EXISTING CONDITIONS MEMORANDUM
FOR
MARWELL BOULEVARD AND DARROW ROAD AREA

LOCATED IN
TWINSBURG TOWNSHIP
SUMMIT COUNTY, OHIO

PREPARED FOR:
SUMMIT COUNTY SURFACE WATER MANAGEMENT DISTRICT

PREPARED
May 2025

PREPARED BY

Environmental Design Group
The community impact people.
450 Grant Street
Akron, Ohio 44311

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List of Acronyms

AACE - Association for the Advancement of Cost Engineering

AOI – Area of Interest

BRIC – Building Resilient Infrastructure and Communities

CMP – Corrugated Metal Pipe

EDG – Environmental Design Group

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

H&H – Hydrologic and Hydraulic

HEC – Hydrologic Engineering Center

HMR – Hydrometeorological Report

HOA – Home Owners Association

HUC – Hydrologic Unit Code

LERRD – lands, easements, rights-of-way, relocations and disposal areas

LiDAR – Light Detection and Ranging

MWCD – Muskingum Watershed Conservancy District

NAVD 88 – North American Vertical Datum of 1988

NHD – National Hydrography Dataset

NLCD – National Land Cover Database

NPS-IS – Nonpoint Source Implementation Strategic Plan

NRCS – Natural Resources Conservation Service

NWP – Nationwide Permit

OGRIP – Ohio Geographically Referenced Information Program

OPCC – Opinion of Probably Construction Cost

PCN – Pre-Construction Notification

PWM – Partners in Watershed Management

STREAMSTATS – Web-based GIS application for water-resources engineering created and maintained by USGS

SWCD – Soil & Water Conservation District

USACE – United States Army Corps of Engineers

USGS – United States Geological Survey

USDA – United States Department of Agriculture

WRRSP – Water Resource Restoration Sponsor Program

WSEL – Water Surface Elevation

Executive Summary

Environmental Design Group was retained to identify the best and most cost-effective solution to mitigate flooding and improve water quality by reducing peak flows and their frequency along with reducing pollutants in the stormwater runoff within the Marwell & Darrow Roads area. This report summarizes the existing conditions of the study area. This information will be used as the basis for providing stormwater improvement concepts for consideration to secure approvals to prepare final drawings, quantities, notes, restrictions, permitting and right-of-way acquisition for Summit County and its stakeholders for informed decision making going forward. The project area is located in Summit County near the intersection of Marwell and Darrow Roads. A vicinity map is provided in **Figure 1**.

Environmental Design Group performed a desktop analysis of the project area and its contributing drainage area including a review of existing drawings and supplied information, mapping and GIS data, aerial photography and land cover information, soils information, and hydraulic conveyance characteristics. A site visit was performed to validate site characteristics by surveying relevant drainage structures, topography, and areas of concern.

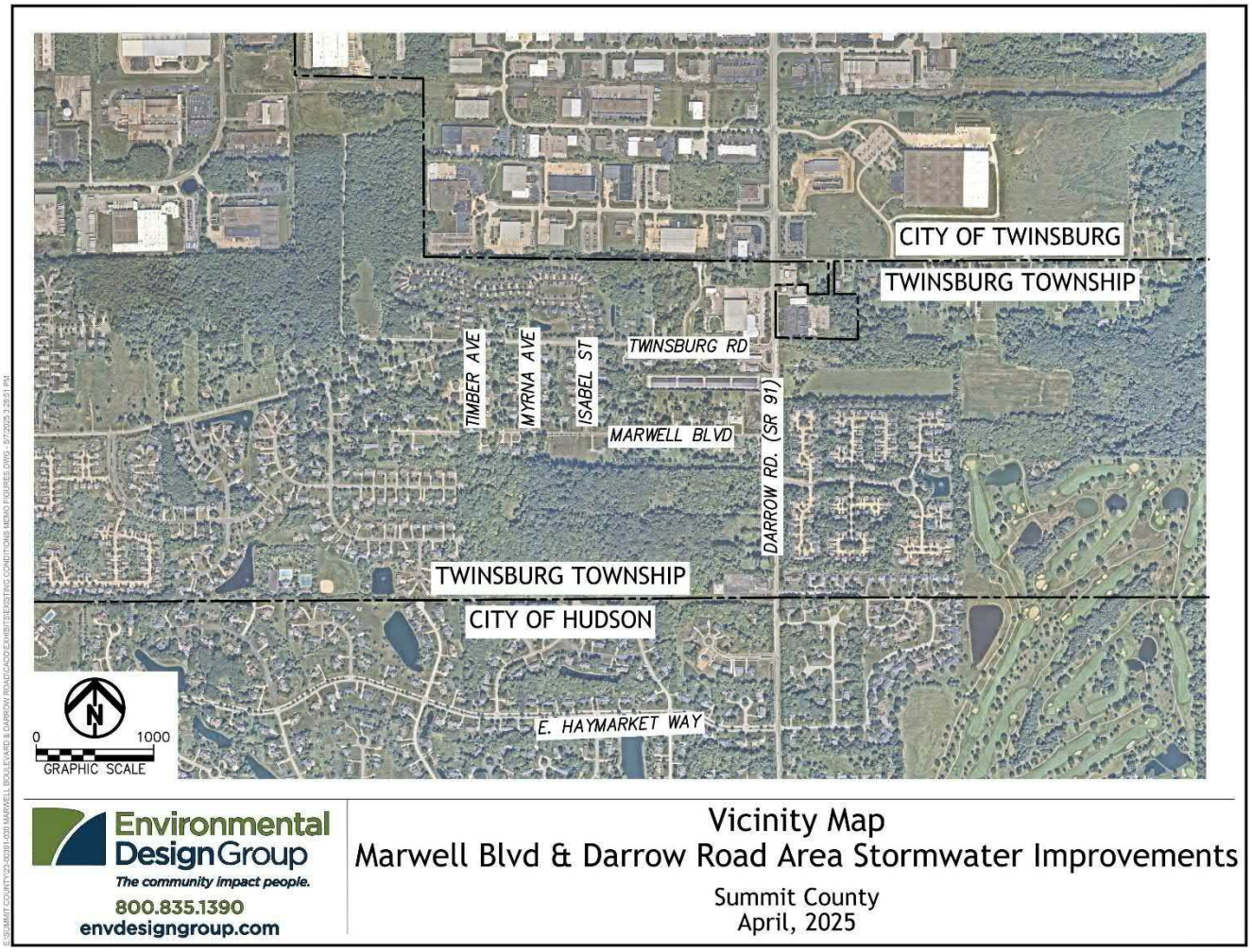


Figure 1 Vicinity Map

Existing Conditions

According to the data received from the Tinker's Creek Stormwater Model, this project is located within subcatchment TCAC_009S. This subcatchment is a defined drainage area within the Town of Twinsburg HUC-12 watershed (041100020504), part of the larger Tinker's Creek Watershed, which ultimately drains into the Cuyahoga River. **Figure 2** below shows the location of this subcatchment.

TCAC_009S includes a mix of residential neighborhoods, commercial developments, and undeveloped land, resulting in a substantial percentage of impervious surfaces. These land use patterns contribute to elevated stormwater runoff volumes and increased peak flows during rainfall events. The drainage system within the subcatchment consists of storm sewers, culverts, and open channels; however, several of these components are either undersized or inadequately maintained. As a result, the area frequently experiences localized flooding and surface ponding during moderate to heavy storm events.

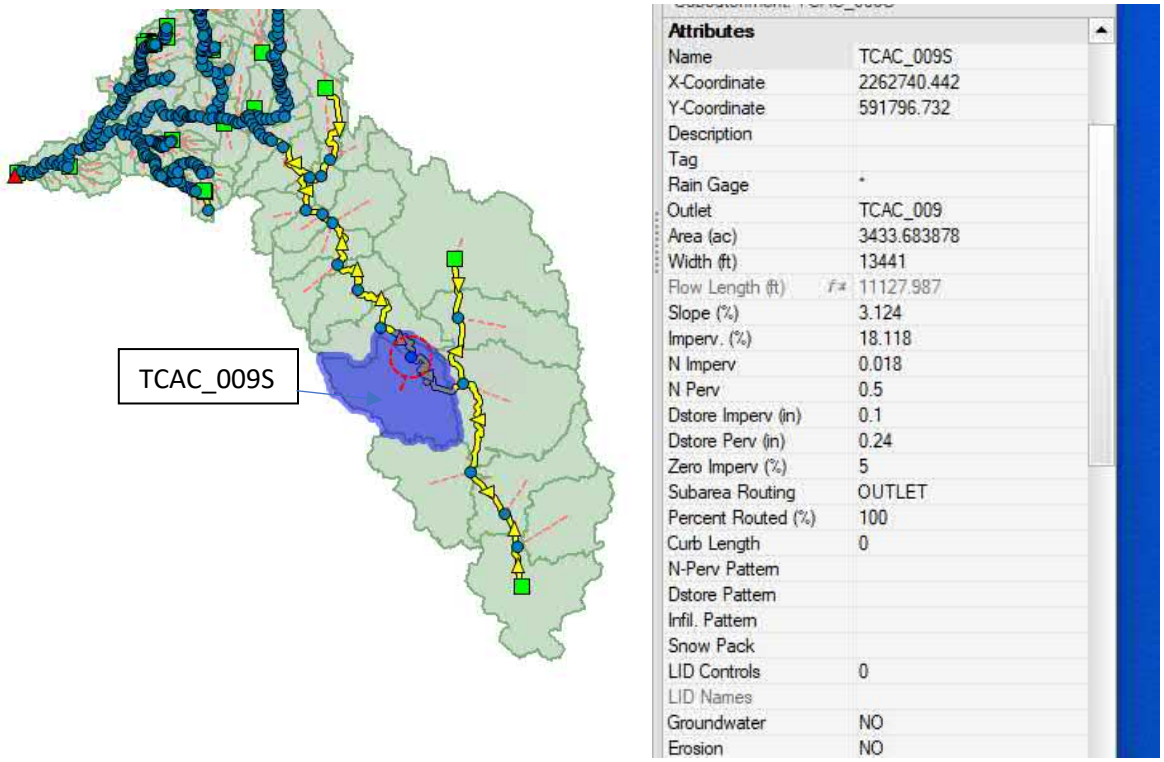


Figure 2 Tinker's Creek Subcatchment TCAC_009S

Soil conditions within TCAC_009S are varied, with both moderately draining and poorly draining soils present. These hydrologic soil groups limit infiltration, contributing further to rapid surface runoff and increased strain on existing stormwater infrastructure. Together, these physical and infrastructural conditions highlight the need for

targeted stormwater management strategies aimed at improving flow conveyance, reducing flood risk, and enhancing water quality. A Hydrologic Soil Group Map is included as **Attachment 2.**

Stormwater Model Summary – Marwell, Twinsburg, and Darrow Roads

A detailed stormwater model was developed for the drainage area encompassing **Marwell Boulevard, Twinsburg Road, and Darrow Road** in **Twinsburg Township, Summit County, Ohio**, within **subcatchment TCAC_009S** of the **Tinker's Creek Watershed**. The model was constructed using **Autodesk Storm and Sanitary Analysis (SSA)** software to evaluate localized flooding and assess the performance of existing stormwater infrastructure under design storm conditions.

The model consists of:

- **49 subbasins** ranging from large overland catchments to small surface drain areas.
- **67 nodes**, including:
  - **60 junctions** representing manholes or inlets,
  - **2 outfalls** for final discharge locations,
  - **2 flow diversions**, and
  - **3 storage nodes** simulating detention/retention functions.
- **76 links**, which include:
  - **60 pipes** forming the primary storm sewer network,
  - **4 open channels** conveying overland flow,
  - **8 orifices** regulating flow into/out of storage structures, and
  - **4 weirs** used for overflow and outlet control.

Subbasins were analyzed using **SCS TR-55 methods** for hydrology, with composite **Curve Numbers** (CN) derived from soil and land use data. The modeled **100-year, 24-hour storm** event generated peak flows ranging widely across the watershed, with **peak runoff rates as high as 70.6 cfs** in subcatchments like **SubCB-22 (TwinOaks)**. Time of Concentration (Tc) values varied depending on topography and land cover, with some subbasins exhibiting rapid responses under a minute, while others had more attenuated flows exceeding an hour.

Initial results highlight areas with **high peak runoff** and limited infiltration capacity, particularly in highly impervious zones and locations with steep slopes. These outputs will guide design recommendations, including potential stormwater infrastructure improvements, detention sizing, and targeted green infrastructure practices to reduce localized flooding and enhance system capacity.

Drainage Study Purpose

The purpose of this study is to evaluate existing drainage conditions within the Marwell & Darrow Roads area. The area has experienced flooding in multiple locations due to undersized or aging infrastructure and increased runoff from upstream impervious surfaces. This study supports Summit County's goals for infrastructure resilience and compliance with regional stormwater management requirements. The study area is shown in ***Figure 3*** and the analyzed drainage area is shown in **Figure 4**.

Desktop Analysis

Review of Existing Drawings and Supplied Information

The following information has been provided by Summit County and reviewed by EDG for this Project:

- **Cuyahoga River South Stormwater Master Plan – Section 1: Introduction**
  Prepared by the Northeast Ohio Regional Sewer District (NEORSD), March 2019.
  This document outlines the goals, structure, and foundational definitions of the Stormwater Master Plan (SWMP) for the Cuyahoga River South (CRS) watershed. It includes a breakdown of subwatersheds, regional stormwater system definitions, risk assessment methodology (BRE/ALR), and a high-level summary of the planning process and priorities.
- **Tinker's Creek Watershed Master Plan**
  Prepared by Tinker's Creek Watershed Partners, date not specified (based on contents from 2020 and earlier).
  This plan provides a comprehensive overview of the entire Tinker's Creek watershed, its subwatersheds, stormwater infrastructure, natural resources, and existing conditions. It informs both restoration planning and capital improvement prioritization. It is referenced by and complementary to both NPS-IS Plans for the Brandywine and Twinsburg HUC-12 subwatersheds.
- **Nine-Element Nonpoint Source Implementation Strategic Plan – Tinker's Creek, Town of Twinsburg HUC-12**
  Prepared by Chagrin Valley Engineering, Ltd., for Tinker's Creek Watershed Partners, July 2017.
  This strategic plan includes watershed characterization, land use, historical background, and implementation strategies specific to the Town of Twinsburg portion of the Tinker's Creek watershed. It identifies critical areas and water quality improvement projects to guide implementation and funding eligibility.
- **Nine-Element Nonpoint Source Implementation Strategic Plan – Brandywine Creek HUC-12**
  Prepared by Tinker's Creek Watershed Partners, January 2020.
  This NPS-IS Plan focuses on the Brandywine Creek watershed and includes detailed assessment of physical and biological conditions, identification of critical areas, and strategies for restoration and stormwater management. It serves as a roadmap for future project implementation and funding.

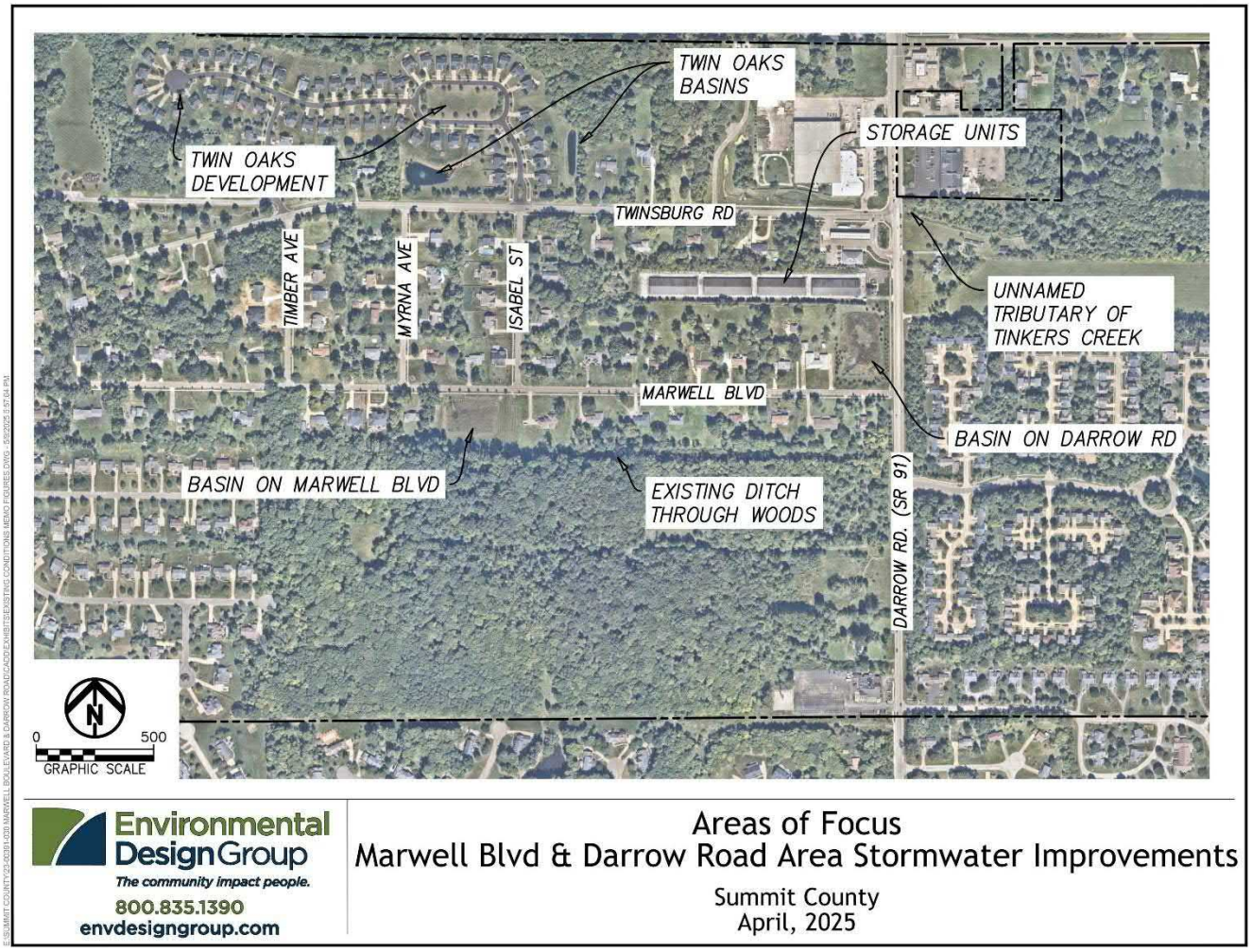


Figure 3 Study Area and Areas of Focus

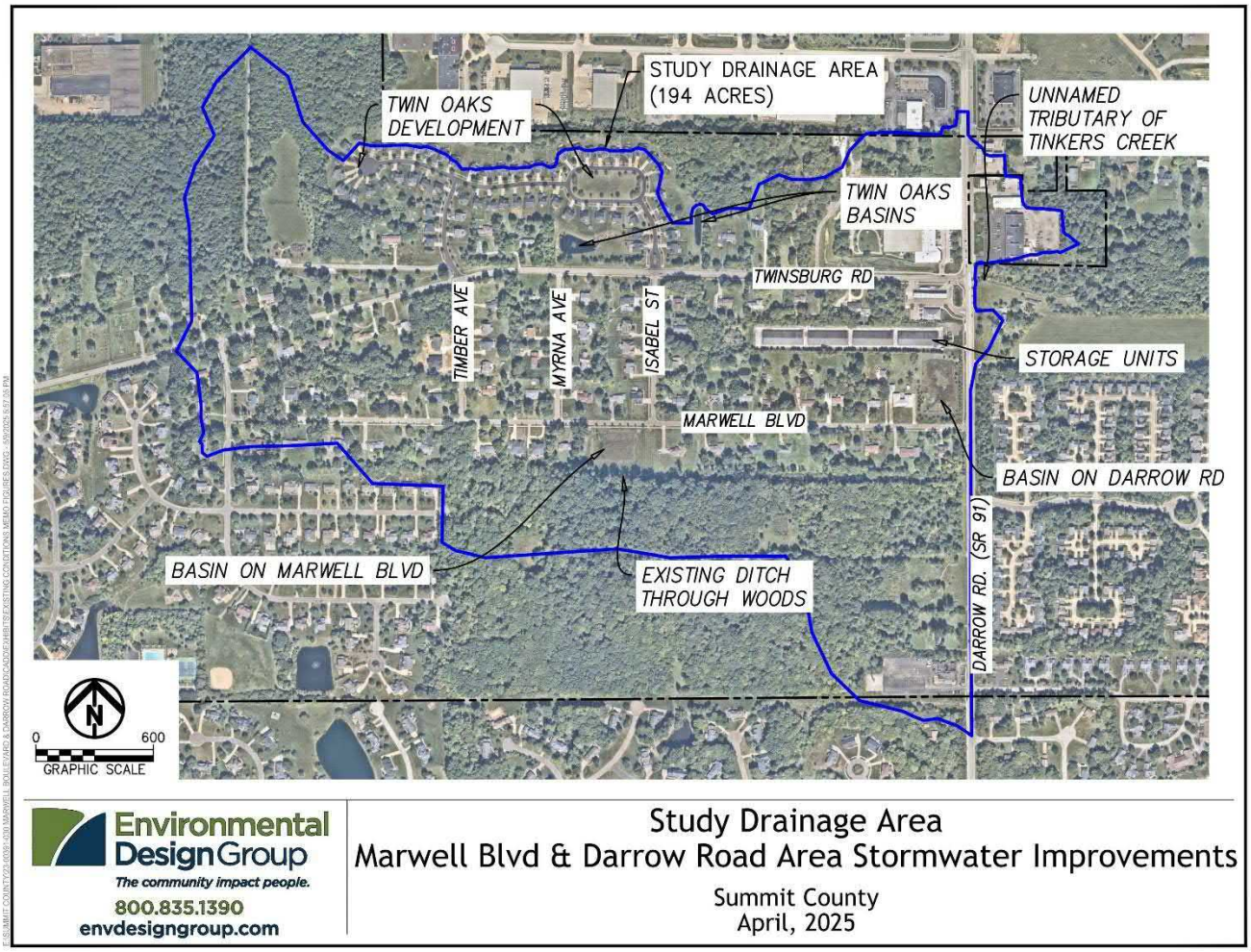


Figure 4 Study Drainage Area

Limited Survey of Existing Stormwater Drainage System

Survey data was collected by EDG to inform the creation of the model. Basin, ditch, and other topographic features were surveyed as well as the invert and rims of stormwater structures.

