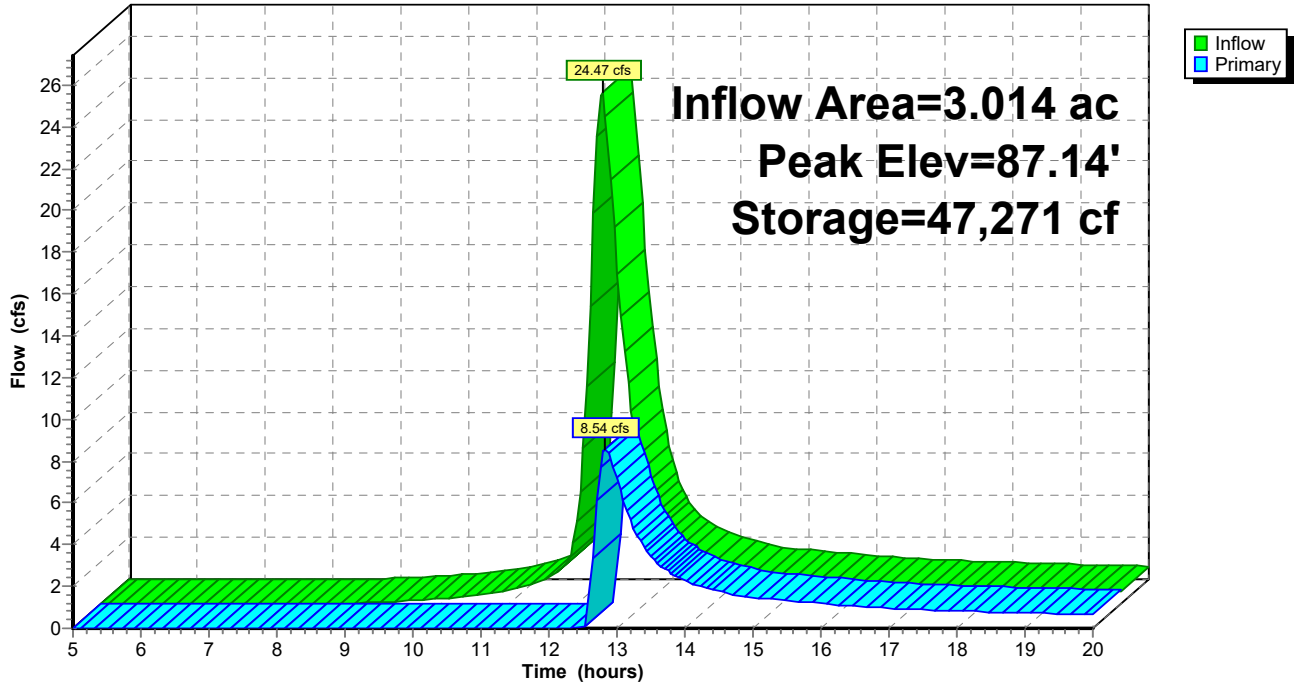
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=8.49 cfs @ 12.84 hrs HW=87.14' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 8.49 cfs @ 1.58 fps)

Pond 1P: PROPOSED POND

Hydrograph



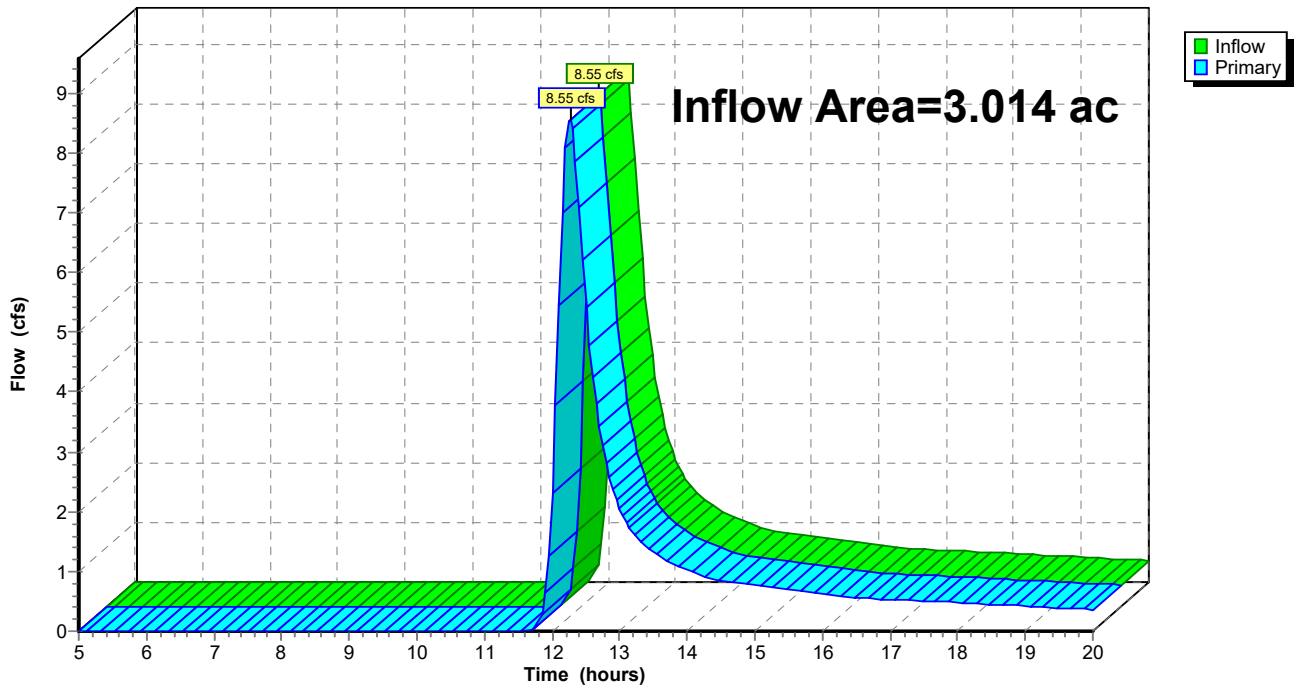
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 3.30" for 10 DAY-100YR event
Inflow = 8.55 cfs @ 12.26 hrs, Volume= 0.828 af
Primary = 8.55 cfs @ 12.26 hrs, Volume= 0.828 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.11"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.06 cfs 0.029 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>1.66"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=7.03 cfs 0.416 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.37' Max Vel=0.48 fps Inflow=7.03 cfs 0.416 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=4.24 cfs 0.404 af

Pond 1P: PROPOSED POND Peak Elev=85.83' Storage=17,567 cf Inflow=4.24 cfs 0.404 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.06 cfs 0.029 af
Primary=0.06 cfs 0.029 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.06 cfs @ 13.80 hrs, Volume= 0.029 af, Depth> 0.11"

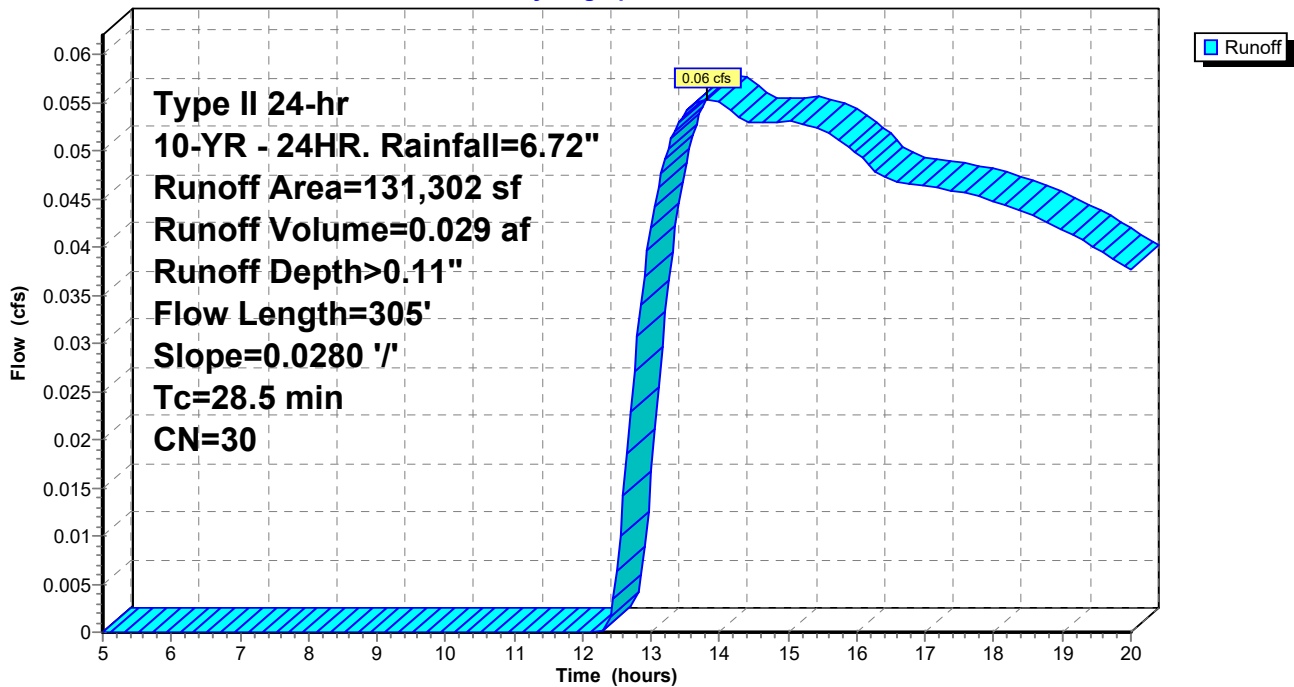
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 7.03 cfs @ 12.07 hrs, Volume= 0.416 af, Depth> 1.66"

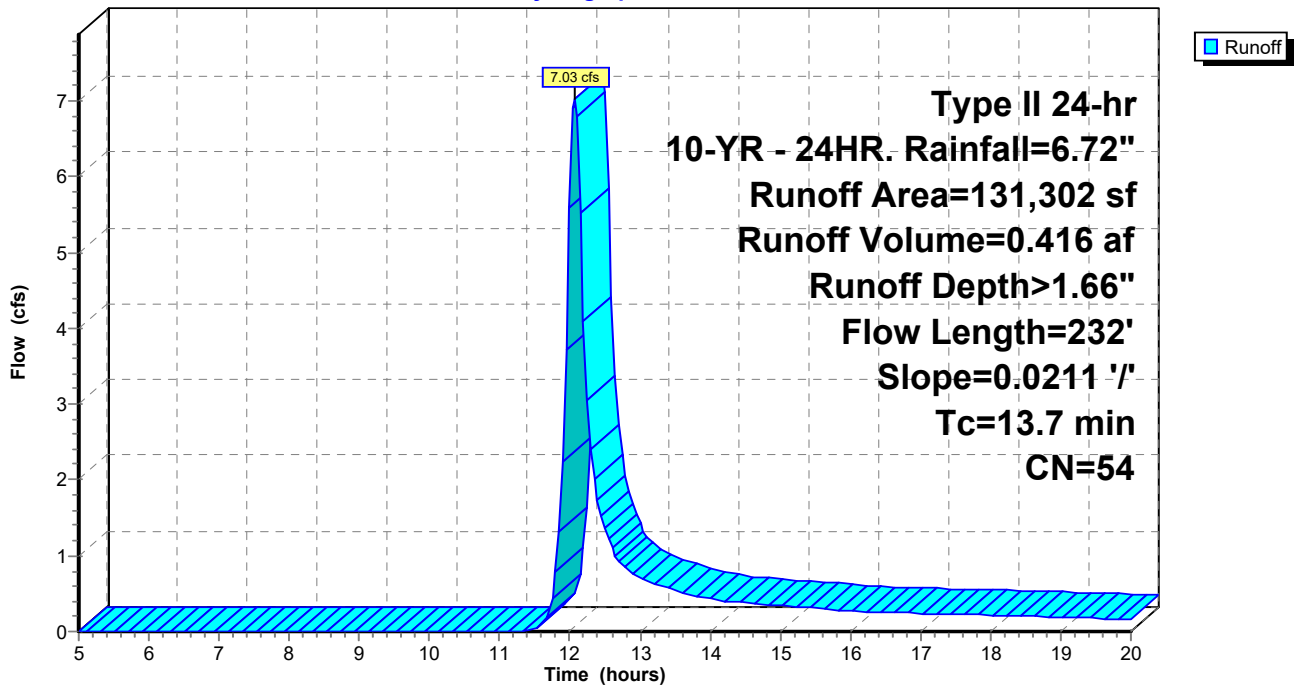
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 1.66" for 10-YR - 24HR. event
Inflow = 7.03 cfs @ 12.07 hrs, Volume= 0.416 af
Outflow = 4.24 cfs @ 12.44 hrs, Volume= 0.404 af, Atten= 40%, Lag= 22.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.48 fps, Min. Travel Time= 14.6 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 30.0 min

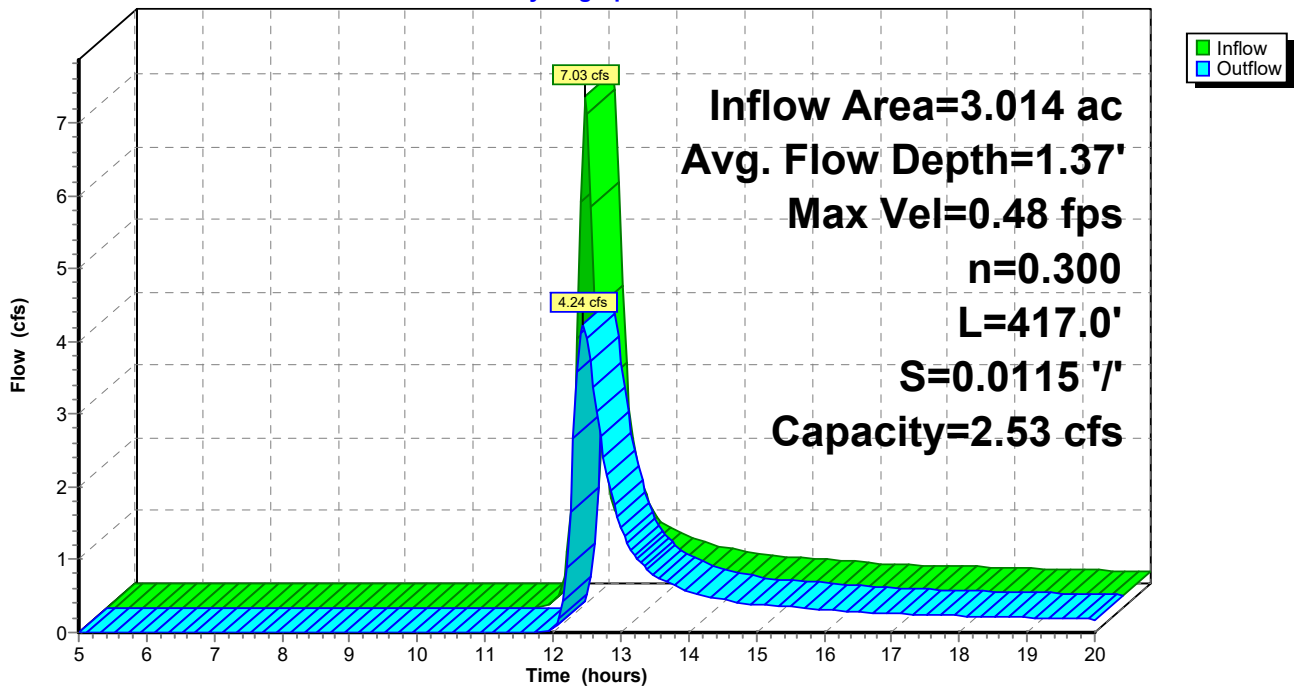
Peak Storage= 3,721 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 ' / ' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 ' / '
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 1.61" for 10-YR - 24HR. event
 Inflow = 4.24 cfs @ 12.44 hrs, Volume= 0.404 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 85.83' @ 20.00 hrs Surf.Area= 21,725 sf Storage= 17,567 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

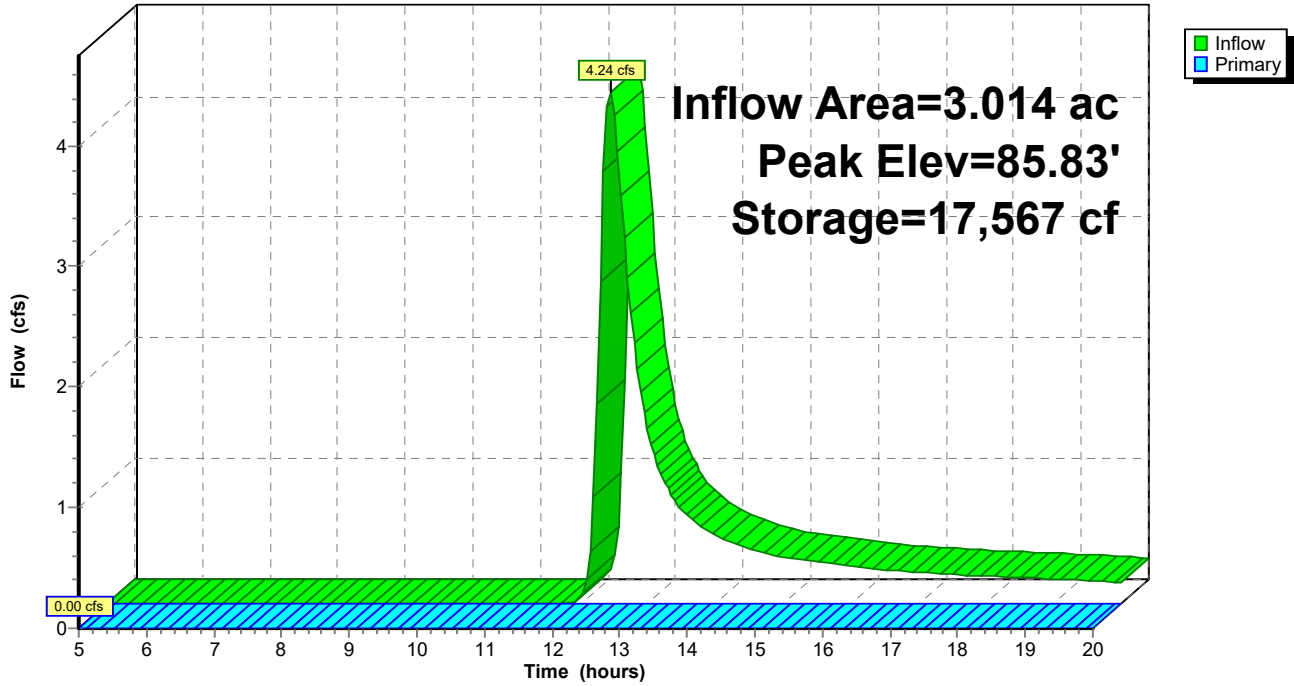
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



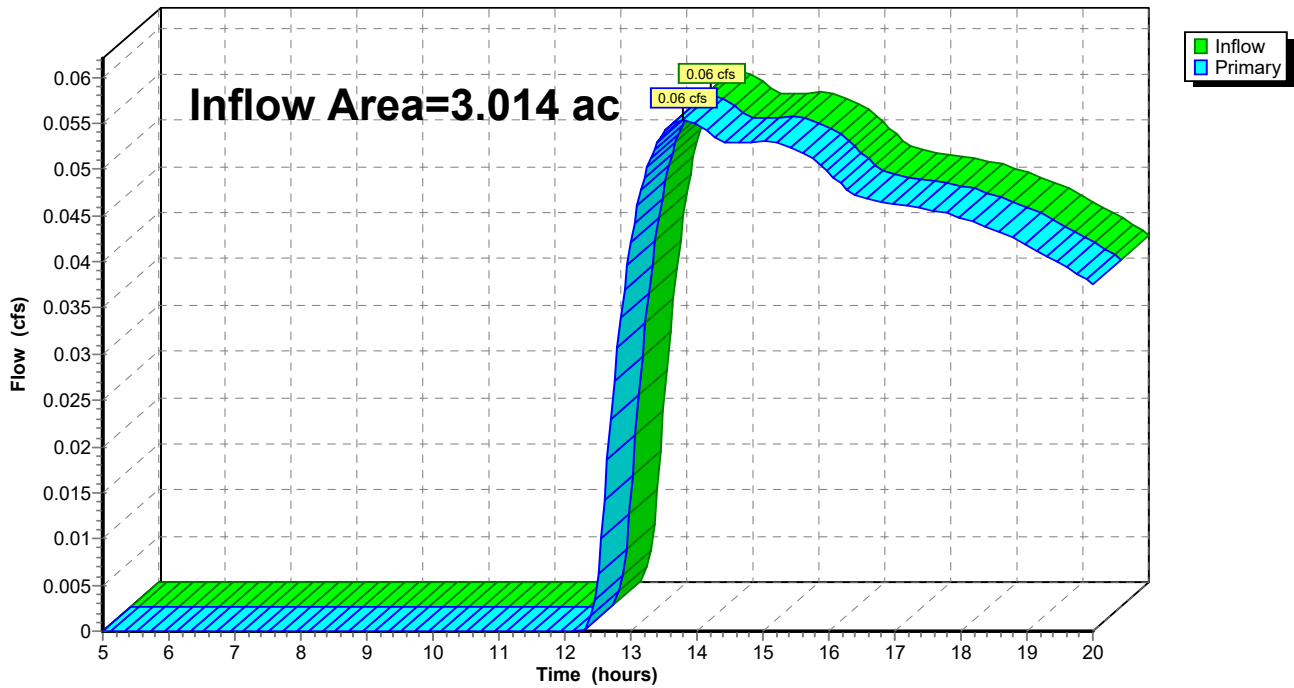
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.11" for 10-YR - 24HR. event
Inflow = 0.06 cfs @ 13.80 hrs, Volume= 0.029 af
Primary = 0.06 cfs @ 13.80 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.31"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.24 cfs 0.077 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>2.36"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=10.26 cfs 0.593 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.84' Max Vel=0.51 fps Inflow=10.26 cfs 0.593 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=6.45 cfs 0.578 af

Pond 1P: PROPOSED POND Peak Elev=86.17' Storage=25,139 cf Inflow=6.45 cfs 0.578 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.24 cfs 0.077 af
Primary=0.24 cfs 0.077 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.24 cfs @ 12.60 hrs, Volume= 0.077 af, Depth> 0.31"

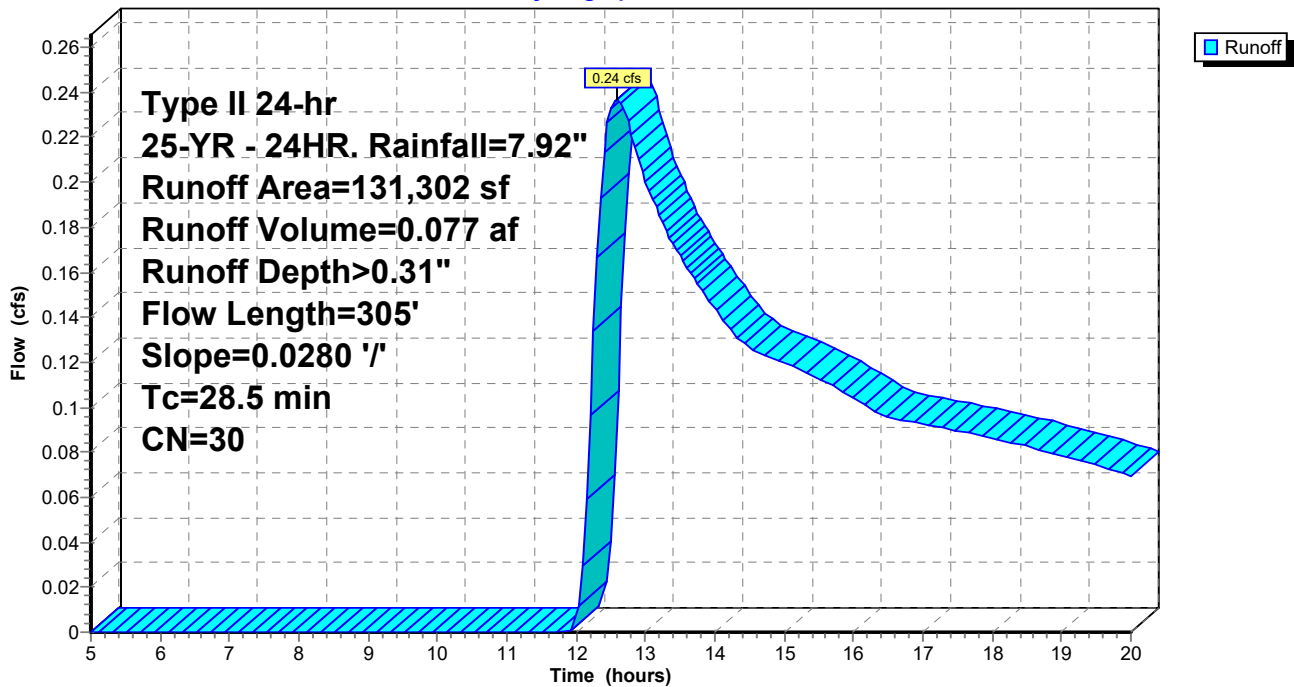
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 10.26 cfs @ 12.07 hrs, Volume= 0.593 af, Depth> 2.36"

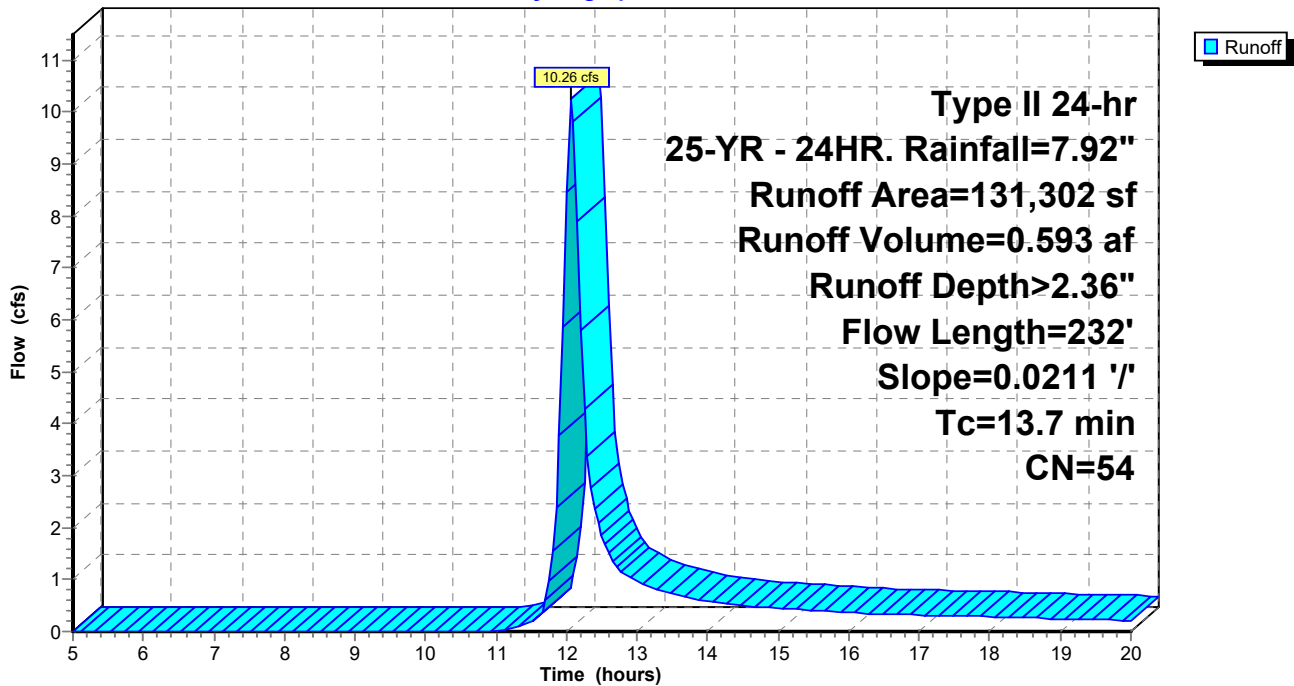
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 2.36" for 25-YR - 24HR. event
Inflow = 10.26 cfs @ 12.07 hrs, Volume= 0.593 af
Outflow = 6.45 cfs @ 12.42 hrs, Volume= 0.578 af, Atten= 37%, Lag= 21.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.51 fps, Min. Travel Time= 13.6 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 28.3 min

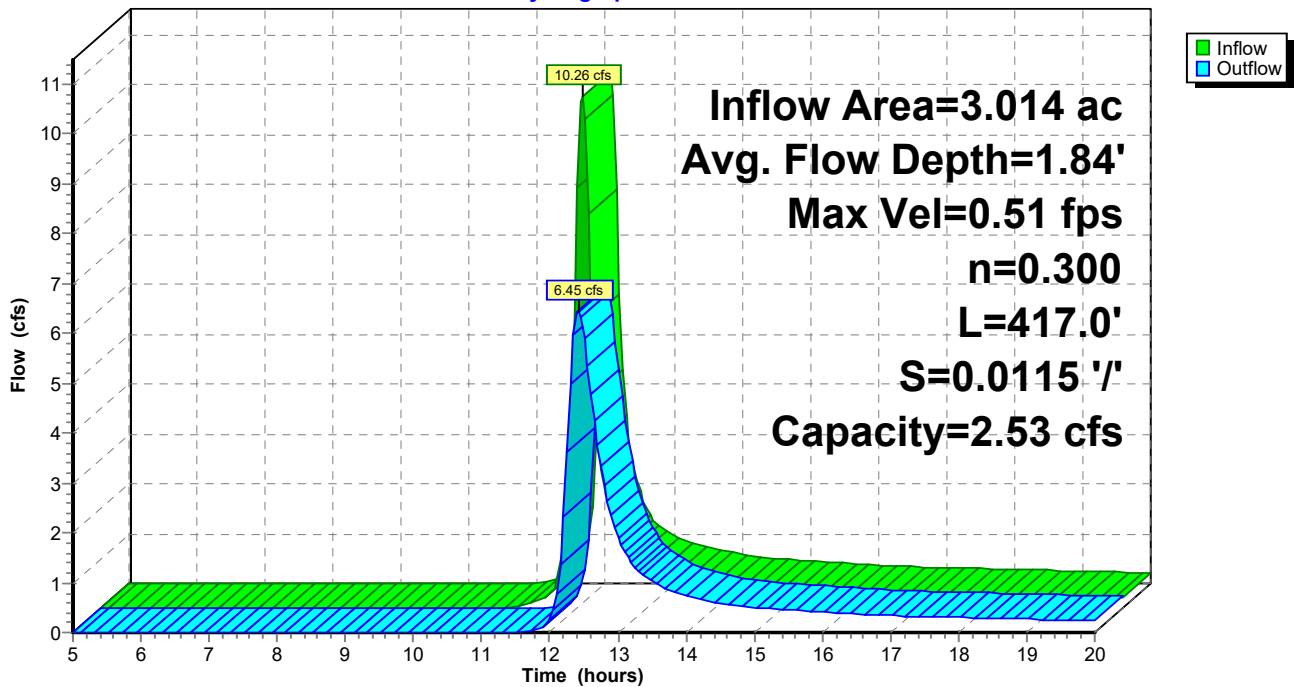
Peak Storage= 5,295 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.84'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 '/'
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 2.30" for 25-YR - 24HR. event
 Inflow = 6.45 cfs @ 12.42 hrs, Volume= 0.578 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 86.17' @ 20.00 hrs Surf.Area= 22,173 sf Storage= 25,139 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

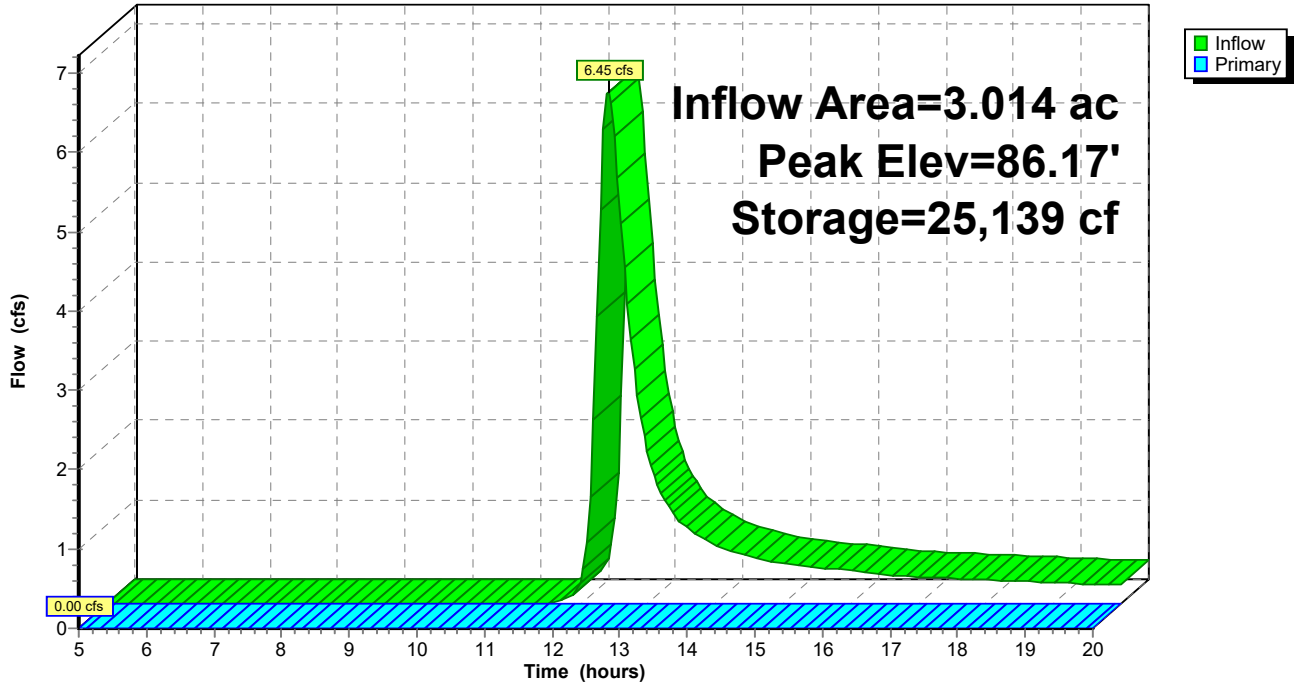
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



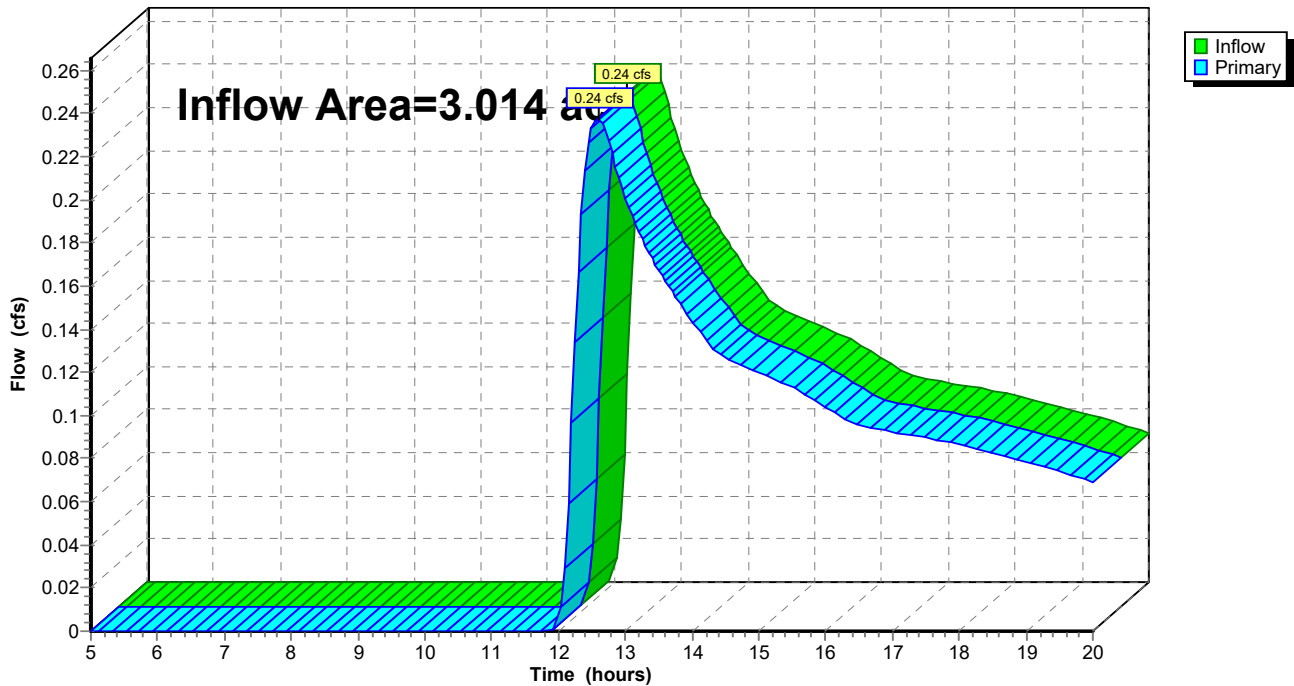
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.31" for 25-YR - 24HR. event
Inflow = 0.24 cfs @ 12.60 hrs, Volume= 0.077 af
Primary = 0.24 cfs @ 12.60 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Repo Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=0.00 cfs 0.000 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=85.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

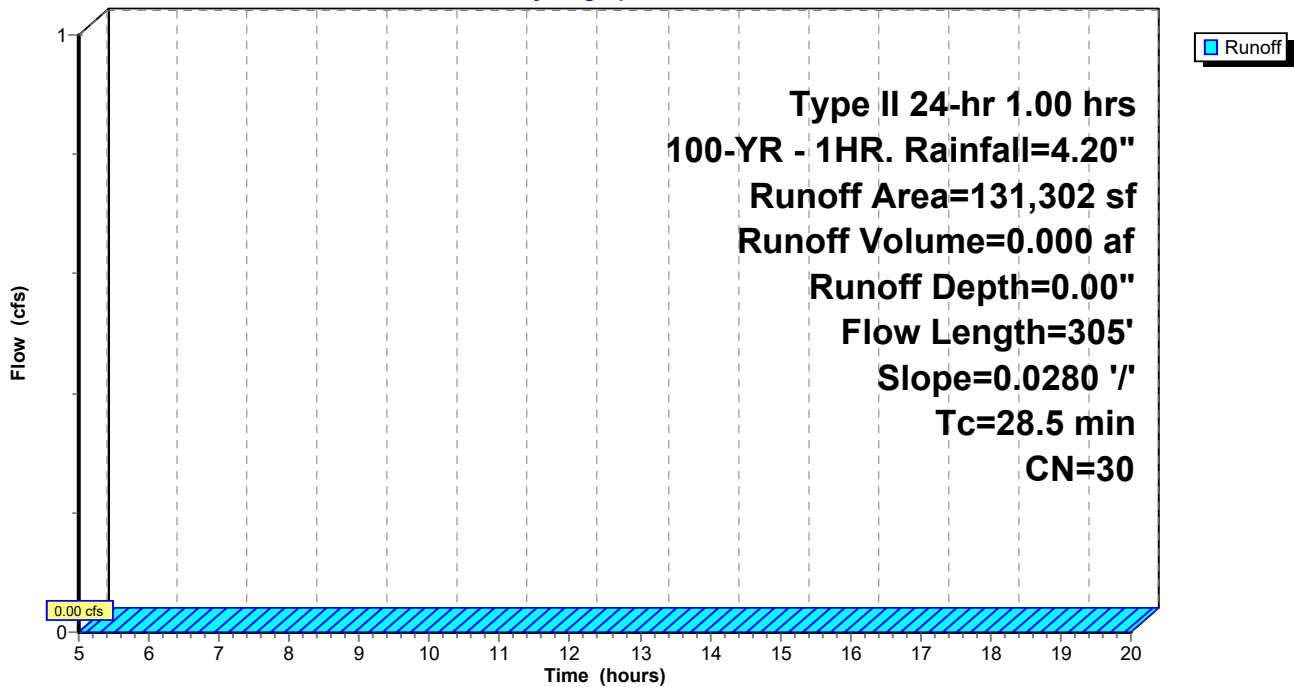
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

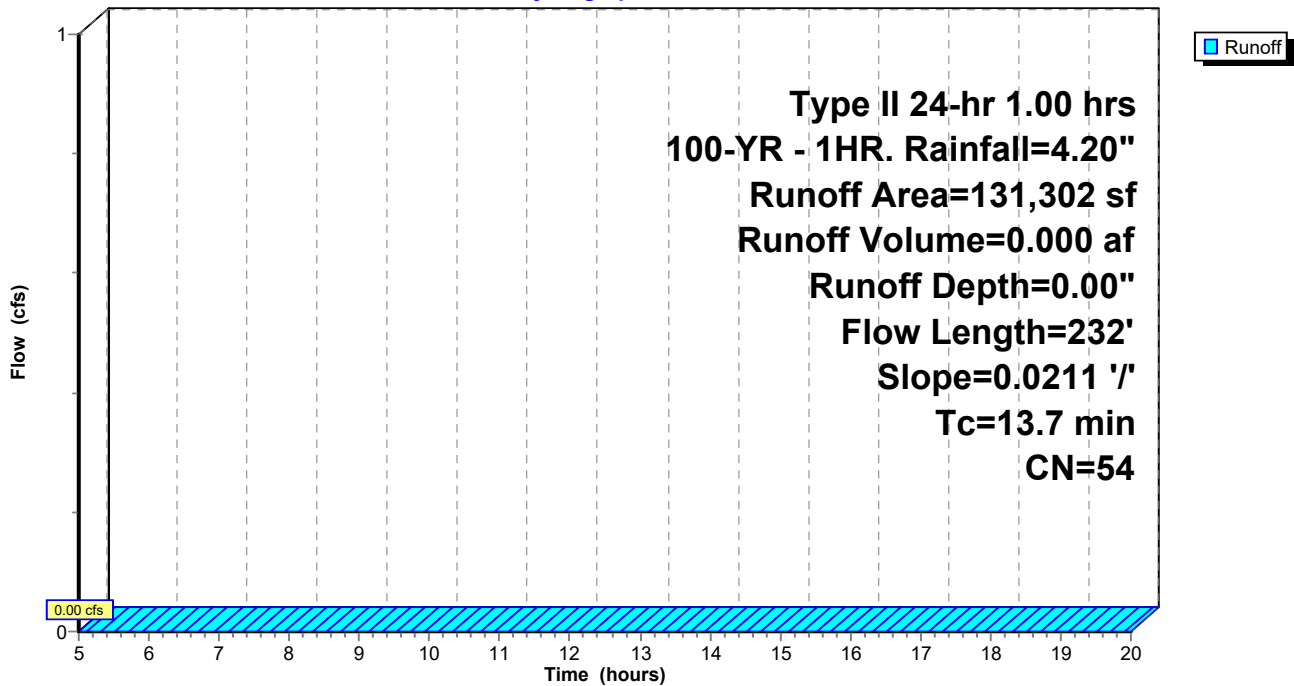
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

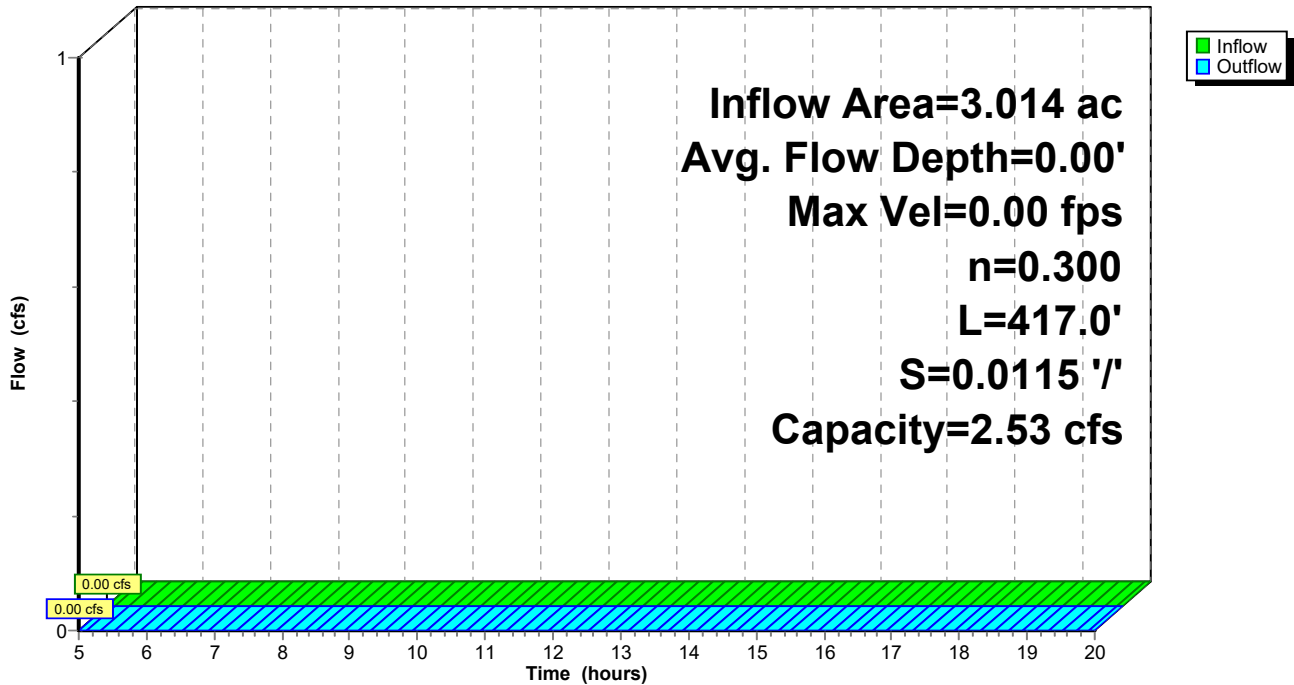
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 417.0' Slope= 0.0115 '/'
 Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 85.00' @ 5.00 hrs Surf.Area= 20,658 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

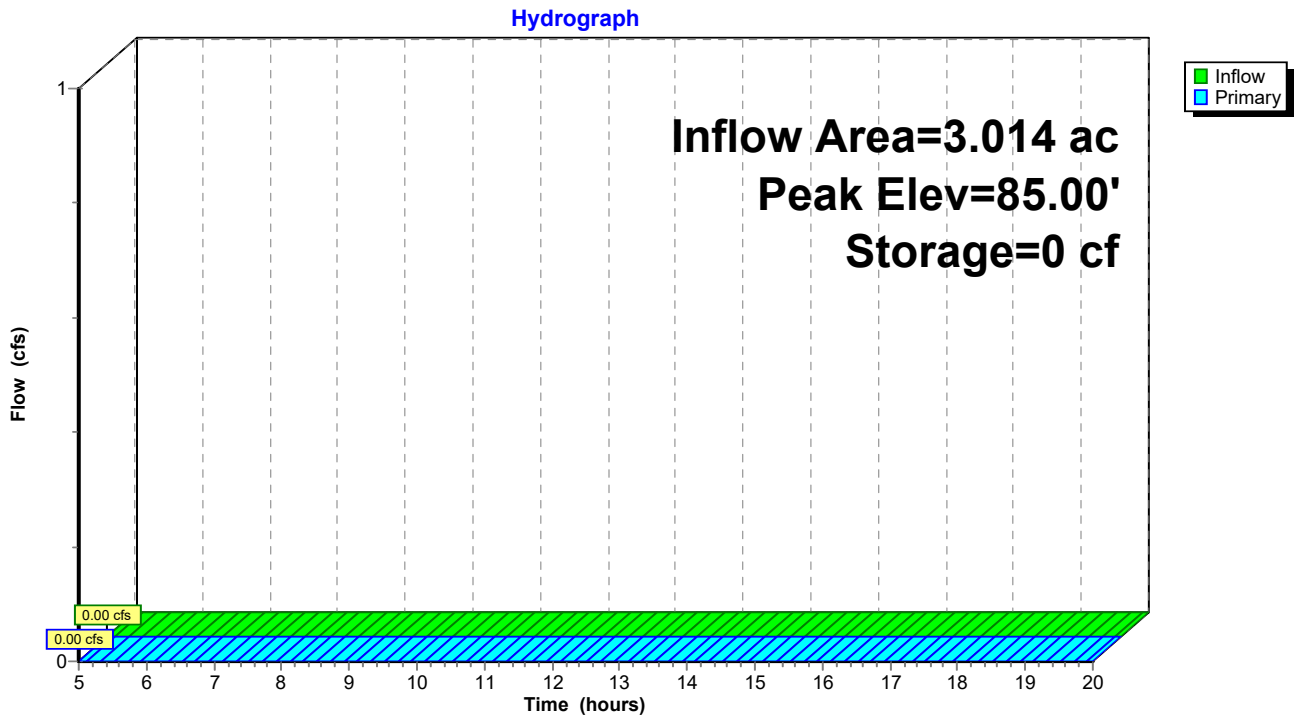
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



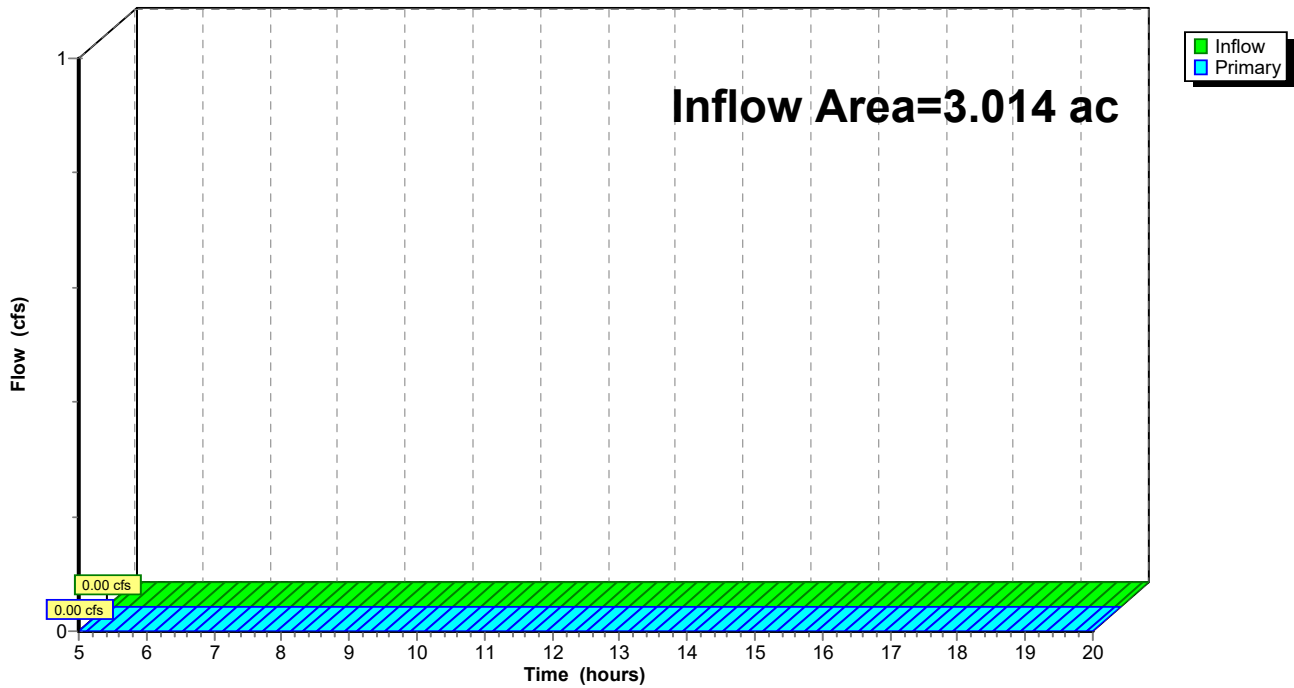
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.77"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=1.18 cfs 0.194 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>3.61"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=15.91 cfs 0.907 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=2.66' Max Vel=0.54 fps Inflow=15.91 cfs 0.907 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=10.29 cfs 0.888 af

Pond 1P: PROPOSED POND Peak Elev=86.77' Storage=38,660 cf Inflow=10.29 cfs 0.888 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=1.18 cfs 0.194 af
Primary=1.18 cfs 0.194 af

Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.18 cfs @ 12.35 hrs, Volume= 0.194 af, Depth> 0.77"

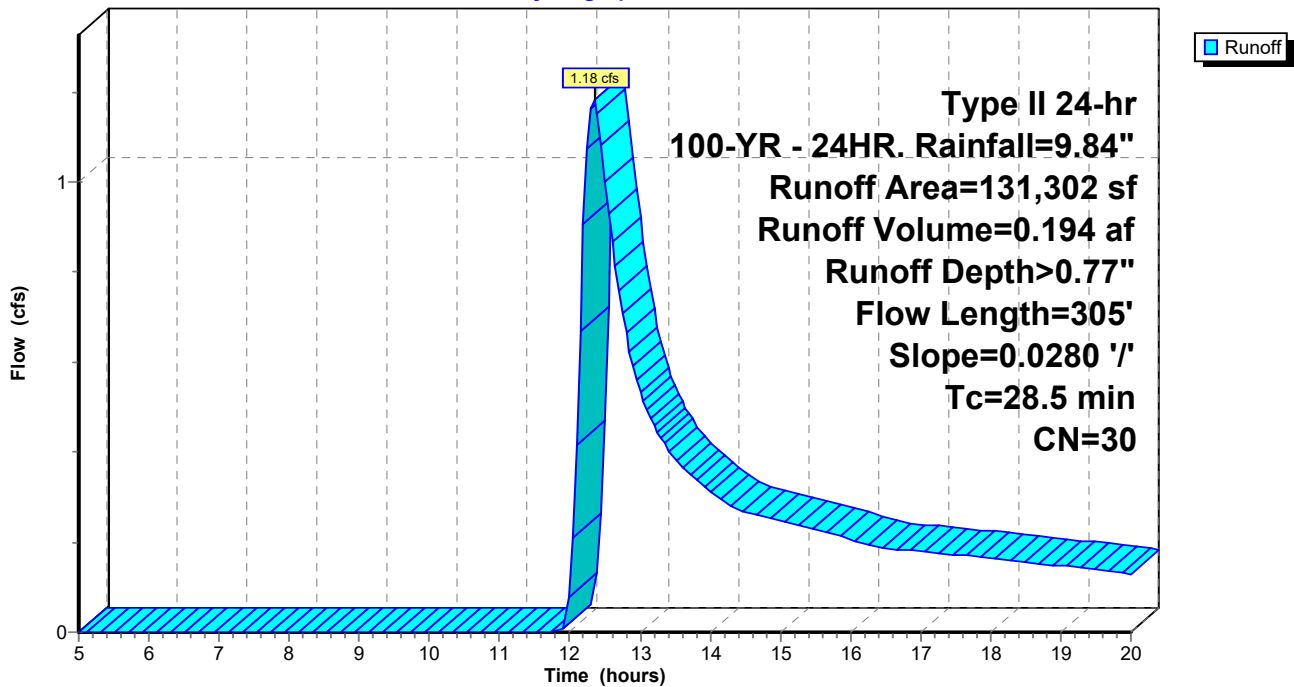
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 15.91 cfs @ 12.06 hrs, Volume= 0.907 af, Depth> 3.61"

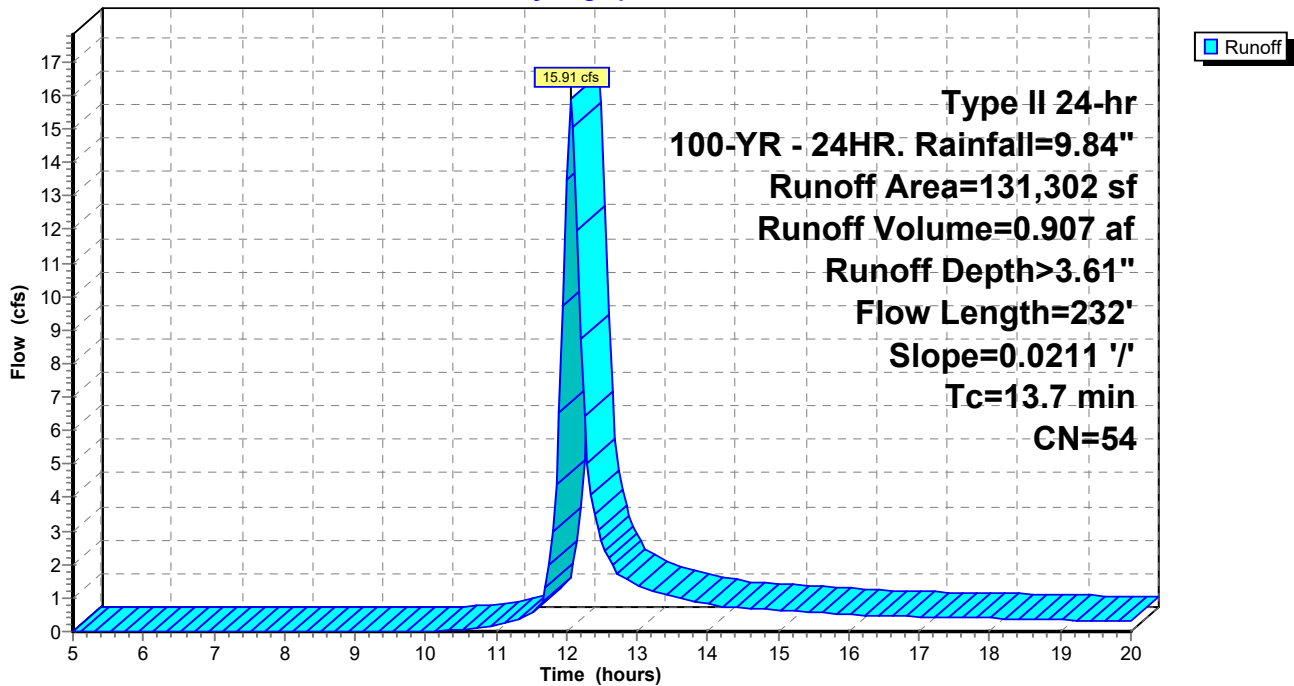
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 3.61" for 100-YR - 24HR. event
Inflow = 15.91 cfs @ 12.06 hrs, Volume= 0.907 af
Outflow = 10.29 cfs @ 12.40 hrs, Volume= 0.888 af, Atten= 35%, Lag= 20.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 12.9 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 26.4 min

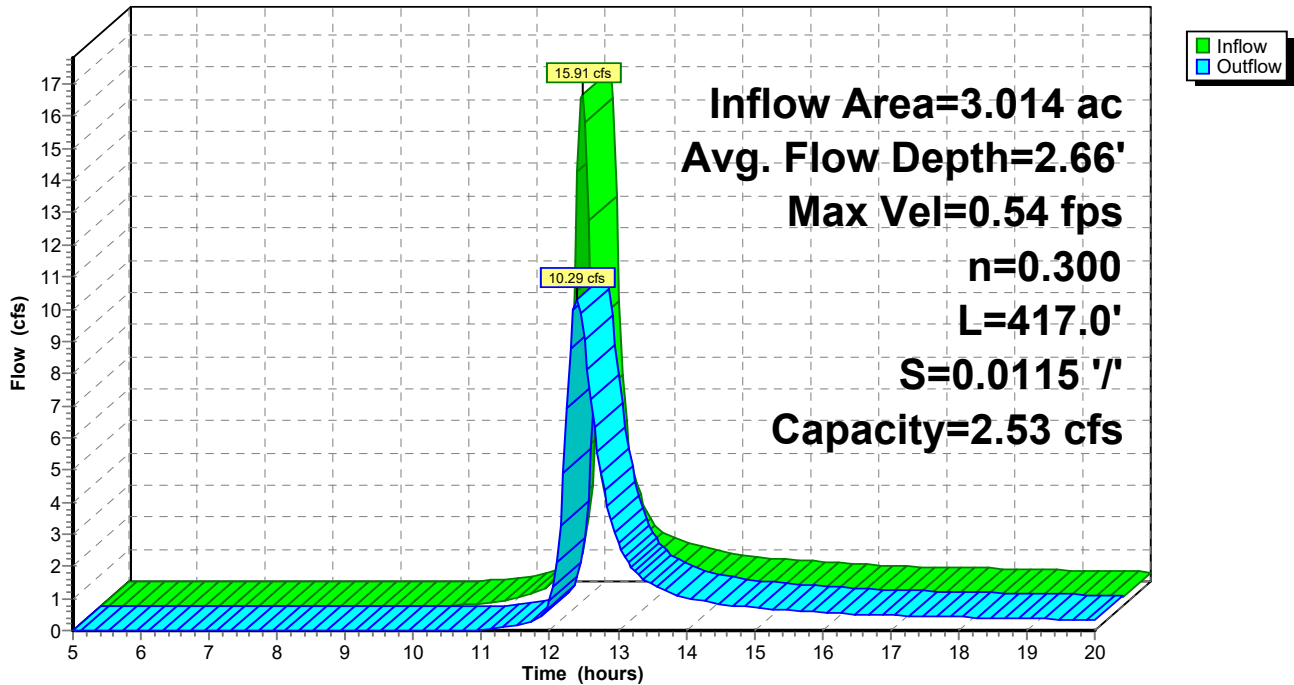
Peak Storage= 8,031 cf @ 12.18 hrs
Average Depth at Peak Storage= 2.66'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 417.0' Slope= 0.0115 '/'
Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 2 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 3.54" for 100-YR - 24HR. event
 Inflow = 10.29 cfs @ 12.40 hrs, Volume= 0.888 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 86.77' @ 20.00 hrs Surf.Area= 22,959 sf Storage= 38,660 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

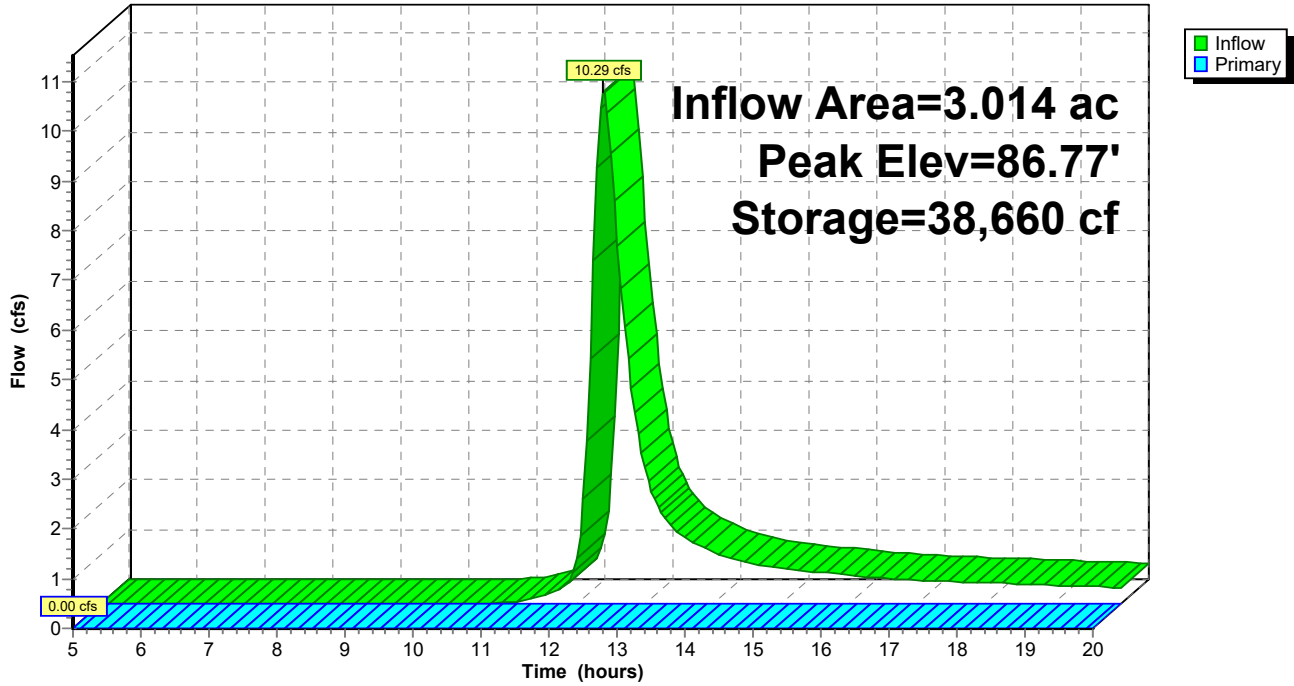
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



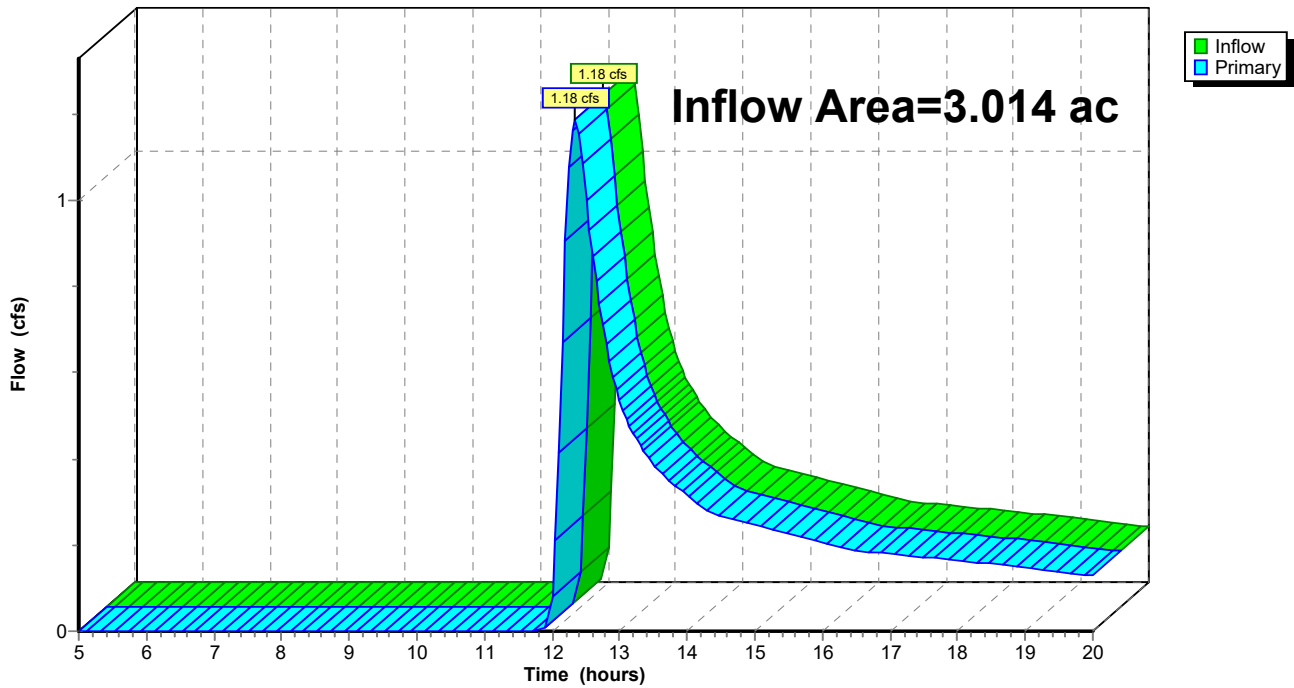
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.77" for 100-YR - 24HR. event
Inflow = 1.18 cfs @ 12.35 hrs, Volume= 0.194 af
Primary = 1.18 cfs @ 12.35 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Repo Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=0.00 cfs 0.000 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=85.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

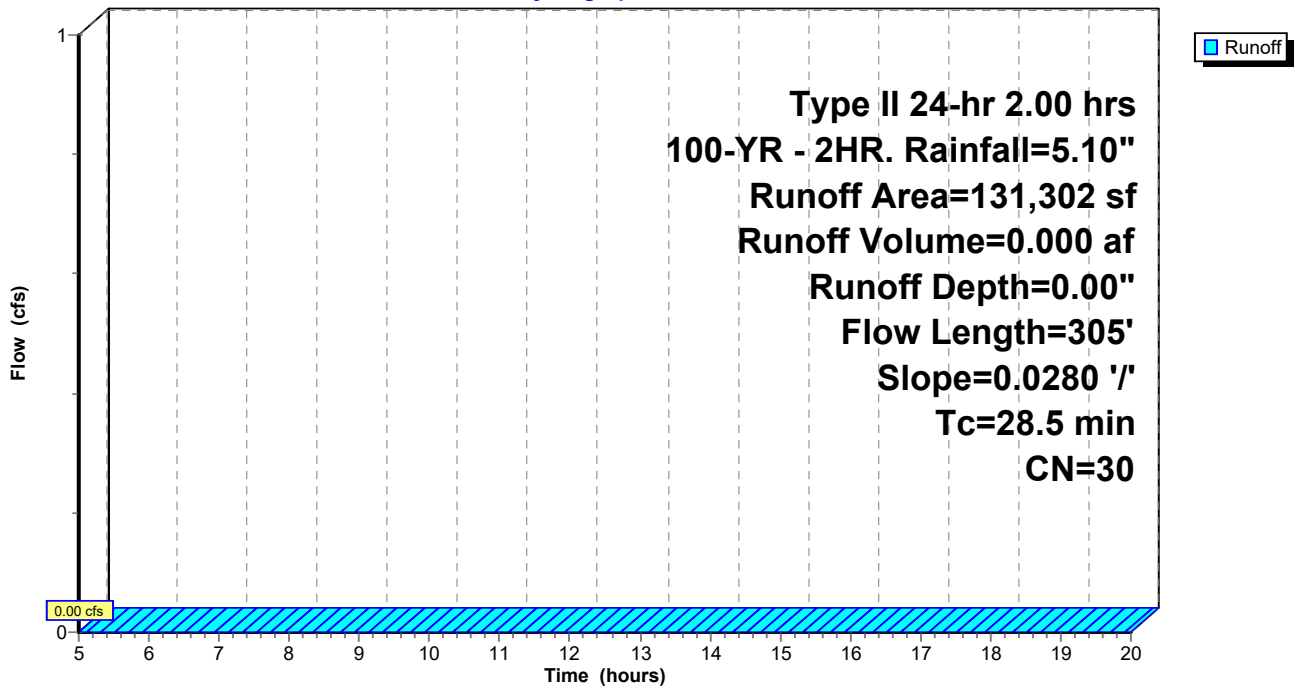
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

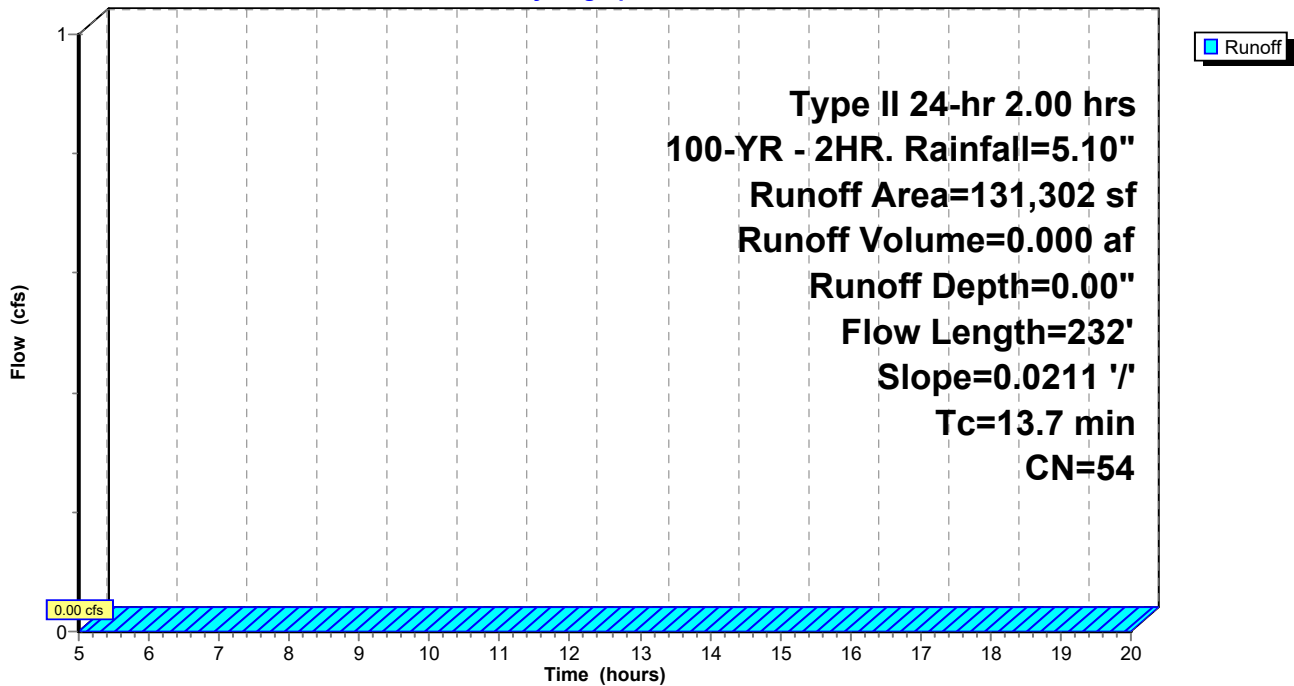
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

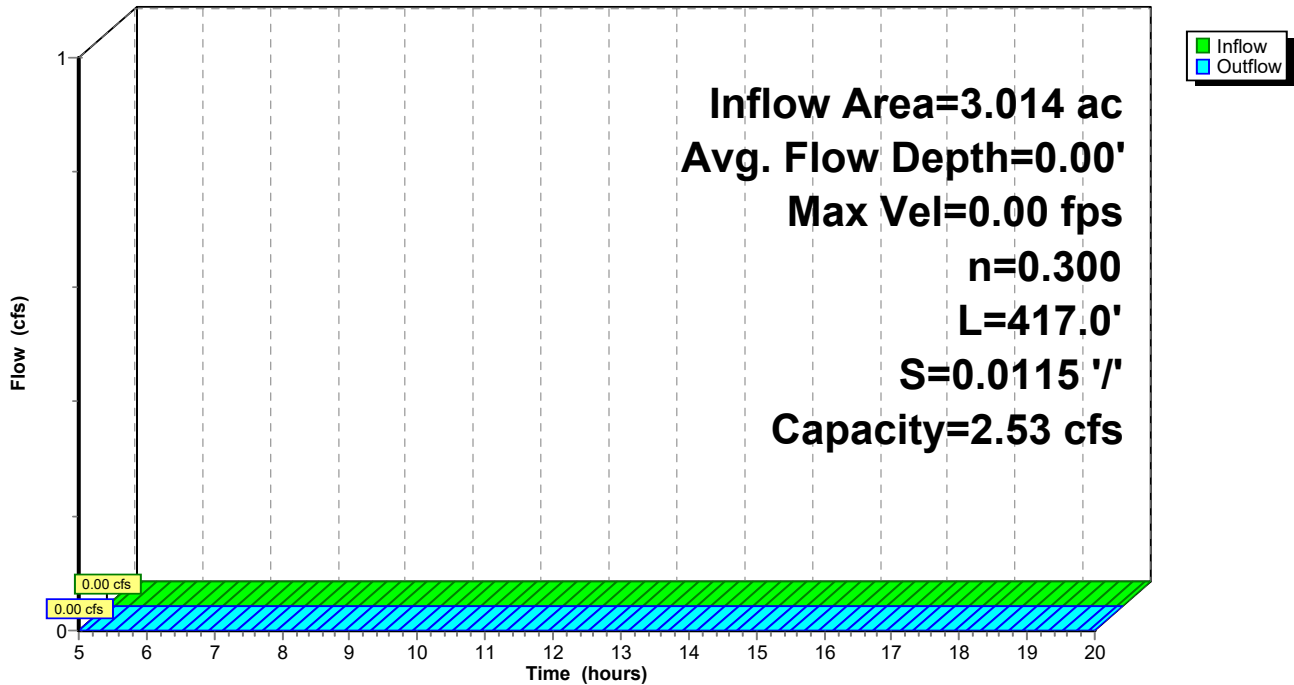
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 417.0' Slope= 0.0115 '/'
 Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 85.00' @ 5.00 hrs Surf.Area= 20,658 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

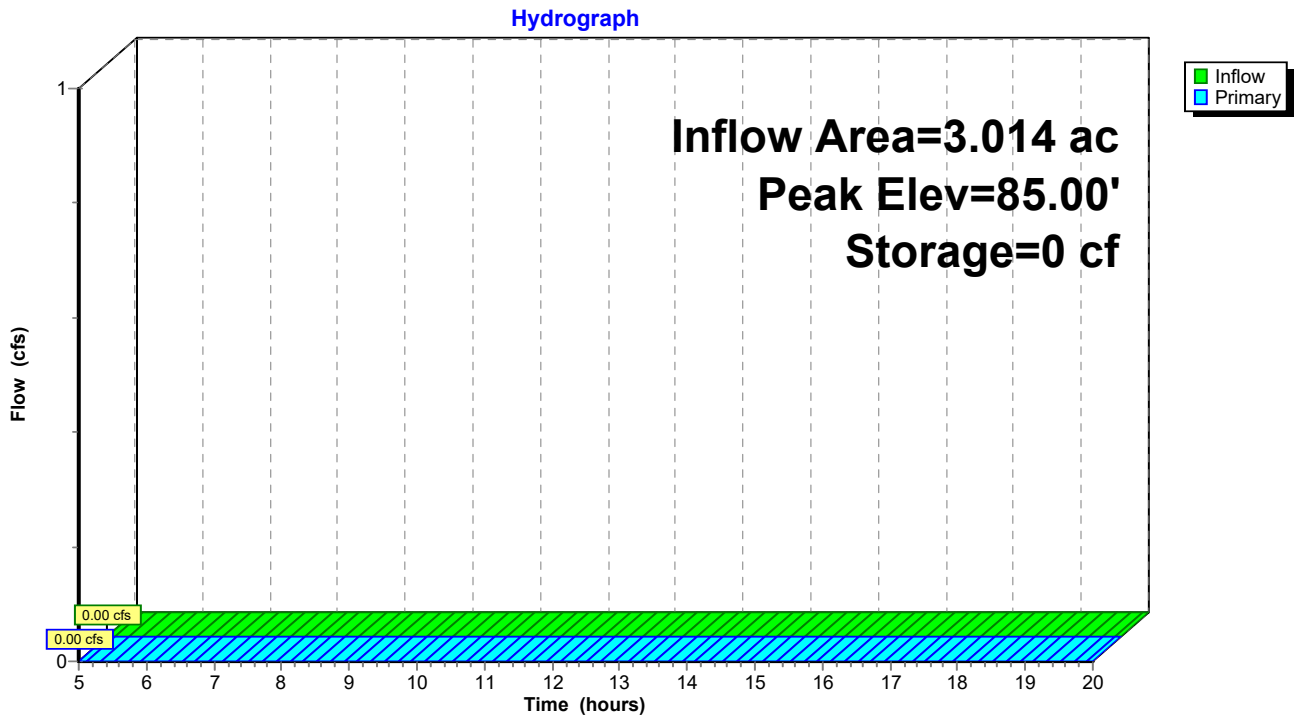
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

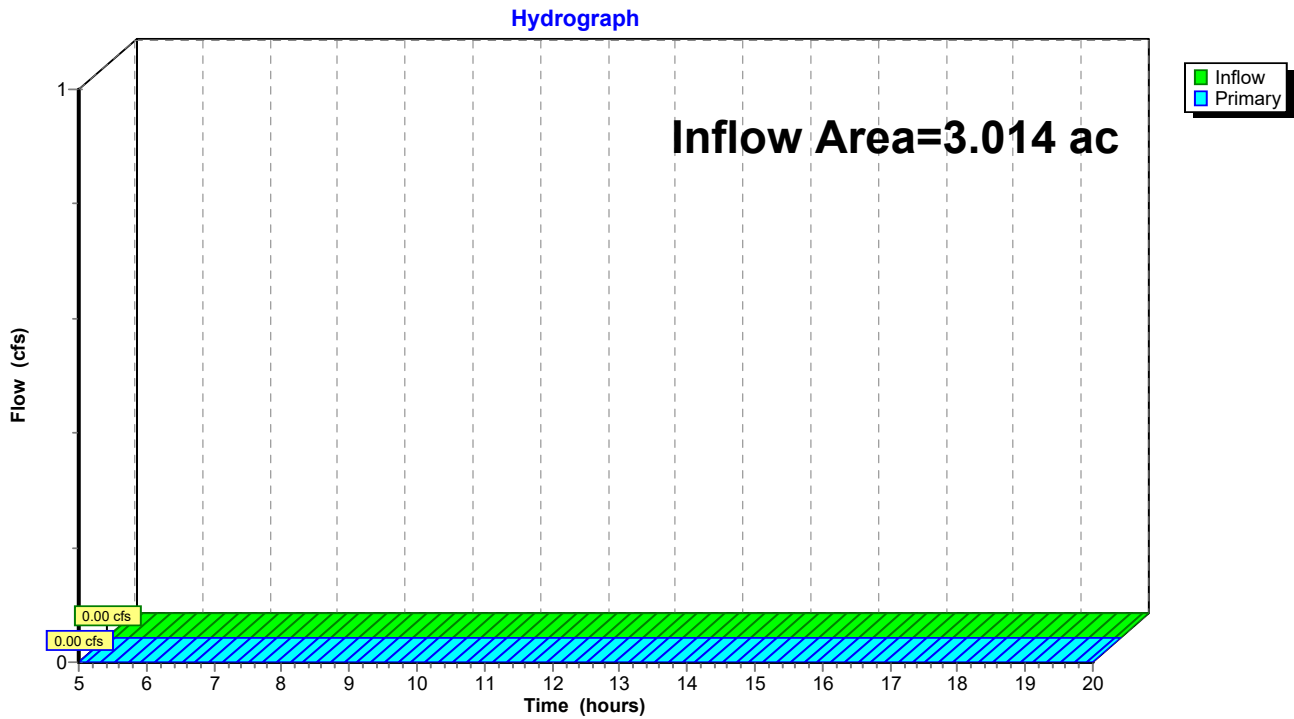


Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION



Staging Area 4 Basin 2 HydroCAD Repo Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=0.00 cfs 0.000 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=85.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

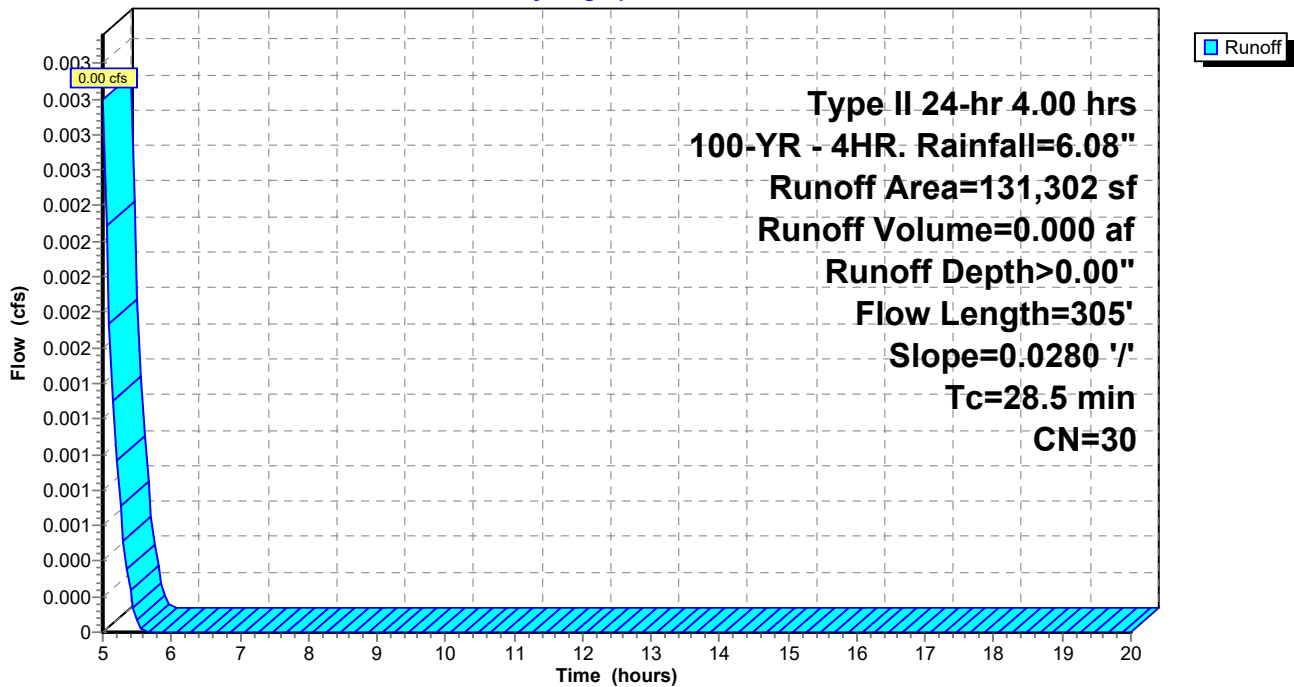
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

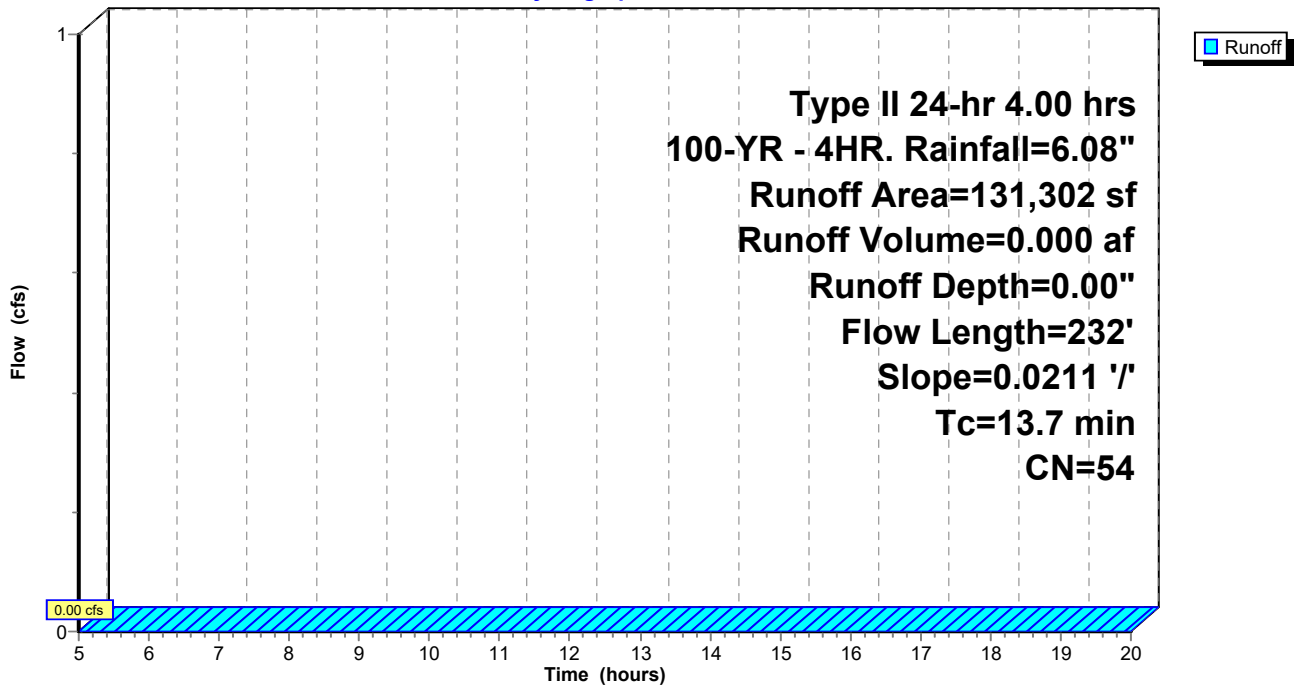
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

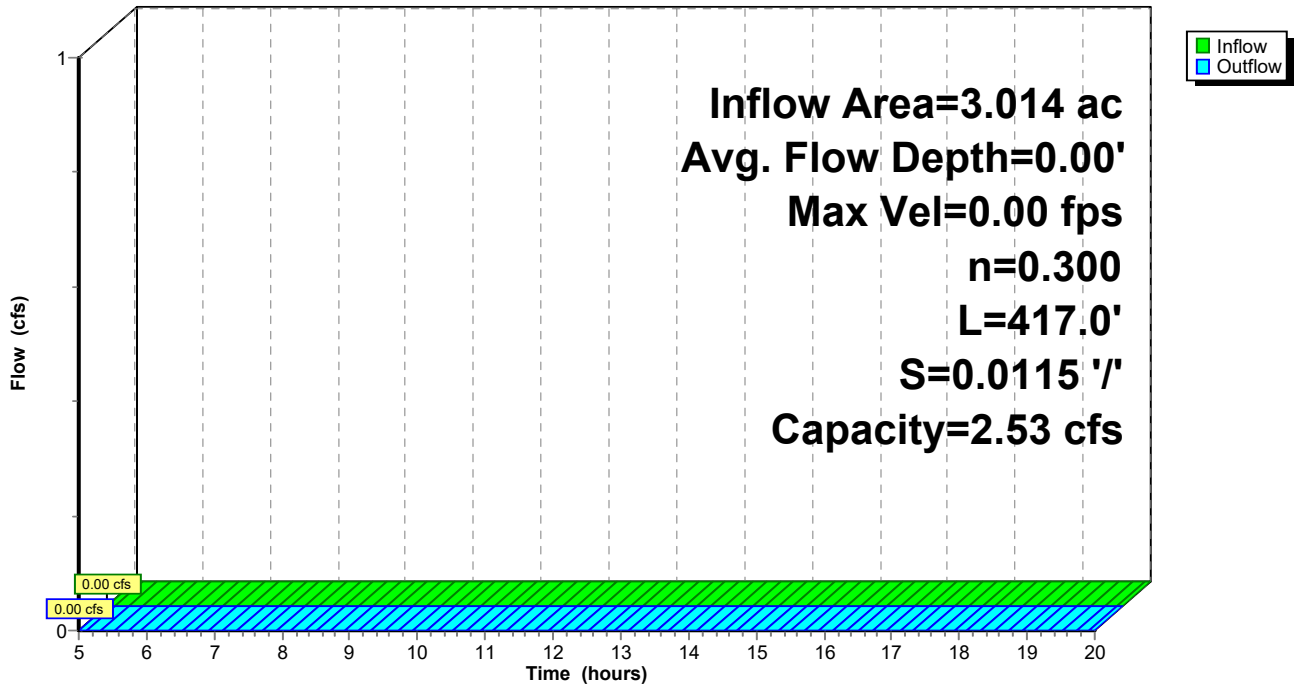
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 417.0' Slope= 0.0115 '/'
 Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 85.00' @ 5.00 hrs Surf.Area= 20,658 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

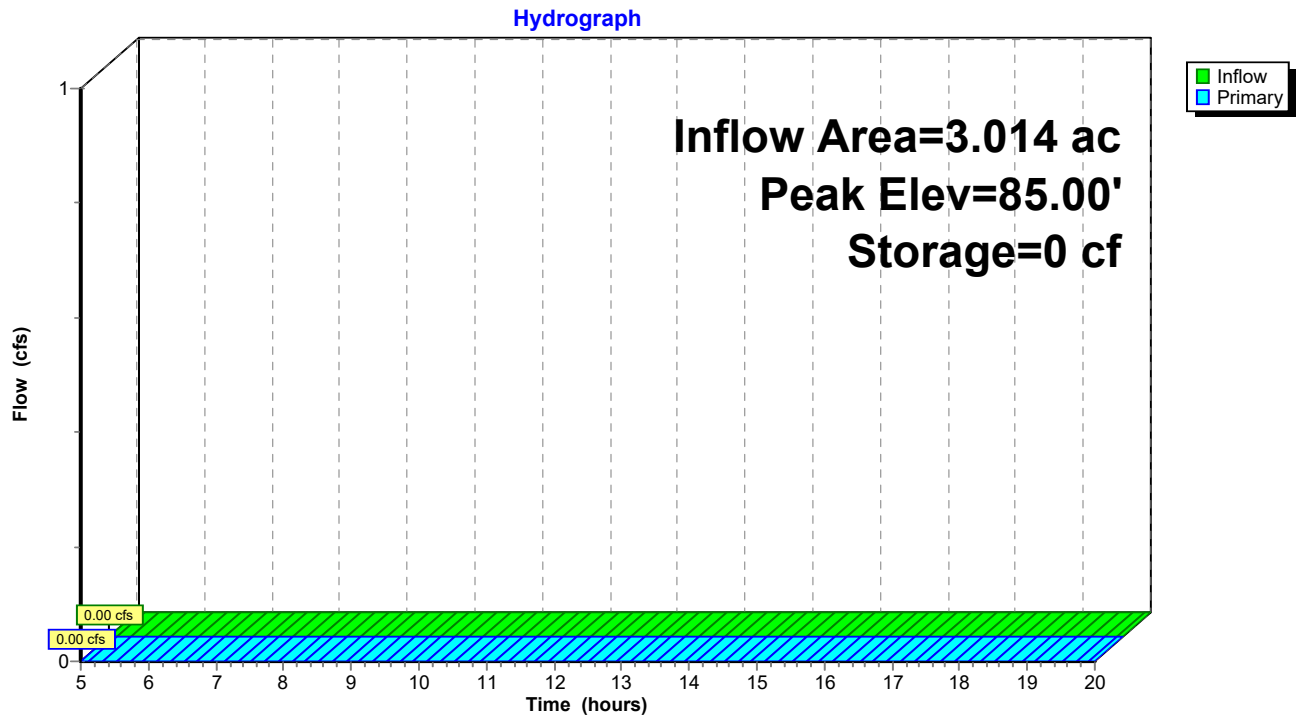
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



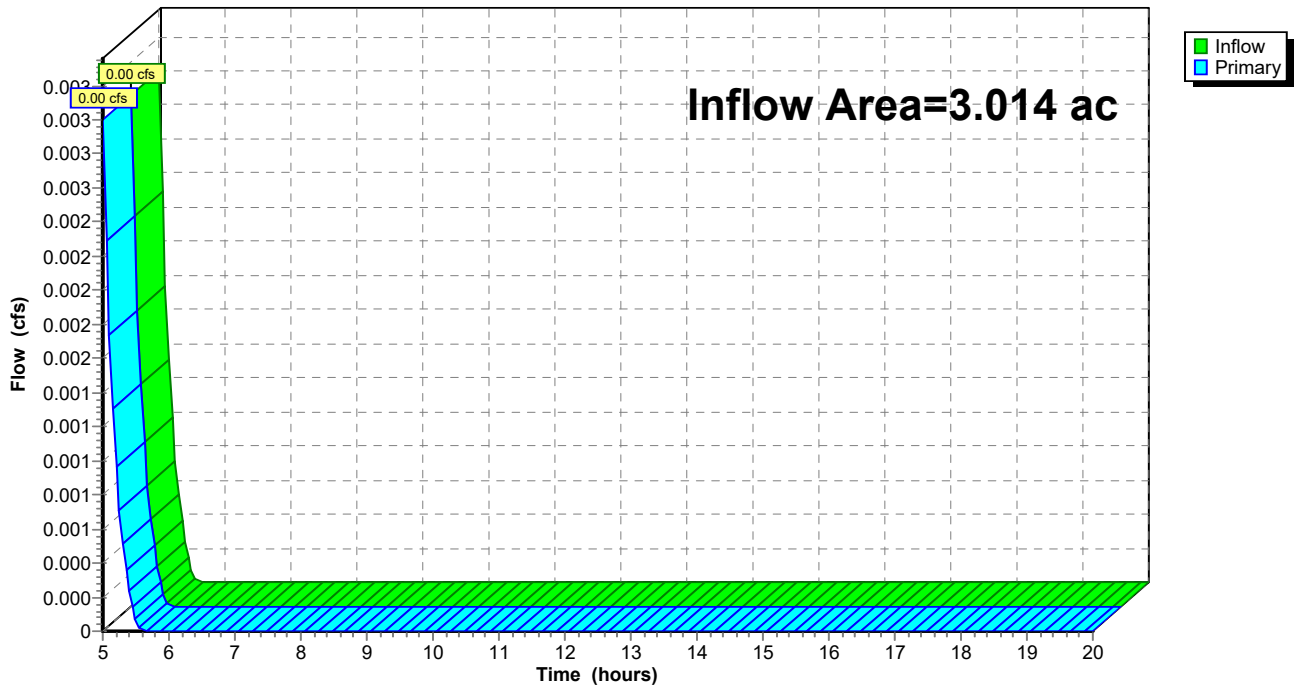
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 2 HydroCAD Repo Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

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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

Subcatchment1S: PRE DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.22"
Flow Length=305' Slope=0.0280 '/' Tc=28.5 min CN=30 Runoff=0.29 cfs 0.054 af

Subcatchment2S: POST DEVELOPED Runoff Area=131,302 sf 0.00% Impervious Runoff Depth>0.76"
Flow Length=232' Slope=0.0211 '/' Tc=13.7 min CN=54 Runoff=1.33 cfs 0.190 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.56' Max Vel=0.31 fps Inflow=1.33 cfs 0.190 af
n=0.300 L=417.0' S=0.0115 '/' Capacity=2.53 cfs Outflow=0.87 cfs 0.187 af

Pond 1P: PROPOSED POND Peak Elev=85.39' Storage=8,141 cf Inflow=0.87 cfs 0.187 af
Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.29 cfs 0.054 af
Primary=0.29 cfs 0.054 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.29 cfs @ 5.00 hrs, Volume= 0.054 af, Depth> 0.22"

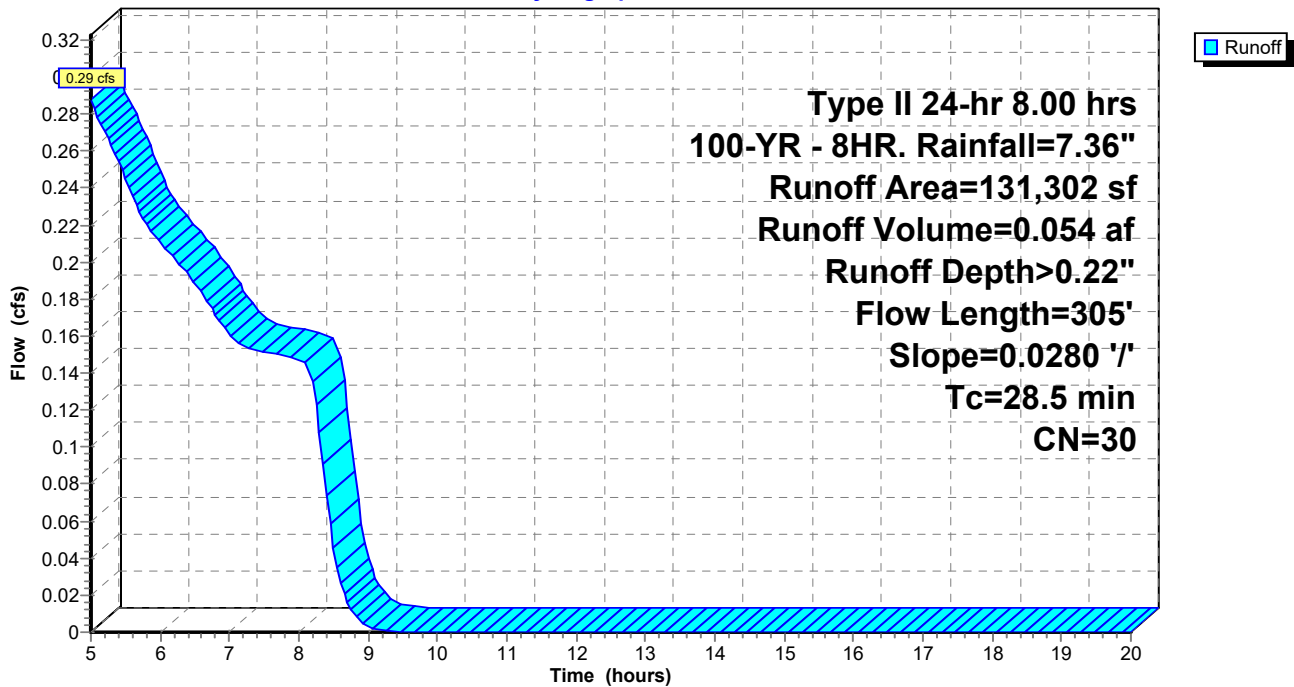
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
131,302	30	Meadow, non-grazed, HSG A
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	305	0.0280	0.18		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Runoff = 1.33 cfs @ 5.00 hrs, Volume= 0.190 af, Depth> 0.76"

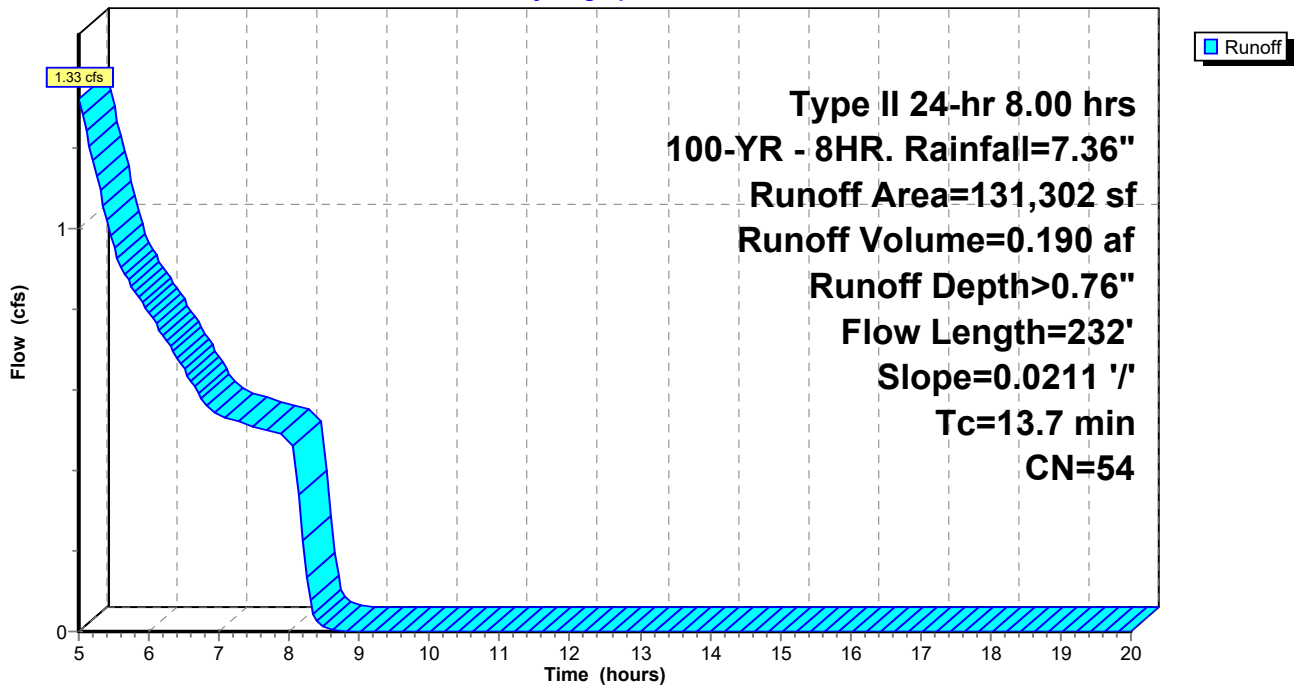
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
44,559	30	Meadow, non-grazed, HSG A
* 71,066	65	Gravel Laydown (35% Void)
15,677	76	Gravel roads, HSG A
131,302	54	Weighted Average
131,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	232	0.0211	0.28		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE SITE

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.76" for 100-YR - 8HR. event
 Inflow = 1.33 cfs @ 5.00 hrs, Volume= 0.190 af
 Outflow = 0.87 cfs @ 6.08 hrs, Volume= 0.187 af, Atten= 34%, Lag= 65.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.31 fps, Min. Travel Time= 22.7 min
 Avg. Velocity = 0.10 fps, Avg. Travel Time= 71.7 min

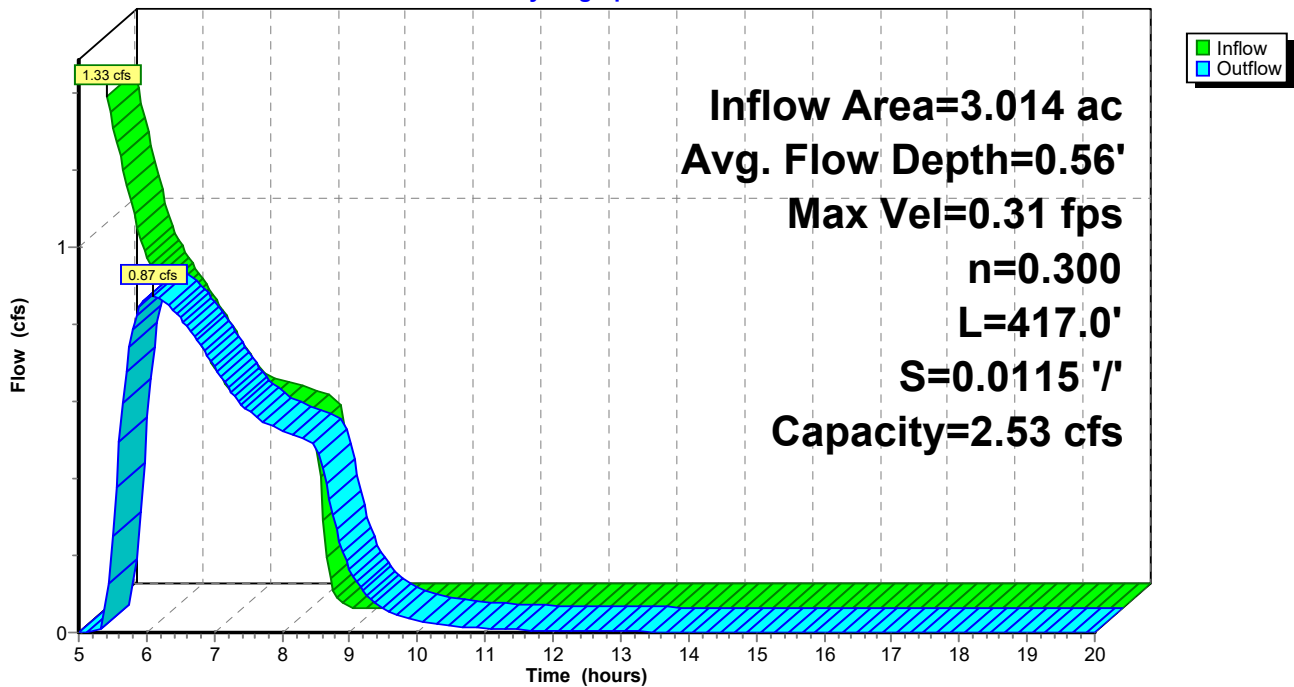
Peak Storage= 1,187 cf @ 5.71 hrs
 Average Depth at Peak Storage= 0.56'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 2.53 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 417.0' Slope= 0.0115 '/'
 Inlet Invert= 91.80', Outlet Invert= 87.00'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.74" for 100-YR - 8HR. event
 Inflow = 0.87 cfs @ 6.08 hrs, Volume= 0.187 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 85.39' @ 20.00 hrs Surf.Area= 21,159 sf Storage= 8,141 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	67,828 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

