DRAINAGE ANALYSIS FOR
MATTHES VINEYARD
MEADOWOOD ROAD, NAPA COUNTY, CA
APN 025-070-043

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BARTELT
ENGINEERING

Revision Summary

Date Revised	Comment
June 2023 - Revised	Table 7 Revised to Reflect Correct Comparison Results from Tables 3 Through 6.

BARTELT ENGINEERING

DRAINAGE ANALYSIS FOR MATTHES VINEYARDS MEADOWOOD LANE, NAPA COUNTY, CA APN 025-070-043

As required by Napa County Planning Building & Environmental Service (PBES), Bartelt Engineering has prepared a Drainage Analysis for the Matthes Vineyards project to compare existing (pre-development) and proposed (post-development) peak storm water runoff.

Project Description

The proposed project involves a Track I Vineyard Development and Erosion Control Plan that includes the planting of three (3) separate vineyard blocks (Vineyard Block A, Block B1, and Block B2) located on the above referenced subject parcel that is located within the Agricultural Watershed (AW) zoning district. The recent 2020 Glass Wildfire destroyed much of the vegetation on the parcel; however, this report will consider pre-fire conditions as "existing" (pre-development) conditions. The existing (pre-Glass Wildfire) 40.00± acre subject parcel is mostly undeveloped and consists of mixed chapparal, rock outcrops, wooded and grass areas, two (2) wells, a drainage course along the east side of the parcel, and portions of two (2) existing vineyard blocks encroaching from APNs 025-070-029 and 021-320-0022, owned and operated by Forman Vineyard. The portion of the existing vineyard block on the subject parcel that encroaches from APN 021-320-022 was approved under ECP #98278-ECPA while the portion of the existing vineyard block on the subject parcel that encroaches from APN 025-070-029 was constructed prior to the Napa County Conservation Regulations and was addressed under an Easement Agreement between the property owners. The project will be constructed in one (1) phase and includes a total vineyard area of 11.1 ± acres of vineyard having a disturbed area of approximately 13.2± acres. Refer to the attached Track I Vineyard Development and Erosion Control Plan prepared by Bartelt Engineering for the existing and proposed development.

Drainage Exhibit

The Drainage Exhibit included with the Track I Vineyard Development and Erosion Control Plan shows the approximate location of the subject parcel property lines, the project watersheds, existing structures/features, drainage course alignment, the proposed vineyard development areas, and proposed storm drain infrastructure. The exhibit was created using topographic information sourced from the "Map of Topography by Aerial Methods of a Portion of the Lands of Matthes" prepared by Albion Surveys, Inc. dated January 10, 2006. Project watersheds shown on the Drainage Exhibit were drawn in Autodesk Civil 3D 2023 and exported to Autodesk's® Storm and Sewer Analysis 2023 where land use, area, rainfall data, and other subbasin properties were assigned. The analysis evaluates overland flow, channelized and pipe flow, inlet capacity, storage, and several outfall structures at different locations.

Methodology

This analysis was based on the United States Department of Agriculture (USDA) Urban Hydrology for Small Watersheds Technical Release 55 (TR-55) procedures for calculating storm runoff volume, peak rate of discharge, hydrographs, and storage volumes using Autodesk® Storm and Sanitary Analysis (SSA) 2023. Time of concentration (Tc) values were calculated using the TR-55 methodology for Sheet Flow, Shallow Concentrated Flow, and Channel Flow (where appropriate) which require Manning's roughness, surface type, flow

lengths, slopes, and rainfall user inputs; TR-55 and hydrographs are modeled using TR-20 methodology. Both methods utilize the Soil Conservation Service (SCS) runoff equation to predict the peak flow rate as well as the total volume runoff and were used to simulate the 2, 10, 50, and 100-year, 24-hour storm events. Open channel, closed conduit, inlet structures, storage nodes, and outfall elements were modeled in Autodesk SSA and/or Autodesk Hydraflow Extension for Autodesk Civil 3D.

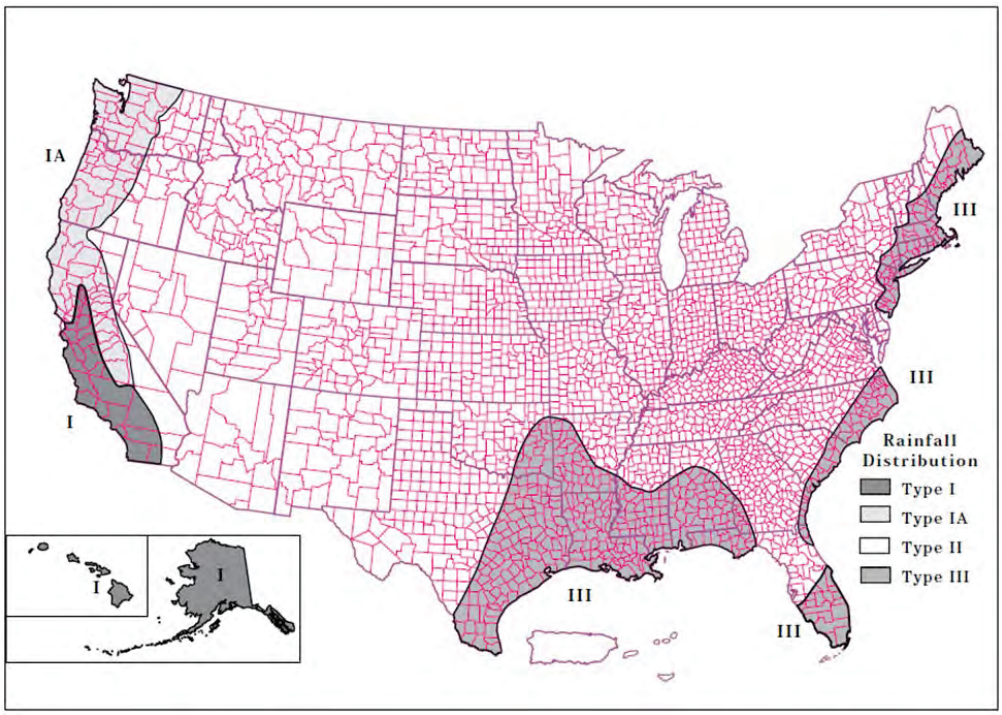
HYDROLOGY OVERVIEW

The subject parcel is located approximately one and a half (1-1/2) miles northeast of the City of St. Helena. A drainage course is located on the easterly side of subject parcel and runs in a northerly to southerly direction towards the Napa River. The subject parcel is entirely located within Zone X which is defined as "areas determined to be outside the 0.2% annual chance floodplain" by FEMA[1] and therefore not impacted by a 500-year flood.

Rainfall

Rainfall data used in the TR-55 procedures includes four (4) regional rainfall time distributions (Types I, IA, II, and III) all over a 24-hour period. The rainfall distributions are based on geographic boundaries which are shown on the following figure:

FIGURE 1: APPROXIMATE GEOGRAPHIC BOUNDARIES FOR RAINFALL DISTRIBUTIONS



[1] United States Department of Homeland Security, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Panel Number 06055C0264E effective September 26, 2008.

The 24-hour rainfall data utilized in this analysis are based on point precipitation frequency estimations provided by National Oceanic Atmosphere Administration (NOAA)[2] for a Type 1A rainfall distribution. The table below summarizes the precipitation (rainfall) depth over various storm recurrence intervals (storm frequency) for the project site:

TABLE 1: RAINFALL DEPTH VERSUS DURATION

	24-HOUR			
Storm Frequency:	2-Yr	10-Yr	50-Yr	100-Yr
Rainfall (in):	4.43	6.52	9.01	10.10

Watershed Summary

The hydrology analysis evaluates runoff from two (2) watershed areas that include offsite (non-project) and onsite (project) areas. According to the Natural Resources Conservation Service (NRCS) Soil Report, the soil types found on the parcel and the corresponding Hydrologic Soil Group (HSG) consist of the following:

- Forward silt loam, 12 to 57 percent slopes (map symbol 140, HSG C)
- Rock outcrop-Kidd complex, 50 to 75 percent slopes (map symbol 177, HSG D)[3]

The Slope Analysis Exhibit included with the Track I Vineyard Development and Erosion Control Plan shows areas and corresponding slope ranges on the entire parcel. The Universal Soil Loss Equation (USLE) worksheet and the included with the Track I Vineyard Development and Erosion Control Plan provide average slopes along specific sections located throughout the proposed vineyard development. The existing (pre-development) project watersheds consist of rock-outcrops, grasslands, and/or woodland areas. The proposed (post-development) project watersheds will have portions of some of the existing surface features replaced with vineyard.

Land Use and Curve Number Details

As part of the analysis, the project watersheds were subdivided into areas based on the cover description (i.e. pavement, gravel, grassland, etc.), soil type, and condition (i.e. good, fair, or poor). A runoff curve number (CN) is assigned based on the cover type, hydrologic condition, and hydrologic soil group (HSG). A curve number is an empirical value which aids in predicting storm water runoff or infiltration.

The subdivided areas of each watershed are shown on the Drainage Exhibit of the Track I Vineyard Development and Erosion Control Plan and summarized in the following table for both the existing (pre-development) conditions and proposed conditions (post-development).

[2] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS) from NOAA Atlas 14, Volume 6, Version 2; location name: St. Helena, CA, US, latitude: 38.5137^{O}, longitude: -122.4535^{O} and elevation: 230.61 ft.

[3] A HSG of D is assumed for the Rock outcrop-Kidd complex which is a conservative estimate and consistent with properties for Kidd loam type soils.

TABLE 2: WATERSHED WEIGHTED CURVE NUMBER COMPARISON			
Watershed	**Weighted Curve Number (Existing)**	**Weighted Curve Number (Proposed)**	**Difference (Δ)**
A	81.80	79.28	-1.03
B	73.0	73.20	0.2

Time of Concentration

The time of concentration (Tc) represents the time it takes for stormwater runoff to travel to a point of interest, identified as the Point of Concentration (POC) on the Drainage Exhibit, from the hydraulically most distant point of a watershed.

The Tc for Watershed A will change under the proposed Track I Vineyard Development and Erosion Control Plan because diversions (open channels), agricultural drop inlets, and pipes (close conduits) are proposed which will alter the path used to determine the Tc. The diversions are necessary to comply with Napa County's allowable soil loss for vineyard developments. Discrete areas within Watershed A were identified to correspond with the proposed diversions which define catchment areas. Stormwater runoff from a catchment area is directed to agricultural drop inlets. Drop inlets are connected to underground storm drain pipe that are connected to tee-spreaders. The tee-spreaders are proposed at the discharge points for the three (3) pipe networks proposed in Watershed A.

The Tc for Watershed B will remain the same under both existing and proposed conditions because no storm drain pipes or drainage courses are proposed that would modify the path used to determine the Tc and POC. The path used to determine the Tc for each watershed is described below.

Watershed A

Under existing conditions, Watershed A is approximately 20.12± acres. Initial offsite overland sheet flow at the furthest extent of the watershed travels 100 feet through mixed chapparal, grass, and rock areas with an average slope of 18%. A Manning's roughness factor of 0.3 for a natural, poor grass cover, moderately rough surface was applied per the TR-55 manual. Overland sheet flow transitions to shallow concentrated flow and travels for 1106± feet, both offsite and onsite, over mixed chapparal, grass, and rock areas (model surface type of Grass pasture) with an average slope of 21% until it reaches POC A. POC A outlets just downhill of proposed vineyard Block A on the parcel. The Tc for Watershed A is calculated to be 11 minutes 45 seconds.

Under proposed conditions, Watershed A is approximately 20.20± acres. This slight increase in area is due to the proposed vineyard layout and corresponding drainage patterns. As stated previously, discrete areas within the watersheds were identified to correspond to specific drainage conveyances delineated by proposed vineyard block diversions and existing conditions. These discrete areas produce a manageable number of catchment areas for the SSA software to analyze while maintaining model fidelity with actual proposed site conditions. Each discrete area can be identified and associated with the corresponding diversion swale and drop inlet by the naming convention used throughout the report. The majority of runoff from Vineyard Block A is directed to agricultural drop inlets by diversion swales where it is captured and then piped to three (3) proposed onsite tee-spreaders located

below the vineyard block. The tee-spreaders then discharge onto a rock energy dissipater and level spreader with a rock gallery for additional volume and flow rate attenuation. The level spreader forces the runoff to return to pre-development overland sheet flow characteristics. The proposed storm drain system within Block A also intercepts both offsite and onsite run-on in three (3) places before it reaches Block A. The intercepted flow comingles with the flow from the developed areas and together are conveyed through the system ultimately discharging in its pre-development pattern.

Along with identifying individual internal vineyard block catchments based on the locations of the proposed diversions which direct runoff to onsite agricultural drop inlets, Watershed A is made up of five (5) sub-watershed areas outside of Vineyard Block A's boundary and are described as the following:

- Sub-watershed A-1 ("Sub-A_18" as identified on the SSA output pages):
    - Initial offsite (north of north property line) overland sheet flow at the furthest extent of the sub-watershed travels 100 feet through mixed chapparal, grass, and rock areas with an average slope of 18%. A Manning's roughness factor of 0.3 for a natural, poor grass cover, moderately rough surface was applied along this path.
    - Sheet flow transitions to shallow concentrated flow and travels for 274± feet over mixed chapparal, grass, and rock areas (modeled as Grass pasture) with an average slope of 27% until it is intercepted by a diversion and directed to an agricultural drop inlet (DI #18) north of Block A.
    - Captured flow is conveyed through underground storm drain pipes until it is discharged from a tee-spreader into the energy dissipater and level spreader at the bottom of Block A (POC A) as sheet flow.
    - The Tc for sub-watershed A-1 (Sub-A_18) when runoff reaches DI #18 is calculated to be 7 minutes 17 seconds.
- Sub-watershed A-2 ("Sub-A_09" as identified on the SSA output pages):
    - Initial offsite (north of north property line) overland sheet flow at the furthest extent of the sub-watershed travels 100 feet through mixed chapparal, grass, and rock areas with an average slope of 12%. A Manning's roughness factor of 0.3 for a natural, poor grass cover, moderately rough surface was applied along this path.
    - Sheet flow transitions to shallow concentrated flow and travels for 151± feet through mixed chapparal, grass, and rock areas with an average slope of 15% until it enters the upper portion of Vineyard Block B1 and is intercepted by a diversion. The diversion then conveys the runoff through the vineyard block and discharges it over a rock energy dissipater back onto mixed chaparral and grass areas. From here, runoff flows as shallow concentrated flow for 159± feet with an average slope of 32% until it is intercepted by a diversion and directed to an agricultural drop inlet (DI #09) north of Block A. The SSA input/output uses a conservative flow path (350 feet at a 26% slope) and surface type (Grass pasture) to account for this mixed flow path.
    - Captured flow is conveyed through underground storm drain pipes until it is discharged from a tee-spreader into the energy dissipater and level spreader at the bottom of Block A (POC A) as sheet flow.
    - The Tc for sub-watershed A-2 (Sub-A_09) when runoff reaches DI #09 is calculated to be 8 minutes 43 seconds.

- Sub-watershed A-3 ("Sub-A_24" as identified on the SSA output pages):
  - Initial onsite overland sheet flow at the furthest extent of the sub-watershed travels 100 feet through the lower portion of vineyard Block B1 with an average slope of 26%. A Manning's roughness factor of 0.47 was applied for the initial overland sheet flow segment for "No Till, 60-100% residue Cover".
  - Sheet flow transitions to shallow concentrated flow and travels for 89± feet over woodland and/or grass areas (modeled as Forest) with an average slope of 25% until it is intercepted by a diversion and directed to an agricultural drop inlet (DI #24) at the base of the sub-watershed.
  - Captured flow is conveyed through underground storm drain pipes until it is discharged from a tee-spreader into the energy dissipater and level spreader at the bottom of Block A (POC A) as sheet flow.
  - The Tc for sub-watershed A-3 (Sub-A_24) when runoff reaches DI #24 is calculated to be 8 minutes 38 seconds.
- Sub-watershed A-4 ("Sub-A (Offsite SE) as identified on the SSA output pages):
  - Initial offsite (southeast of vineyard Block A) overland sheet flow at the furthest extent of the sub-watershed travels 100 feet through mixed chapparal, grass, and rock areas with an average slope of 29%. A Manning's roughness factor of 0.3 for a natural, poor grass cover, moderately rough surface was applied along this path.
  - Sheet flow transitions to shallow concentrated flow and travels for 279± feet over mixed chapparal, grass, and rock areas (modeled as "Grass pasture") with an average slope of 28%.
  - The Tc for sub-watershed A-4 (Sub-A (Offsite SE)) when runoff reaches Watershed A's boundary is calculated to be 6 minutes 13 seconds.
- Sub-watershed A-5 ("Sub-A (Offsite W) as identified on the SSA output pages):
  - Initial offsite (remaining portion of offsite run-on west of west property line) overland sheet flow at the furthest extent of the sub-watershed travels 100 feet through mixed chapparal, grass, and rock areas with an average slope of 19%. A Manning's roughness factor of 0.3 for a natural, poor grass cover, moderately rough surface was applied along this path.
  - Sheet flow transitions to shallow concentrated flow and travels for 633± feet over mixed chapparal, grass, and rock areas (modeled as "Grass pasture") with an average slope of 18% until it crosses the west property line and becomes offsite run-on just below Block A (POC A).
  - The Tc for sub-watershed A-5 (Sub-A (Offsite W)) when runoff reaches the tee-spreaders is calculated to be 9 minutes 26 seconds.

<u>Watershed B</u>

Under existing and proposed conditions, Watershed B is approximately 5.13± and 5.05± acres, respectively. This slight decrease in area is the same as the increase in Watershed A which is due to the proposed vineyard layout and corresponding drainage patterns. Initial offsite overland sheet flow at the furthest extent of the watershed travels 100 feet through woodland and/or grass areas with an average slope of 11%. A Manning's roughness factor of 0.8 was applied for "natural woods with dense underbrush". Overland sheet flow transitions to shallow concentrated flow and travels for 293± feet over "Forest" areas with an average slope of 27%. Due to the terrain (supported by the topographic contours throughout Watershed B), shallow concentrated runoff proceeds down the slope in parallel

flow paths from the ridgeline finally entering the existing drainage course (DC-B) identified on the exhibit. Only under the developed condition are staggered waterbars proposed in the vineyard block which should maintain this type of parallel flow path and not cause erosion. The location of the POC is the downstream most point within the drainage course that runoff from the development contributes to. The Tc for the existing and proposed Watershed B is calculated to be 19 minutes 49 seconds.

The pre-development Point of Concentration for Watershed B is more representative of a linear line of interest rather than a single discrete discharge point because the topography of the land generates sheet flow rather than channelized flow (like a swale, ditch, or pipe) found in Watershed B. This flow regime is maintained under post-development conditions by the proposed tee-spreaders and the energy dissipater and level spreader.

Hydrology Results

The calculated 2-year, 10-year, 50-year, and 100-year 24-hour peak stormwater runoff volume and flow rate at the point of concentration for the existing conditions (pre-development) and proposed conditions (post-development) are as follows:

TABLE 3: WATERSHED ANALYSIS SUMMARY: 2-YEAR STORM EVENT COMPARISON

Condition	Watershed	Total Runoff (ac-ft)	Peak Runoff (cfs)
Existing	A	4.30	12.58
Proposed	A	4.11	12.00
Proposed - Existing	Δ A	-0.19	-0.58
Existing	B	0.79	1.91
Proposed	B	0.78	1.90
Proposed - Existing	Δ B	-0.01	-0.01

TABLE 4: WATERSHED ANALYSIS SUMMARY: 10-YEAR STORM EVENT COMPARISON

Condition	Watershed	Total Runoff (ac-ft)	Peak Runoff (cfs)
Existing	A	7.47	22.76
Proposed	A	7.24	22.18
Proposed - Existing	Δ A	-0.23	-0.58
Existing	B	1.51	4.10
Proposed	B	1.49	4.07
Proposed - Existing	Δ B	-0.02	-0.03

TABLE 5: WATERSHED ANALYSIS SUMMARY: 50-YEAR STORM EVENT COMPARISON

Condition	Watershed	Total Runoff (ac-ft)	Peak Runoff (cfs)
Existing	A	11.41	35.29
Proposed	A	11.16	34.79
Proposed - Existing	Δ A	-0.25	-0.50
Existing	B	2.44	7.00
Proposed	B	2.42	6.93
Proposed - Existing	Δ B	-0.02	-0.07

TABLE 6: WATERSHED ANALYSIS SUMMARY: 100-YEAR STORM EVENT COMPARISON

Condition	Watershed	Total Runoff (ac-ft)	Peak Runoff (cfs)
Existing	A	13.17	40.81
Proposed	A	12.91	40.38
Proposed - Existing	Δ A	-0.26	-0.43
Existing	B	2.87	8.32
Proposed	B	2.83	8.22
Proposed - Existing	Δ B	-0.04	-0.10

The proposed (post-development) condition stormwater total runoff volume and peak runoff rate for the watersheds are calculated to be less than existing (pre-development) conditions under all the storm events and durations.

Runoff and associated volume under all storm events is attenuated by the proposed tee-spreaders and rock energy dissipater and level spreader at the storm drain systems' outfalls. The tee-spreaders discharge attenuated flow through their orifices and/or weirs into a rock energy dissipater and level spreader which further attenuates the flow. Ultimately, capacity in the level spreader is exceeded and flow overtops the edge and continues downhill in a linear mode; the runoff maintains a parallel, sheet flow like characteristic resulting in a volume-rate per foot (cfs/ft) runoff scheme as it crosses the property line similar to pre-development conditions.

HYDRAULICS OVERVIEW

There are no stormwater open channel or closed conduit elements under the existing (pre-development) condition within the watersheds except for the existing drainage course along the east side of the parcel. Cross-slope diversions (open channels) are required to be constructed in the proposed vineyard blocks as a result of the USLE analysis and Napa

County regulations. The diversions allow for runoff to be intercepted and conveyed either to a waterbar with an energy dissipater at the outlet outside the vineyard block or to an agricultural drop inlet before the flow transitions from sheet flow to shallow concentrated flow or channelized flow which could cause soil loss greater than allowed. Drop inlets are connected to each other through an underground storm drain system that consists of connected closed conduit pipes. A tee-spreader is connected at the outfall of the closed conduit system where necessary. The tee-spreader provides volume detention, flow rate attenuation, and forces the closed conduit flow into sheet flow as it discharges through a series of orifices and/or weirs (see the Track I Vineyard Development and Erosion Control Plan for a schematic of the proposed tee-spreader).

Open Channel

Runoff in the form of sheet flow or shallow concentrated flow is intercepted by cross-slope diversions as shown on the Track I Vineyard Development and Erosion Control Plan. The proposed cross-slope diversions were analyzed as open channel elements. Each open channel was modeled with a triangular-shaped cross-section, six (6) inches in depth, with 1:3 (V:H) maximum slide slopes, a Manning's Roughness coefficient of 0.033 (maximum value for "Excavated or Dredged Channels; Grass, some weeds"), and a minimum of 2% running (longitudinal) slope. The diversions are connected to either a waterbar with an energy dissipater at the outlet or drop inlets.

The existing drainage course (DC-B) along the east side of the parcel that receives runoff from Watershed B was included in the analysis and the location shown on the Track I Vineyard Development and Erosion Control Plan. The analysis included characterizes such as the cross-section, longitudinal (channel) slope, and Manning's Roughness coefficient. The results for both the pre-development and post-development conditions under all storm events can be found in the output worksheets.

Drop Inlet

The proposed diversions within vineyard Block A are connected to proposed agricultural drop inlets as shown on the Track I Vineyard Development and Erosion Control Plan. The proposed agricultural drop inlets were analyzed as drop grate inlets. Each drop inlet was modeled as a circular shaped riser, 12 inches in diameter, in a sag condition. The drop inlets are connected to a proposed underground storm drain system.

Closed Conduit

The proposed drops inlets on vineyard Block A are connected to proposed underground storm drain systems. There are three (3) storm drain systems proposed for the project as shown on the Track I Vineyard Development and Erosion Control Plan. Each proposed underground storm drain systems was analyzed as a series of closed conduit elements. Each conduit was modeled as a 12 inch diameter circular shaped pipe with a Manning's Roughness coefficient of 0.013 (average value for smooth plastic (ADS) pipe). Pipes will generally parallel the site topography so they are not installed too deep or too shallow but in no way be less than 2%. Pipes shall be installed so that approximately three (3) to four (4) feet of cover (above the crown of the pipe) is provided so they will not interfere or be damaged during vineyard farming practices (ie. ripping). The storm drain systems will connect to individual tee-spreaders at their outfalls.

An existing storm drain pipe is in the proximity of Section A-A (shown on the Track I Vineyard Development and Erosion Control Plan) and conveys the drainage course's stormwater under the existing gravel access road; however, it was not modeled under this analysis.

Outfall

Outfalls at the ends of waterbars will be rock energy dissipators as shown in the detail on the Track I Vineyard Development and Erosion Control Plan. The three (3) storm drain systems in Watersheds A will each connect to a tee-spreader which will perform as an outfall structure. Each tee-spreader was modeled as a storage node that consists of a 12 inch diameter 40 foot long pipe, with (1) foot wide weirs each nine (9) inches above the pipe invert, and a total of 10 orifices each having a diameter of one (1) inch at the pipe invert (See Plan for additional specifications). Each tee-spreader will discharge flow onto a rock energy dissipator and level spreader as shown in the detail on the Track I Vineyard Development and Erosion Control Plan. Each tee-spreader and rock energy dissipator and level spreader will provide the following benefits: 1) runoff rate attenuation due to the orifices and weirs; 2) runoff volume detention within the tee-spreader and the rock gallery; and, 3) transition closed conduit flow to sheet flow. The proposed (post-development) flow-rate is less than the existing (pre-development) rate for each storm event at the outfalls as shown in Table 7 below.

TABLE 7: EXISTING AND PROPOSED OUTFALL COMPARISON SUMMARY

Storm Event (24-hr)	Peak Discharge (cfs)					
	Watershed A			Watershed B		
	Existing	Proposed	Δ	Existing	Proposed	Δ
2-Year	12.58	12.00	-0.58	1.91	1.90	-0.01
10-Year	22.76	22.18	-0.58	4.10	4.07	-0.03
50-Year	35.29	34.79	-0.50	7.00	6.93	-0.07
100-Year	40.81	40.38	-0.43	8.32	8.22	-0.10

Hydraulics Results

The proposed stormwater open channel, drop inlet, closed conduit, storage, and outfall elements can adequately intercept, convey, capture, store, and discharge the calculated 2-year, 10-year, 50-year, and 100-year 24-hour peak stormwater runoff flow rates for the pre-existing conditions (pre-development). Calculated proposed open channel flow velocities are below the allowable limits for channel boundary erosion. Furthermore, all watersheds' proposed (post-development) runoff rates are equal to or less than existing (pre-development) runoff rates for all storm events. Watershed A post-development runoff is intercepted by a rock energy dissipater and level spreader and returned to its pre-development overland sheet flow characteristic. See the SAA output worksheets for details.

Conclusions

As demonstrated in this report, the hydrology and hydraulic evaluations resulted in a decrease in peak stormwater runoff rates and total volume for the two watersheds as a result of the proposed project development.

Attachments

Drainage Exhibit (included in the Track I Vineyard Development and Erosion Control Plan, sheets EC11 – EC13)

Flood Insurance Rate Map

Rainfall Data (NOAA Point Precipitation Frequency Estimates)

Autodesk Storm and Sewer Analysis Outputs

Autodesk Hydraflow Extension for Autodesk Civil 3D Worksheets

References

Autodesk® Storm and Sanitary Analysis 2023 ©. 32-bit Windows based application. Version 13.5.255.0.

Hydraflow Express Extension for Autodesk® Civil 3D®. 32-bit Windows based application. Version 2020.4.

U.S. Department of Agriculture. June 1986. Technical Release 55 Urban Hydrology for Small Watersheds.

U.S. Department of Agriculture. August 2007. Part 654 Stream Restoration Design National Engineering Handbook, Chapter 8 Threshold Channel Design.

U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM), 06055C0420E effective September 26, 2008.

National Flood Hazard Layer FIRMette

FEMA

122°27'28"W 38°31'18"N

122°26'50"W 38°30'50"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 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

N

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 2/10/2021 at 1:52 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.

NOAA Atlas 14, Volume 6, Version 2
Location name: Saint Helena, California, USA*
Latitude: 38.5137°, Longitude: -122.4535°
Elevation: 230.61 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.133 (0.118-0.151)	0.162 (0.144-0.185)	0.202 (0.179-0.230)	0.234 (0.205-0.269)	0.279 (0.235-0.333)	0.313 (0.258-0.384)	0.349 (0.280-0.440)	0.387 (0.300-0.503)	0.439 (0.325-0.598)	0.480 (0.342-0.680)
10-min	0.190 (0.169-0.216)	0.233 (0.207-0.265)	0.289 (0.256-0.330)	0.335 (0.294-0.386)	0.399 (0.337-0.478)	0.449 (0.370-0.551)	0.501 (0.401-0.631)	0.555 (0.431-0.722)	0.629 (0.466-0.858)	0.688 (0.490-0.975)
15-min	0.230 (0.205-0.261)	0.281 (0.250-0.320)	0.349 (0.309-0.399)	0.406 (0.356-0.467)	0.483 (0.408-0.578)	0.543 (0.448-0.666)	0.606 (0.485-0.763)	0.671 (0.521-0.873)	0.761 (0.563-1.04)	0.832 (0.593-1.18)
30-min	0.347 (0.309-0.394)	0.424 (0.377-0.483)	0.527 (0.467-0.601)	0.612 (0.537-0.704)	0.728 (0.615-0.871)	0.819 (0.675-1.00)	0.913 (0.732-1.15)	1.01 (0.785-1.32)	1.15 (0.849-1.56)	1.25 (0.894-1.78)
60-min	0.519 (0.462-0.589)	0.634 (0.564-0.721)	0.788 (0.698-0.898)	0.914 (0.802-1.05)	1.09 (0.919-1.30)	1.23 (1.01-1.50)	1.37 (1.09-1.72)	1.51 (1.17-1.97)	1.71 (1.27-2.34)	1.88 (1.34-2.66)
2-hr	0.793 (0.706-0.901)	0.963 (0.856-1.10)	1.18 (1.05-1.35)	1.36 (1.19-1.56)	1.59 (1.34-1.90)	1.77 (1.46-2.17)	1.95 (1.56-2.45)	2.13 (1.65-2.77)	2.37 (1.75-3.23)	2.55 (1.82-3.61)
3-hr	1.02 (0.909-1.16)	1.24 (1.10-1.41)	1.51 (1.34-1.73)	1.73 (1.52-1.99)	2.02 (1.70-2.41)	2.23 (1.84-2.74)	2.44 (1.96-3.08)	2.66 (2.06-3.46)	2.94 (2.18-4.01)	3.15 (2.25-4.47)
6-hr	1.56 (1.38-1.77)	1.88 (1.67-2.14)	2.30 (2.04-2.62)	2.62 (2.30-3.02)	3.05 (2.57-3.65)	3.36 (2.77-4.12)	3.67 (2.94-4.62)	3.97 (3.08-5.17)	4.37 (3.23-5.95)	4.66 (3.32-6.61)
12-hr	2.23 (1.98-2.53)	2.73 (2.43-3.11)	3.37 (2.98-3.84)	3.87 (3.40-4.46)	4.53 (3.82-5.42)	5.01 (4.13-6.15)	5.50 (4.40-6.93)	5.97 (4.64-7.77)	6.60 (4.89-9.00)	7.07 (5.04-10.0)
24-hr	3.12 (2.81-3.55)	3.90 (3.51-4.43)	4.90 (4.39-5.58)	5.69 (5.06-6.52)	6.74 (5.83-7.93)	7.52 (6.40-9.01)	8.30 (6.92-10.1)	9.08 (7.40-11.4)	10.1 (7.96-13.1)	10.9 (8.33-14.5)
2-day	4.10 (3.69-4.65)	5.25 (4.71-5.96)	6.71 (6.01-7.64)	7.86 (6.99-9.01)	9.37 (8.12-11.0)	10.5 (8.94-12.6)	11.6 (9.69-14.2)	12.7 (10.4-15.9)	14.2 (11.2-18.4)	15.3 (11.7-20.4)
3-day	4.72 (4.24-5.35)	6.11 (5.49-6.95)	7.88 (7.06-8.97)	9.27 (8.25-10.6)	11.1 (9.61-13.1)	12.4 (10.6-14.9)	13.8 (11.5-16.9)	15.1 (12.3-18.9)	16.9 (13.3-21.8)	18.2 (13.9-24.2)
4-day	5.23 (4.70-5.94)	6.80 (6.10-7.72)	8.78 (7.87-10.00)	10.3 (9.21-11.9)	12.4 (10.7-14.6)	13.9 (11.8-16.7)	15.4 (12.9-18.8)	16.9 (13.8-21.2)	18.9 (14.9-24.5)	20.3 (15.6-27.1)
7-day	6.54 (5.88-7.42)	8.39 (7.54-9.53)	10.8 (9.64-12.3)	12.6 (11.3-14.5)	15.1 (13.1-17.8)	17.0 (14.5-20.4)	18.8 (15.7-23.1)	20.7 (16.9-25.9)	23.2 (18.2-30.0)	25.0 (19.2-33.4)
10-day	7.46 (6.71-8.47)	9.51 (8.54-10.8)	12.1 (10.9-13.8)	14.2 (12.7-16.3)	17.0 (14.7-20.0)	19.1 (16.2-22.8)	21.1 (17.6-25.8)	23.2 (18.9-29.1)	26.0 (20.4-33.7)	28.1 (21.5-37.4)
20-day	9.88 (8.89-11.2)	12.6 (11.3-14.3)	16.0 (14.3-18.2)	18.6 (16.6-21.4)	22.2 (19.2-26.1)	24.8 (21.1-29.7)	27.3 (22.8-33.4)	29.9 (24.4-37.4)	33.3 (26.2-43.1)	35.8 (27.4-47.7)
30-day	11.7 (10.5-13.3)	14.9 (13.4-16.9)	18.9 (16.9-21.5)	22.0 (19.6-25.2)	26.0 (22.5-30.6)	29.0 (24.7-34.7)	31.8 (26.6-38.9)	34.7 (28.3-43.4)	38.3 (30.2-49.7)	41.0 (31.4-54.8)
45-day	14.2 (12.8-16.2)	18.1 (16.3-20.6)	22.8 (20.5-26.0)	26.4 (23.5-30.3)	31.1 (26.9-36.6)	34.4 (29.3-41.2)	37.6 (31.4-46.0)	40.7 (33.2-50.9)	44.6 (35.2-57.9)	47.5 (36.4-63.4)
60-day	16.9 (15.2-19.1)	21.3 (19.2-24.2)	26.8 (24.0-30.5)	30.9 (27.5-35.4)	36.0 (31.2-42.5)	39.7 (33.8-47.6)	43.2 (36.0-52.8)	46.6 (37.9-58.3)	50.8 (40.0-65.8)	53.8 (41.1-71.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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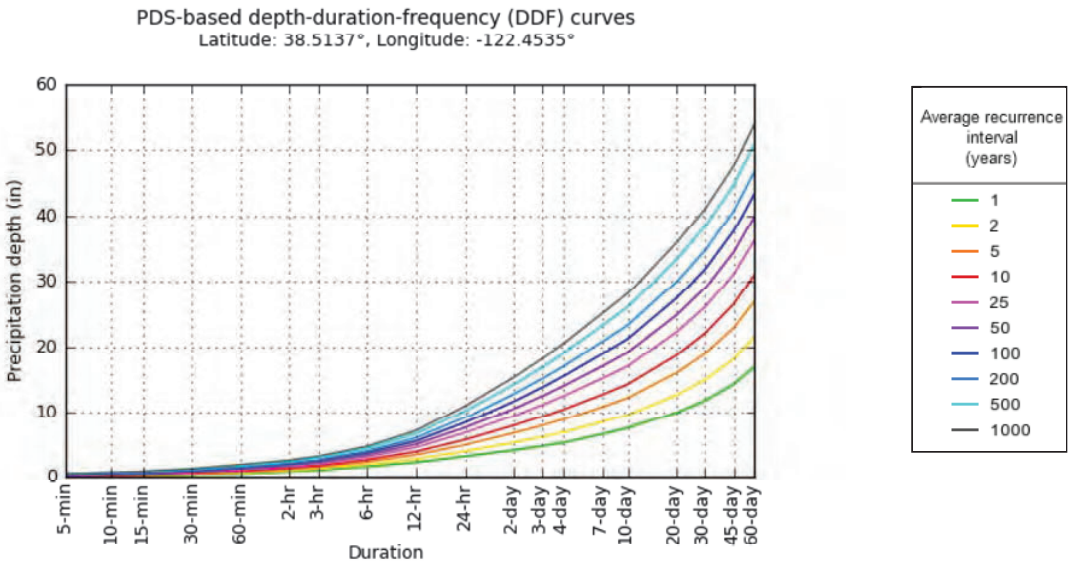
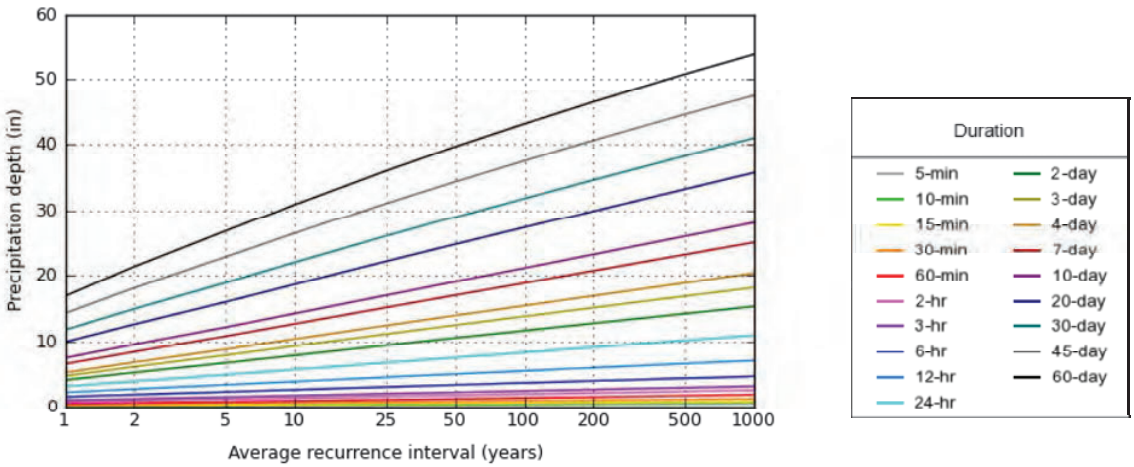
PF graphical





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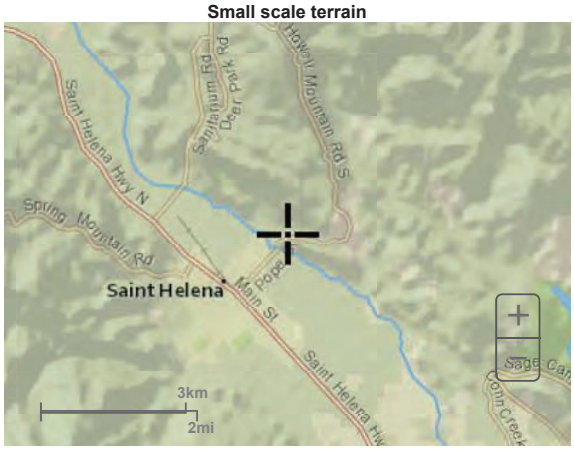
Maps & aerials

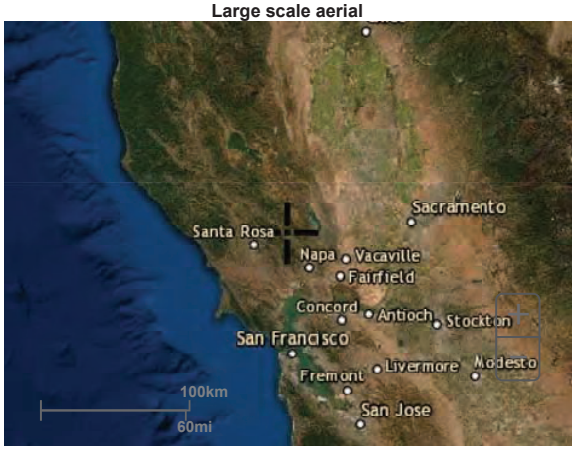
Small scale terrain



Large scale terrain

Large scale map

Large scale aerial



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Disclaimer

Project Description

File Name	2001-DRHY-Existing.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	2
Nodes	3
Junctions	1
Outfalls	2
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	1
Channels	1
Pipes	0
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
	Rain Gage-	Time Se	100Yr 24Hr	Intensity	inches	Califo	Napa (Y	100.00	10.10	SCS Type IA 24-hr

Subbasin Summary

Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A	20.12	81.87	4.43	2.56	51.57	12.58	0 00:11:45
Sub-B	5.13	73.00	4.43	1.84	9.45	1.91	0 00:19:49

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 20.12
Peak Rate Factor 484
Weighted Curve Number 81.87
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	2.27	C	73
Brush, Poor	17.85	D	83
Composite Area & Weighted CN	20.12		81.87

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

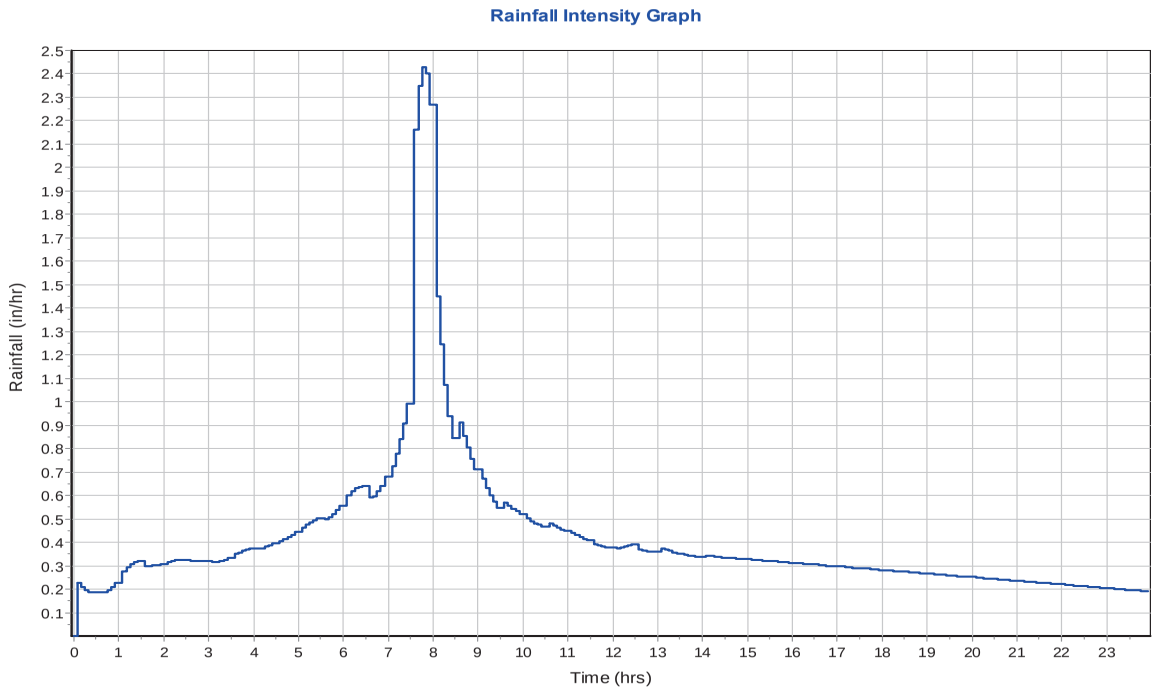
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1106	0	0
Slope (%) :	21	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.21	0	0
Computed Flow Time (min) :	5.74	0	0

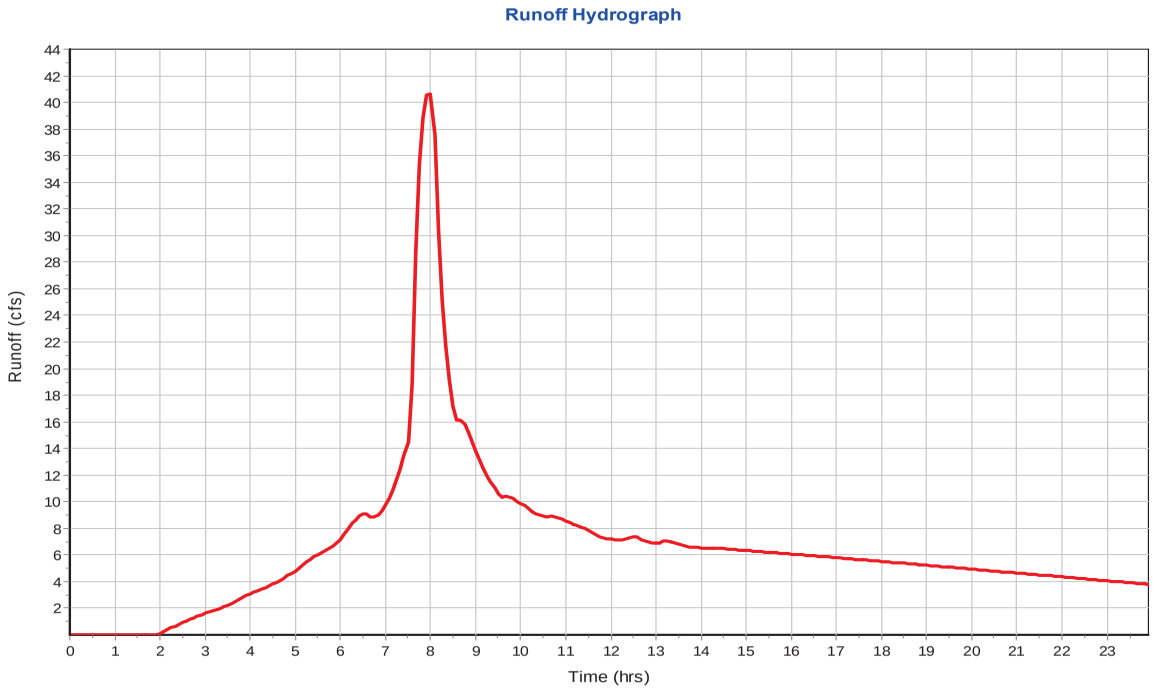
Total TOC (min) 11.76

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.56
Peak Runoff (cfs)	12.58
Weighted Curve Number	81.87
Time of Concentration (days hh:mm:ss)	0 00:11:46

Subbasin : Sub-A





Subbasin : Sub-B

Input Data

Area (ac) 5.13
Peak Rate Factor 484
Weighted Curve Number 73
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.13	C	73
Composite Area & Weighted CN	5.13		73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

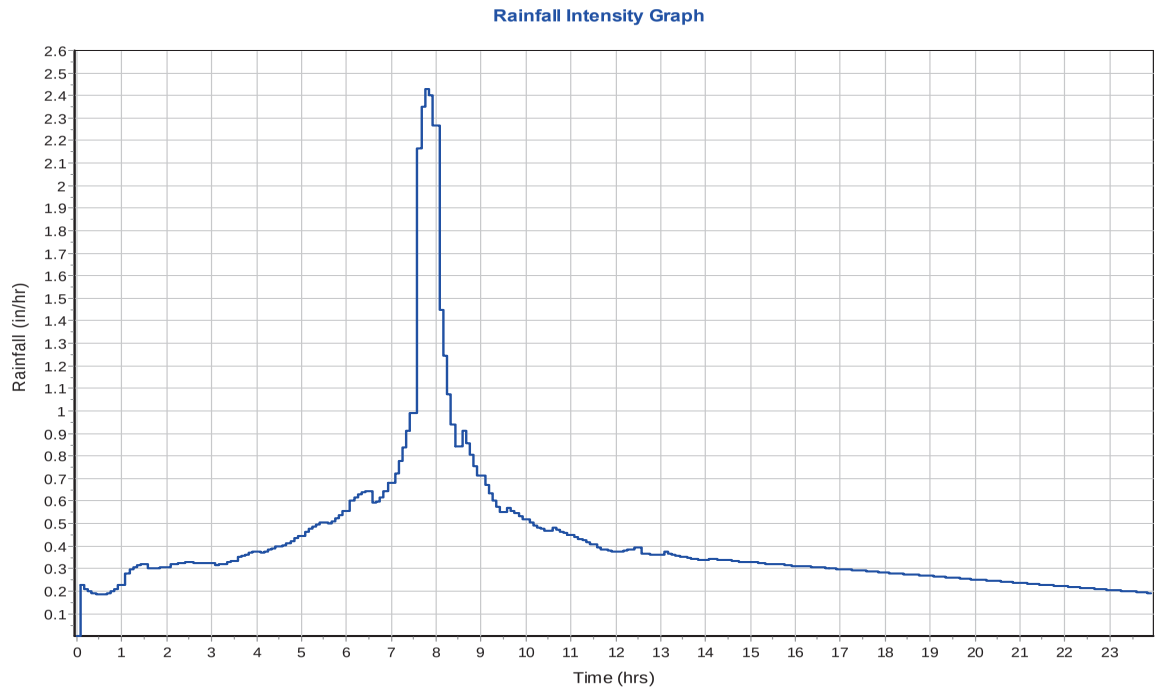
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

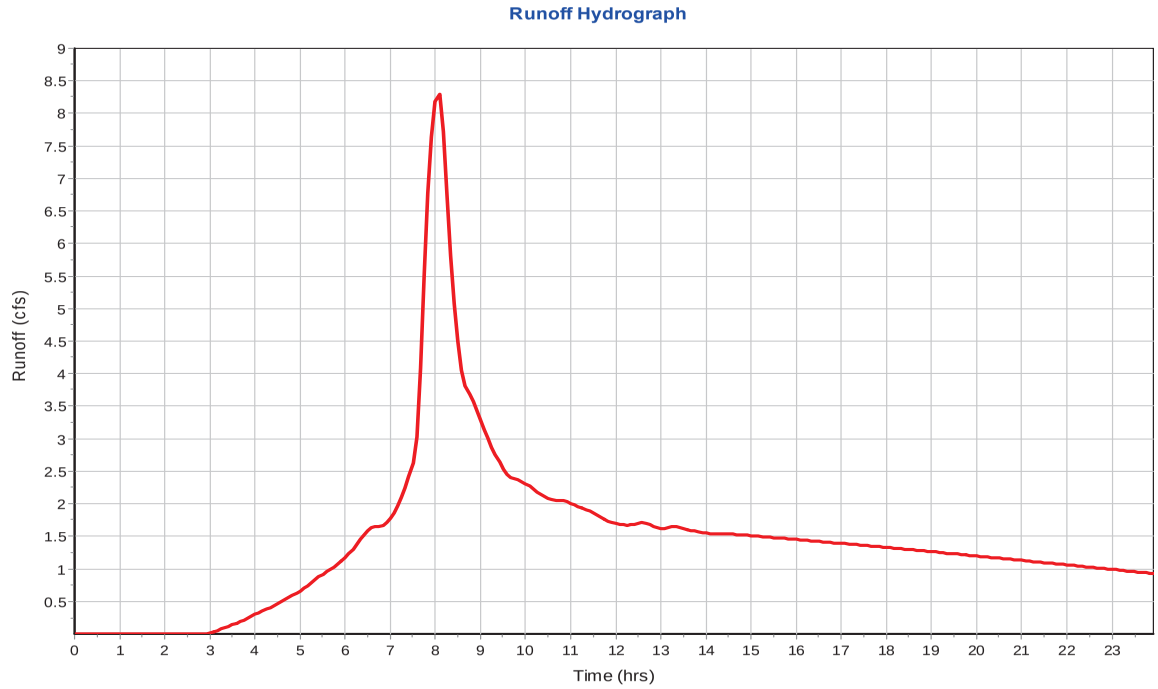
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 1.84
Peak Runoff (cfs) 1.91
Weighted Curve Number 73
Time of Concentration (days hh:mm:ss) 0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	17.58	User-Defined	4.0	18.9	0.0400	0.5000	0.00	No

Channel Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
DC-B	1.89	0 08:11	860.24	0.00	5.10	3.10	0.41	0.10	0.00	

Project Description

File Name	2001-DRHY-Existing.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	2
Nodes	3
Junctions	1
Outfalls	2
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	1
Channels	1
Pipes	0
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
	Rain Gage-	Time Se	100Yr 24Hr	Intensity	inches	Califo	Napa (Y	100.00	10.10	SCS Type IA 24-hr

Subbasin Summary

Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A	20.12	81.87	6.52	4.45	89.61	22.76	0 00:11:45
Sub-B	5.13	73.00	6.52	3.53	18.08	4.10	0 00:19:49

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 20.12
Peak Rate Factor 484
Weighted Curve Number 81.87
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	2.27	C	73
Brush, Poor	17.85	D	83
Composite Area & Weighted CN	20.12		81.87

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

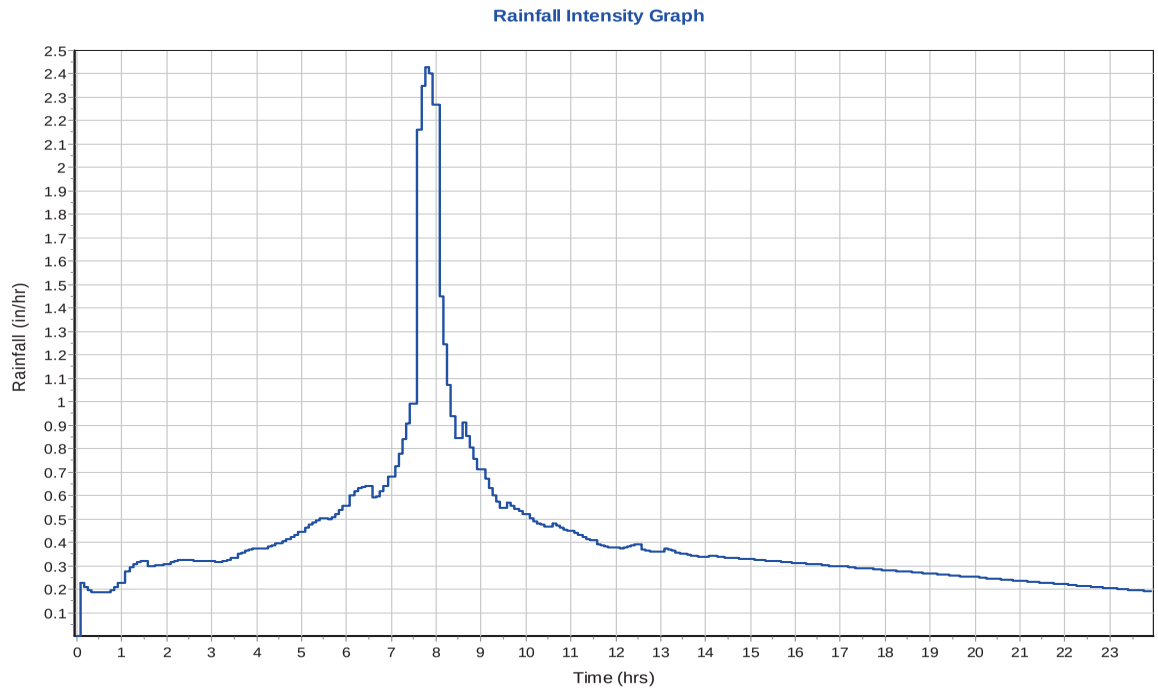
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1106	0	0
Slope (%) :	21	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.21	0	0
Computed Flow Time (min) :	5.74	0	0

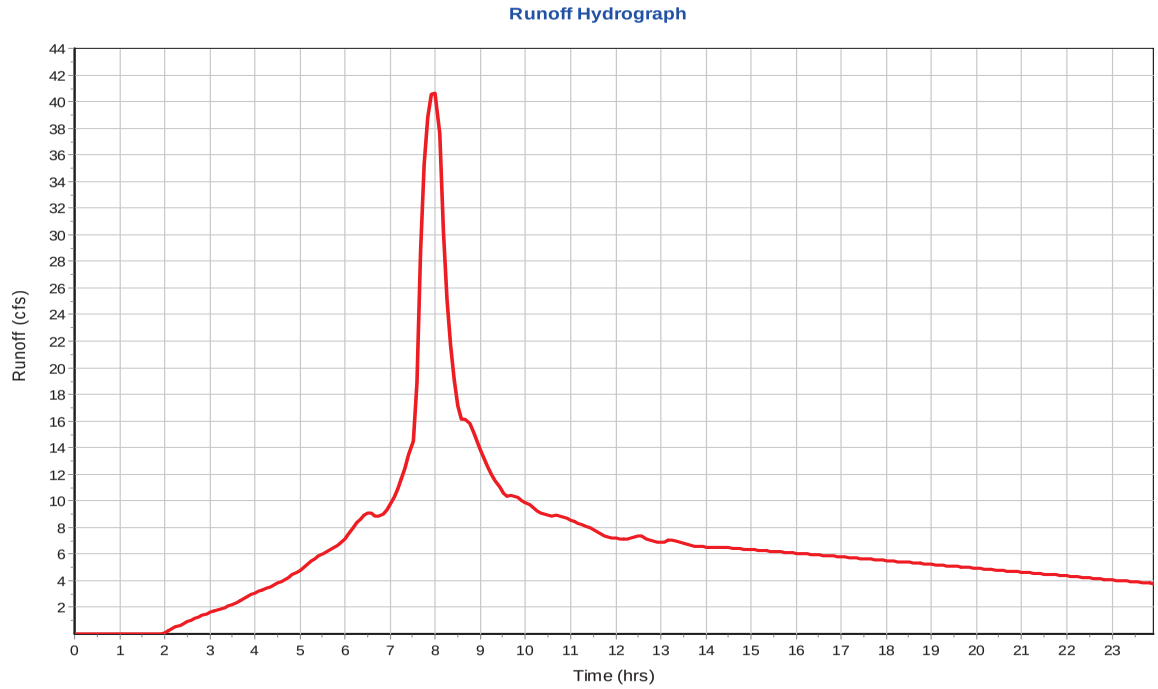
Total TOC (min) 11.76

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.45
Peak Runoff (cfs)	22.76
Weighted Curve Number	81.87
Time of Concentration (days hh:mm:ss)	0 00:11:46

Subbasin : Sub-A





Subbasin : Sub-B

Input Data

Area (ac) 5.13
Peak Rate Factor 484
Weighted Curve Number 73
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.13	C	73
Composite Area & Weighted CN	5.13		73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

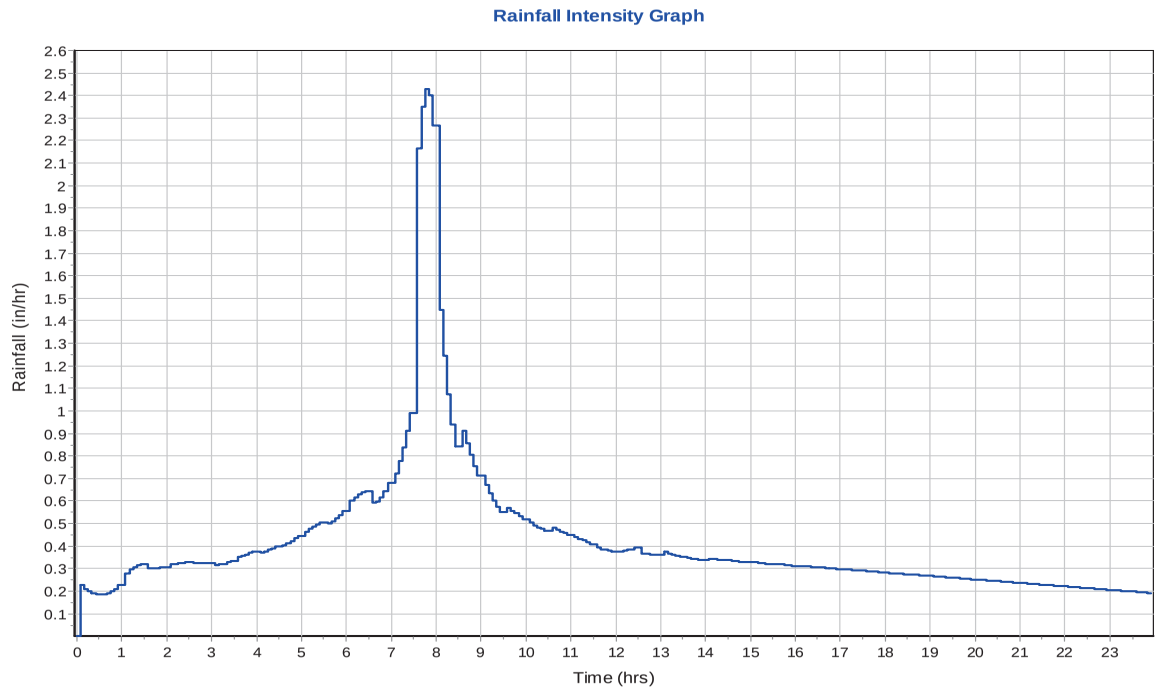
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

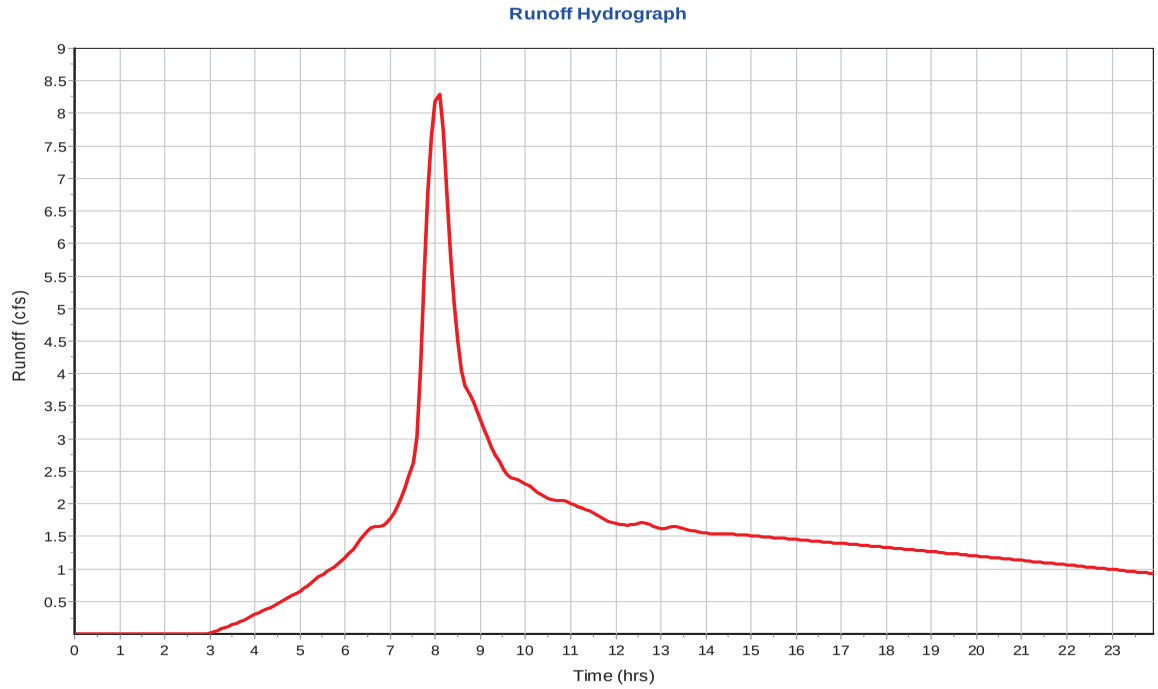
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 3.53
Peak Runoff (cfs) 4.1
Weighted Curve Number 73
Time of Concentration (days hh:mm:ss) 0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	17.58	User-Defined	4.0	18.9	0.0400	0.5000	0.00	No

Channel Results

Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
DC-B	4.09	0 08:11	860.24	0.00	6.16	2.57	0.54	0.14	0.00	

Project Description

File Name	2001-DRHY-Existing.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	2
Nodes	3
Junctions	1
Outfalls	2
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	1
Channels	1
Pipes	0
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
	Rain Gage-	Time Se	100Yr 24Hr	Intensity	inches	Califo	Napa (Y	100.00	10.10	SCS Type IA 24-hr

Subbasin Summary

Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A	20.12	81.87	9.01	6.81	136.96	35.29	0 00:11:45
Sub-B	5.13	73.00	9.01	5.72	29.32	7.00	0 00:19:49

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 20.12
Peak Rate Factor 484
Weighted Curve Number 81.87
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	2.27	C	73
Brush, Poor	17.85	D	83
Composite Area & Weighted CN	20.12		81.87

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

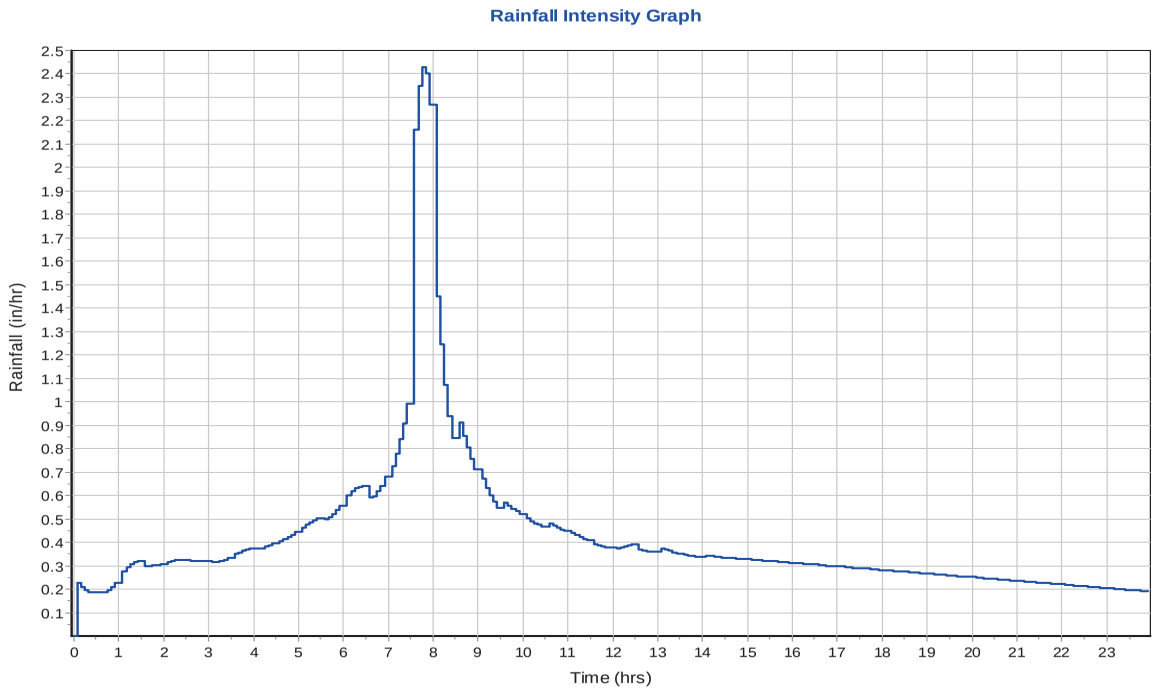
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1106	0	0
Slope (%) :	21	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.21	0	0
Computed Flow Time (min) :	5.74	0	0

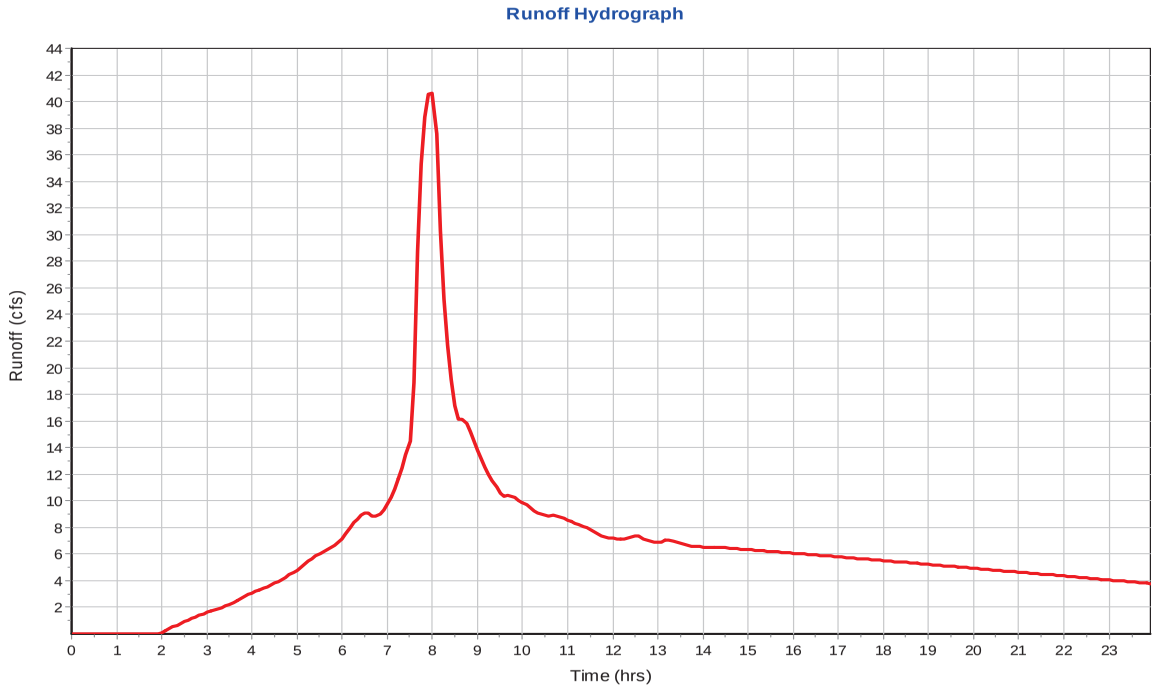
Total TOC (min) 11.76

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.81
Peak Runoff (cfs)	35.29
Weighted Curve Number	81.87
Time of Concentration (days hh:mm:ss)	0 00:11:46

Subbasin : Sub-A





Subbasin : Sub-B

Input Data

Area (ac) 5.13
Peak Rate Factor 484
Weighted Curve Number 73
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.13	C	73
Composite Area & Weighted CN	5.13		73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

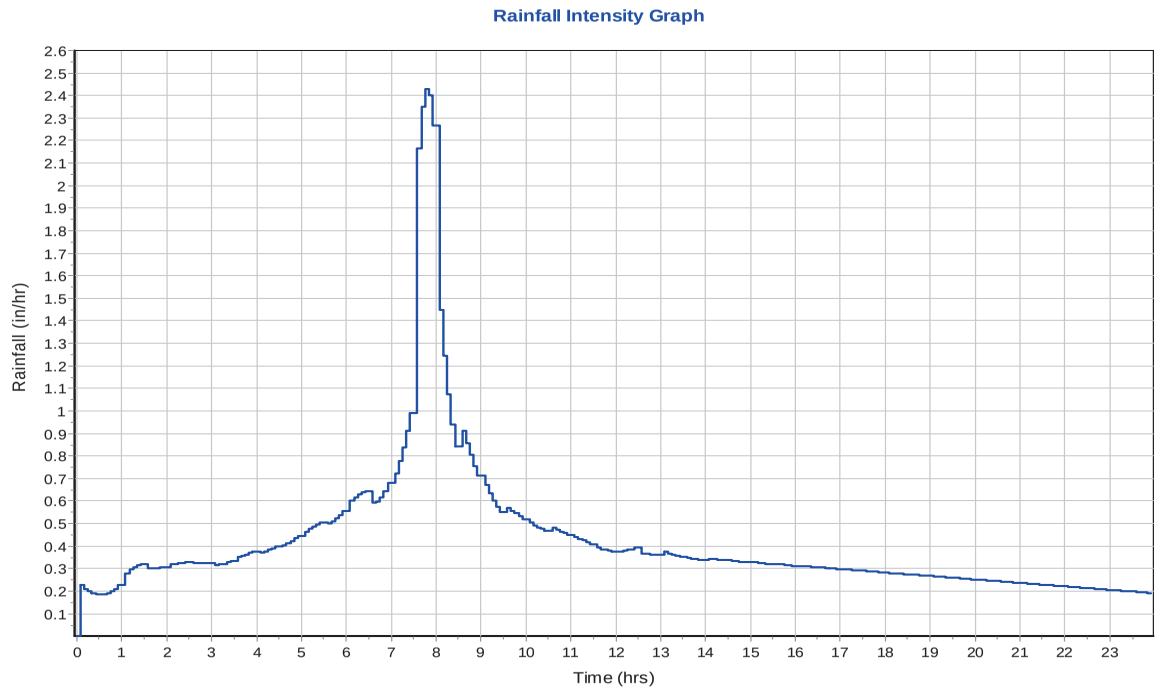
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

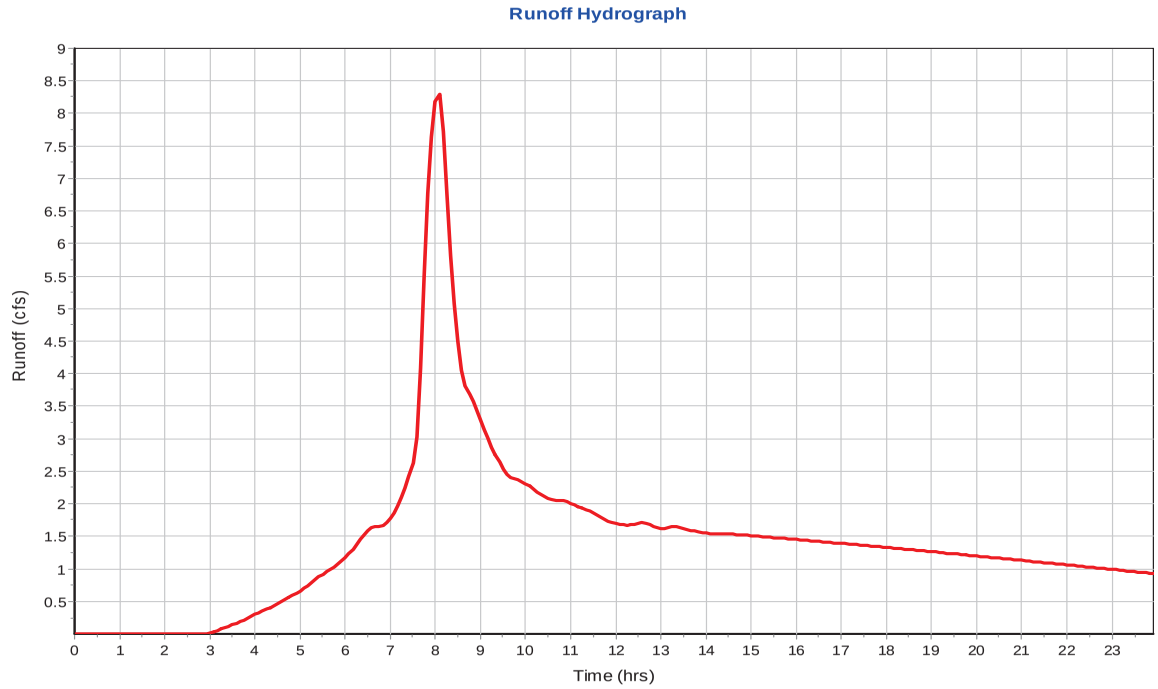
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 5.72
Peak Runoff (cfs) 7
Weighted Curve Number 73
Time of Concentration (days hh:mm:ss) 0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	17.58	User-Defined	4.0	18.9	0.0400	0.5000	0.00	No

Channel Results

Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
DC-B	6.97	0 08:10	860.24	0.01	7.00	2.26	0.67	0.17	0.00	

Project Description

File Name	2001-DRHY-Existing.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	2
Nodes	3
Junctions	1
Outfalls	2
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	1
Channels	1
Pipes	0
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
	Rain Gage-	Time Se	100Yr 24Hr	Intensity	inches	Califo	Napa (Y	100.00	10.10	SCS Type IA 24-hr

Subbasin Summary

Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A	20.12	81.87	10.10	7.86	158.06	40.81	0 00:11:45
Sub-B	5.13	73.00	10.10	6.71	34.42	8.32	0 00:19:49

Subbasin Hydrology

Subbasin : Sub-A

Input Data

Area (ac) 20.12
Peak Rate Factor 484
Weighted Curve Number 81.87
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	2.27	C	73
Brush, Poor	17.85	D	83
Composite Area & Weighted CN	20.12		81.87

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

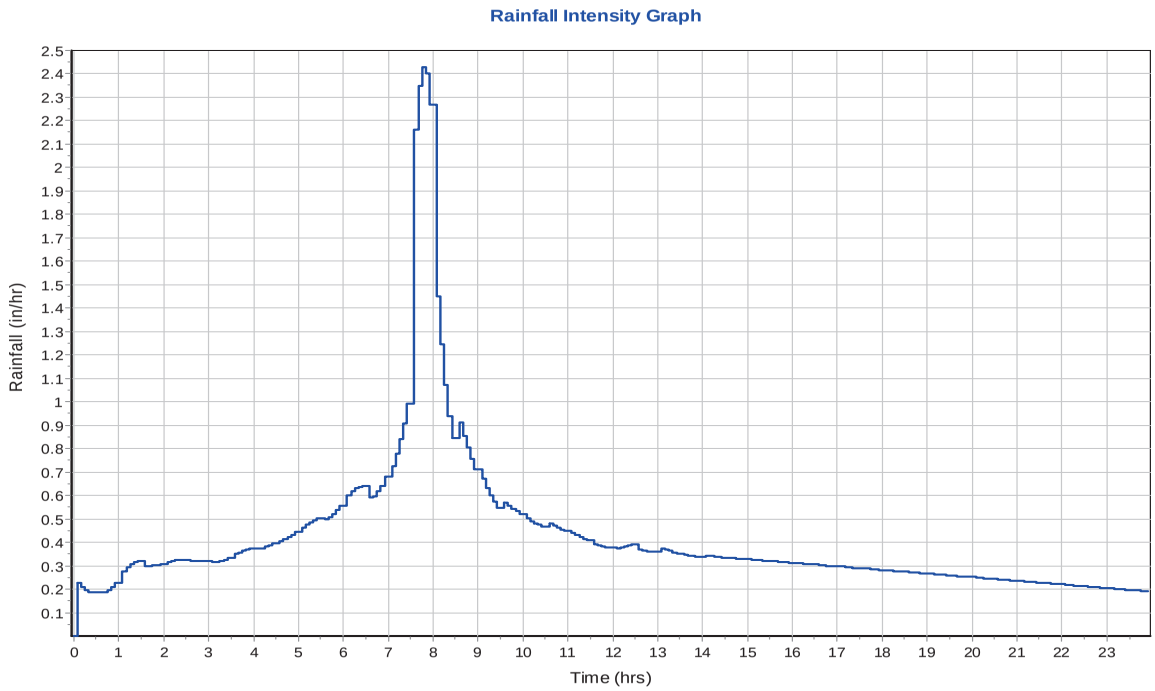
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1106	0	0
Slope (%) :	21	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.21	0	0
Computed Flow Time (min) :	5.74	0	0

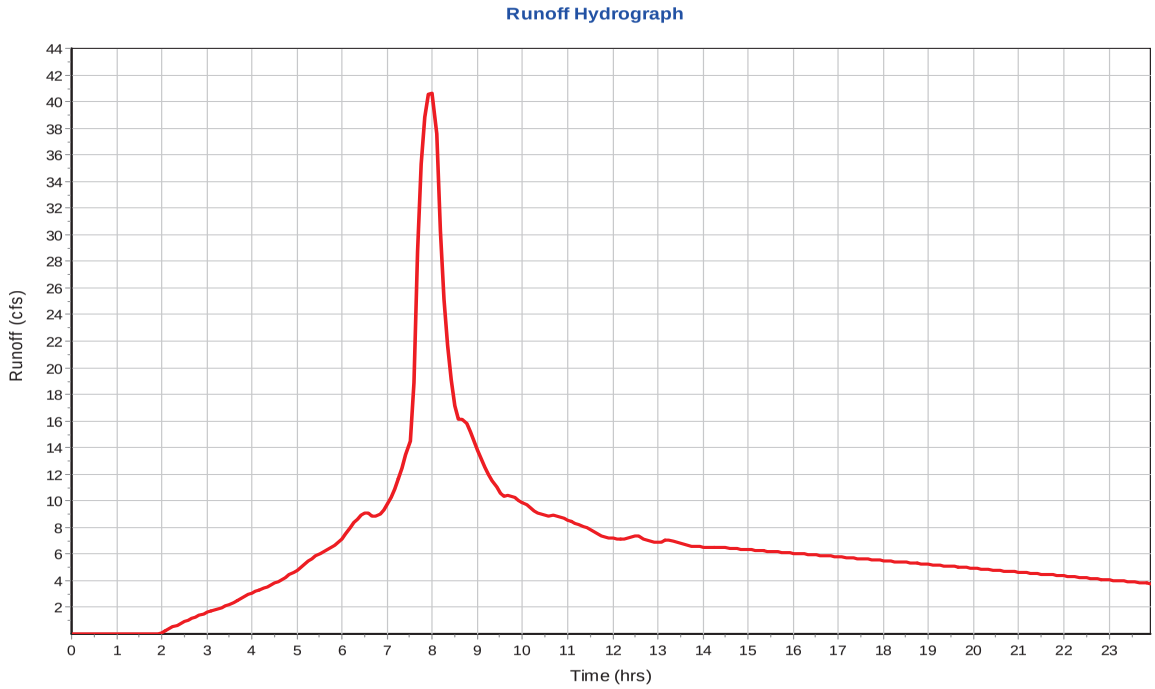
Total TOC (min) 11.76

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.86
Peak Runoff (cfs)	40.81
Weighted Curve Number	81.87
Time of Concentration (days hh:mm:ss)	0 00:11:46

Subbasin : Sub-A





Subbasin : Sub-B

Input Data

Area (ac) 5.13
Peak Rate Factor 484
Weighted Curve Number 73
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	5.13	C	73
Composite Area & Weighted CN	5.13		73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

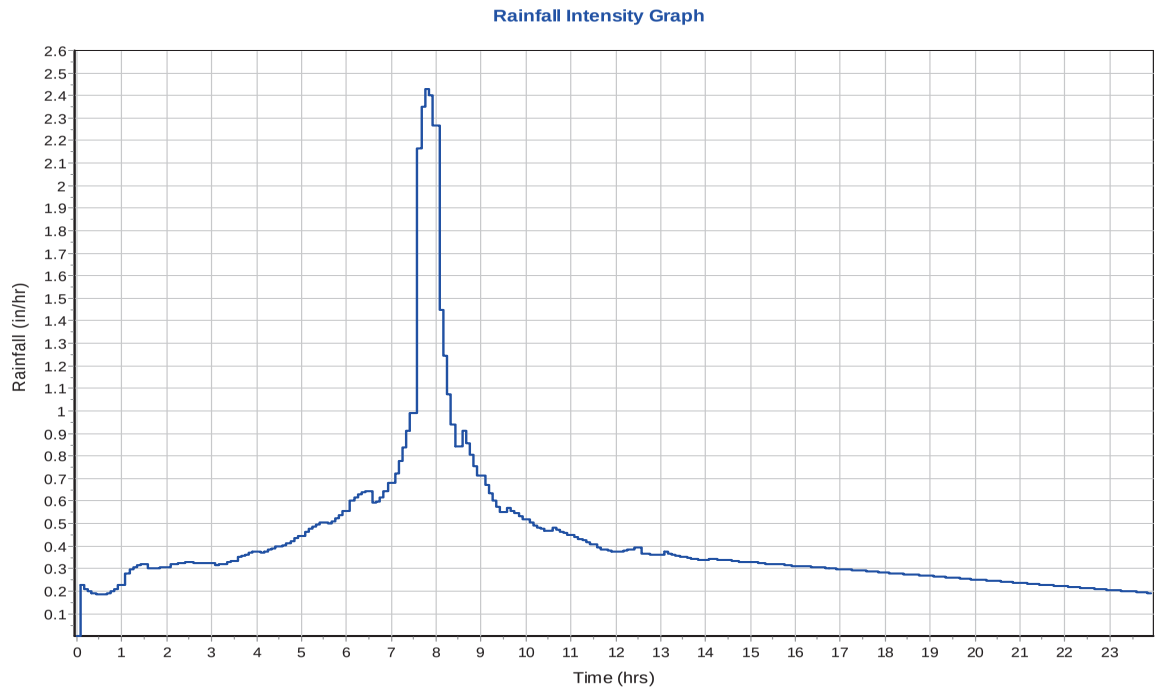
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