Publicly Available GIS Data

2-foot Contours were obtained from OGRIP. This dataset supplemented topographic survey data collected for this drainage study. This data was used to delineate some minor drainage areas, but mostly to determine areas for potential improvements, such as basins or increased flood storage. Elevation data used in this drainage study references NAVD 88.

Aerial Photography and Land Cover

According to aerial photography, the Study Area appears to consist of residential developments, public roadways, and vacant lands of low-lying areas with dense vegetation. EDG used the ground cover shown in aerial photography to help develop a basic stormwater model for the concept analyses.

Delineated Land Cover and aerial photography are shown in ***Figure 5***.

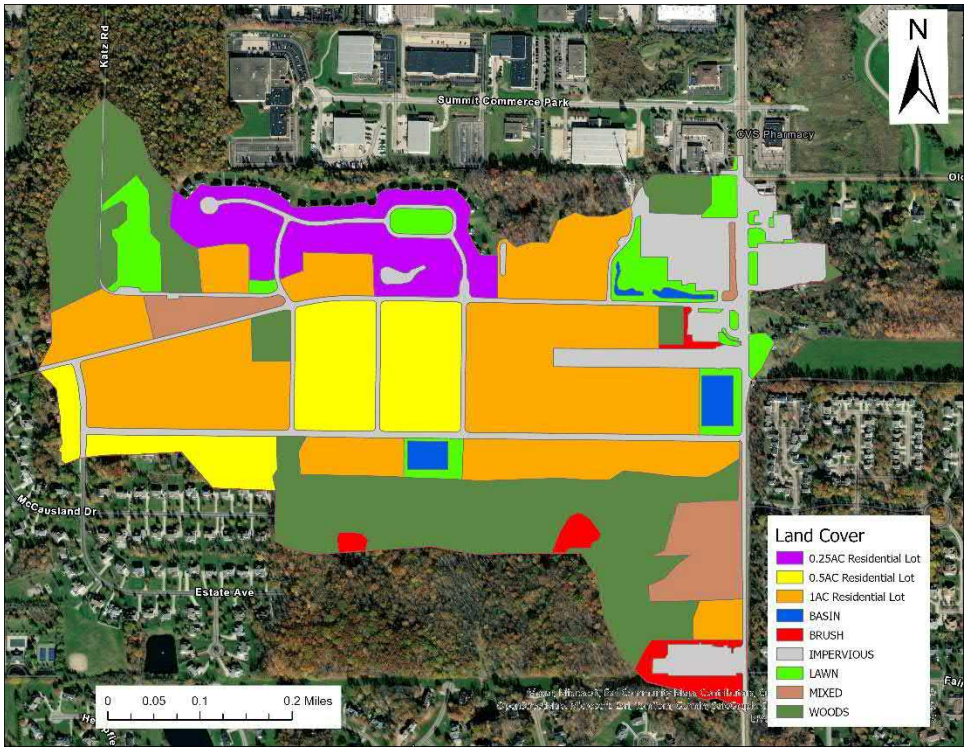


Figure 5 Land Cover

Soils

Soil data for the Study Area, or the Area of Interest (AOI) was obtained from USDA National Resources Conservation Soils (NRCS) online Web Soil Survey tool. The web soil survey information indicates soils in the Study Area are a mix of urban land complex, silt loams, and sandy loam with classifications within hydrologic soil groups A, B/D, C, C/D or D as shown in ***Figure 6***. A custom soil report from USDA NRCS is provided in ***Attachment 2*** with select soil properties, qualities, and features.

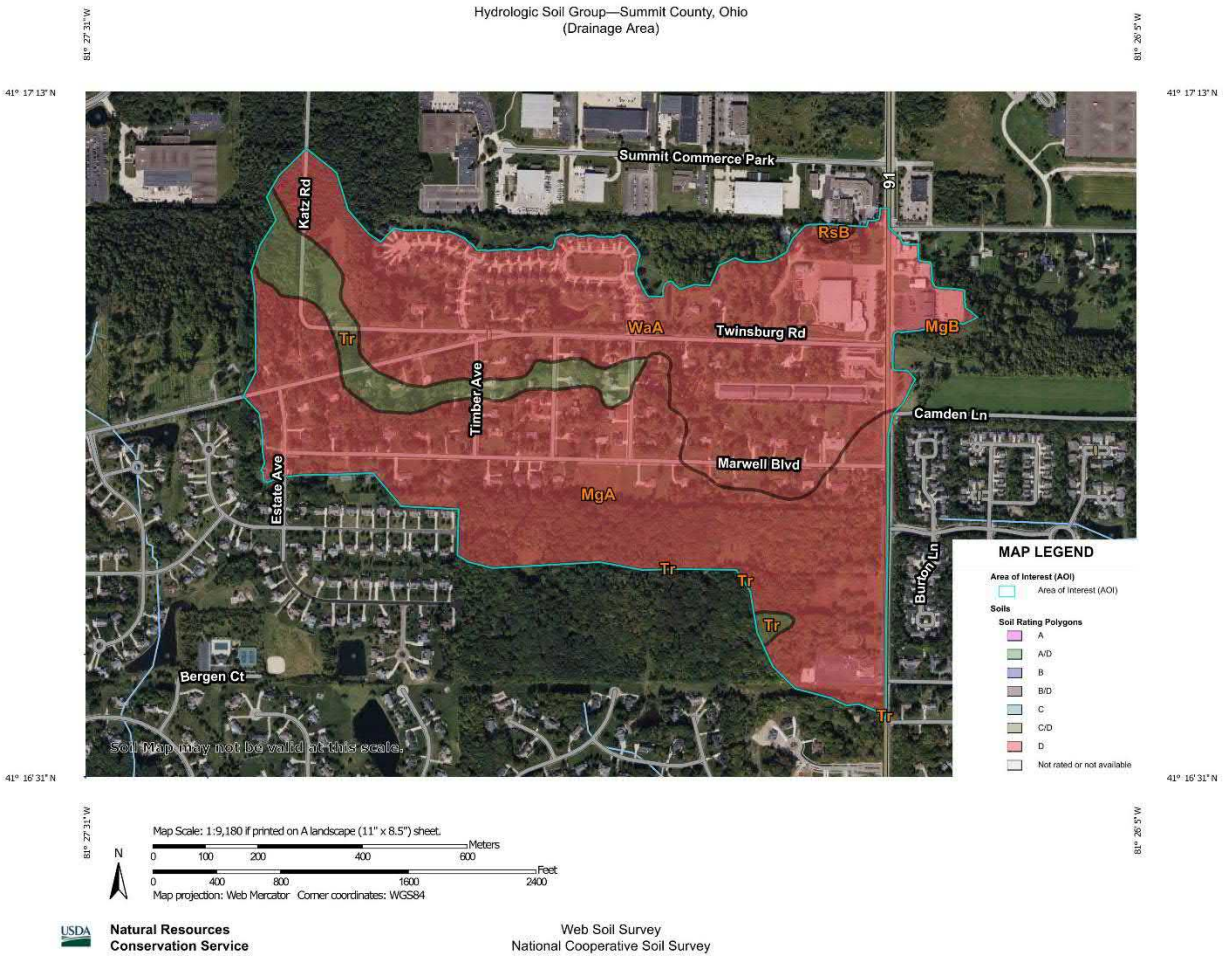


Figure 6 Hydrologic Soil Map

FEMA Data

EDG did search FEMA records through the Flood Map Service Center. The drainage area is located in Zone X, areas of minimal flooding. ***Figure 7*** shows FEMA's FIRMette.

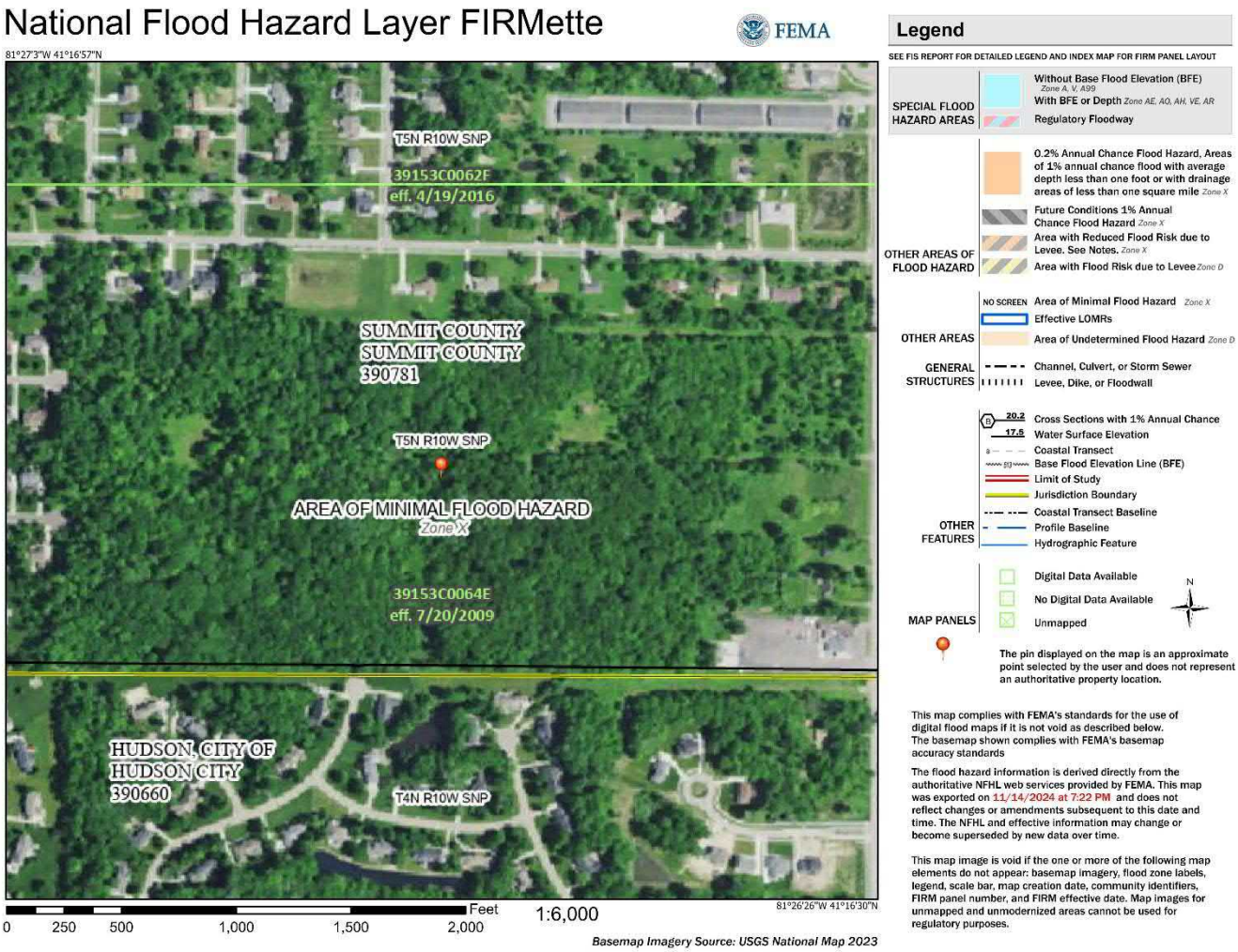


Figure 7 FEMA Flood Hazard Map

Site Investigation

EDG visited the study area on March 3, 19, and 20 and April 5, 2025 to gather additional information, investigate the existing drainage system, and review potential opportunities for stormwater improvements for the purposes of this Conceptual Engineering Memorandum. During these site visits, EDG staff walked along Darrow Road from the existing ditch in the woods to the intersection of Old Mill Road, along Twinsburg Road from Darrow Road to west of Estate Ave,. EDG continued the field investigation along Estate Ave from Twinsburg Road to McCausland Dr. and ended on the east end of McCausland Dr. The entire lengths of Marwell Blvd, Timber Ave, Myrna Ave, and Isabel St. were investigated. EDG also investigated along and behind the property of the storage units, the ditch in the wooded area south of Marwell Blvd, and the outlet basin for Twin Oaks Development. Photographic highlights from the field review are shown in ***Figure 8***.

Additionally, areas to the south within the city limits of Hudson were evaluated. Based on the topography, the drainage area cuts across the woods following the HUC line closely. The area south of the HUC line drains south to the Chadds Ford Development, the drainage enters a basin in the development, then drains via storm sewer under Forest Oaks drive into another basin and ultimately continues south. The point at which drainage could flood route across the HUC line and into the studied catchment is ~1134.00. The overflow point of the pond 1 is ~1130.00, followed by a spillover point in Forest Oaks of ~1128.50, and finally an emergency weir, in pond 2, at ~1126.00. No drainage from Chadds Ford is entering the studied system. Please see **Figure 9** & **Figure 10** below.

The east end of McCausland drive drains via overland flow to the west into to catch basins about halfway down the road. These catch basins ultimately drain west and away from the project tributary.

The following three bulleted lists summarize EDG's observations and additional figures are included that provide photographic representation of some of the areas discussed in this section. The location of where each photograph was taken is shown in ***Figure 8***.

1. EDG made the following notes and general observations during the field visit and discussions with various property owners:
    - Poor drainage was observed in the backyards of the properties surrounding the berm of the storage unit property.
    - The outlet culvert under Darrow Road does not flow to capacity as the invert is below the water elevation of the unnamed tributary it outlets to.
    - The Twin Oaks development does contribute to this studies drainage area. This was later confirmed through historical drawings; however, it was also determined that the emergency spillway for the second basin carries water outside of the study area.