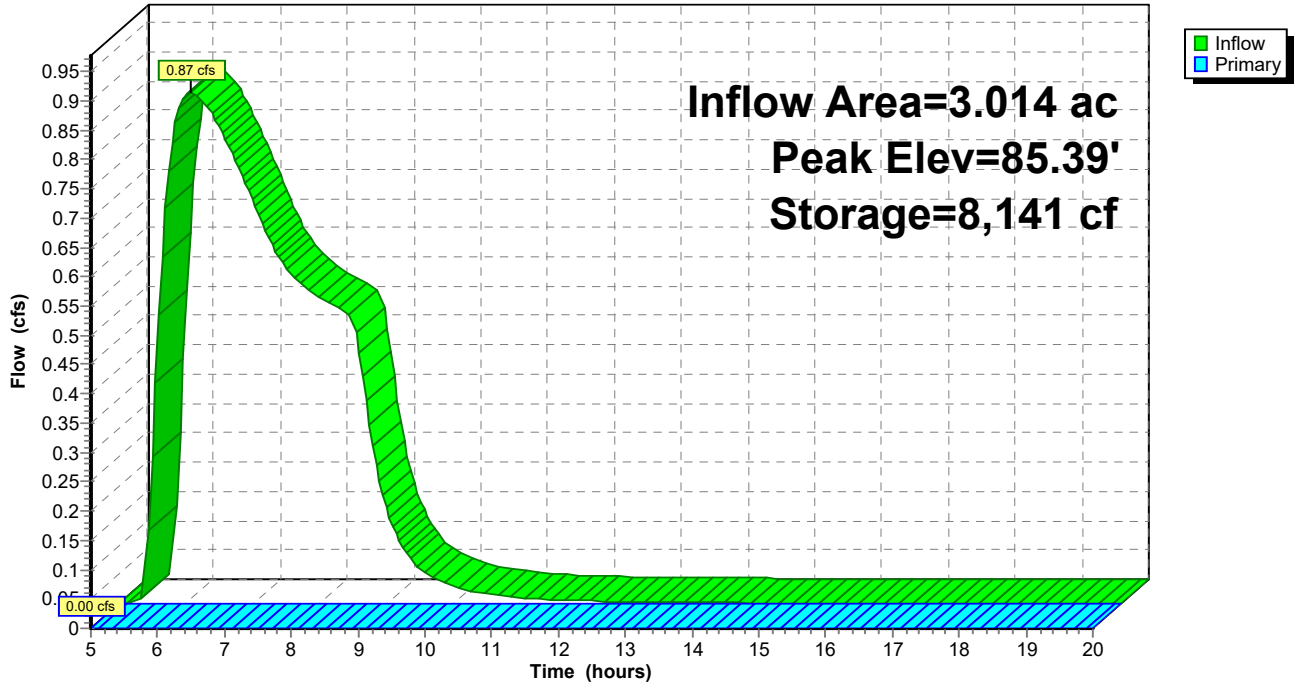
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	20,658	0	0
86.00	21,945	21,302	21,302
87.00	23,257	22,601	43,903
88.00	24,594	23,926	67,828

Device	Routing	Invert	Outlet Devices
#1	Primary	86.90'	43.6 deg x 22.0' long x 0.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=85.00' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



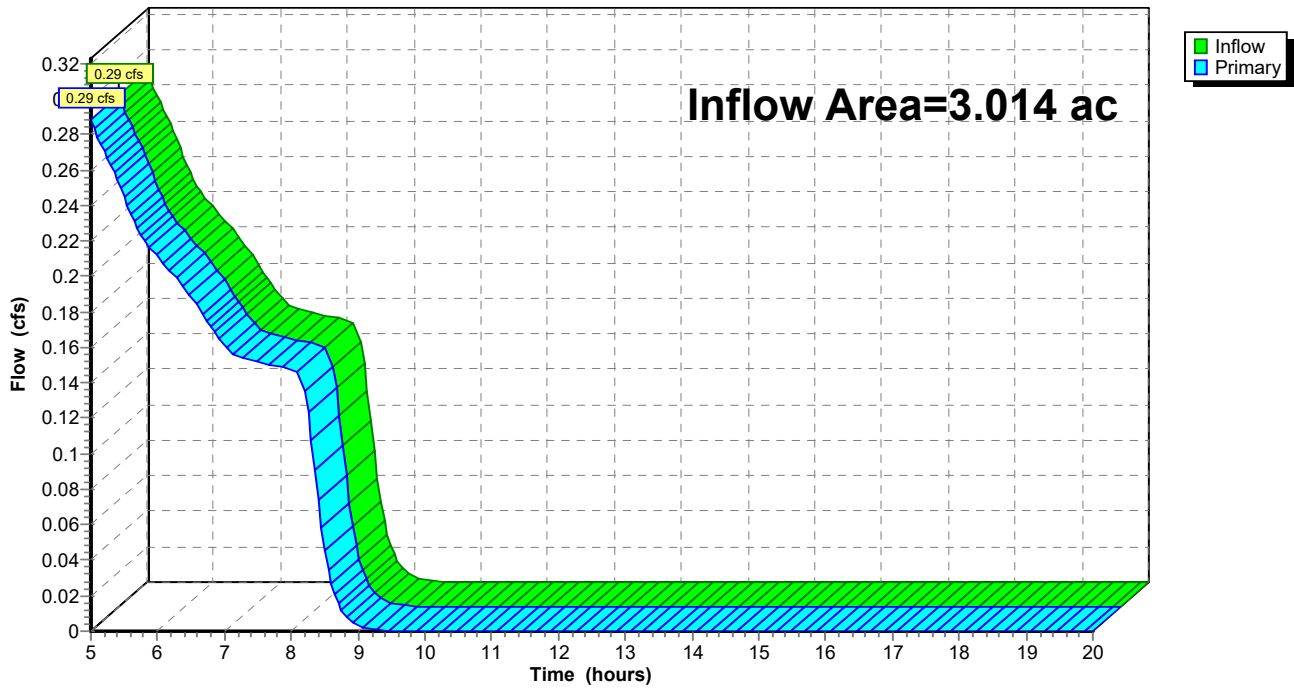
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 3.014 ac, 0.00% Impervious, Inflow Depth > 0.22" for 100-YR - 8HR. event
 Inflow = 0.29 cfs @ 5.00 hrs, Volume= 0.054 af
 Primary = 0.29 cfs @ 5.00 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

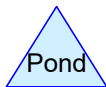
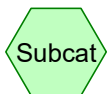
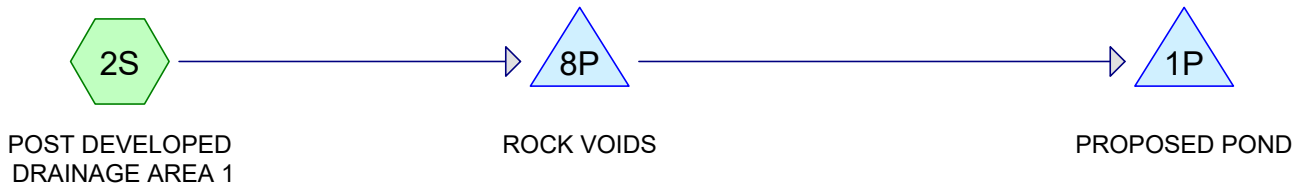
Hydrograph



PRE-DEVELOPED SITE



POST DEVELOPED SITE



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>2.30"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=8.10 cfs 2.303 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>6.12"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=38.19 cfs 6.118 af

Pond 1P: PROPOSED POND Peak Elev=83.09' Storage=181,608 cf Inflow=61.32 cfs 4.496 af
Discarded=0.19 cfs 0.118 af Primary=0.93 cfs 0.236 af Outflow=1.12 cfs 0.354 af

Pond 8P: ROCK VOIDS Peak Elev=88.59' Storage=24,248 cf Inflow=38.19 cfs 6.118 af
Discarded=1.31 cfs 1.064 af Primary=61.32 cfs 4.496 af Outflow=62.63 cfs 5.560 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=8.10 cfs 2.303 af
Primary=8.10 cfs 2.303 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 8.10 cfs @ 13.23 hrs, Volume= 2.303 af, Depth> 2.30"

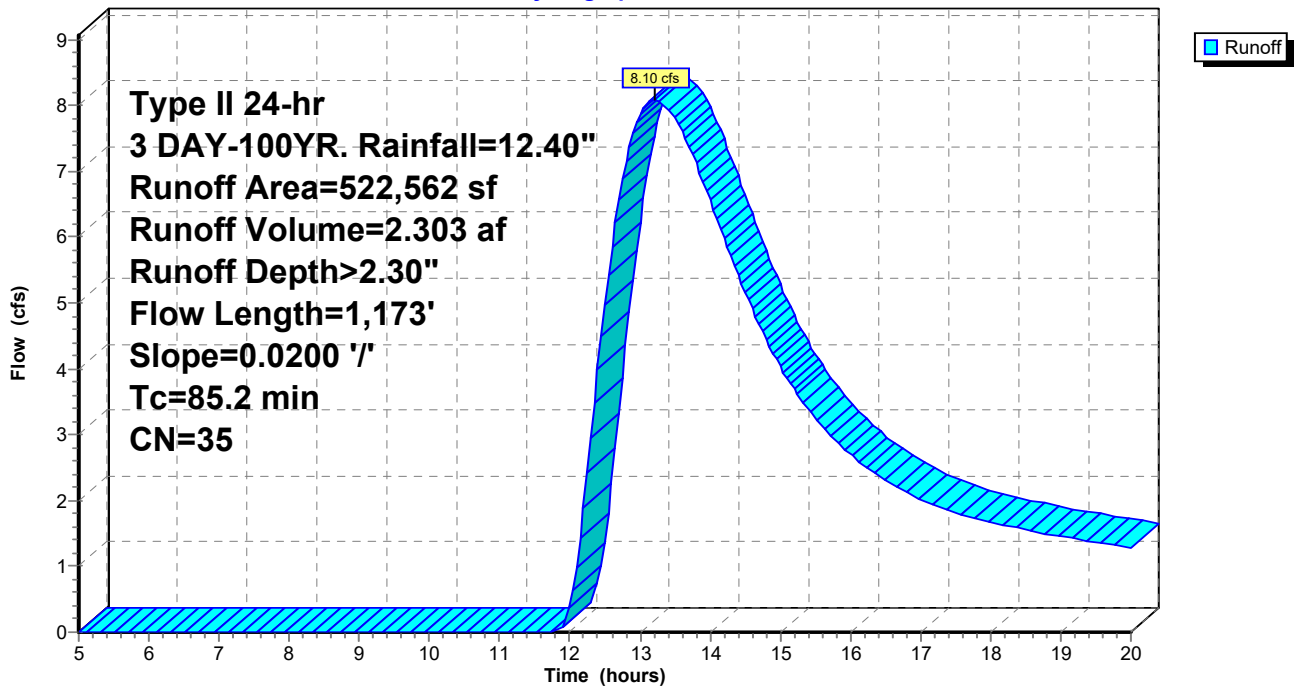
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 38.19 cfs @ 12.50 hrs, Volume= 6.118 af, Depth> 6.12"

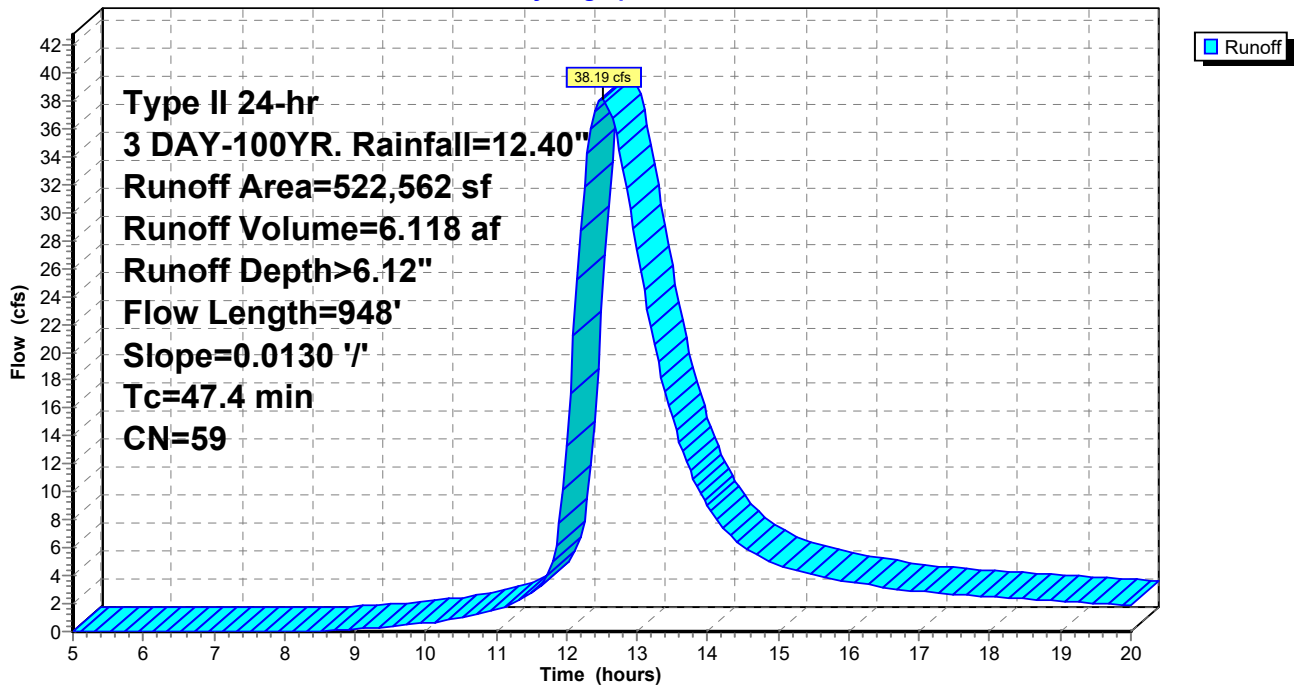
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 4.50" for 3 DAY-100YR. event
 Inflow = 61.32 cfs @ 12.55 hrs, Volume= 4.496 af
 Outflow = 1.12 cfs @ 18.29 hrs, Volume= 0.354 af, Atten= 98%, Lag= 344.6 min
 Discarded = 0.19 cfs @ 18.29 hrs, Volume= 0.118 af
 Primary = 0.93 cfs @ 18.29 hrs, Volume= 0.236 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.09' @ 18.29 hrs Surf.Area= 63,895 sf Storage= 181,608 cf

Plug-Flow detention time= 319.6 min calculated for 0.352 af (8% of inflow)
 Center-of-Mass det. time= 240.5 min (1,056.4 - 815.9)

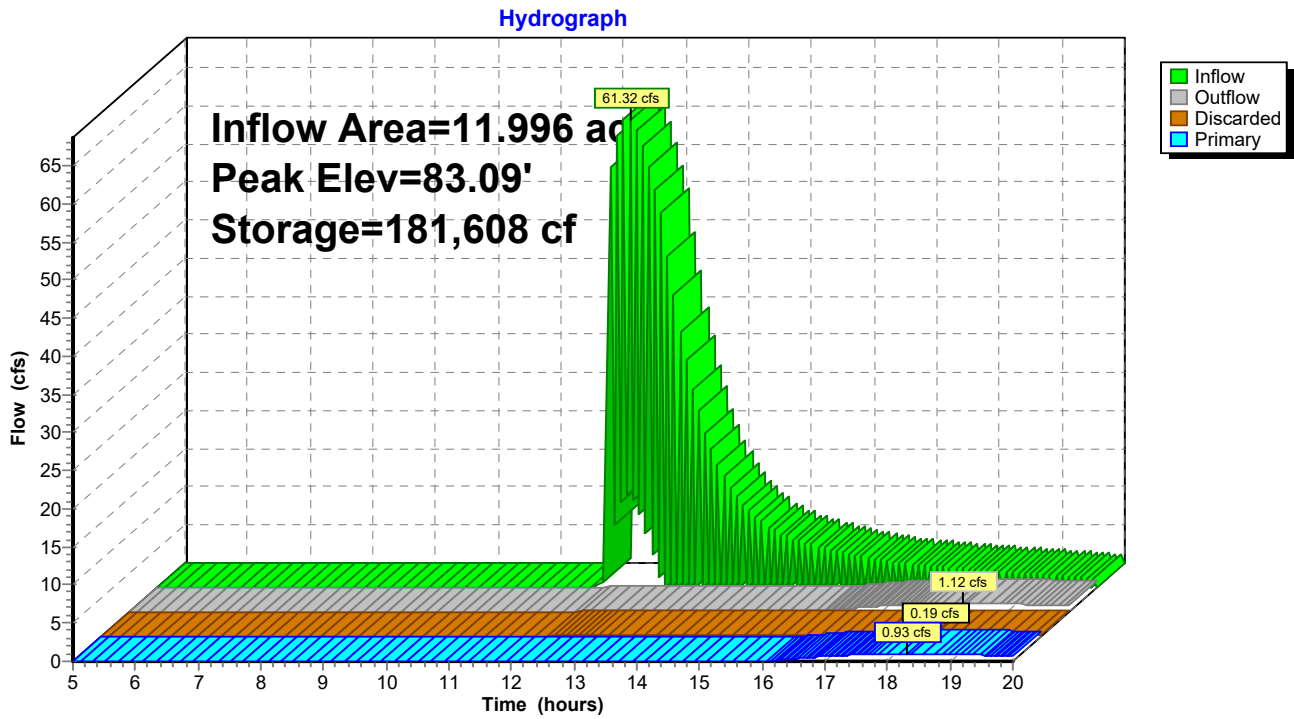
Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.19 cfs @ 18.29 hrs HW=83.09' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.92 cfs @ 18.29 hrs HW=83.09' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.92 cfs @ 0.98 fps)

Pond 1P: PROPOSED POND



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 6.12" for 3 DAY-100YR. event
 Inflow = 38.19 cfs @ 12.50 hrs, Volume= 6.118 af
 Outflow = 62.63 cfs @ 12.55 hrs, Volume= 5.560 af, Atten= 0%, Lag= 2.8 min
 Discarded = 1.31 cfs @ 11.30 hrs, Volume= 1.064 af
 Primary = 61.32 cfs @ 12.55 hrs, Volume= 4.496 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.59' @ 12.55 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 39.2 min calculated for 5.542 af (91% of inflow)
 Center-of-Mass det. time= 10.9 min (832.8 - 822.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

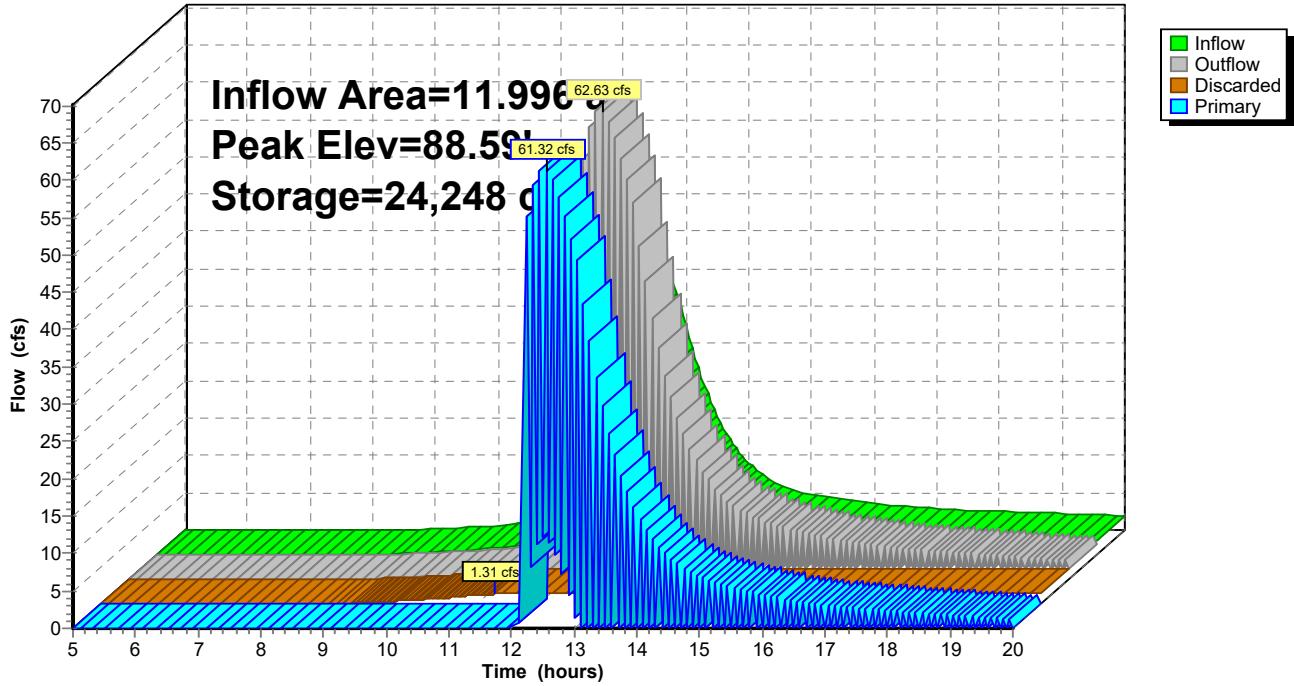
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 11.30 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=61.32 cfs @ 12.55 hrs HW=88.59' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 61.32 cfs @ 3.48 fps)

Pond 8P: ROCK VOIDS

Hydrograph



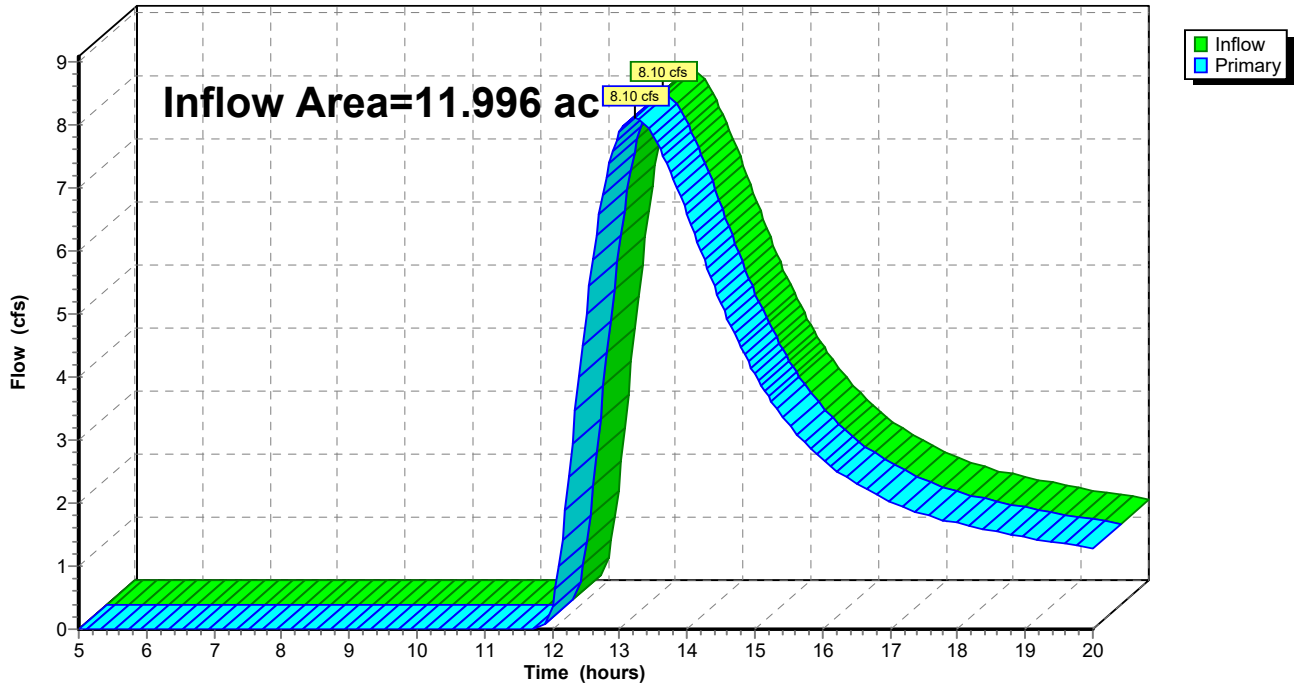
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 2.30" for 3 DAY-100YR. event
Inflow = 8.10 cfs @ 13.23 hrs, Volume= 2.303 af
Primary = 8.10 cfs @ 13.23 hrs, Volume= 2.303 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>3.09"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=11.30 cfs 3.090 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>7.40"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=46.20 cfs 7.396 af

Pond 1P: PROPOSED POND Peak Elev=83.28' Storage=193,627 cf Inflow=50.42 cfs 5.715 af
Discarded=0.19 cfs 0.121 af Primary=4.81 cfs 1.410 af Outflow=4.99 cfs 1.531 af

Pond 8P: ROCK VOIDS Peak Elev=88.46' Storage=24,248 cf Inflow=46.20 cfs 7.396 af
Discarded=1.31 cfs 1.122 af Primary=50.42 cfs 5.715 af Outflow=51.73 cfs 6.837 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=11.30 cfs 3.090 af
Primary=11.30 cfs 3.090 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 11.30 cfs @ 13.17 hrs, Volume= 3.090 af, Depth> 3.09"

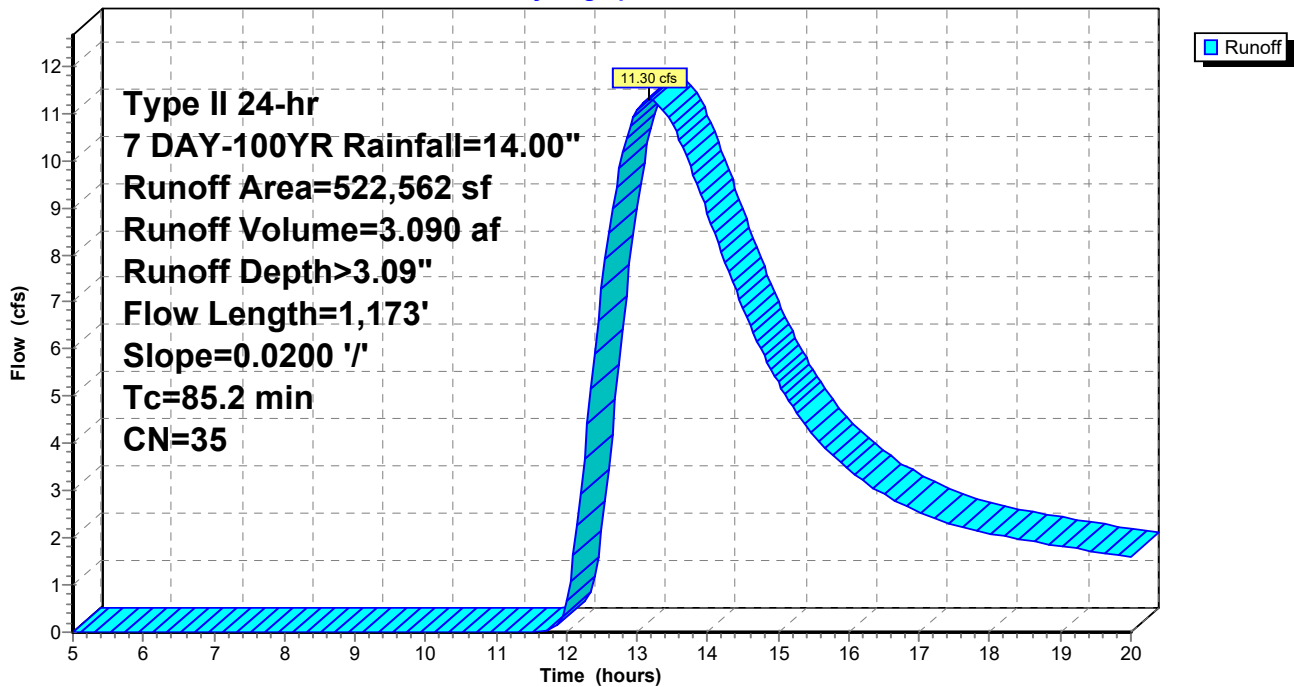
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 46.20 cfs @ 12.50 hrs, Volume= 7.396 af, Depth> 7.40"

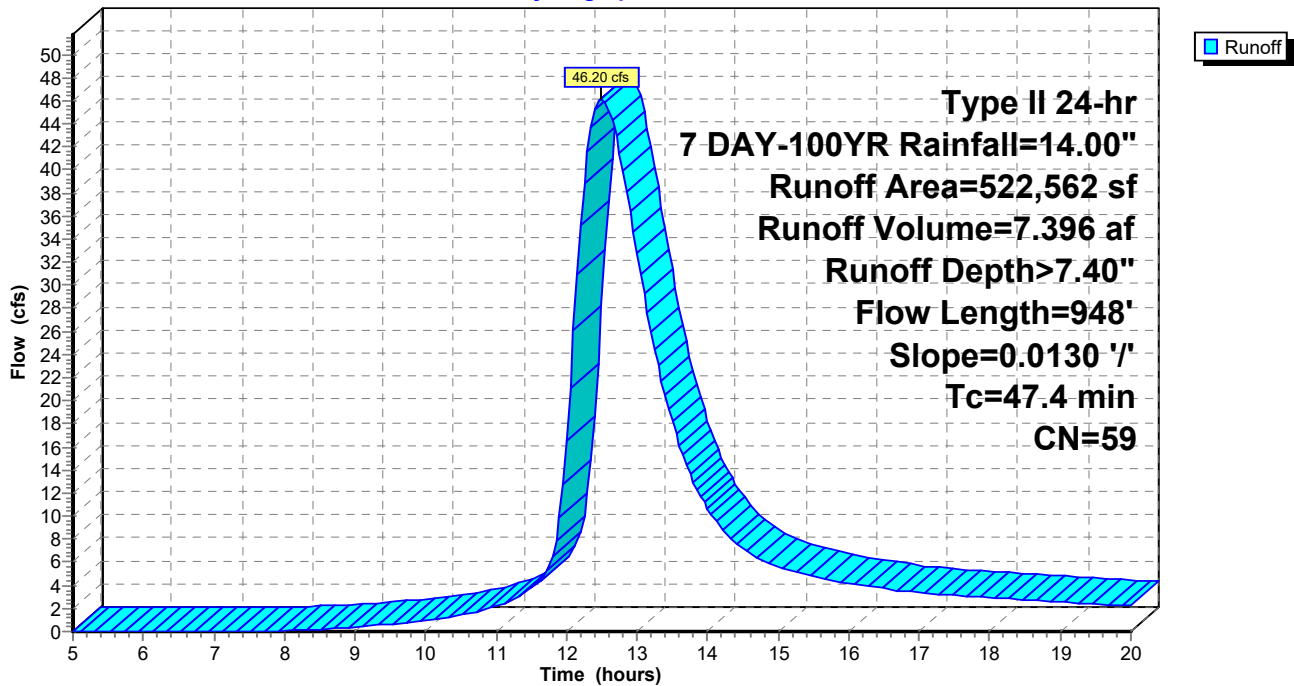
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 5.72" for 7 DAY-100YR event
 Inflow = 50.42 cfs @ 12.45 hrs, Volume= 5.715 af
 Outflow = 4.99 cfs @ 14.80 hrs, Volume= 1.531 af, Atten= 90%, Lag= 141.0 min
 Discarded = 0.19 cfs @ 14.80 hrs, Volume= 0.121 af
 Primary = 4.81 cfs @ 14.80 hrs, Volume= 1.410 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.28' @ 14.80 hrs Surf.Area= 64,527 sf Storage= 193,627 cf

Plug-Flow detention time= 232.3 min calculated for 1.531 af (27% of inflow)
 Center-of-Mass det. time= 158.8 min (974.3 - 815.5)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

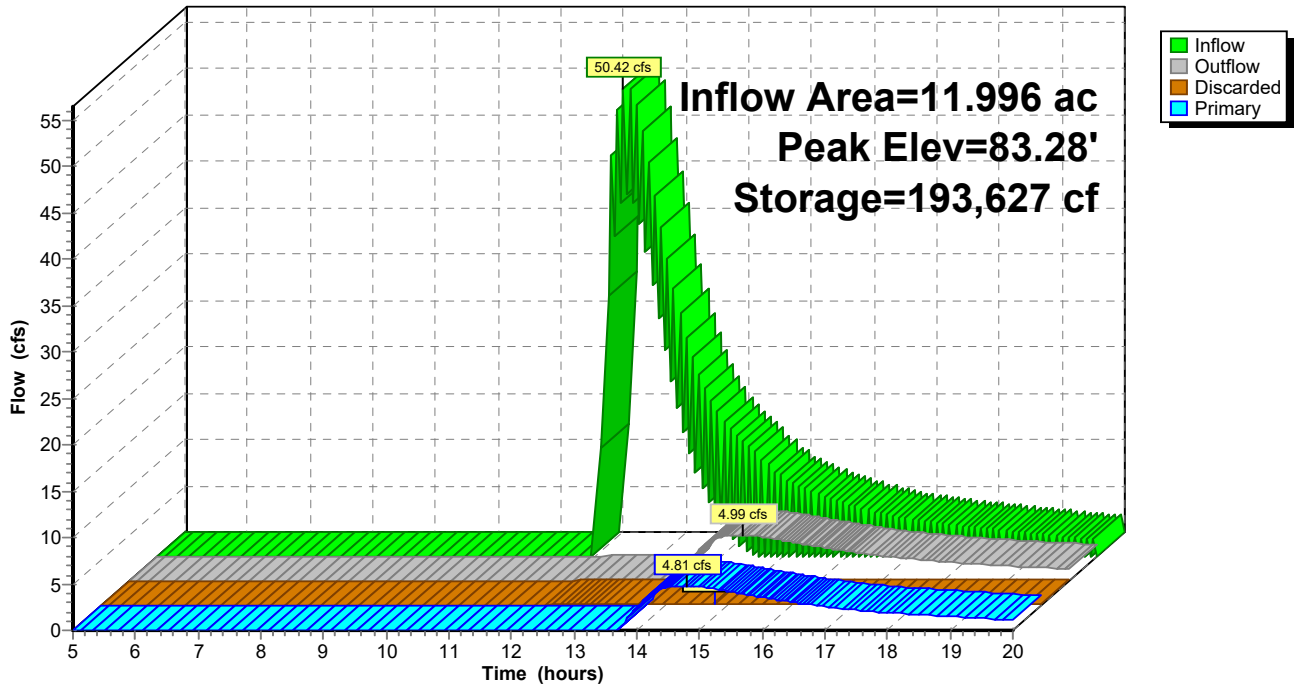
Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.19 cfs @ 14.80 hrs HW=83.28' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=4.80 cfs @ 14.80 hrs HW=83.28' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 4.80 cfs @ 1.69 fps)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 7.40" for 7 DAY-100YR event
 Inflow = 46.20 cfs @ 12.50 hrs, Volume= 7.396 af
 Outflow = 51.73 cfs @ 12.45 hrs, Volume= 6.837 af, Atten= 0%, Lag= 0.0 min
 Discarded = 1.31 cfs @ 10.95 hrs, Volume= 1.122 af
 Primary = 50.42 cfs @ 12.45 hrs, Volume= 5.715 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.46' @ 12.45 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 33.7 min calculated for 6.815 af (92% of inflow)
 Center-of-Mass det. time= 9.3 min (827.4 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

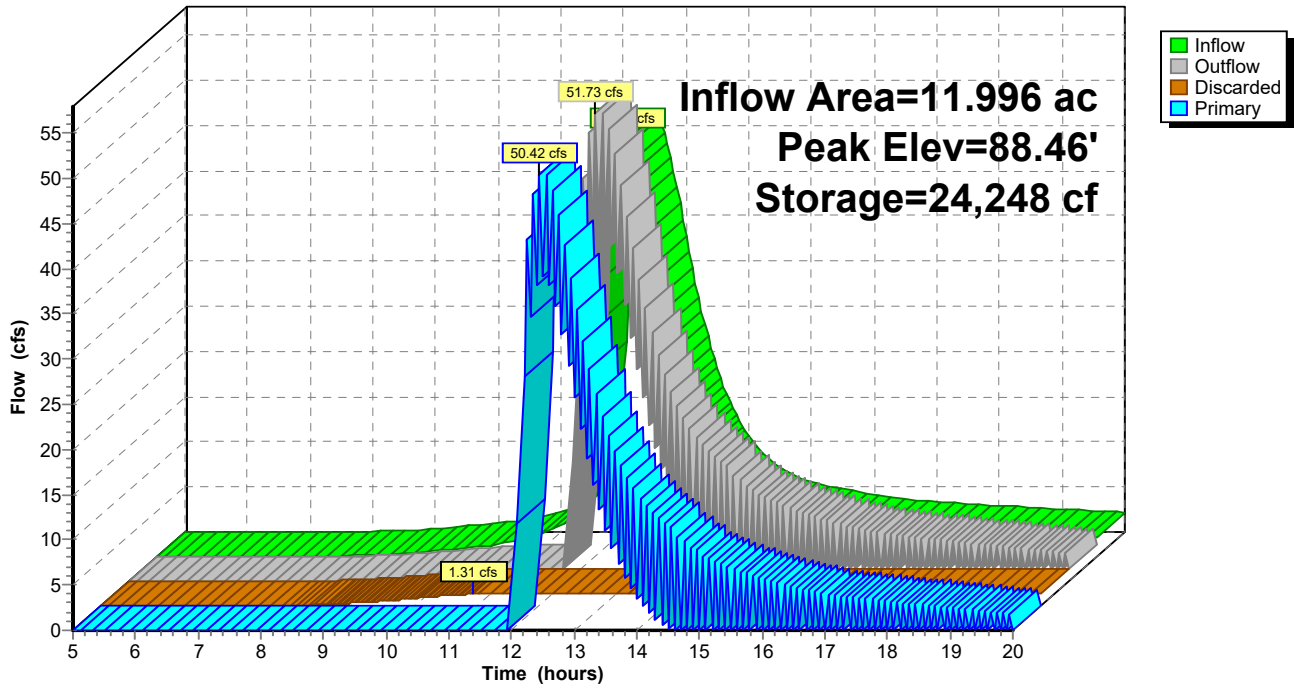
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 10.95 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=50.42 cfs @ 12.45 hrs HW=88.46' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 50.42 cfs @ 3.26 fps)

Pond 8P: ROCK VOIDS

Hydrograph



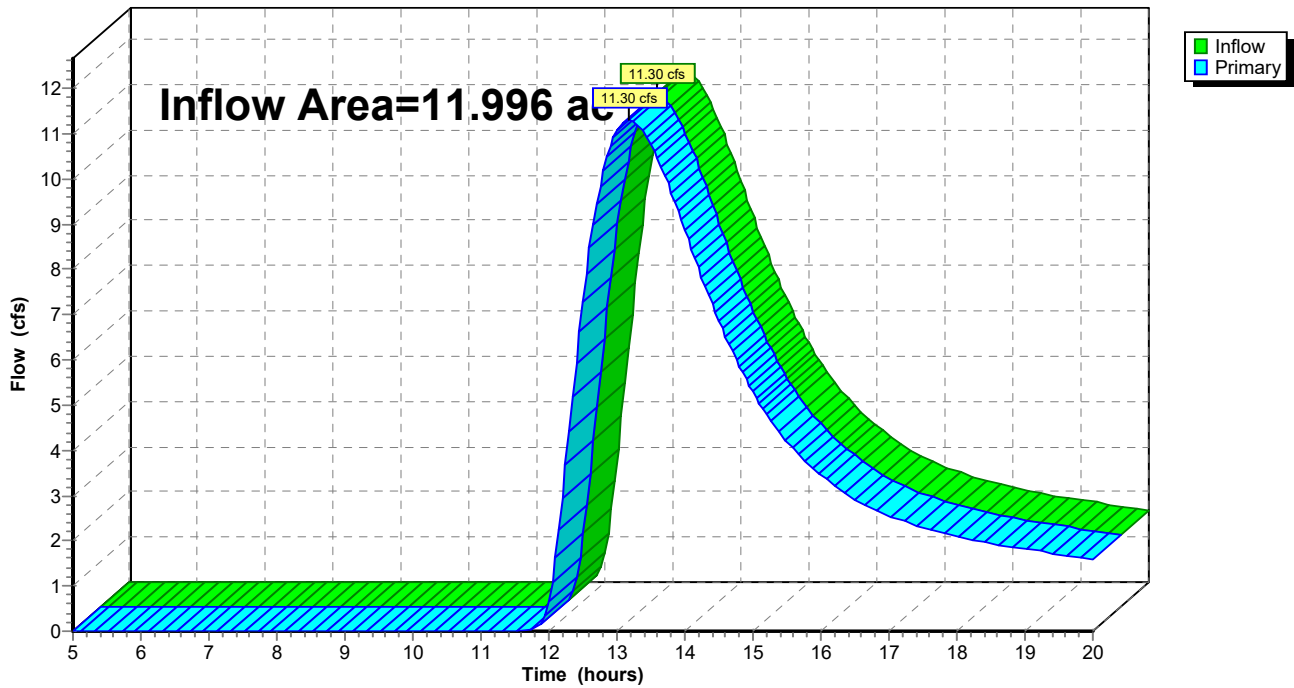
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 3.09" for 7 DAY-100YR event
Inflow = 11.30 cfs @ 13.17 hrs, Volume= 3.090 af
Primary = 11.30 cfs @ 13.17 hrs, Volume= 3.090 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>4.23"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=16.02 cfs 4.229 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>9.13"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=56.93 cfs 9.123 af

Pond 1P: PROPOSED POND Peak Elev=83.56' Storage=212,031 cf Inflow=68.34 cfs 7.370 af
Discarded=0.19 cfs 0.123 af Primary=13.80 cfs 3.025 af Outflow=13.99 cfs 3.148 af

Pond 8P: ROCK VOIDS Peak Elev=88.67' Storage=24,248 cf Inflow=56.93 cfs 9.123 af
Discarded=1.31 cfs 1.194 af Primary=68.34 cfs 7.370 af Outflow=69.64 cfs 8.564 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=16.02 cfs 4.229 af
Primary=16.02 cfs 4.229 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 16.02 cfs @ 13.14 hrs, Volume= 4.229 af, Depth> 4.23"

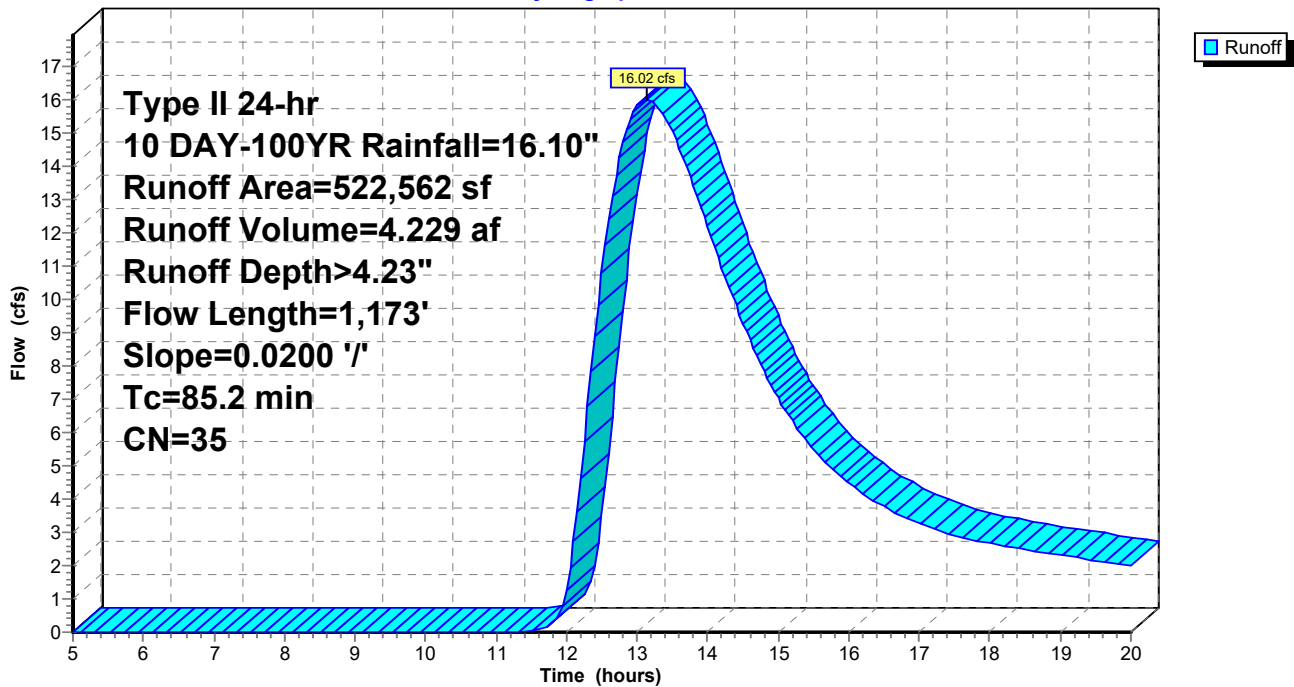
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 56.93 cfs @ 12.49 hrs, Volume= 9.123 af, Depth> 9.13"

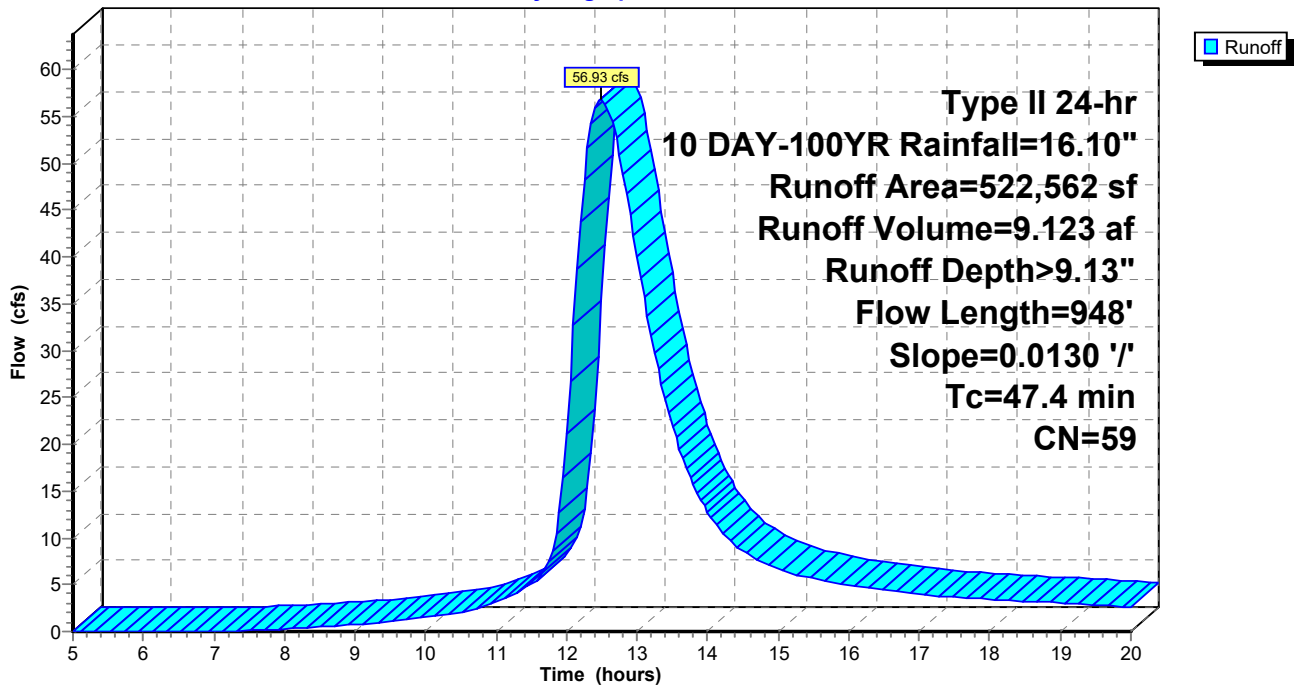
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 7.37" for 10 DAY-100YR event
 Inflow = 68.34 cfs @ 12.45 hrs, Volume= 7.370 af
 Outflow = 13.99 cfs @ 13.82 hrs, Volume= 3.148 af, Atten= 80%, Lag= 82.3 min
 Discarded = 0.19 cfs @ 13.82 hrs, Volume= 0.123 af
 Primary = 13.80 cfs @ 13.82 hrs, Volume= 3.025 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.56' @ 13.82 hrs Surf.Area= 65,485 sf Storage= 212,031 cf

Plug-Flow detention time= 176.5 min calculated for 3.137 af (43% of inflow)
 Center-of-Mass det. time= 109.8 min (924.2 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

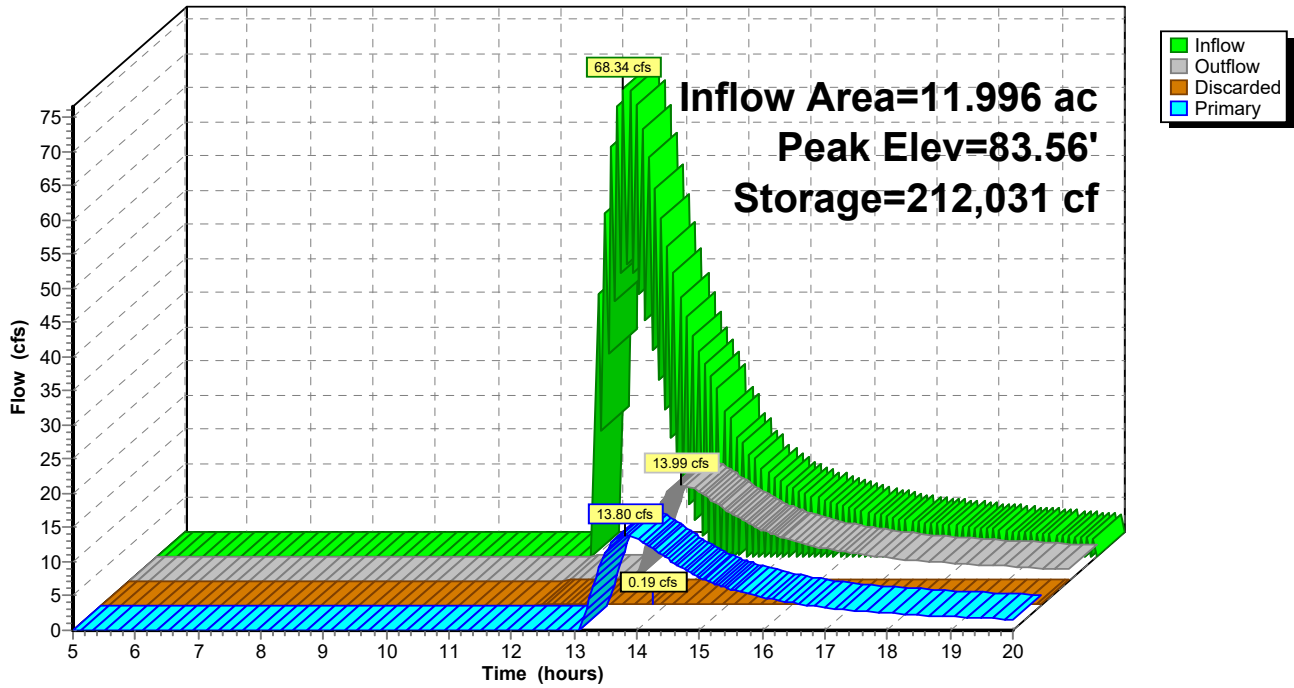
Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.19 cfs @ 13.82 hrs HW=83.56' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=13.78 cfs @ 13.82 hrs HW=83.56' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 13.78 cfs @ 2.39 fps)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 9.13" for 10 DAY-100YR event
 Inflow = 56.93 cfs @ 12.49 hrs, Volume= 9.123 af
 Outflow = 69.64 cfs @ 12.45 hrs, Volume= 8.564 af, Atten= 0%, Lag= 0.0 min
 Discarded = 1.31 cfs @ 10.40 hrs, Volume= 1.194 af
 Primary = 68.34 cfs @ 12.45 hrs, Volume= 7.370 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.67' @ 12.45 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 29.0 min calculated for 8.564 af (94% of inflow)
 Center-of-Mass det. time= 8.3 min (821.8 - 813.6)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

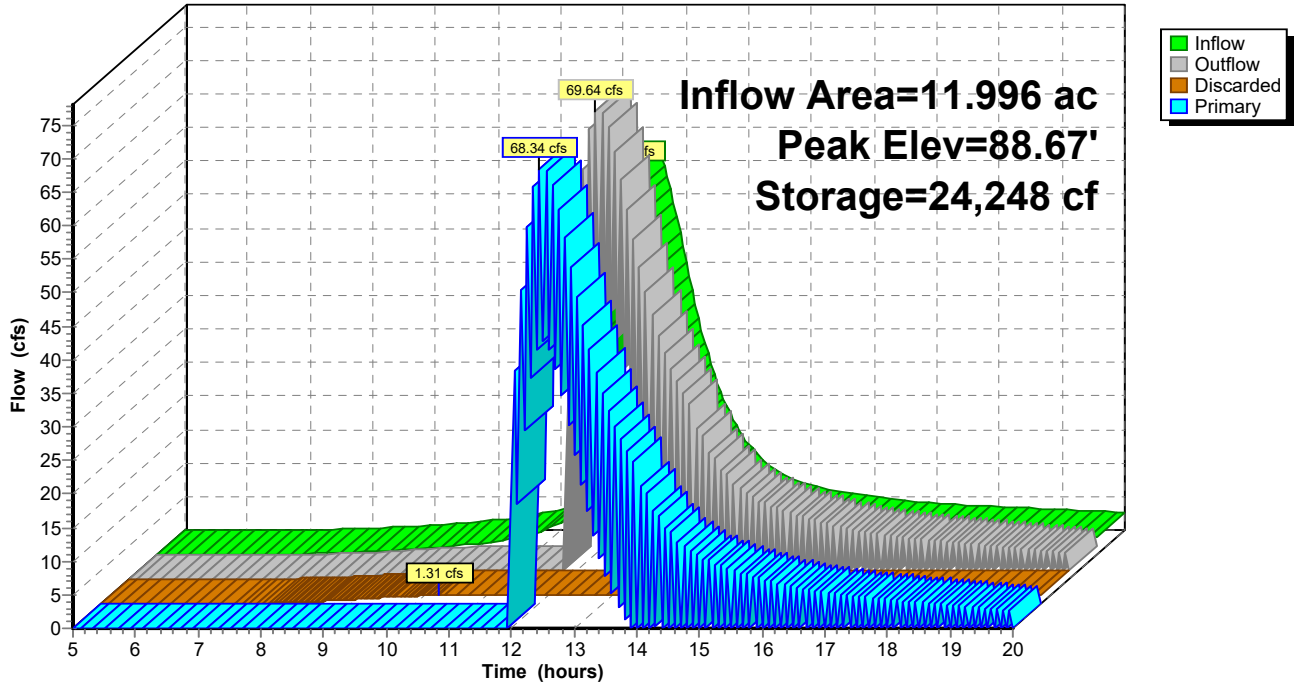
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 10.40 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=68.05 cfs @ 12.45 hrs HW=88.67' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 68.05 cfs @ 3.61 fps)

Pond 8P: ROCK VOIDS

Hydrograph



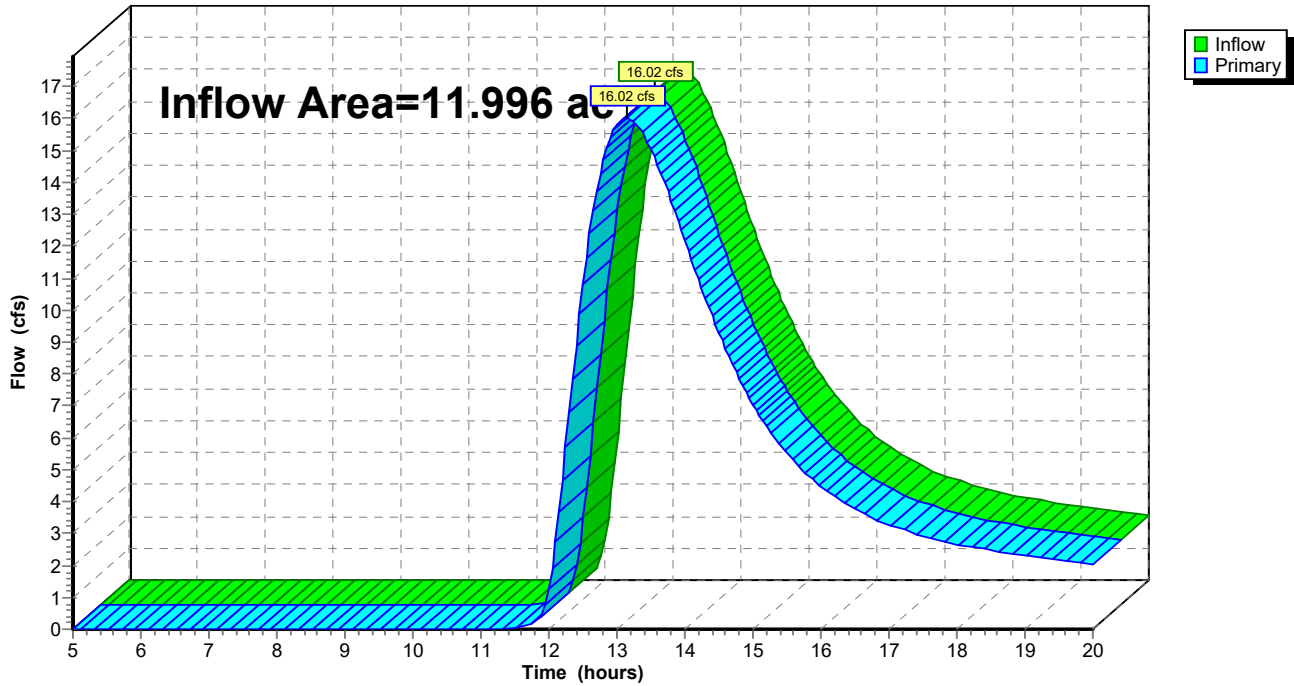
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 4.23" for 10 DAY-100YR event
Inflow = 16.02 cfs @ 13.14 hrs, Volume= 4.229 af
Primary = 16.02 cfs @ 13.14 hrs, Volume= 4.229 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.30"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=0.71 cfs 0.302 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>2.04"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=12.13 cfs 2.042 af

Pond 1P: PROPOSED POND Peak Elev=80.51' Storage=27,787 cf Inflow=14.76 cfs 0.688 af
Discarded=0.16 cfs 0.096 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.096 af

Pond 8P: ROCK VOIDS Peak Elev=87.95' Storage=24,248 cf Inflow=12.13 cfs 2.042 af
Discarded=1.31 cfs 0.882 af Primary=14.76 cfs 0.688 af Outflow=16.06 cfs 1.569 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.71 cfs 0.302 af
Primary=0.71 cfs 0.302 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.71 cfs @ 13.94 hrs, Volume= 0.302 af, Depth> 0.30"

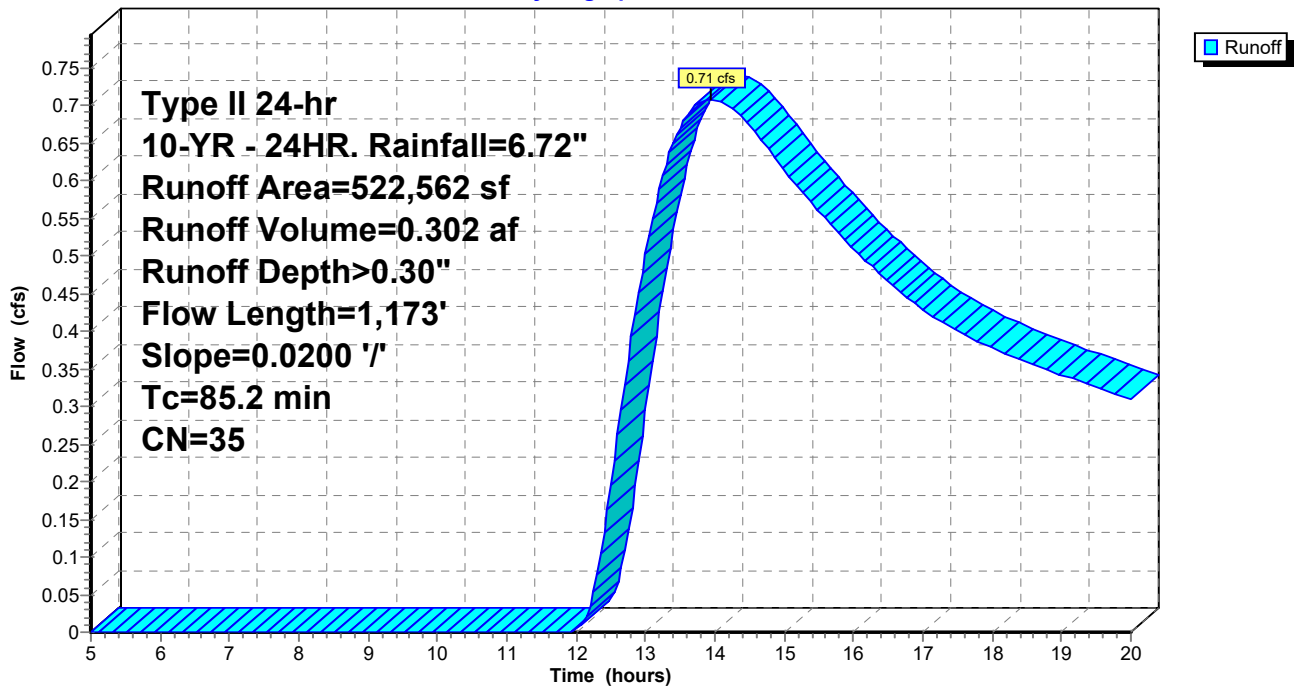
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 12.13 cfs @ 12.55 hrs, Volume= 2.042 af, Depth> 2.04"

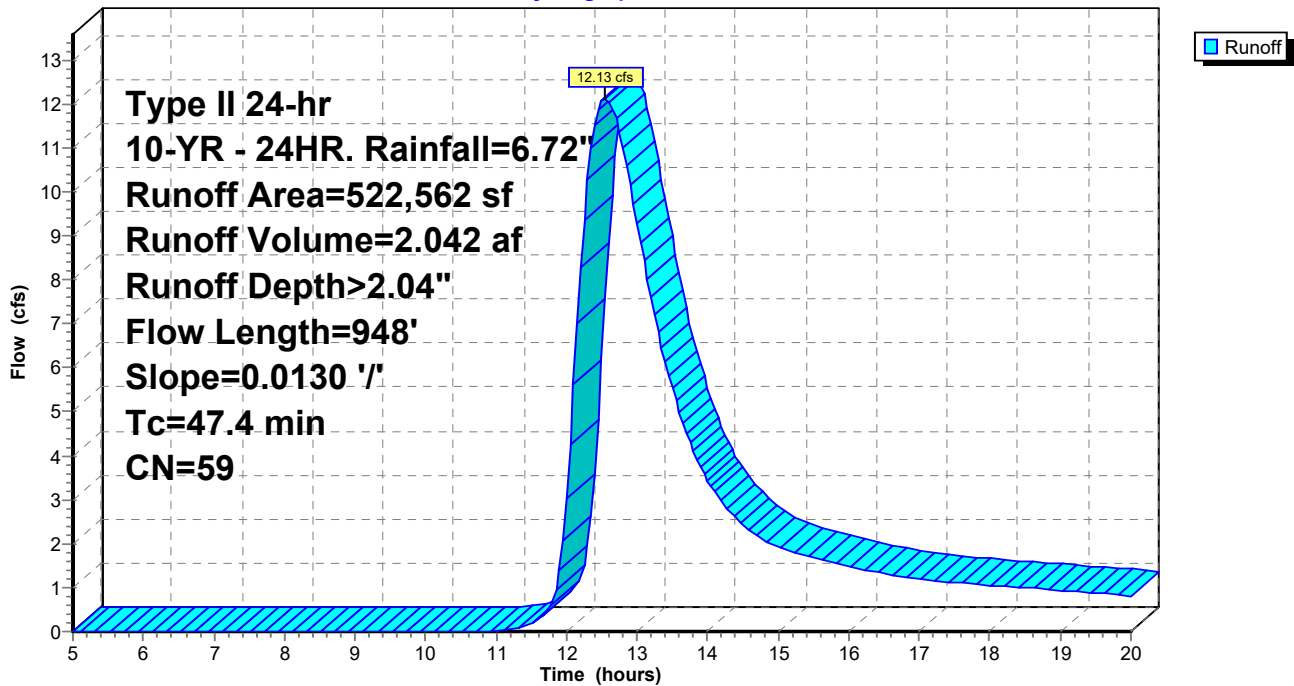
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.69" for 10-YR - 24HR. event
 Inflow = 14.76 cfs @ 12.80 hrs, Volume= 0.688 af
 Outflow = 0.16 cfs @ 16.05 hrs, Volume= 0.096 af, Atten= 99%, Lag= 194.5 min
 Discarded = 0.16 cfs @ 16.05 hrs, Volume= 0.096 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.51' @ 16.05 hrs Surf.Area= 55,247 sf Storage= 27,787 cf

Plug-Flow detention time= 215.6 min calculated for 0.096 af (14% of inflow)
 Center-of-Mass det. time= 173.2 min (985.1 - 811.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

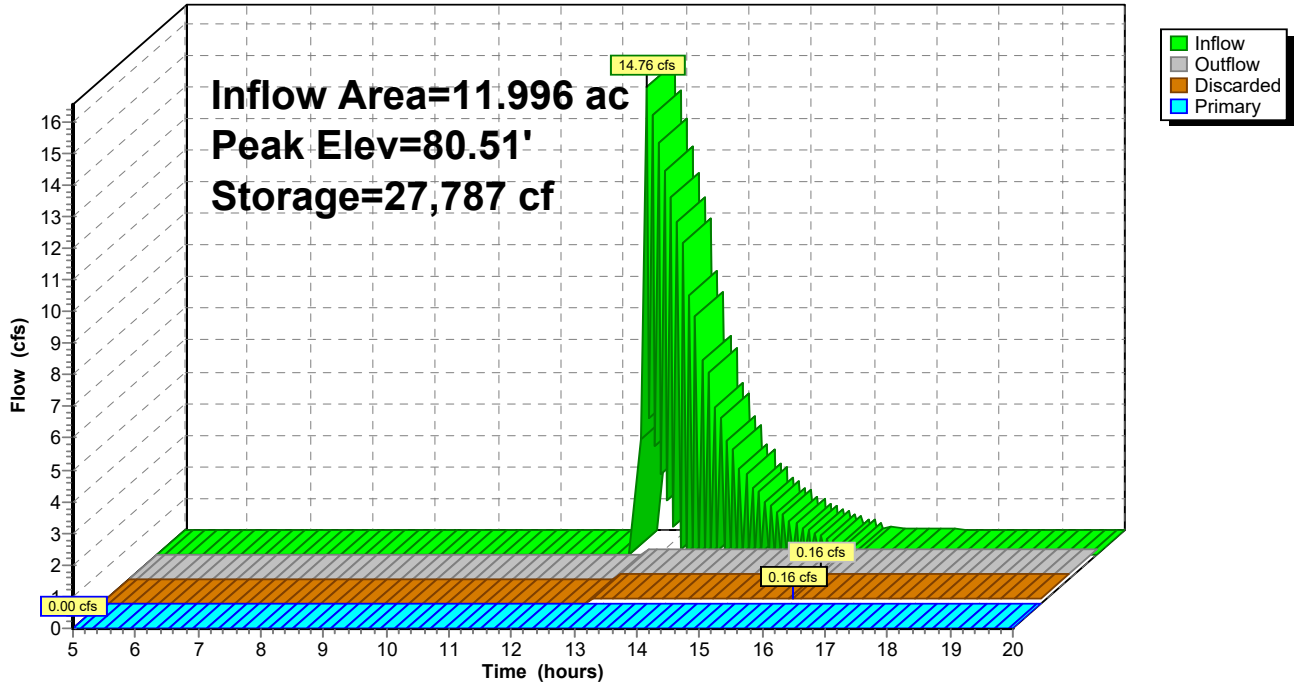
Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 16.05 hrs HW=80.51' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 2.04" for 10-YR - 24HR. event
 Inflow = 12.13 cfs @ 12.55 hrs, Volume= 2.042 af
 Outflow = 16.06 cfs @ 12.80 hrs, Volume= 1.569 af, Atten= 0%, Lag= 15.3 min
 Discarded = 1.31 cfs @ 12.10 hrs, Volume= 0.882 af
 Primary = 14.76 cfs @ 12.80 hrs, Volume= 0.688 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.95' @ 12.80 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 107.3 min calculated for 1.564 af (77% of inflow)
 Center-of-Mass det. time= 49.7 min (893.1 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

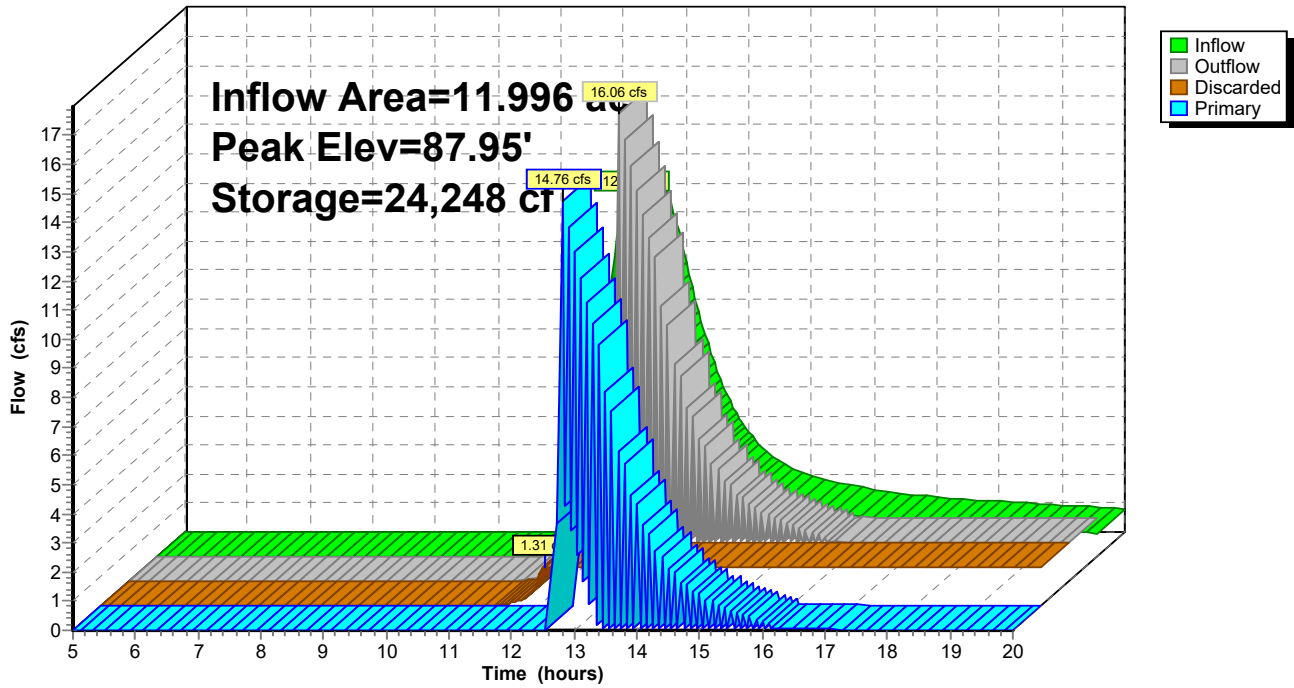
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 12.10 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=13.58 cfs @ 12.80 hrs HW=87.93' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 13.58 cfs @ 1.95 fps)

Pond 8P: ROCK VOIDS

Hydrograph



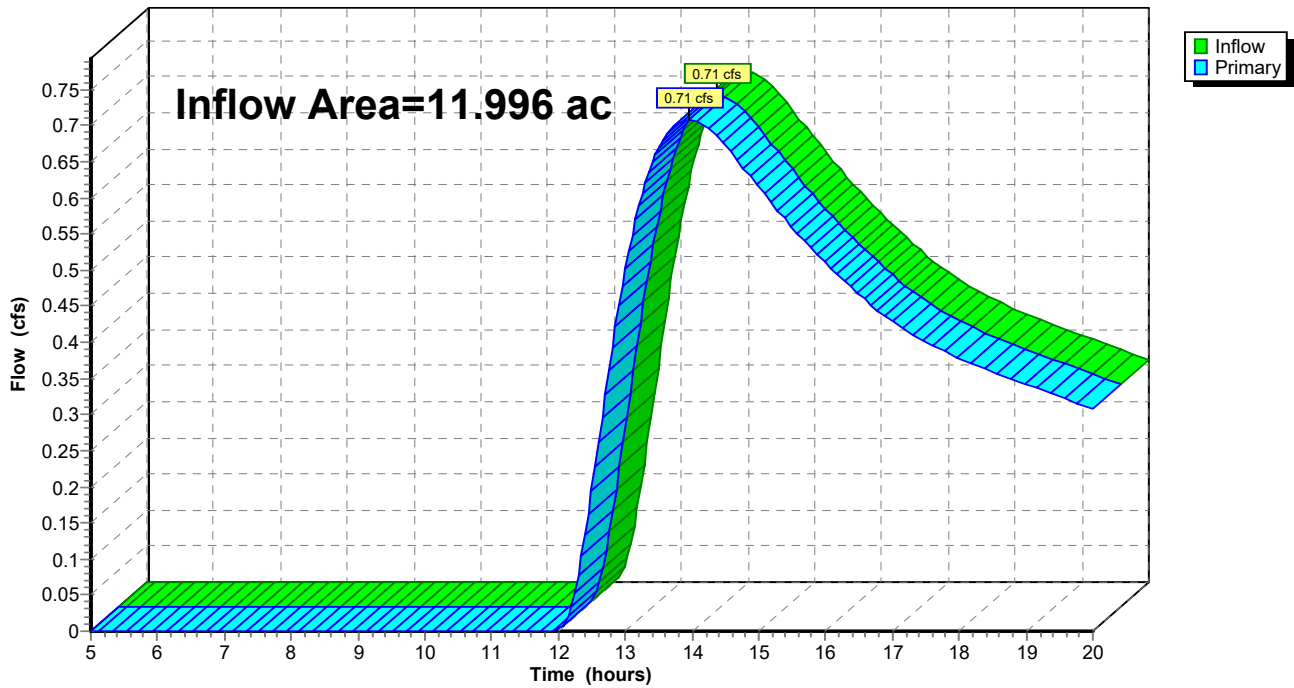
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.30" for 10-YR - 24HR. event
Inflow = 0.71 cfs @ 13.94 hrs, Volume= 0.302 af
Primary = 0.71 cfs @ 13.94 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Prepared by HP Inc.

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.60"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=1.63 cfs 0.595 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>2.82"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=17.14 cfs 2.817 af

Pond 1P: PROPOSED POND Peak Elev=81.02' Storage=56,595 cf Inflow=21.67 cfs 1.375 af
Discarded=0.17 cfs 0.102 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.102 af

Pond 8P: ROCK VOIDS Peak Elev=88.07' Storage=24,248 cf Inflow=17.14 cfs 2.817 af
Discarded=1.31 cfs 0.909 af Primary=21.67 cfs 1.375 af Outflow=22.97 cfs 2.284 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=1.63 cfs 0.595 af
Primary=1.63 cfs 0.595 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.63 cfs @ 13.55 hrs, Volume= 0.595 af, Depth> 0.60"

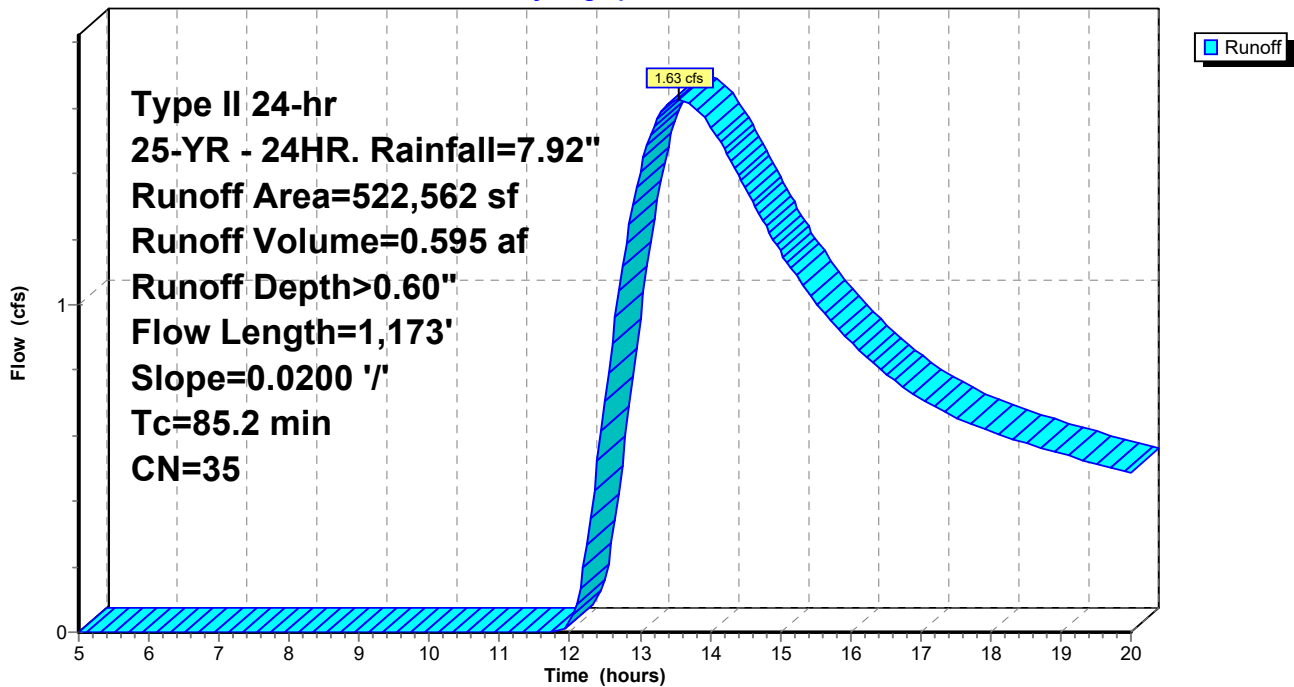
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 17.14 cfs @ 12.53 hrs, Volume= 2.817 af, Depth> 2.82"

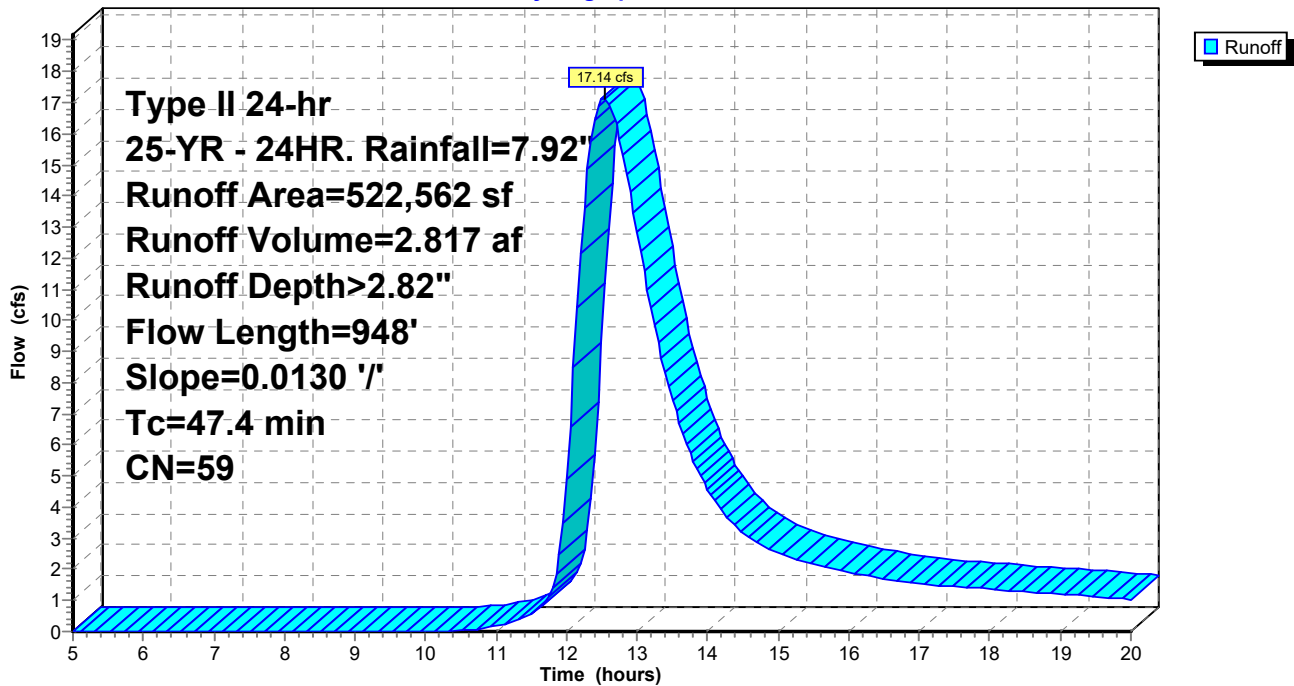
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 1.38" for 25-YR - 24HR. event
 Inflow = 21.67 cfs @ 12.60 hrs, Volume= 1.375 af
 Outflow = 0.17 cfs @ 17.35 hrs, Volume= 0.102 af, Atten= 99%, Lag= 284.9 min
 Discarded = 0.17 cfs @ 17.35 hrs, Volume= 0.102 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 81.02' @ 17.35 hrs Surf.Area= 56,955 sf Storage= 56,595 cf

Plug-Flow detention time= 223.3 min calculated for 0.102 af (7% of inflow)
 Center-of-Mass det. time= 168.6 min (978.6 - 809.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.17 cfs @ 17.35 hrs HW=81.02' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Staging Area 4 Basin 3 HydroCAD Report

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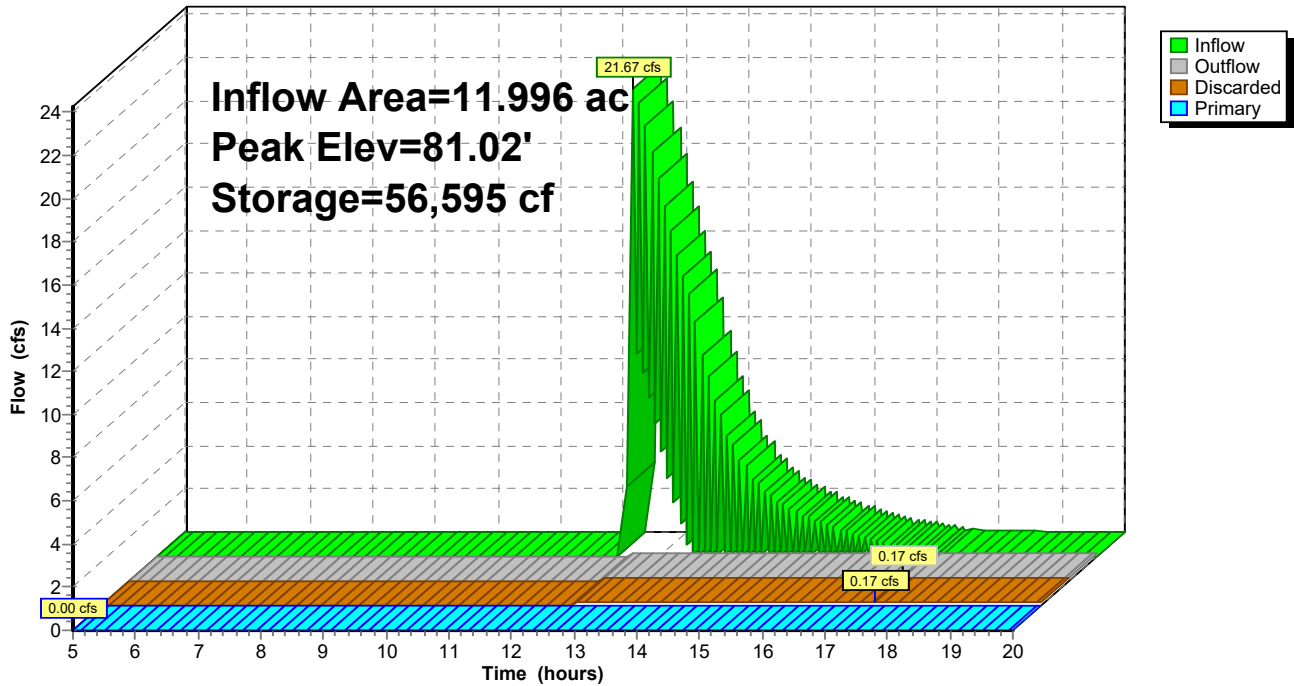
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 2.82" for 25-YR - 24HR. event
 Inflow = 17.14 cfs @ 12.53 hrs, Volume= 2.817 af
 Outflow = 22.97 cfs @ 12.60 hrs, Volume= 2.284 af, Atten= 0%, Lag= 4.1 min
 Discarded = 1.31 cfs @ 12.00 hrs, Volume= 0.909 af
 Primary = 21.67 cfs @ 12.60 hrs, Volume= 1.375 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.07' @ 12.60 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 78.2 min calculated for 2.284 af (81% of inflow)
 Center-of-Mass det. time= 27.9 min (865.1 - 837.2)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

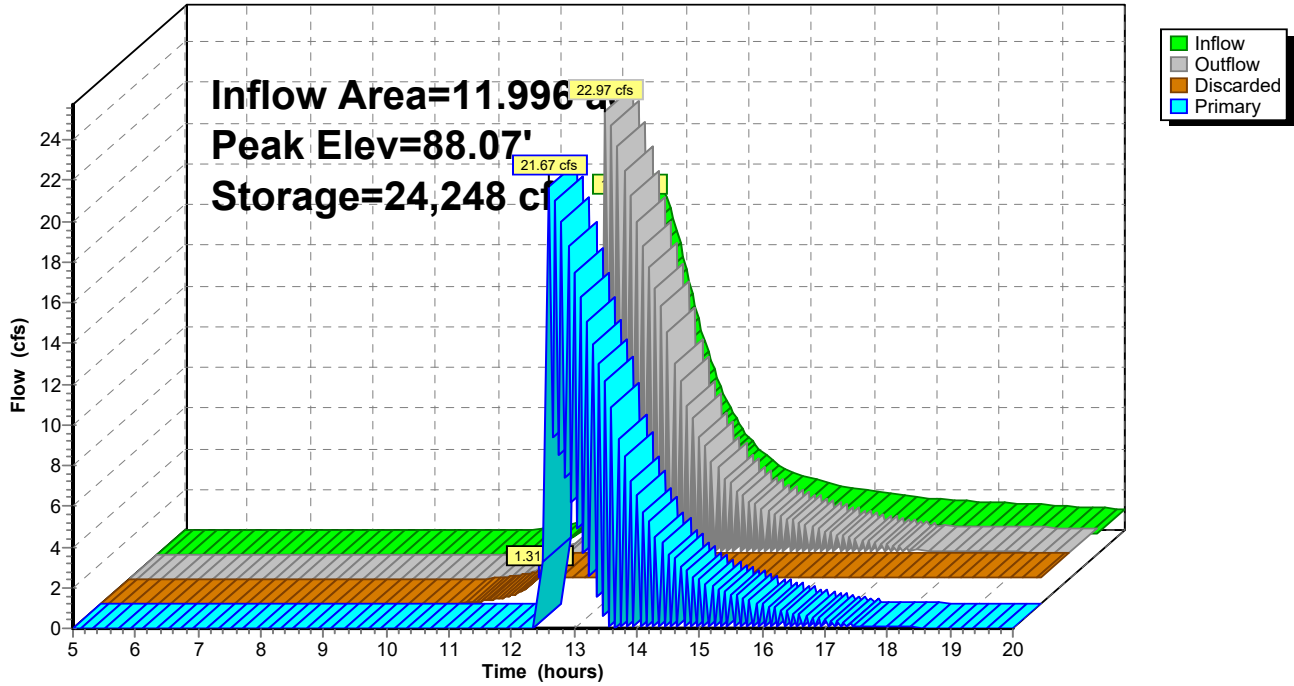
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 12.00 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=21.67 cfs @ 12.60 hrs HW=88.07' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 21.67 cfs @ 2.33 fps)

Pond 8P: ROCK VOIDS

Hydrograph



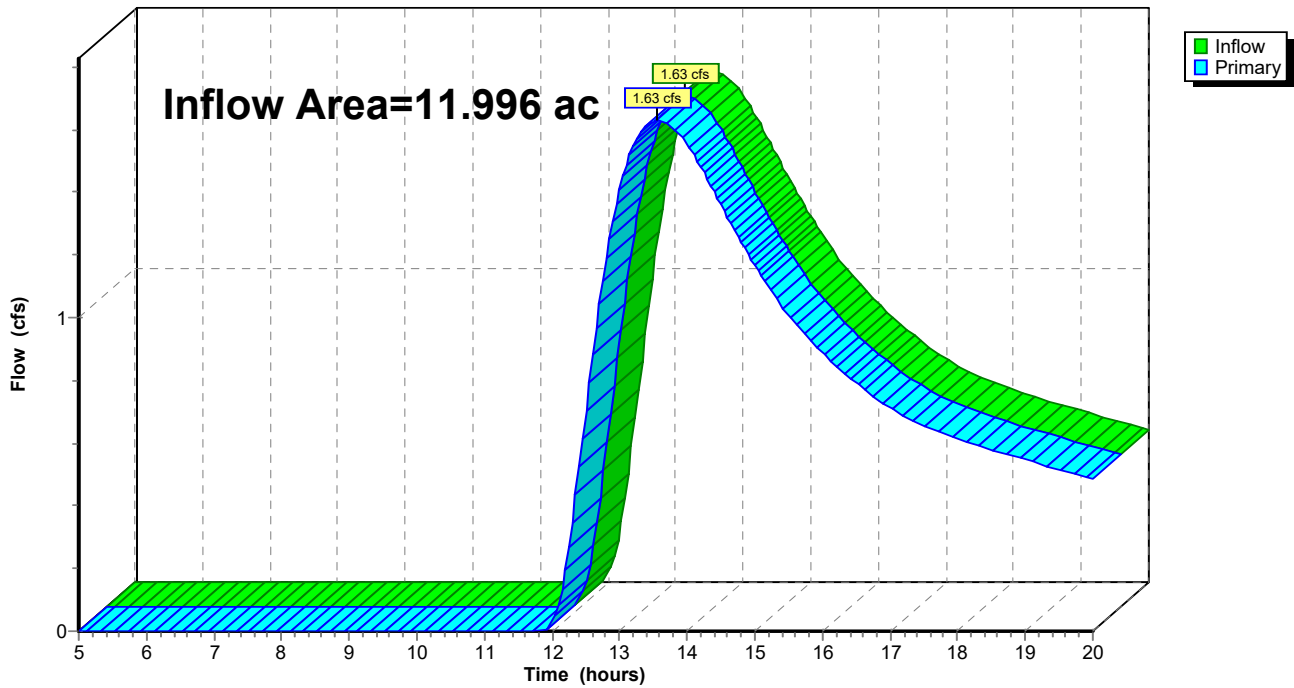
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.60" for 25-YR - 24HR. event
Inflow = 1.63 cfs @ 13.55 hrs, Volume= 0.595 af
Primary = 1.63 cfs @ 13.55 hrs, Volume= 0.595 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=80.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 8P: ROCK VOIDS Peak Elev=87.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

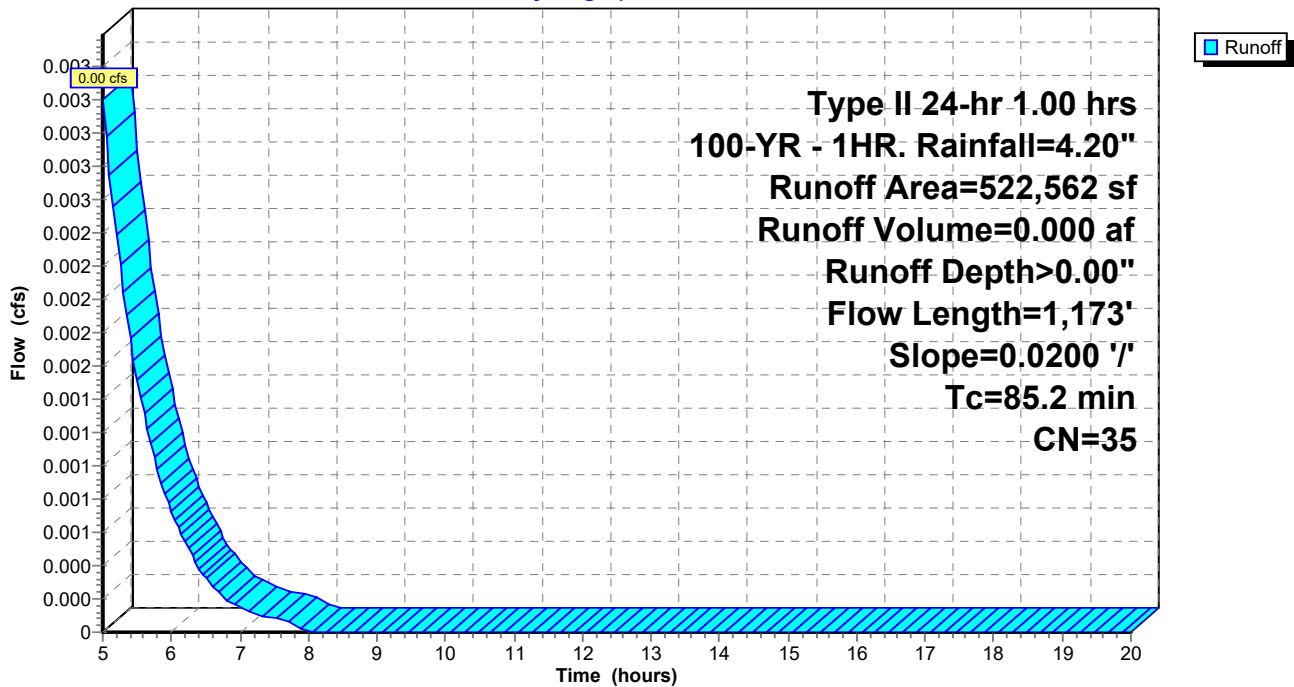
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

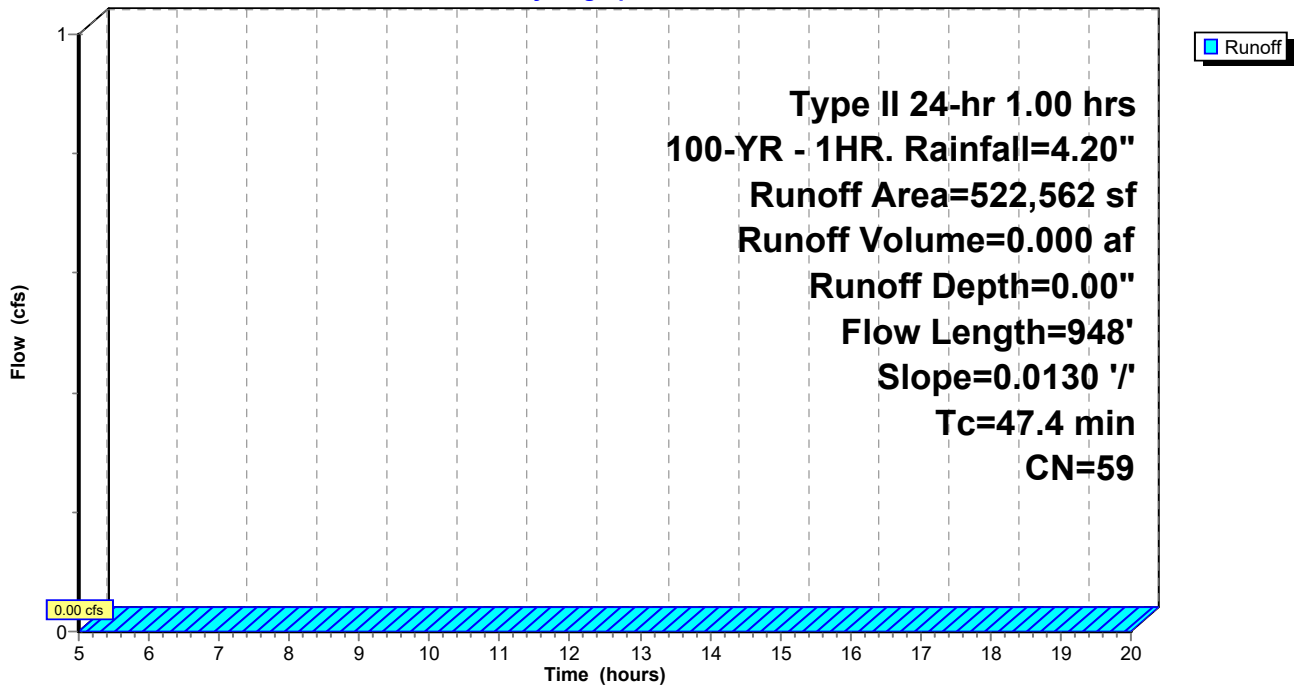
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.00' @ 5.00 hrs Surf.Area= 53,556 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

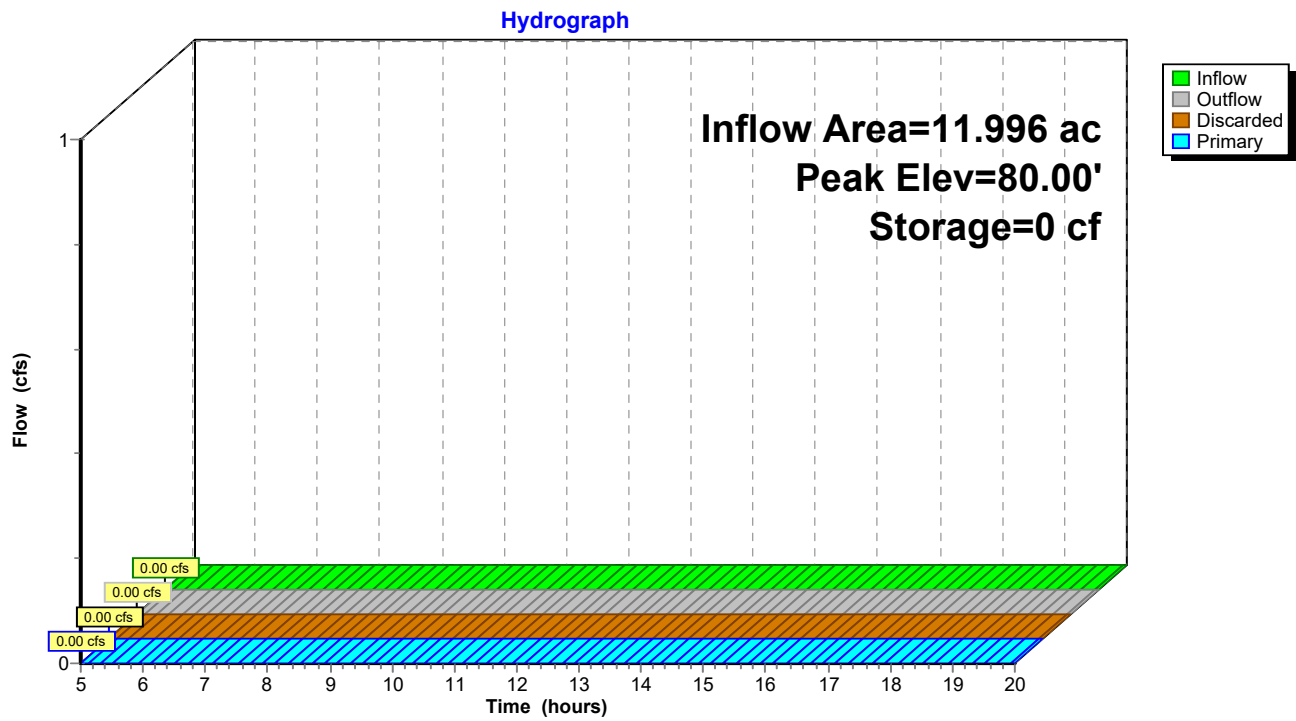
Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.30' @ 5.00 hrs Surf.Area= 346,393 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

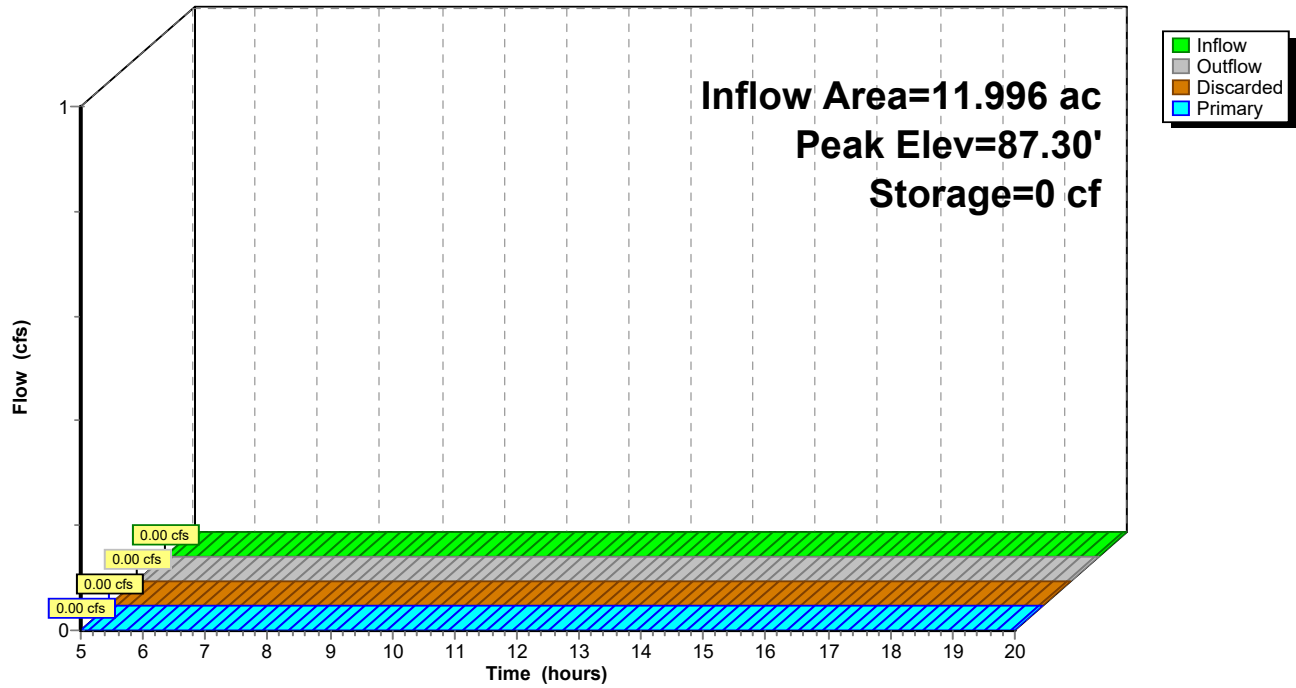
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.30' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.30' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: ROCK VOIDS

Hydrograph



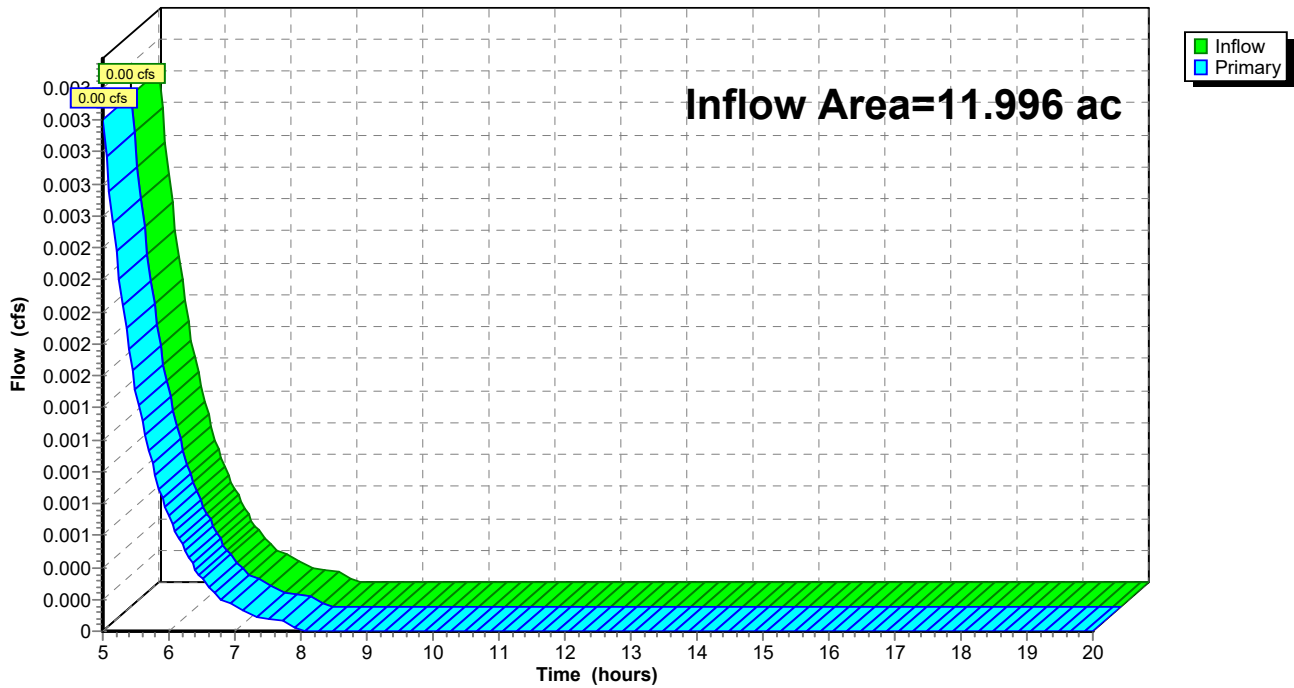
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Prepared by HP Inc.