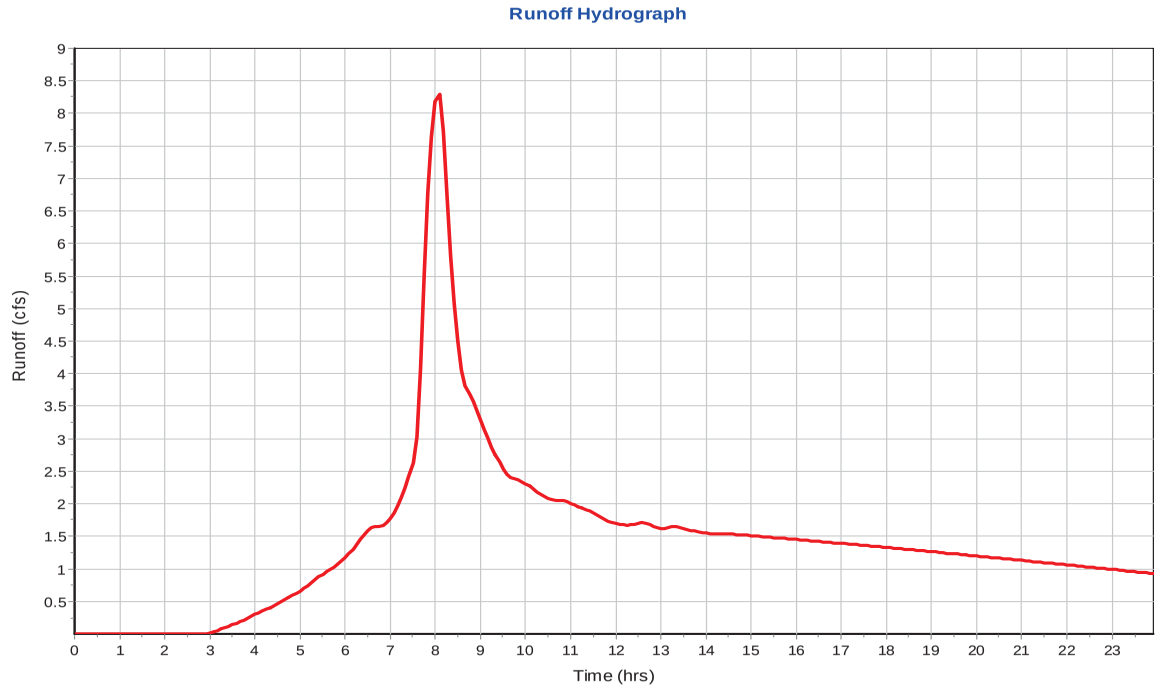
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in) 10.1
Total Runoff (in) 6.71
Peak Runoff (cfs) 8.32
Weighted Curve Number 73
Time of Concentration (days hh:mm:ss) 0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	17.58	User-Defined	4.0	18.9	0.0400	0.5000	0.00	No

Channel Results

Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
DC-B	8.28	0 08:10	860.24	0.01	7.23	2.19	0.71	0.18	0.00	

Project Description

File Name ..... 2001-DRHY-Proposed-SD_TS.SPF
Description .....
Proposed development of vineyard on
undeveloped hillside in Napa County, CA.
Proposed (Post-Development) Conditions
Analysis

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	19
Nodes	45
Junctions	37
Outfalls	5
Flow Diversions	0
Inlets	0
Storage Nodes	3
Links	78
Channels	13
Pipes	24
Pumps	0
Orifices	30
Weirs	11
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution

Subbasin Summary

Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A (Offsite SE)	1.89	484	81.47	4.43	2.53	4.78	1.18	0 00:06:13
Sub-A (Offsite W)	2.13	484	83.00	4.43	2.66	5.67	1.41	0 00:09:26
Sub-A_01E	0.82	484	80.00	4.43	2.40	1.97	0.48	0 00:06:30
Sub-A_01W-02	0.34	484	80.00	4.43	2.40	0.82	0.20	0 00:05:00
Sub-A_02-04	1.33	484	80.00	4.43	2.40	3.19	0.78	0 00:06:40
Sub-A_04-06	1.24	484	80.00	4.43	2.40	2.98	0.72	0 00:06:40
Sub-A_06-09	1.43	484	80.00	4.43	2.40	3.43	0.83	0 00:06:40
Sub-A_09	1.49	484	80.95	4.43	2.48	3.70	0.90	0 00:08:42
Sub-A_18	5.50	484	81.53	4.43	2.53	13.94	3.43	0 00:07:16
Sub-A_19-20	0.20	484	80.00	4.43	2.40	0.48	0.12	0 00:06:19
Sub-A_20-21	0.44	484	80.00	4.43	2.40	1.06	0.26	0 00:05:27
Sub-A_21E-22	0.38	484	77.32	4.43	2.18	0.83	0.19	0 00:05:10
Sub-A_21W-22	0.35	484	80.00	4.43	2.40	0.84	0.21	0 00:06:32
Sub-A_22E-23	0.59	484	75.00	4.43	2.00	1.17	0.26	0 00:08:28
Sub-A_22W-23	0.42	484	79.28	4.43	2.34	0.98	0.24	0 00:05:27
Sub-A_23E-24	0.52	484	74.00	4.43	1.92	1.00	0.22	0 00:06:45
Sub-A_23W-24	0.43	484	77.33	4.43	2.18	0.94	0.22	0 00:06:12
Sub-A_24	0.70	484	77.20	4.43	2.17	1.52	0.35	0 00:08:37
Sub-B	5.05	484	73.20	4.43	1.86	9.38	1.90	0 00:19:49

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
DC-B	Junction	535.0	536.0	535.0	0.0	0.00	1.90	535.41	0.00	3.59	0 00:00	0.00	0.00
DI 01	Junction	394.0	400.0	396.0	400.0	0.00	3.41	394.30	0.00	5.70	0 00:00	0.00	0.00
DI 02	Junction	411.0	418.0	411.0	418.0	0.00	3.22	411.29	0.00	6.73	0 00:00	0.00	0.00
DI 03	Junction	430.0	434.1	430.0	434.1	0.00	2.45	430.26	0.00	3.86	0 00:00	0.00	0.00
DI 04	Junction	446.0	450.0	446.0	450.0	0.00	2.45	446.26	0.00	3.75	0 00:00	0.00	0.00
DI 05	Junction	460.0	464.1	460.0	464.1	0.00	1.73	460.22	0.00	3.86	0 00:00	0.00	0.00
DI 06	Junction	478.0	482.1	478.0	482.1	0.00	1.73	478.21	0.00	3.90	0 00:00	0.00	0.00
DI 07	Junction	496.0	500.0	496.0	500.0	0.00	1.73	496.21	0.00	3.81	0 00:00	0.00	0.00
DI 08	Junction	508.0	511.8	508.0	511.8	0.00	1.73	508.20	0.00	3.62	0 00:00	0.00	0.00
DI 09	Junction	526.0	531.0	526.0	531.0	0.00	0.90	526.18	0.00	4.78	0 00:00	0.00	0.00
DI 10	Junction	417.0	420.0	416.0	420.0	0.00	3.41	417.34	0.00	2.66	0 00:00	0.00	0.00
DI 11	Junction	432.0	436.0	432.0	436.0	0.00	3.41	432.34	0.00	3.68	0 00:00	0.00	0.00
DI 12	Junction	445.0	450.0	446.0	450.0	0.00	3.41	445.37	0.00	4.62	0 00:00	0.00	0.00
DI 13	Junction	454.0	458.0	454.0	458.0	0.00	3.41	454.37	0.00	3.65	0 00:00	0.00	0.00
DI 14	Junction	462.0	466.2	462.0	466.2	0.00	3.41	462.35	0.00	3.89	0 00:00	0.00	0.00
DI 15	Junction	476.0	479.6	476.0	479.6	0.00	3.41	476.30	0.00	3.28	0 00:00	0.00	0.00
DI 16	Junction	494.0	498.1	494.0	498.1	0.00	3.41	494.32	0.00	3.81	0 00:00	0.00	0.00
DI 17	Junction	508.0	512.5	508.0	512.5	0.00	3.41	508.34	0.00	4.16	0 00:00	0.00	0.00
DI 18	Junction	523.4	527.4	523.4	527.4	0.00	3.41	523.69	0.00	3.71	0 00:00	0.00	0.00
DI 19	Junction	414.0	418.3	414.0	418.3	0.00	2.05	414.22	0.00	4.08	0 00:00	0.00	0.00
DI 20	Junction	433.0	437.4	437.4	437.4	0.00	1.94	433.24	0.00	4.16	0 00:00	0.00	0.00
DI 21	Junction	443.0	447.3	443.0	447.3	0.00	1.68	443.24	0.00	4.03	0 00:00	0.00	0.00
DI 22	Junction	464.0	468.0	464.0	468.0	0.00	1.29	464.19	0.00	3.85	0 00:00	0.00	0.00
DI 23	Junction	494.0	498.1	494.0	498.1	0.00	0.79	494.15	0.00	3.91	0 00:00	0.00	0.00
DI 24	Junction	508.0	512.6	508.0	512.6	0.00	0.35	508.12	0.00	4.48	0 00:00	0.00	0.00
HP-02	Junction	415.0	416.5	0.0	0.0	0.00	0.77	416.13	0.00	0.37	0 00:00	0.00	0.00
HP-04W	Junction	450.0	451.0	0.0	0.0	0.00	0.72	450.13	0.00	0.87	0 00:00	0.00	0.00
HP-09	Junction	545.0	546.0	0.0	0.0	0.00	0.90	545.18	0.00	0.82	0 00:00	0.00	0.00
HP-19	Junction	416.5	417.5	0.0	0.0	0.00	0.12	416.62	0.00	0.88	0 00:00	0.00	0.00
HP-20	Junction	436.0	436.0	0.0	0.0	0.00	0.26	436.12	0.00	0.38	0 00:00	0.00	0.00
HP-21	Junction	445.5	446.5	0.0	0.0	0.00	0.20	445.64	0.00	0.86	0 00:00	0.00	0.00

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
HP-22	Junction	467.0	468.0	0.0	0.0	0.00	0.23	467.15	0.00	0.85	0 00:00	0.00	0.00
HP-23	Junction	498.0	499.0	0.0	0.0	0.00	0.22	498.14	0.00	0.86	0 00:00	0.00	0.00
WB-08	Junction	514.0	515.0	0.0	0.0	0.00	0.83	514.12	0.00	0.88	0 00:00	0.00	0.00
WB-21	Junction	445.0	446.0	0.0	0.0	0.00	0.19	445.14	0.00	0.86	0 00:00	0.00	0.00
WB-22	Junction	467.0	468.0	0.0	0.0	0.00	0.27	467.16	0.00	0.84	0 00:00	0.00	0.00
WB-23	Junction	498.0	499.0	0.0	0.0	0.00	0.22	498.14	0.00	0.86	0 00:00	0.00	0.00
Out-A	Outfall	360.0					3.05	360.00					
Out-A_1.1-Tee	Outfall	378.0					3.41	378.00					
Out-A_1.2-Tee	Outfall	378.0					3.41	378.00					
Out-A_2-Tee	Outfall	378.0					2.05	378.00					
Out-B	Outfall	368.0					1.88	368.41					
Stor-A_1.1-Tee	Storage Node	378.0	384.0	378.0		0.00	3.41	379.31				0.00	0.00
Stor-A_1.2-Tee	Storage Node	378.0	384.0	378.0		0.00	3.41	379.31				0.00	0.00
Stor-A_2-Tee	Storage Node	378.0	384.0	378.0		0.00	2.05	379.13				0.00	0.00

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	Pipe	DI 01	Stor-A_1.1-Tee	65.4	394.0	378.0	24.47	12	0.013	3.41	17.62	0.19	17.35	0.30	0.30	0.00	Calculated
Pipe-A-01.1.2	Pipe	DI 02	DI 01	69.5	411.0	394.0	24.45	12	0.013	3.22	17.62	0.18	17.05	0.29	0.29	0.00	Calculated
Pipe-A-01.1.3	Pipe	DI 03	DI 02	68.9	430.0	411.0	27.60	12	0.013	2.45	18.72	0.13	16.49	0.24	0.24	0.00	Calculated
Pipe-A-01.1.4	Pipe	DI 04	DI 03	79.4	446.0	430.0	20.16	12	0.013	2.45	16.00	0.15	14.74	0.26	0.26	0.00	Calculated
Pipe-A-01.1.5	Pipe	DI 05	DI 04	71.2	460.0	446.0	19.66	12	0.013	1.73	15.80	0.11	13.20	0.22	0.22	0.00	Calculated
Pipe-A-01.1.6	Pipe	DI 06	DI 05	75.4	478.0	460.0	23.88	12	0.013	1.73	17.41	0.10	14.15	0.21	0.21	0.00	Calculated
Pipe-A-01.1.7	Pipe	DI 07	DI 06	68.9	496.0	478.0	26.12	12	0.013	1.73	18.21	0.10	14.62	0.21	0.21	0.00	Calculated
Pipe-A-01.1.8	Pipe	DI 08	DI 07	42.5	508.0	496.0	28.26	12	0.013	1.73	18.94	0.09	15.03	0.20	0.20	0.00	Calculated
Pipe-A-01.1.9	Pipe	DI 09	DI 08	80.5	526.0	508.0	22.37	12	0.013	0.90	16.85	0.05	11.40	0.16	0.16	0.00	Calculated
Pipe-A-01.2.1	Pipe	DI 10	Stor-A_1.2-Tee	165.0	417.0	378.0	23.64	12	0.013	3.41	17.32	0.20	17.14	0.30	0.30	0.00	Calculated
Pipe-A-01.2.2	Pipe	DI 11	DI 10	96.9	432.0	417.0	15.48	12	0.013	3.41	14.02	0.24	14.72	0.34	0.34	0.00	Calculated
Pipe-A-01.2.3	Pipe	DI 12	DI 11	86.9	445.0	432.0	14.96	12	0.013	3.41	13.78	0.25	14.54	0.34	0.34	0.00	Calculated
Pipe-A-01.2.4	Pipe	DI 13	DI 12	80.7	454.0	445.0	11.15	12	0.013	3.41	11.90	0.29	13.08	0.37	0.37	0.00	Calculated
Pipe-A-01.2.5	Pipe	DI 14	DI 13	60.0	462.0	454.0	13.33	12	0.013	3.41	13.01	0.26	13.95	0.35	0.35	0.00	Calculated
Pipe-A-01.2.6	Pipe	DI 15	DI 14	57.3	476.0	462.0	24.45	12	0.013	3.41	17.62	0.19	17.35	0.30	0.30	0.00	Calculated
Pipe-A-01.2.7	Pipe	DI 16	DI 15	72.0	494.0	476.0	24.99	12	0.013	3.41	17.81	0.19	17.49	0.30	0.30	0.00	Calculated
Pipe-A-01.2.8	Pipe	DI 17	DI 16	73.3	508.0	494.0	19.11	12	0.013	3.41	15.57	0.22	15.89	0.32	0.32	0.00	Calculated
Pipe-A-01.2.9	Pipe	DI 18	DI 17	106.6	523.3	508.0	14.36	12	0.013	3.41	13.52	0.25	14.35	0.34	0.34	0.00	Calculated
Pipe-A-02.1	Pipe	DI 19	Stor-A_2-Tee	119.8	414.0	378.0	30.05	12	0.013	2.05	19.53	0.11	16.13	0.22	0.22	0.00	Calculated
Pipe-A-02.2	Pipe	DI 20	DI 19	56.9	433.0	414.0	33.38	12	0.013	1.94	20.58	0.09	16.48	0.21	0.21	0.00	Calculated
Pipe-A-02.3	Pipe	DI 21	DI 20	76.1	443.0	433.0	13.13	12	0.013	1.68	12.91	0.13	11.36	0.24	0.24	0.00	Calculated
Pipe-A-02.4	Pipe	DI 22	DI 21	99.3	464.0	443.0	21.14	12	0.013	1.29	16.38	0.08	12.45	0.19	0.19	0.00	Calculated
Pipe-A-02.5	Pipe	DI 23	DI 22	158.3	494.0	464.0	18.95	12	0.013	0.79	15.51	0.05	10.37	0.15	0.15	0.00	Calculated
Pipe-A-02.6	Pipe	DI 24	DI 23	151.9	508.0	494.0	9.22	12	0.013	0.35	10.82	0.03	6.35	0.12	0.12	0.00	Calculated
DC-B	Channel	DC-B	Out-B	950.0	535.0	368.0	17.58	48	0.040	1.88	860.24	0.00	5.09	0.41	0.10	0.00	
DV-02W	Channel	HP-02	DI 02	173.0	416.0	411.0	2.89	6	0.033	0.77	27.23	0.03	1.26	0.13	0.26	0.00	
DV-04	Channel	HP-04W	DI 04	163.0	450.0	446.0	2.45	6	0.033	0.72	25.09	0.03	1.17	0.13	0.26	0.00	
DV-08	Channel	WB-08	DI 08	220.0	514.0	508.0	2.73	6	0.033	0.83	39.68	0.02	1.14	0.12	0.23	0.00	
DV-09	Channel	HP-09	DI 09	150.0	545.0	526.0	12.67	6	0.033	0.90	14.25	0.06	3.19	0.18	0.35	0.00	
DV-19	Channel	HP-19	DI 19	121.0	416.5	414.0	2.07	6	0.033	0.12	5.76	0.02	0.98	0.12	0.23	0.00	
DV-20	Channel	HP-20	DI 20	114.0	436.0	433.0	2.63	6	0.033	0.26	12.99	0.02	1.10	0.11	0.23	0.00	
DV-21E	Channel	WB-21	DI 21	81.0	445.0	443.0	2.47	6	0.033	0.19	6.29	0.03	1.18	0.14	0.27	0.00	
DV-21W	Channel	HP-21	DI 21	114.0	445.5	443.0	2.19	6	0.033	0.20	5.93	0.03	1.15	0.14	0.28	0.00	
DV-22E	Channel	WB-22	DI 22	143.0	467.0	464.0	2.10	6	0.033	0.26	5.80	0.05	1.20	0.16	0.31	0.00	
DV-22W	Channel	HP-22	DI 22	121.0	467.0	464.0	2.48	6	0.033	0.23	6.31	0.04	1.25	0.15	0.29	0.00	
DV-23E	Channel	WB-23	DI 23	172.0	498.0	494.0	2.33	6	0.033	0.22	6.11	0.04	1.20	0.14	0.29	0.00	
DV-23W	Channel	HP-23	DI 23	165.0	498.0	494.0	2.42	6	0.033	0.22	6.23	0.04	1.22	0.14	0.28	0.00	

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Orifice-A_1.1-01	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-02	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-03	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-04	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-05	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-06	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-07	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-08	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-09	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.1-10	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-01	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-02	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-03	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-04	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-05	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-06	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-07	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-08	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-09	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_1.2-10	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-01	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-02	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-03	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-04	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-05	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-06	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-07	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-08	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-09	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Orifice-A_2-10	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.03							
Weir-A_1.1-01	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				0.78							
Weir-A_1.1-02	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				0.78							
Weir-A_1.1-03	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				0.78							
Weir-A_1.1-04	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				0.78							
Weir-A_1.2-01	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				0.78							
Weir-A_1.2-02	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				0.78							
Weir-A_1.2-03	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				0.78							
Weir-A_1.2-04	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				0.78							
Weir-A_2-01	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				0.59							
Weir-A_2-02	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				0.59							
Weir-A_2-03	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				0.59							

Subbasin Hydrology

Subbasin : Sub-A (Offsite SE)

Input Data

Area (ac) 1.89
Peak Rate Factor 484
Weighted Curve Number 81.47
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	0.29	C	73
Brush, Poor	1.6	D	83
Composite Area & Weighted CN	1.89		81.47

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	29	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.34	0	0
Computed Flow Time (min) :	4.97	0	0

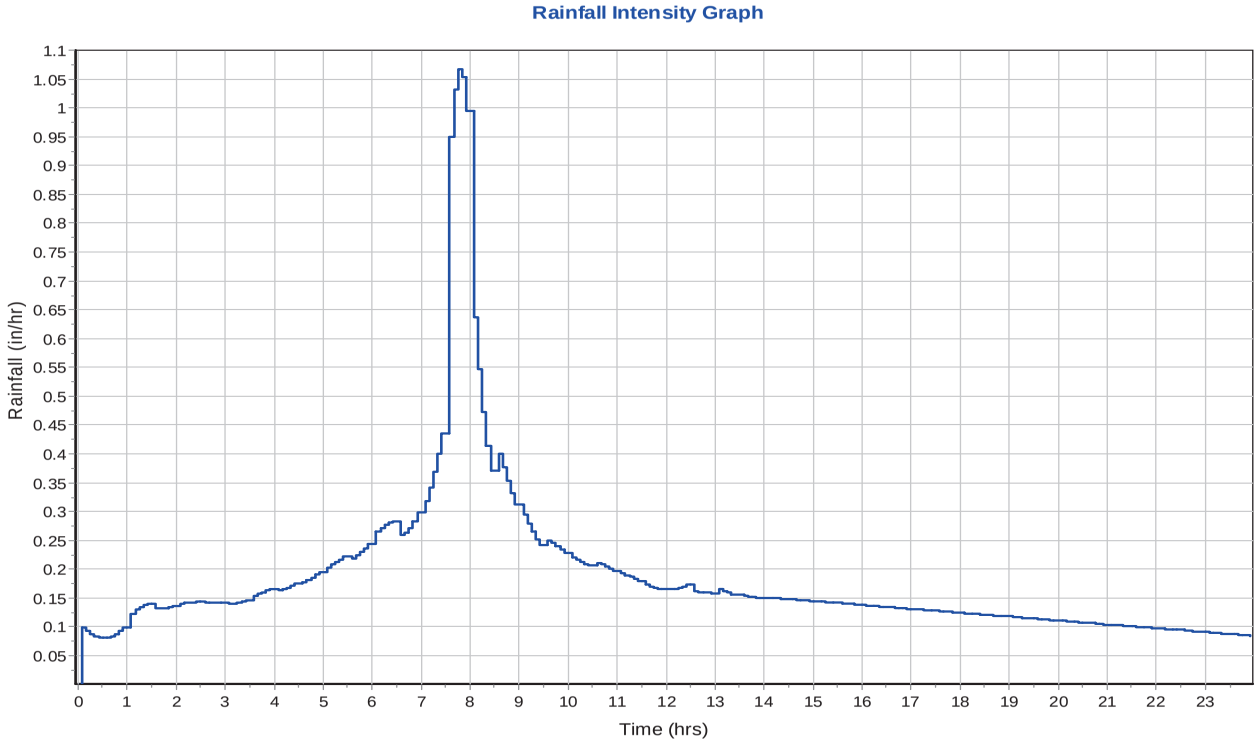
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	279	0	0
Slope (%) :	28	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.7	0	0
Computed Flow Time (min) :	1.26	0	0

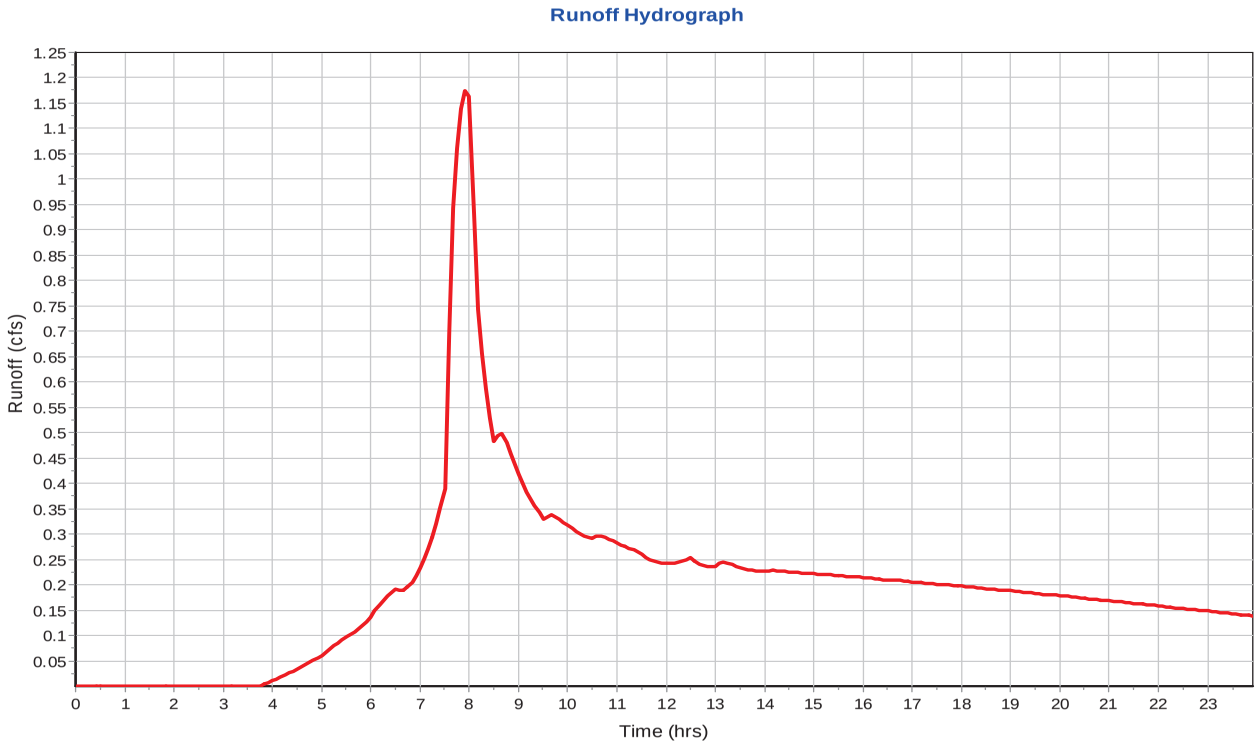
Total TOC (min) 6.23

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.53
Peak Runoff (cfs) 1.18
Weighted Curve Number 81.47
Time of Concentration (days hh:mm:ss) 0 00:06:14

Subbasin : Sub-A (Offsite SE)





Subbasin : Sub-A (Offsite W)

Input Data

Area (ac) 2.13
Peak Rate Factor 484
Weighted Curve Number 83
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Brush, Poor	2.13	D	83
Composite Area & Weighted CN	2.13		83

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	19	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	5.89	0	0

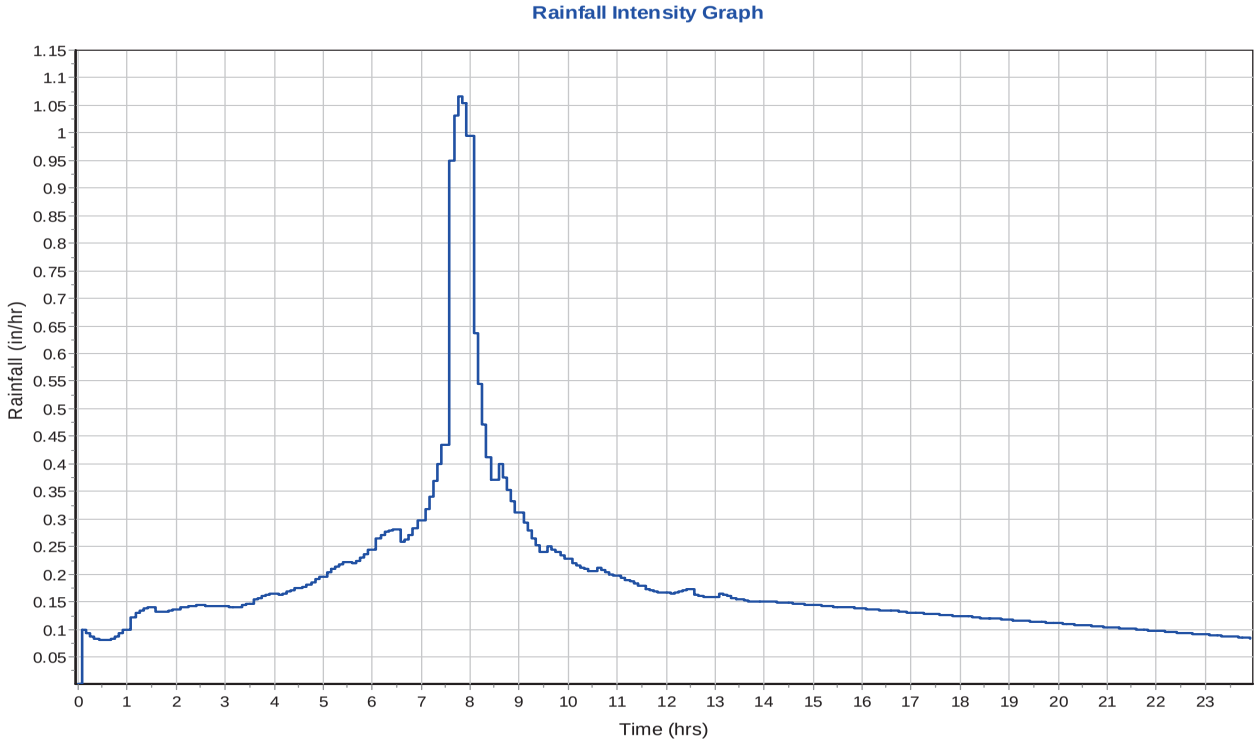
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	633	0	0
Slope (%) :	18	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.97	0	0
Computed Flow Time (min) :	3.55	0	0

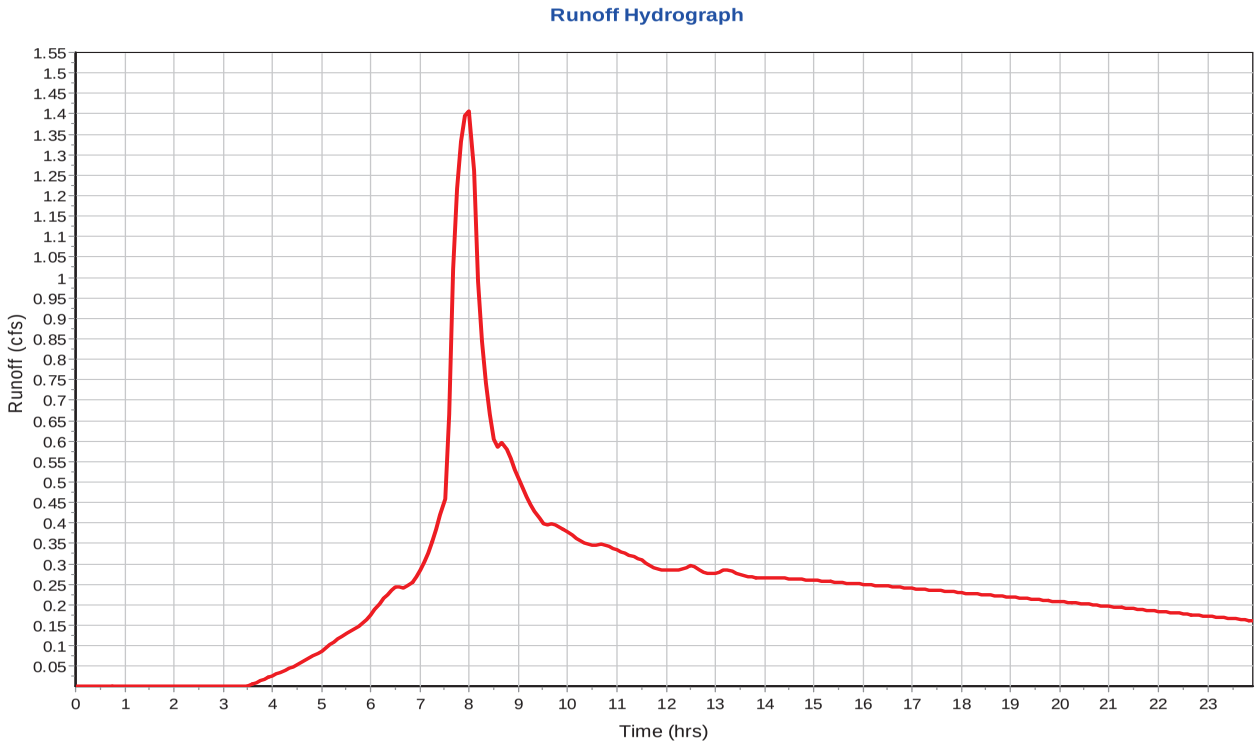
Total TOC (min) 9.44

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.66
Peak Runoff (cfs) 1.41
Weighted Curve Number 83
Time of Concentration (days hh:mm:ss) 0 00:09:26

Subbasin : Sub-A (Offsite W)





Subbasin : Sub-A_01E

Input Data

Area (ac) 0.82
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.82	D	80
Composite Area & Weighted CN	0.82		80

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	30	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.27	0	0
Computed Flow Time (min) :	6.18	0	0

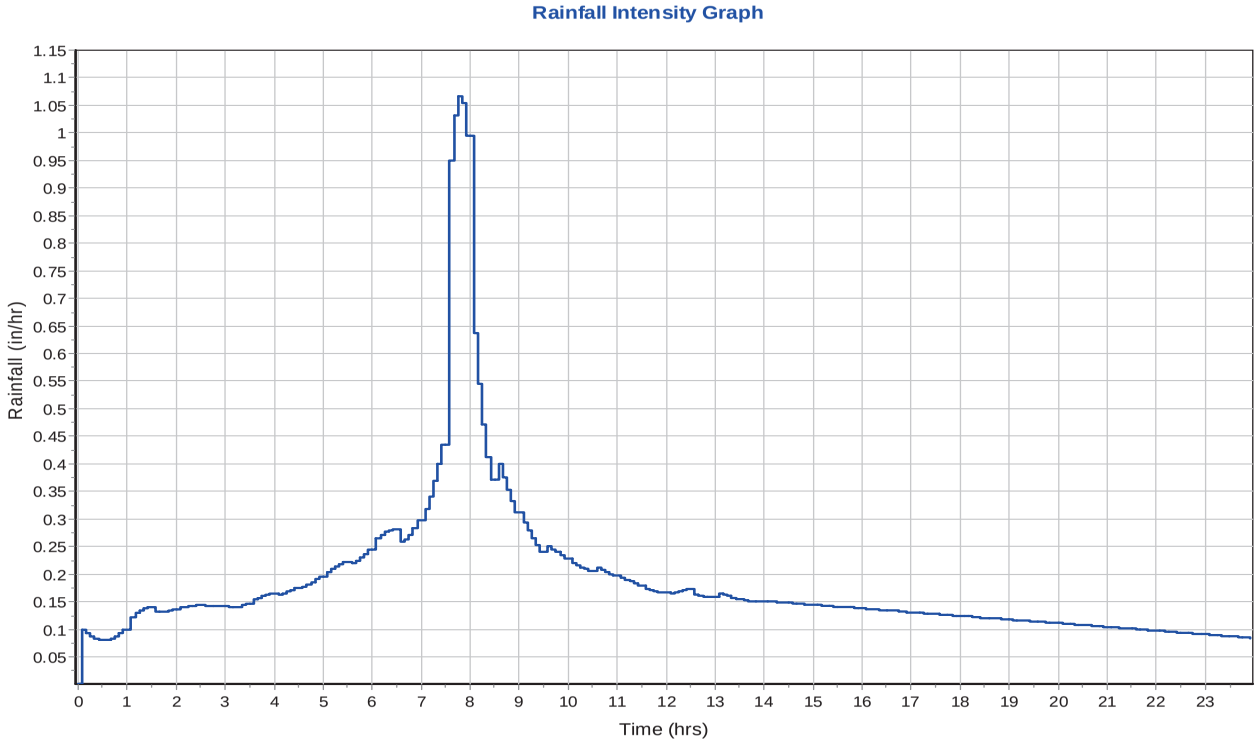
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	77	0	0
Slope (%) :	31	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.9	0	0
Computed Flow Time (min) :	0.33	0	0

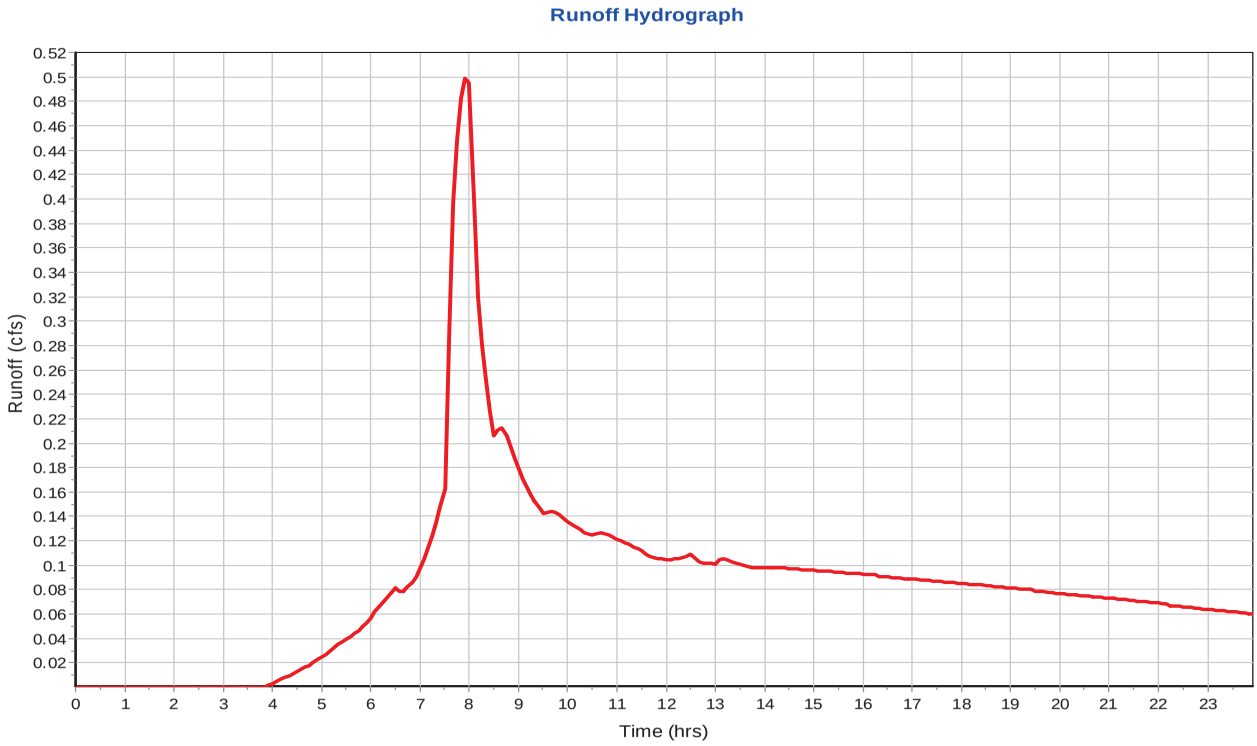
Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.4
Peak Runoff (cfs) 0.48
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:31

Subbasin : Sub-A_01E





Subbasin : Sub-A_01W-02

Input Data

Area (ac) 0.34
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.34	D	80
Composite Area & Weighted CN	0.34		80

Time of Concentration

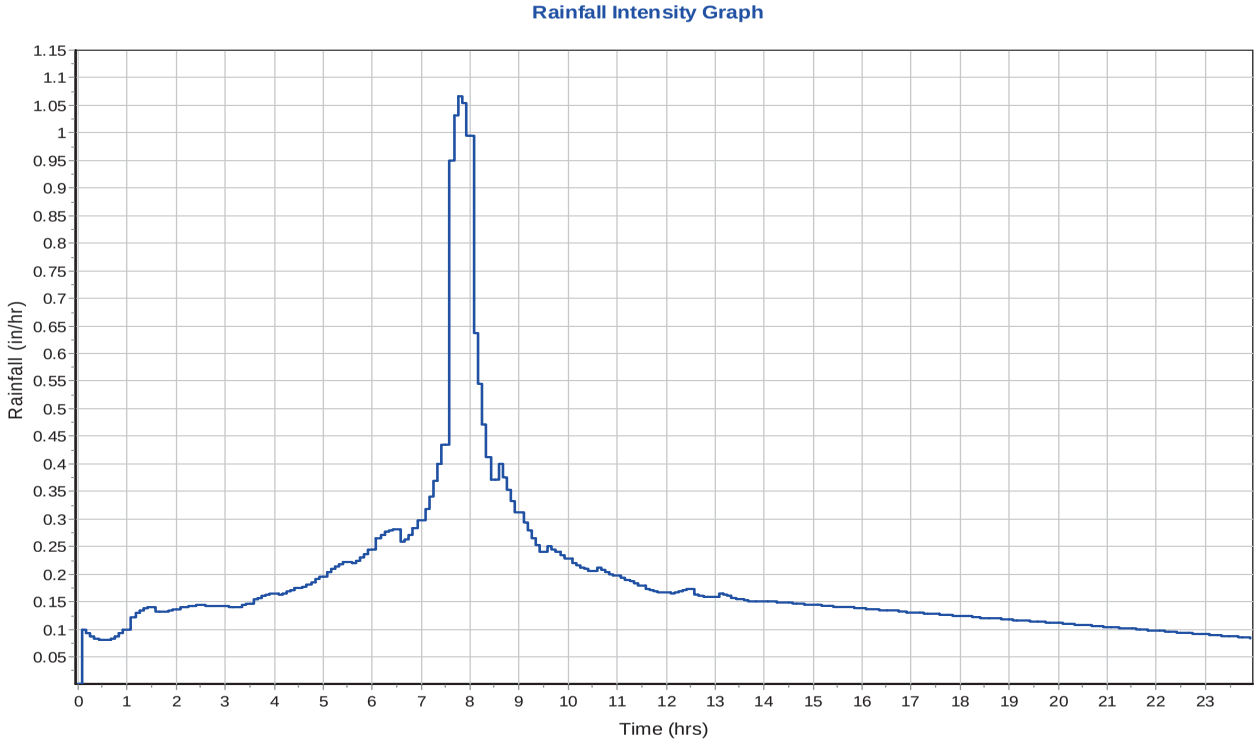
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	60	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	4.83	0	0

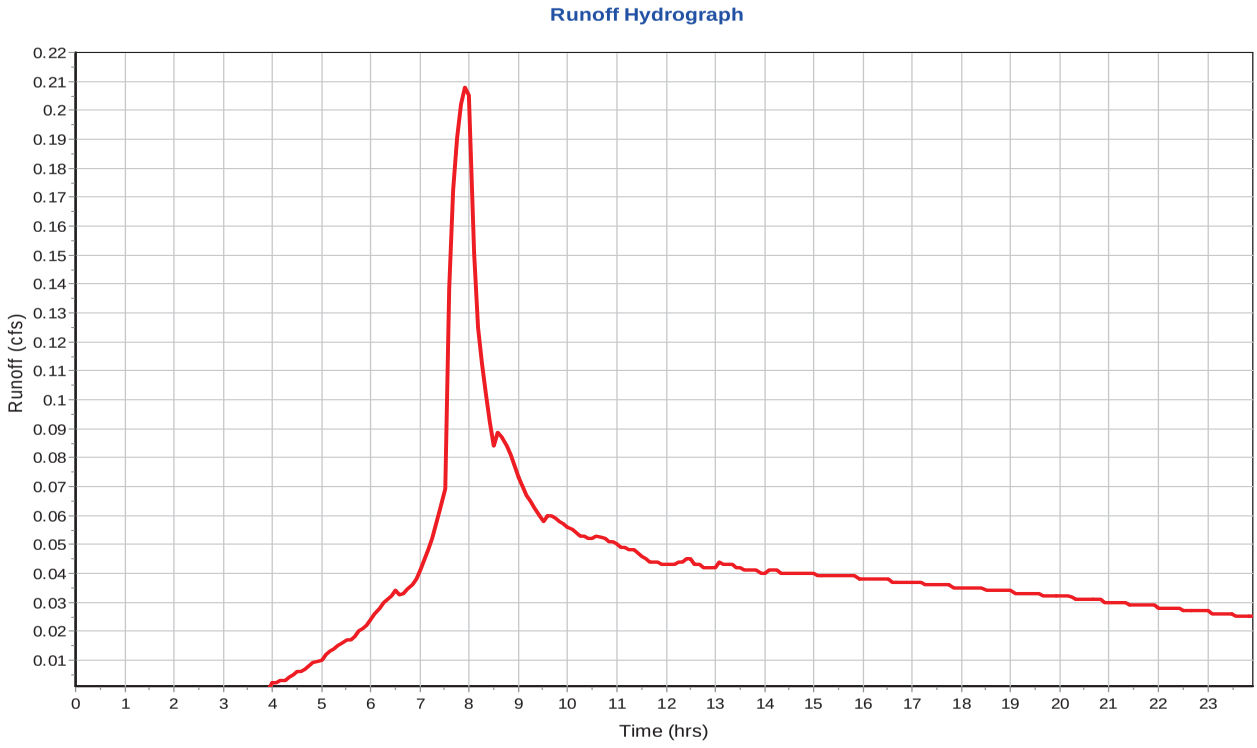
Total TOC (min) 4.83

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.4
Peak Runoff (cfs) 0.2
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:04:50

Subbasin : Sub-A_01W-02





Subbasin : Sub-A_02-04

Input Data

Area (ac) 1.33
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.33	D	80
Composite Area & Weighted CN	1.33		80

Time of Concentration

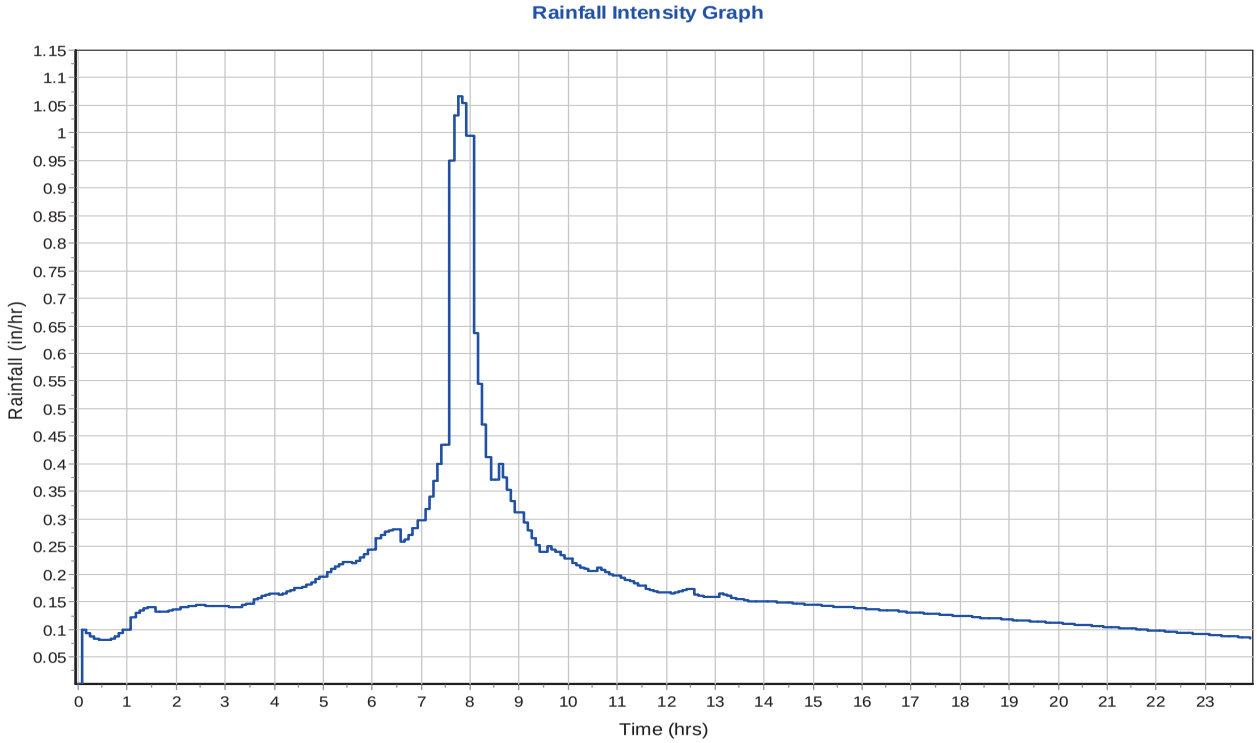
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

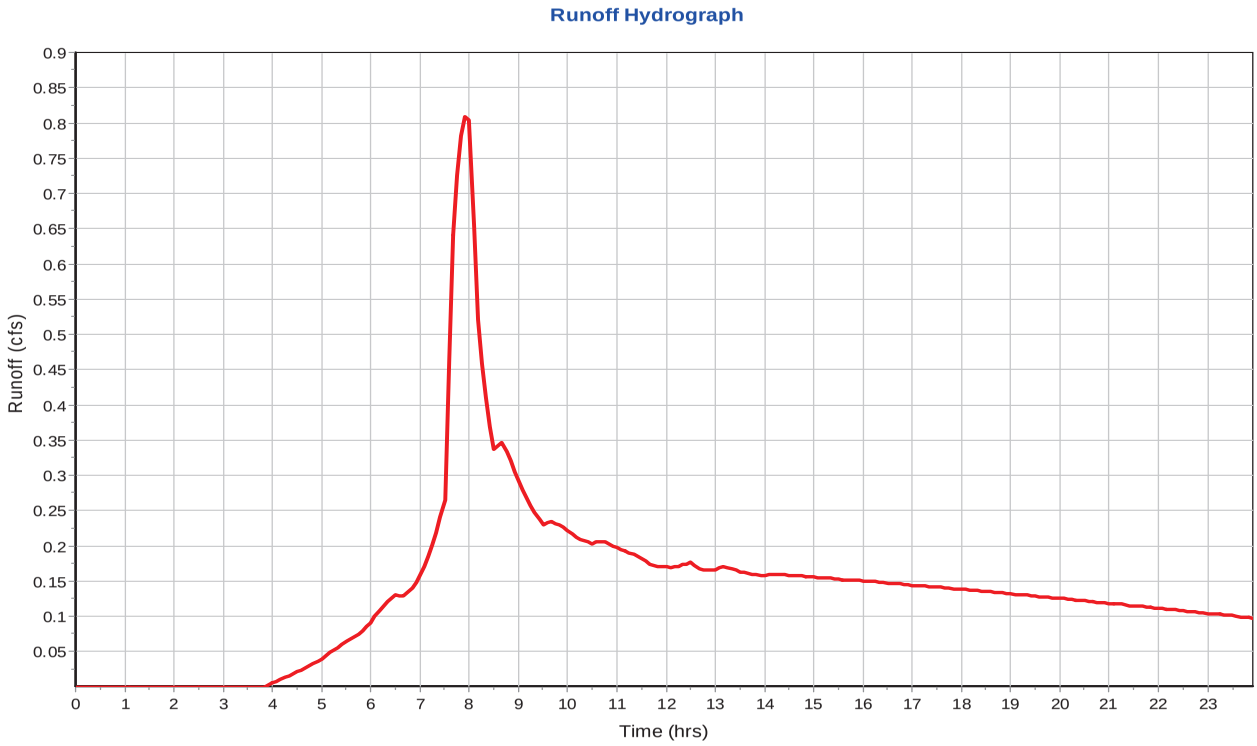
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.4
Peak Runoff (cfs) 0.78
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_02-04





Subbasin : Sub-A_04-06

Input Data

Area (ac) 1.24
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.24	D	80
Composite Area & Weighted CN	1.24		80

Time of Concentration

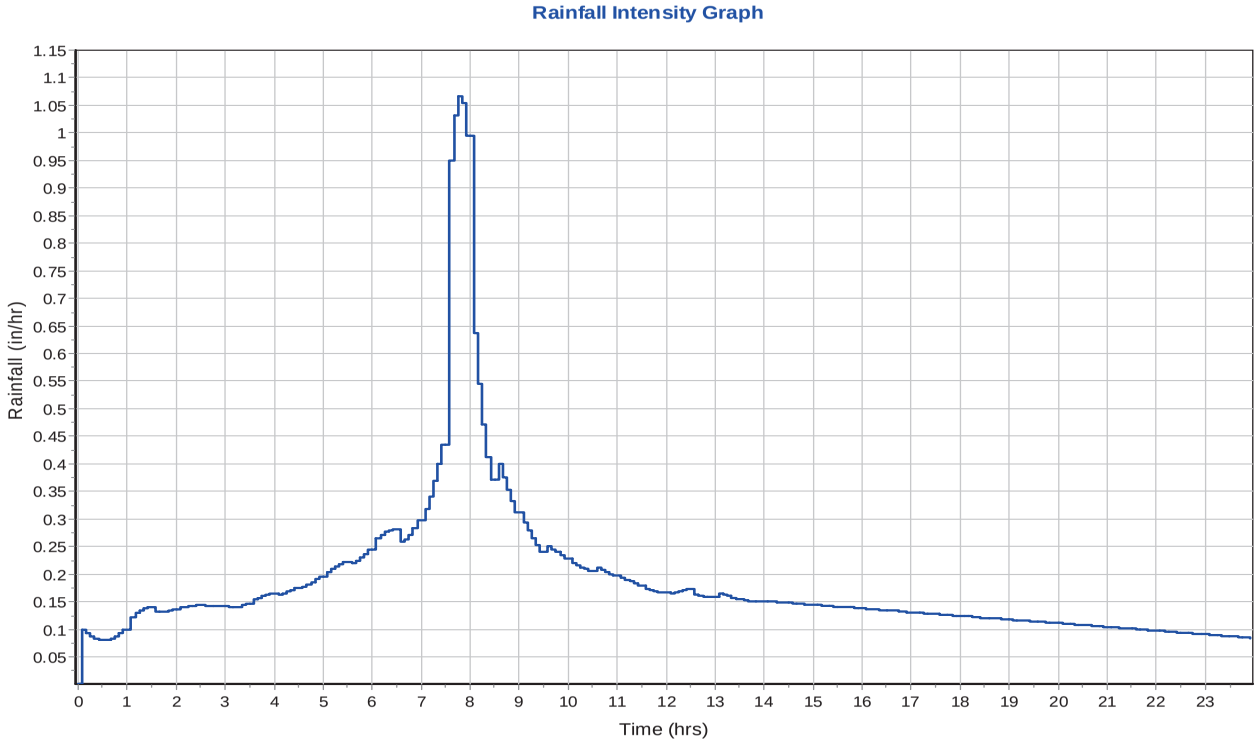
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

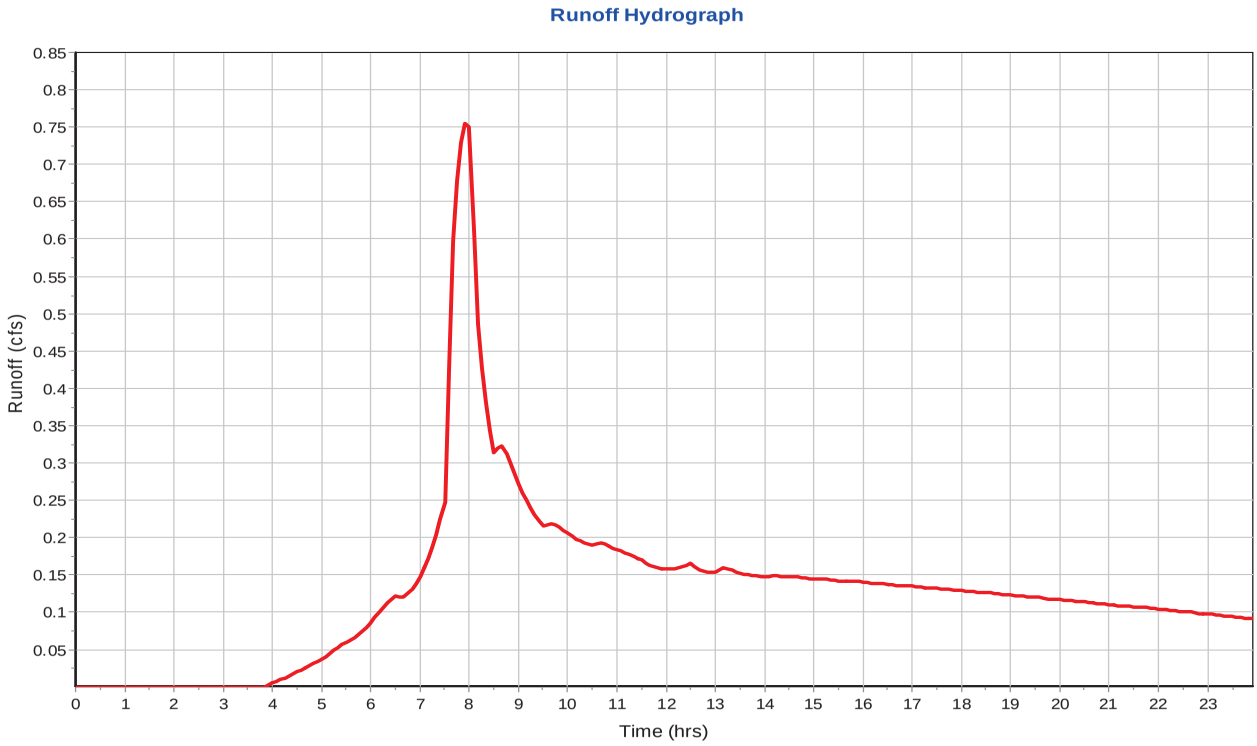
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.4
Peak Runoff (cfs) 0.72
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_04-06





Subbasin : Sub-A_06-09

Input Data

Area (ac) 1.43
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.43	D	80
Composite Area & Weighted CN	1.43		80

Time of Concentration

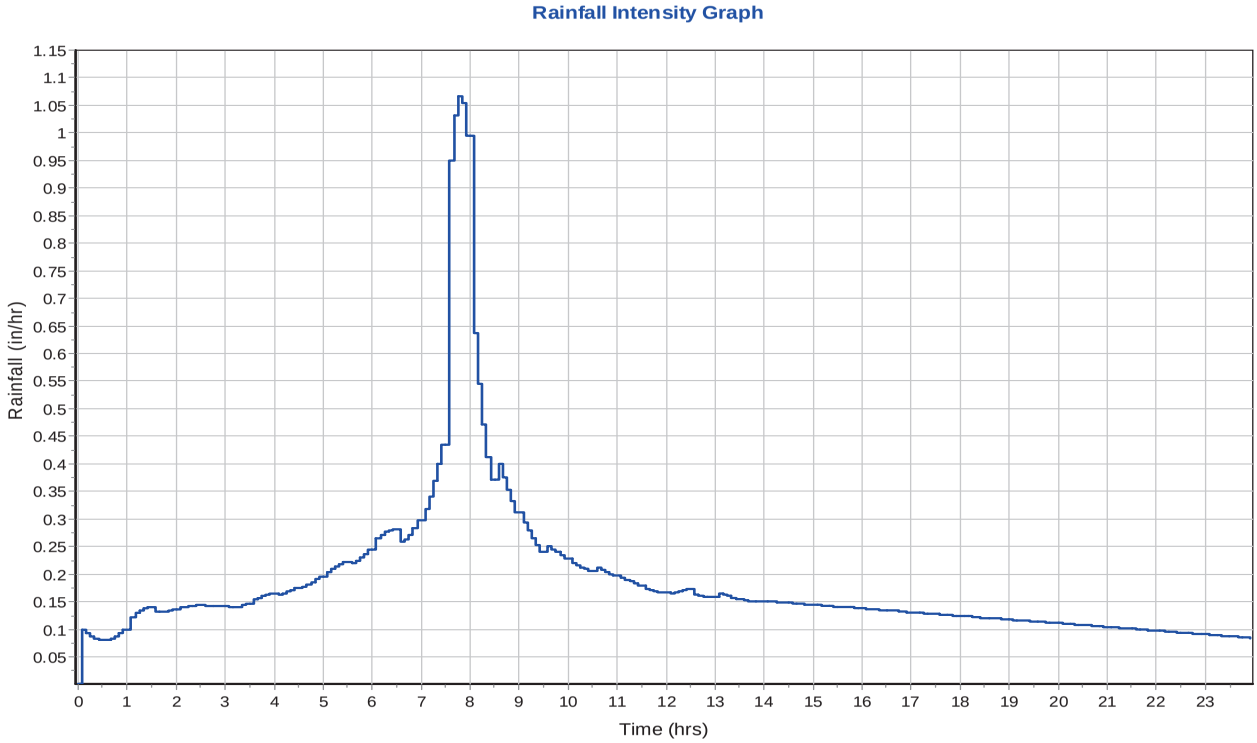
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

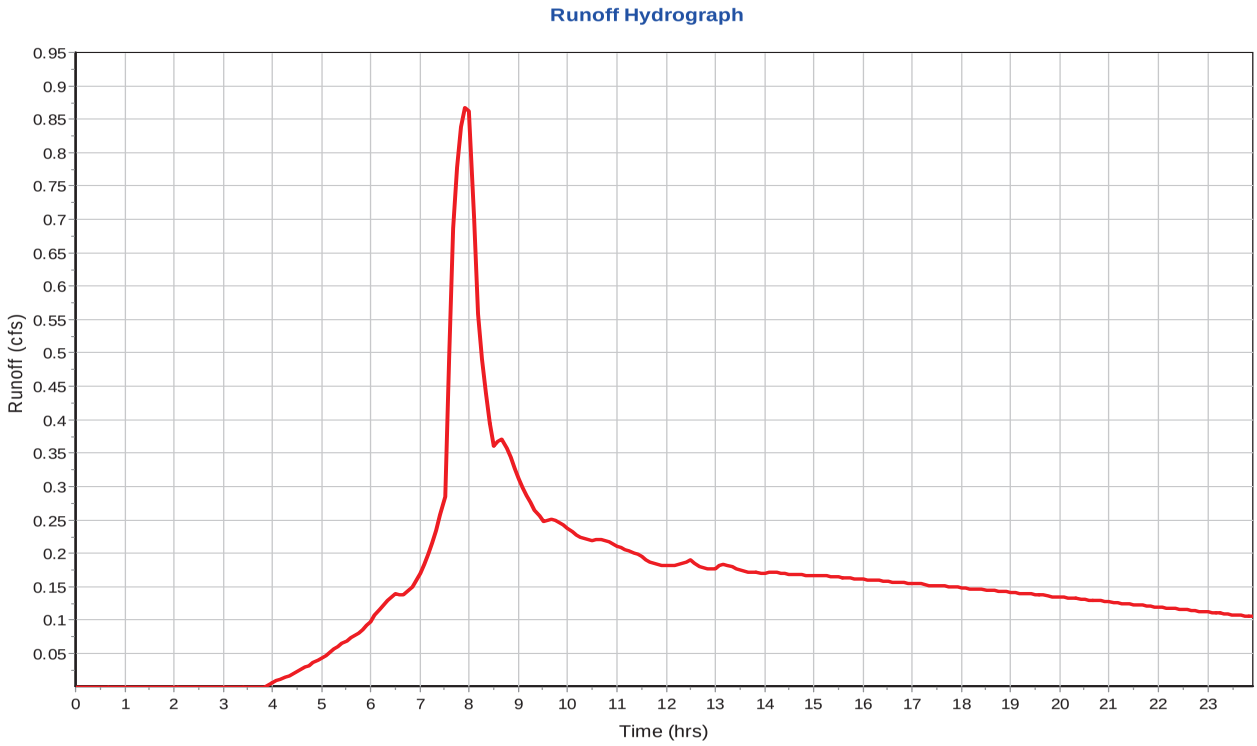
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 4.43
Total Runoff (in) 2.4
Peak Runoff (cfs) 0.83
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_06-09





Subbasin : Sub-A_09

Input Data

Area (ac)	1.49
Peak Rate Factor	484
Weighted Curve Number	80.95
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.64	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.06	C	73
Brush, Poor	0.73	D	83
Composite Area & Weighted CN	1.49		80.95

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	7.08	0	0

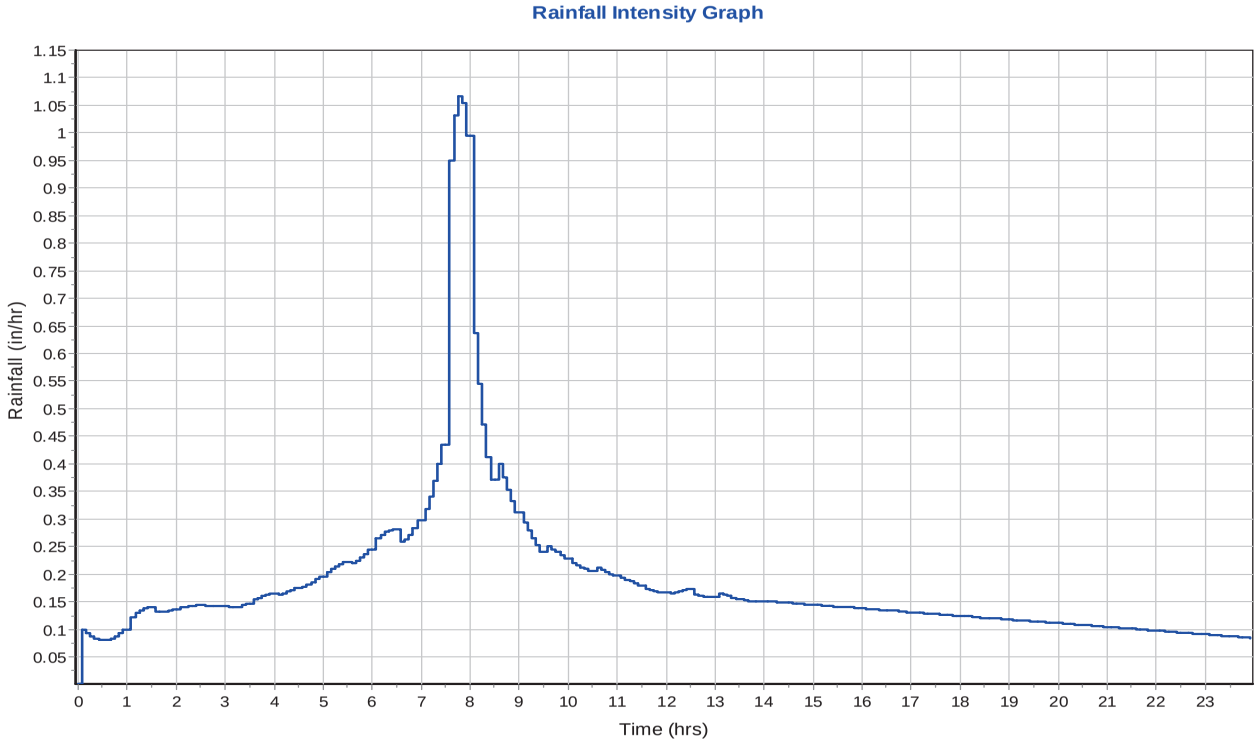
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	350	0	0
Slope (%) :	26	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.57	0	0
Computed Flow Time (min) :	1.63	0	0

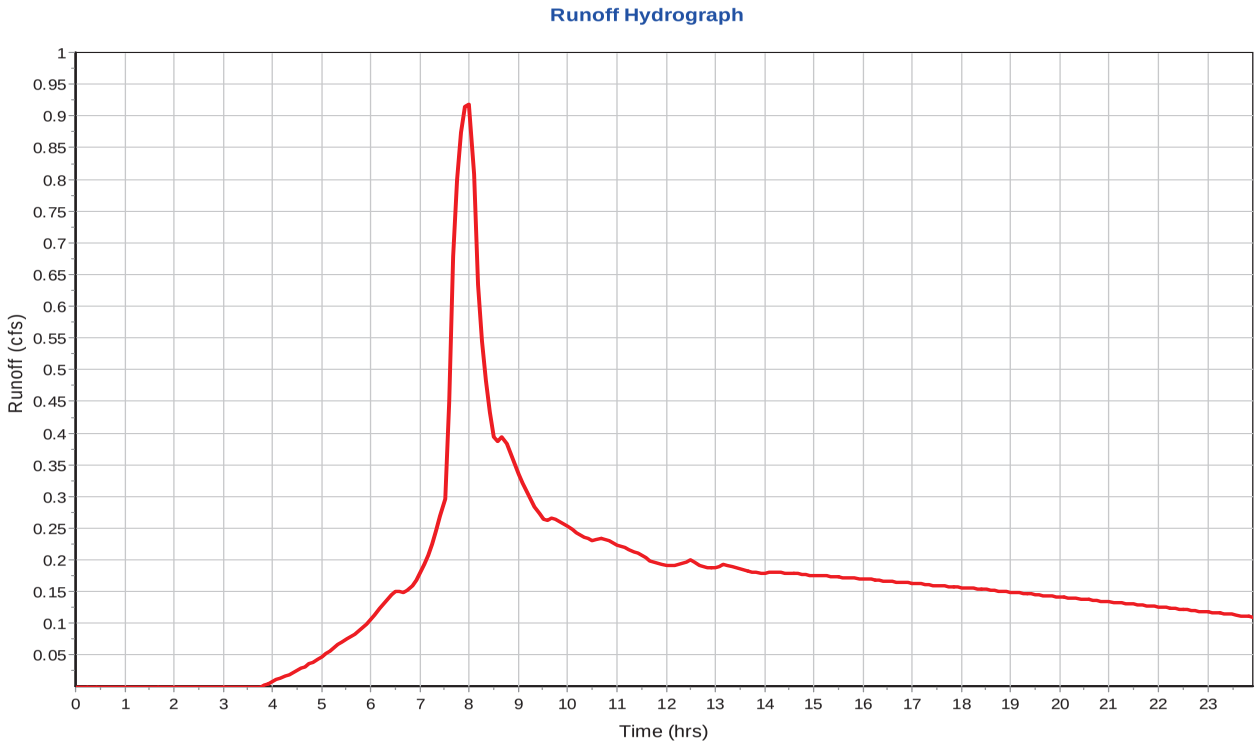
Total TOC (min) 8.71

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.48
Peak Runoff (cfs)	0.9
Weighted Curve Number	80.95
Time of Concentration (days hh:mm:ss)	0 00:08:43

Subbasin : Sub-A_09





Subbasin : Sub-A_18

Input Data

Area (ac)	5.5
Peak Rate Factor	484
Weighted Curve Number	81.53
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	2.7	D	80
Brush, Poor	2.8	D	83
Composite Area & Weighted CN	5.5		81.53

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

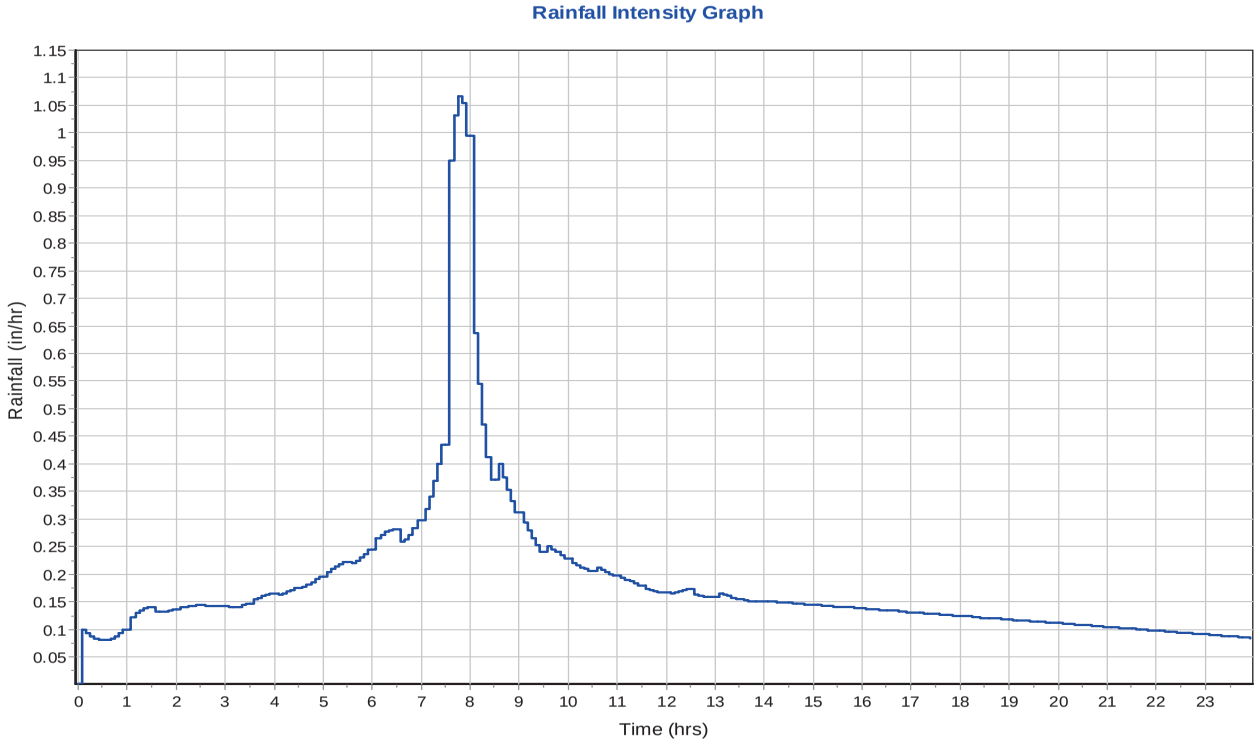
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	274	0	0
Slope (%) :	27	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.64	0	0
Computed Flow Time (min) :	1.25	0	0

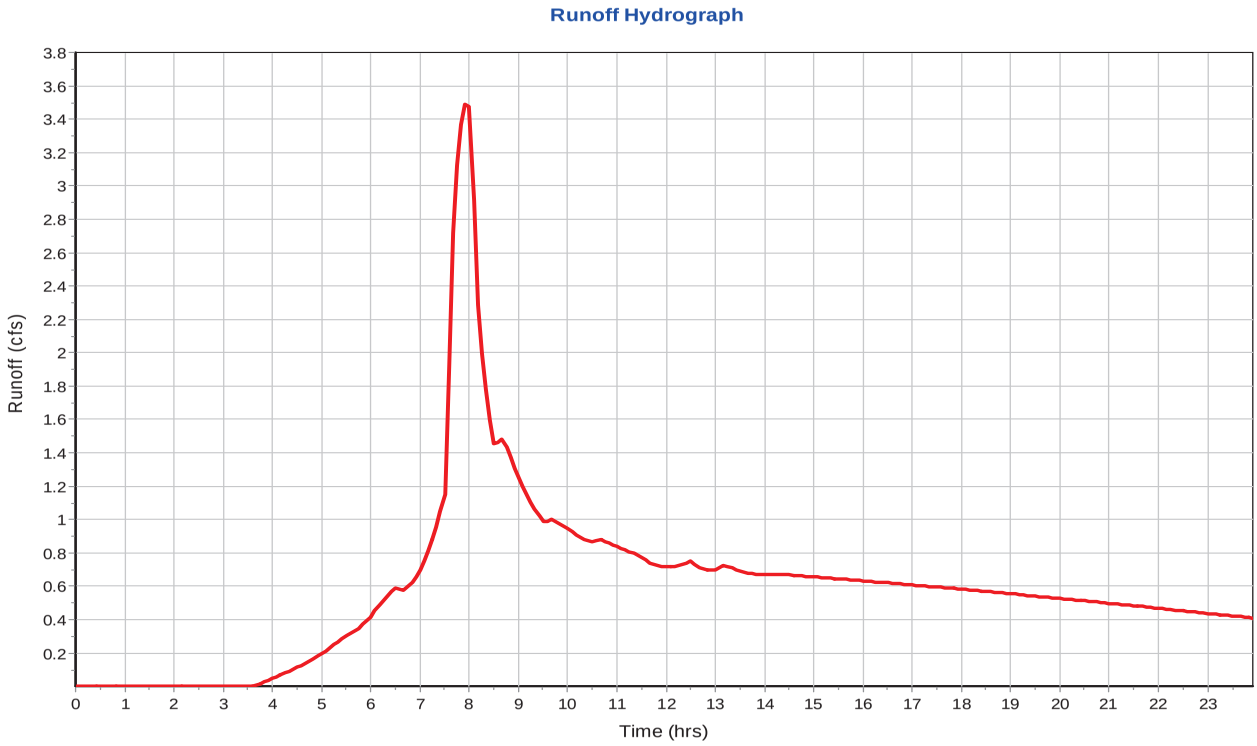
Total TOC (min) 7.28

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.53
Peak Runoff (cfs)	3.43
Weighted Curve Number	81.53
Time of Concentration (days hh:mm:ss)	0 00:07:17

Subbasin : Sub-A_18





Subbasin : Sub-A_19-20

Input Data

Area (ac)	0.2
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.2	D	80
Composite Area & Weighted CN	0.2		80

Time of Concentration

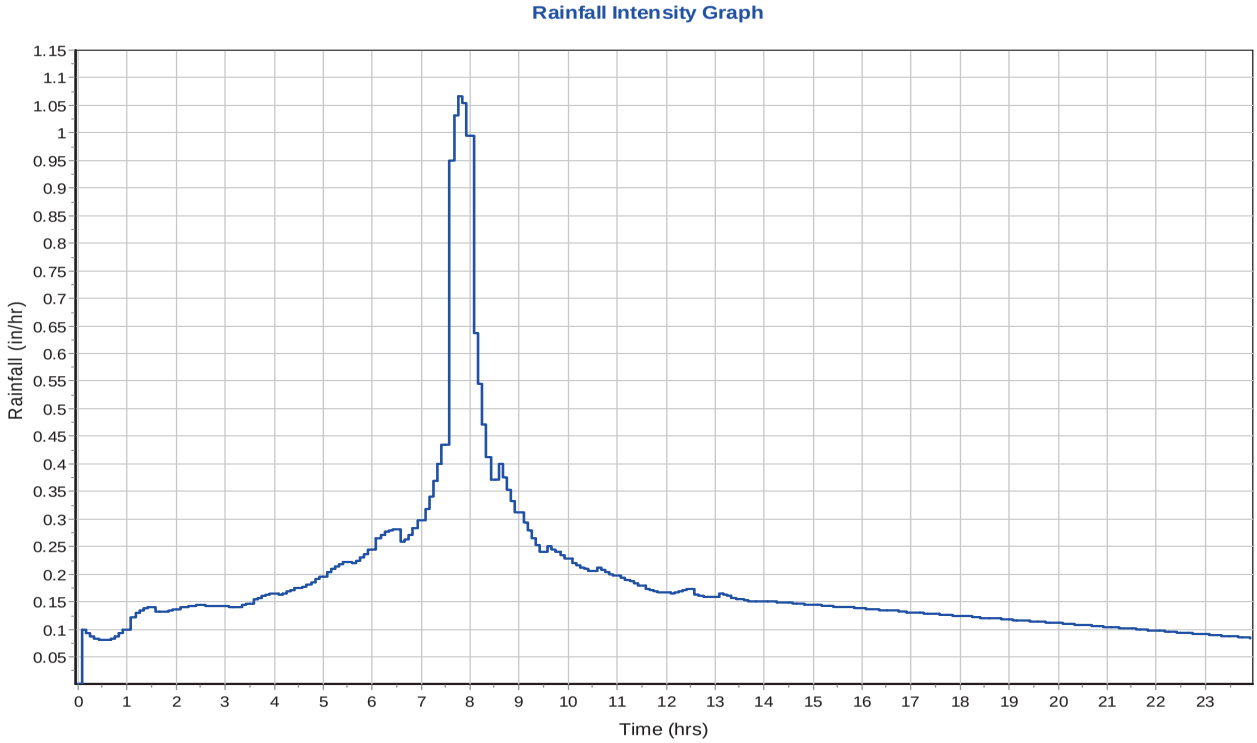
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	92	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.32	0	0

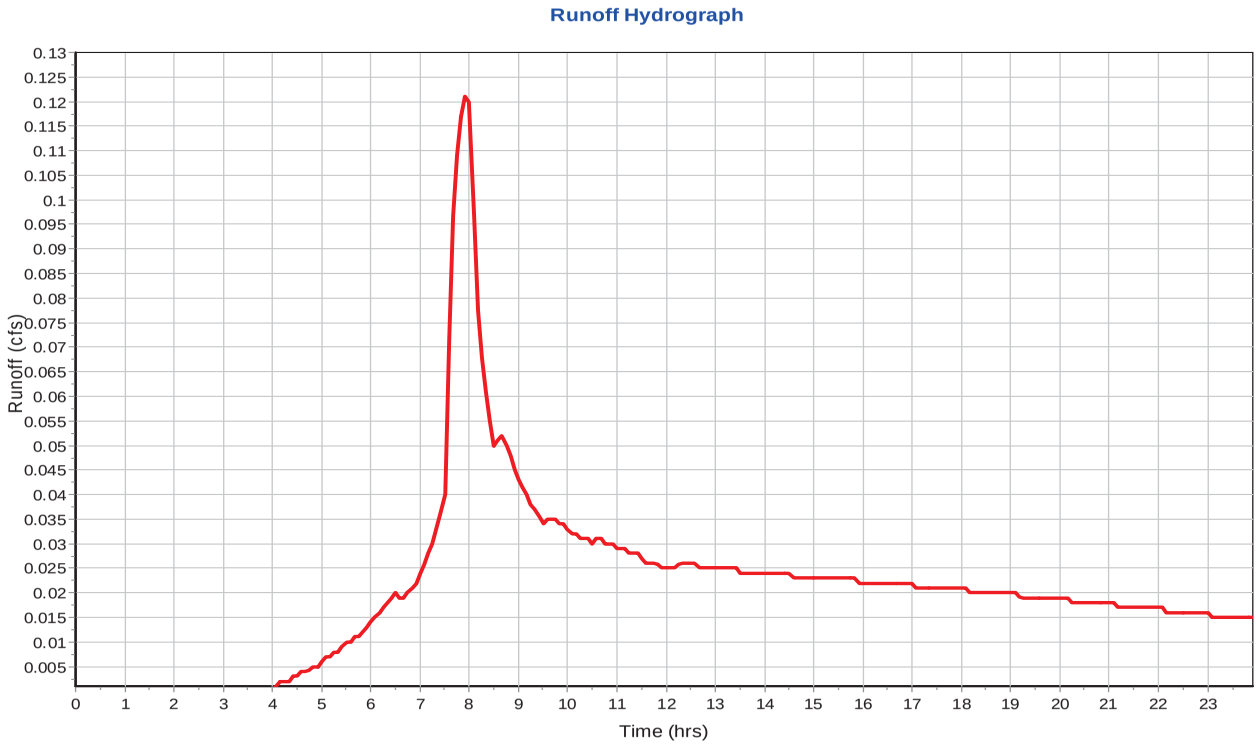
Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.4
Peak Runoff (cfs)	0.12
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:19

Subbasin : Sub-A_19-20





Subbasin : Sub-A_20-21

Input Data

Area (ac)	0.44
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.44	D	80
Composite Area & Weighted CN	0.44		80

Time of Concentration

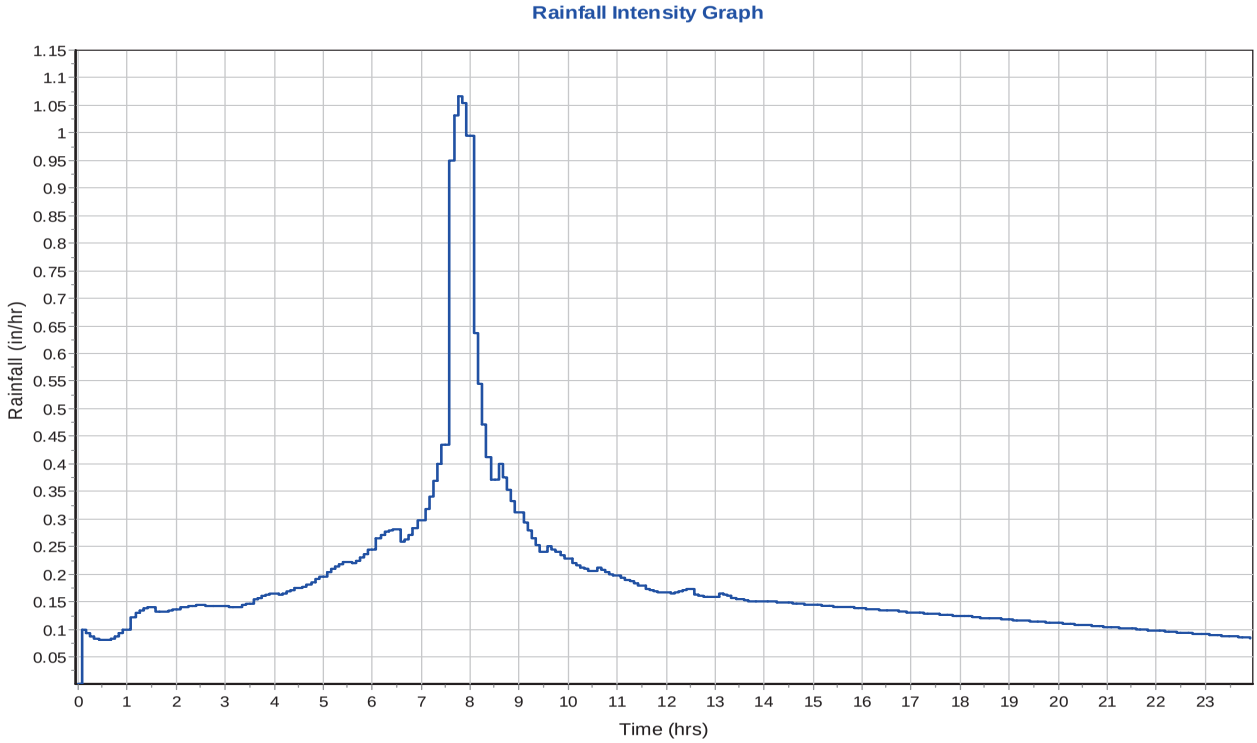
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	70	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	5.46	0	0