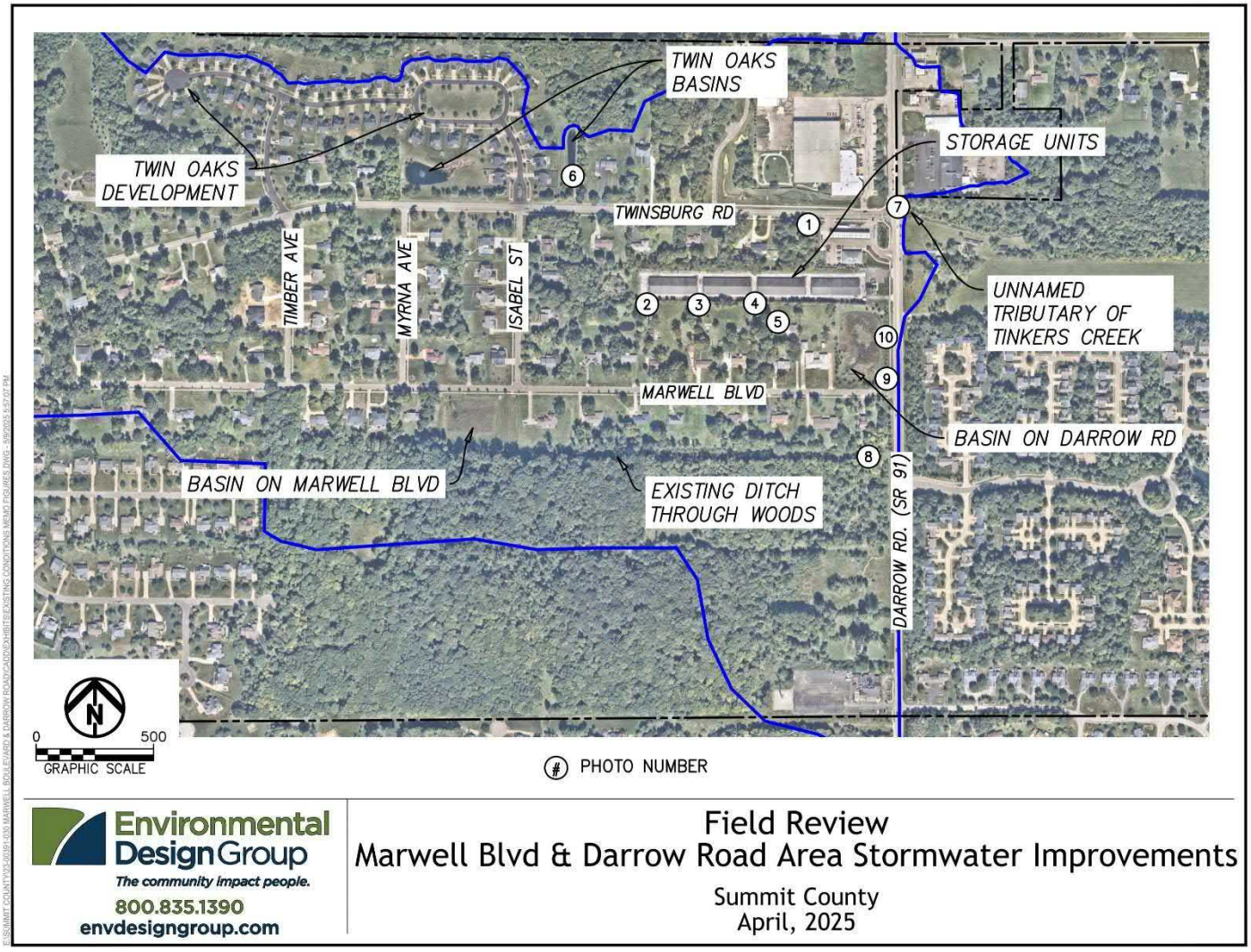


Figure 8 Field Review Map

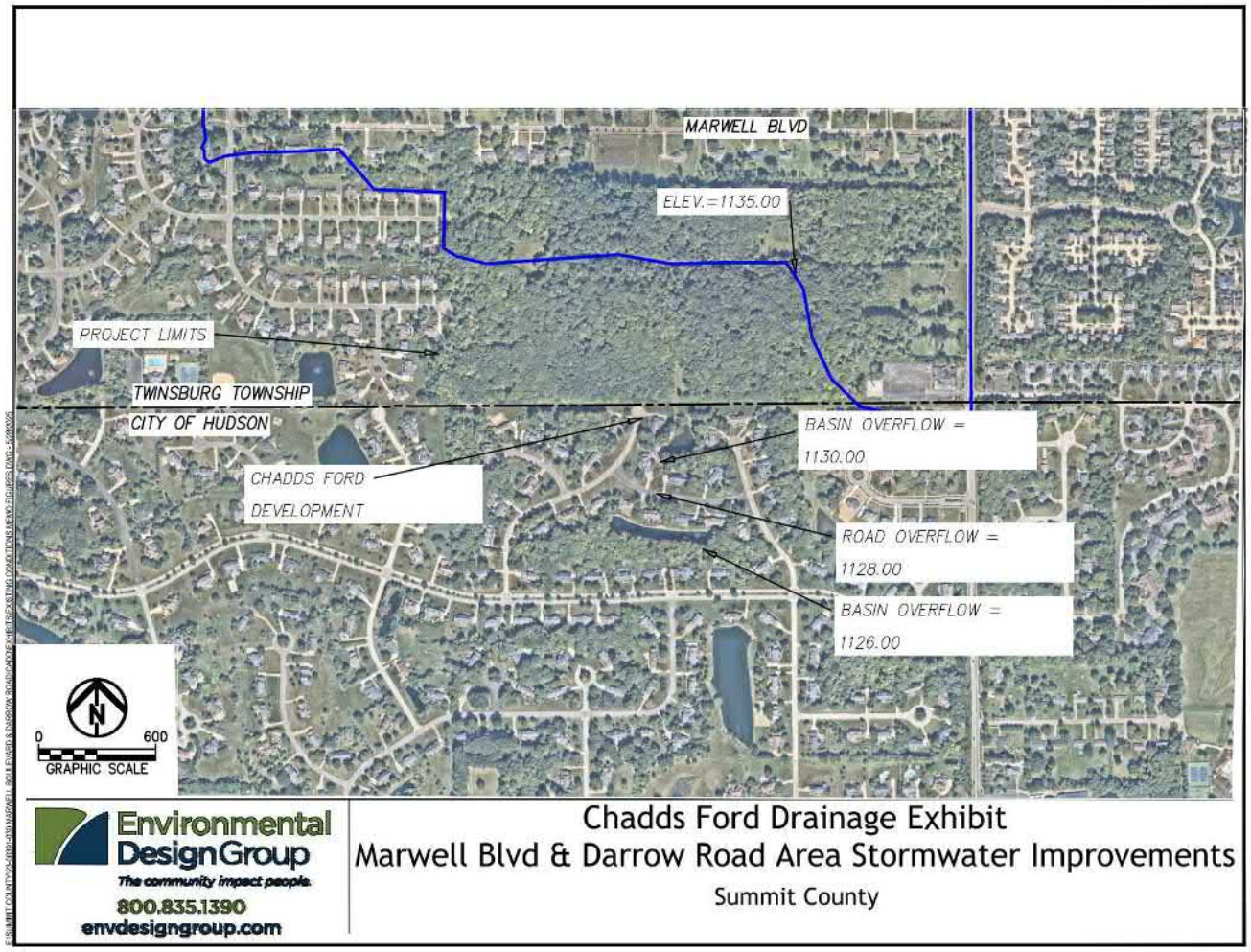


Figure 9 Chadds Ford Drainage Exhibit

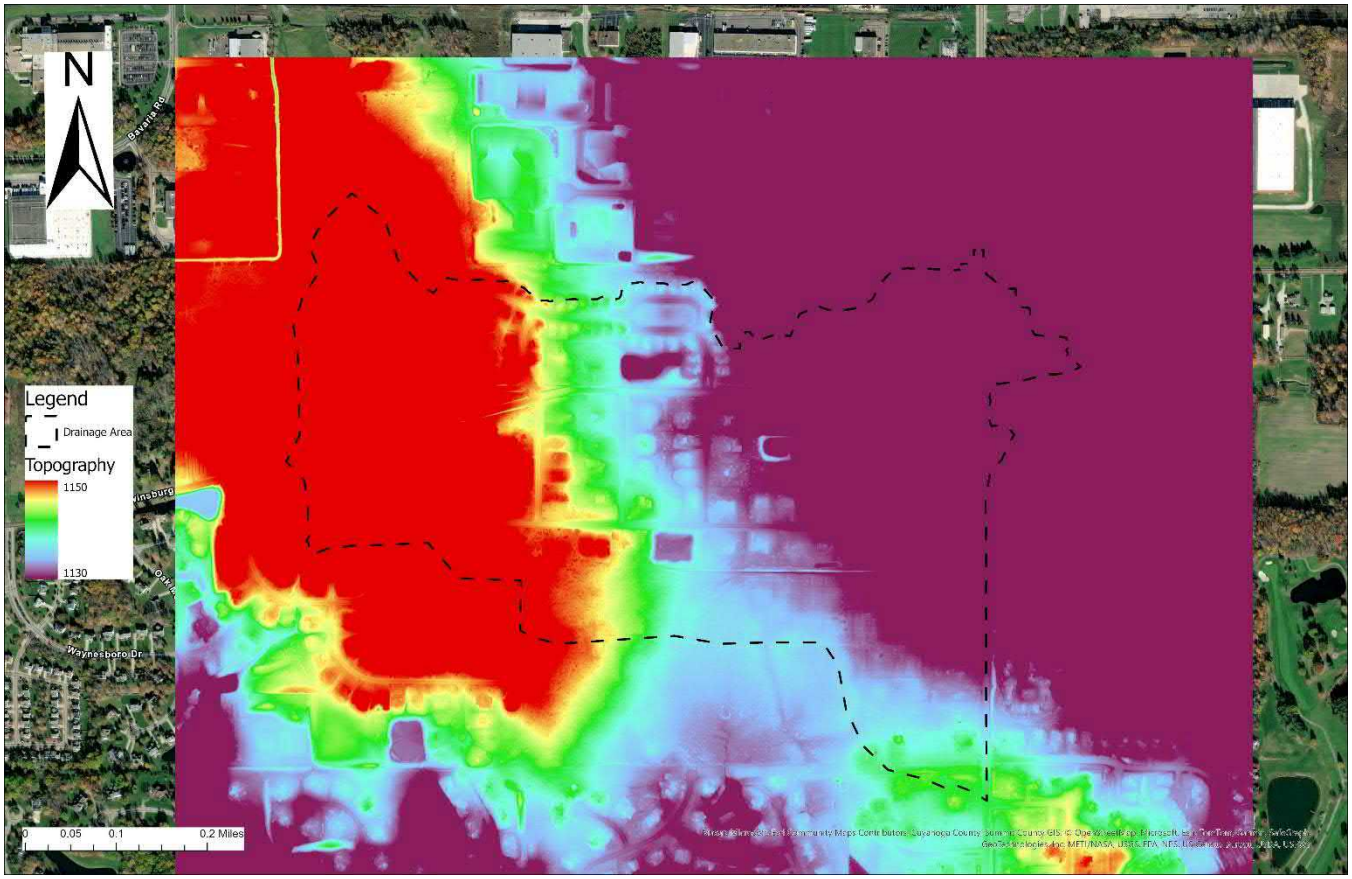


Figure 10 Elevation Map

Photograph 1

Photograph 1 shows the standing water in the wooded area behind the Speedway gas station. The Photograph was taken from the sidewalk northwest of the gas station looking approximately southwest**.**

Photograph 2

Photograph 2 shows erosion caused by channelized flows from the adjacent property, through the berm and into the catch basin located in southwest corner of the storage unit property.

Photograph 3

Photograph 3 shows a yard drain that connects the property south of the storage units to the drainage system of the storage units. The Photograph is taken from the berm looking mostly south.

Photograph 4

Photograph 4 shows a yard drain that connects the property south of the storage units to the drainage system of the storage units. This Photograph was taken south of the middle of the storage units on the south side of the berm.

Photograph 5

Photograph 5 shows standing water located in the backyards of properties south of the storage units. The Photograph was taken from the berm south of the storage units looking south.

Photograph 6

Photograph 6 shows the second basin, outlet structure, and inlet pipe for the Twin Oaks development. The Photograph was taken east of the development and north of Twinsburg Road looking northwest.

Photograph 7

Photograph 7 shows the outlet of the drainage area into the unnamed tributary of Tinkers Creek. The Photograph was taken during a rain event, east of the Twinsburg Road and Darrow Road intersection looking east.

Photograph 8

Photograph 8 shows the ditch in the undeveloped wooded area. The Photograph was taken west of Darrow Road looking west.

Photograph 9

Photograph 9 shows the basin at the corner of Marwell Boulevard and Darrow Road during a rain event. The Photograph was taken northwest of the intersection looking northwest toward the basin.

Photograph 10

Photograph 10 shows the outlet structure of the basin at the corner of Marwell Boulevard and Darrow Road during a rain event. The Photograph was taken west of Darrow Road looking west.

Hydrologic and Hydraulic Modeling

Storm and Sanitary Analysis (SSA) software was utilized to model existing drainage conditions and evaluate potential improvements within the project area. The SSA tool allows for detailed hydrologic and hydraulic simulation of stormwater runoff using established methods such as the SCS TR-55 and Rational Method. By incorporating site-specific data—including rainfall patterns, land use, topography, and existing storm infrastructure—the model will simulate flow rates, runoff volumes, and system performance under various design storm events. The analysis will help identify system deficiencies, such as undersized pipes or surcharging structures, and will support the design and optimization of proposed improvements such as storm sewer upgrades or detention basins. The resulting model outputs, including hydrographs, flow profiles, and flood risk indicators, will inform the development of concepts. Tables 1-4 below detail the inputs used to create the model. A report generated from the model output is included in **Attachment 1.**

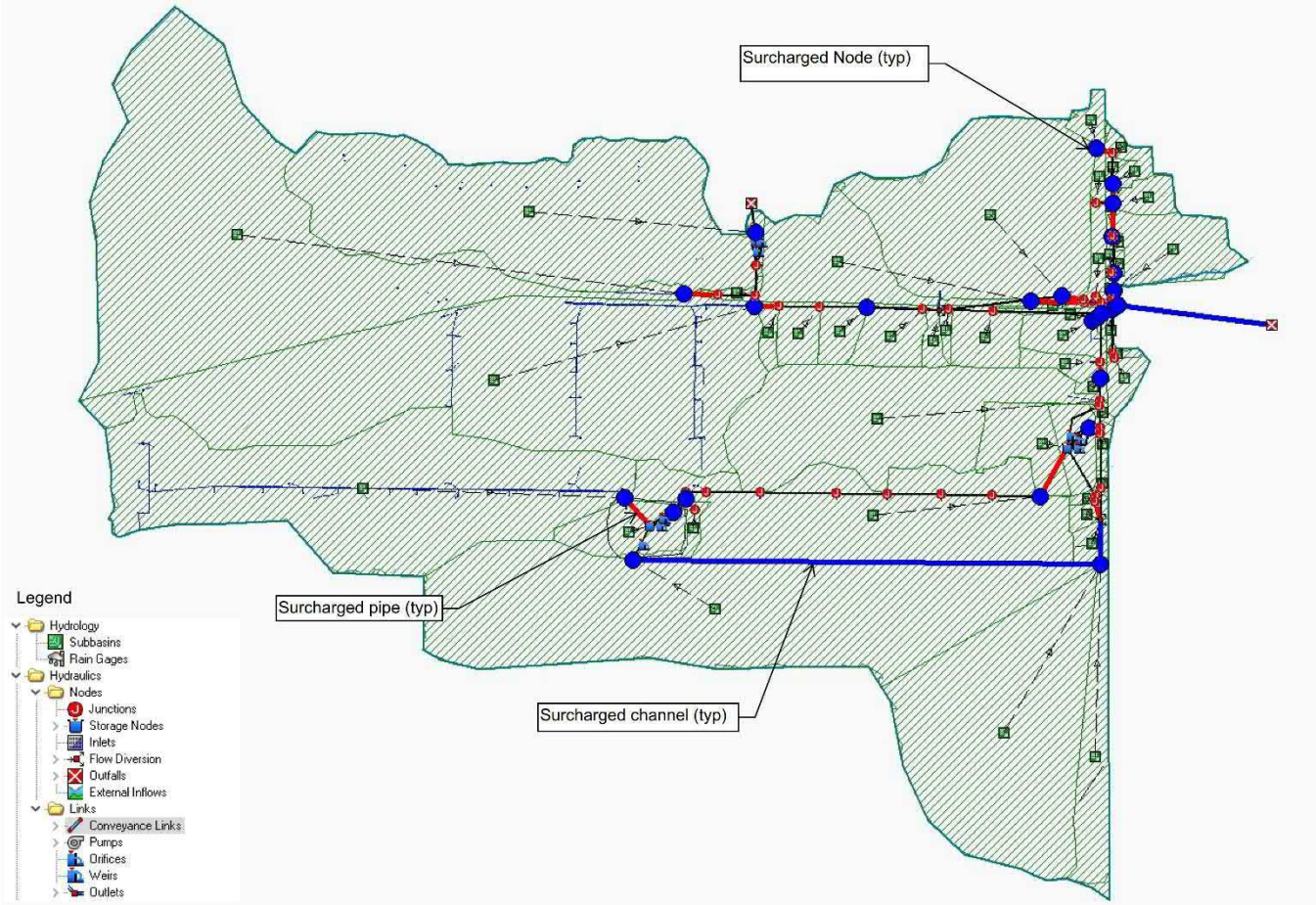


Figure 11 Existing Conditions Model Map

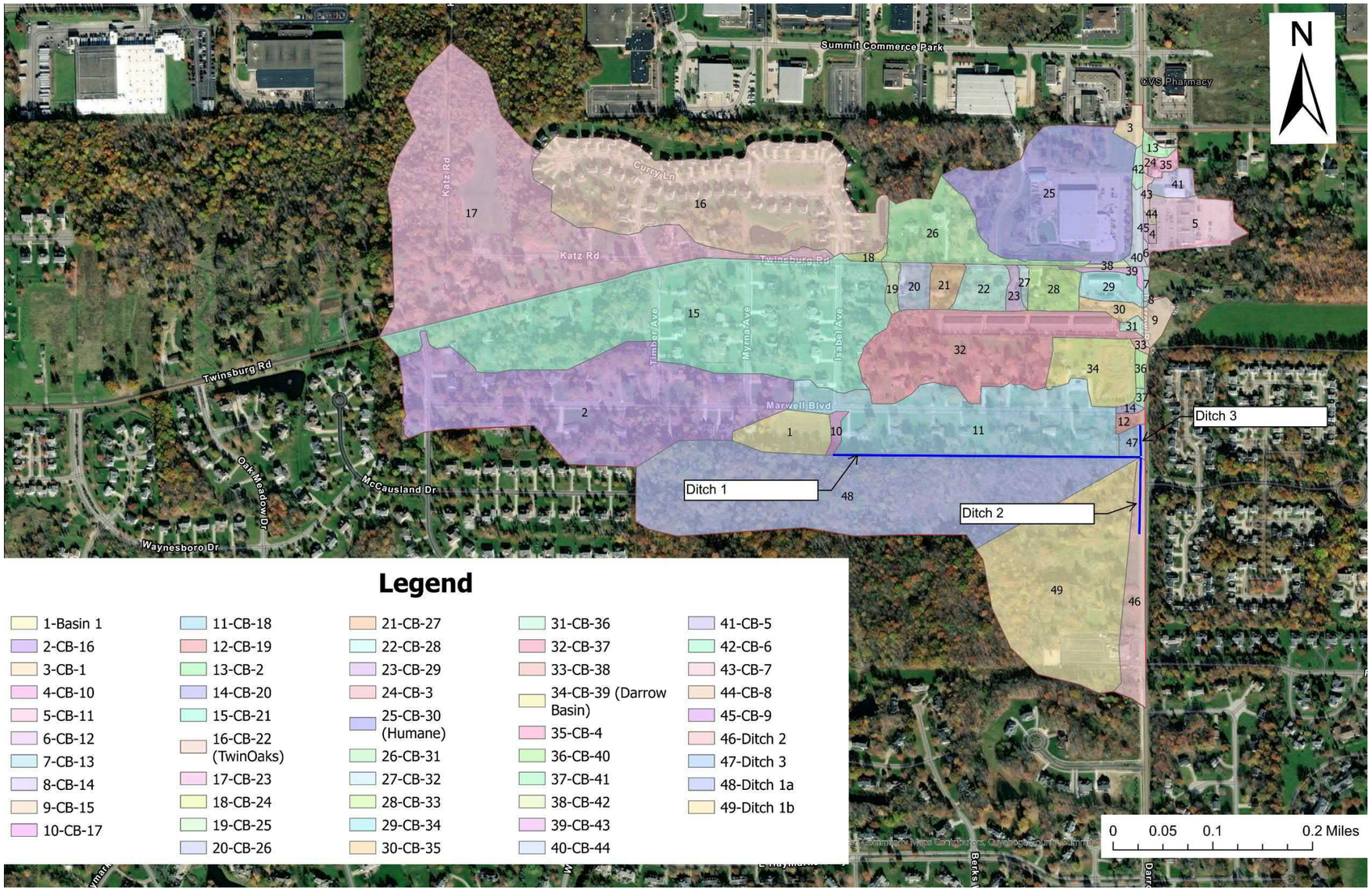


Figure 12 Delineated Sub-catchments

Table 1 Modeled Subbasins

Modeled Drainage Areas								
Subbasin ID	Name	Area	Weighted CN	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		Acres	-	(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	SubBasin1	2.18	88.34	5.50	4.18	9.12	10.21	0 00:17:59
2	SubCB-16	19.34	85.73	5.50	3.91	75.58	50.27	0 00:46:00
3	SubCB-1	0.49	89.57	5.50	4.31	2.11	1.85	0 00:29:19
4	SubCB-10	0.10	80.00	5.50	3.33	0.33	0.34	0 00:24:41
5	SubCB-11	2.67	91.64	5.50	4.54	12.12	12.39	0 00:20:51
6	SubCB-12	0.08	93.73	5.50	4.77	0.38	0.58	0 00:05:00
7	SubCB-13	0.13	92.87	5.50	4.67	0.61	0.88	0 00:05:00
8	SubCB-14	0.04	86.26	5.50	3.93	0.16	0.10	0 00:45:45
9	SubCB-15	0.67	82.45	5.50	3.57	2.39	1.89	0 00:36:09
10	SubCB-17	0.30	80.97	5.50	3.43	1.03	0.91	0 00:30:23
11	SubCB-18	12.35	85.31	5.50	3.87	47.73	39.65	0 00:32:51
12	SubCB-19	0.30	86.66	5.50	4.00	1.20	1.15	0 00:25:23
13	SubCB-2	0.29	97.91	5.50	5.25	1.52	2.00	0 00:06:25
14	SubCB-20	0.14	93.18	5.50	4.71	0.66	0.97	0 00:05:00
15	SubCB-21	26.42	85.09	5.50	3.84	101.51	56.00	0 01:00:27
16	SubCB-22 (TwinOaks)	19.17	87.47	5.50	4.09	78.41	70.60	0 00:28:17
17	SubCB-23	26.94	80.83	5.50	3.41	91.97	42.08	0 01:18:26
18	SubCB-24	0.23	88.68	5.50	4.22	0.97	1.48	0 00:05:00
19	SubCB-25	0.43	84.87	5.50	3.82	1.64	1.89	0 00:17:23
20	SubCB-26	0.95	84.72	5.50	3.80	3.61	4.09	0 00:18:05
21	SubCB-27	0.86	84.80	5.50	3.81	3.28	3.64	0 00:18:57
22	SubCB-28	1.44	84.55	5.50	3.79	5.45	4.87	0 00:29:10
23	SubCB-29	0.41	84.49	5.50	3.78	1.55	1.48	0 00:25:48
24	SubCB-3	0.11	97.06	5.50	5.15	0.57	0.78	0 00:05:00
25	SubCB-30 (humane basin)	12.29	87.92	5.50	4.14	50.84	37.50	0 00:39:07
26	SubCB-31	4.41	84.94	5.50	3.83	16.88	12.92	0 00:37:30
27	SubCB-32	0.21	84.74	5.50	3.80	0.80	0.77	0 00:25:28
28	SubCB-33	1.46	80.64	5.50	3.40	4.96	4.92	0 00:24:27
29	SubCB-34	1.12	93.91	5.50	4.79	5.37	6.83	0 00:10:00

Modeled Drainage Areas								
Subbasin ID	Name	Area	Weighted CN	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		Acres	-	(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
30	SubCB-35	0.60	88.55	5.50	4.20	2.52	3.21	0 00:12:13
31	SubCB-36	0.20	98.00	5.50	5.26	1.05	1.15	0 00:14:10
32	SubCB-37	10.56	87.09	5.50	4.05	42.77	31.40	0 00:39:30
33	SubCB-38	0.11	89.98	5.50	4.35	0.48	0.72	0 00:05:00
34	SubCB-39 (Darrow Basin)	3.11	88.56	5.50	4.21	13.08	11.62	0 00:28:43
35	SubCB-4	0.32	94.15	5.50	4.82	1.54	2.24	0 00:05:00
36	SubCB-40	0.25	89.42	5.50	4.30	1.07	1.63	0 00:05:00
37	SubCB-41	0.11	89.18	5.50	4.27	0.47	0.71	0 00:05:00
38	SubCB-42	0.16	97.17	5.50	5.16	0.83	1.15	0 00:05:00
39	SubCB-43	0.33	94.21	5.50	4.83	1.59	2.33	0 00:05:00
40	SubCB-44	0.64	94.42	5.50	4.85	3.10	3.59	0 00:14:08
41	SubCB-5	0.71	93.30	5.50	4.72	3.35	4.91	0 00:05:00
42	SubCB-6	0.24	96.83	5.50	5.13	1.23	1.74	0 00:05:00
43	SubCB-7	0.17	93.92	5.50	4.79	0.81	1.20	0 00:05:00
44	SubCB-8	0.07	80.00	5.50	3.32	0.23	0.16	0 00:46:15
45	SubCB-9	0.09	94.97	5.50	4.91	0.44	0.63	0 00:05:00
46	SubDitch 2	2.97	86.29	5.50	3.97	11.78	18.07	0 00:05:16
47	SubDitch 3	0.49	83.29	5.50	3.66	1.79	1.83	0 00:23:12
48	Ditch 1a	22.56	76.94	5.50	3.04	68.60	53.59	0 00:36:29
49	Ditch 1b	14.96	79.61	5.50	3.30	49.29	34.34	0 00:43:27