Printed 3/16/2020

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=3.88 cfs 1.223 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>4.17"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=25.82 cfs 4.169 af

Pond 1P: PROPOSED POND Peak Elev=81.94' Storage=110,380 cf Inflow=45.86 cfs 2.642 af
Discarded=0.18 cfs 0.109 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.109 af

Pond 8P: ROCK VOIDS Peak Elev=88.40' Storage=24,248 cf Inflow=25.82 cfs 4.169 af
Discarded=1.31 cfs 0.970 af Primary=45.86 cfs 2.642 af Outflow=47.17 cfs 3.612 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=3.88 cfs 1.223 af
Primary=3.88 cfs 1.223 af

Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 3.88 cfs @ 13.34 hrs, Volume= 1.223 af, Depth> 1.22"

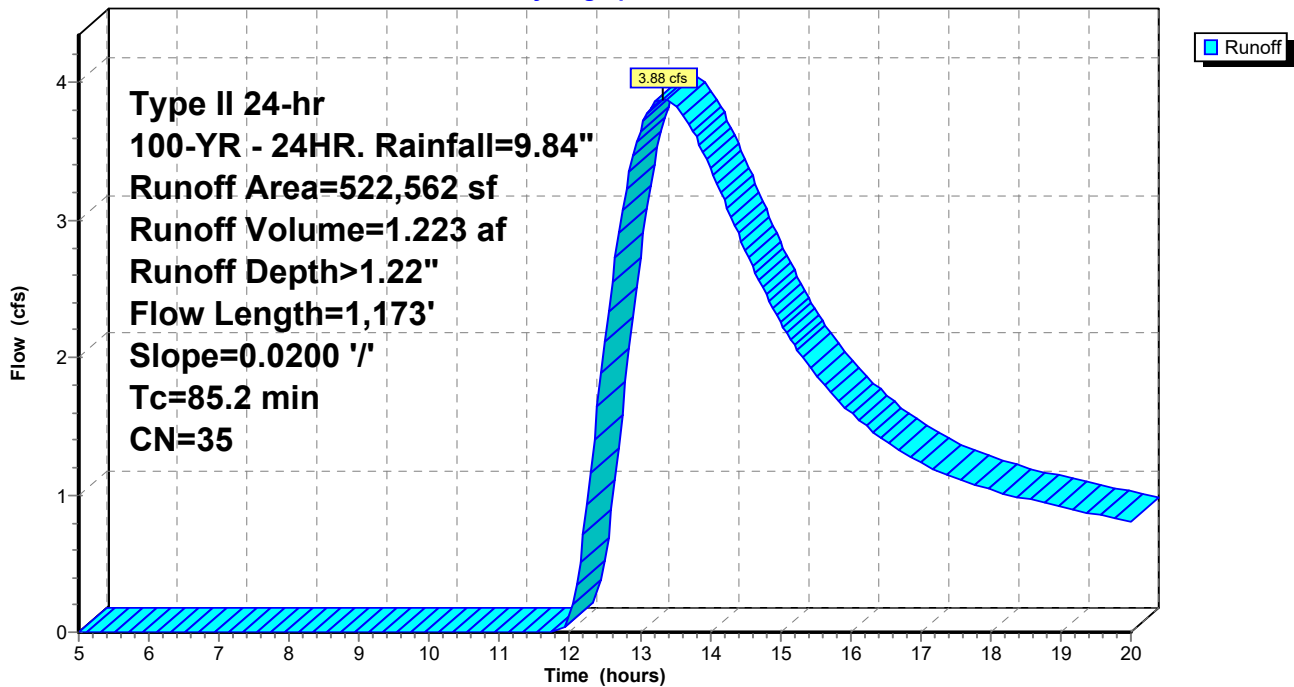
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 25.82 cfs @ 12.52 hrs, Volume= 4.169 af, Depth> 4.17"

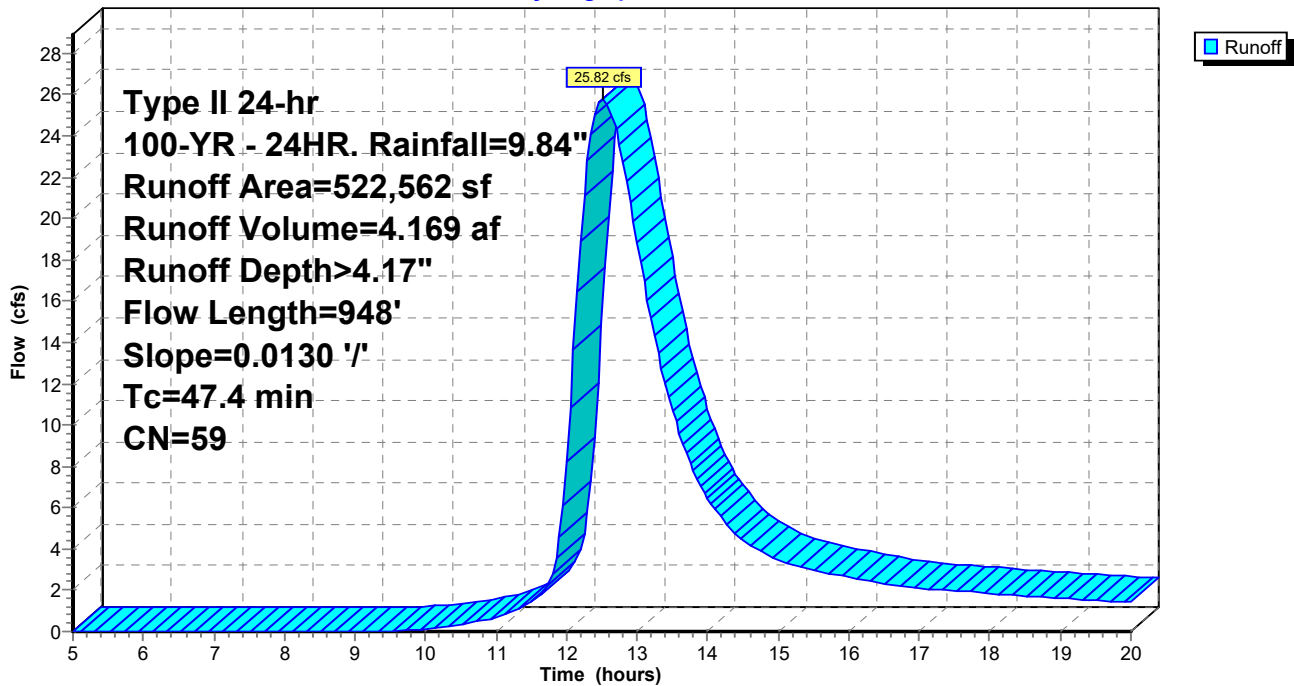
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 2.64" for 100-YR - 24HR. event
 Inflow = 45.86 cfs @ 12.50 hrs, Volume= 2.642 af
 Outflow = 0.18 cfs @ 19.67 hrs, Volume= 0.109 af, Atten= 100%, Lag= 430.1 min
 Discarded = 0.18 cfs @ 19.67 hrs, Volume= 0.109 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 81.94' @ 19.67 hrs Surf.Area= 60,026 sf Storage= 110,380 cf

Plug-Flow detention time= 230.4 min calculated for 0.109 af (4% of inflow)
 Center-of-Mass det. time= 160.1 min (974.3 - 814.2)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

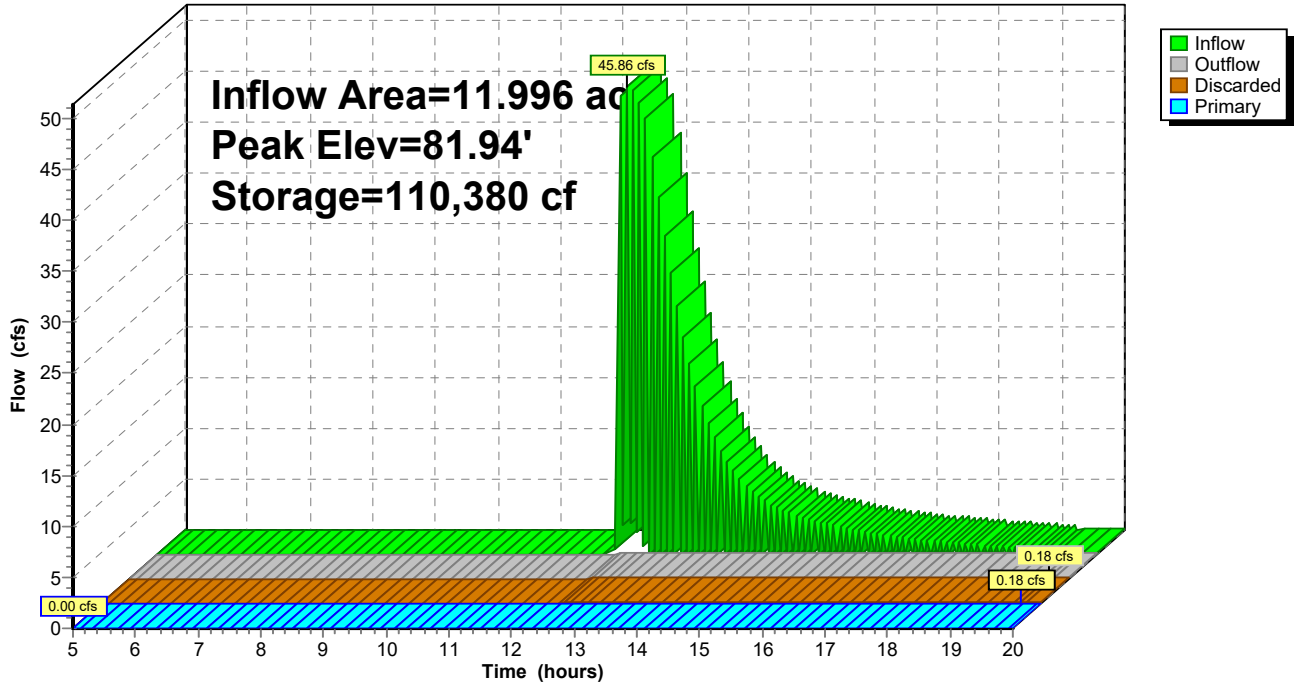
Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 19.67 hrs HW=81.94' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 4.17" for 100-YR - 24HR. event
 Inflow = 25.82 cfs @ 12.52 hrs, Volume= 4.169 af
 Outflow = 47.17 cfs @ 12.50 hrs, Volume= 3.612 af, Atten= 0%, Lag= 0.0 min
 Discarded = 1.31 cfs @ 11.85 hrs, Volume= 0.970 af
 Primary = 45.86 cfs @ 12.50 hrs, Volume= 2.642 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.40' @ 12.50 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 54.8 min calculated for 3.612 af (87% of inflow)
 Center-of-Mass det. time= 15.9 min (845.6 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

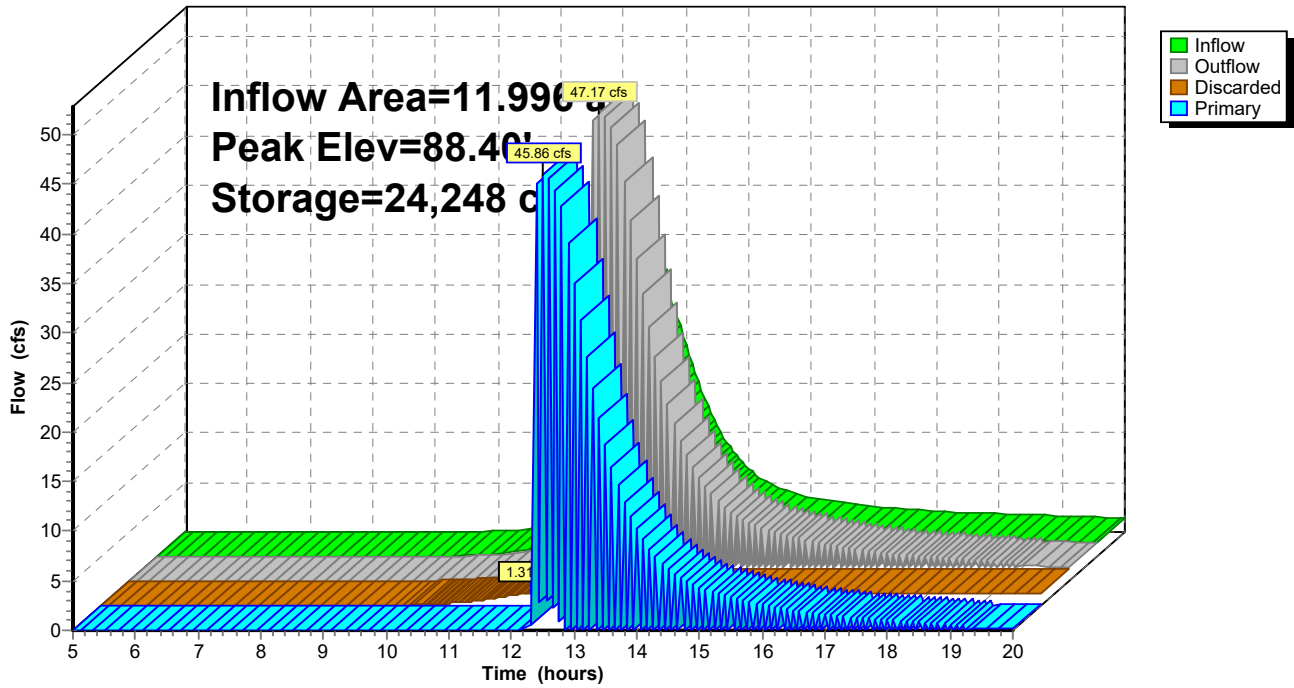
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 11.85 hrs HW=87.32' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=45.80 cfs @ 12.50 hrs HW=88.40' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 45.80 cfs @ 3.15 fps)

Pond 8P: ROCK VOIDS

Hydrograph



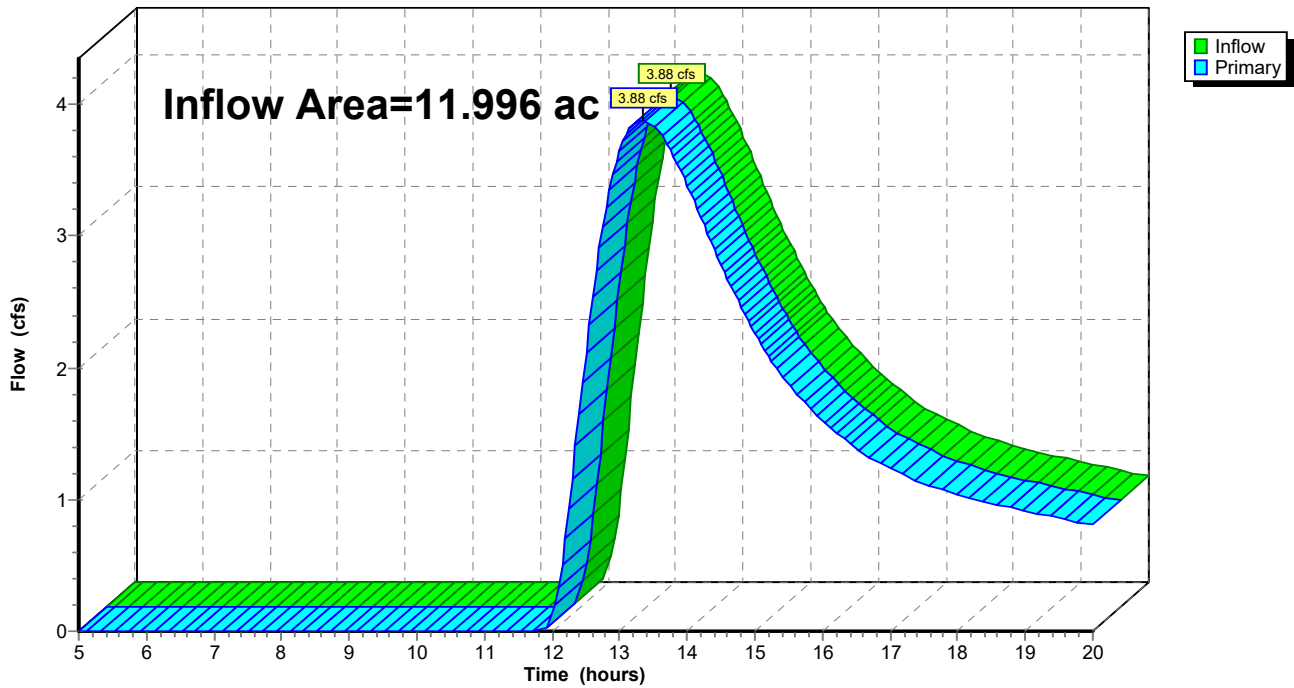
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 1.22" for 100-YR - 24HR. event
Inflow = 3.88 cfs @ 13.34 hrs, Volume= 1.223 af
Primary = 3.88 cfs @ 13.34 hrs, Volume= 1.223 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=0.06 cfs 0.004 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=0.01 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=80.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 8P: ROCK VOIDS Peak Elev=87.30' Storage=5 cf Inflow=0.01 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.06 cfs 0.004 af
Primary=0.06 cfs 0.004 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.06 cfs @ 5.00 hrs, Volume= 0.004 af, Depth> 0.00"

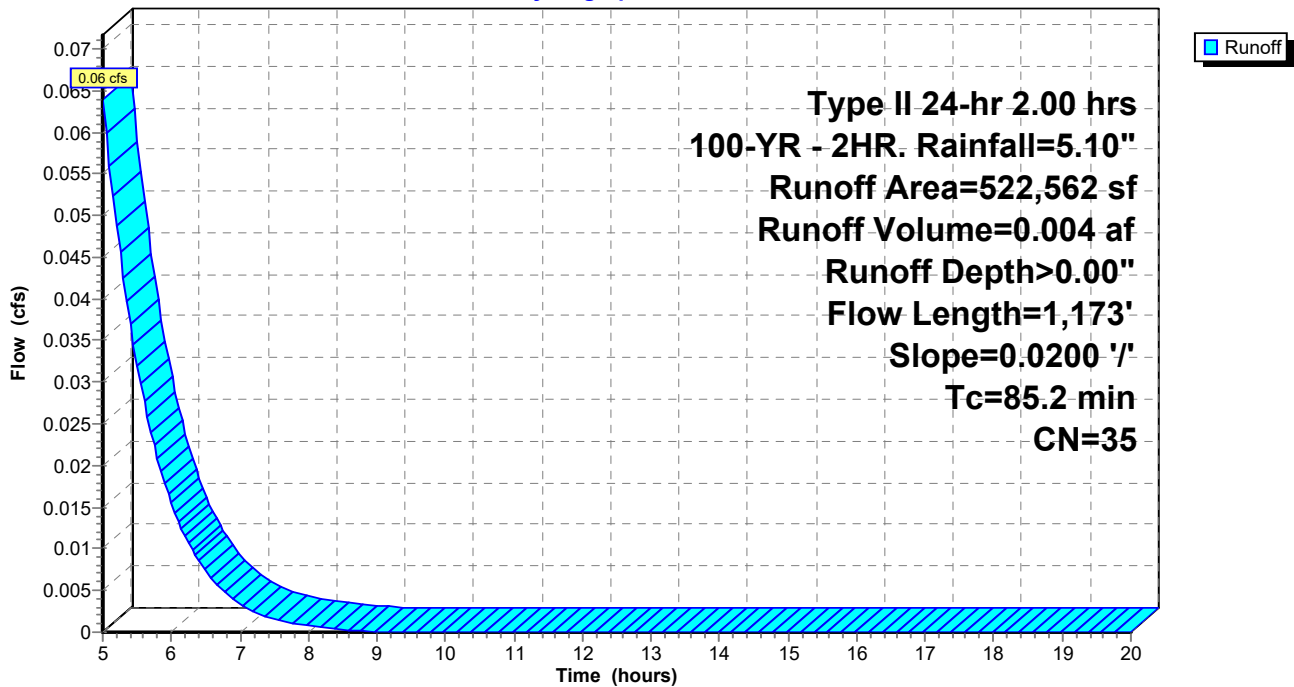
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

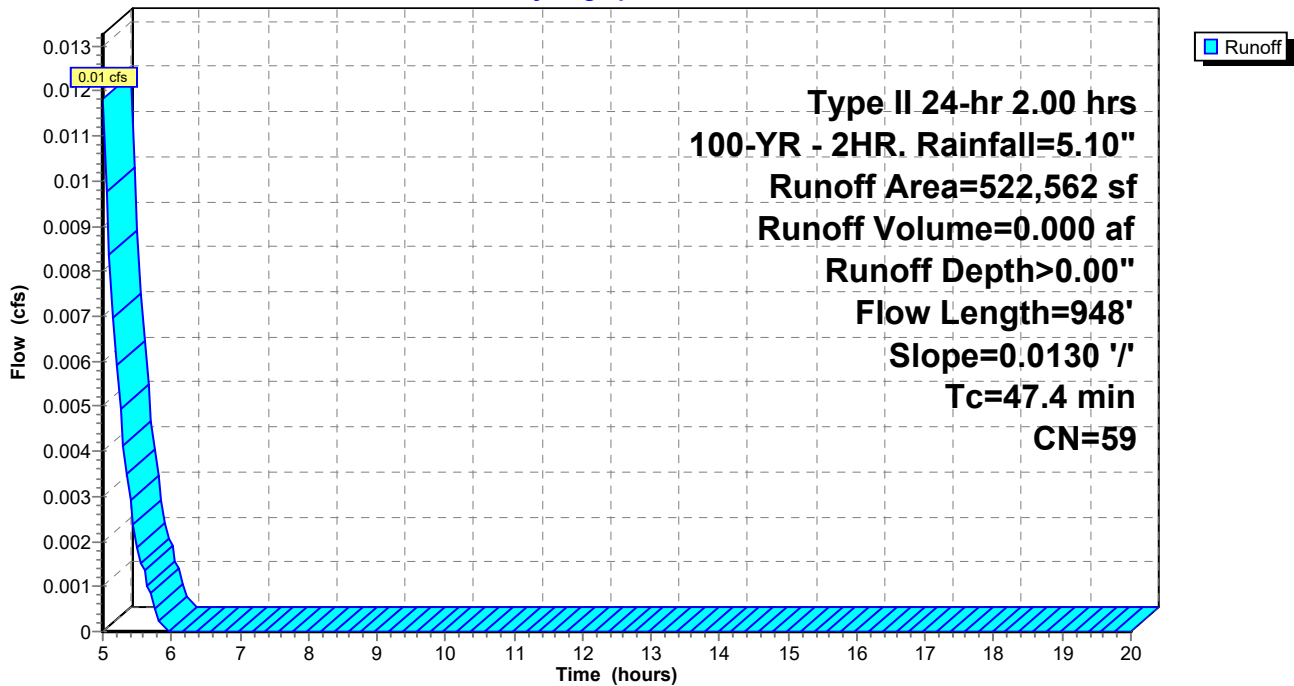
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.00' @ 5.00 hrs Surf.Area= 53,556 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

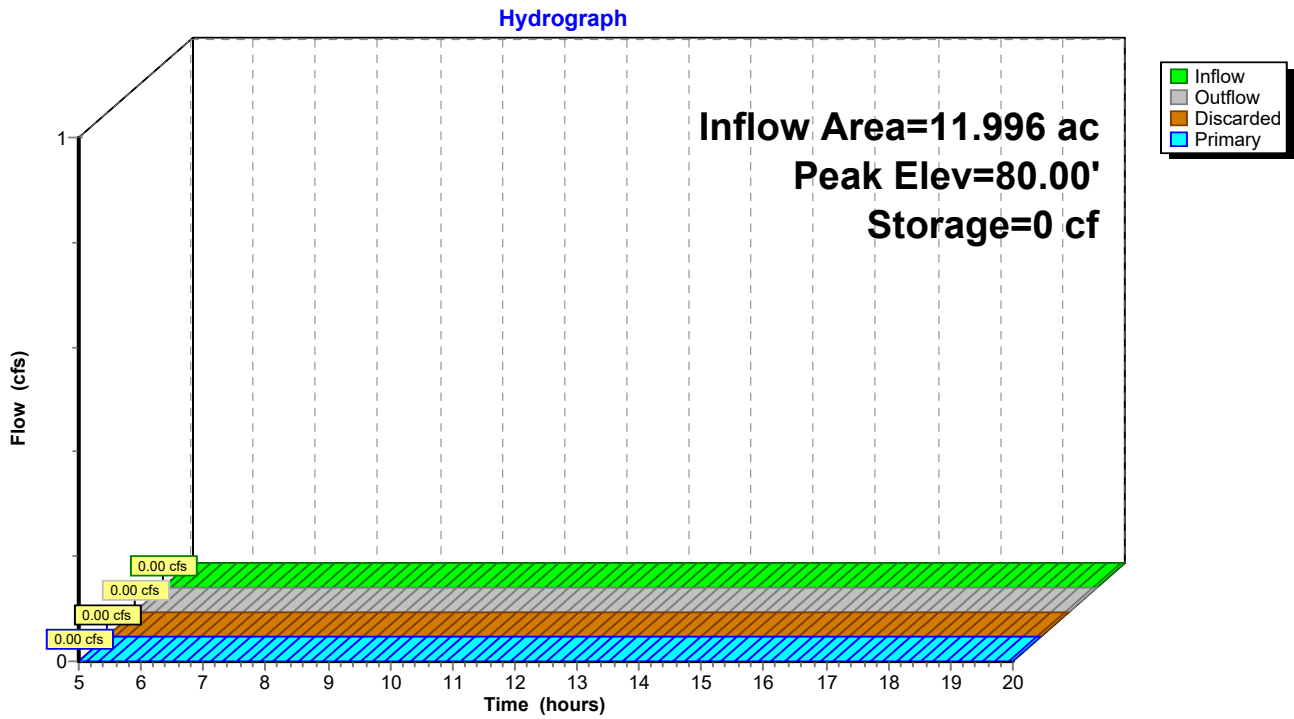
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 2HR. event
 Inflow = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.25 hrs, Volume= 0.000 af, Atten= 58%, Lag= 15.1 min
 Discarded = 0.00 cfs @ 5.25 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.30' @ 5.25 hrs Surf.Area= 346,393 sf Storage= 5 cf

Plug-Flow detention time= 20.6 min calculated for 0.000 af (92% of inflow)
 Center-of-Mass det. time= 15.5 min (327.8 - 312.3)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

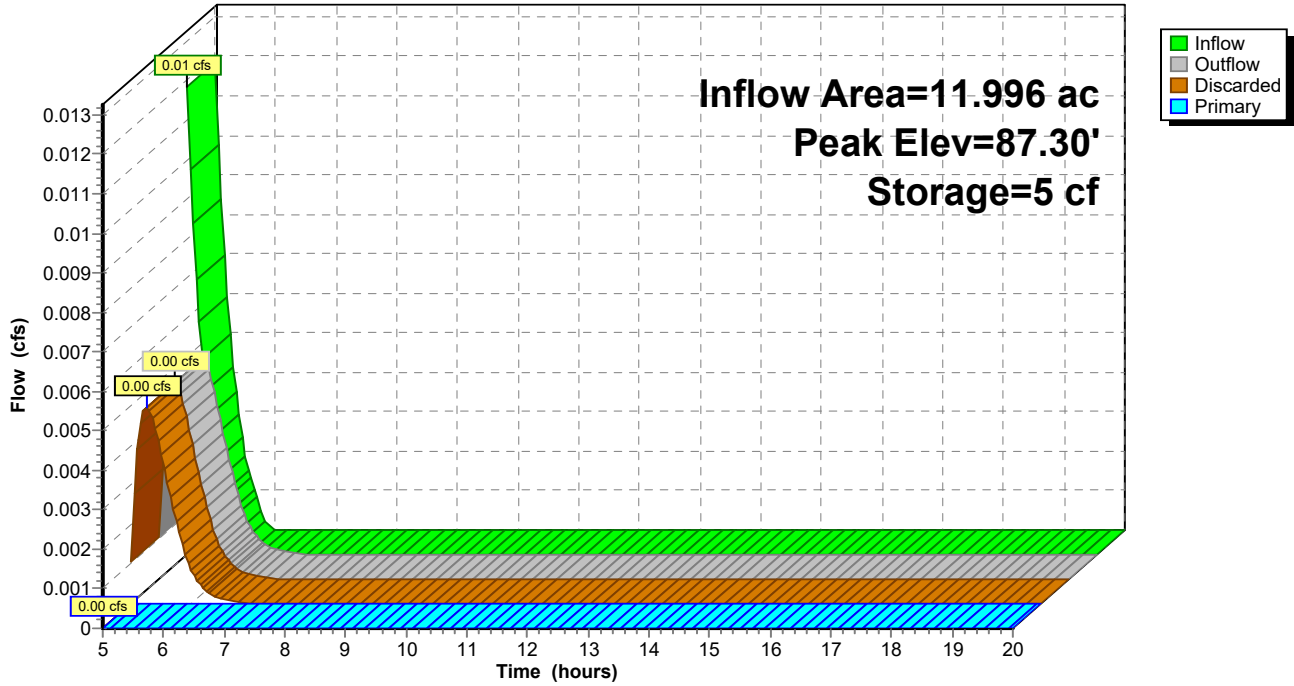
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.25 hrs HW=87.30' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.30' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: ROCK VOIDS

Hydrograph



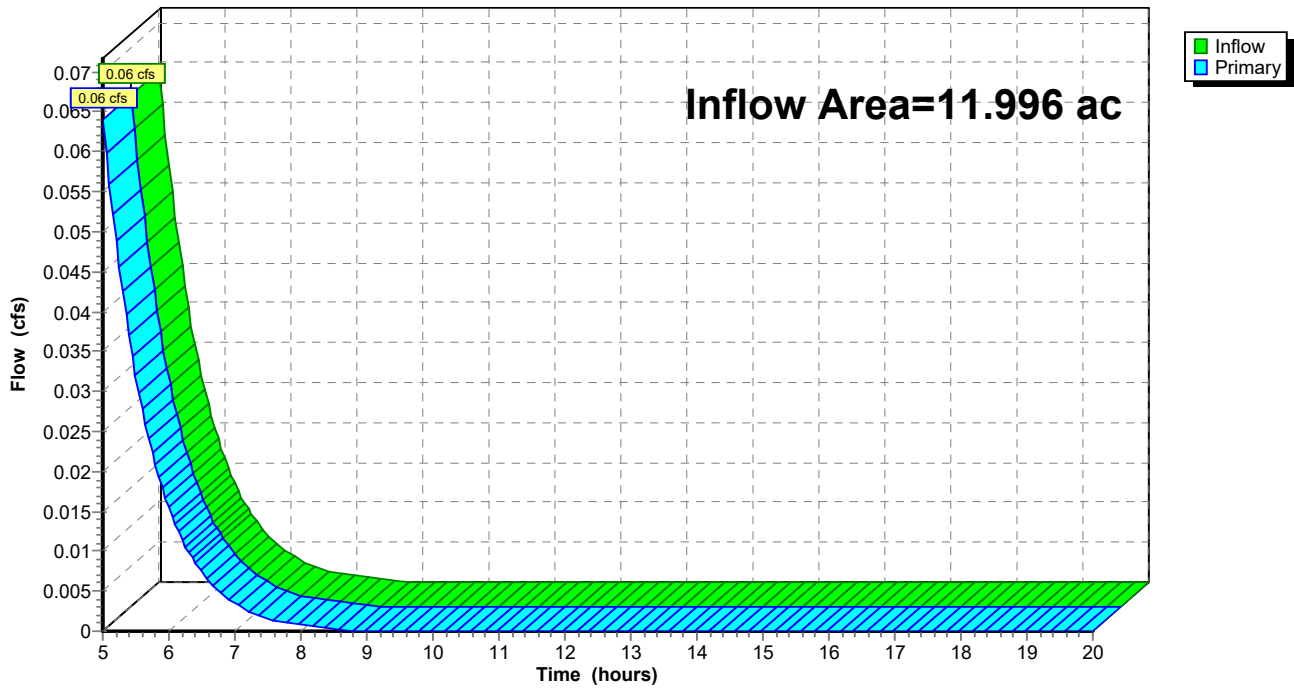
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 2HR. event
 Inflow = 0.06 cfs @ 5.00 hrs, Volume= 0.004 af
 Primary = 0.06 cfs @ 5.00 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=0.86 cfs 0.067 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.05"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=1.27 cfs 0.047 af

Pond 1P: PROPOSED POND Peak Elev=80.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 8P: ROCK VOIDS Peak Elev=87.30' Storage=592 cf Inflow=1.27 cfs 0.047 af
Discarded=0.64 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.64 cfs 0.047 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.86 cfs 0.067 af
Primary=0.86 cfs 0.067 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.86 cfs @ 5.00 hrs, Volume= 0.067 af, Depth> 0.07"

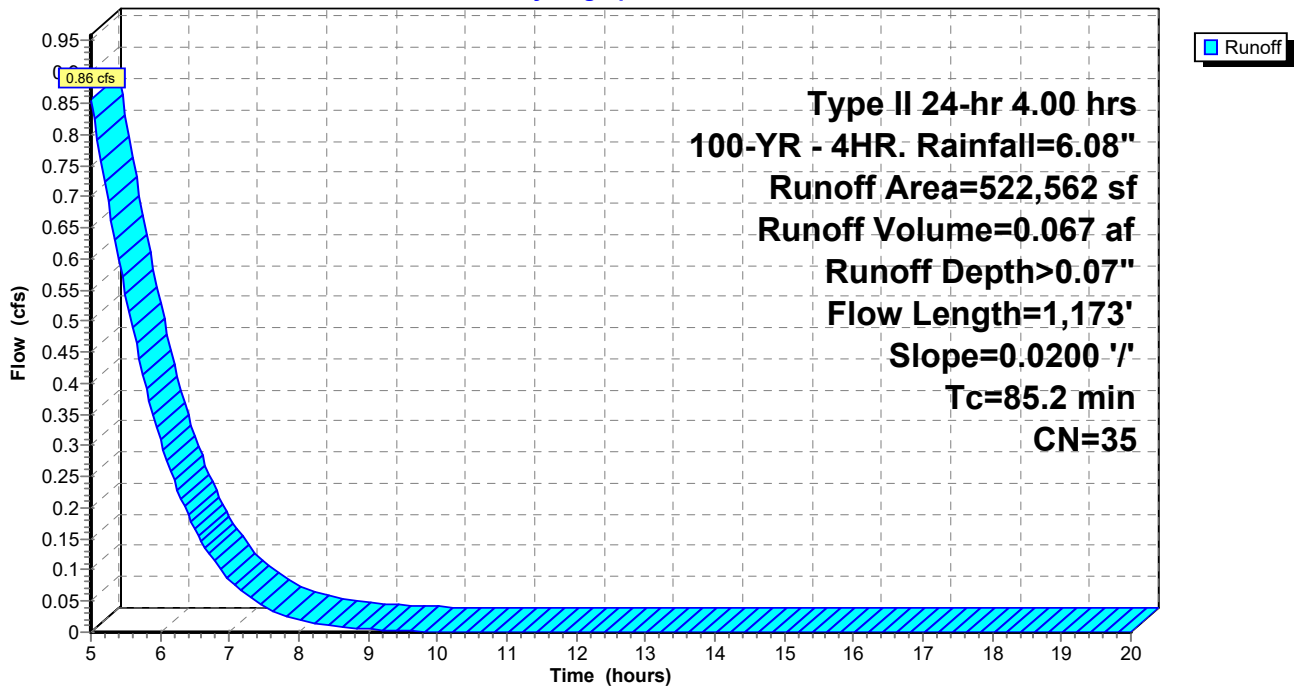
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 1.27 cfs @ 5.00 hrs, Volume= 0.047 af, Depth> 0.05"

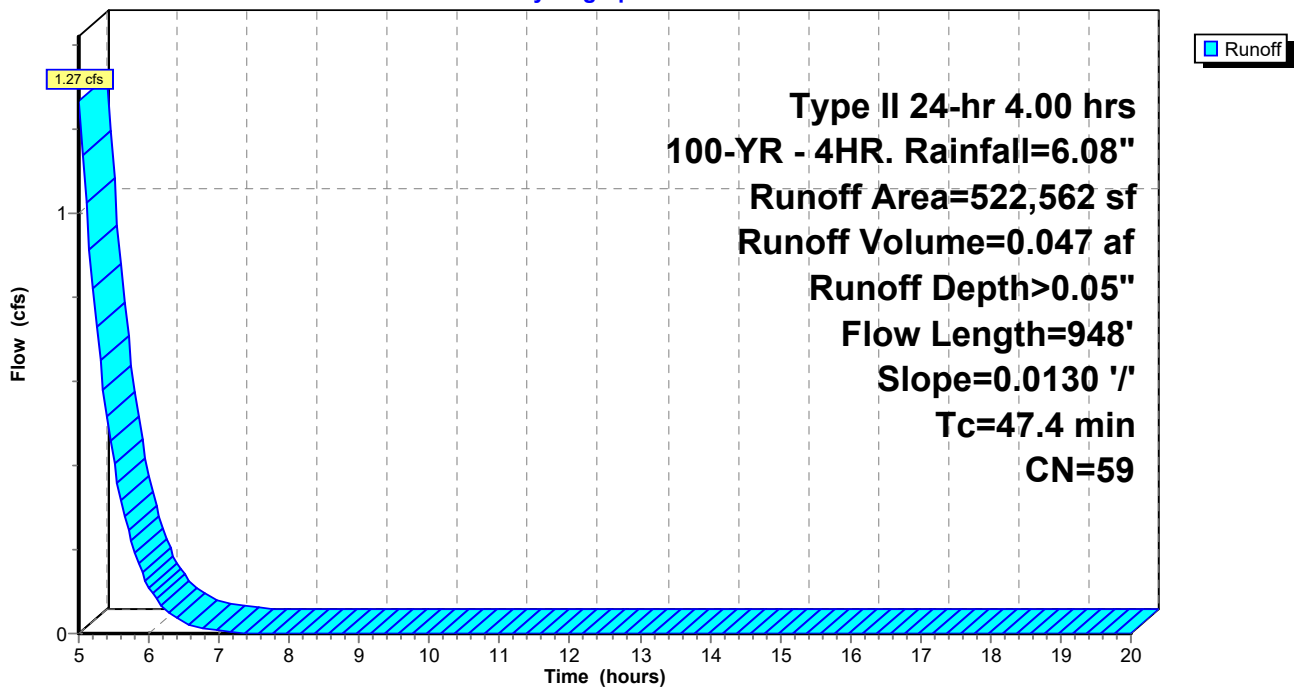
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
* 117,820	35	Meadow, non-grazed, HSG A
* 346,393	65	Uncompacted Gravel (35% Void)
* 58,349	74	Gravel roads, HSG A
522,562	59	Weighted Average
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.00' @ 5.00 hrs Surf.Area= 53,556 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

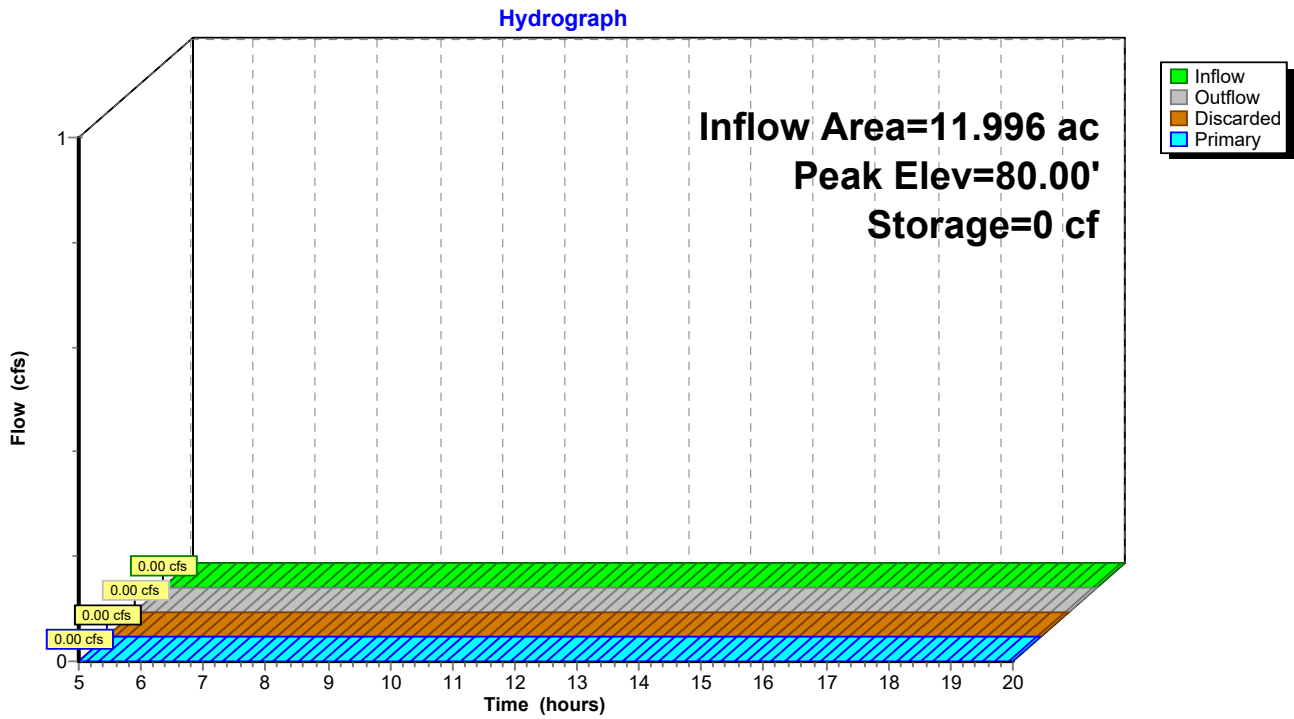
Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.05" for 100-YR - 4HR. event
 Inflow = 1.27 cfs @ 5.00 hrs, Volume= 0.047 af
 Outflow = 0.64 cfs @ 5.31 hrs, Volume= 0.047 af, Atten= 50%, Lag= 18.7 min
 Discarded = 0.64 cfs @ 5.31 hrs, Volume= 0.047 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.30' @ 5.31 hrs Surf.Area= 346,393 sf Storage= 592 cf

Plug-Flow detention time= 20.5 min calculated for 0.045 af (95% of inflow)
 Center-of-Mass det. time= 15.5 min (337.6 - 322.2)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

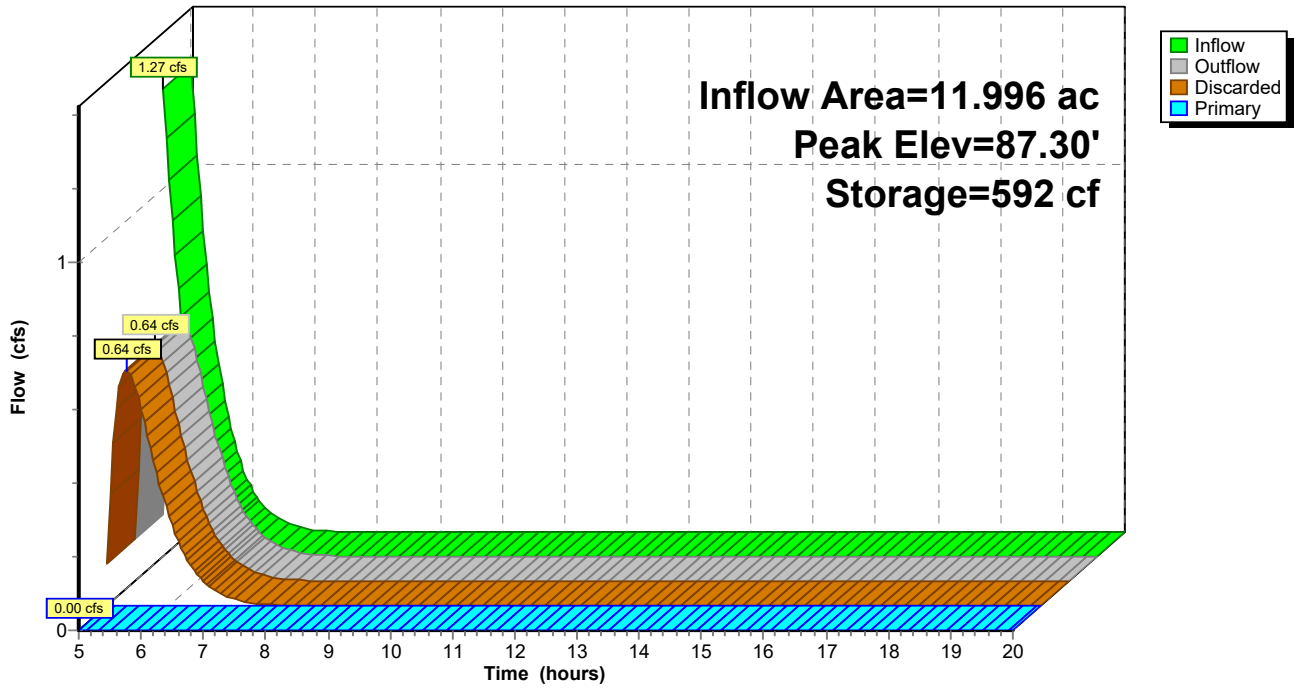
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.64 cfs @ 5.31 hrs HW=87.30' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=87.30' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: ROCK VOIDS

Hydrograph



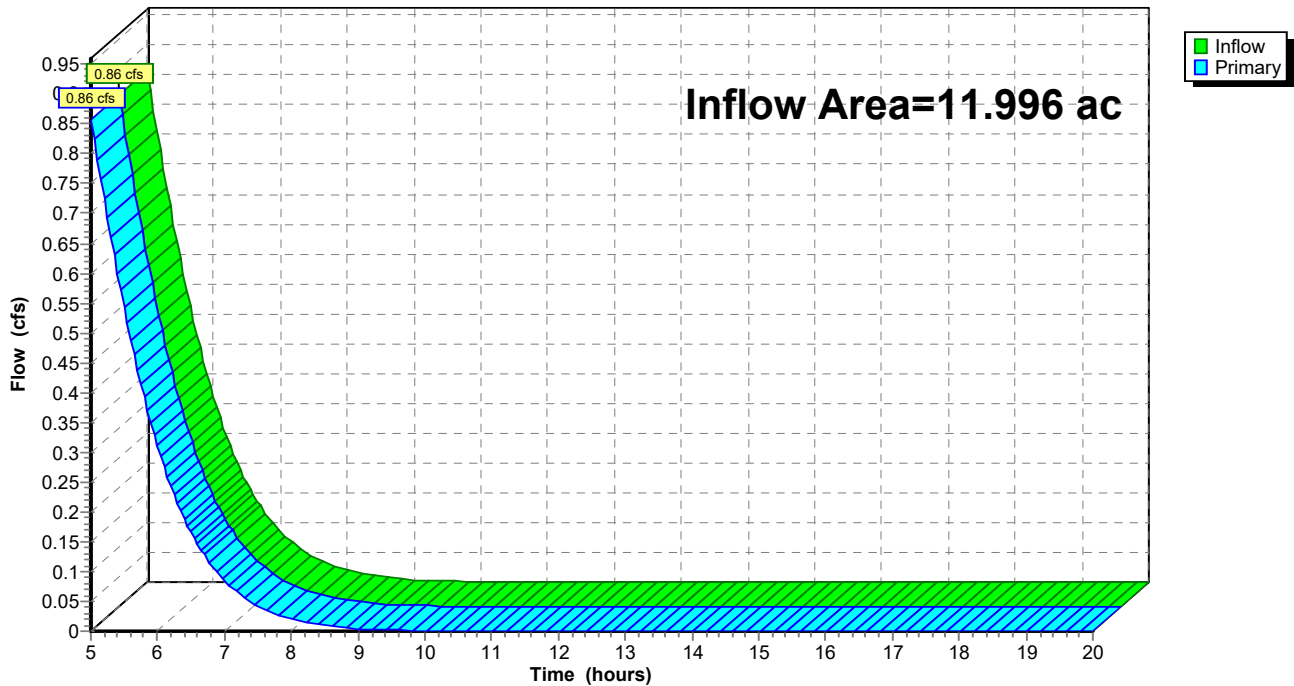
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.07" for 100-YR - 4HR. event
Inflow = 0.86 cfs @ 5.00 hrs, Volume= 0.067 af
Primary = 0.86 cfs @ 5.00 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 3 HydroCAD Report Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>0.55"
Flow Length=1,173' Slope=0.0200 '/' Tc=85.2 min CN=35 Runoff=1.97 cfs 0.550 af

Subcatchment2S: POST DEVELOPED Runoff Area=522,562 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=948' Slope=0.0130 '/' Tc=47.4 min CN=59 Runoff=15.94 cfs 1.630 af

Pond 1P: PROPOSED POND Peak Elev=80.47' Storage=25,312 cf Inflow=8.65 cfs 0.622 af
Discarded=0.16 cfs 0.190 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.190 af

Pond 8P: ROCK VOIDS Peak Elev=87.82' Storage=24,248 cf Inflow=15.94 cfs 1.630 af
Discarded=1.31 cfs 1.008 af Primary=8.65 cfs 0.622 af Outflow=9.95 cfs 1.630 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=1.97 cfs 0.550 af
Primary=1.97 cfs 0.550 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.97 cfs @ 5.77 hrs, Volume= 0.550 af, Depth> 0.55"

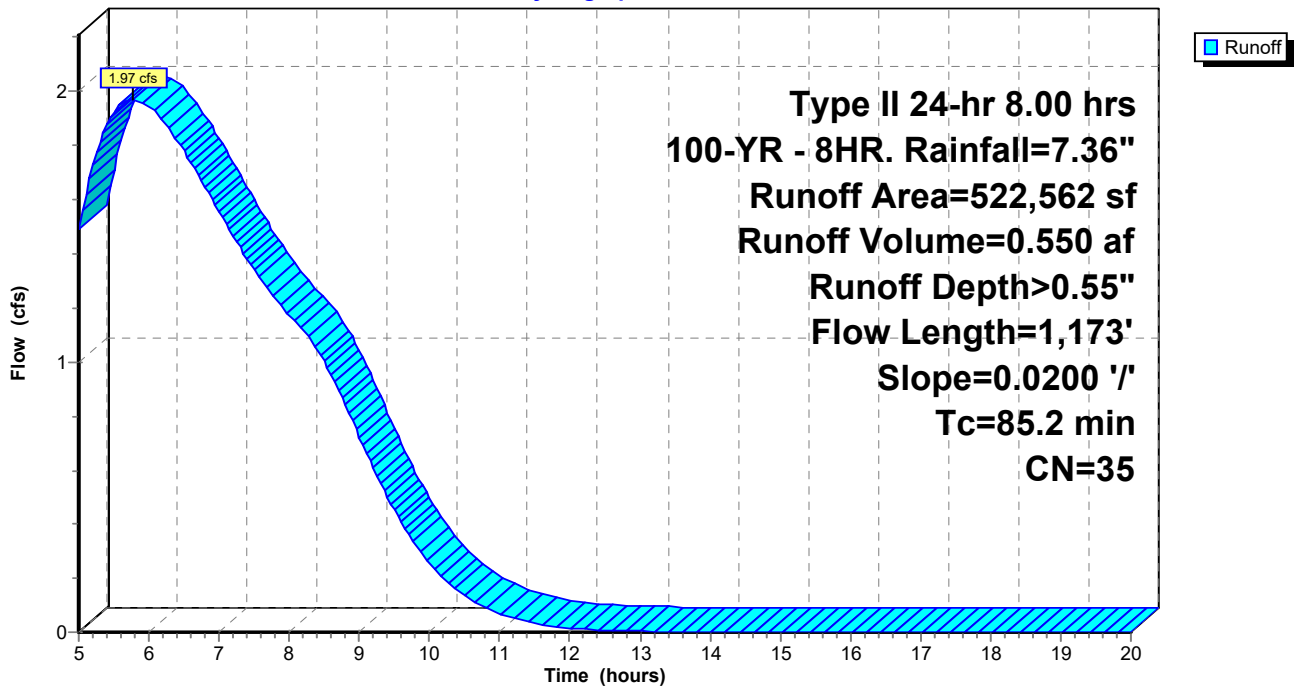
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
* 522,562	35	Meadow, non-grazed, HSG A
522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	1,173	0.0200	0.23		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 15.94 cfs @ 5.00 hrs, Volume= 1.630 af, Depth> 1.63"

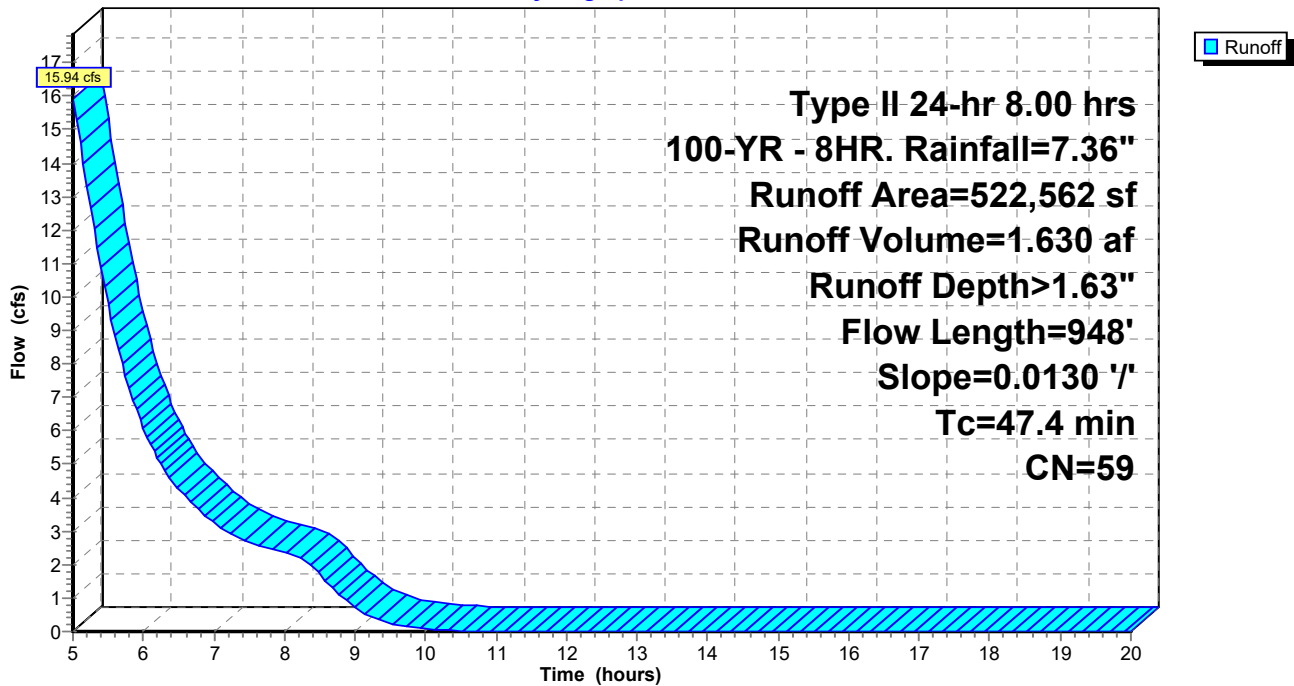
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

	Area (sf)	CN	Description
*	117,820	35	Meadow, non-grazed, HSG A
*	346,393	65	Uncompacted Gravel (35% Void)
*	58,349	74	Gravel roads, HSG A
	522,562	59	Weighted Average
	522,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.4	948	0.0130	0.33		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth = 0.62" for 100-YR - 8HR. event
 Inflow = 8.65 cfs @ 5.65 hrs, Volume= 0.622 af
 Outflow = 0.16 cfs @ 8.60 hrs, Volume= 0.190 af, Atten= 98%, Lag= 177.5 min
 Discarded = 0.16 cfs @ 8.60 hrs, Volume= 0.190 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.47' @ 8.60 hrs Surf.Area= 55,098 sf Storage= 25,312 cf

Plug-Flow detention time= 424.5 min calculated for 0.190 af (31% of inflow)
 Center-of-Mass det. time= 378.9 min (769.6 - 390.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	274,830 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	53,556	0	0
80.50	55,211	27,192	27,192
81.50	58,538	56,875	84,066
82.50	61,891	60,215	144,281
83.50	65,268	63,580	207,860
84.50	68,671	66,970	274,830

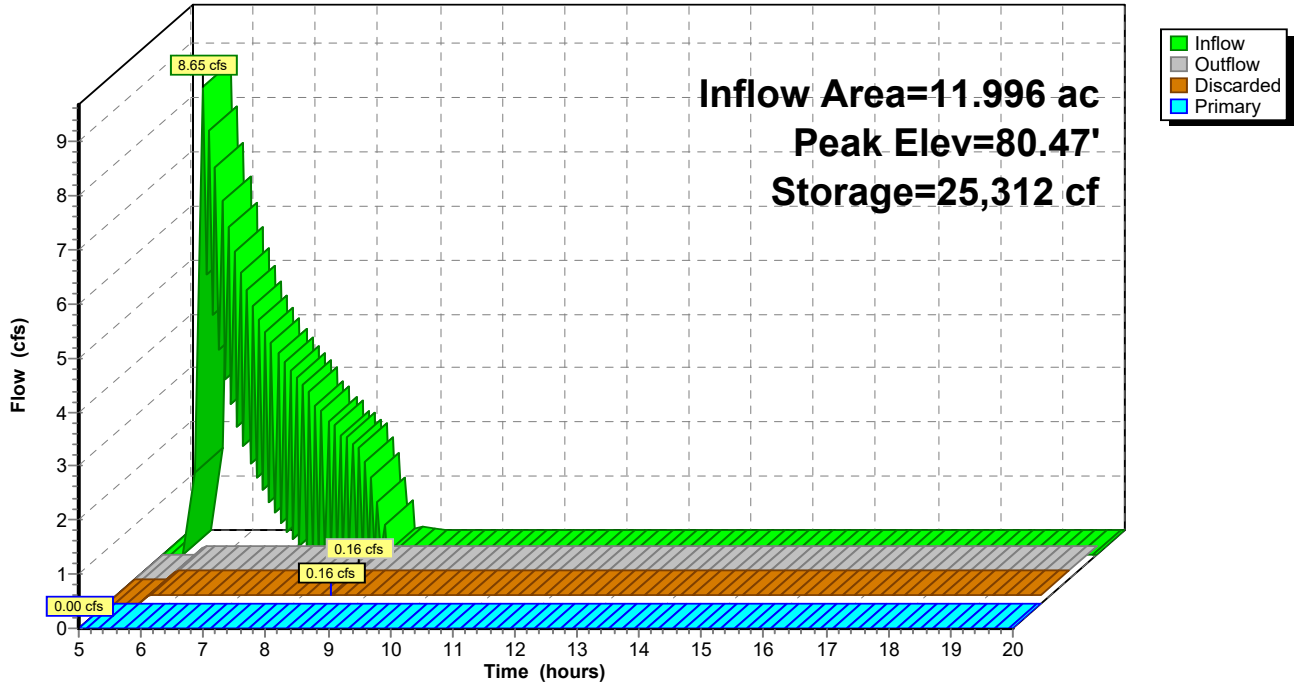
Device	Routing	Invert	Outlet Devices
#1	Primary	83.00'	43.6 deg x 10.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Discarded	80.00'	0.126 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 8.60 hrs HW=80.47' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
 ↑**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Summary for Pond 8P: ROCK VOIDS

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 1.63" for 100-YR - 8HR. event
 Inflow = 15.94 cfs @ 5.00 hrs, Volume= 1.630 af
 Outflow = 9.95 cfs @ 5.65 hrs, Volume= 1.630 af, Atten= 38%, Lag= 38.8 min
 Discarded = 1.31 cfs @ 5.05 hrs, Volume= 1.008 af
 Primary = 8.65 cfs @ 5.65 hrs, Volume= 0.622 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 87.82' @ 5.65 hrs Surf.Area= 346,393 sf Storage= 24,248 cf

Plug-Flow detention time= 140.5 min calculated for 1.599 af (98% of inflow)
 Center-of-Mass det. time= 132.7 min (507.0 - 374.3)

Volume	Invert	Avail.Storage	Storage Description
#1	87.30'	24,248 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 69,279 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.30	346,393	0	0
87.50	346,393	69,279	69,279

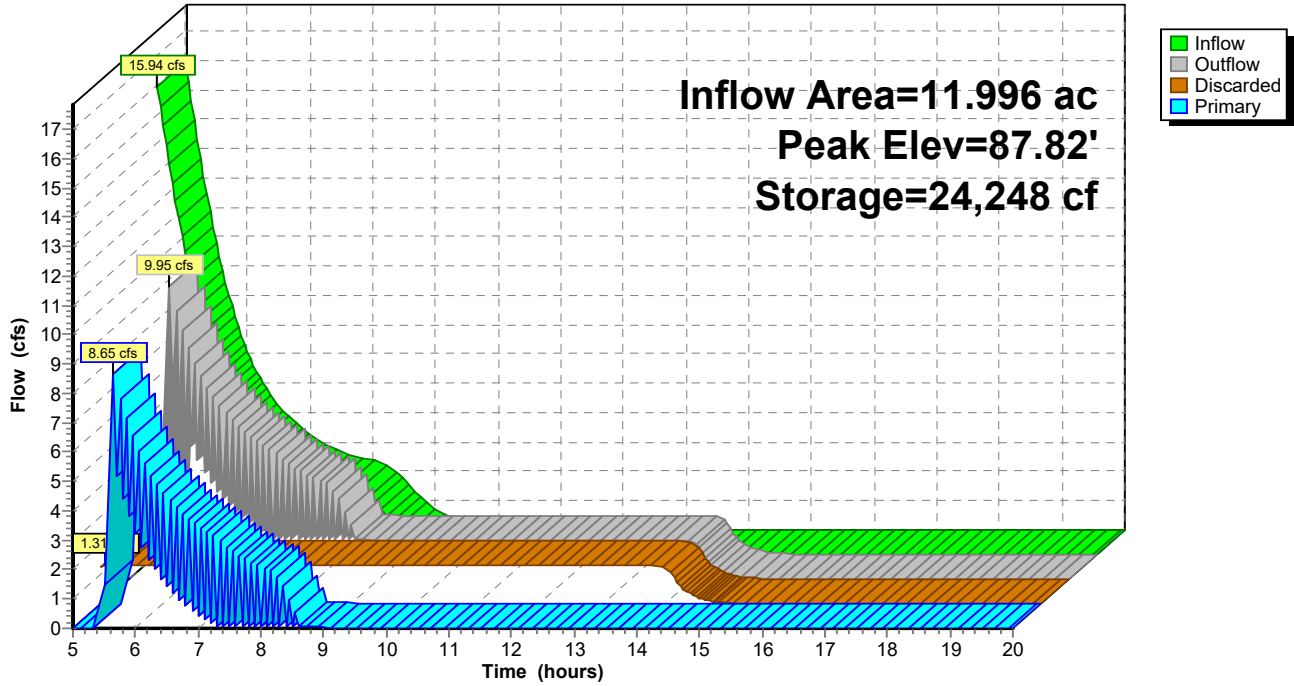
Device	Routing	Invert	Outlet Devices
#1	Primary	87.49'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	87.30'	0.163 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=1.31 cfs @ 5.05 hrs HW=87.33' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 1.31 cfs)

Primary OutFlow Max=8.44 cfs @ 5.65 hrs HW=87.81' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Weir Controls 8.44 cfs @ 1.63 fps)

Pond 8P: ROCK VOIDS

Hydrograph



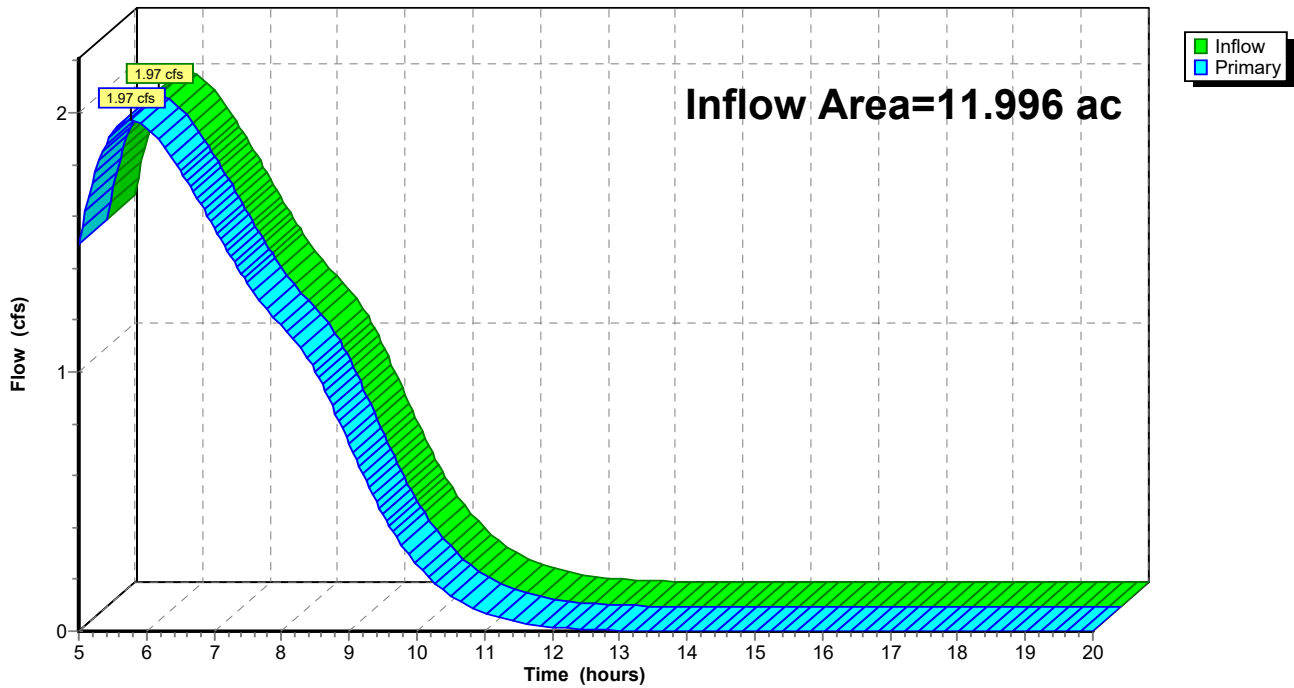
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 11.996 ac, 0.00% Impervious, Inflow Depth > 0.55" for 100-YR - 8HR. event
Inflow = 1.97 cfs @ 5.77 hrs, Volume= 0.550 af
Primary = 1.97 cfs @ 5.77 hrs, Volume= 0.550 af, Atten= 0%, Lag= 0.0 min

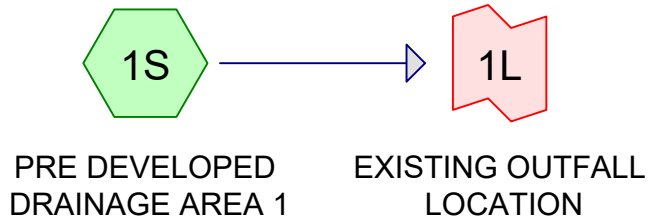
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EXISTING OUTFALL LOCATION

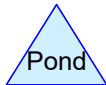
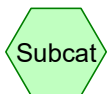
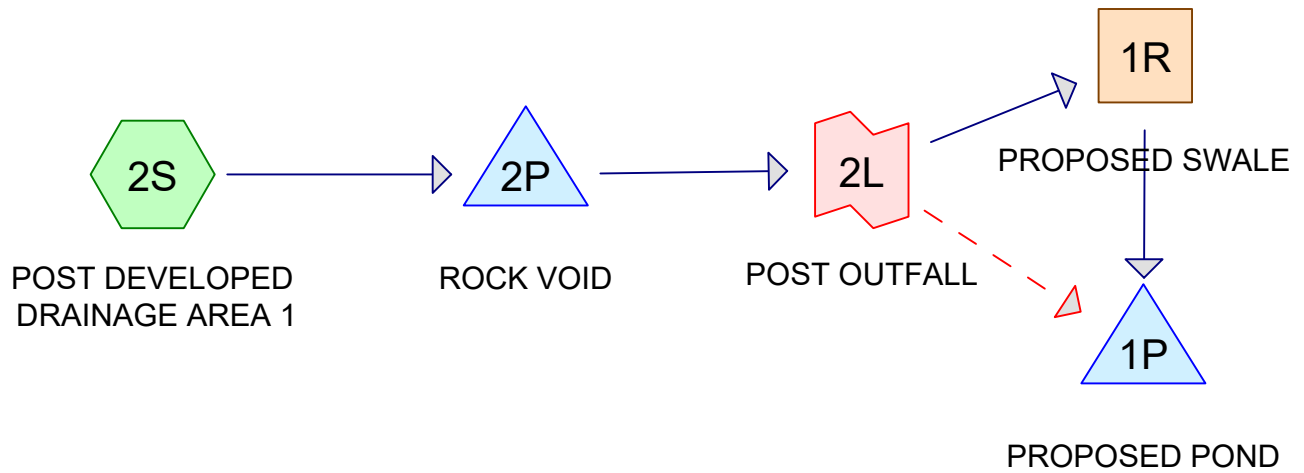
Hydrograph



PRE-DEVELOPED SITE



POST DEVELOPED SITE



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>1.53"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=8.94 cfs 3.081 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>5.68"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=75.66 cfs 11.460 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.06' Max Vel=2.89 fps Inflow=22.90 cfs 2.499 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=18.64 cfs 2.484 af

Pond 1P: PROPOSED POND Peak Elev=83.75' Storage=395,466 cf Inflow=86.53 cfs 9.980 af
Discarded=0.09 cfs 0.057 af Primary=3.37 cfs 0.855 af Outflow=3.46 cfs 0.912 af

Pond 2P: ROCK VOID Peak Elev=91.34' Storage=43,033 cf Inflow=75.66 cfs 11.460 af
Discarded=0.57 cfs 0.474 af Primary=91.61 cfs 9.995 af Outflow=92.17 cfs 10.469 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=8.94 cfs 3.081 af
Primary=8.94 cfs 3.081 af

Link 2L: POST OUTFALL x 0.25 Inflow=91.61 cfs 9.995 af
Primary=22.90 cfs 2.499 af Secondary=68.70 cfs 7.496 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 8.94 cfs @ 13.57 hrs, Volume= 3.081 af, Depth> 1.53"

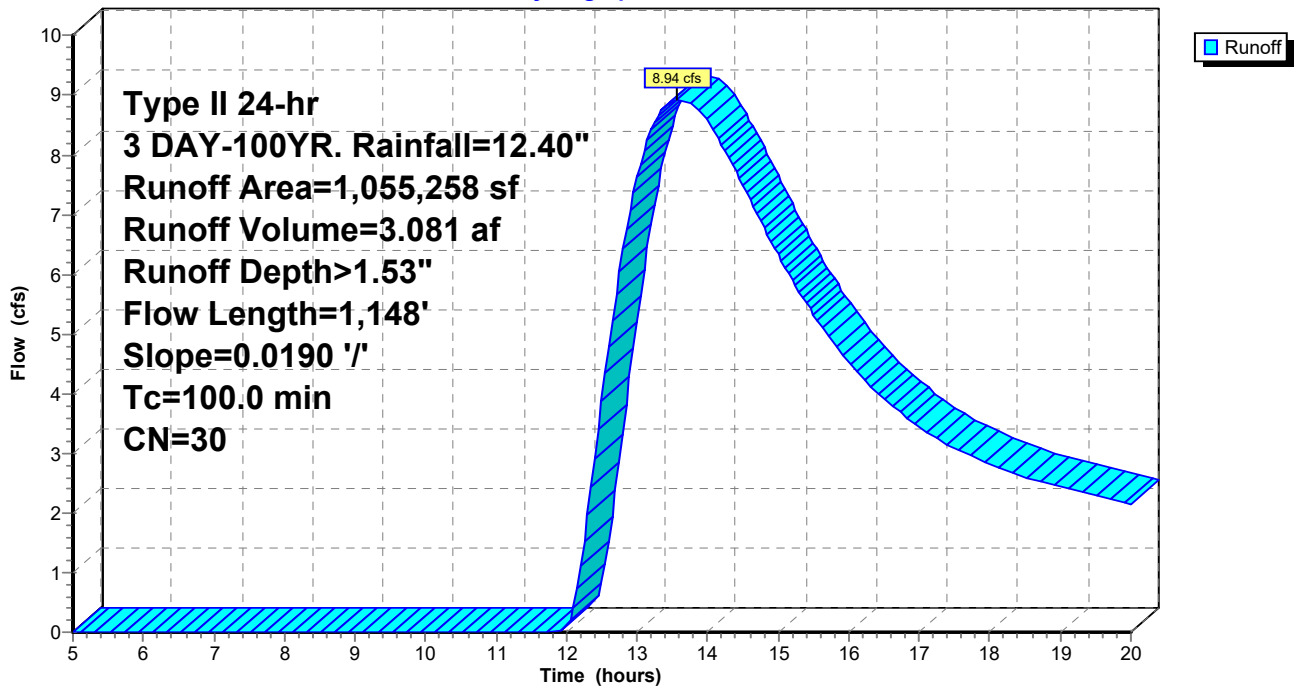
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 75.66 cfs @ 12.46 hrs, Volume= 11.460 af, Depth> 5.68"

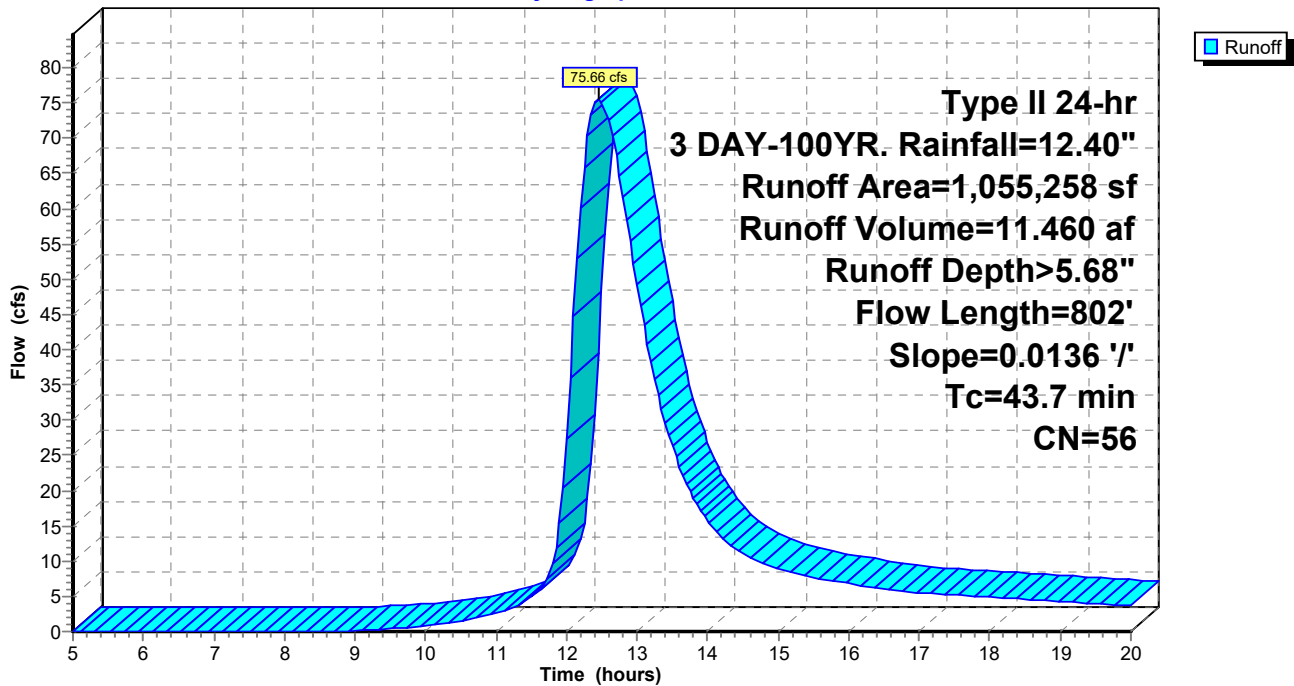
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.24" for 3 DAY-100YR. event
Inflow = 22.90 cfs @ 12.45 hrs, Volume= 2.499 af
Outflow = 18.64 cfs @ 12.57 hrs, Volume= 2.484 af, Atten= 19%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 7.3 min

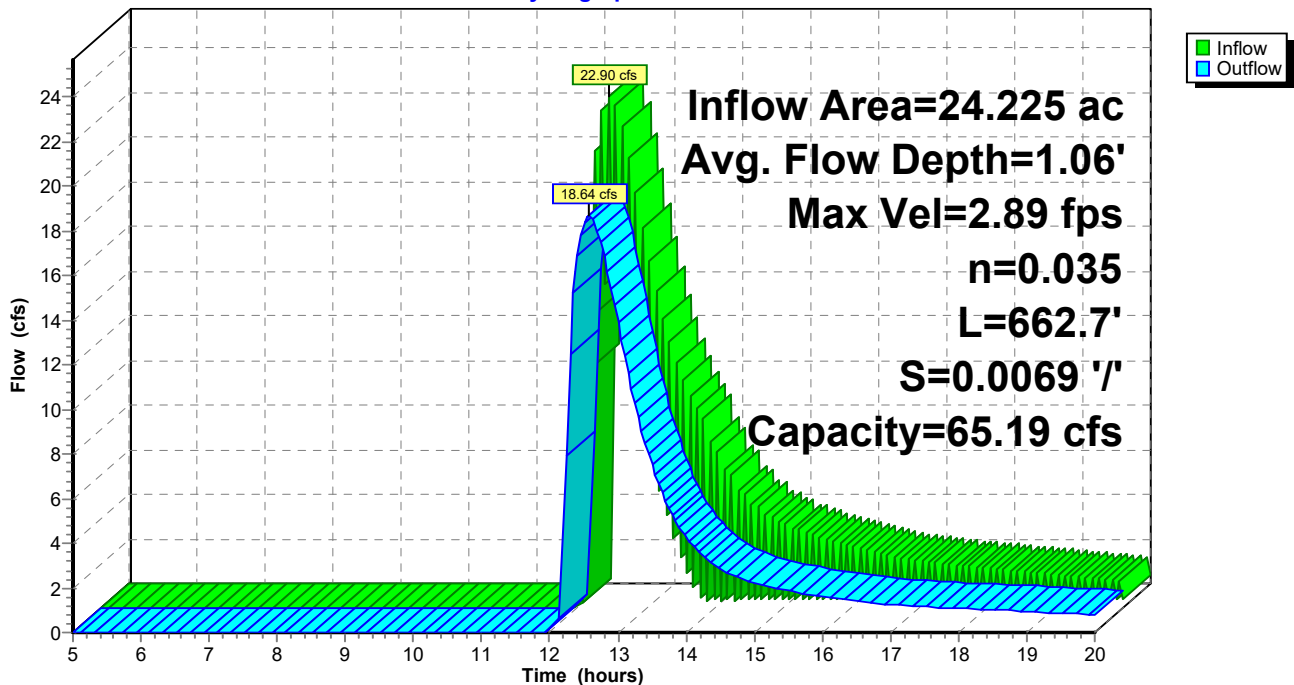
Peak Storage= 4,275 cf @ 12.51 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 ' / ' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 ' / '
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 4.94" for 3 DAY-100YR. event
 Inflow = 86.53 cfs @ 12.45 hrs, Volume= 9.980 af
 Outflow = 3.46 cfs @ 19.48 hrs, Volume= 0.912 af, Atten= 96%, Lag= 421.5 min
 Discarded = 0.09 cfs @ 19.48 hrs, Volume= 0.057 af
 Primary = 3.37 cfs @ 19.48 hrs, Volume= 0.855 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.75' @ 19.48 hrs Surf.Area= 96,116 sf Storage= 395,466 cf

Plug-Flow detention time= 360.3 min calculated for 0.912 af (9% of inflow)
 Center-of-Mass det. time= 261.6 min (1,094.3 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

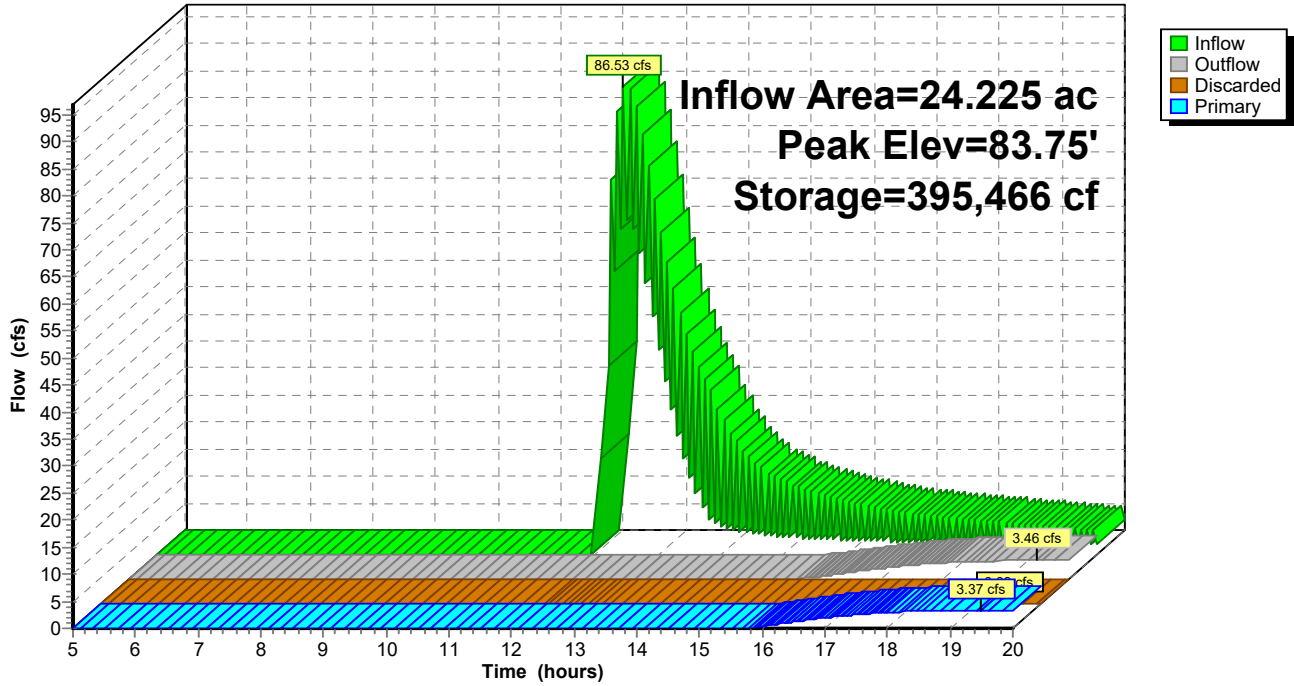
Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.09 cfs @ 19.48 hrs HW=83.75' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.37 cfs @ 19.48 hrs HW=83.75' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Weir Controls 3.37 cfs @ 1.88 fps)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 5.68" for 3 DAY-100YR. event
 Inflow = 75.66 cfs @ 12.46 hrs, Volume= 11.460 af
 Outflow = 92.17 cfs @ 12.45 hrs, Volume= 10.469 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.57 cfs @ 10.80 hrs, Volume= 0.474 af
 Primary = 91.61 cfs @ 12.45 hrs, Volume= 9.995 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.34' @ 12.45 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 39.1 min calculated for 10.469 af (91% of inflow)
 Center-of-Mass det. time= 11.4 min (834.0 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

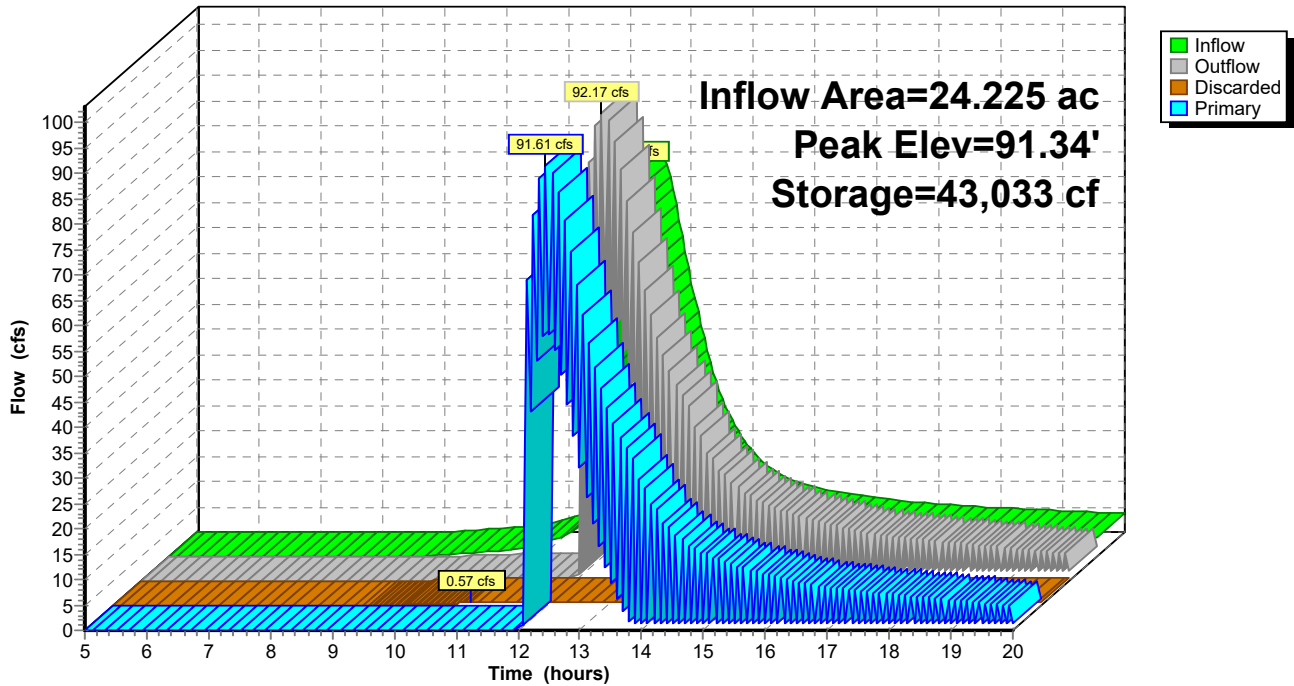
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 10.80 hrs HW=89.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=91.52 cfs @ 12.45 hrs HW=91.34' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 91.52 cfs @ 3.98 fps)

Pond 2P: ROCK VOID

Hydrograph



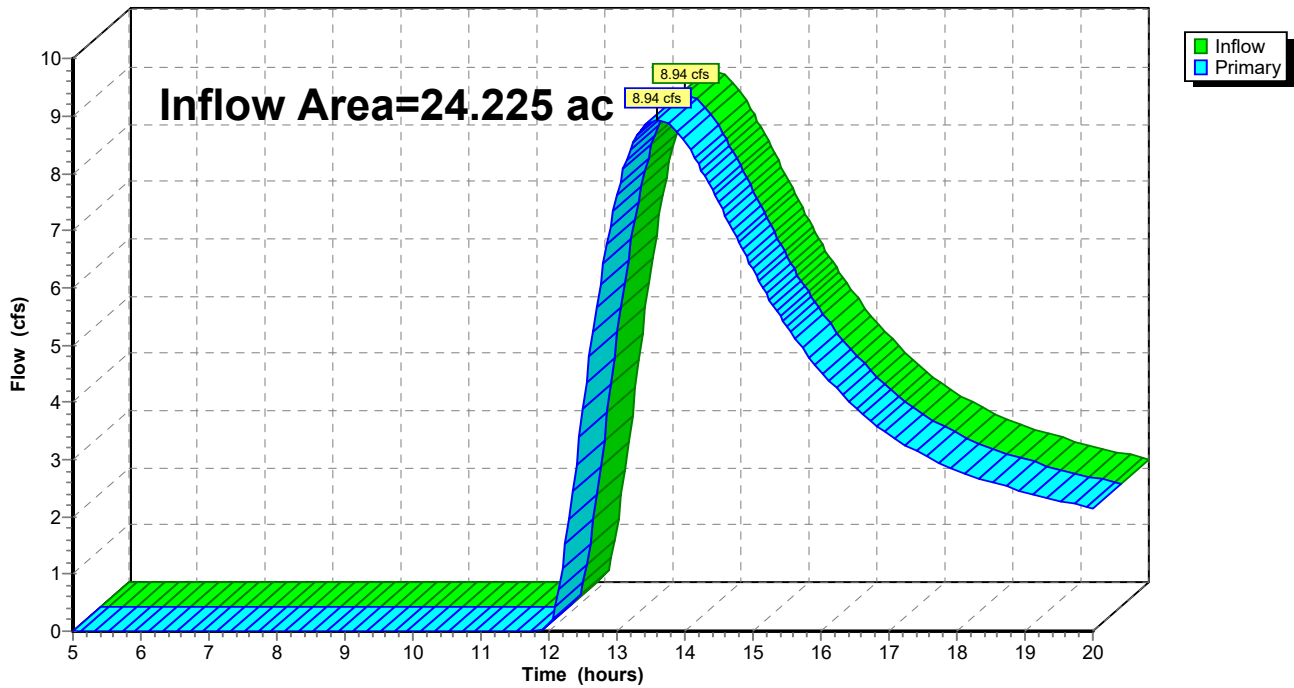
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.53" for 3 DAY-100YR. event
Inflow = 8.94 cfs @ 13.57 hrs, Volume= 3.081 af
Primary = 8.94 cfs @ 13.57 hrs, Volume= 3.081 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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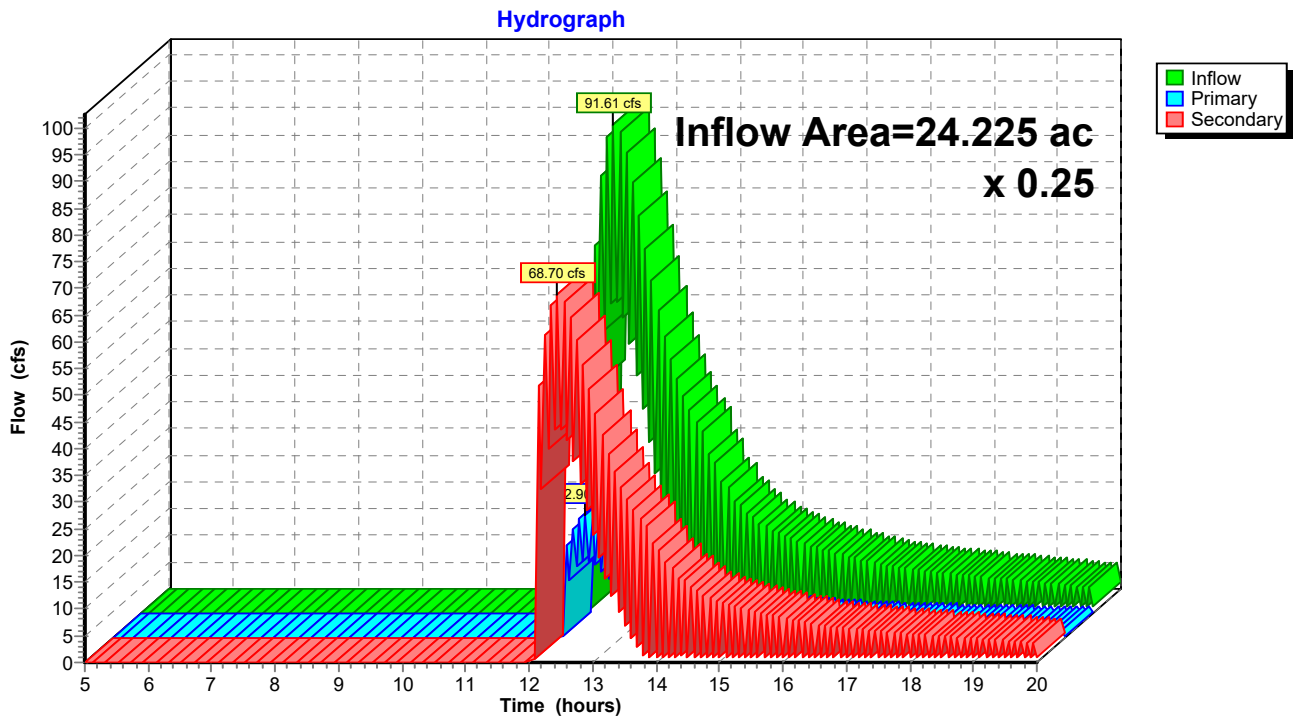
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Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 4.95" for 3 DAY-100YR. event
Inflow = 91.61 cfs @ 12.45 hrs, Volume= 9.995 af
Primary = 22.90 cfs @ 12.45 hrs, Volume= 2.499 af, Atten= 75%, Lag= 0.0 min
Secondary = 68.70 cfs @ 12.45 hrs, Volume= 7.496 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>2.16"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=13.32 cfs 4.356 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>6.92"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=92.43 cfs 13.962 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.17' Max Vel=3.06 fps Inflow=25.81 cfs 3.119 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=22.83 cfs 3.103 af

Pond 1P: PROPOSED POND Peak Elev=84.00' Storage=419,571 cf Inflow=99.52 cfs 12.460 af
Discarded=0.09 cfs 0.058 af Primary=7.70 cfs 3.133 af Outflow=7.79 cfs 3.191 af

Pond 2P: ROCK VOID Peak Elev=91.46' Storage=43,033 cf Inflow=92.43 cfs 13.962 af
Discarded=0.57 cfs 0.493 af Primary=103.26 cfs 12.476 af Outflow=103.83 cfs 12.969 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=13.32 cfs 4.356 af
Primary=13.32 cfs 4.356 af

Link 2L: POST OUTFALL x 0.25 Inflow=103.26 cfs 12.476 af
Primary=25.81 cfs 3.119 af Secondary=77.44 cfs 9.357 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 13.32 cfs @ 13.53 hrs, Volume= 4.356 af, Depth> 2.16"

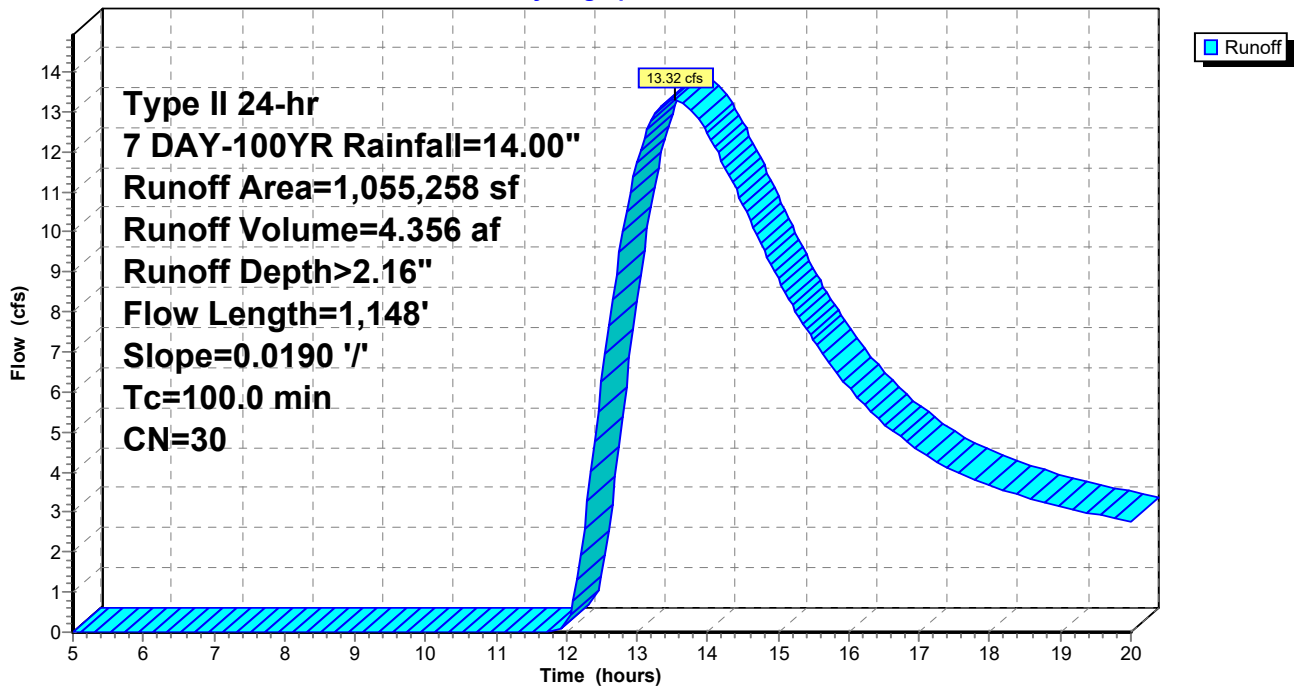
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 92.43 cfs @ 12.45 hrs, Volume= 13.962 af, Depth> 6.92"

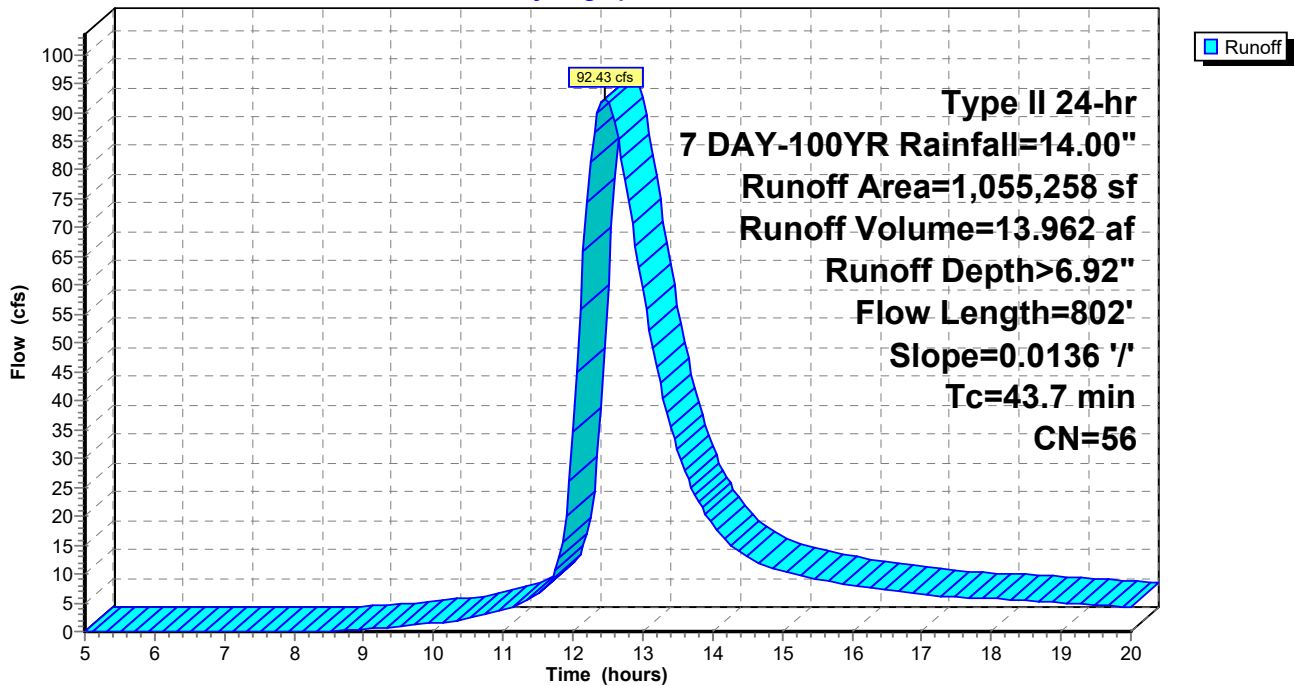
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.55" for 7 DAY-100YR event
Inflow = 25.81 cfs @ 12.45 hrs, Volume= 3.119 af
Outflow = 22.83 cfs @ 12.56 hrs, Volume= 3.103 af, Atten= 12%, Lag= 6.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.06 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 6.9 min

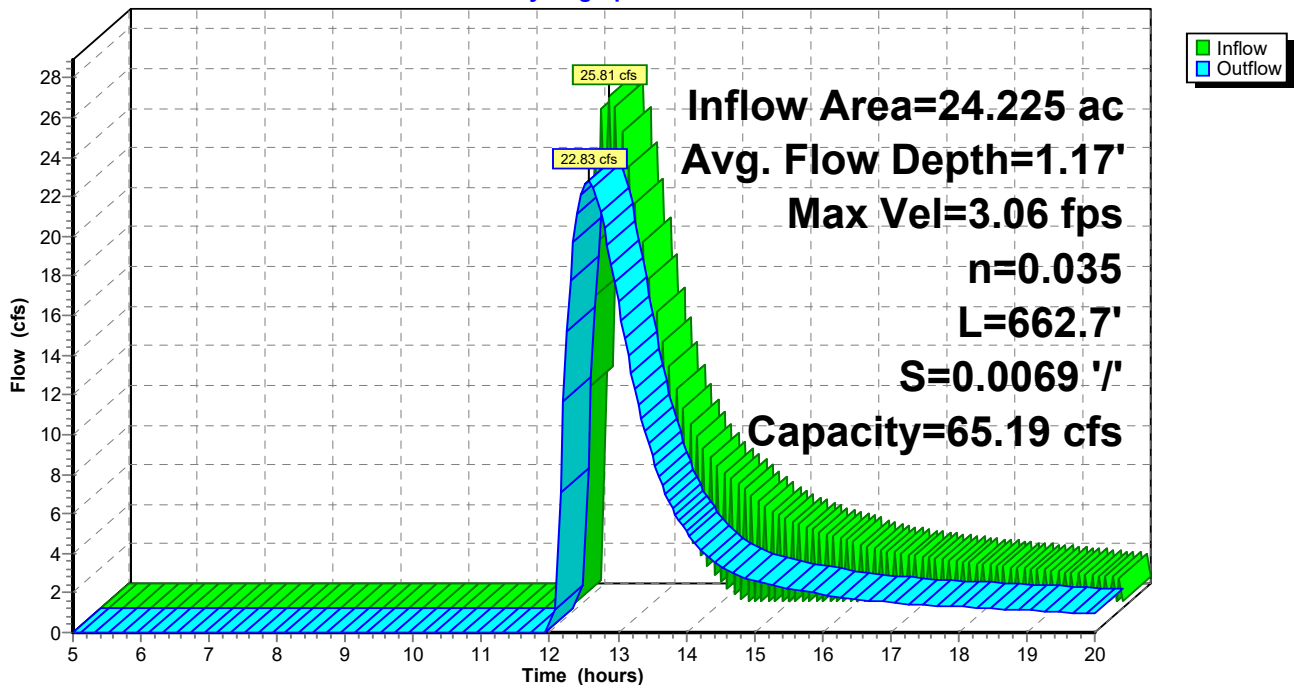
Peak Storage= 4,943 cf @ 12.50 hrs
Average Depth at Peak Storage= 1.17'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 '/'
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 6.17" for 7 DAY-100YR event
 Inflow = 99.52 cfs @ 12.45 hrs, Volume= 12.460 af
 Outflow = 7.79 cfs @ 15.88 hrs, Volume= 3.191 af, Atten= 92%, Lag= 205.6 min
 Discarded = 0.09 cfs @ 15.88 hrs, Volume= 0.058 af
 Primary = 7.70 cfs @ 15.88 hrs, Volume= 3.133 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 84.00' @ 15.88 hrs Surf.Area= 96,676 sf Storage= 419,571 cf

Plug-Flow detention time= 274.8 min calculated for 3.191 af (26% of inflow)
 Center-of-Mass det. time= 186.1 min (1,014.4 - 828.3)