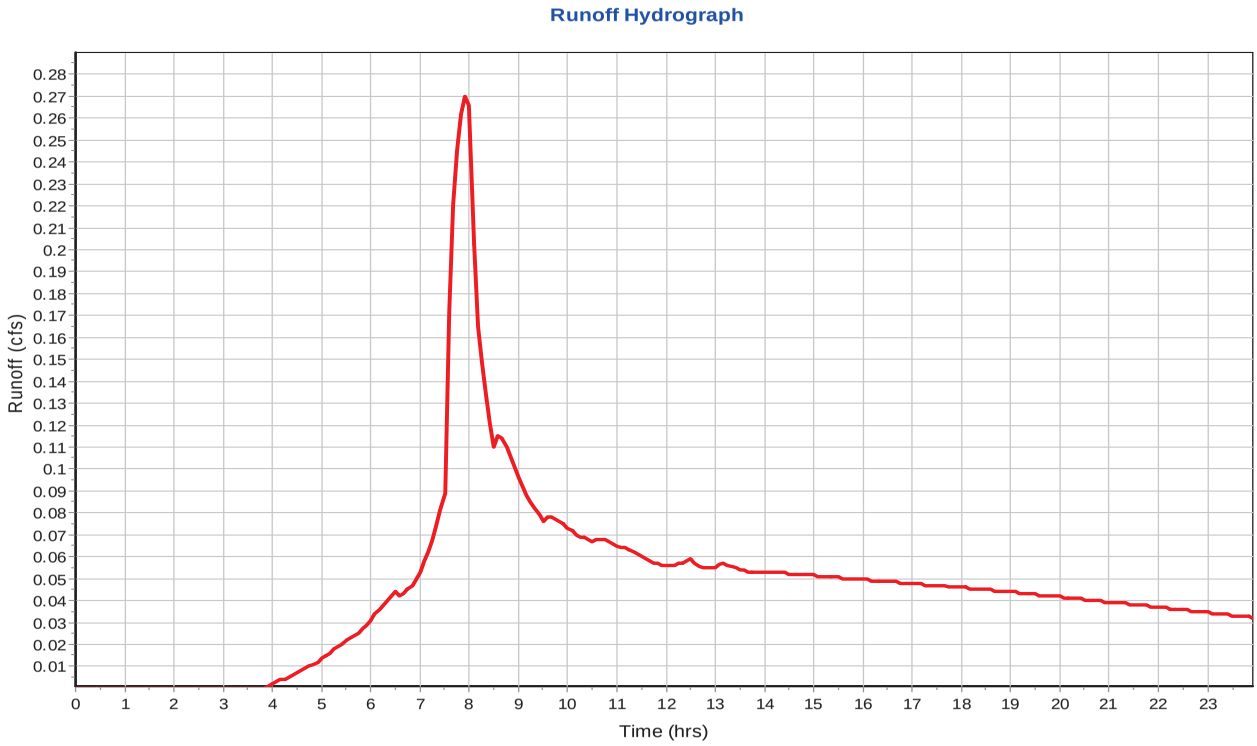
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.4
Peak Runoff (cfs)	0.26
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_20-21





Subbasin : Sub-A_21E-22

Input Data

Area (ac)	0.38
Peak Rate Factor	484
Weighted Curve Number	77.32
Rain Gage ID	Rain Gage-01

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
Pasture, grassland, or range, Good	0.21	D	80
Pasture, grassland, or range, Good	0.17	C	74
Composite Area & Weighted CN	0.38		77.32

Time of Concentration

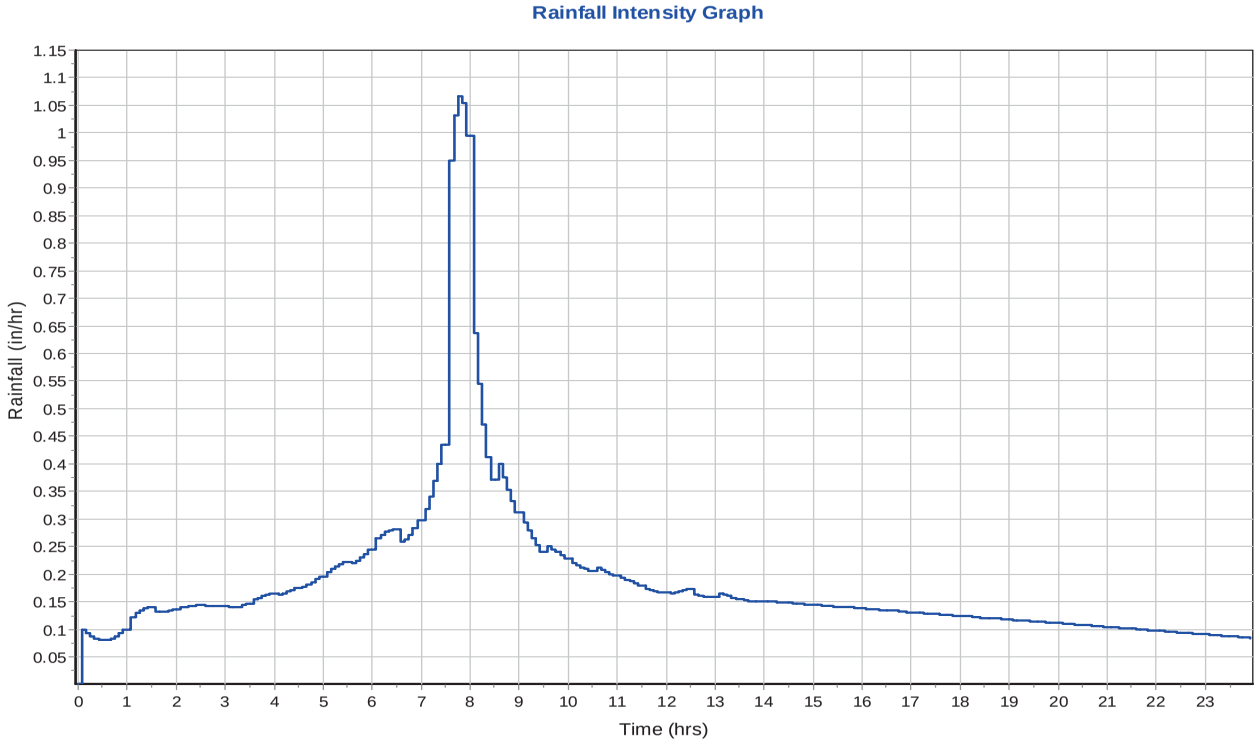
	Subarea	Subarea	Subarea
Sheet Flow Computations	A	B	C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	73	0	0
Slope (%) :	25	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	5.17	0	0

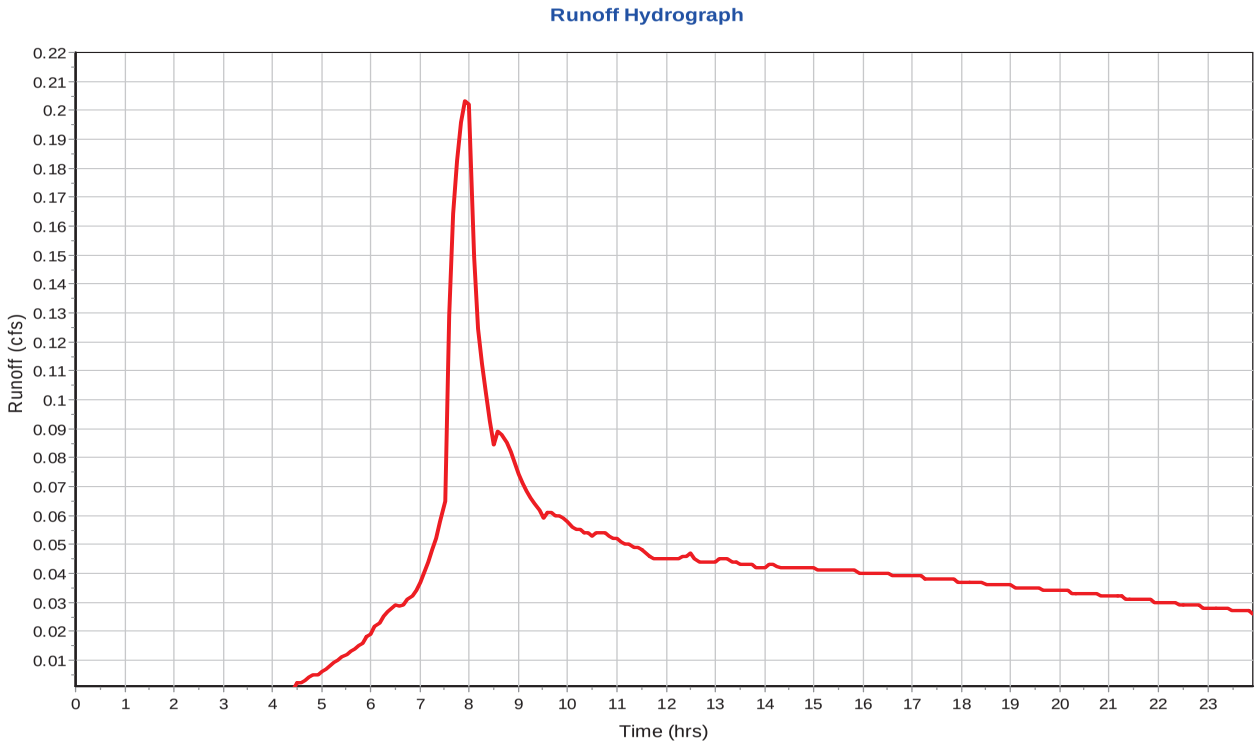
Total TOC (min) 5.17

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.18
Peak Runoff (cfs)	0.19
Weighted Curve Number	77.32
Time of Concentration (days hh:mm:ss)	0 00:05:10

Subbasin : Sub-A_21E-22





Subbasin : Sub-A_21W-22

Input Data

Area (ac)	0.35
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.35	D	80
Composite Area & Weighted CN	0.35		80

Time of Concentration

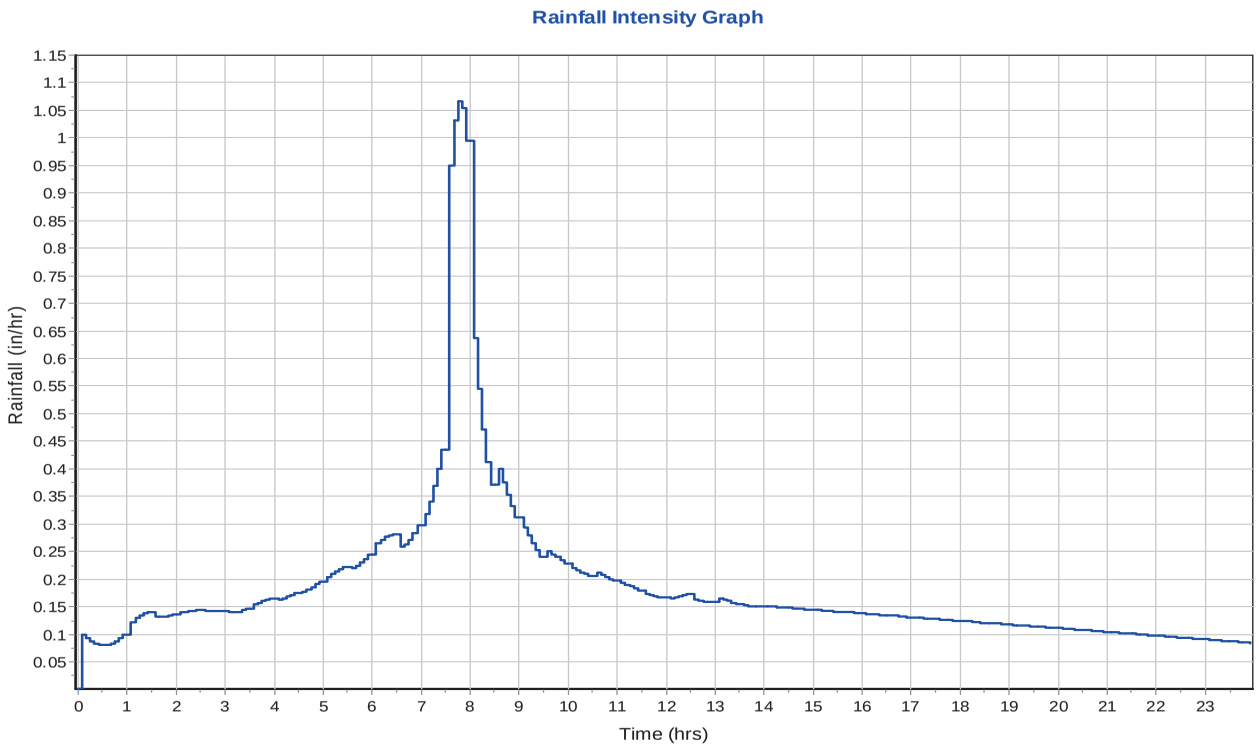
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.25	0	0
Computed Flow Time (min) :	6.54	0	0

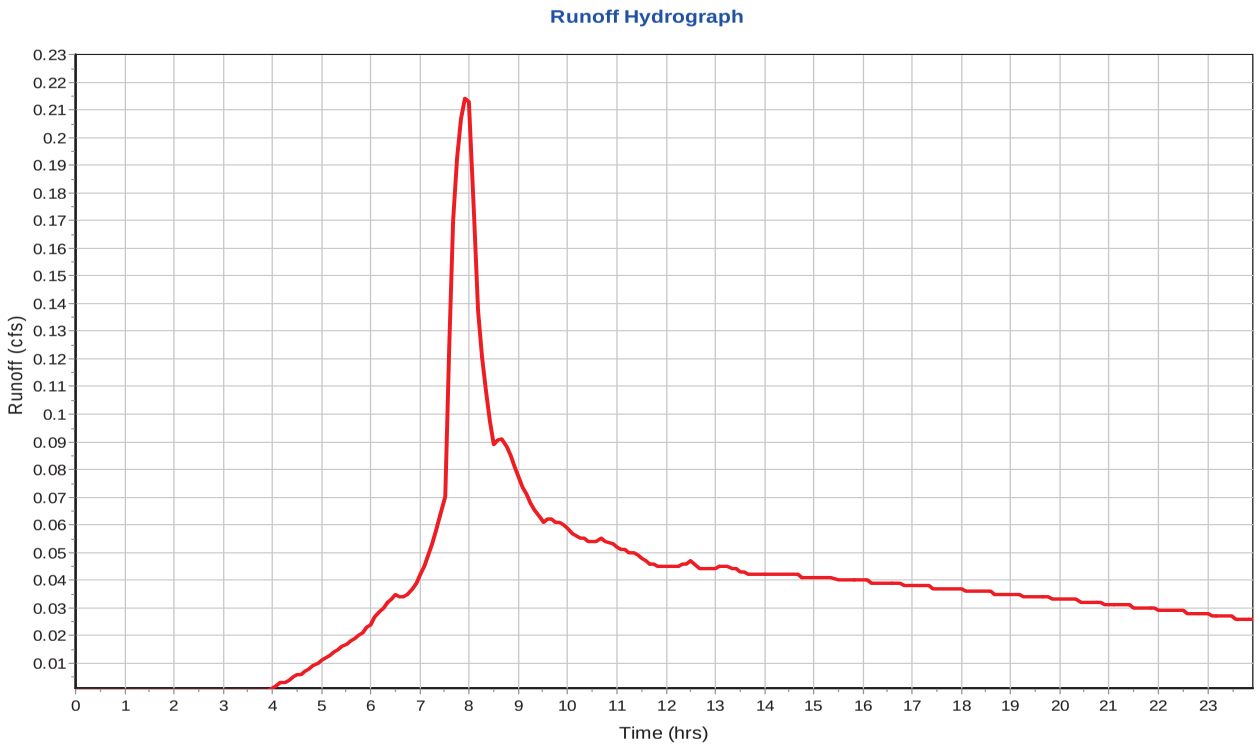
Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.4
Peak Runoff (cfs)	0.21
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:32

Subbasin : Sub-A_21W-22





Subbasin : Sub-A_22E-23

Input Data

Area (ac)	0.59
Peak Rate Factor	484
Weighted Curve Number	75
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.1	D	80
Pasture, grassland, or range, Good	0.49	C	74
Composite Area & Weighted CN	0.59		75

Time of Concentration

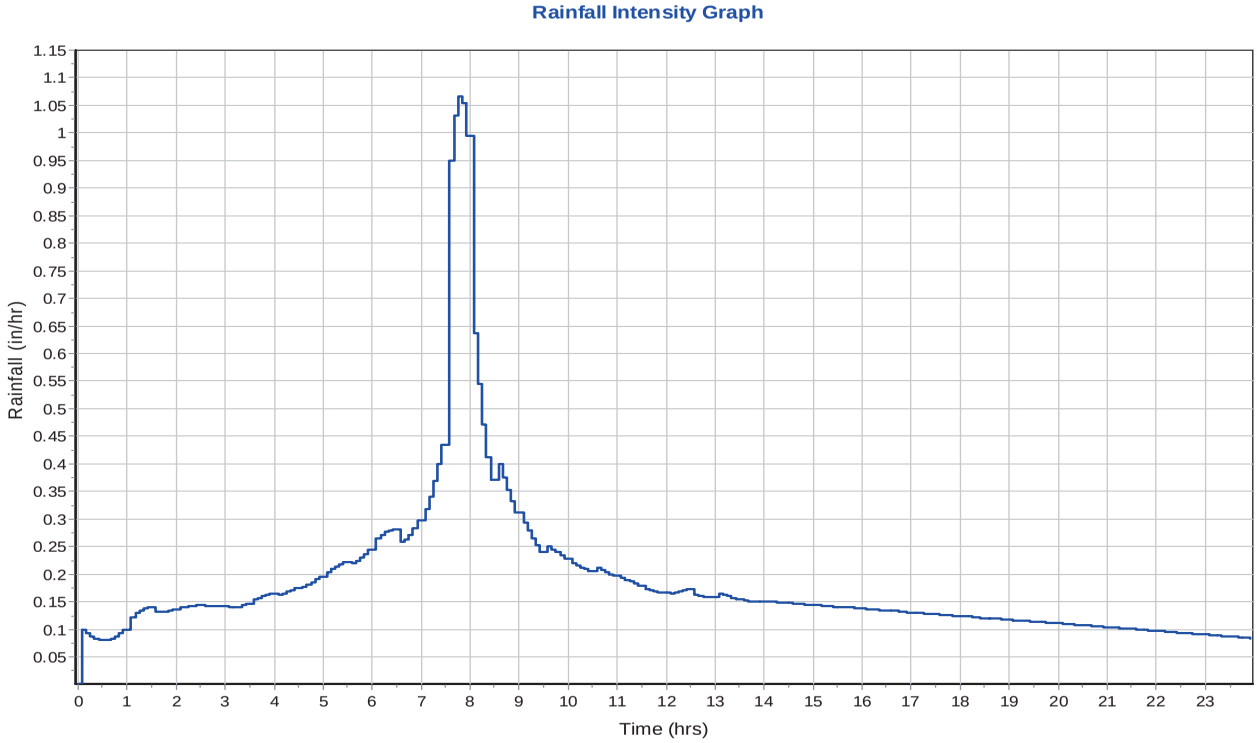
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	105	0	0
Slope (%) :	15	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.48	0	0

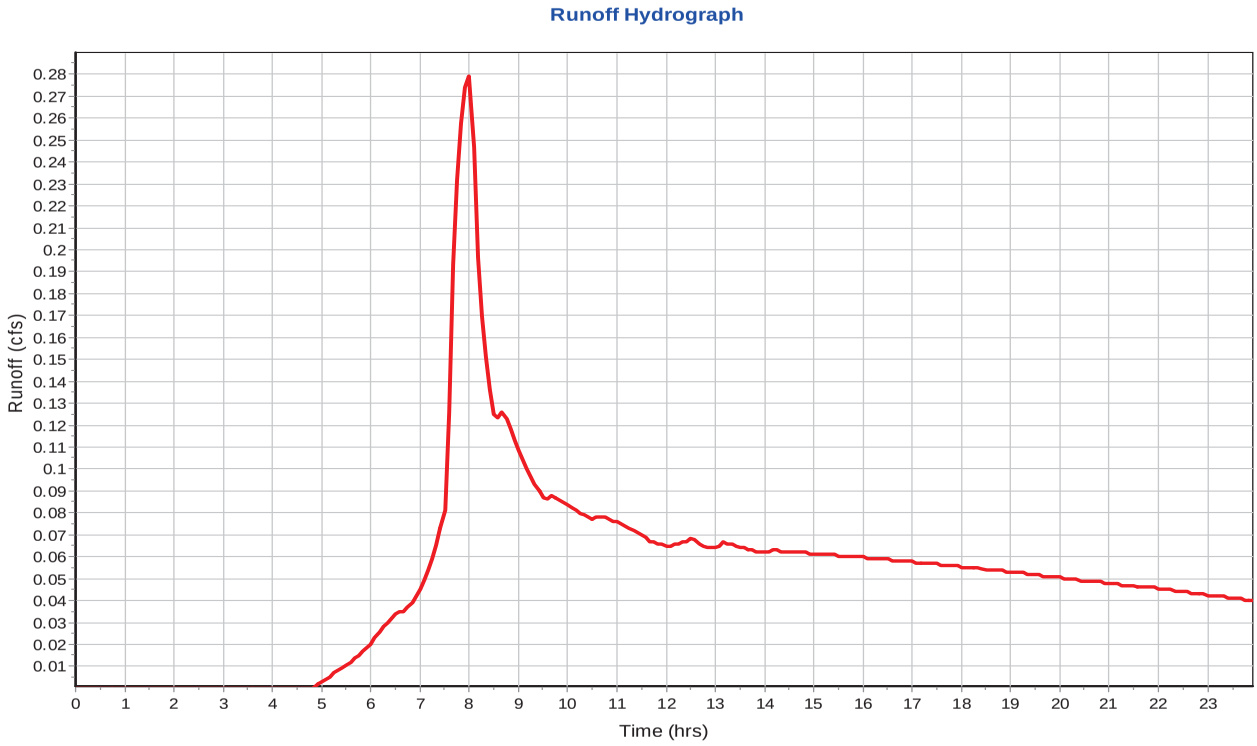
Total TOC (min) 8.48

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2
Peak Runoff (cfs)	0.26
Weighted Curve Number	75
Time of Concentration (days hh:mm:ss)	0 00:08:29

Subbasin : Sub-A_22E-23





Subbasin : Sub-A_22W-23

Input Data

Area (ac)	0.42
Peak Rate Factor	484
Weighted Curve Number	79.28
Rain Gage ID	Rain Gage-01

Composite Curve Number

32	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.37	D	80
Pasture, grassland, or range, Good	0.05	C	74
Composite Area & Weighted CN	0.42		79.28

Time of Concentration

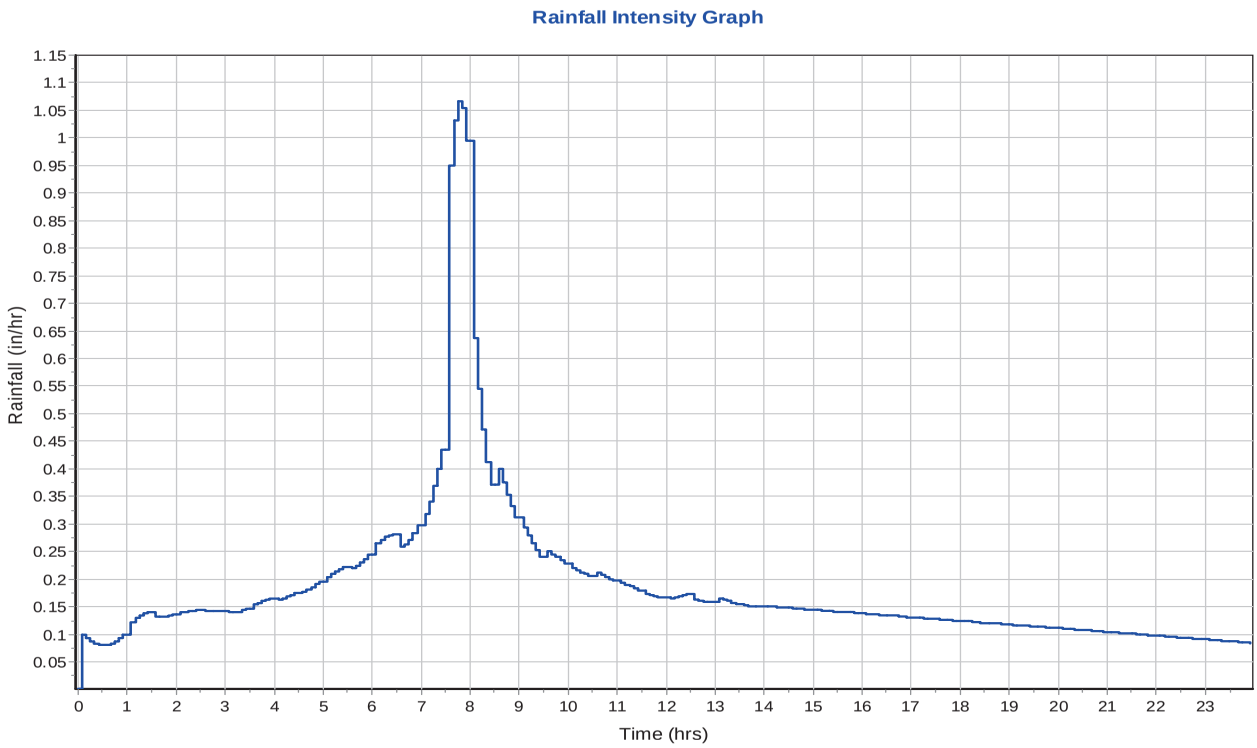
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	75	0	0
Slope (%) :	23	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	5.46	0	0

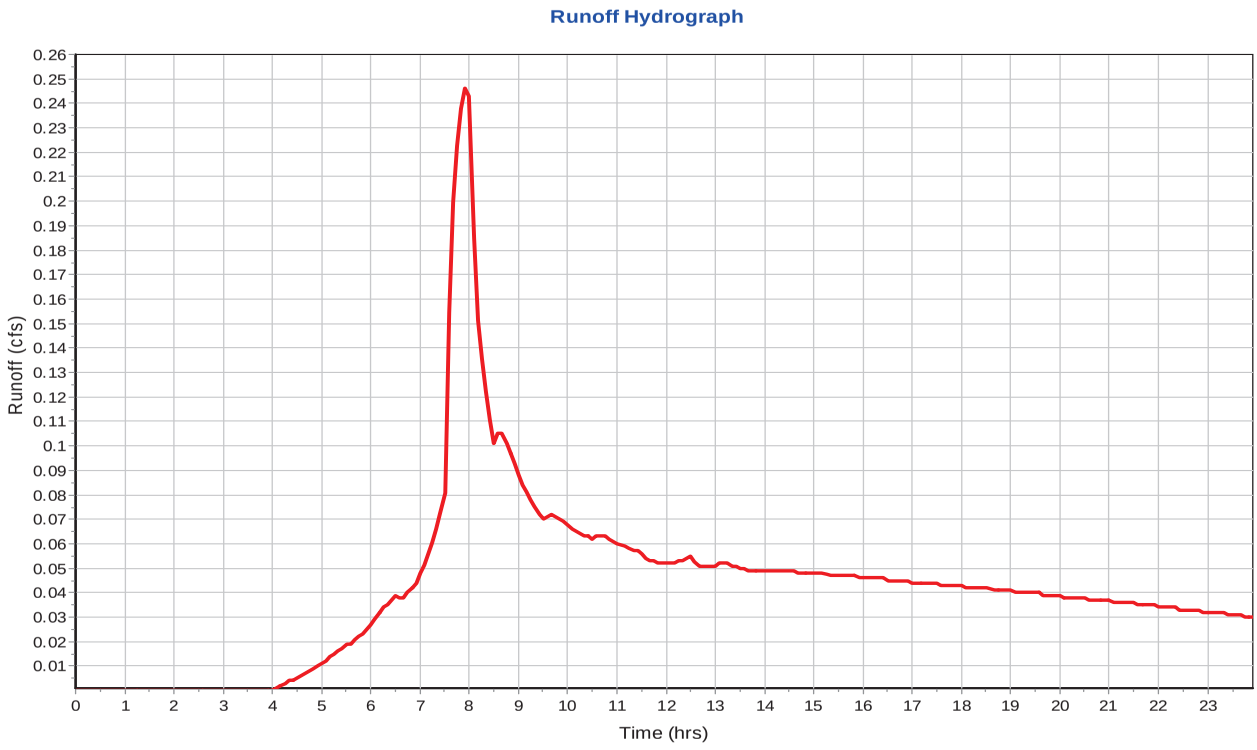
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.34
Peak Runoff (cfs)	0.24
Weighted Curve Number	79.28
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_22W-23





Subbasin : Sub-A_23E-24

Input Data

Area (ac)	0.52
Peak Rate Factor	484
Weighted Curve Number	74
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.52	C	74
Composite Area & Weighted CN	0.52		74

Time of Concentration

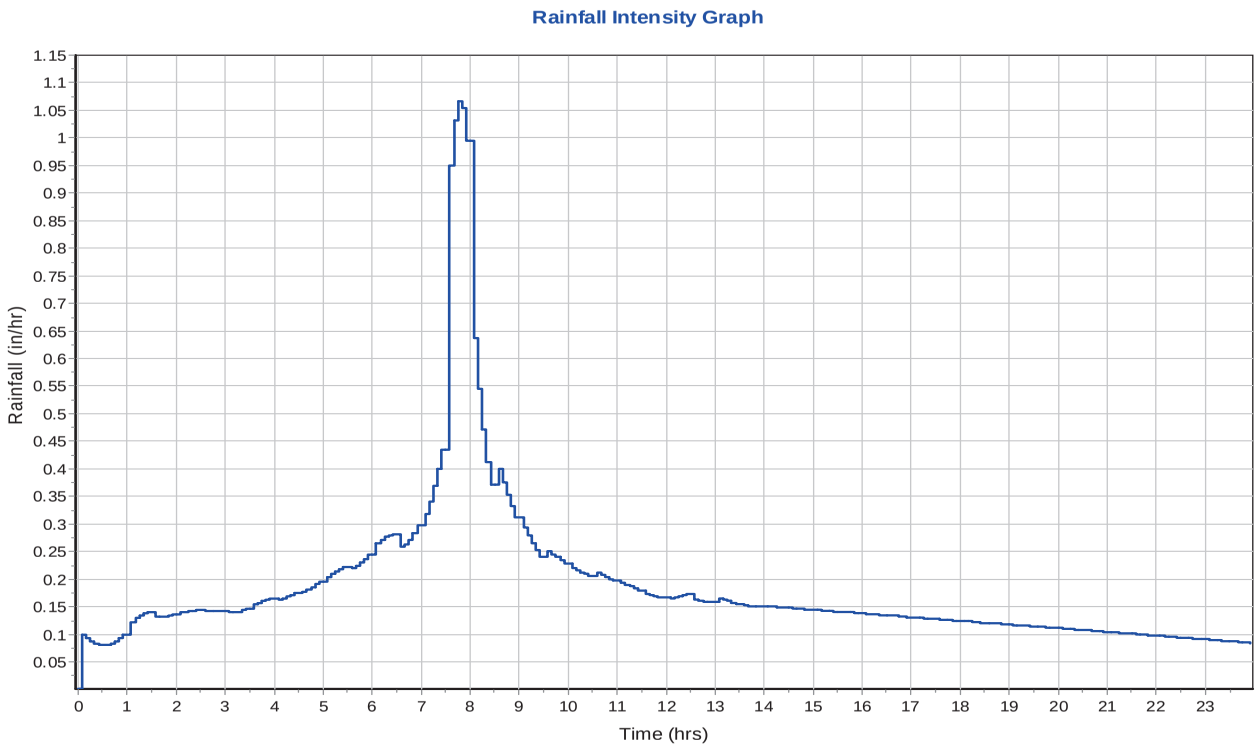
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	50	0	0
Slope (%) :	6	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.12	0	0
Computed Flow Time (min) :	6.75	0	0

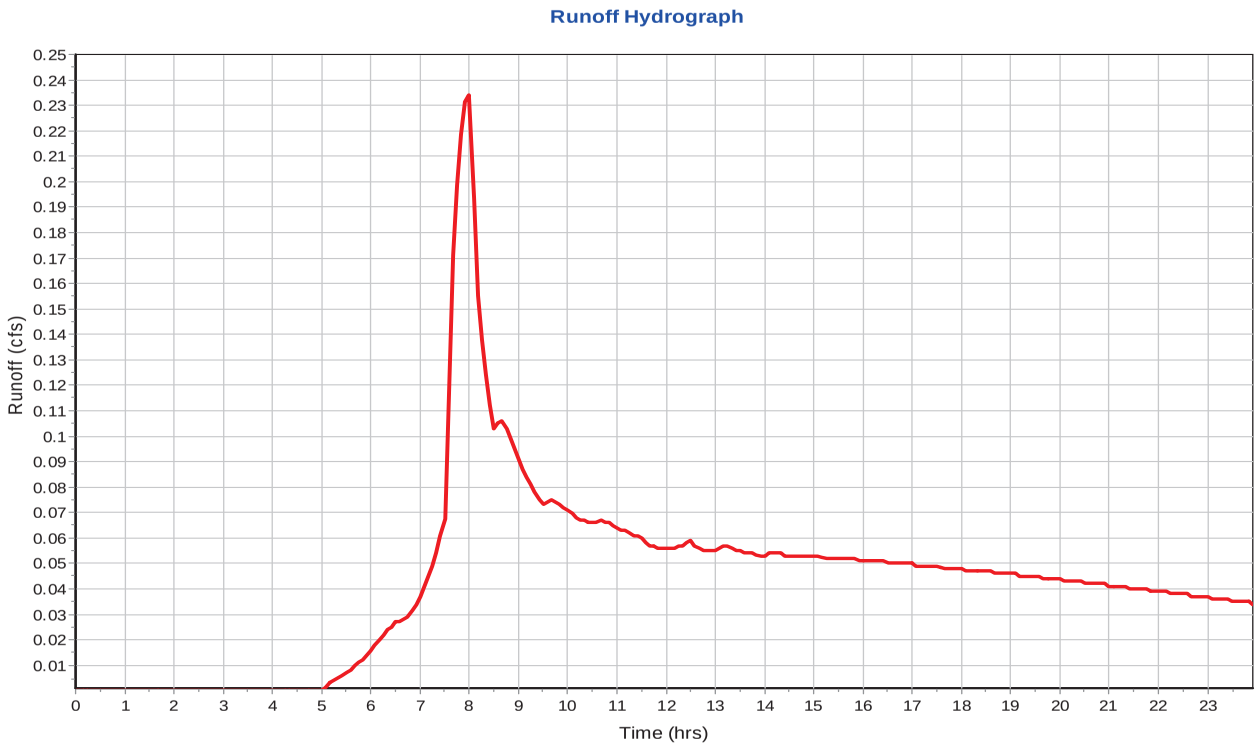
Total TOC (min) 6.75

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	1.92
Peak Runoff (cfs)	0.22
Weighted Curve Number	74
Time of Concentration (days hh:mm:ss)	0 00:06:45

Subbasin : Sub-A_23E-24





Subbasin : Sub-A_23W-24

Input Data

Area (ac)	0.43
Peak Rate Factor	484
Weighted Curve Number	77.33
Rain Gage ID	Rain Gage-01

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
Pasture, grassland, or range, Good	0.24	D	80
Pasture, grassland, or range, Good	0.19	C	74
Composite Area & Weighted CN	0.43		77.33

Time of Concentration

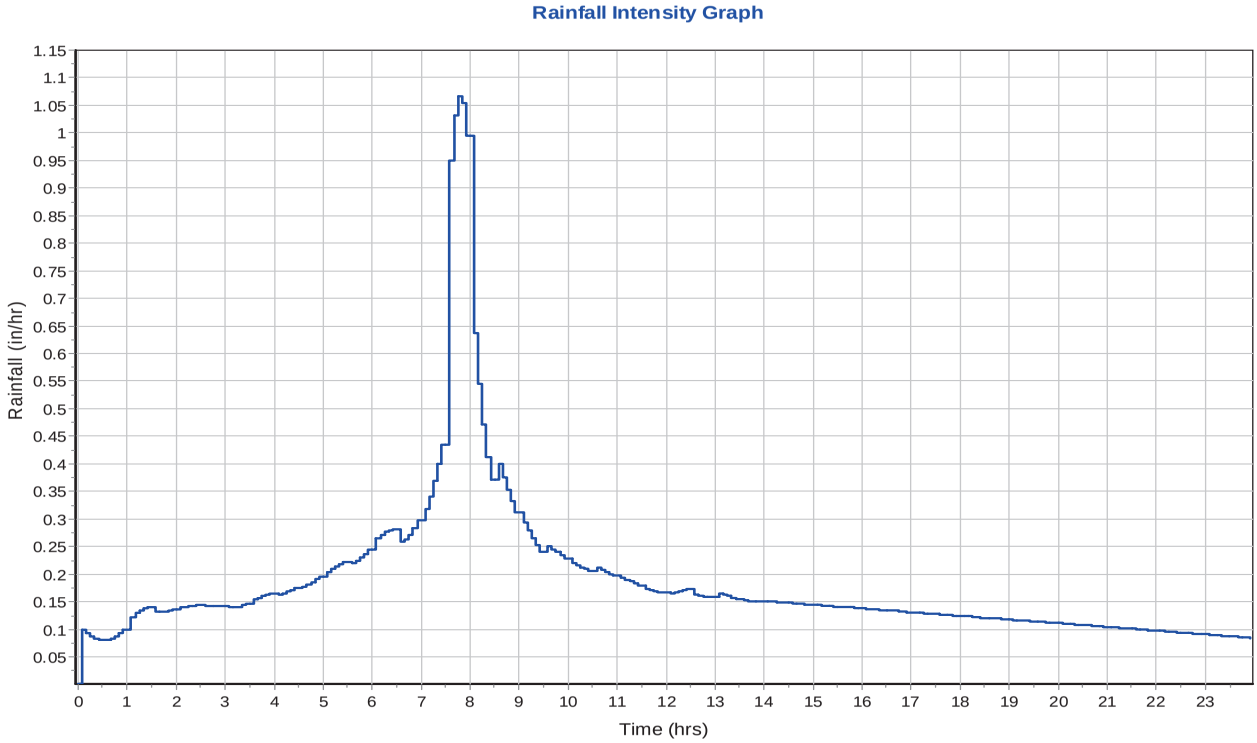
	Subarea	Subarea	Subarea
Sheet Flow Computations	A	B	C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.21	0	0

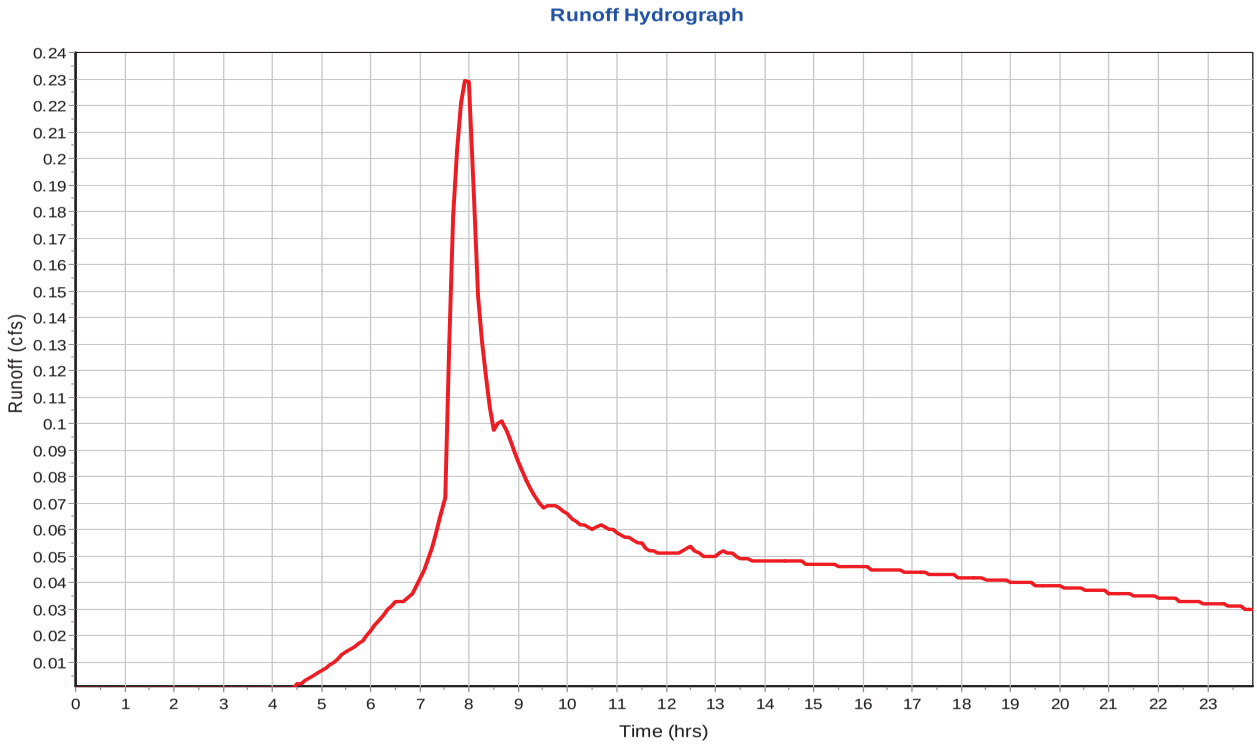
Total TOC (min) 6.21

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.18
Peak Runoff (cfs)	0.22
Weighted Curve Number	77.33
Time of Concentration (days hh:mm:ss)	0 00:06:13

Subbasin : Sub-A_23W-24





Subbasin : Sub-A_24

Input Data

Area (ac)	0.7
Peak Rate Factor	484
Weighted Curve Number	77.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.14	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.31	C	73
Brush, Poor	0.19	D	83
Composite Area & Weighted CN	0.7		77.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.47	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	7.44	0	0

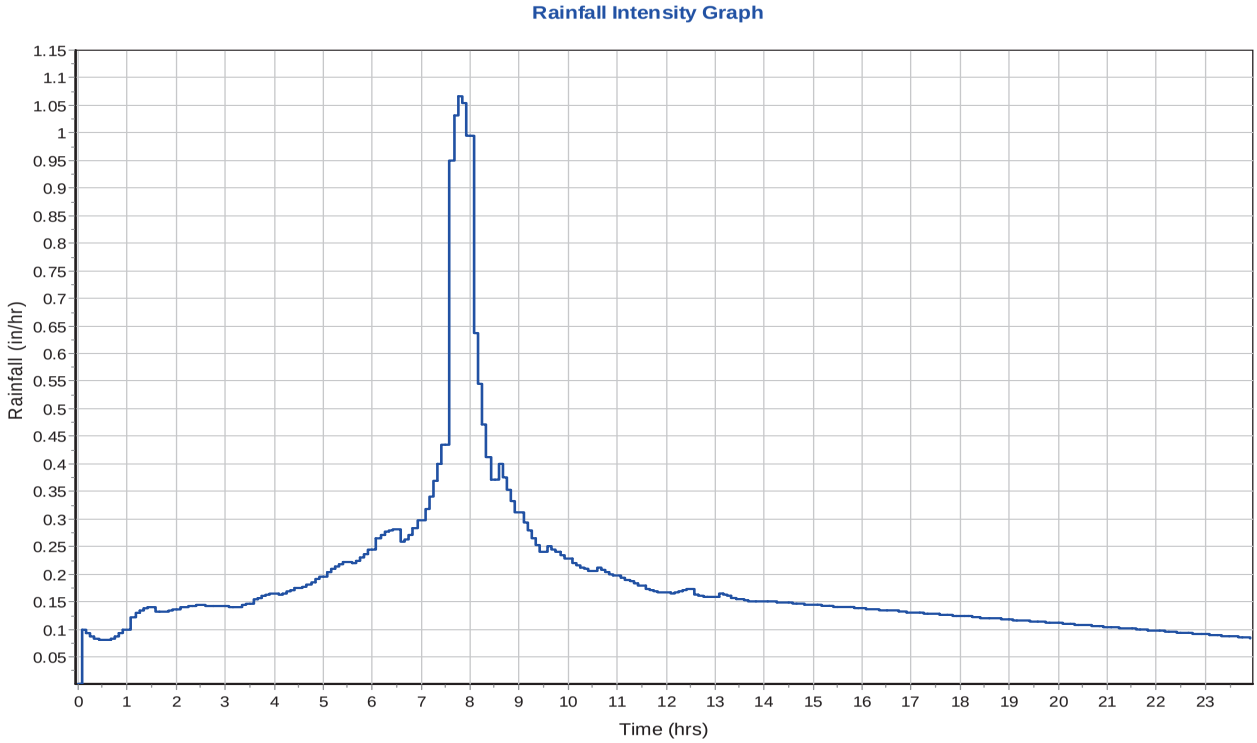
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	89	0	0
Slope (%) :	25	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0	0
Computed Flow Time (min) :	1.19	0	0

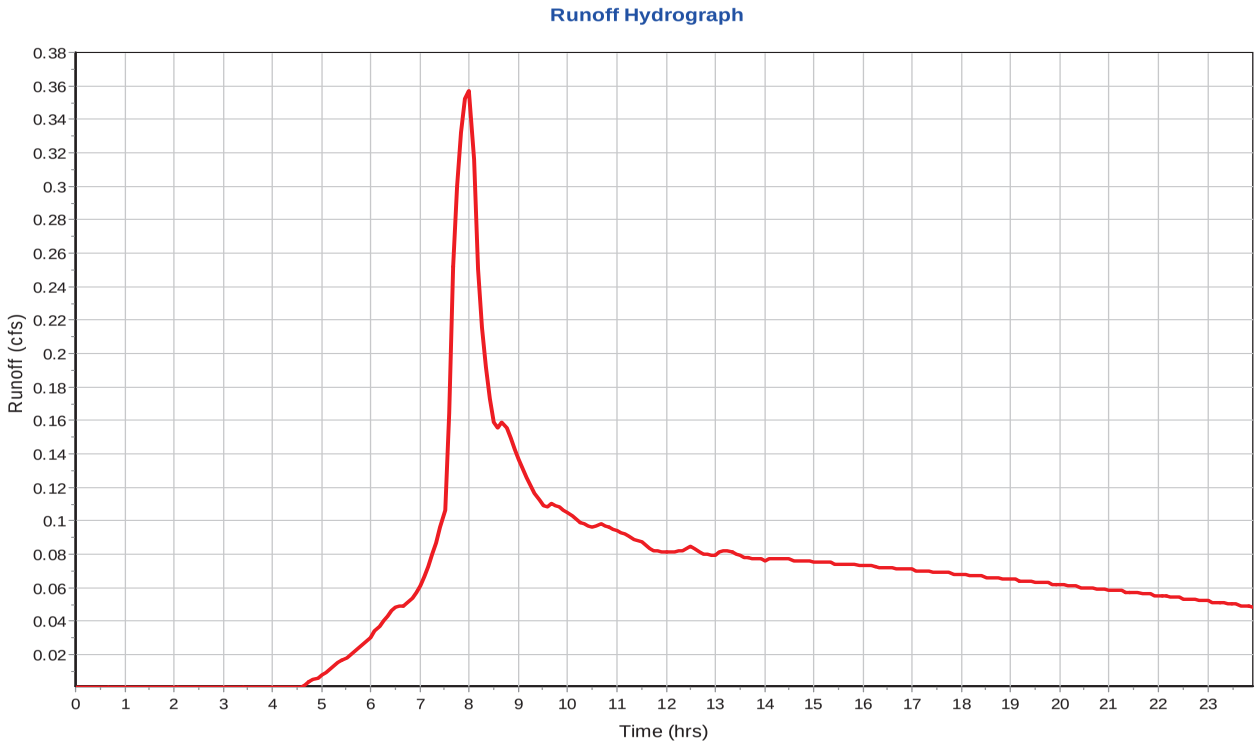
Total TOC (min) 8.63

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	2.17
Peak Runoff (cfs)	0.35
Weighted Curve Number	77.2
Time of Concentration (days hh:mm:ss)	0 00:08:38

Subbasin : Sub-A_24





Subbasin : Sub-B

Input Data

Area (ac)	5.05
Peak Rate Factor	484
Weighted Curve Number	73.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	4.03	C	73
Pasture, grassland, or range, Good	1.02	C	74
Composite Area & Weighted CN	5.05		73.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

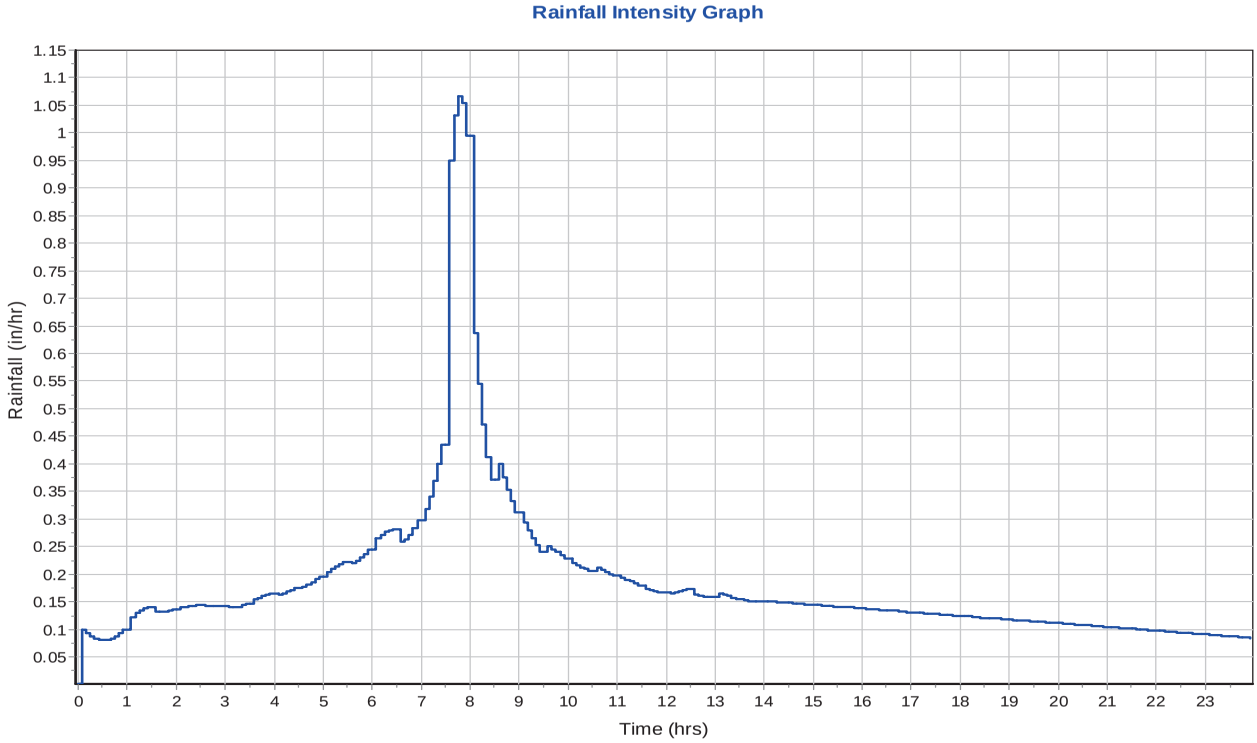
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

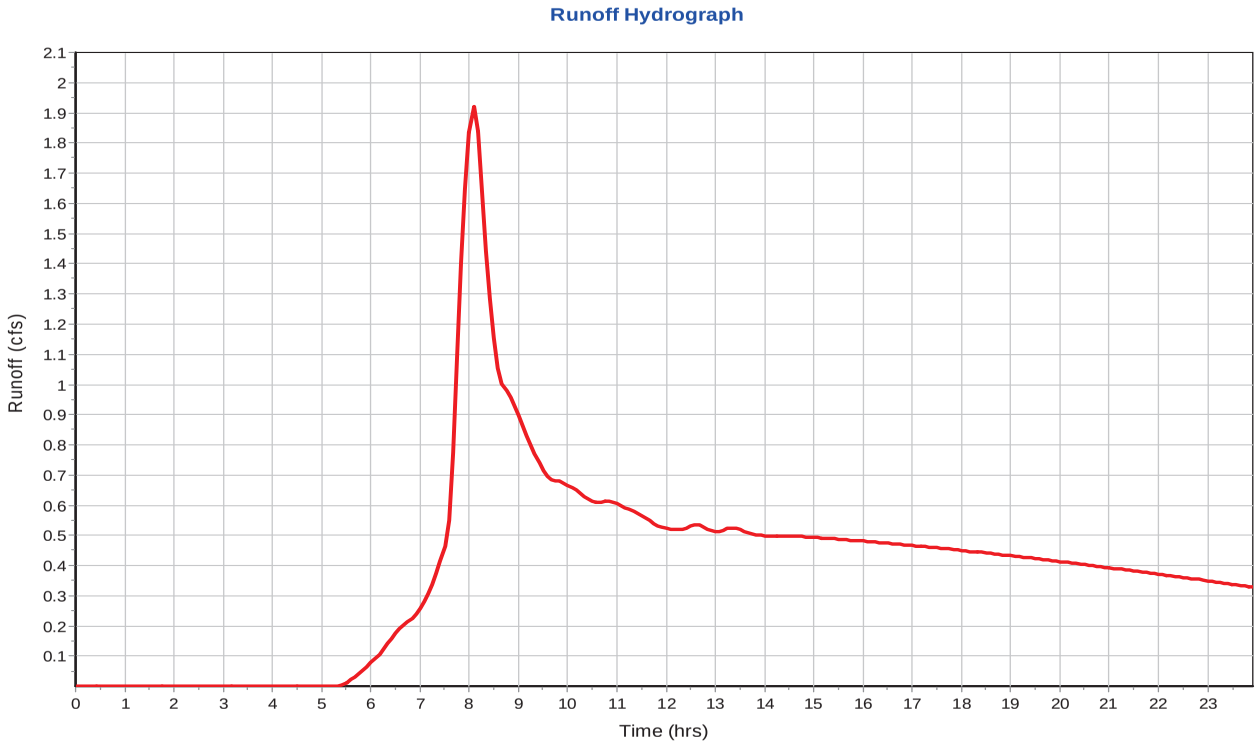
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in)	4.43
Total Runoff (in)	1.86
Peak Runoff (cfs)	1.9
Weighted Curve Number	73.2
Time of Concentration (days hh:mm:ss)	0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	167.00	17.58	User-Defined	4.0	18.9	0.040	0.000	0.500	0.000	0.00	No
DV-02W	173.00	416.00	411.00	5.00	2.89	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-04	162.99	450.00	446.00	4.00	2.45	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-08	220.00	514.00	508.00	6.00	2.73	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-09	150.00	545.00	526.00	19.00	12.67	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-19	121.00	416.50	414.00	2.50	2.07	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-20	114.00	436.00	433.00	3.00	2.63	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21E	81.00	445.00	443.00	2.00	2.47	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21W	114.00	445.50	443.00	2.50	2.19	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22E	143.00	467.00	464.00	3.00	2.10	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22W	121.00	467.00	464.00	3.00	2.48	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23E	172.00	498.00	494.00	4.00	2.33	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23W	165.00	498.00	494.00	4.00	2.42	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No

Channel Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)
DC-B	1.88	0 08:11	860.24	0.00	5.09	3.11	0.41	0.10	0.00
DV-02W	0.77	0 08:05	27.23	0.03	1.26	2.29	0.13	0.26	0.00
DV-04	0.72	0 08:05	25.09	0.03	1.17	2.32	0.13	0.26	0.00
DV-08	0.83	0 08:05	39.68	0.02	1.14	3.22	0.12	0.23	0.00
DV-09	0.90	0 08:05	14.25	0.06	3.19	0.78	0.18	0.35	0.00
DV-19	0.12	0 08:05	5.76	0.02	0.98	2.06	0.12	0.23	0.00
DV-20	0.26	0 08:01	12.99	0.02	1.10	1.73	0.11	0.23	0.00
DV-21E	0.19	0 08:01	6.29	0.03	1.18	1.14	0.14	0.27	0.00
DV-21W	0.20	0 08:05	5.93	0.03	1.15	1.65	0.14	0.28	0.00
DV-22E	0.26	0 08:05	5.80	0.05	1.20	1.99	0.16	0.31	0.00
DV-22W	0.23	0 08:01	6.31	0.04	1.25	1.61	0.15	0.29	0.00
DV-23E	0.22	0 08:05	6.11	0.04	1.20	2.39	0.14	0.29	0.00
DV-23W	0.22	0 08:05	6.23	0.04	1.22	2.25	0.14	0.28	0.00

Pipe Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
Pipe-A-01.1.1	65.39	394.00	378.00	16.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.2	69.53	411.00	394.00	17.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.3	68.85	430.00	411.00	19.00	27.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.4	79.38	446.00	430.00	16.00	20.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.5	71.22	460.00	446.00	14.00	19.7	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.6	75.38	478.00	460.00	18.00	23.9	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.7	68.91	496.00	478.00	18.00	26.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.8	42.46	508.00	496.00	12.00	28.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.9	80.47	526.00	508.00	18.00	22.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.1	165.00	417.00	378.00	39.00	23.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.2	96.92	432.00	417.00	15.00	15.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.3	86.88	445.00	432.00	13.00	15.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.4	80.74	454.00	445.00	9.00	11.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.5	60.02	462.00	454.00	8.00	13.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.6	57.26	476.00	462.00	14.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.7	72.02	494.00	476.00	18.00	25.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.8	73.27	508.00	494.00	14.00	19.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.9	106.58	523.30	508.00	15.30	14.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.1	119.80	414.00	378.00	36.00	30.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.2	56.92	433.00	414.00	19.00	33.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.3	76.14	443.00	433.00	10.00	13.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.4	99.32	464.00	443.00	21.00	21.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.5	158.33	494.00	464.00	30.00	19.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.6	151.88	508.00	494.00	14.00	9.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1

Pipe Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	3.41	0 08:05	17.62	0.19	17.35	0.06	0.30	0.30	0.00	Calculated
Pipe-A-01.1.2	3.22	0 08:05	17.62	0.18	17.05	0.07	0.29	0.29	0.00	Calculated
Pipe-A-01.1.3	2.45	0 08:06	18.72	0.13	16.49	0.07	0.24	0.24	0.00	Calculated
Pipe-A-01.1.4	2.45	0 08:05	16.00	0.15	14.74	0.09	0.26	0.26	0.00	Calculated
Pipe-A-01.1.5	1.73	0 08:05	15.80	0.11	13.20	0.09	0.22	0.22	0.00	Calculated
Pipe-A-01.1.6	1.73	0 08:05	17.41	0.10	14.15	0.09	0.21	0.21	0.00	Calculated
Pipe-A-01.1.7	1.73	0 08:05	18.21	0.10	14.62	0.08	0.21	0.21	0.00	Calculated
Pipe-A-01.1.8	1.73	0 08:05	18.94	0.09	15.03	0.05	0.20	0.20	0.00	Calculated
Pipe-A-01.1.9	0.90	0 08:05	16.85	0.05	11.40	0.12	0.16	0.16	0.00	Calculated
Pipe-A-01.2.1	3.41	0 08:01	17.32	0.20	17.14	0.16	0.30	0.30	0.00	Calculated
Pipe-A-01.2.2	3.41	0 08:01	14.02	0.24	14.72	0.11	0.34	0.34	0.00	Calculated
Pipe-A-01.2.3	3.41	0 08:01	13.78	0.25	14.54	0.10	0.34	0.34	0.00	Calculated
Pipe-A-01.2.4	3.41	0 08:00	11.90	0.29	13.08	0.10	0.37	0.37	0.00	Calculated
Pipe-A-01.2.5	3.41	0 08:00	13.01	0.26	13.95	0.07	0.35	0.35	0.00	Calculated
Pipe-A-01.2.6	3.41	0 08:00	17.62	0.19	17.35	0.06	0.30	0.30	0.00	Calculated
Pipe-A-01.2.7	3.41	0 08:00	17.81	0.19	17.49	0.07	0.30	0.30	0.00	Calculated
Pipe-A-01.2.8	3.41	0 08:00	15.57	0.22	15.89	0.08	0.32	0.32	0.00	Calculated
Pipe-A-01.2.9	3.41	0 08:00	13.52	0.25	14.35	0.12	0.34	0.34	0.00	Calculated
Pipe-A-02.1	2.05	0 08:05	19.53	0.11	16.13	0.12	0.22	0.22	0.00	Calculated
Pipe-A-02.2	1.94	0 08:05	20.58	0.09	16.48	0.06	0.21	0.21	0.00	Calculated
Pipe-A-02.3	1.68	0 08:05	12.91	0.13	11.36	0.11	0.24	0.24	0.00	Calculated
Pipe-A-02.4	1.29	0 08:05	16.38	0.08	12.45	0.13	0.19	0.19	0.00	Calculated
Pipe-A-02.5	0.79	0 08:05	15.51	0.05	10.37	0.25	0.15	0.15	0.00	Calculated
Pipe-A-02.6	0.35	0 08:05	10.82	0.03	6.35	0.40	0.12	0.12	0.00	Calculated

Storage Nodes

Storage Node : Stor-A_1.1-Tee

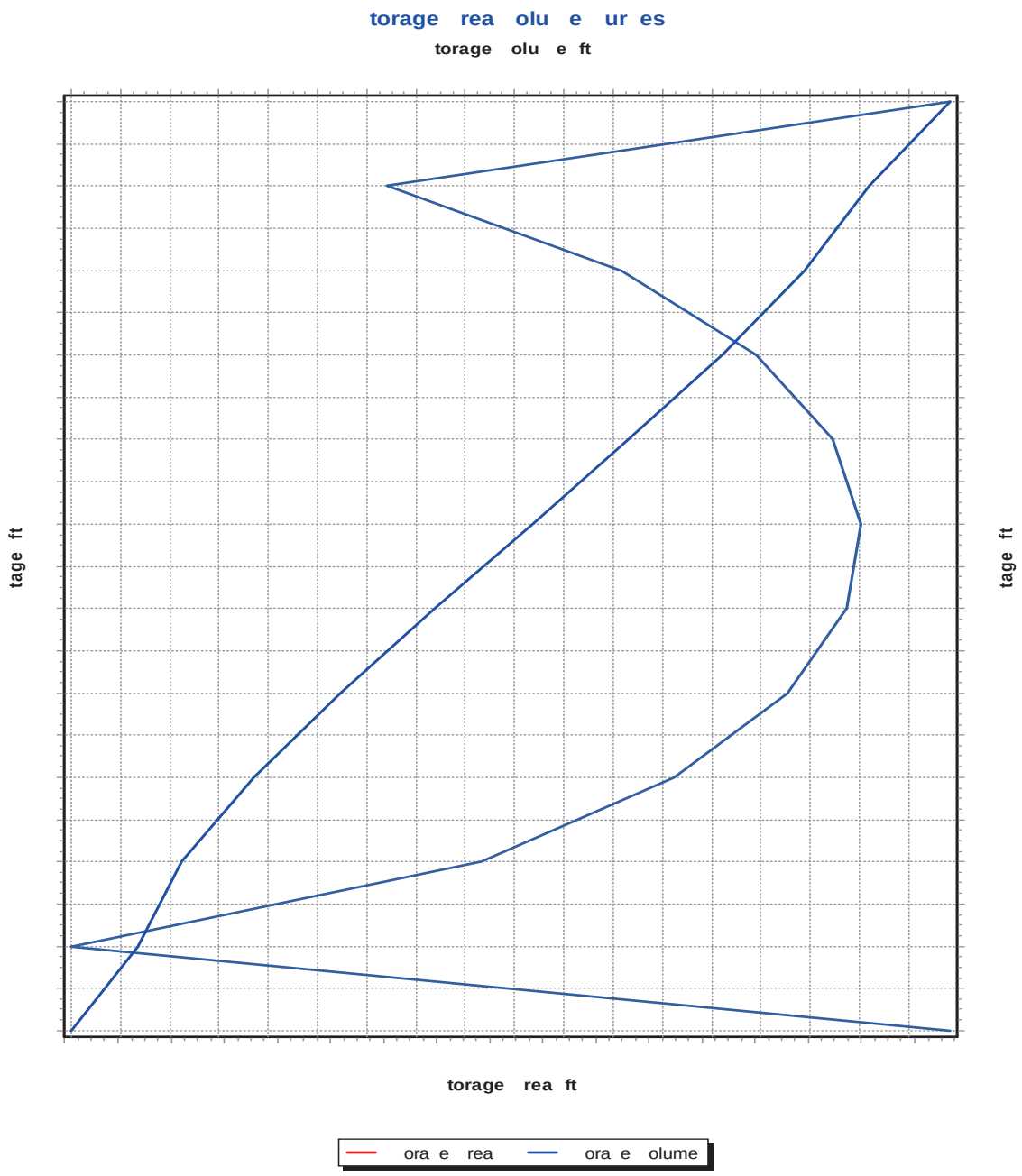
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_01.1 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.1-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.1-0	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.1-0	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.1-0	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.1-0	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.1-	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	3.41
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	3.41
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	379.31
Max HGL Depth Attained (ft)	1.31
Average HGL Elevation Attained (ft)	378.67
Average HGL Depth Attained (ft)	0.67
Time of Max HGL Occurrence (days hh:mm)	0 08:05
Total Exfiltration Volume (1000-ft³)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Storage Node : Stor-A_1.2-Tee

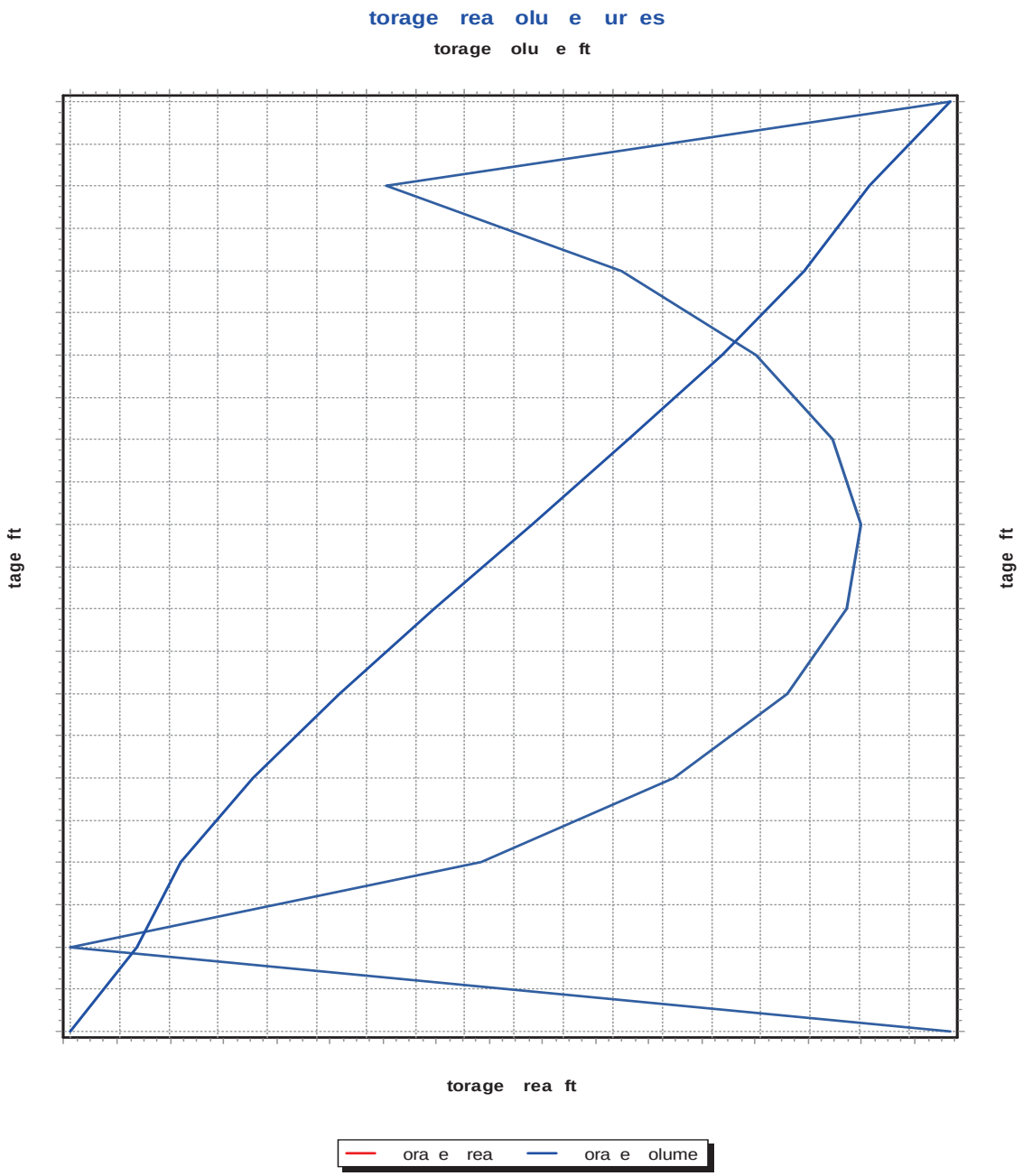
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.2-0:	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.2-0:	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.2-0:	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.2-0	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.2-	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	3.41
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	3.41
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	379.31
Max HGL Depth Attained (ft)	1.31
Average HGL Elevation Attained (ft)	378.68
Average HGL Depth Attained (ft)	0.68
Time of Max HGL Occurrence (days hh:mm)	0 08:02
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Storage Node : Stor-A_2-Tee

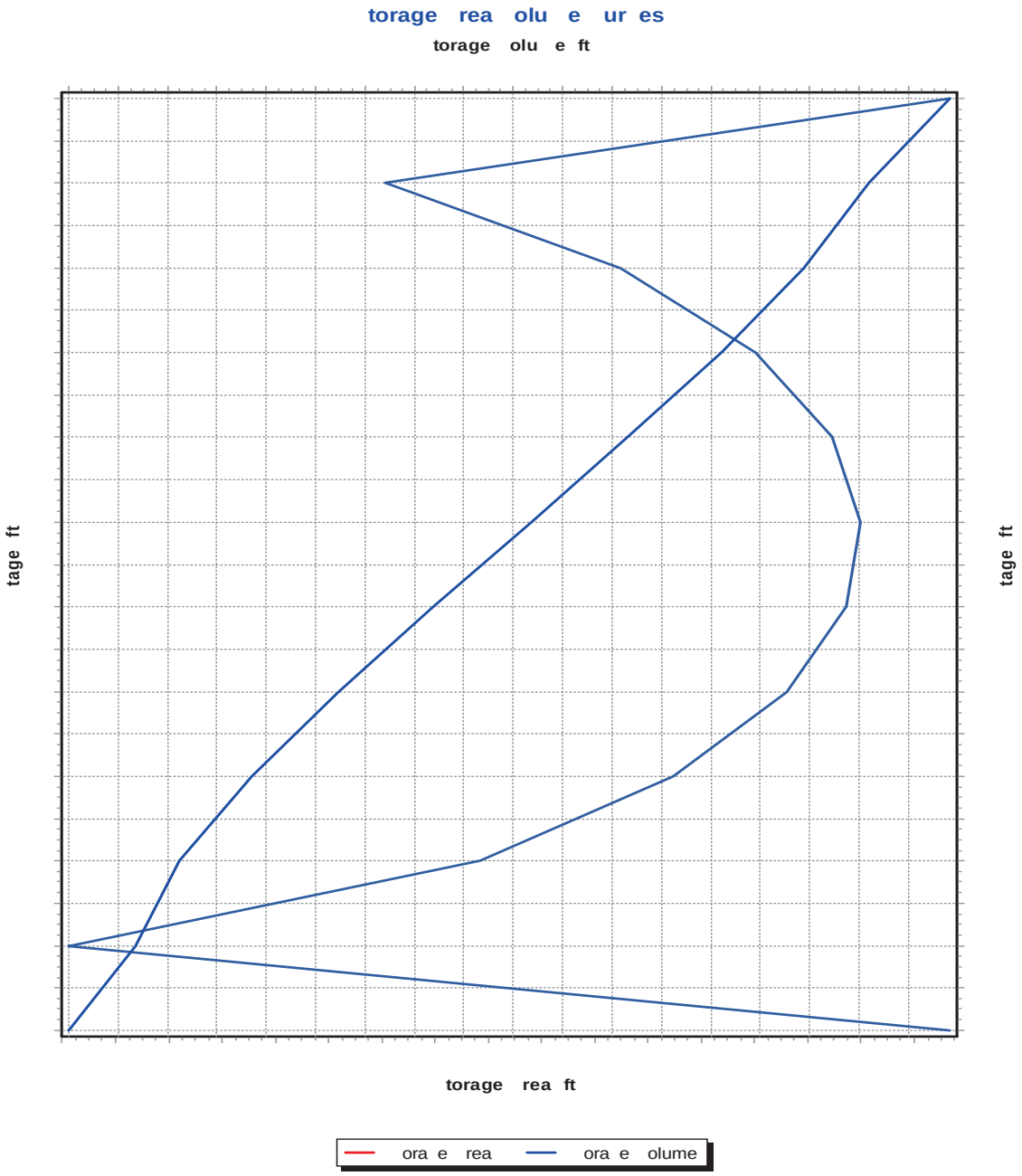
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_2-0:	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_2-0:	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_2-0:	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_2-0	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_2-1	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	2.05
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	2.05
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	379.13
Max HGL Depth Attained (ft)	1.13
Average HGL Elevation Attained (ft)	378.62
Average HGL Depth Attained (ft)	0.62
Time of Max HGL Occurrence (days hh:mm)	0 08:06
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Project Description

File Name	2001-DRHY-Proposed-SD_TS.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA. Proposed (Post-Development) Conditions Analysis

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	19
Nodes	45
Junctions	37
Outfalls	5
Flow Diversions	0
Inlets	0
Storage Nodes	3
Links	78
Channels	13
Pipes	24
Pumps	0
Orifices	30
Weirs	11
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution

Subbasin Summary

Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A (Offsite SE)	1.89	484	81.47	6.52	4.41	8.34	2.14	0 00:06:13
Sub-A (Offsite W)	2.13	484	83.00	6.52	4.58	9.75	2.51	0 00:09:26
Sub-A_01E	0.82	484	80.00	6.52	4.25	3.49	0.89	0 00:06:30
Sub-A_01W-02	0.34	484	80.00	6.52	4.25	1.45	0.37	0 00:05:00
Sub-A_02-04	1.33	484	80.00	6.52	4.25	5.66	1.45	0 00:06:40
Sub-A_04-06	1.24	484	80.00	6.52	4.25	5.27	1.35	0 00:06:40
Sub-A_06-09	1.43	484	80.00	6.52	4.25	6.08	1.55	0 00:06:40
Sub-A_09	1.49	484	80.95	6.52	4.36	6.49	1.66	0 00:08:42
Sub-A_18	5.50	484	81.53	6.52	4.42	24.29	6.24	0 00:07:16
Sub-A_19-20	0.20	484	80.00	6.52	4.25	0.86	0.22	0 00:06:19
Sub-A_20-21	0.44	484	80.00	6.52	4.25	1.87	0.48	0 00:05:27
Sub-A_21E-22	0.38	484	77.32	6.52	3.97	1.51	0.38	0 00:05:10
Sub-A_21W-22	0.35	484	80.00	6.52	4.25	1.49	0.38	0 00:06:32
Sub-A_22E-23	0.59	484	75.00	6.52	3.73	2.19	0.54	0 00:08:28
Sub-A_22W-23	0.42	484	79.28	6.52	4.18	1.75	0.44	0 00:05:27
Sub-A_23E-24	0.52	484	74.00	6.52	3.63	1.88	0.46	0 00:06:45
Sub-A_23W-24	0.43	484	77.33	6.52	3.97	1.70	0.43	0 00:06:12
Sub-A_24	0.70	484	77.20	6.52	3.96	2.77	0.69	0 00:08:37
Sub-B	5.05	484	73.20	6.52	3.55	17.90	4.07	0 00:19:49

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
DC-B	Junction	535.0	536.0	535.0	0.0	0.00	4.06	535.54	0.00	3.46	0 00:00	0.00	0.00
DI 01	Junction	394.0	400.0	396.0	400.0	0.00	6.35	394.41	0.00	5.59	0 00:00	0.00	0.00
DI 02	Junction	411.0	418.0	411.0	418.0	0.00	5.98	411.40	0.00	6.62	0 00:00	0.00	0.00
DI 03	Junction	430.0	434.1	430.0	434.1	0.00	4.54	430.36	0.00	3.76	0 00:00	0.00	0.00
DI 04	Junction	446.0	450.0	446.0	450.0	0.00	4.54	446.36	0.00	3.65	0 00:00	0.00	0.00
DI 05	Junction	460.0	464.1	460.0	464.1	0.00	3.19	460.31	0.00	3.78	0 00:00	0.00	0.00
DI 06	Junction	478.0	482.1	478.0	482.1	0.00	3.19	478.29	0.00	3.82	0 00:00	0.00	0.00
DI 07	Junction	496.0	500.0	496.0	500.0	0.00	3.19	496.28	0.00	3.73	0 00:00	0.00	0.00
DI 08	Junction	508.0	511.8	508.0	511.8	0.00	3.19	508.28	0.00	3.55	0 00:00	0.00	0.00
DI 09	Junction	526.0	531.0	526.0	531.0	0.00	1.65	526.22	0.00	4.73	0 00:00	0.00	0.00
DI 10	Junction	417.0	420.0	416.0	420.0	0.00	6.23	417.47	0.00	2.53	0 00:00	0.00	0.00
DI 11	Junction	432.0	436.0	432.0	436.0	0.00	6.23	432.47	0.00	3.54	0 00:00	0.00	0.00
DI 12	Junction	445.0	450.0	446.0	450.0	0.00	6.23	445.51	0.00	4.47	0 00:00	0.00	0.00
DI 13	Junction	454.0	458.0	454.0	458.0	0.00	6.23	454.51	0.00	3.50	0 00:00	0.00	0.00
DI 14	Junction	462.0	466.2	462.0	466.2	0.00	6.23	462.49	0.00	3.75	0 00:00	0.00	0.00
DI 15	Junction	476.0	479.6	476.0	479.6	0.00	6.23	476.41	0.00	3.17	0 00:00	0.00	0.00
DI 16	Junction	494.0	498.1	494.0	498.1	0.00	6.23	494.44	0.00	3.68	0 00:00	0.00	0.00
DI 17	Junction	508.0	512.5	508.0	512.5	0.00	6.23	508.48	0.00	4.02	0 00:00	0.00	0.00
DI 18	Junction	523.3	527.4	523.3	527.4	0.00	6.23	523.82	0.00	3.57	0 00:00	0.00	0.00
DI 19	Junction	414.0	418.3	414.0	418.3	0.00	4.00	414.31	0.00	3.99	0 00:00	0.00	0.00
DI 20	Junction	433.0	437.4	437.4	437.4	0.00	3.78	433.34	0.00	4.06	0 00:00	0.00	0.00
DI 21	Junction	443.0	447.3	443.0	447.3	0.00	3.30	443.34	0.00	3.93	0 00:00	0.00	0.00
DI 22	Junction	464.0	468.0	464.0	468.0	0.00	2.54	464.27	0.00	3.77	0 00:00	0.00	0.00
DI 23	Junction	494.0	498.1	494.0	498.1	0.00	1.57	494.21	0.00	3.85	0 00:00	0.00	0.00
DI 24	Junction	508.0	512.6	508.0	512.6	0.00	0.69	508.17	0.00	4.43	0 00:00	0.00	0.00
HP-02	Junction	415.0	416.5	0.0	0.0	0.00	1.44	416.17	0.00	0.33	0 00:00	0.00	0.00
HP-04W	Junction	450.0	451.0	0.0	0.0	0.00	1.35	450.17	0.00	0.83	0 00:00	0.00	0.00
HP-09	Junction	545.0	546.0	0.0	0.0	0.00	1.65	545.22	0.00	0.78	0 00:00	0.00	0.00
HP-19	Junction	416.5	417.5	0.0	0.0	0.00	0.22	416.65	0.00	0.85	0 00:00	0.00	0.00
HP-20	Junction	436.0	436.0	0.0	0.0	0.00	0.48	436.15	0.00	0.35	0 00:00	0.00	0.00
HP-21	Junction	445.5	446.5	0.0	0.0	0.00	0.38	445.68	0.00	0.82	0 00:00	0.00	0.00

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
HP-22	Junction	467.0	468.0	0.0	0.0	0.00	0.44	467.18	0.00	0.82	0 00:00	0.00	0.00
HP-23	Junction	498.0	499.0	0.0	0.0	0.00	0.43	498.18	0.00	0.82	0 00:00	0.00	0.00
WB-08	Junction	514.0	515.0	0.0	0.0	0.00	1.55	514.15	0.00	0.85	0 00:00	0.00	0.00
WB-21	Junction	445.0	446.0	0.0	0.0	0.00	0.38	445.17	0.00	0.83	0 00:00	0.00	0.00
WB-22	Junction	467.0	468.0	0.0	0.0	0.00	0.54	467.20	0.00	0.80	0 00:00	0.00	0.00
WB-23	Junction	498.0	499.0	0.0	0.0	0.00	0.46	498.19	0.00	0.81	0 00:00	0.00	0.00
Out-A	Outfall	360.0					5.53	360.00					
Out-A_1.1-Tee	Outfall	378.0					6.31	378.00					
Out-A_1.2-Tee	Outfall	378.0					6.18	378.00					
Out-A_2-Tee	Outfall	378.0					3.98	378.00					
Out-B	Outfall	368.0					4.05	368.54					
Stor-A_1.1-Tee	Storage Node	378.0	384.0	378.0		0.00	6.35	380.44				0.00	0.00
Stor-A_1.2-Tee	Storage Node	378.0	384.0	378.0		0.00	6.23	380.38				0.00	0.00
Stor-A_2-Tee	Storage Node	378.0	384.0	378.0		0.00	4.00	379.92				0.00	0.00