Table 2 Node Summary

ID	Name	Type	Invert Elevation	Ground/ Rim Elevation	Initial Elevation	Surcharge Elevation	Peak Inflow	Max HGL Elevation	Max Surcharge Depth	Min Freeboard Attained	Time of Peak Flooding Occurence	Total Flooded Volume	Total Time Flooded
-	-	-	(ft)	(ft)	(ft)	(ft)	(ft^2)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)
1	CB 16	Junction	1131.94	1135.86	1131.94	0.00	0.00	50.24	1135.86	0.00	0.00	0 12:25	2.85
2	CB-1	Junction	1115.20	1118.50	1115.20	0.00	0.00	1.85	1118.50	0.00	0.00	0 12:15	1.01
3	CB-10	Junction	1111.47	1115.20	1110.95	0.00	0.00	3.60	1115.20	0.00	0.00	0 12:00	2.52
4	CB-11	Junction	1111.47	1115.57	1109.74	0.00	0.00	13.03	1115.57	0.00	0.00	0 12:10	7.59
5	CB-12	Junction	1111.47	1115.17	1111.47	0.00	0.00	1.45	1113.22	0.00	1.95	0 00:00	0.00
6	CB-13	Junction	1110.73	1115.23	1110.73	0.00	0.00	2.09	1115.23	0.00	0.00	0 12:20	0.29
7	CB-14	Junction	1112.69	1116.26	1112.69	0.00	0.00	1.98	1113.28	0.00	2.98	0 00:00	0.00
8	CB-15	Junction	1113.00	1114.67	1113.00	0.00	0.00	1.88	1113.52	0.00	1.14	0 00:00	0.00
9	CB-17	Junction	1130.84	1132.60	1130.84	0.00	0.00	0.90	1131.16	0.00	1.44	0 00:00	0.00
10	CB-18	Junction	1115.25	1121.67	1115.25	0.00	0.00	41.16	1121.67	0.00	0.00	0 12:15	57.96
11	CB-2	Junction	1114.03	1119.28	1114.03	0.00	0.00	2.11	1116.20	0.00	3.08	0 00:00	0.00
12	CB20	Junction	1115.56	1121.75	1115.56	0.00	0.00	16.53	1117.66	0.00	4.08	0 00:00	0.00
13	CB-21	Junction	1119.47	1125.19	1119.47	0.00	0.00	82.57	1125.19	0.00	0.00	0 12:33	12.04
14	CB-22	Junction	1123.13	1127.38	1123.13	0.00	0.00	23.66	1124.46	0.00	2.92	0 00:00	0.00
15	CB-23	Junction	1128.07	1131.25	1128.07	0.00	0.00	41.95	1131.25	0.00	0.00	0 12:45	53.94
16	CB-24	Junction	1121.38	1125.47	1121.38	0.00	0.00	27.37	1125.76	0.00	0.71	0 00:00	0.00
17	CB-25	Junction	1118.87	1124.65	1118.87	0.00	0.00	61.57	1121.87	0.00	2.78	0 00:00	0.00
18	CB-26	Junction	1117.45	1123.45	1117.45	0.00	0.00	64.62	1119.89	0.00	3.56	0 00:00	0.00
19	CB-27	Junction	1115.95	1121.87	1115.95	0.00	0.00	67.61	1121.87	0.00	0.00	0 12:14	0.75
20	CB-28	Junction	1114.42	1119.93	1114.42	0.00	0.00	69.36	1117.14	0.00	2.79	0 00:00	0.00
21	CB-3	Junction	1113.87	1117.87	1113.87	0.00	0.00	0.78	1114.02	0.00	3.85	0 00:00	0.00
22	CB-30	Junction	1110.52	1116.77	0.00	0.00	0.00	105.49	1116.77	0.00	0.00	0 12:15	160.34
23	CB-31	Junction	1112.00	1115.40	1112.00	0.00	0.00	12.88	1115.40	0.00	0.00	0 12:20	10.93
24	CB-32	Junction	1111.54	1118.79	1111.54	0.00	0.00	0.76	1111.93	0.00	6.86	0 00:00	0.00
25	CB-34	Junction	1111.94	1116.34	1111.94	0.00	0.00	6.70	1116.34	0.00	0.00	0 12:05	0.87
26	CB-35	Junction	1111.69	1116.39	1111.69	0.00	0.00	41.03	1114.19	0.00	2.20	0 00:00	0.00
27	CB-36	Junction	1112.12	1118.00	1112.12	0.00	0.00	40.90	1118.00	0.00	0.00	0 12:20	0.49
28	CB-37	Junction	1113.61	1118.81	1113.61	0.00	0.00	40.55	1115.17	0.00	3.64	0 00:00	0.00
29	CB-38	Junction	1114.06	1118.16	1114.06	0.00	0.00	10.98	1114.95	0.00	3.86	0 00:00	0.00

ID	Name	Type	Invert Elevation	Ground/ Rim Elevation	Initial Elevation	Surcharge Elevation	Peak Inflow	Max HGL Elevation	Max Surcharge Depth	Min Freeboard Attained	Time of Peak Flooding Occurence	Total Flooded Volume	Total Time Flooded
-	-	-	(ft)	(ft)	(ft)	(ft)	(ft^2)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)
30	CB-39	Junction	1115.41	1119.11	1115.41	0.00	0.00	3.27	1119.11	0.00	0.00	0 14:11	0.73
31	CB-4	Junction	1113.04	1118.71	1113.04	0.00	0.00	5.08	1118.71	0.00	0.00	0 12:00	0.47
32	CB-40	Junction	1114.72	1119.00	1114.72	0.00	0.00	10.43	1116.22	0.00	2.78	0 00:00	0.00
33	CB-41	Junction	1117.36	1121.00	1117.36	0.00	0.00	8.87	1118.16	0.00	2.84	0 00:00	0.00
34	CB42	Junction	1111.88	1115.28	1111.88	0.00	0.00	1.15	1112.07	0.00	3.21	0 00:00	0.00
35	CB-43	Junction	1111.42	1114.77	1111.42	0.00	0.00	4.98	1114.77	0.00	0.00	0 12:00	0.24
36	CB44	Junction	1110.87	1114.77	1110.87	0.00	0.00	3.54	1111.52	0.00	3.25	0 00:00	0.00
37	CB-5	Junction	1112.31	1117.73	1112.31	0.00	0.00	8.85	1117.73	0.00	0.00	0 12:00	1.85
38	CB-6	Junction	1113.00	1117.23	1113.00	0.00	0.00	1.74	1113.65	0.00	3.58	0 00:00	0.00
39	CB-7	Junction	1111.90	1116.43	1111.90	0.00	0.00	1.20	1116.43	0.00	0.00	0 12:00	0.07
40	CB-8	Junction	1111.85	1116.86	1111.85	0.00	0.00	2.89	1112.90	0.00	3.96	0 00:00	0.00
41	CB-9	Junction	1111.47	1115.42	1111.25	0.00	0.00	0.63	1112.11	0.00	3.31	0 00:00	0.00
42	CreekInv	Junction	1109.24	1113.04	1110.20	1113.04	0.00	49.27	1113.04	0.00	0.00	0 12:03	76.71
43	Ditch1	Junction	1121.99	1124.31	0.00	1124.99	0.00	54.65	1124.31	0.00	0.00	0 12:25	25.86
44	5-Jun	Junction	1136.54	1138.05	1136.54	1138.05	0.00	53.55	1143.15	0.00	0.00	0 12:20	15.77
45	MH-1	Junction	1109.79	0.00	1109.79	0.00	0.00	7.37	1112.43	0.00	0.36	0 00:00	0.00
46	MH-2	Junction	1109.54	1118.10	1109.54	0.00	0.00	46.73	1114.00	0.00	4.10	0 00:00	0.00
47	MH-3	Junction	1109.78	1116.72	1109.78	0.00	0.00	48.40	1116.72	0.00	0.00	0 12:14	4.68
48	Out-1Pipe - (225)	Junction	1127.00	1129.00	0.00	1129.00	0.00	3.59	1128.00	0.00	1.00	0 00:00	0.00
49	Out-1Pipe - (230)	Junction	1111.36	1117.37	1111.36	0.00	0.00	5.54	1117.37	0.00	0.00	0 12:15	0.00
50	Structure - (141)	Junction	1117.08	1121.73	0.00	0.00	0.00	16.07	1118.58	0.00	3.15	0 00:00	0.00
51	Structure - (148)	Junction	1118.24	1123.29	1118.24	0.00	0.00	2.20	1118.71	0.00	4.57	0 00:00	0.00
52	Structure - (150)	Junction	1120.21	1123.99	1120.21	0.00	0.00	2.21	1120.73	0.00	3.26	0 00:00	0.00
53	Structure - (153)	Junction	1121.60	1126.24	1121.60	0.00	0.00	2.22	1122.12	0.00	4.12	0 00:00	0.00

ID	Name	Type	Invert Elevation	Ground/ Rim Elevation	Initial Elevation	Surcharge Elevation	Peak Inflow	Max HGL Elevation	Max Surcharge Depth	Min Freeboard Attained	Time of Peak Flooding Occurence	Total Flooded Volume	Total Time Flooded
-	-	-	(ft)	(ft)	(ft)	(ft)	(ft^2)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)
54	Structure - (155)	Junction	1123.40	1128.06	1123.40	0.00	0.00	2.23	1125.49	0.00	2.58	0 00:00	0.00
55	Structure - (157)	Junction	1127.98	1131.73	1127.98	0.00	0.00	2.24	1128.87	0.00	2.86	0 00:00	0.00
56	Structure - (158)	Junction	1129.74	1133.75	1129.74	0.00	0.00	2.26	1130.52	0.00	3.23	0 00:00	0.00
57	Structure - (159)	Junction	1130.11	1132.94	1130.11	0.00	0.00	2.29	1131.11	0.00	1.83	0 00:00	0.00
58	Structure - (162)	Junction	1130.20	1134.06	1130.20	0.00	0.00	2.69	1136.81	0.00	0.00	0 12:15	0.22
59	Structure - (164)	Junction	1130.39	1135.09	1130.39	0.00	0.00	11.42	1135.09	0.00	0.00	0 13:21	30.48
60	Structure - (220)	Junction	1115.00	1117.80	1112.27	0.00	0.00	8.86	1115.77	0.00	2.03	0 00:00	0.00
61	CreekOut	Outfall	1106.56					10.87	1108.06				
62	Out-01	Outfall	1125.00					10.89	1125.00				
63	CB-19	Flow Diversions	1117.55	1122.50	0.00		0.00	23.64	1120.92				0.00
64	CB-29	Flow Diversions	1111.57	1119.97	1111.57		0.00	70.80	1113.66				0.00
65	DarrowBasin	Storage Node	1115.25	1120.00	1115.25		0.00	27.61	1119.32				0.00
66	MarwellBasin	Storage Node	1130.39	1137.00	1130.39		0.00	50.08	1135.59				0.00
67	TwinOaks Pond	Storage Node	1123.50	1128.00	1123.50		0.00	70.33	1128.00				7.85

Table 3 Link Summary

ID	Name	Type	Inlet Node	Outlet Node	Length	Inlet Invert	Outlet Invert	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/Decide Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	-	-	-	-	(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	Link-01	Pipe	CB-30	MH-1	89.38	1110.52	1110.43	0.1000	24.000	0.0150	6.73	6.22	1.08	2.32	2.00	1.00	620.00	SURCHARGED
2	Link-02	Pipe	CB42	MH-1	13.34	1111.88	1109.79	15.6700	12.000	0.0130	1.15	14.10	0.08	10.82	0.19	0.19	0.00	Calculated
3	Link-04	Pipe	Out-1Pipe - (230)	MH-3	426.69	1111.36	1109.78	0.3700	18.000	0.0150	5.64	5.54	1.02	3.67	1.31	0.88	0.00	> CAPACITY
4	Link-05	Pipe	CB-19	Structure - (141)	69.55	1117.55	1117.08	0.6800	18.000	0.0150	16.07	14.97	1.07	4.93	1.50	1.00	97.00	SURCHARGED
5	Pipe - (106)	Pipe	CB-24	CB-21	42.44	1121.38	1120.64	1.7400	24.000	0.0120	27.38	32.36	0.85	11.55	1.40	0.71	0.00	Calculated
6	Pipe - (107)	Pipe	CB-22	CB-24	114.78	1123.13	1121.38	1.5200	24.000	0.0120	23.66	30.26	0.78	10.66	1.33	0.67	0.00	Calculated
7	Pipe - (109)	Pipe	CB-21	CB-25	98.22	1119.47	1118.87	0.6100	36.000	0.0120	60.36	56.47	1.07	9.30	3.00	1.00	41.00	SURCHARGED
8	Pipe - (111)	Pipe	CB-25	CB-26	160.05	1118.87	1117.45	0.8900	36.000	0.0120	61.31	68.06	0.90	11.14	2.13	0.74	0.00	Calculated
9	Pipe - (112)	Pipe	CB-26	CB-27	184.17	1117.45	1115.95	0.8100	36.000	0.0120	64.58	65.21	0.99	10.70	2.35	0.81	0.00	Calculated
10	Pipe - (113)	Pipe	CB-27	CB-28	221.97	1115.95	1114.42	0.6900	36.000	0.0120	64.51	59.99	1.08	9.90	2.85	0.95	0.00	> CAPACITY
11	Pipe - (114)	Pipe	CB-28	CB-29	63.63	1114.42	1111.57	4.4800	36.000	0.0120	69.34	152.92	0.45	21.10	1.41	0.47	0.00	Calculated
12	Pipe - (116)	Pipe	CB-29	CB-32	36.55	1111.57	1111.54	0.0800	36.000	0.0120	0.00	20.70	0.00	0.00	0.00	0.00	0.00	Calculated
13	Pipe - (117)	Pipe	CB-29	CB-30	75.50	1111.57	1110.52	1.3900	36.000	0.0120	70.77	85.21	0.83	13.48	2.08	0.70	0.00	Calculated
14	Pipe - (118)	Pipe	CB-31	MH-2	278.45	1112.00	1112.00	0.0000	24.000	0.0130	0.46	0.43	1.08	0.16	2.00	1.00	429.00	SURCHARGED
15	Pipe - (122)	Pipe	CB44	MH-2	30.89	1110.87	1110.34	1.7200	12.000	0.0130	3.54	4.67	0.76	6.54	0.65	0.65	0.00	Calculated
16	Pipe - (126)	Pipe	MH-3	MH-2	40.20	1109.78	1109.54	0.6000	30.000	0.0120	36.96	34.33	1.08	8.09	2.50	1.00	29.00	SURCHARGED
17	Pipe - (127)	Pipe	MH-1	MH-2	67.63	1109.79	1109.54	0.3700	36.000	0.0120	7.37	43.93	0.17	4.61	0.83	0.28	0.00	Calculated
18	Pipe - (130)	Pipe	CB-43	MH-3	16.85	1111.42	1111.25	1.0000	12.000	0.0130	3.84	3.56	1.08	5.22	1.00	1.00	16.00	SURCHARGED
19	Pipe - (131)	Pipe	CB-34	CB-43	30.54	1111.94	1111.77	0.5600	12.000	0.0130	2.80	2.66	1.05	3.97	1.00	1.00	22.00	SURCHARGED
20	Pipe - (138)	Pipe	CB-35	MH-3	193.20	1111.69	1109.78	0.9900	30.000	0.0120	40.43	44.18	0.92	10.43	1.86	0.75	0.00	Calculated
21	Pipe - (139)	Pipe	CB-36	CB-35	60.42	1112.12	1111.69	0.7100	30.000	0.0120	40.34	37.49	1.08	8.85	2.50	1.00	3.00	SURCHARGED
22	Pipe - (141)	Pipe	CB-37	CB-36	90.06	1113.61	1112.12	1.6500	30.000	0.0120	40.53	57.16	0.71	12.63	1.56	0.62	0.00	Calculated
23	Pipe - (143)	Pipe	CB-38	CB-37	20.12	1114.06	1113.61	2.2400	30.000	0.0120	10.98	66.45	0.17	10.00	0.69	0.28	0.00	Calculated
24	Pipe - (144)	Pipe	CB-40	CB-38	87.78	1114.72	1114.06	0.7500	30.000	0.0120	10.43	38.53	0.27	6.67	0.89	0.36	0.00	Calculated
25	Pipe - (145)	Pipe	CB-39	CB-40	45.85	1115.41	1115.22	0.4100	12.000	0.0120	2.66	2.48	1.07	3.68	1.00	1.00	84.00	SURCHARGED
26	Pipe - (146)	Pipe	Structure - (220)	CB-40	25.00	1115.00	1114.72	1.1200	30.000	0.0120	8.86	47.03	0.19	7.35	0.73	0.29	0.00	Calculated
27	Pipe - (150)	Pipe	CB20	DarrowBasin	66.96	1116.76	1115.58	1.7600	30.000	0.0120	16.46	58.99	0.28	10.34	0.89	0.36	0.00	Calculated

ID	Name	Type	Inlet Node	Outlet Node	Length	Inlet Invert	Outlet Invert	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/Decide Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	-	-	-	-	(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
28	Pipe - (151)	Pipe	Structure - (141)	CB20	20.21	1117.08	1115.56	7.5200	30.000	0.0120	16.06	121.85	0.13	17.24	0.59	0.25	0.00	Calculated
29	Pipe - (154)	Pipe	CB-19	CB-41	120.38	1119.67	1117.36	1.9200	18.000	0.0120	8.67	15.75	0.55	9.12	0.79	0.53	0.00	Calculated
30	Pipe - (156)	Pipe	CB-18	DarrowBasin	61.34	1115.25	1115.25	0.0000	24.000	0.0130	0.99	0.91	1.08	0.33	2.00	1.00	896.00	SURCHARGED
31	Pipe - (157)	Pipe	Structure - (148)	CB-18	189.33	1118.24	1116.45	0.9500	18.000	0.0130	2.19	10.21	0.21	4.61	0.47	0.31	0.00	Calculated
32	Pipe - (159)	Pipe	Structure - (150)	Structure - (148)	199.61	1120.21	1118.24	0.9900	18.000	0.0130	2.20	10.44	0.21	4.69	0.46	0.31	0.00	Calculated
33	Pipe - (162)	Pipe	Structure - (153)	Structure - (150)	215.23	1121.60	1120.21	0.6500	18.000	0.0130	2.21	8.44	0.26	4.04	0.52	0.35	0.00	Calculated
34	Pipe - (164)	Pipe	Structure - (155)	Structure - (153)	199.59	1123.40	1121.60	0.9000	15.000	0.0130	2.22	6.13	0.36	4.62	0.51	0.42	0.00	Calculated
35	Pipe - (166)	Pipe	Structure - (157)	Structure - (155)	299.82	1127.98	1124.98	1.0000	15.000	0.0130	2.23	6.46	0.34	4.82	0.50	0.40	0.00	Calculated
36	Pipe - (167)	Pipe	Structure - (158)	Structure - (157)	210.46	1129.74	1128.23	0.7200	12.000	0.0130	2.24	3.02	0.74	4.27	0.63	0.64	0.00	Calculated
37	Pipe - (168)	Pipe	Structure - (159)	Structure - (158)	84.40	1130.11	1129.74	0.4400	12.000	0.0130	2.26	2.36	0.96	3.50	0.76	0.78	0.00	Calculated
38	Pipe - (171)	Pipe	Structure - (162)	Structure - (159)	25.29	1130.20	1130.11	0.3600	12.000	0.0130	2.29	2.13	1.08	3.14	1.00	1.00	32.00	SURCHARGED
39	Pipe - (172)	Pipe	CB-17	Structure - (162)	60.26	1130.84	1129.91	1.5400	12.000	0.0120	0.90	3.98	0.23	4.09	0.32	0.32	0.00	Calculated
40	Pipe - (173)	Pipe	Structure - (164)	Structure - (162)	75.12	1130.39	1129.91	0.6400	12.000	0.0130	1.94	1.79	1.08	2.59	1.00	1.00	715.00	SURCHARGED
41	Pipe - (174)	Pipe	CB 16	MarwellBasin	44.65	1131.94	1130.59	3.0200	24.000	0.0130	42.39	39.34	1.08	14.45	2.00	1.00	20.00	SURCHARGED
42	Pipe - (208)	Pipe	CB-41	Structure - (220)	212.53	1117.36	1115.00	1.1100	30.000	0.0130	8.86	43.25	0.20	6.93	0.77	0.31	0.00	Calculated
43	Pipe - (209)	Pipe	CB-15	CB-14	24.77	1113.00	1112.76	0.9700	12.000	0.0130	1.88	3.51	0.54	4.54	0.52	0.52	0.00	Calculated
44	Pipe - (211)	Pipe	CB-14	CB-13	169.78	1112.69	1110.73	1.1500	12.000	0.0130	1.98	3.83	0.52	4.92	0.51	0.51	0.00	Calculated
45	Pipe - (212)	Pipe	CB-11	CB-12	38.45	1111.47	1111.47	0.0000	21.000	0.0120	0.95	0.88	1.08	0.43	1.75	1.00	279.00	SURCHARGED
46	Pipe - (213)	Pipe	CB-10	CB-11	71.86	1111.47	1111.47	0.0000	21.000	0.0120	0.69	0.64	1.08	0.31	1.75	1.00	166.00	SURCHARGED
47	Pipe - (216)	Pipe	CB-9	CB-10	4.63	1111.47	1111.47	0.0000	18.000	0.0120	0.63	1.67	0.38	0.88	0.64	0.43	0.00	Calculated
48	Pipe - (217)	Pipe	CB-8	CB-10	140.54	1111.86	1111.47	0.2800	18.000	0.0120	2.86	5.99	0.48	3.37	0.73	0.49	0.00	Calculated
49	Pipe - (218)	Pipe	CB-7	CB-8	2.83	1111.90	1111.90	0.0000	12.000	0.0130	0.72	0.67	1.08	0.98	1.00	1.00	12.00	SURCHARGED
50	Pipe - (219)	Pipe	CB-5	CB-8	130.31	1112.31	1111.86	0.3500	12.000	0.0130	2.26	2.09	1.08	3.21	1.00	1.00	32.00	SURCHARGED
51	Pipe - (220)	Pipe	CB-6	CB-5	63.99	1113.00	1112.73	0.4200	12.000	0.0130	1.73	2.31	0.75	3.24	0.64	0.64	0.00	Calculated