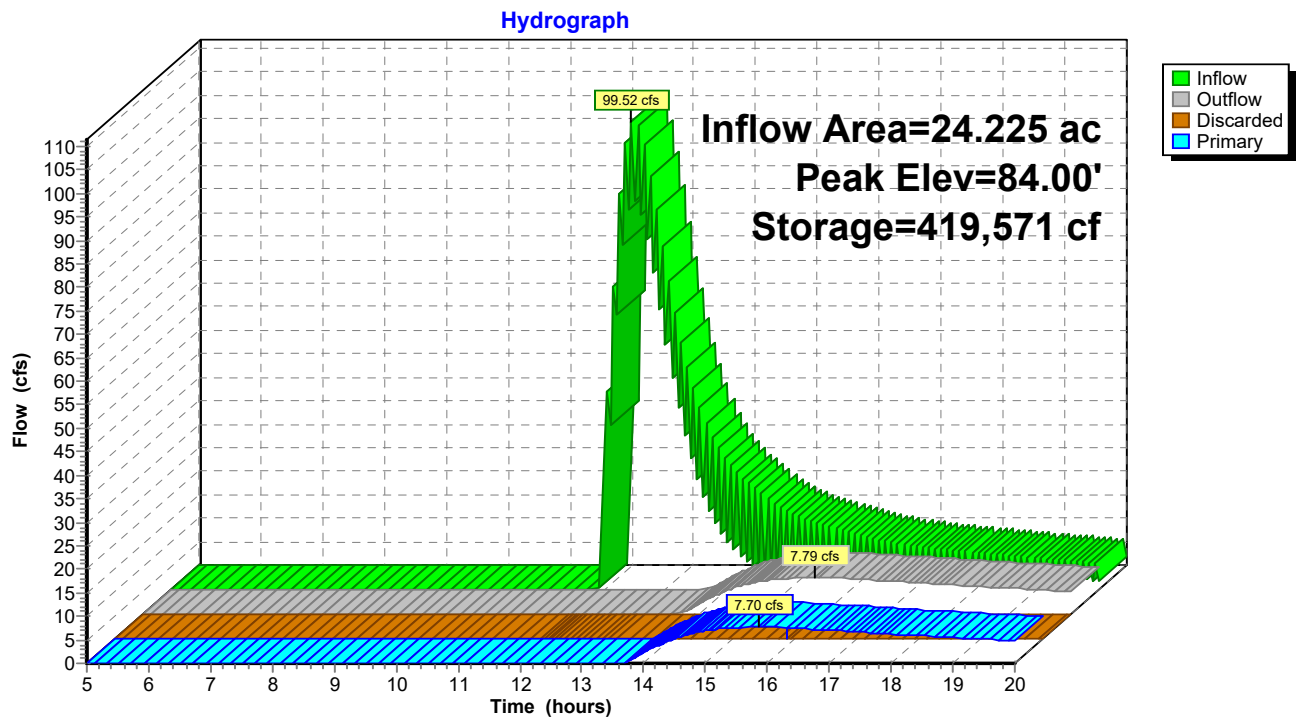
Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.09 cfs @ 15.88 hrs HW=84.00' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=7.69 cfs @ 15.88 hrs HW=84.00' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Weir Controls 7.69 cfs @ 2.45 fps)

Pond 1P: PROPOSED POND



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 6.92" for 7 DAY-100YR event
 Inflow = 92.43 cfs @ 12.45 hrs, Volume= 13.962 af
 Outflow = 103.83 cfs @ 12.45 hrs, Volume= 12.969 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.57 cfs @ 10.20 hrs, Volume= 0.493 af
 Primary = 103.26 cfs @ 12.45 hrs, Volume= 12.476 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.46' @ 12.45 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 33.8 min calculated for 12.969 af (93% of inflow)
 Center-of-Mass det. time= 10.2 min (828.8 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 10.20 hrs HW=89.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=103.23 cfs @ 12.45 hrs HW=91.46' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 103.23 cfs @ 4.14 fps)

Staging Area 4 Basin 4 HydroCAD Report

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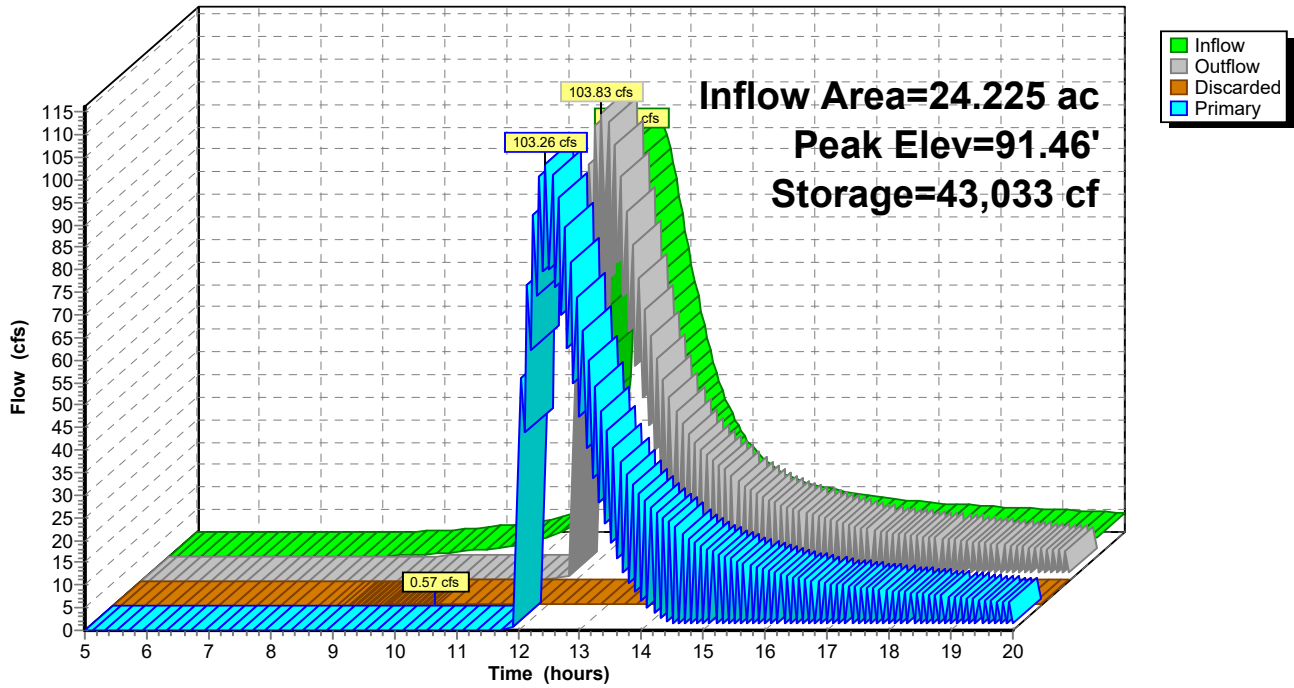
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Pond 2P: ROCK VOID

Hydrograph



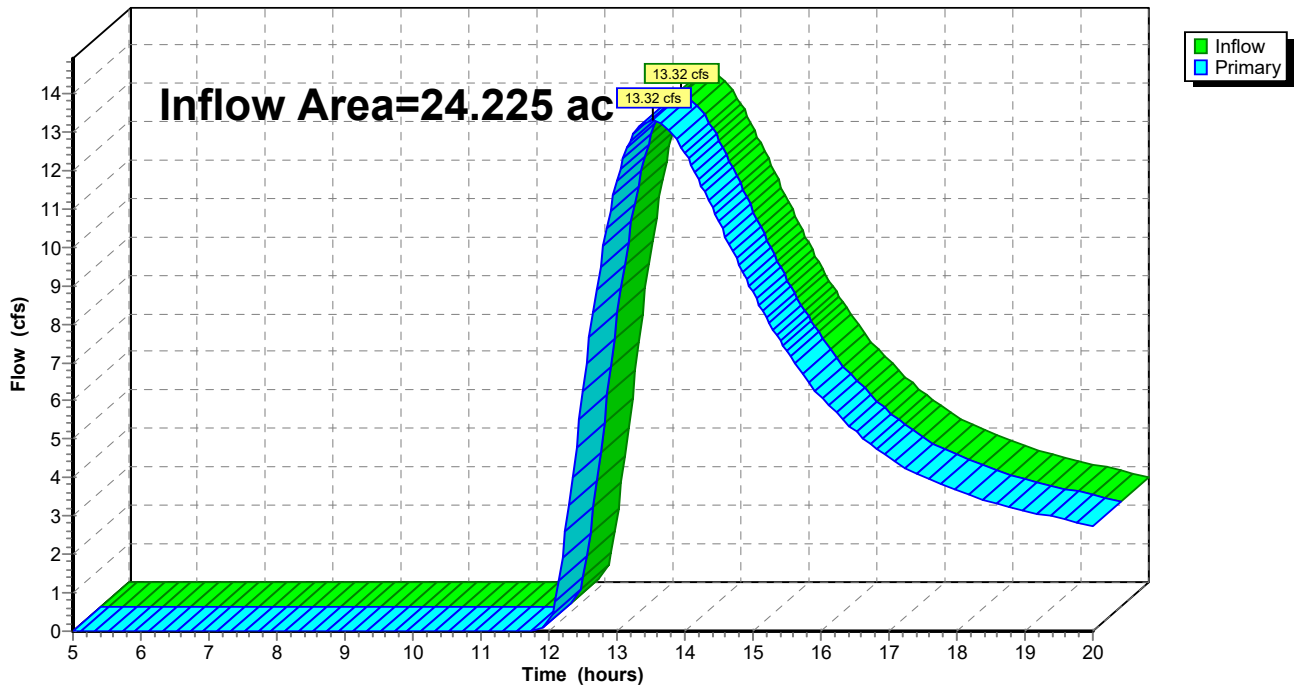
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 2.16" for 7 DAY-100YR event
Inflow = 13.32 cfs @ 13.53 hrs, Volume= 4.356 af
Primary = 13.32 cfs @ 13.53 hrs, Volume= 4.356 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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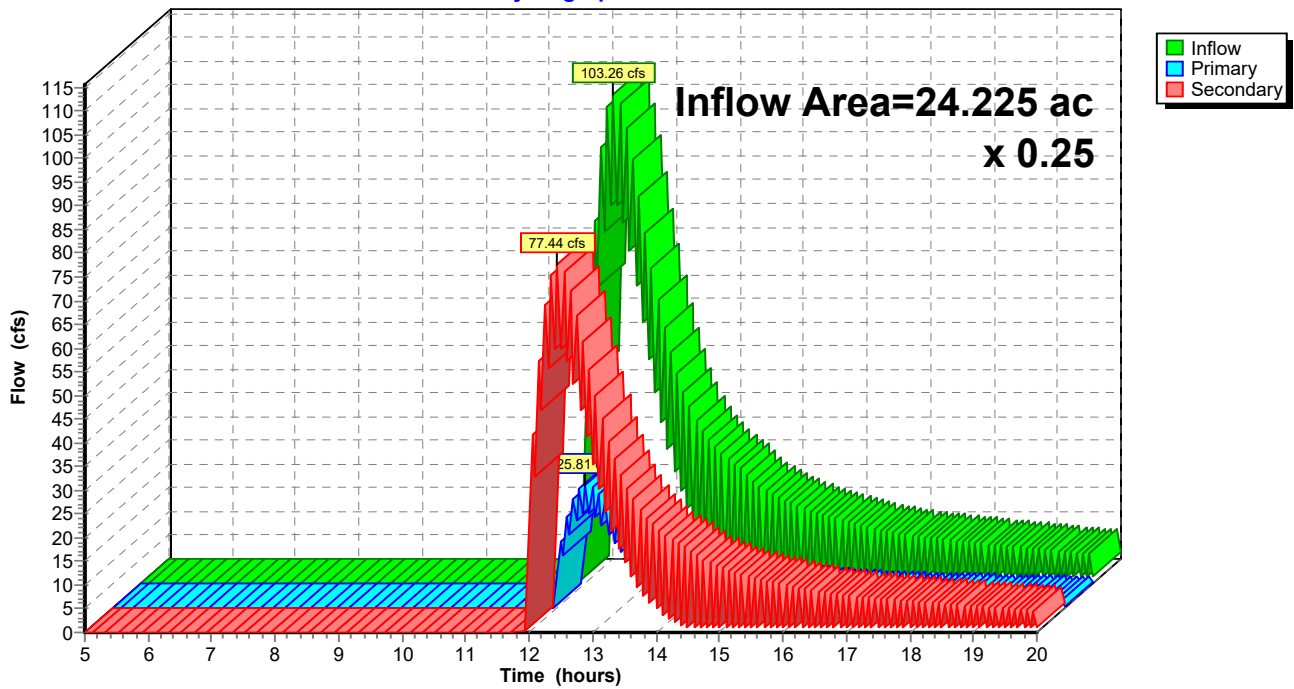
Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 6.18" for 7 DAY-100YR event
Inflow = 103.26 cfs @ 12.45 hrs, Volume= 12.476 af
Primary = 25.81 cfs @ 12.45 hrs, Volume= 3.119 af, Atten= 75%, Lag= 0.0 min
Secondary = 77.44 cfs @ 12.45 hrs, Volume= 9.357 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>3.10"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=20.08 cfs 6.256 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>8.60"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=115.02 cfs 17.360 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.32' Max Vel=3.26 fps Inflow=30.18 cfs 3.963 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=28.46 cfs 3.942 af

Pond 1P: PROPOSED POND Peak Elev=84.46' Storage=464,751 cf Inflow=118.71 cfs 15.832 af
Discarded=0.09 cfs 0.060 af Primary=18.73 cfs 6.355 af Outflow=18.82 cfs 6.415 af

Pond 2P: ROCK VOID Peak Elev=91.63' Storage=43,033 cf Inflow=115.02 cfs 17.360 af
Discarded=0.57 cfs 0.525 af Primary=120.73 cfs 15.853 af Outflow=121.30 cfs 16.379 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=20.08 cfs 6.256 af
Primary=20.08 cfs 6.256 af

Link 2L: POST OUTFALL x 0.25 Inflow=120.73 cfs 15.853 af
Primary=30.18 cfs 3.963 af Secondary=90.55 cfs 11.890 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 20.08 cfs @ 13.45 hrs, Volume= 6.256 af, Depth> 3.10"

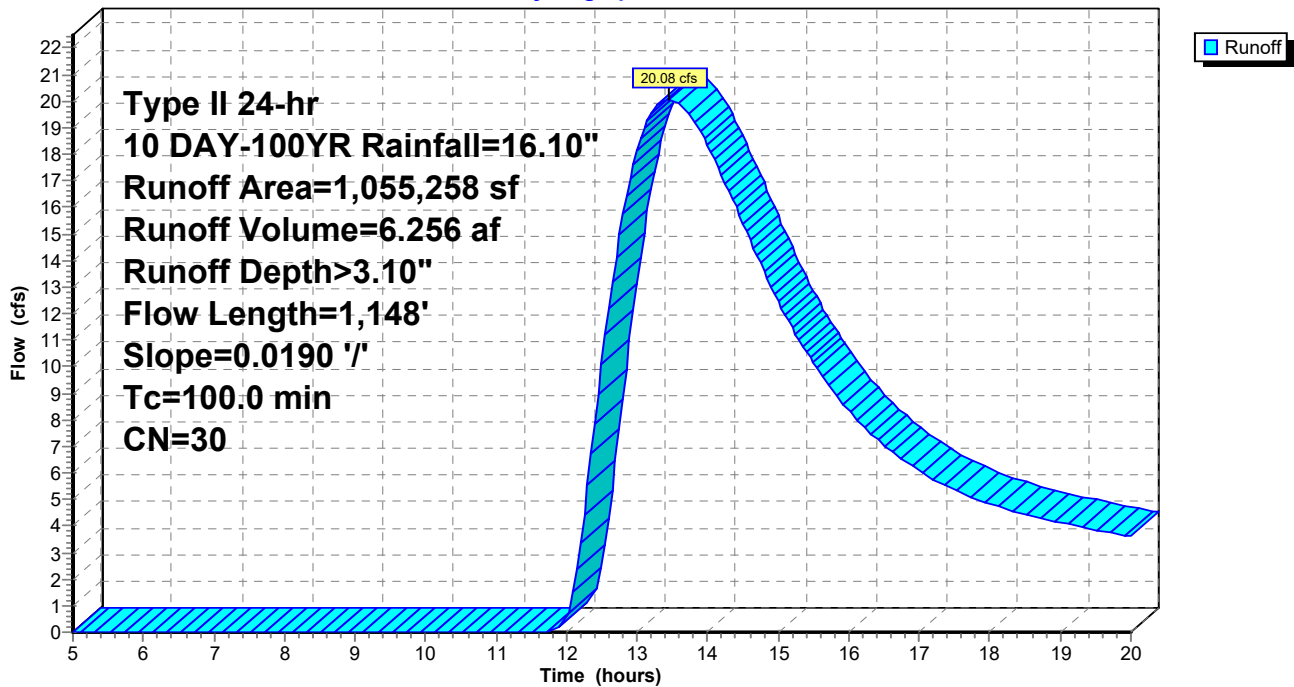
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 115.02 cfs @ 12.45 hrs, Volume= 17.360 af, Depth> 8.60"

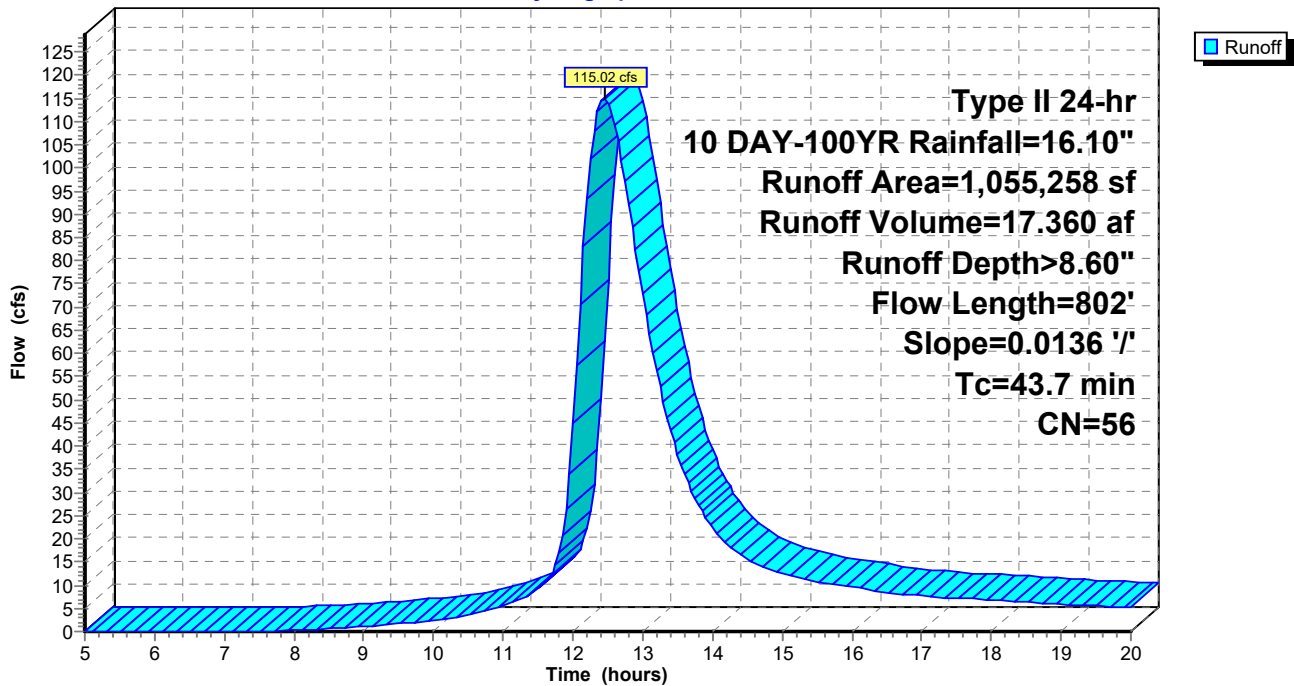
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.96" for 10 DAY-100YR event
Inflow = 30.18 cfs @ 12.40 hrs, Volume= 3.963 af
Outflow = 28.46 cfs @ 12.55 hrs, Volume= 3.942 af, Atten= 6%, Lag= 8.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 6.6 min

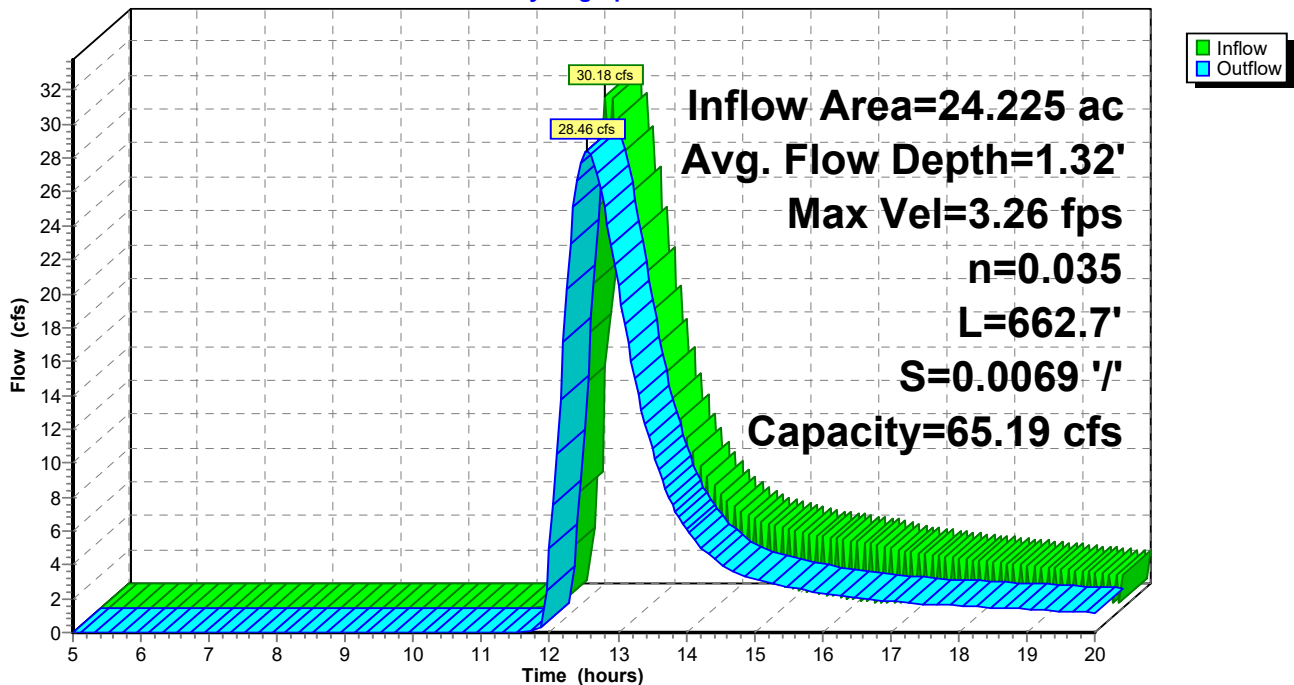
Peak Storage= 5,794 cf @ 12.49 hrs
Average Depth at Peak Storage= 1.32'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 ' / ' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 ' / '
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 7.84" for 10 DAY-100YR event
 Inflow = 118.71 cfs @ 12.50 hrs, Volume= 15.832 af
 Outflow = 18.82 cfs @ 14.21 hrs, Volume= 6.415 af, Atten= 84%, Lag= 102.8 min
 Discarded = 0.09 cfs @ 14.21 hrs, Volume= 0.060 af
 Primary = 18.73 cfs @ 14.21 hrs, Volume= 6.355 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 84.46' @ 14.21 hrs Surf.Area= 98,090 sf Storage= 464,751 cf

Plug-Flow detention time= 216.4 min calculated for 6.415 af (41% of inflow)
 Center-of-Mass det. time= 136.4 min (960.4 - 823.9)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

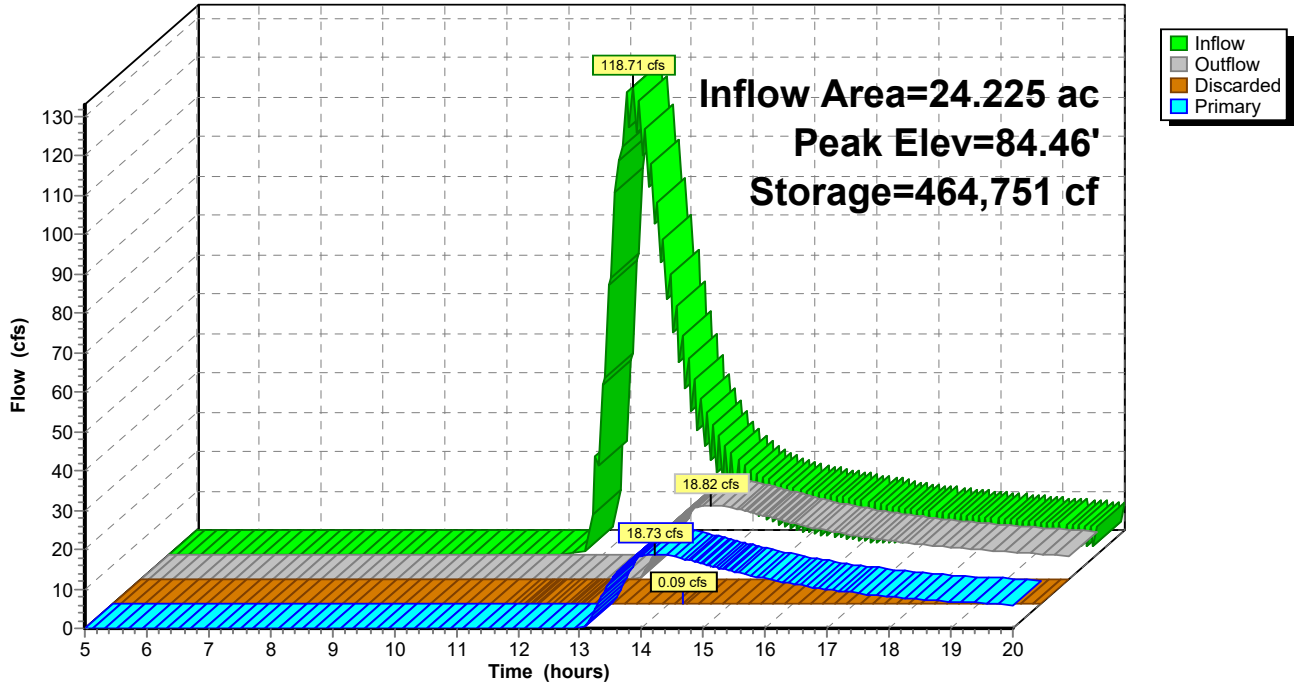
Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.09 cfs @ 14.21 hrs HW=84.46' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=18.73 cfs @ 14.21 hrs HW=84.46' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Weir Controls 18.73 cfs @ 3.25 fps)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 8.60" for 10 DAY-100YR event
 Inflow = 115.02 cfs @ 12.45 hrs, Volume= 17.360 af
 Outflow = 121.30 cfs @ 12.40 hrs, Volume= 16.379 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.57 cfs @ 9.50 hrs, Volume= 0.525 af
 Primary = 120.73 cfs @ 12.40 hrs, Volume= 15.853 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.63' @ 12.40 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 28.8 min calculated for 16.324 af (94% of inflow)
 Center-of-Mass det. time= 9.7 min (823.8 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

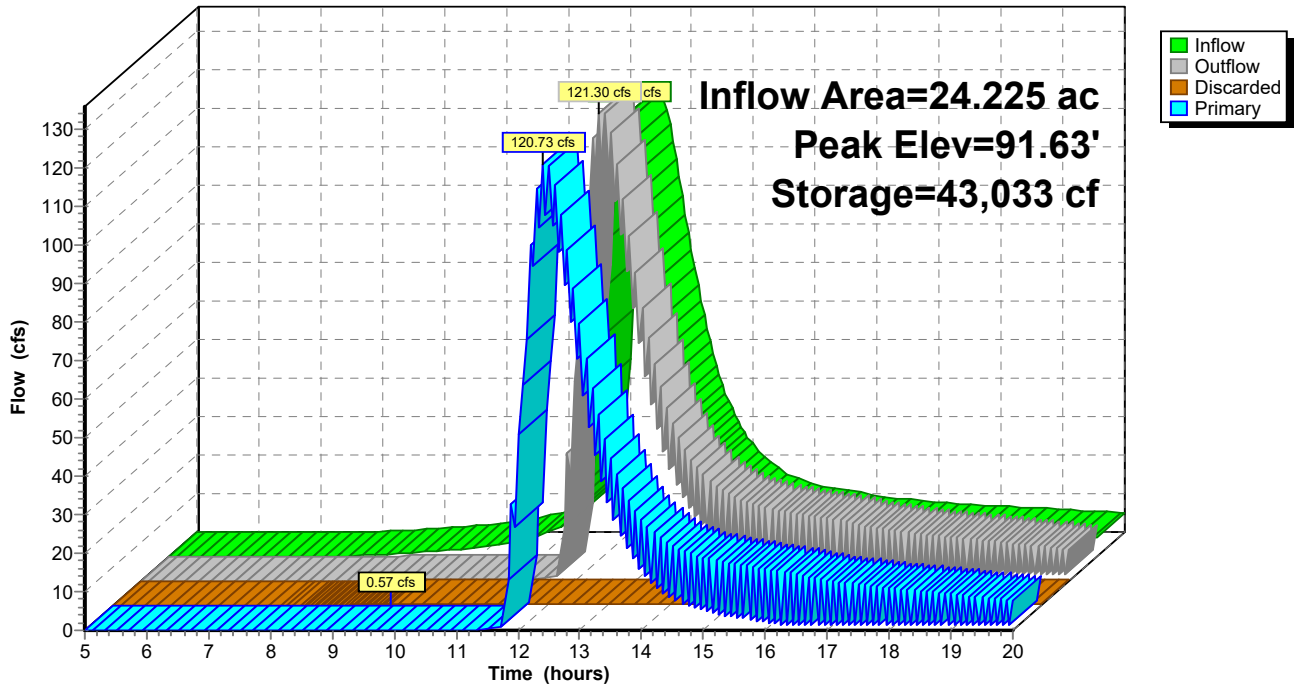
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 9.50 hrs HW=89.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=120.73 cfs @ 12.40 hrs HW=91.63' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 120.73 cfs @ 4.37 fps)

Pond 2P: ROCK VOID

Hydrograph



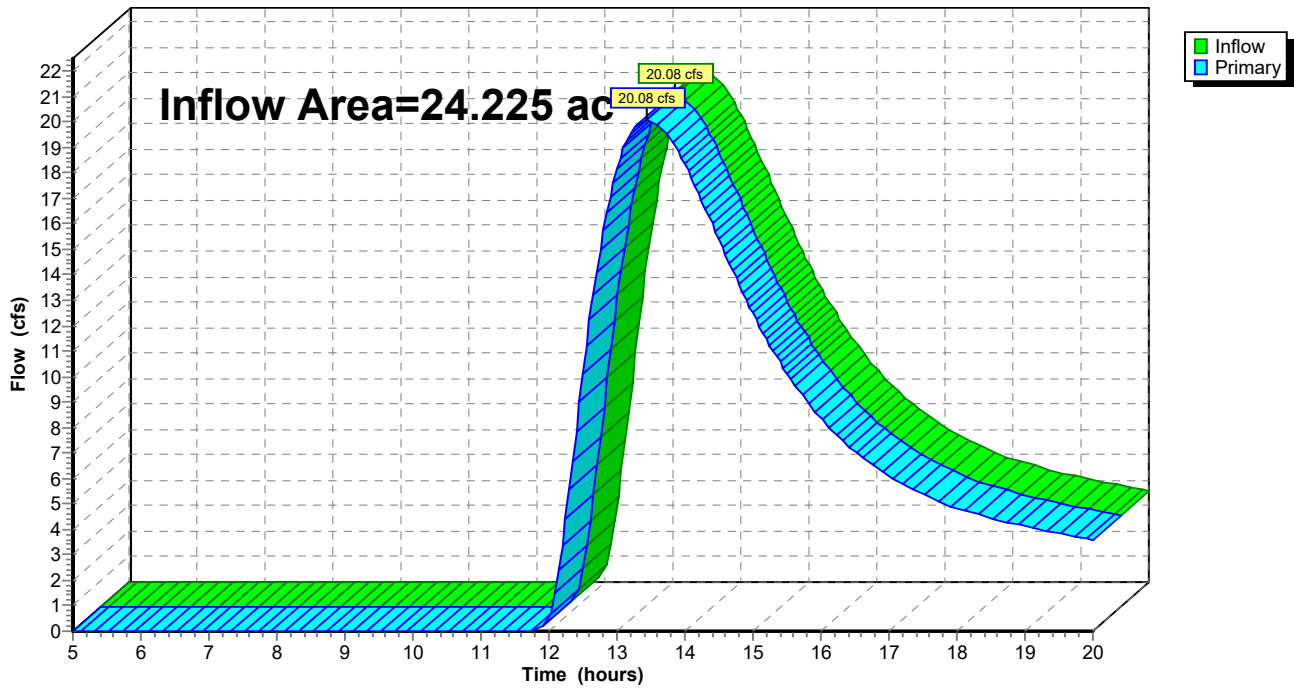
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 3.10" for 10 DAY-100YR event
Inflow = 20.08 cfs @ 13.45 hrs, Volume= 6.256 af
Primary = 20.08 cfs @ 13.45 hrs, Volume= 6.256 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



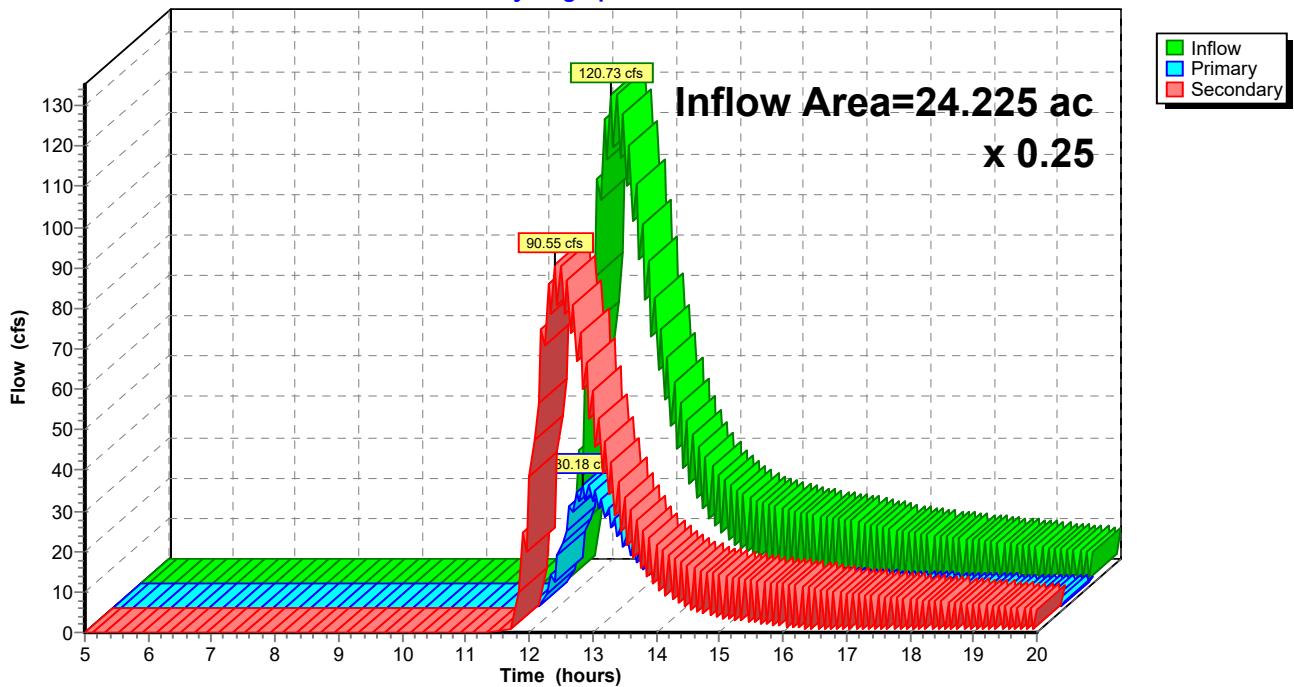
Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 7.85" for 10 DAY-100YR event
Inflow = 120.73 cfs @ 12.40 hrs, Volume= 15.853 af
Primary = 30.18 cfs @ 12.40 hrs, Volume= 3.963 af, Atten= 75%, Lag= 0.0 min
Secondary = 90.55 cfs @ 12.40 hrs, Volume= 11.890 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Prepared by HP Inc.

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.10"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=0.40 cfs 0.193 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>1.79"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=22.14 cfs 3.614 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.47' Max Vel=1.85 fps Inflow=5.80 cfs 0.569 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=4.26 cfs 0.560 af

Pond 1P: PROPOSED POND Peak Elev=80.48' Storage=96,654 cf Inflow=17.73 cfs 2.268 af
Discarded=0.08 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.047 af

Pond 2P: ROCK VOID Peak Elev=90.48' Storage=43,033 cf Inflow=22.14 cfs 3.614 af
Discarded=0.57 cfs 0.383 af Primary=23.20 cfs 2.277 af Outflow=23.77 cfs 2.660 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.40 cfs 0.193 af
Primary=0.40 cfs 0.193 af

Link 2L: POST OUTFALL x 0.25 Inflow=23.20 cfs 2.277 af
Primary=5.80 cfs 0.569 af Secondary=17.40 cfs 1.708 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.40 cfs @ 16.35 hrs, Volume= 0.193 af, Depth> 0.10"

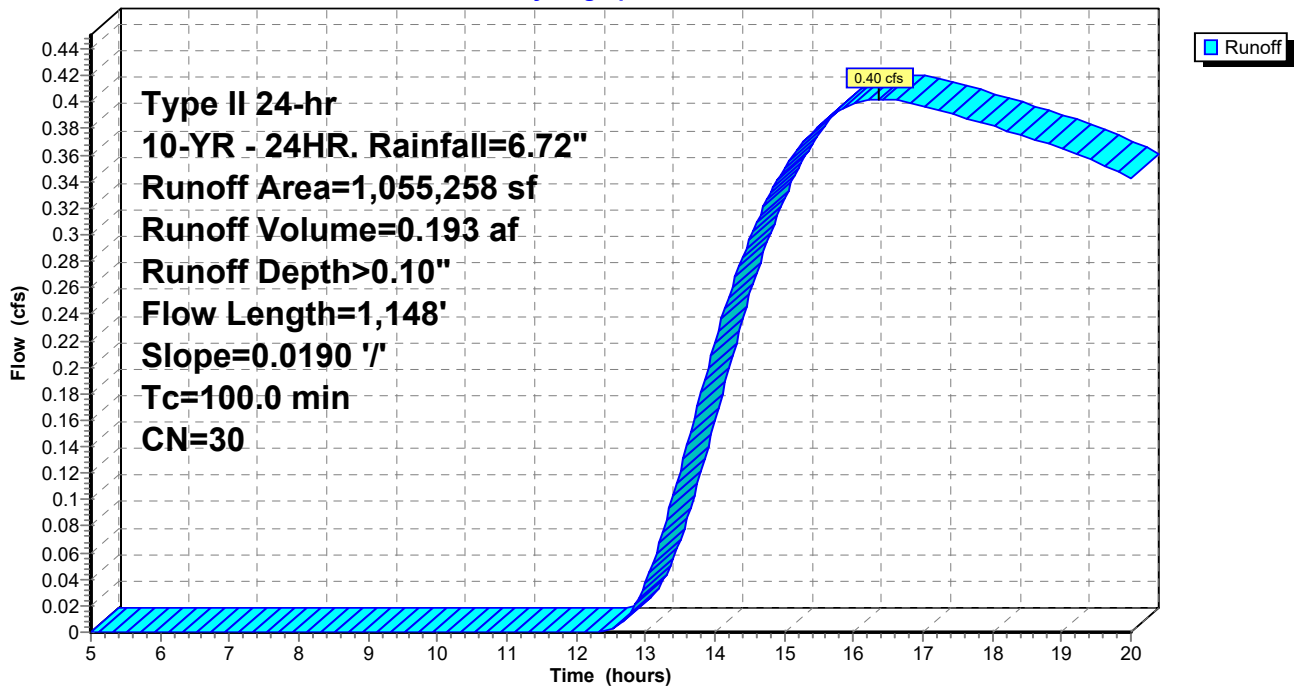
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 22.14 cfs @ 12.51 hrs, Volume= 3.614 af, Depth> 1.79"

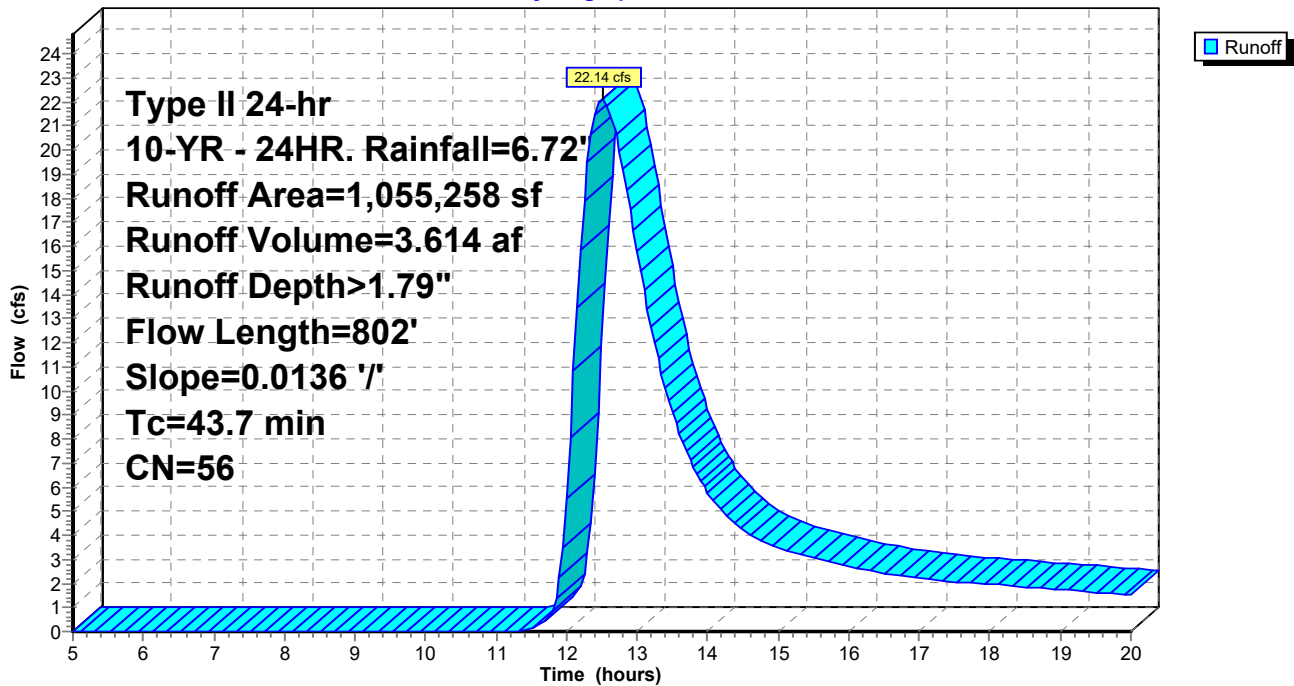
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.28" for 10-YR - 24HR. event
Inflow = 5.80 cfs @ 12.72 hrs, Volume= 0.569 af
Outflow = 4.26 cfs @ 13.00 hrs, Volume= 0.560 af, Atten= 27%, Lag= 17.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 11.3 min

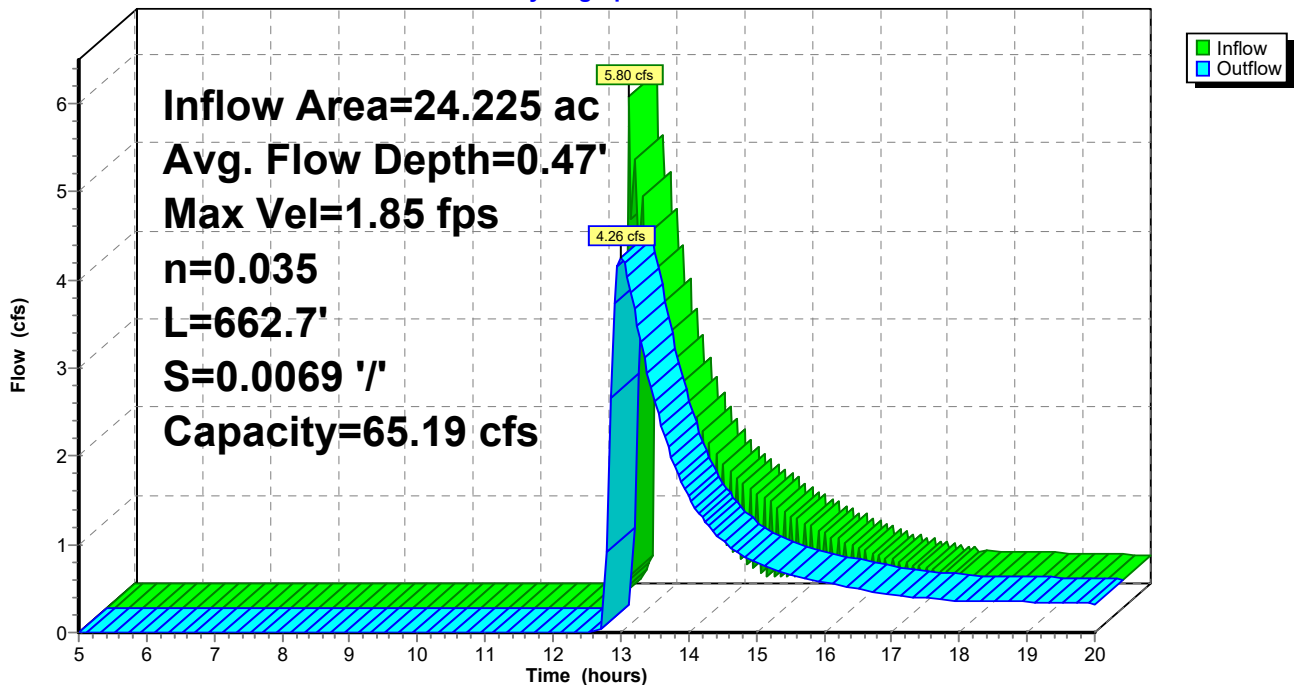
Peak Storage= 1,525 cf @ 12.90 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 ' / ' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 ' / '
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.12" for 10-YR - 24HR. event
 Inflow = 17.73 cfs @ 12.90 hrs, Volume= 2.268 af
 Outflow = 0.08 cfs @ 20.00 hrs, Volume= 0.047 af, Atten= 100%, Lag= 425.9 min
 Discarded = 0.08 cfs @ 20.00 hrs, Volume= 0.047 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.48' @ 20.00 hrs Surf.Area= 84,751 sf Storage= 96,654 cf

Plug-Flow detention time= 222.6 min calculated for 0.047 af (2% of inflow)
 Center-of-Mass det. time= 104.8 min (983.3 - 878.5)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

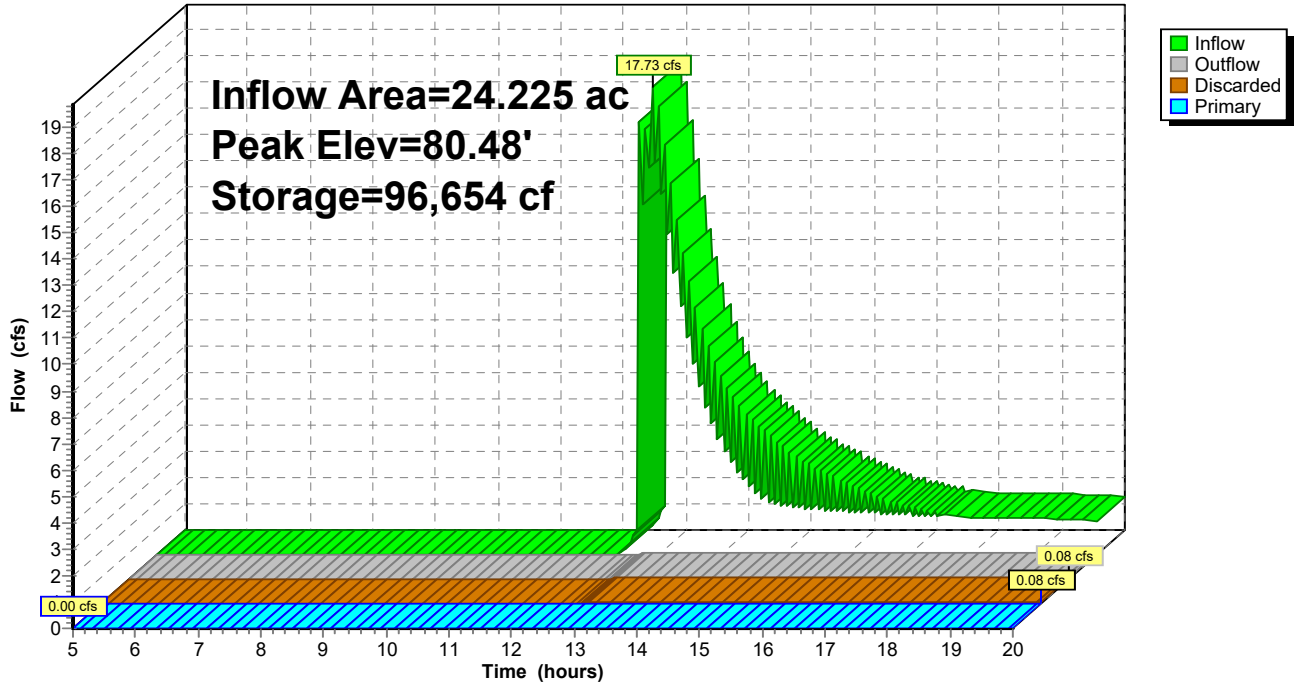
Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.08 cfs @ 20.00 hrs HW=80.48' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.79" for 10-YR - 24HR. event
 Inflow = 22.14 cfs @ 12.51 hrs, Volume= 3.614 af
 Outflow = 23.77 cfs @ 12.72 hrs, Volume= 2.660 af, Atten= 0%, Lag= 12.5 min
 Discarded = 0.57 cfs @ 12.05 hrs, Volume= 0.383 af
 Primary = 23.20 cfs @ 12.72 hrs, Volume= 2.277 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.48' @ 12.70 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 106.4 min calculated for 2.651 af (73% of inflow)
 Center-of-Mass det. time= 42.4 min (887.8 - 845.3)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

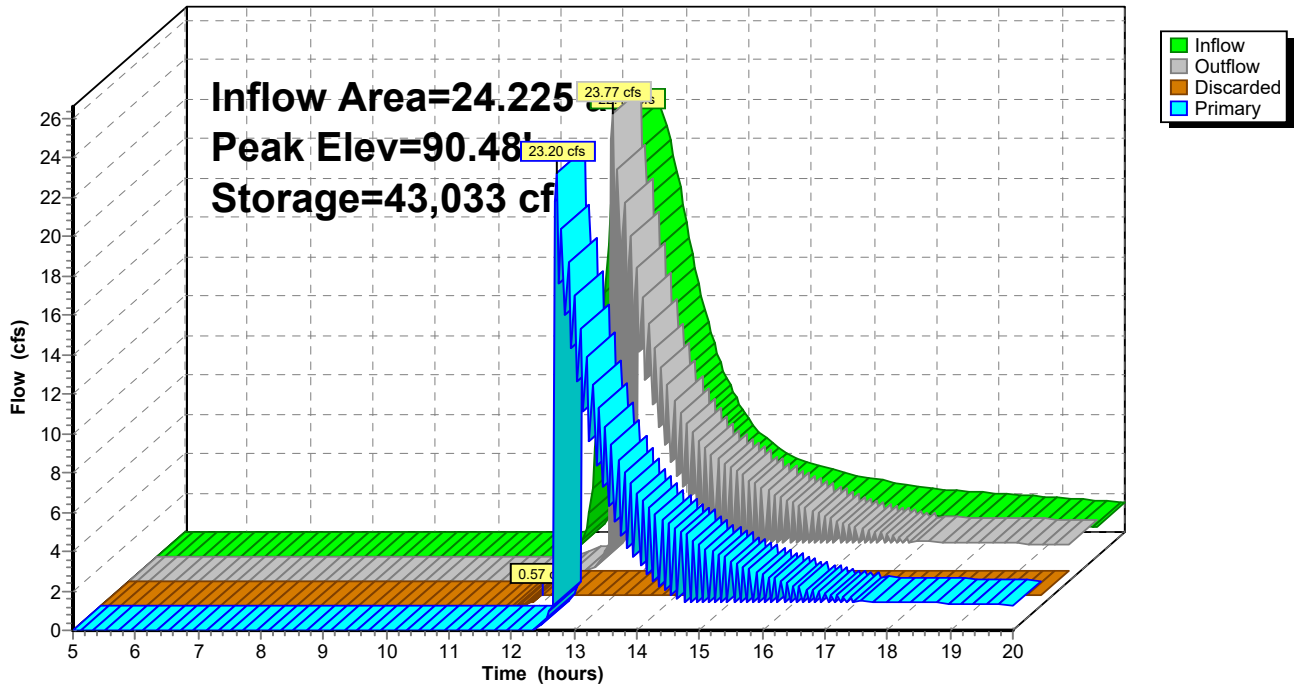
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 12.05 hrs HW=89.81' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=20.41 cfs @ 12.72 hrs HW=90.46' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 20.41 cfs @ 2.28 fps)

Pond 2P: ROCK VOID

Hydrograph



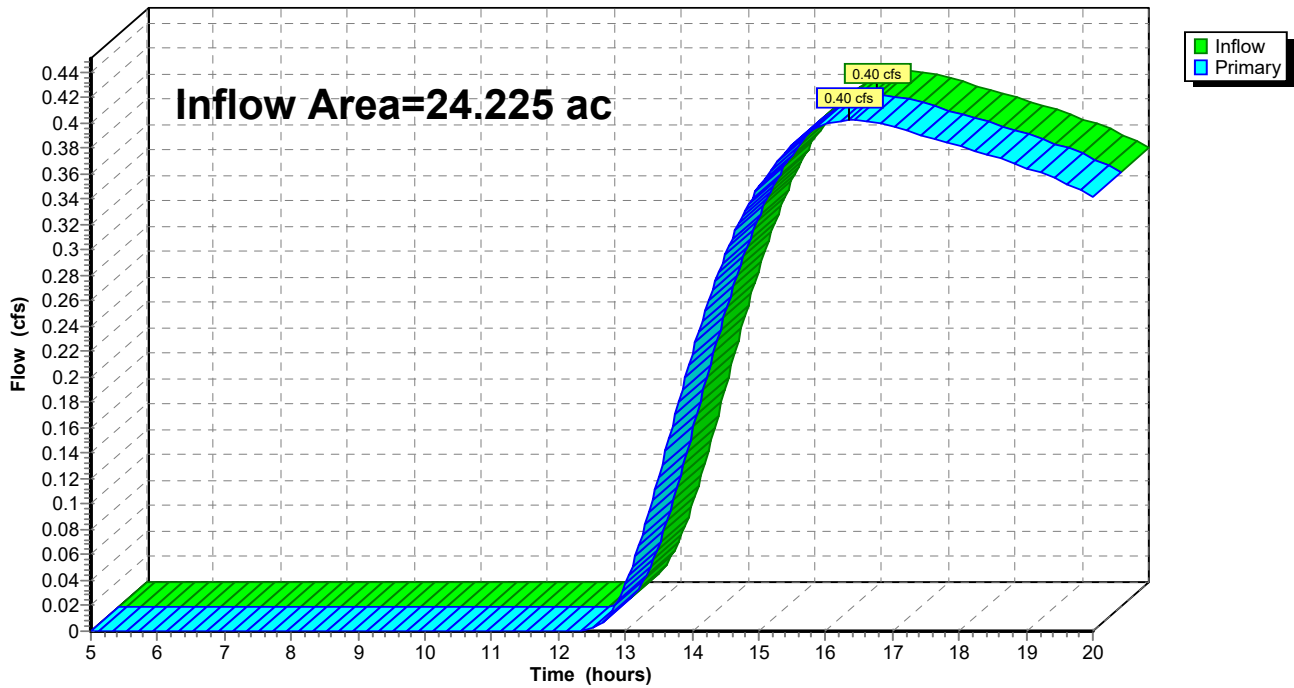
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.10" for 10-YR - 24HR. event
Inflow = 0.40 cfs @ 16.35 hrs, Volume= 0.193 af
Primary = 0.40 cfs @ 16.35 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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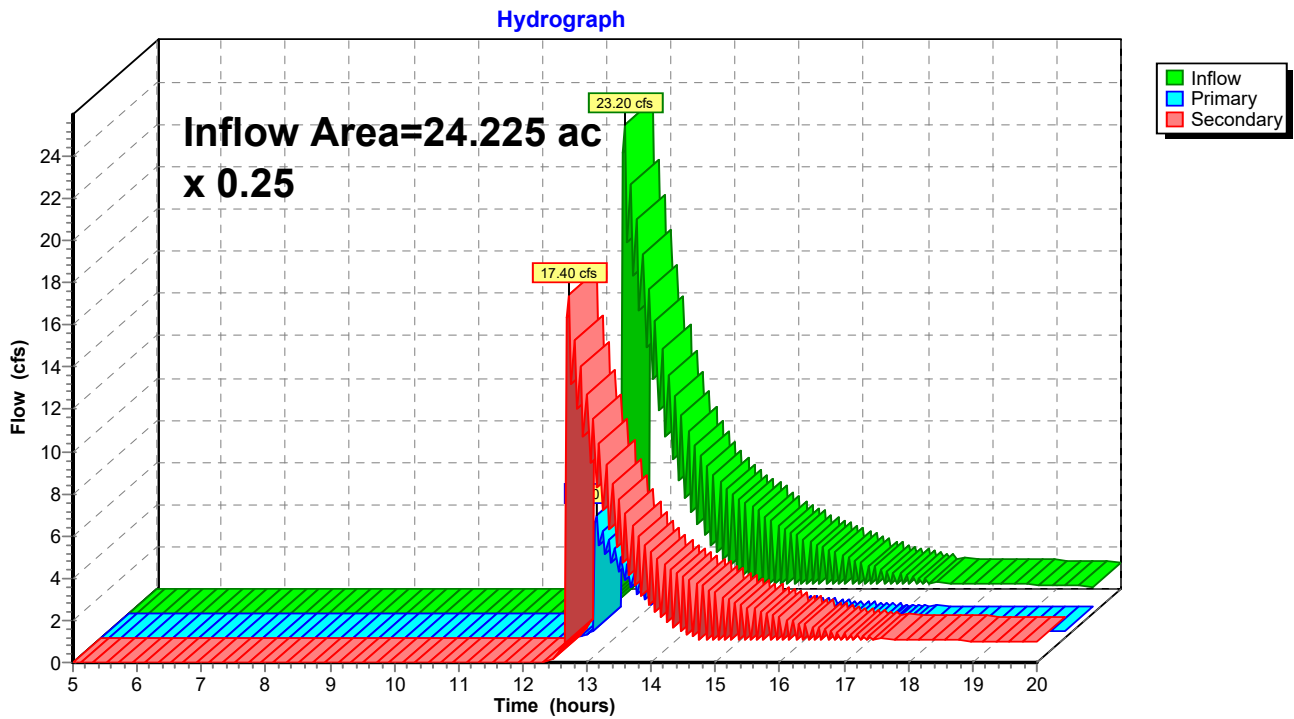
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Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.13" for 10-YR - 24HR. event
Inflow = 23.20 cfs @ 12.72 hrs, Volume= 2.277 af
Primary = 5.80 cfs @ 12.72 hrs, Volume= 0.569 af, Atten= 75%, Lag= 0.0 min
Secondary = 17.40 cfs @ 12.72 hrs, Volume= 1.708 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.27"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=1.16 cfs 0.544 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>2.52"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=32.24 cfs 5.081 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.63' Max Vel=2.19 fps Inflow=12.35 cfs 0.925 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=7.31 cfs 0.915 af

Pond 1P: PROPOSED POND Peak Elev=81.19' Storage=158,422 cf Inflow=41.98 cfs 3.689 af
Discarded=0.08 cfs 0.050 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.050 af

Pond 2P: ROCK VOID Peak Elev=90.85' Storage=43,033 cf Inflow=32.24 cfs 5.081 af
Discarded=0.57 cfs 0.395 af Primary=49.39 cfs 3.699 af Outflow=49.96 cfs 4.094 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=1.16 cfs 0.544 af
Primary=1.16 cfs 0.544 af

Link 2L: POST OUTFALL x 0.25 Inflow=49.39 cfs 3.699 af
Primary=12.35 cfs 0.925 af Secondary=37.04 cfs 2.774 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.16 cfs @ 14.57 hrs, Volume= 0.544 af, Depth> 0.27"

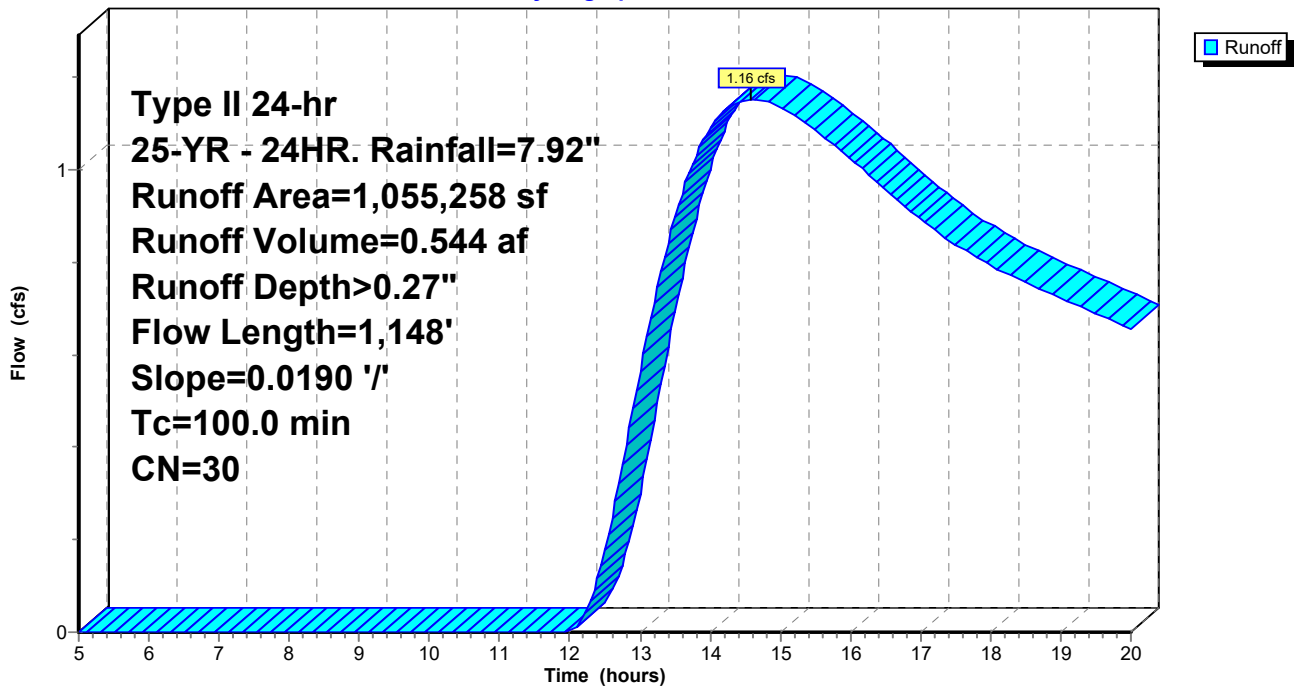
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 32.24 cfs @ 12.49 hrs, Volume= 5.081 af, Depth> 2.52"

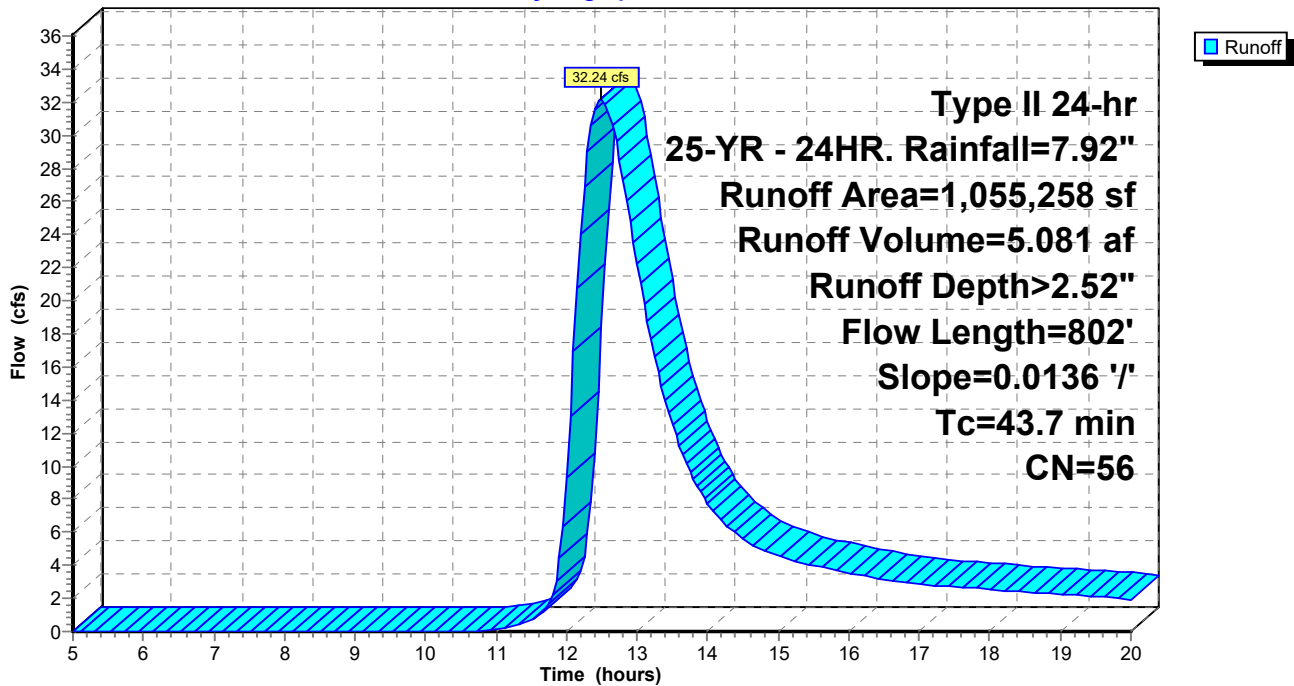
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.46" for 25-YR - 24HR. event
Inflow = 12.35 cfs @ 12.50 hrs, Volume= 0.925 af
Outflow = 7.31 cfs @ 12.78 hrs, Volume= 0.915 af, Atten= 41%, Lag= 16.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 9.8 min

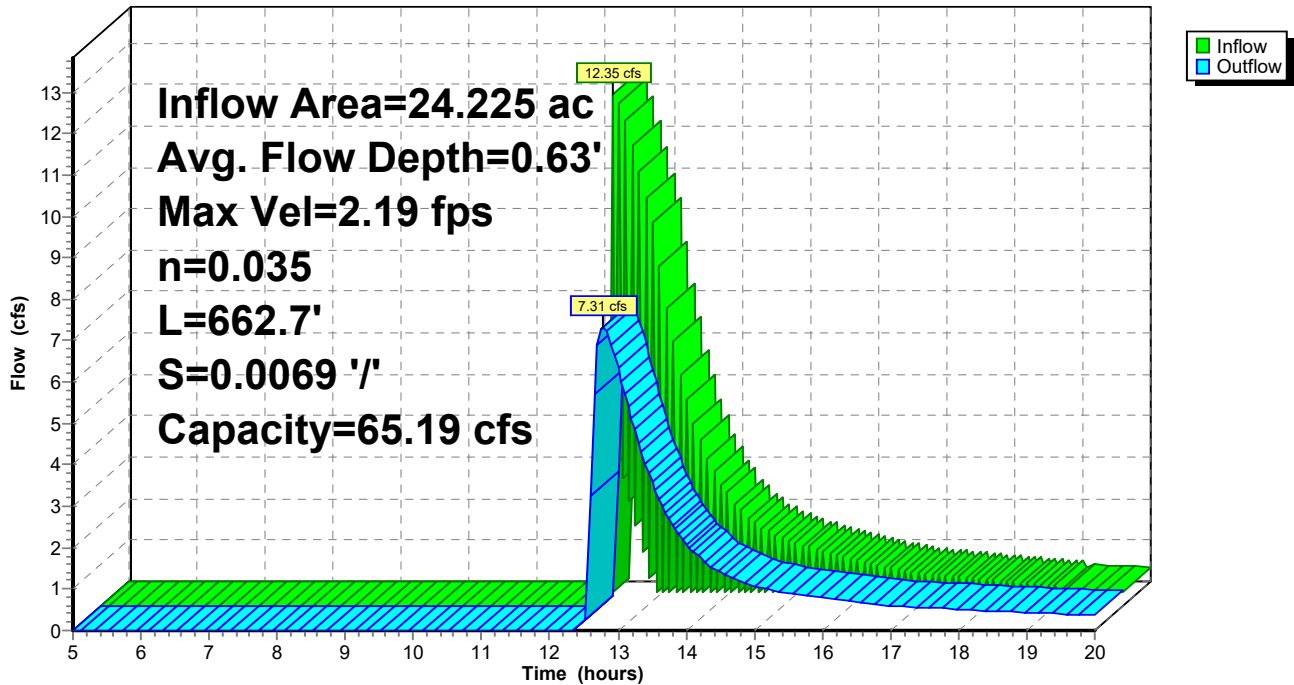
Peak Storage= 2,214 cf @ 12.70 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 ' ' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 ' '
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.83" for 25-YR - 24HR. event
 Inflow = 41.98 cfs @ 12.70 hrs, Volume= 3.689 af
 Outflow = 0.08 cfs @ 20.00 hrs, Volume= 0.050 af, Atten= 100%, Lag= 438.0 min
 Discarded = 0.08 cfs @ 20.00 hrs, Volume= 0.050 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 81.19' @ 20.00 hrs Surf.Area= 87,928 sf Storage= 158,422 cf

Plug-Flow detention time= 229.5 min calculated for 0.050 af (1% of inflow)
 Center-of-Mass det. time= 120.5 min (977.7 - 857.2)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

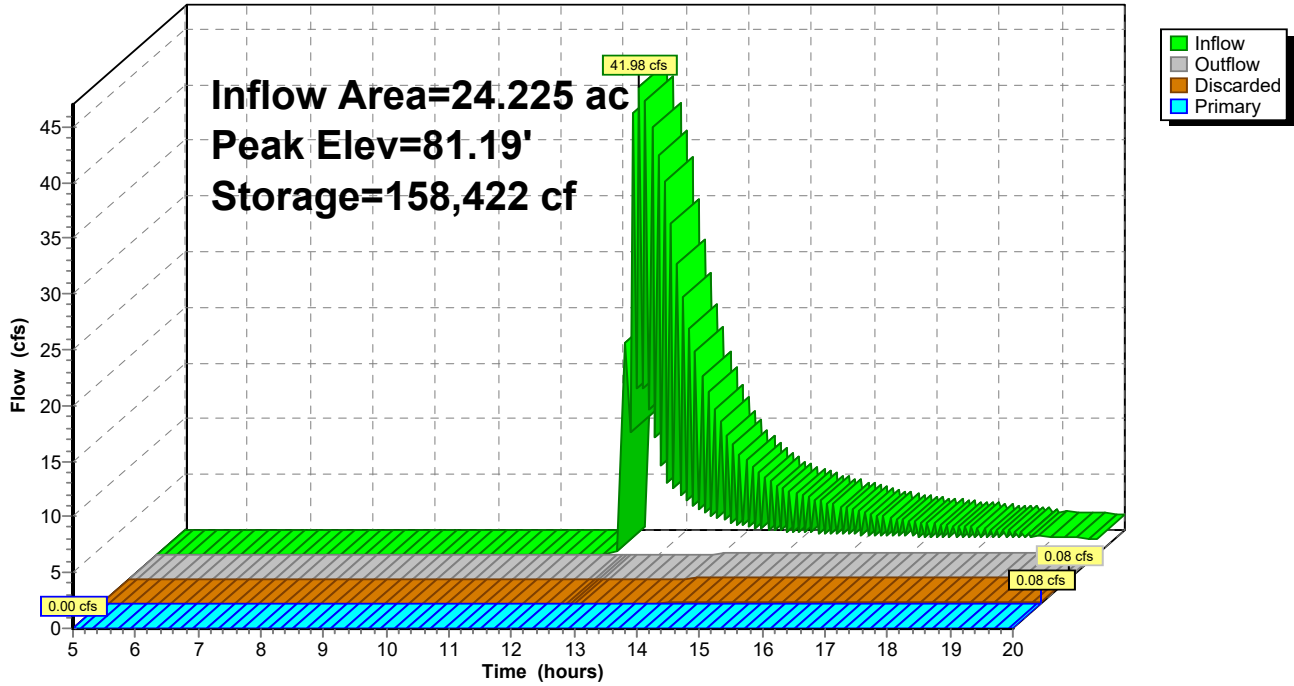
Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.08 cfs @ 20.00 hrs HW=81.19' (Free Discharge)
 ↑1=**Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=**Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 2.52" for 25-YR - 24HR. event
 Inflow = 32.24 cfs @ 12.49 hrs, Volume= 5.081 af
 Outflow = 49.96 cfs @ 12.50 hrs, Volume= 4.094 af, Atten= 0%, Lag= 0.6 min
 Discarded = 0.57 cfs @ 12.00 hrs, Volume= 0.395 af
 Primary = 49.39 cfs @ 12.50 hrs, Volume= 3.699 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.85' @ 12.50 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 77.5 min calculated for 4.094 af (81% of inflow)
 Center-of-Mass det. time= 25.5 min (864.1 - 838.6)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

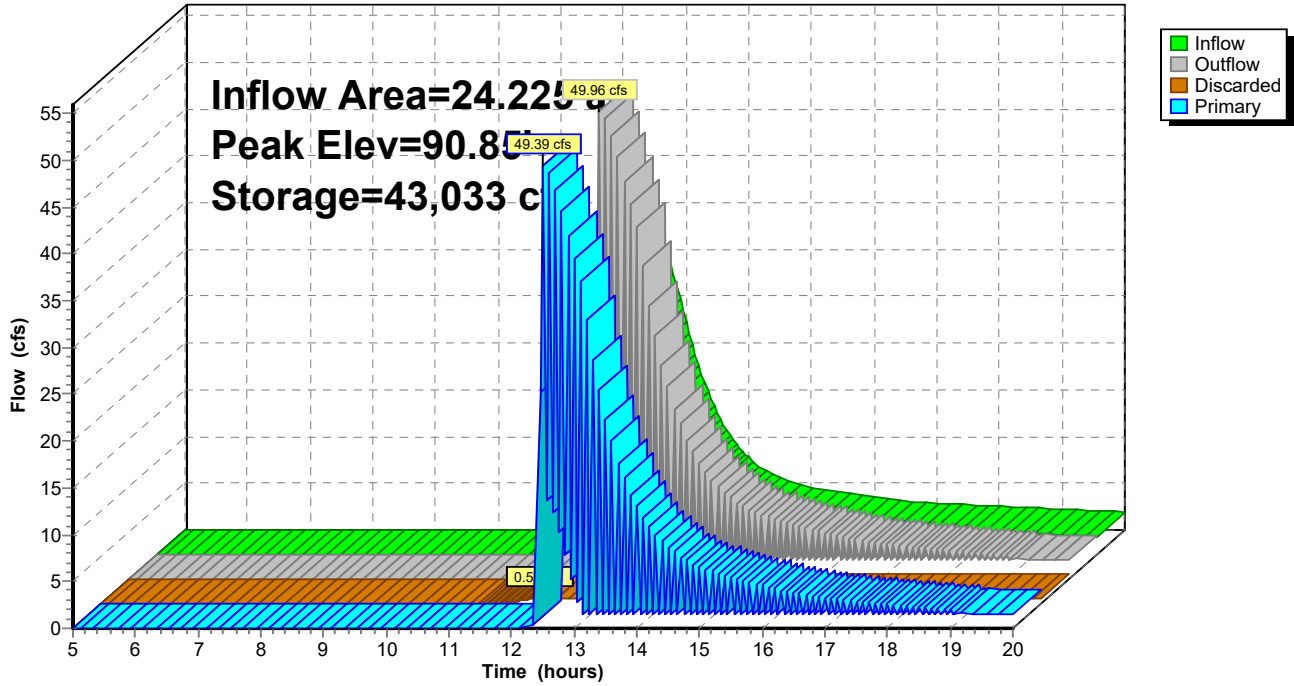
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 12.00 hrs HW=89.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=49.39 cfs @ 12.50 hrs HW=90.85' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 49.39 cfs @ 3.24 fps)

Pond 2P: ROCK VOID

Hydrograph



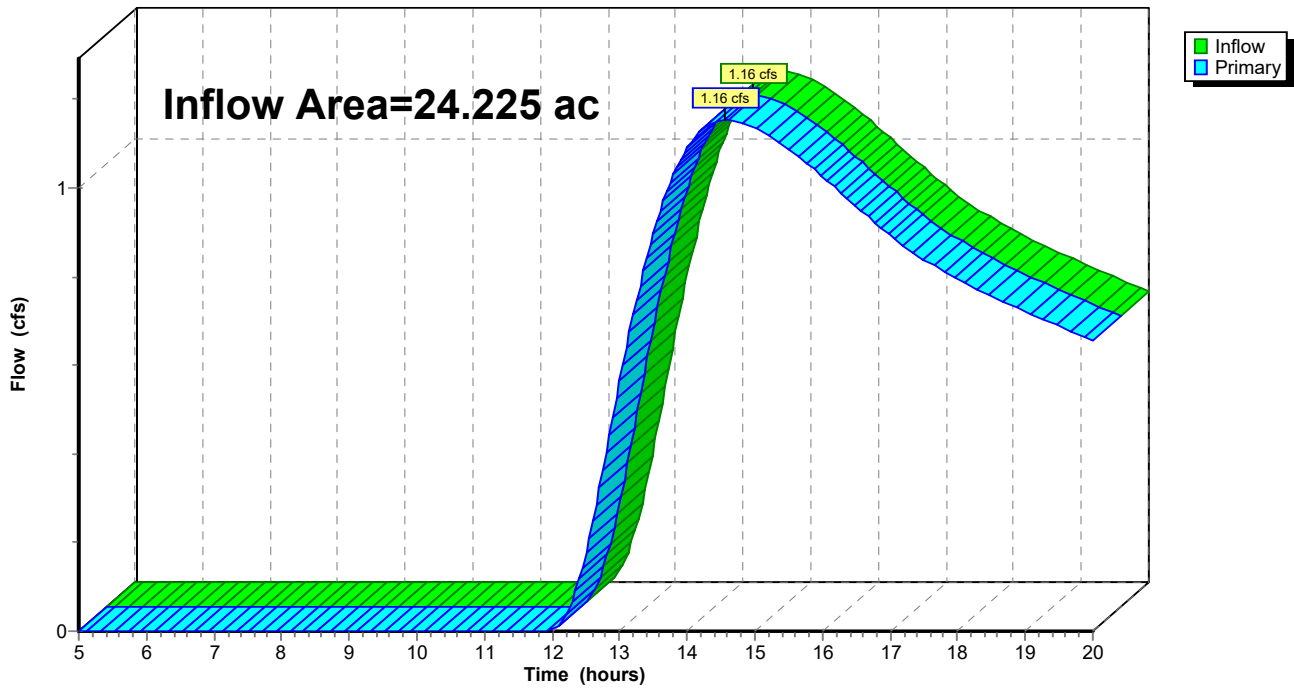
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.27" for 25-YR - 24HR. event
Inflow = 1.16 cfs @ 14.57 hrs, Volume= 0.544 af
Primary = 1.16 cfs @ 14.57 hrs, Volume= 0.544 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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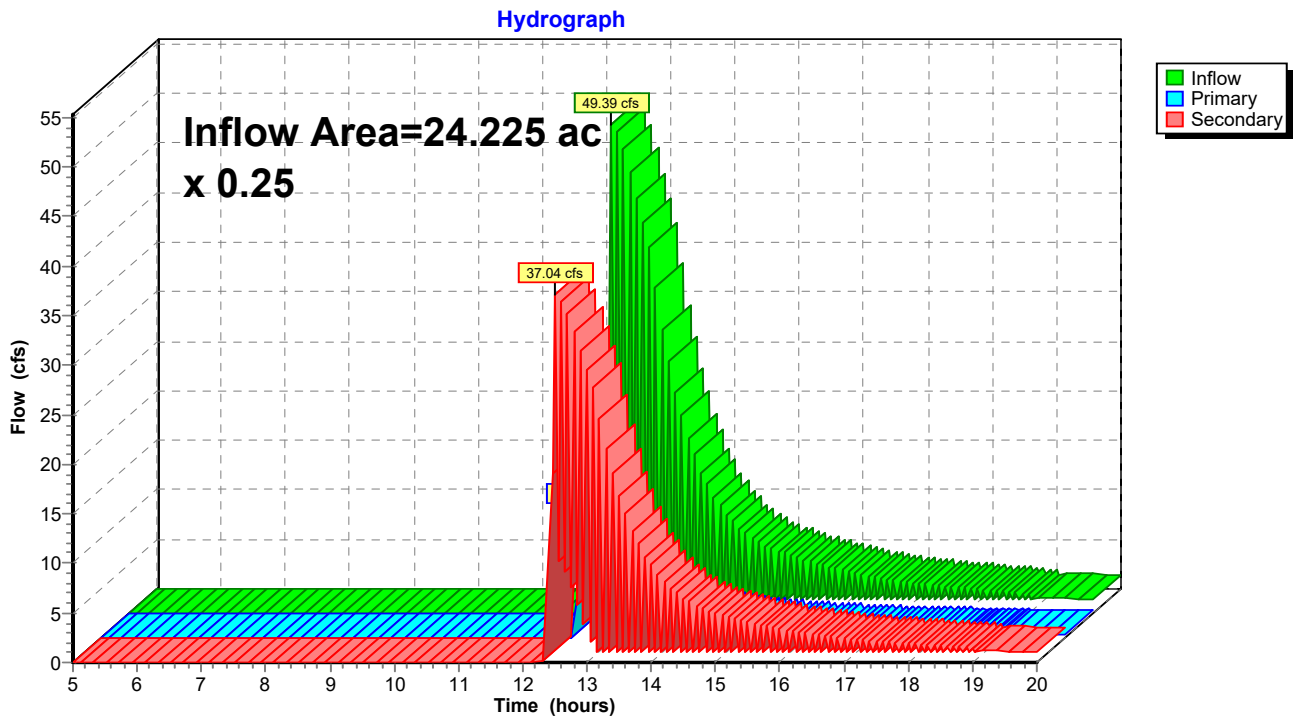
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Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.83" for 25-YR - 24HR. event
Inflow = 49.39 cfs @ 12.50 hrs, Volume= 3.699 af
Primary = 12.35 cfs @ 12.50 hrs, Volume= 0.925 af, Atten= 75%, Lag= 0.0 min
Secondary = 37.04 cfs @ 12.50 hrs, Volume= 2.774 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=0.00 cfs 0.000 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=79.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2P: ROCK VOID Peak Elev=89.80' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 2L: POST OUTFALL x 0.25 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

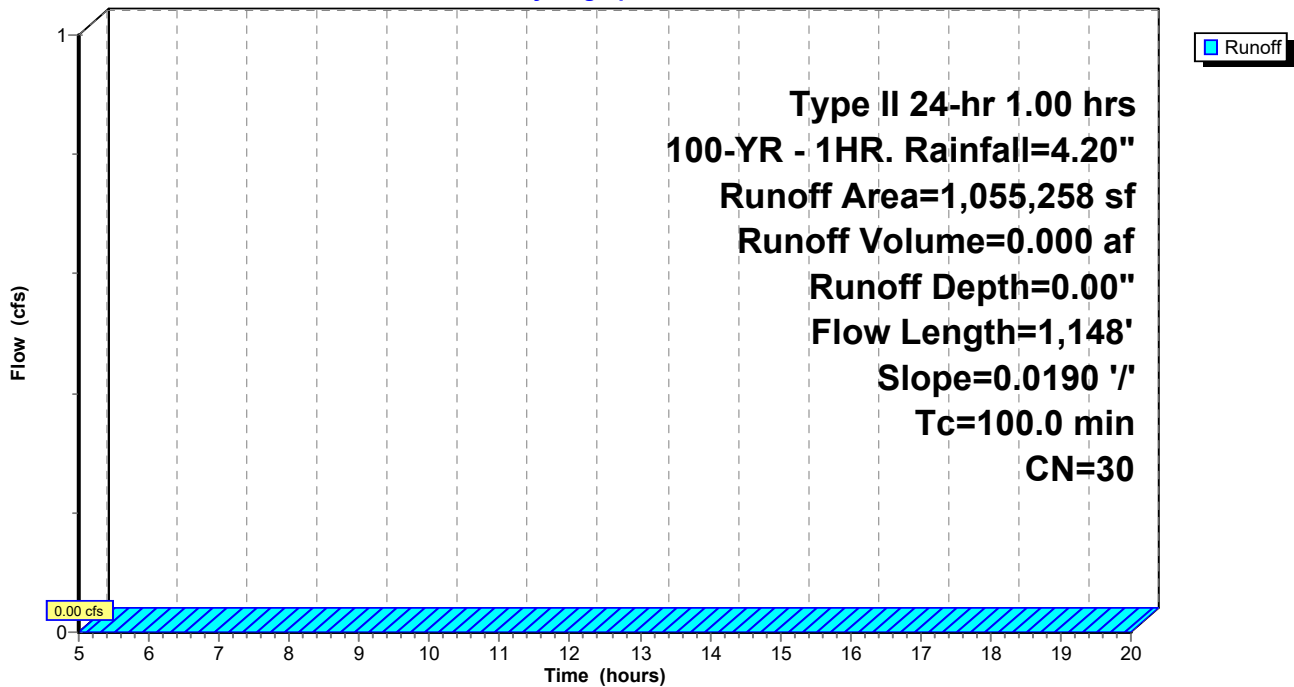
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

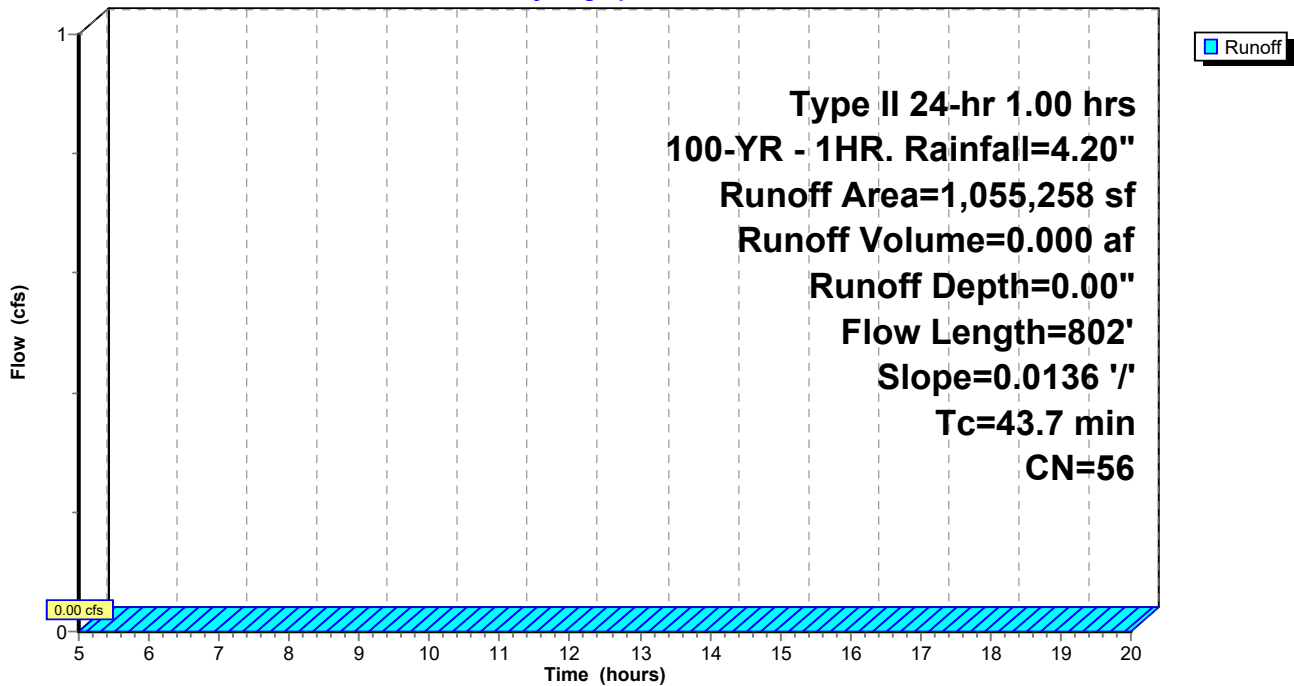
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

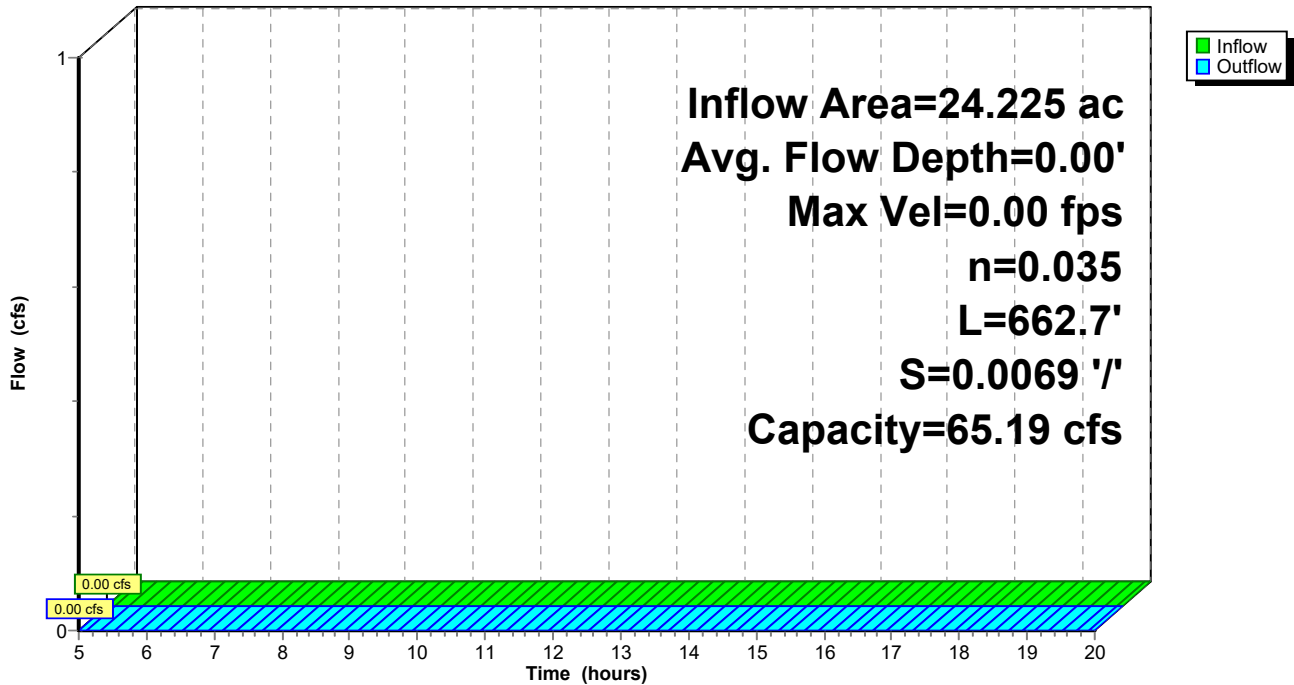
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 2.0 '/' Top Width= 12.00'
 Length= 662.7' Slope= 0.0069 '/'
 Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.30' @ 5.00 hrs Surf.Area= 79,551 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

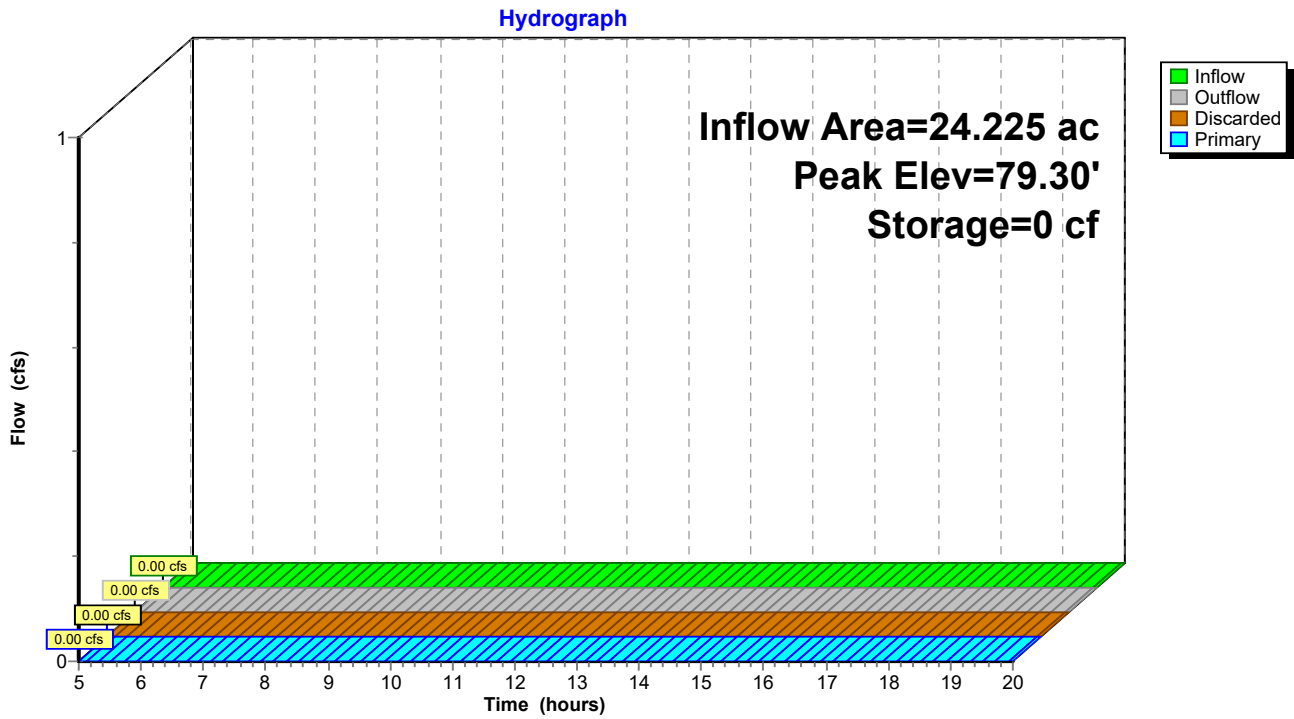
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.80' @ 5.00 hrs Surf.Area= 614,761 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

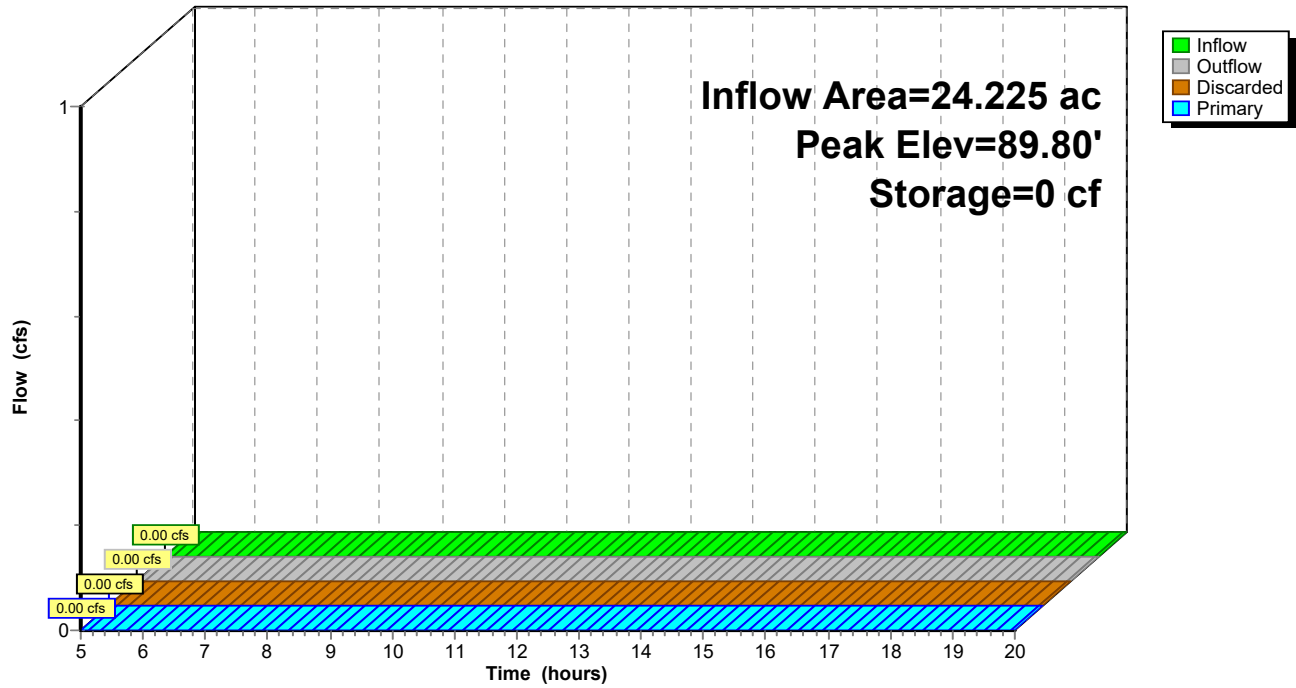
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=89.80' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=89.80' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: ROCK VOID

Hydrograph

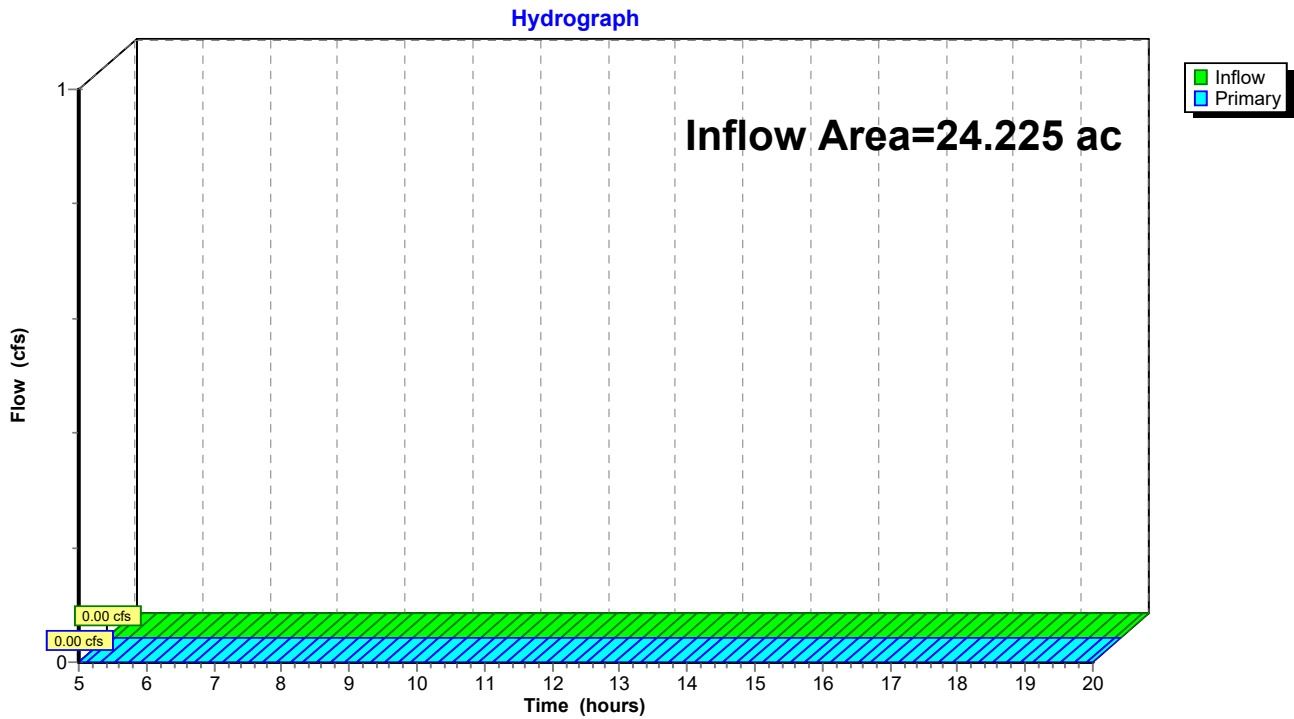


Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

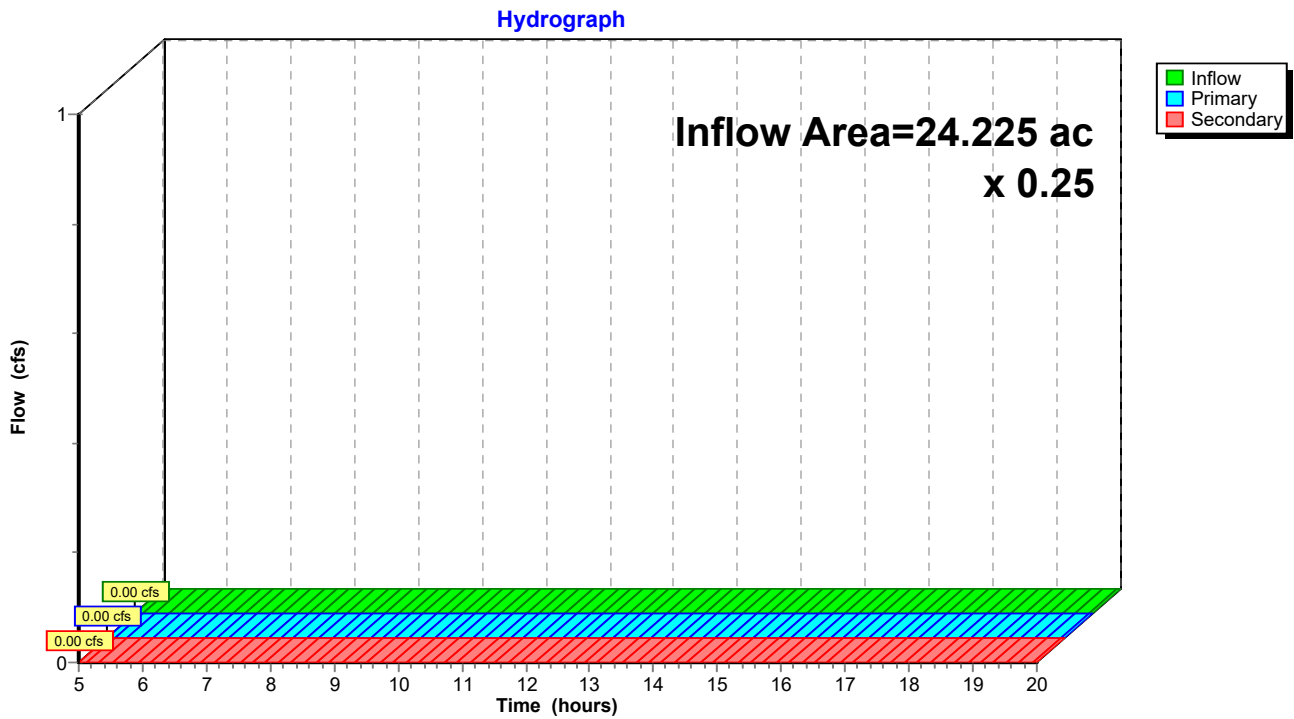


Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Prepared by HP Inc.