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	Pipe	DI 01	Stor-A_1.1-Tee	65.4	394.0	378.0	24.47	12	0.013	6.35	17.62	0.36	20.59	0.41	0.41	0.00	Calculated
Pipe-A-01.1.2	Pipe	DI 02	DI 01	69.5	411.0	394.0	24.45	12	0.013	5.98	17.62	0.34	20.26	0.40	0.40	0.00	Calculated
Pipe-A-01.1.3	Pipe	DI 03	DI 02	68.8	430.0	411.0	27.60	12	0.013	4.54	18.72	0.24	19.63	0.33	0.34	0.00	Calculated
Pipe-A-01.1.4	Pipe	DI 04	DI 03	79.4	446.0	430.0	20.16	12	0.013	4.54	16.00	0.28	17.53	0.36	0.36	0.00	Calculated
Pipe-A-01.1.5	Pipe	DI 05	DI 04	71.2	460.0	446.0	19.66	12	0.013	3.19	15.80	0.20	15.75	0.30	0.31	0.00	Calculated
Pipe-A-01.1.6	Pipe	DI 06	DI 05	75.4	478.0	460.0	23.88	12	0.013	3.19	17.41	0.18	16.87	0.29	0.29	0.00	Calculated
Pipe-A-01.1.7	Pipe	DI 07	DI 06	68.9	496.0	478.0	26.12	12	0.013	3.19	18.21	0.18	17.42	0.28	0.28	0.00	Calculated
Pipe-A-01.1.8	Pipe	DI 08	DI 07	42.5	508.0	496.0	28.26	12	0.013	3.19	18.94	0.17	17.93	0.28	0.28	0.00	Calculated
Pipe-A-01.1.9	Pipe	DI 09	DI 08	80.5	526.0	508.0	22.37	12	0.013	1.65	16.85	0.10	13.65	0.21	0.21	0.00	Calculated
Pipe-A-01.2.1	Pipe	DI 10	Stor-A_1.2-Tee	165.0	417.0	378.0	23.64	12	0.013	6.23	17.32	0.36	20.23	0.41	0.41	0.00	Calculated
Pipe-A-01.2.2	Pipe	DI 11	DI 10	96.9	432.0	417.0	15.48	12	0.013	6.23	14.02	0.44	17.31	0.47	0.47	0.00	Calculated
Pipe-A-01.2.3	Pipe	DI 12	DI 11	86.9	445.0	432.0	14.96	12	0.013	6.23	13.78	0.45	17.10	0.47	0.47	0.00	Calculated
Pipe-A-01.2.4	Pipe	DI 13	DI 12	80.7	454.0	445.0	11.15	12	0.013	6.23	11.90	0.52	15.31	0.51	0.51	0.00	Calculated
Pipe-A-01.2.5	Pipe	DI 14	DI 13	60.0	462.0	454.0	13.33	12	0.013	6.23	13.01	0.48	16.38	0.49	0.49	0.00	Calculated
Pipe-A-01.2.6	Pipe	DI 15	DI 14	57.3	476.0	462.0	24.45	12	0.013	6.23	17.62	0.35	20.48	0.41	0.41	0.00	Calculated
Pipe-A-01.2.7	Pipe	DI 16	DI 15	72.0	494.0	476.0	24.99	12	0.013	6.23	17.81	0.35	20.65	0.41	0.41	0.00	Calculated
Pipe-A-01.2.8	Pipe	DI 17	DI 16	73.3	508.0	494.0	19.11	12	0.013	6.23	15.57	0.40	18.72	0.44	0.44	0.00	Calculated
Pipe-A-01.2.9	Pipe	DI 18	DI 17	106.6	523.3	508.0	14.36	12	0.013	6.23	13.52	0.46	16.86	0.48	0.48	0.00	Calculated
Pipe-A-02.1	Pipe	DI 19	Stor-A_2-Tee	119.8	414.0	378.0	30.05	12	0.013	4.00	19.53	0.20	19.53	0.31	0.31	0.00	Calculated
Pipe-A-02.2	Pipe	DI 20	DI 19	56.9	433.0	414.0	33.38	12	0.013	3.78	20.58	0.18	19.95	0.29	0.29	0.00	Calculated
Pipe-A-02.3	Pipe	DI 21	DI 20	76.1	443.0	433.0	13.13	12	0.013	3.30	12.91	0.26	13.75	0.34	0.34	0.00	Calculated
Pipe-A-02.4	Pipe	DI 22	DI 21	99.3	464.0	443.0	21.14	12	0.013	2.54	16.38	0.16	15.15	0.27	0.27	0.00	Calculated
Pipe-A-02.5	Pipe	DI 23	DI 22	158.3	494.0	464.0	18.95	12	0.013	1.57	15.51	0.10	12.67	0.21	0.21	0.00	Calculated
Pipe-A-02.6	Pipe	DI 24	DI 23	151.9	508.0	494.0	9.22	12	0.013	0.69	10.82	0.06	7.69	0.17	0.17	0.00	Calculated
DC-B	Channel	DC-B	Out-B	950.0	535.0	368.0	17.58	48	0.040	4.05	860.24	0.00	6.15	0.54	0.14	0.00	
DV-02W	Channel	HP-02	DI 02	173.0	416.0	411.0	2.89	6	0.033	1.44	27.23	0.05	1.47	0.17	0.33	0.00	
DV-04	Channel	HP-04W	DI 04	163.0	450.0	446.0	2.45	6	0.033	1.34	25.09	0.05	1.36	0.17	0.33	0.00	
DV-08	Channel	WB-08	DI 08	220.0	514.0	508.0	2.73	6	0.033	1.54	39.68	0.04	1.33	0.15	0.30	0.00	
DV-09	Channel	HP-09	DI 09	150.0	545.0	526.0	12.67	6	0.033	1.65	14.25	0.12	3.70	0.22	0.45	0.00	
DV-19	Channel	HP-19	DI 19	121.0	416.5	414.0	2.07	6	0.033	0.21	5.76	0.04	1.14	0.15	0.29	0.00	
DV-20	Channel	HP-20	DI 20	114.0	436.0	433.0	2.63	6	0.033	0.48	12.99	0.04	1.28	0.15	0.29	0.00	
DV-21E	Channel	WB-21	DI 21	81.0	445.0	443.0	2.47	6	0.033	0.38	6.29	0.06	1.39	0.17	0.35	0.00	
DV-21W	Channel	HP-21	DI 21	114.0	445.5	443.0	2.19	6	0.033	0.38	5.93	0.06	1.34	0.18	0.36	0.00	
DV-22E	Channel	WB-22	DI 22	143.0	467.0	464.0	2.10	6	0.033	0.54	5.80	0.09	1.43	0.20	0.41	0.00	
DV-22W	Channel	HP-22	DI 22	121.0	467.0	464.0	2.48	6	0.033	0.44	6.31	0.07	1.46	0.18	0.37	0.00	
DV-23E	Channel	WB-23	DI 23	172.0	498.0	494.0	2.33	6	0.033	0.46	6.11	0.08	1.44	0.19	0.38	0.00	
DV-23W	Channel	HP-23	DI 23	165.0	498.0	494.0	2.42	6	0.033	0.43	6.23	0.07	1.44	0.18	0.37	0.00	

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Orifice-A_1.1-01	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-02	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-03	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-04	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-05	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-06	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-07	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-08	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-09	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.1-10	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-01	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-02	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-03	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-04	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-05	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-06	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-07	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-08	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-09	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_1.2-10	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-01	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-02	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-03	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-04	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-05	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-06	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-07	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-08	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-09	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Orifice-A_2-10	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.04							
Weir-A_1.1-01	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				1.47							
Weir-A_1.1-02	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				1.47							
Weir-A_1.1-03	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				1.47							
Weir-A_1.1-04	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				1.47							
Weir-A_1.2-01	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				1.44							
Weir-A_1.2-02	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				1.44							
Weir-A_1.2-03	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				1.44							
Weir-A_1.2-04	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				1.44							
Weir-A_2-01	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.20							
Weir-A_2-02	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.20							
Weir-A_2-03	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.20							

Subbasin Hydrology

Subbasin : Sub-A (Offsite SE)

Input Data

Area (ac) 1.89
Peak Rate Factor 484
Weighted Curve Number 81.47
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	0.29	C	73
Brush, Poor	1.6	D	83
Composite Area & Weighted CN	1.89		81.47

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	29	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.34	0	0
Computed Flow Time (min) :	4.97	0	0

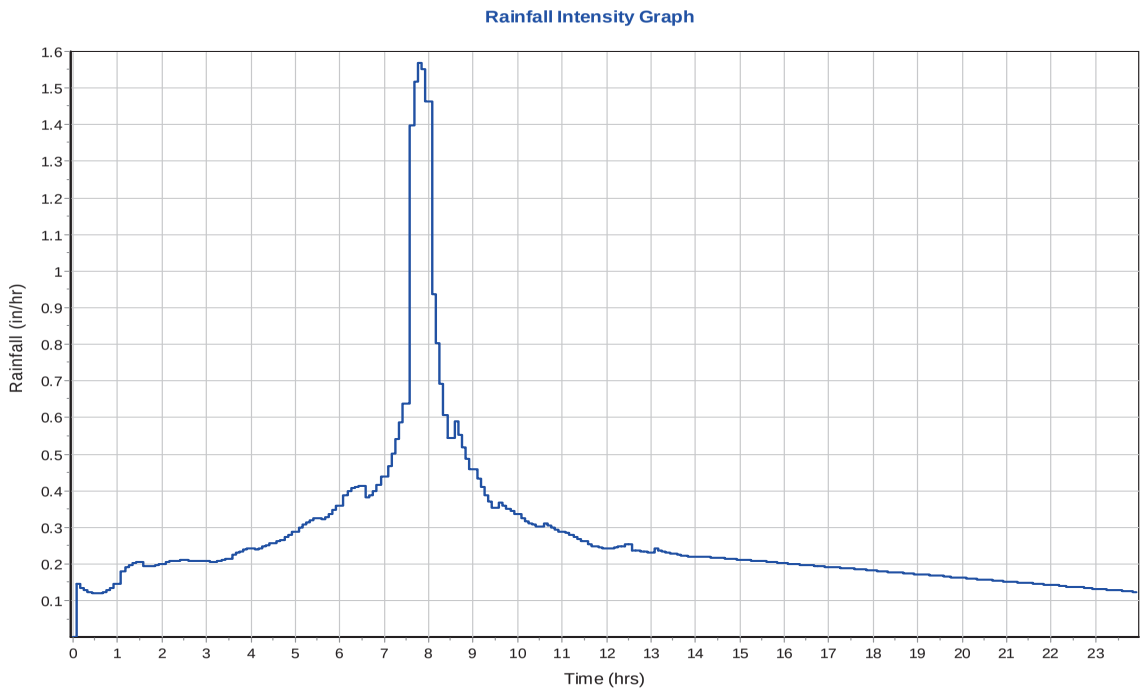
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	279	0	0
Slope (%) :	28	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.7	0	0
Computed Flow Time (min) :	1.26	0	0

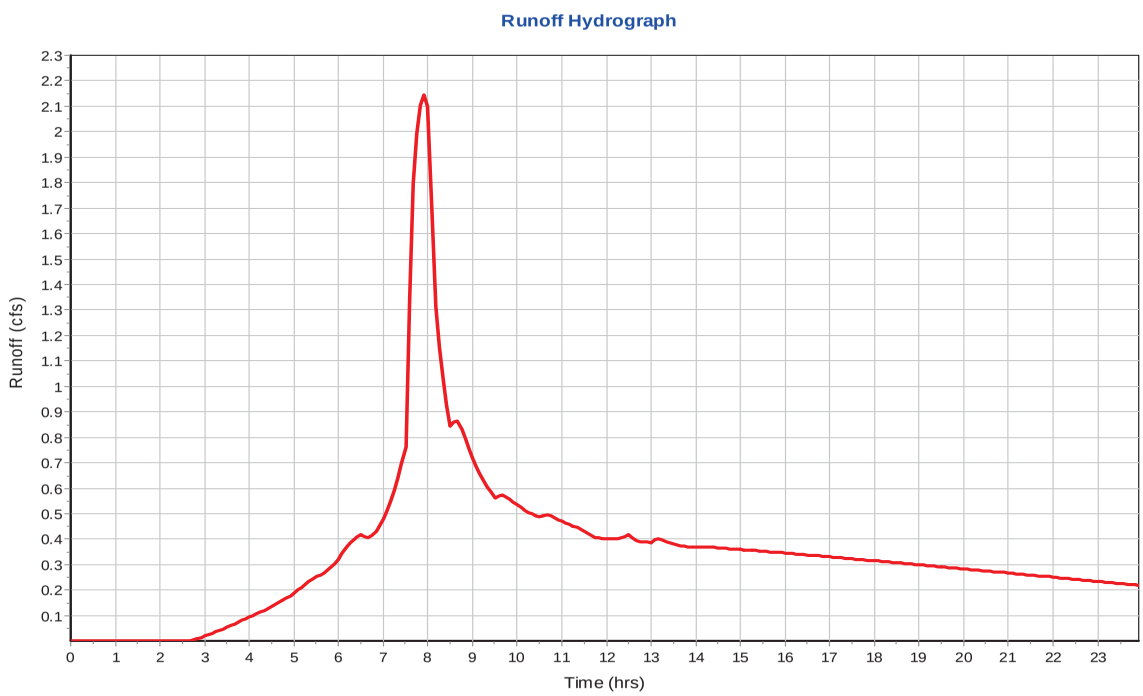
Total TOC (min) 6.23

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.41
Peak Runoff (cfs) 2.14
Weighted Curve Number 81.47
Time of Concentration (days hh:mm:ss) 0 00:06:14

Subbasin : Sub-A (Offsite SE)





Subbasin : Sub-A (Offsite W)

Input Data

Area (ac) 2.13
Peak Rate Factor 484
Weighted Curve Number 83
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Brush, Poor	2.13	D	83
Composite Area & Weighted CN	2.13		83

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	19	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	5.89	0	0

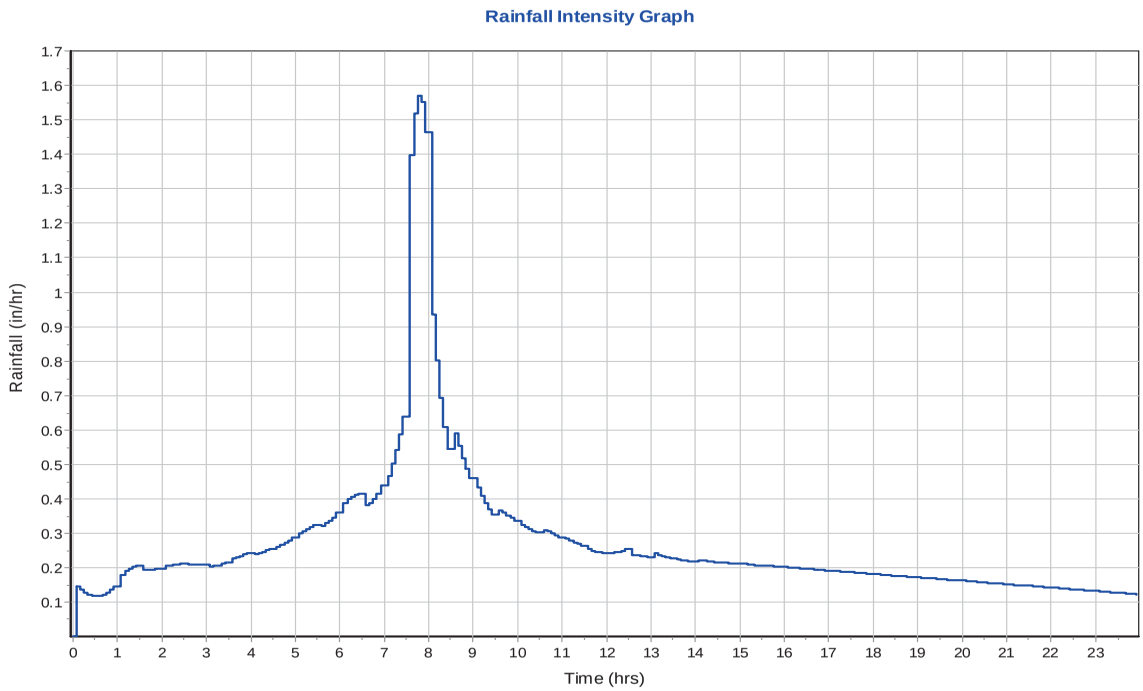
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	633	0	0
Slope (%) :	18	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.97	0	0
Computed Flow Time (min) :	3.55	0	0

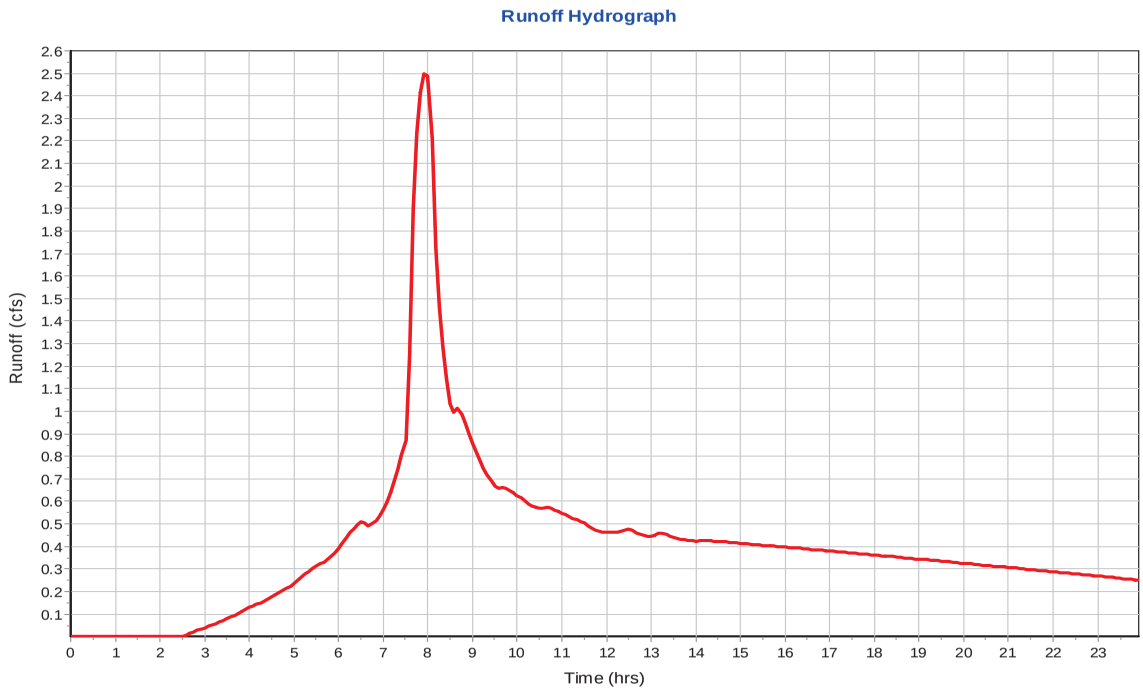
Total TOC (min) 9.44

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.58
Peak Runoff (cfs) 2.51
Weighted Curve Number 83
Time of Concentration (days hh:mm:ss) 0 00:09:26

Subbasin : Sub-A (Offsite W)





Subbasin : Sub-A_01E

Input Data

Area (ac) 0.82
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.82	D	80
Composite Area & Weighted CN	0.82		80

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	30	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.27	0	0
Computed Flow Time (min) :	6.18	0	0

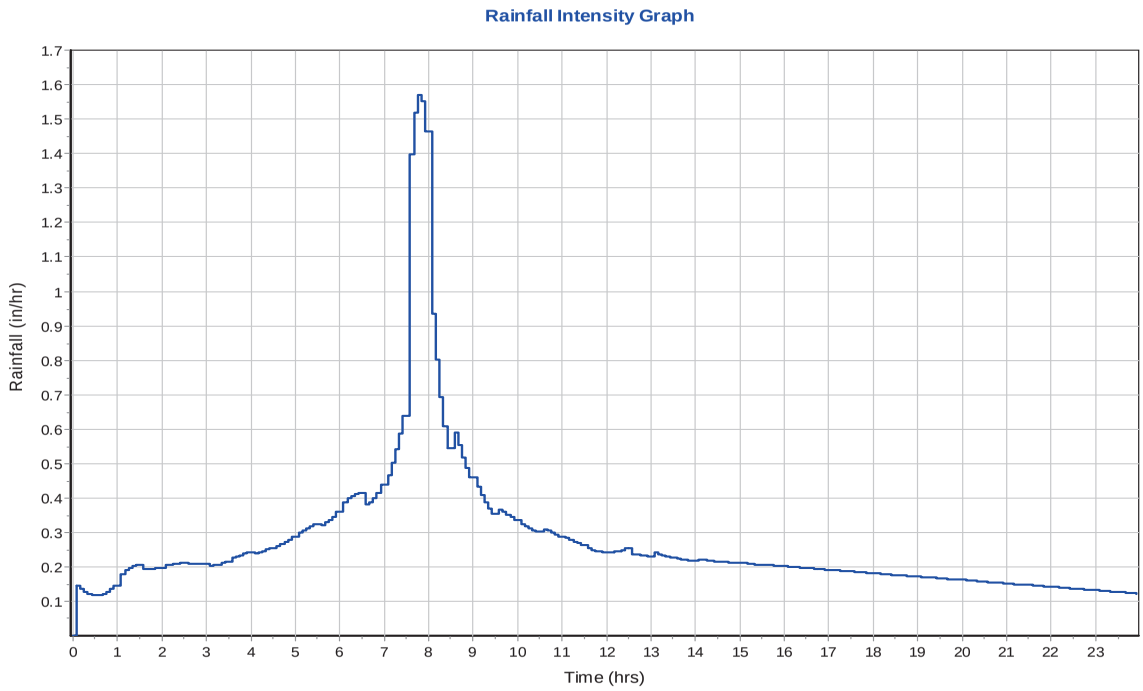
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	77	0	0
Slope (%) :	31	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.9	0	0
Computed Flow Time (min) :	0.33	0	0

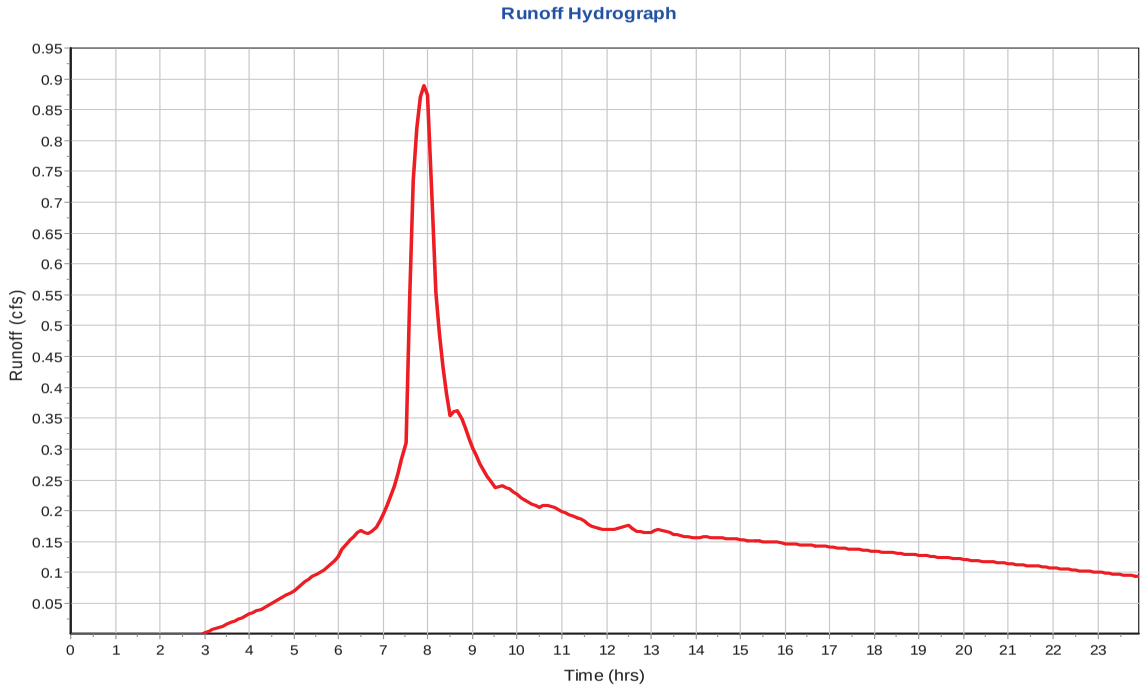
Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.25
Peak Runoff (cfs) 0.89
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:31

Subbasin : Sub-A_01E





Subbasin : Sub-A_01W-02

Input Data

Area (ac) 0.34
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.34	D	80
Composite Area & Weighted CN	0.34		80

Time of Concentration

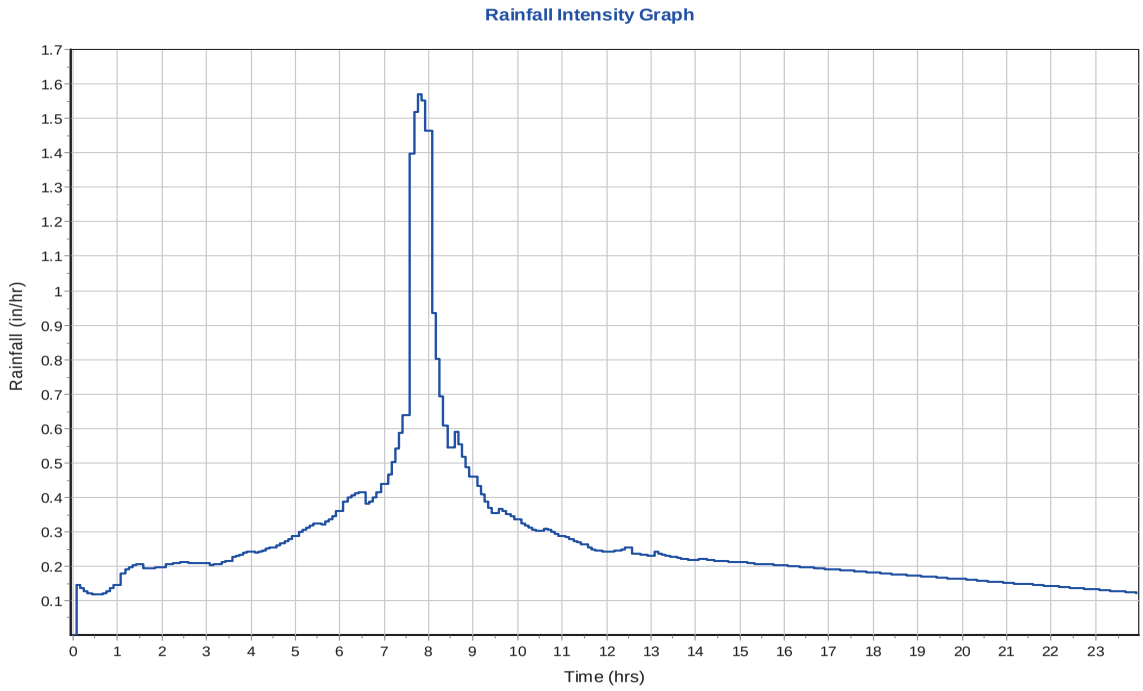
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	60	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	4.83	0	0

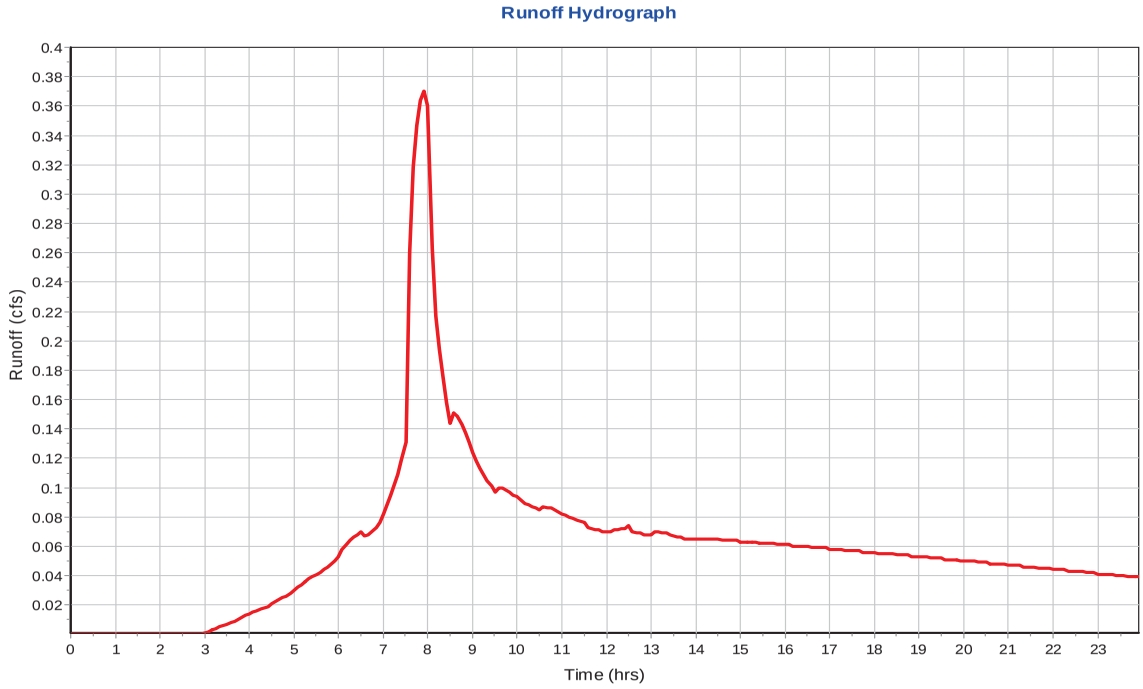
Total TOC (min) 4.83

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.25
Peak Runoff (cfs) 0.37
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:04:50

Subbasin : Sub-A_01W-02





Subbasin : Sub-A_02-04

Input Data

Area (ac) 1.33
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.33	D	80
Composite Area & Weighted CN	1.33		80

Time of Concentration

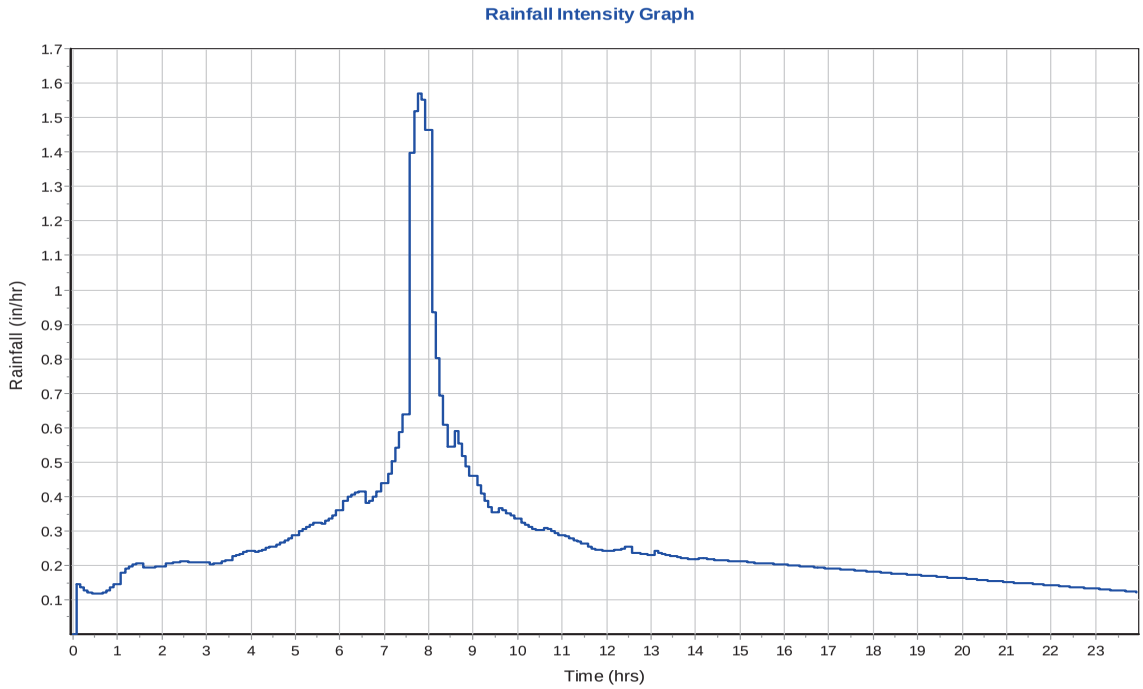
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

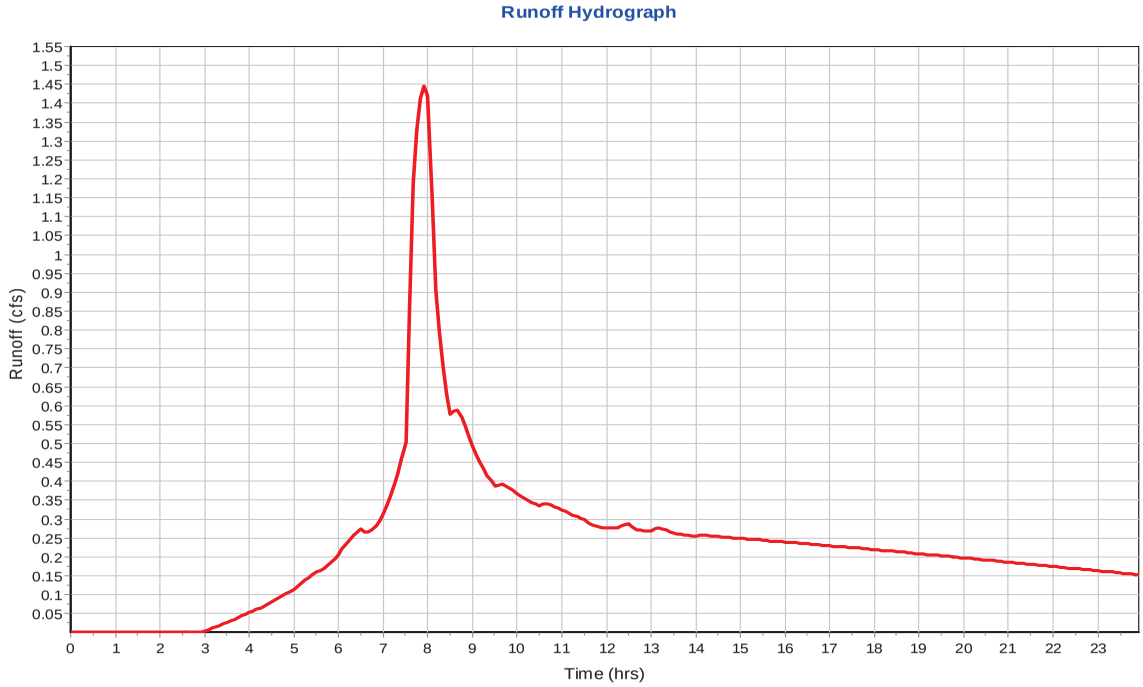
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.25
Peak Runoff (cfs) 1.45
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_02-04





Subbasin : Sub-A_04-06

Input Data

Area (ac) 1.24
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.24	D	80
Composite Area & Weighted CN	1.24		80

Time of Concentration

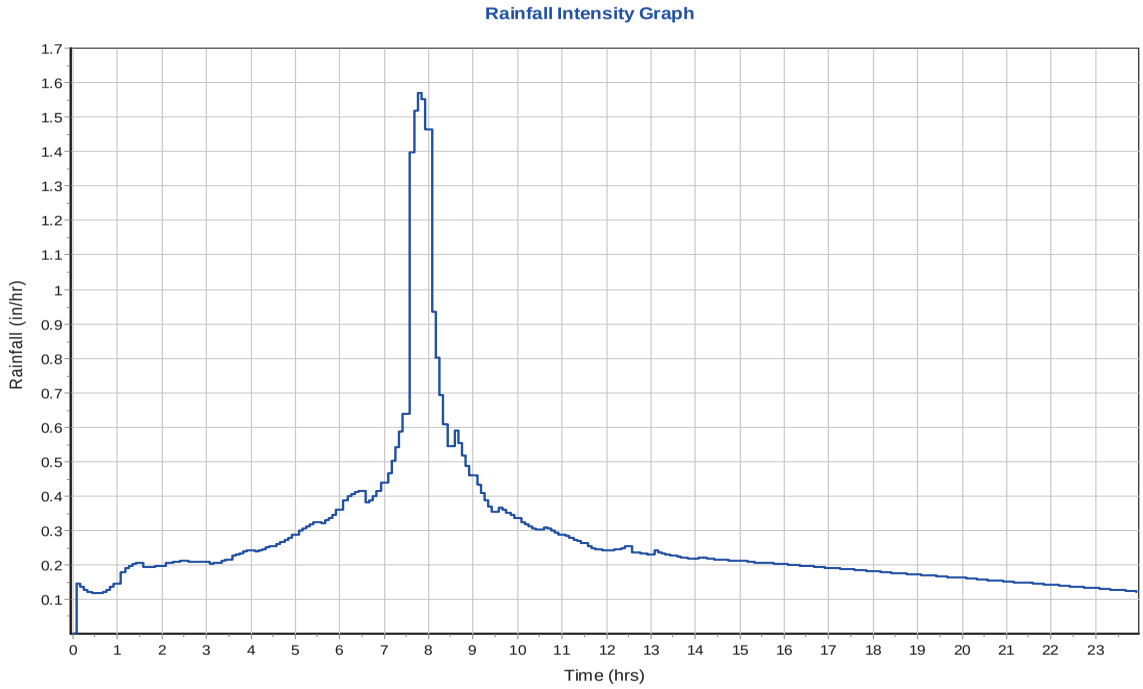
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

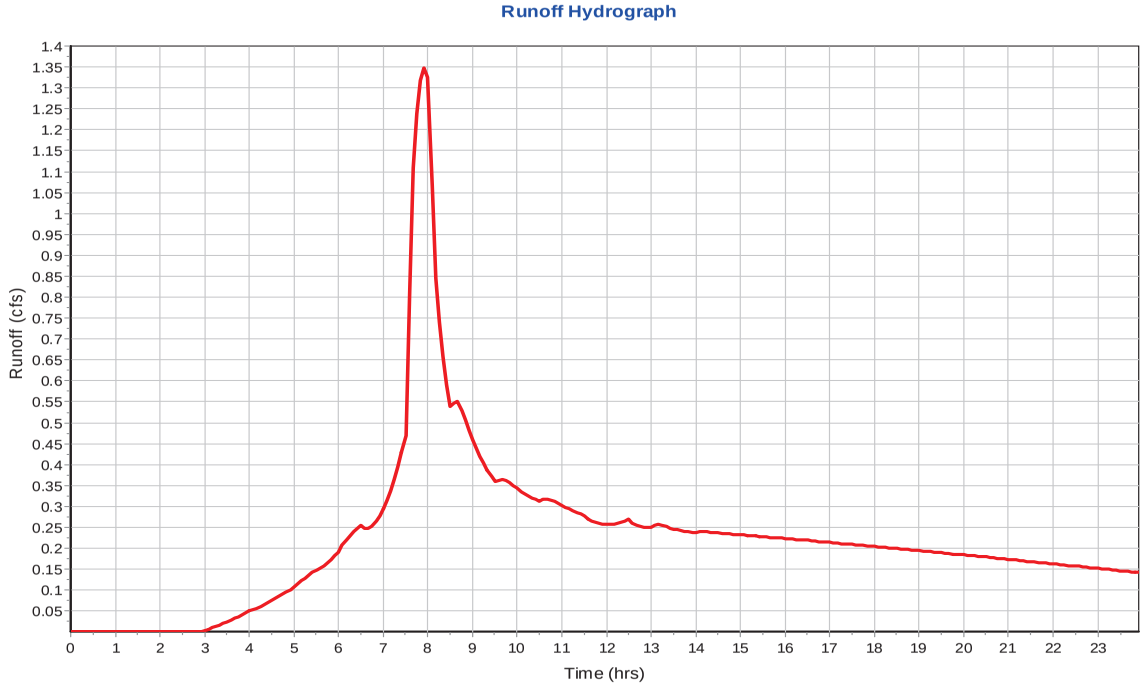
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.25
Peak Runoff (cfs) 1.35
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_04-06





Subbasin : Sub-A_06-09

Input Data

Area (ac) 1.43
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.43	D	80
Composite Area & Weighted CN	1.43		80

Time of Concentration

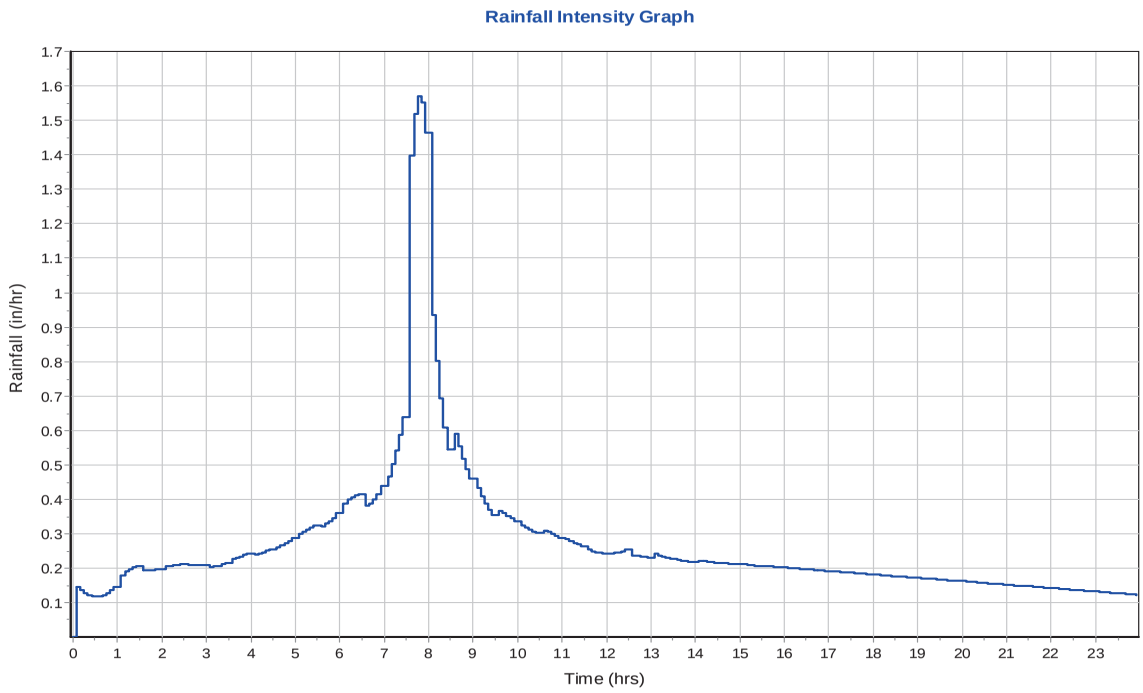
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

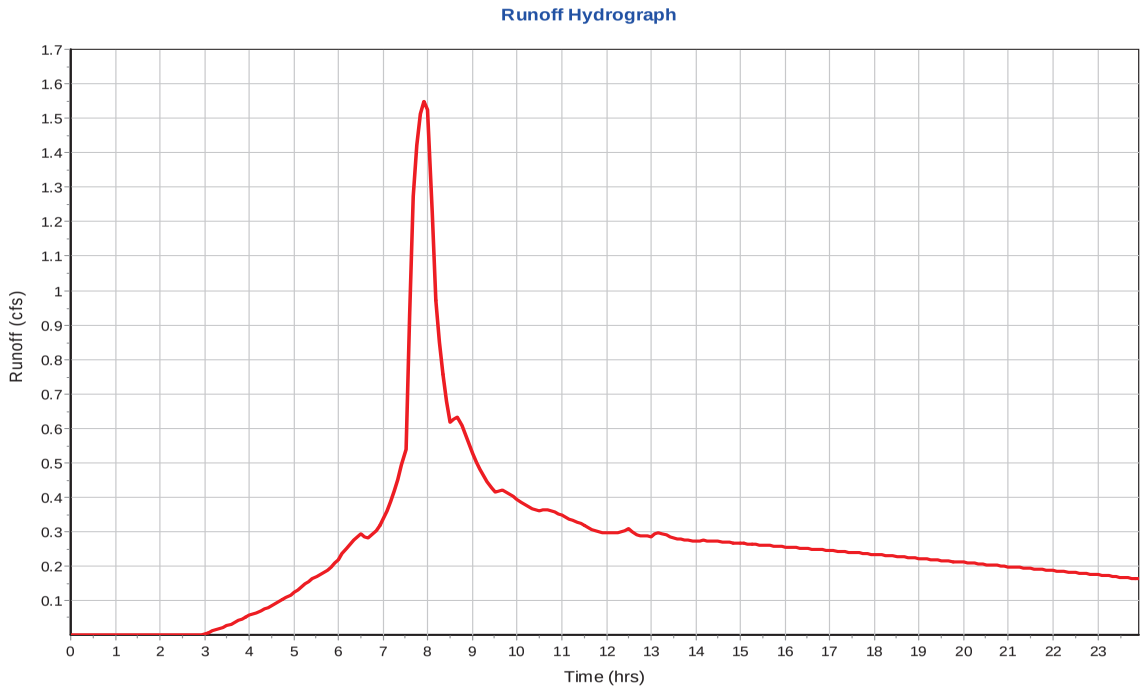
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.25
Peak Runoff (cfs) 1.55
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_06-09





Subbasin : Sub-A_09

Input Data

Area (ac) 1.49
Peak Rate Factor 484
Weighted Curve Number 80.95
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.64	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.06	C	73
Brush, Poor	0.73	D	83
Composite Area & Weighted CN	1.49		80.95

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	7.08	0	0

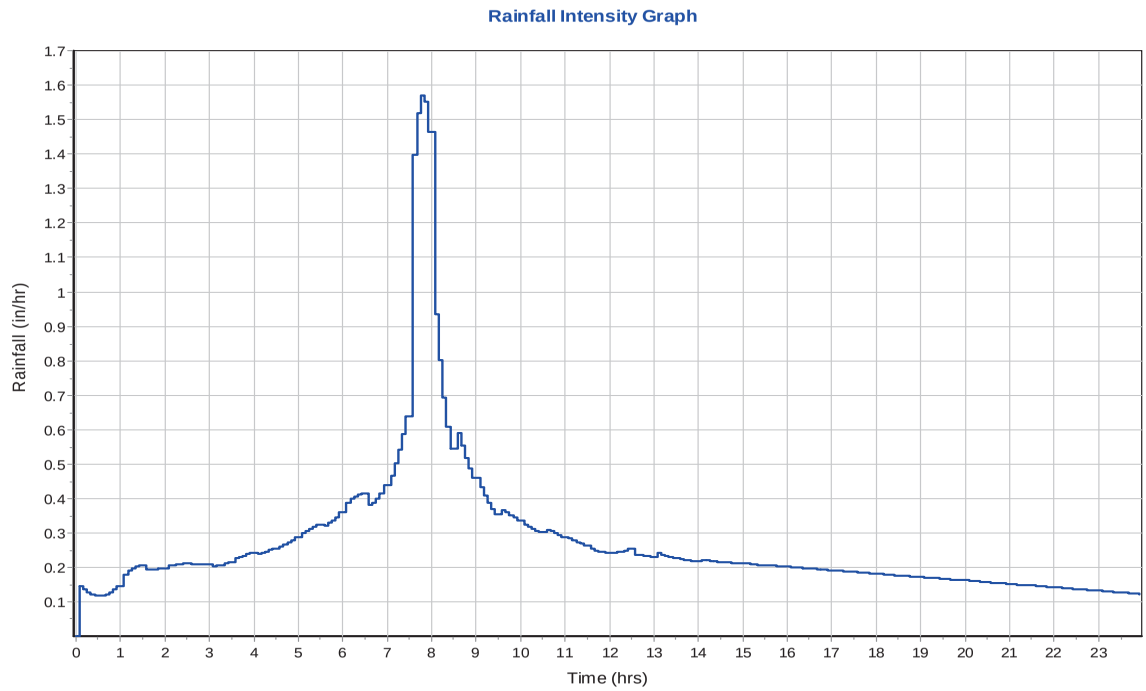
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	350	0	0
Slope (%) :	26	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.57	0	0
Computed Flow Time (min) :	1.63	0	0

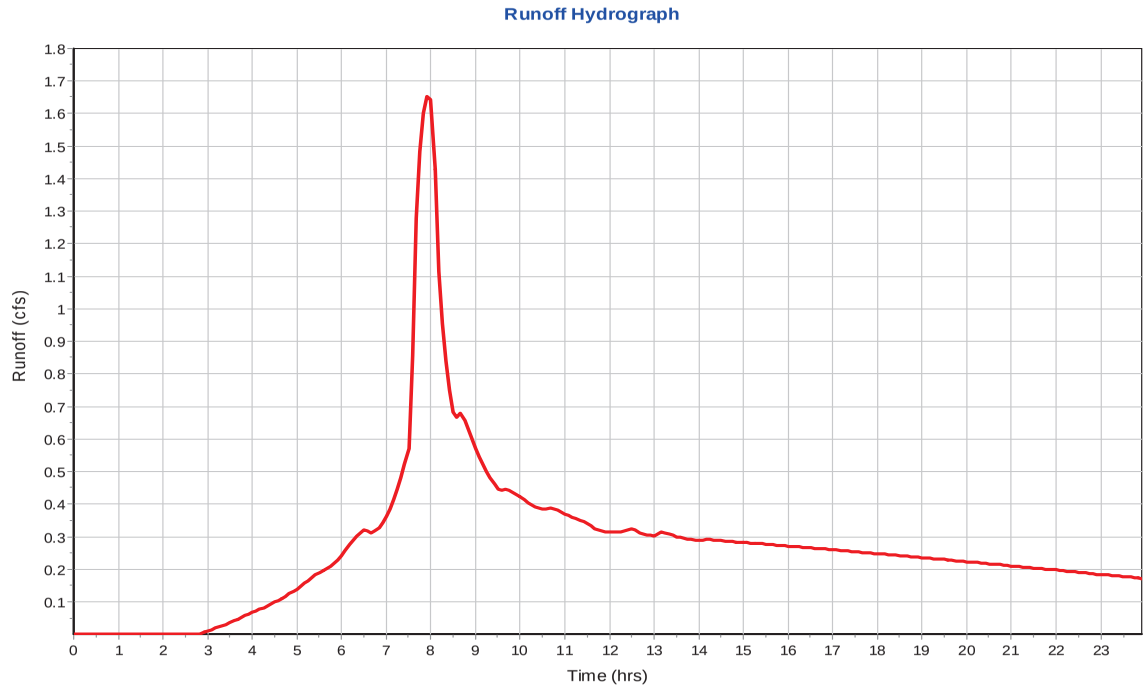
Total TOC (min) 8.71

Subbasin Runoff Results

Total Rainfall (in) 6.52
Total Runoff (in) 4.36
Peak Runoff (cfs) 1.66
Weighted Curve Number 80.95
Time of Concentration (days hh:mm:ss) 0 00:08:43

Subbasin : Sub-A_09





Subbasin : Sub-A_18

Input Data

Area (ac)	5.5
Peak Rate Factor	484
Weighted Curve Number	81.53
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	2.7	D	80
Brush, Poor	2.8	D	83
Composite Area & Weighted CN	5.5		81.53

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

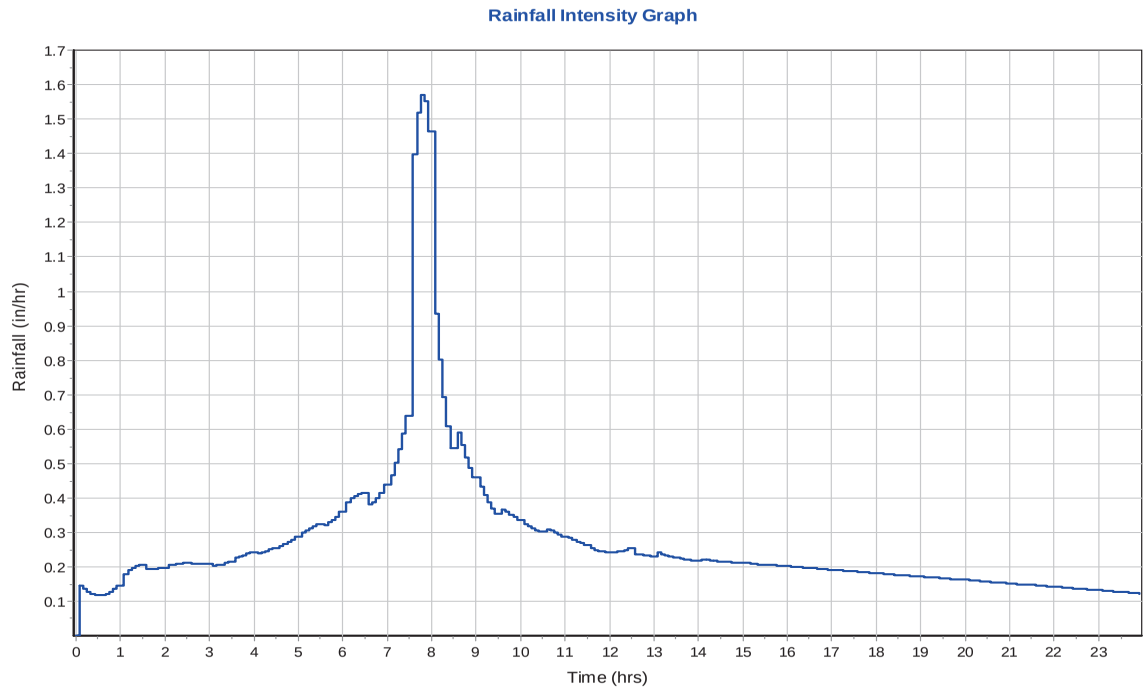
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	274	0	0
Slope (%) :	27	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.64	0	0
Computed Flow Time (min) :	1.25	0	0

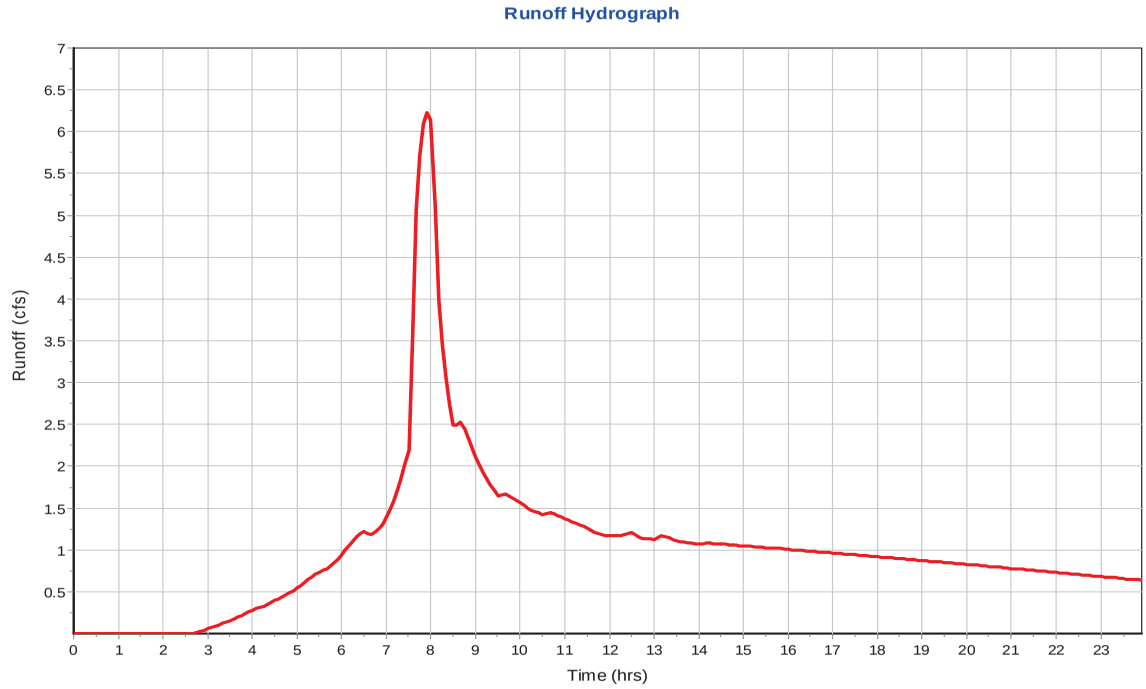
Total TOC (min) 7.28

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.42
Peak Runoff (cfs)	6.24
Weighted Curve Number	81.53
Time of Concentration (days hh:mm:ss)	0 00:07:17

Subbasin : Sub-A_18





Subbasin : Sub-A_19-20

Input Data

Area (ac)	0.2
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.2	D	80
Composite Area & Weighted CN	0.2		80

Time of Concentration

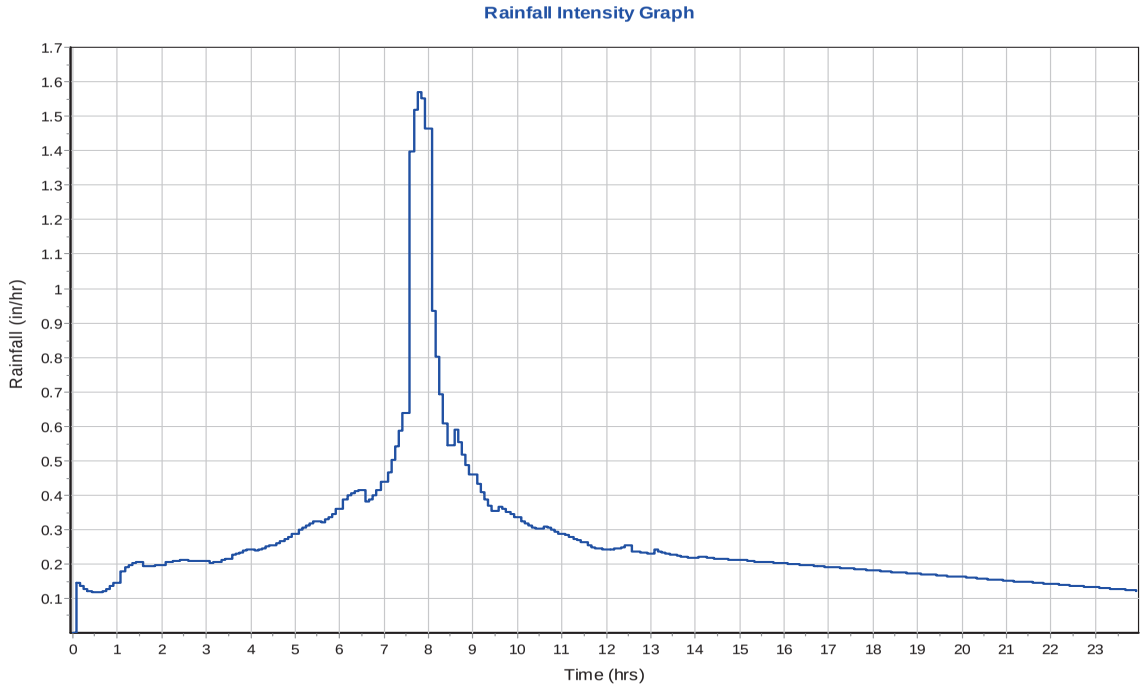
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	92	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.32	0	0

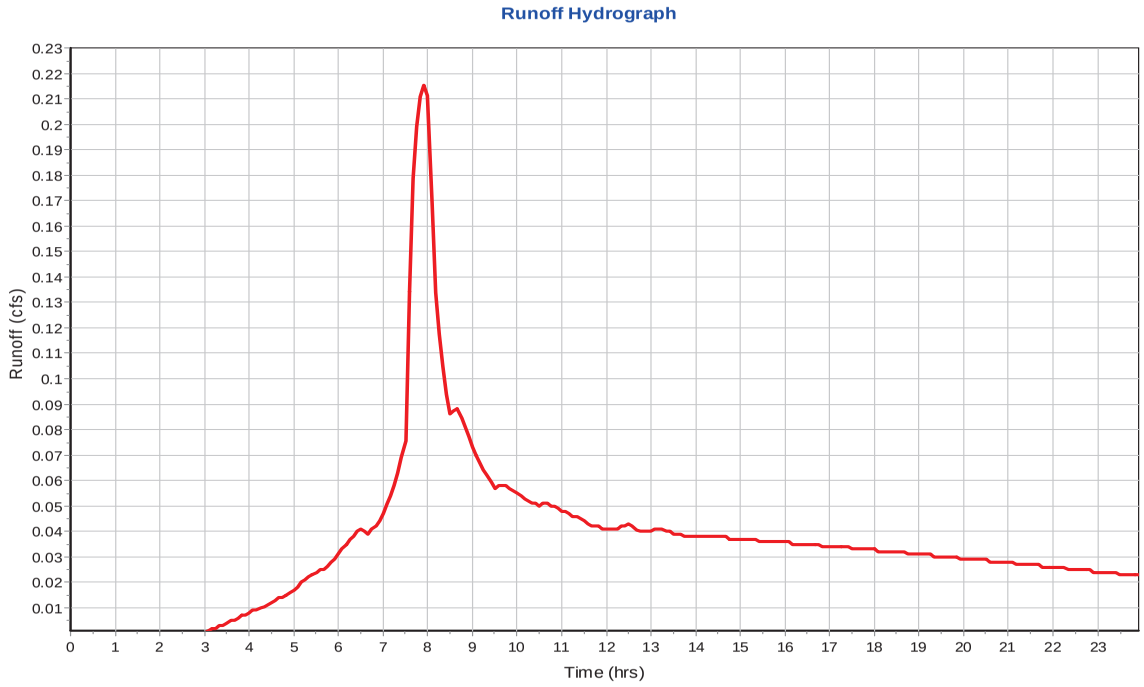
Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.25
Peak Runoff (cfs)	0.22
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:19

Subbasin : Sub-A_19-20





Subbasin : Sub-A_20-21

Input Data

Area (ac)	0.44
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.44	D	80
Composite Area & Weighted CN	0.44		80

Time of Concentration

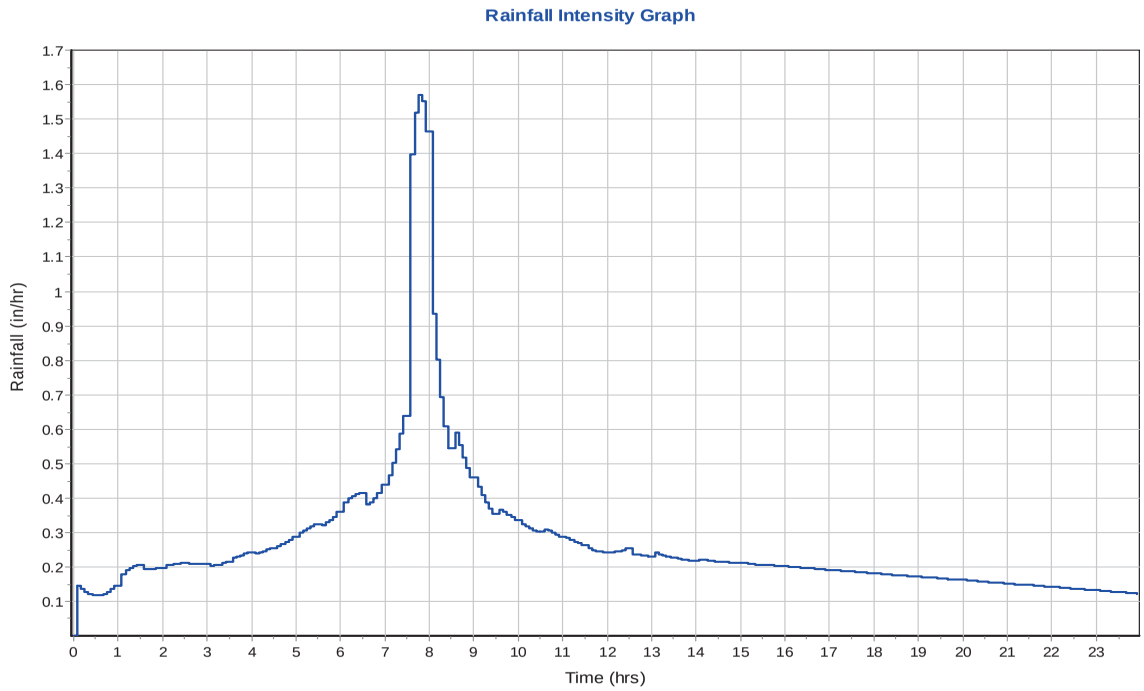
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	70	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	5.46	0	0

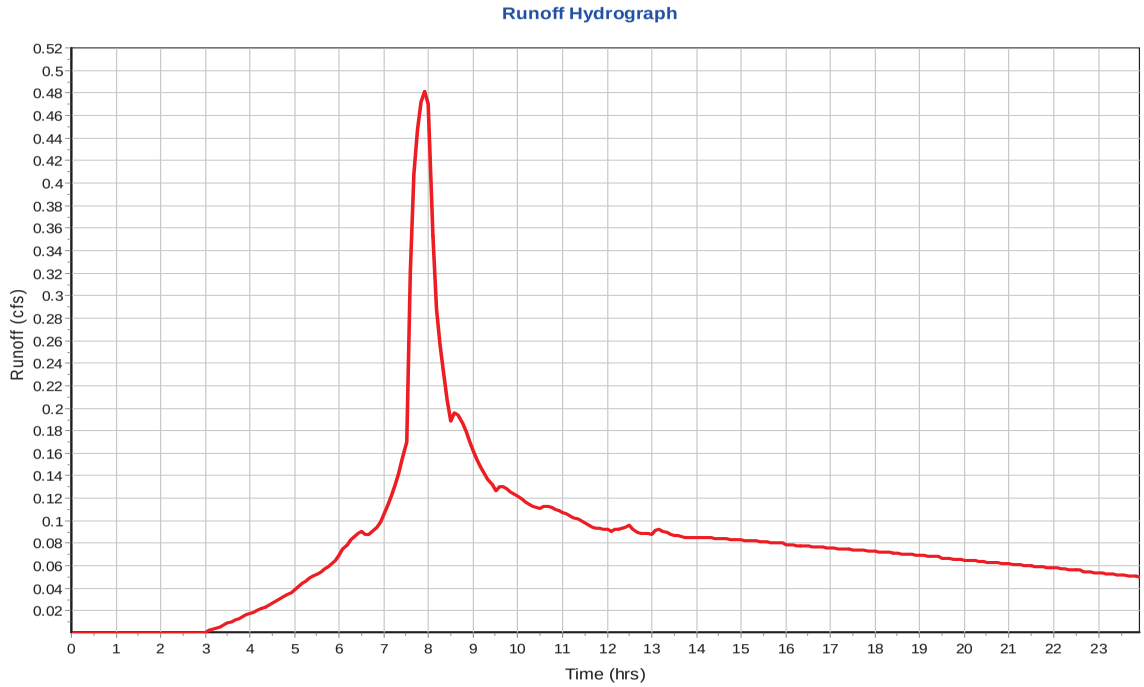
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.25
Peak Runoff (cfs)	0.48
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_20-21





Subbasin : Sub-A_21E-22

Input Data

Area (ac)	0.38
Peak Rate Factor	484
Weighted Curve Number	77.32
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.21	D	80
Pasture, grassland, or range, Good	0.17	C	74
Composite Area & Weighted CN	0.38		77.32

Time of Concentration

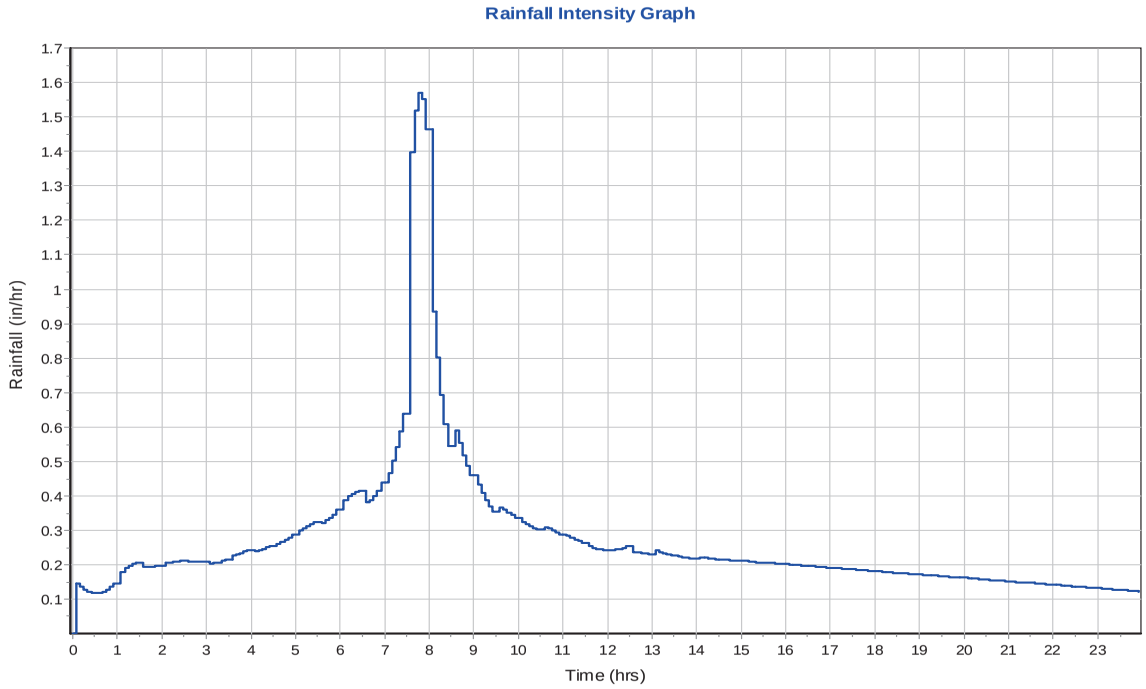
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	73	0	0
Slope (%) :	25	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	5.17	0	0

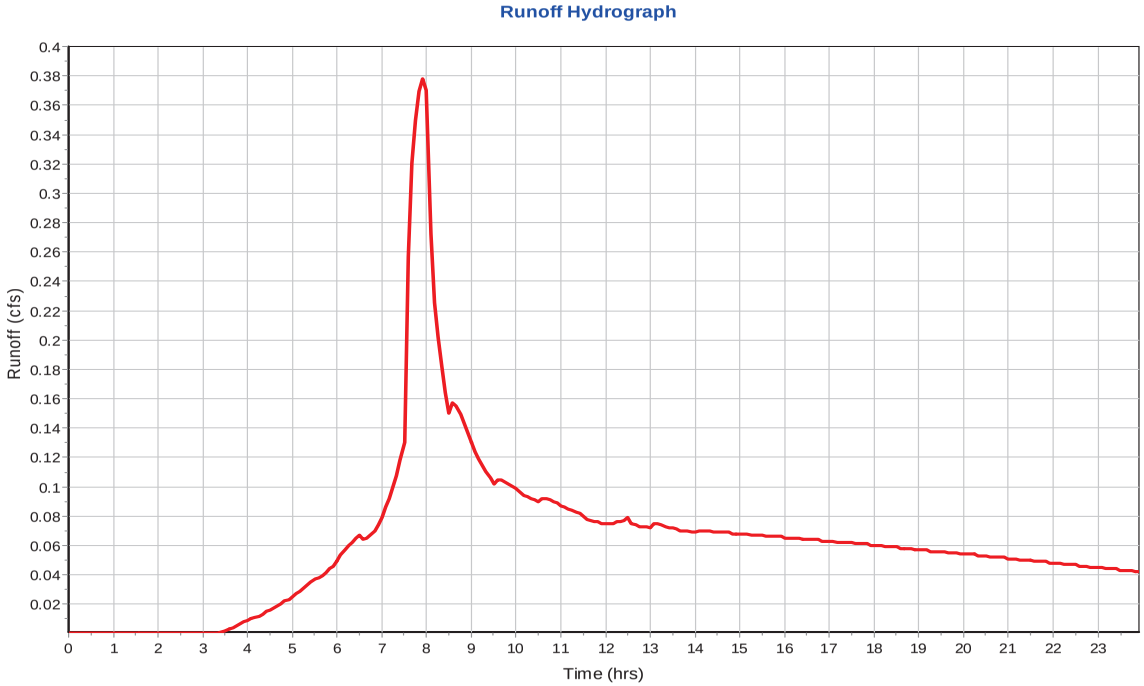
Total TOC (min) 5.17

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.97
Peak Runoff (cfs)	0.38
Weighted Curve Number	77.32
Time of Concentration (days hh:mm:ss)	0 00:05:10

Subbasin : Sub-A_21E-22





Subbasin : Sub-A_21W-22

Input Data

Area (ac)	0.35
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.35	D	80
Composite Area & Weighted CN	0.35		80

Time of Concentration

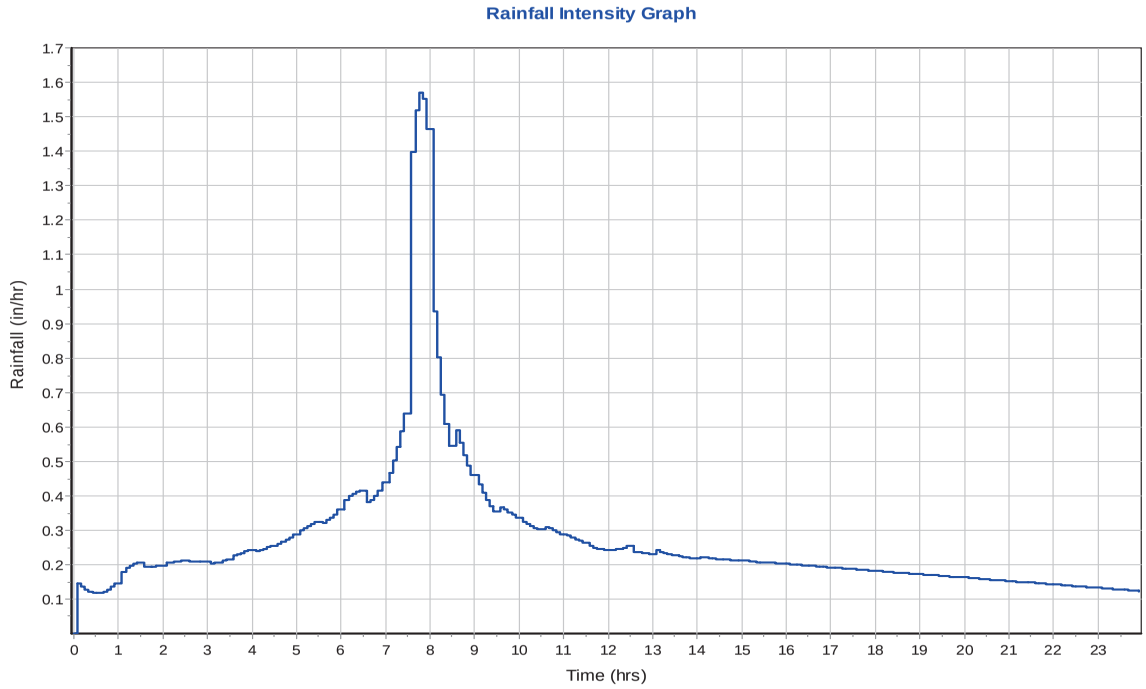
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.25	0	0
Computed Flow Time (min) :	6.54	0	0

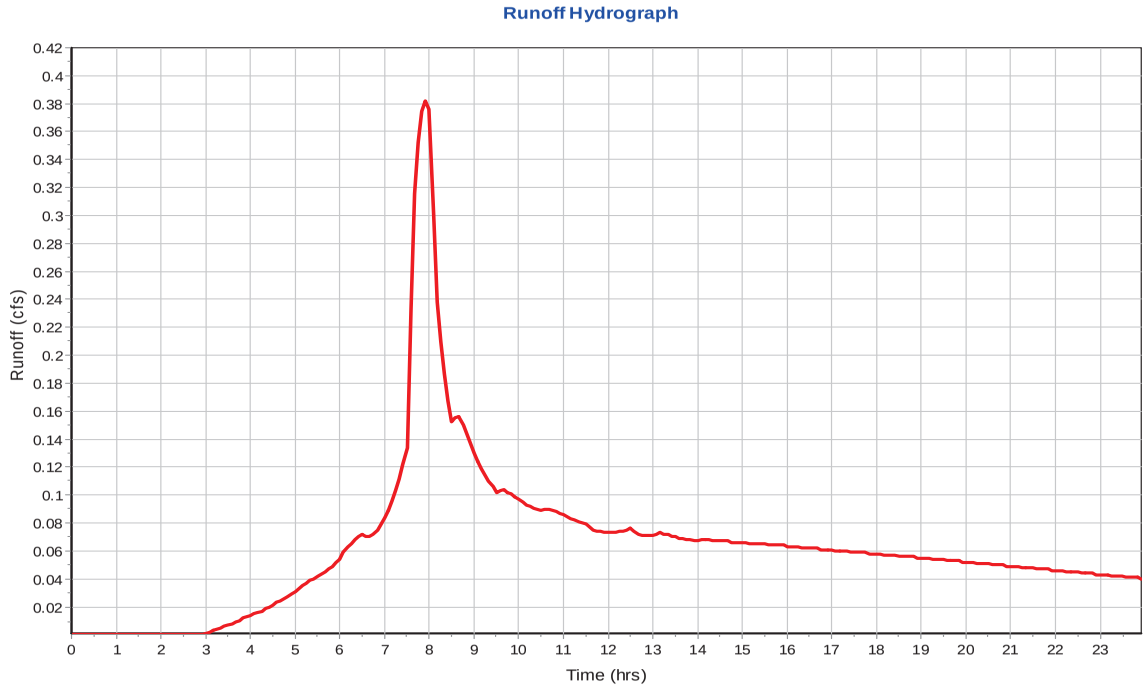
Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.25
Peak Runoff (cfs)	0.38
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:32

Subbasin : Sub-A_21W-22





Subbasin : Sub-A_22E-23

Input Data

Area (ac)	0.59
Peak Rate Factor	484
Weighted Curve Number	75
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.1	D	80
Pasture, grassland, or range, Good	0.49	C	74
Composite Area & Weighted CN	0.59		75

Time of Concentration

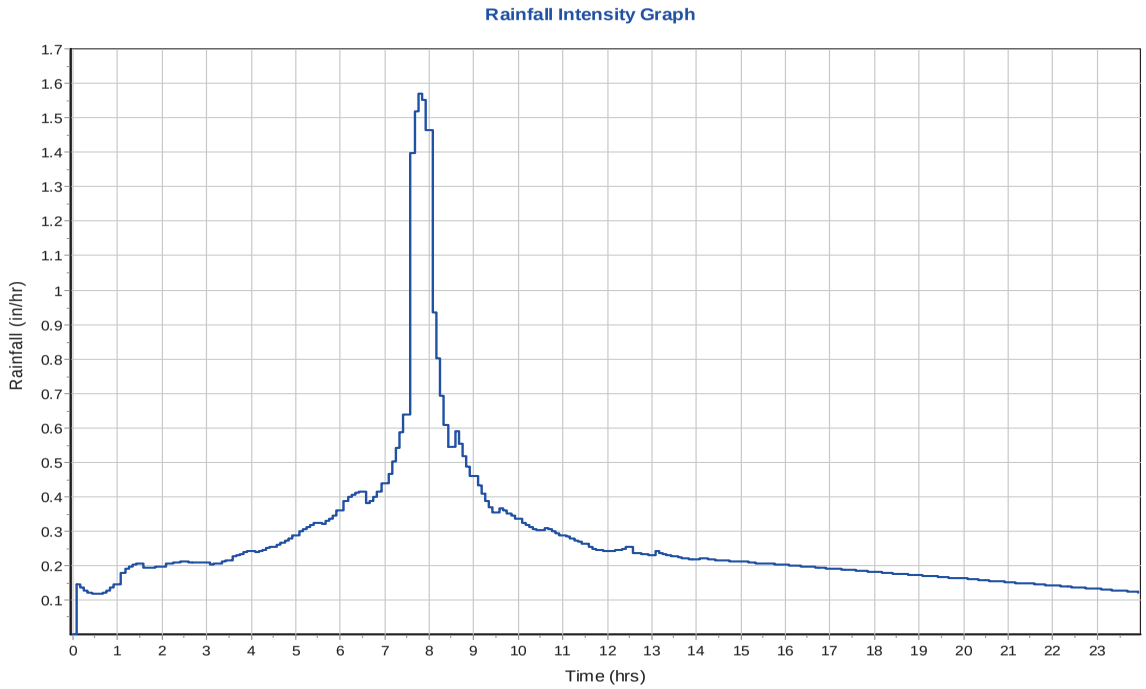
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	105	0	0
Slope (%) :	15	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.48	0	0

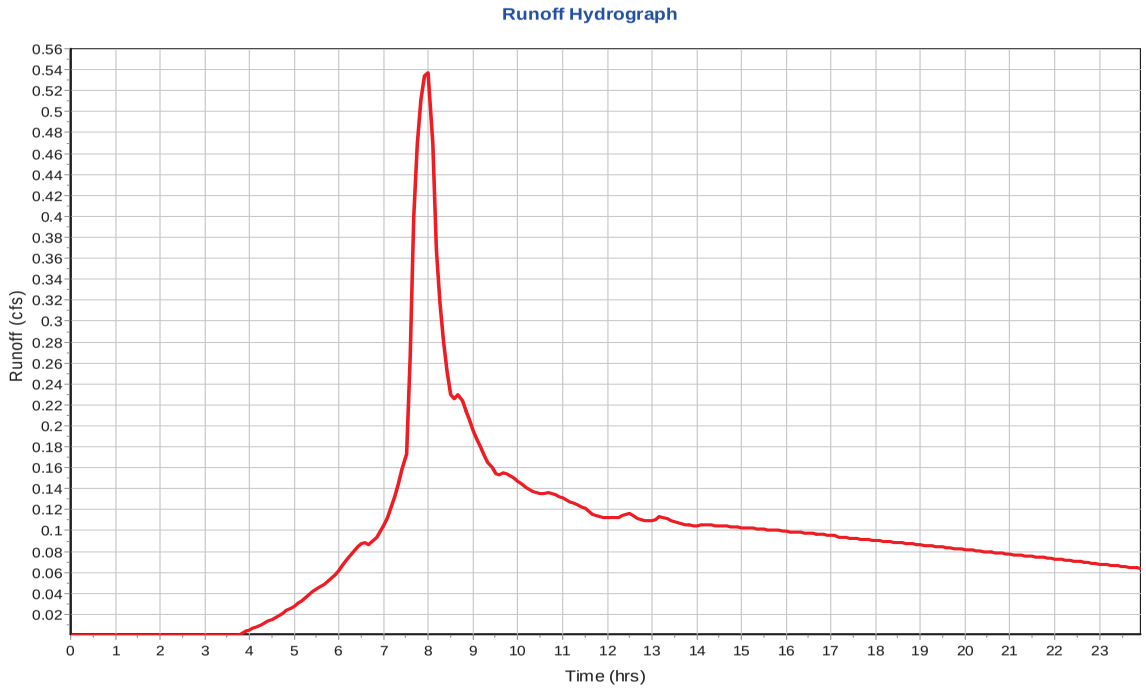
Total TOC (min) 8.48

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.73
Peak Runoff (cfs)	0.54
Weighted Curve Number	75
Time of Concentration (days hh:mm:ss)	0 00:08:29

Subbasin : Sub-A_22E-23





Subbasin : Sub-A_22W-23

Input Data

Area (ac)	0.42
Peak Rate Factor	484
Weighted Curve Number	79.28
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.37	D	80
Pasture, grassland, or range, Good	0.05	C	74
Composite Area & Weighted CN	0.42		79.28

Time of Concentration

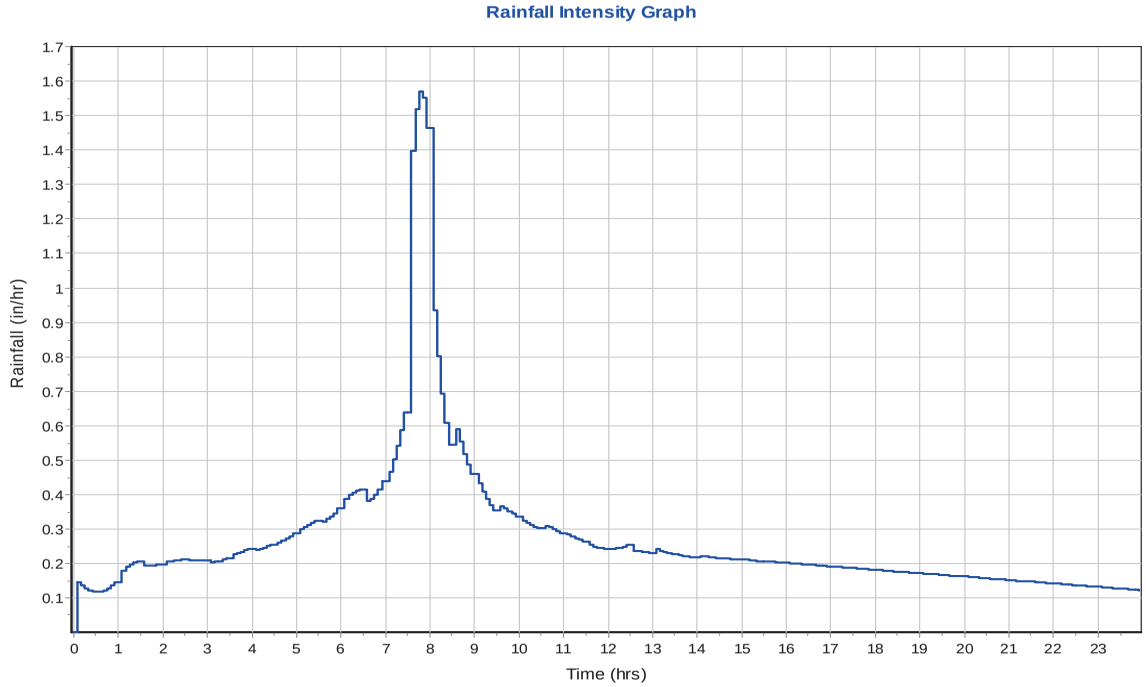
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	75	0	0
Slope (%) :	23	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	5.46	0	0

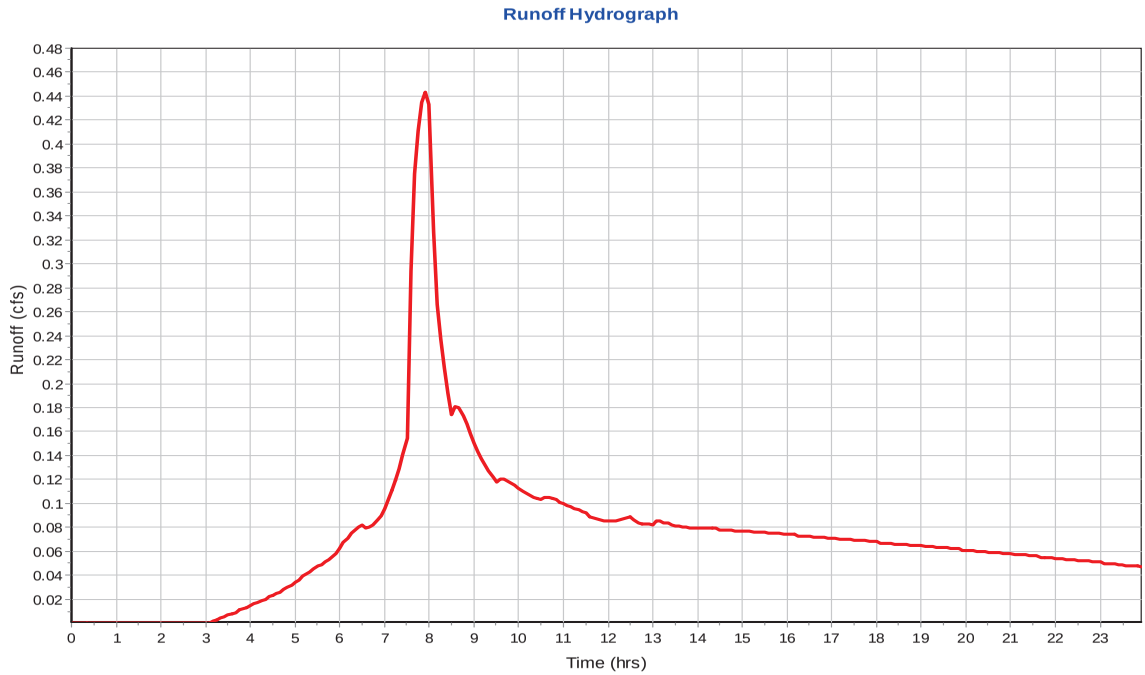
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	4.18
Peak Runoff (cfs)	0.44
Weighted Curve Number	79.28
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_22W-23