ID	Name	Type	Inlet Node	Outlet Node	Length	Inlet Invert	Outlet Invert	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/Decide Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	-	-	-	-	(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
52	Pipe - (221)	Pipe	CB-4	CB-5	79.13	1113.04	1112.73	0.3900	12.000	0.0130	2.41	2.23	1.08	3.43	1.00	1.00	17.00	SURCHARGED
53	Pipe - (222)	Pipe	CB-3	CB-4	4.10	1113.87	1113.13	18.0300	12.000	0.0130	0.78	15.13	0.05	10.14	0.15	0.15	0.00	Calculated
54	Pipe - (223)	Pipe	CB-2	CB-4	121.11	1114.03	1113.13	0.7400	12.000	0.0130	2.09	3.07	0.68	4.22	0.60	0.61	0.00	Calculated
55	Pipe - (224)	Pipe	CB-1	CB-2	67.59	1115.20	1115.20	0.0000	12.000	0.0130	0.15	0.14	1.08	0.21	1.00	1.00	132.00	SURCHARGED
56	Pipe - (225)	Pipe	CB-23	Out-1Pipe - (225)	124.01	1128.07	1127.00	0.8700	12.000	0.0130	3.59	3.32	1.08	4.93	1.00	1.00	306.00	SURCHARGED
57	Pipe - (230)	Pipe	CB-32	Out-1Pipe - (230)	175.91	1111.54	1111.36	0.1000	36.000	0.0130	0.76	21.34	0.04	1.44	0.39	0.13	0.00	Calculated
58	Pipe_12-CR	Pipe	CB-12	CreekInv	24.83	1111.47	1109.85	6.5200	21.000	0.0130	1.45	40.47	0.04	7.96	0.23	0.13	0.00	Calculated
59	Pipe_13-CR	Pipe	CB-13	CreekInv	21.92	1110.73	1110.70	0.1400	12.000	0.0130	1.41	1.32	1.07	1.96	1.00	1.00	36.00	SURCHARGED
60	Pipe_M2-CR	Pipe	MH-2	CreekInv	64.02	1109.54	1109.24	0.4700	36.000	0.0120	46.60	49.46	0.94	8.02	2.26	0.77	0.00	Calculated
61	Creek	Channel	CreekInv	CreekOut	1106.59	1109.24	1106.56	0.2400	18.000	0.0250	10.87	10.87	1.00	2.42	1.50	1.00	684.00	
62	Ditch3	Channel	Ditch1	CB-19	179.15	1121.99	1119.92	1.1600	12.000	0.0320	20.73	20.73	1.00	3.78	1.00	1.00	79.00	
63	Link-06	Channel	Out-1Pipe - (225)	CB-24	159.58	1127.00	1125.47	0.9600	12.000	0.0320	3.68	33.22	0.11	1.90	0.29	0.29	0.00	
64	Link-07	Channel	5-Jun	Ditch1	1834.55	1136.54	1121.99	0.7900	12.000	0.0320	18.23	18.23	1.00	3.44	1.00	1.00	47.00	
65	D3	Orifice	DarrowBasin	CB-39		1115.25	1115.41		3.000		0.46							
66	D4	Orifice	DarrowBasin	CB-39		1115.25	1115.41		4.000		0.68							
67	DG	Orifice	DarrowBasin	CB-39		1115.25	1115.41		23.000		2.13							
68	M8	Orifice	MarwellBasin	Structure - (164)		1130.39	1130.39		8.000		3.72							
69	MG	Orifice	MarwellBasin	Structure - (164)		1130.39	1130.39		23.000		7.70							
70	TO1.25	Orifice	TwinOaks Pond	CB-22		1123.50	1123.13		1.250		0.09							
71	TO18	Orifice	TwinOaks Pond	CB-22		1123.50	1123.13		18.000		15.94							
72	TOG	Orifice	TwinOaks Pond	CB-22		1123.50	1123.13		23.000		7.64							

ID	Name	Type	Inlet Node	Outlet Node	Length	Inlet Invert	Outlet Invert	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/Decide Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
	-	-	-	-	(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
73	Darrow	Weir	DarrowBasin	CB-38		1115.25	1114.06				7.51							
74	Marwell	Weir	MarwellBasin	Structure - (162)		1130.39	1130.20				0.00							
75	Marwell2	Weir	MarwellBasin	5-Jun		1130.39	1136.54				0.00							
76	TwinOaksPondOF	Weir	TwinOaks Pond	Out-01		1123.50	1125.00				10.89							

Table 4 Junction Summary

ID	Name	Type	Invert Elevation	Ground/ Rim Elevation	Initial Water Elevation	Initial Water Depth	Surcharge Elevation	Surcharge Depth	Ponded Area	Minimum Pipe Cover
-	-	-	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft^2)	(in)
1	CB 16	1131.94	1135.86	3.92	1131.94	0.00	0.00	-1135.86	0.00	23.00
2	CB-1	1115.20	1118.50	3.30	1115.20	0.00	0.00	-1118.50	0.00	27.60
3	CB-10	1111.47	1115.20	3.73	1110.95	-0.52	0.00	-1115.20	0.00	23.76
4	CB-11	1111.47	1115.57	4.10	1109.74	-1.73	0.00	-1115.57	0.00	28.20
5	CB-12	1111.47	1115.17	3.70	1111.47	0.00	0.00	-1115.17	0.00	23.40
6	CB-13	1110.73	1115.23	4.50	1110.73	0.00	0.00	-1115.23	0.00	42.00
7	CB-14	1112.69	1116.26	3.57	1112.69	0.00	0.00	-1116.26	0.00	30.00
8	CB-15	1113.00	1114.67	1.67	1113.00	0.00	0.00	-1114.67	0.00	8.00
9	CB-17	1130.84	1132.60	1.76	1130.84	0.00	0.00	-1132.60	0.00	9.12
10	CB-18	1115.25	1121.67	6.42	1115.25	0.00	0.00	-1121.67	0.00	44.60
11	CB-2	1114.03	1119.28	5.25	1114.03	0.00	0.00	-1119.28	0.00	36.96
12	CB20	1115.56	1121.75	6.19	1115.56	0.00	0.00	-1121.75	0.00	29.85
13	CB-21	1119.47	1125.19	5.72	1119.47	0.00	0.00	-1125.19	0.00	30.60
14	CB-22	1123.13	1127.38	4.25	1123.13	0.00	0.00	-1127.38	0.00	0.00
15	CB-23	1128.07	1131.25	3.17	1128.07	0.00	0.00	-1131.25	0.00	26.08
16	CB-24	1121.38	1125.47	4.09	1121.38	0.00	0.00	-1125.47	0.00	0.00
17	CB-25	1118.87	1124.65	5.78	1118.87	0.00	0.00	-1124.65	0.00	33.36
18	CB-26	1117.45	1123.45	6.00	1117.45	0.00	0.00	-1123.45	0.00	36.00
19	CB-27	1115.95	1121.87	5.92	1115.95	0.00	0.00	-1121.87	0.00	35.04
20	CB-28	1114.42	1119.93	5.51	1114.42	0.00	0.00	-1119.93	0.00	30.12
21	CB-3	1113.87	1117.87	4.00	1113.87	0.00	0.00	-1117.87	0.00	36.00
22	CB-30	1110.52	1116.77	6.25	0.00	-1110.52	0.00	-1116.77	0.00	39.00
23	CB-31	1112.00	1115.40	3.40	1112.00	0.00	0.00	-1115.40	0.00	16.80
24	CB-32	1111.54	1118.79	7.25	1111.54	0.00	0.00	-1118.79	0.00	51.00
25	CB-34	1111.94	1116.34	4.40	1111.94	0.00	0.00	-1116.34	0.00	40.80
26	CB-35	1111.69	1116.39	4.70	1111.69	0.00	0.00	-1116.39	0.00	26.40
27	CB-36	1112.12	1118.00	5.88	1112.12	0.00	0.00	-1118.00	0.00	40.56
28	CB-37	1113.61	1118.81	5.20	1113.61	0.00	0.00	-1118.81	0.00	32.40
29	CB-38	1114.06	1118.16	4.10	1114.06	0.00	0.00	-1118.16	0.00	0.00
30	CB-39	1115.41	1119.11	3.70	1115.41	0.00	0.00	-1119.11	0.00	0.00
31	CB-4	1113.04	1118.71	5.67	1113.04	0.00	0.00	-1118.71	0.00	54.96
32	CB-40	1114.72	1119.00	4.28	1114.72	0.00	0.00	-1119.00	0.00	21.36

ID	Name	Type	Invert Elevation	Ground/ Rim Elevation	Initial Water Elevation	Initial Water Depth	Surcharge Elevation	Surcharge Depth	Ponded Area	Minimum Pipe Cover
-	-	-	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft2)	(in)
33	CB-41	1117.36	1121.00	3.64	1117.36	0.00	0.00	-1121.00	0.00	13.64
34	CB42	1111.88	1115.28	3.40	1111.88	0.00	0.00	-1115.28	0.00	28.80
35	CB-43	1111.42	1114.77	3.35	1111.42	0.00	0.00	-1114.77	0.00	24.00
36	CB44	1110.87	1114.77	3.90	1110.87	0.00	0.00	-1114.77	0.00	34.80
37	CB-5	1112.31	1117.73	5.42	1112.31	0.00	0.00	-1117.73	0.00	48.00
38	CB-6	1113.00	1117.23	4.23	1113.00	0.00	0.00	-1117.23	0.00	38.76
39	CB-7	1111.90	1116.43	4.53	1111.90	0.00	0.00	-1116.43	0.00	42.36
40	CB-8	1111.85	1116.86	5.01	1111.85	0.00	0.00	-1116.86	0.00	42.00
41	CB-9	1111.47	1115.42	3.95	1111.25	-0.22	0.00	-1115.42	0.00	29.40
42	CreekInv	1109.24	1113.04	3.80	1110.20	0.96	1113.04	0.00	0.00	9.60
43	Ditch1	1121.99	1124.31	2.32	0.00	-1121.99	1124.99	0.68	0.00	15.84
44	5-Jun	1136.54	1138.05	1.51	1136.54	0.00	1138.05	0.00	0.00	0.00
45	MH-1	1109.79	0.00	-1109.79	1109.79	0.00	0.00	0.00	0.00	0.00
46	MH-2	1109.54	1118.10	8.56	1109.54	0.00	0.00	-1118.10	0.00	49.25
47	MH-3	1109.78	1116.72	6.94	1109.78	0.00	0.00	-1116.73	0.00	53.34
48	Out-1Pipe - (225)	1127.00	1129.00	2.00	0.00	-1127.00	1129.00	0.00	0.00	12.00
49	Out-1Pipe - (230)	1111.36	1117.37	6.01	1111.36	0.00	0.00	-1117.37	0.00	36.12
50	Structure - (141)	1117.08	1121.73	4.65	0.00	-1117.08	0.00	-1121.73	0.00	25.80
51	Structure - (148)	1118.24	1123.29	5.05	1118.24	0.00	0.00	-1123.29	0.00	42.55
52	Structure - (150)	1120.21	1123.99	3.78	1120.21	0.00	0.00	-1123.99	0.00	27.40
53	Structure - (153)	1121.60	1126.24	4.64	1121.60	0.00	0.00	-1126.24	0.00	37.72
54	Structure - (155)	1123.40	1128.06	4.66	1123.40	0.00	0.00	-1128.06	0.00	22.00
55	Structure - (157)	1127.98	1131.73	3.75	1127.98	0.00	0.00	-1131.73	0.00	30.00
56	Structure - (158)	1129.74	1133.75	4.01	1129.74	0.00	0.00	-1133.75	0.00	36.12
57	Structure - (159)	1130.11	1132.94	2.83	1130.11	0.00	0.00	-1132.94	0.00	22.00
58	Structure - (162)	1130.20	1134.06	3.86	1130.20	0.00	0.00	-1134.06	0.00	0.00
59	Structure - (164)	1130.39	1135.09	4.70	1130.39	0.00	0.00	-1135.09	0.00	0.00
60	Structure - (220)	1115.00	1117.80	2.80	1112.27	-2.73	0.00	-1117.80	0.00	3.63

Conclusion

The existing conditions analysis of the Marwell Boulevard, Twinsburg Road, and Darrow Road drainage area within subcatchment TCAC_009S reveals a stormwater system that is under increasing stress due to a combination of high impervious surface coverage, limited detention, and aging or undersized infrastructure. The SSA-based model confirms that several subbasins produce high peak runoff rates with short times of concentration, leading to rapid accumulation of flow and localized flooding, particularly during moderate to heavy storm events.

The system was modeled for a 100-year flood. All the storm components that are over capacity are shown on Figure 9. Of particular concern are Ditch 1 and Ditch 2. Also, several pipes coming from the gas station, and from the west in the Darrow/Twinsburg intersection surcharge. (Pipe-118 was not found in the survey so the inverts are estimated.) The Final outlet culvert does not surcharge. However, it is near capacity which is already limited since the outlet ditch WSE is higher than the culvert's outlet invert.

Hydrologic inputs indicate that subbasins such as SubCB-22 (TwinOaks), Ditch 1a, and SubDitch 2 are key contributors to peak flows exceeding downstream system capacity. Hydraulic results further identify pipe surcharging and insufficient conveyance in multiple locations. Existing storage and flow control structures provide some mitigation but are insufficient under current runoff conditions. Without intervention, these issues are expected to worsen as impervious cover increases, and precipitation patterns intensify due to climate change.

EDG recommends 3 concepts to help improve drainage, reduce flooding concerns, and improve the water quality that is tributary to Tinkers Creek. The first concept will incorporate a water quality component to the existing detention basin near the midpoint of Marwell Boulevard, to the existing basin near the intersection of Marwell and Darrow Road. Neither basin looks to have water quality features built into the bottom portions of each. The concept would add micropools and forebays to each and provide a quantity of water quality volume. Another part of concept one will evaluate the modification of the emergency weir of the smaller basin near the mid-point of Marwell Boulevard. By modifying this weir, it may be feasible to drain the emergency flood routing from the street to a ditch at the rear of the residential lots on the wooded vacant lot behind those homes. This could be beneficial if the storm sewer were to clog with debris and rather than have the street accept the emergency flow, it could be routed through the ditch instead. The second concept evaluates the improvement of the wooded vacant lot with a water quality bmp. The lot has wetlands on it currently; it would be beneficial to try and add some meandering channels and possibly connect the wetland areas. This would benefit the tributary to Tinkers Creek. Lastly, EDG will look at the improvement of the ODOT culvert under Darrow Road. This culvert is the outlet point for the entire study area and thus controls the flow from the neighborhoods that it serves. A change in its function could improve the efficiency of the whole system.

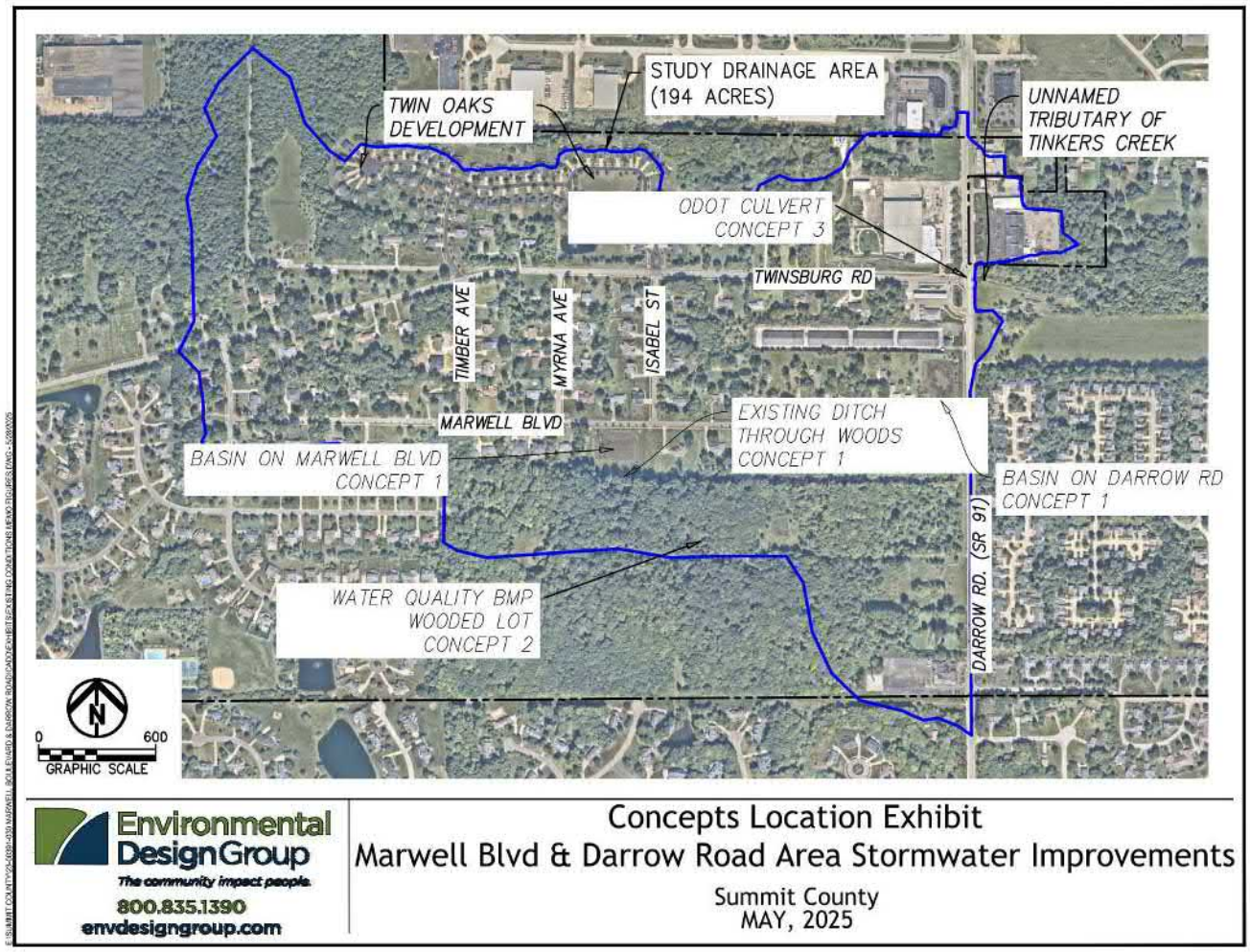


Figure 13 Concepts Location Exhibit

Attachment 1: SSA Model Output

Project Description

File Name	Marwell-ExCon.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-55
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

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	10	seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins	49
Nodes	67
Junctions	60
Outfalls	2
Flow Diversions	2
Inlets	0
Storage Nodes	3
Links	76
Channels	4
Pipes	60
Pumps	0
Orifices	8
Weirs	4
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
1	Rain Gage-01	Time Series	100YR	Cumulative	inches	Ohio	Summit	100.00	5.50	SCS Type II 24-hr