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.70"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=3.57 cfs 1.419 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>3.80"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=50.00 cfs 7.674 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.84' Max Vel=2.56 fps Inflow=13.30 cfs 1.564 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=12.16 cfs 1.552 af

Pond 1P: PROPOSED POND Peak Elev=82.42' Storage=269,601 cf Inflow=51.22 cfs 6.246 af
Discarded=0.09 cfs 0.053 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.053 af

Pond 2P: ROCK VOID Peak Elev=90.90' Storage=43,033 cf Inflow=50.00 cfs 7.674 af
Discarded=0.57 cfs 0.426 af Primary=53.19 cfs 6.258 af Outflow=53.76 cfs 6.684 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=3.57 cfs 1.419 af
Primary=3.57 cfs 1.419 af

Link 2L: POST OUTFALL x 0.25 Inflow=53.19 cfs 6.258 af
Primary=13.30 cfs 1.564 af Secondary=39.89 cfs 4.693 af

Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 3.57 cfs @ 13.88 hrs, Volume= 1.419 af, Depth> 0.70"

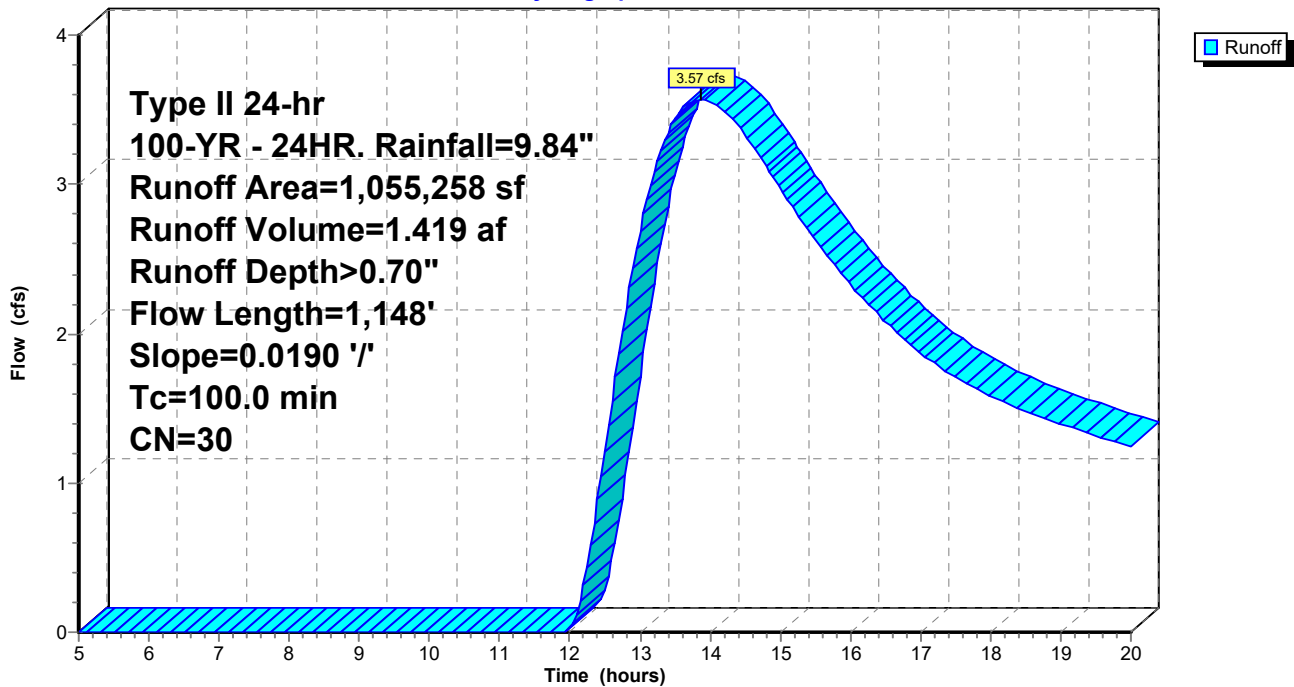
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 50.00 cfs @ 12.47 hrs, Volume= 7.674 af, Depth> 3.80"

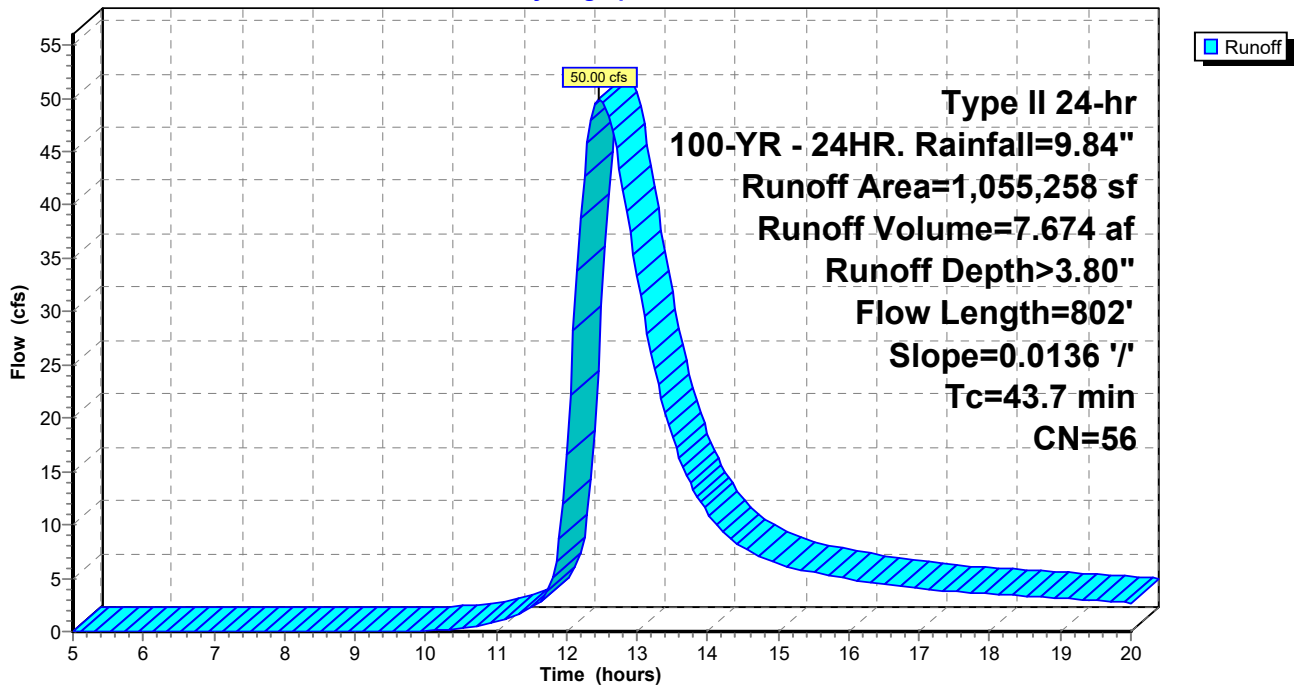
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

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Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.77" for 100-YR - 24HR. event
Inflow = 13.30 cfs @ 12.45 hrs, Volume= 1.564 af
Outflow = 12.16 cfs @ 12.63 hrs, Volume= 1.552 af, Atten= 9%, Lag= 10.6 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= 4.3 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 8.3 min

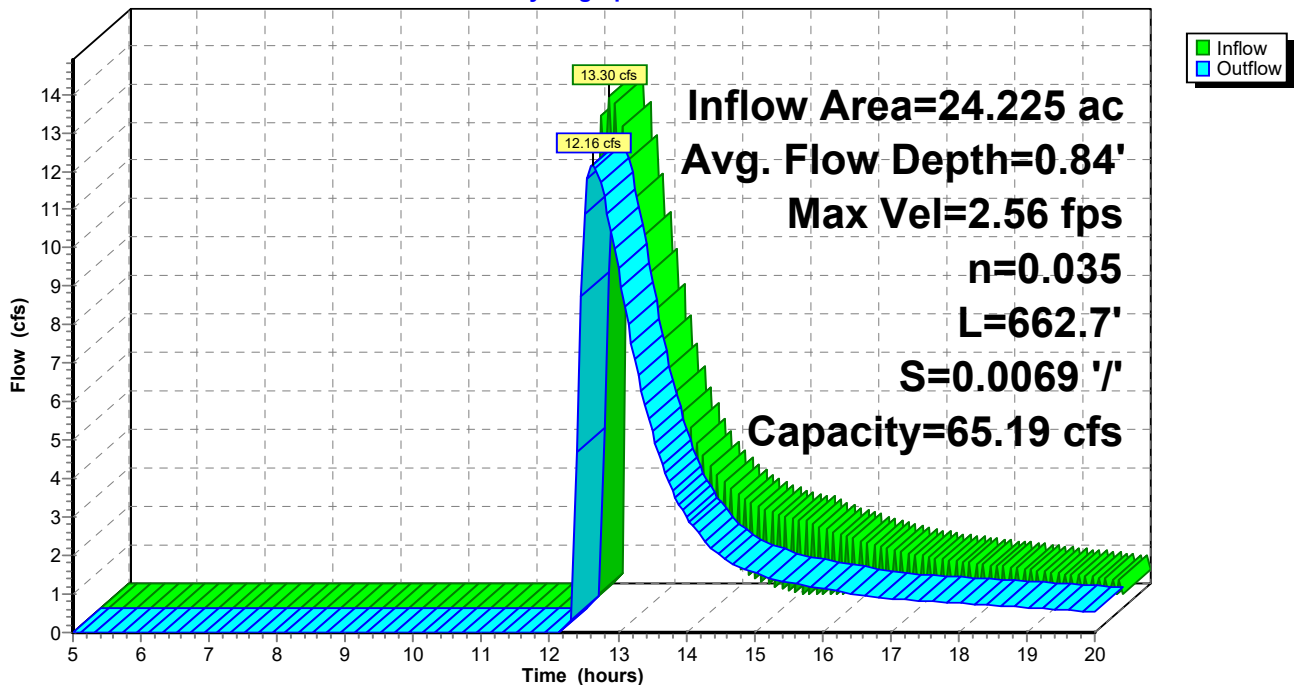
Peak Storage= 3,158 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 662.7' Slope= 0.0069 '/'
Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 3.09" for 100-YR - 24HR. event
 Inflow = 51.22 cfs @ 12.55 hrs, Volume= 6.246 af
 Outflow = 0.09 cfs @ 20.00 hrs, Volume= 0.053 af, Atten= 100%, Lag= 447.0 min
 Discarded = 0.09 cfs @ 20.00 hrs, Volume= 0.053 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 82.42' @ 20.00 hrs Surf.Area= 93,138 sf Storage= 269,601 cf

Plug-Flow detention time= 235.9 min calculated for 0.053 af (1% of inflow)
 Center-of-Mass det. time= 130.4 min (973.4 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

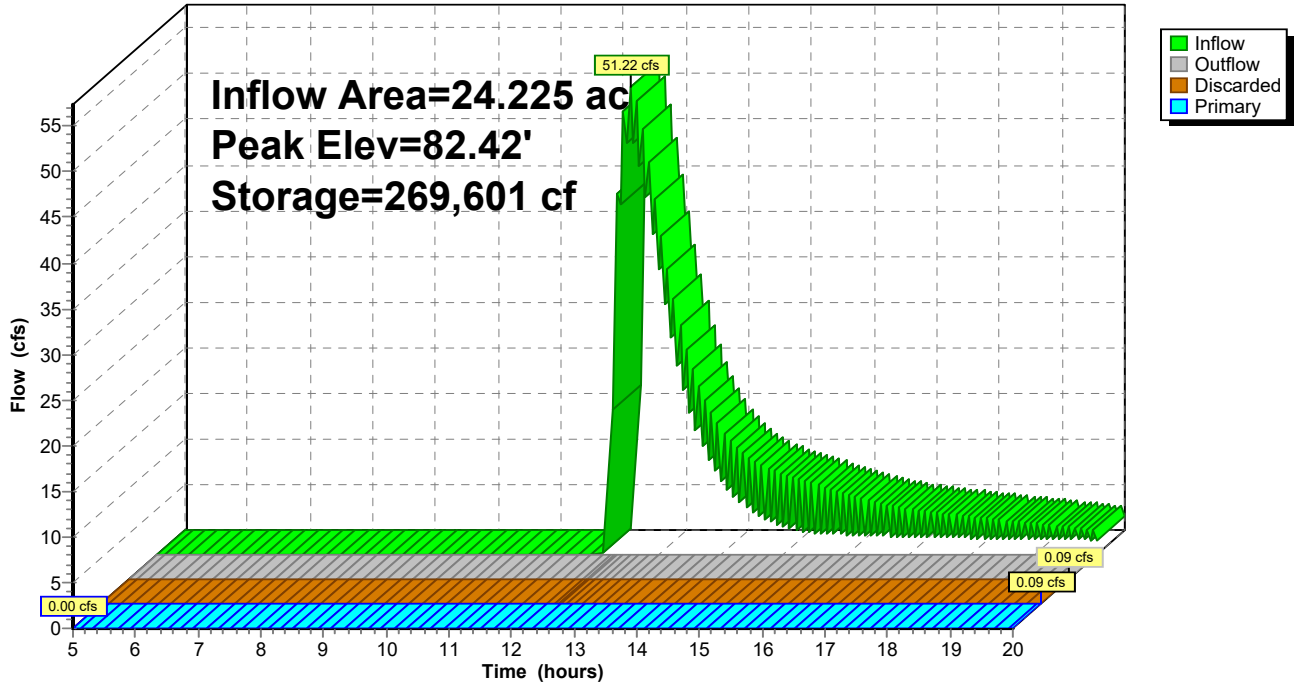
Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.09 cfs @ 20.00 hrs HW=82.42' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND

Hydrograph



Staging Area 4 Basin 4 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 3.80" for 100-YR - 24HR. event
 Inflow = 50.00 cfs @ 12.47 hrs, Volume= 7.674 af
 Outflow = 53.76 cfs @ 12.45 hrs, Volume= 6.684 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.57 cfs @ 11.60 hrs, Volume= 0.426 af
 Primary = 53.19 cfs @ 12.45 hrs, Volume= 6.258 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.90' @ 12.45 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 54.3 min calculated for 6.684 af (87% of inflow)
 Center-of-Mass det. time= 16.1 min (846.7 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

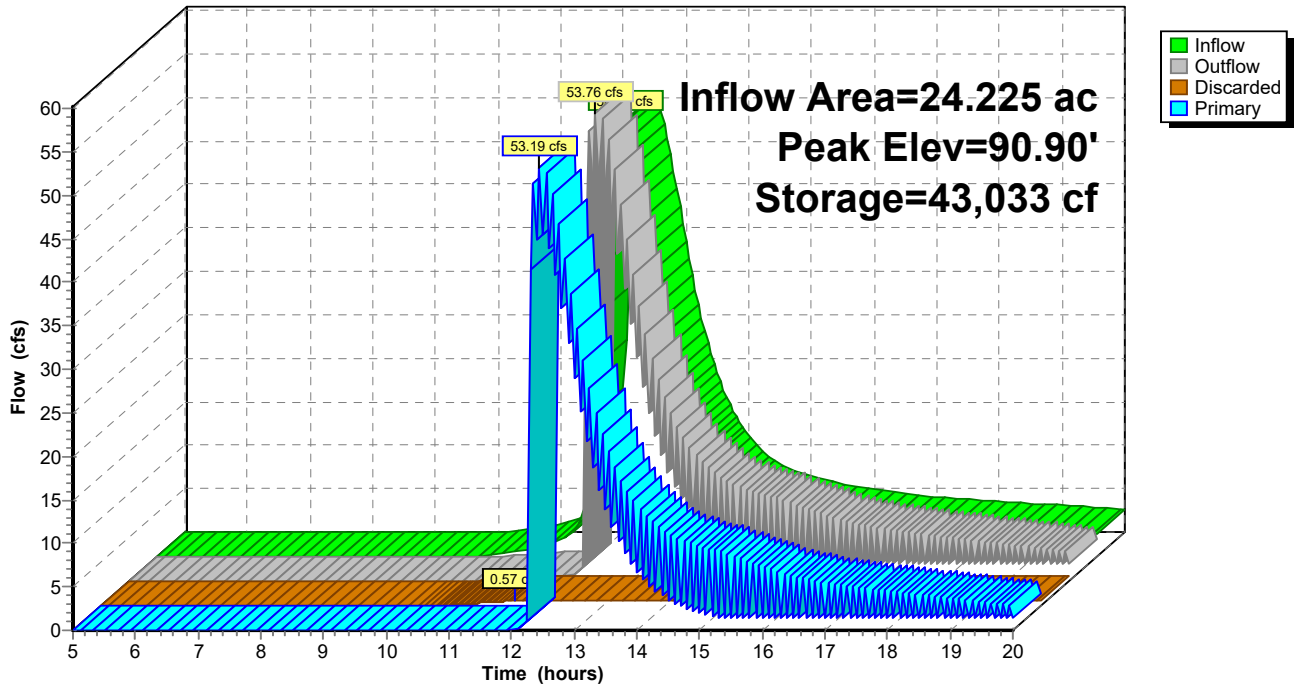
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 11.60 hrs HW=89.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=53.05 cfs @ 12.45 hrs HW=90.90' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 53.05 cfs @ 3.32 fps)

Pond 2P: ROCK VOID

Hydrograph



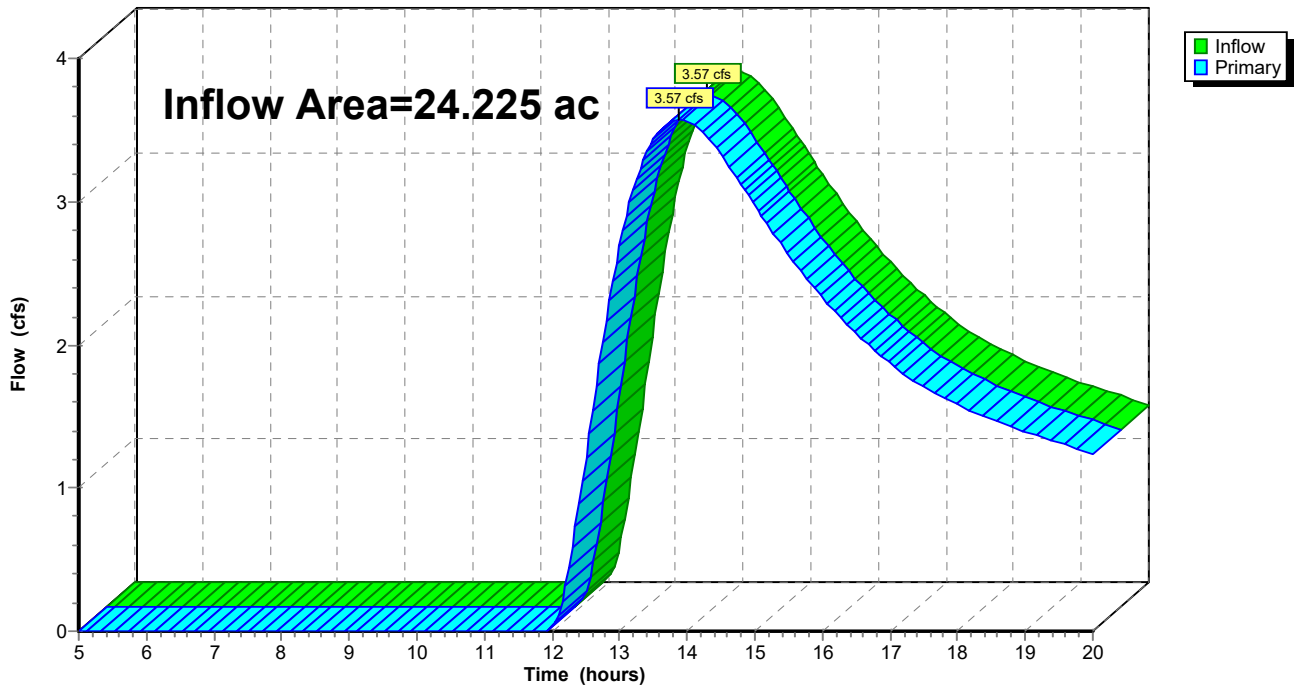
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.70" for 100-YR - 24HR. event
Inflow = 3.57 cfs @ 13.88 hrs, Volume= 1.419 af
Primary = 3.57 cfs @ 13.88 hrs, Volume= 1.419 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

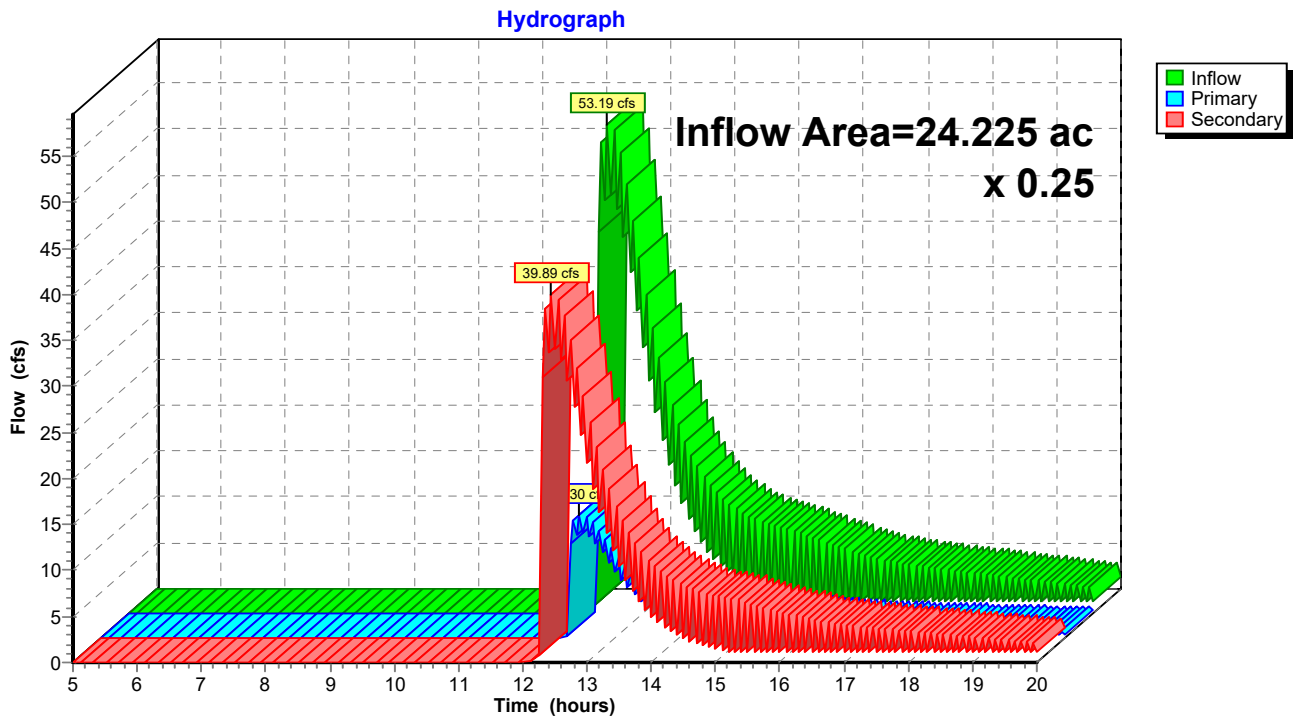


Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 3.10" for 100-YR - 24HR. event
Inflow = 53.19 cfs @ 12.45 hrs, Volume= 6.258 af
Primary = 13.30 cfs @ 12.45 hrs, Volume= 1.564 af, Atten= 75%, Lag= 0.0 min
Secondary = 39.89 cfs @ 12.45 hrs, Volume= 4.693 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.00"
 Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=0.02 cfs 0.002 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.00"
 Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=0.01 cfs 0.000 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=79.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2P: ROCK VOID Peak Elev=89.80' Storage=6 cf Inflow=0.01 cfs 0.000 af
 Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.02 cfs 0.002 af
 Primary=0.02 cfs 0.002 af

Link 2L: POST OUTFALL x 0.25 Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.02 cfs @ 5.00 hrs, Volume= 0.002 af, Depth> 0.00"

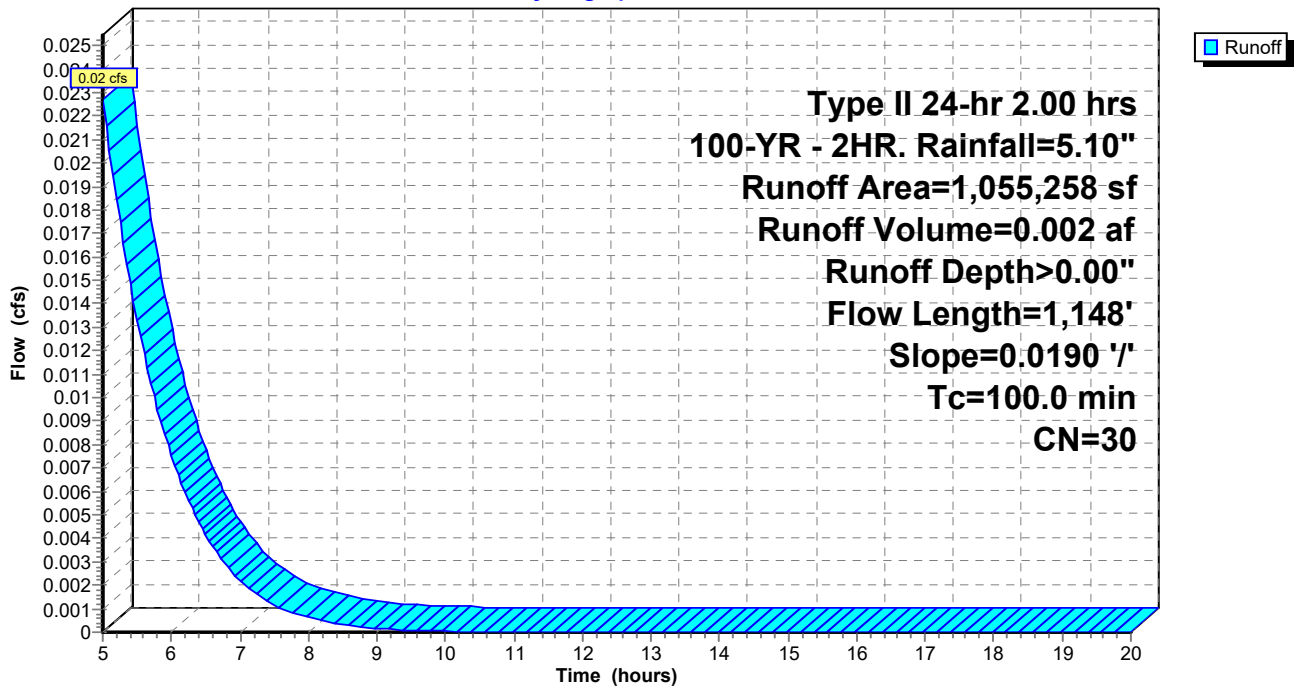
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af, Depth> 0.00"

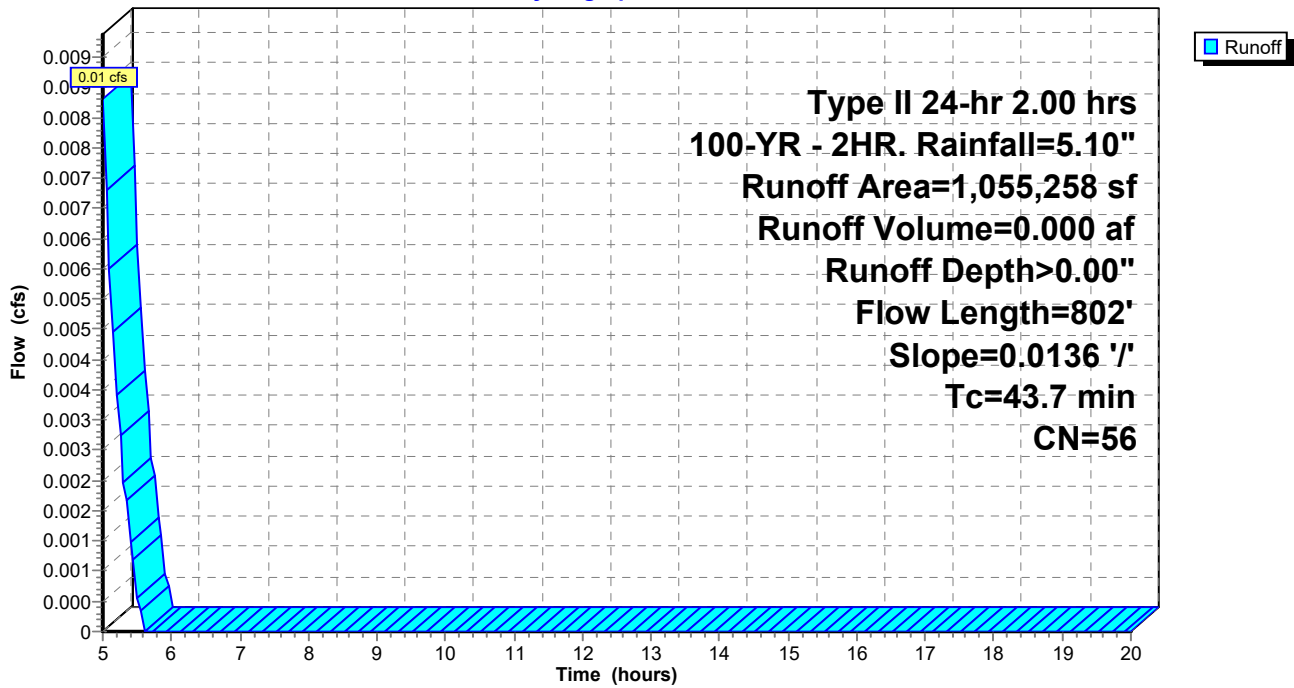
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

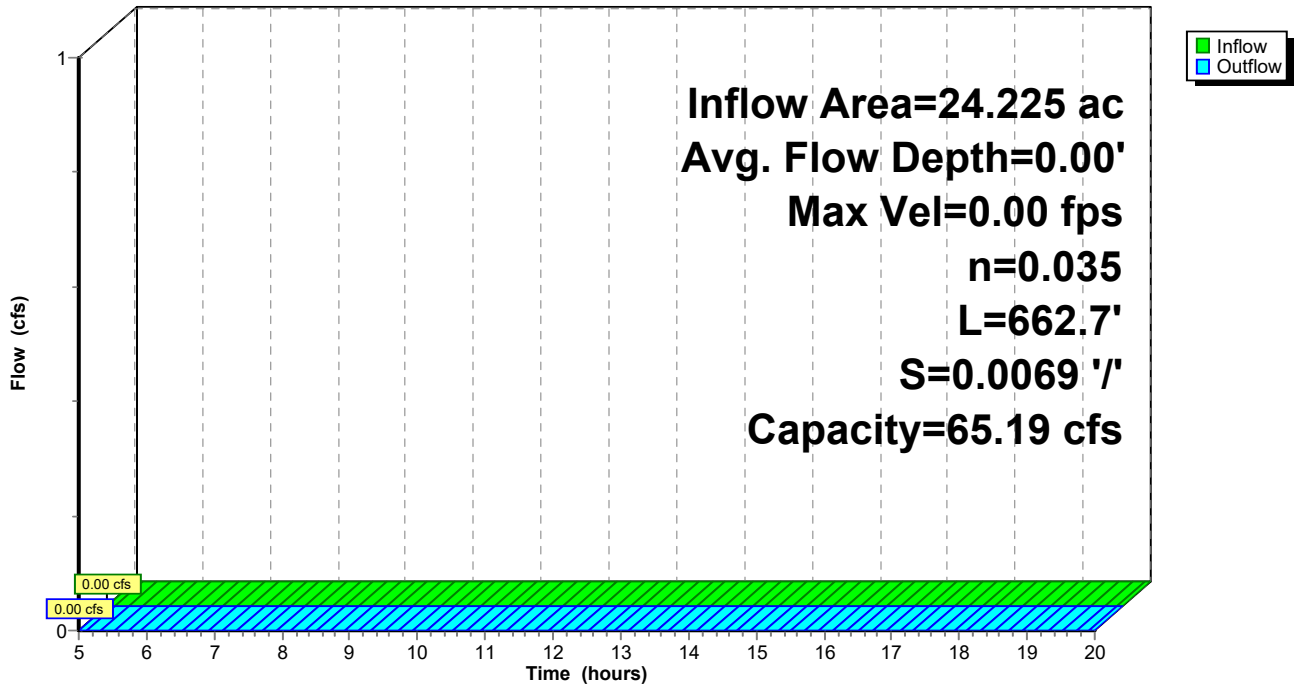
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 2.0 '/' Top Width= 12.00'
 Length= 662.7' Slope= 0.0069 '/'
 Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.30' @ 5.00 hrs Surf.Area= 79,551 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

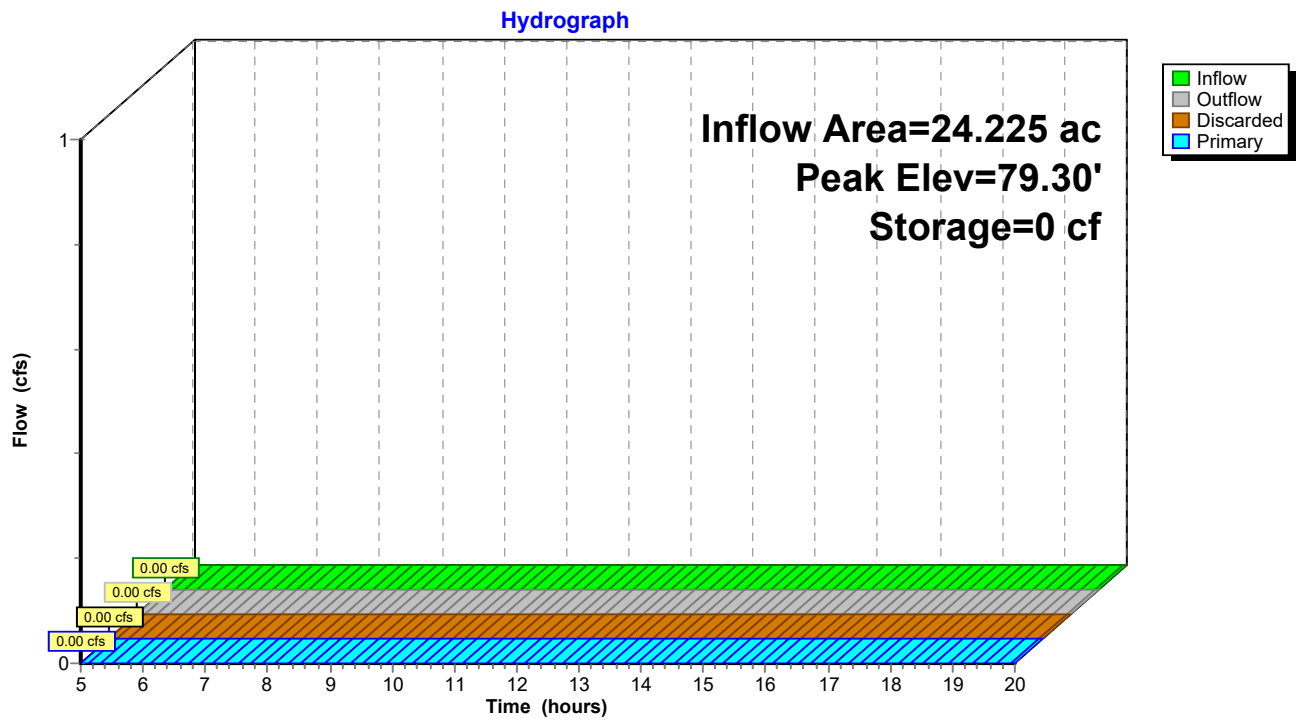
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 2HR. event
 Inflow = 0.01 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.41 hrs, Volume= 0.000 af, Atten= 83%, Lag= 24.8 min
 Discarded = 0.00 cfs @ 5.41 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.80' @ 5.41 hrs Surf.Area= 614,761 sf Storage= 6 cf

Plug-Flow detention time= 72.8 min calculated for 0.000 af (90% of inflow)
 Center-of-Mass det. time= 63.0 min (372.1 - 309.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

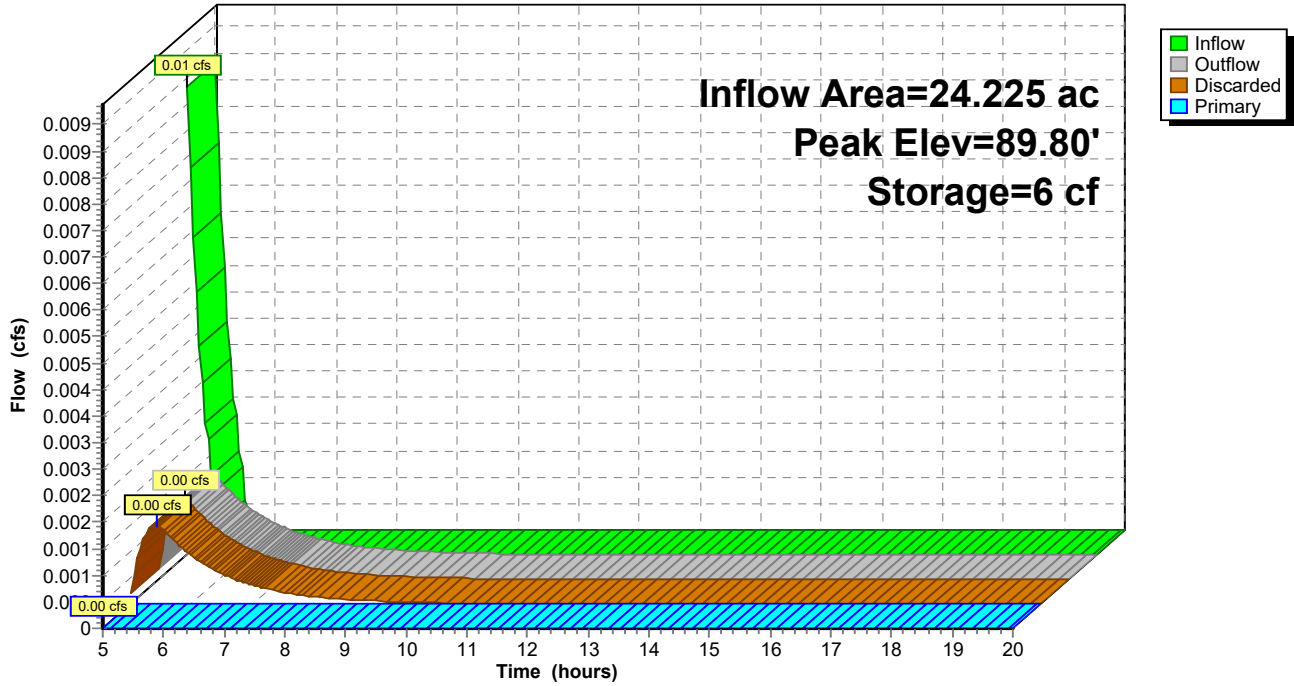
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 5.41 hrs HW=89.80' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=89.80' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: ROCK VOID

Hydrograph



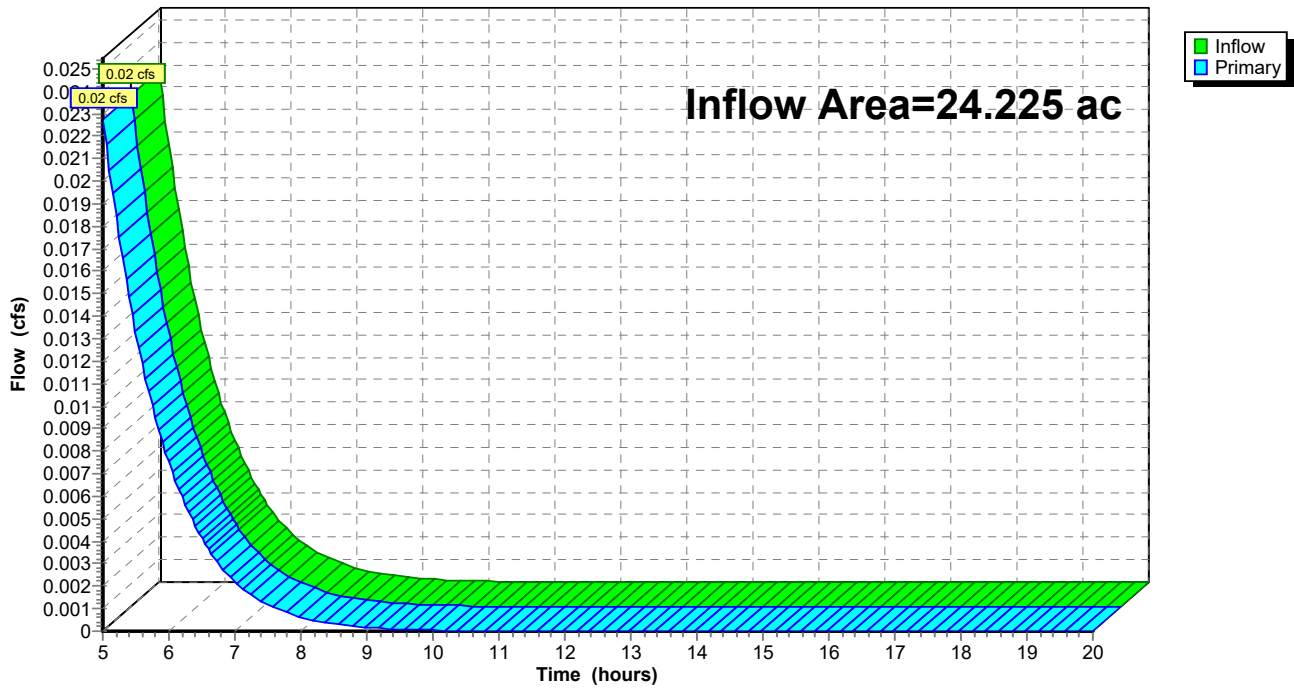
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 2HR. event
 Inflow = 0.02 cfs @ 5.00 hrs, Volume= 0.002 af
 Primary = 0.02 cfs @ 5.00 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

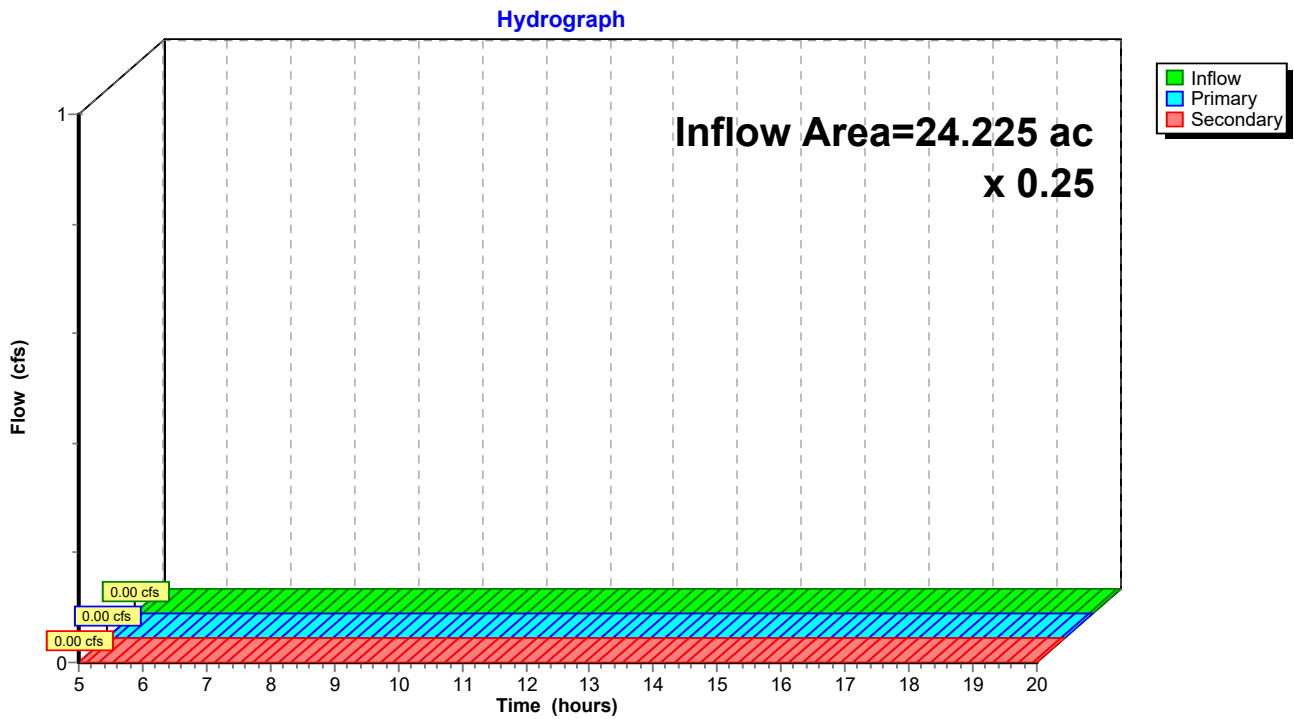


Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.04"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=0.69 cfs 0.071 af

Subcatchment2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.03"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=1.92 cfs 0.065 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND Peak Elev=79.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2P: ROCK VOID Peak Elev=89.81' Storage=1,625 cf Inflow=1.92 cfs 0.065 af
Discarded=0.43 cfs 0.065 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.065 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.69 cfs 0.071 af
Primary=0.69 cfs 0.071 af

Link 2L: POST OUTFALL x 0.25 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.69 cfs @ 5.00 hrs, Volume= 0.071 af, Depth> 0.04"

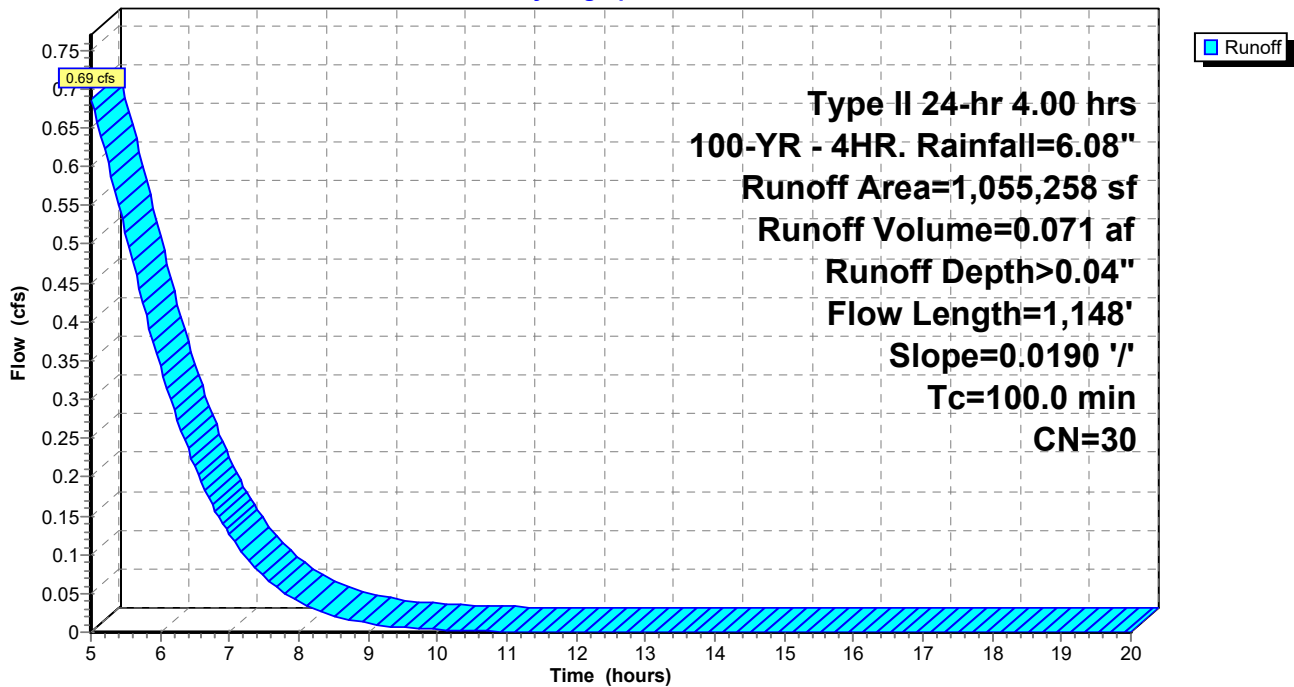
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 1.92 cfs @ 5.00 hrs, Volume= 0.065 af, Depth> 0.03"

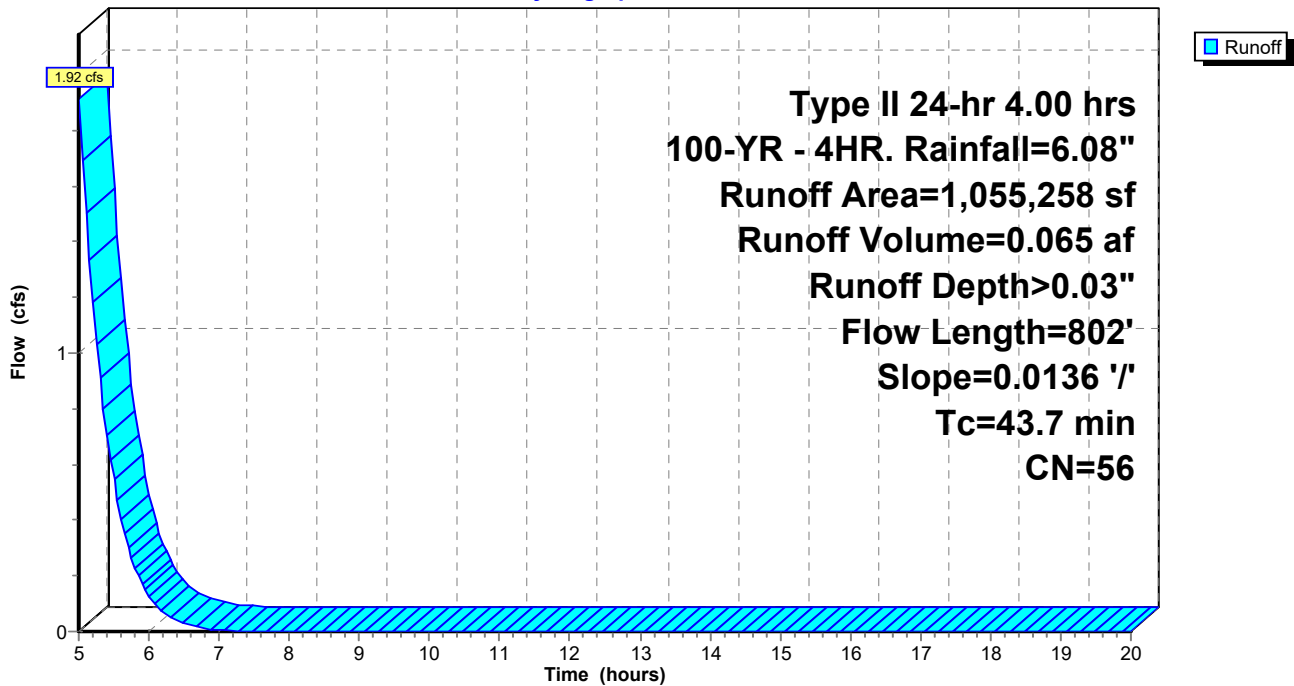
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

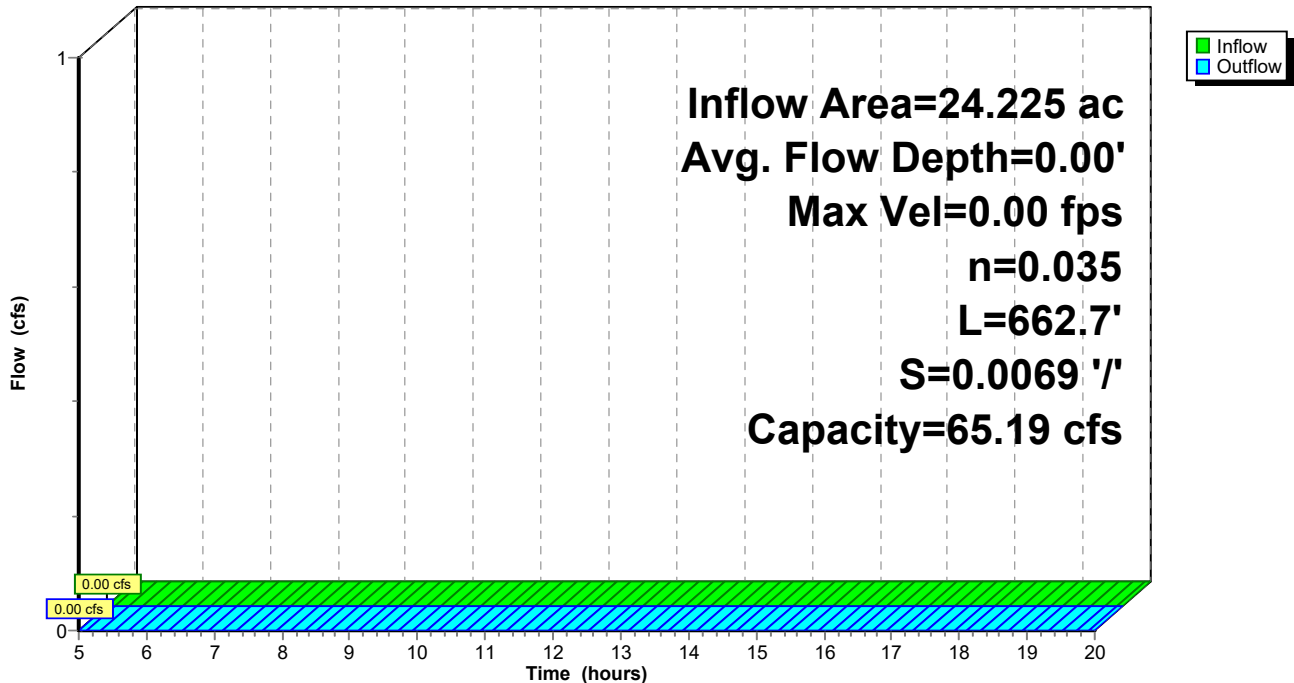
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 2.0 '/' Top Width= 12.00'
 Length= 662.7' Slope= 0.0069 '/'
 Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.30' @ 5.00 hrs Surf.Area= 79,551 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

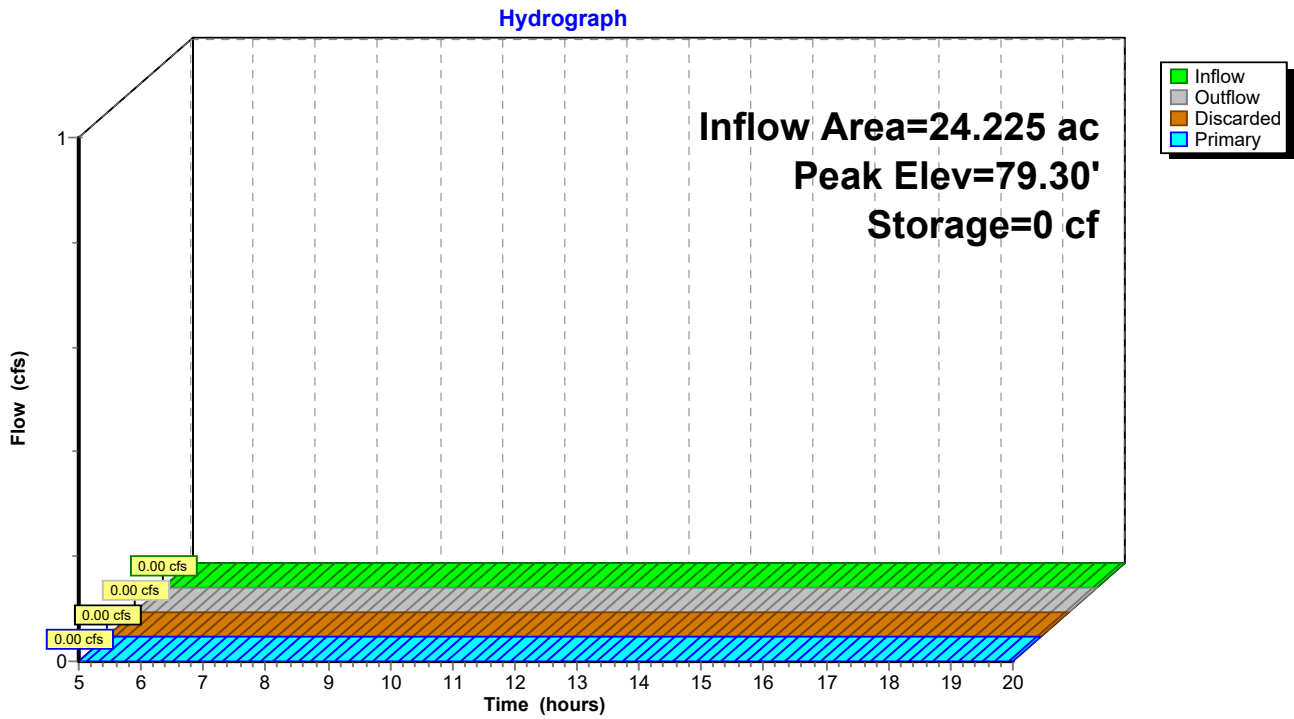
Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.03" for 100-YR - 4HR. event
 Inflow = 1.92 cfs @ 5.00 hrs, Volume= 0.065 af
 Outflow = 0.43 cfs @ 5.58 hrs, Volume= 0.065 af, Atten= 78%, Lag= 35.0 min
 Discarded = 0.43 cfs @ 5.58 hrs, Volume= 0.065 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.81' @ 5.58 hrs Surf.Area= 614,761 sf Storage= 1,625 cf

Plug-Flow detention time= 71.9 min calculated for 0.061 af (94% of inflow)
 Center-of-Mass det. time= 63.0 min (383.1 - 320.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

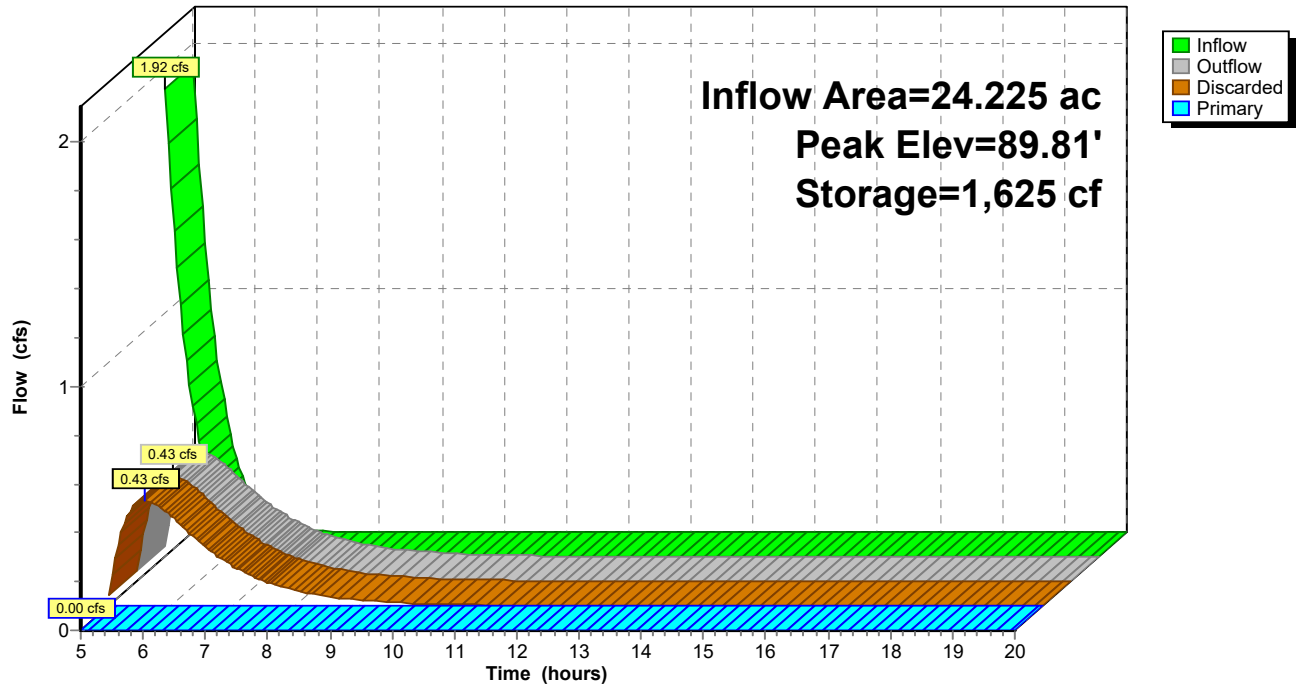
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.43 cfs @ 5.58 hrs HW=89.81' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=89.80' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: ROCK VOID

Hydrograph



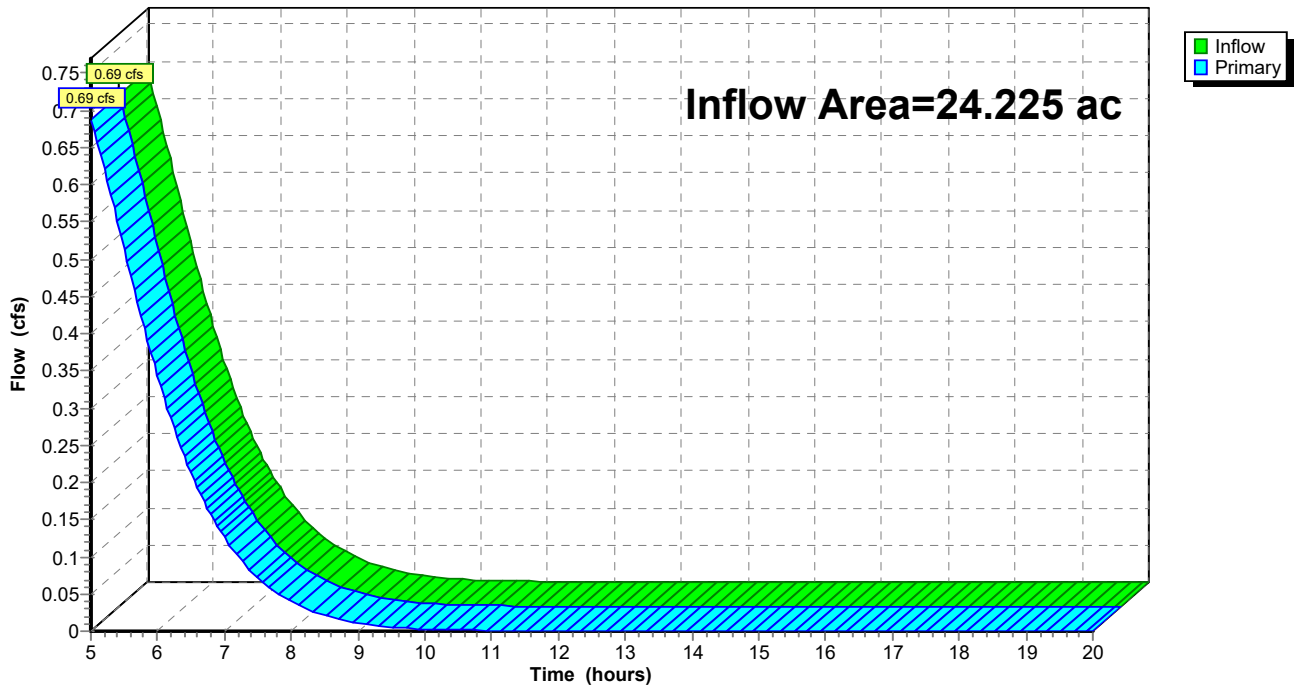
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.04" for 100-YR - 4HR. event
Inflow = 0.69 cfs @ 5.00 hrs, Volume= 0.071 af
Primary = 0.69 cfs @ 5.00 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

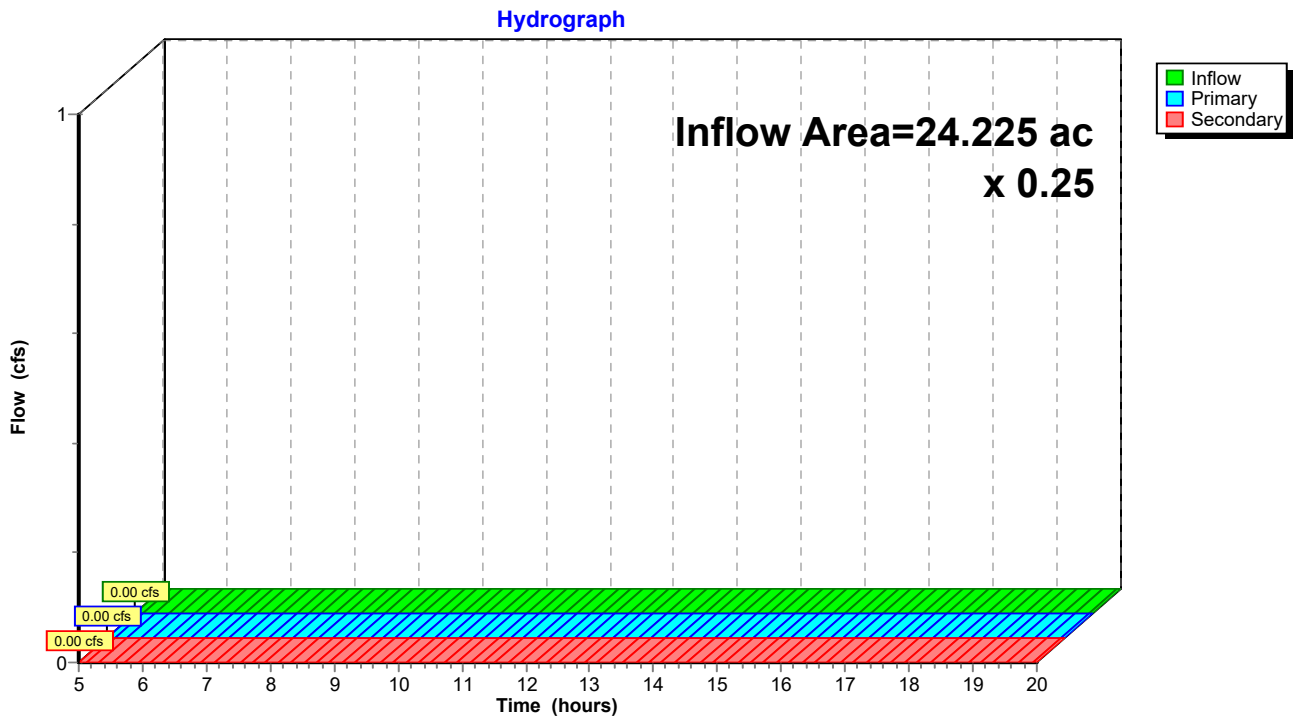


Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PRE DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>0.27"
Flow Length=1,148' Slope=0.0190 '/' Tc=100.0 min CN=30 Runoff=1.61 cfs 0.548 af

Subcatchment 2S: POST DEVELOPED Runoff Area=1,055,258 sf 0.00% Impervious Runoff Depth>1.40"
Flow Length=802' Slope=0.0136 '/' Tc=43.7 min CN=56 Runoff=27.97 cfs 2.835 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.38' Max Vel=1.65 fps Inflow=6.61 cfs 0.464 af
n=0.035 L=662.7' S=0.0069 '/' Capacity=65.19 cfs Outflow=2.97 cfs 0.464 af

Pond 1P: PROPOSED POND Peak Elev=80.26' Storage=78,342 cf Inflow=19.89 cfs 1.856 af
Discarded=0.08 cfs 0.092 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.092 af

Pond 2P: ROCK VOID Peak Elev=90.55' Storage=43,033 cf Inflow=27.97 cfs 2.835 af
Discarded=0.57 cfs 0.708 af Primary=26.44 cfs 1.856 af Outflow=27.01 cfs 2.564 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=1.61 cfs 0.548 af
Primary=1.61 cfs 0.548 af

Link 2L: POST OUTFALL x 0.25 Inflow=26.44 cfs 1.856 af
Primary=6.61 cfs 0.464 af Secondary=19.83 cfs 1.392 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.61 cfs @ 6.78 hrs, Volume= 0.548 af, Depth> 0.27"

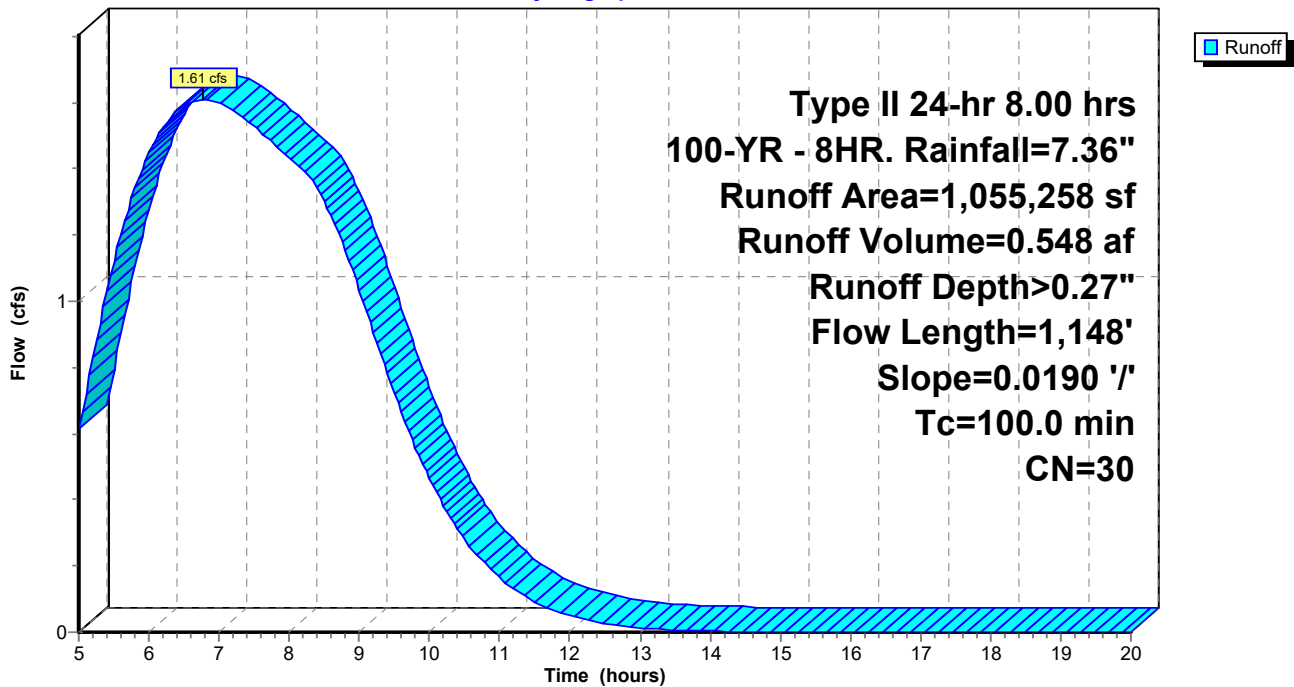
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
1,055,258	30	Meadow, non-grazed, HSG A
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
100.0	1,148	0.0190	0.19		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 27.97 cfs @ 5.00 hrs, Volume= 2.835 af, Depth> 1.40"

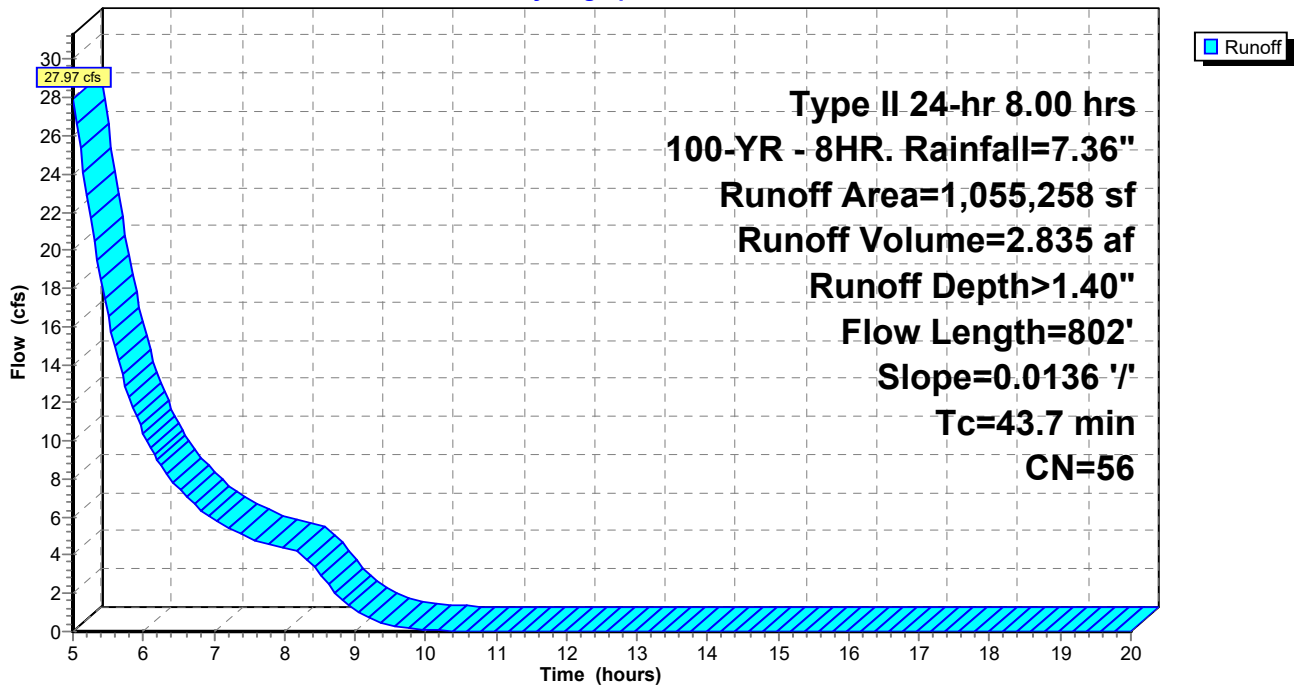
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
300,592	30	Meadow, non-grazed, HSG A
* 684,281	65	Uncompacted Gravel (35% Void)
70,385	76	Gravel roads, HSG A
1,055,258	56	Weighted Average
1,055,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.7	802	0.0136	0.31		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.23" for 100-YR - 8HR. event
 Inflow = 6.61 cfs @ 5.60 hrs, Volume= 0.464 af
 Outflow = 2.97 cfs @ 5.88 hrs, Volume= 0.464 af, Atten= 55%, Lag= 16.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.65 fps, Min. Travel Time= 6.7 min
 Avg. Velocity = 0.59 fps, Avg. Travel Time= 18.6 min

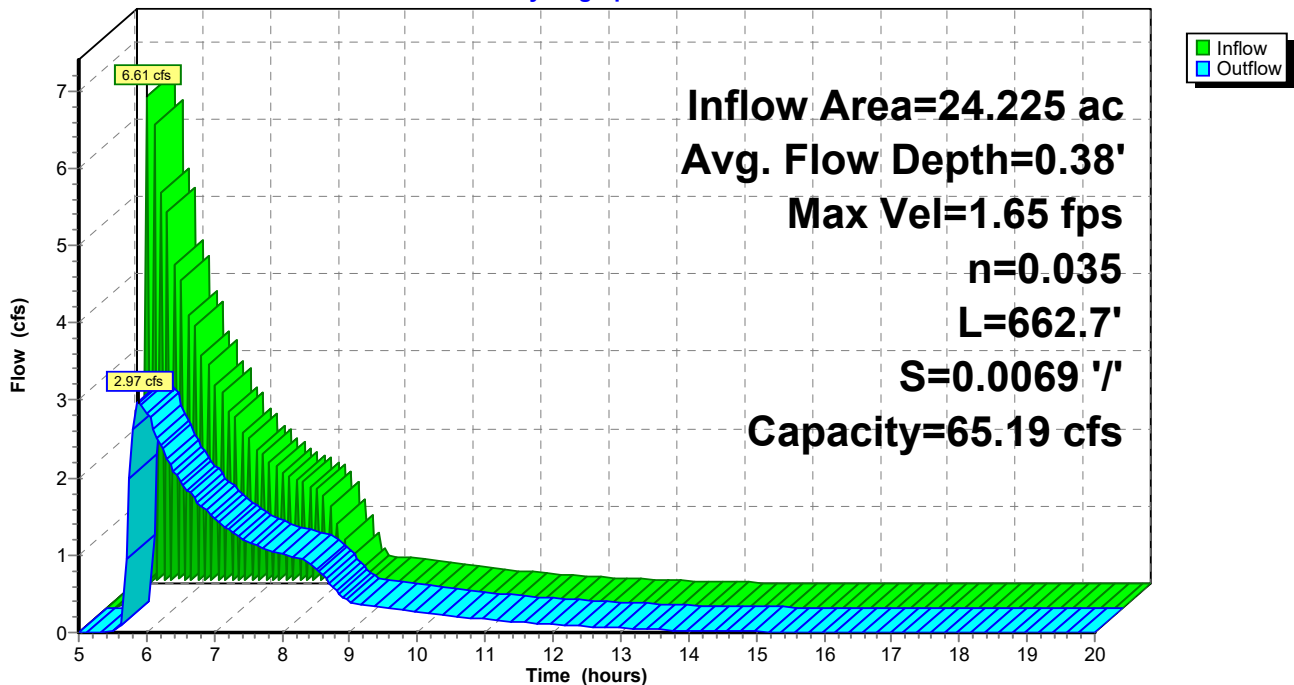
Peak Storage= 1,214 cf @ 5.76 hrs
 Average Depth at Peak Storage= 0.38'
 Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 65.19 cfs

4.00' x 2.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 2.0 ' / ' Top Width= 12.00'
 Length= 662.7' Slope= 0.0069 ' / '
 Inlet Invert= 87.10', Outlet Invert= 82.50'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.92" for 100-YR - 8HR. event
 Inflow = 19.89 cfs @ 5.60 hrs, Volume= 1.856 af
 Outflow = 0.08 cfs @ 13.97 hrs, Volume= 0.092 af, Atten= 100%, Lag= 502.3 min
 Discarded = 0.08 cfs @ 13.97 hrs, Volume= 0.092 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.26' @ 13.97 hrs Surf.Area= 83,787 sf Storage= 78,342 cf

Plug-Flow detention time= 434.2 min calculated for 0.092 af (5% of inflow)
 Center-of-Mass det. time= 334.6 min (770.2 - 435.7)

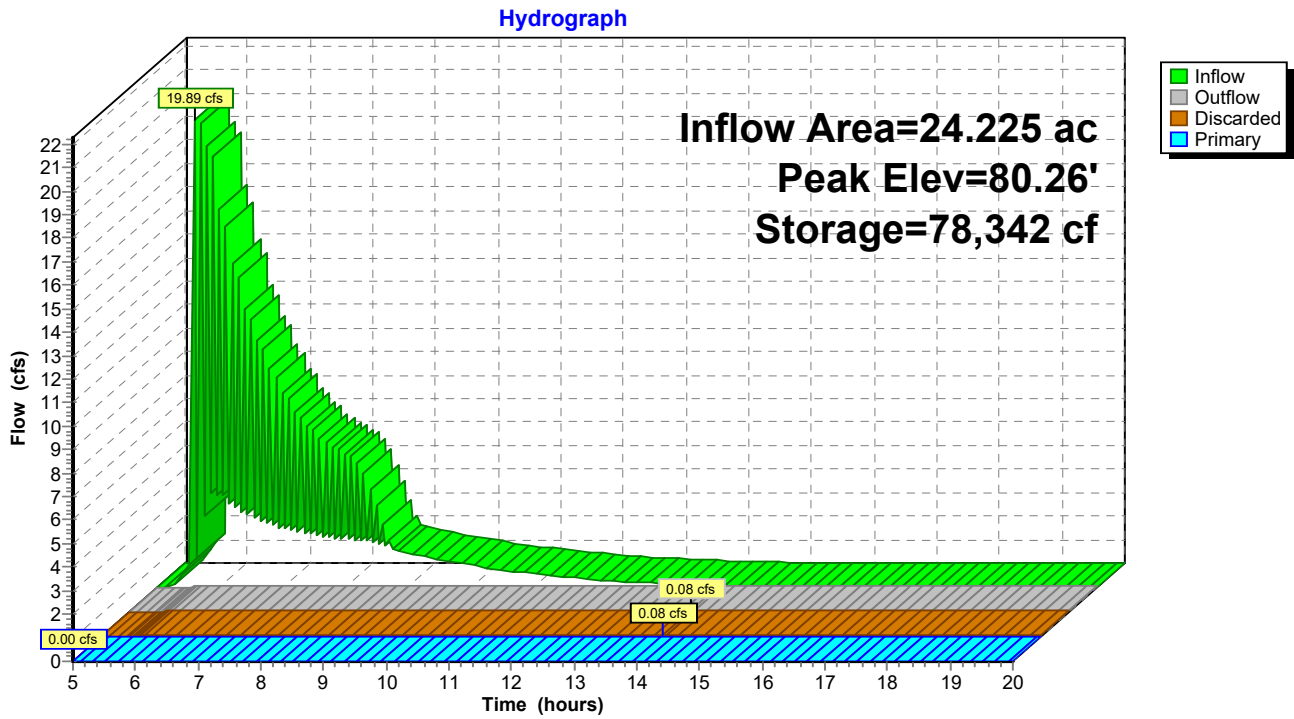
Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	548,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.30	79,551	0	0
80.30	83,967	81,759	81,759
81.30	88,408	86,188	167,947
82.30	92,873	90,641	258,587
84.30	97,351	190,224	448,811
85.30	101,880	99,616	548,427

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	83.40'	43.6 deg x 5.0' long x 1.90' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Discarded OutFlow Max=0.08 cfs @ 13.97 hrs HW=80.26' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.30' (Free Discharge)
 ↑2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Summary for Pond 2P: ROCK VOID

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 1.40" for 100-YR - 8HR. event
 Inflow = 27.97 cfs @ 5.00 hrs, Volume= 2.835 af
 Outflow = 27.01 cfs @ 5.60 hrs, Volume= 2.564 af, Atten= 3%, Lag= 36.0 min
 Discarded = 0.57 cfs @ 5.05 hrs, Volume= 0.708 af
 Primary = 26.44 cfs @ 5.60 hrs, Volume= 1.856 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.55' @ 5.60 hrs Surf.Area= 614,761 sf Storage= 43,033 cf

Plug-Flow detention time= 166.1 min calculated for 2.507 af (88% of inflow)
 Center-of-Mass det. time= 144.5 min (519.5 - 375.0)

Volume	Invert	Avail.Storage	Storage Description
#1	89.80'	43,033 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 122,952 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.80	614,761	0	0
90.00	614,761	122,952	122,952

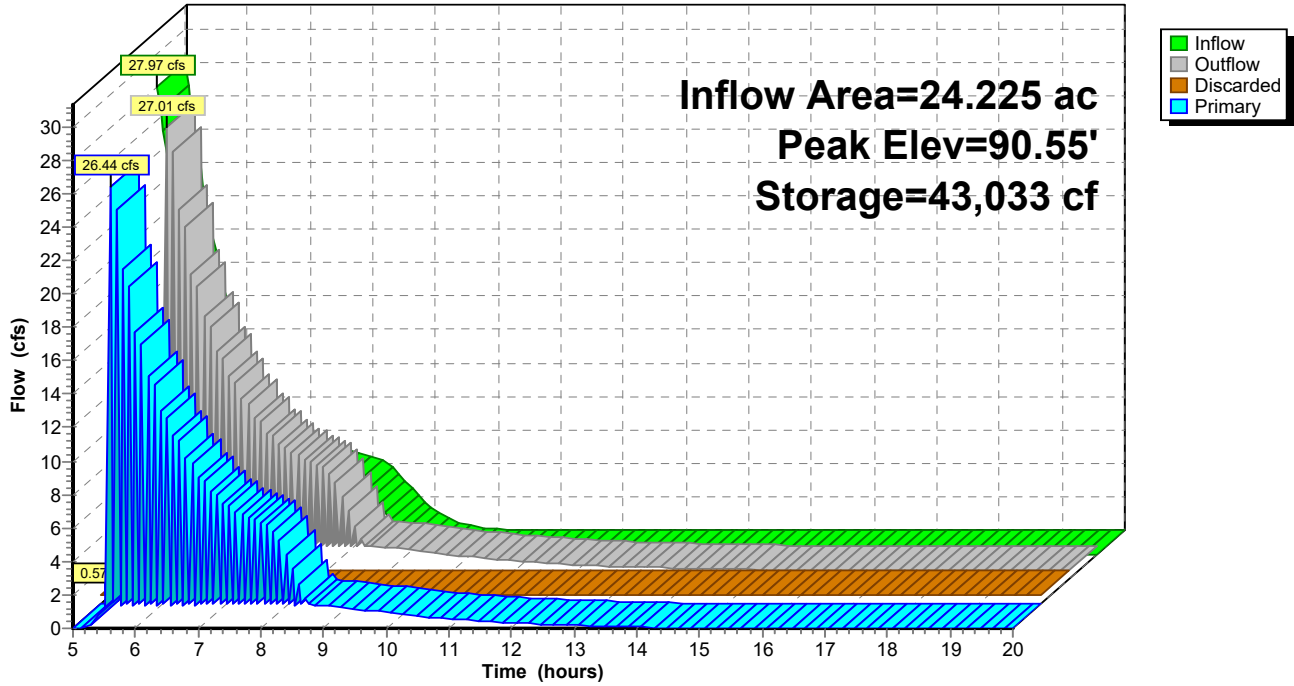
Device	Routing	Invert	Outlet Devices
#1	Primary	89.90'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	89.80'	0.040 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.57 cfs @ 5.05 hrs HW=89.83' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=26.37 cfs @ 5.60 hrs HW=90.55' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Weir Controls 26.37 cfs @ 2.53 fps)

Pond 2P: ROCK VOID

Hydrograph



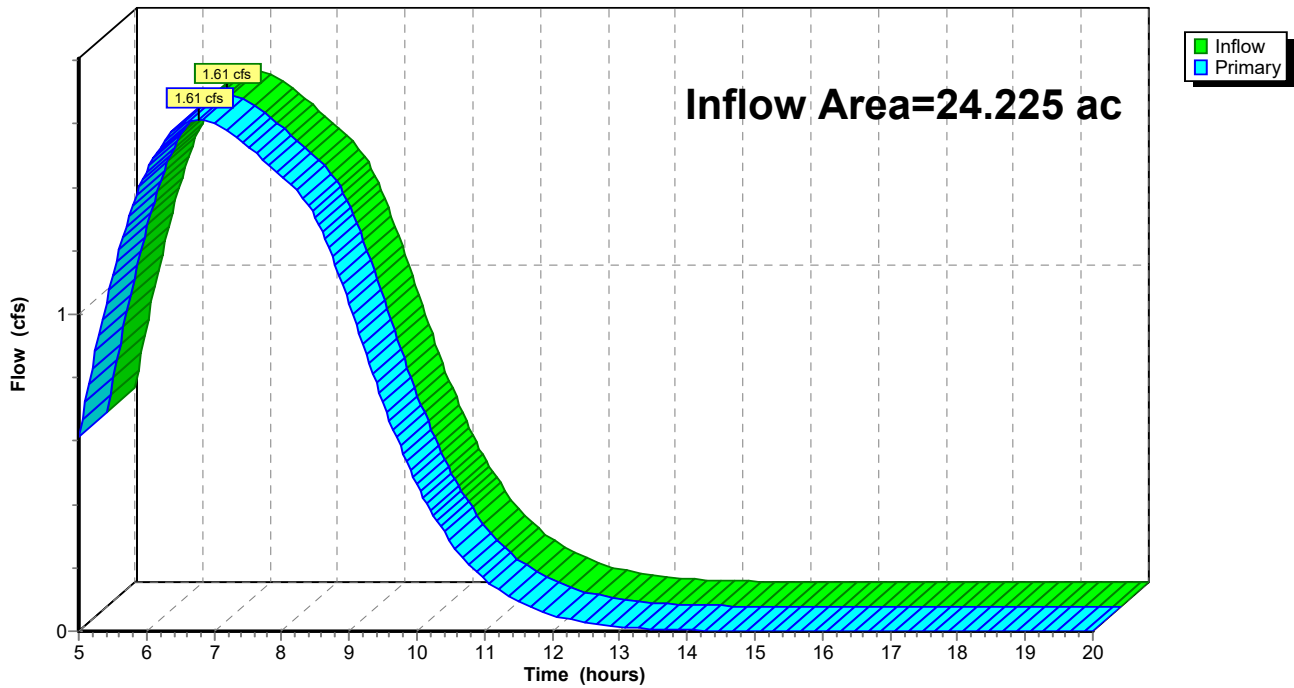
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth > 0.27" for 100-YR - 8HR. event
Inflow = 1.61 cfs @ 6.78 hrs, Volume= 0.548 af
Primary = 1.61 cfs @ 6.78 hrs, Volume= 0.548 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



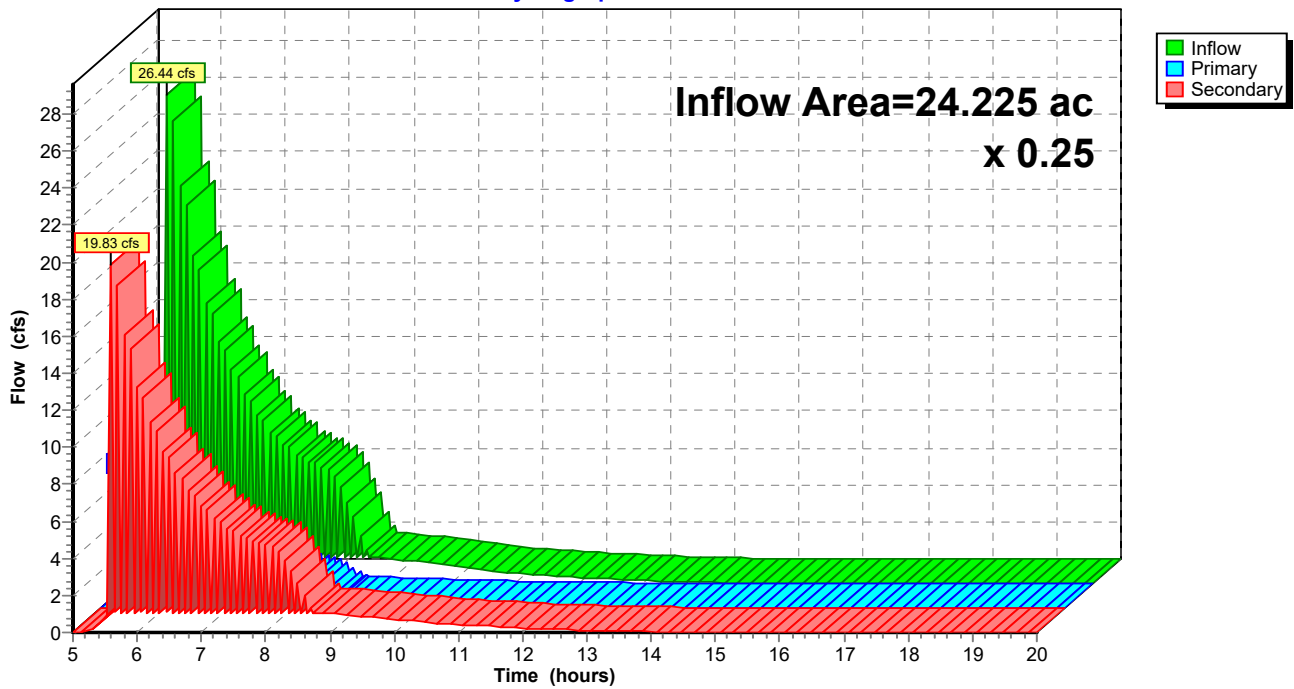
Summary for Link 2L: POST OUTFALL

Inflow Area = 24.225 ac, 0.00% Impervious, Inflow Depth = 0.92" for 100-YR - 8HR. event
 Inflow = 26.44 cfs @ 5.60 hrs, Volume= 1.856 af
 Primary = 6.61 cfs @ 5.60 hrs, Volume= 0.464 af, Atten= 75%, Lag= 0.0 min
 Secondary = 19.83 cfs @ 5.60 hrs, Volume= 1.392 af

Primary outflow = Inflow x 0.25, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

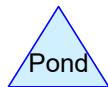
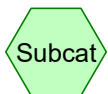
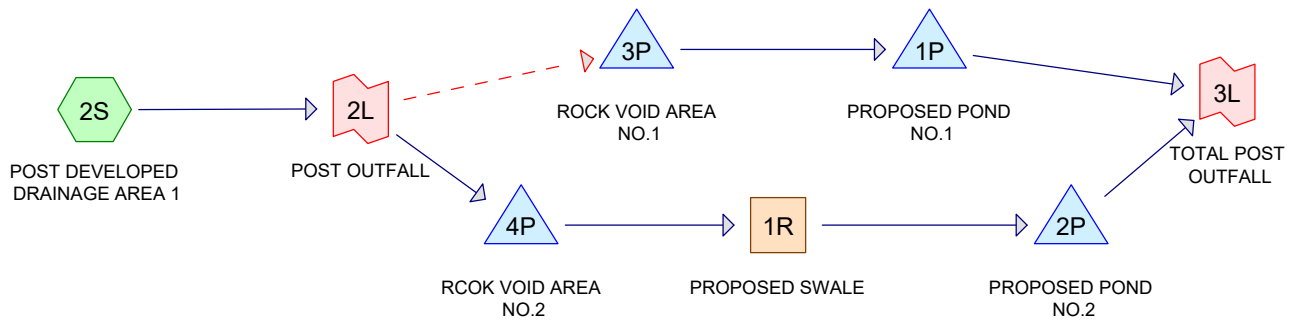
Hydrograph



PRE-DEVELOPED SITE



POST DEVELOPED SITE



Routing Diagram for Staging Area 4 Basin 5 HydroCAD Report

Prepared by HP Inc., Printed 3/16/2020

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Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>1.47"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=2.82 cfs 1.114 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>4.96"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=16.01 cfs 3.753 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=4.72' Max Vel=0.31 fps Inflow=12.04 cfs 2.194 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=11.06 cfs 2.177 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=93.17' Storage=35,469 cf Inflow=4.50 cfs 0.815 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=92.79' Storage=94,788 cf Inflow=11.06 cfs 2.177 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.51' Storage=3,519 cf Inflow=4.32 cfs 1.013 af
Discarded=0.16 cfs 0.118 af Primary=4.50 cfs 0.815 af Outflow=4.66 cfs 0.933 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.39' Storage=9,651 cf Inflow=11.69 cfs 2.740 af
Discarded=0.44 cfs 0.323 af Primary=12.04 cfs 2.194 af Outflow=12.48 cfs 2.517 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=2.82 cfs 1.114 af
Primary=2.82 cfs 1.114 af

Link 2L: POST OUTFALL x 0.73 Inflow=16.01 cfs 3.753 af
Primary=11.69 cfs 2.740 af Secondary=4.32 cfs 1.013 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 2.82 cfs @ 14.15 hrs, Volume= 1.114 af, Depth> 1.47"

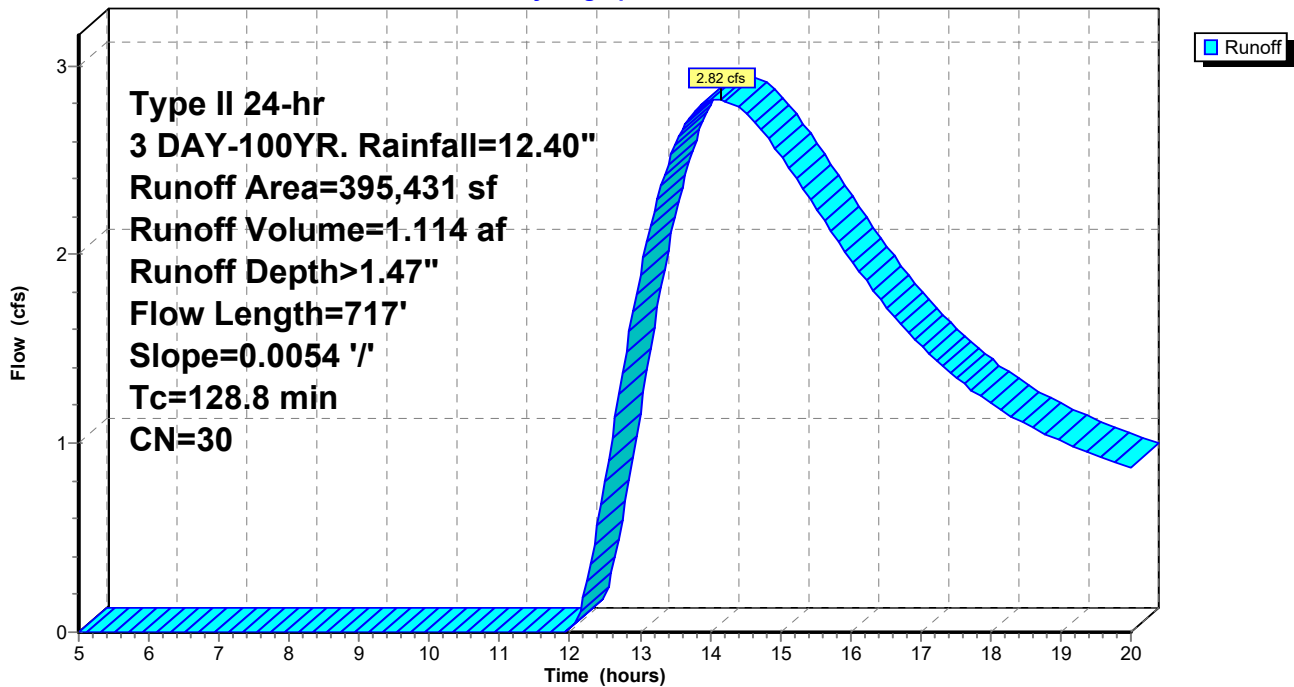
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 16.01 cfs @ 12.97 hrs, Volume= 3.753 af, Depth> 4.96"

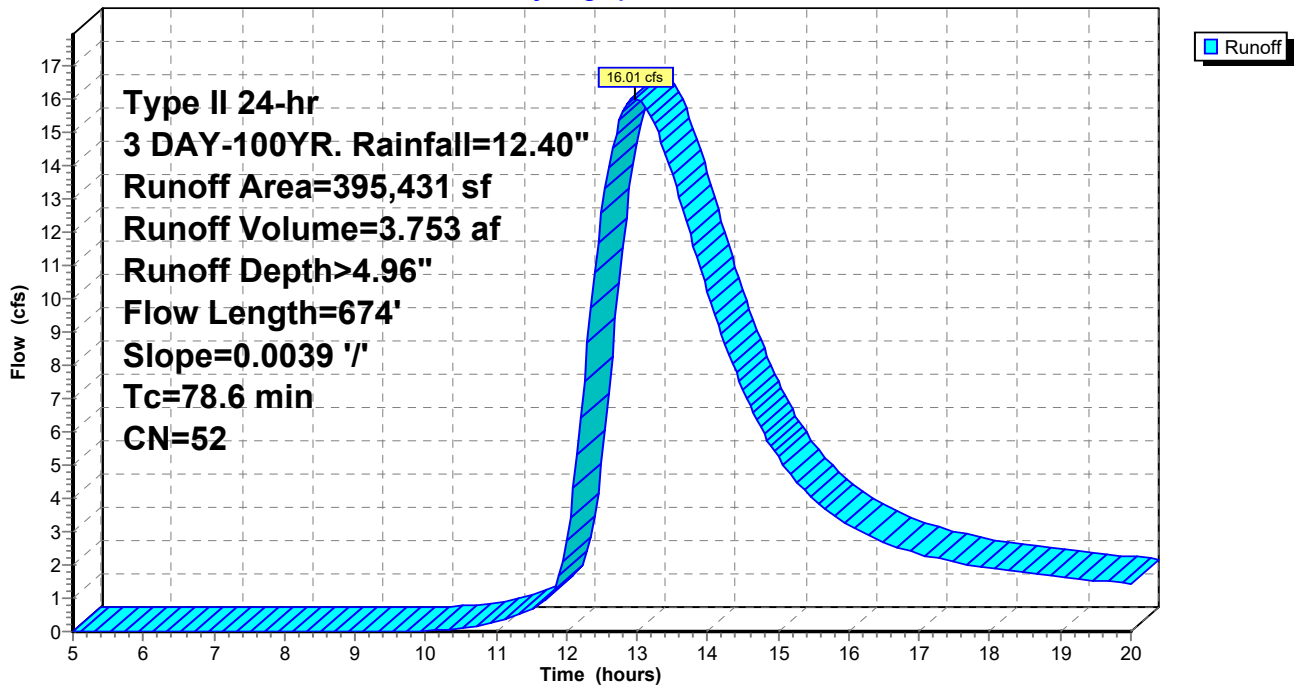
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 2.90" for 3 DAY-100YR. event
Inflow = 12.04 cfs @ 12.95 hrs, Volume= 2.194 af
Outflow = 11.06 cfs @ 13.25 hrs, Volume= 2.177 af, Atten= 8%, Lag= 18.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.31 fps, Min. Travel Time= 7.7 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 9.5 min

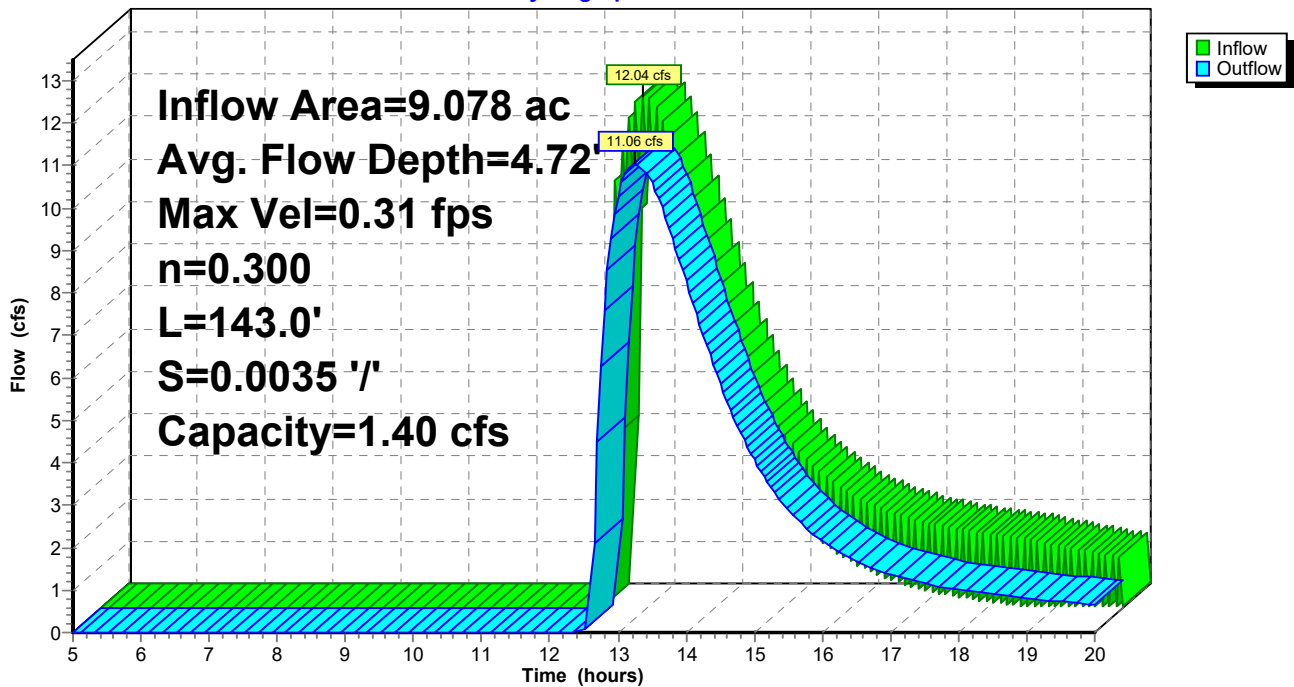
Peak Storage= 5,102 cf @ 13.12 hrs
Average Depth at Peak Storage= 4.72'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 ' Top Width= 8.00'
Length= 143.0' Slope= 0.0035 '/'
Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 4.50 cfs @ 13.00 hrs, Volume= 0.815 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.17' @ 20.00 hrs Surf.Area= 29,064 sf Storage= 35,469 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

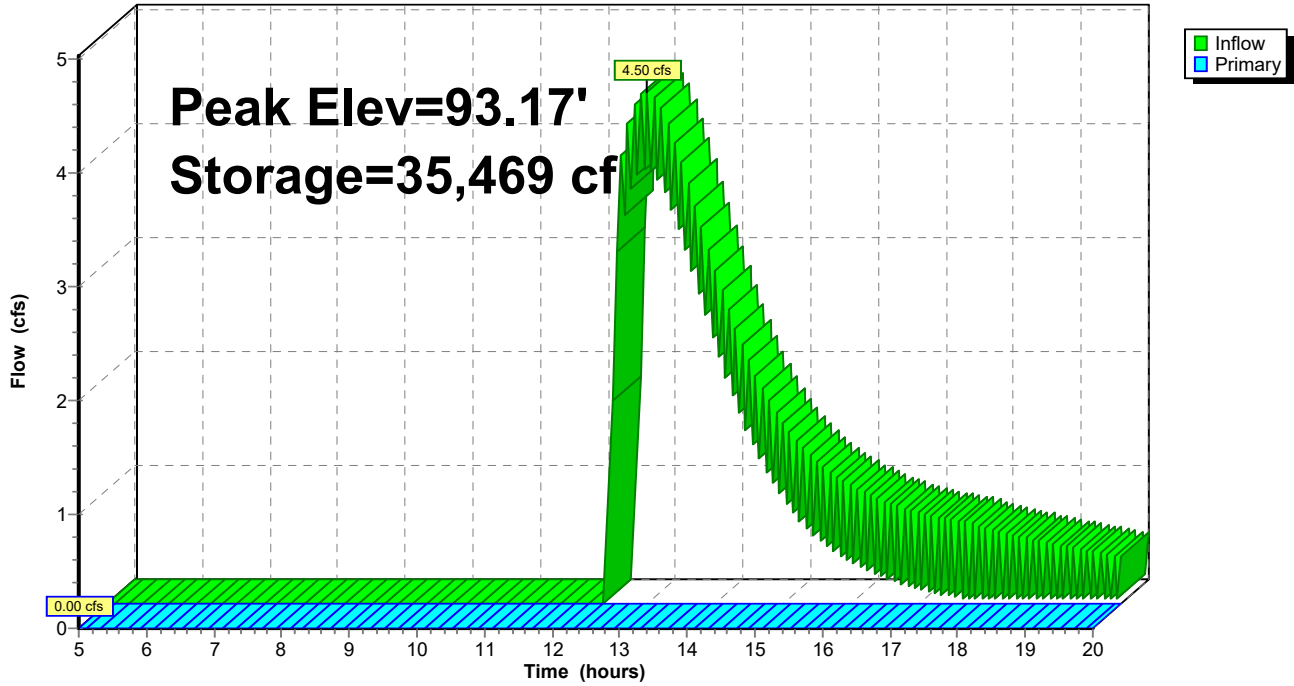
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 2.88" for 3 DAY-100YR. event
 Inflow = 11.06 cfs @ 13.25 hrs, Volume= 2.177 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.79' @ 20.00 hrs Surf.Area= 65,622 sf Storage= 94,788 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