Subbasin : Sub-A_23E-24

Input Data

Area (ac)	0.52
Peak Rate Factor	484
Weighted Curve Number	74
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.52	C	74
Composite Area & Weighted CN	0.52		74

Time of Concentration

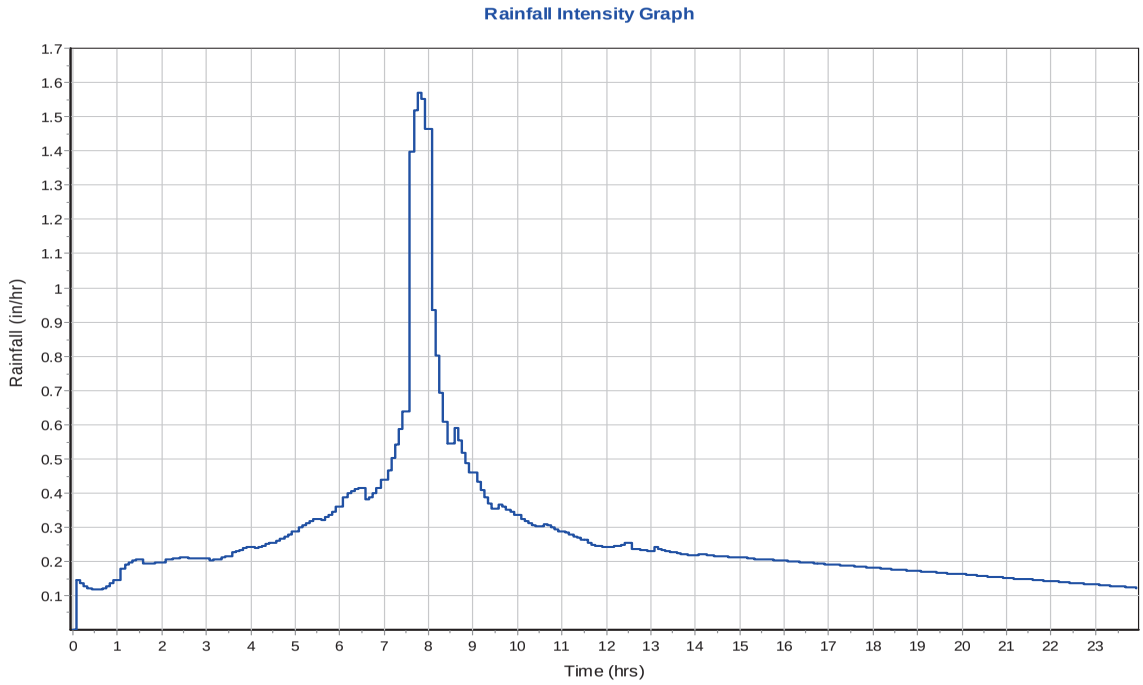
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	50	0	0
Slope (%) :	6	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.12	0	0
Computed Flow Time (min) :	6.75	0	0

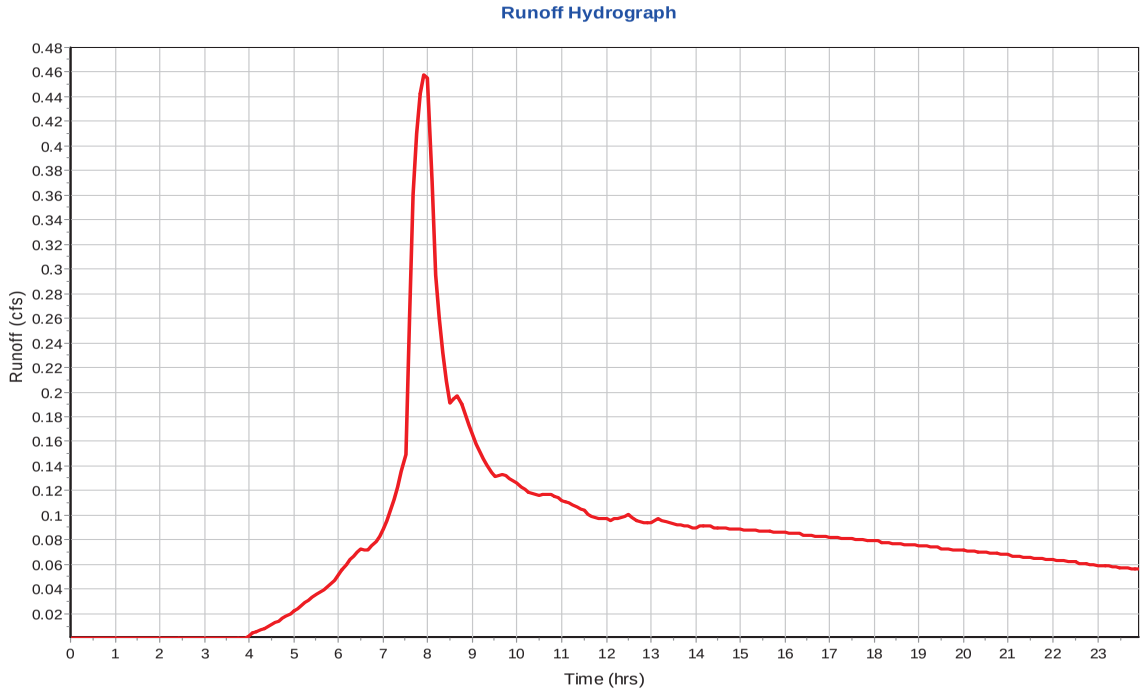
Total TOC (min) 6.75

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.63
Peak Runoff (cfs)	0.46
Weighted Curve Number	74
Time of Concentration (days hh:mm:ss)	0 00:06:45

Subbasin : Sub-A_23E-24





Subbasin : Sub-A_23W-24

Input Data

Area (ac)	0.43
Peak Rate Factor	484
Weighted Curve Number	77.33
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.24	D	80
Pasture, grassland, or range, Good	0.19	C	74
Composite Area & Weighted CN	0.43		77.33

Time of Concentration

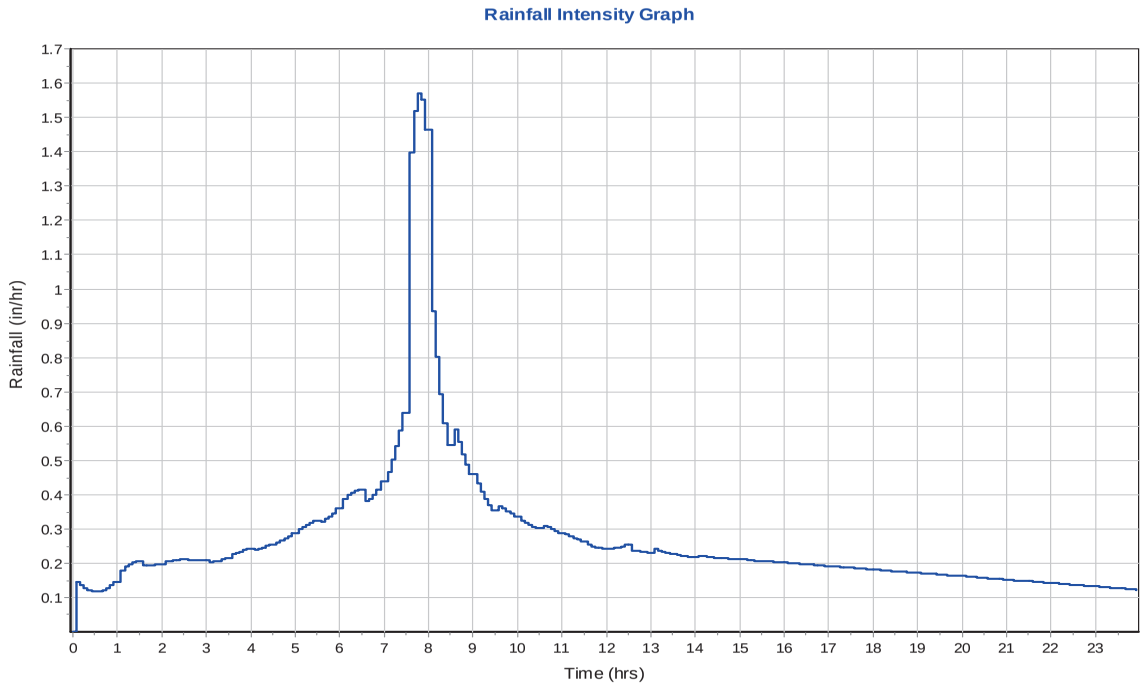
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.21	0	0

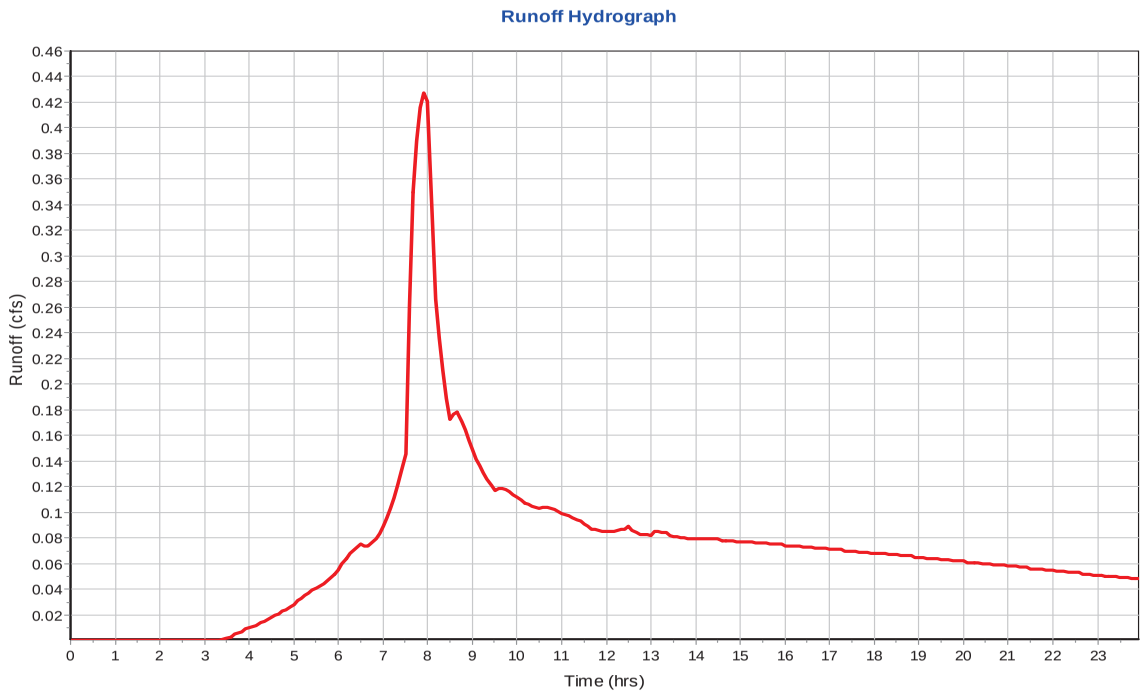
Total TOC (min) 6.21

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.97
Peak Runoff (cfs)	0.43
Weighted Curve Number	77.33
Time of Concentration (days hh:mm:ss)	0 00:06:13

Subbasin : Sub-A_23W-24





Subbasin : Sub-A_24

Input Data

Area (ac)	0.7
Peak Rate Factor	484
Weighted Curve Number	77.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.14	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.31	C	73
Brush, Poor	0.19	D	83
Composite Area & Weighted CN	0.7		77.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.47	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	7.44	0	0

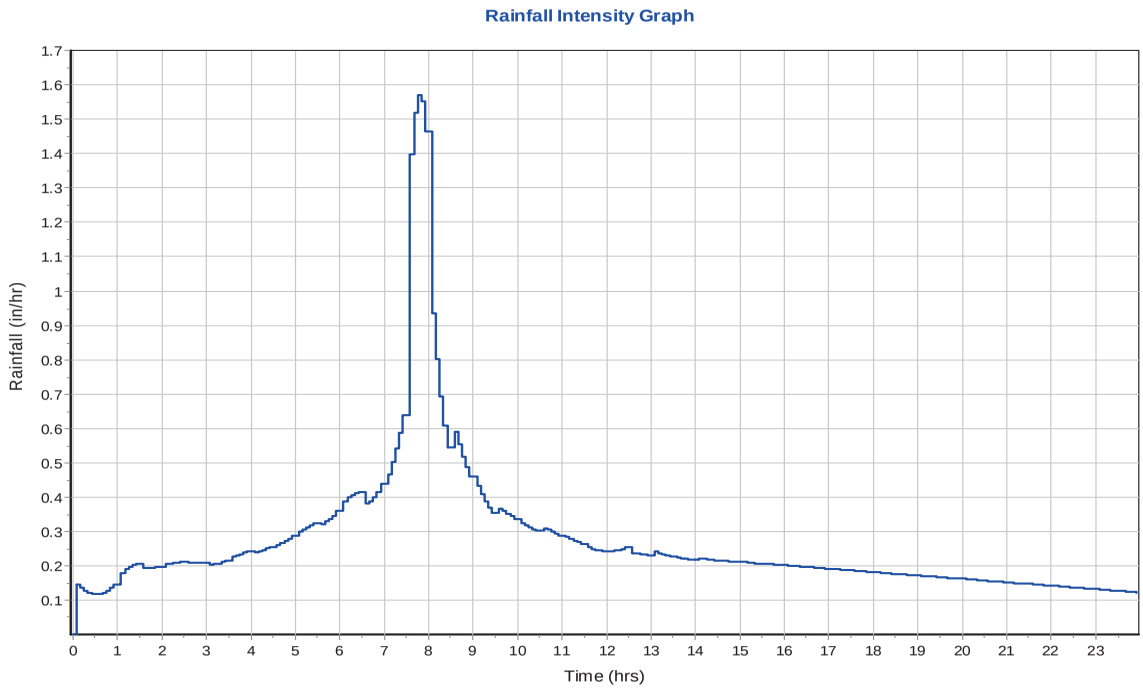
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	89	0	0
Slope (%) :	25	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0	0
Computed Flow Time (min) :	1.19	0	0

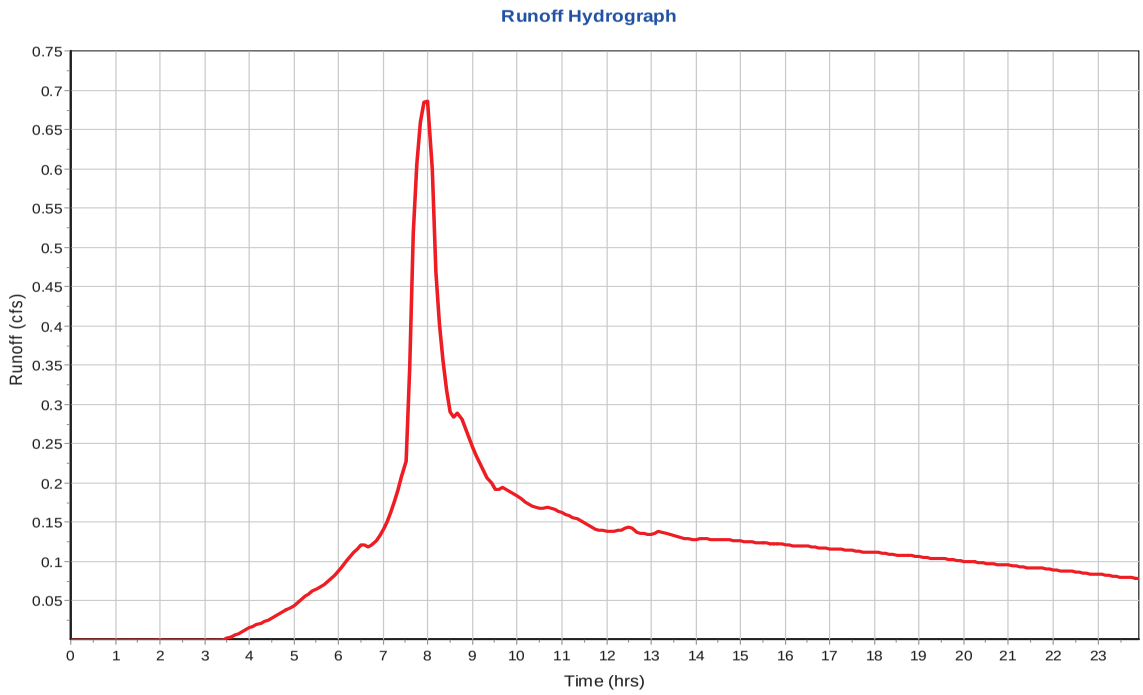
Total TOC (min) 8.63

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.96
Peak Runoff (cfs)	0.69
Weighted Curve Number	77.2
Time of Concentration (days hh:mm:ss)	0 00:08:38

Subbasin : Sub-A_24





Subbasin : Sub-B

Input Data

Area (ac)	5.05
Peak Rate Factor	484
Weighted Curve Number	73.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32	Area (acres)	Soil Group	Curve Number
Soil/Surface Description			
Woods, Fair	4.03	C	73
Pasture, grassland, or range, Good	1.02	C	74
Composite Area & Weighted CN	5.05		73.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

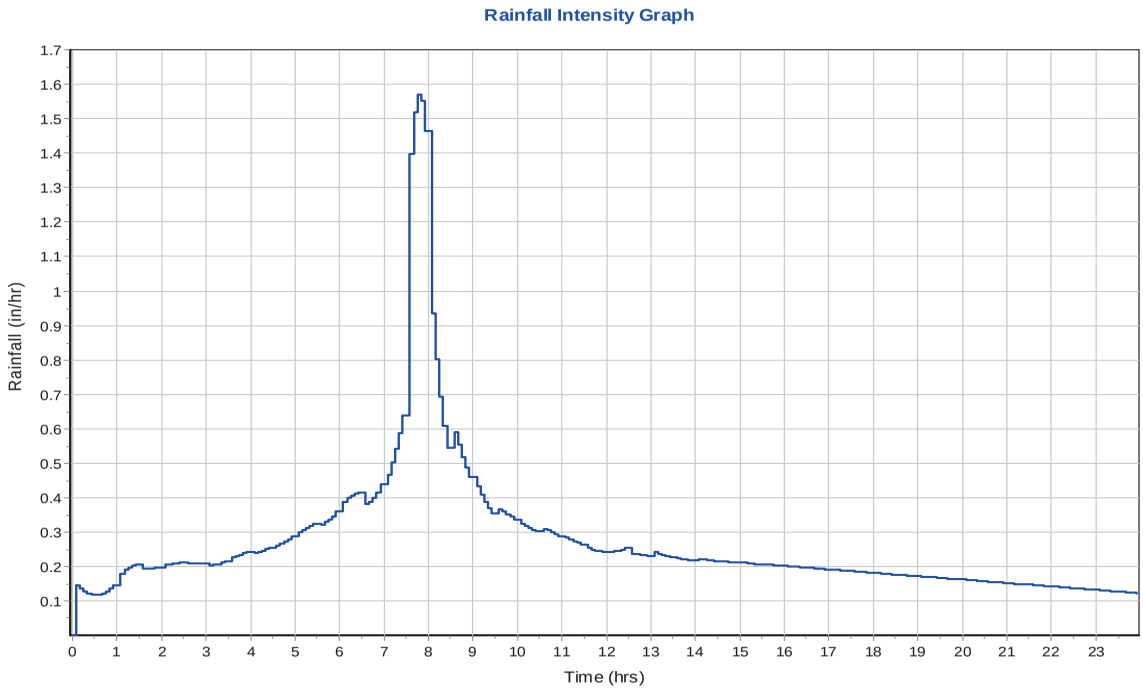
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

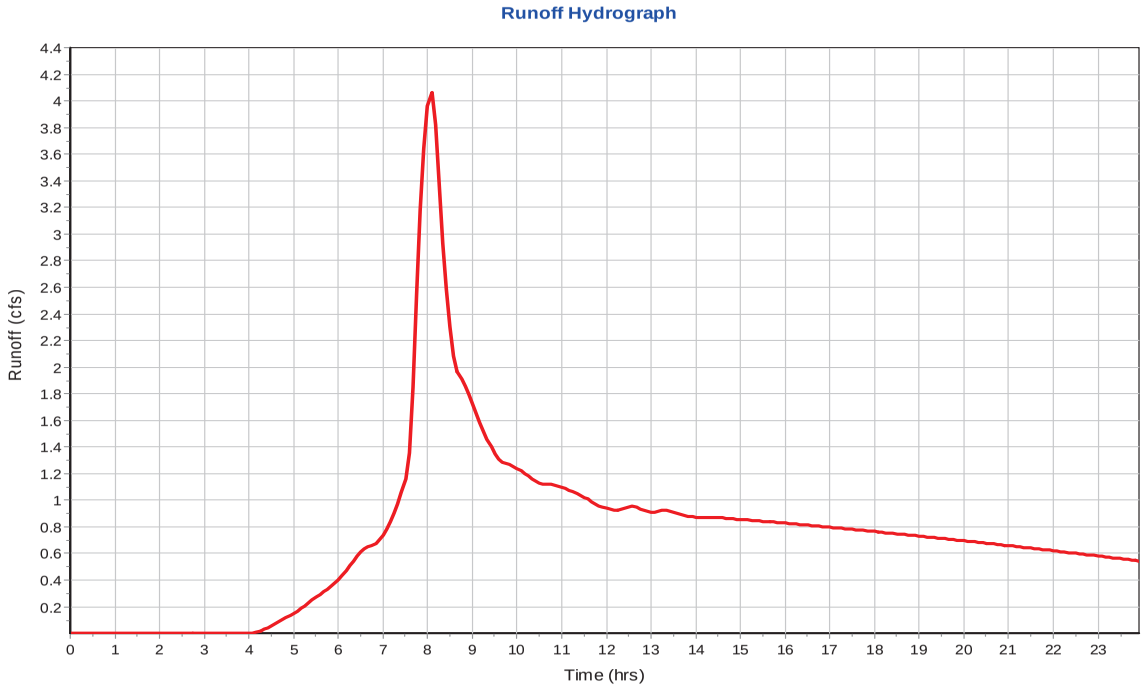
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in)	6.52
Total Runoff (in)	3.55
Peak Runoff (cfs)	4.07
Weighted Curve Number	73.2
Time of Concentration (days hh:mm:ss)	0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	167.00	17.58	User-Defined	4.0	18.9	0.040	0.000	0.500	0.000	0.00	No
DV-02W	173.00	416.00	411.00	5.00	2.89	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-04	162.99	450.00	446.00	4.00	2.45	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-08	220.00	514.00	508.00	6.00	2.73	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-09	150.00	545.00	526.00	19.00	12.67	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-19	121.00	416.50	414.00	2.50	2.07	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-20	114.00	436.00	433.00	3.00	2.63	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21E	81.00	445.00	443.00	2.00	2.47	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21W	114.00	445.50	443.00	2.50	2.19	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22E	143.00	467.00	464.00	3.00	2.10	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22W	121.00	467.00	464.00	3.00	2.48	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23E	172.00	498.00	494.00	4.00	2.33	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23W	165.00	498.00	494.00	4.00	2.42	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No

Channel Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)
DC-B	4.05	0 08:11	860.24	0.00	6.15	2.57	0.54	0.14	0.00
DV-02W	1.44	0 08:01	27.23	0.05	1.47	1.96	0.17	0.33	0.00
DV-04	1.34	0 08:01	25.09	0.05	1.36	2.00	0.17	0.33	0.00
DV-08	1.54	0 08:02	39.68	0.04	1.33	2.76	0.15	0.30	0.00
DV-09	1.65	0 08:00	14.25	0.12	3.70	0.68	0.22	0.45	0.00
DV-19	0.21	0 08:01	5.76	0.04	1.14	1.77	0.15	0.29	0.00
DV-20	0.48	0 08:01	12.99	0.04	1.28	1.48	0.15	0.29	0.00
DV-21E	0.38	0 08:00	6.29	0.06	1.39	0.97	0.17	0.35	0.00
DV-21W	0.38	0 08:01	5.93	0.06	1.34	1.42	0.18	0.36	0.00
DV-22E	0.54	0 08:05	5.80	0.09	1.43	1.67	0.20	0.41	0.00
DV-22W	0.44	0 08:00	6.31	0.07	1.46	1.38	0.18	0.37	0.00
DV-23E	0.46	0 08:05	6.11	0.08	1.44	1.99	0.19	0.38	0.00
DV-23W	0.43	0 08:01	6.23	0.07	1.44	1.91	0.18	0.37	0.00

Pipe Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
Pipe-A-01.1.1	65.39	394.00	378.00	16.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.2	69.53	411.00	394.00	17.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.3	68.85	430.00	411.00	19.00	27.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.4	79.38	446.00	430.00	16.00	20.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.5	71.22	460.00	446.00	14.00	19.7	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.6	75.38	478.00	460.00	18.00	23.9	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.7	68.91	496.00	478.00	18.00	26.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.8	42.46	508.00	496.00	12.00	28.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.9	80.47	526.00	508.00	18.00	22.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.1	165.00	417.00	378.00	39.00	23.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.2	96.92	432.00	417.00	15.00	15.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.3	86.88	445.00	432.00	13.00	15.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.4	80.74	454.00	445.00	9.00	11.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.5	60.02	462.00	454.00	8.00	13.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.6	57.26	476.00	462.00	14.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.7	72.02	494.00	476.00	18.00	25.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.8	73.27	508.00	494.00	14.00	19.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.9	106.58	523.30	508.00	15.30	14.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.1	119.80	414.00	378.00	36.00	30.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.2	56.92	433.00	414.00	19.00	33.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.3	76.14	443.00	433.00	10.00	13.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.4	99.32	464.00	443.00	21.00	21.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.5	158.33	494.00	464.00	30.00	19.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.6	151.88	508.00	494.00	14.00	9.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1

Pipe Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	6.35	0 08:01	17.62	0.36	20.59	0.05	0.41	0.41	0.00	Calculated
Pipe-A-01.1.2	5.98	0 08:01	17.62	0.34	20.26	0.06	0.40	0.40	0.00	Calculated
Pipe-A-01.1.3	4.54	0 08:01	18.72	0.24	19.63	0.06	0.33	0.34	0.00	Calculated
Pipe-A-01.1.4	4.54	0 08:01	16.00	0.28	17.53	0.08	0.36	0.36	0.00	Calculated
Pipe-A-01.1.5	3.19	0 08:01	15.80	0.20	15.75	0.08	0.30	0.31	0.00	Calculated
Pipe-A-01.1.6	3.19	0 08:01	17.41	0.18	16.87	0.07	0.29	0.29	0.00	Calculated
Pipe-A-01.1.7	3.19	0 08:01	18.21	0.18	17.42	0.07	0.28	0.28	0.00	Calculated
Pipe-A-01.1.8	3.19	0 08:01	18.94	0.17	17.93	0.04	0.28	0.28	0.00	Calculated
Pipe-A-01.1.9	1.65	0 08:01	16.85	0.10	13.65	0.10	0.21	0.21	0.00	Calculated
Pipe-A-01.2.1	6.23	0 08:00	17.32	0.36	20.23	0.14	0.41	0.41	0.00	Calculated
Pipe-A-01.2.2	6.23	0 08:00	14.02	0.44	17.31	0.09	0.47	0.47	0.00	Calculated
Pipe-A-01.2.3	6.23	0 08:00	13.78	0.45	17.10	0.08	0.47	0.47	0.00	Calculated
Pipe-A-01.2.4	6.23	0 08:00	11.90	0.52	15.31	0.09	0.51	0.51	0.00	Calculated
Pipe-A-01.2.5	6.23	0 08:00	13.01	0.48	16.38	0.06	0.49	0.49	0.00	Calculated
Pipe-A-01.2.6	6.23	0 08:00	17.62	0.35	20.48	0.05	0.41	0.41	0.00	Calculated
Pipe-A-01.2.7	6.23	0 08:00	17.81	0.35	20.65	0.06	0.41	0.41	0.00	Calculated
Pipe-A-01.2.8	6.23	0 08:00	15.57	0.40	18.72	0.07	0.44	0.44	0.00	Calculated
Pipe-A-01.2.9	6.23	0 08:00	13.52	0.46	16.86	0.11	0.48	0.48	0.00	Calculated
Pipe-A-02.1	4.00	0 08:01	19.53	0.20	19.53	0.10	0.31	0.31	0.00	Calculated
Pipe-A-02.2	3.78	0 08:01	20.58	0.18	19.95	0.05	0.29	0.29	0.00	Calculated
Pipe-A-02.3	3.30	0 08:01	12.91	0.26	13.75	0.09	0.34	0.34	0.00	Calculated
Pipe-A-02.4	2.54	0 08:02	16.38	0.16	15.15	0.11	0.27	0.27	0.00	Calculated
Pipe-A-02.5	1.57	0 08:02	15.51	0.10	12.67	0.21	0.21	0.21	0.00	Calculated
Pipe-A-02.6	0.69	0 08:05	10.82	0.06	7.69	0.33	0.17	0.17	0.00	Calculated

Storage Nodes

Storage Node : Stor-A_1.1-Tee

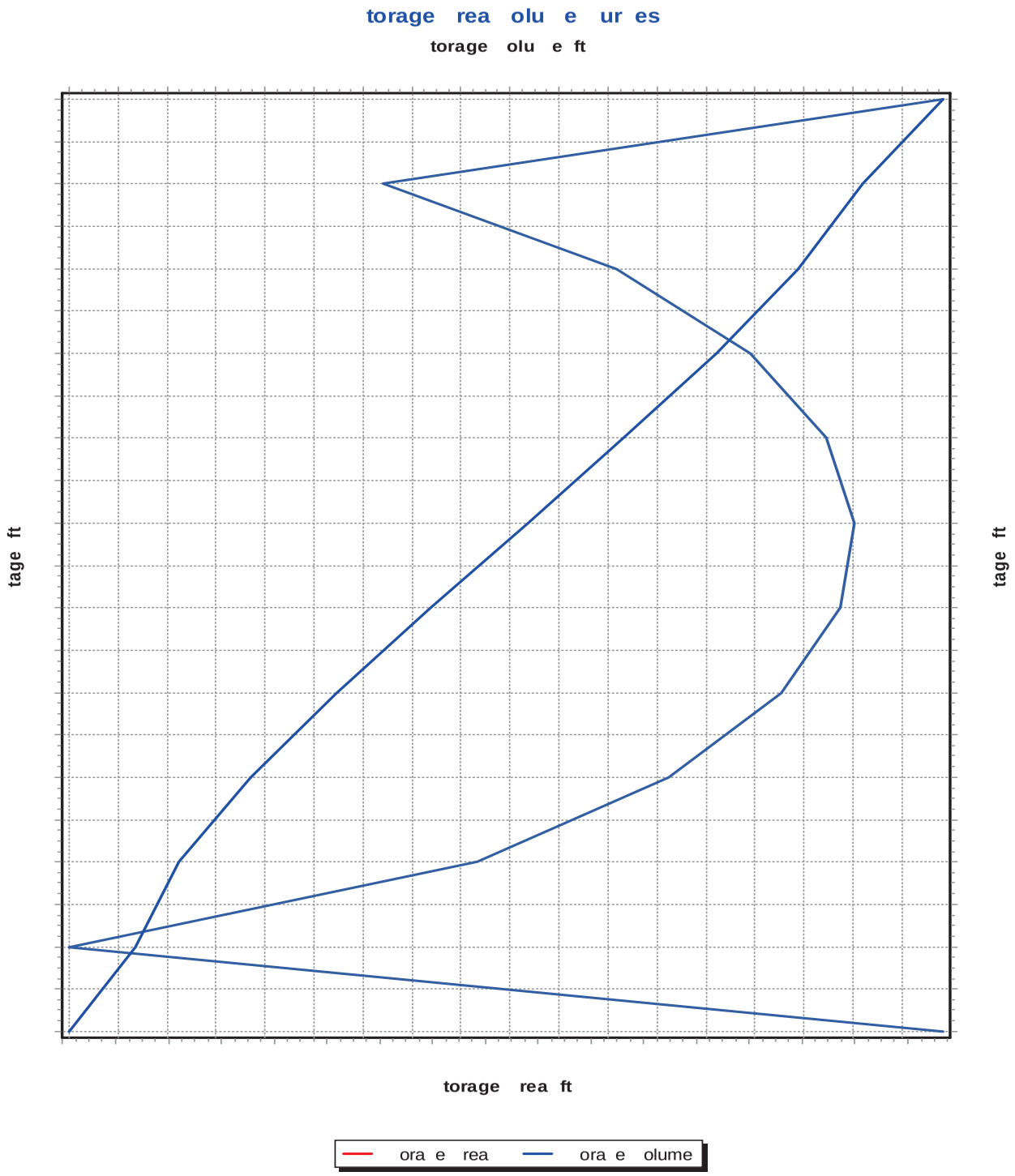
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_01.1 (Tee Spreader)

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.1-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.1-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.1-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.1-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.1-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.1-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.1-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.1-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.1-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.1-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.1-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.1-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.1-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.1-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.1-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	6.35
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	6.31
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	380.44
Max HGL Depth Attained (ft)	2.44
Average HGL Elevation Attained (ft)	378.78
Average HGL Depth Attained (ft)	0.78
Time of Max HGL Occurrence (days hh:mm)	0 08:05
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Storage Node : Stor-A_1.2-Tee

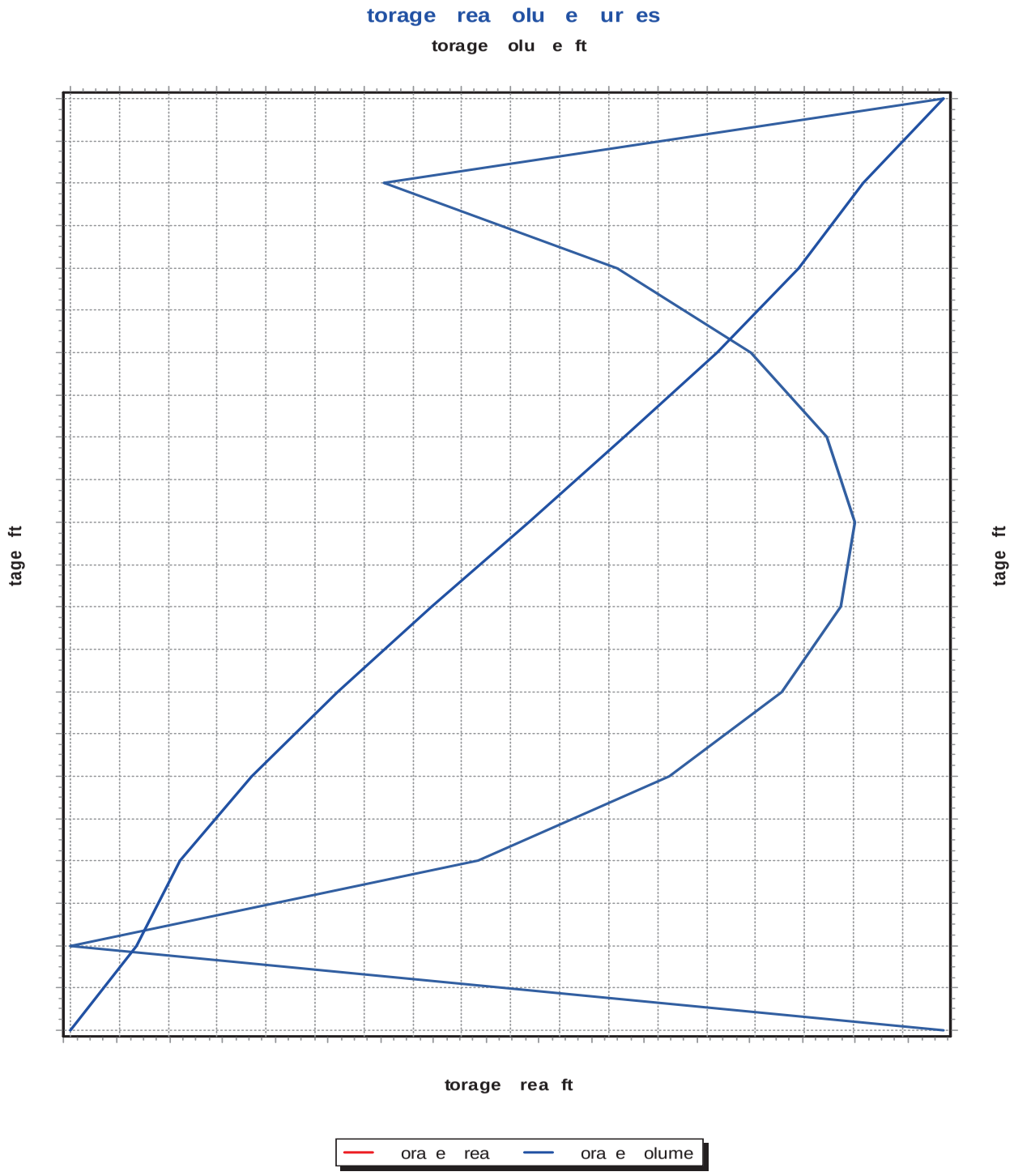
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.2-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	6.23
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	6.18
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	380.38
Max HGL Depth Attained (ft)	2.38
Average HGL Elevation Attained (ft)	378.78
Average HGL Depth Attained (ft)	0.78
Time of Max HGL Occurrence (days hh:mm)	0 08:03
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Storage Node : Stor-A_2-Tee

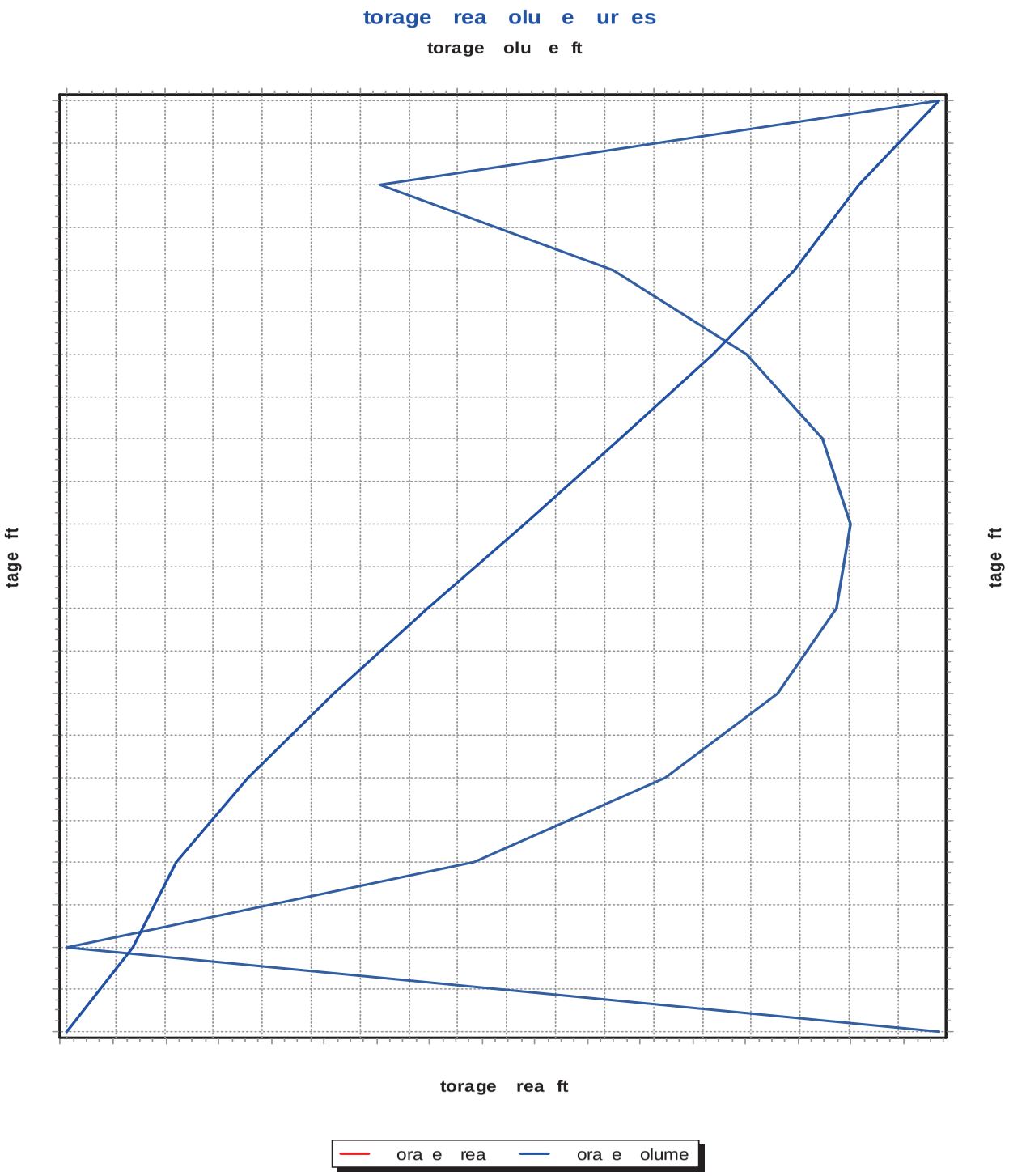
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	4
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	3.98
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	379.92
Max HGL Depth Attained (ft)	1.92
Average HGL Elevation Attained (ft)	378.73
Average HGL Depth Attained (ft)	0.73
Time of Max HGL Occurrence (days hh:mm)	0 08:04
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Project Description

File Name	2001-DRHY-Proposed-SD_TS.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA. Proposed (Post-Development) Conditions Analysis

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	19
Nodes	45
Junctions	37
Outfalls	5
Flow Diversions	0
Inlets	0
Storage Nodes	3
Links	78
Channels	13
Pipes	24
Pumps	0
Orifices	30
Weirs	11
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution

Subbasin Summary

Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A (Offsite SE)	1.89	484	81.47	9.01	6.76	12.77	3.33	0 00:06:13
Sub-A (Offsite W)	2.13	484	83.00	9.01	6.95	14.79	3.85	0 00:09:26
Sub-A_01E	0.82	484	80.00	9.01	6.58	5.39	1.40	0 00:06:30
Sub-A_01W-02	0.34	484	80.00	9.01	6.58	2.24	0.58	0 00:05:00
Sub-A_02-04	1.33	484	80.00	9.01	6.58	8.75	2.28	0 00:06:40
Sub-A_04-06	1.24	484	80.00	9.01	6.58	8.16	2.13	0 00:06:40
Sub-A_06-09	1.43	484	80.00	9.01	6.58	9.41	2.44	0 00:06:40
Sub-A_09	1.49	484	80.95	9.01	6.69	9.97	2.59	0 00:08:42
Sub-A_18	5.50	484	81.53	9.01	6.77	37.21	9.70	0 00:07:16
Sub-A_19-20	0.20	484	80.00	9.01	6.58	1.32	0.34	0 00:06:19
Sub-A_20-21	0.44	484	80.00	9.01	6.58	2.89	0.76	0 00:05:27
Sub-A_21E-22	0.38	484	77.32	9.01	6.25	2.37	0.61	0 00:05:10
Sub-A_21W-22	0.35	484	80.00	9.01	6.58	2.30	0.60	0 00:06:32
Sub-A_22E-23	0.59	484	75.00	9.01	5.96	3.51	0.90	0 00:08:28
Sub-A_22W-23	0.42	484	79.28	9.01	6.49	2.71	0.70	0 00:05:27
Sub-A_23E-24	0.52	484	74.00	9.01	5.84	3.03	0.77	0 00:06:45
Sub-A_23W-24	0.43	484	77.33	9.01	6.25	2.68	0.69	0 00:06:12
Sub-A_24	0.70	484	77.20	9.01	6.23	4.36	1.12	0 00:08:37
Sub-B	5.05	484	73.20	9.01	5.74	28.98	6.93	0 00:19:49

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
DC-B	Junction	535.0	536.0	535.0	0.0	0.00	6.91	535.66	0.00	3.34	0 00:00	0.00	0.00
DI 01	Junction	394.0	400.0	396.0	400.0	0.00	10.00	394.54	0.00	5.46	0 00:00	0.00	0.00
DI 02	Junction	411.0	418.0	411.0	418.0	0.00	9.42	411.52	0.00	6.50	0 00:00	0.00	0.00
DI 03	Junction	430.0	434.1	430.0	434.1	0.00	7.15	430.47	0.00	3.65	0 00:00	0.00	0.00
DI 04	Junction	446.0	450.0	446.0	450.0	0.00	7.15	446.47	0.00	3.55	0 00:00	0.00	0.00
DI 05	Junction	460.0	464.1	460.0	464.1	0.00	5.03	460.39	0.00	3.70	0 00:00	0.00	0.00
DI 06	Junction	478.0	482.1	478.0	482.1	0.00	5.03	478.37	0.00	3.74	0 00:00	0.00	0.00
DI 07	Junction	496.0	500.0	496.0	500.0	0.00	5.03	496.36	0.00	3.66	0 00:00	0.00	0.00
DI 08	Junction	508.0	511.8	508.0	511.8	0.00	5.02	508.35	0.00	3.48	0 00:00	0.00	0.00
DI 09	Junction	526.0	531.0	526.0	531.0	0.00	2.59	526.26	0.00	4.69	0 00:00	0.00	0.00
DI 10	Junction	417.0	420.0	416.0	420.0	0.00	9.69	417.61	0.00	2.38	0 00:00	0.00	0.00
DI 11	Junction	432.0	436.0	432.0	436.0	0.00	9.69	432.62	0.00	3.40	0 00:00	0.00	0.00
DI 12	Junction	445.0	450.0	446.0	450.0	0.00	9.69	445.69	0.00	4.30	0 00:00	0.00	0.00
DI 13	Junction	454.0	458.0	454.0	458.0	0.00	9.69	454.69	0.00	3.33	0 00:00	0.00	0.00
DI 14	Junction	462.0	466.2	462.0	466.2	0.00	9.69	462.64	0.00	3.59	0 00:00	0.00	0.00
DI 15	Junction	476.0	479.6	476.0	479.6	0.00	9.69	476.53	0.00	3.05	0 00:00	0.00	0.00
DI 16	Junction	494.0	498.1	494.0	498.1	0.00	9.69	494.57	0.00	3.55	0 00:00	0.00	0.00
DI 17	Junction	508.0	512.5	508.0	512.5	0.00	9.69	508.63	0.00	3.87	0 00:00	0.00	0.00
DI 18	Junction	523.3	527.4	523.3	527.4	0.00	9.70	523.97	0.00	3.42	0 00:00	0.00	0.00
DI 19	Junction	414.0	418.3	414.0	418.3	0.00	6.48	414.40	0.00	3.90	0 00:00	0.00	0.00
DI 20	Junction	433.0	437.4	437.4	437.4	0.00	6.14	433.45	0.00	3.95	0 00:00	0.00	0.00
DI 21	Junction	443.0	447.3	443.0	447.3	0.00	5.38	443.45	0.00	3.83	0 00:00	0.00	0.00
DI 22	Junction	464.0	468.0	464.0	468.0	0.00	4.17	464.34	0.00	3.69	0 00:00	0.00	0.00
DI 23	Junction	494.0	498.1	494.0	498.1	0.00	2.57	494.28	0.00	3.78	0 00:00	0.00	0.00
DI 24	Junction	508.0	512.6	508.0	512.6	0.00	1.11	508.22	0.00	4.38	0 00:00	0.00	0.00
HP-02	Junction	415.0	416.5	0.0	0.0	0.00	2.28	416.20	0.00	0.30	0 00:00	0.00	0.00
HP-04W	Junction	450.0	451.0	0.0	0.0	0.00	2.12	450.20	0.00	0.80	0 00:00	0.00	0.00
HP-09	Junction	545.0	546.0	0.0	0.0	0.00	2.59	545.26	0.00	0.74	0 00:00	0.00	0.00
HP-19	Junction	416.5	417.5	0.0	0.0	0.00	0.34	416.67	0.00	0.83	0 00:00	0.00	0.00
HP-20	Junction	436.0	436.0	0.0	0.0	0.00	0.76	436.17	0.00	0.33	0 00:00	0.00	0.00
HP-21	Junction	445.5	446.5	0.0	0.0	0.00	0.60	445.71	0.00	0.79	0 00:00	0.00	0.00

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
HP-22	Junction	467.0	468.0	0.0	0.0	0.00	0.70	467.22	0.00	0.78	0 00:00	0.00	0.00
HP-23	Junction	498.0	499.0	0.0	0.0	0.00	0.69	498.22	0.00	0.78	0 00:00	0.00	0.00
WB-08	Junction	514.0	515.0	0.0	0.0	0.00	2.44	514.18	0.00	0.82	0 00:00	0.00	0.00
WB-21	Junction	445.0	446.0	0.0	0.0	0.00	0.61	445.21	0.00	0.79	0 00:00	0.00	0.00
WB-22	Junction	467.0	468.0	0.0	0.0	0.00	0.89	467.25	0.00	0.75	0 00:00	0.00	0.00
WB-23	Junction	498.0	499.0	0.0	0.0	0.00	0.77	498.23	0.00	0.77	0 00:00	0.00	0.00
Out-A	Outfall	360.0					8.58	360.00					
Out-A_1.1-Tee	Outfall	378.0					9.57	378.00					
Out-A_1.2-Tee	Outfall	378.0					9.32	378.00					
Out-A_2-Tee	Outfall	378.0					6.27	378.00					
Out-B	Outfall	368.0					6.90	368.66					
Stor-A_1.1-Tee	Storage Node	378.0	384.0	378.0		0.00	10.00	382.53				0.00	0.00
Stor-A_1.2-Tee	Storage Node	378.0	384.0	378.0		0.00	9.69	382.34				0.00	0.00
Stor-A_2-Tee	Storage Node	378.0	384.0	378.0		0.00	6.48	381.54				0.00	0.00

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	Pipe	DI 01	Stor-A_1.1-Tee	65.4	394.0	378.0	24.47	12	0.013	10.00	17.62	0.57	23.13	0.54	0.54	0.00	Calculated
Pipe-A-01.1.2	Pipe	DI 02	DI 01	69.5	411.0	394.0	24.45	12	0.013	9.42	17.62	0.53	22.80	0.52	0.52	0.00	Calculated
Pipe-A-01.1.3	Pipe	DI 03	DI 02	68.8	430.0	411.0	27.60	12	0.013	7.15	18.72	0.38	22.22	0.43	0.43	0.00	Calculated
Pipe-A-01.1.4	Pipe	DI 04	DI 03	79.4	446.0	430.0	20.16	12	0.013	7.15	16.00	0.45	19.79	0.47	0.47	0.00	Calculated
Pipe-A-01.1.5	Pipe	DI 05	DI 04	71.2	460.0	446.0	19.66	12	0.013	5.03	15.80	0.32	17.85	0.39	0.39	0.00	Calculated
Pipe-A-01.1.6	Pipe	DI 06	DI 05	75.4	478.0	460.0	23.88	12	0.013	5.03	17.41	0.29	19.17	0.37	0.37	0.00	Calculated
Pipe-A-01.1.7	Pipe	DI 07	DI 06	68.9	496.0	478.0	26.12	12	0.013	5.03	18.21	0.28	19.80	0.36	0.36	0.00	Calculated
Pipe-A-01.1.8	Pipe	DI 08	DI 07	42.5	508.0	496.0	28.26	12	0.013	5.03	18.94	0.27	20.38	0.35	0.35	0.00	Calculated
Pipe-A-01.1.9	Pipe	DI 09	DI 08	80.5	526.0	508.0	22.37	12	0.013	2.59	16.85	0.15	15.53	0.26	0.26	0.00	Calculated
Pipe-A-01.2.1	Pipe	DI 10	Stor-A_1.2-Tee	165.0	417.0	378.0	23.64	12	0.013	9.69	17.32	0.56	22.66	0.53	0.53	0.00	Calculated
Pipe-A-01.2.2	Pipe	DI 11	DI 10	96.9	432.0	417.0	15.48	12	0.013	9.69	14.02	0.69	19.25	0.61	0.61	0.00	Calculated
Pipe-A-01.2.3	Pipe	DI 12	DI 11	86.9	445.0	432.0	14.96	12	0.013	9.69	13.78	0.70	18.99	0.62	0.62	0.00	Calculated
Pipe-A-01.2.4	Pipe	DI 13	DI 12	80.7	454.0	445.0	11.15	12	0.013	9.69	11.90	0.81	16.88	0.69	0.69	0.00	Calculated
Pipe-A-01.2.5	Pipe	DI 14	DI 13	60.0	462.0	454.0	13.33	12	0.013	9.69	13.01	0.74	18.15	0.64	0.64	0.00	Calculated
Pipe-A-01.2.6	Pipe	DI 15	DI 14	57.3	476.0	462.0	24.45	12	0.013	9.69	17.62	0.55	22.95	0.53	0.53	0.00	Calculated
Pipe-A-01.2.7	Pipe	DI 16	DI 15	72.0	494.0	476.0	24.99	12	0.013	9.69	17.81	0.54	23.15	0.53	0.53	0.00	Calculated
Pipe-A-01.2.8	Pipe	DI 17	DI 16	73.3	508.0	494.0	19.11	12	0.013	9.69	15.57	0.62	20.89	0.57	0.57	0.00	Calculated
Pipe-A-01.2.9	Pipe	DI 18	DI 17	106.6	523.3	508.0	14.36	12	0.013	9.69	13.52	0.72	18.71	0.63	0.63	0.00	Calculated
Pipe-A-02.1	Pipe	DI 19	Stor-A_2-Tee	119.8	414.0	378.0	30.05	12	0.013	6.48	19.53	0.33	22.33	0.40	0.40	0.00	Calculated
Pipe-A-02.2	Pipe	DI 20	DI 19	56.9	433.0	414.0	33.38	12	0.013	6.14	20.58	0.30	22.86	0.37	0.37	0.00	Calculated
Pipe-A-02.3	Pipe	DI 21	DI 20	76.1	443.0	433.0	13.13	12	0.013	5.38	12.91	0.42	15.69	0.45	0.45	0.00	Calculated
Pipe-A-02.4	Pipe	DI 22	DI 21	99.3	464.0	443.0	21.14	12	0.013	4.17	16.38	0.25	17.42	0.34	0.34	0.00	Calculated
Pipe-A-02.5	Pipe	DI 23	DI 22	158.3	494.0	464.0	18.95	12	0.013	2.57	15.51	0.17	14.61	0.28	0.28	0.00	Calculated
Pipe-A-02.6	Pipe	DI 24	DI 23	151.9	508.0	494.0	9.22	12	0.013	1.11	10.82	0.10	8.88	0.22	0.22	0.00	Calculated
DC-B	Channel	DC-B	Out-B	950.0	535.0	368.0	17.58	48	0.040	6.90	860.24	0.01	6.99	0.66	0.17	0.00	
DV-02W	Channel	HP-02	DI 02	173.0	416.0	411.0	2.89	6	0.033	2.28	27.23	0.08	1.64	0.20	0.39	0.00	
DV-04	Channel	HP-04W	DI 04	163.0	450.0	446.0	2.45	6	0.033	2.12	25.09	0.08	1.52	0.20	0.40	0.00	
DV-08	Channel	WB-08	DI 08	220.0	514.0	508.0	2.73	6	0.033	2.44	39.68	0.06	1.49	0.18	0.35	0.00	
DV-09	Channel	HP-09	DI 09	150.0	545.0	526.0	12.67	6	0.033	2.59	14.25	0.18	4.14	0.26	0.53	0.00	
DV-19	Channel	HP-19	DI 19	121.0	416.5	414.0	2.07	6	0.033	0.34	5.76	0.06	1.27	0.17	0.35	0.00	
DV-20	Channel	HP-20	DI 20	114.0	436.0	433.0	2.63	6	0.033	0.76	12.99	0.06	1.43	0.17	0.34	0.00	
DV-21E	Channel	WB-21	DI 21	81.0	445.0	443.0	2.47	6	0.033	0.61	6.29	0.10	1.57	0.21	0.42	0.00	
DV-21W	Channel	HP-21	DI 21	114.0	445.5	443.0	2.19	6	0.033	0.60	5.93	0.10	1.49	0.21	0.42	0.00	
DV-22E	Channel	WB-22	DI 22	143.0	467.0	464.0	2.10	6	0.033	0.89	5.80	0.15	1.62	0.25	0.50	0.00	
DV-22W	Channel	HP-22	DI 22	121.0	467.0	464.0	2.48	6	0.033	0.70	6.31	0.11	1.63	0.22	0.44	0.00	
DV-23E	Channel	WB-23	DI 23	172.0	498.0	494.0	2.33	6	0.033	0.77	6.11	0.13	1.63	0.23	0.46	0.00	
DV-23W	Channel	HP-23	DI 23	165.0	498.0	494.0	2.42	6	0.033	0.69	6.23	0.11	1.62	0.22	0.44	0.00	

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Orifice-A_1.1-01	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-02	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-03	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-04	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-05	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-06	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-07	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-08	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-09	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-10	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-01	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-02	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-03	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-04	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-05	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-06	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-07	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-08	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-09	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-10	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-01	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-02	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-03	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-04	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-05	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-06	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-07	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-08	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-09	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Orifice-A_2-10	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.05							
Weir-A_1.1-01	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.25							
Weir-A_1.1-02	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.25							
Weir-A_1.1-03	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.25							
Weir-A_1.1-04	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.25							
Weir-A_1.2-01	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.19							
Weir-A_1.2-02	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.19							
Weir-A_1.2-03	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.19							
Weir-A_1.2-04	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.19							
Weir-A_2-01	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.92							
Weir-A_2-02	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.92							
Weir-A_2-03	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				1.92							

Subbasin Hydrology

Subbasin : Sub-A (Offsite SE)

Input Data

Area (ac) 1.89
Peak Rate Factor 484
Weighted Curve Number 81.47
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	0.29	C	73
Brush, Poor	1.6	D	83
Composite Area & Weighted CN	1.89		81.47

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	29	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.34	0	0
Computed Flow Time (min) :	4.97	0	0

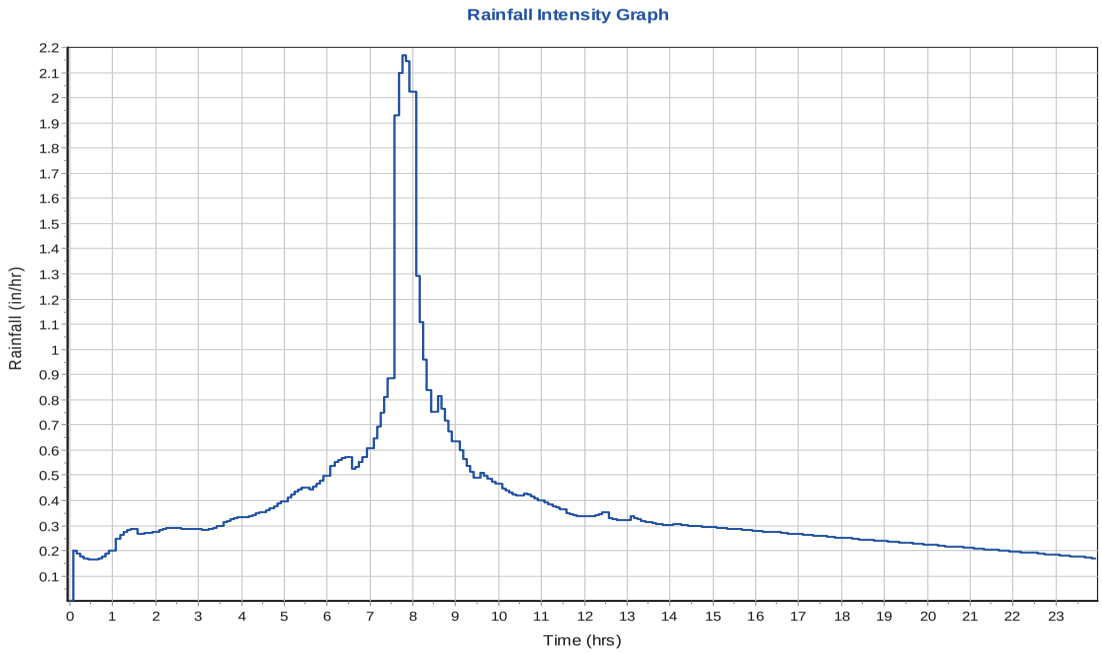
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	279	0	0
Slope (%) :	28	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.7	0	0
Computed Flow Time (min) :	1.26	0	0

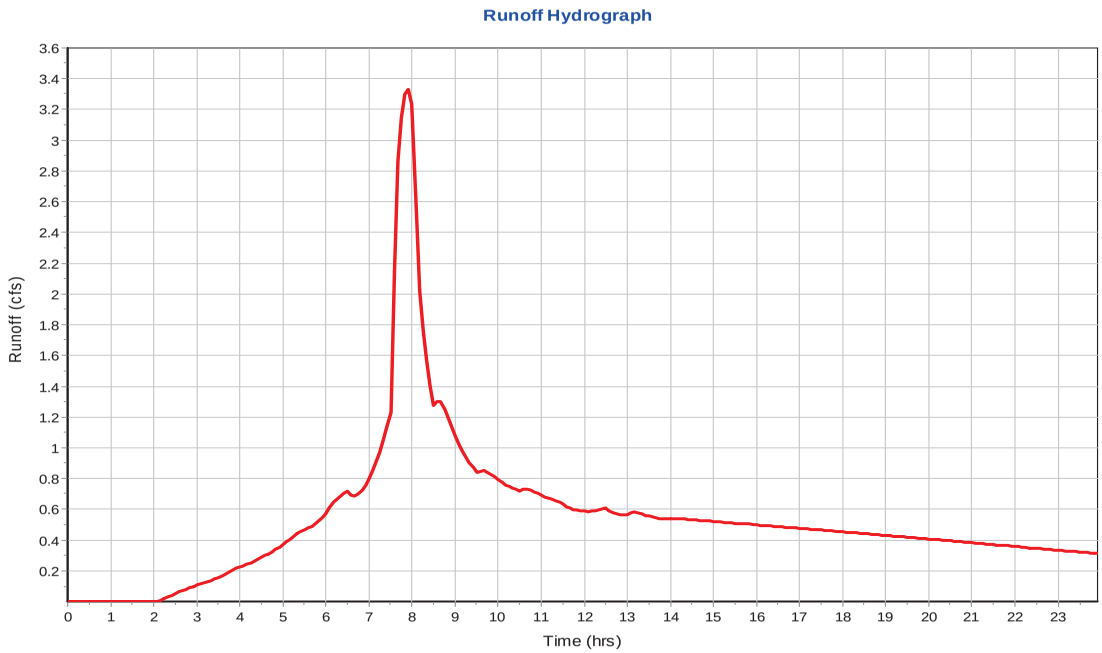
Total TOC (min) 6.23

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.76
Peak Runoff (cfs) 3.33
Weighted Curve Number 81.47
Time of Concentration (days hh:mm:ss) 0 00:06:14

Subbasin : Sub-A (Offsite SE)





Subbasin : Sub-A (Offsite W)

Input Data

Area (ac) 2.13
Peak Rate Factor 484
Weighted Curve Number 83
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Brush, Poor	2.13	D	83
Composite Area & Weighted CN	2.13		83

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	19	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	5.89	0	0

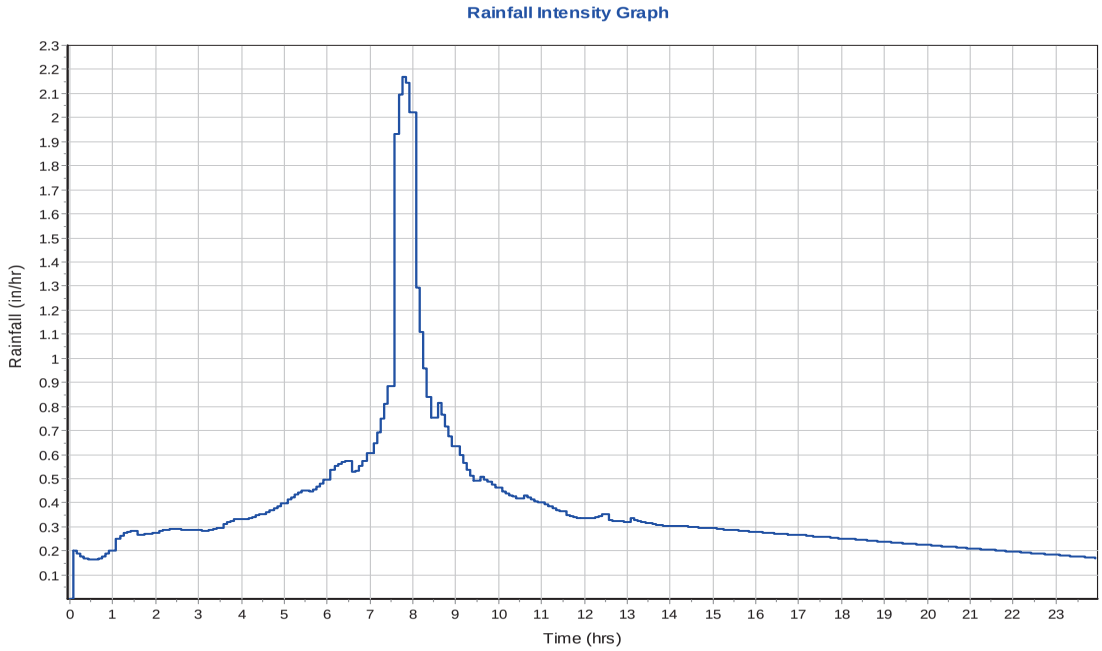
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	633	0	0
Slope (%) :	18	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.97	0	0
Computed Flow Time (min) :	3.55	0	0

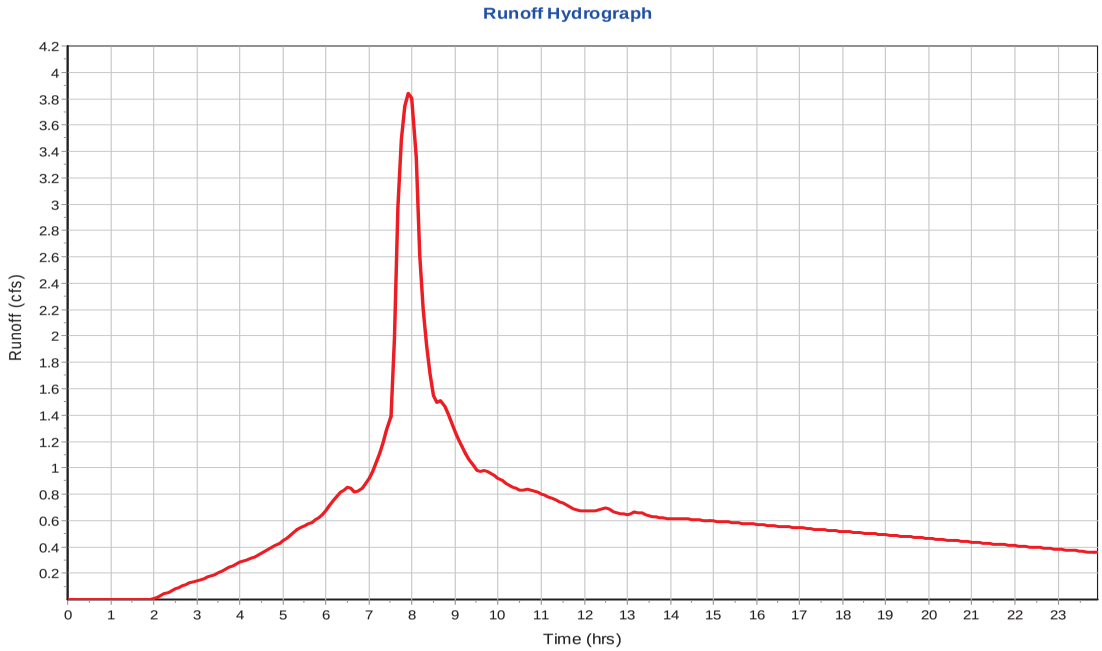
Total TOC (min) 9.44

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.95
Peak Runoff (cfs) 3.85
Weighted Curve Number 83
Time of Concentration (days hh:mm:ss) 0 00:09:26

Subbasin : Sub-A (Offsite W)





Subbasin : Sub-A_01E

Input Data

Area (ac) 0.82
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.82	D	80
Composite Area & Weighted CN	0.82		80

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	30	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.27	0	0
Computed Flow Time (min) :	6.18	0	0

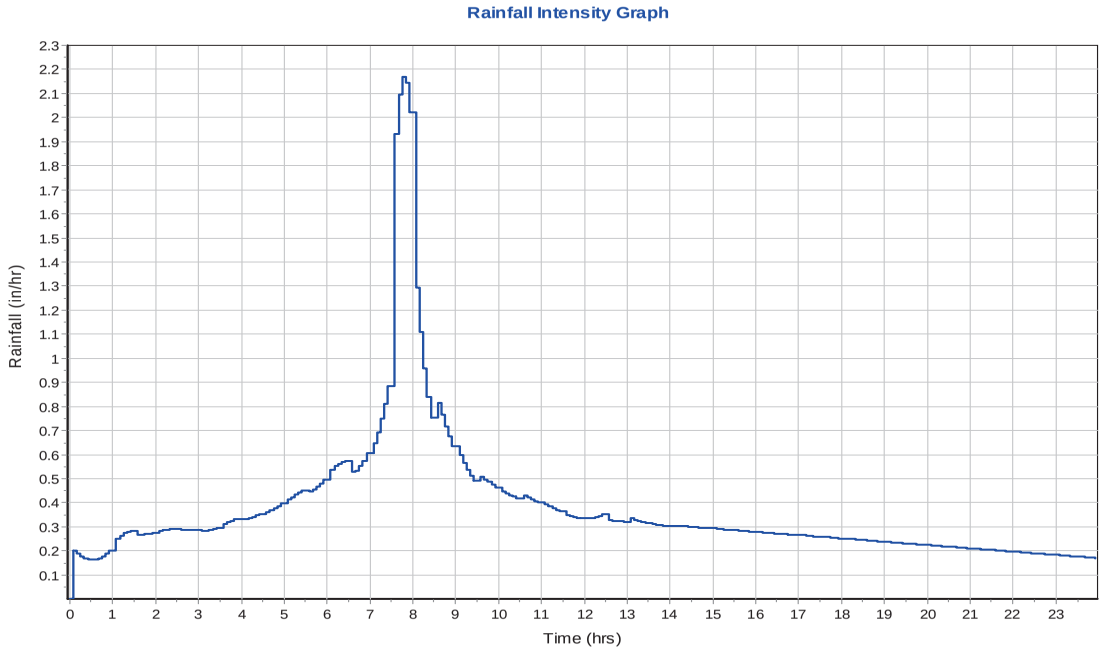
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	77	0	0
Slope (%) :	31	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.9	0	0
Computed Flow Time (min) :	0.33	0	0

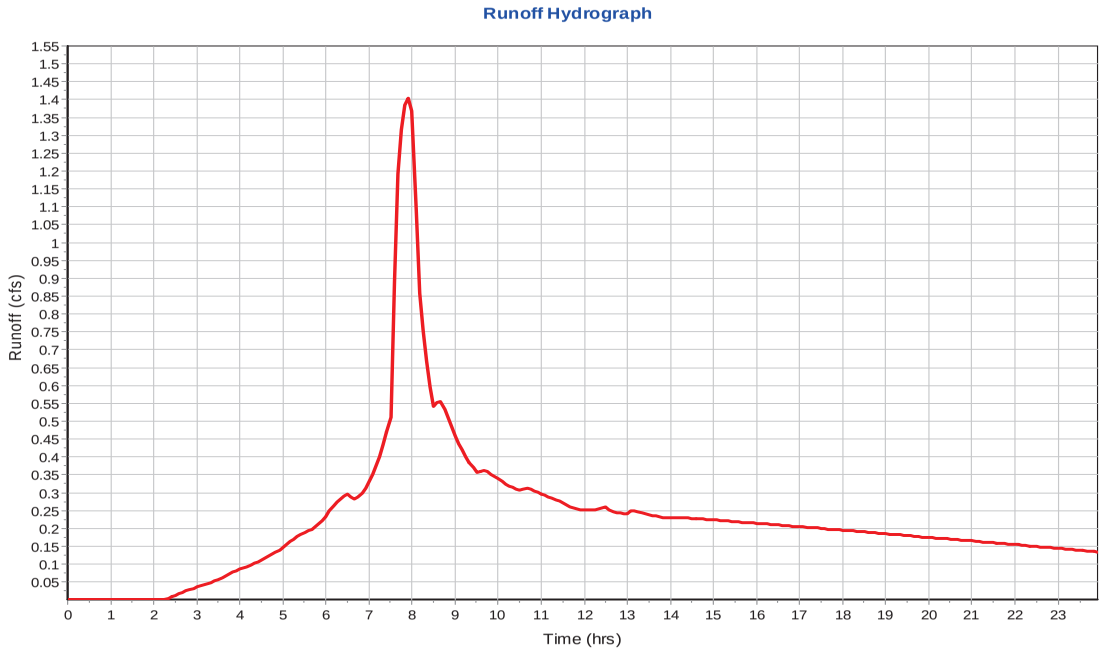
Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.58
Peak Runoff (cfs) 1.4
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:31

Subbasin : Sub-A_01E





Subbasin : Sub-A_01W-02

Input Data

Area (ac) 0.34
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.34	D	80
Composite Area & Weighted CN	0.34		80

Time of Concentration

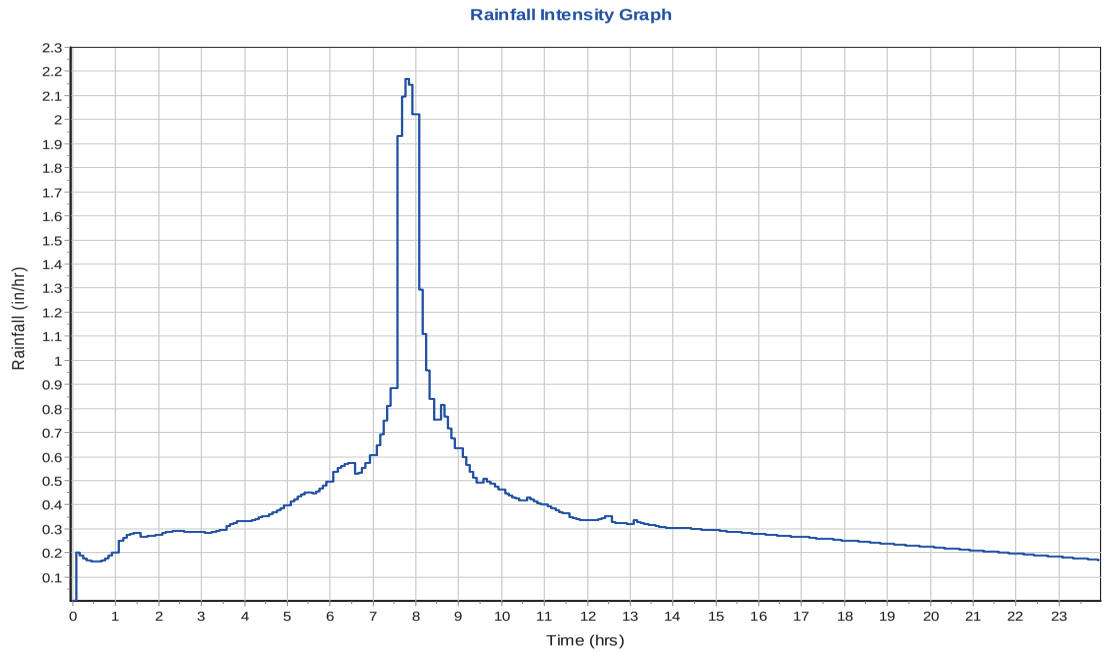
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	60	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	4.83	0	0

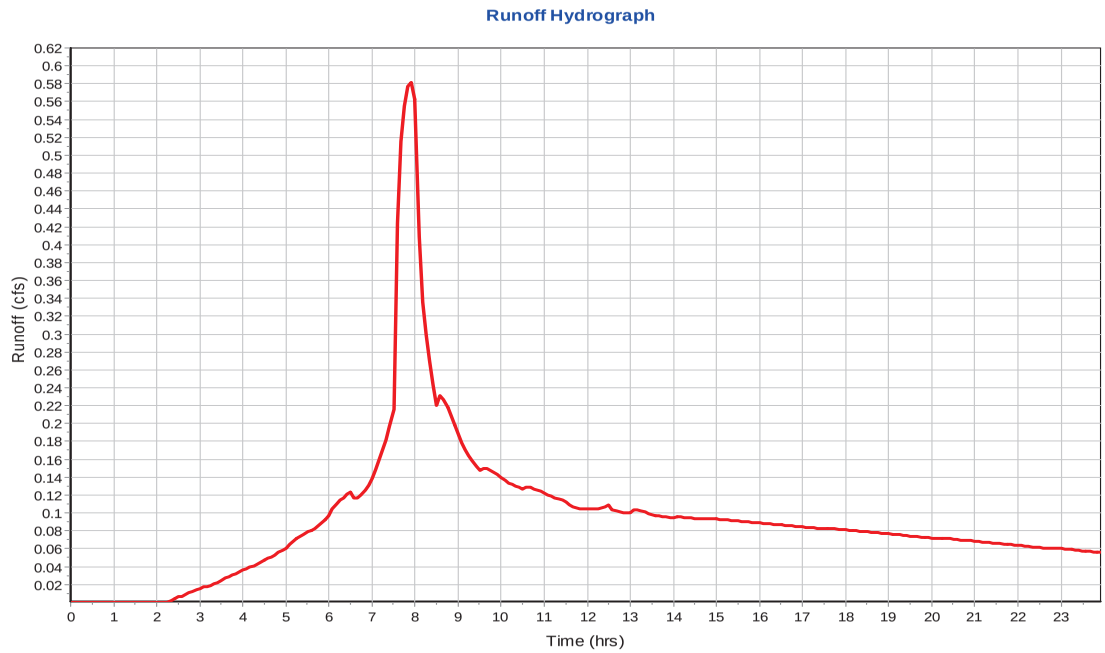
Total TOC (min) 4.83

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.58
Peak Runoff (cfs) 0.58
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:04:50

Subbasin : Sub-A_01W-02





Subbasin : Sub-A_02-04

Input Data

Area (ac) 1.33
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.33	D	80
Composite Area & Weighted CN	1.33		80

Time of Concentration

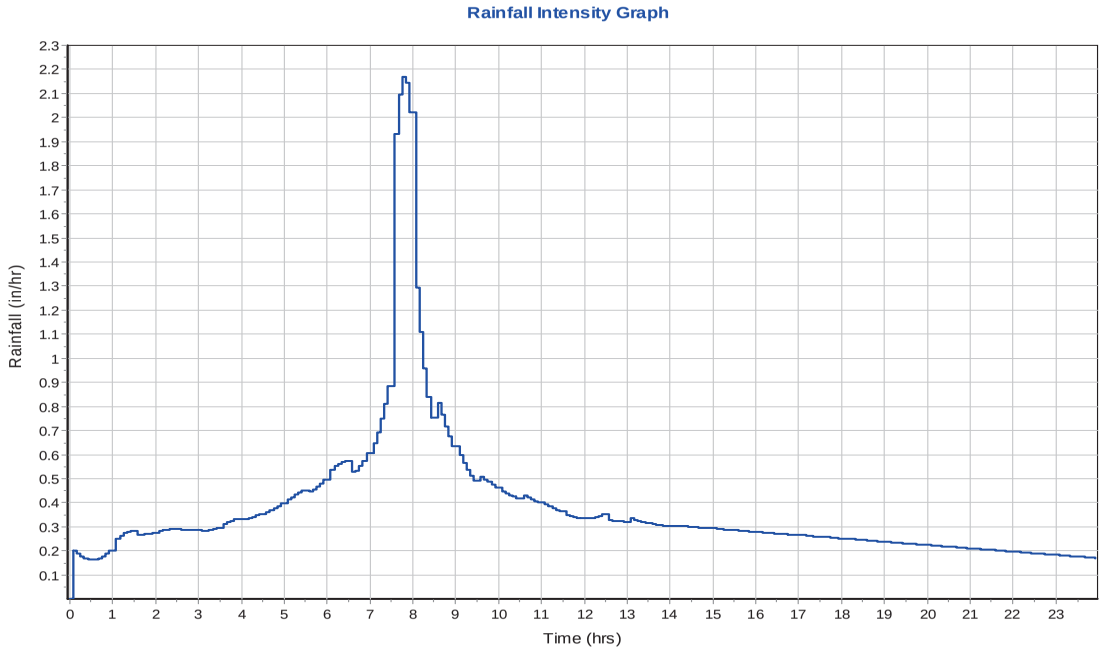
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

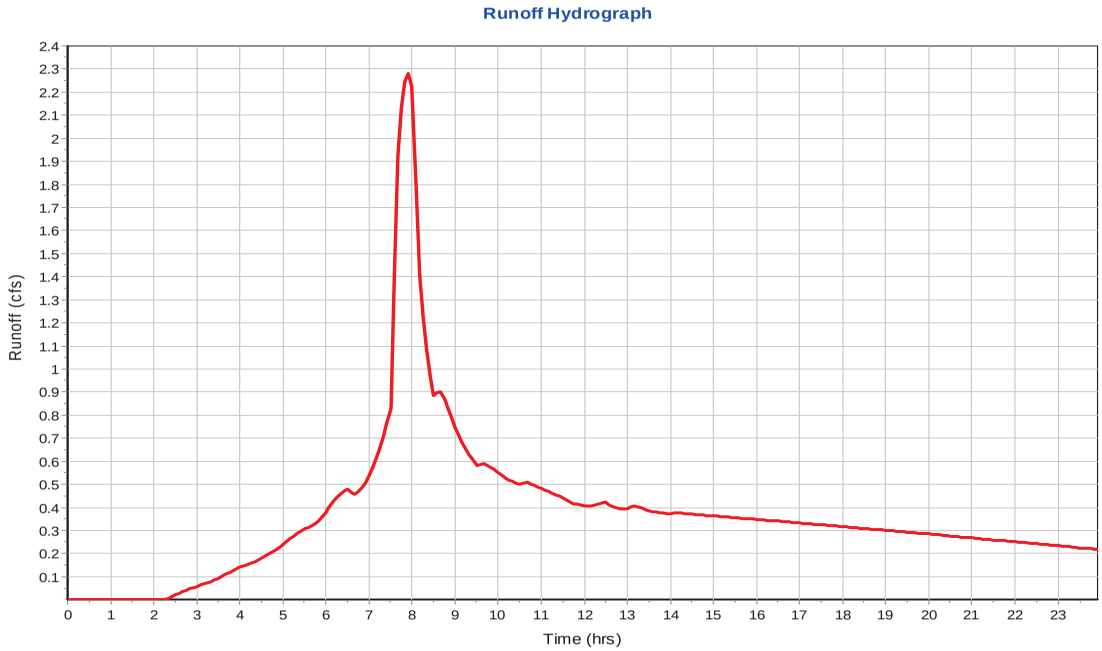
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.58
Peak Runoff (cfs) 2.28
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_02-04





Subbasin : Sub-A_04-06

Input Data

Area (ac) 1.24
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.24	D	80
Composite Area & Weighted CN	1.24		80

Time of Concentration

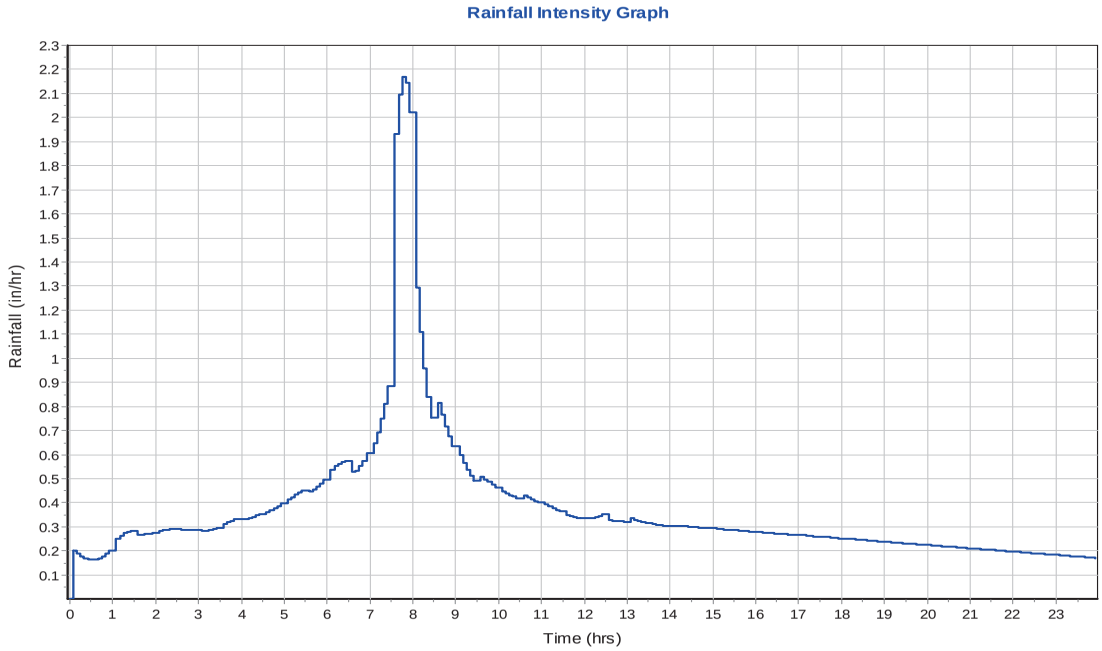
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