Subbasin Summary

SN	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)
1	Ditch 1a	22.56	0.00	76.94	5.50	3.04	68.60	53.59	0 00:36:29
2	Ditch 1b	14.96	0.00	79.61	5.50	3.30	49.29	34.34	0 00:43:27
3	SubBasin1	2.18	0.00	88.34	5.50	4.18	9.12	10.21	0 00:17:59
4	SubCB-1	0.49	0.00	89.57	5.50	4.31	2.11	1.85	0 00:29:19
5	SubCB-10	0.10	0.00	80.00	5.50	3.33	0.33	0.34	0 00:24:41
6	SubCB-11	2.67	0.00	91.64	5.50	4.54	12.12	12.39	0 00:20:51
7	SubCB-12	0.08	0.00	93.73	5.50	4.77	0.38	0.58	0 00:05:00
8	SubCB-13	0.13	0.00	92.87	5.50	4.67	0.61	0.88	0 00:05:00
9	SubCB-14	0.04	0.00	86.26	5.50	3.93	0.16	0.10	0 00:45:45
10	SubCB-15	0.67	0.00	82.45	5.50	3.57	2.39	1.89	0 00:36:09
11	SubCB-16	19.34	0.00	85.73	5.50	3.91	75.58	50.27	0 00:46:00
12	SubCB-17	0.30	0.00	80.97	5.50	3.43	1.03	0.91	0 00:30:23
13	SubCB-18	12.35	0.00	85.31	5.50	3.87	47.73	39.65	0 00:32:51
14	SubCB-19	0.30	0.00	86.66	5.50	4.00	1.20	1.15	0 00:25:23
15	SubCB-2	0.29	0.00	97.91	5.50	5.25	1.52	2.00	0 00:06:25
16	SubCB-20	0.14	0.00	93.18	5.50	4.71	0.66	0.97	0 00:05:00
17	SubCB-21	26.42	0.00	85.09	5.50	3.84	101.51	56.00	0 01:00:27
18	SubCB-22 (TwinOaks)	19.17	0.00	87.47	5.50	4.09	78.41	70.60	0 00:28:17
19	SubCB-23	26.94	0.00	80.83	5.50	3.41	91.97	42.08	0 01:18:26
20	SubCB-24	0.23	0.00	88.68	5.50	4.22	0.97	1.48	0 00:05:00
21	SubCB-25	0.43	0.00	84.87	5.50	3.82	1.64	1.89	0 00:17:23
22	SubCB-26	0.95	0.00	84.72	5.50	3.80	3.61	4.09	0 00:18:05
23	SubCB-27	0.86	0.00	84.80	5.50	3.81	3.28	3.64	0 00:18:57
24	SubCB-28	1.44	0.00	84.55	5.50	3.79	5.45	4.87	0 00:29:10
25	SubCB-29	0.41	0.00	84.49	5.50	3.78	1.55	1.48	0 00:25:48
26	SubCB-3	0.11	0.00	97.06	5.50	5.15	0.57	0.78	0 00:05:00
27	SubCB-30 (humane basin)	12.29	0.00	87.92	5.50	4.14	50.84	37.50	0 00:39:07
28	SubCB-31	4.41	0.00	84.94	5.50	3.83	16.88	12.92	0 00:37:30
29	SubCB-32	0.21	0.00	84.74	5.50	3.80	0.80	0.77	0 00:25:28
30	SubCB-33	1.46	0.00	80.64	5.50	3.40	4.96	4.92	0 00:24:27
31	SubCB-34	1.12	0.00	93.91	5.50	4.79	5.37	6.83	0 00:10:00
32	SubCB-35	0.60	0.00	88.55	5.50	4.20	2.52	3.21	0 00:12:13
33	SubCB-36	0.20	0.00	98.00	5.50	5.26	1.05	1.15	0 00:14:10
34	SubCB-37	10.56	0.00	87.09	5.50	4.05	42.77	31.40	0 00:39:30
35	SubCB-38	0.11	0.00	89.98	5.50	4.35	0.48	0.72	0 00:05:00
36	SubCB-39 (Darrow Basin)	3.11	0.00	88.56	5.50	4.21	13.08	11.62	0 00:28:43
37	SubCB-4	0.32	0.00	94.15	5.50	4.82	1.54	2.24	0 00:05:00
38	SubCB-40	0.25	0.00	89.42	5.50	4.30	1.07	1.63	0 00:05:00
39	SubCB-41	0.11	0.00	89.18	5.50	4.27	0.47	0.71	0 00:05:00
40	SubCB-42	0.16	0.00	97.17	5.50	5.16	0.83	1.15	0 00:05:00
41	SubCB-43	0.33	0.00	94.21	5.50	4.83	1.59	2.33	0 00:05:00
42	SubCB-44	0.64	0.00	94.42	5.50	4.85	3.10	3.59	0 00:14:08
43	SubCB-5	0.71	0.00	93.30	5.50	4.72	3.35	4.91	0 00:05:00
44	SubCB-6	0.24	0.00	96.83	5.50	5.13	1.23	1.74	0 00:05:00
45	SubCB-7	0.17	0.00	93.92	5.50	4.79	0.81	1.20	0 00:05:00
46	SubCB-8	0.07	0.00	80.00	5.50	3.32	0.23	0.16	0 00:46:15
47	SubCB-9	0.09	0.00	94.97	5.50	4.91	0.44	0.63	0 00:05:00
48	SubDitch 2	2.97	0.00	86.29	5.50	3.97	11.78	18.07	0 00:05:16
49	SubDitch 3	0.49	0.00	83.29	5.50	3.66	1.79	1.83	0 00:23:12

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	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)
1	CB 16	Junction	1131.94	1135.86	1131.94	0.00	0.00	50.24	1135.86	0.00	0.00	0 12:25	2.85	26.00
2	CB-1	Junction	1115.20	1118.50	1115.20	0.00	0.00	1.85	1118.50	0.00	0.00	0 12:15	1.01	145.00
3	CB-10	Junction	1111.47	1115.20	1110.95	0.00	0.00	3.60	1115.20	0.00	0.00	0 12:00	2.52	183.00
4	CB-11	Junction	1111.47	1115.57	1109.74	0.00	0.00	13.03	1115.57	0.00	0.00	0 12:10	7.59	295.00
5	CB-12	Junction	1111.47	1115.17	1111.47	0.00	0.00	1.45	1113.22	0.00	1.95	0 00:00	0.00	0.00
6	CB-13	Junction	1110.73	1115.23	1110.73	0.00	0.00	2.09	1115.23	0.00	0.00	0 12:20	0.29	38.00
7	CB-14	Junction	1112.69	1116.26	1112.69	0.00	0.00	1.98	1113.28	0.00	2.98	0 00:00	0.00	0.00
8	CB-15	Junction	1113.00	1114.67	1113.00	0.00	0.00	1.88	1113.52	0.00	1.14	0 00:00	0.00	0.00
9	CB-17	Junction	1130.84	1132.60	1130.84	0.00	0.00	0.90	1131.16	0.00	1.44	0 00:00	0.00	0.00
10	CB-18	Junction	1115.25	1121.67	1115.25	0.00	0.00	41.16	1121.67	0.00	0.00	0 12:15	57.96	912.00
11	CB-2	Junction	1114.03	1119.28	1114.03	0.00	0.00	2.11	1116.20	0.00	3.08	0 00:00	0.00	0.00
12	CB20	Junction	1115.56	1121.75	1115.56	0.00	0.00	16.53	1117.66	0.00	4.08	0 00:00	0.00	0.00
13	CB-21	Junction	1119.47	1125.19	1119.47	0.00	0.00	82.57	1125.19	0.00	0.00	0 12:33	12.04	47.00
14	CB-22	Junction	1123.13	1127.38	1123.13	0.00	0.00	23.66	1124.46	0.00	2.92	0 00:00	0.00	0.00
15	CB-23	Junction	1128.07	1131.25	1128.07	0.00	0.00	41.95	1131.25	0.00	0.00	0 12:45	53.94	316.00
16	CB-24	Junction	1121.38	1125.47	1121.38	0.00	0.00	27.37	1125.76	0.00	0.71	0 00:00	0.00	0.00
17	CB-25	Junction	1118.87	1124.65	1118.87	0.00	0.00	61.57	1121.87	0.00	2.78	0 00:00	0.00	0.00
18	CB-26	Junction	1117.45	1123.45	1117.45	0.00	0.00	64.62	1119.89	0.00	3.56	0 00:00	0.00	0.00
19	CB-27	Junction	1115.95	1121.87	1115.95	0.00	0.00	67.61	1121.87	0.00	0.00	0 12:14	0.75	15.00
20	CB-28	Junction	1114.42	1119.93	1114.42	0.00	0.00	69.36	1117.14	0.00	2.79	0 00:00	0.00	0.00
21	CB-3	Junction	1113.87	1117.87	1113.87	0.00	0.00	0.78	1114.02	0.00	3.85	0 00:00	0.00	0.00
22	CB-30	Junction	1110.52	1116.77	0.00	0.00	0.00	105.49	1116.77	0.00	0.00	0 12:15	160.34	636.00
23	CB-31	Junction	1112.00	1115.40	1112.00	0.00	0.00	12.88	1115.40	0.00	0.00	0 12:20	10.93	464.00
24	CB-32	Junction	1111.54	1118.79	1111.54	0.00	0.00	0.76	1111.93	0.00	6.86	0 00:00	0.00	0.00
25	CB-34	Junction	1111.94	1116.34	1111.94	0.00	0.00	6.70	1116.34	0.00	0.00	0 12:05	0.87	24.00
26	CB-35	Junction	1111.69	1116.39	1111.69	0.00	0.00	41.03	1114.19	0.00	2.20	0 00:00	0.00	0.00
27	CB-36	Junction	1112.12	1118.00	1112.12	0.00	0.00	40.90	1118.00	0.00	0.00	0 12:20	0.49	14.00
28	CB-37	Junction	1113.61	1118.81	1113.61	0.00	0.00	40.55	1115.17	0.00	3.64	0 00:00	0.00	0.00
29	CB-38	Junction	1114.06	1118.16	1114.06	0.00	0.00	10.98	1114.95	0.00	3.86	0 00:00	0.00	0.00
30	CB-39	Junction	1115.41	1119.11	1115.41	0.00	0.00	3.27	1119.11	0.00	0.00	0 14:11	0.73	102.00
31	CB-4	Junction	1113.04	1118.71	1113.04	0.00	0.00	5.08	1118.71	0.00	0.00	0 12:00	0.47	20.00
32	CB-40	Junction	1114.72	1119.00	1114.72	0.00	0.00	10.43	1116.22	0.00	2.78	0 00:00	0.00	0.00
33	CB-41	Junction	1117.36	1121.00	1117.36	0.00	0.00	8.87	1118.16	0.00	2.84	0 00:00	0.00	0.00
34	CB42	Junction	1111.88	1115.28	1111.88	0.00	0.00	1.15	1112.07	0.00	3.21	0 00:00	0.00	0.00
35	CB-43	Junction	1111.42	1114.77	1111.42	0.00	0.00	4.98	1114.77	0.00	0.00	0 12:00	0.24	19.00
36	CB44	Junction	1110.87	1114.77	1110.87	0.00	0.00	3.54	1111.52	0.00	3.25	0 00:00	0.00	0.00
37	CB-5	Junction	1112.31	1117.73	1112.31	0.00	0.00	8.85	1117.73	0.00	0.00	0 12:00	1.85	34.00
38	CB-6	Junction	1113.00	1117.23	1113.00	0.00	0.00	1.74	1113.65	0.00	3.58	0 00:00	0.00	0.00
39	CB-7	Junction	1111.90	1116.43	1111.90	0.00	0.00	1.20	1116.43	0.00	0.00	0 12:00	0.07	14.00
40	CB-8	Junction	1111.85	1116.86	1111.85	0.00	0.00	2.89	1112.90	0.00	3.96	0 00:00	0.00	0.00
41	CB-9	Junction	1111.47	1115.42	1111.25	0.00	0.00	0.63	1112.11	0.00	3.31	0 00:00	0.00	0.00
42	CreekInv	Junction	1109.24	1113.04	1110.20	1113.04	0.00	49.27	1113.04	0.00	0.00	0 12:03	76.71	690.00
43	Ditch1	Junction	1121.99	1124.31	0.00	1124.99	0.00	54.65	1124.31	0.00	0.00	0 12:25	25.86	80.00
44	5-Jun	Junction	1136.54	1138.05	1136.54	1138.05	0.00	53.55	1143.15	0.00	0.00	0 12:20	15.77	52.00
45	MH-1	Junction	1109.79	0.00	1109.79	0.00	0.00	7.37	1112.43	0.00	0.36	0 00:00	0.00	0.00
46	MH-2	Junction	1109.54	1118.10	1109.54	0.00	0.00	46.73	1114.00	0.00	4.10	0 00:00	0.00	0.00
47	MH-3	Junction	1109.78	1116.72	1109.78	0.00	0.00	48.40	1116.72	0.00	0.00	0 12:14	4.68	33.00
48	Out-1Pipe - (225)	Junction	1127.00	1129.00	0.00	1129.00	0.00	3.59	1128.00	0.00	1.00	0 00:00	0.00	0.00
49	Out-1Pipe - (230)	Junction	1111.36	1117.37	1111.36	0.00	0.00	5.54	1117.37	0.00	0.00	0 12:15	0.00	1.00
50	Structure - (141)	Junction	1117.08	1121.73	0.00	0.00	0.00	16.07	1118.58	0.00	3.15	0 00:00	0.00	0.00
51	Structure - (148)	Junction	1118.24	1123.29	1118.24	0.00	0.00	2.20	1118.71	0.00	4.57	0 00:00	0.00	0.00
52	Structure - (150)	Junction	1120.21	1123.99	1120.21	0.00	0.00	2.21	1120.73	0.00	3.26	0 00:00	0.00	0.00
53	Structure - (153)	Junction	1121.60	1126.24	1121.60	0.00	0.00	2.22	1122.12	0.00	4.12	0 00:00	0.00	0.00
54	Structure - (155)	Junction	1123.40	1128.06	1123.40	0.00	0.00	2.23	1125.49	0.00	2.58	0 00:00	0.00	0.00
55	Structure - (157)	Junction	1127.98	1131.73	1127.98	0.00	0.00	2.24	1128.87	0.00	2.86	0 00:00	0.00	0.00
56	Structure - (158)	Junction	1129.74	1133.75	1129.74	0.00	0.00	2.26	1130.52	0.00	3.23	0 00:00	0.00	0.00
57	Structure - (159)	Junction	1130.11	1132.94	1130.11	0.00	0.00	2.29	1131.11	0.00	1.83	0 00:00	0.00	0.00
58	Structure - (162)	Junction	1130.20	1134.06	1130.20	0.00	0.00	2.69	1136.81	0.00	0.00	0 12:15	0.22	43.00
59	Structure - (164)	Junction	1130.39	1135.09	1130.39	0.00	0.00	11.42	1135.09	0.00	0.00	0 13:21	30.48	723.00
60	Structure - (220)	Junction	1115.00	1117.80	1112.27	0.00	0.00	8.86	1115.77	0.00	2.03	0 00:00	0.00	0.00
61	CreekOut	Outfall	1106.56					10.87	1108.06					
62	Out-01	Outfall	1125.00					10.89	1125.00					
63	CB-19	Flow Diversions	1117.55	1122.50	0.00		0.00	23.64	1120.92				0.00	0.00
64	CB-29	Flow Diversions	1111.57	1119.97	1111.57		0.00	70.80	1113.66				0.00	0.00
65	DarrowBasin	Storage Node	1115.25	1120.00	1115.25		0.00	27.61	1119.32				0.00	0.00
66	MarwellBasin	Storage Node	1130.39	1137.00	1130.39		0.00	50.08	1135.59				0.00	0.00
67	TwinOaksPond	Storage Node	1123.50	1128.00	1123.50		0.00	70.33	1128.00				7.85	22.00

Link Summary

SN	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
1	Link-01	Pipe	CB-30	MH-1	89.38	1110.52	1110.43	0.1000	24.000	0.0150	6.73	6.22	1.08	2.32	2.00	1.00	620.00	SURCHARGED
2	Link-02	Pipe	CB42	MH-1	13.34	1111.88	1109.79	15.6700	12.000	0.0130	1.15	14.10	0.08	10.82	0.19	0.19	0.00	Calculated
3	Link-04	Pipe	Out-1Pipe - (230)	MH-3	426.69	1111.36	1109.78	0.3700	18.000	0.0150	5.64	5.54	1.02	3.67	1.31	0.88	0.00	> CAPACITY
4	Link-05	Pipe	CB-19	Structure - (141)	69.55	1117.55	1117.08	0.6800	18.000	0.0150	16.07	14.97	1.07	4.93	1.50	1.00	97.00	SURCHARGED
5	Pipe - (106)	Pipe	CB-24	CB-21	42.44	1121.38	1120.64	1.7400	24.000	0.0120	27.38	32.36	0.85	11.55	1.40	0.71	0.00	Calculated
6	Pipe - (107)	Pipe	CB-22	CB-24	114.78	1123.13	1121.38	1.5200	24.000	0.0120	23.66	30.26	0.78	10.66	1.33	0.67	0.00	Calculated
7	Pipe - (109)	Pipe	CB-21	CB-25	98.22	1119.47	1118.87	0.6100	36.000	0.0120	60.36	56.47	1.07	9.30	3.00	1.00	41.00	SURCHARGED
8	Pipe - (111)	Pipe	CB-25	CB-26	160.05	1118.87	1117.45	0.8900	36.000	0.0120	61.31	68.06	0.90	11.14	2.13	0.74	0.00	Calculated
9	Pipe - (112)	Pipe	CB-26	CB-27	184.17	1117.45	1115.95	0.8100	36.000	0.0120	64.58	65.21	0.99	10.70	2.35	0.81	0.00	Calculated
10	Pipe - (113)	Pipe	CB-27	CB-28	221.97	1115.95	1114.42	0.6900	36.000	0.0120	64.51	59.99	1.08	9.90	2.85	0.95	0.00	> CAPACITY
11	Pipe - (114)	Pipe	CB-28	CB-29	63.63	1114.42	1111.57	4.4800	36.000	0.0120	69.34	152.92	0.45	21.10	1.41	0.47	0.00	Calculated
12	Pipe - (116)	Pipe	CB-29	CB-32	36.55	1111.57	1111.54	0.0800	36.000	0.0120	0.00	20.70	0.00	0.00	0.00	0.00	0.00	Calculated
13	Pipe - (117)	Pipe	CB-29	CB-30	75.50	1111.57	1110.52	1.3900	36.000	0.0120	70.77	85.21	0.83	13.48	2.08	0.70	0.00	Calculated
14	Pipe - (118)	Pipe	CB-31	MH-2	278.45	1112.00	1112.00	0.0000	24.000	0.0130	0.46	0.43	1.08	0.16	2.00	1.00	429.00	SURCHARGED
15	Pipe - (122)	Pipe	CB44	MH-2	30.89	1110.87	1110.34	1.7200	12.000	0.0130	3.54	4.67	0.76	6.54	0.65	0.65	0.00	Calculated
16	Pipe - (126)	Pipe	MH-3	MH-2	40.20	1109.78	1109.54	0.6000	30.000	0.0120	36.96	34.33	1.08	8.09	2.50	1.00	29.00	SURCHARGED
17	Pipe - (127)	Pipe	MH-1	MH-2	67.63	1109.79	1109.54	0.3700	36.000	0.0120	7.37	43.93	0.17	4.61	0.83	0.28	0.00	Calculated
18	Pipe - (130)	Pipe	CB-43	MH-3	16.85	1111.42	1111.25	1.0000	12.000	0.0130	3.84	3.56	1.08	5.22	1.00	1.00	16.00	SURCHARGED
19	Pipe - (131)	Pipe	CB-34	CB-43	30.54	1111.94	1111.77	0.5600	12.000	0.0130	2.80	2.66	1.05	3.97	1.00	1.00	22.00	SURCHARGED
20	Pipe - (138)	Pipe	CB-35	MH-3	193.20	1111.69	1109.78	0.9900	30.000	0.0120	40.43	44.18	0.92	10.43	1.86	0.75	0.00	Calculated
21	Pipe - (139)	Pipe	CB-36	CB-35	60.42	1112.12	1111.69	0.7100	30.000	0.0120	40.34	37.49	1.08	8.85	2.50	1.00	3.00	SURCHARGED
22	Pipe - (141)	Pipe	CB-37	CB-36	90.06	1113.61	1112.12	1.6500	30.000	0.0120	40.53	57.16	0.71	12.63	1.56	0.62	0.00	Calculated
23	Pipe - (143)	Pipe	CB-38	CB-37	20.12	1114.06	1113.61	2.2400	30.000	0.0120	10.98	66.45	0.17	10.00	0.69	0.28	0.00	Calculated
24	Pipe - (144)	Pipe	CB-40	CB-38	87.78	1114.72	1114.06	0.7500	30.000	0.0120	10.43	38.53	0.27	6.67	0.89	0.36	0.00	Calculated
25	Pipe - (145)	Pipe	CB-39	CB-40	45.85	1115.41	1115.22	0.4100	12.000	0.0120	2.66	2.48	1.07	3.68	1.00	1.00	84.00	SURCHARGED
26	Pipe - (146)	Pipe	Structure - (220)	CB-40	25.00	1115.00	1114.72	1.1200	30.000	0.0120	8.86	47.03	0.19	7.35	0.73	0.29	0.00	Calculated
27	Pipe - (150)	Pipe	CB20	DarrowBasin	66.96	1116.76	1115.58	1.7600	30.000	0.0120	16.46	58.99	0.28	10.34	0.89	0.36	0.00	Calculated
28	Pipe - (151)	Pipe	Structure - (141)	CB20	20.21	1117.08	1115.56	7.5200	30.000	0.0120	16.06	121.85	0.13	17.24	0.59	0.25	0.00	Calculated
29	Pipe - (154)	Pipe	CB-19	CB-41	120.38	1119.67	1117.36	1.9200	18.000	0.0120	8.67	15.75	0.55	9.12	0.79	0.53	0.00	Calculated
30	Pipe - (156)	Pipe	CB-18	DarrowBasin	61.34	1115.25	1115.25	0.0000	24.000	0.0130	0.99	0.91	1.08	0.33	2.00	1.00	896.00	SURCHARGED
31	Pipe - (157)	Pipe	Structure - (148)	CB-18	189.33	1118.24	1116.45	0.9500	18.000	0.0130	2.19	10.21	0.21	4.61	0.47	0.31	0.00	Calculated
32	Pipe - (159)	Pipe	Structure - (150)	Structure - (148)	199.61	1120.21	1118.24	0.9900	18.000	0.0130	2.20	10.44	0.21	4.69	0.46	0.31	0.00	Calculated
33	Pipe - (162)	Pipe	Structure - (153)	Structure - (150)	215.23	1121.60	1120.21	0.6500	18.000	0.0130	2.21	8.44	0.26	4.04	0.52	0.35	0.00	Calculated
34	Pipe - (164)	Pipe	Structure - (155)	Structure - (153)	199.59	1123.40	1121.60	0.9000	15.000	0.0130	2.22	6.13	0.36	4.62	0.51	0.42	0.00	Calculated
35	Pipe - (166)	Pipe	Structure - (157)	Structure - (155)	299.82	1127.98	1124.98	1.0000	15.000	0.0130	2.23	6.46	0.34	4.82	0.50	0.40	0.00	Calculated
36	Pipe - (167)	Pipe	Structure - (158)	Structure - (157)	210.46	1129.74	1128.23	0.7200	12.000	0.0130	2.24	3.02	0.74	4.27	0.63	0.64	0.00	Calculated
37	Pipe - (168)	Pipe	Structure - (159)	Structure - (158)	84.40	1130.11	1129.74	0.4400	12.000	0.0130	2.26	2.36	0.96	3.50	0.76	0.78	0.00	Calculated
38	Pipe - (171)	Pipe	Structure - (162)	Structure - (159)	25.29	1130.20	1130.11	0.3600	12.000	0.0130	2.29	2.13	1.08	3.14	1.00	1.00	32.00	SURCHARGED
39	Pipe - (172)	Pipe	CB-17	Structure - (162)	60.26	1130.84	1129.91	1.5400	12.000	0.0120	0.90	3.98	0.23	4.09	0.32	0.32	0.00	Calculated
40	Pipe - (173)	Pipe	Structure - (164)	Structure - (162)	75.12	1130.39	1129.91	0.6400	12.000	0.0130	1.94	1.79	1.08	2.59	1.00	1.00	715.00	SURCHARGED
41	Pipe - (174)	Pipe	CB 16	MarwellBasin	44.65	1131.94	1130.59	3.0200	24.000	0.0130	42.39	39.34	1.08	14.45	2.00	1.00	20.00	SURCHARGED
42	Pipe - (208)	Pipe	CB-41	Structure - (220)	212.53	1117.36	1115.00	1.1100	30.000	0.0130	8.86	43.25	0.20	6.93	0.77	0.31	0.00	Calculated
43	Pipe - (209)	Pipe	CB-15	CB-14	24.77	1113.00	1112.76	0.9700	12.000	0.0130	1.88	3.51	0.54	4.54	0.52	0.52	0.00	Calculated
44	Pipe - (211)	Pipe	CB-14	CB-13	169.78	1112.69	1110.73	1.1500	12.000	0.0130	1.98	3.83	0.52	4.92	0.51	0.51	0.00	Calculated
45	Pipe - (212)	Pipe	CB-11	CB-12	38.45	1111.47	1111.47	0.0000	21.000	0.0120	0.95	0.88	1.08	0.43	1.75	1.00	279.00	SURCHARGED