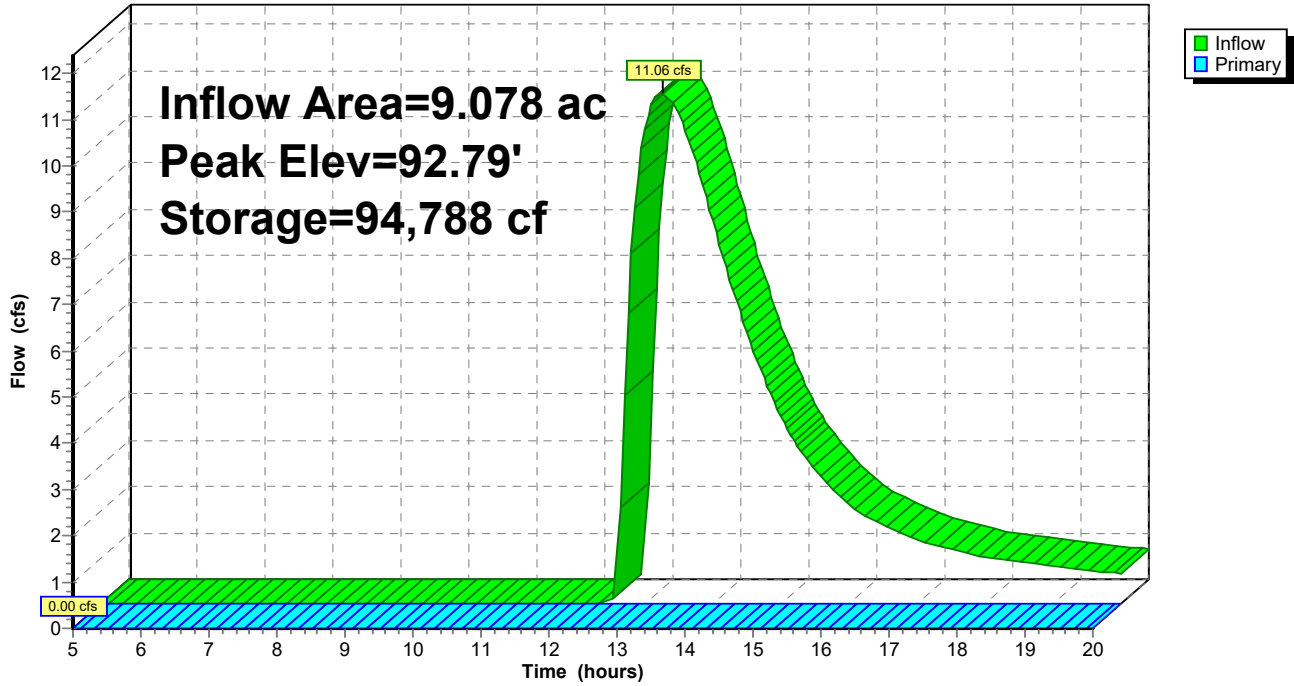
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 4.32 cfs @ 12.97 hrs, Volume= 1.013 af
 Outflow = 4.66 cfs @ 13.00 hrs, Volume= 0.933 af, Atten= 0%, Lag= 1.5 min
 Discarded = 0.16 cfs @ 11.80 hrs, Volume= 0.118 af
 Primary = 4.50 cfs @ 13.00 hrs, Volume= 0.815 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.51' @ 13.00 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 34.8 min calculated for 0.933 af (92% of inflow)
 Center-of-Mass det. time= 11.1 min (870.3 - 859.2)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 11.80 hrs HW=95.11' (Free Discharge)

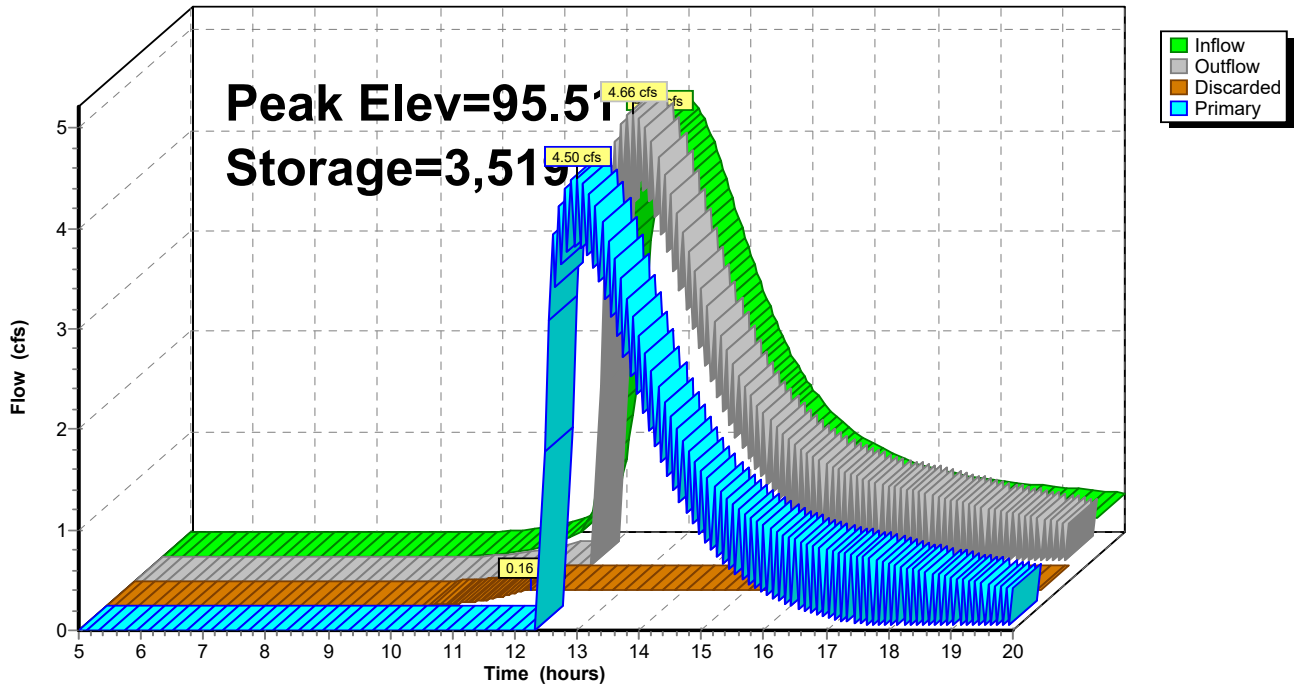
↑ **2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=4.49 cfs @ 13.00 hrs HW=95.51' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 4.49 cfs @ 1.30 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 3.62" for 3 DAY-100YR. event
 Inflow = 11.69 cfs @ 12.97 hrs, Volume= 2.740 af
 Outflow = 12.48 cfs @ 12.95 hrs, Volume= 2.517 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.44 cfs @ 11.80 hrs, Volume= 0.323 af
 Primary = 12.04 cfs @ 12.95 hrs, Volume= 2.194 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.39' @ 12.95 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 34.8 min calculated for 2.509 af (92% of inflow)
 Center-of-Mass det. time= 11.0 min (870.2 - 859.2)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

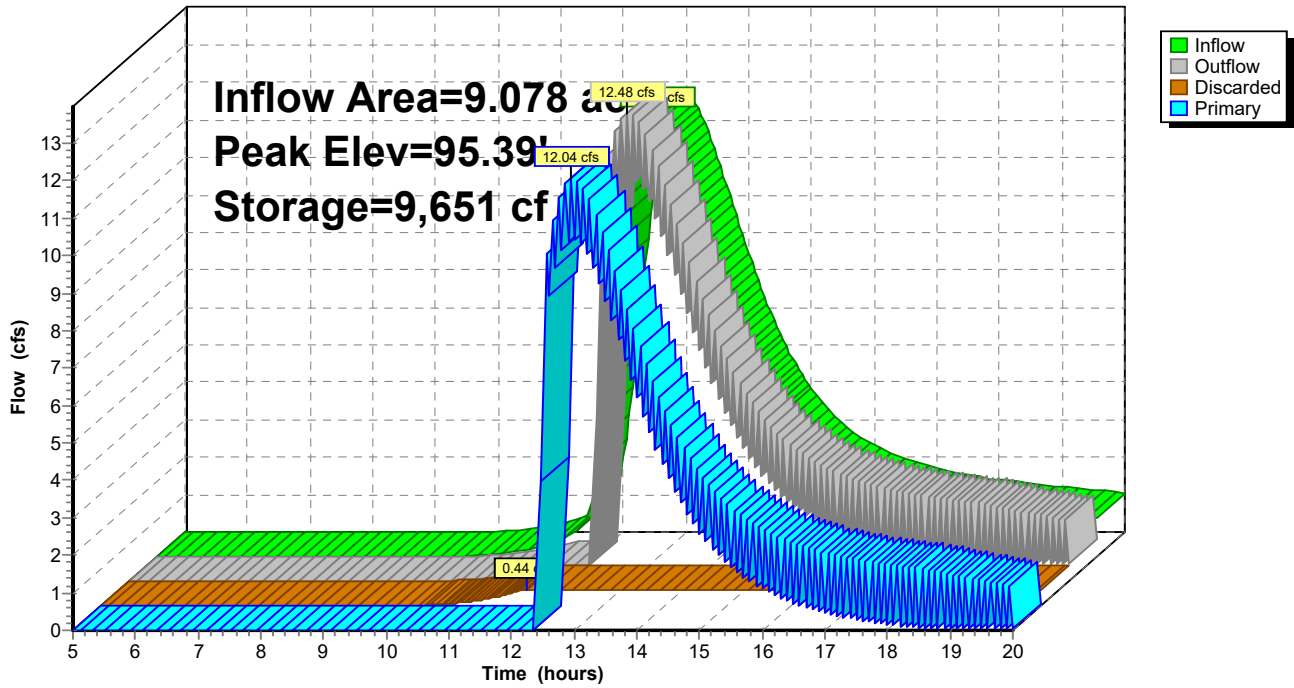
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 11.80 hrs HW=94.81' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=12.03 cfs @ 12.95 hrs HW=95.39' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 12.03 cfs @ 1.86 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



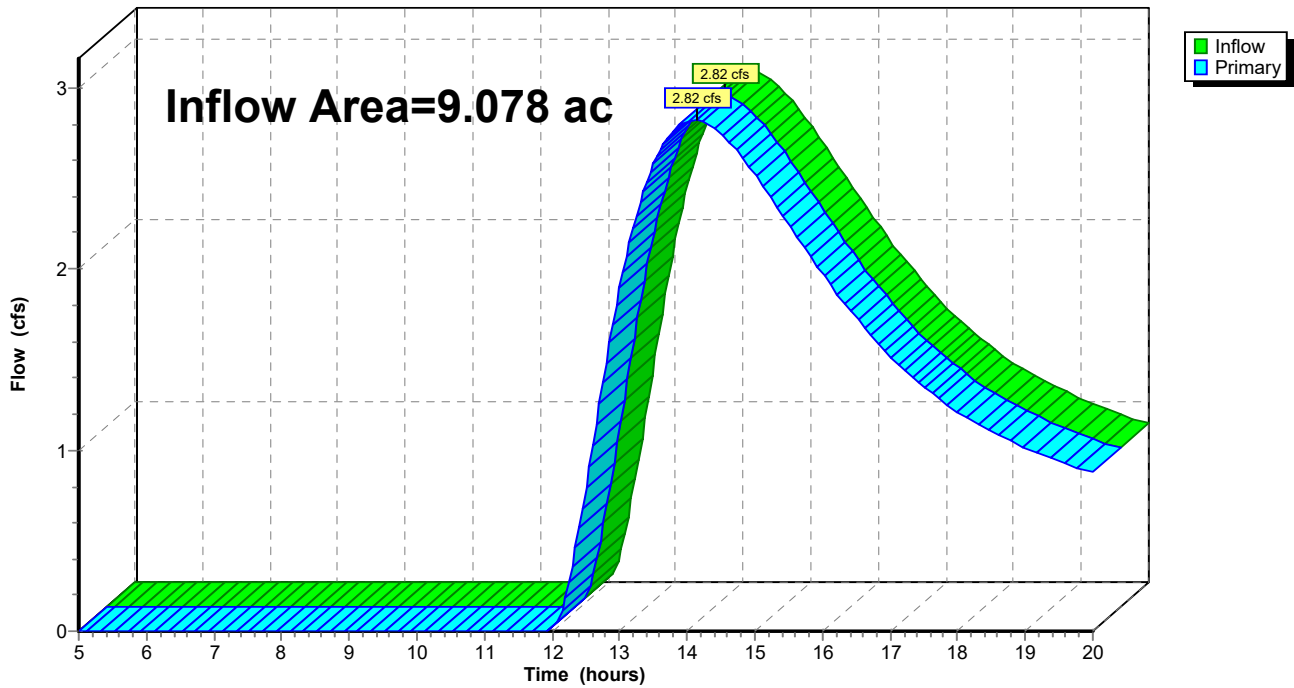
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.47" for 3 DAY-100YR. event
Inflow = 2.82 cfs @ 14.15 hrs, Volume= 1.114 af
Primary = 2.82 cfs @ 14.15 hrs, Volume= 1.114 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

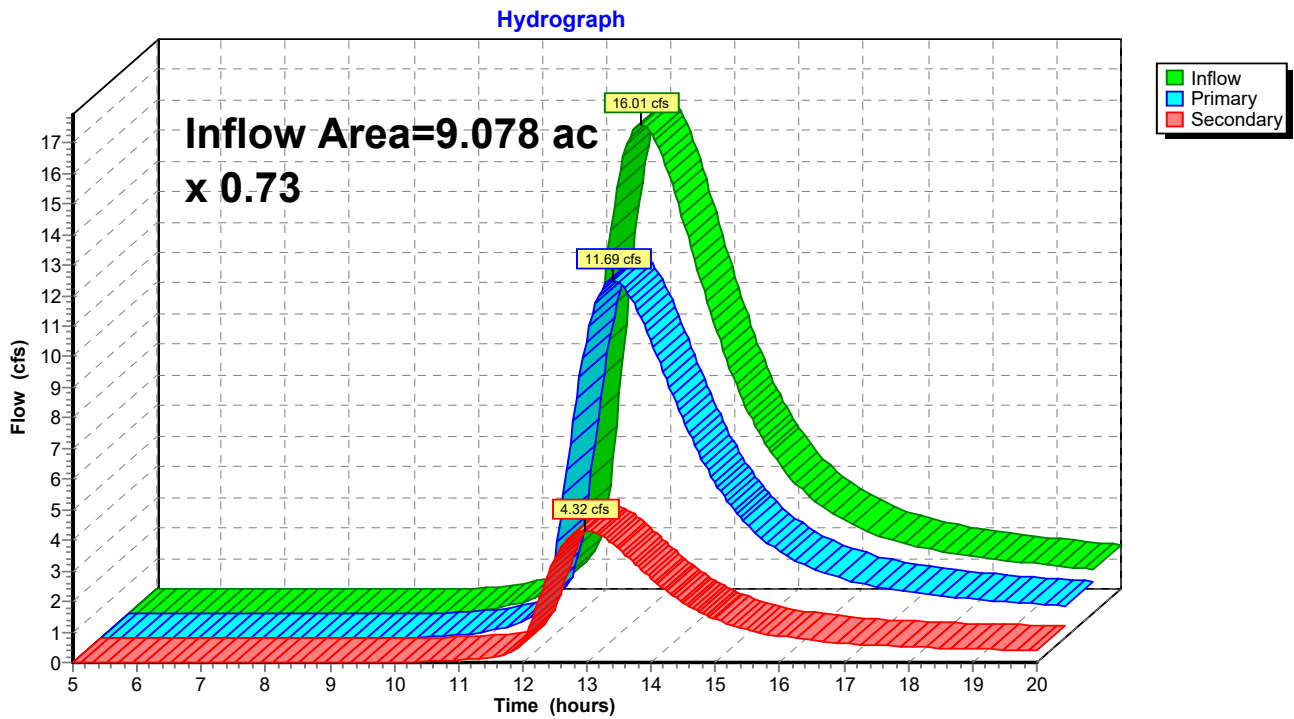


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 4.96" for 3 DAY-100YR. event
Inflow = 16.01 cfs @ 12.97 hrs, Volume= 3.753 af
Primary = 11.69 cfs @ 12.97 hrs, Volume= 2.740 af, Atten= 27%, Lag= 0.0 min
Secondary = 4.32 cfs @ 12.97 hrs, Volume= 1.013 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

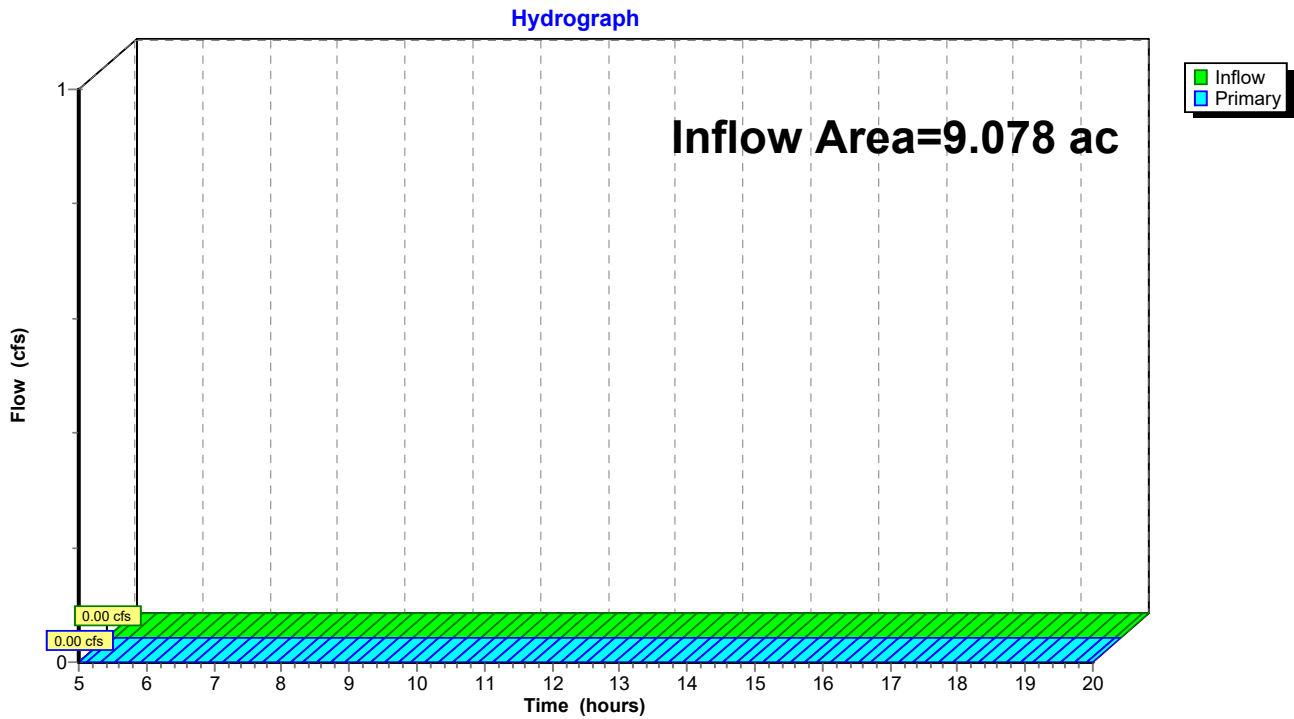


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 3 DAY-100YR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>2.09"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=4.17 cfs 1.579 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>6.12"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=19.88 cfs 4.630 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=5.80' Max Vel=0.31 fps Inflow=14.51 cfs 2.818 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=13.86 cfs 2.796 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=93.51' Storage=45,508 cf Inflow=5.69 cfs 1.046 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=93.20' Storage=121,739 cf Inflow=13.86 cfs 2.796 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.54' Storage=3,519 cf Inflow=5.37 cfs 1.250 af
Discarded=0.16 cfs 0.124 af Primary=5.69 cfs 1.046 af Outflow=5.85 cfs 1.170 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.44' Storage=9,651 cf Inflow=14.51 cfs 3.380 af
Discarded=0.44 cfs 0.340 af Primary=14.51 cfs 2.818 af Outflow=14.95 cfs 3.158 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=4.17 cfs 1.579 af
Primary=4.17 cfs 1.579 af

Link 2L: POST OUTFALL x 0.73 Inflow=19.88 cfs 4.630 af
Primary=14.51 cfs 3.380 af Secondary=5.37 cfs 1.250 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 4.17 cfs @ 14.01 hrs, Volume= 1.579 af, Depth> 2.09"

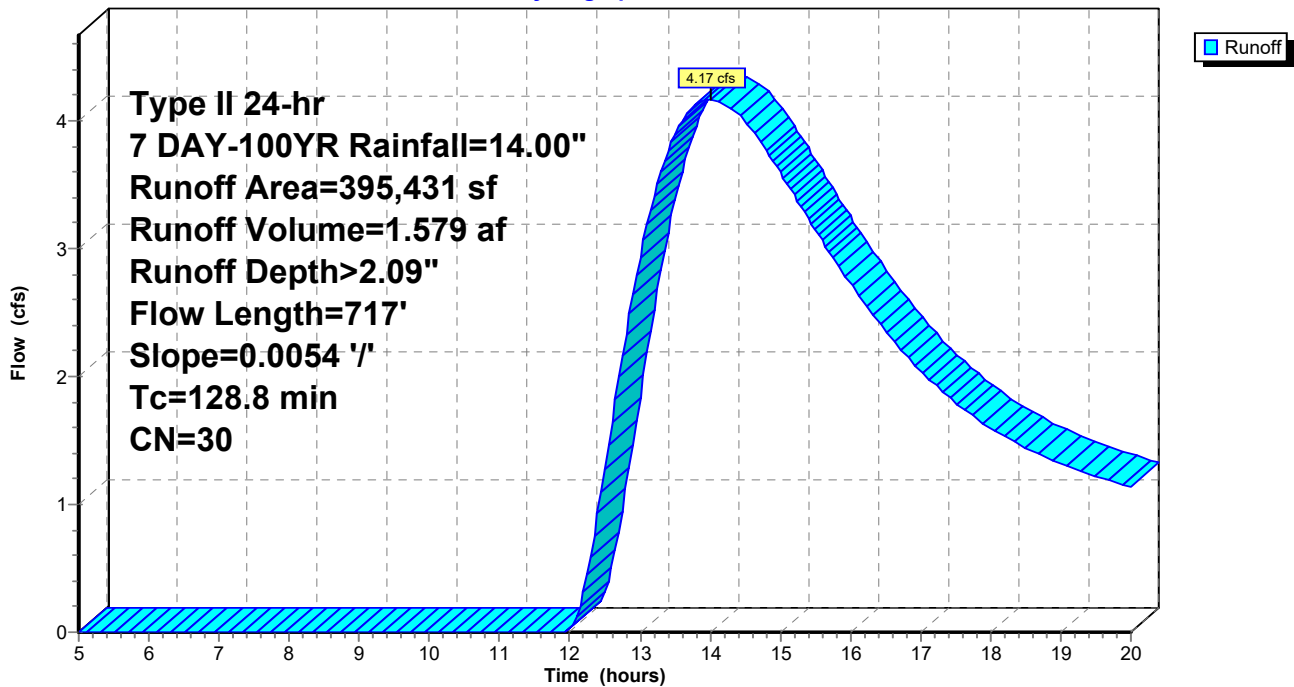
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 19.88 cfs @ 12.96 hrs, Volume= 4.630 af, Depth> 6.12"

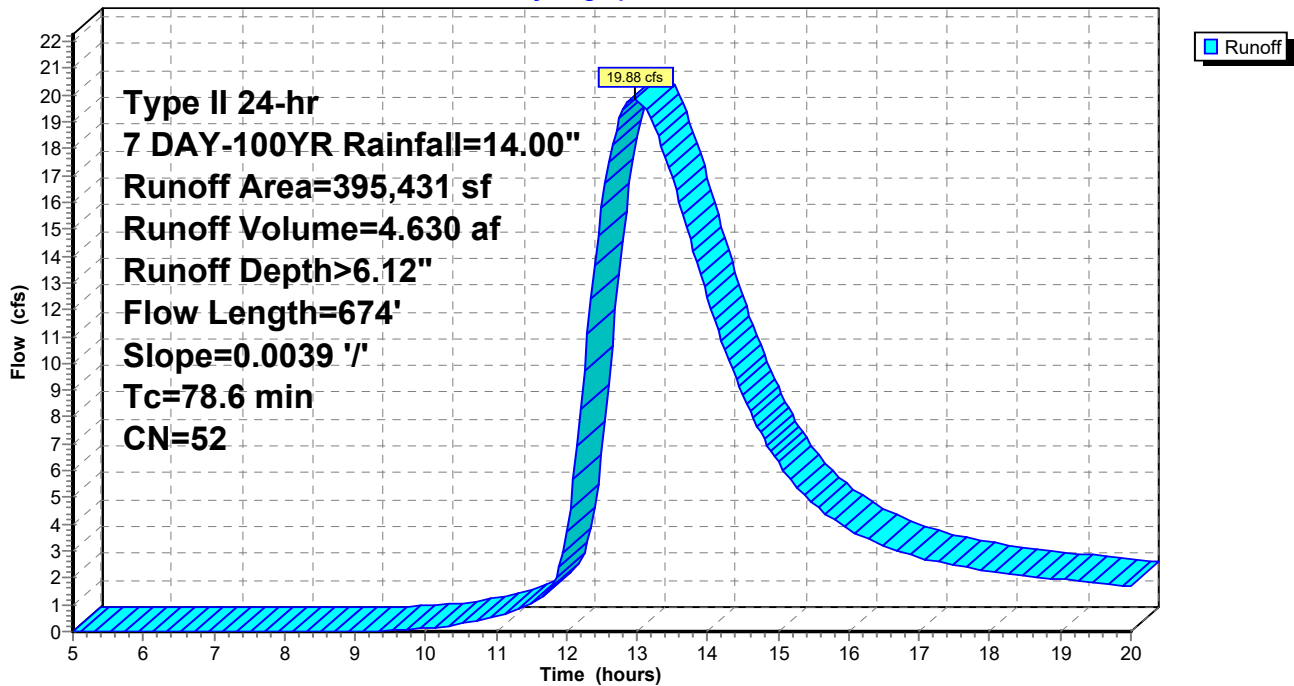
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 3.72" for 7 DAY-100YR event
Inflow = 14.51 cfs @ 12.95 hrs, Volume= 2.818 af
Outflow = 13.86 cfs @ 13.23 hrs, Volume= 2.796 af, Atten= 5%, Lag= 16.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.31 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 9.1 min

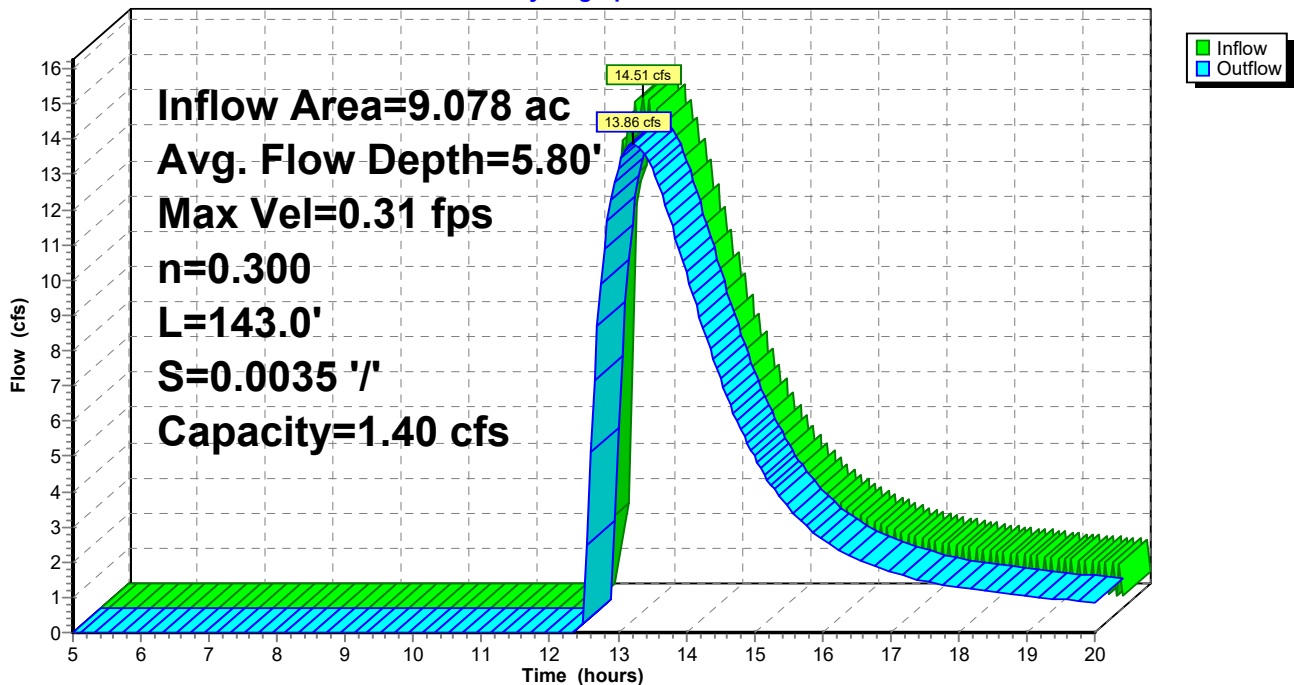
Peak Storage= 6,335 cf @ 13.10 hrs
Average Depth at Peak Storage= 5.80'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 ' / ' Top Width= 8.00'
Length= 143.0' Slope= 0.0035 ' / '
Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 5.69 cfs @ 13.00 hrs, Volume= 1.046 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.51' @ 20.00 hrs Surf.Area= 29,717 sf Storage= 45,508 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

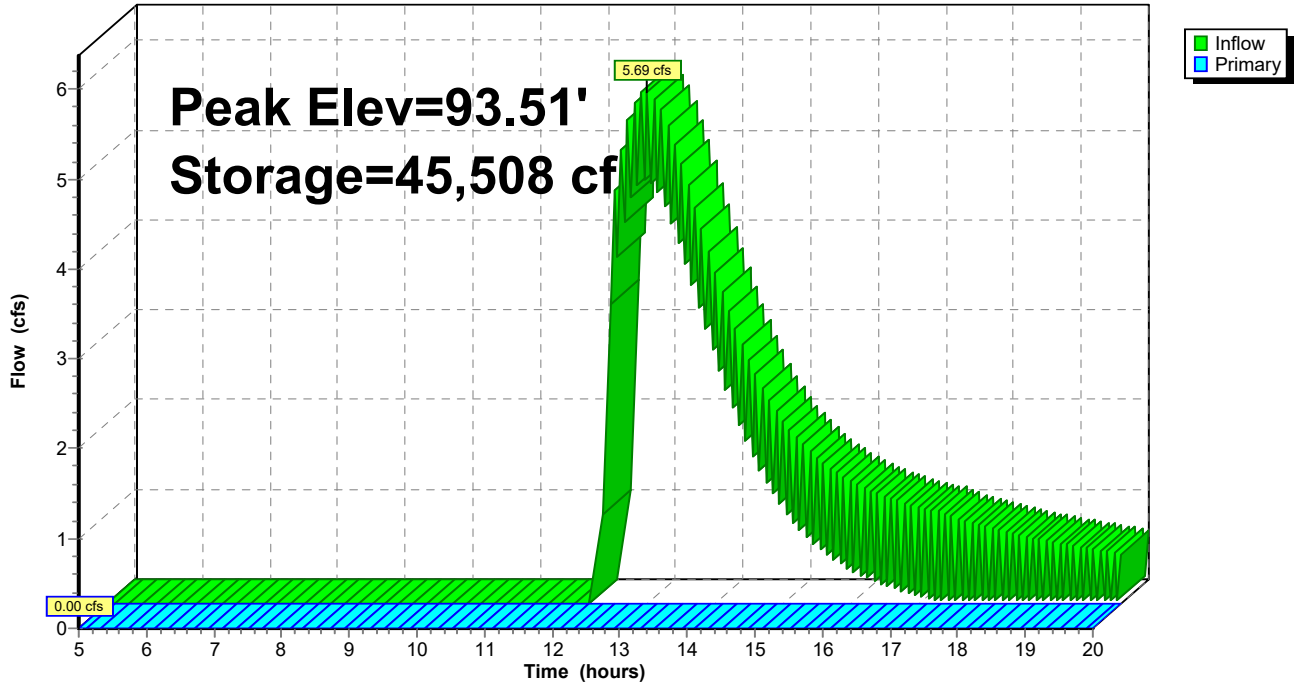
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 3.70" for 7 DAY-100YR event
 Inflow = 13.86 cfs @ 13.23 hrs, Volume= 2.796 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.20' @ 20.00 hrs Surf.Area= 66,690 sf Storage= 121,739 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

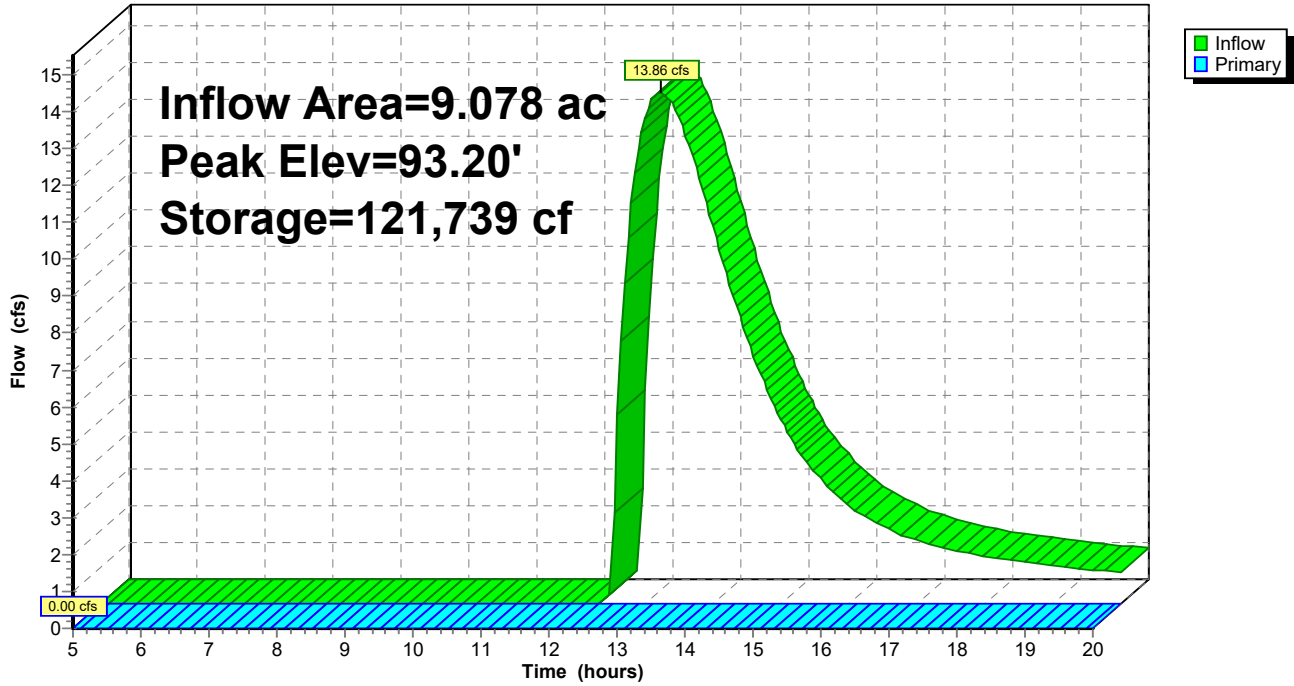
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 5.37 cfs @ 12.96 hrs, Volume= 1.250 af
 Outflow = 5.85 cfs @ 13.00 hrs, Volume= 1.170 af, Atten= 0%, Lag= 2.3 min
 Discarded = 0.16 cfs @ 11.45 hrs, Volume= 0.124 af
 Primary = 5.69 cfs @ 13.00 hrs, Volume= 1.046 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.54' @ 13.00 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 28.9 min calculated for 1.170 af (94% of inflow)
 Center-of-Mass det. time= 9.2 min (864.5 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 11.45 hrs HW=95.11' (Free Discharge)

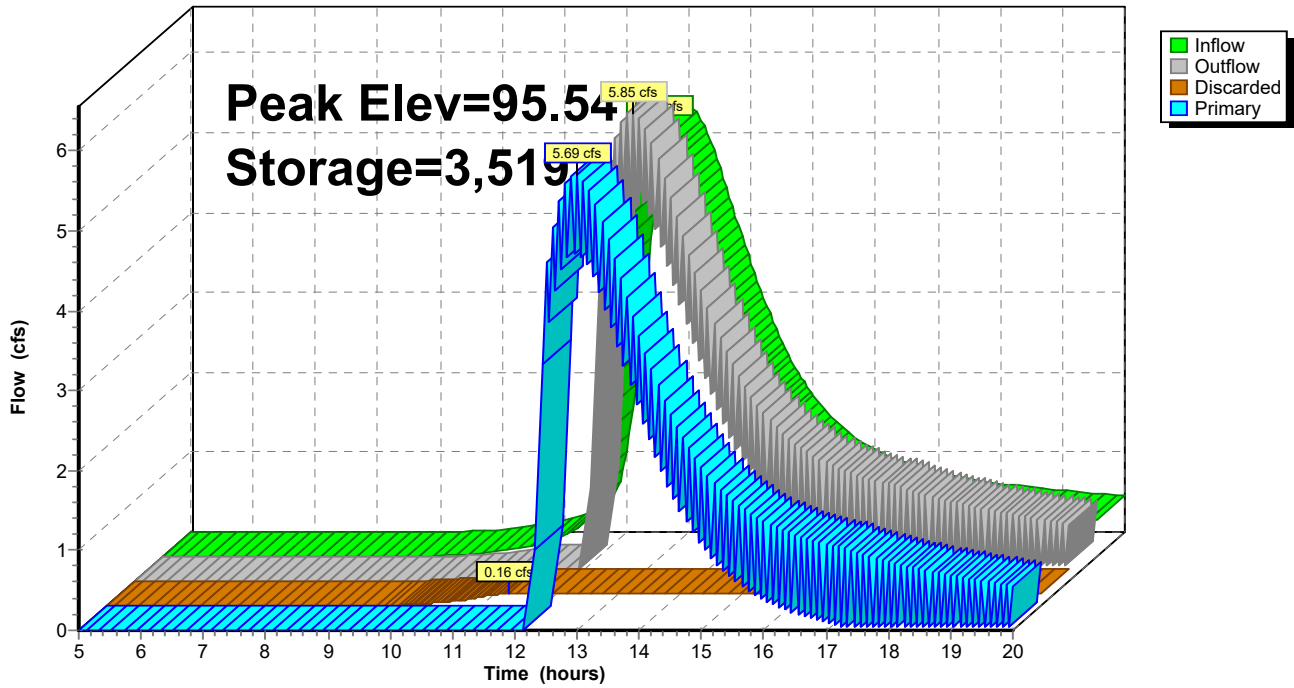
↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=5.68 cfs @ 13.00 hrs HW=95.54' (Free Discharge)

↑**1=Broad-Crested Rectangular Weir**(Weir Controls 5.68 cfs @ 1.42 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 7 DAY-100YR Rainfall=14.00"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 4.47" for 7 DAY-100YR event
 Inflow = 14.51 cfs @ 12.96 hrs, Volume= 3.380 af
 Outflow = 14.95 cfs @ 12.95 hrs, Volume= 3.158 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.44 cfs @ 11.45 hrs, Volume= 0.340 af
 Primary = 14.51 cfs @ 12.95 hrs, Volume= 2.818 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.44' @ 12.95 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 29.0 min calculated for 3.147 af (93% of inflow)
 Center-of-Mass det. time= 9.1 min (864.4 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

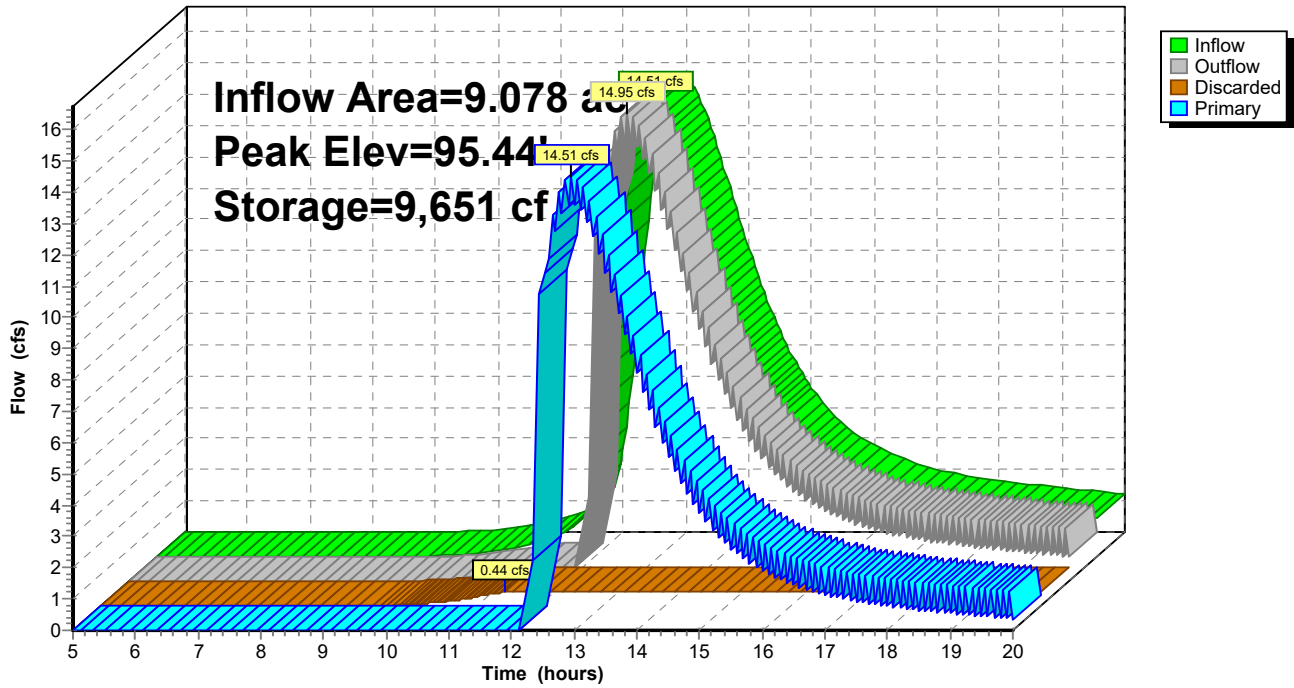
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 11.45 hrs HW=94.81' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=14.51 cfs @ 12.95 hrs HW=95.44' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 14.51 cfs @ 2.00 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



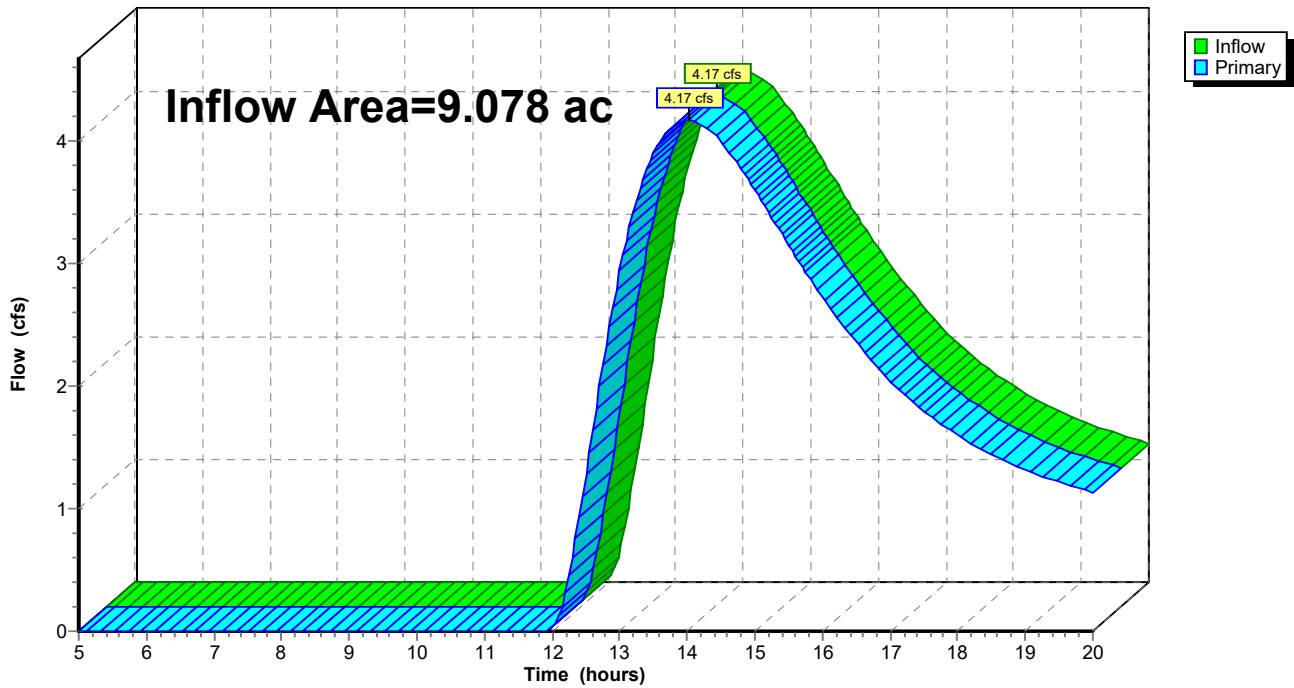
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 2.09" for 7 DAY-100YR event
Inflow = 4.17 cfs @ 14.01 hrs, Volume= 1.579 af
Primary = 4.17 cfs @ 14.01 hrs, Volume= 1.579 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

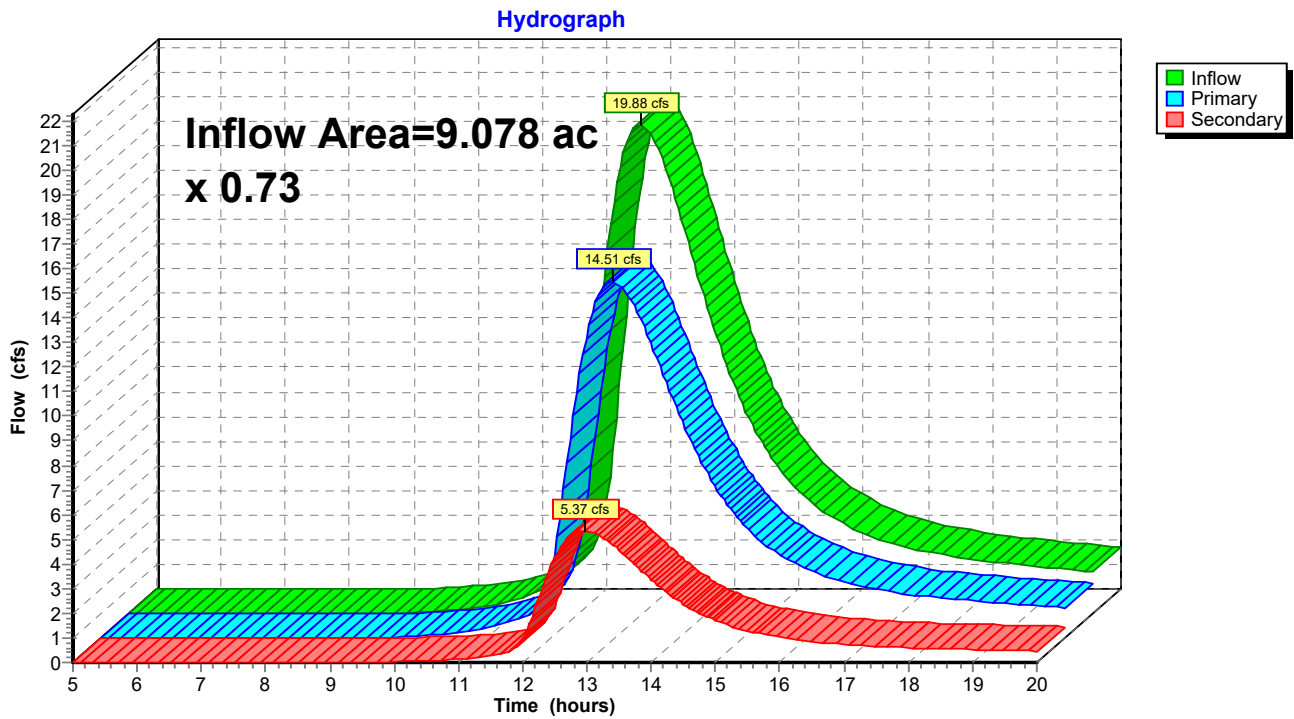


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 6.12" for 7 DAY-100YR event
Inflow = 19.88 cfs @ 12.96 hrs, Volume= 4.630 af
Primary = 14.51 cfs @ 12.96 hrs, Volume= 3.380 af, Atten= 27%, Lag= 0.0 min
Secondary = 5.37 cfs @ 12.96 hrs, Volume= 1.250 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

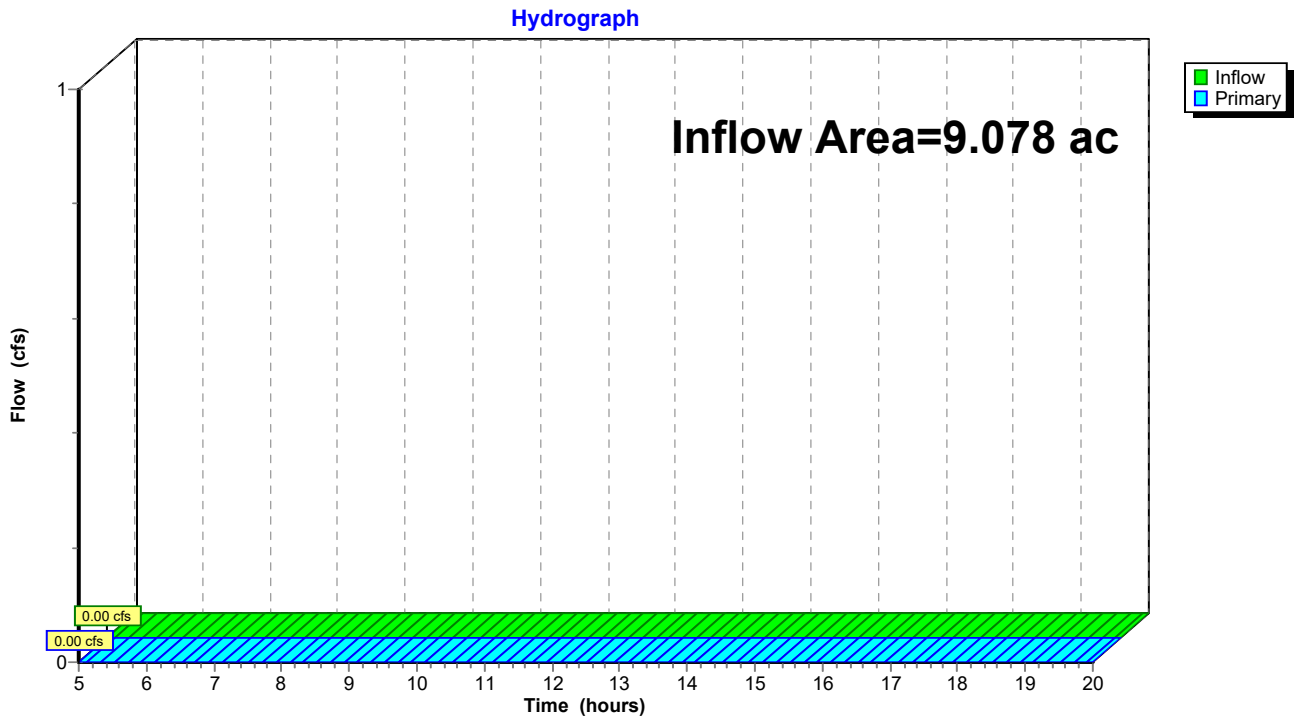


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 7 DAY-100YR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>3.01"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=6.24 cfs 2.275 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>7.71"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=25.14 cfs 5.832 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=7.26' Max Vel=0.32 fps Inflow=25.00 cfs 3.676 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=17.66 cfs 3.647 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=93.93' Storage=58,037 cf Inflow=9.74 cfs 1.362 af
Outflow=0.38 cfs 0.029 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=93.31' Storage=129,225 cf Inflow=17.66 cfs 3.647 af
Outflow=2.84 cfs 0.752 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.64' Storage=3,519 cf Inflow=6.79 cfs 1.575 af
Discarded=0.16 cfs 0.132 af Primary=9.74 cfs 1.362 af Outflow=9.90 cfs 1.495 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.62' Storage=9,651 cf Inflow=18.35 cfs 4.257 af
Discarded=0.44 cfs 0.362 af Primary=25.00 cfs 3.676 af Outflow=25.44 cfs 4.038 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=6.24 cfs 2.275 af
Primary=6.24 cfs 2.275 af

Link 2L: POST OUTFALL x 0.73 Inflow=25.14 cfs 5.832 af
Primary=18.35 cfs 4.257 af Secondary=6.79 cfs 1.575 af

Link 3L: TOTAL POST OUTFALL Inflow=2.84 cfs 0.781 af
Primary=2.84 cfs 0.781 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 6.24 cfs @ 13.91 hrs, Volume= 2.275 af, Depth> 3.01"

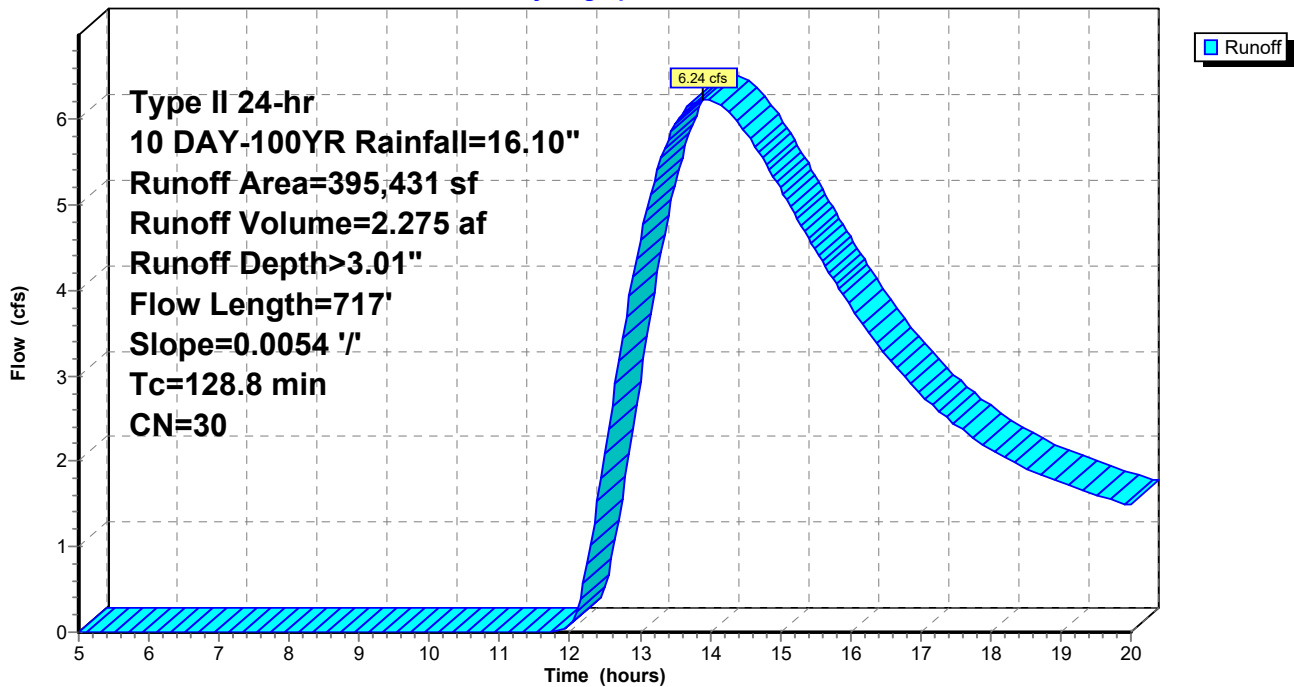
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 25.14 cfs @ 12.95 hrs, Volume= 5.832 af, Depth> 7.71"

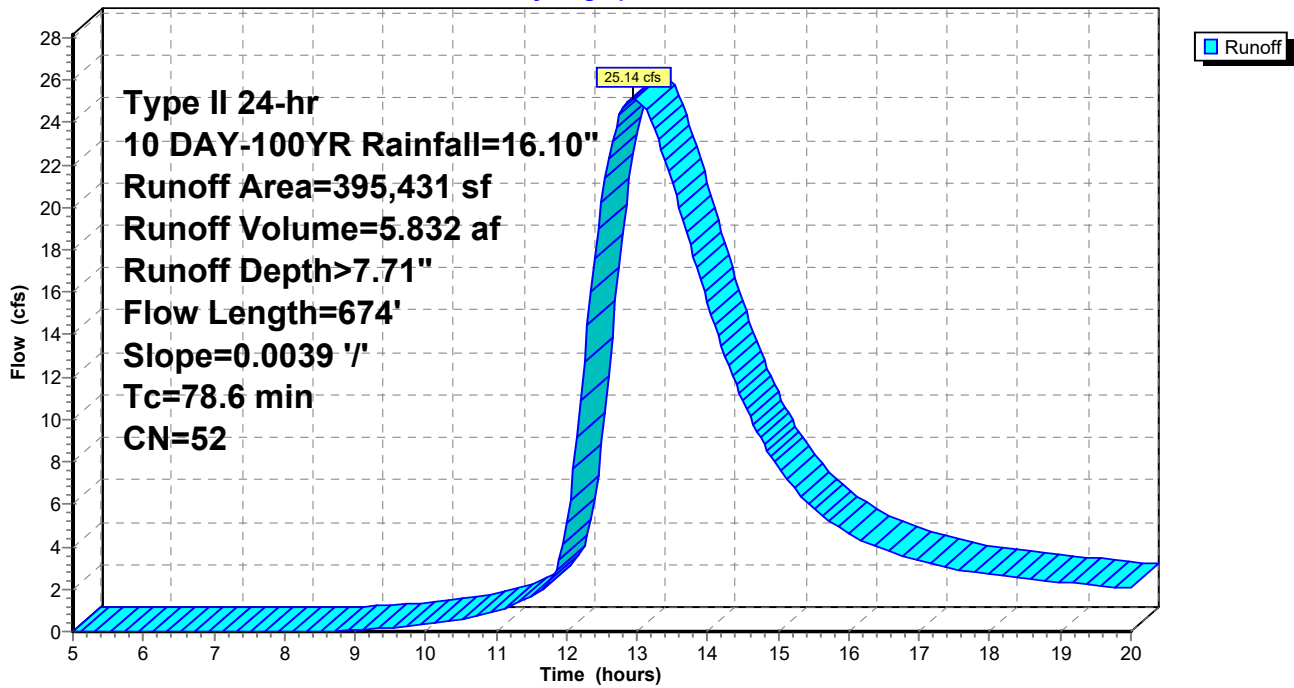
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 4.86" for 10 DAY-100YR event
 Inflow = 25.00 cfs @ 12.90 hrs, Volume= 3.676 af
 Outflow = 17.66 cfs @ 13.21 hrs, Volume= 3.647 af, Atten= 29%, Lag= 18.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.32 fps, Min. Travel Time= 7.5 min
 Avg. Velocity = 0.27 fps, Avg. Travel Time= 8.8 min

Peak Storage= 8,005 cf @ 13.08 hrs
 Average Depth at Peak Storage= 7.26'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

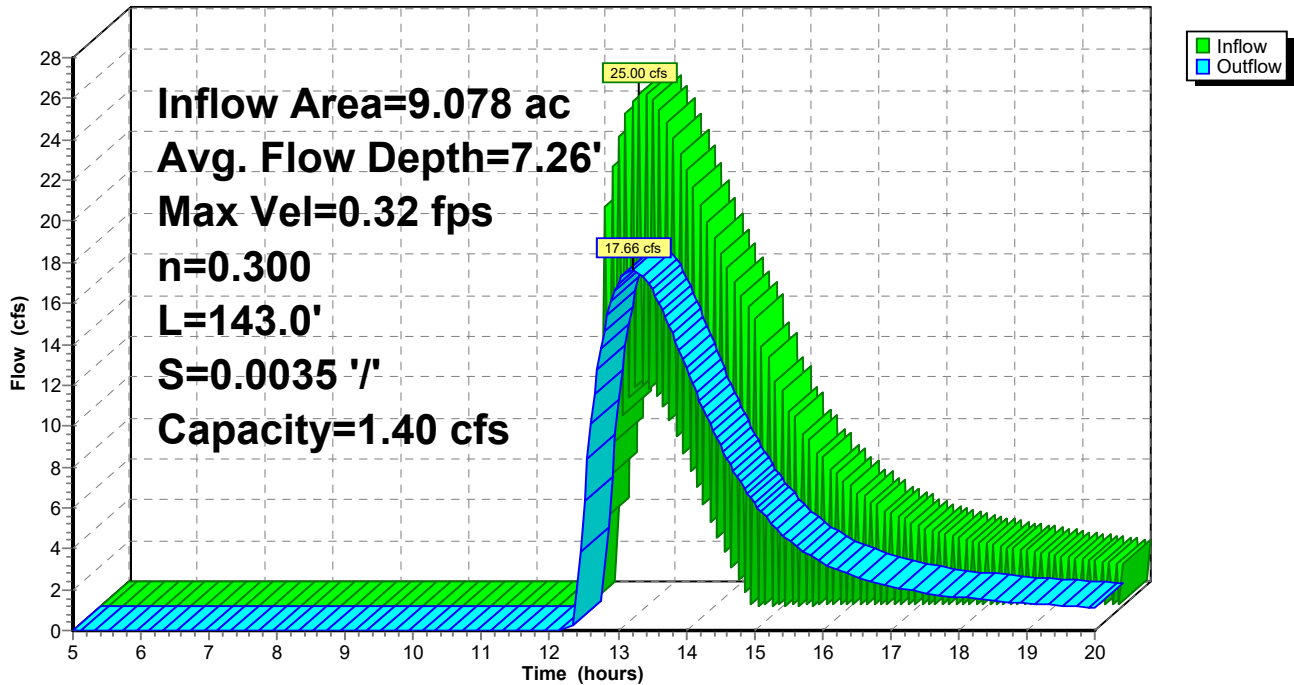
4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 143.0' Slope= 0.0035 '/'
 Inlet Invert= 93.80', Outlet Invert= 93.30'



‡

Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 9.74 cfs @ 12.90 hrs, Volume= 1.362 af
 Outflow = 0.38 cfs @ 20.00 hrs, Volume= 0.029 af, Atten= 96%, Lag= 426.0 min
 Primary = 0.38 cfs @ 20.00 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.93' @ 20.00 hrs Surf.Area= 30,514 sf Storage= 58,037 cf

Plug-Flow detention time= 431.8 min calculated for 0.029 af (2% of inflow)
 Center-of-Mass det. time= 316.0 min (1,170.5 - 854.5)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

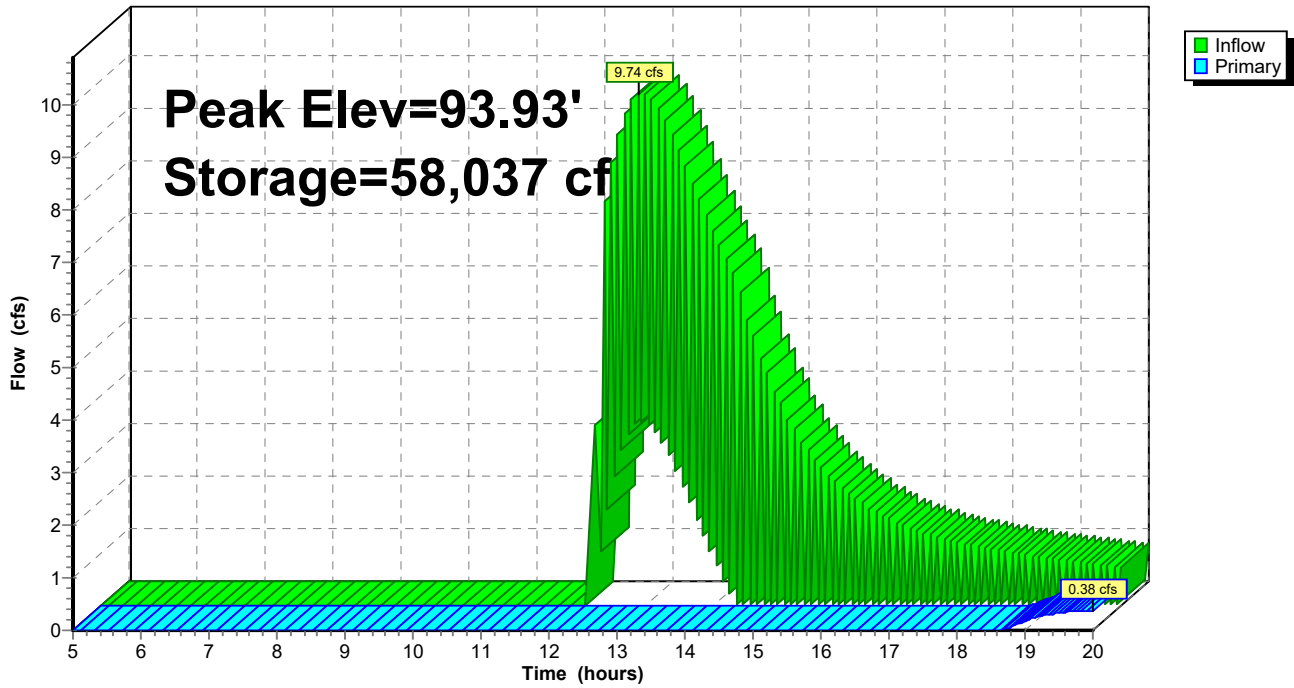
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.35 cfs @ 20.00 hrs HW=93.93' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 0.35 cfs @ 0.56 fps)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 4.82" for 10 DAY-100YR event
 Inflow = 17.66 cfs @ 13.21 hrs, Volume= 3.647 af
 Outflow = 2.84 cfs @ 16.33 hrs, Volume= 0.752 af, Atten= 84%, Lag= 187.4 min
 Primary = 2.84 cfs @ 16.33 hrs, Volume= 0.752 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 93.31' @ 16.33 hrs Surf.Area= 66,984 sf Storage= 129,225 cf

Plug-Flow detention time= 277.7 min calculated for 0.749 af (21% of inflow)
 Center-of-Mass det. time= 181.2 min (1,048.5 - 867.3)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

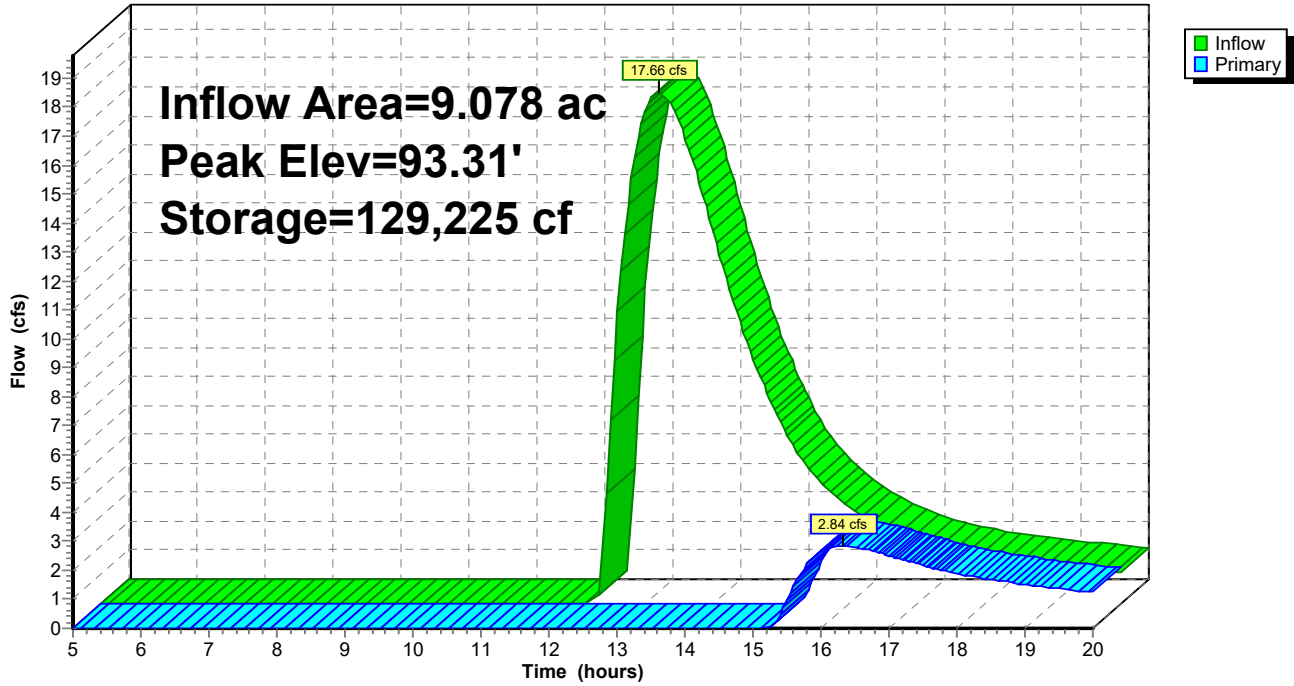
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=2.84 cfs @ 16.33 hrs HW=93.31' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 2.84 cfs @ 1.05 fps)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 6.79 cfs @ 12.95 hrs, Volume= 1.575 af
 Outflow = 9.90 cfs @ 12.90 hrs, Volume= 1.495 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 10.95 hrs, Volume= 0.132 af
 Primary = 9.74 cfs @ 12.90 hrs, Volume= 1.362 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.64' @ 12.90 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 23.6 min calculated for 1.490 af (95% of inflow)
 Center-of-Mass det. time= 7.8 min (858.7 - 850.9)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 10.95 hrs HW=95.11' (Free Discharge)

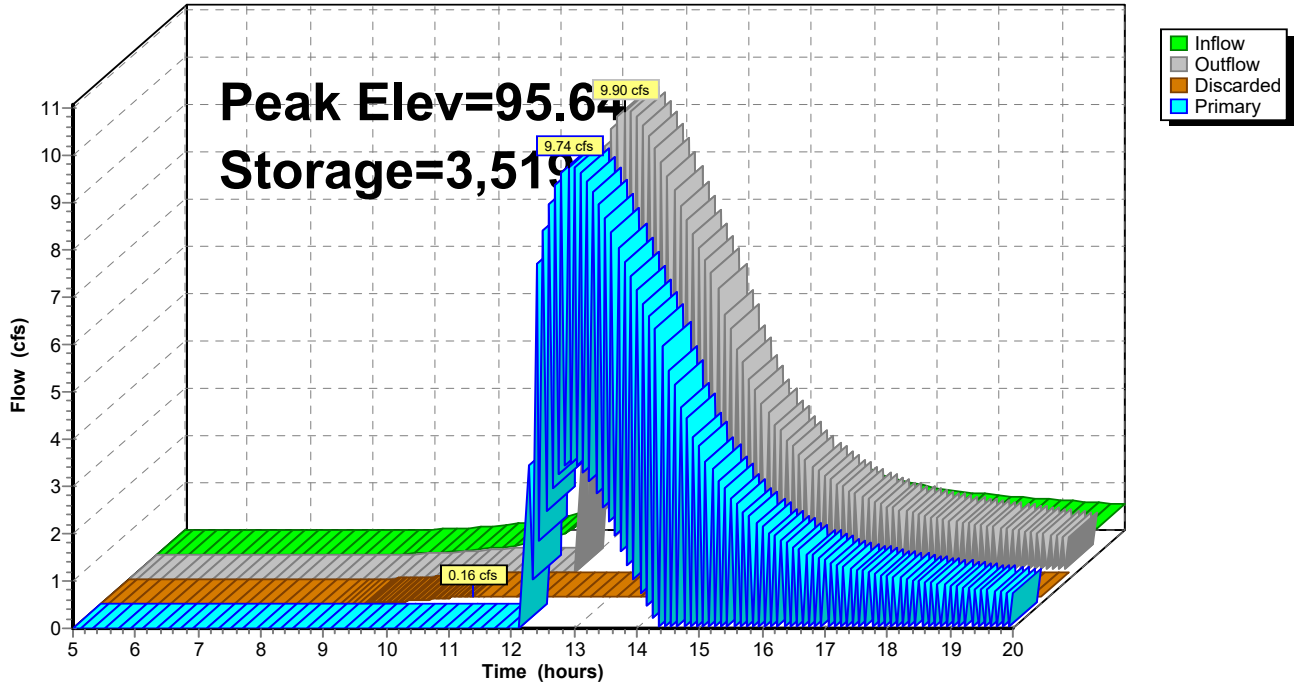
↑ **2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=9.74 cfs @ 12.90 hrs HW=95.64' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 9.74 cfs @ 1.72 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10 DAY-100YR Rainfall=16.10"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 5.63" for 10 DAY-100YR event
 Inflow = 18.35 cfs @ 12.95 hrs, Volume= 4.257 af
 Outflow = 25.44 cfs @ 12.90 hrs, Volume= 4.038 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.44 cfs @ 11.10 hrs, Volume= 0.362 af
 Primary = 25.00 cfs @ 12.90 hrs, Volume= 3.676 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.62' @ 12.90 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 23.9 min calculated for 4.024 af (95% of inflow)
 Center-of-Mass det. time= 7.9 min (858.8 - 850.9)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

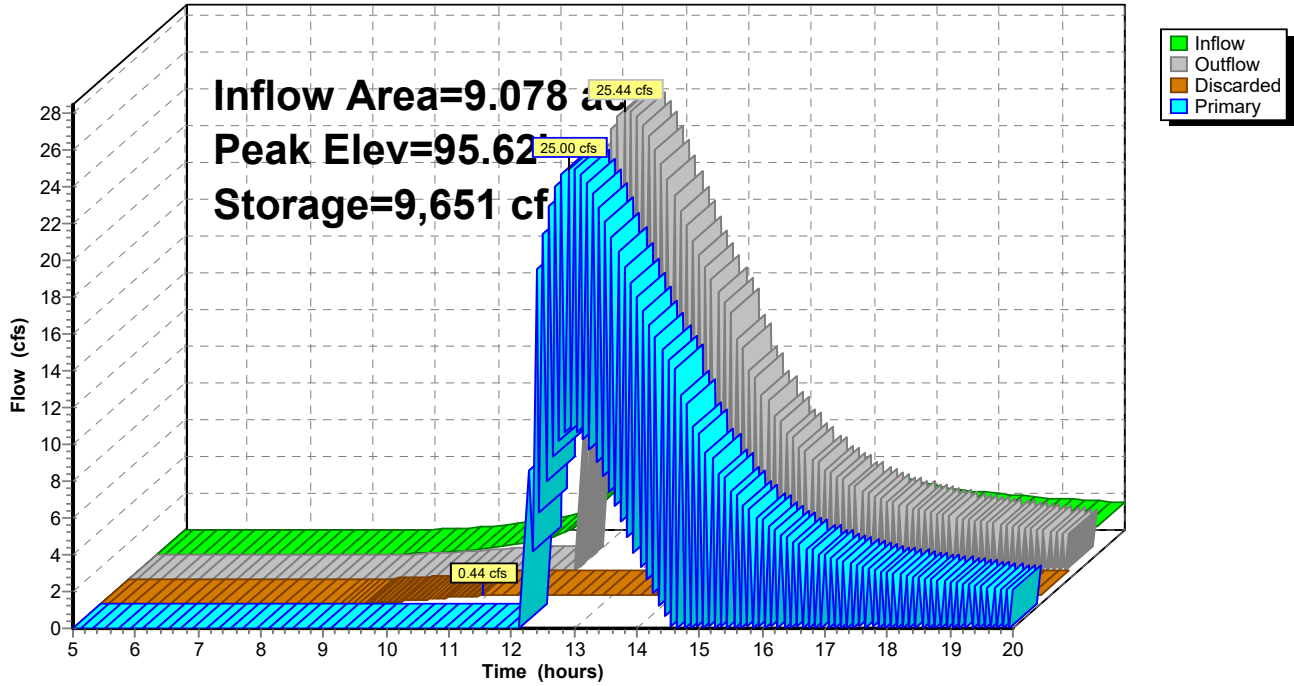
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 11.10 hrs HW=94.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=25.00 cfs @ 12.90 hrs HW=95.62' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 25.00 cfs @ 2.47 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



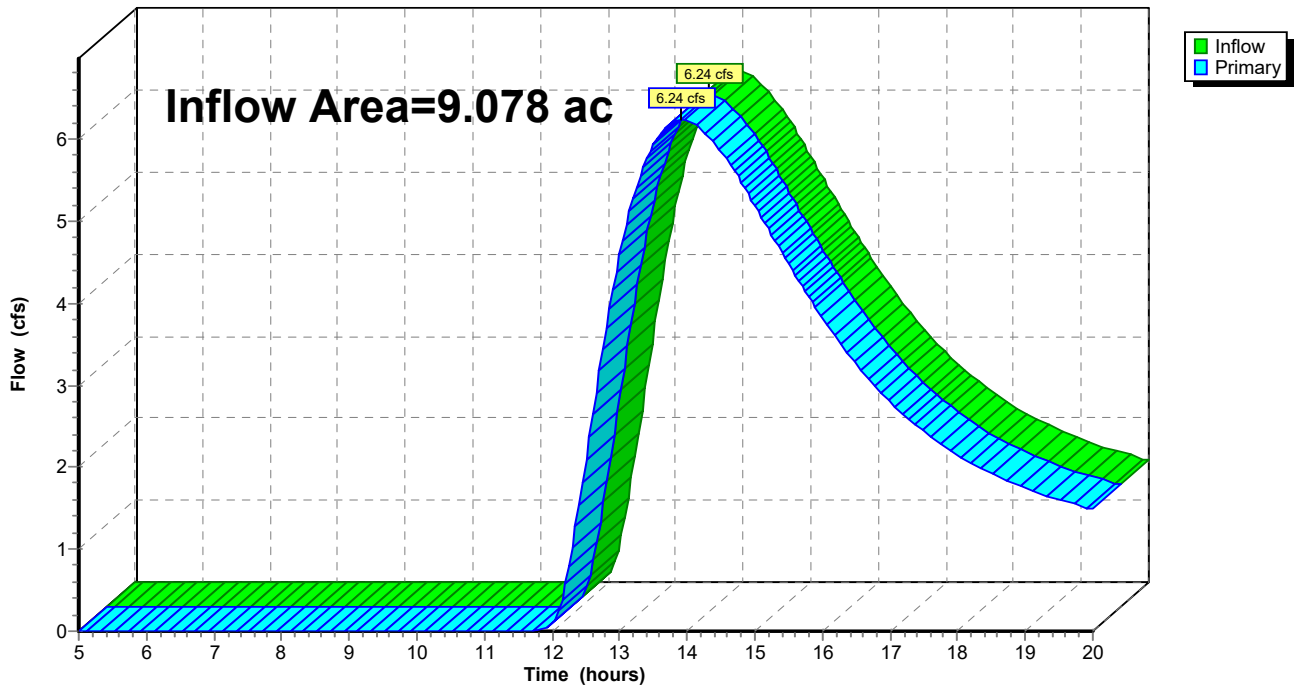
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 3.01" for 10 DAY-100YR event
Inflow = 6.24 cfs @ 13.91 hrs, Volume= 2.275 af
Primary = 6.24 cfs @ 13.91 hrs, Volume= 2.275 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

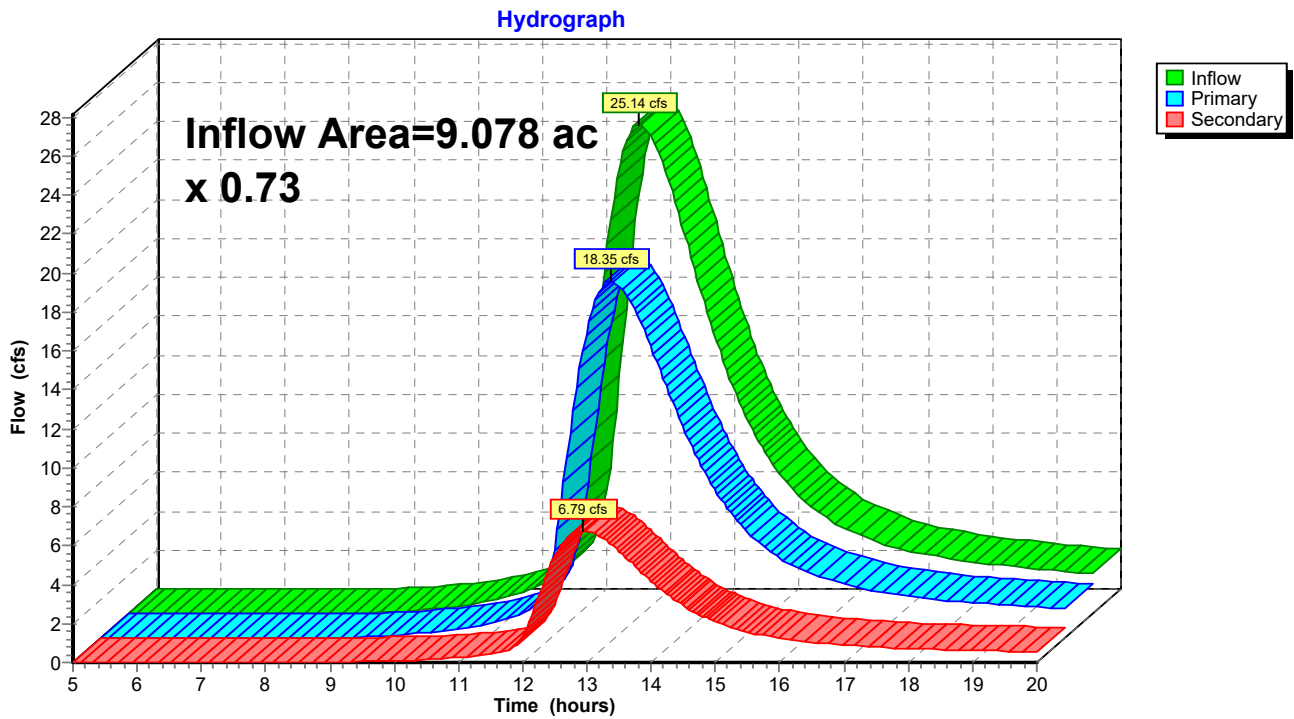


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 7.71" for 10 DAY-100YR event
Inflow = 25.14 cfs @ 12.95 hrs, Volume= 5.832 af
Primary = 18.35 cfs @ 12.95 hrs, Volume= 4.257 af, Atten= 27%, Lag= 0.0 min
Secondary = 6.79 cfs @ 12.95 hrs, Volume= 1.575 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL



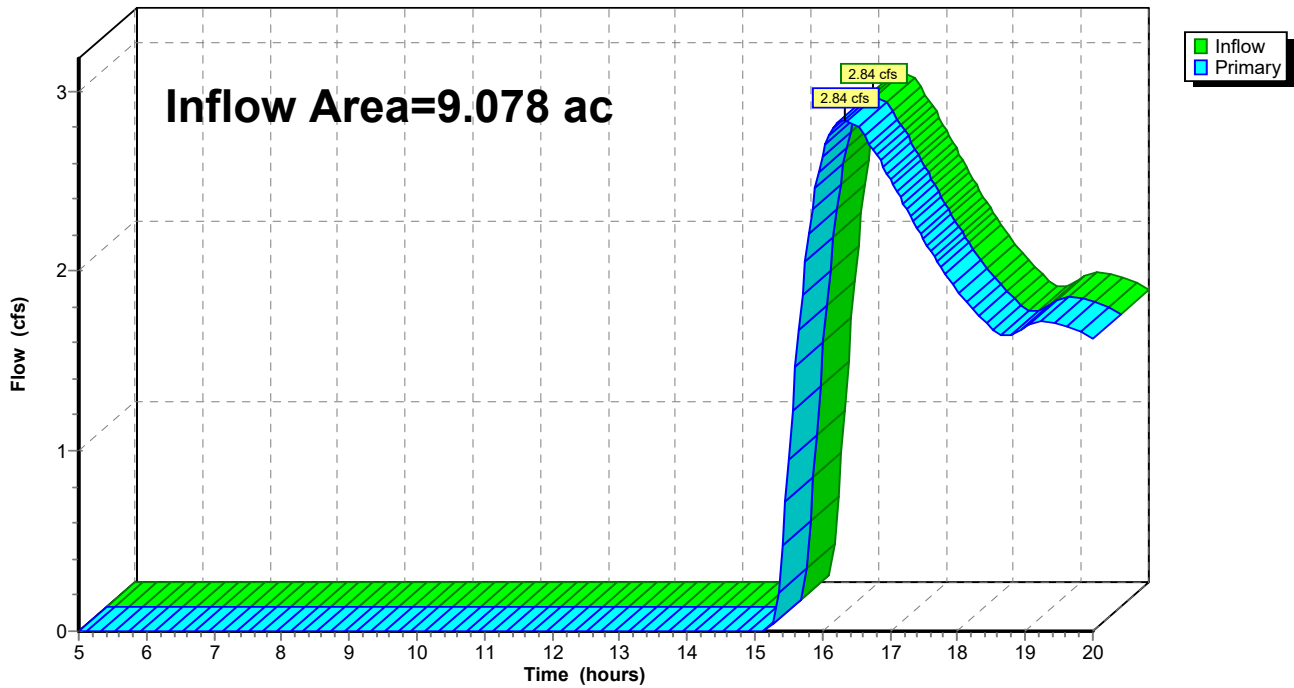
Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.03" for 10 DAY-100YR event
Inflow = 2.84 cfs @ 16.33 hrs, Volume= 0.781 af
Primary = 2.84 cfs @ 16.33 hrs, Volume= 0.781 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.09"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.14 cfs 0.066 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>1.42"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=4.13 cfs 1.076 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.21' Max Vel=0.25 fps Inflow=2.97 cfs 0.282 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=1.93 cfs 0.280 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=92.08' Storage=4,709 cf Inflow=1.70 cfs 0.108 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.50' Storage=12,185 cf Inflow=1.93 cfs 0.280 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.40' Storage=3,519 cf Inflow=1.12 cfs 0.291 af
Discarded=0.16 cfs 0.104 af Primary=1.70 cfs 0.108 af Outflow=1.86 cfs 0.213 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.15' Storage=9,651 cf Inflow=3.02 cfs 0.786 af
Discarded=0.44 cfs 0.287 af Primary=2.97 cfs 0.282 af Outflow=3.41 cfs 0.568 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=0.14 cfs 0.066 af
Primary=0.14 cfs 0.066 af

Link 2L: POST OUTFALL x 0.73 Inflow=4.13 cfs 1.076 af
Primary=3.02 cfs 0.786 af Secondary=1.12 cfs 0.291 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.14 cfs @ 17.31 hrs, Volume= 0.066 af, Depth> 0.09"

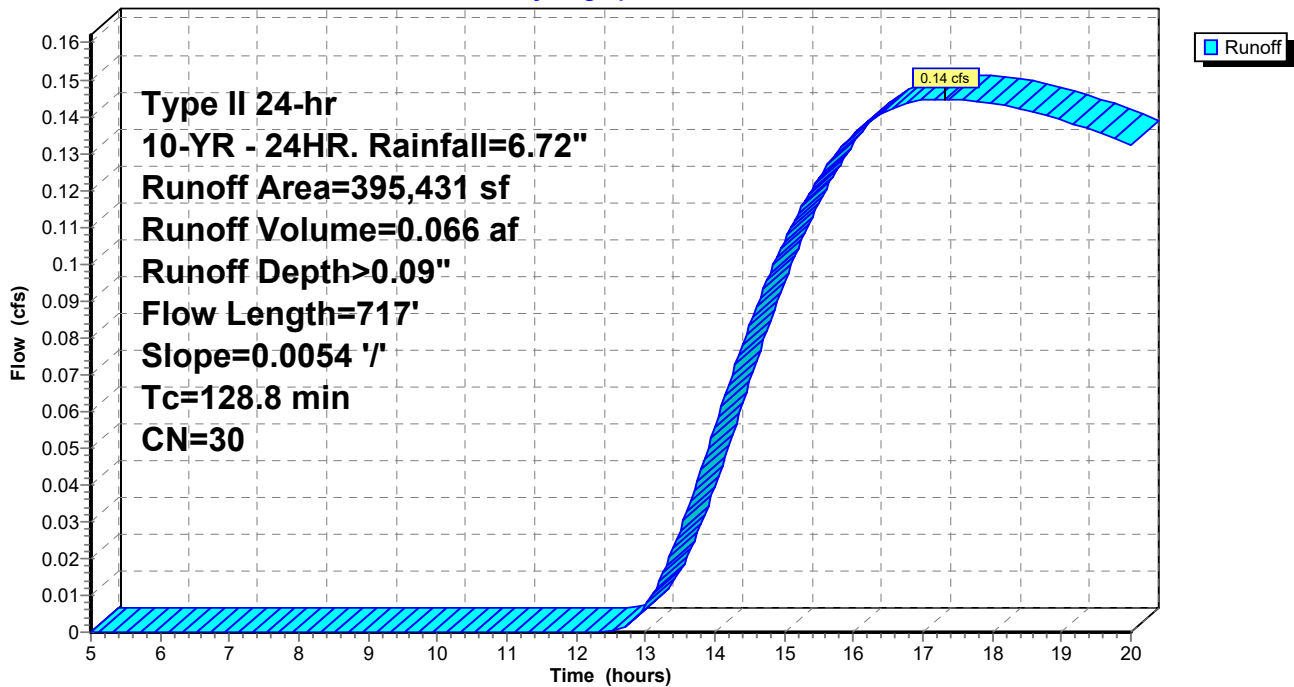
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 4.13 cfs @ 13.09 hrs, Volume= 1.076 af, Depth> 1.42"

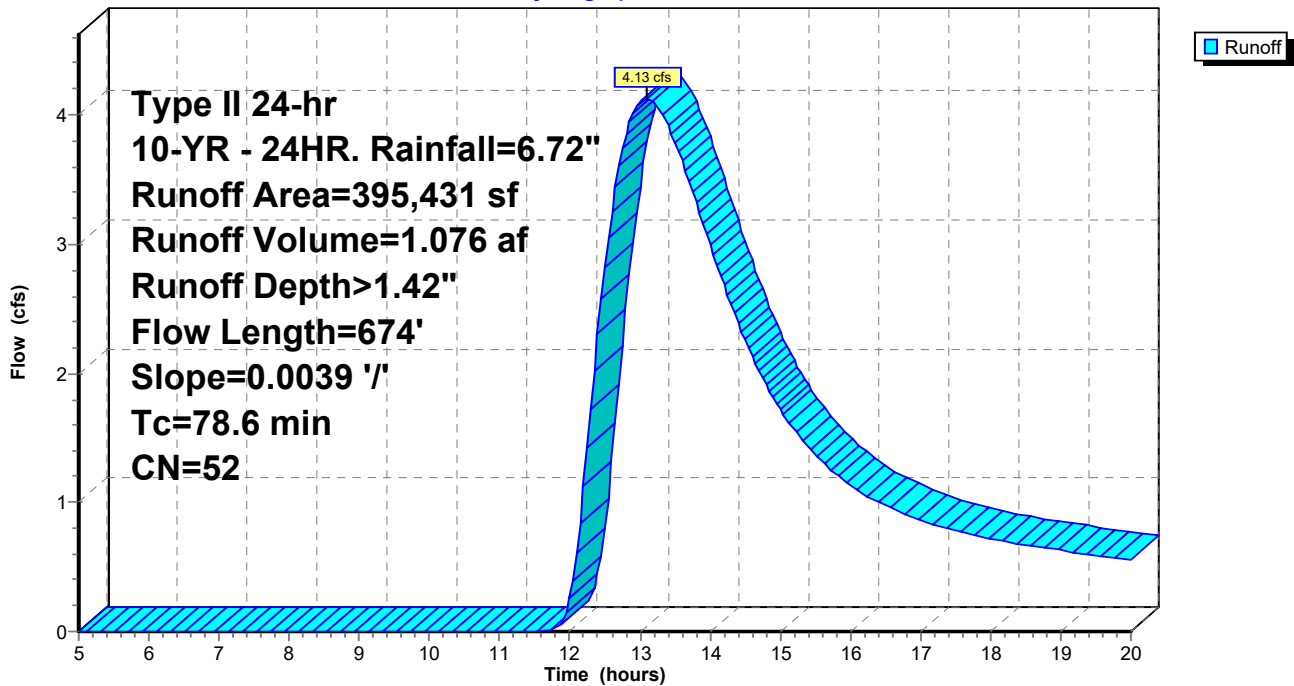
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.37" for 10-YR - 24HR. event
Inflow = 2.97 cfs @ 13.50 hrs, Volume= 0.282 af
Outflow = 1.93 cfs @ 14.01 hrs, Volume= 0.280 af, Atten= 35%, Lag= 30.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.25 fps, Min. Travel Time= 9.4 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 16.4 min

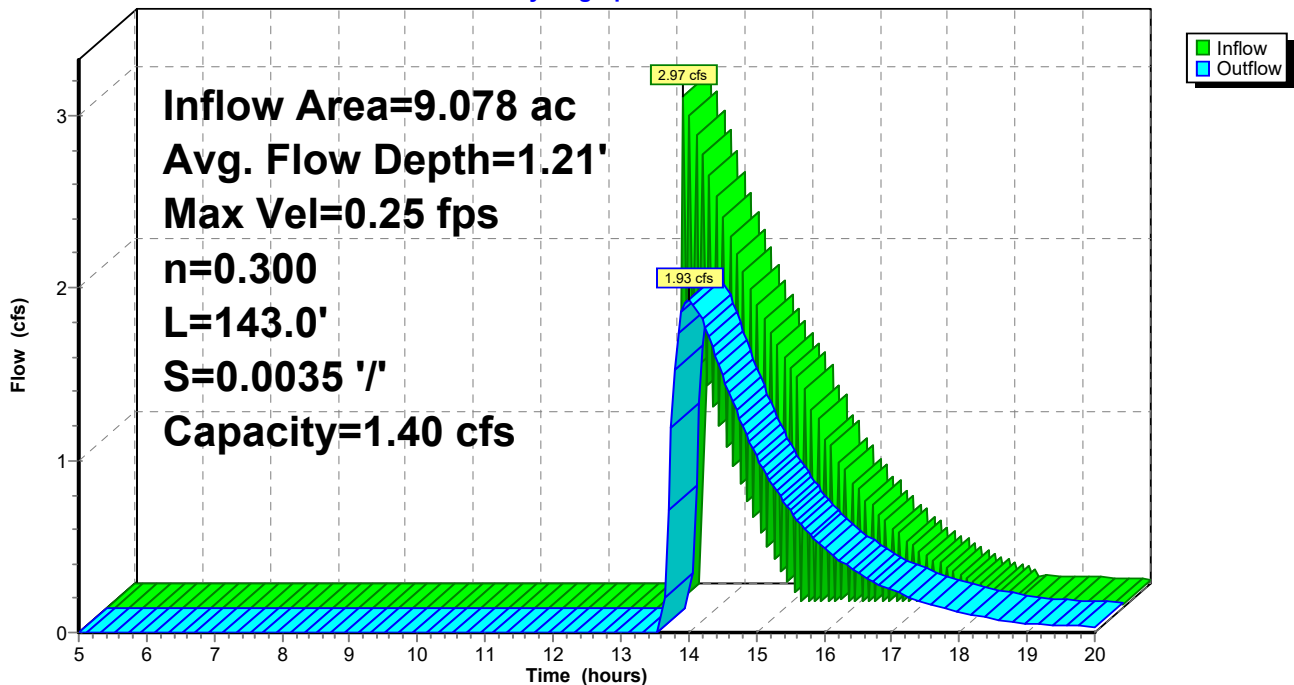
Peak Storage= 1,094 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.21'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 ' / ' Top Width= 8.00'
Length= 143.0' Slope= 0.0035 ' / '
Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 1.70 cfs @ 13.50 hrs, Volume= 0.108 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.08' @ 20.00 hrs Surf.Area= 26,984 sf Storage= 4,709 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

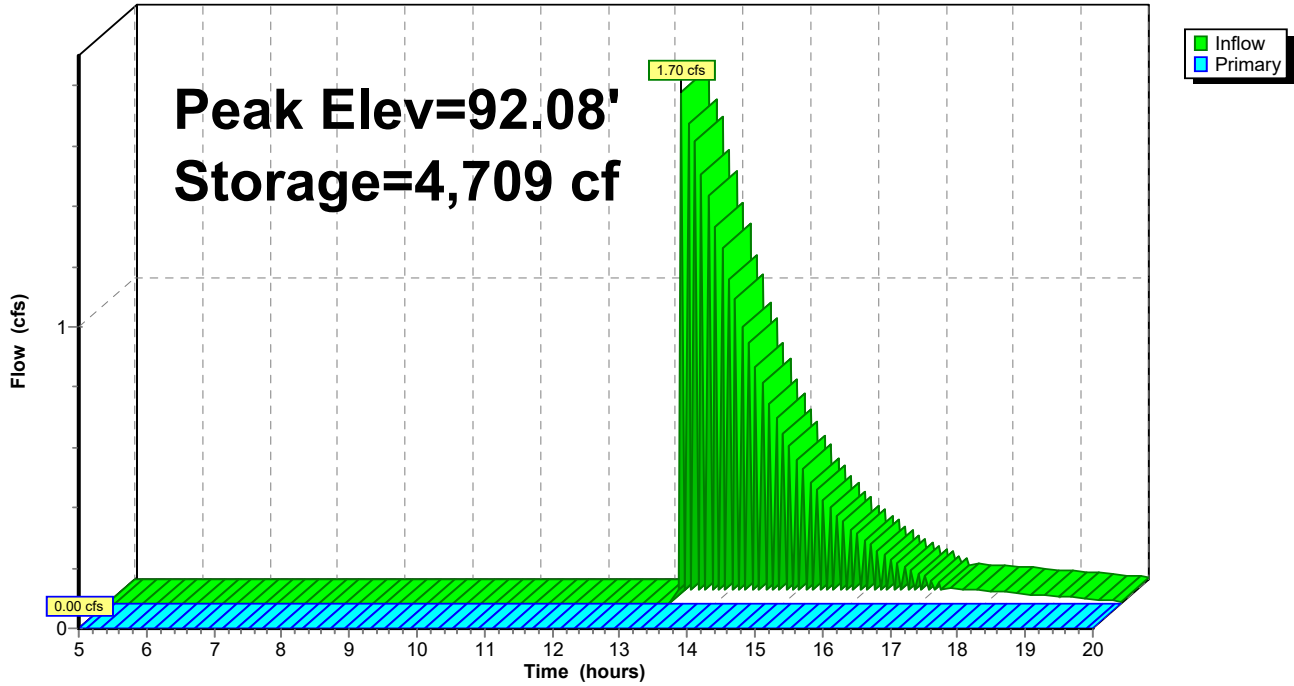
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.37" for 10-YR - 24HR. event
Inflow = 1.93 cfs @ 14.01 hrs, Volume= 0.280 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.50' @ 20.00 hrs Surf.Area= 62,256 sf Storage= 12,185 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

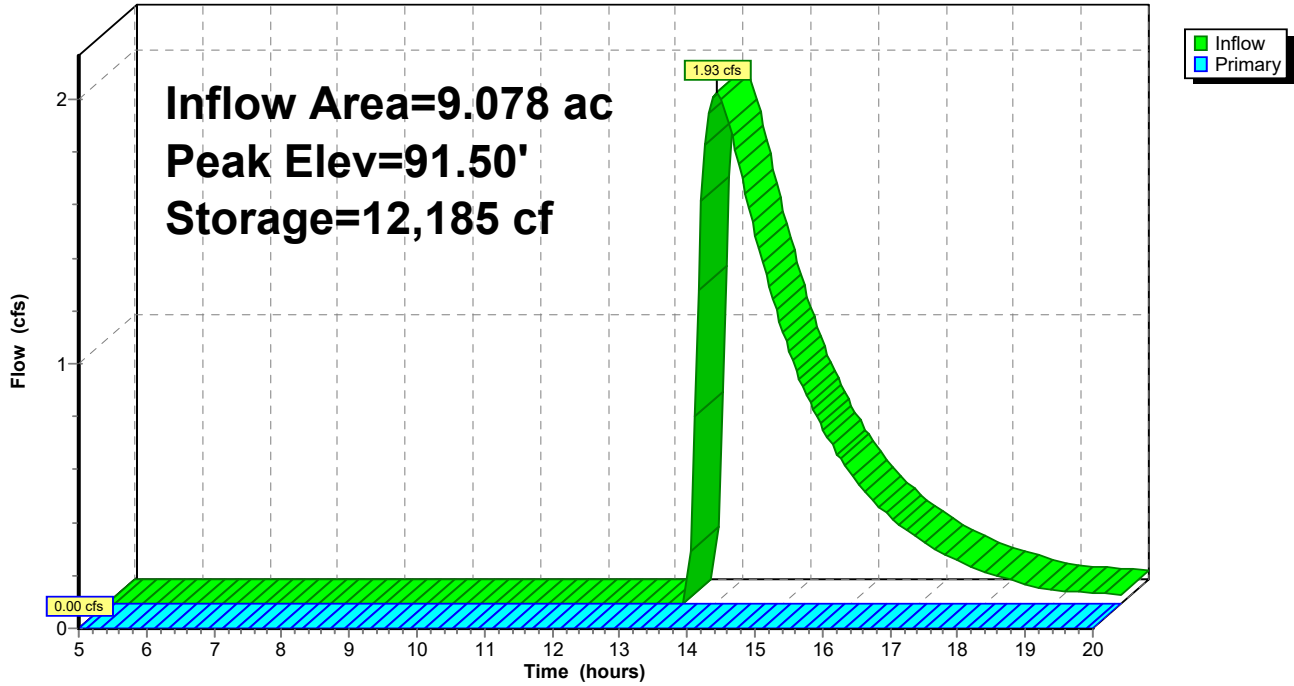
Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 1.12 cfs @ 13.09 hrs, Volume= 0.291 af
 Outflow = 1.86 cfs @ 13.50 hrs, Volume= 0.213 af, Atten= 0%, Lag= 24.5 min
 Discarded = 0.16 cfs @ 12.30 hrs, Volume= 0.104 af
 Primary = 1.70 cfs @ 13.50 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.40' @ 13.50 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 106.8 min calculated for 0.213 af (73% of inflow)
 Center-of-Mass det. time= 44.6 min (926.6 - 882.1)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

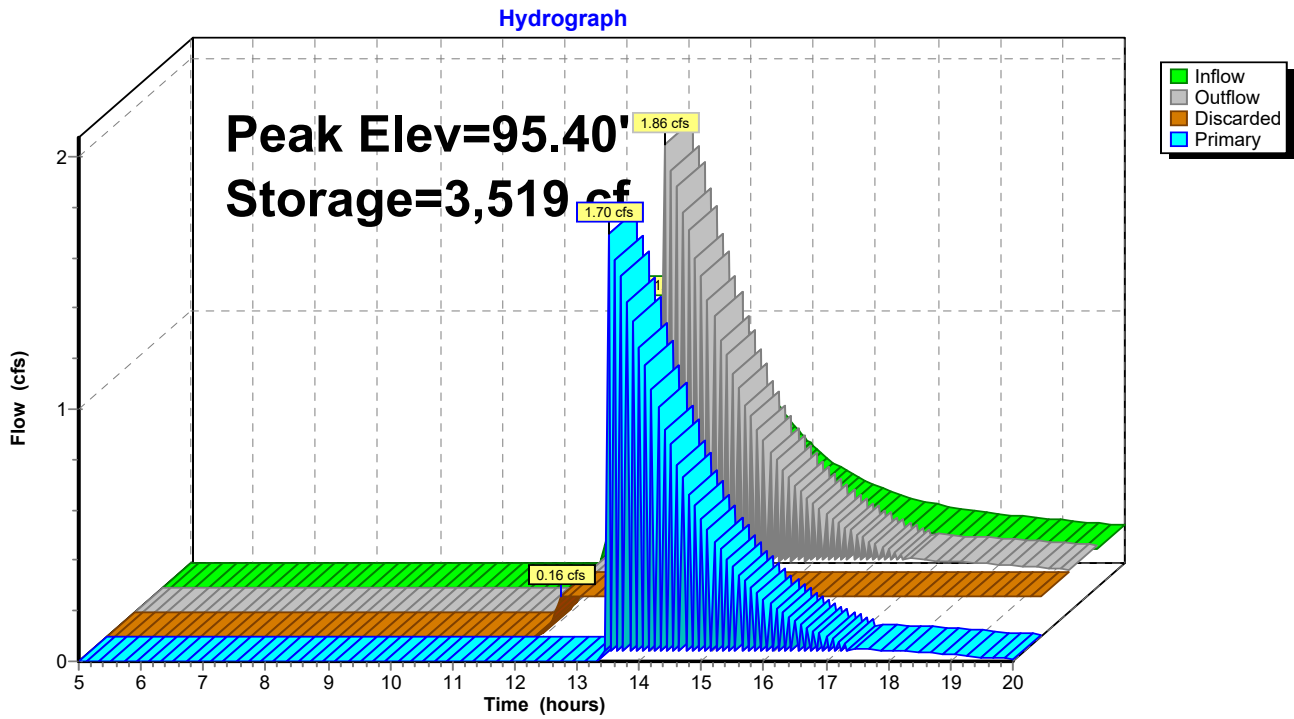
Discarded OutFlow Max=0.16 cfs @ 12.30 hrs HW=95.11' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=1.70 cfs @ 13.50 hrs HW=95.40' (Free Discharge)

↑**1=Broad-Crested Rectangular Weir**(Weir Controls 1.70 cfs @ 0.94 fps)

Pond 3P: ROCK VOID AREA NO.1



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.04" for 10-YR - 24HR. event
 Inflow = 3.02 cfs @ 13.09 hrs, Volume= 0.786 af
 Outflow = 3.41 cfs @ 13.50 hrs, Volume= 0.568 af, Atten= 0%, Lag= 24.5 min
 Discarded = 0.44 cfs @ 12.30 hrs, Volume= 0.287 af
 Primary = 2.97 cfs @ 13.50 hrs, Volume= 0.282 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.15' @ 13.50 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 107.7 min calculated for 0.568 af (72% of inflow)
 Center-of-Mass det. time= 44.1 min (926.1 - 882.1)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