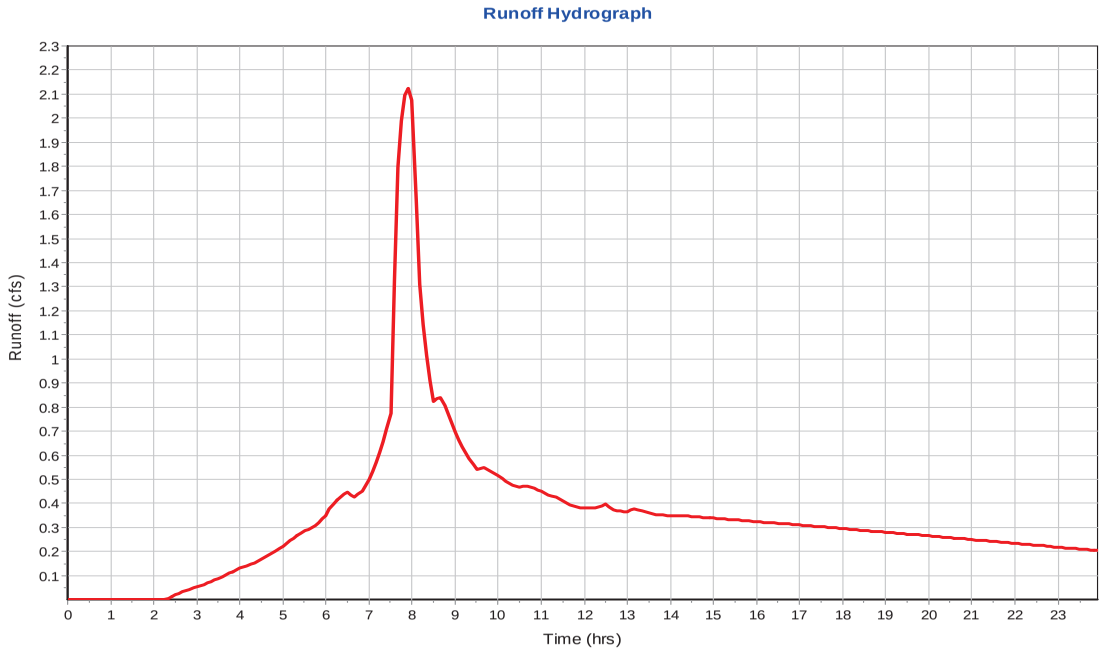
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.58
Peak Runoff (cfs) 2.13
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_04-06





Subbasin : Sub-A_06-09

Input Data

Area (ac) 1.43
Peak Rate Factor 484
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.43	D	80
Composite Area & Weighted CN	1.43		80

Time of Concentration

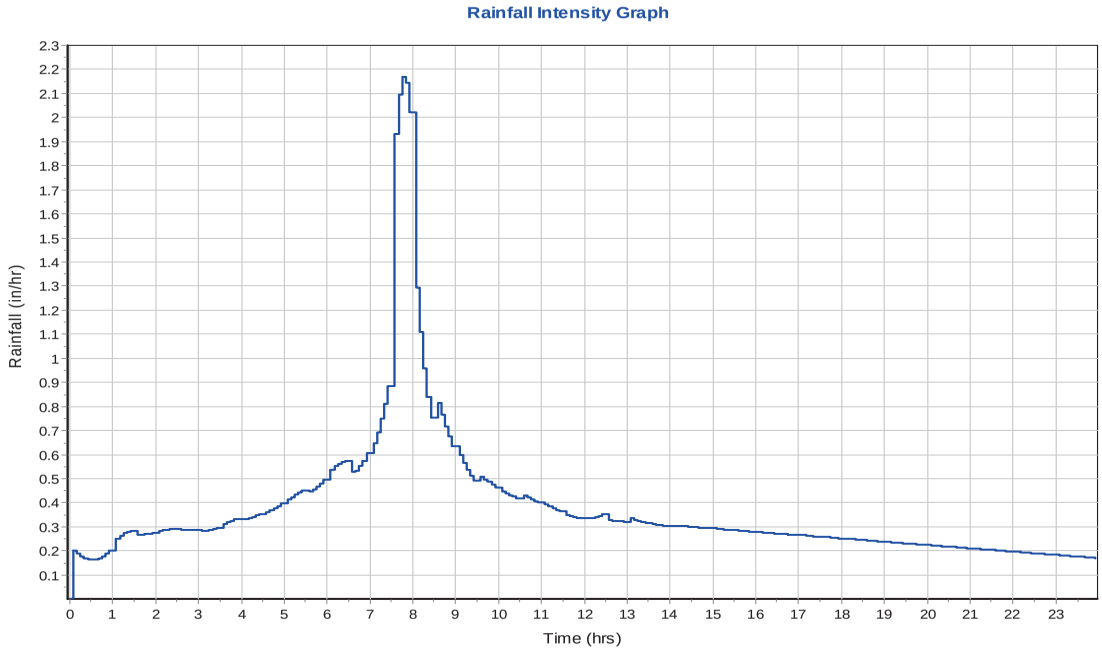
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

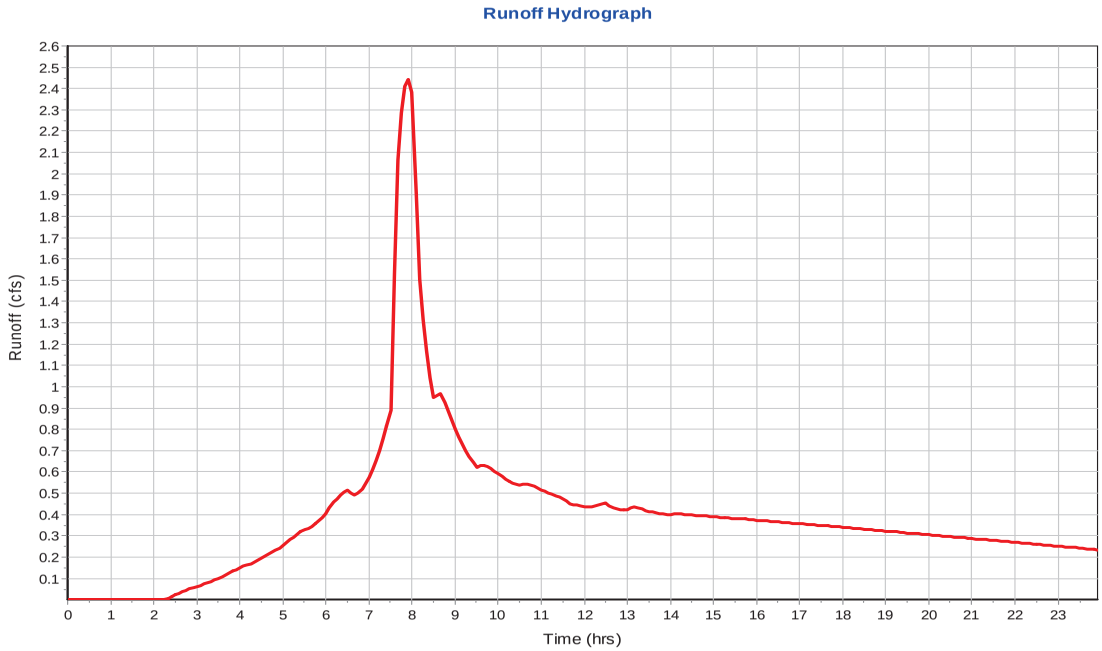
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.58
Peak Runoff (cfs) 2.44
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:06:41

Subbasin : Sub-A_06-09





Subbasin : Sub-A_09

Input Data

Area (ac) 1.49
Peak Rate Factor 484
Weighted Curve Number 80.95
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.64	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.06	C	73
Brush, Poor	0.73	D	83
Composite Area & Weighted CN	1.49		80.95

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	7.08	0	0

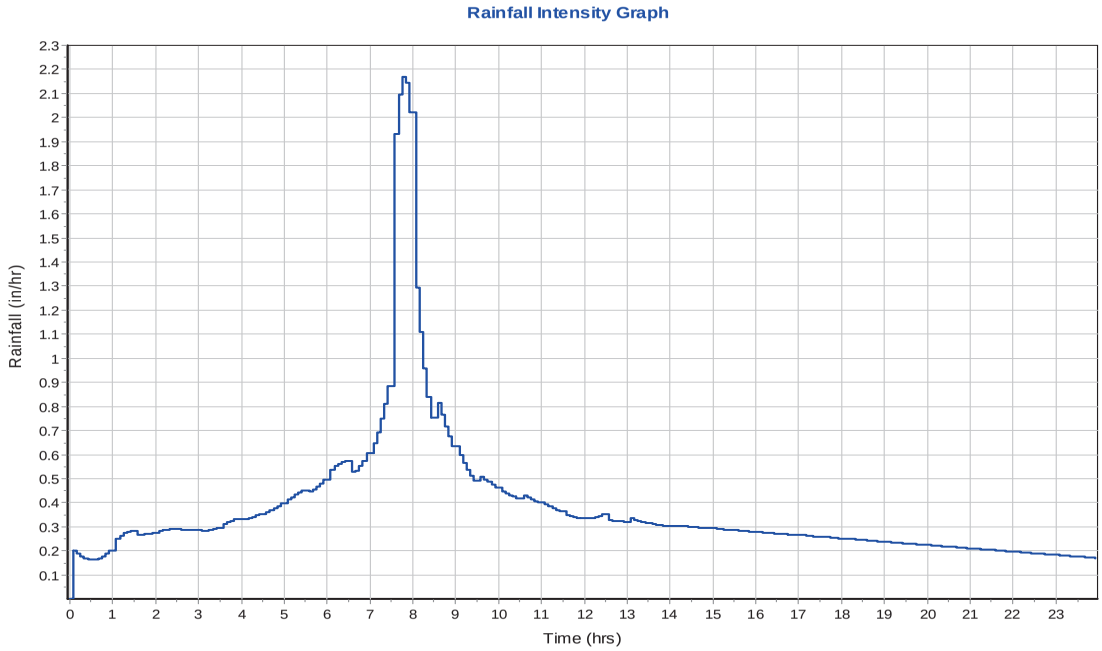
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	350	0	0
Slope (%) :	26	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.57	0	0
Computed Flow Time (min) :	1.63	0	0

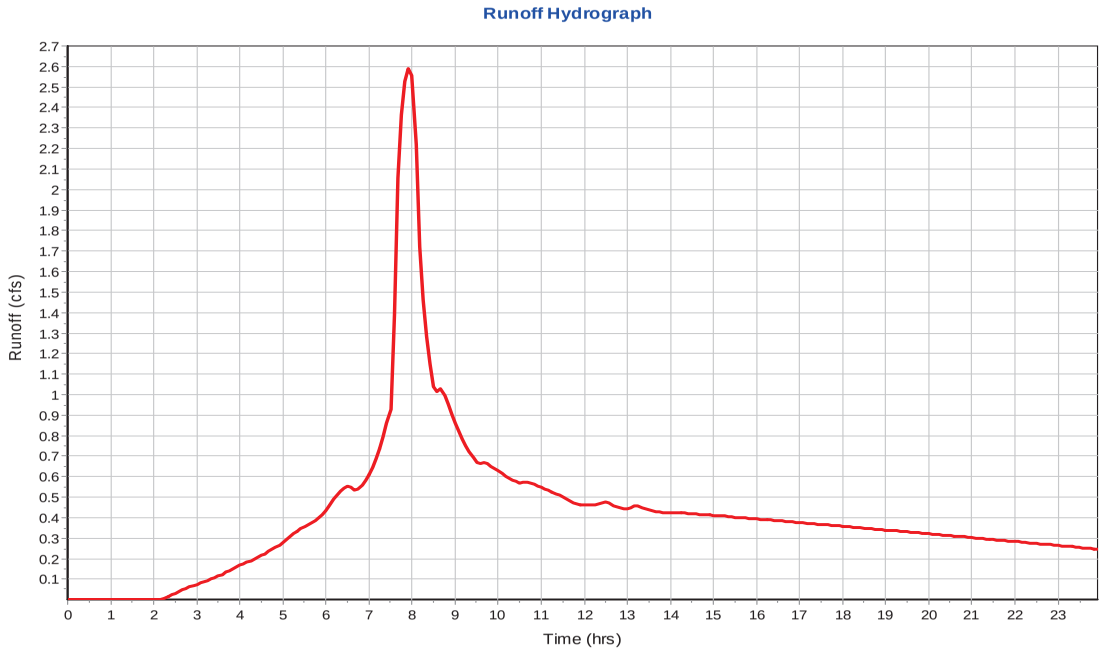
Total TOC (min) 8.71

Subbasin Runoff Results

Total Rainfall (in) 9.01
Total Runoff (in) 6.69
Peak Runoff (cfs) 2.59
Weighted Curve Number 80.95
Time of Concentration (days hh:mm:ss) 0 00:08:43

Subbasin : Sub-A_09





Subbasin : Sub-A_18

Input Data

Area (ac)	5.5
Peak Rate Factor	484
Weighted Curve Number	81.53
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	2.7	D	80
Brush, Poor	2.8	D	83
Composite Area & Weighted CN	5.5		81.53

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

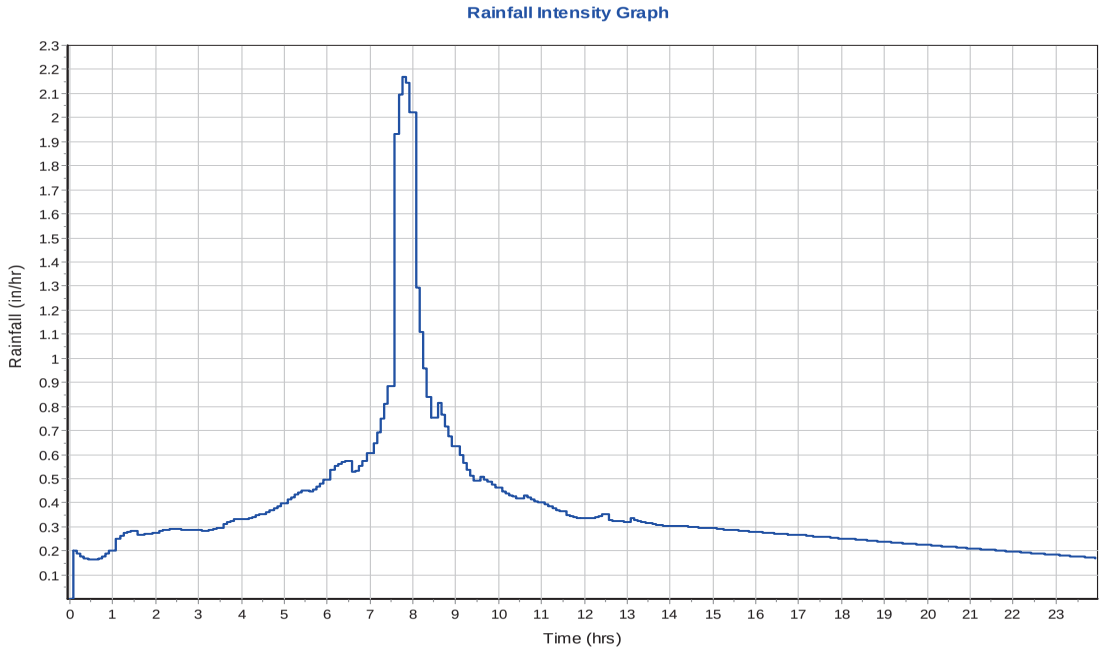
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	274	0	0
Slope (%) :	27	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.64	0	0
Computed Flow Time (min) :	1.25	0	0

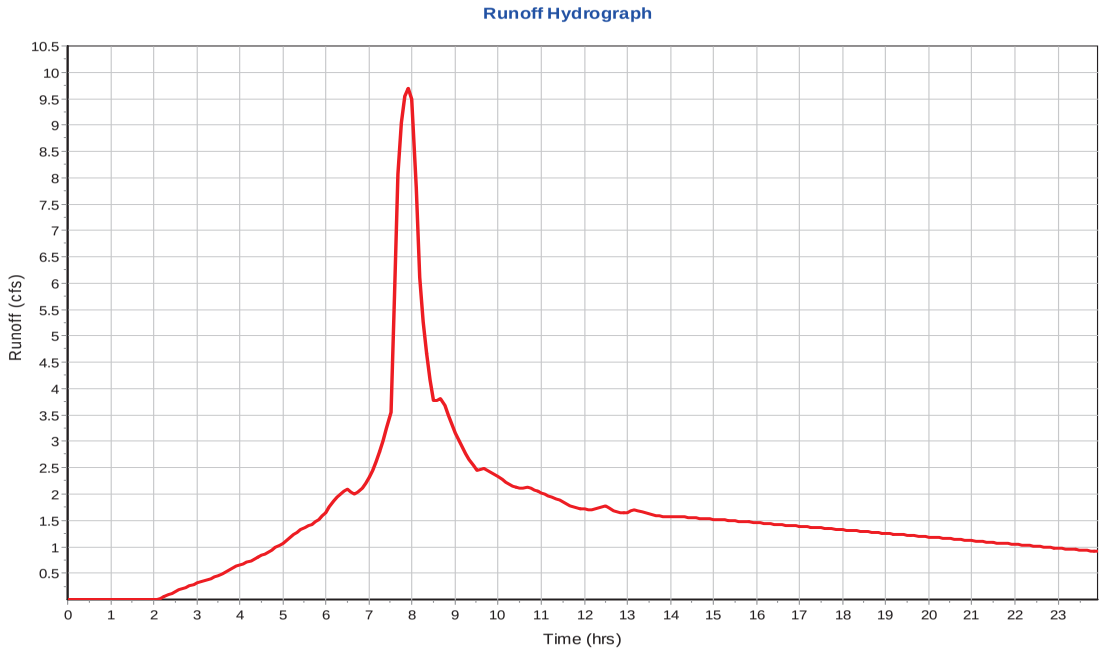
Total TOC (min) 7.28

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.77
Peak Runoff (cfs)	9.7
Weighted Curve Number	81.53
Time of Concentration (days hh:mm:ss)	0 00:07:17

Subbasin : Sub-A_18





Subbasin : Sub-A_19-20

Input Data

Area (ac)	0.2
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.2	D	80
Composite Area & Weighted CN	0.2		80

Time of Concentration

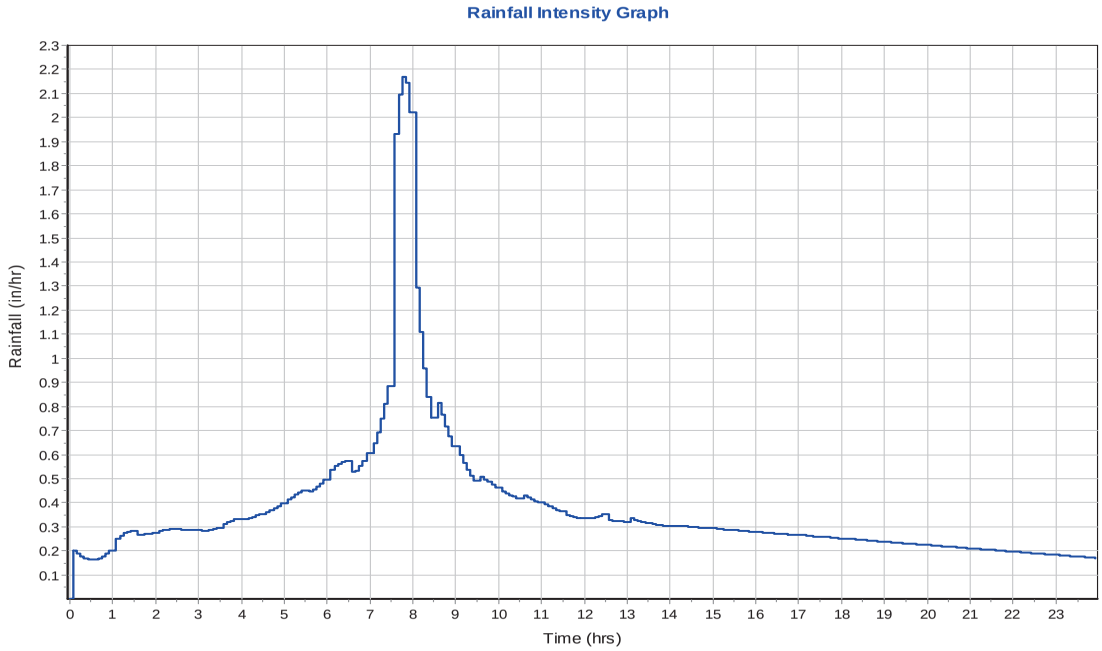
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	92	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.32	0	0

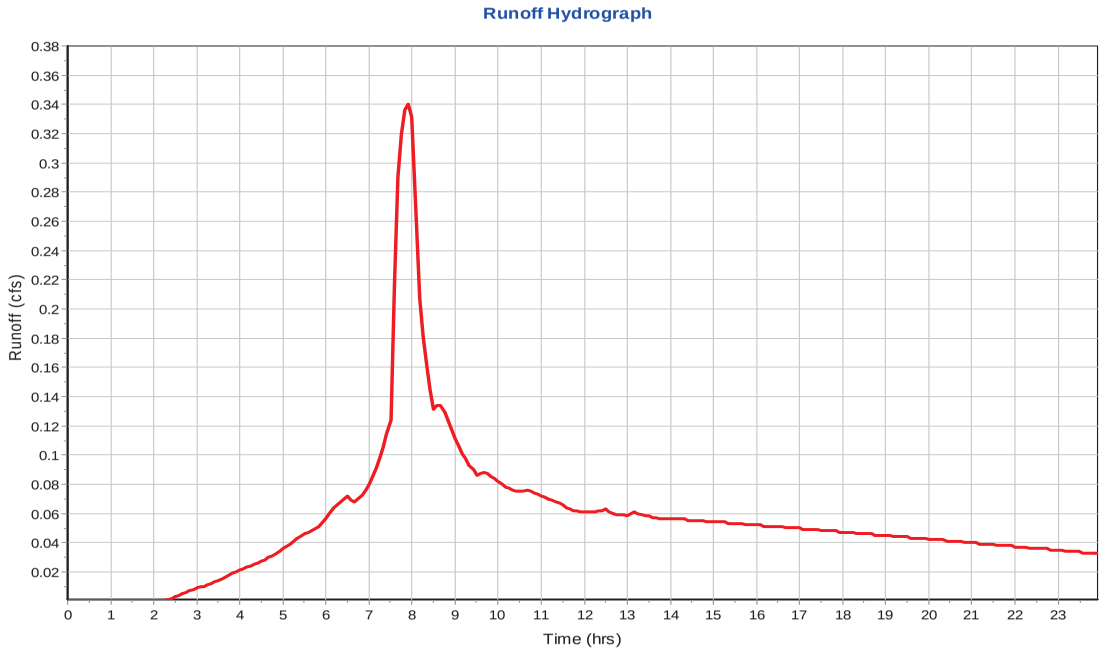
Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.58
Peak Runoff (cfs)	0.34
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:19

Subbasin : Sub-A_19-20





Subbasin : Sub-A_20-21

Input Data

Area (ac)	0.44
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.44	D	80
Composite Area & Weighted CN	0.44		80

Time of Concentration

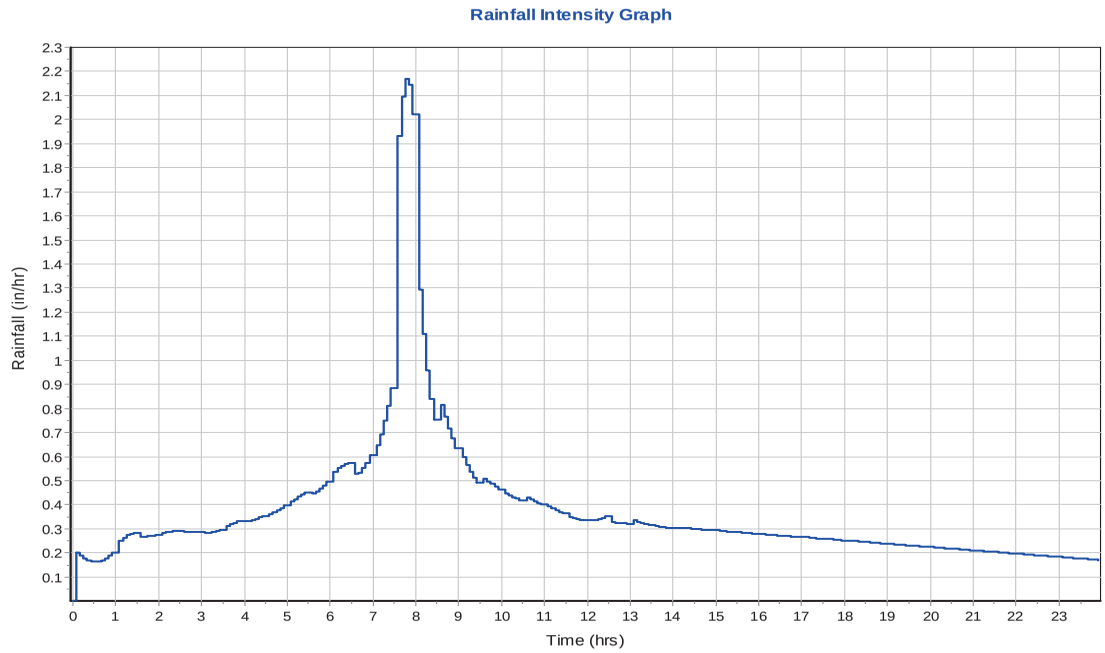
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	70	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	5.46	0	0

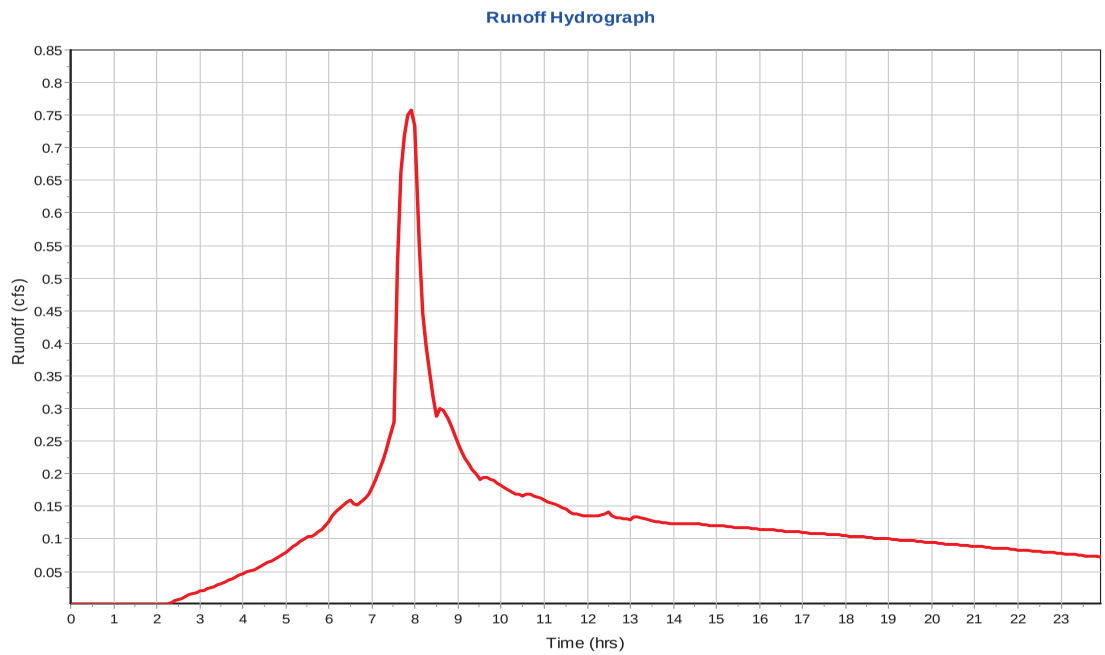
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.58
Peak Runoff (cfs)	0.76
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_20-21





Subbasin : Sub-A_21E-22

Input Data

Area (ac)	0.38
Peak Rate Factor	484
Weighted Curve Number	77.32
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.21	D	80
Pasture, grassland, or range, Good	0.17	C	74
Composite Area & Weighted CN	0.38		77.32

Time of Concentration

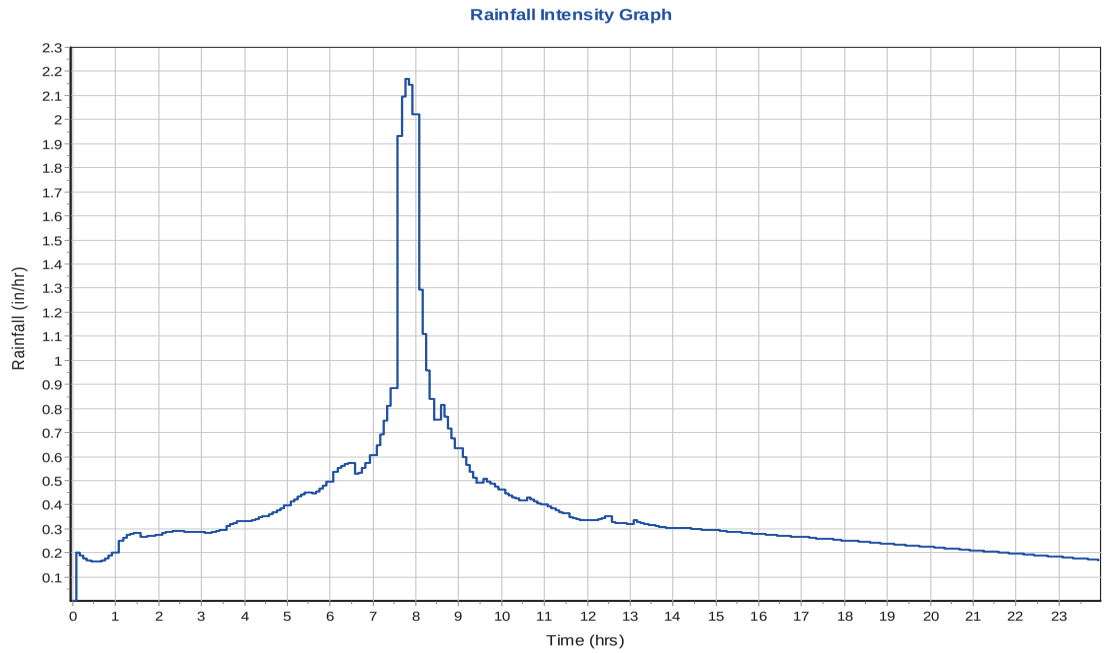
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	73	0	0
Slope (%) :	25	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	5.17	0	0

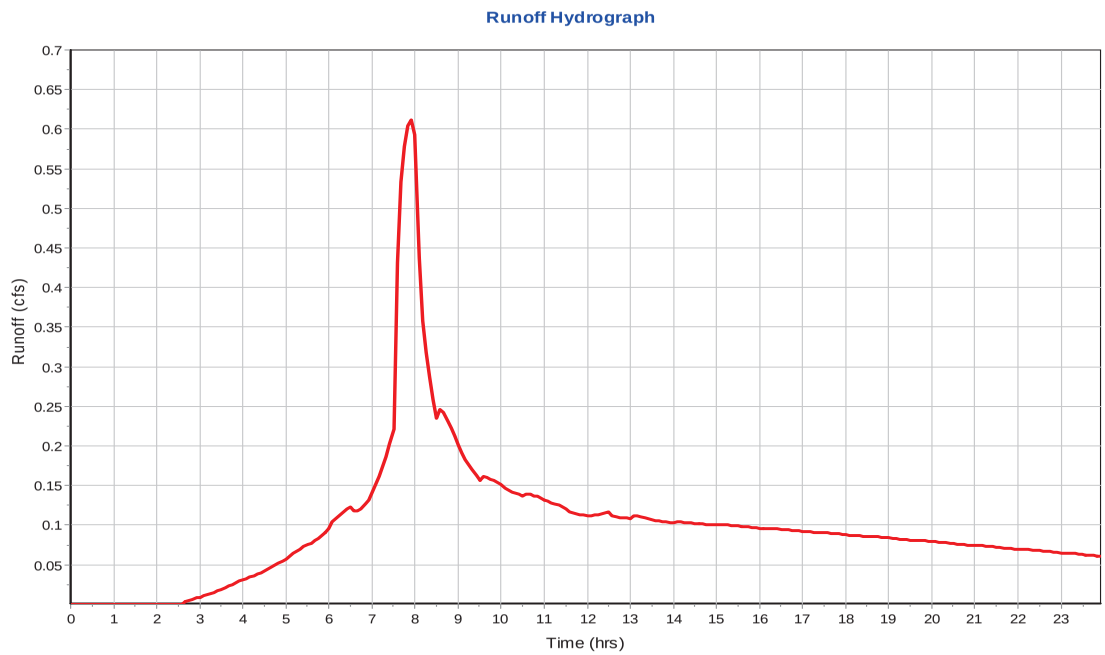
Total TOC (min) 5.17

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.25
Peak Runoff (cfs)	0.61
Weighted Curve Number	77.32
Time of Concentration (days hh:mm:ss)	0 00:05:10

Subbasin : Sub-A_21E-22





Subbasin : Sub-A_21W-22

Input Data

Area (ac)	0.35
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.35	D	80
Composite Area & Weighted CN	0.35		80

Time of Concentration

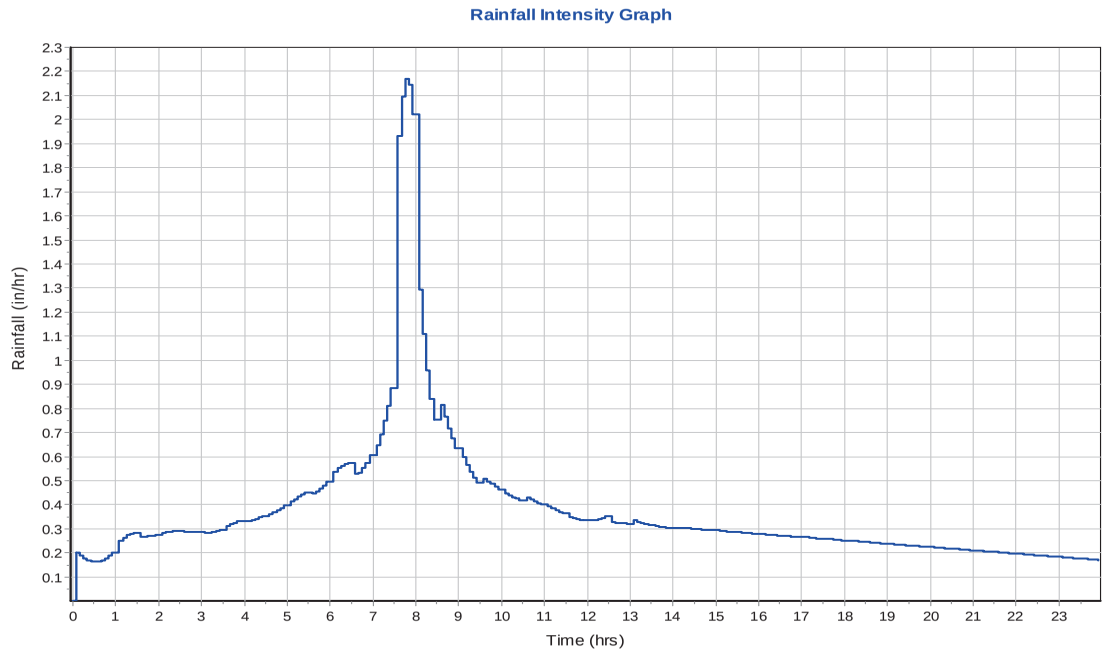
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.25	0	0
Computed Flow Time (min) :	6.54	0	0

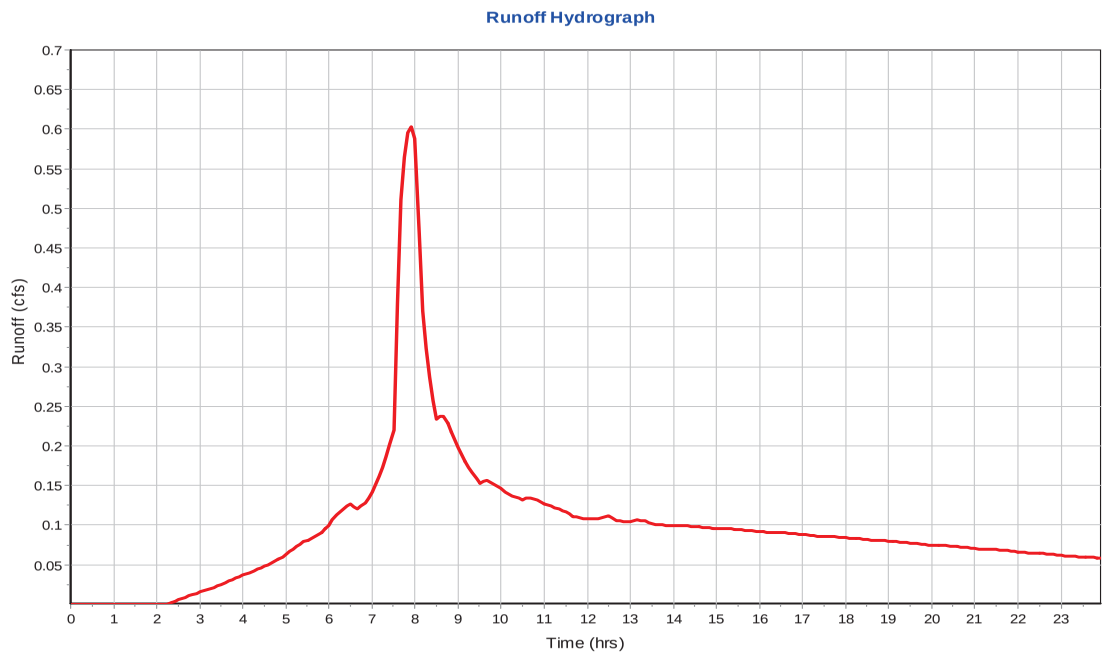
Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.58
Peak Runoff (cfs)	0.6
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:32

Subbasin : Sub-A_21W-22





Subbasin : Sub-A_22E-23

Input Data

Area (ac)	0.59
Peak Rate Factor	484
Weighted Curve Number	75
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.1	D	80
Pasture, grassland, or range, Good	0.49	C	74
Composite Area & Weighted CN	0.59		75

Time of Concentration

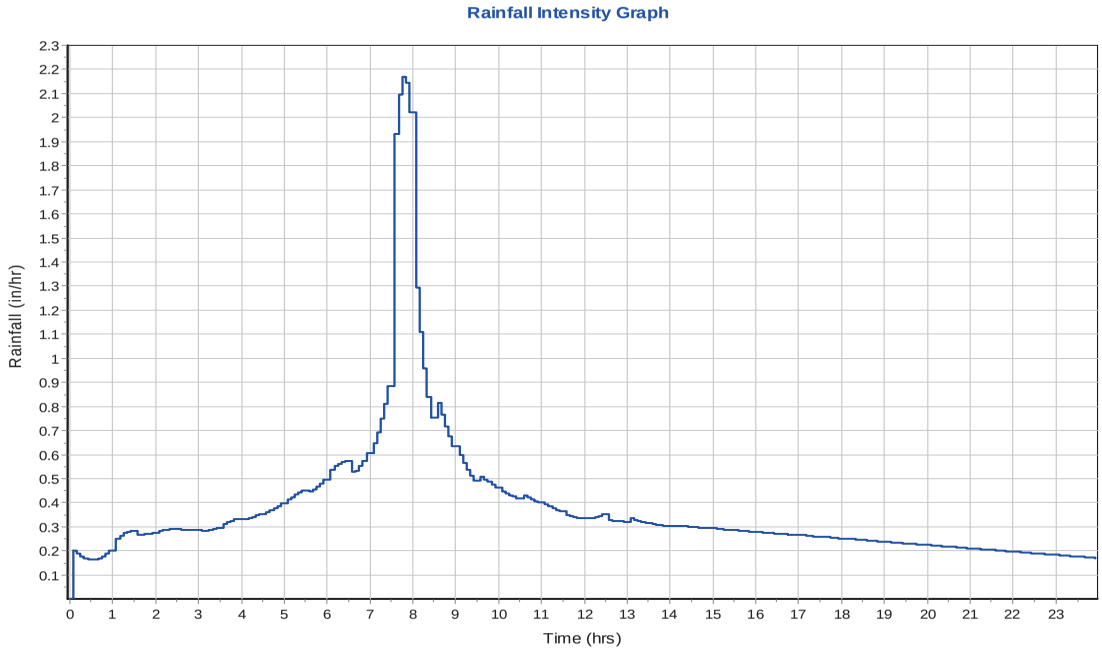
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	105	0	0
Slope (%) :	15	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.48	0	0

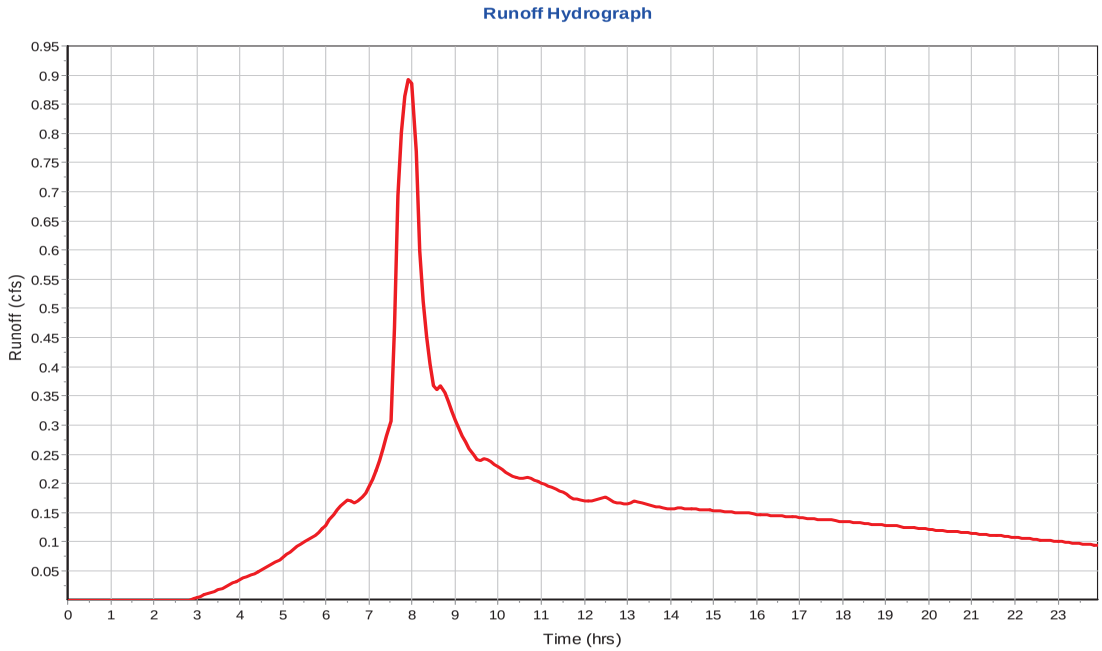
Total TOC (min) 8.48

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	5.96
Peak Runoff (cfs)	0.9
Weighted Curve Number	75
Time of Concentration (days hh:mm:ss)	0 00:08:29

Subbasin : Sub-A_22E-23





Subbasin : Sub-A_22W-23

Input Data

Area (ac)	0.42
Peak Rate Factor	484
Weighted Curve Number	79.28
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.37	D	80
Pasture, grassland, or range, Good	0.05	C	74
Composite Area & Weighted CN	0.42		79.28

Time of Concentration

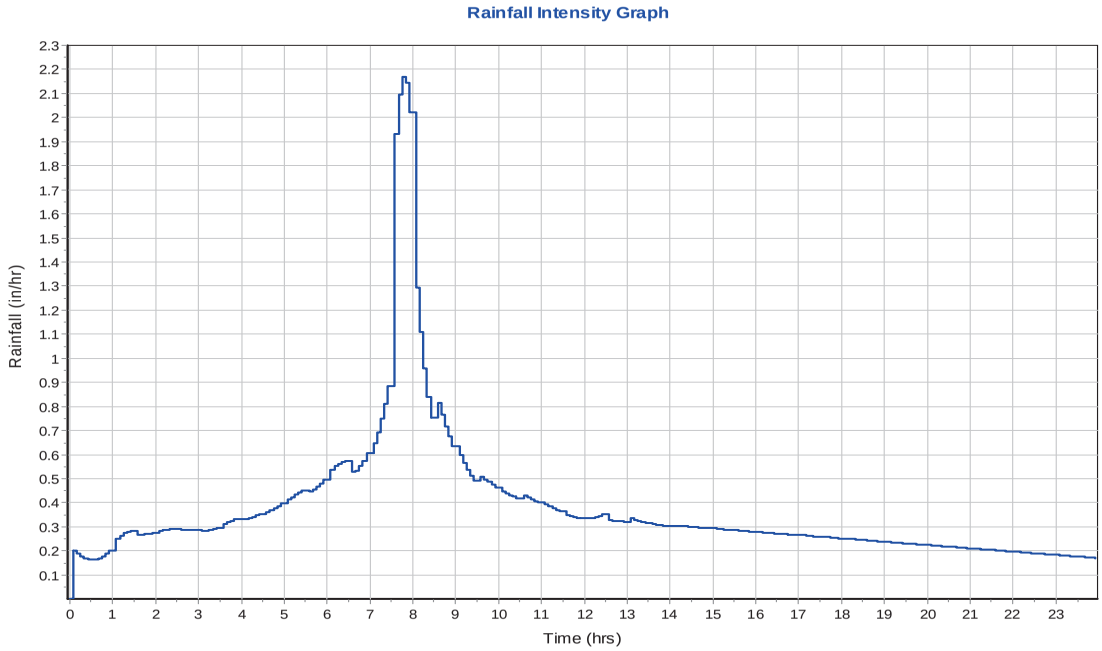
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	75	0	0
Slope (%) :	23	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	5.46	0	0

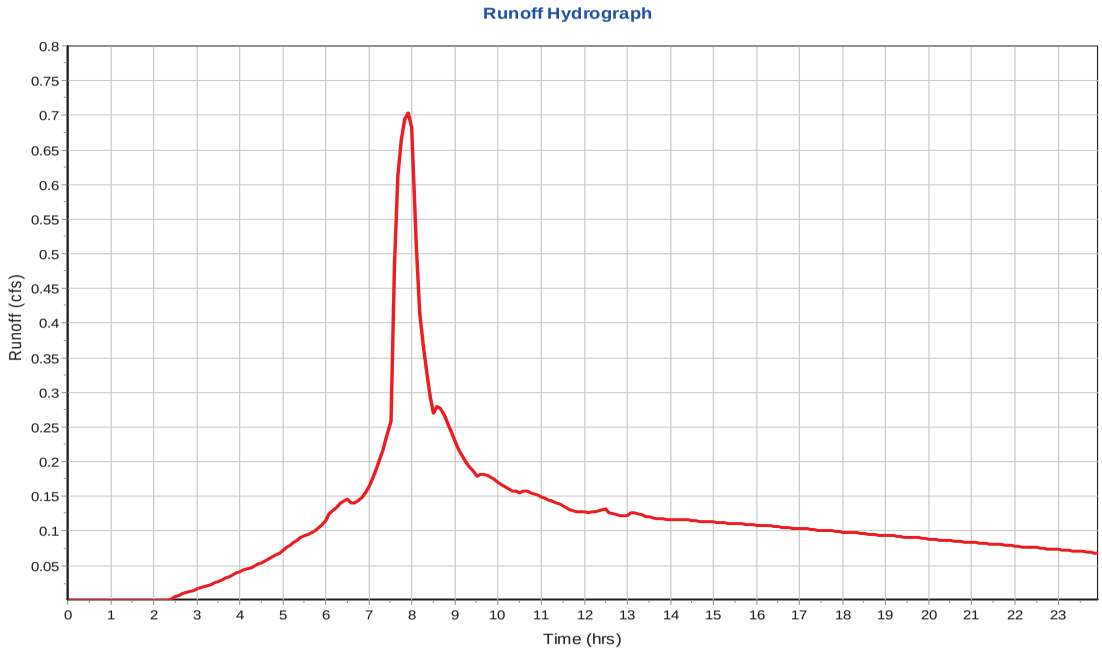
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.49
Peak Runoff (cfs)	0.7
Weighted Curve Number	79.28
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_22W-23





Subbasin : Sub-A_23E-24

Input Data

Area (ac)	0.52
Peak Rate Factor	484
Weighted Curve Number	74
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.52	C	74
Composite Area & Weighted CN	0.52		74

Time of Concentration

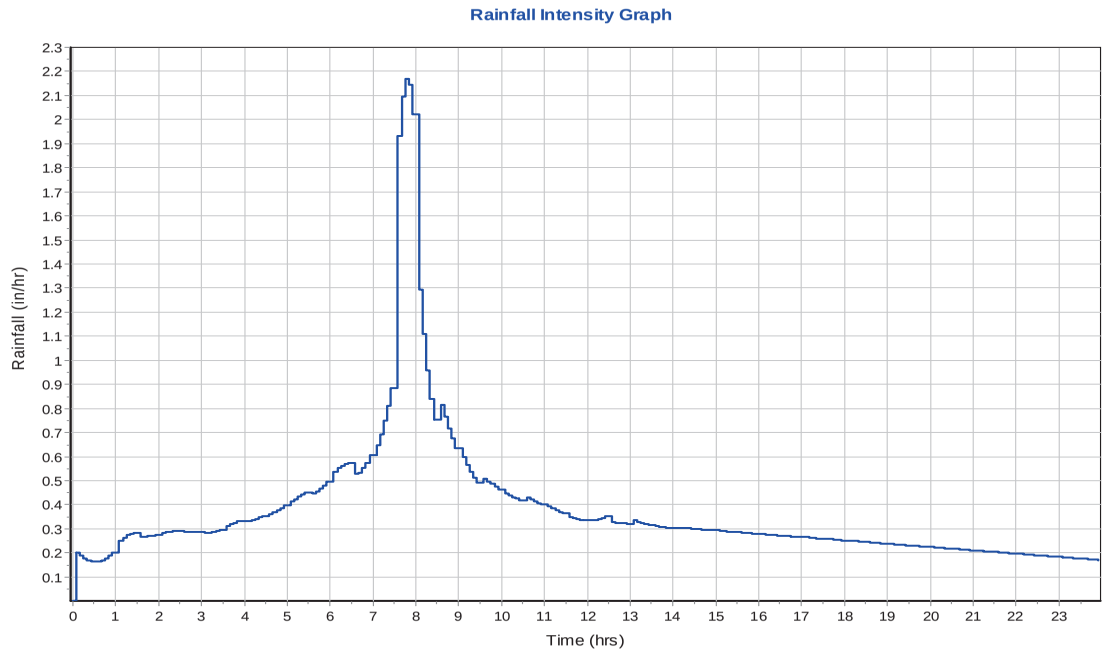
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	50	0	0
Slope (%) :	6	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.12	0	0
Computed Flow Time (min) :	6.75	0	0

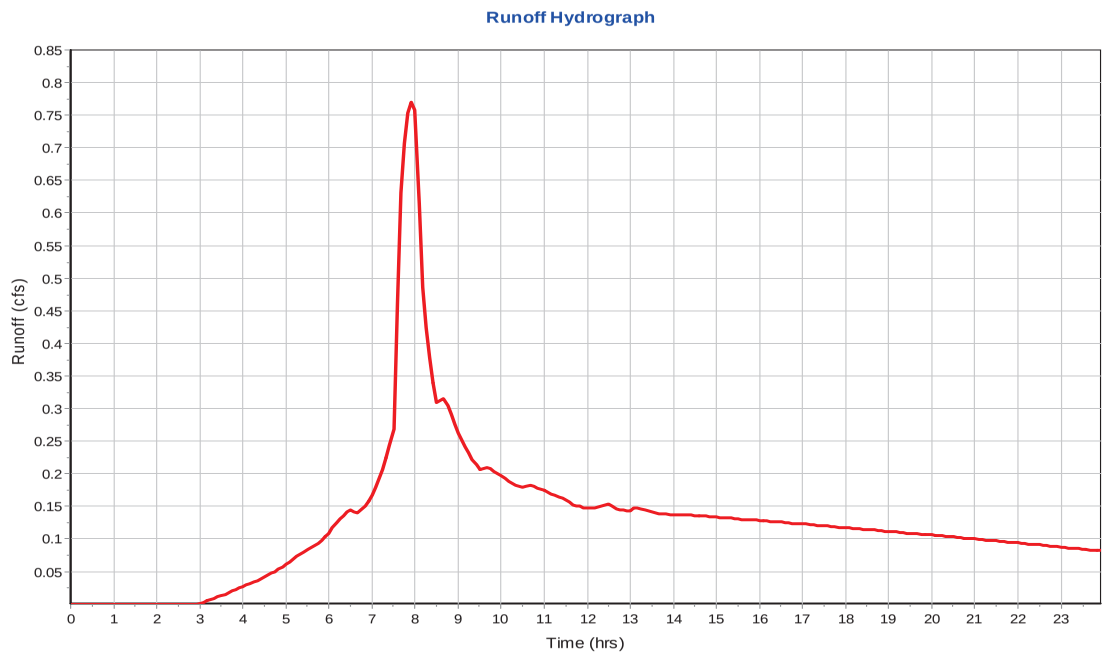
Total TOC (min) 6.75

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	5.84
Peak Runoff (cfs)	0.77
Weighted Curve Number	74
Time of Concentration (days hh:mm:ss)	0 00:06:45

Subbasin : Sub-A_23E-24





Subbasin : Sub-A_23W-24

Input Data

Area (ac)	0.43
Peak Rate Factor	484
Weighted Curve Number	77.33
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.24	D	80
Pasture, grassland, or range, Good	0.19	C	74
Composite Area & Weighted CN	0.43		77.33

Time of Concentration

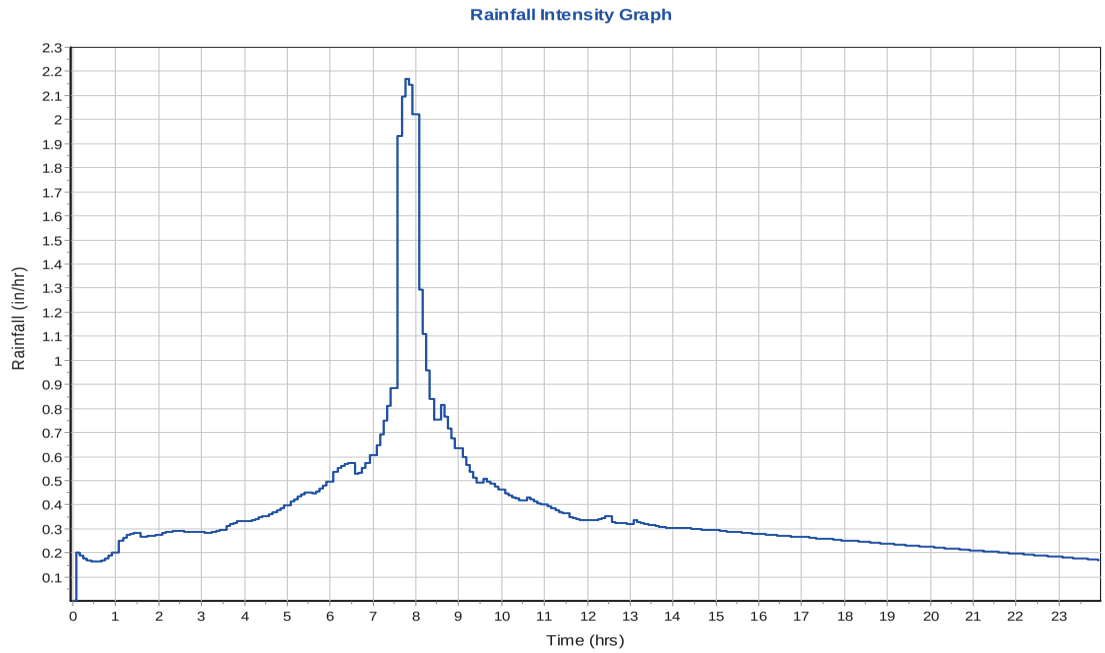
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.21	0	0

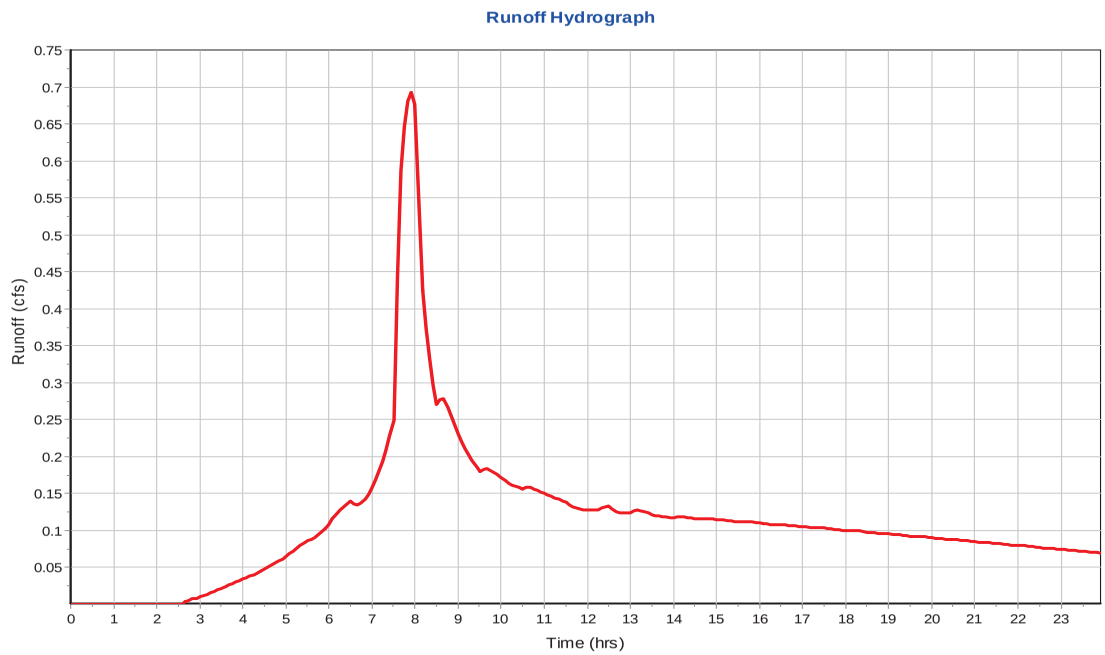
Total TOC (min) 6.21

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.25
Peak Runoff (cfs)	0.69
Weighted Curve Number	77.33
Time of Concentration (days hh:mm:ss)	0 00:06:13

Subbasin : Sub-A_23W-24





Subbasin : Sub-A_24

Input Data

Area (ac)	0.7
Peak Rate Factor	484
Weighted Curve Number	77.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.14	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.31	C	73
Brush, Poor	0.19	D	83
Composite Area & Weighted CN	0.7		77.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.47	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	7.44	0	0

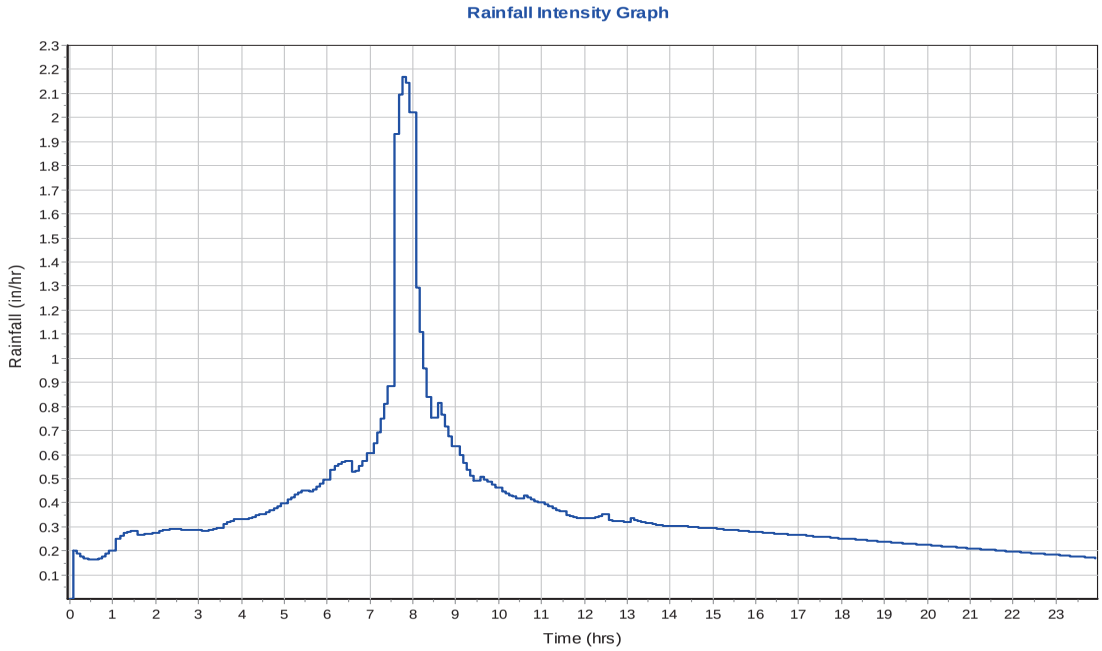
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	89	0	0
Slope (%) :	25	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0	0
Computed Flow Time (min) :	1.19	0	0

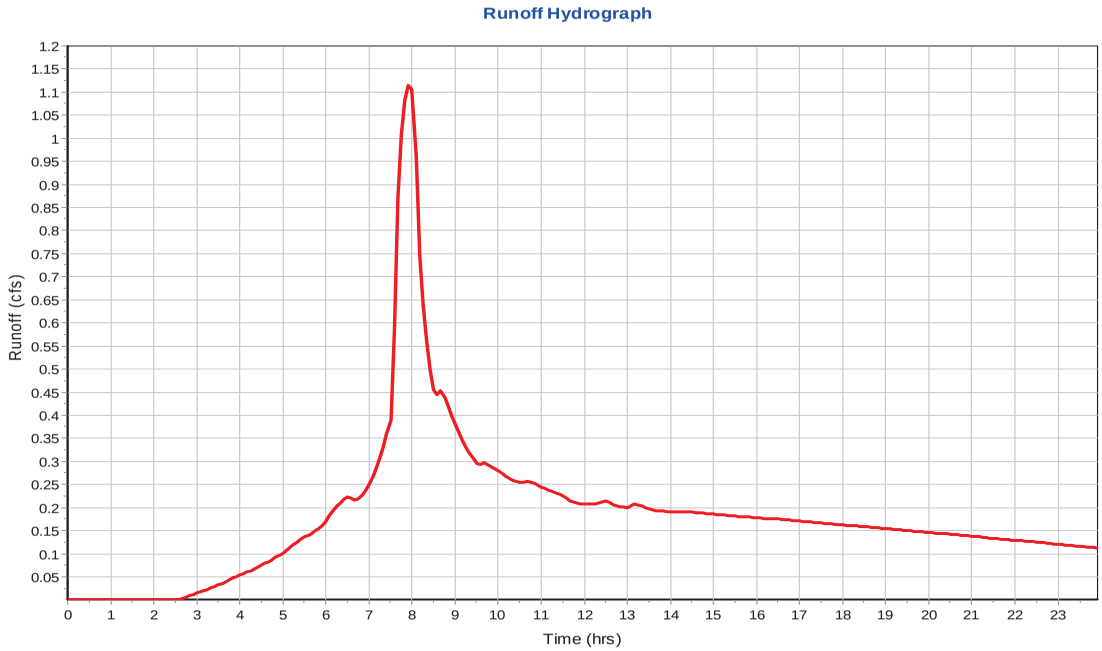
Total TOC (min) 8.63

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	6.23
Peak Runoff (cfs)	1.12
Weighted Curve Number	77.2
Time of Concentration (days hh:mm:ss)	0 00:08:38

Subbasin : Sub-A_24





Subbasin : Sub-B

Input Data

Area (ac)	5.05
Peak Rate Factor	484
Weighted Curve Number	73.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	4.03	C	73
Pasture, grassland, or range, Good	1.02	C	74
Composite Area & Weighted CN	5.05		73.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

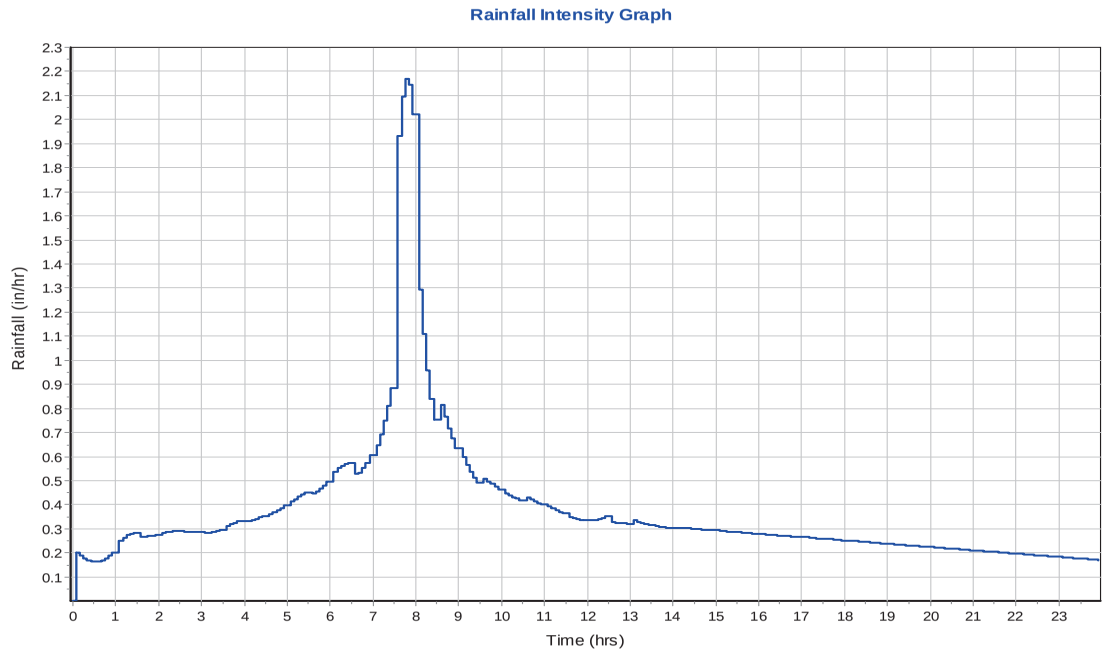
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpaved	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

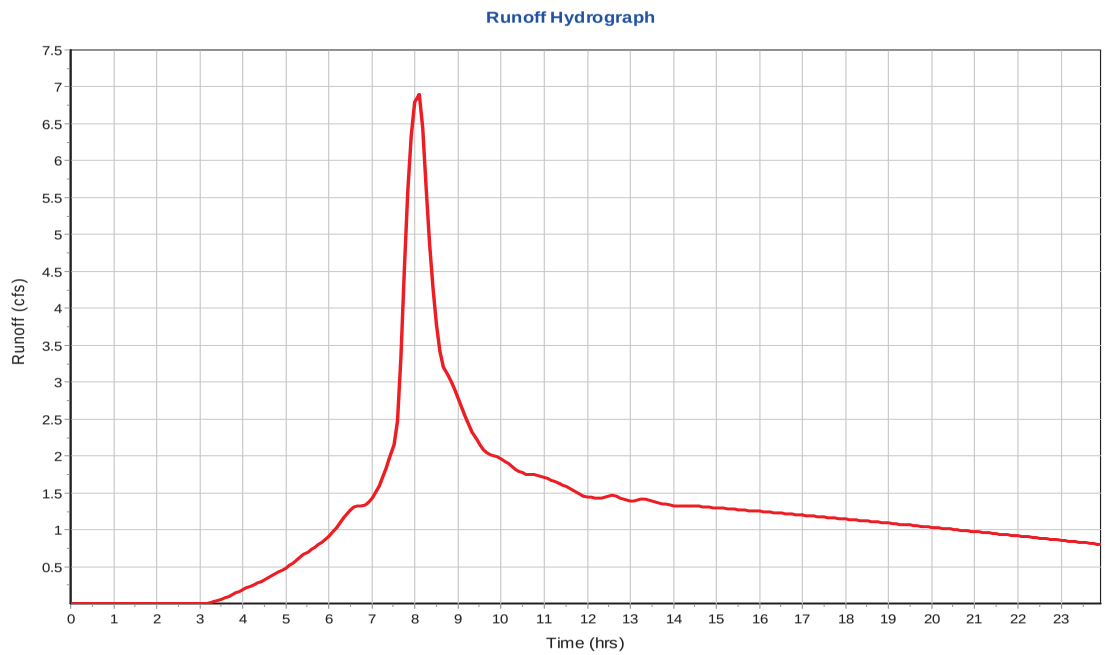
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in)	9.01
Total Runoff (in)	5.74
Peak Runoff (cfs)	6.93
Weighted Curve Number	73.2
Time of Concentration (days hh:mm:ss)	0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	167.00	17.58	User-Defined	4.0	18.9	0.040	0.000	0.500	0.000	0.00	No
DV-02W	173.00	416.00	411.00	5.00	2.89	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-04	162.99	450.00	446.00	4.00	2.45	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-08	220.00	514.00	508.00	6.00	2.73	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-09	150.00	545.00	526.00	19.00	12.67	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-19	121.00	416.50	414.00	2.50	2.07	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-20	114.00	436.00	433.00	3.00	2.63	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21E	81.00	445.00	443.00	2.00	2.47	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21W	114.00	445.50	443.00	2.50	2.19	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22E	143.00	467.00	464.00	3.00	2.10	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22W	121.00	467.00	464.00	3.00	2.48	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23E	172.00	498.00	494.00	4.00	2.33	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23W	165.00	498.00	494.00	4.00	2.42	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No

Channel Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
DC-B	6.90	0 08:10	860.24	0.01	6.99	2.27	0.66	0.17	0.00	
DV-02W	2.28	0 08:01	27.23	0.08	1.64	1.76	0.20	0.39	0.00	
DV-04	2.12	0 08:01	25.09	0.08	1.52	1.79	0.20	0.40	0.00	
DV-08	2.44	0 08:01	39.68	0.06	1.49	2.46	0.18	0.35	0.00	
DV-09	2.59	0 08:00	14.25	0.18	4.14	0.60	0.26	0.53	0.00	
DV-19	0.34	0 08:00	5.76	0.06	1.27	1.59	0.17	0.35	0.00	
DV-20	0.76	0 08:00	12.99	0.06	1.43	1.33	0.17	0.34	0.00	
DV-21E	0.61	0 08:00	6.29	0.10	1.57	0.86	0.21	0.42	0.00	
DV-21W	0.60	0 08:00	5.93	0.10	1.49	1.28	0.21	0.42	0.00	
DV-22E	0.89	0 08:01	5.80	0.15	1.62	1.47	0.25	0.50	0.00	
DV-22W	0.70	0 08:00	6.31	0.11	1.63	1.24	0.22	0.44	0.00	
DV-23E	0.77	0 08:01	6.11	0.13	1.63	1.76	0.23	0.46	0.00	
DV-23W	0.69	0 08:01	6.23	0.11	1.62	1.70	0.22	0.44	0.00	

Pipe Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
Pipe-A-01.1.1	65.4	394.0	378.0	16.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.2	69.5	411.0	394.0	17.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.3	68.8	430.0	411.0	19.00	27.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.4	79.4	446.0	430.0	16.00	20.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.5	71.2	460.0	446.0	14.00	19.7	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.6	75.4	478.0	460.0	18.00	23.9	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.7	68.9	496.0	478.0	18.00	26.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.8	42.5	508.0	496.0	12.00	28.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.9	80.5	526.0	508.0	18.00	22.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.1	165.0	417.0	378.0	39.00	23.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.2	96.9	432.0	417.0	15.00	15.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.3	86.9	445.0	432.0	13.00	15.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.4	80.7	454.0	445.0	9.00	11.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.5	60.0	462.0	454.0	8.00	13.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.6	57.3	476.0	462.0	14.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.7	72.0	494.0	476.0	18.00	25.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.8	73.3	508.0	494.0	14.00	19.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.9	106.6	523.3	508.0	15.30	14.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.1	119.8	414.0	378.0	36.00	30.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.2	56.9	433.0	414.0	19.00	33.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.3	76.1	443.0	433.0	10.00	13.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.4	99.3	464.0	443.0	21.00	21.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.5	158.3	494.0	464.0	30.00	19.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.6	151.9	508.0	494.0	14.00	9.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1

Pipe Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	10.00	0 08:01	17.62	0.57	23.13	0.05	0.54	0.54	0.00	Calculated
Pipe-A-01.1.2	9.42	0 08:01	17.62	0.53	22.80	0.05	0.52	0.52	0.00	Calculated
Pipe-A-01.1.3	7.15	0 08:01	18.72	0.38	22.22	0.05	0.43	0.43	0.00	Calculated
Pipe-A-01.1.4	7.15	0 08:01	16.00	0.45	19.79	0.07	0.47	0.47	0.00	Calculated
Pipe-A-01.1.5	5.03	0 08:01	15.80	0.32	17.85	0.07	0.39	0.39	0.00	Calculated
Pipe-A-01.1.6	5.03	0 08:01	17.41	0.29	19.17	0.07	0.37	0.37	0.00	Calculated
Pipe-A-01.1.7	5.03	0 08:01	18.21	0.28	19.80	0.06	0.36	0.36	0.00	Calculated
Pipe-A-01.1.8	5.03	0 08:01	18.94	0.27	20.38	0.03	0.35	0.35	0.00	Calculated
Pipe-A-01.1.9	2.59	0 08:00	16.85	0.15	15.53	0.09	0.26	0.26	0.00	Calculated
Pipe-A-01.2.1	9.69	0 08:00	17.32	0.56	22.66	0.12	0.53	0.53	0.00	Calculated
Pipe-A-01.2.2	9.69	0 08:00	14.02	0.69	19.25	0.08	0.61	0.61	0.00	Calculated
Pipe-A-01.2.3	9.69	0 08:00	13.78	0.70	18.99	0.08	0.62	0.62	0.00	Calculated
Pipe-A-01.2.4	9.69	0 08:00	11.90	0.81	16.88	0.08	0.69	0.69	0.00	Calculated
Pipe-A-01.2.5	9.69	0 08:00	13.01	0.74	18.15	0.06	0.64	0.64	0.00	Calculated
Pipe-A-01.2.6	9.69	0 08:00	17.62	0.55	22.95	0.04	0.53	0.53	0.00	Calculated
Pipe-A-01.2.7	9.69	0 08:00	17.81	0.54	23.15	0.05	0.53	0.53	0.00	Calculated
Pipe-A-01.2.8	9.69	0 08:00	15.57	0.62	20.89	0.06	0.57	0.57	0.00	Calculated
Pipe-A-01.2.9	9.69	0 08:00	13.52	0.72	18.71	0.09	0.63	0.63	0.00	Calculated
Pipe-A-02.1	6.48	0 08:01	19.53	0.33	22.33	0.09	0.40	0.40	0.00	Calculated
Pipe-A-02.2	6.14	0 08:01	20.58	0.30	22.86	0.04	0.37	0.37	0.00	Calculated
Pipe-A-02.3	5.38	0 08:01	12.91	0.42	15.69	0.08	0.45	0.45	0.00	Calculated
Pipe-A-02.4	4.17	0 08:01	16.38	0.25	17.42	0.10	0.34	0.34	0.00	Calculated
Pipe-A-02.5	2.57	0 08:01	15.51	0.17	14.61	0.18	0.28	0.28	0.00	Calculated
Pipe-A-02.6	1.11	0 08:00	10.82	0.10	8.88	0.29	0.22	0.22	0.00	Calculated

Storage Nodes

Storage Node : Stor-A_1.1-Tee

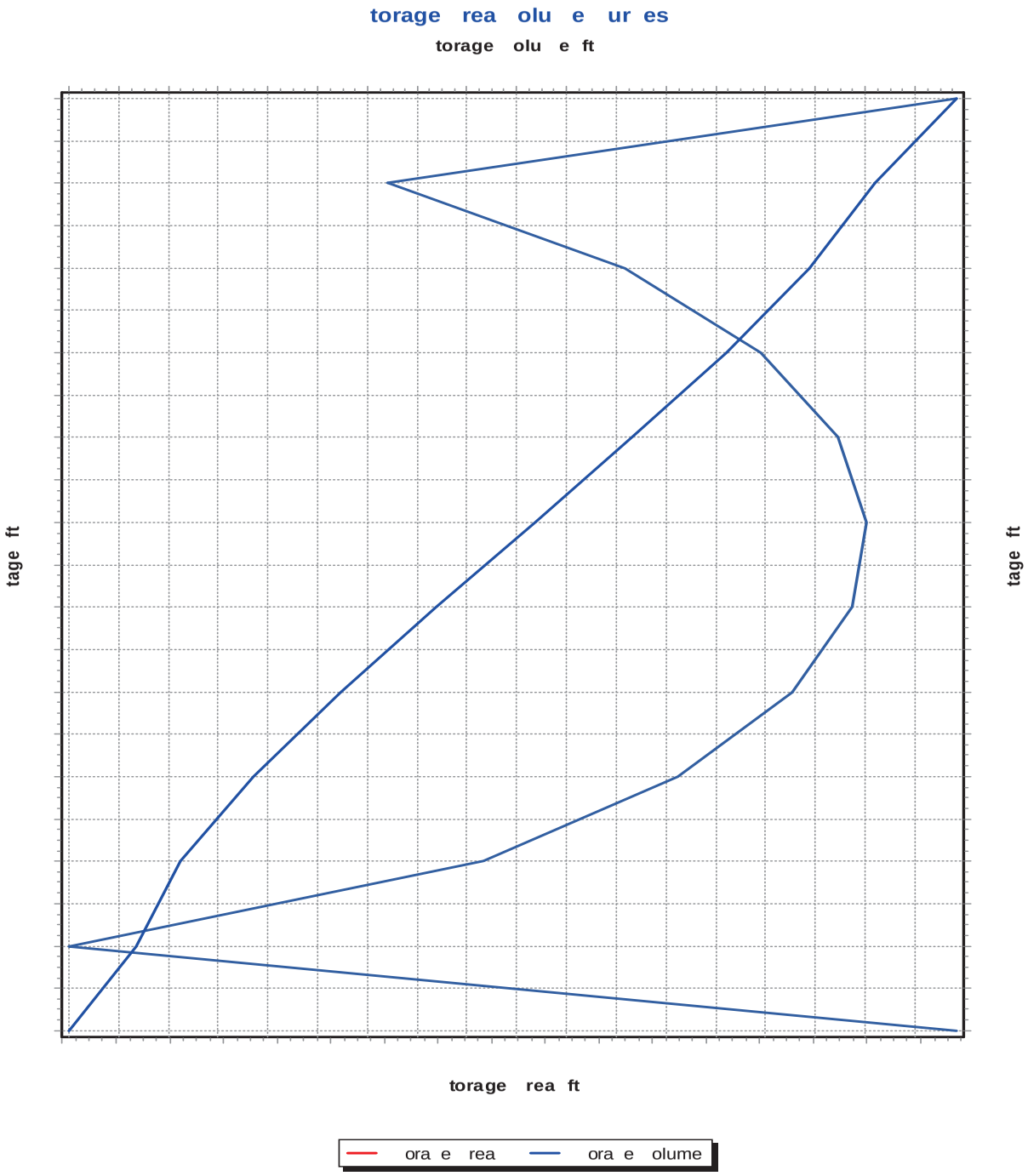
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_01.1 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.1-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.1-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.1-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.1-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.1-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.1-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.1-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.1-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.1-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.1-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.1-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.1-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.1-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.1-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.1-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs) 10
Peak Lateral Inflow (cfs) 0
Peak Outflow (cfs) 9.57
Peak Exfiltration Flow Rate (cfm) 0
Max HGL Elevation Attained (ft) 382.53
Max HGL Depth Attained (ft) 4.53
Average HGL Elevation Attained (ft) 378.93
Average HGL Depth Attained (ft) 0.93
Time of Max HGL Occurrence (days hh:mm) 0 08:07
Total Exfiltration Volume (1000-ft^3) 0
Total Flooded Volume (ac-in) 0
Total Time Flooded (min) 0
Total Retention Time (sec) 0

Storage Node : Stor-A_1.2-Tee

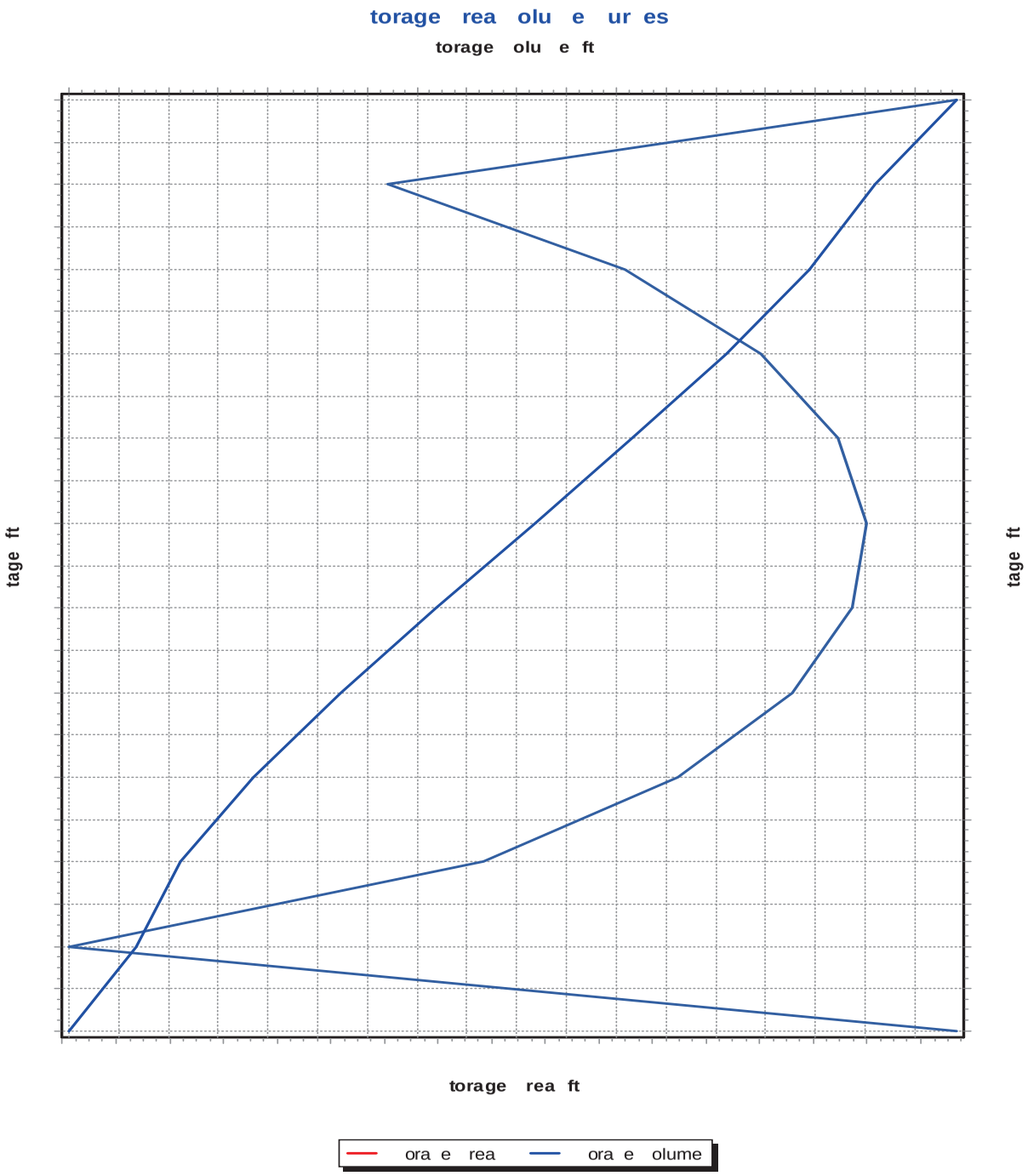
Input Data

Invert Elevation (ft) 378.00
Max (Rim) Elevation (ft) 384.00
Max (Rim) Offset (ft) 6.00
Initial Water Elevation (ft) 378.00
Initial Water Depth (ft) 0.00
Ponded Area (ft^2) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.2-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs) 9.69
Peak Lateral Inflow (cfs) 0
Peak Outflow (cfs) 9.32
Peak Exfiltration Flow Rate (cfm) 0
Max HGL Elevation Attained (ft) 382.34
Max HGL Depth Attained (ft) 4.34
Average HGL Elevation Attained (ft) 378.93
Average HGL Depth Attained (ft) 0.93
Time of Max HGL Occurrence (days hh:mm) 0 08:06
Total Exfiltration Volume (1000-ft^3) 0
Total Flooded Volume (ac-in) 0
Total Time Flooded (min) 0
Total Retention Time (sec) 0