Link Summary

SN	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
46	Pipe - (213)	Pipe	CB-10	CB-11	71.86	1111.47	1111.47	0.0000	21.000	0.0120	0.69	0.64	1.08	0.31	1.75	1.00	166.00	SURCHARGED
47	Pipe - (216)	Pipe	CB-9	CB-10	4.63	1111.47	1111.47	0.0000	18.000	0.0120	0.63	1.67	0.38	0.88	0.64	0.43	0.00	Calculated
48	Pipe - (217)	Pipe	CB-8	CB-10	140.54	1111.86	1111.47	0.2800	18.000	0.0120	2.86	5.99	0.48	3.37	0.73	0.49	0.00	Calculated
49	Pipe - (218)	Pipe	CB-7	CB-8	2.83	1111.90	1111.90	0.0000	12.000	0.0130	0.72	0.67	1.08	0.98	1.00	1.00	12.00	SURCHARGED
50	Pipe - (219)	Pipe	CB-5	CB-8	130.31	1112.31	1111.86	0.3500	12.000	0.0130	2.26	2.09	1.08	3.21	1.00	1.00	32.00	SURCHARGED
51	Pipe - (220)	Pipe	CB-6	CB-5	63.99	1113.00	1112.73	0.4200	12.000	0.0130	1.73	2.31	0.75	3.24	0.64	0.64	0.00	Calculated
52	Pipe - (221)	Pipe	CB-4	CB-5	79.13	1113.04	1112.73	0.3900	12.000	0.0130	2.41	2.23	1.08	3.43	1.00	1.00	17.00	SURCHARGED
53	Pipe - (222)	Pipe	CB-3	CB-4	4.10	1113.87	1113.13	18.0300	12.000	0.0130	0.78	15.13	0.05	10.14	0.15	0.15	0.00	Calculated
54	Pipe - (223)	Pipe	CB-2	CB-4	121.11	1114.03	1113.13	0.7400	12.000	0.0130	2.09	3.07	0.68	4.22	0.60	0.61	0.00	Calculated
55	Pipe - (224)	Pipe	CB-1	CB-2	67.59	1115.20	1115.20	0.0000	12.000	0.0130	0.15	0.14	1.08	0.21	1.00	1.00	132.00	SURCHARGED
56	Pipe - (225)	Pipe	CB-23	Out-1Pipe - (225)	124.01	1128.07	1127.00	0.8700	12.000	0.0130	3.59	3.32	1.08	4.93	1.00	1.00	306.00	SURCHARGED
57	Pipe - (230)	Pipe	CB-32	Out-1Pipe - (230)	175.91	1111.54	1111.36	0.1000	36.000	0.0130	0.76	21.34	0.04	1.44	0.39	0.13	0.00	Calculated
58	Pipe_12-CR	Pipe	CB-12	CreekInv	24.83	1111.47	1109.85	6.5200	21.000	0.0130	1.45	40.47	0.04	7.96	0.23	0.13	0.00	Calculated
59	Pipe_13-CR	Pipe	CB-13	CreekInv	21.92	1110.73	1110.70	0.1400	12.000	0.0130	1.41	1.32	1.07	1.96	1.00	1.00	36.00	SURCHARGED
60	Pipe_M2-CR	Pipe	MH-2	CreekInv	64.02	1109.54	1109.24	0.4700	36.000	0.0120	46.60	49.46	0.94	8.02	2.26	0.77	0.00	Calculated
61	Creek	Channel	CreekInv	CreekOut	1106.59	1109.24	1106.56	0.2400	18.000	0.0250	10.87	10.87	1.00	2.42	1.50	1.00	684.00	
62	Ditch3	Channel	Ditch1	CB-19	179.15	1121.99	1119.92	1.1600	12.000	0.0320	20.73	20.73	1.00	3.78	1.00	1.00	79.00	
63	Link-06	Channel	Out-1Pipe - (225)	CB-24	159.58	1127.00	1125.47	0.9600	12.000	0.0320	3.68	33.22	0.11	1.90	0.29	0.29	0.00	
64	Link-07	Channel	5-Jun	Ditch1	1834.55	1136.54	1121.99	0.7900	12.000	0.0320	18.23	18.23	1.00	3.44	1.00	1.00	47.00	
65	D3	Orifice	DarrowBasin	CB-39		1115.25	1115.41		3.000	0.46								
66	D4	Orifice	DarrowBasin	CB-39		1115.25	1115.41		4.000	0.68								
67	DG	Orifice	DarrowBasin	CB-39		1115.25	1115.41		23.000	2.13								
68	M8	Orifice	MarwellBasin	Structure - (164)		1130.39	1130.39		8.000	3.72								
69	MG	Orifice	MarwellBasin	Structure - (164)		1130.39	1130.39		23.000	7.70								
70	TO1.25	Orifice	TwinOaksPond	CB-22		1123.50	1123.13		1.250	0.09								
71	TO18	Orifice	TwinOaksPond	CB-22		1123.50	1123.13		18.000	15.94								
72	TOG	Orifice	TwinOaksPond	CB-22		1123.50	1123.13		23.000	7.64								
73	Darrow	Weir	DarrowBasin	CB-38		1115.25	1114.06			7.51								
74	Marwell	Weir	MarwellBasin	Structure - (162)		1130.39	1130.20			0.00								
75	Marwell2	Weir	MarwellBasin	5-Jun		1130.39	1136.54			0.00								
76	TwinOaksPondOF	Weir	TwinOaksPond	Out-01		1123.50	1125.00			10.89								

Subbasin Hydrology

Subbasin : Ditch 1a

Input Data

Area (ac) 22.56
Peak Rate Factor 0
Weighted Curve Number 76.94
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	22.56	-	76.94
Composite Area & Weighted CN	22.56		76.94

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	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.5	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.88	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.05	0	0
Computed Flow Time (min) :	30.38	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	835.23	0	0
Slope (%) :	2	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.28	0	0
Computed Flow Time (min) :	6.11	0	0

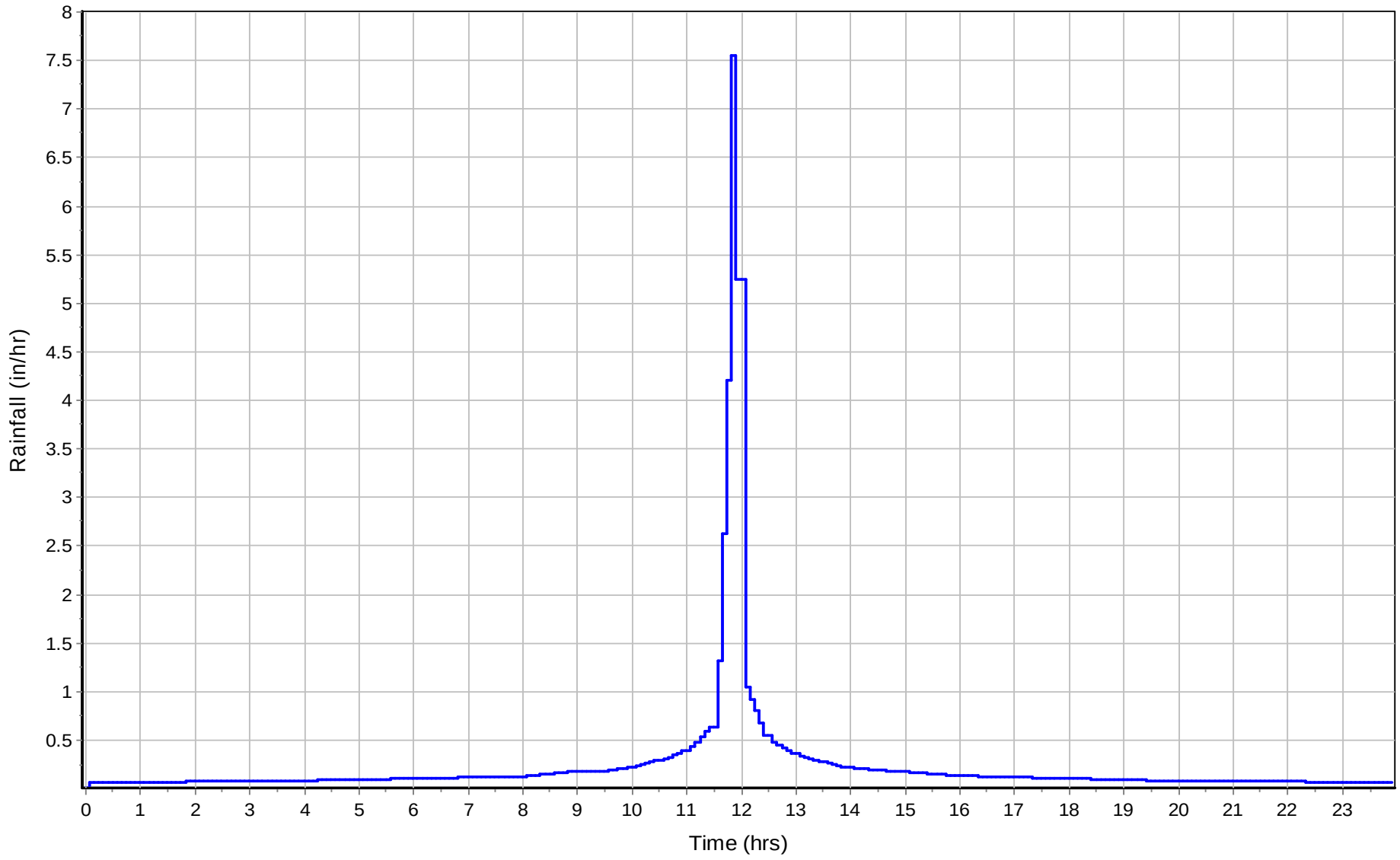
Total TOC (min) 36.49

Subbasin Runoff Results

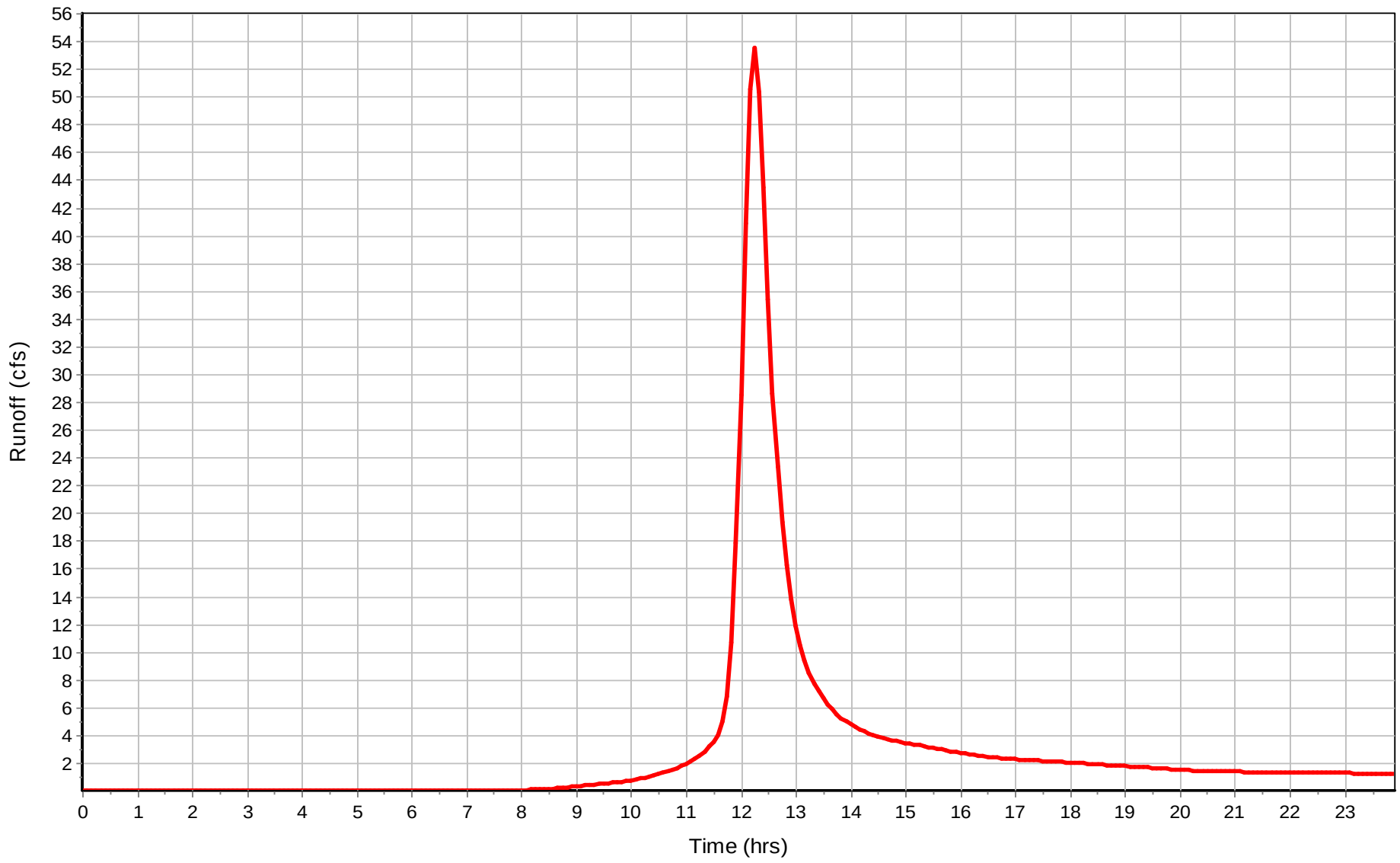
Total Rainfall (in)	5.5
Total Runoff (in)	3.04
Peak Runoff (cfs)	53.59
Weighted Curve Number	76.94
Time of Concentration (days hh:mm:ss)	0 00:36:29

Subbasin : Ditch 1a

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Ditch 1b

Input Data

Area (ac)	14.96
Peak Rate Factor	0
Weighted Curve Number	79.61
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	14.96	-	79.61
Composite Area & Weighted CN	14.96		79.61

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.5	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.64	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.05	0	0
Computed Flow Time (min) :	32.09	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1255.16	0	0
Slope (%) :	1.3	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.84	0	0
Computed Flow Time (min) :	11.37	0	0