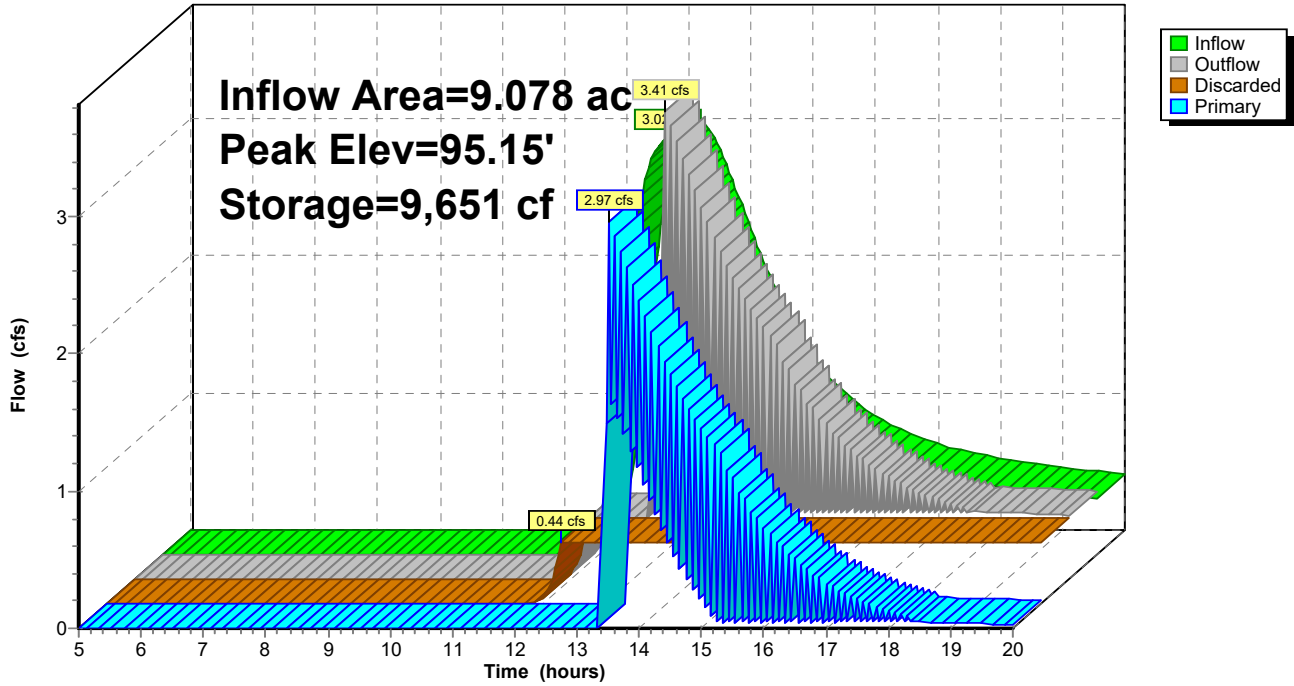
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 12.30 hrs HW=94.81' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=2.97 cfs @ 13.50 hrs HW=95.15' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 2.97 cfs @ 1.13 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



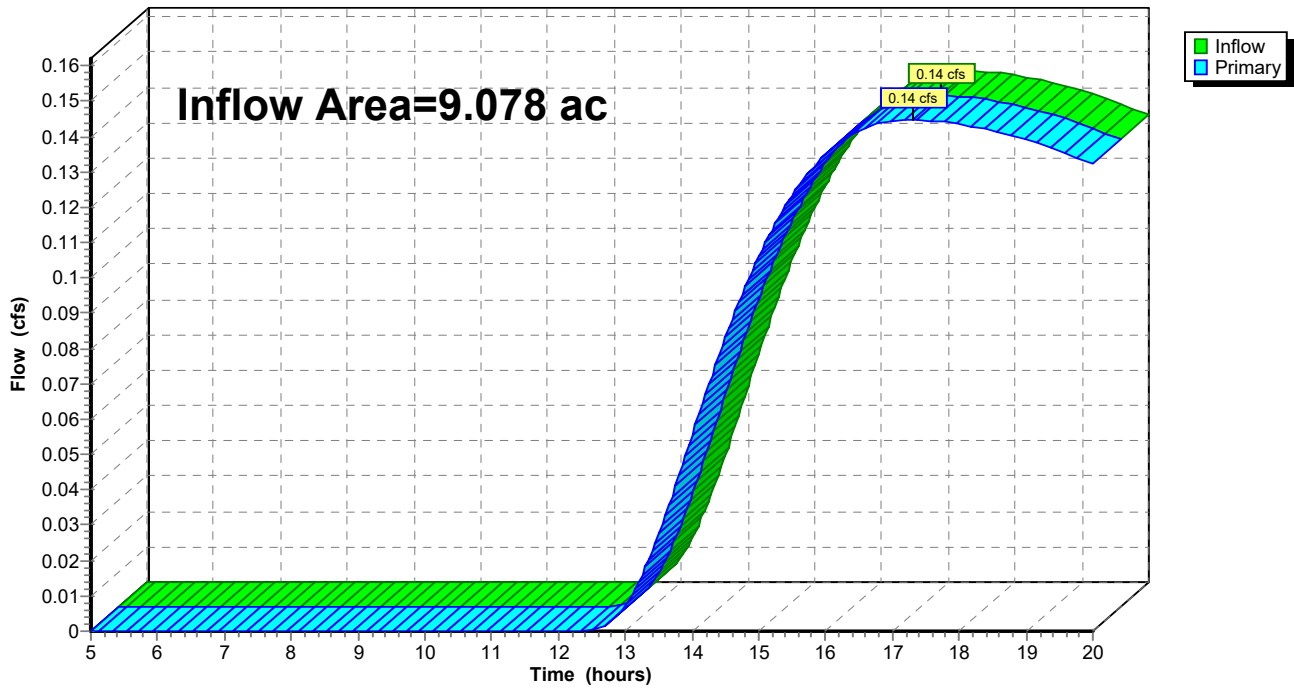
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.09" for 10-YR - 24HR. event
Inflow = 0.14 cfs @ 17.31 hrs, Volume= 0.066 af
Primary = 0.14 cfs @ 17.31 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

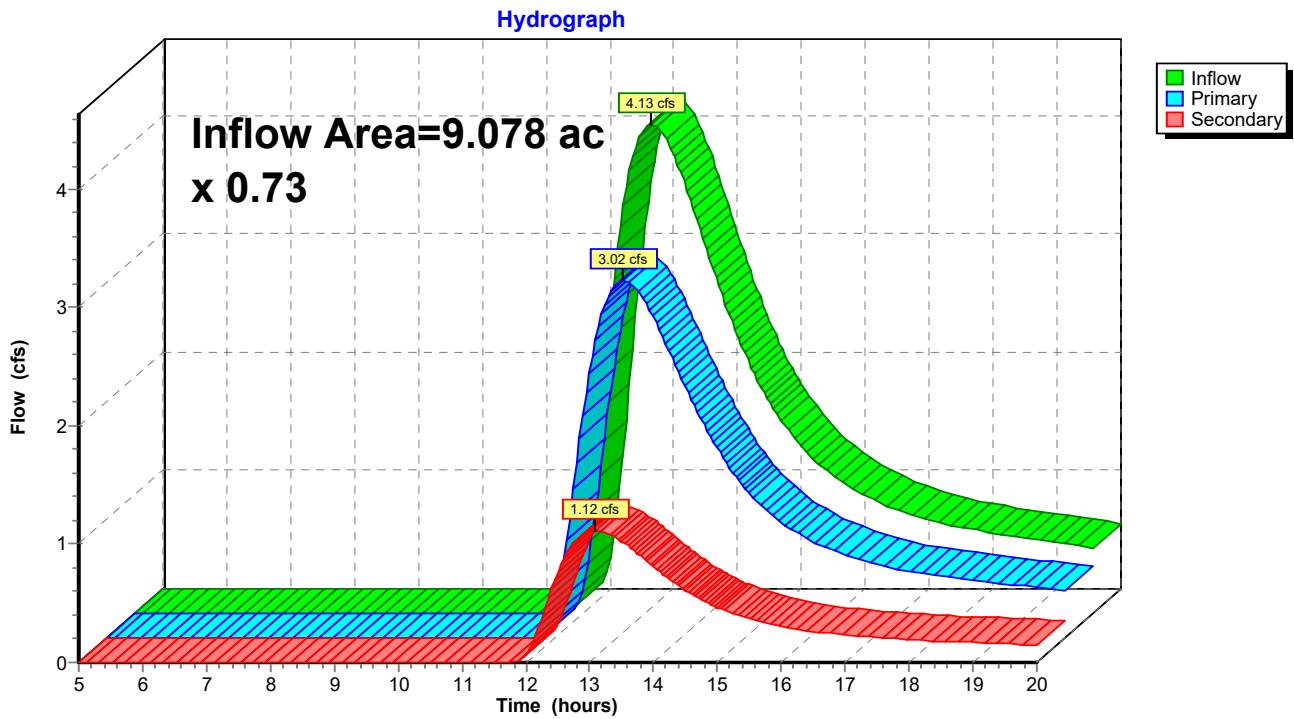


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.42" for 10-YR - 24HR. event
Inflow = 4.13 cfs @ 13.09 hrs, Volume= 1.076 af
Primary = 3.02 cfs @ 13.09 hrs, Volume= 0.786 af, Atten= 27%, Lag= 0.0 min
Secondary = 1.12 cfs @ 13.09 hrs, Volume= 0.291 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

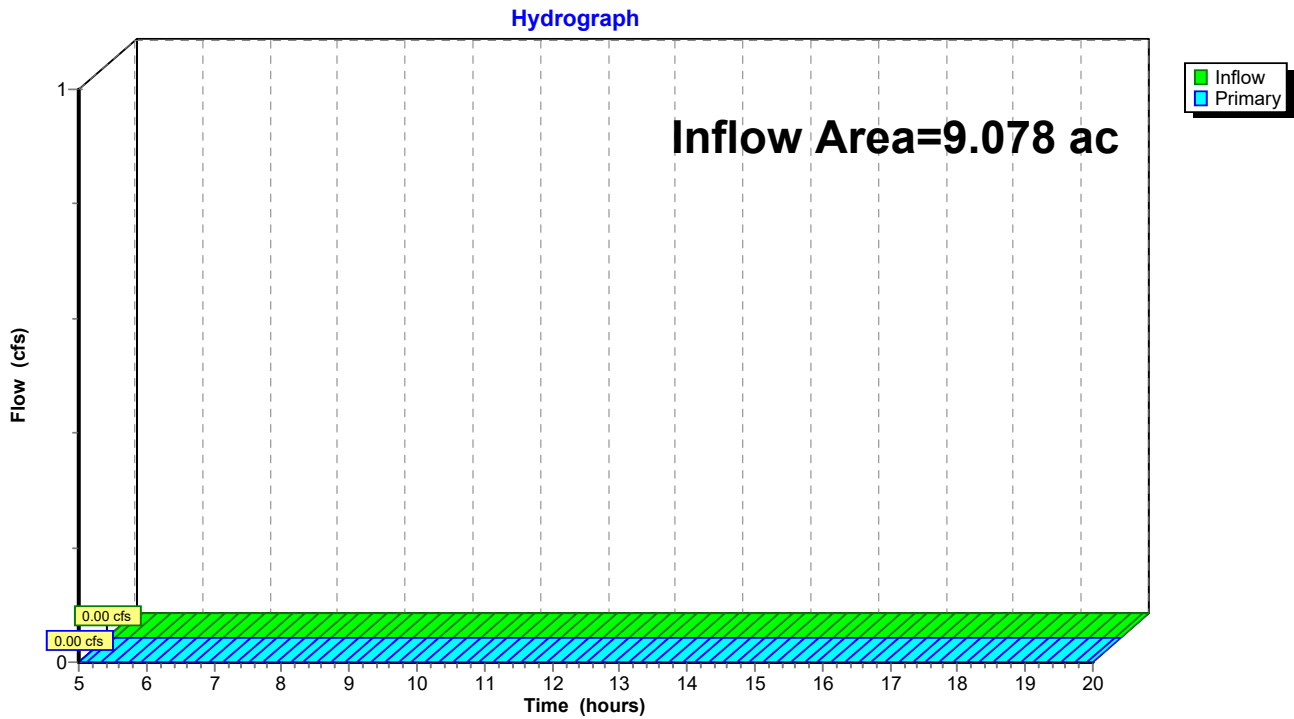


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR - 24HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.25"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.40 cfs 0.192 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>2.07"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=6.27 cfs 1.563 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.91' Max Vel=0.28 fps Inflow=4.57 cfs 0.629 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=3.76 cfs 0.624 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=92.28' Storage=10,252 cf Inflow=2.28 cfs 0.235 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.74' Storage=27,188 cf Inflow=3.76 cfs 0.624 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.43' Storage=3,519 cf Inflow=1.69 cfs 0.422 af
Discarded=0.16 cfs 0.106 af Primary=2.28 cfs 0.235 af Outflow=2.44 cfs 0.341 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.21' Storage=9,651 cf Inflow=4.58 cfs 1.141 af
Discarded=0.44 cfs 0.290 af Primary=4.57 cfs 0.629 af Outflow=5.01 cfs 0.919 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=0.40 cfs 0.192 af
Primary=0.40 cfs 0.192 af

Link 2L: POST OUTFALL x 0.73 Inflow=6.27 cfs 1.563 af
Primary=4.58 cfs 1.141 af Secondary=1.69 cfs 0.422 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.40 cfs @ 15.34 hrs, Volume= 0.192 af, Depth> 0.25"

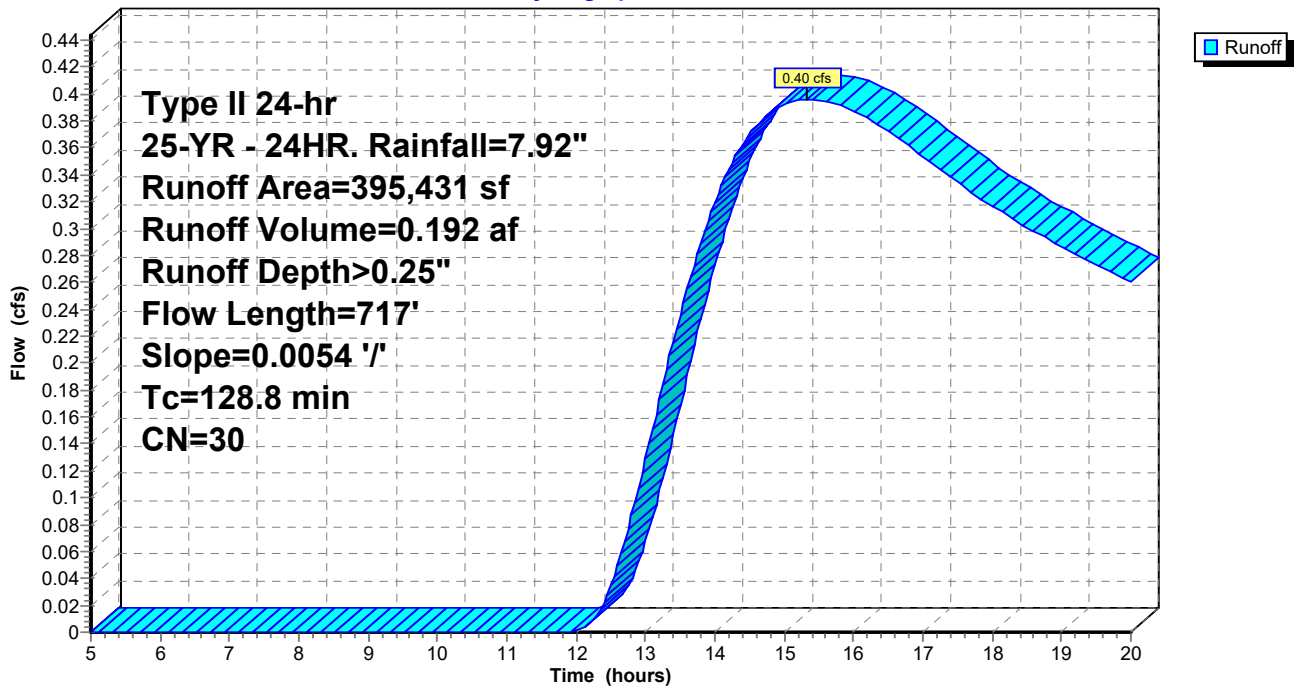
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 6.27 cfs @ 13.05 hrs, Volume= 1.563 af, Depth> 2.07"

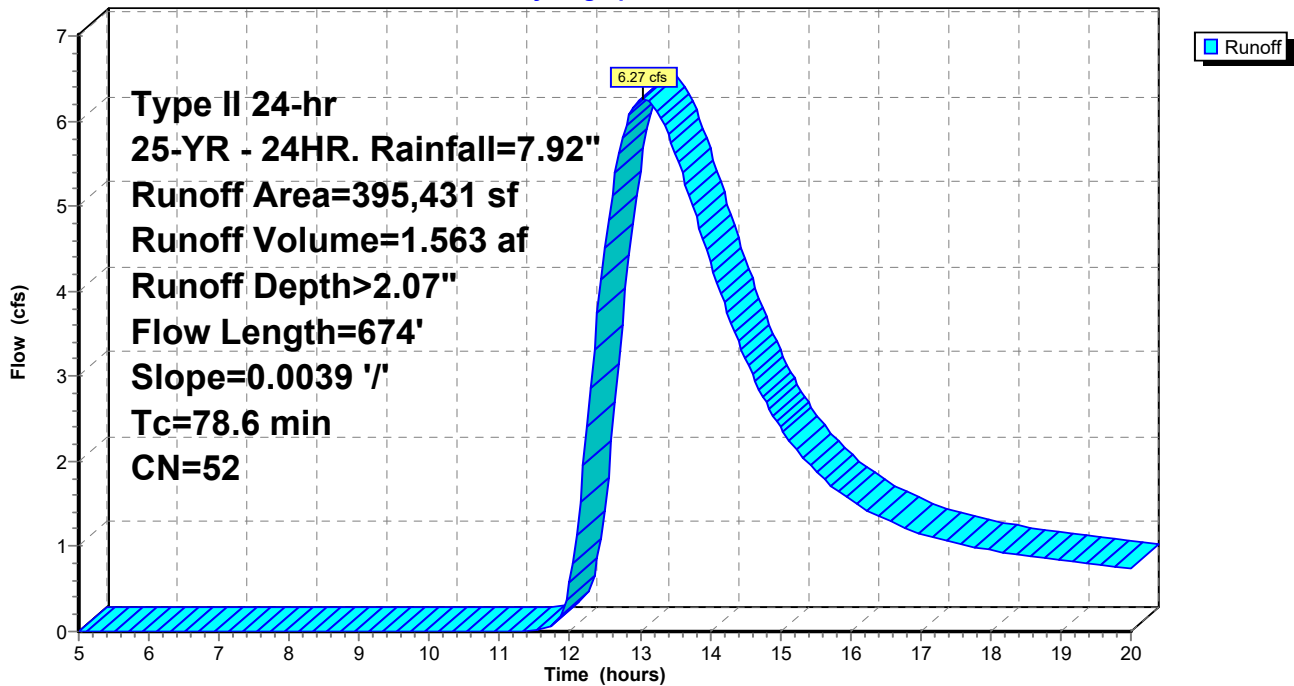
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.83" for 25-YR - 24HR. event
Inflow = 4.57 cfs @ 13.05 hrs, Volume= 0.629 af
Outflow = 3.76 cfs @ 13.59 hrs, Volume= 0.624 af, Atten= 18%, Lag= 32.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.28 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 12.8 min

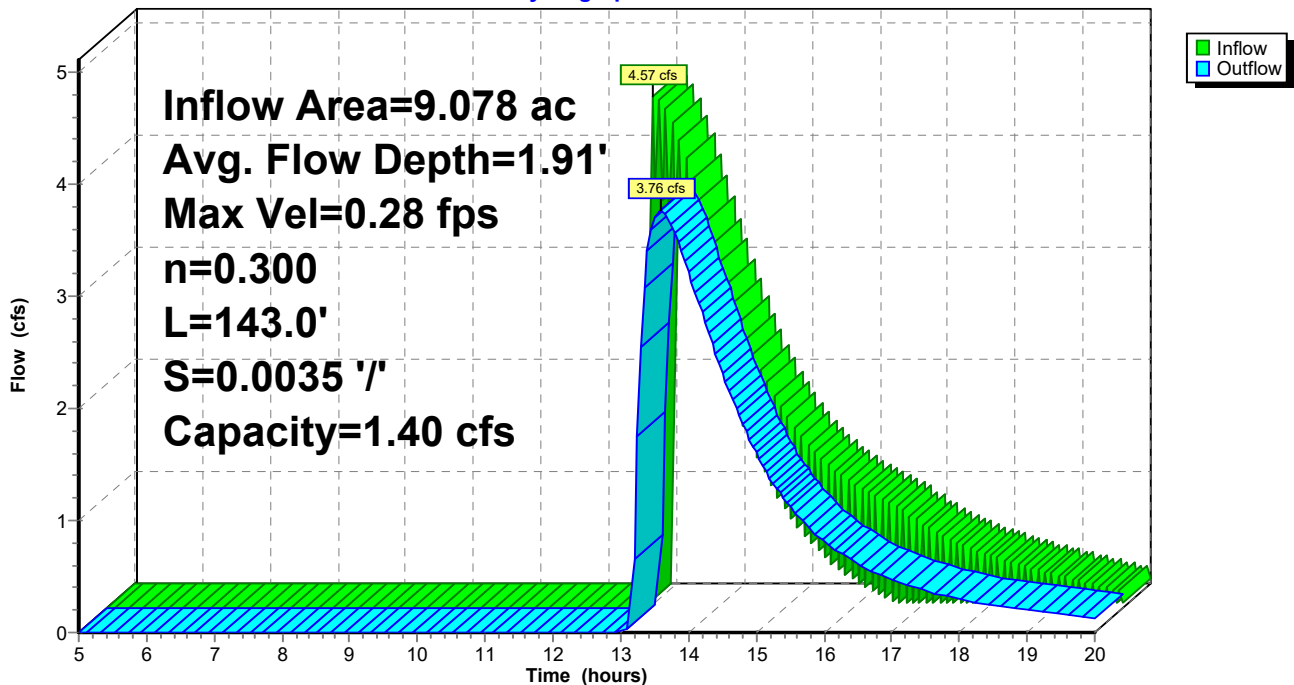
Peak Storage= 1,899 cf @ 13.44 hrs
Average Depth at Peak Storage= 1.91'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 143.0' Slope= 0.0035 '/'
Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 2.28 cfs @ 13.05 hrs, Volume= 0.235 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.28' @ 20.00 hrs Surf.Area= 27,370 sf Storage= 10,252 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

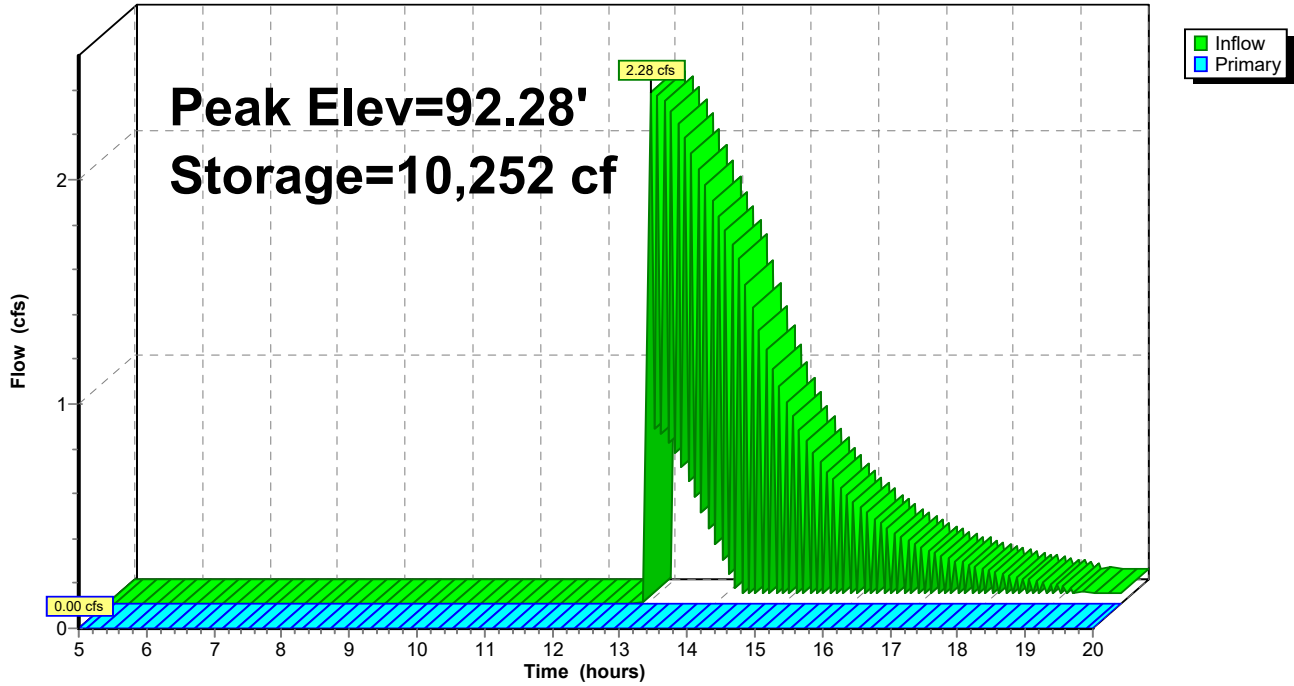
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.83" for 25-YR - 24HR. event
 Inflow = 3.76 cfs @ 13.59 hrs, Volume= 0.624 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.74' @ 20.00 hrs Surf.Area= 62,879 sf Storage= 27,188 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

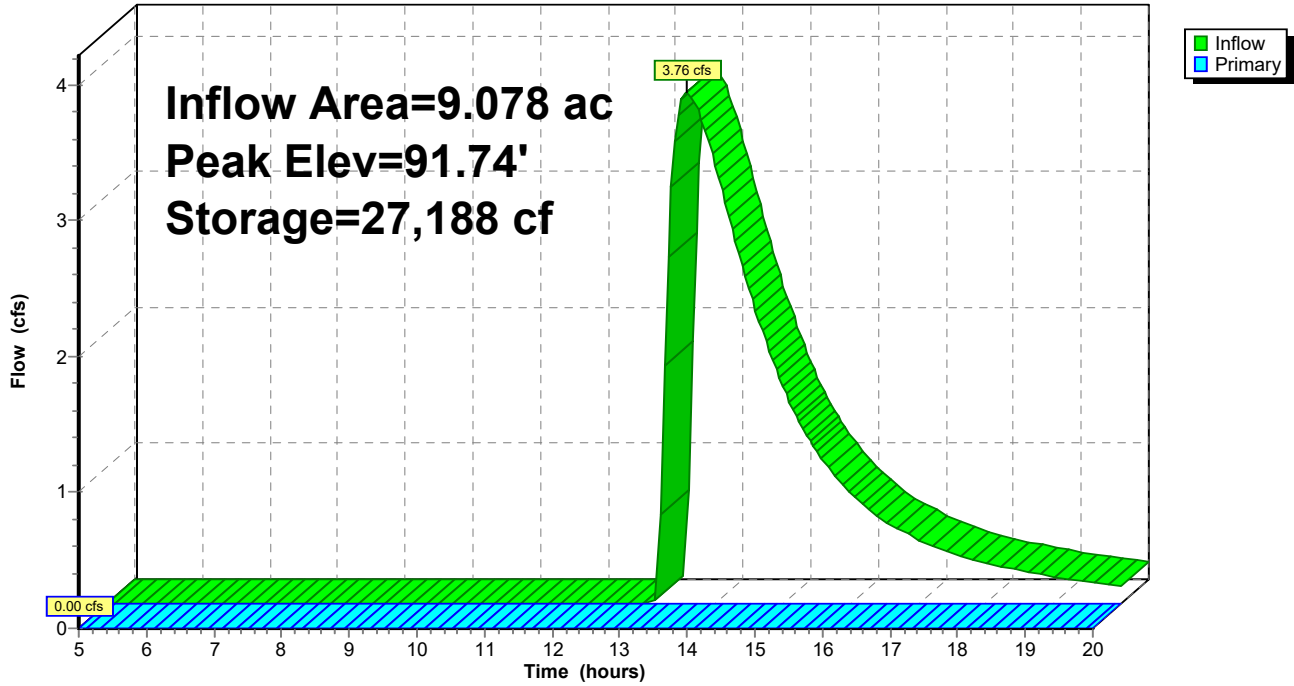
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 1.69 cfs @ 13.05 hrs, Volume= 0.422 af
 Outflow = 2.44 cfs @ 13.05 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.3 min
 Discarded = 0.16 cfs @ 12.20 hrs, Volume= 0.106 af
 Primary = 2.28 cfs @ 13.05 hrs, Volume= 0.235 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.43' @ 13.05 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 75.3 min calculated for 0.340 af (81% of inflow)
 Center-of-Mass det. time= 27.7 min (902.6 - 875.0)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

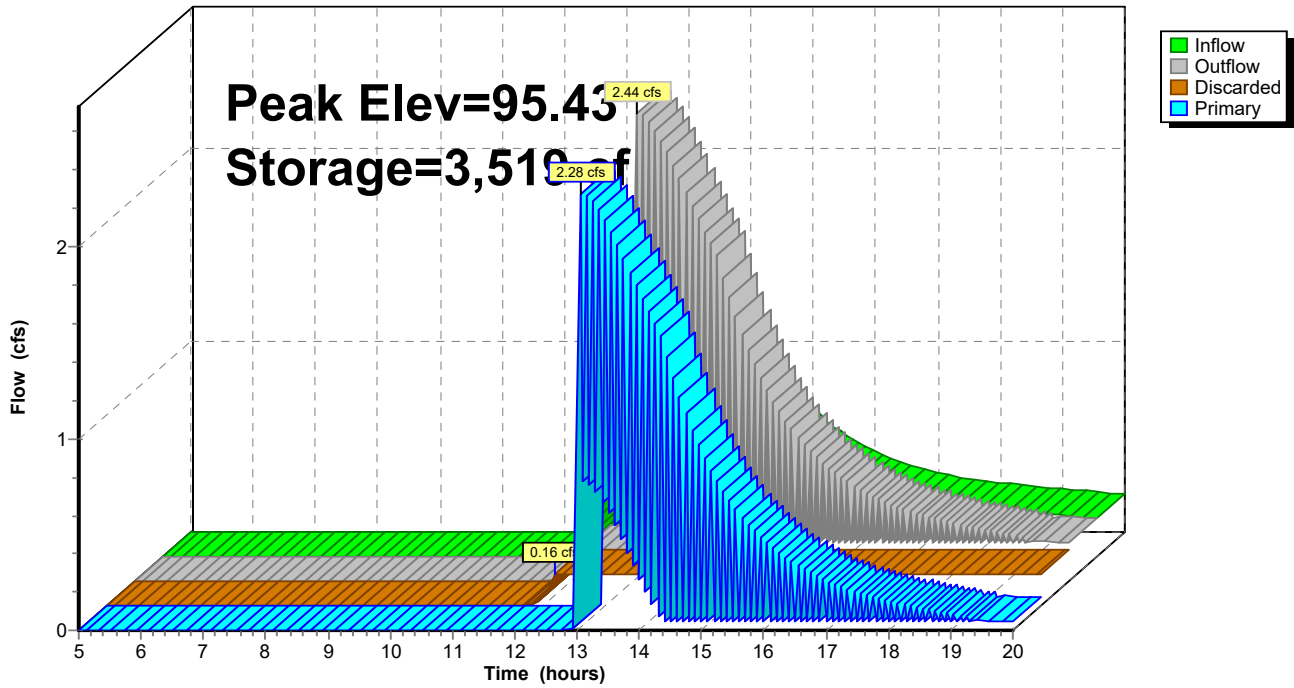
Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 12.20 hrs HW=95.11' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=2.28 cfs @ 13.05 hrs HW=95.43' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 2.28 cfs @ 1.04 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.51" for 25-YR - 24HR. event
 Inflow = 4.58 cfs @ 13.05 hrs, Volume= 1.141 af
 Outflow = 5.01 cfs @ 13.05 hrs, Volume= 0.919 af, Atten= 0%, Lag= 0.3 min
 Discarded = 0.44 cfs @ 12.25 hrs, Volume= 0.290 af
 Primary = 4.57 cfs @ 13.05 hrs, Volume= 0.629 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.21' @ 13.05 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 76.2 min calculated for 0.916 af (80% of inflow)
 Center-of-Mass det. time= 28.0 min (902.9 - 875.0)

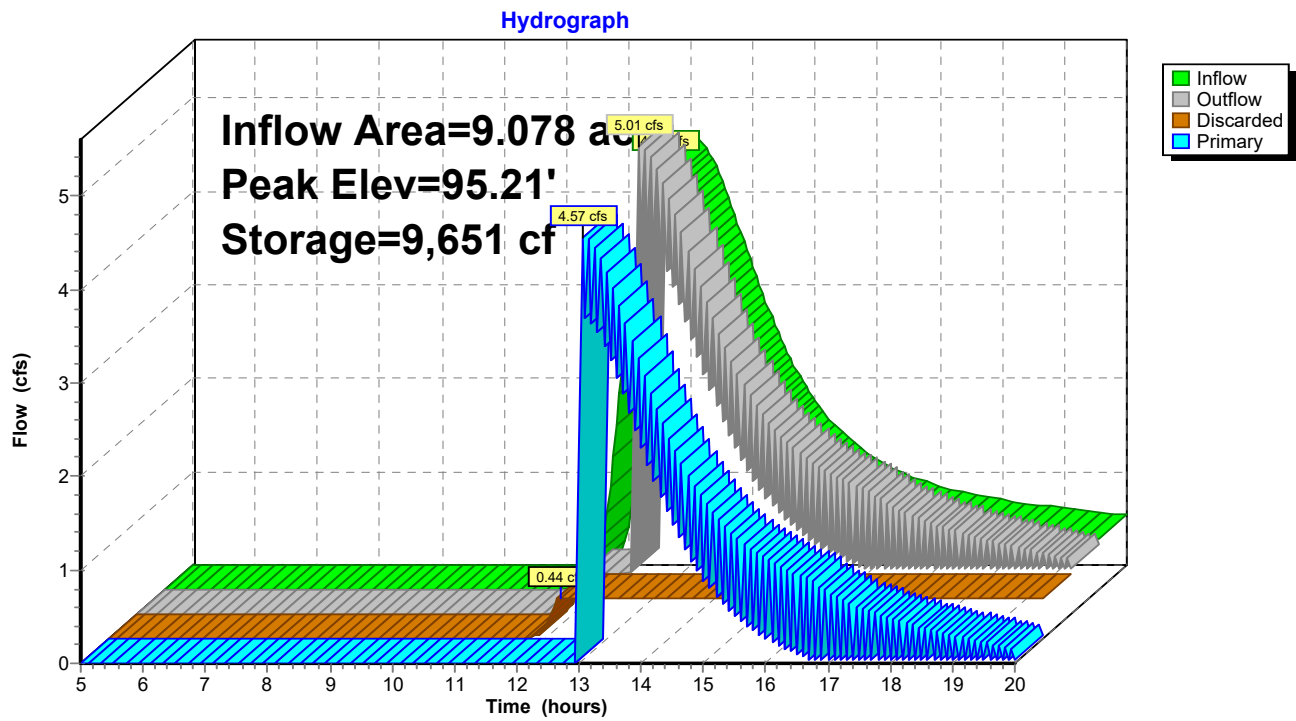
Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 12.25 hrs HW=94.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=4.57 cfs @ 13.05 hrs HW=95.21' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 4.57 cfs @ 1.31 fps)

Pond 4P: RCOK VOID AREA NO.2



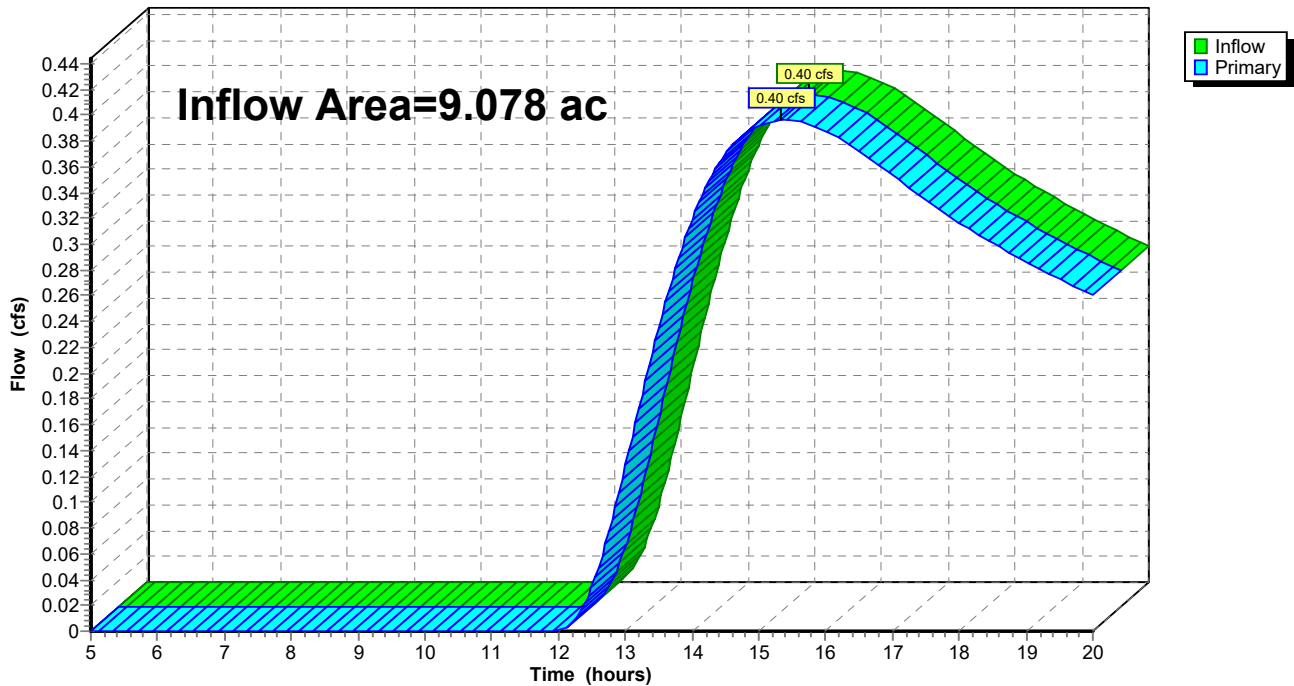
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.25" for 25-YR - 24HR. event
Inflow = 0.40 cfs @ 15.34 hrs, Volume= 0.192 af
Primary = 0.40 cfs @ 15.34 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

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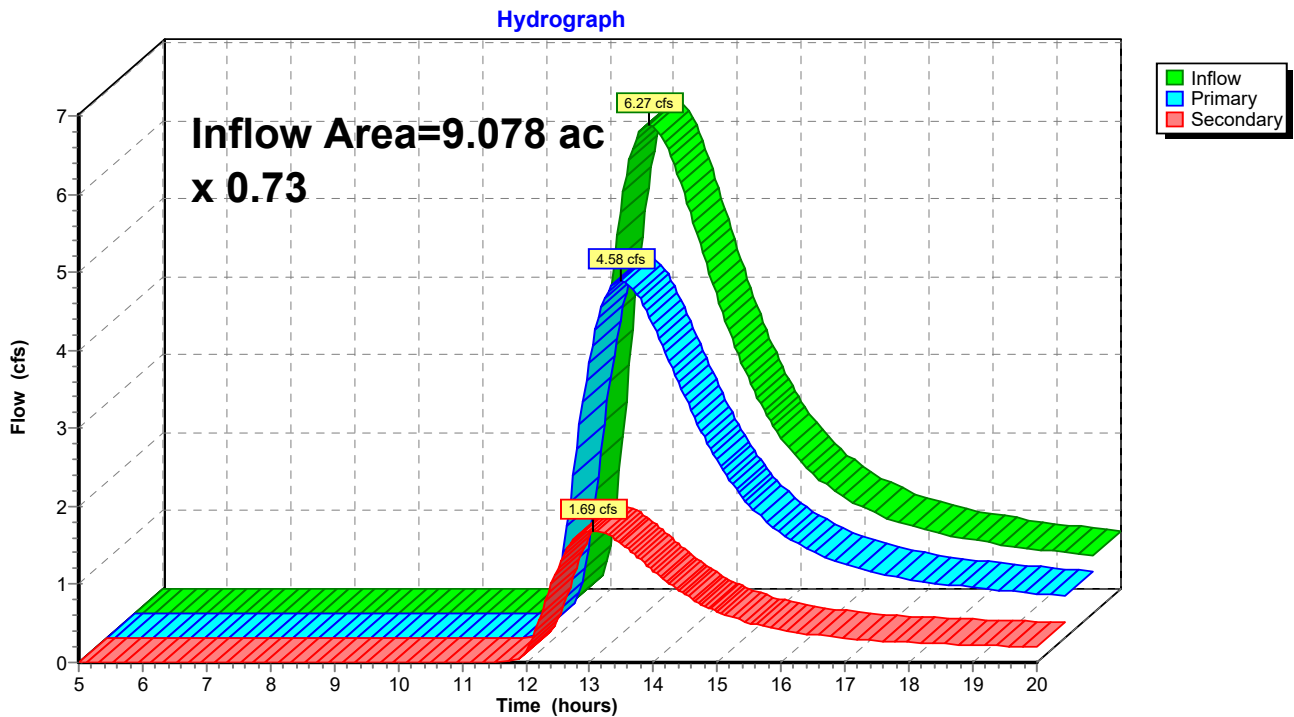
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Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 2.07" for 25-YR - 24HR. event
Inflow = 6.27 cfs @ 13.05 hrs, Volume= 1.563 af
Primary = 4.58 cfs @ 13.05 hrs, Volume= 1.141 af, Atten= 27%, Lag= 0.0 min
Secondary = 1.69 cfs @ 13.05 hrs, Volume= 0.422 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

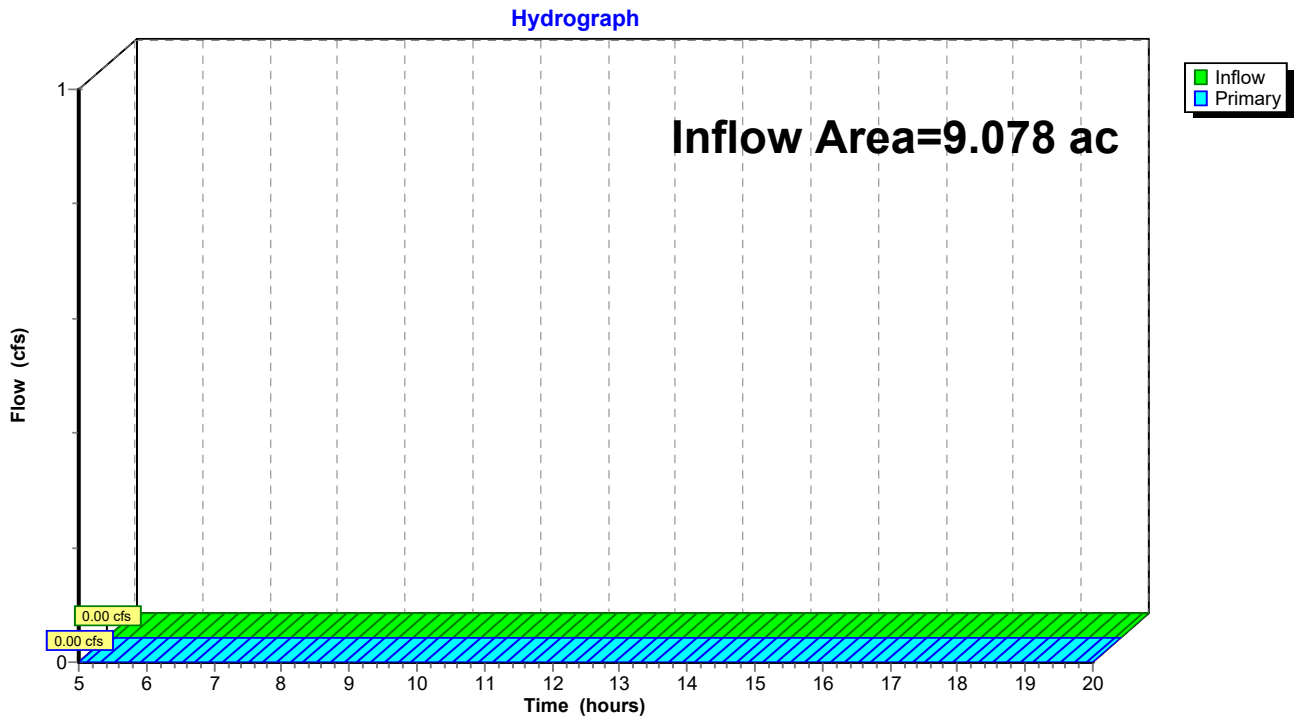


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 25-YR - 24HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.00"
 Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=0.04 cfs 0.002 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=91.90' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREA NO.1 Peak Elev=95.10' Storage=7 cf Inflow=0.01 cfs 0.001 af
 Discarded=0.01 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.001 af

Pond 4P: RCOK VOID AREA NO.2 Peak Elev=94.80' Storage=18 cf Inflow=0.03 cfs 0.002 af
 Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af

Link 2L: POST OUTFALL x 0.73 Inflow=0.04 cfs 0.002 af
 Primary=0.03 cfs 0.002 af Secondary=0.01 cfs 0.001 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

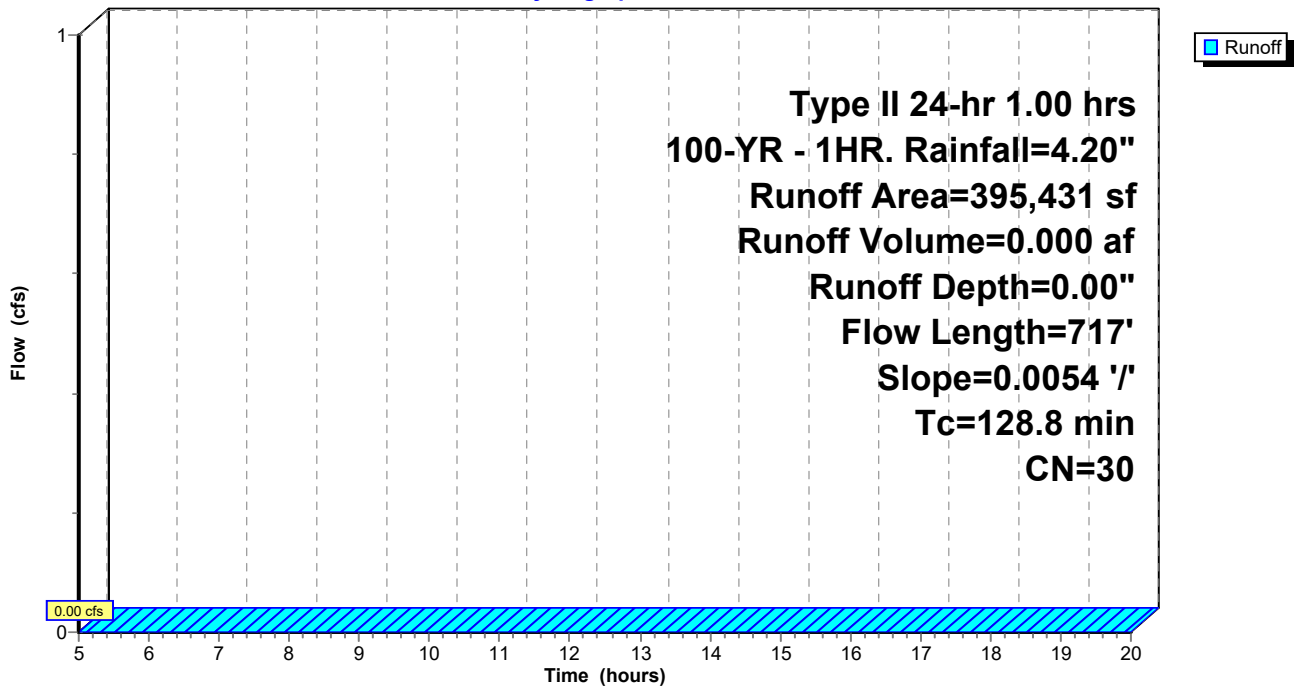
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.04 cfs @ 5.00 hrs, Volume= 0.002 af, Depth> 0.00"

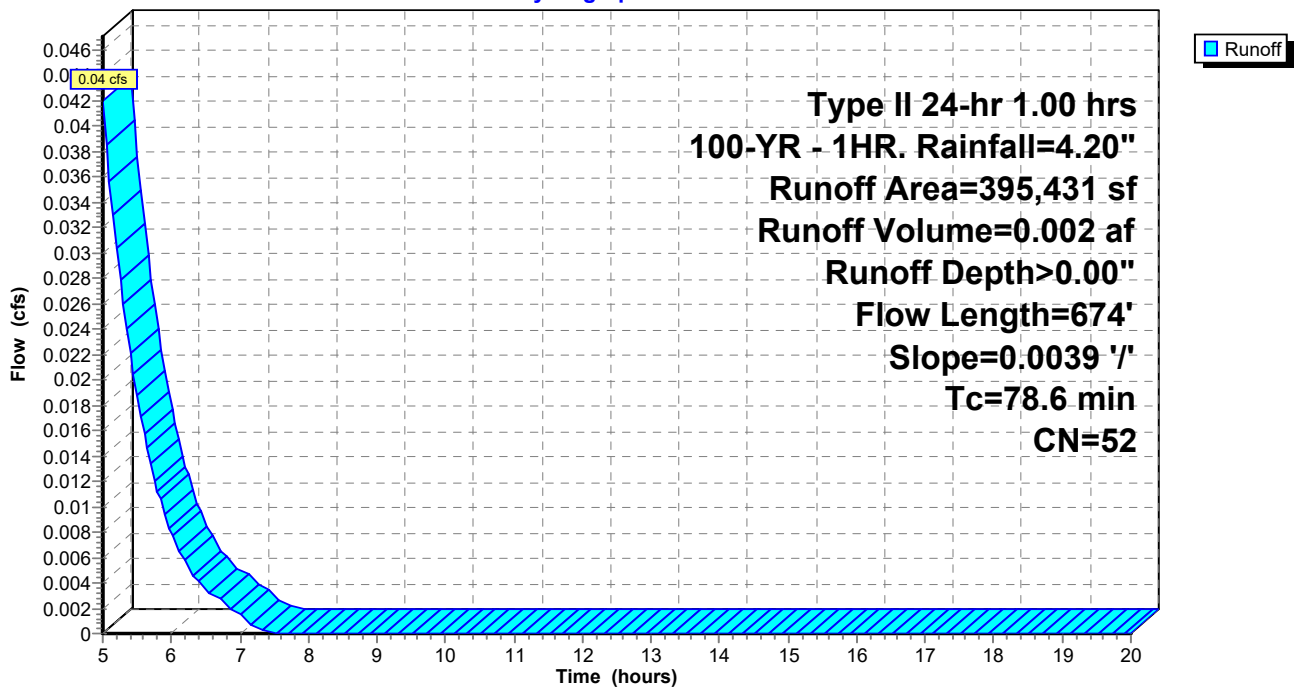
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

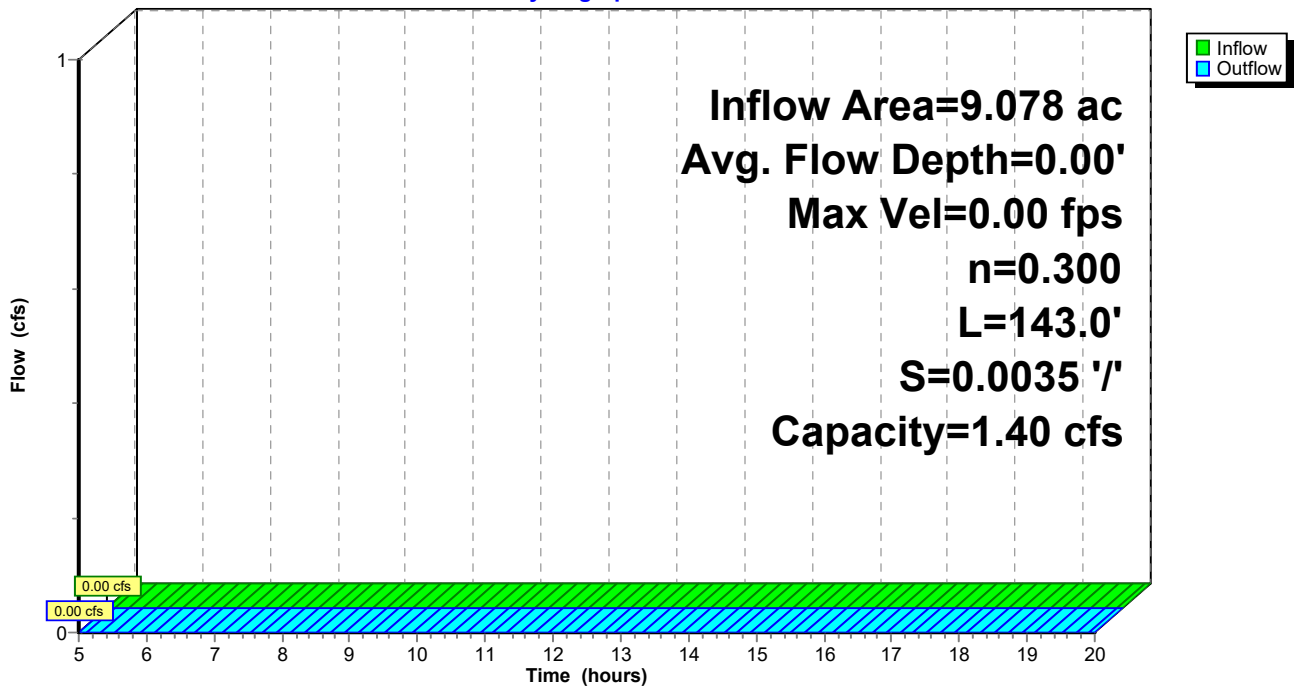
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 143.0' Slope= 0.0035 '/'
 Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.90' @ 5.00 hrs Surf.Area= 26,653 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

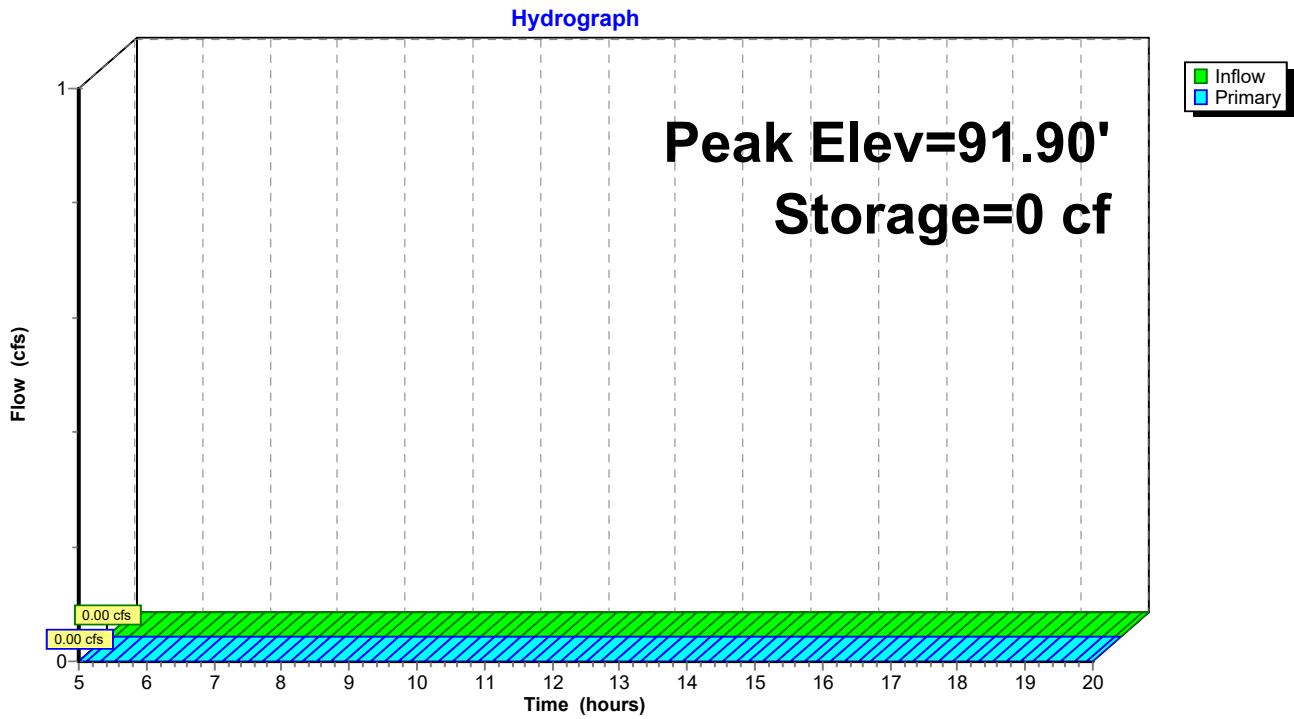
Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1



Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.30' @ 5.00 hrs Surf.Area= 61,746 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

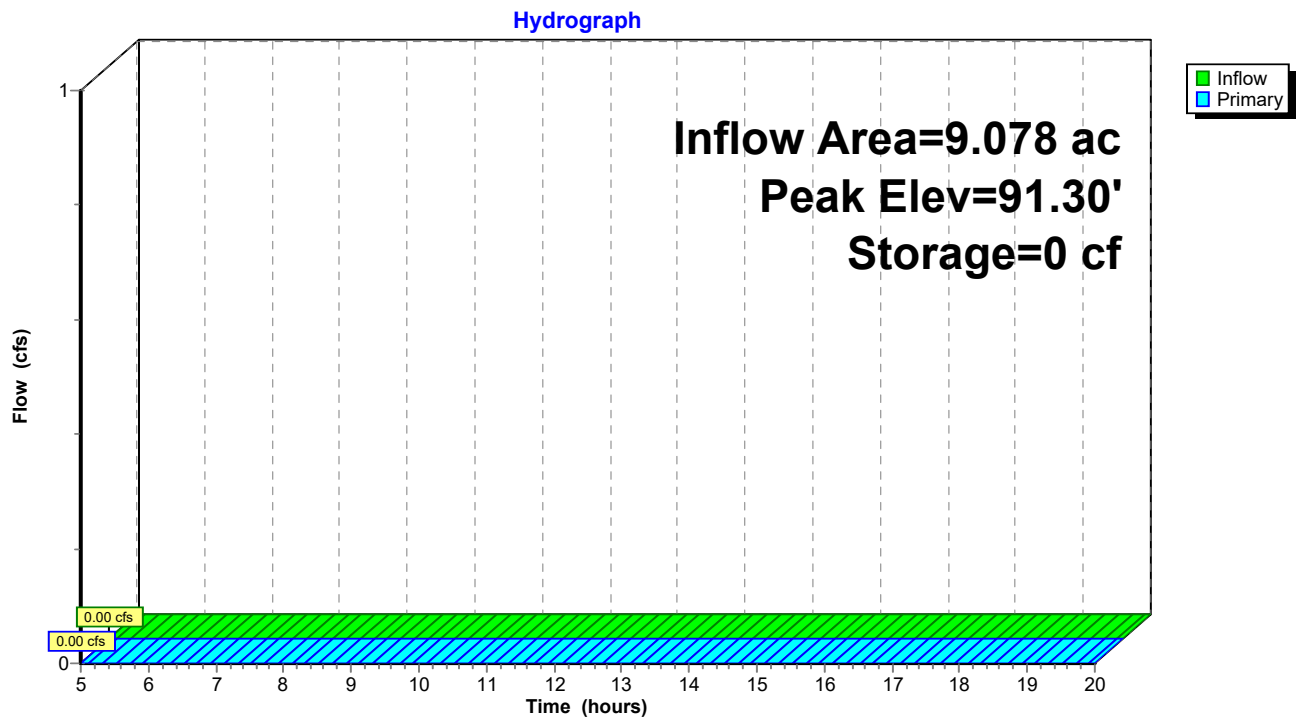
Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2



Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 0.01 cfs @ 5.00 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 5.41 hrs, Volume= 0.001 af, Atten= 48%, Lag= 24.4 min
 Discarded = 0.01 cfs @ 5.41 hrs, Volume= 0.001 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.10' @ 5.41 hrs Surf.Area= 50,275 sf Storage= 7 cf

Plug-Flow detention time= 24.1 min calculated for 0.001 af (96% of inflow)
 Center-of-Mass det. time= 18.3 min (349.7 - 331.4)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

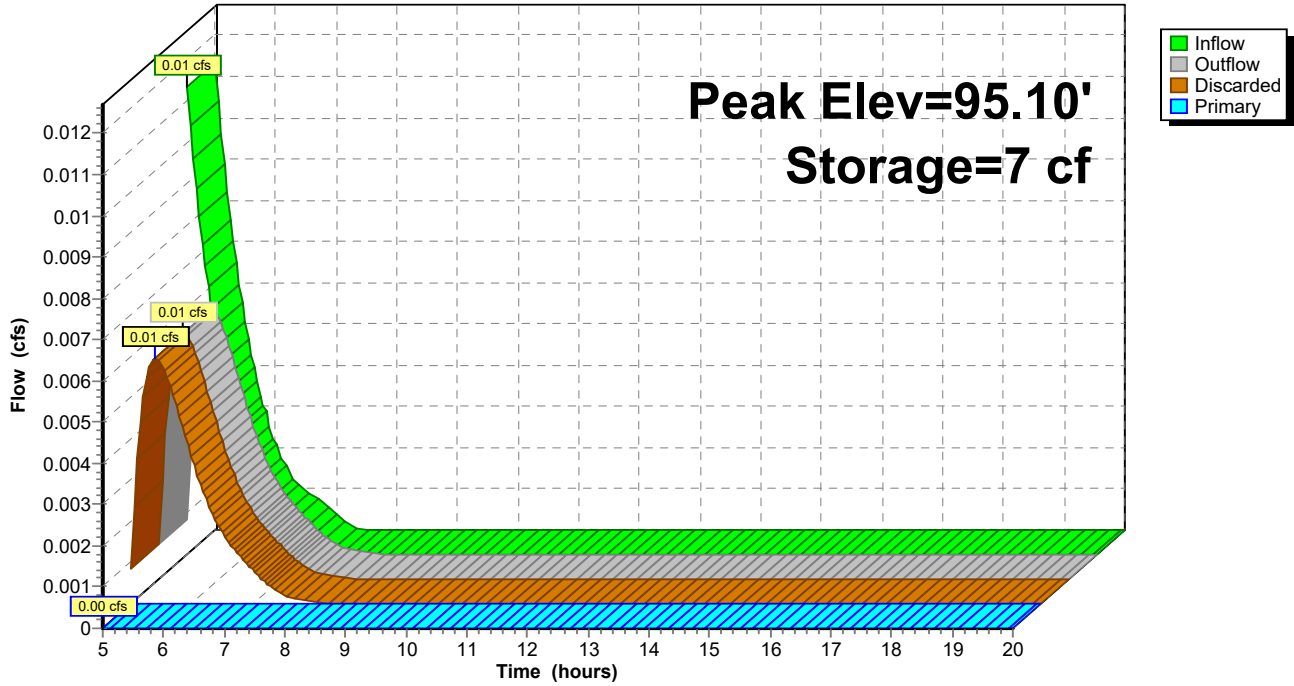
Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.01 cfs @ 5.41 hrs HW=95.10' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=95.10' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 1HR. event
 Inflow = 0.03 cfs @ 5.00 hrs, Volume= 0.002 af
 Outflow = 0.02 cfs @ 5.41 hrs, Volume= 0.002 af, Atten= 48%, Lag= 24.4 min
 Discarded = 0.02 cfs @ 5.41 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.80' @ 5.41 hrs Surf.Area= 137,877 sf Storage= 18 cf

Plug-Flow detention time= 24.1 min calculated for 0.002 af (96% of inflow)
 Center-of-Mass det. time= 18.3 min (349.7 - 331.4)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

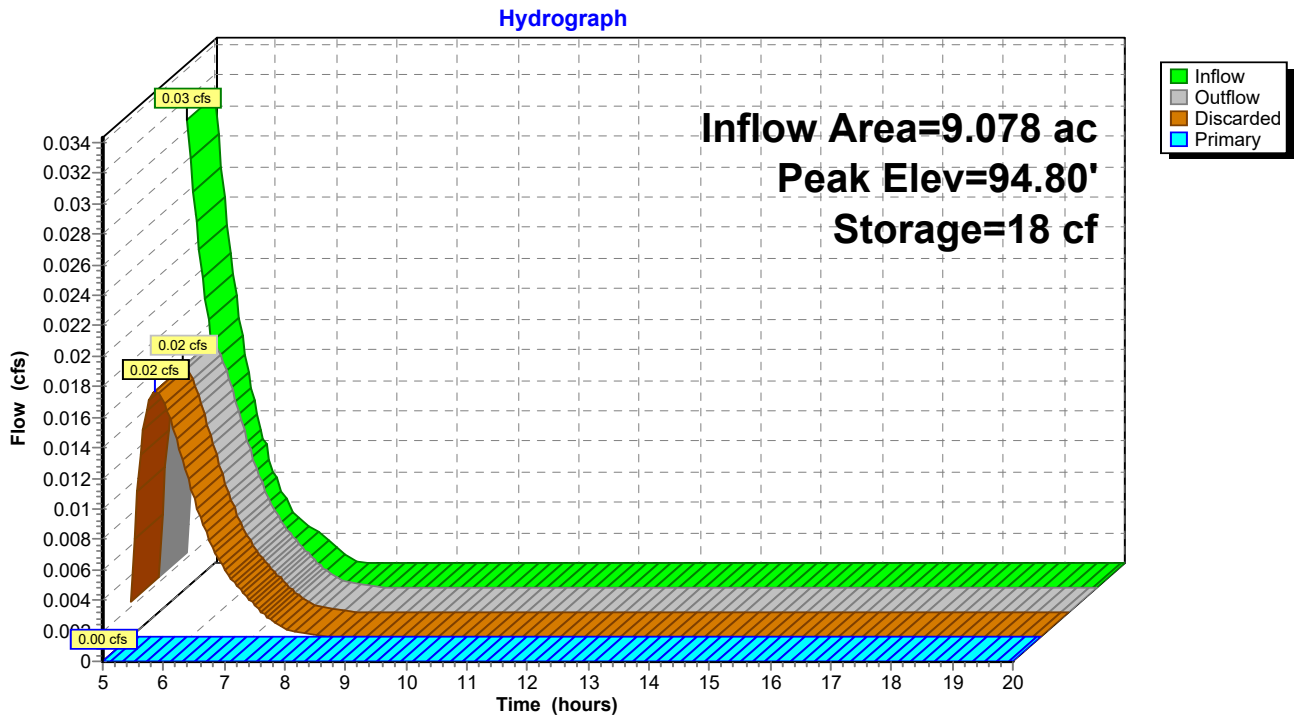
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 5.41 hrs HW=94.80' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=94.80' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: RCOK VOID AREA NO.2

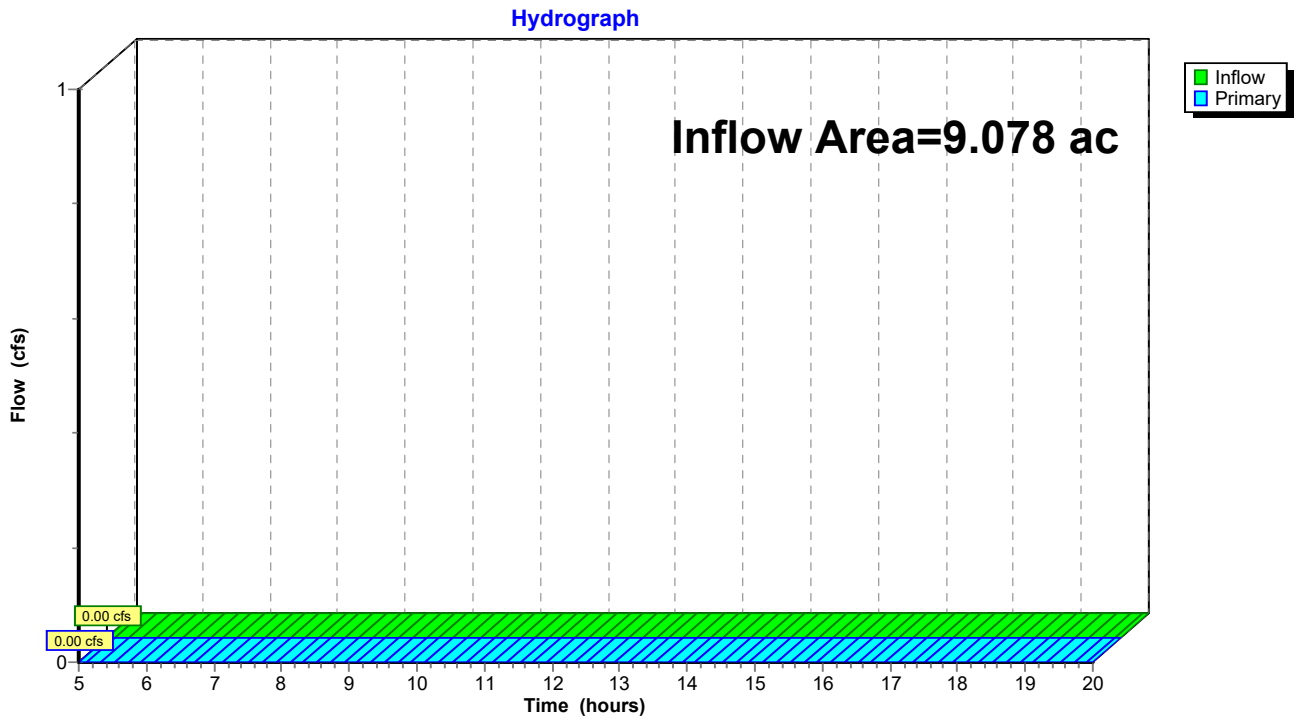


Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

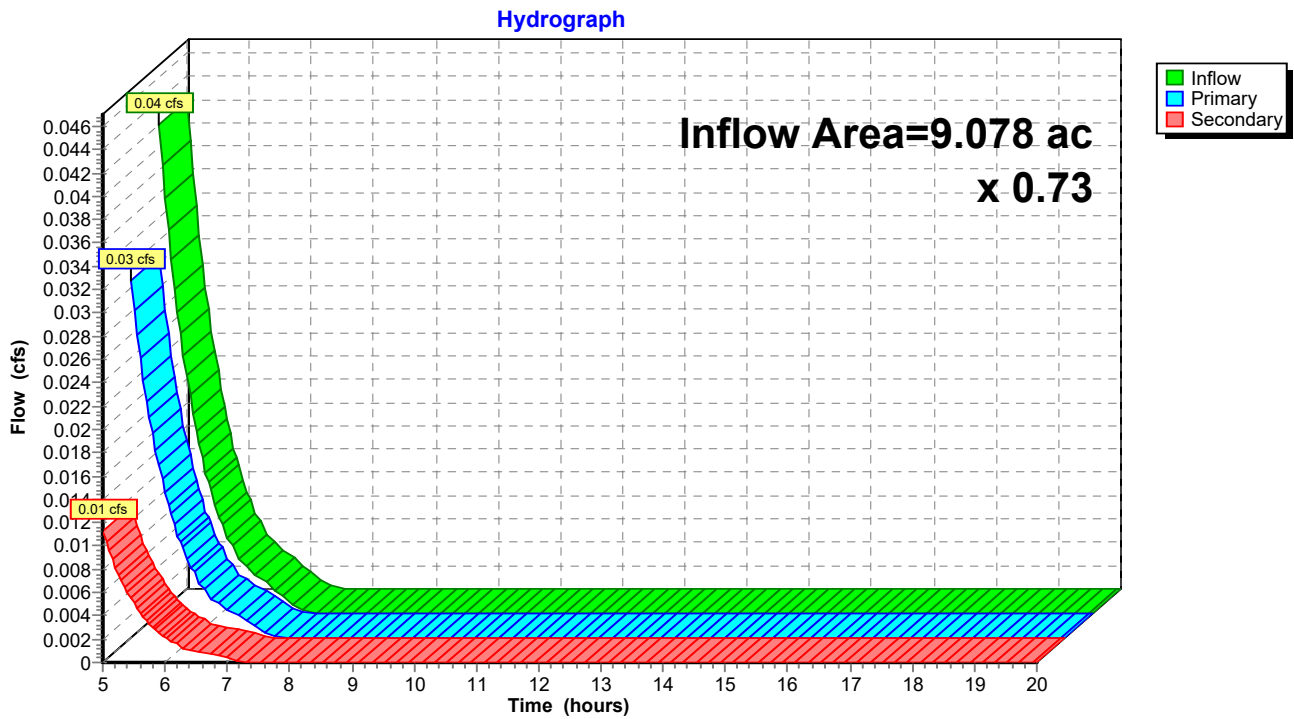


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 1HR. event
 Inflow = 0.04 cfs @ 5.00 hrs, Volume= 0.002 af
 Primary = 0.03 cfs @ 5.00 hrs, Volume= 0.002 af, Atten= 27%, Lag= 0.0 min
 Secondary = 0.01 cfs @ 5.00 hrs, Volume= 0.001 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

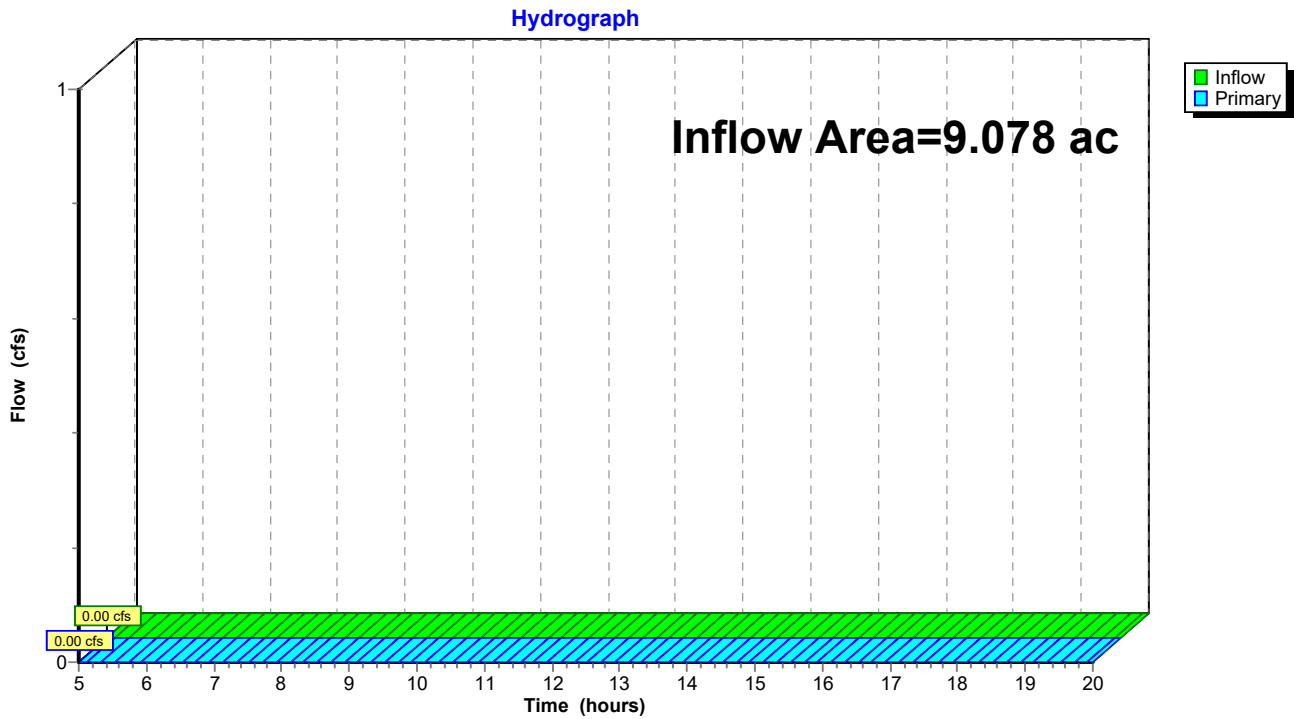


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.67"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=1.16 cfs 0.509 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>3.23"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=10.19 cfs 2.442 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=3.07' Max Vel=0.30 fps Inflow=13.12 cfs 1.261 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=6.78 cfs 1.251 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=92.65' Storage=20,430 cf Inflow=4.39 cfs 0.469 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=92.17' Storage=54,446 cf Inflow=6.78 cfs 1.251 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREANO.1 Peak Elev=95.50' Storage=3,519 cf Inflow=2.75 cfs 0.659 af
Discarded=0.16 cfs 0.109 af Primary=4.39 cfs 0.469 af Outflow=4.55 cfs 0.578 af

Pond 4P: RCOK VOID AREANO.2 Peak Elev=95.42' Storage=9,651 cf Inflow=7.44 cfs 1.783 af
Discarded=0.44 cfs 0.300 af Primary=13.12 cfs 1.261 af Outflow=13.56 cfs 1.561 af

Link 1L: EXISTING OUTFALLLOCATION Inflow=1.16 cfs 0.509 af
Primary=1.16 cfs 0.509 af

Link 2L: POST OUTFALL x 0.73 Inflow=10.19 cfs 2.442 af
Primary=7.44 cfs 1.783 af Secondary=2.75 cfs 0.659 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 1.16 cfs @ 14.45 hrs, Volume= 0.509 af, Depth> 0.67"

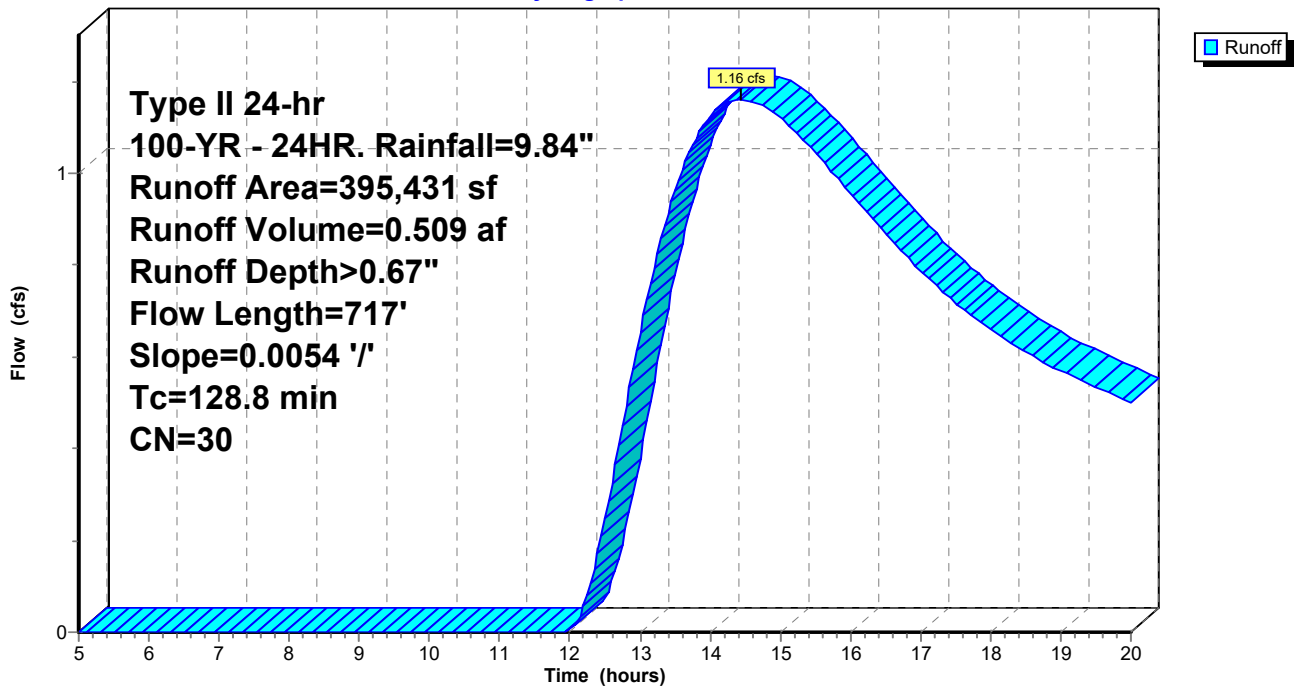
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



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Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 10.19 cfs @ 13.00 hrs, Volume= 2.442 af, Depth> 3.23"

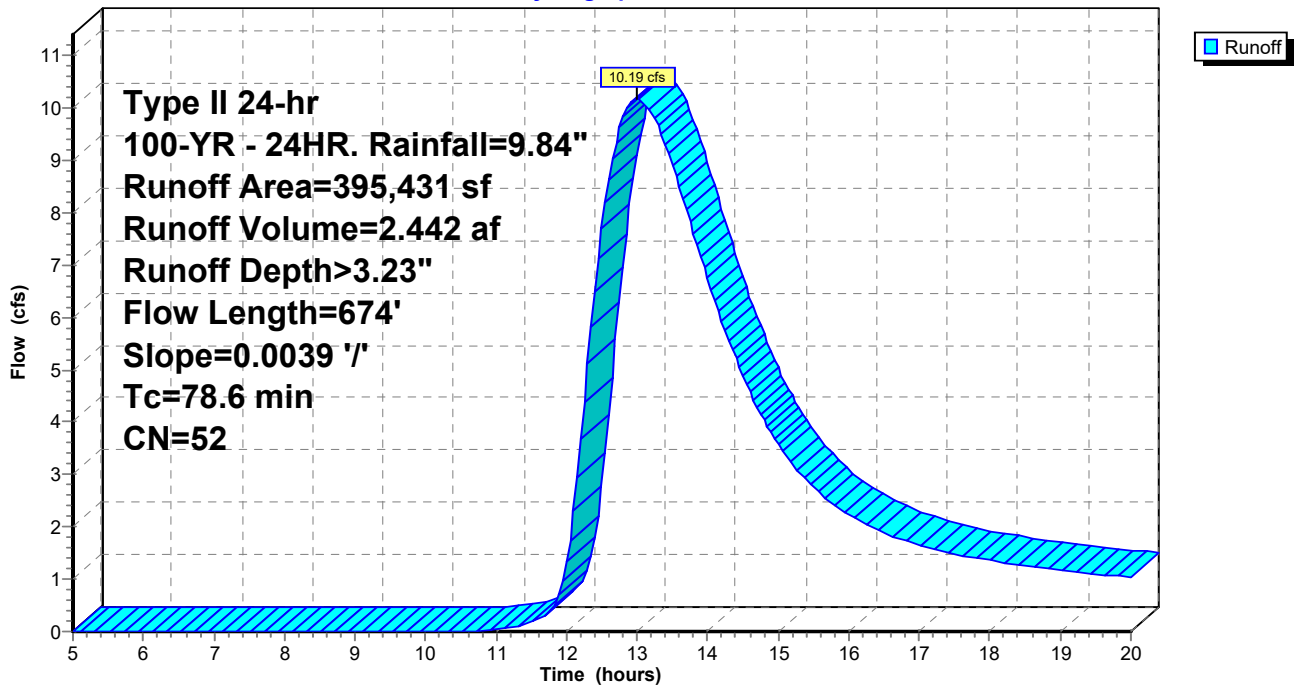
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.67" for 100-YR - 24HR. event
Inflow = 13.12 cfs @ 13.05 hrs, Volume= 1.261 af
Outflow = 6.78 cfs @ 13.35 hrs, Volume= 1.251 af, Atten= 48%, Lag= 18.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.30 fps, Min. Travel Time= 7.9 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 10.7 min

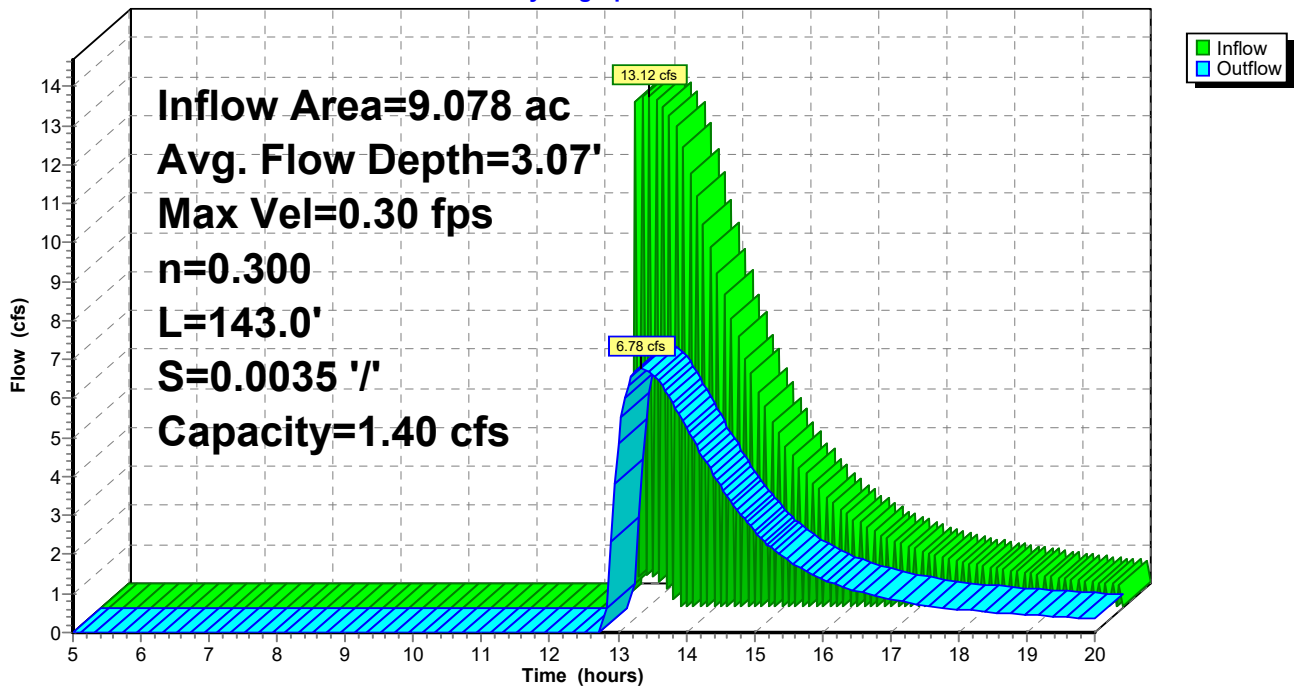
Peak Storage= 3,226 cf @ 13.22 hrs
Average Depth at Peak Storage= 3.07'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 143.0' Slope= 0.0035 '/'
Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 4.39 cfs @ 13.05 hrs, Volume= 0.469 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.65' @ 20.00 hrs Surf.Area= 28,063 sf Storage= 20,430 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

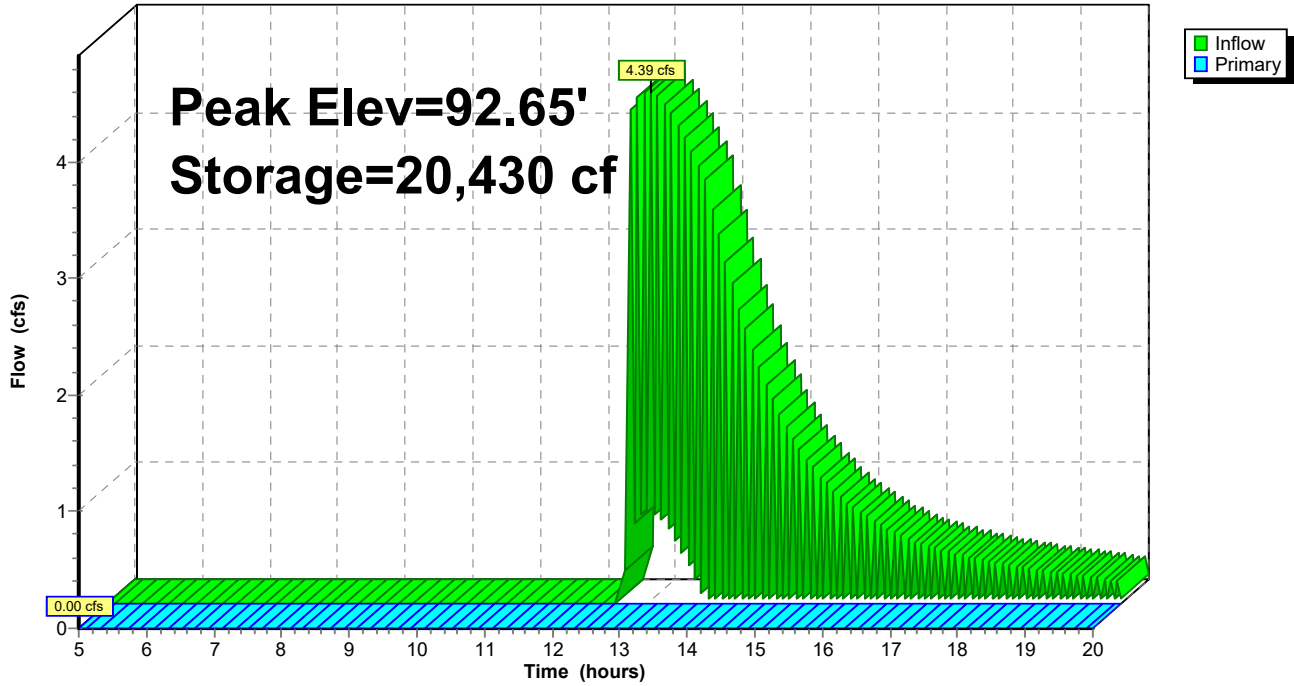
Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.65" for 100-YR - 24HR. event
 Inflow = 6.78 cfs @ 13.35 hrs, Volume= 1.251 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.17' @ 20.00 hrs Surf.Area= 63,994 sf Storage= 54,446 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

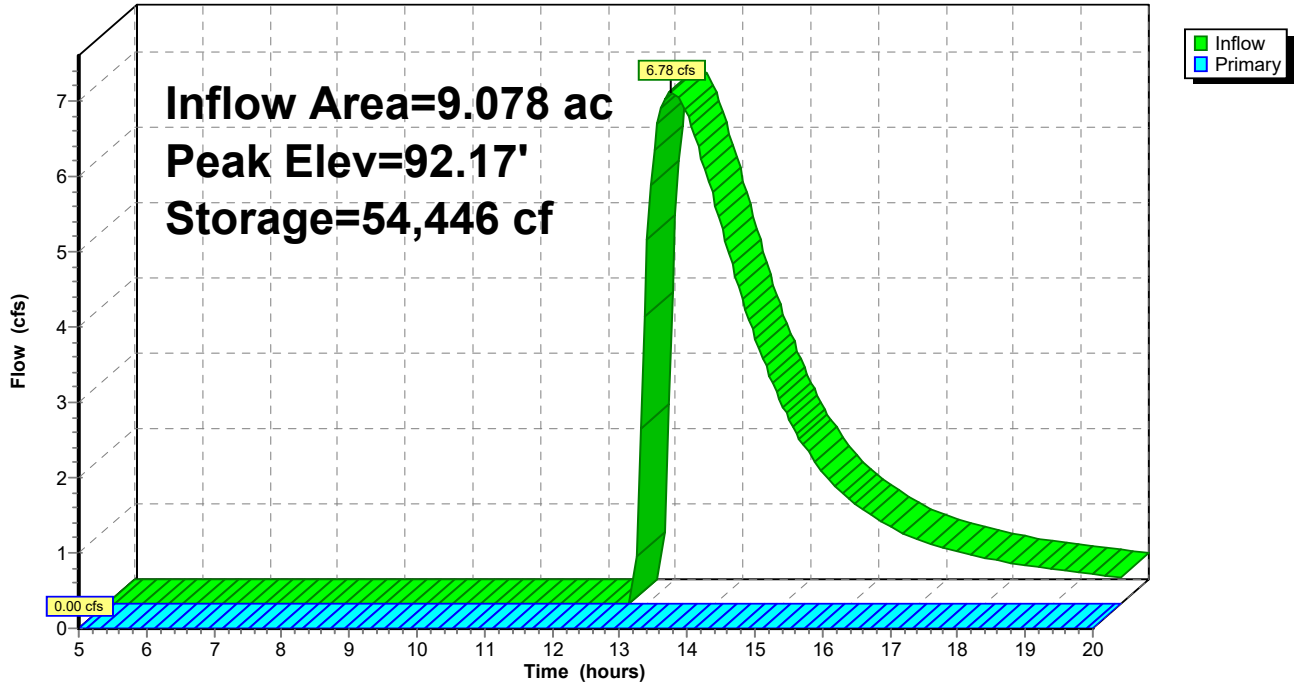
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 2.75 cfs @ 13.00 hrs, Volume= 0.659 af
 Outflow = 4.55 cfs @ 13.05 hrs, Volume= 0.578 af, Atten= 0%, Lag= 2.8 min
 Discarded = 0.16 cfs @ 12.10 hrs, Volume= 0.109 af
 Primary = 4.39 cfs @ 13.05 hrs, Volume= 0.469 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.50' @ 13.05 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 50.9 min calculated for 0.578 af (88% of inflow)
 Center-of-Mass det. time= 16.9 min (883.9 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 12.10 hrs HW=95.12' (Free Discharge)

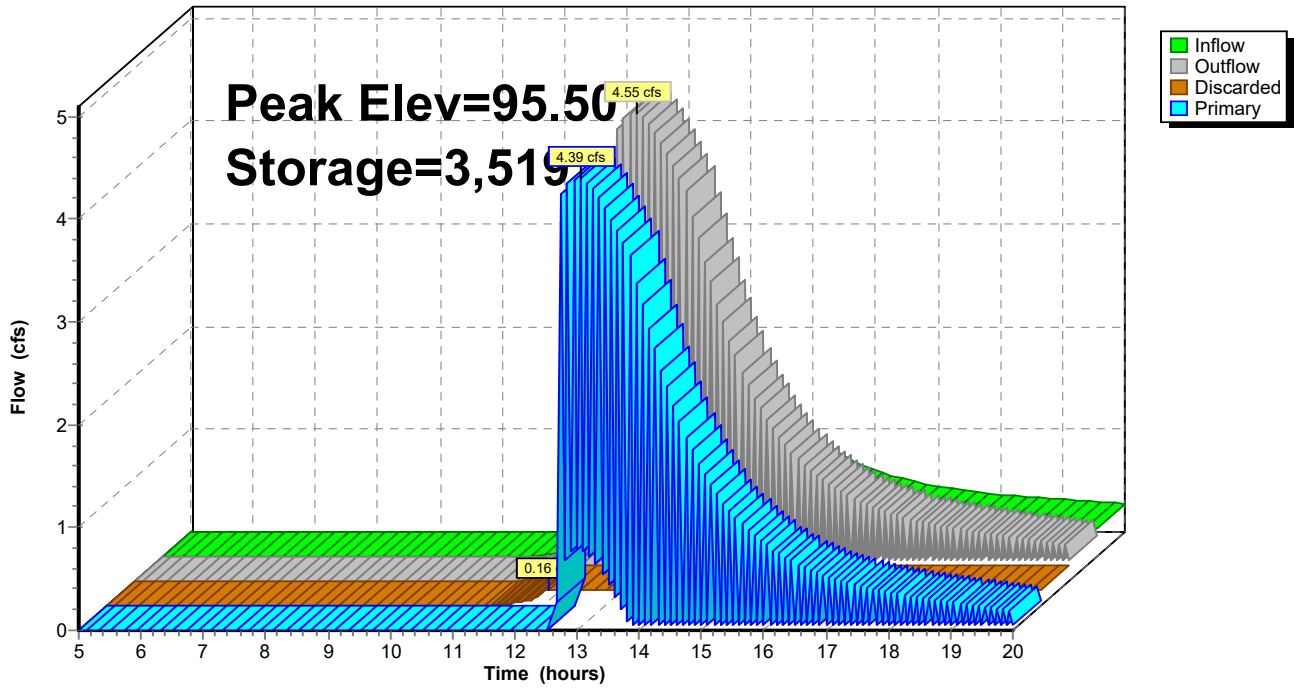
↑ **2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=4.39 cfs @ 13.05 hrs HW=95.50' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 4.39 cfs @ 1.29 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Staging Area 4 Basin 5 HydroCAD Report

Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

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Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 2.36" for 100-YR - 24HR. event
 Inflow = 7.44 cfs @ 13.00 hrs, Volume= 1.783 af
 Outflow = 13.56 cfs @ 13.05 hrs, Volume= 1.561 af, Atten= 0%, Lag= 2.8 min
 Discarded = 0.44 cfs @ 12.10 hrs, Volume= 0.300 af
 Primary = 13.12 cfs @ 13.05 hrs, Volume= 1.261 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.42' @ 13.05 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 51.5 min calculated for 1.561 af (88% of inflow)
 Center-of-Mass det. time= 17.1 min (884.1 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

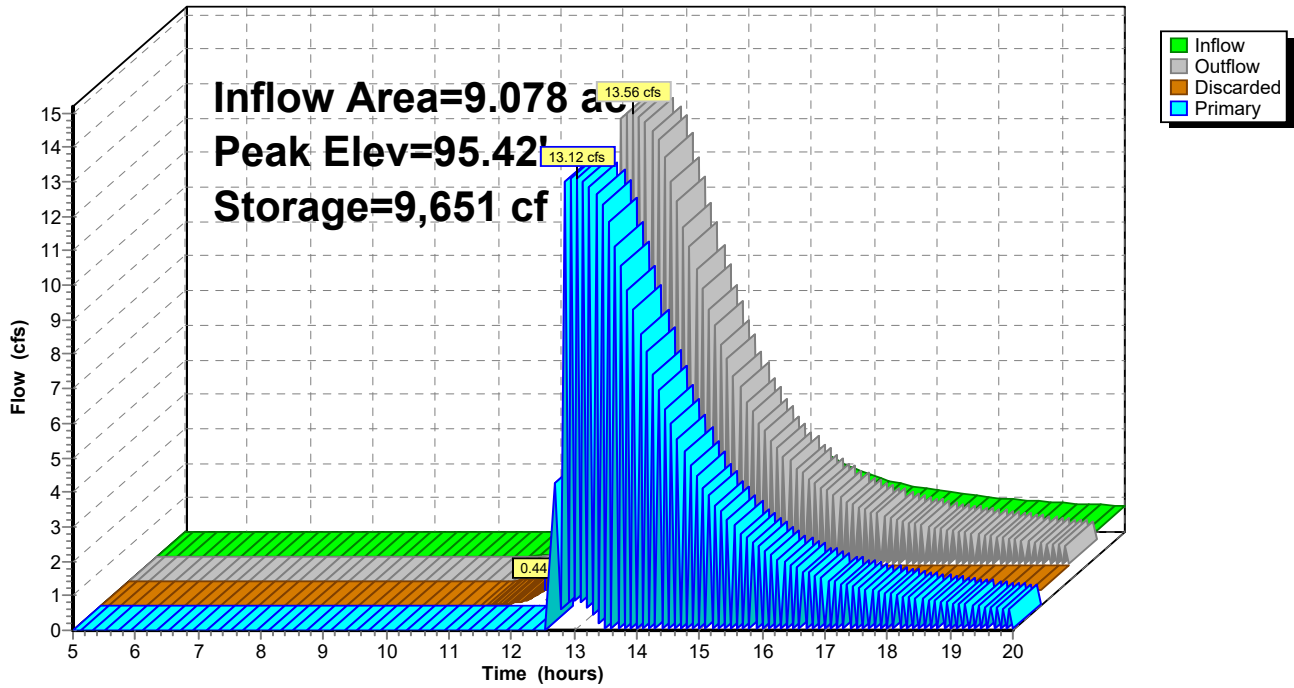
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 12.10 hrs HW=94.82' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=13.12 cfs @ 13.05 hrs HW=95.42' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 13.12 cfs @ 1.92 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



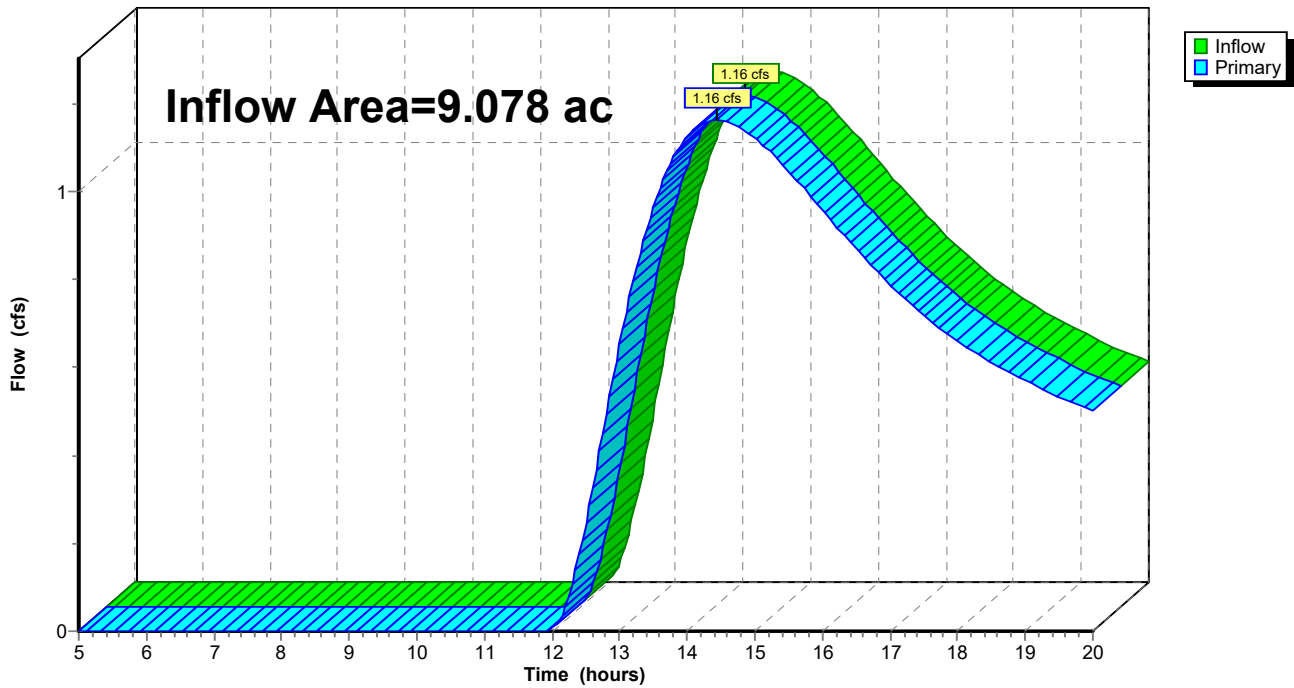
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.67" for 100-YR - 24HR. event
Inflow = 1.16 cfs @ 14.45 hrs, Volume= 0.509 af
Primary = 1.16 cfs @ 14.45 hrs, Volume= 0.509 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

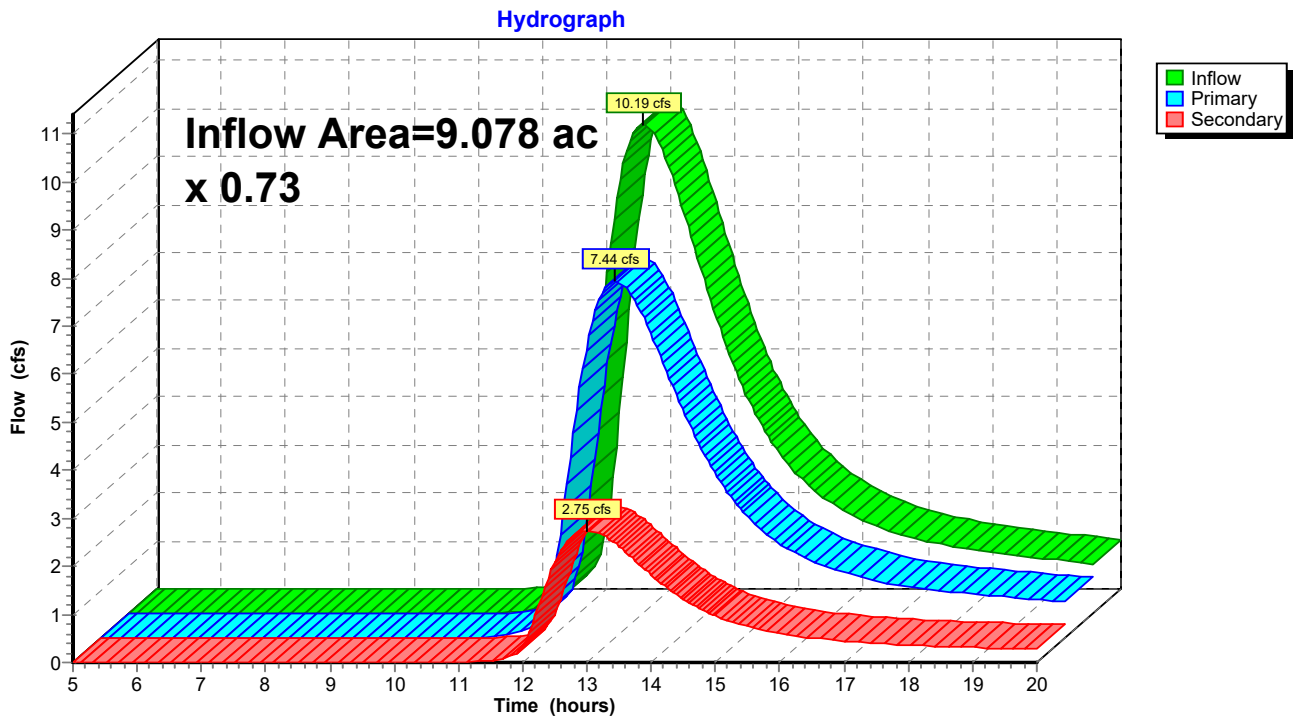


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 3.23" for 100-YR - 24HR. event
Inflow = 10.19 cfs @ 13.00 hrs, Volume= 2.442 af
Primary = 7.44 cfs @ 13.00 hrs, Volume= 1.783 af, Atten= 27%, Lag= 0.0 min
Secondary = 2.75 cfs @ 13.00 hrs, Volume= 0.659 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