Storage Node : Stor-A_2-Tee

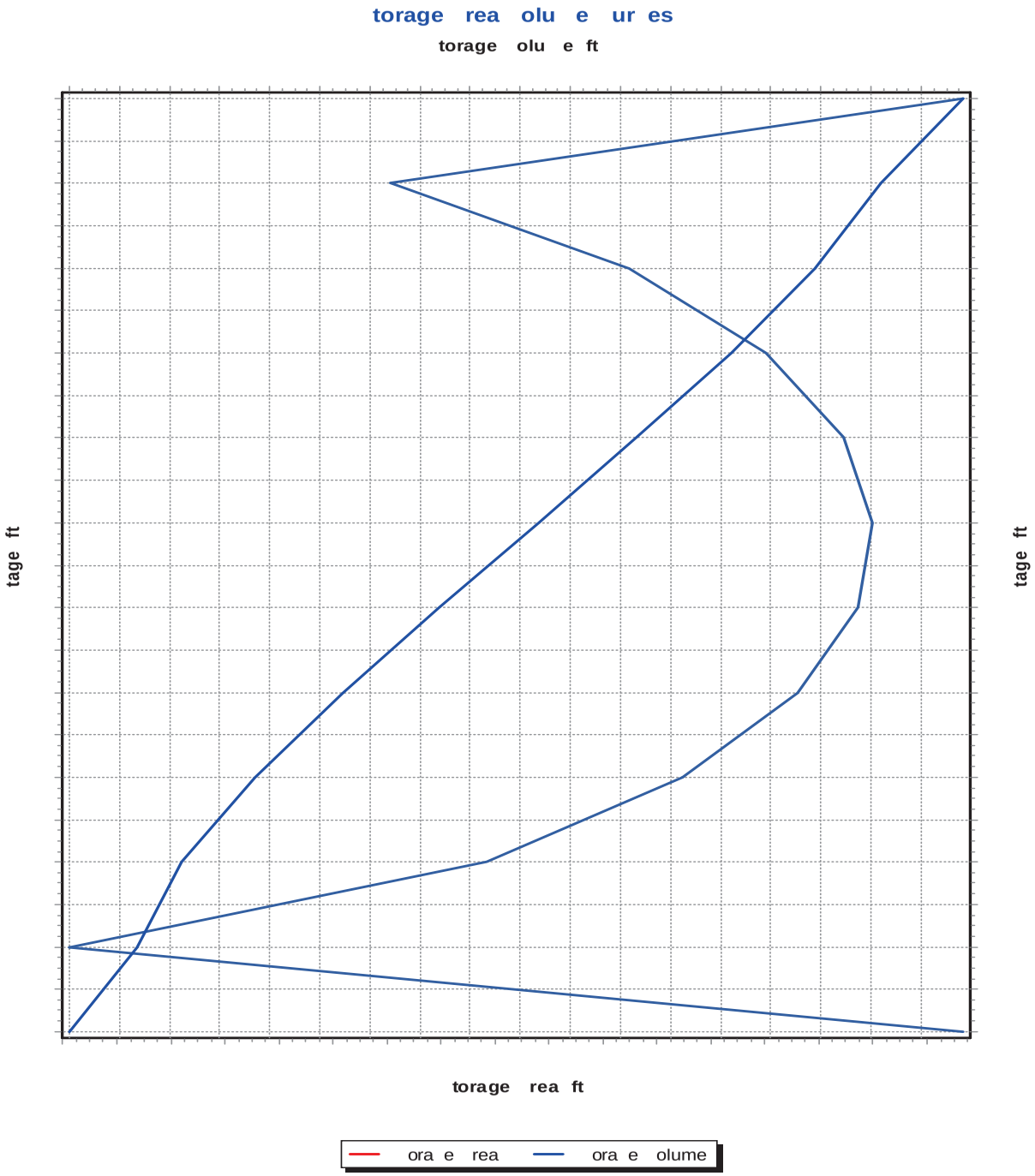
Input Data

Invert Elevation (ft) 378.00
Max (Rim) Elevation (ft) 384.00
Max (Rim) Offset (ft) 6.00
Initial Water Elevation (ft) 378.00
Initial Water Depth (ft) 0.00
Ponded Area (ft^2) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs) 6.48
Peak Lateral Inflow (cfs) 0
Peak Outflow (cfs) 6.27
Peak Exfiltration Flow Rate (cfm) 0
Max HGL Elevation Attained (ft) 381.54
Max HGL Depth Attained (ft) 3.54
Average HGL Elevation Attained (ft) 378.86
Average HGL Depth Attained (ft) 0.86
Time of Max HGL Occurrence (days hh:mm) 0 08:06
Total Exfiltration Volume (1000-ft^3) 0
Total Flooded Volume (ac-in) 0
Total Time Flooded (min) 0
Total Retention Time (sec) 0

Project Description

File Name	2001-DRHY-Proposed-SD_TS.SPF
Description	Proposed development of vineyard on undeveloped hillside in Napa County, CA. Proposed (Post-Development) Conditions Analysis

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-20
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Number of Elements

	Qty
Rain Gages	1
Subbasins	19
Nodes	45
Junctions	37
Outfalls	5
Flow Diversions	0
Inlets	0
Storage Nodes	3
Links	78
Channels	13
Pipes	24
Pumps	0
Orifices	30
Weirs	11
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution

Subbasin Summary

Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-A (Offsite SE)	1.89	484	81.47	10.10	7.81	14.75	3.85	0 00:06:13
Sub-A (Offsite W)	2.13	484	83.00	10.10	8.00	17.04	4.44	0 00:09:26
Sub-A_01E	0.82	484	80.00	10.10	7.62	6.25	1.63	0 00:06:30
Sub-A_01W-02	0.34	484	80.00	10.10	7.62	2.59	0.68	0 00:05:00
Sub-A_02-04	1.33	484	80.00	10.10	7.62	10.13	2.65	0 00:06:40
Sub-A_04-06	1.24	484	80.00	10.10	7.62	9.44	2.47	0 00:06:40
Sub-A_06-09	1.43	484	80.00	10.10	7.62	10.89	2.84	0 00:06:40
Sub-A_09	1.49	484	80.95	10.10	7.74	11.53	3.00	0 00:08:42
Sub-A_18	5.50	484	81.53	10.10	7.81	42.97	11.22	0 00:07:16
Sub-A_19-20	0.20	484	80.00	10.10	7.62	1.53	0.39	0 00:06:19
Sub-A_20-21	0.44	484	80.00	10.10	7.62	3.35	0.88	0 00:05:27
Sub-A_21E-22	0.38	484	77.32	10.10	7.27	2.76	0.72	0 00:05:10
Sub-A_21W-22	0.35	484	80.00	10.10	7.62	2.67	0.70	0 00:06:32
Sub-A_22E-23	0.59	484	75.00	10.10	6.97	4.10	1.06	0 00:08:28
Sub-A_22W-23	0.42	484	79.28	10.10	7.52	3.15	0.82	0 00:05:27
Sub-A_23E-24	0.52	484	74.00	10.10	6.84	3.55	0.91	0 00:06:45
Sub-A_23W-24	0.43	484	77.33	10.10	7.27	3.12	0.81	0 00:06:12
Sub-A_24	0.70	484	77.20	10.10	7.26	5.08	1.31	0 00:08:37
Sub-B	5.05	484	73.20	10.10	6.74	34.01	8.22	0 00:19:49

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
DC-B	Junction	535.0	536.0	535.0	0.0	0.00	8.19	535.71	0.00	3.29	0 00:00	0.00	0.00
DI 01	Junction	394.0	400.0	396.0	400.0	0.00	11.61	394.59	0.00	5.41	0 00:00	0.00	0.00
DI 02	Junction	411.0	418.0	411.0	418.0	0.00	10.94	411.57	0.00	6.45	0 00:00	0.00	0.00
DI 03	Junction	430.0	434.1	430.0	434.1	0.00	8.30	430.51	0.00	3.61	0 00:00	0.00	0.00
DI 04	Junction	446.0	450.0	446.0	450.0	0.00	8.30	446.51	0.00	3.50	0 00:00	0.00	0.00
DI 05	Junction	460.0	464.1	460.0	464.1	0.00	5.83	460.42	0.00	3.67	0 00:00	0.00	0.00
DI 06	Junction	478.0	482.1	478.0	482.1	0.00	5.83	478.40	0.00	3.71	0 00:00	0.00	0.00
DI 07	Junction	496.0	500.0	496.0	500.0	0.00	5.83	496.39	0.00	3.63	0 00:00	0.00	0.00
DI 08	Junction	508.0	511.8	508.0	511.8	0.00	5.83	508.38	0.00	3.45	0 00:00	0.00	0.00
DI 09	Junction	526.0	531.0	526.0	531.0	0.00	3.00	526.29	0.00	4.67	0 00:00	0.00	0.00
DI 10	Junction	417.0	420.0	416.0	420.0	0.00	11.21	417.68	0.00	2.32	0 00:00	0.00	0.00
DI 11	Junction	432.0	436.0	432.0	436.0	0.00	11.21	432.69	0.00	3.33	0 00:00	0.00	0.00
DI 12	Junction	445.0	450.0	446.0	450.0	0.00	11.21	445.77	0.00	4.21	0 00:00	0.00	0.00
DI 13	Junction	454.0	458.0	454.0	458.0	0.00	11.21	454.77	0.00	3.25	0 00:00	0.00	0.00
DI 14	Junction	462.0	466.2	462.0	466.2	0.00	11.21	462.72	0.00	3.52	0 00:00	0.00	0.00
DI 15	Junction	476.0	479.6	476.0	479.6	0.00	11.21	476.58	0.00	3.00	0 00:00	0.00	0.00
DI 16	Junction	494.0	498.1	494.0	498.1	0.00	11.21	494.63	0.00	3.50	0 00:00	0.00	0.00
DI 17	Junction	508.0	512.5	508.0	512.5	0.00	11.21	508.70	0.00	3.81	0 00:00	0.00	0.00
DI 18	Junction	523.3	527.4	523.3	527.4	0.00	11.22	524.04	0.00	3.35	0 00:00	0.00	0.00
DI 19	Junction	414.0	418.3	414.0	418.3	0.00	7.58	414.43	0.00	3.87	0 00:00	0.00	0.00
DI 20	Junction	433.0	437.4	437.4	437.4	0.00	7.18	433.49	0.00	3.91	0 00:00	0.00	0.00
DI 21	Junction	443.0	447.3	443.0	447.3	0.00	6.31	443.49	0.00	3.78	0 00:00	0.00	0.00
DI 22	Junction	464.0	468.0	464.0	468.0	0.00	4.89	464.37	0.00	3.66	0 00:00	0.00	0.00
DI 23	Junction	494.0	498.1	494.0	498.1	0.00	3.03	494.30	0.00	3.76	0 00:00	0.00	0.00
DI 24	Junction	508.0	512.6	508.0	512.6	0.00	1.31	508.24	0.00	4.37	0 00:00	0.00	0.00
HP-02	Junction	415.0	416.5	0.0	0.0	0.00	2.65	416.21	0.00	0.29	0 00:00	0.00	0.00
HP-04W	Junction	450.0	451.0	0.0	0.0	0.00	2.47	450.21	0.00	0.79	0 00:00	0.00	0.00
HP-09	Junction	545.0	546.0	0.0	0.0	0.00	3.00	545.28	0.00	0.72	0 00:00	0.00	0.00
HP-19	Junction	416.5	417.5	0.0	0.0	0.00	0.40	416.68	0.00	0.82	0 00:00	0.00	0.00
HP-20	Junction	436.0	436.0	0.0	0.0	0.00	0.88	436.18	0.00	0.32	0 00:00	0.00	0.00
HP-21	Junction	445.5	446.5	0.0	0.0	0.00	0.70	445.72	0.00	0.78	0 00:00	0.00	0.00

Node Summary

Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
HP-22	Junction	467.0	468.0	0.0	0.0	0.00	0.82	467.23	0.00	0.77	0 00:00	0.00	0.00
HP-23	Junction	498.0	499.0	0.0	0.0	0.00	0.81	498.23	0.00	0.77	0 00:00	0.00	0.00
WB-08	Junction	514.0	515.0	0.0	0.0	0.00	2.84	514.19	0.00	0.81	0 00:00	0.00	0.00
WB-21	Junction	445.0	446.0	0.0	0.0	0.00	0.71	445.22	0.00	0.78	0 00:00	0.00	0.00
WB-22	Junction	467.0	468.0	0.0	0.0	0.00	1.05	467.26	0.00	0.74	0 00:00	0.00	0.00
WB-23	Junction	498.0	499.0	0.0	0.0	0.00	0.91	498.25	0.00	0.75	0 00:00	0.00	0.00
Out-A	Outfall	360.0					9.92	360.00					
Out-A_1.1-Tee	Outfall	378.0					10.80	378.00					
Out-A_1.2-Tee	Outfall	378.0					10.51	378.00					
Out-A_2-Tee	Outfall	378.0					7.16	378.00					
Out-B	Outfall	368.0					8.19	368.71					
Stor-A_1.1-Tee	Storage Node	378.0	384.0	378.0		0.00	11.61	383.54				0.00	0.00
Stor-A_1.2-Tee	Storage Node	378.0	384.0	378.0		0.00	11.21	383.29				0.00	0.00
Stor-A_2-Tee	Storage Node	378.0	384.0	378.0		0.00	7.58	382.36				0.00	0.00

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	Pipe	DI 01	Stor-A_1.1-Tee	65.4	394.0	378.0	24.47	12	0.013	11.61	17.62	0.66	23.94	0.59	0.59	0.00	Calculated
Pipe-A-01.1.2	Pipe	DI 02	DI 01	69.5	411.0	394.0	24.45	12	0.013	10.94	17.62	0.62	23.62	0.57	0.57	0.00	Calculated
Pipe-A-01.1.3	Pipe	DI 03	DI 02	68.8	430.0	411.0	27.60	12	0.013	8.30	18.72	0.44	23.11	0.47	0.47	0.00	Calculated
Pipe-A-01.1.4	Pipe	DI 04	DI 03	79.4	446.0	430.0	20.16	12	0.013	8.30	16.00	0.52	20.55	0.51	0.51	0.00	Calculated
Pipe-A-01.1.5	Pipe	DI 05	DI 04	71.2	460.0	446.0	19.66	12	0.013	5.83	15.80	0.37	18.58	0.42	0.42	0.00	Calculated
Pipe-A-01.1.6	Pipe	DI 06	DI 05	75.4	478.0	460.0	23.88	12	0.013	5.83	17.41	0.34	19.96	0.40	0.40	0.00	Calculated
Pipe-A-01.1.7	Pipe	DI 07	DI 06	68.9	496.0	478.0	26.12	12	0.013	5.83	18.21	0.32	20.62	0.39	0.39	0.00	Calculated
Pipe-A-01.1.8	Pipe	DI 08	DI 07	42.5	508.0	496.0	28.26	12	0.013	5.83	18.94	0.31	21.22	0.38	0.38	0.00	Calculated
Pipe-A-01.1.9	Pipe	DI 09	DI 08	80.5	526.0	508.0	22.37	12	0.013	3.00	16.85	0.18	16.18	0.29	0.29	0.00	Calculated
Pipe-A-01.2.1	Pipe	DI 10	Stor-A_1.2-Tee	165.0	417.0	378.0	23.64	12	0.013	11.21	17.32	0.65	23.44	0.59	0.59	0.00	Calculated
Pipe-A-01.2.2	Pipe	DI 11	DI 10	96.9	432.0	417.0	15.48	12	0.013	11.21	14.02	0.80	19.82	0.68	0.68	0.00	Calculated
Pipe-A-01.2.3	Pipe	DI 12	DI 11	86.9	445.0	432.0	14.96	12	0.013	11.21	13.78	0.81	19.55	0.68	0.69	0.00	Calculated
Pipe-A-01.2.4	Pipe	DI 13	DI 12	80.7	454.0	445.0	11.15	12	0.013	11.21	11.90	0.94	17.22	0.77	0.77	0.00	Calculated
Pipe-A-01.2.5	Pipe	DI 14	DI 13	60.0	462.0	454.0	13.33	12	0.013	11.21	13.01	0.86	18.62	0.72	0.72	0.00	Calculated
Pipe-A-01.2.6	Pipe	DI 15	DI 14	57.3	476.0	462.0	24.45	12	0.013	11.21	17.62	0.64	23.75	0.58	0.58	0.00	Calculated
Pipe-A-01.2.7	Pipe	DI 16	DI 15	72.0	494.0	476.0	24.99	12	0.013	11.21	17.81	0.63	23.95	0.58	0.58	0.00	Calculated
Pipe-A-01.2.8	Pipe	DI 17	DI 16	73.3	508.0	494.0	19.11	12	0.013	11.21	15.57	0.72	21.58	0.63	0.63	0.00	Calculated
Pipe-A-01.2.9	Pipe	DI 18	DI 17	106.6	523.3	508.0	14.36	12	0.013	11.21	13.52	0.83	19.24	0.70	0.70	0.00	Calculated
Pipe-A-02.1	Pipe	DI 19	Stor-A_2-Tee	119.8	414.0	378.0	30.05	12	0.013	7.58	19.53	0.39	23.28	0.43	0.43	0.00	Calculated
Pipe-A-02.2	Pipe	DI 20	DI 19	56.9	433.0	414.0	33.38	12	0.013	7.18	20.58	0.35	23.85	0.41	0.41	0.00	Calculated
Pipe-A-02.3	Pipe	DI 21	DI 20	76.1	443.0	433.0	13.13	12	0.013	6.31	12.91	0.49	16.34	0.49	0.49	0.00	Calculated
Pipe-A-02.4	Pipe	DI 22	DI 21	99.3	464.0	443.0	21.14	12	0.013	4.89	16.38	0.30	18.21	0.37	0.37	0.00	Calculated
Pipe-A-02.5	Pipe	DI 23	DI 22	158.3	494.0	464.0	18.95	12	0.013	3.03	15.51	0.20	15.31	0.30	0.30	0.00	Calculated
Pipe-A-02.6	Pipe	DI 24	DI 23	151.9	508.0	494.0	9.22	12	0.013	1.31	10.82	0.12	9.28	0.24	0.24	0.00	Calculated
DC-B	Channel	DC-B	Out-B	950.0	535.0	368.0	17.58	48	0.040	8.19	860.24	0.01	7.22	0.71	0.18	0.00	
DV-02W	Channel	HP-02	DI 02	173.0	416.0	411.0	2.89	6	0.033	2.64	27.23	0.10	1.70	0.21	0.42	0.00	
DV-04	Channel	HP-04W	DI 04	163.0	450.0	446.0	2.45	6	0.033	2.47	25.09	0.10	1.57	0.21	0.42	0.00	
DV-08	Channel	WB-08	DI 08	220.0	514.0	508.0	2.73	6	0.033	2.83	39.68	0.07	1.54	0.19	0.37	0.00	
DV-09	Channel	HP-09	DI 09	150.0	545.0	526.0	12.67	6	0.033	3.00	14.25	0.21	4.29	0.28	0.56	0.00	
DV-19	Channel	HP-19	DI 19	121.0	416.5	414.0	2.07	6	0.033	0.39	5.76	0.07	1.32	0.18	0.37	0.00	
DV-20	Channel	HP-20	DI 20	114.0	436.0	433.0	2.63	6	0.033	0.88	12.99	0.07	1.48	0.18	0.36	0.00	
DV-21E	Channel	WB-21	DI 21	81.0	445.0	443.0	2.47	6	0.033	0.71	6.29	0.11	1.63	0.22	0.44	0.00	
DV-21W	Channel	HP-21	DI 21	114.0	445.5	443.0	2.19	6	0.033	0.70	5.93	0.12	1.55	0.22	0.45	0.00	
DV-22E	Channel	WB-22	DI 22	143.0	467.0	464.0	2.10	6	0.033	1.05	5.80	0.18	1.69	0.26	0.53	0.00	
DV-22W	Channel	HP-22	DI 22	121.0	467.0	464.0	2.48	6	0.033	0.82	6.31	0.13	1.69	0.23	0.46	0.00	
DV-23E	Channel	WB-23	DI 23	172.0	498.0	494.0	2.33	6	0.033	0.91	6.11	0.15	1.70	0.24	0.49	0.00	
DV-23W	Channel	HP-23	DI 23	165.0	498.0	494.0	2.42	6	0.033	0.81	6.23	0.13	1.68	0.23	0.47	0.00	

Link Summary

Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Orifice-A_1.1-01	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-02	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-03	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-04	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-05	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-06	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-07	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-08	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-09	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.1-10	Orifice	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-01	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-02	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-03	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-04	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-05	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-06	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-07	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-08	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
Orifice-A_1.2-09	Orifice	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0		1		0.06							
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Orifice-A_2-01	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-02	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-03	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-04	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-05	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-06	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-07	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-08	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-09	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Orifice-A_2-10	Orifice	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0		1		0.06							
Weir-A_1.1-01	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.54							
Weir-A_1.1-02	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.54							
Weir-A_1.1-03	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.54							
Weir-A_1.1-04	Weir	Stor-A_1.1-Tee	Out-A_1.1-Tee		378.0	378.0				2.54							
Weir-A_1.2-01	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.47							
Weir-A_1.2-02	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.47							
Weir-A_1.2-03	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.47							
Weir-A_1.2-04	Weir	Stor-A_1.2-Tee	Out-A_1.2-Tee		378.0	378.0				2.47							
Weir-A_2-01	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				2.20							
Weir-A_2-02	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				2.20							
Weir-A_2-03	Weir	Stor-A_2-Tee	Out-A_2-Tee		378.0	378.0				2.20							

Subbasin Hydrology

Subbasin : Sub-A (Offsite SE)

Input Data

Area (ac) 1.89
Peak Rate Factor 484
Weighted Curve Number 81.47
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	0.29	C	73
Brush, Poor	1.6	D	83
Composite Area & Weighted CN	1.89		81.47

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	29	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.34	0	0
Computed Flow Time (min) :	4.97	0	0

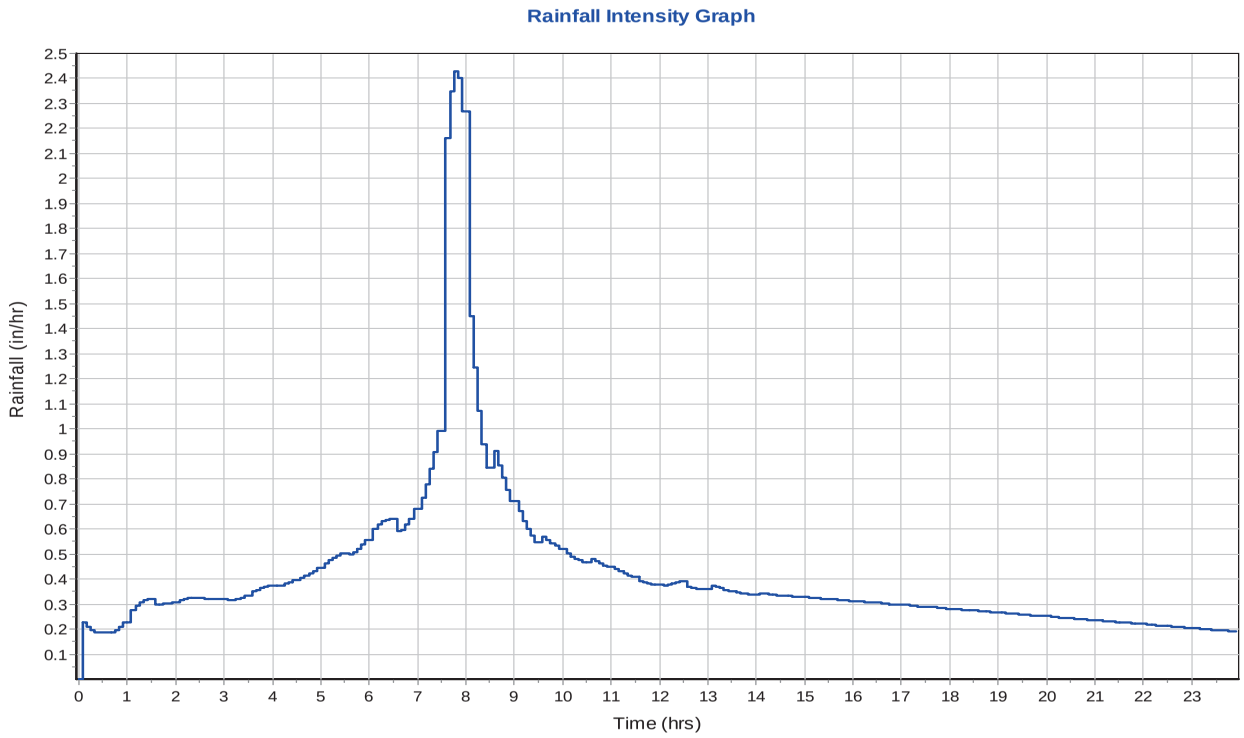
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	279	0	0
Slope (%) :	28	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.7	0	0
Computed Flow Time (min) :	1.26	0	0

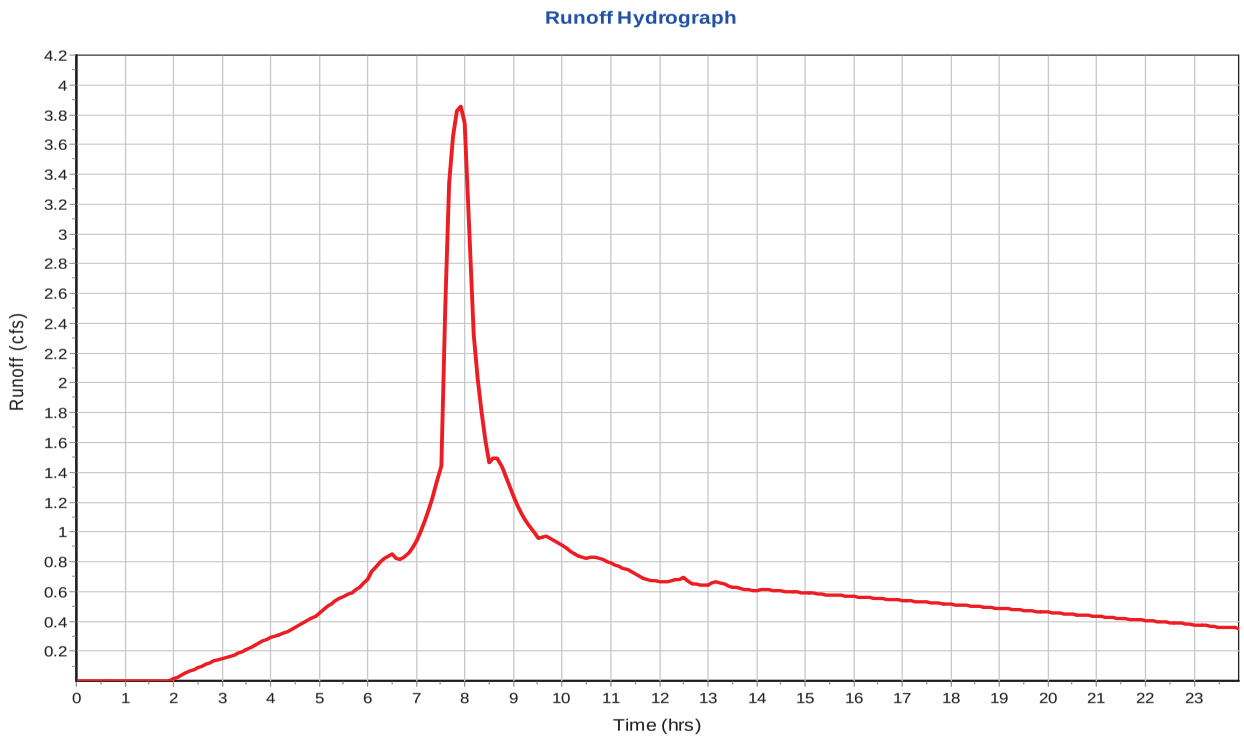
Total TOC (min) 6.23

Subbasin Runoff Results

Total Rainfall (in) 10.1
Total Runoff (in) 7.81
Peak Runoff (cfs) 3.85
Weighted Curve Number 81.47
Time of Concentration (days hh:mm:ss) 0 00:06:14

Subbasin : Sub-A (Offsite SE)





Subbasin : Sub-A (Offsite W)

Input Data

Area (ac)	2.13
Peak Rate Factor	484
Weighted Curve Number	83
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Brush, Poor	2.13	D	83
Composite Area & Weighted CN	2.13		83

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	19	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	5.89	0	0

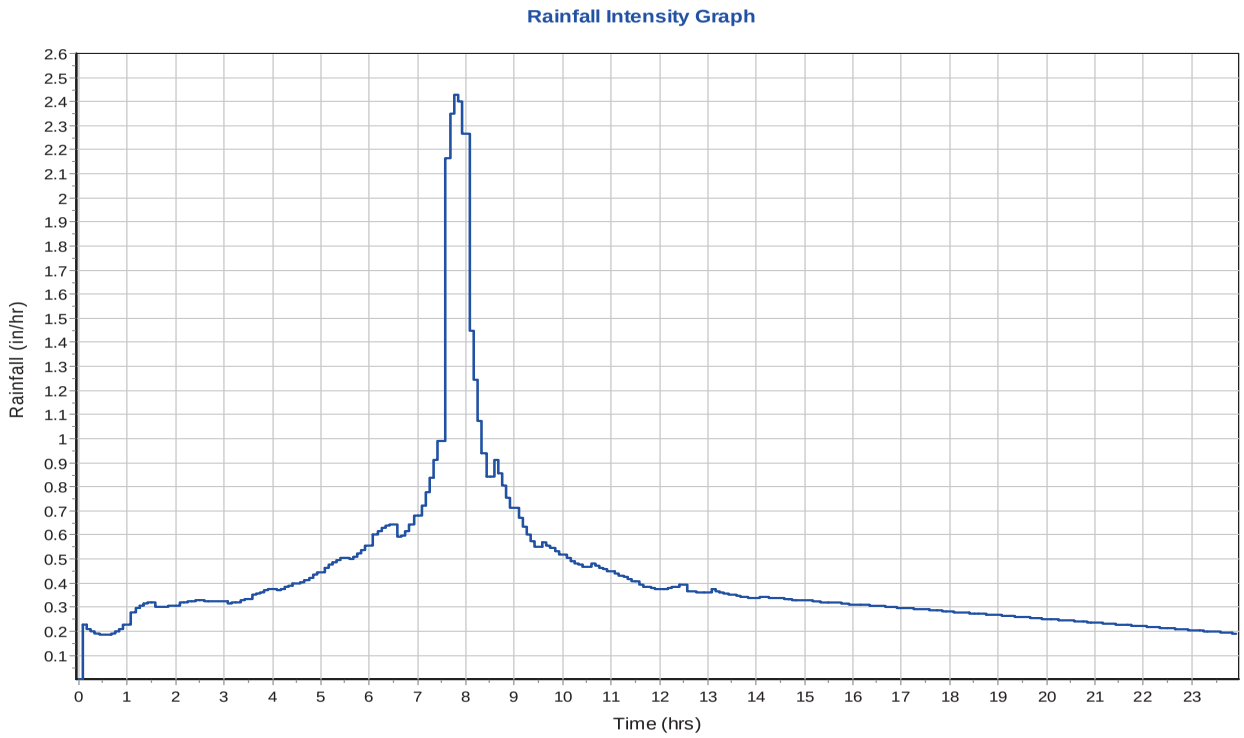
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	633	0	0
Slope (%) :	18	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	2.97	0	0
Computed Flow Time (min) :	3.55	0	0

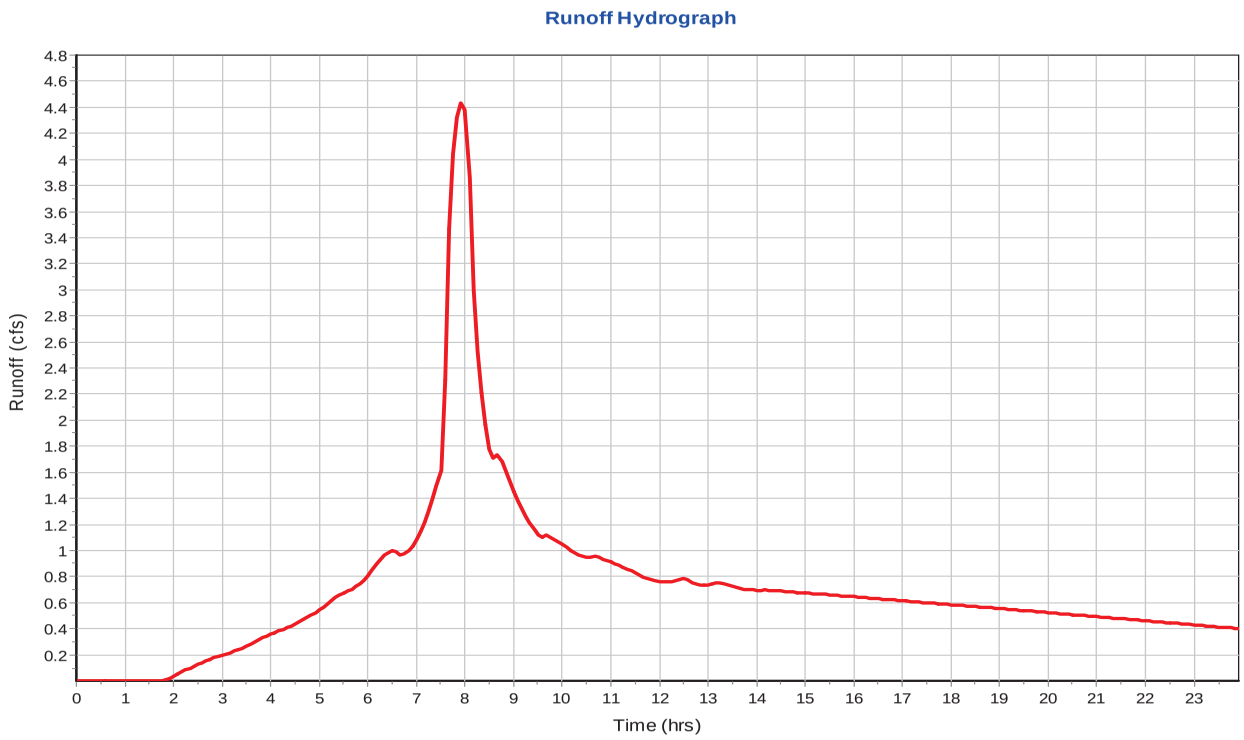
Total TOC (min) 9.44

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	8
Peak Runoff (cfs)	4.44
Weighted Curve Number	83
Time of Concentration (days hh:mm:ss)	0 00:09:26

Subbasin : Sub-A (Offsite W)





Subbasin : Sub-A_01E

Input Data

Area (ac)	0.82
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.82	D	80
Composite Area & Weighted CN	0.82		80

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	30	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.27	0	0
Computed Flow Time (min) :	6.18	0	0

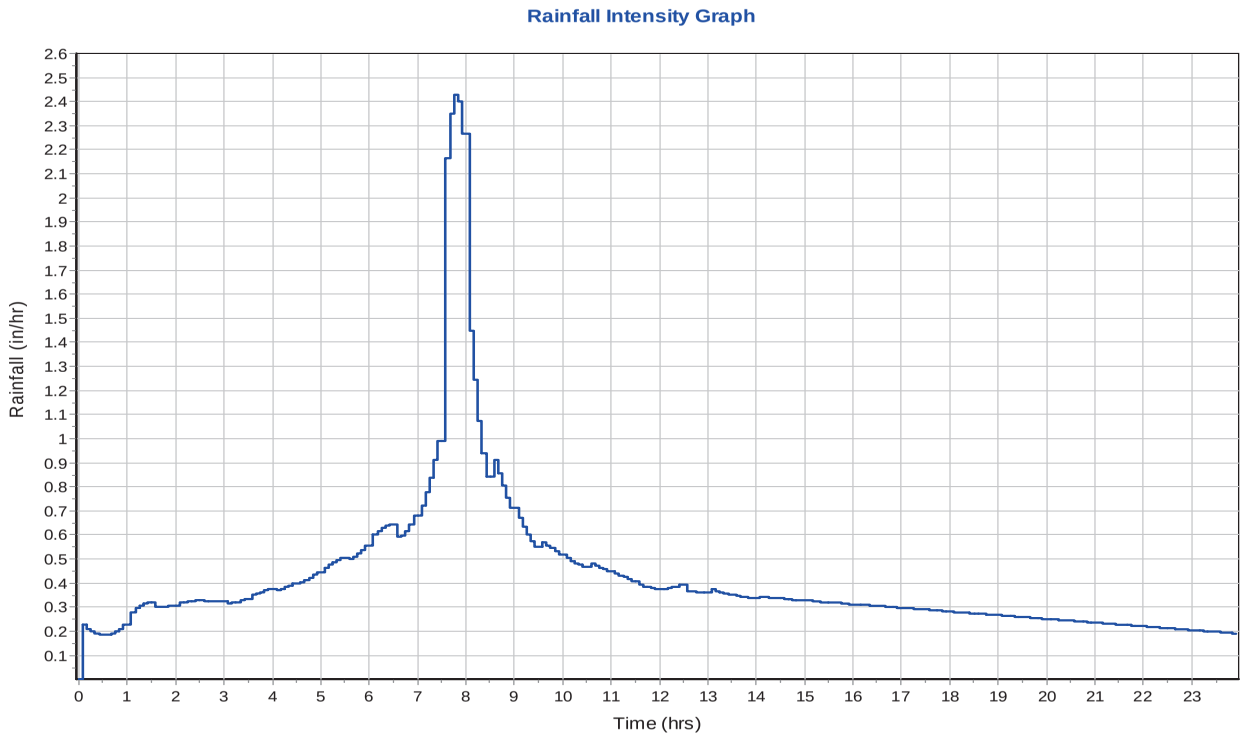
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	77	0	0
Slope (%) :	31	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.9	0	0
Computed Flow Time (min) :	0.33	0	0

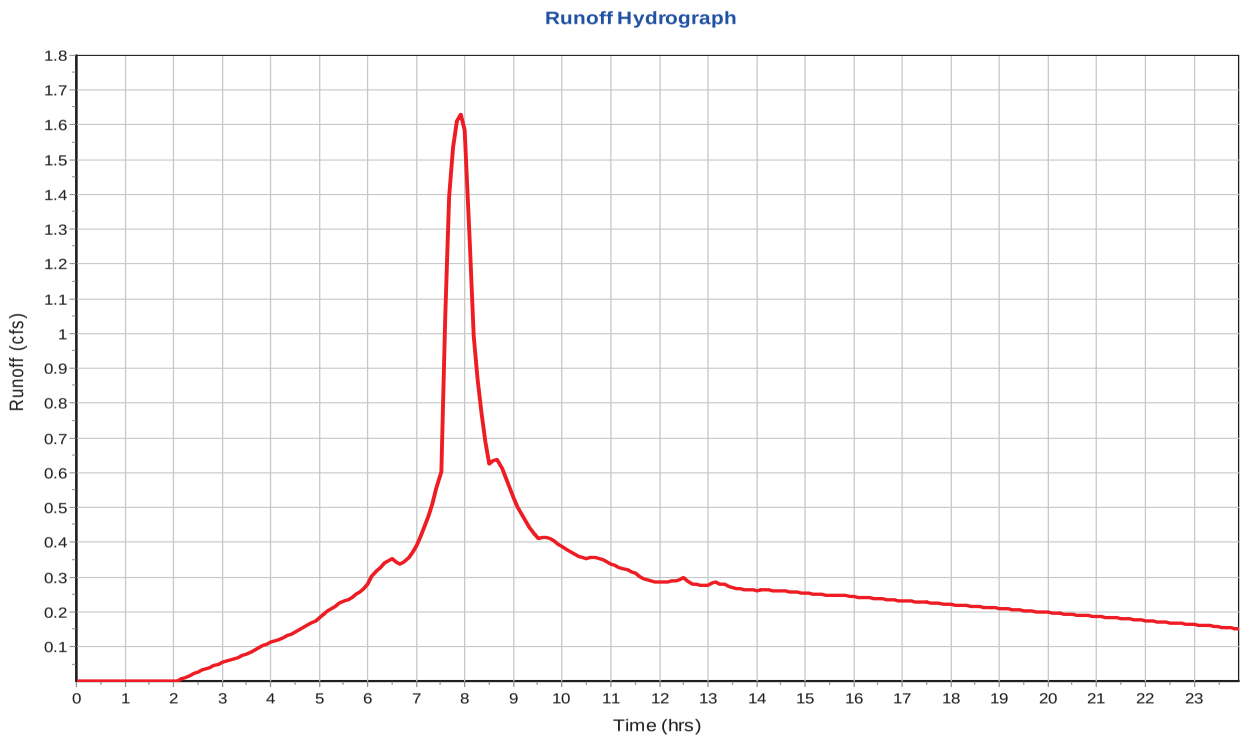
Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	1.63
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:31

Subbasin : Sub-A_01E





Subbasin : Sub-A_01W-02

Input Data

Area (ac)	0.34
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.34	D	80
Composite Area & Weighted CN	0.34		80

Time of Concentration

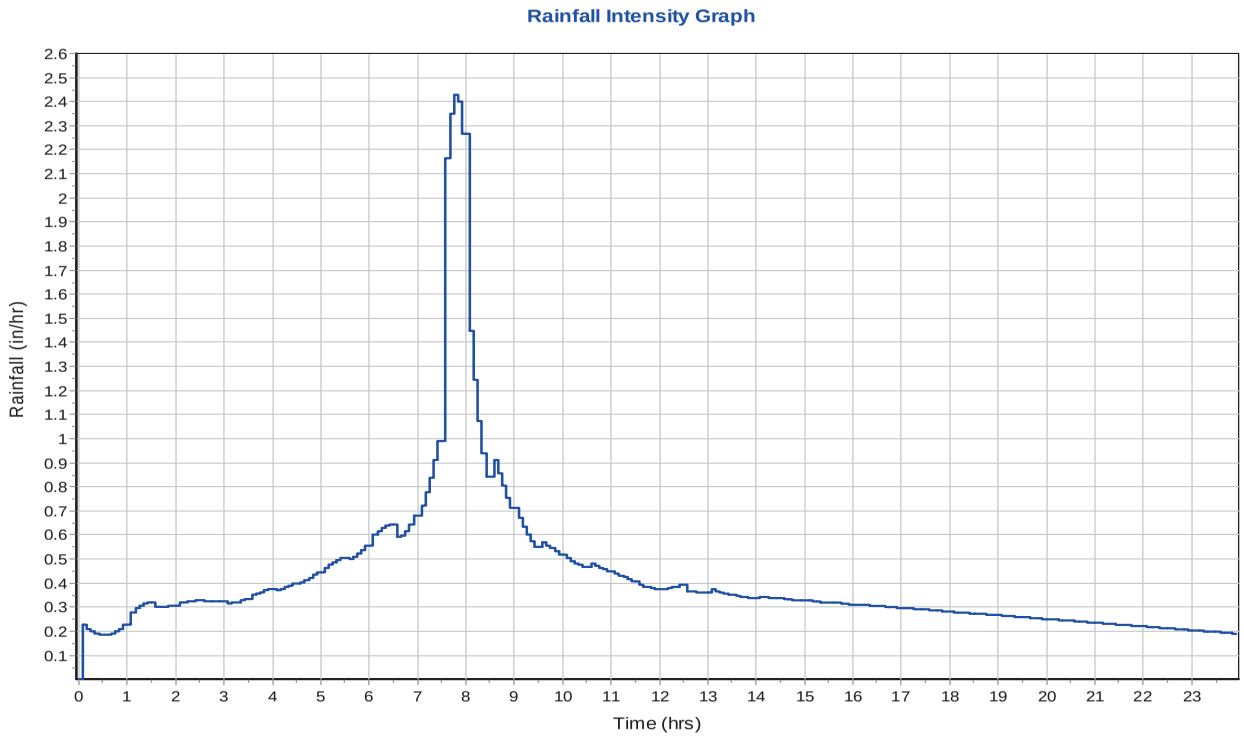
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	60	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	4.83	0	0

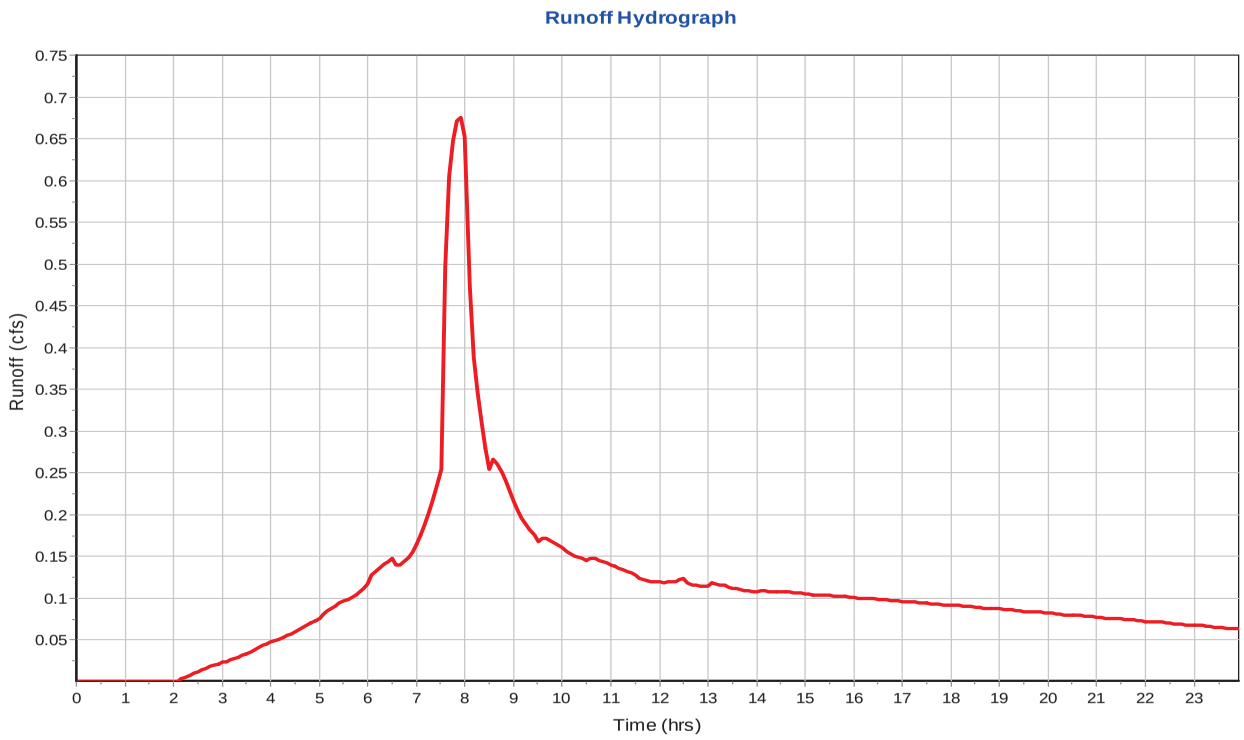
Total TOC (min) 4.83

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	0.68
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:04:50

Subbasin : Sub-A_01W-02





Subbasin : Sub-A_02-04

Input Data

Area (ac)	1.33
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.33	D	80
Composite Area & Weighted CN	1.33		80

Time of Concentration

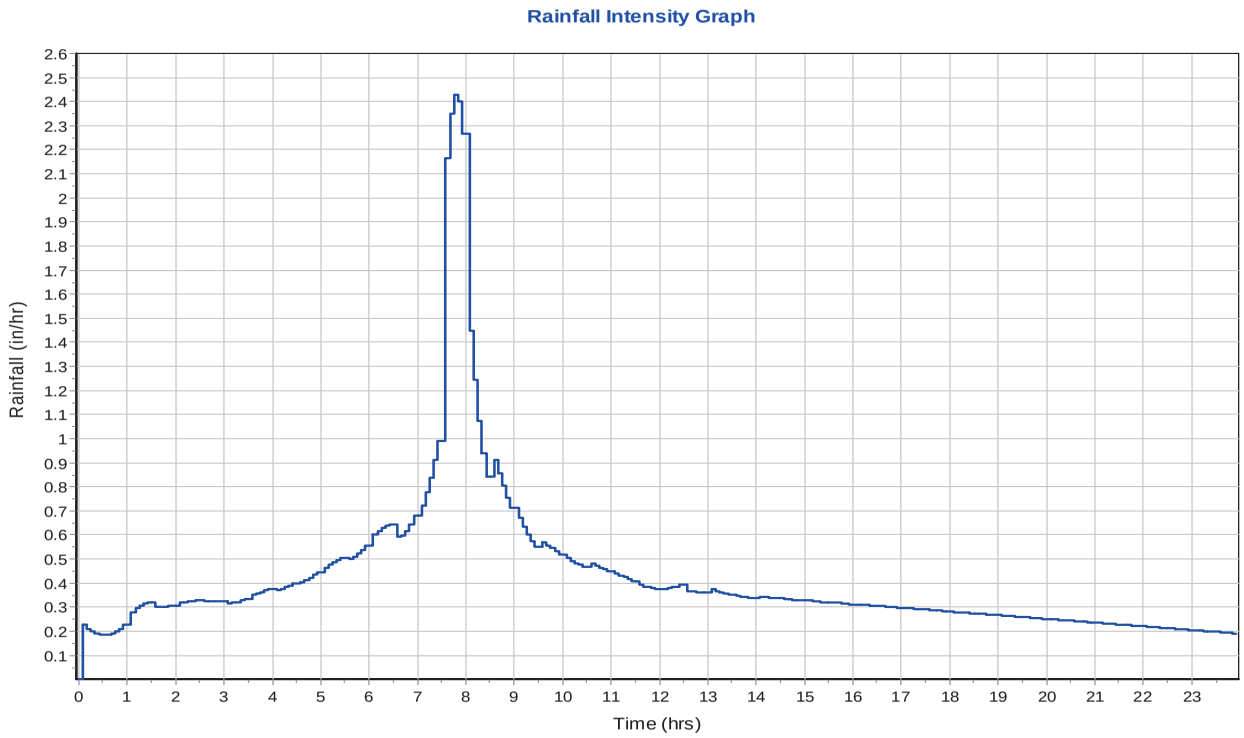
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

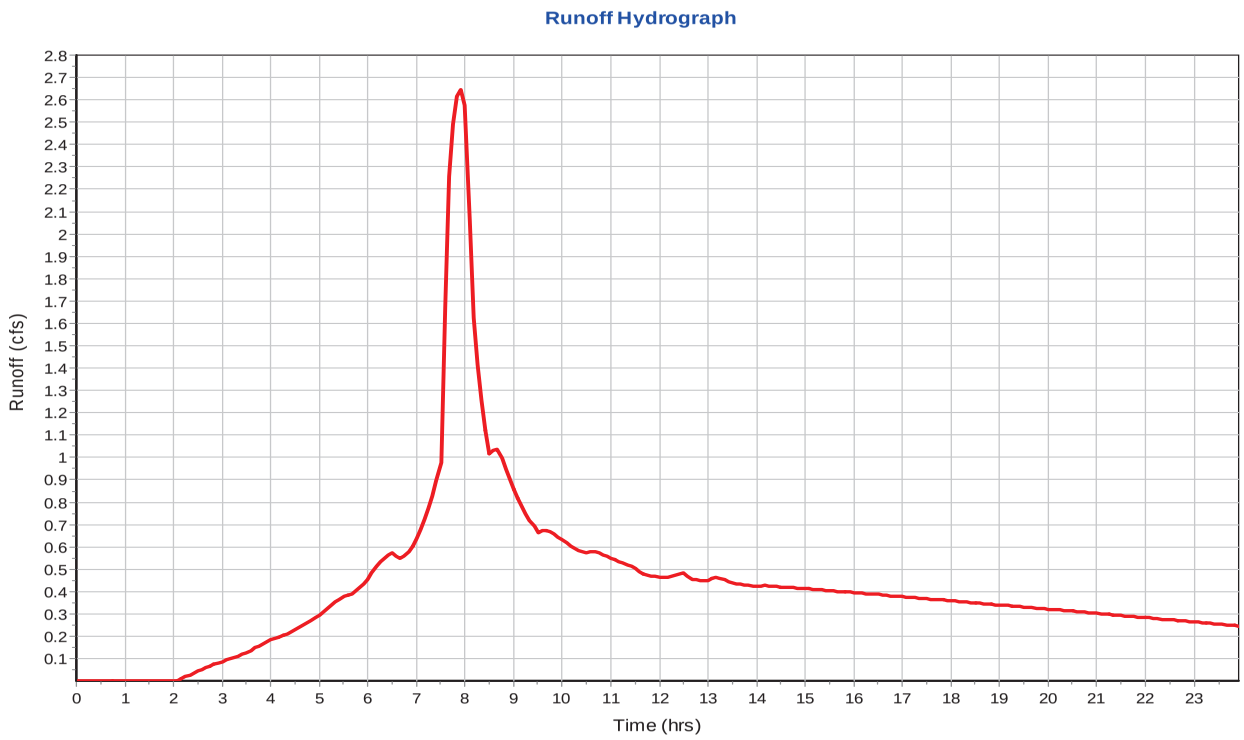
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	2.65
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:41

Subbasin : Sub-A_02-04





Subbasin : Sub-A_04-06

Input Data

Area (ac)	1.24
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.24	D	80
Composite Area & Weighted CN	1.24		80

Time of Concentration

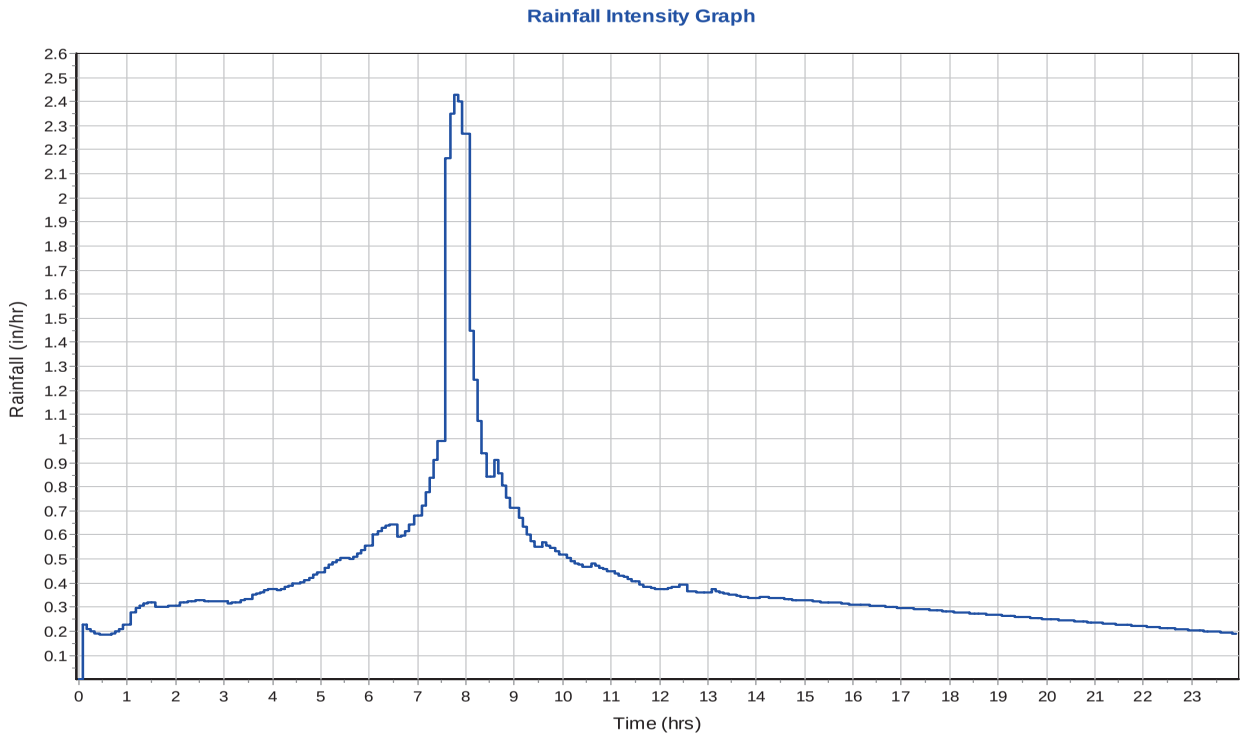
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

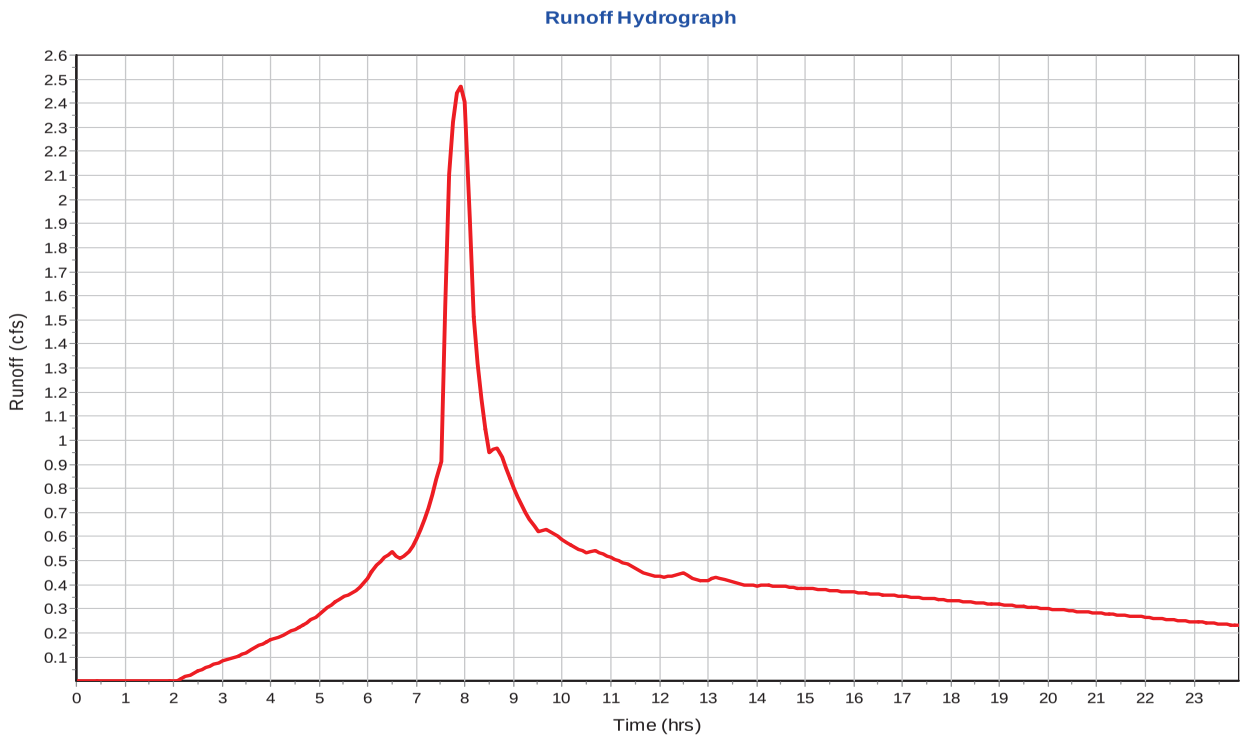
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	2.47
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:41

Subbasin : Sub-A_04-06





Subbasin : Sub-A_06-09

Input Data

Area (ac)	1.43
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	1.43	D	80
Composite Area & Weighted CN	1.43		80

Time of Concentration

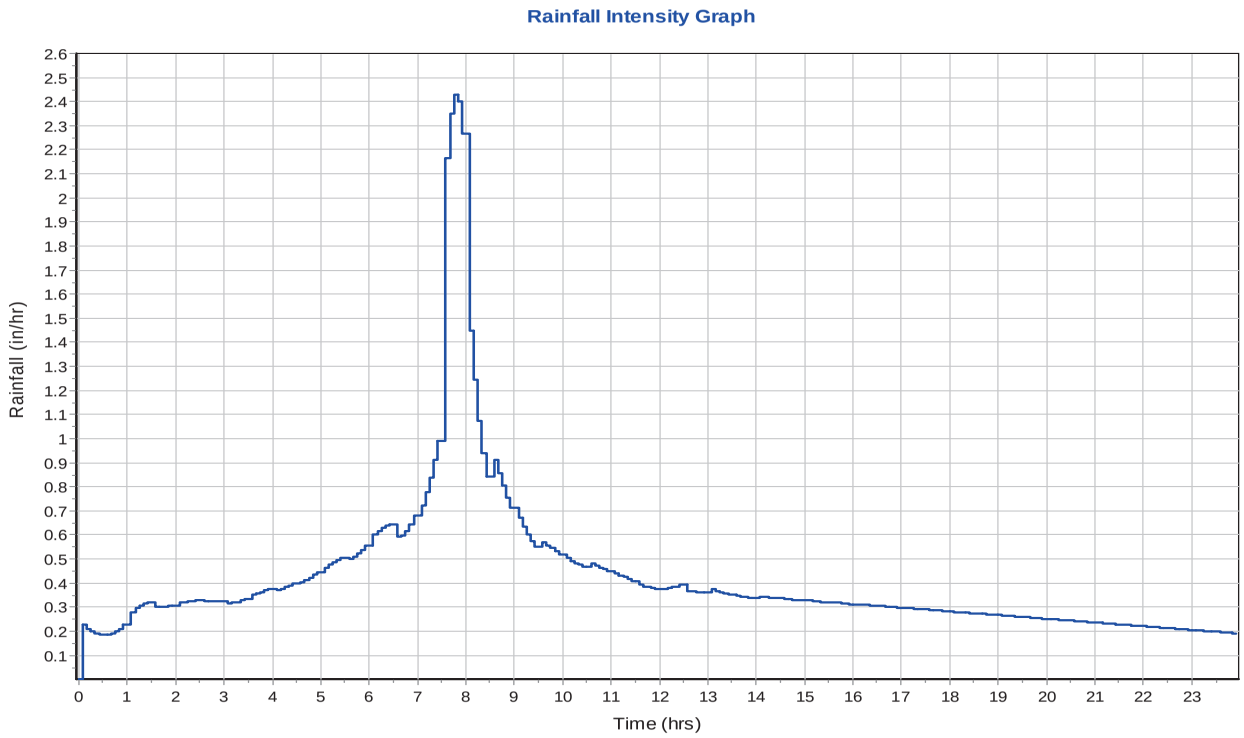
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	6.68	0	0

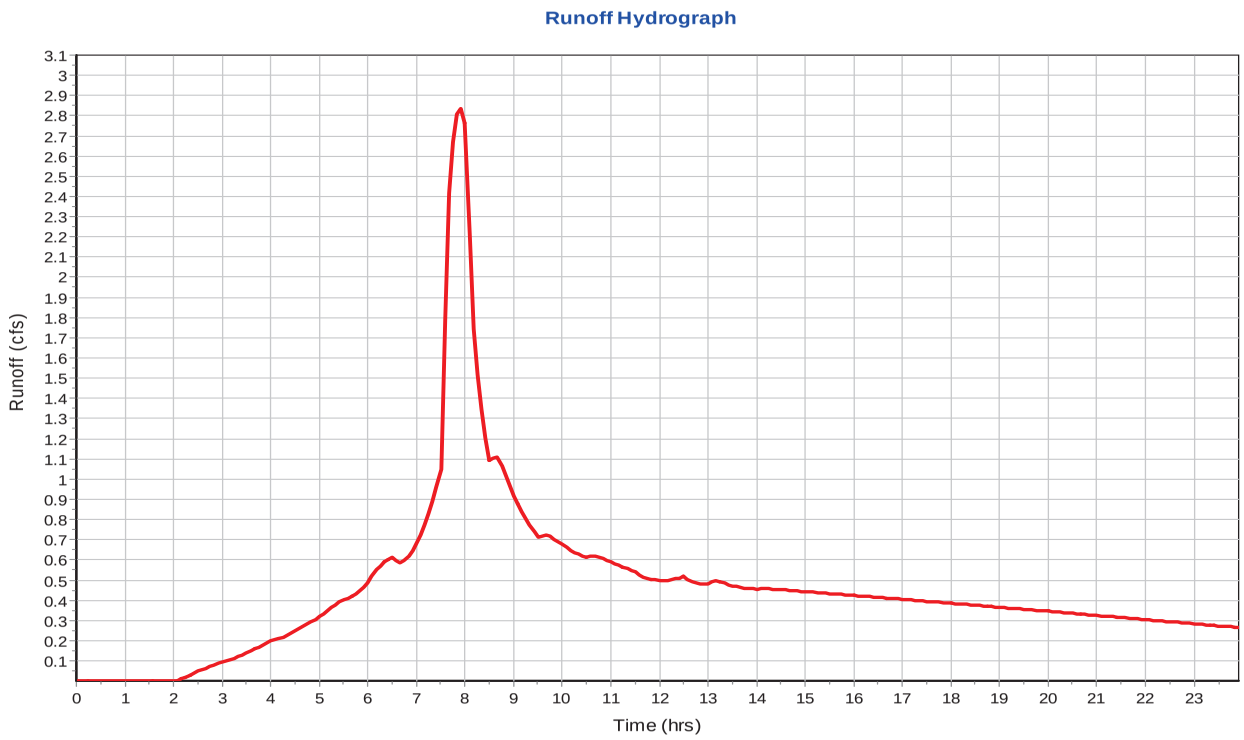
Total TOC (min) 6.68

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	2.84
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:41

Subbasin : Sub-A_06-09





Subbasin : Sub-A_09

Input Data

Area (ac)	1.49
Peak Rate Factor	484
Weighted Curve Number	80.95
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.64	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.06	C	73
Brush, Poor	0.73	D	83
Composite Area & Weighted CN	1.49		80.95

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	7.08	0	0

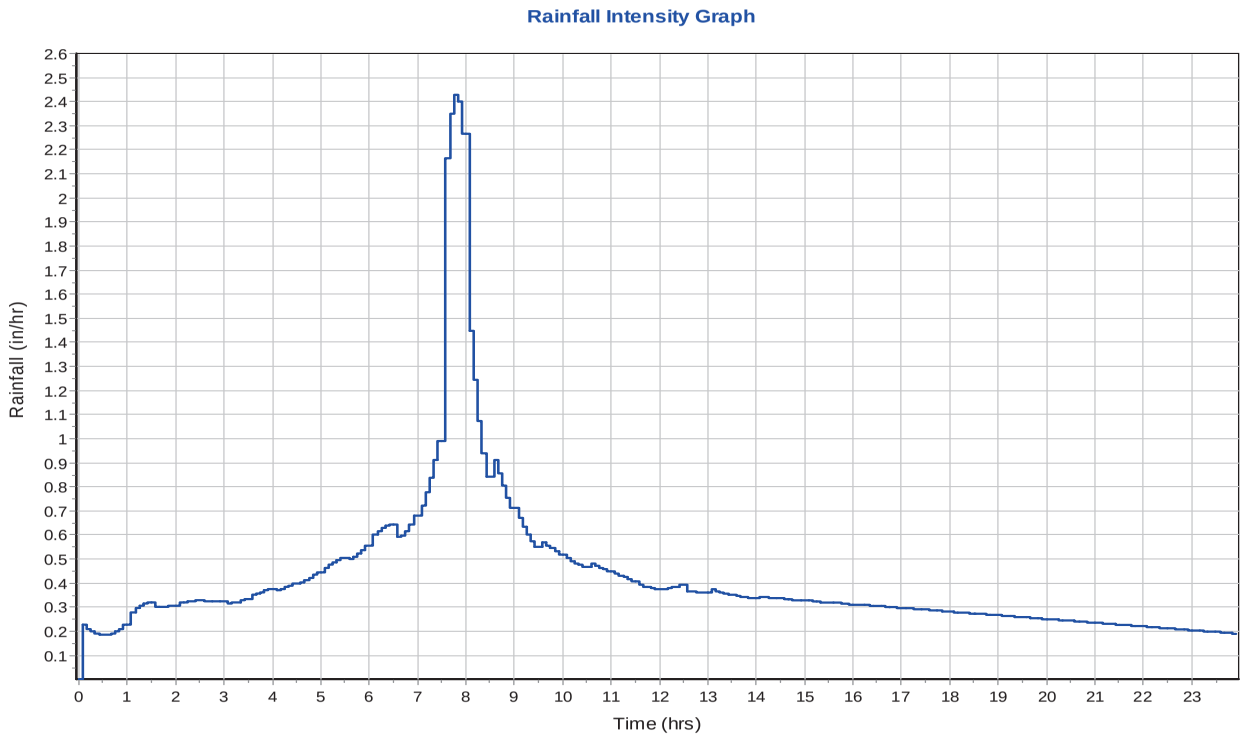
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	350	0	0
Slope (%) :	26	0	0
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	3.57	0	0
Computed Flow Time (min) :	1.63	0	0

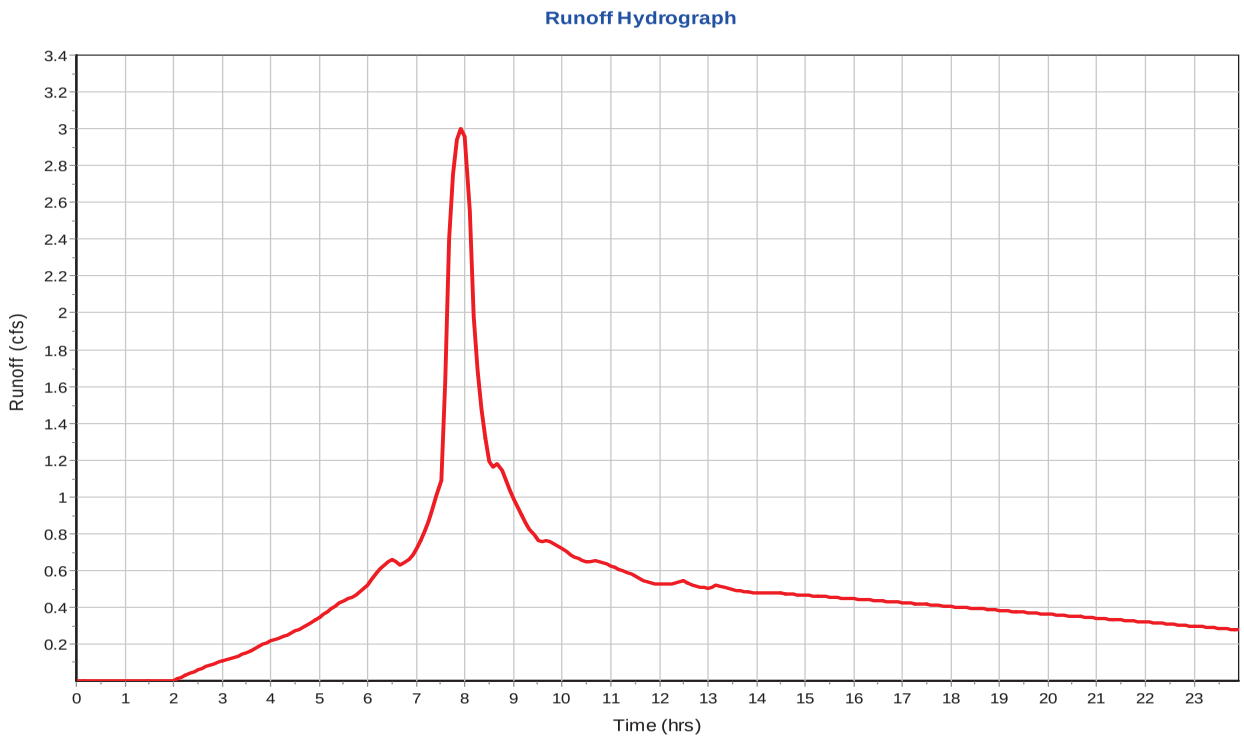
Total TOC (min) 8.71

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.74
Peak Runoff (cfs)	3
Weighted Curve Number	80.95
Time of Concentration (days hh:mm:ss)	0 00:08:43

Subbasin : Sub-A_09





Subbasin : Sub-A_18

Input Data

Area (ac)	5.5
Peak Rate Factor	484
Weighted Curve Number	81.53
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	2.7	D	80
Brush, Poor	2.8	D	83
Composite Area & Weighted CN	5.5		81.53

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	18	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.28	0	0
Computed Flow Time (min) :	6.02	0	0

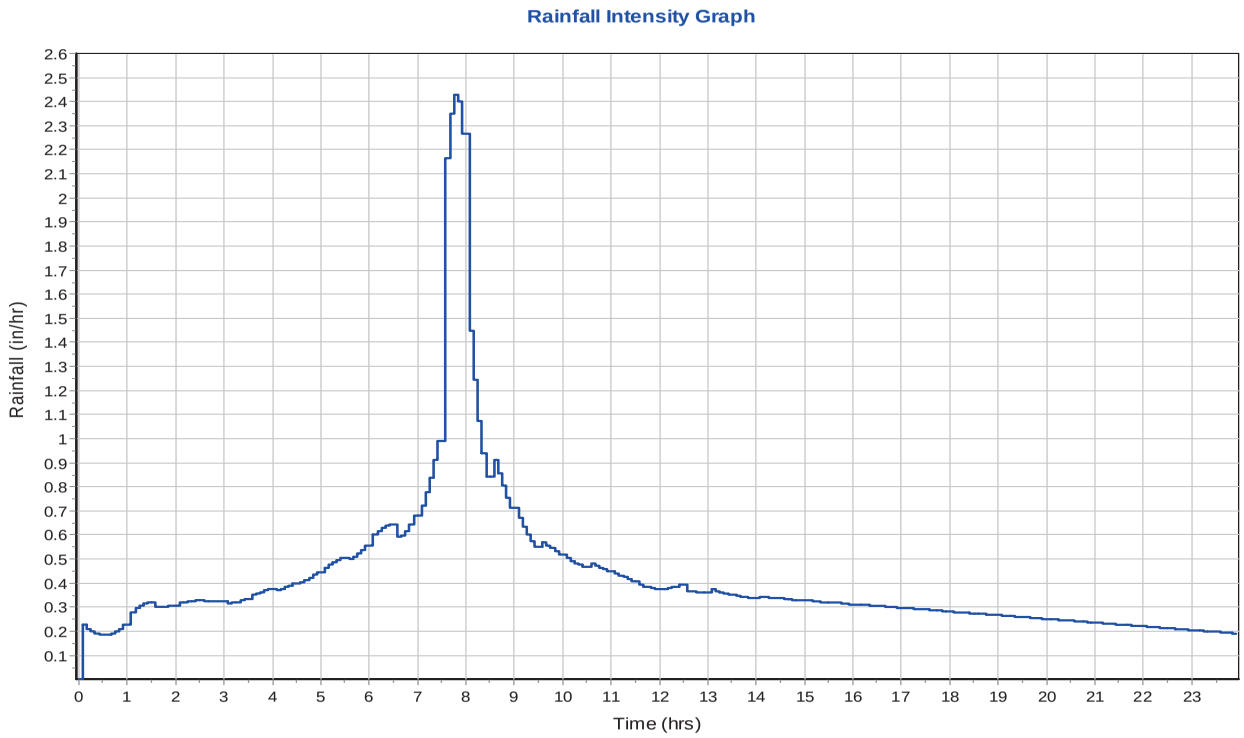
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	274	0	0
Slope (%) :	27	0	0
Surface Type :	Grass pasture	Unpavec	Unpaved
Velocity (ft/sec) :	3.64	0	0
Computed Flow Time (min) :	1.25	0	0

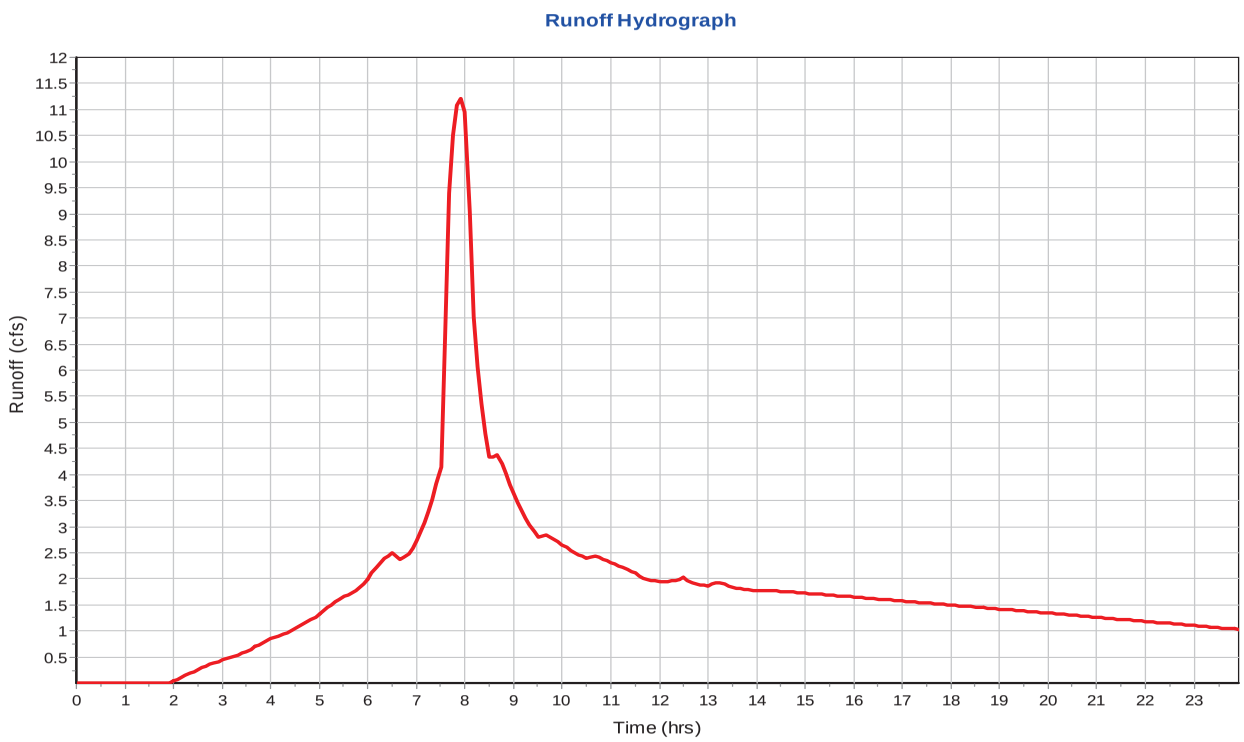
Total TOC (min) 7.28

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.81
Peak Runoff (cfs)	11.22
Weighted Curve Number	81.53
Time of Concentration (days hh:mm:ss)	0 00:07:17

Subbasin : Sub-A_18





Subbasin : Sub-A_19-20

Input Data

Area (ac)	0.2
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.2	D	80
Composite Area & Weighted CN	0.2		80

Time of Concentration

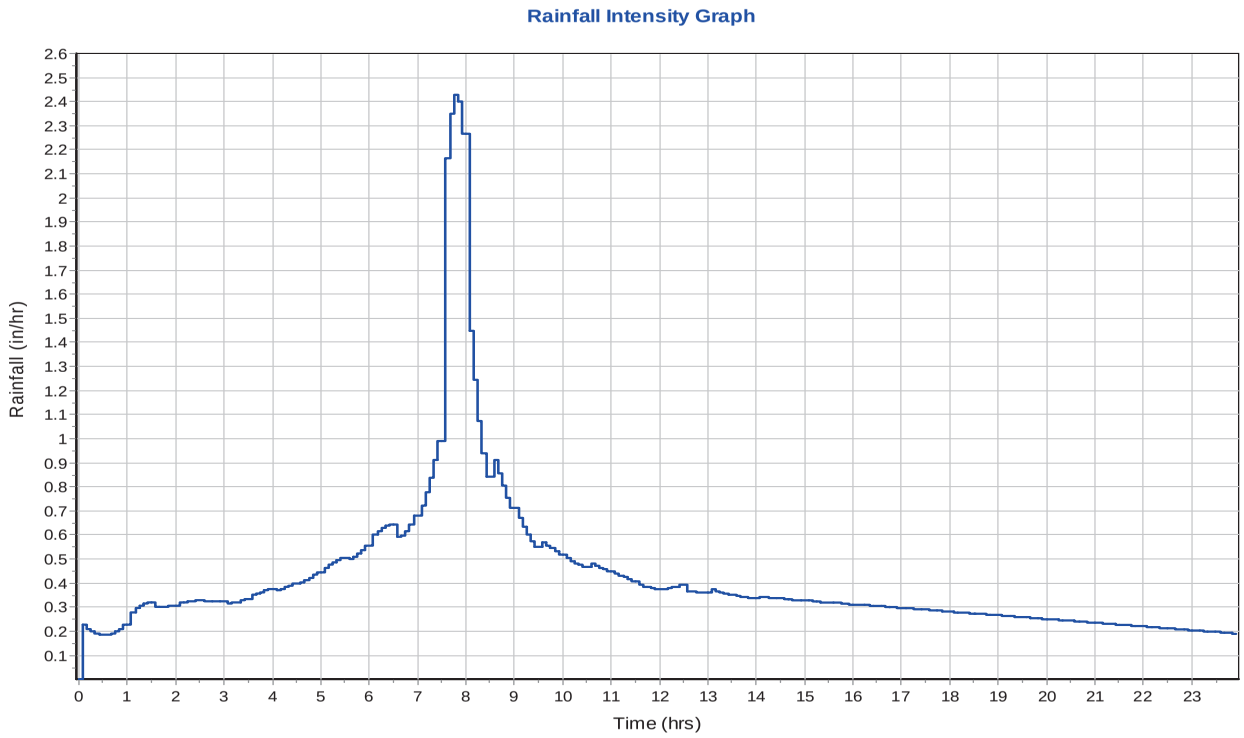
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	92	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.32	0	0

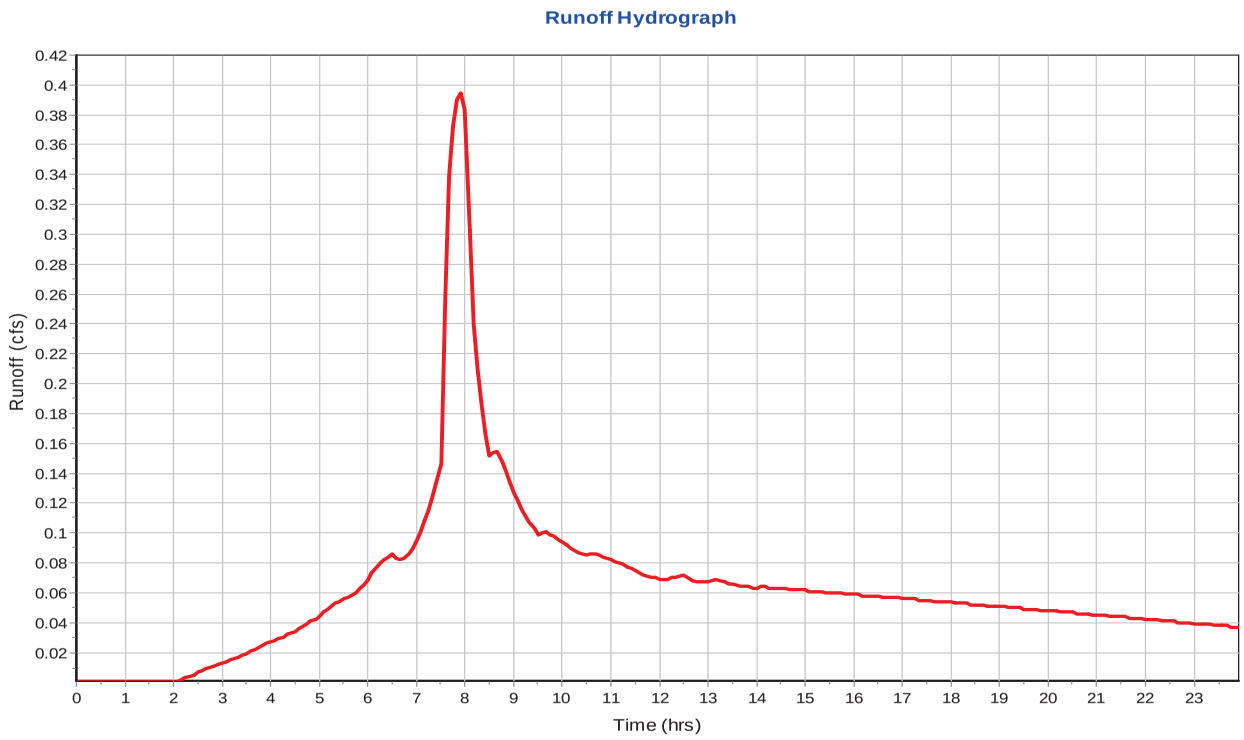
Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	0.39
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:19

Subbasin : Sub-A_19-20





Subbasin : Sub-A_20-21

Input Data

Area (ac)	0.44
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.44	D	80
Composite Area & Weighted CN	0.44		80

Time of Concentration

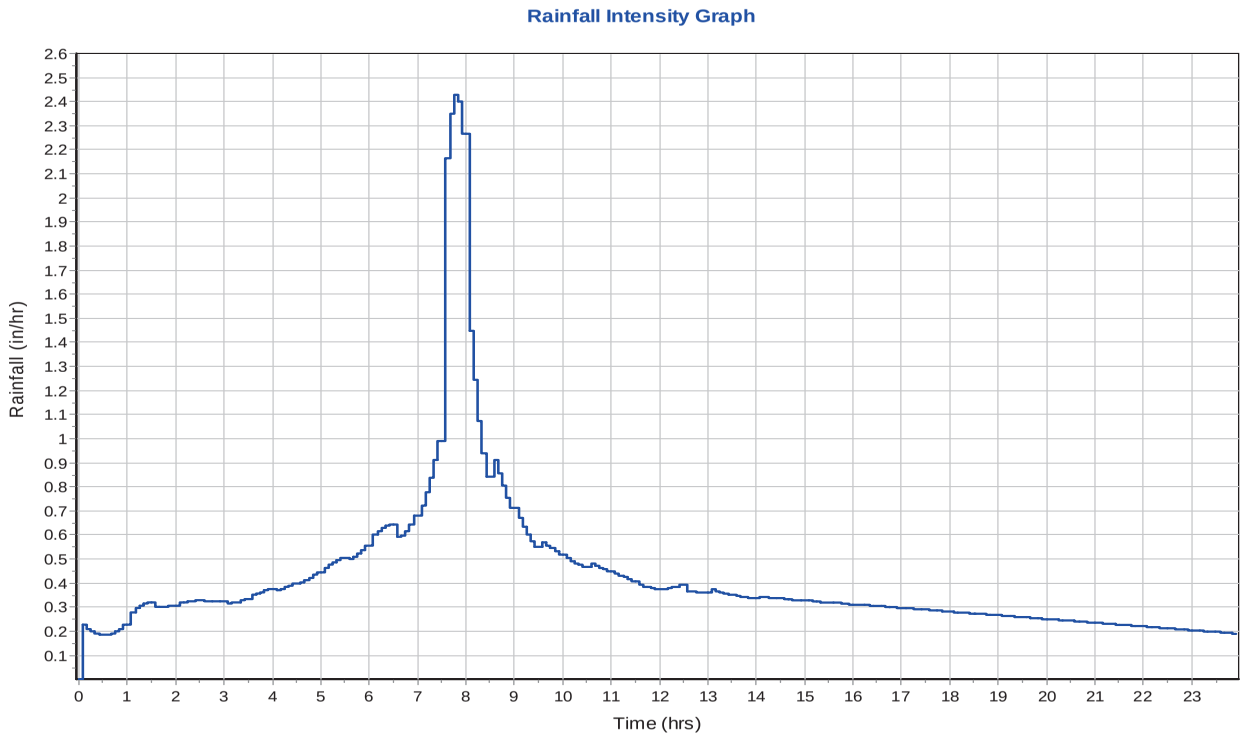
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	70	0	0
Slope (%) :	20	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	5.46	0	0

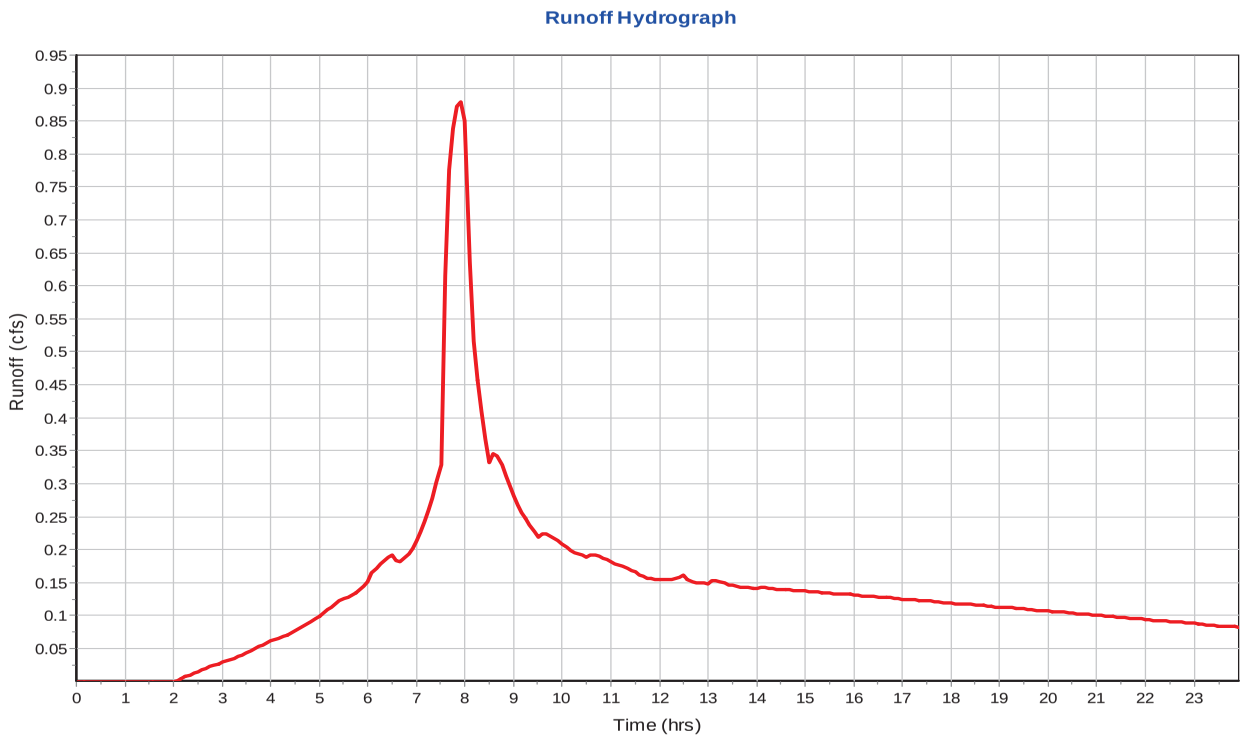
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	0.88
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_20-21





Subbasin : Sub-A_21E-22

Input Data

Area (ac)	0.38
Peak Rate Factor	484
Weighted Curve Number	77.32
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.21	D	80
Pasture, grassland, or range, Good	0.17	C	74
Composite Area & Weighted CN	0.38		77.32

Time of Concentration

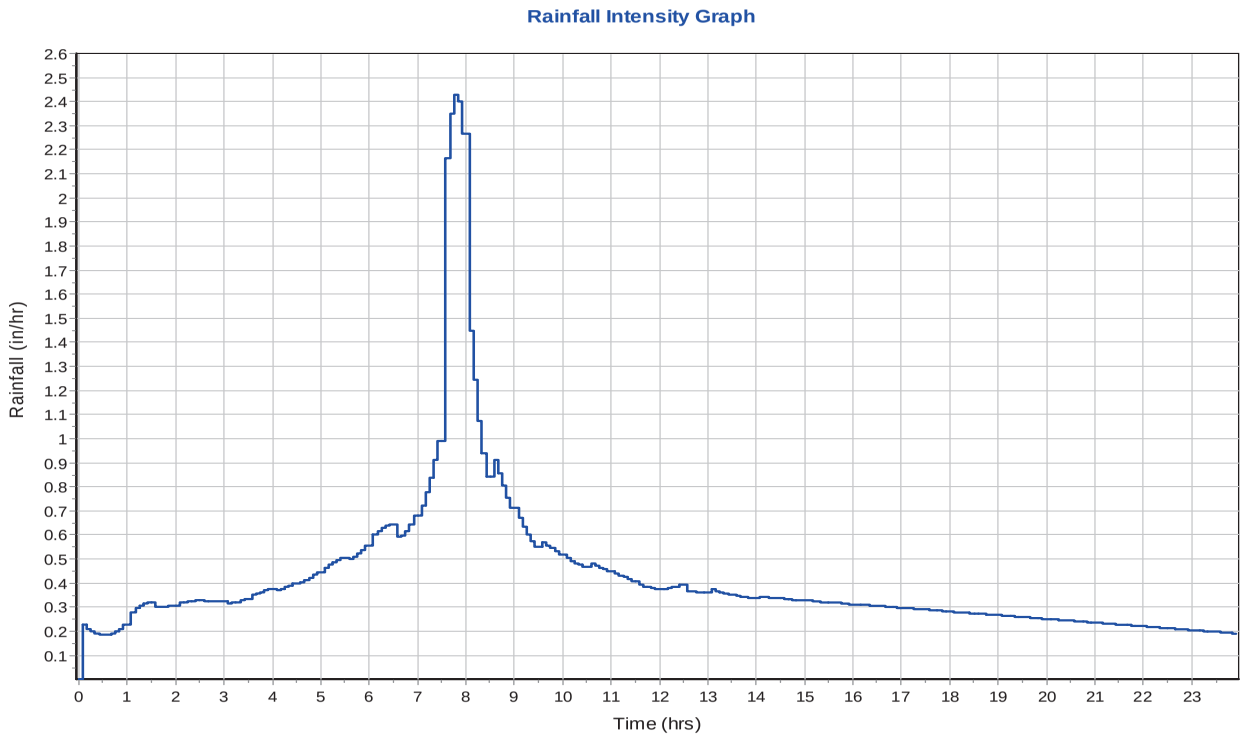
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	73	0	0
Slope (%) :	25	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	5.17	0	0

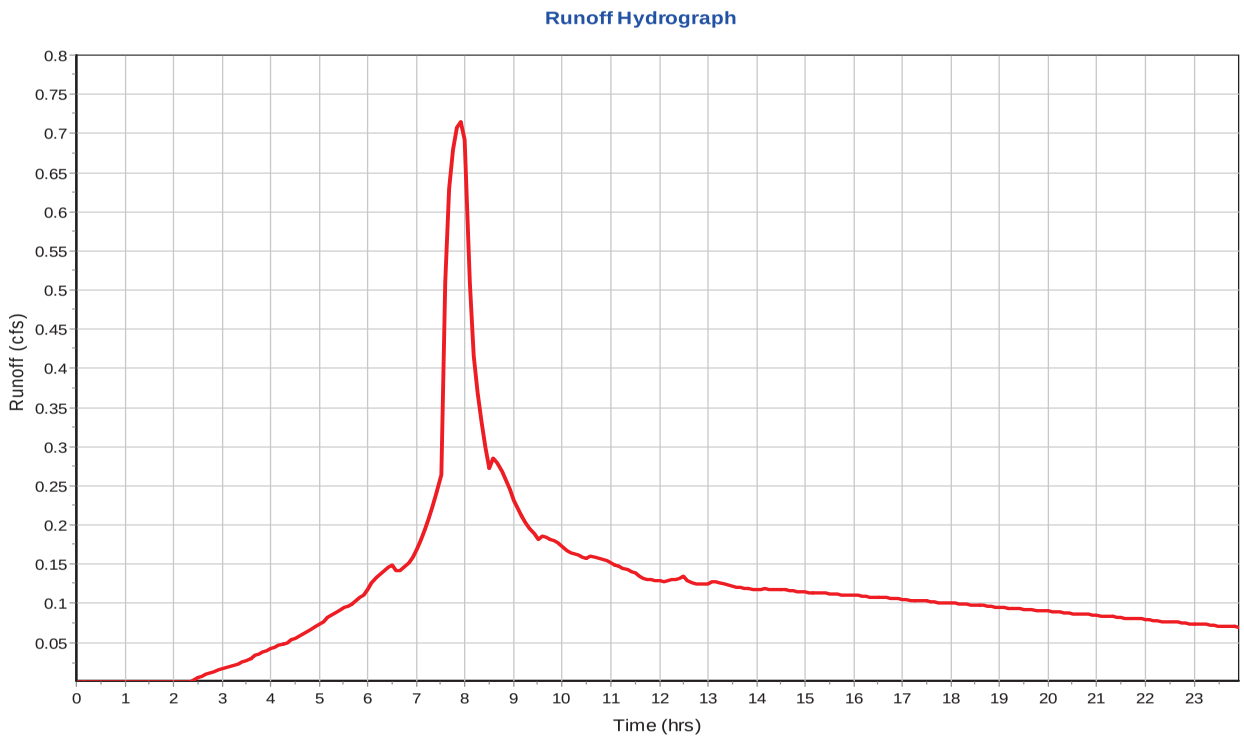
Total TOC (min) 5.17

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.27
Peak Runoff (cfs)	0.72
Weighted Curve Number	77.32
Time of Concentration (days hh:mm:ss)	0 00:05:10

Subbasin : Sub-A_21E-22





Subbasin : Sub-A_21W-22

Input Data

Area (ac)	0.35
Peak Rate Factor	484
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.35	D	80
Composite Area & Weighted CN	0.35		80

Time of Concentration

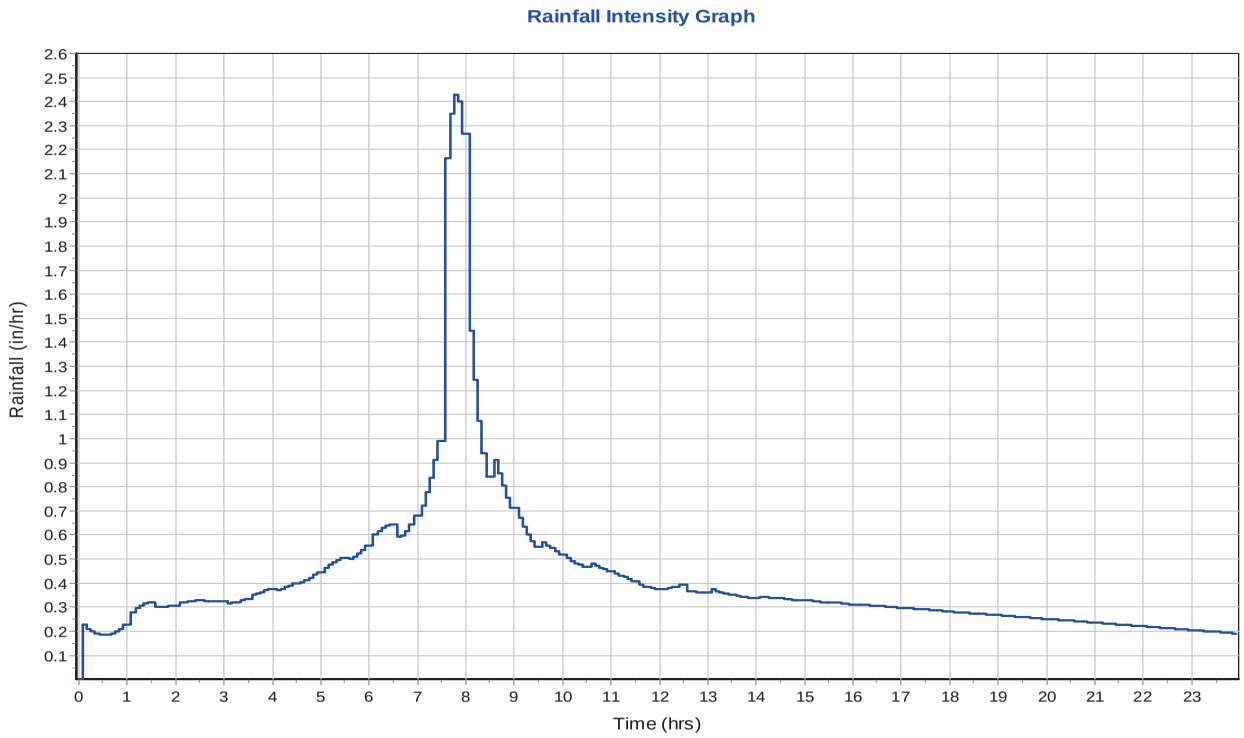
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.25	0	0
Computed Flow Time (min) :	6.54	0	0

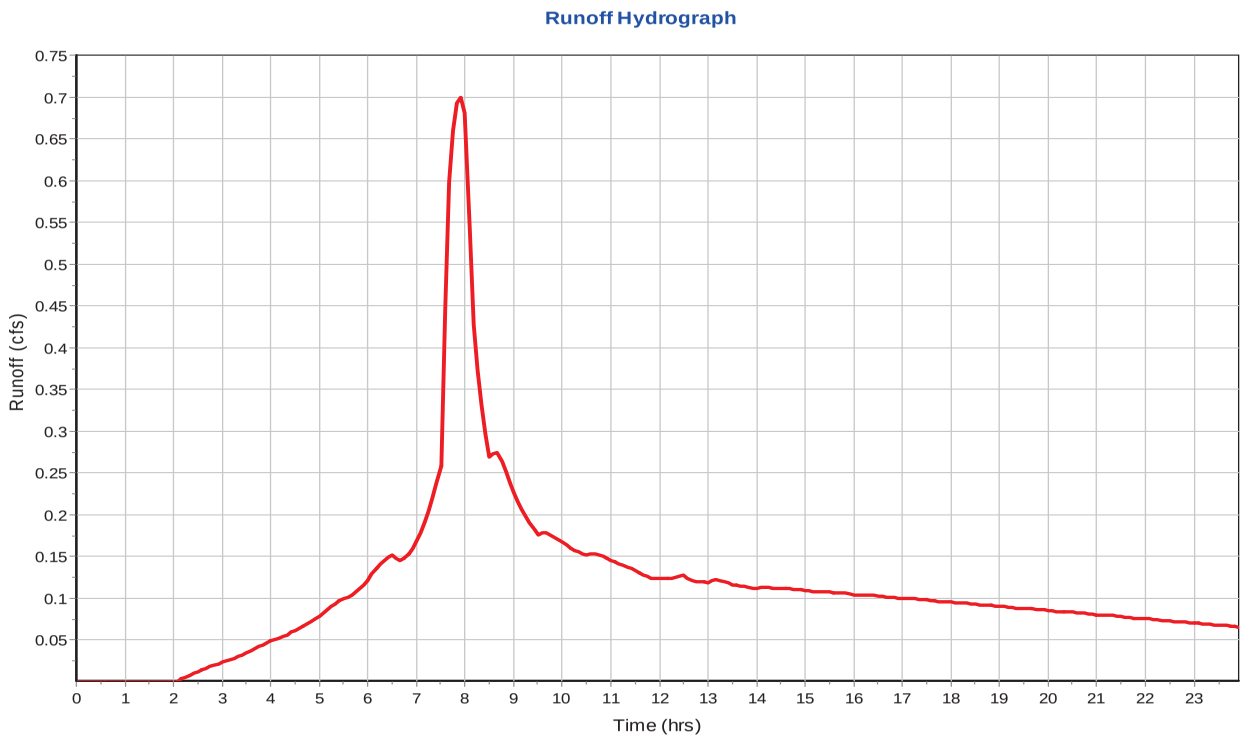
Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.62
Peak Runoff (cfs)	0.7
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:06:32

Subbasin : Sub-A_21W-22





Subbasin : Sub-A_22E-23

Input Data

Area (ac)	0.59
Peak Rate Factor	484
Weighted Curve Number	75
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.1	D	80
Pasture, grassland, or range, Good	0.49	C	74
Composite Area & Weighted CN	0.59		75

Time of Concentration

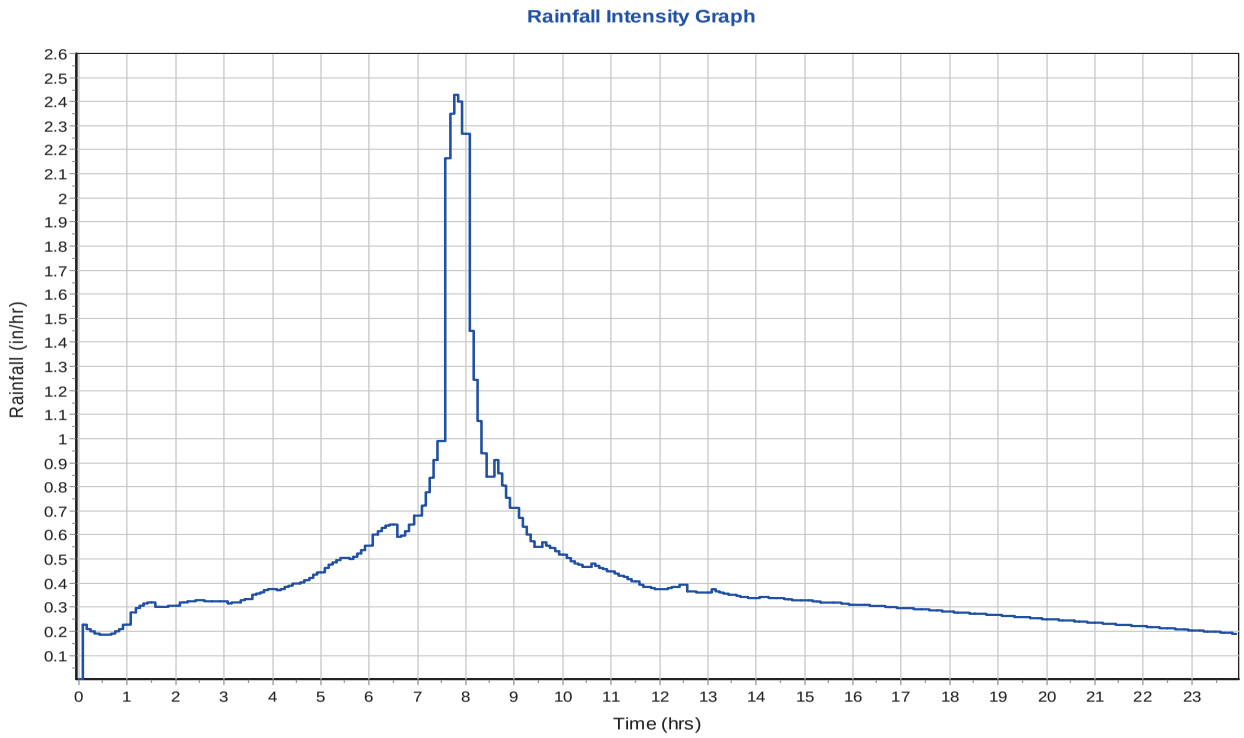
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	105	0	0
Slope (%) :	15	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.48	0	0

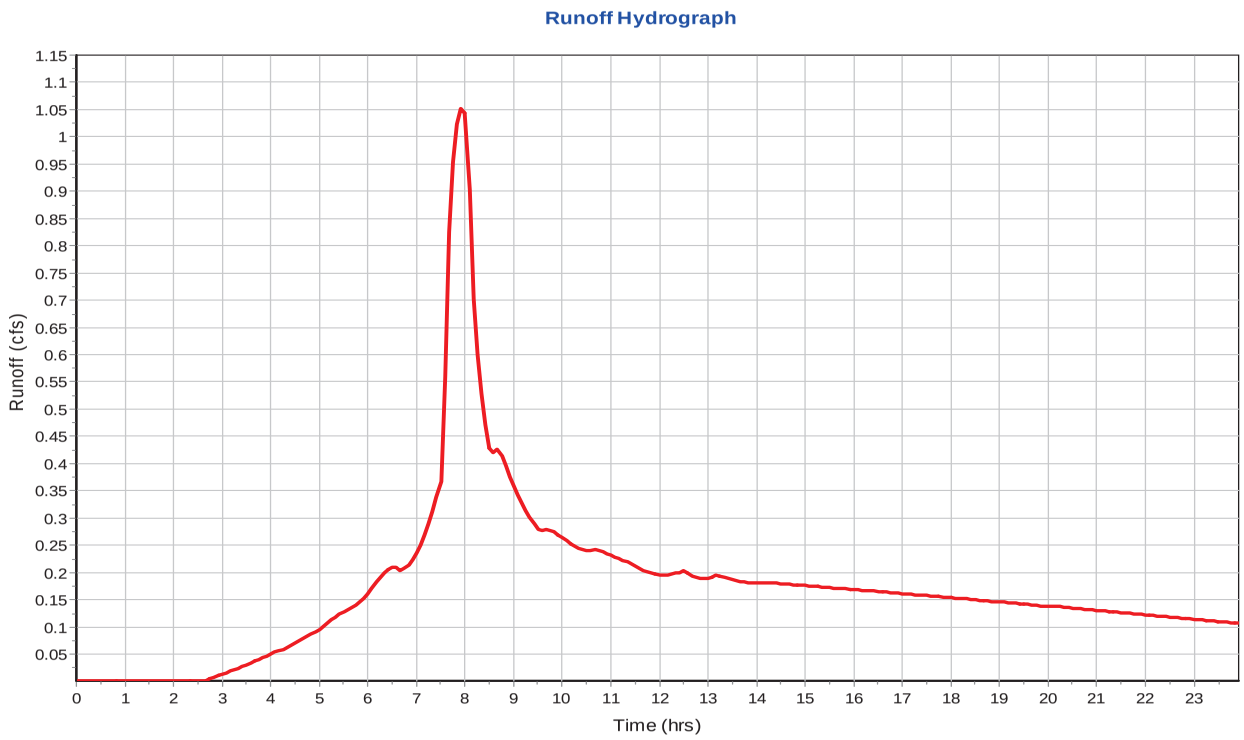
Total TOC (min) 8.48

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	6.97
Peak Runoff (cfs)	1.06
Weighted Curve Number	75
Time of Concentration (days hh:mm:ss)	0 00:08:29

Subbasin : Sub-A_22E-23





Subbasin : Sub-A_22W-23

Input Data

Area (ac)	0.42
Peak Rate Factor	484
Weighted Curve Number	79.28
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.37	D	80
Pasture, grassland, or range, Good	0.05	C	74
Composite Area & Weighted CN	0.42		79.28

Time of Concentration

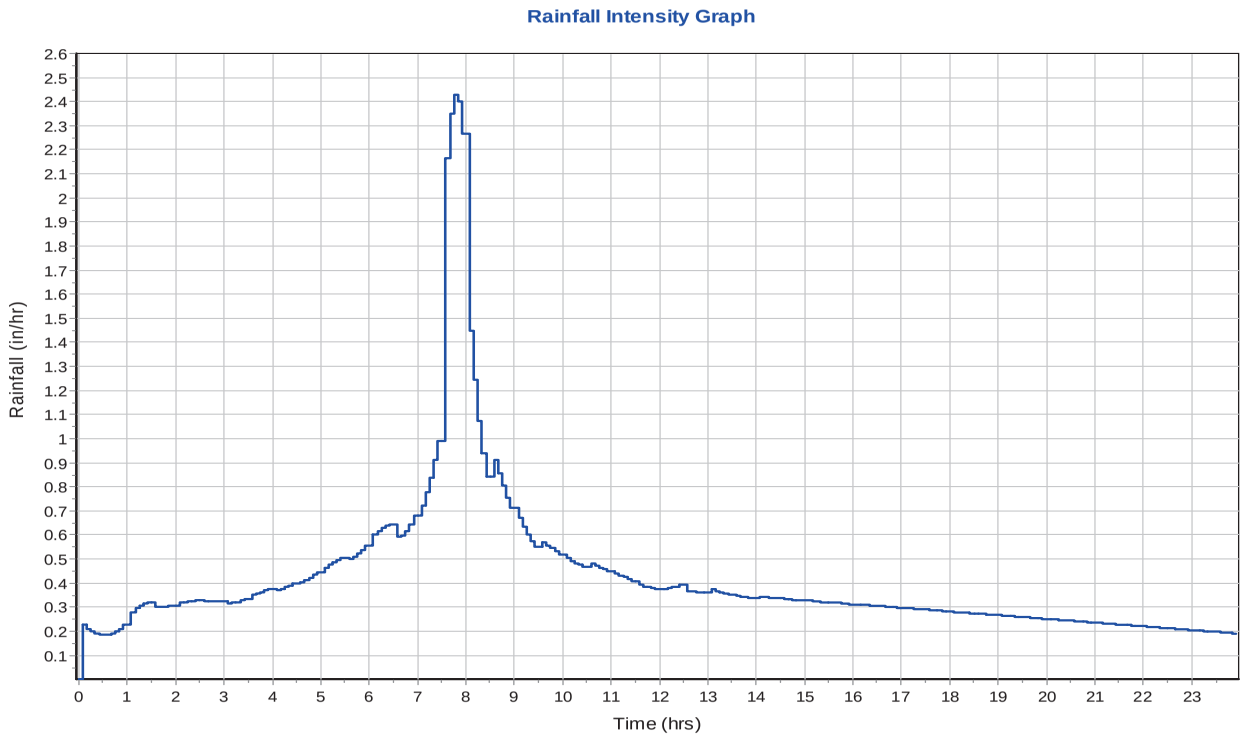
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	75	0	0
Slope (%) :	23	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	5.46	0	0

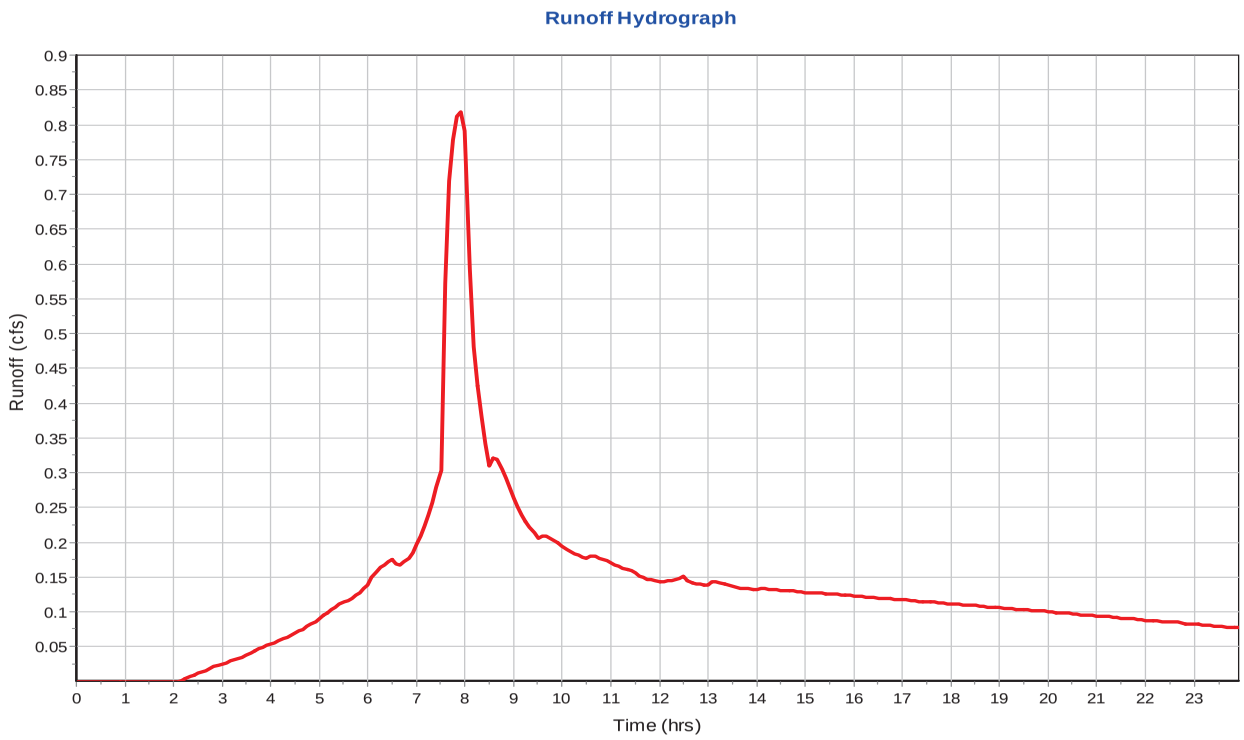
Total TOC (min) 5.46

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.52
Peak Runoff (cfs)	0.82
Weighted Curve Number	79.28
Time of Concentration (days hh:mm:ss)	0 00:05:28

Subbasin : Sub-A_22W-23





Subbasin : Sub-A_23E-24

Input Data

Area (ac)	0.52
Peak Rate Factor	484
Weighted Curve Number	74
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.52	C	74
Composite Area & Weighted CN	0.52		74

Time of Concentration

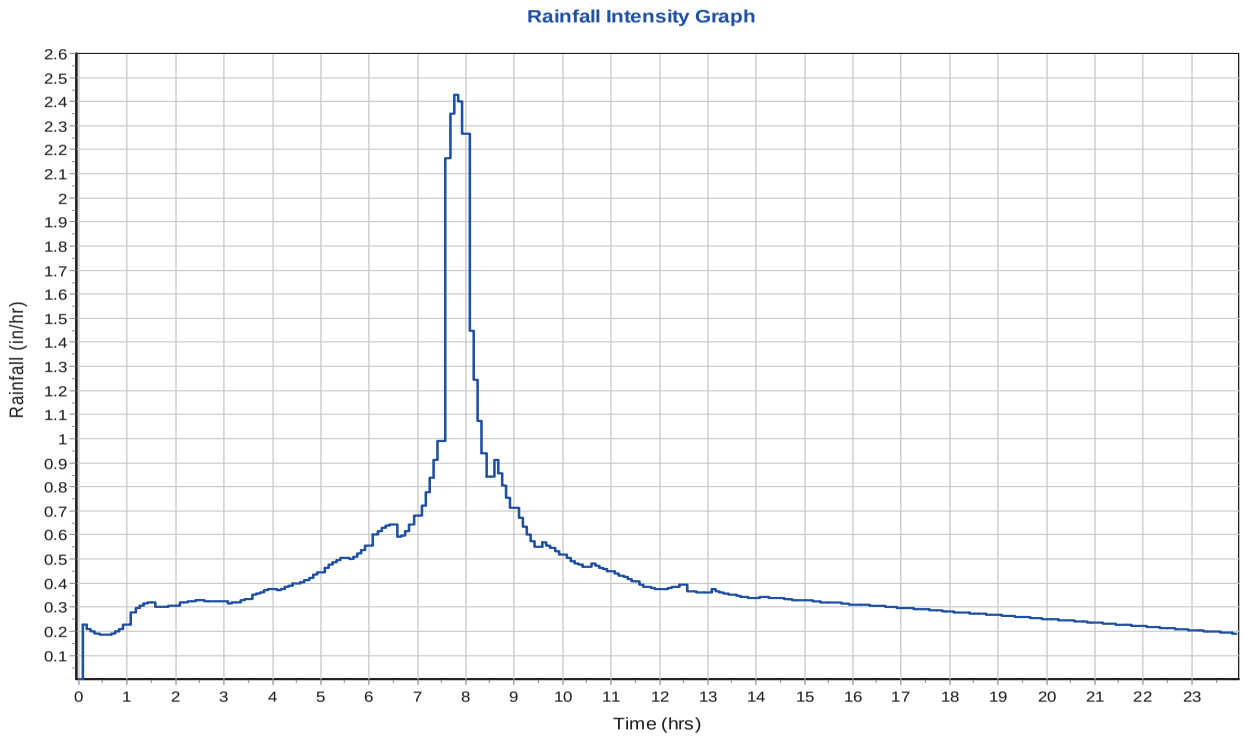
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	50	0	0
Slope (%) :	6	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.12	0	0
Computed Flow Time (min) :	6.75	0	0

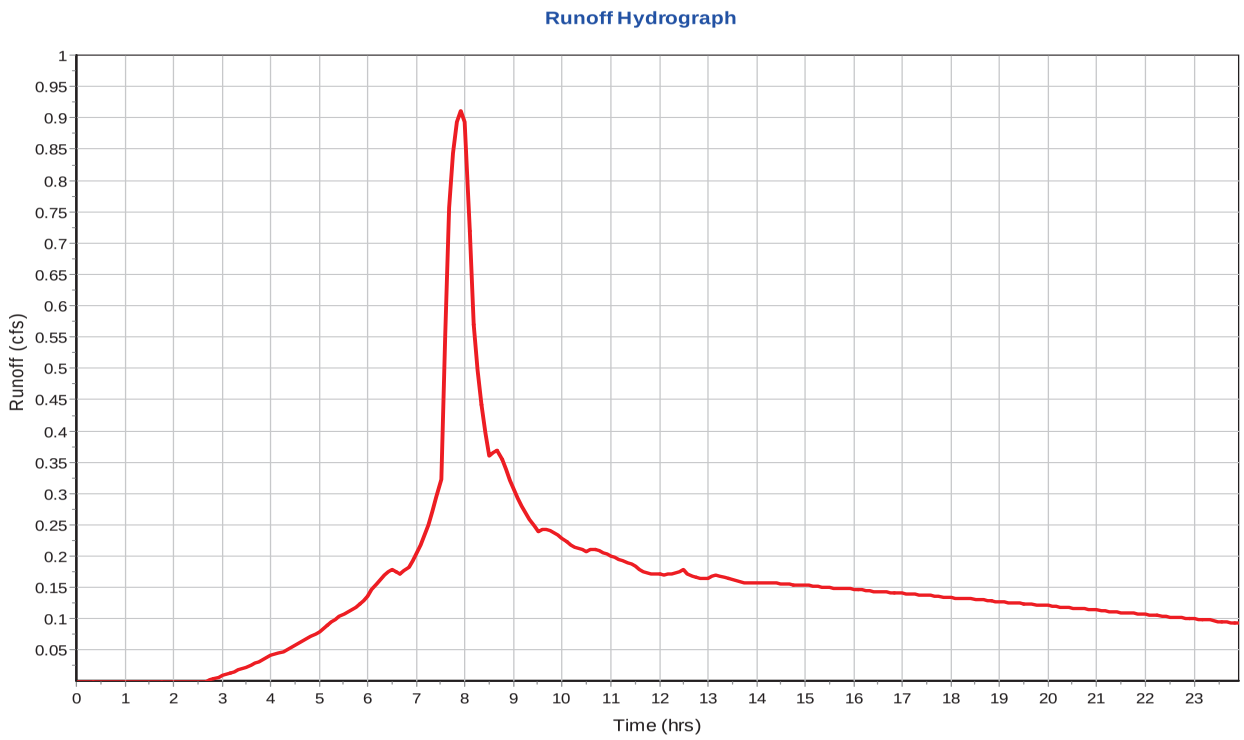
Total TOC (min) 6.75

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	6.84
Peak Runoff (cfs)	0.91
Weighted Curve Number	74
Time of Concentration (days hh:mm:ss)	0 00:06:45

Subbasin : Sub-A_23E-24





Subbasin : Sub-A_23W-24

Input Data

Area (ac)	0.43
Peak Rate Factor	484
Weighted Curve Number	77.33
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.24	D	80
Pasture, grassland, or range, Good	0.19	C	74
Composite Area & Weighted CN	0.43		77.33

Time of Concentration

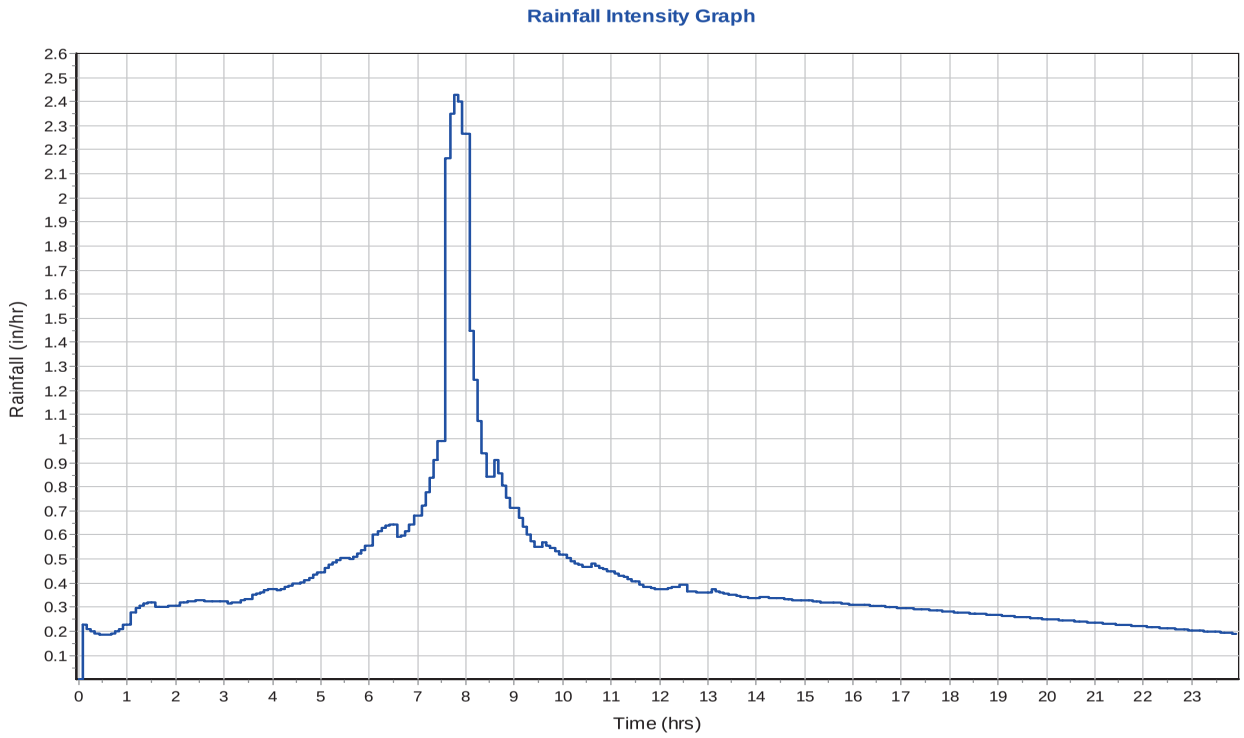
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	90	0	0
Slope (%) :	24	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.24	0	0
Computed Flow Time (min) :	6.21	0	0

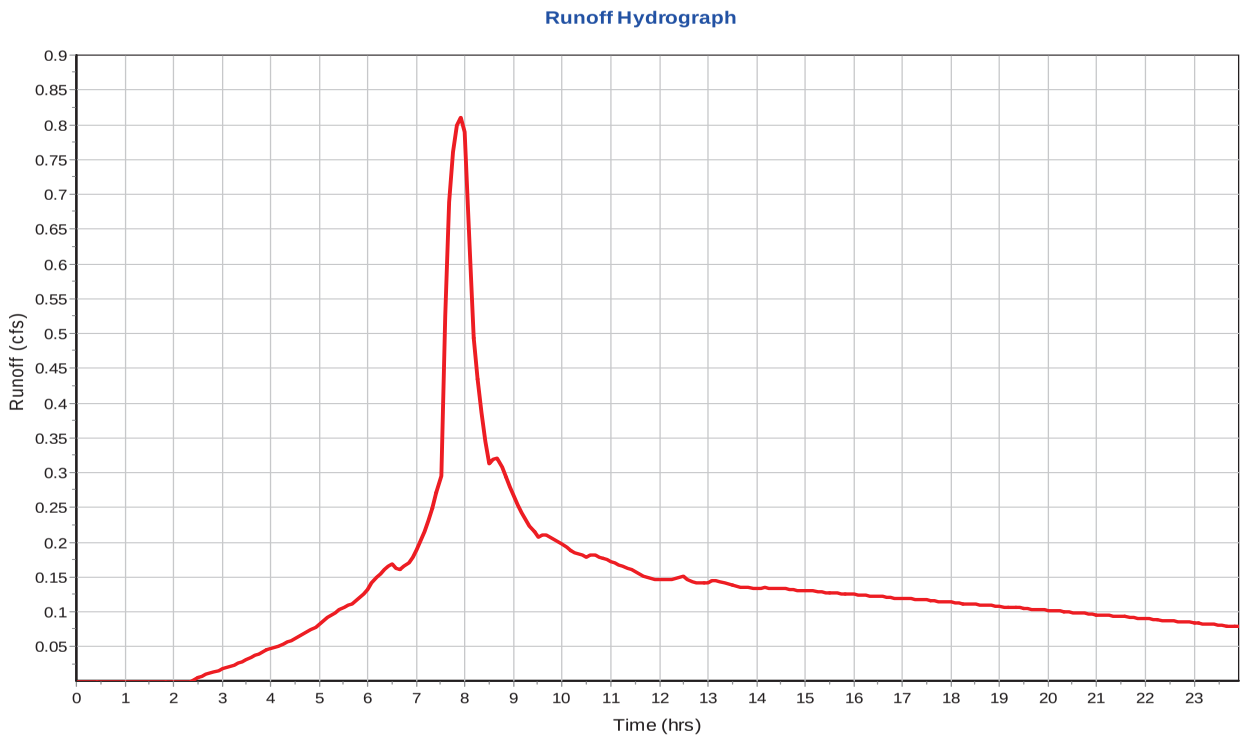
Total TOC (min) 6.21

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.27
Peak Runoff (cfs)	0.81
Weighted Curve Number	77.33
Time of Concentration (days hh:mm:ss)	0 00:06:13

Subbasin : Sub-A_23W-24





Subbasin : Sub-A_24

Input Data

Area (ac)	0.7
Peak Rate Factor	484
Weighted Curve Number	77.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Good	0.14	D	80
Pasture, grassland, or range, Good	0.06	C	74
Woods, Fair	0.31	C	73
Brush, Poor	0.19	D	83
Composite Area & Weighted CN	0.7		77.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.47	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	26	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.22	0	0
Computed Flow Time (min) :	7.44	0	0

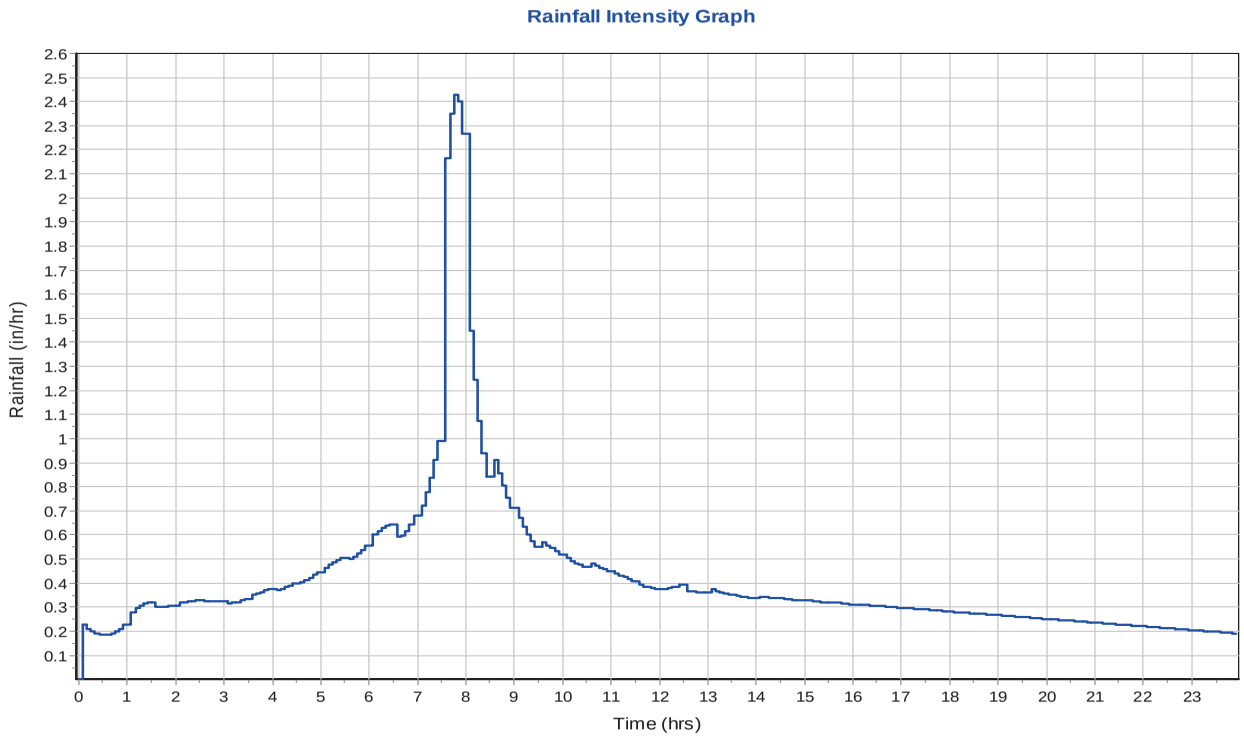
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	89	0	0
Slope (%) :	25	0	0
Surface Type :	Forest	Unpavec	Unpaved
Velocity (ft/sec) :	1.25	0	0
Computed Flow Time (min) :	1.19	0	0

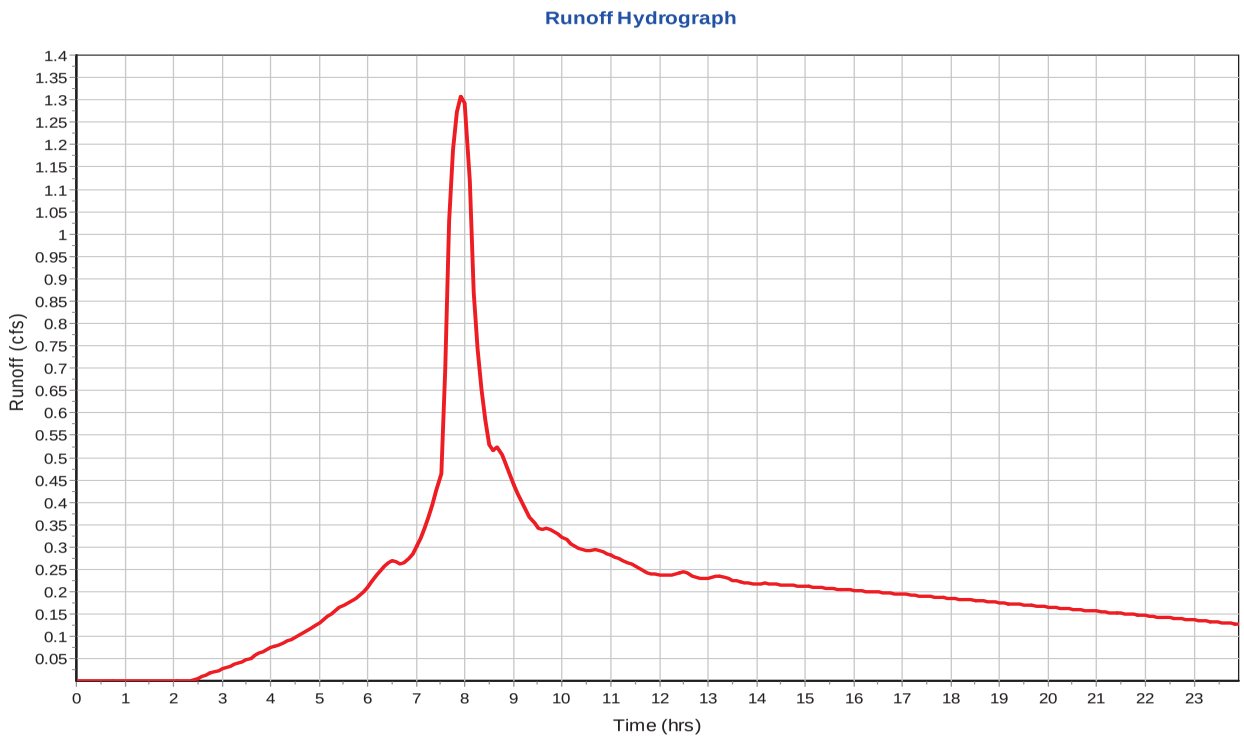
Total TOC (min) 8.63

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	7.26
Peak Runoff (cfs)	1.31
Weighted Curve Number	77.2
Time of Concentration (days hh:mm:ss)	0 00:08:38

Subbasin : Sub-A_24





Subbasin : Sub-B

Input Data

Area (ac)	5.05
Peak Rate Factor	484
Weighted Curve Number	73.2
Rain Gage ID	Rain Gage-01

Composite Curve Number

32	Area (acres)	Soil Group	Curve Number
Soil/Surface Description			
Woods, Fair	4.03	C	73
Pasture, grassland, or range, Good	1.02	C	74
Composite Area & Weighted CN	5.05		73.2

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.8	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11	0	0
2 yr, 24 hr Rainfall (in) :	4.43	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.07	0	0

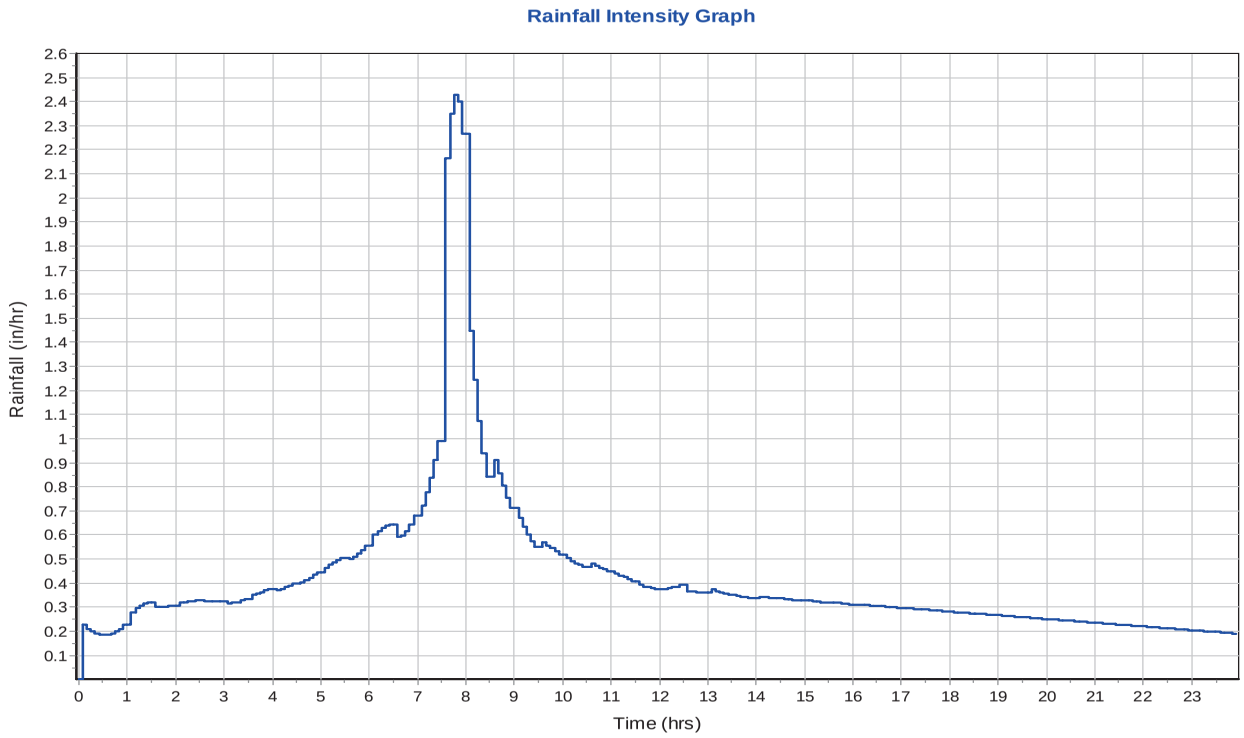
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	293	0	0
Slope (%) :	27	0	0
Surface Type :	Forest	Unpavec	Unpaved
Velocity (ft/sec) :	1.3	0	0
Computed Flow Time (min) :	3.76	0	0

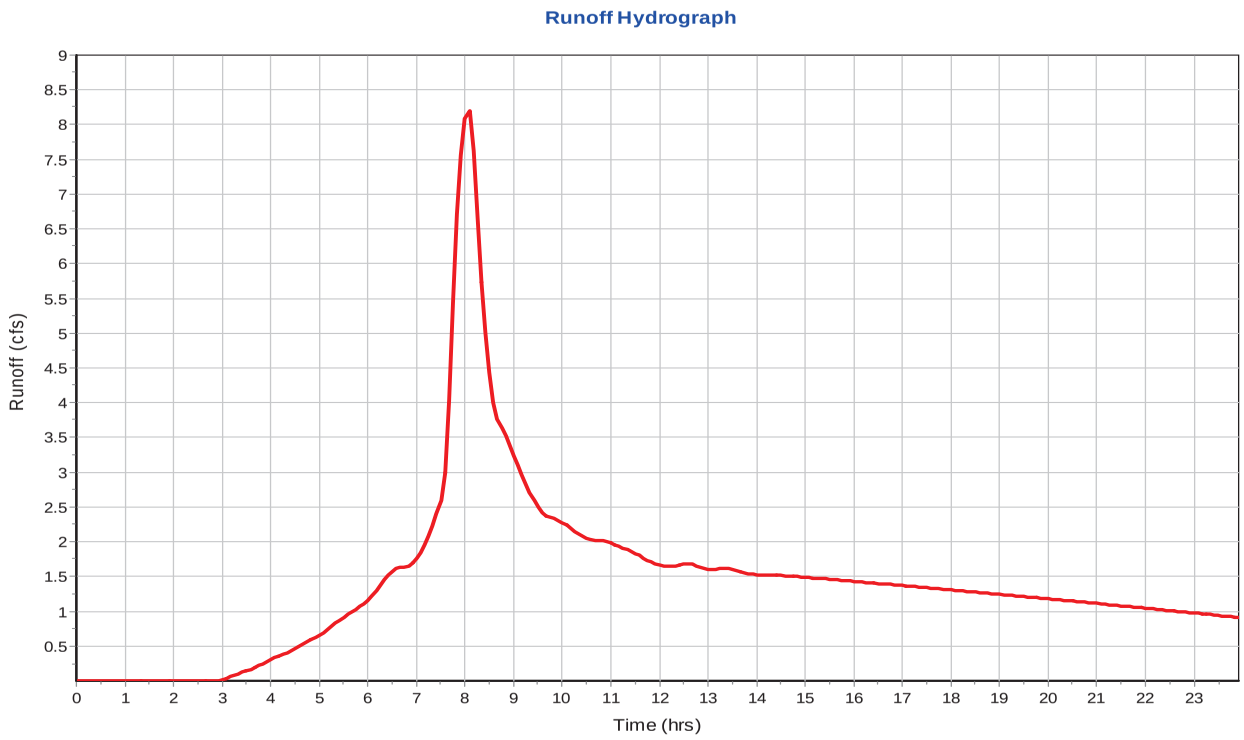
Total TOC (min) 19.82

Subbasin Runoff Results

Total Rainfall (in)	10.1
Total Runoff (in)	6.74
Peak Runoff (cfs)	8.22
Weighted Curve Number	73.2
Time of Concentration (days hh:mm:ss)	0 00:19:49

Subbasin : Sub-B





Channel Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
DC-B	950.00	535.00	368.00	167.00	17.58	User-Defined	4.0	18.9	0.040	0.000	0.500	0.000	0.00	No
DV-02W	173.00	416.00	411.00	5.00	2.89	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-04	162.99	450.00	446.00	4.00	2.45	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-08	220.00	514.00	508.00	6.00	2.73	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-09	150.00	545.00	526.00	19.00	12.67	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-19	121.00	416.50	414.00	2.50	2.07	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-20	114.00	436.00	433.00	3.00	2.63	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21E	81.00	445.00	443.00	2.00	2.47	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-21W	114.00	445.50	443.00	2.50	2.19	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22E	143.00	467.00	464.00	3.00	2.10	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-22W	121.00	467.00	464.00	3.00	2.48	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23E	172.00	498.00	494.00	4.00	2.33	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No
DV-23W	165.00	498.00	494.00	4.00	2.42	Triangular	0.5	9.0	0.033	0.500	0.500	0.000	0.00	No

Channel Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
DC-B	8.19	0 08:10	860.24	0.01	7.22	2.19	0.71	0.18	0.00	
DV-02W	2.64	0 08:00	27.23	0.10	1.70	1.70	0.21	0.42	0.00	
DV-04	2.47	0 08:00	25.09	0.10	1.57	1.73	0.21	0.42	0.00	
DV-08	2.83	0 08:01	39.68	0.07	1.54	2.38	0.19	0.37	0.00	
DV-09	3.00	0 08:00	14.25	0.21	4.29	0.58	0.28	0.56	0.00	
DV-19	0.39	0 08:00	5.76	0.07	1.32	1.53	0.18	0.37	0.00	
DV-20	0.88	0 08:00	12.99	0.07	1.48	1.28	0.18	0.36	0.00	
DV-21E	0.71	0 08:00	6.29	0.11	1.63	0.83	0.22	0.44	0.00	
DV-21W	0.70	0 08:00	5.93	0.12	1.55	1.23	0.22	0.45	0.00	
DV-22E	1.05	0 08:01	5.80	0.18	1.69	1.41	0.26	0.53	0.00	
DV-22W	0.82	0 08:00	6.31	0.13	1.69	1.19	0.23	0.46	0.00	
DV-23E	0.91	0 08:01	6.11	0.15	1.70	1.69	0.24	0.49	0.00	
DV-23W	0.81	0 08:00	6.23	0.13	1.68	1.64	0.23	0.47	0.00	

Pipe Input

Element ID	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
Pipe-A-01.1.1	65.4	394.0	378.0	16.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.2	69.5	411.0	394.0	17.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.3	68.8	430.0	411.0	19.00	27.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.4	79.4	446.0	430.0	16.00	20.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.5	71.2	460.0	446.0	14.00	19.7	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.6	75.4	478.0	460.0	18.00	23.9	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.7	68.9	496.0	478.0	18.00	26.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.8	42.5	508.0	496.0	12.00	28.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.1.9	80.5	526.0	508.0	18.00	22.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.1	165.0	417.0	378.0	39.00	23.6	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.2	96.9	432.0	417.0	15.00	15.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.3	86.9	445.0	432.0	13.00	15.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.4	80.7	454.0	445.0	9.00	11.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.5	60.0	462.0	454.0	8.00	13.3	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.6	57.3	476.0	462.0	14.00	24.5	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.7	72.0	494.0	476.0	18.00	25.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.8	73.3	508.0	494.0	14.00	19.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-01.2.9	106.6	523.3	508.0	15.30	14.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.1	119.8	414.0	378.0	36.00	30.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.2	56.9	433.0	414.0	19.00	33.4	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.3	76.1	443.0	433.0	10.00	13.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.4	99.3	464.0	443.0	21.00	21.1	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.5	158.3	494.0	464.0	30.00	19.0	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1
Pipe-A-02.6	151.9	508.0	494.0	14.00	9.2	CIRCULAR	12	0.013	0.500	0.500	0.000	0.00	No	1

Pipe Results

Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
Pipe-A-01.1.1	11.61	0 08:01	17.62	0.66	23.94	0.05	0.59	0.59	0.00	Calculated
Pipe-A-01.1.2	10.94	0 08:01	17.62	0.62	23.62	0.05	0.57	0.57	0.00	Calculated
Pipe-A-01.1.3	8.30	0 08:01	18.72	0.44	23.11	0.05	0.47	0.47	0.00	Calculated
Pipe-A-01.1.4	8.30	0 08:01	16.00	0.52	20.55	0.06	0.51	0.51	0.00	Calculated
Pipe-A-01.1.5	5.83	0 08:01	15.80	0.37	18.58	0.06	0.42	0.42	0.00	Calculated
Pipe-A-01.1.6	5.83	0 08:01	17.41	0.34	19.96	0.06	0.40	0.40	0.00	Calculated
Pipe-A-01.1.7	5.83	0 08:01	18.21	0.32	20.62	0.06	0.39	0.39	0.00	Calculated
Pipe-A-01.1.8	5.83	0 08:01	18.94	0.31	21.22	0.03	0.38	0.38	0.00	Calculated
Pipe-A-01.1.9	3.00	0 08:00	16.85	0.18	16.18	0.08	0.29	0.29	0.00	Calculated
Pipe-A-01.2.1	11.21	0 08:00	17.32	0.65	23.44	0.12	0.59	0.59	0.00	Calculated
Pipe-A-01.2.2	11.21	0 08:00	14.02	0.80	19.82	0.08	0.68	0.68	0.00	Calculated
Pipe-A-01.2.3	11.21	0 08:00	13.78	0.81	19.55	0.07	0.68	0.69	0.00	Calculated
Pipe-A-01.2.4	11.21	0 08:00	11.90	0.94	17.22	0.08	0.77	0.77	0.00	Calculated
Pipe-A-01.2.5	11.21	0 08:00	13.01	0.86	18.62	0.05	0.72	0.72	0.00	Calculated
Pipe-A-01.2.6	11.21	0 08:00	17.62	0.64	23.75	0.04	0.58	0.58	0.00	Calculated
Pipe-A-01.2.7	11.21	0 08:00	17.81	0.63	23.95	0.05	0.58	0.58	0.00	Calculated
Pipe-A-01.2.8	11.21	0 08:00	15.57	0.72	21.58	0.06	0.63	0.63	0.00	Calculated
Pipe-A-01.2.9	11.21	0 08:00	13.52	0.83	19.24	0.09	0.70	0.70	0.00	Calculated
Pipe-A-02.1	7.58	0 08:01	19.53	0.39	23.28	0.09	0.43	0.43	0.00	Calculated
Pipe-A-02.2	7.18	0 08:01	20.58	0.35	23.85	0.04	0.41	0.41	0.00	Calculated
Pipe-A-02.3	6.31	0 08:01	12.91	0.49	16.34	0.08	0.49	0.49	0.00	Calculated
Pipe-A-02.4	4.89	0 08:01	16.38	0.30	18.21	0.09	0.37	0.37	0.00	Calculated
Pipe-A-02.5	3.03	0 08:01	15.51	0.20	15.31	0.17	0.30	0.30	0.00	Calculated
Pipe-A-02.6	1.31	0 08:00	10.82	0.12	9.28	0.27	0.24	0.24	0.00	Calculated

Storage Nodes

Storage Node : Stor-A_1.1-Tee

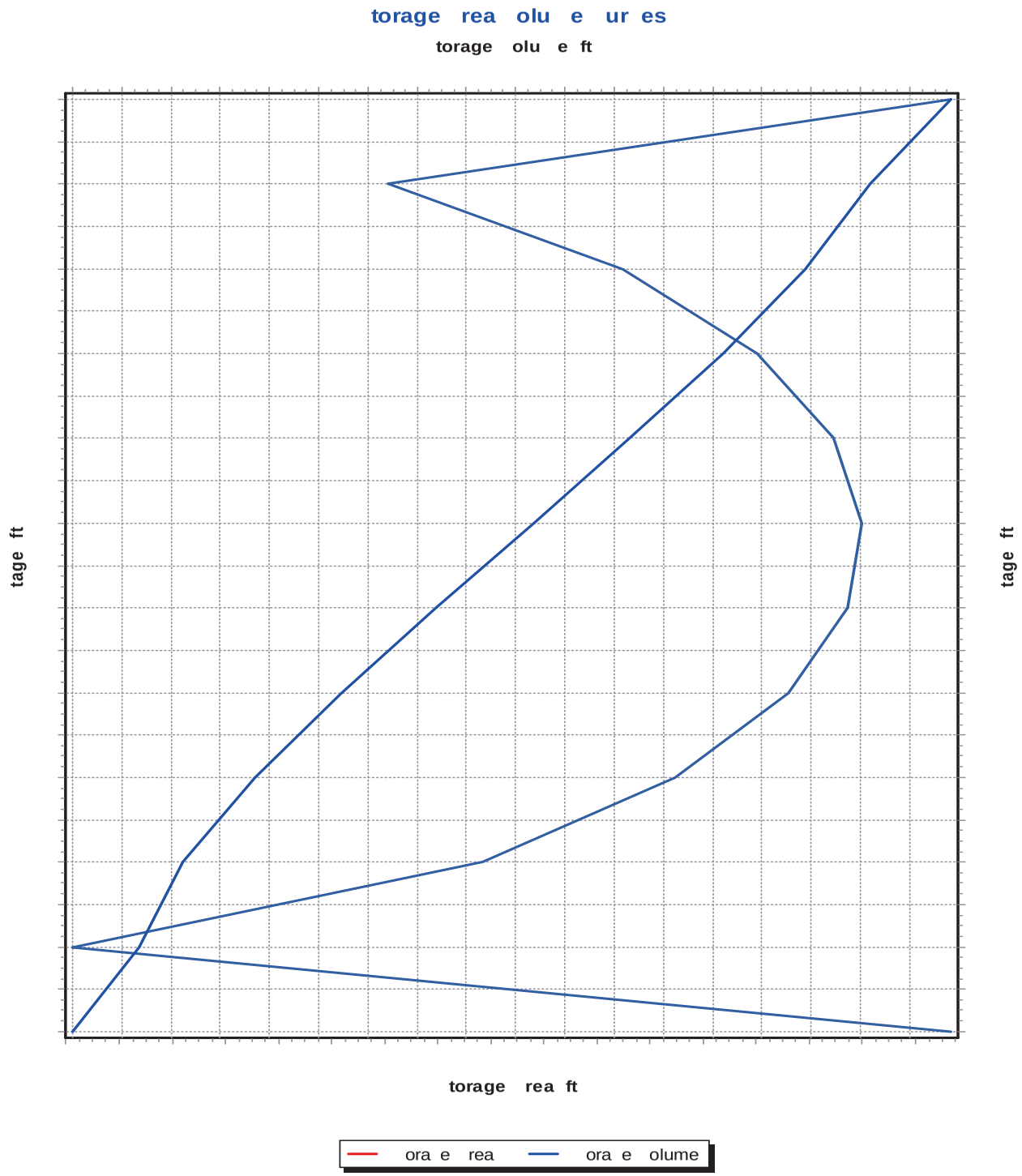
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_01.1 (Tee Spreader)

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.1-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.1-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.1-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.1-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.1-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.1-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.1-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.1-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.1-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.1-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.1-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.1-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.1-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.1-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.1-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs) 11.61
Peak Lateral Inflow (cfs) 0
Peak Outflow (cfs) 10.8
Peak Exfiltration Flow Rate (cfm) 0
Max HGL Elevation Attained (ft) 383.54
Max HGL Depth Attained (ft) 5.54
Average HGL Elevation Attained (ft) 379.01
Average HGL Depth Attained (ft) 1.01
Time of Max HGL Occurrence (days hh:mm) 0 08:07
Total Exfiltration Volume (1000-ft^3) 0
Total Flooded Volume (ac-in) 0
Total Time Flooded (min) 0
Total Retention Time (sec) 0

Storage Node : Stor-A_1.2-Tee

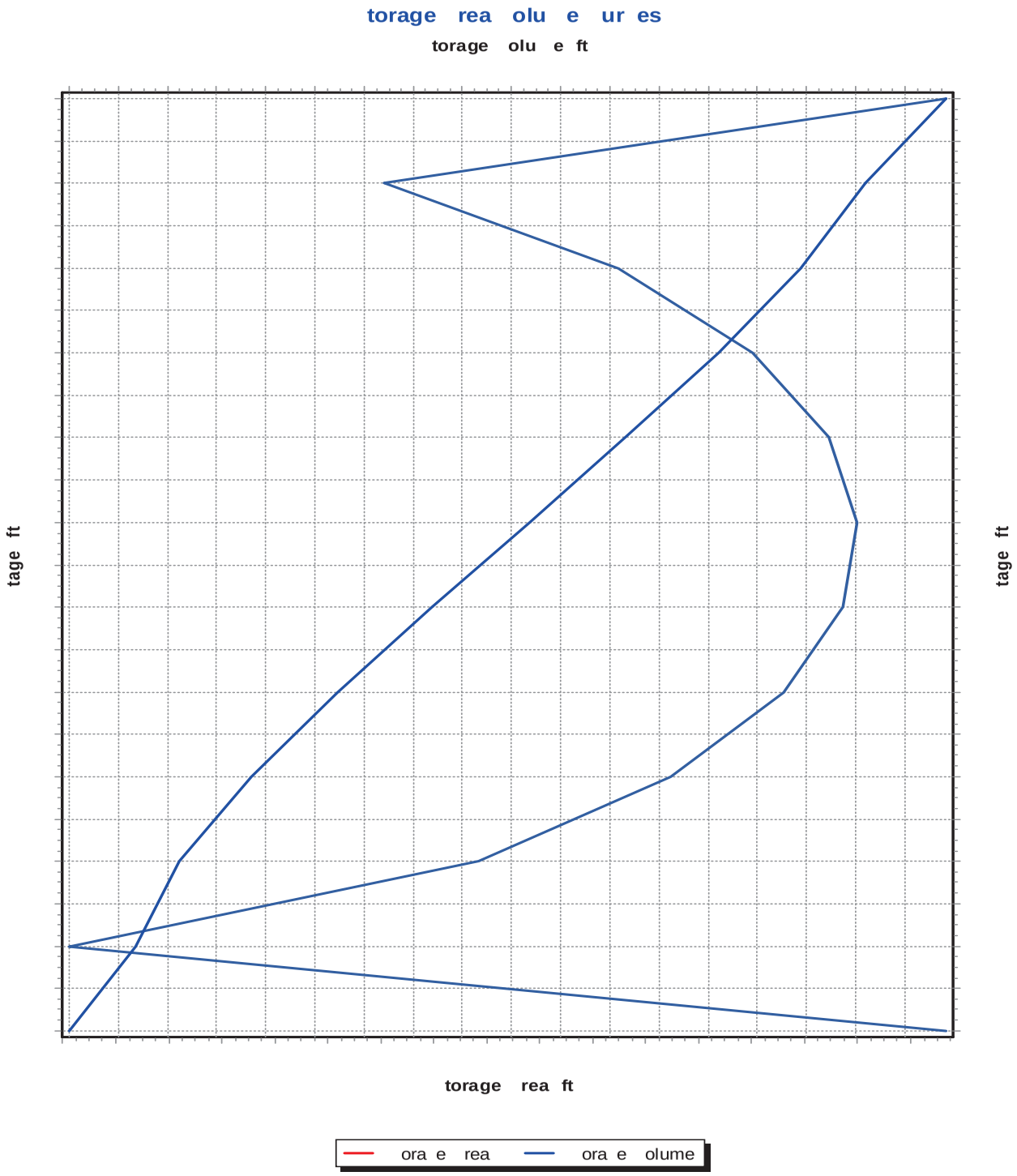
Input Data

Invert Elevation (ft) 378.00
Max (Rim) Elevation (ft) 384.00
Max (Rim) Offset (ft) 6.00
Initial Water Elevation (ft) 378.00
Initial Water Depth (ft) 0.00
Ponded Area (ft^2) 0.00
Evaporation Loss 0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_1.2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_1.2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_1.2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_1.2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33
4	Weir-A_1.2-04	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_1.2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_1.2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_1.2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_1.2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_1.2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_1.2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_1.2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_1.2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_1.2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_1.2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	11.21
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	10.51
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	383.29
Max HGL Depth Attained (ft)	5.29
Average HGL Elevation Attained (ft)	379
Average HGL Depth Attained (ft)	1
Time of Max HGL Occurrence (days hh:mm)	0 08:06
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Storage Node : Stor-A_2-Tee

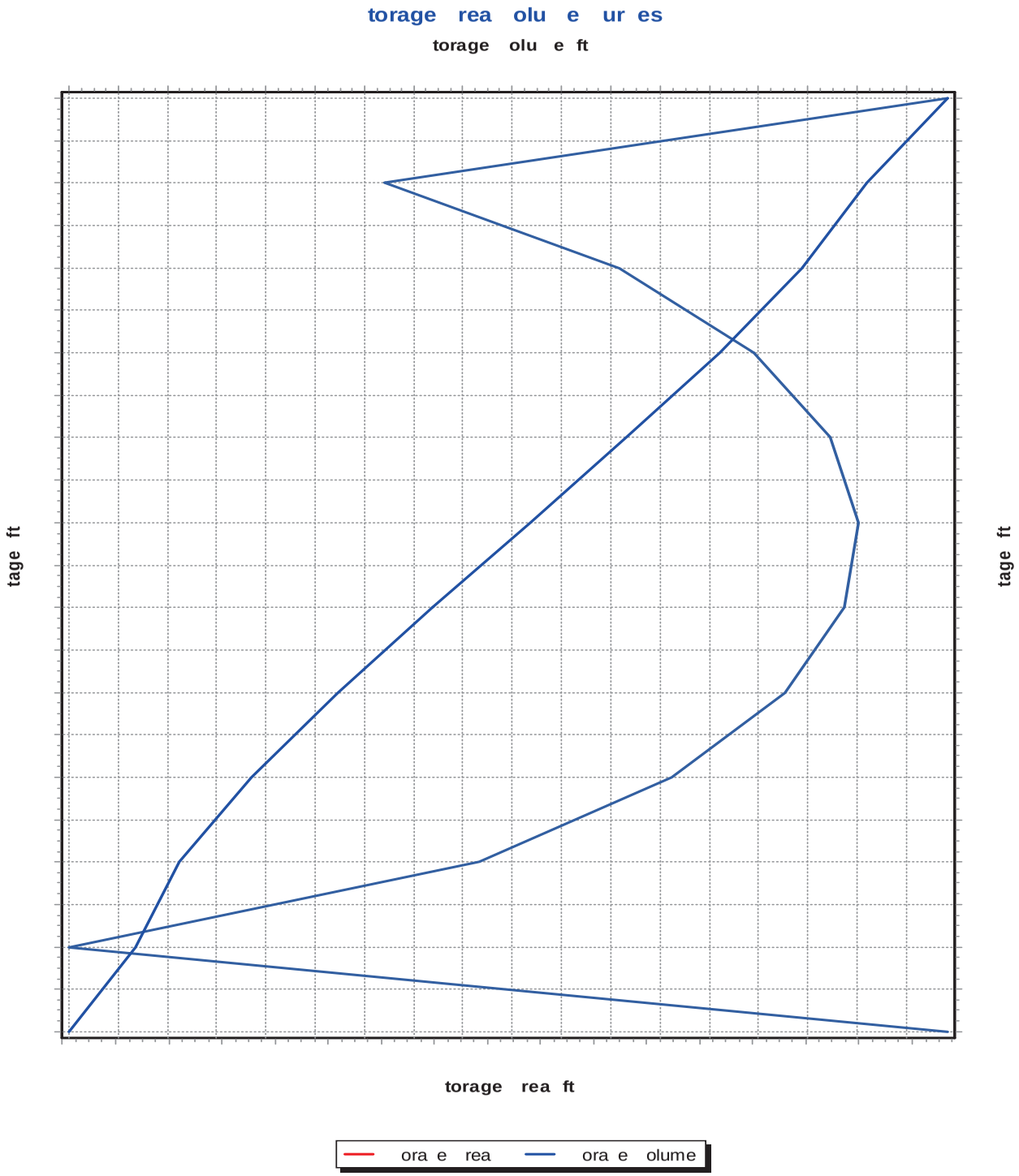
Input Data

Invert Elevation (ft)	378.00
Max (Rim) Elevation (ft)	384.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	378.00
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-A_02 (Tee Spreader)

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	43.3333	0
0.1	10.2416	2.68
0.2	25.6818	4.48
0.3	32.9579	7.41
0.4	37.2141	10.92
0.5	39.4405	14.75
0.6	39.9778	18.72
0.7	38.8959	22.66
0.8	36.0493	26.41
0.9	30.9551	29.76
1	22.1108	32.41
1.1	43.3333	35.68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Storage Node : Stor-A_2-Tee (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-A_2-01	Rectangular	No	378.75	0.75	1.00	0.25	3.33
2	Weir-A_2-02	Rectangular	No	378.75	0.75	1.00	0.25	3.33
3	Weir-A_2-03	Rectangular	No	378.75	0.75	1.00	0.25	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-A_2-01	Bottom	CIRCULAR	No	1.00			378.00	0.61
2	Orifice-A_2-02	Bottom	CIRCULAR	No	1.00			378.00	0.61
3	Orifice-A_2-03	Bottom	CIRCULAR	No	1.00			378.00	0.61
4	Orifice-A_2-04	Bottom	CIRCULAR	No	1.00			378.00	0.61
5	Orifice-A_2-05	Bottom	CIRCULAR	No	1.00			378.00	0.61
6	Orifice-A_2-06	Bottom	CIRCULAR	No	1.00			378.00	0.61
7	Orifice-A_2-07	Bottom	CIRCULAR	No	1.00			378.00	0.61
8	Orifice-A_2-08	Bottom	CIRCULAR	No	1.00			378.00	0.61
9	Orifice-A_2-09	Bottom	CIRCULAR	No	1.00			378.00	0.61
10	Orifice-A_2-10	Bottom	CIRCULAR	No	1.00			378.00	0.61

Output Summary Results

Peak Inflow (cfs)	7.58
Peak Lateral Inflow (cfs)	0
Peak Outflow (cfs)	7.16
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	382.36
Max HGL Depth Attained (ft)	4.36
Average HGL Elevation Attained (ft)	378.92
Average HGL Depth Attained (ft)	0.92
Time of Max HGL Occurrence (days hh:mm)	0 08:07
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0

Weir Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. 02/2023

Agricultural Drop Inlet (12-Inch Diameter)

Rectangular Weir

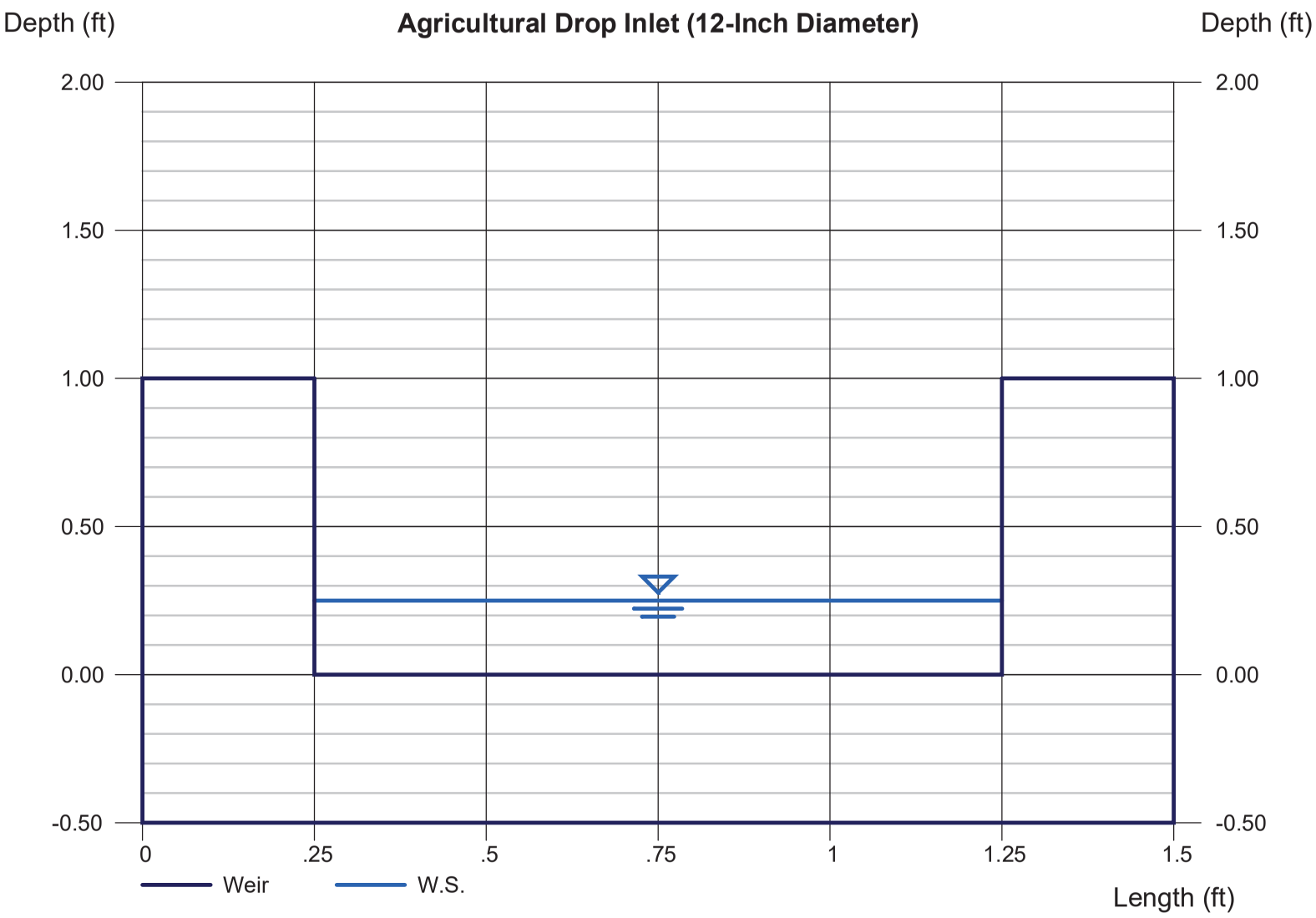
Crest	=	Sharp
Bottom Length (ft)	=	1.00
Total Depth (ft)	=	1.00

Calculations

Weir Coeff. Cw	=	3.33
Compute by:		Q vs Depth
No. Increments	=	4

Highlighted

Depth (ft)	=	0.25
Q (cfs)	=	0.416
Area (sqft)	=	0.25
Velocity (ft/s)	=	1.67
Top Width (ft)	=	1.00



Depth	Q
(ft)	(cfs)
0.25	0.416
0.50	1.177
0.75	2.163
1.00	3.330

Area	Veloc
(sqft)	(ft/s)
0.25	1.67
0.50	2.35
0.75	2.88
1.00	3.33

TopWidth	Energy
(ft)	(ft)
1.00	0.29
1.00	0.59
1.00	0.88
1.00	1.17