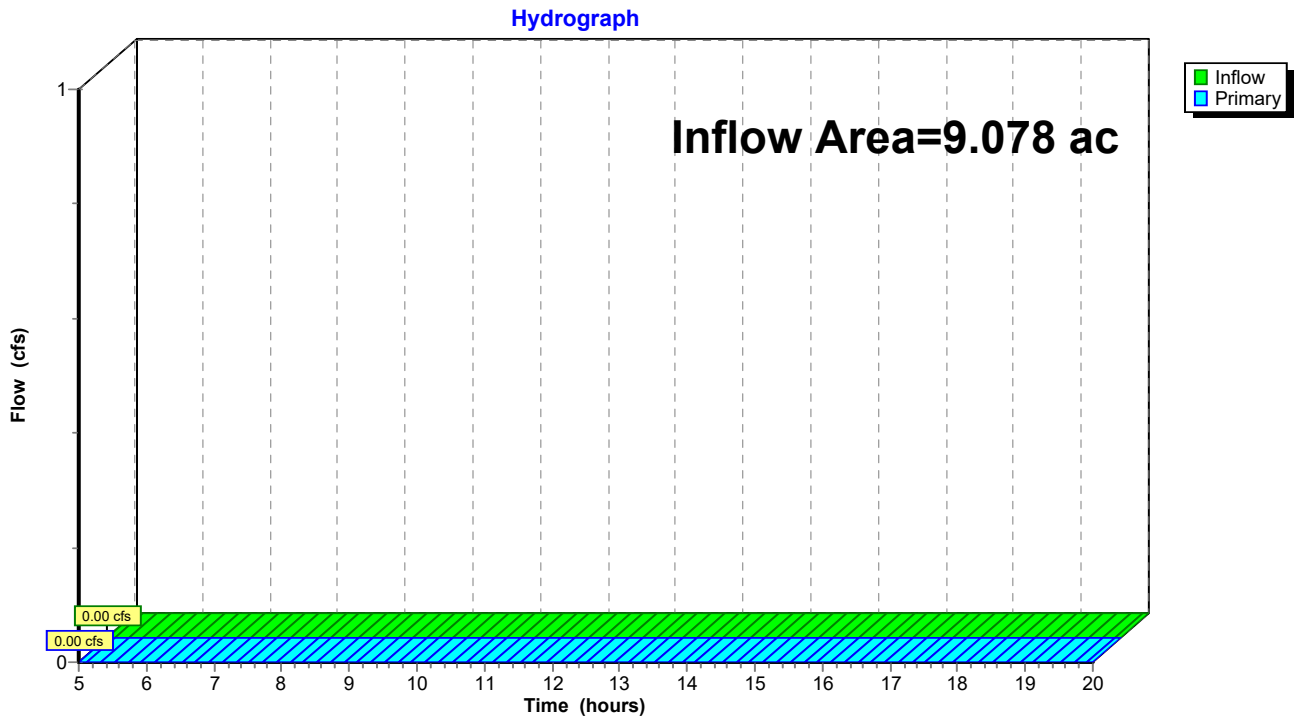


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 24HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.00"
 Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.01 cfs 0.001 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.01"
 Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=0.21 cfs 0.011 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=91.90' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREA NO.1 Peak Elev=95.10' Storage=33 cf Inflow=0.06 cfs 0.003 af
 Discarded=0.03 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.003 af

Pond 4P: RCOK VOID AREA NO.2 Peak Elev=94.80' Storage=90 cf Inflow=0.16 cfs 0.008 af
 Discarded=0.08 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.008 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.01 cfs 0.001 af
 Primary=0.01 cfs 0.001 af

Link 2L: POST OUTFALL x 0.73 Inflow=0.21 cfs 0.011 af
 Primary=0.16 cfs 0.008 af Secondary=0.06 cfs 0.003 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.01 cfs @ 5.00 hrs, Volume= 0.001 af, Depth> 0.00"

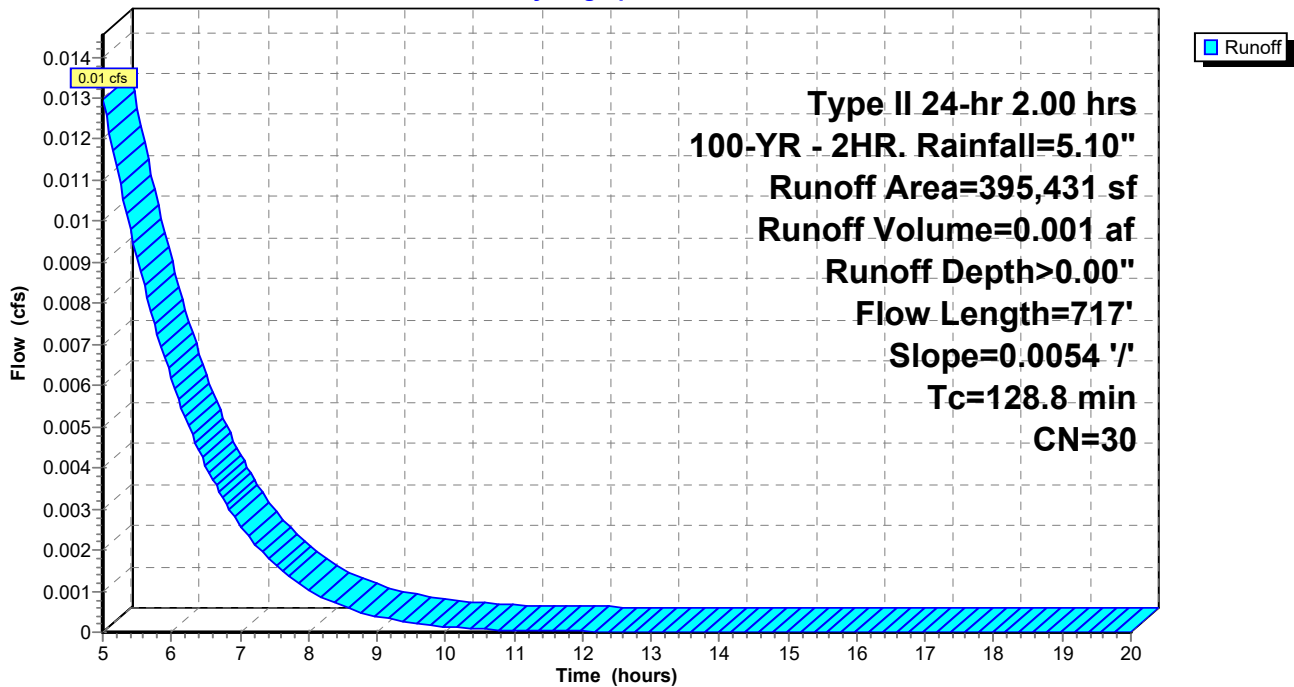
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 0.21 cfs @ 5.00 hrs, Volume= 0.011 af, Depth> 0.01"

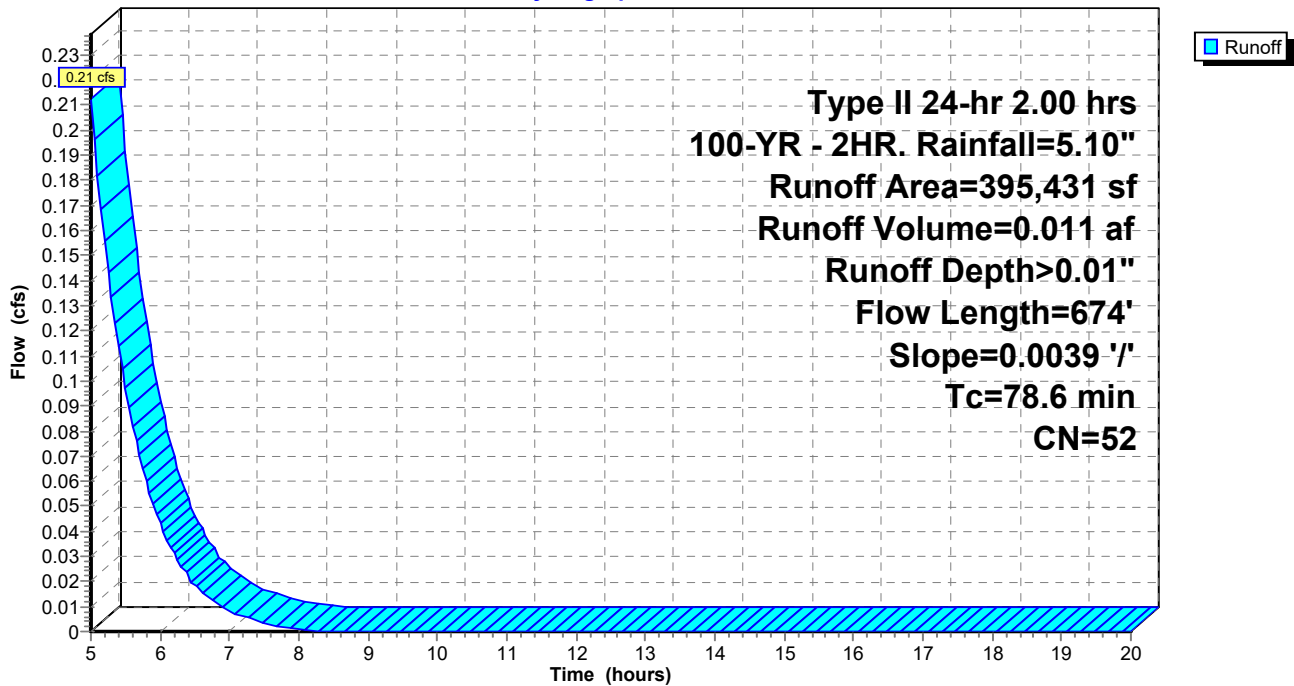
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

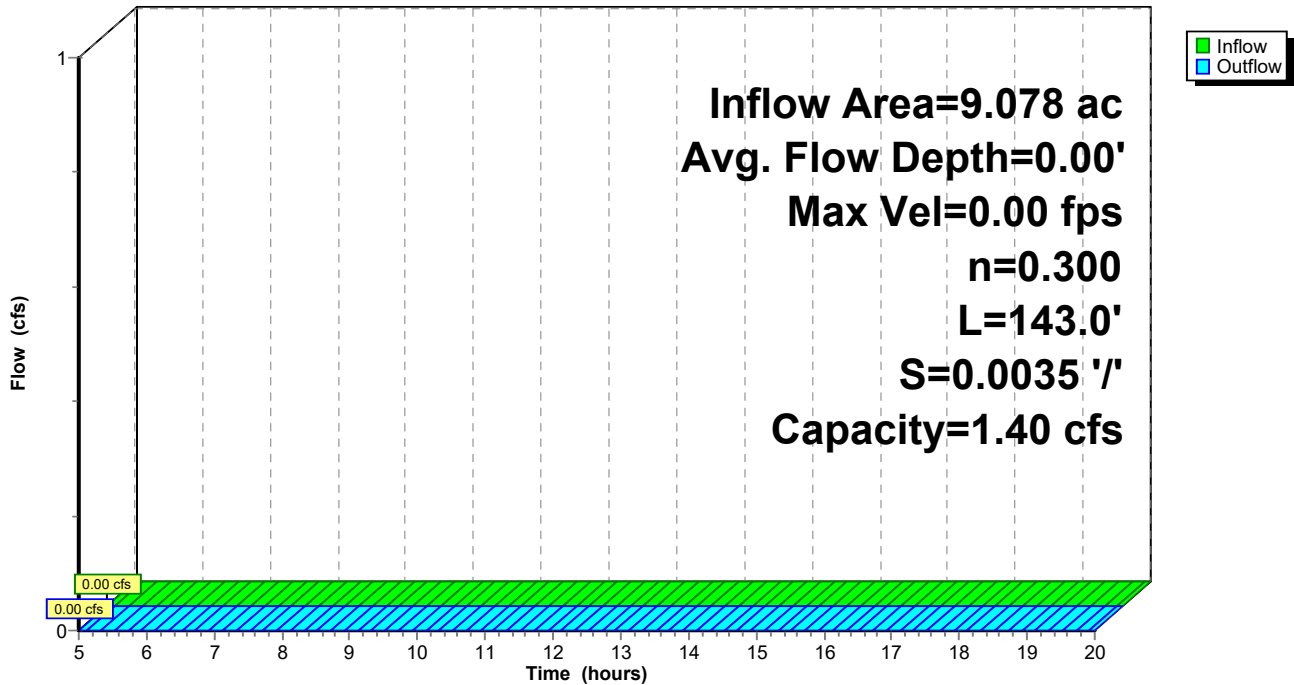
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 143.0' Slope= 0.0035 '/'
 Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.90' @ 5.00 hrs Surf.Area= 26,653 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

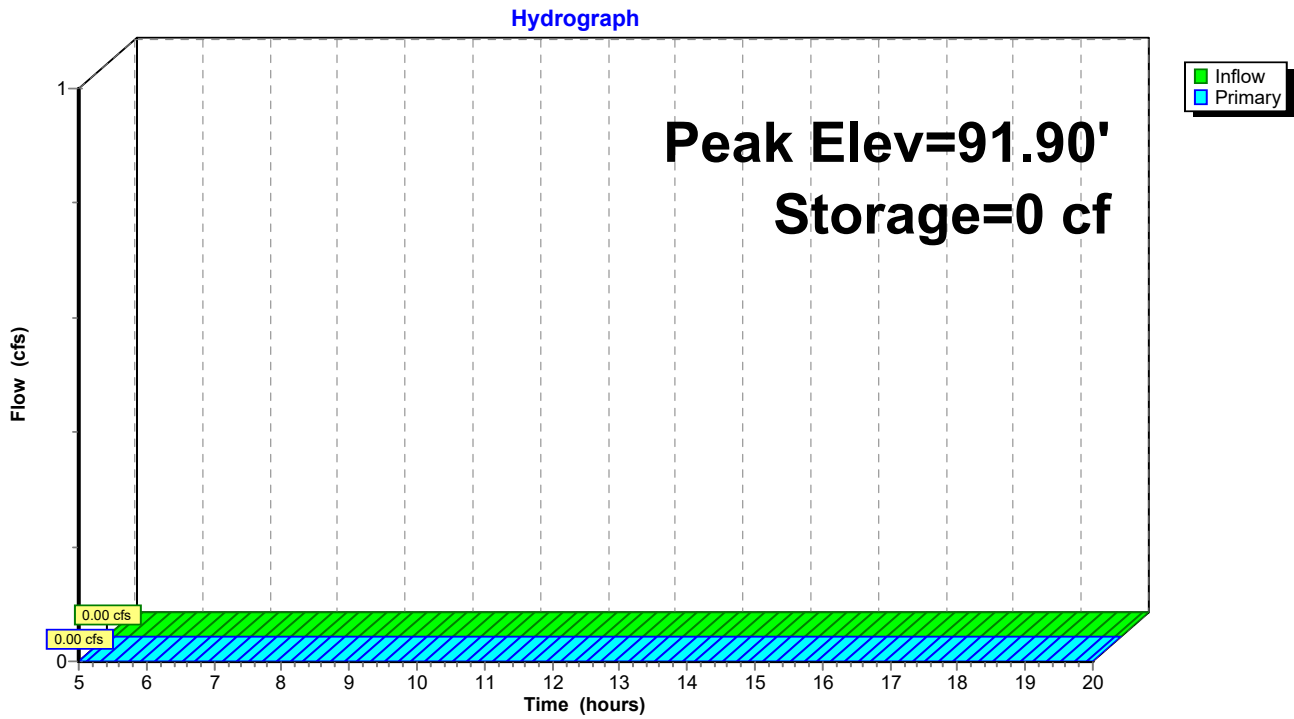
Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1



Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.30' @ 5.00 hrs Surf.Area= 61,746 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

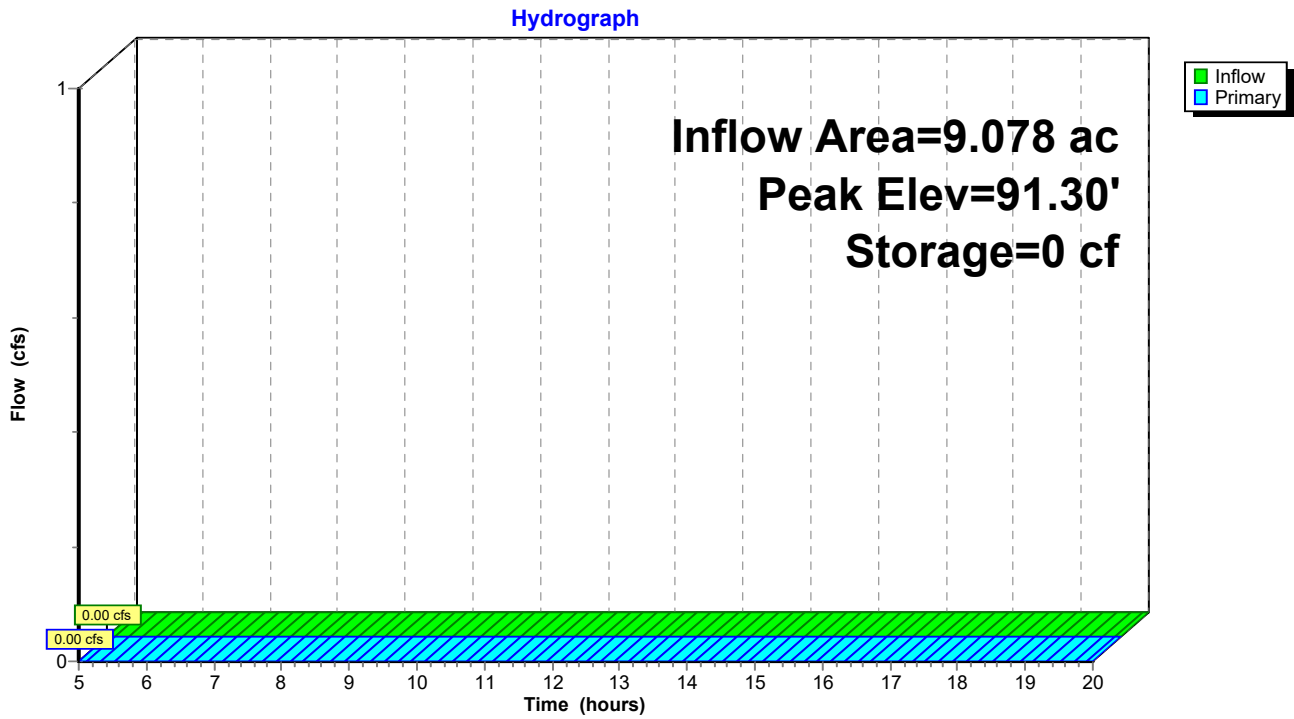
Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2



Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 0.06 cfs @ 5.00 hrs, Volume= 0.003 af
 Outflow = 0.03 cfs @ 5.41 hrs, Volume= 0.003 af, Atten= 47%, Lag= 24.5 min
 Discarded = 0.03 cfs @ 5.41 hrs, Volume= 0.003 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.10' @ 5.41 hrs Surf.Area= 50,275 sf Storage= 33 cf

Plug-Flow detention time= 23.6 min calculated for 0.003 af (96% of inflow)
 Center-of-Mass det. time= 18.3 min (352.2 - 334.0)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

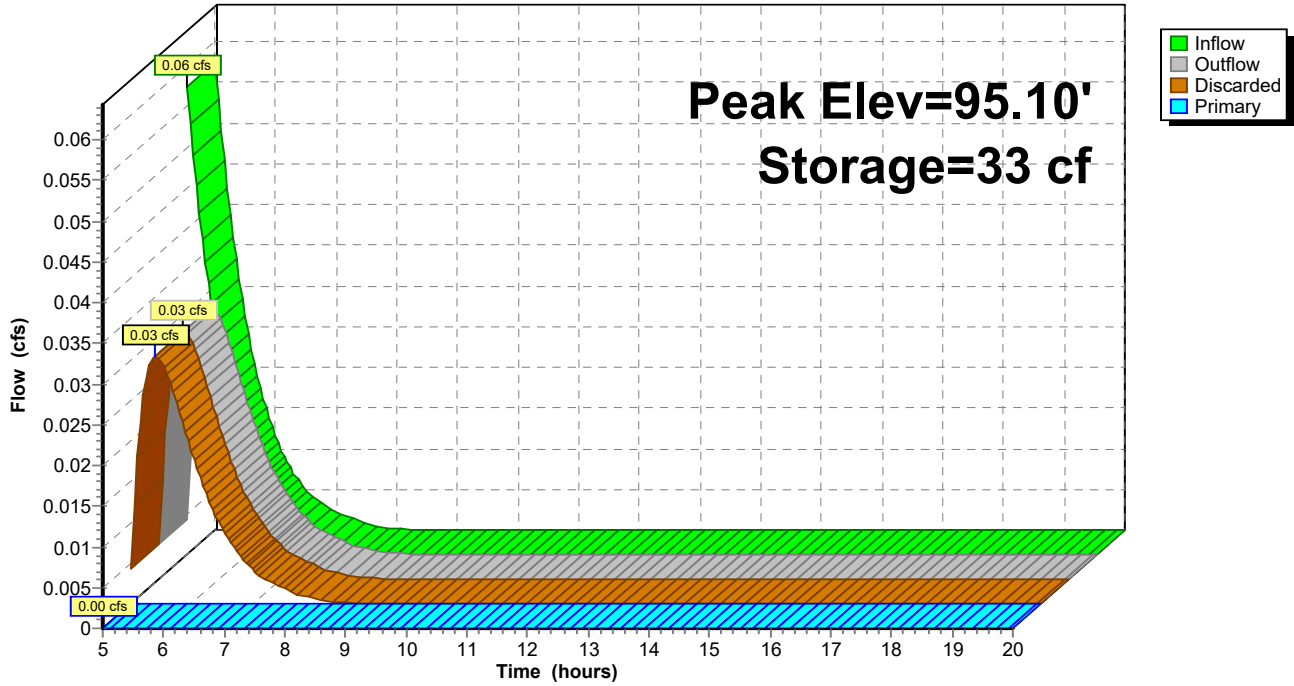
Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 5.41 hrs HW=95.10' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=95.10' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.01" for 100-YR - 2HR. event
 Inflow = 0.16 cfs @ 5.00 hrs, Volume= 0.008 af
 Outflow = 0.08 cfs @ 5.41 hrs, Volume= 0.008 af, Atten= 47%, Lag= 24.5 min
 Discarded = 0.08 cfs @ 5.41 hrs, Volume= 0.008 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.80' @ 5.41 hrs Surf.Area= 137,877 sf Storage= 90 cf

Plug-Flow detention time= 24.7 min calculated for 0.008 af (96% of inflow)
 Center-of-Mass det. time= 18.3 min (352.2 - 334.0)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

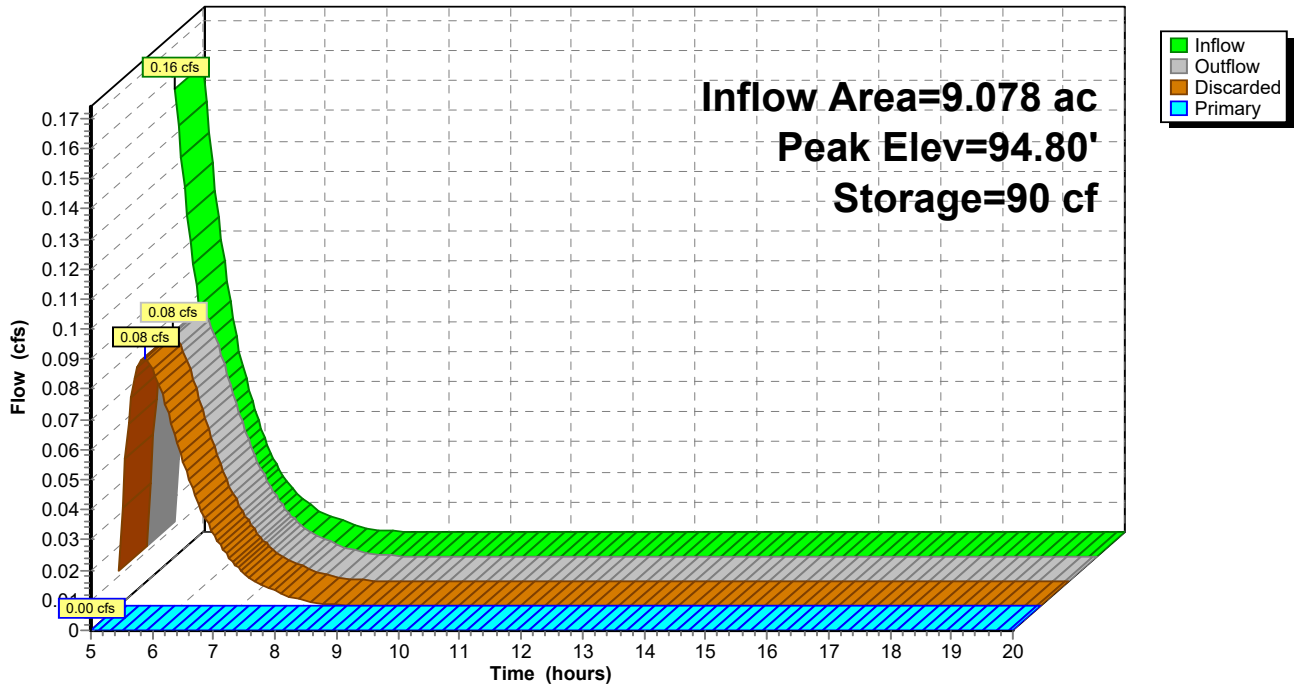
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 5.41 hrs HW=94.80' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=94.80' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



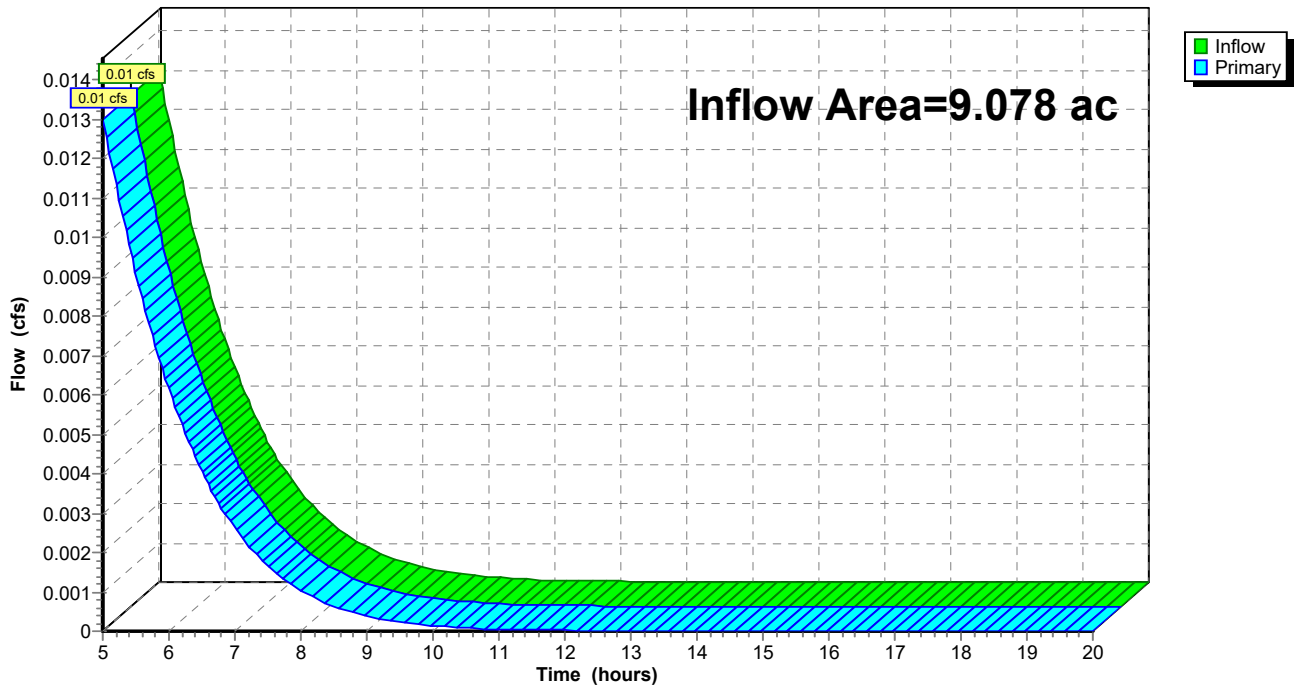
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.00" for 100-YR - 2HR. event
 Inflow = 0.01 cfs @ 5.00 hrs, Volume= 0.001 af
 Primary = 0.01 cfs @ 5.00 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

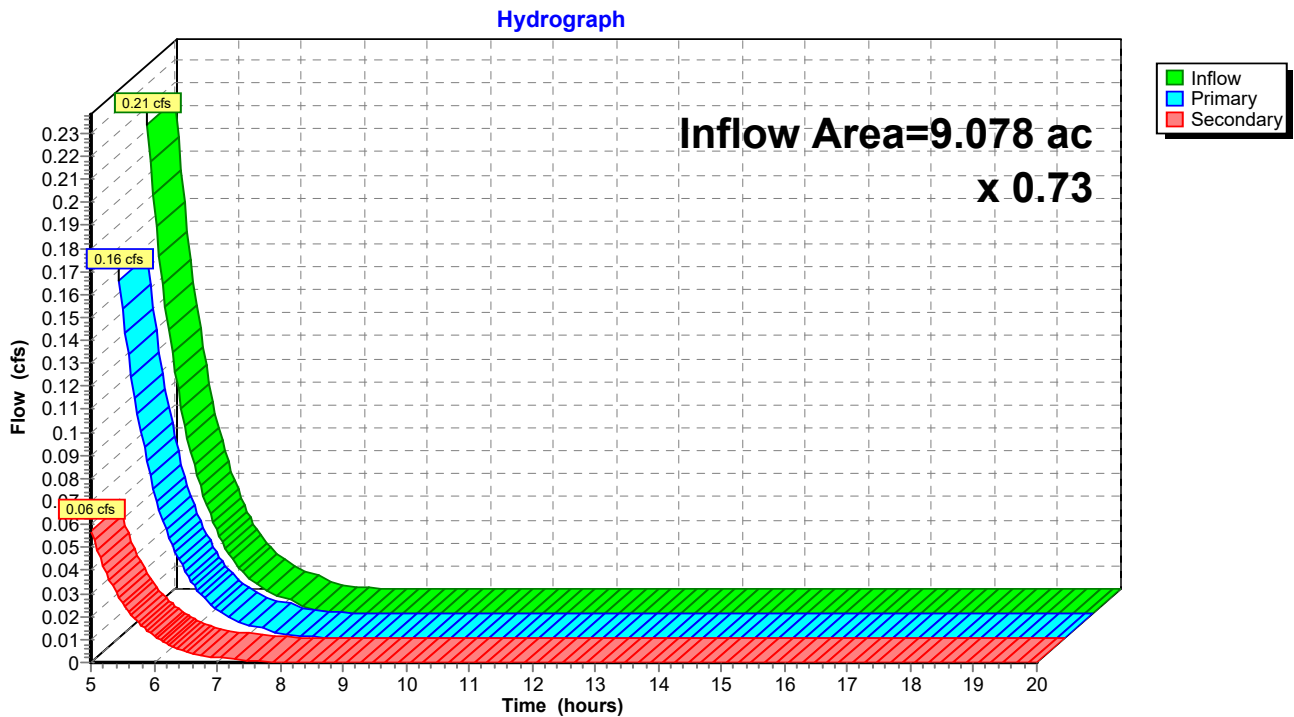


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.01" for 100-YR - 2HR. event
 Inflow = 0.21 cfs @ 5.00 hrs, Volume= 0.011 af
 Primary = 0.16 cfs @ 5.00 hrs, Volume= 0.008 af, Atten= 27%, Lag= 0.0 min
 Secondary = 0.06 cfs @ 5.00 hrs, Volume= 0.003 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

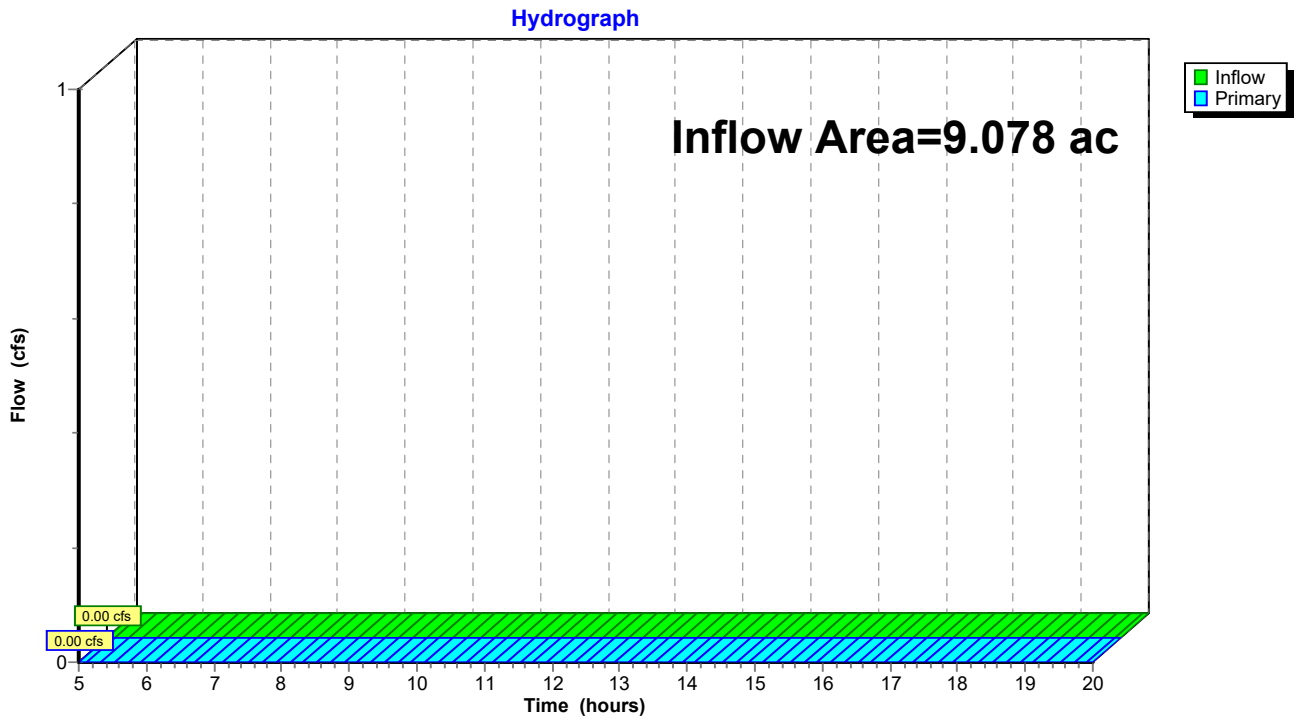


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Prepared by HP Inc.

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.05"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.23 cfs 0.036 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.19"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=2.10 cfs 0.141 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=91.90' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.30' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREA NO.1 Peak Elev=95.14' Storage=695 cf Inflow=0.57 cfs 0.038 af
Discarded=0.16 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.038 af

Pond 4P: ROCK VOID AREA NO.2 Peak Elev=94.84' Storage=1,857 cf Inflow=1.53 cfs 0.103 af
Discarded=0.44 cfs 0.103 af Primary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.103 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.23 cfs 0.036 af
Primary=0.23 cfs 0.036 af

Link 2L: POST OUTFALL x 0.73 Inflow=2.10 cfs 0.141 af
Primary=1.53 cfs 0.103 af Secondary=0.57 cfs 0.038 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.23 cfs @ 5.00 hrs, Volume= 0.036 af, Depth> 0.05"

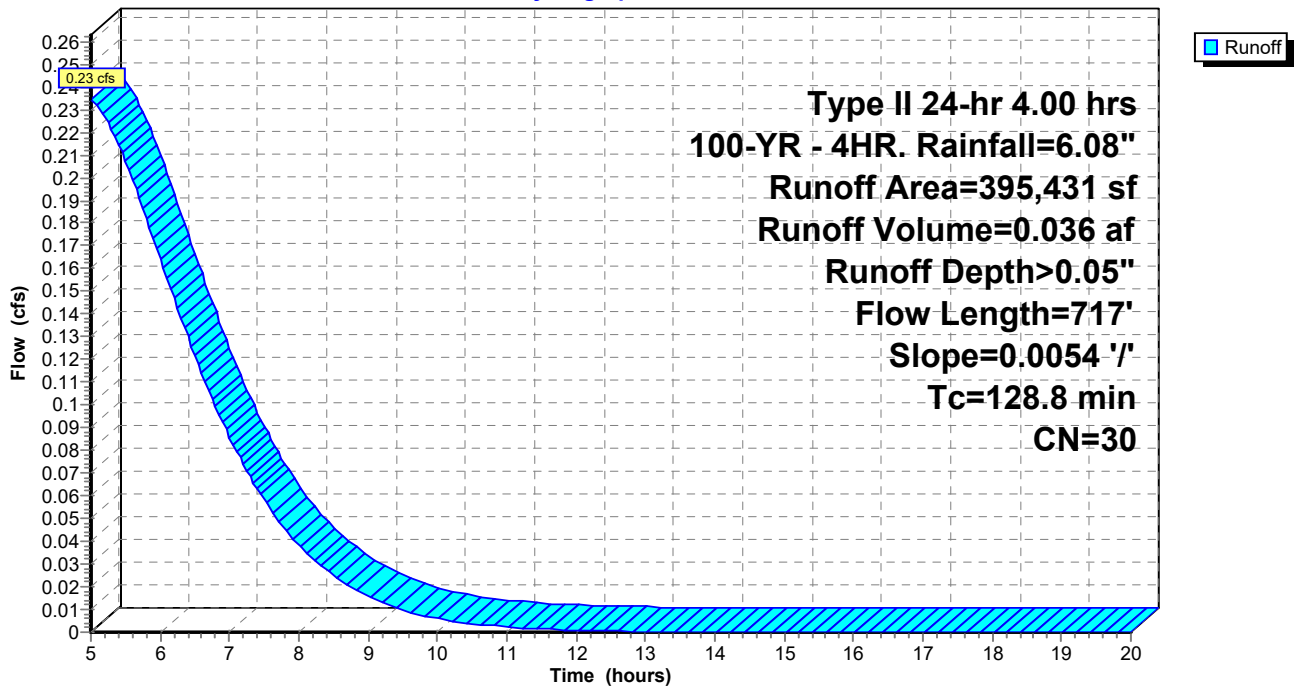
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 2.10 cfs @ 5.00 hrs, Volume= 0.141 af, Depth> 0.19"

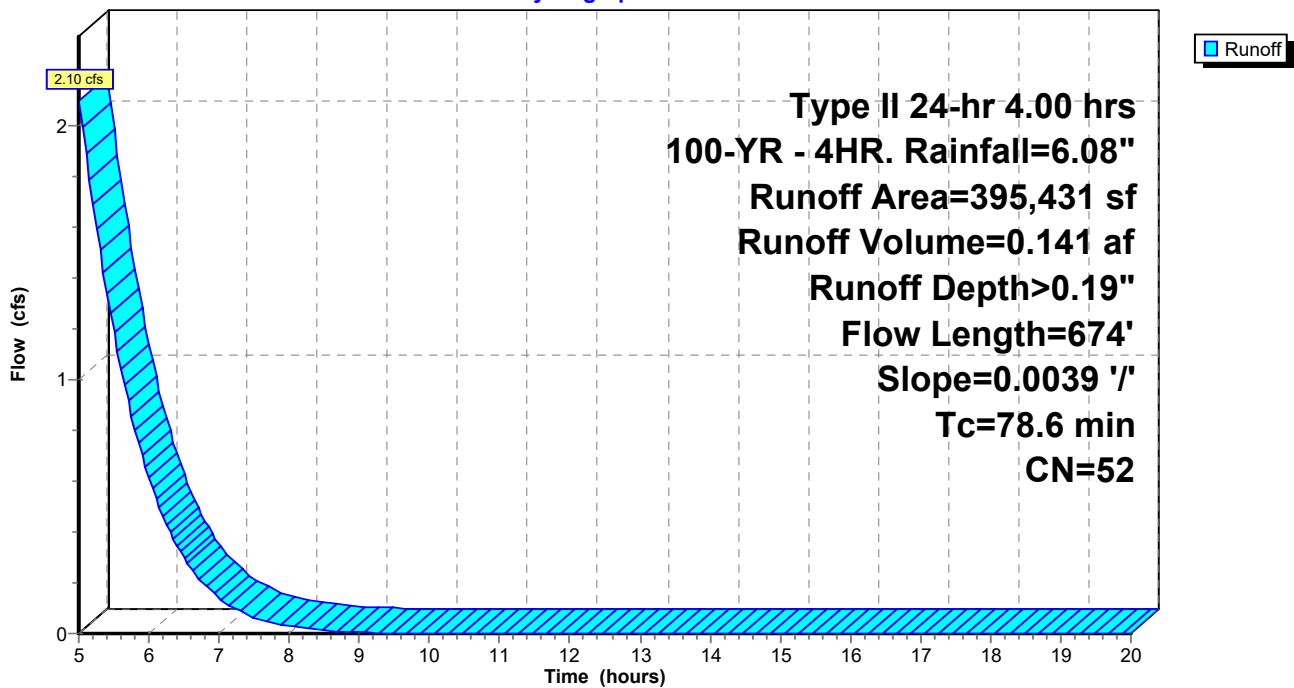
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

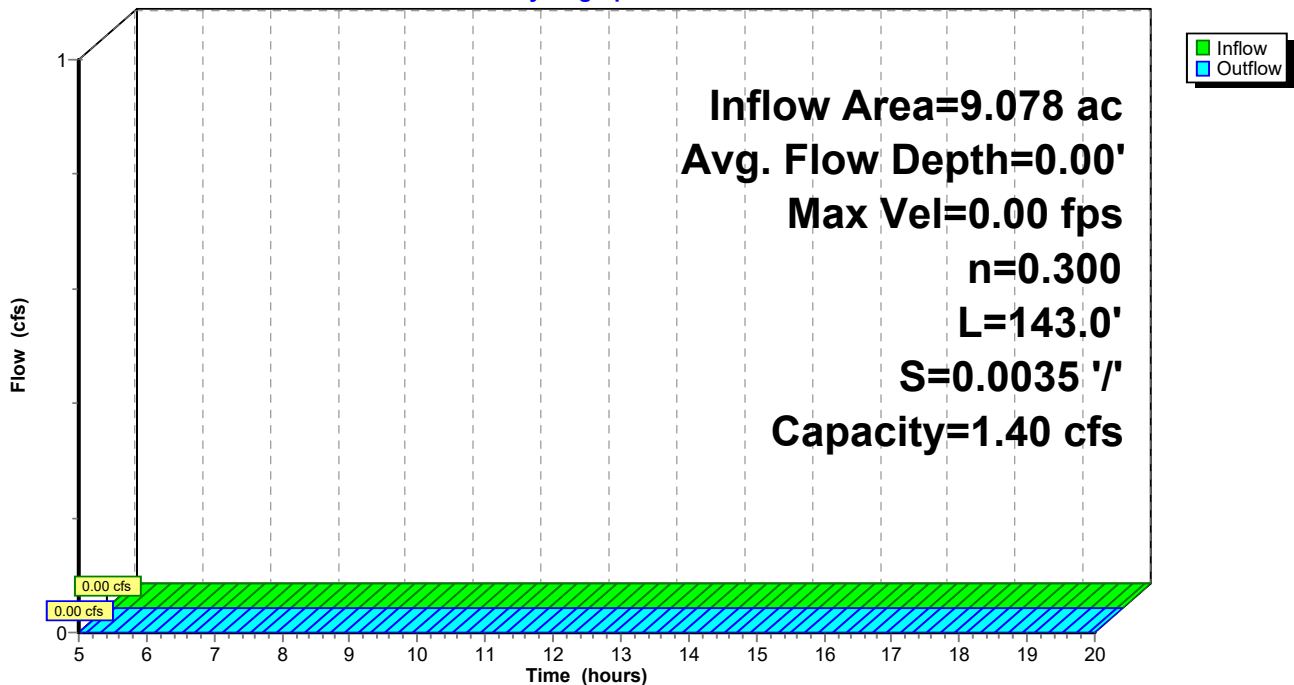
Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 143.0' Slope= 0.0035 '/'
 Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.90' @ 5.00 hrs Surf.Area= 26,653 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

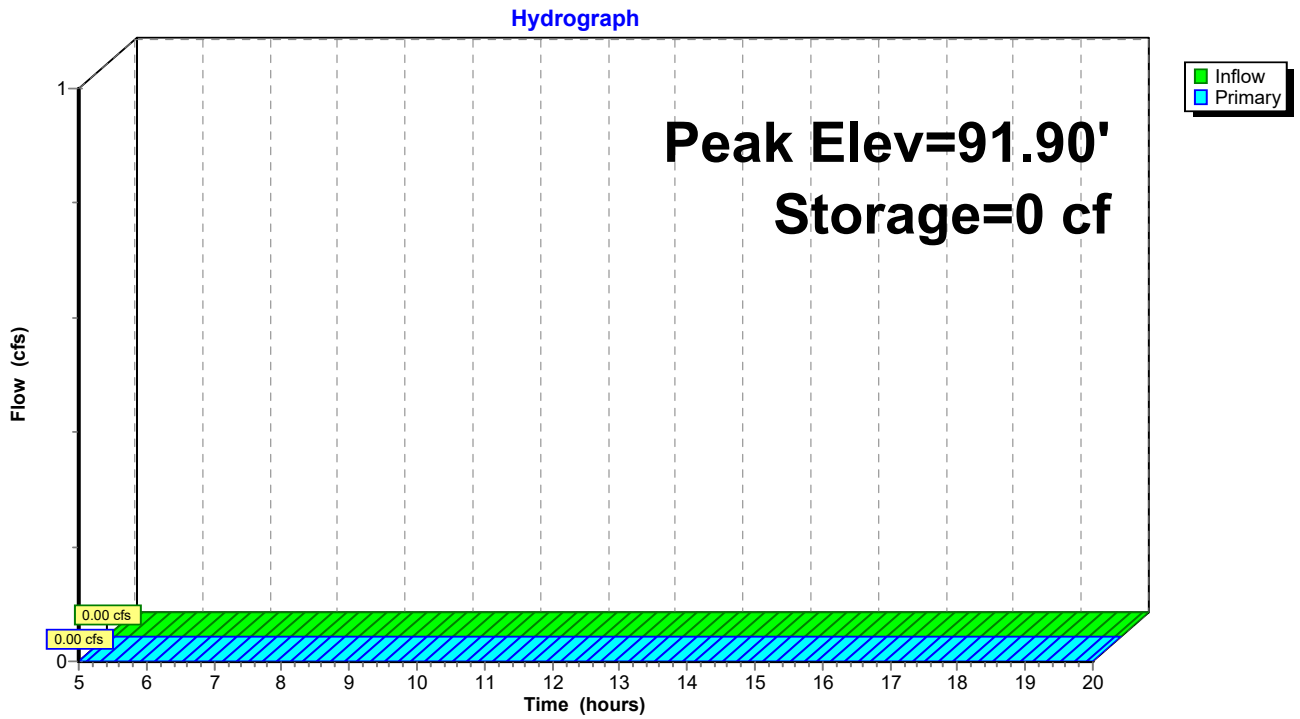
Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1



Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.30' @ 5.00 hrs Surf.Area= 61,746 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

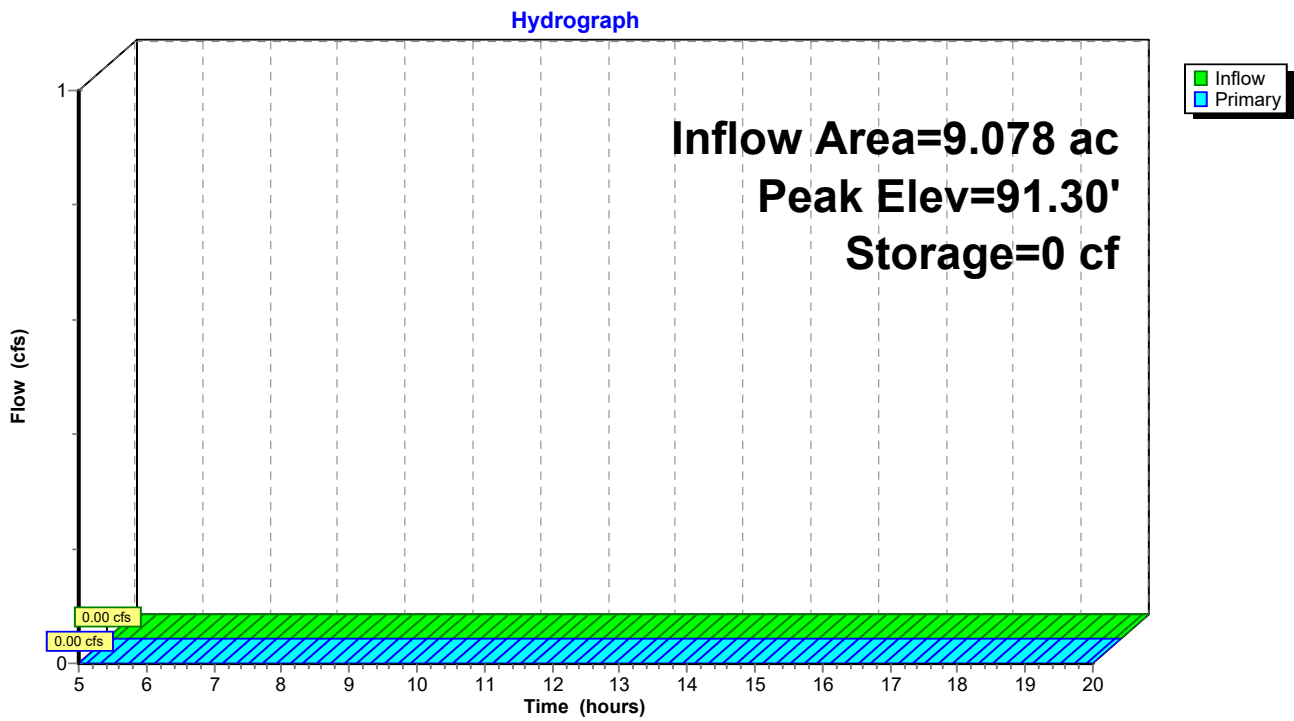
Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2



Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 0.57 cfs @ 5.00 hrs, Volume= 0.038 af
 Outflow = 0.16 cfs @ 5.10 hrs, Volume= 0.038 af, Atten= 72%, Lag= 6.0 min
 Discarded = 0.16 cfs @ 5.10 hrs, Volume= 0.038 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.14' @ 6.02 hrs Surf.Area= 50,275 sf Storage= 695 cf

Plug-Flow detention time= 55.2 min calculated for 0.037 af (97% of inflow)
 Center-of-Mass det. time= 48.0 min (388.9 - 340.9)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

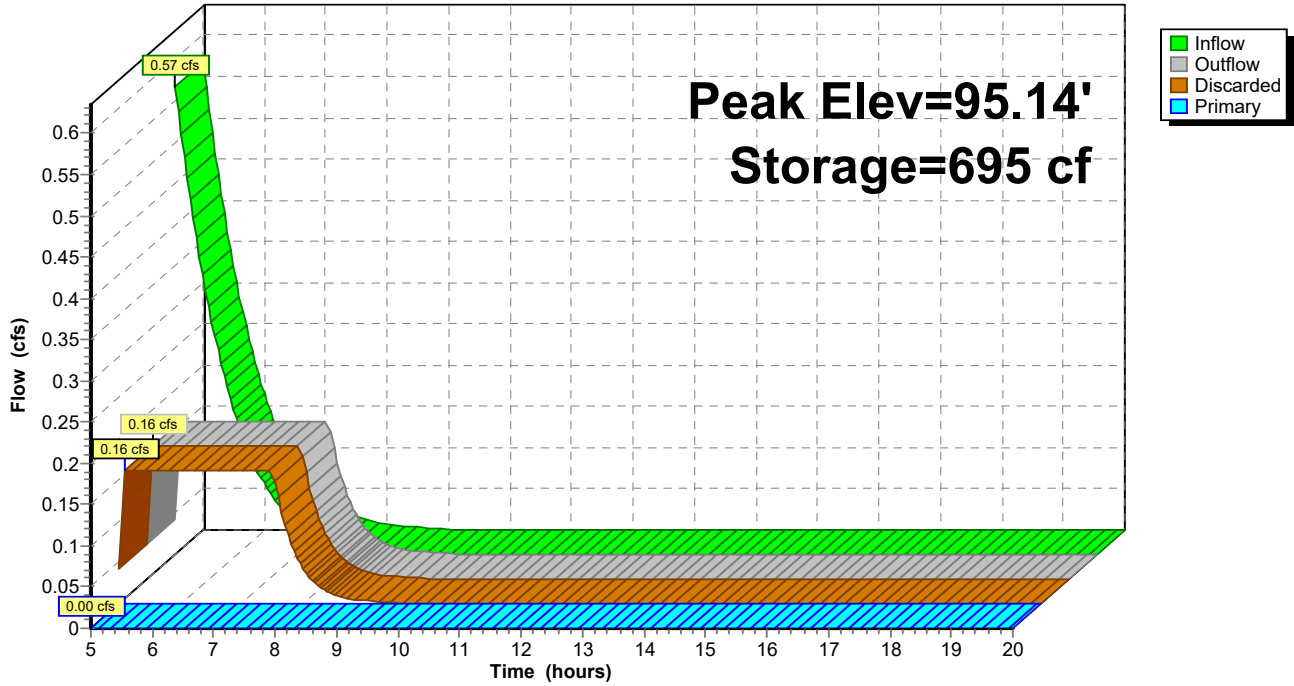
Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 5.10 hrs HW=95.11' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=95.10' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.14" for 100-YR - 4HR. event
 Inflow = 1.53 cfs @ 5.00 hrs, Volume= 0.103 af
 Outflow = 0.44 cfs @ 5.10 hrs, Volume= 0.103 af, Atten= 71%, Lag= 6.0 min
 Discarded = 0.44 cfs @ 5.10 hrs, Volume= 0.103 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 94.84' @ 6.01 hrs Surf.Area= 137,877 sf Storage= 1,857 cf

Plug-Flow detention time= 54.0 min calculated for 0.100 af (97% of inflow)
 Center-of-Mass det. time= 46.9 min (387.8 - 340.9)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

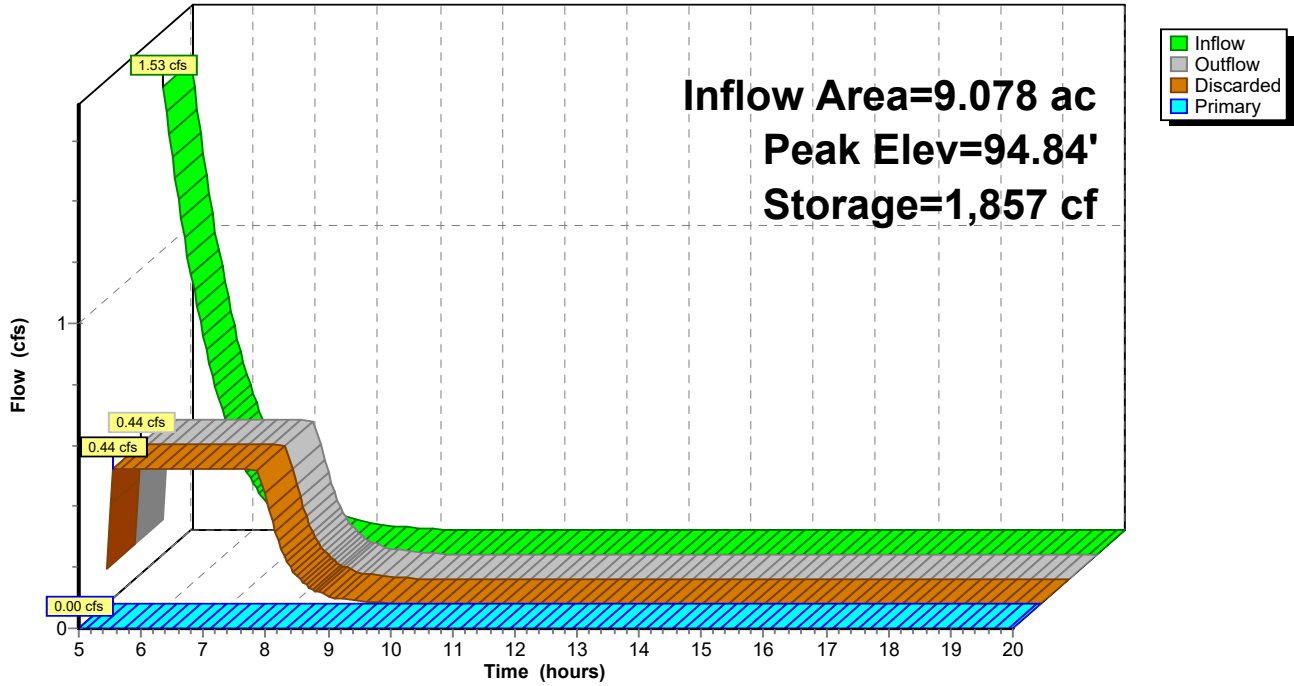
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 5.10 hrs HW=94.81' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=94.80' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



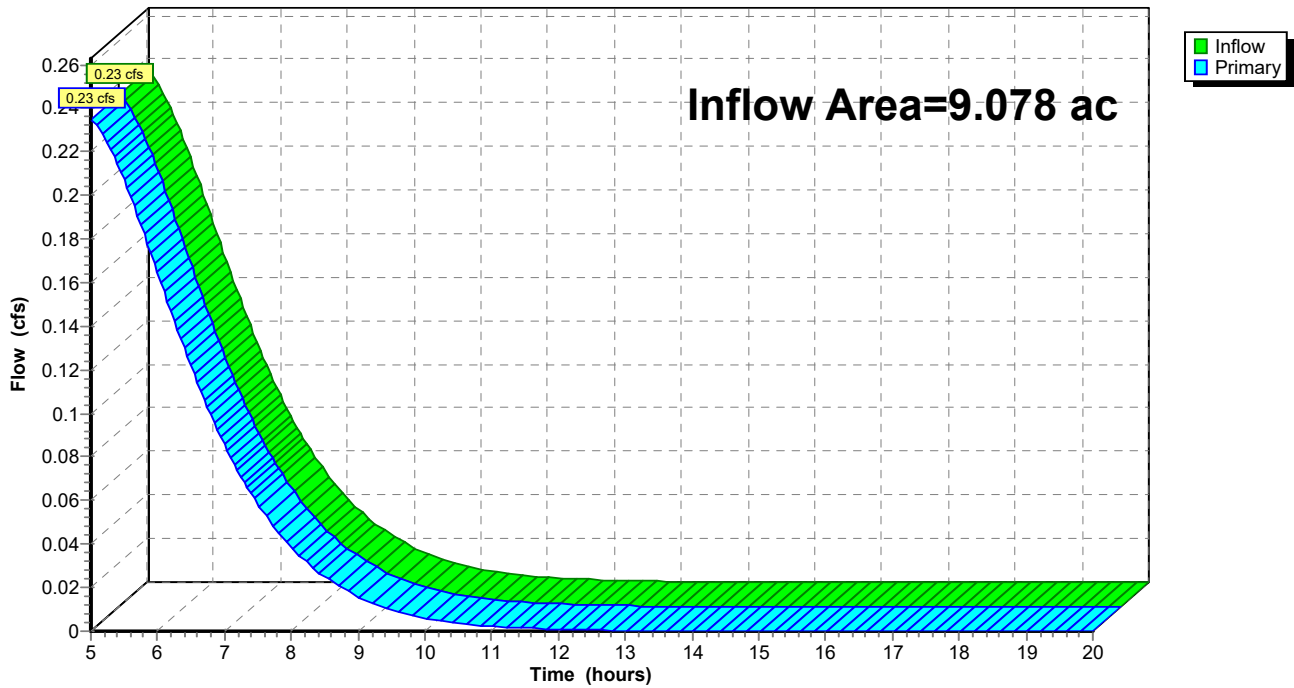
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.05" for 100-YR - 4HR. event
Inflow = 0.23 cfs @ 5.00 hrs, Volume= 0.036 af
Primary = 0.23 cfs @ 5.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

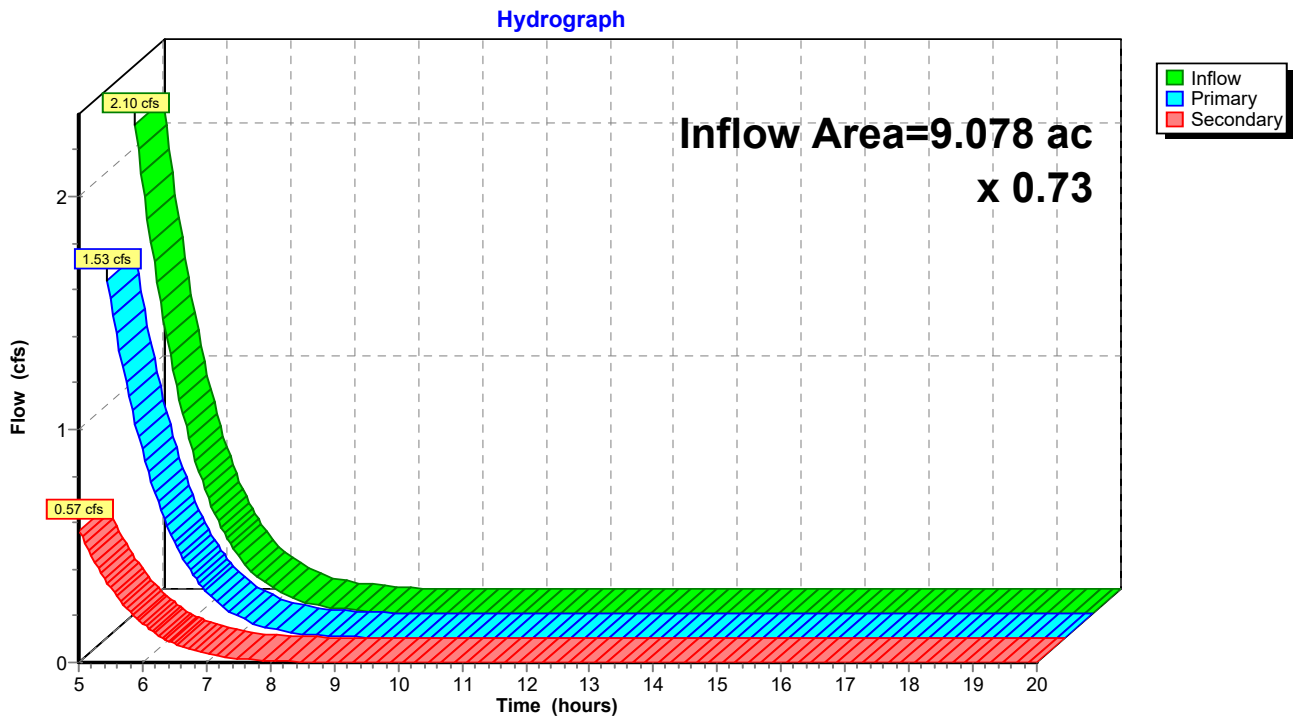


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.19" for 100-YR - 4HR. event
 Inflow = 2.10 cfs @ 5.00 hrs, Volume= 0.141 af
 Primary = 1.53 cfs @ 5.00 hrs, Volume= 0.103 af, Atten= 27%, Lag= 0.0 min
 Secondary = 0.57 cfs @ 5.00 hrs, Volume= 0.038 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

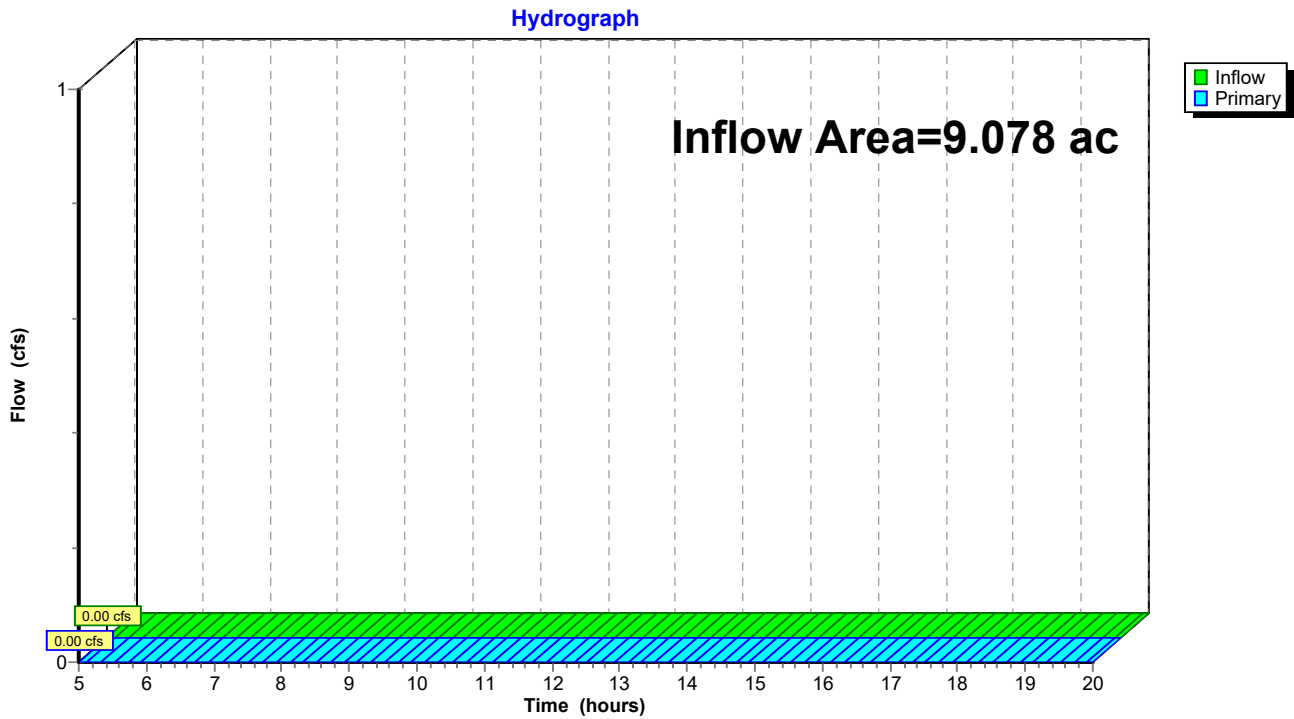


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Staging Area 4 Basin 5 HydroCAD Report Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Prepared by HP Inc.

Printed 3/16/2020

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>0.27"
Flow Length=717' Slope=0.0054 '/' Tc=128.8 min CN=30 Runoff=0.55 cfs 0.208 af

Subcatchment2S: POST DEVELOPED Runoff Area=395,431 sf 0.00% Impervious Runoff Depth>1.68"
Flow Length=674' Slope=0.0039 '/' Tc=78.6 min CN=52 Runoff=6.81 cfs 1.273 af

Reach 1R: PROPOSED SWALE Avg. Flow Depth=1.81' Max Vel=0.28 fps Inflow=4.81 cfs 0.518 af
n=0.300 L=143.0' S=0.0035 '/' Capacity=1.40 cfs Outflow=3.49 cfs 0.518 af

Pond 1P: PROPOSED POND NO.1 Peak Elev=92.21' Storage=8,464 cf Inflow=1.84 cfs 0.194 af
Outflow=0.00 cfs 0.000 af

Pond 2P: PROPOSED POND NO.2 Peak Elev=91.66' Storage=22,558 cf Inflow=3.49 cfs 0.518 af
Outflow=0.00 cfs 0.000 af

Pond 3P: ROCK VOID AREA NO.1 Peak Elev=95.41' Storage=3,519 cf Inflow=1.84 cfs 0.344 af
Discarded=0.16 cfs 0.149 af Primary=1.84 cfs 0.194 af Outflow=2.00 cfs 0.344 af

Pond 4P: RCOK VOID AREA NO.2 Peak Elev=95.22' Storage=9,651 cf Inflow=4.97 cfs 0.929 af
Discarded=0.44 cfs 0.412 af Primary=4.81 cfs 0.518 af Outflow=5.26 cfs 0.929 af

Link 1L: EXISTING OUTFALL LOCATION Inflow=0.55 cfs 0.208 af
Primary=0.55 cfs 0.208 af

Link 2L: POST OUTFALL x 0.73 Inflow=6.81 cfs 1.273 af
Primary=4.97 cfs 0.929 af Secondary=1.84 cfs 0.344 af

Link 3L: TOTAL POST OUTFALL Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Runoff = 0.55 cfs @ 7.43 hrs, Volume= 0.208 af, Depth> 0.27"

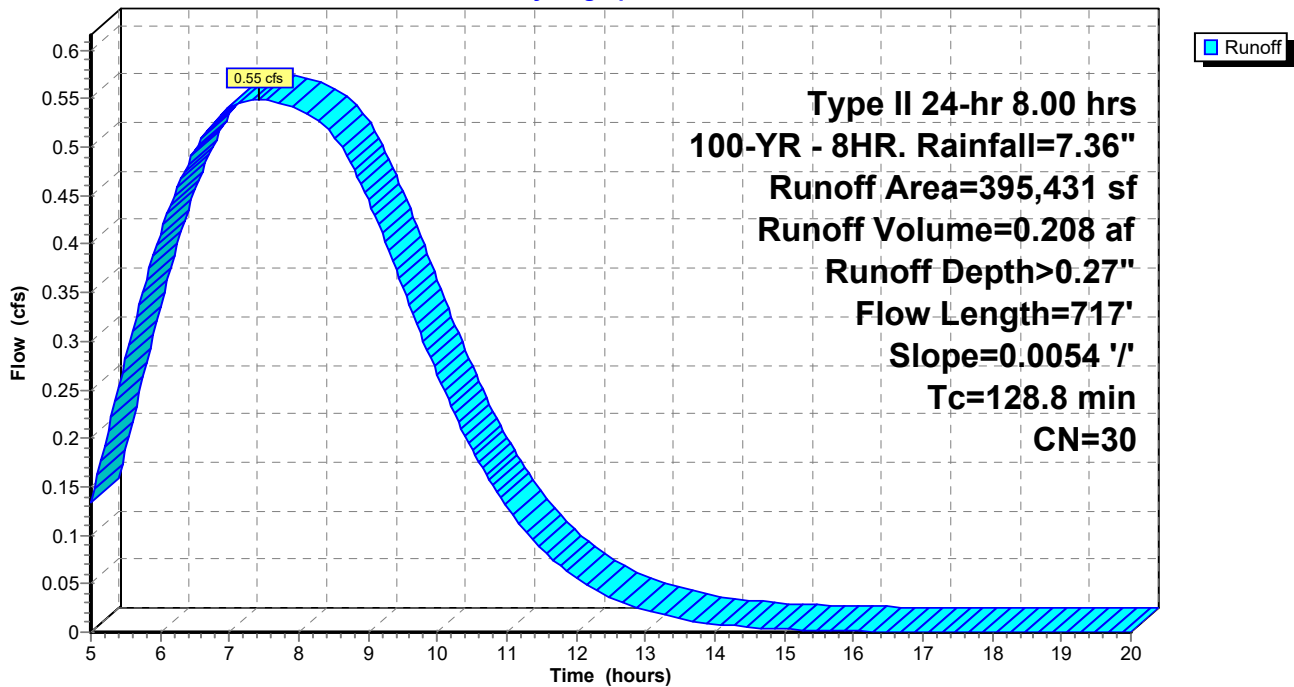
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
395,431	30	Meadow, non-grazed, HSG A
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.8	717	0.0054	0.09		Lag/CN Method,

Subcatchment 1S: PRE DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Runoff = 6.81 cfs @ 5.18 hrs, Volume= 1.273 af, Depth> 1.68"

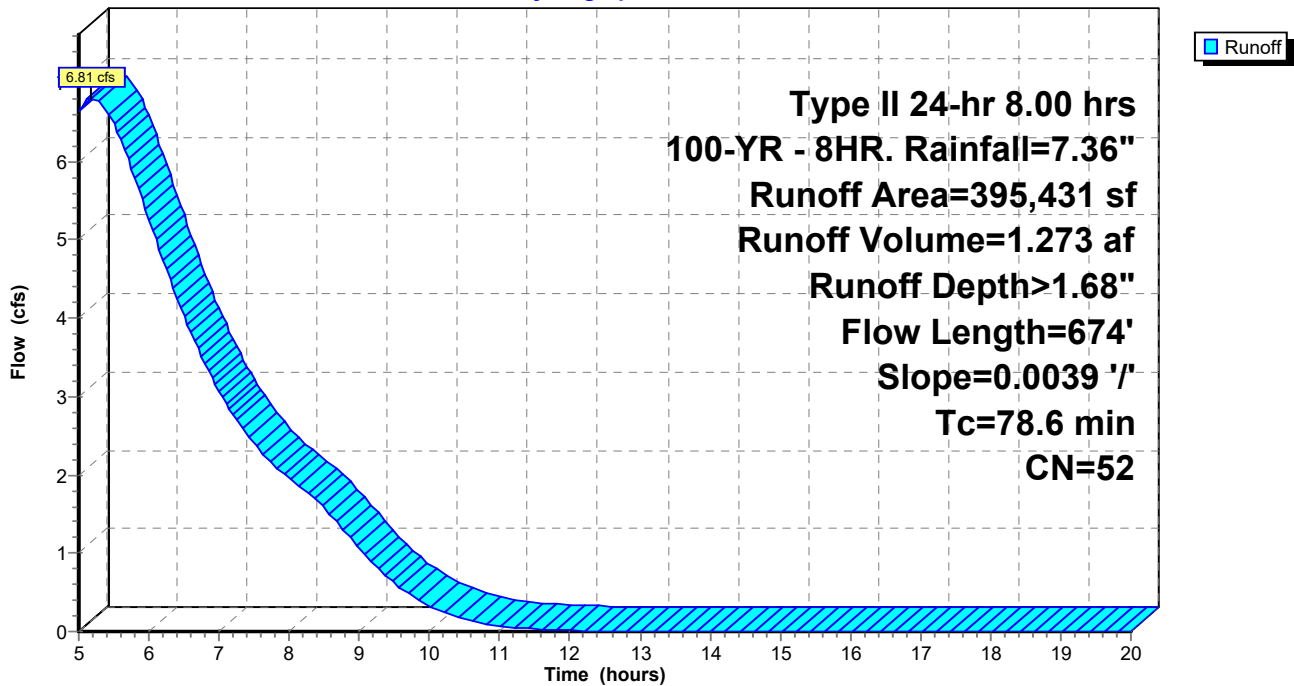
Runoff by SCS TR-20 method, UH=Georgia-323, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

Area (sf)	CN	Description
163,868	30	Meadow, non-grazed, HSG A
* 188,394	65	Uncompacted Gravel (35% Void)
43,169	76	Gravel roads, HSG A
395,431	52	Weighted Average
395,431		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	674	0.0039	0.14		Lag/CN Method,

Subcatchment 2S: POST DEVELOPED DRAINAGE AREA 1

Hydrograph



Summary for Reach 1R: PROPOSED SWALE

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.68" for 100-YR - 8HR. event
 Inflow = 4.81 cfs @ 5.65 hrs, Volume= 0.518 af
 Outflow = 3.49 cfs @ 6.10 hrs, Volume= 0.518 af, Atten= 28%, Lag= 27.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.28 fps, Min. Travel Time= 8.5 min
 Avg. Velocity = 0.08 fps, Avg. Travel Time= 30.8 min

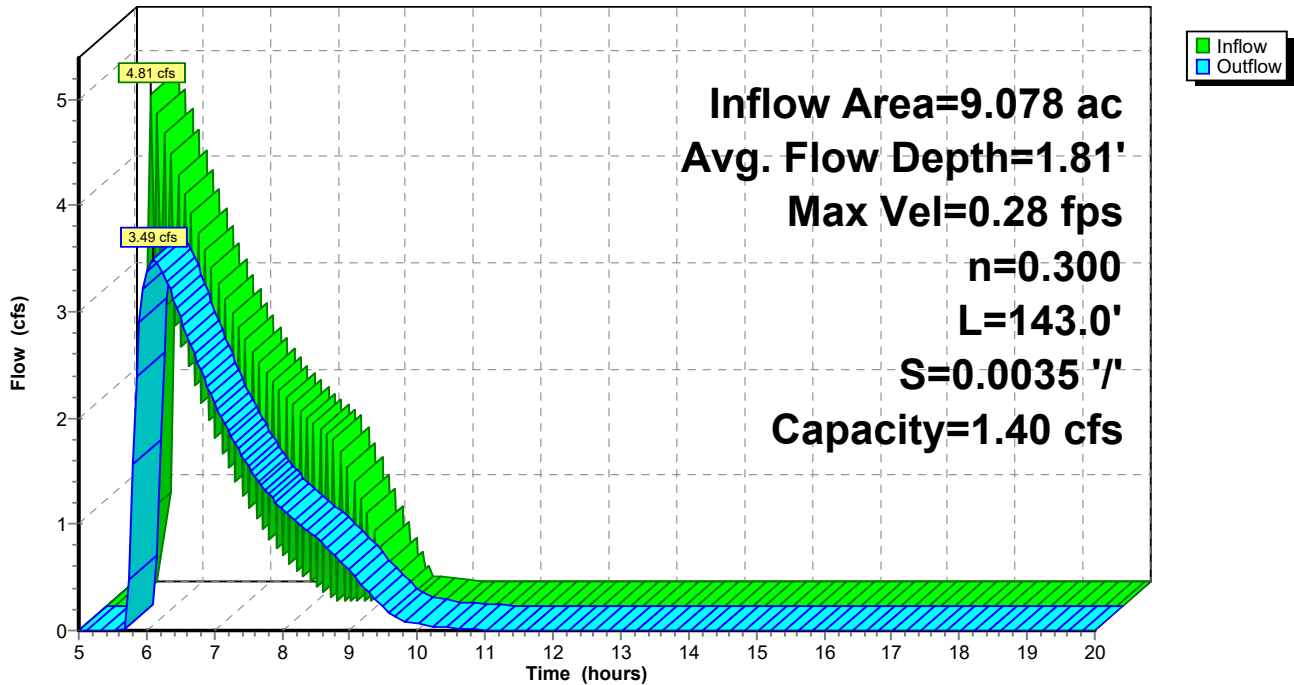
Peak Storage= 1,778 cf @ 5.96 hrs
 Average Depth at Peak Storage= 1.81'
 Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 1.40 cfs

4.00' x 1.00' deep channel, n= 0.300
 Side Slope Z-value= 2.0 '/' Top Width= 8.00'
 Length= 143.0' Slope= 0.0035 '/'
 Inlet Invert= 93.80', Outlet Invert= 93.30'



Reach 1R: PROPOSED SWALE

Hydrograph



Summary for Pond 1P: PROPOSED POND NO.1

Inflow = 1.84 cfs @ 5.60 hrs, Volume= 0.194 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.21' @ 10.20 hrs Surf.Area= 27,246 sf Storage= 8,464 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

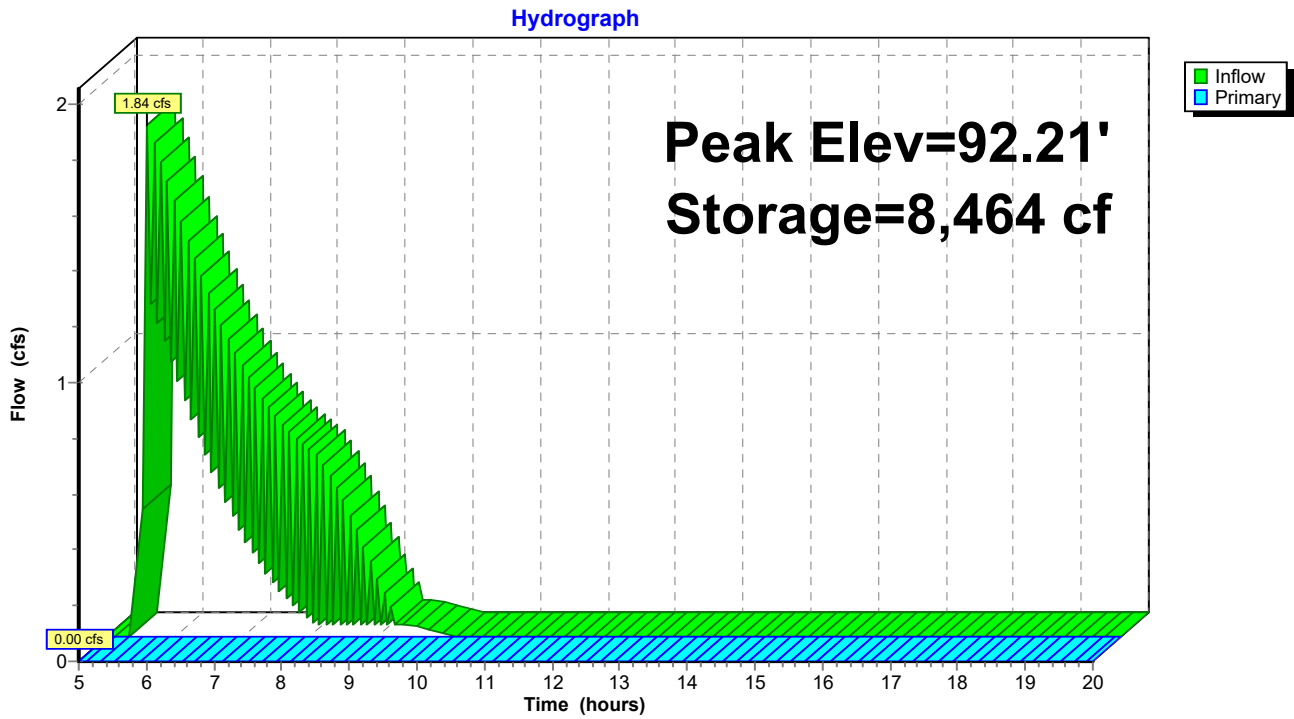
Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	88,517 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	26,653	0	0
92.90	28,541	27,597	27,597
93.90	30,454	29,498	57,095
94.90	32,391	31,423	88,517

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	43.6 deg x 20.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.90' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 1P: PROPOSED POND NO.1



Summary for Pond 2P: PROPOSED POND NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.68" for 100-YR - 8HR. event
 Inflow = 3.49 cfs @ 6.10 hrs, Volume= 0.518 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 91.66' @ 20.00 hrs Surf.Area= 62,687 sf Storage= 22,558 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.30'	196,983 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

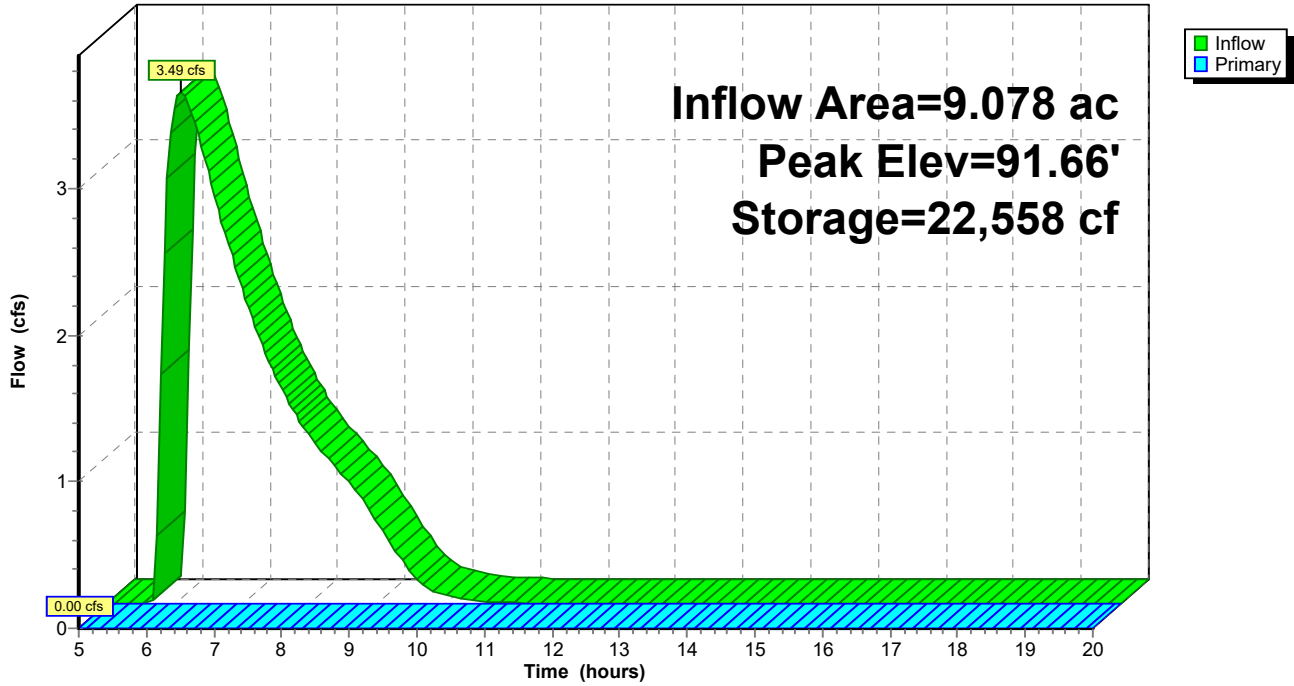
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.30	61,746	0	0
92.30	64,342	63,044	63,044
93.30	66,963	65,653	128,697
94.30	69,609	68,286	196,983

Device	Routing	Invert	Outlet Devices
#1	Primary	93.20'	43.6 deg x 25.0' long x 1.10' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=91.30' (Free Discharge)
 ↑1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 2P: PROPOSED POND NO.2

Hydrograph



Summary for Pond 3P: ROCK VOID AREA NO.1

Inflow = 1.84 cfs @ 5.18 hrs, Volume= 0.344 af
 Outflow = 2.00 cfs @ 5.60 hrs, Volume= 0.344 af, Atten= 0%, Lag= 25.0 min
 Discarded = 0.16 cfs @ 5.05 hrs, Volume= 0.149 af
 Primary = 1.84 cfs @ 5.60 hrs, Volume= 0.194 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.41' @ 5.60 hrs Surf.Area= 50,275 sf Storage= 3,519 cf

Plug-Flow detention time= 116.2 min calculated for 0.340 af (99% of inflow)
 Center-of-Mass det. time= 111.3 min (506.3 - 395.0)

Volume	Invert	Avail.Storage	Storage Description
#1	95.10'	3,519 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 10,055 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.10	50,275	0	0
95.30	50,275	10,055	10,055

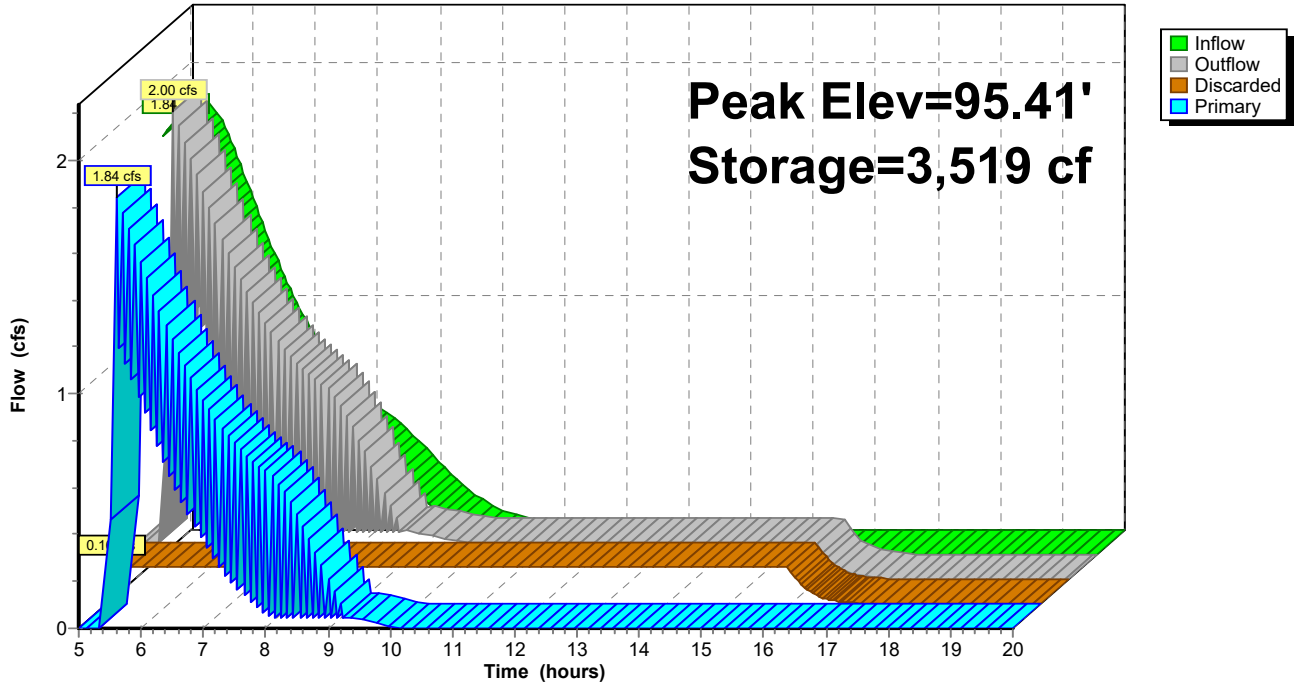
Device	Routing	Invert	Outlet Devices
#1	Primary	95.29'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	95.10'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.16 cfs @ 5.05 hrs HW=95.13' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=1.84 cfs @ 5.60 hrs HW=95.41' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 1.84 cfs @ 0.97 fps)

Pond 3P: ROCK VOID AREA NO.1

Hydrograph



Summary for Pond 4P: RCOK VOID AREA NO.2

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.23" for 100-YR - 8HR. event
 Inflow = 4.97 cfs @ 5.18 hrs, Volume= 0.929 af
 Outflow = 5.26 cfs @ 5.65 hrs, Volume= 0.929 af, Atten= 0%, Lag= 28.0 min
 Discarded = 0.44 cfs @ 5.05 hrs, Volume= 0.412 af
 Primary = 4.81 cfs @ 5.65 hrs, Volume= 0.518 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 95.22' @ 5.65 hrs Surf.Area= 137,877 sf Storage= 9,651 cf

Plug-Flow detention time= 118.5 min calculated for 0.920 af (99% of inflow)
 Center-of-Mass det. time= 113.6 min (508.6 - 395.0)

Volume	Invert	Avail.Storage	Storage Description
#1	94.80'	9,651 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 27,575 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.80	137,877	0	0
95.00	137,877	27,575	27,575

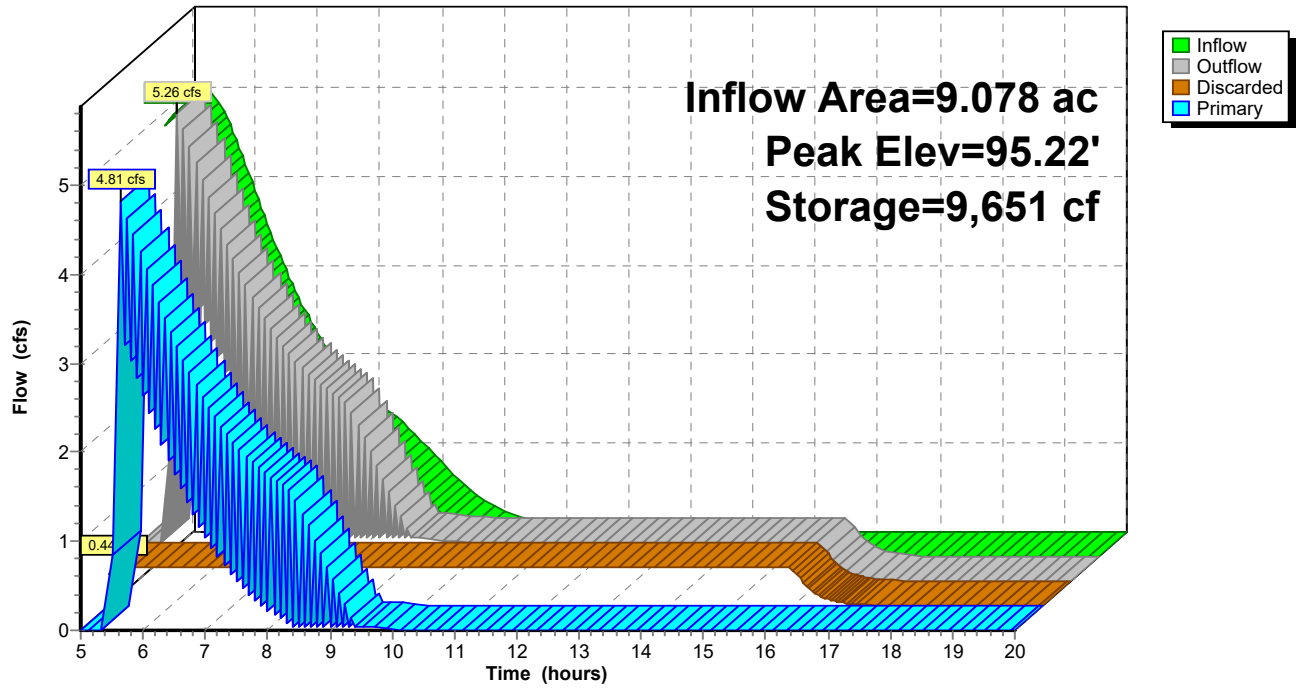
Device	Routing	Invert	Outlet Devices
#1	Primary	94.99'	16.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Discarded	94.80'	0.138 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.44 cfs @ 5.05 hrs HW=94.83' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=4.81 cfs @ 5.65 hrs HW=95.22' (Free Discharge)
 ↑**1=Broad-Crested Rectangular Weir** (Weir Controls 4.81 cfs @ 1.34 fps)

Pond 4P: RCOK VOID AREA NO.2

Hydrograph



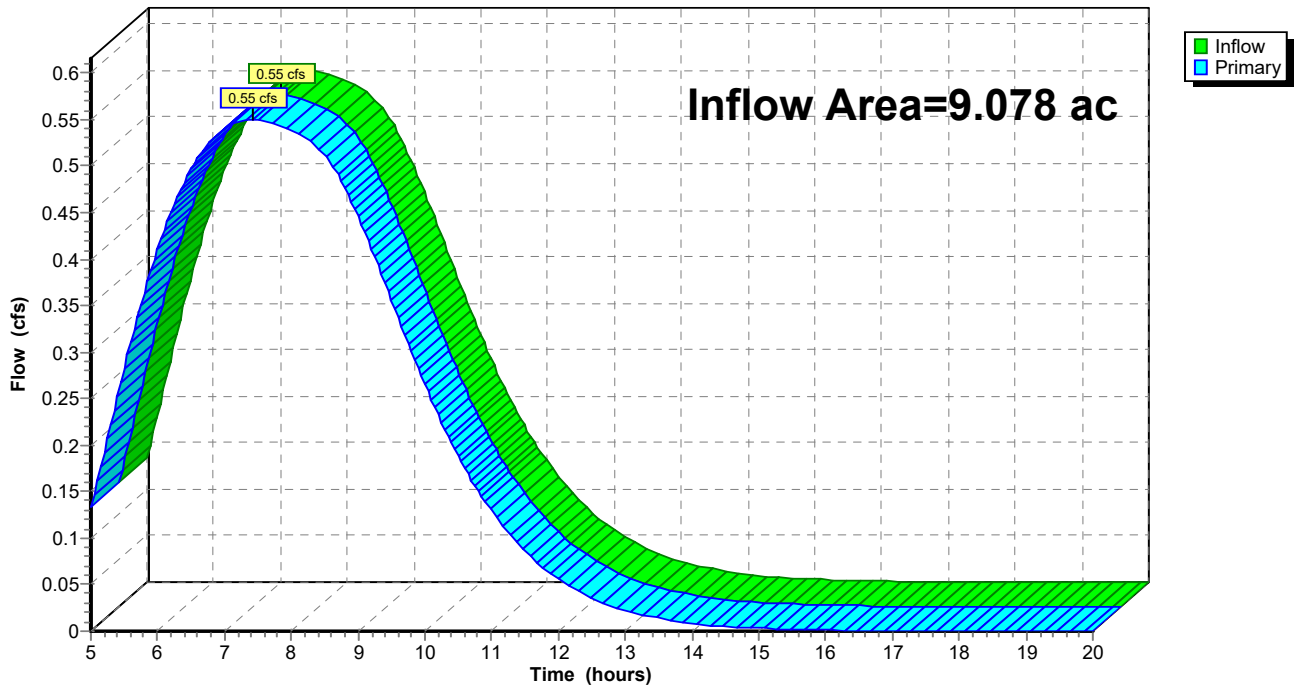
Summary for Link 1L: EXISTING OUTFALL LOCATION

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 0.27" for 100-YR - 8HR. event
Inflow = 0.55 cfs @ 7.43 hrs, Volume= 0.208 af
Primary = 0.55 cfs @ 7.43 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.0 min

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

Link 1L: EXISTING OUTFALL LOCATION

Hydrograph

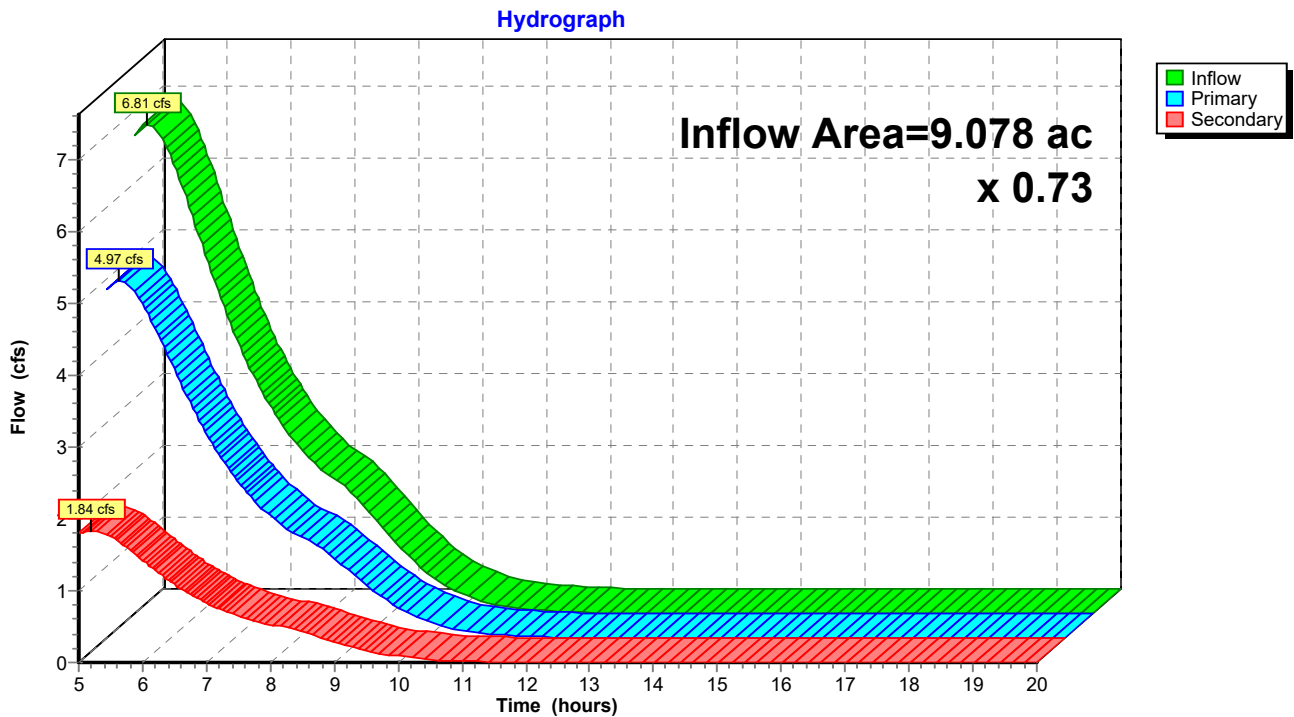


Summary for Link 2L: POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth > 1.68" for 100-YR - 8HR. event
 Inflow = 6.81 cfs @ 5.18 hrs, Volume= 1.273 af
 Primary = 4.97 cfs @ 5.18 hrs, Volume= 0.929 af, Atten= 27%, Lag= 0.0 min
 Secondary = 1.84 cfs @ 5.18 hrs, Volume= 0.344 af

Primary outflow = Inflow x 0.73, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: POST OUTFALL

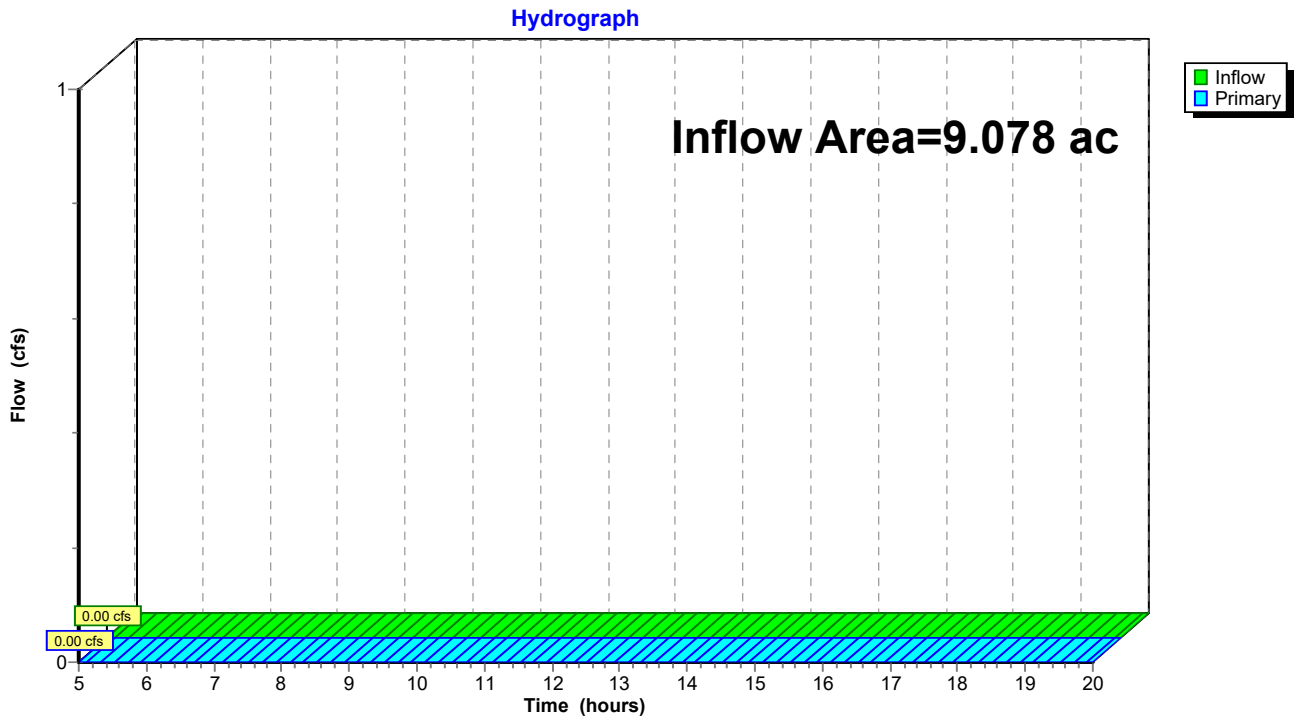


Summary for Link 3L: TOTAL POST OUTFALL

Inflow Area = 9.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 8HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: TOTAL POST OUTFALL



Appendix C – FEMA Firm Map

National Flood Hazard Layer FIRMette



30°23'37.15"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	Area of Minimal Flood Hazard Zone X
	NO SCREEN
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation
	20.2 17.5
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/26/2019 at 1:59:00 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

83°18'47.25"W

83°19'24.71"W

Appendix D – Rainfall Distribution Data

Appendix D

District Rainfall Distribution Data

Values for P_{total} (inches)¹

For the counties of Madison, Hamilton, Suwannee, Columbia, Baker and Union.

Frequency (years)	Duration (hours)							
	1	2	4	8	24	72	168	240
3	2.50	2.64	3.08	3.52	4.56	5.80	7.30	8.00
10	3.05	3.70	4.40	5.12	6.72	8.30	10.10	11.80
25	3.45	4.30	5.12	6.00	7.92	10.00	12.30	14.00
100	4.20	5.10	6.08	7.36	9.84	12.40	14.00	16.10

For the counties of Taylor, Lafayette, Dixie, Gilchrist, Levy, Alachua and Bradford.

Frequency (years)	Duration (hours)							
	1	2	4	8	24	72	168	240
3	2.60	3.20	3.80	4.48	6.00	7.60	9.50	10.80
10	3.20	4.00	4.80	5.84	7.92	8.90	11.00	12.50
25	3.60	4.40	5.28	6.56	8.64	11.00	13.00	15.00
100	4.40	5.40	6.72	8.00	11.04	13.80	16.00	18.00

1-HOUR DURATION

T(hrs)	P/ P_{total}	I/ P_{total}
0	0	0
.1	.020	.200
.2	.080	.600
.3	.200	1.200
.4	.410	2.100
.5	.625	2.150
.6	.805	1.800
.7	.915	1.100
.8	.985	0.700
.9	.995	0.100
1.0	1.000	0

¹ Values for durations through 24 hours were taken from Florida Department of Transportation intensity curves. Values for durations greater than 24 hours were taken from National Weather Service Technical Paper No. 49, 1964.

Appendix E – Water Management District Boundary

Appendix E

Part VII APPENDICES Appendix

District Boundary