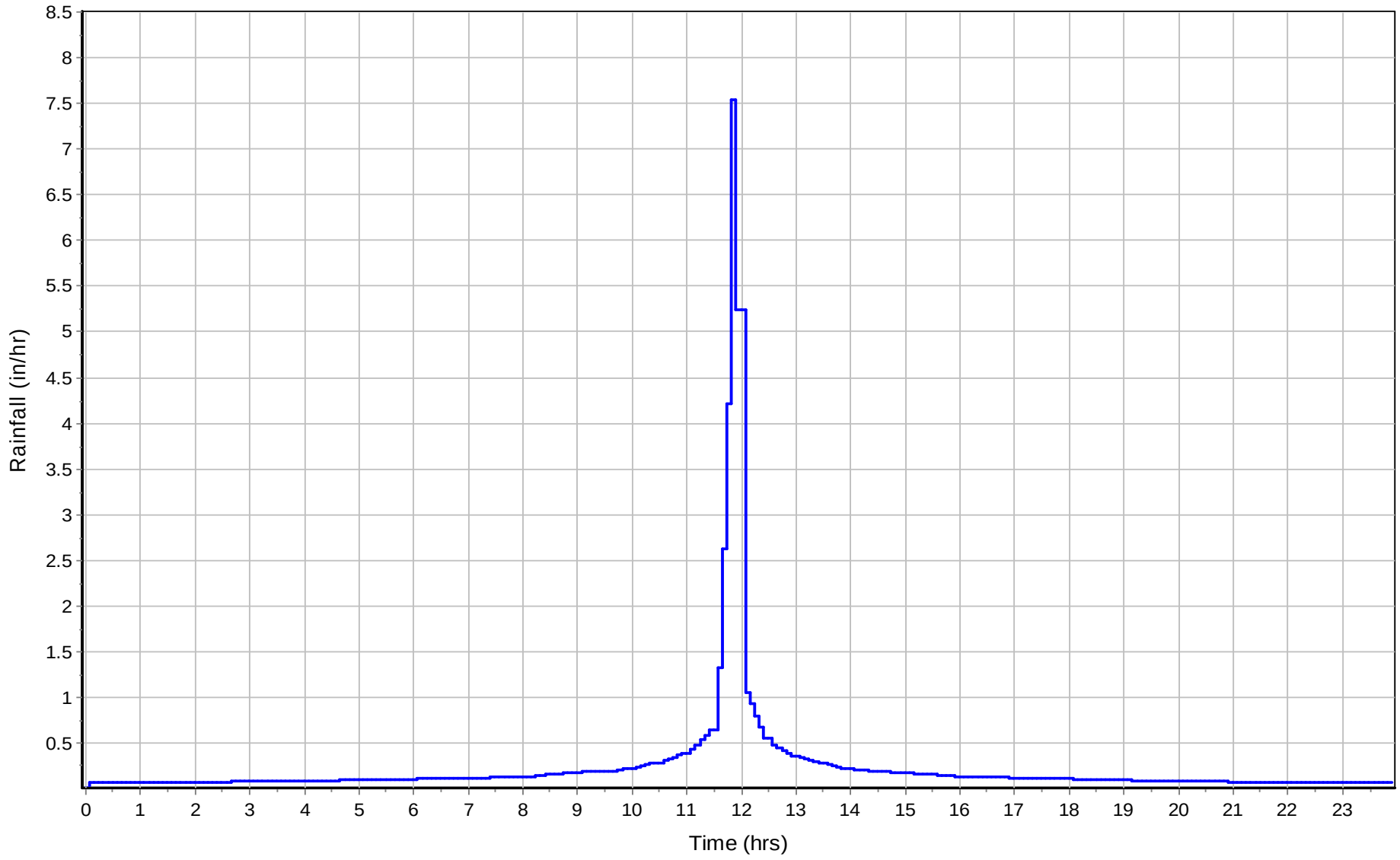
Total TOC (min) 43.46

Subbasin Runoff Results

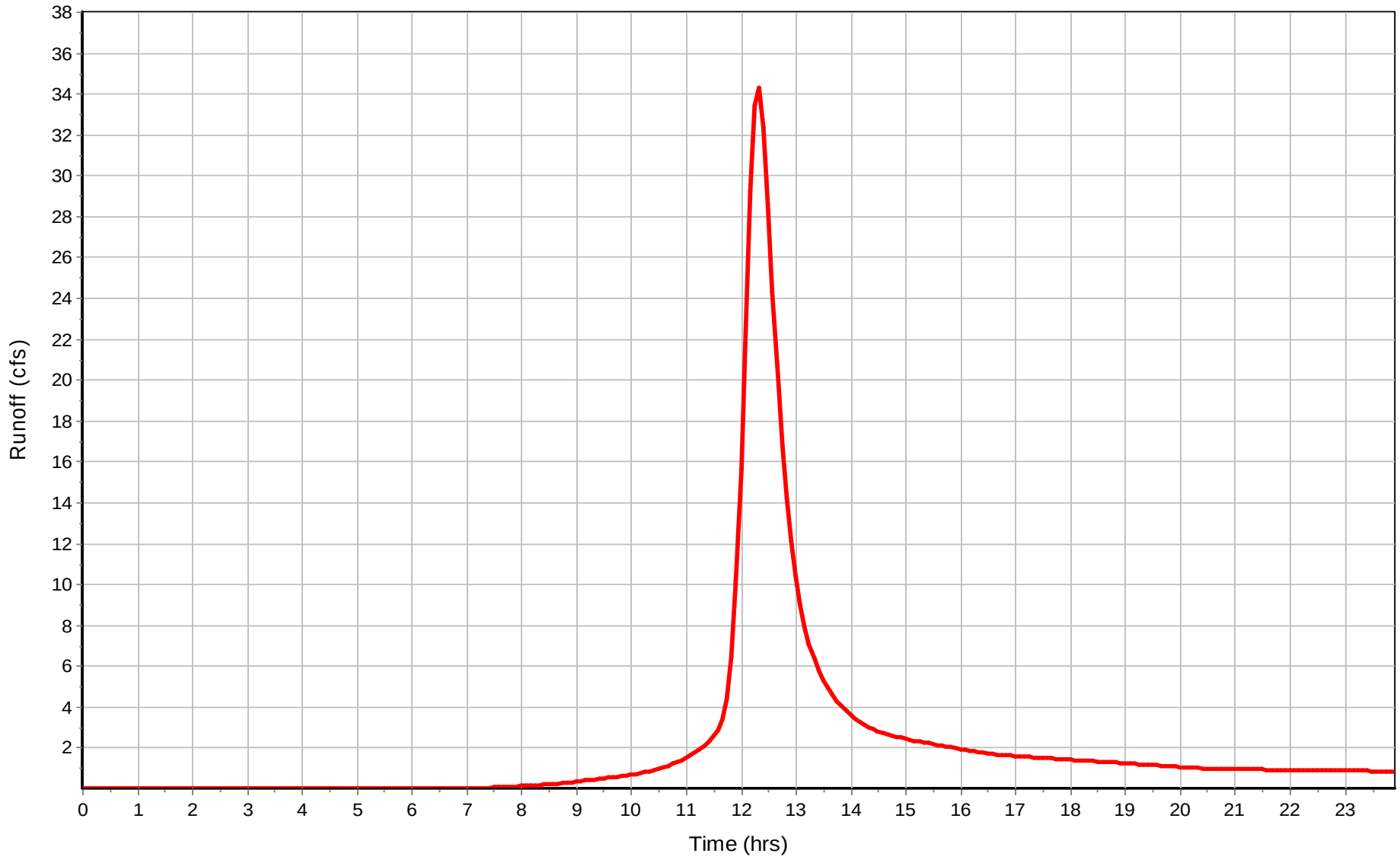
Total Rainfall (in)	5.5
Total Runoff (in)	3.3
Peak Runoff (cfs)	34.34
Weighted Curve Number	79.61
Time of Concentration (days hh:mm:ss)	0 00:43:28

Subbasin : Ditch 1b

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubBasin1

Input Data

Area (ac)	2.18
Peak Rate Factor	0
Weighted Curve Number	88.34
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	2.18	-	88.34
Composite Area & Weighted CN	2.18		88.34

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	17.19	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	193.12	0	0
Slope (%) :	6.16	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	4	0	0
Computed Flow Time (min) :	0.8	0	0

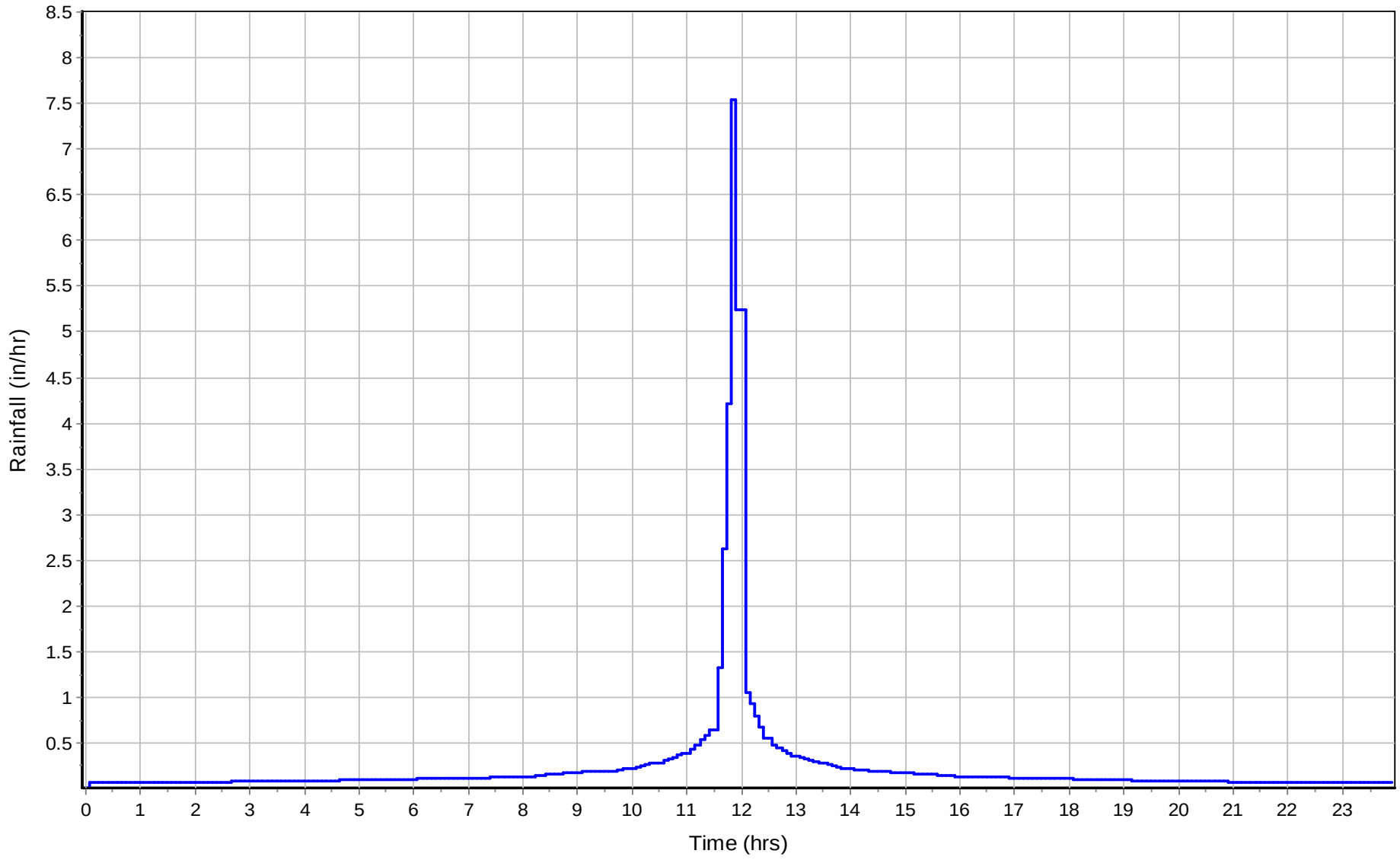
Total TOC (min) 17.99

Subbasin Runoff Results

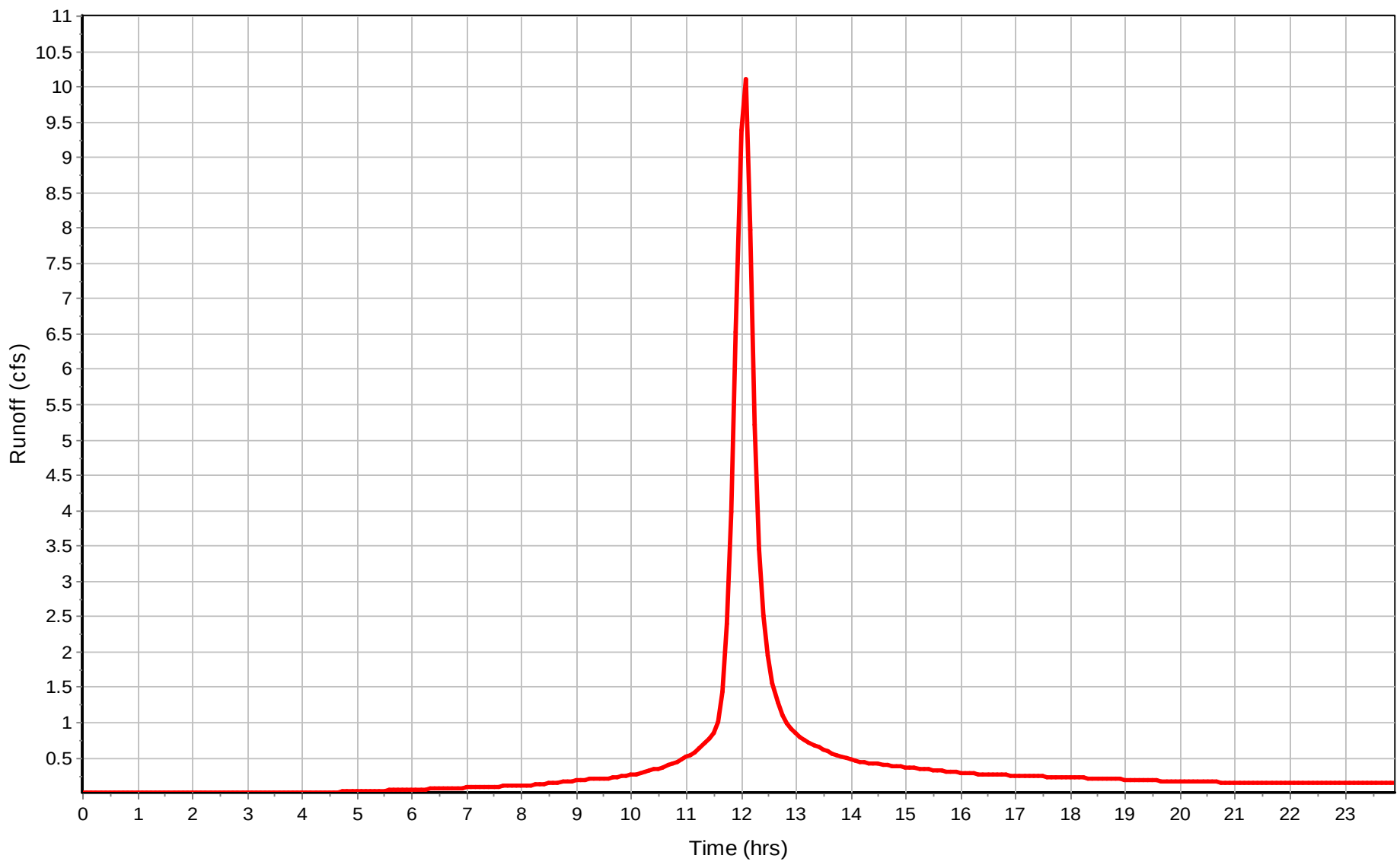
Total Rainfall (in)	5.5
Total Runoff (in)	4.18
Peak Runoff (cfs)	10.21
Weighted Curve Number	88.34
Time of Concentration (days hh:mm:ss)	0 00:17:59

Subbasin : SubBasin1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-1

Input Data

Area (ac)	0.49
Peak Rate Factor	0
Weighted Curve Number	89.57
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.49	-	89.57
Composite Area & Weighted CN	0.49		89.57

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.68	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	26.59	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	229.69	0	0
Slope (%) :	0.75	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.4	0	0
Computed Flow Time (min) :	2.73	0	0

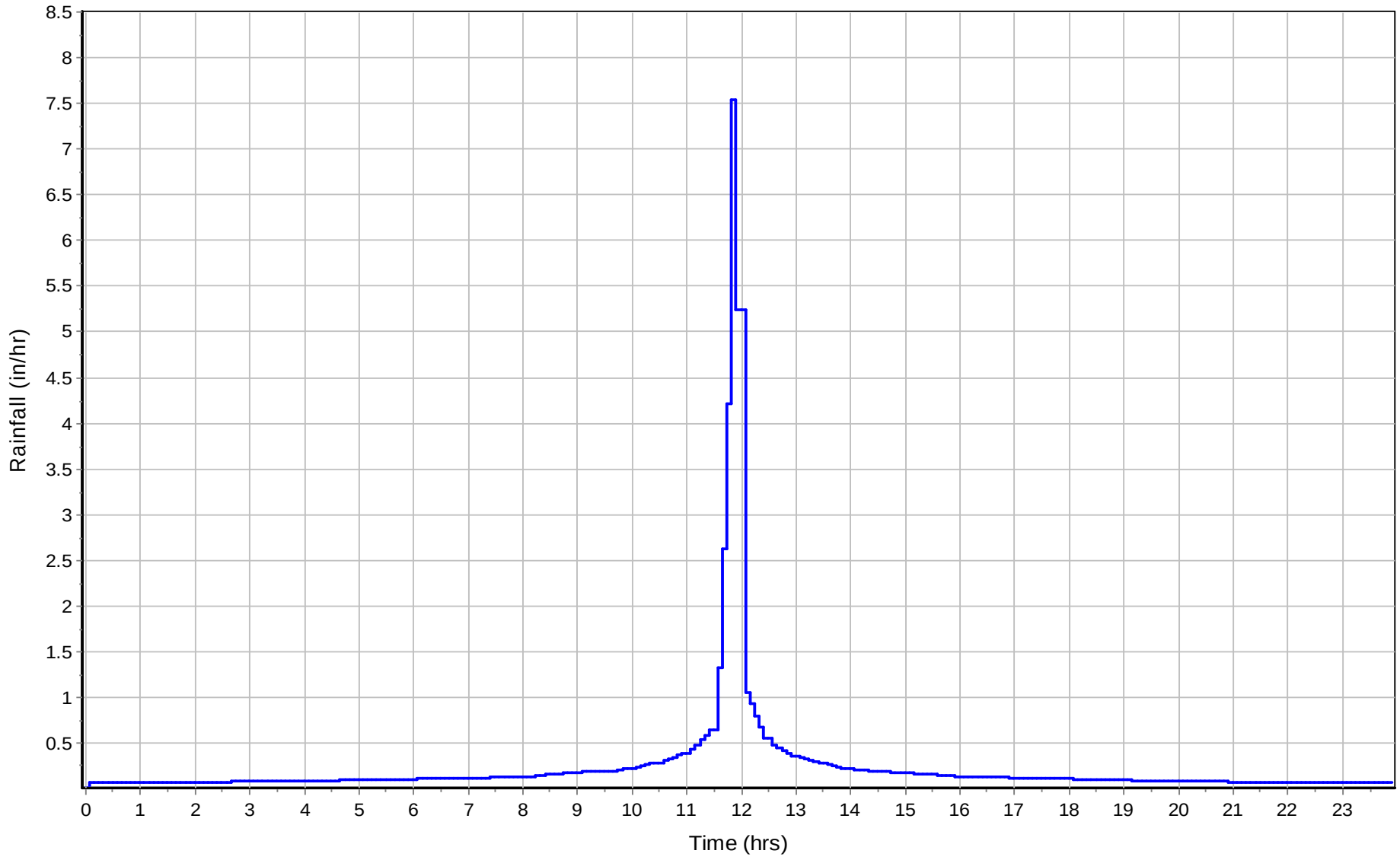
Total TOC (min) 29.32

Subbasin Runoff Results

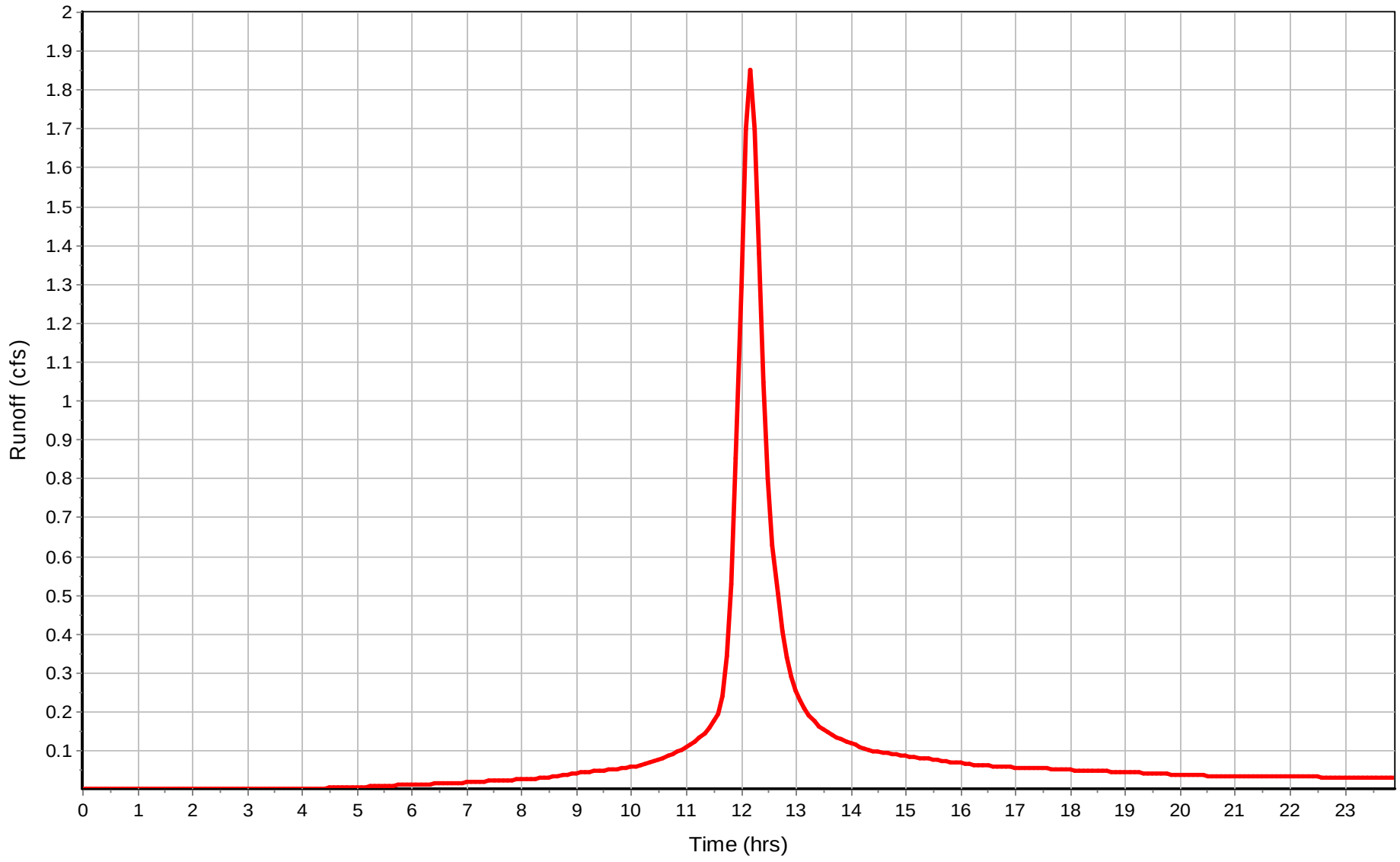
Total Rainfall (in)	5.5
Total Runoff (in)	4.31
Peak Runoff (cfs)	1.85
Weighted Curve Number	89.57
Time of Concentration (days hh:mm:ss)	0 00:29:19

Subbasin : SubCB-1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-10

Input Data

Area (ac) 0.1
Peak Rate Factor 0
Weighted Curve Number 80
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.1	-	80
Composite Area & Weighted CN	0.1		80

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	96.18	0	0
Slope (%) :	1.87	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	24.69	0	0

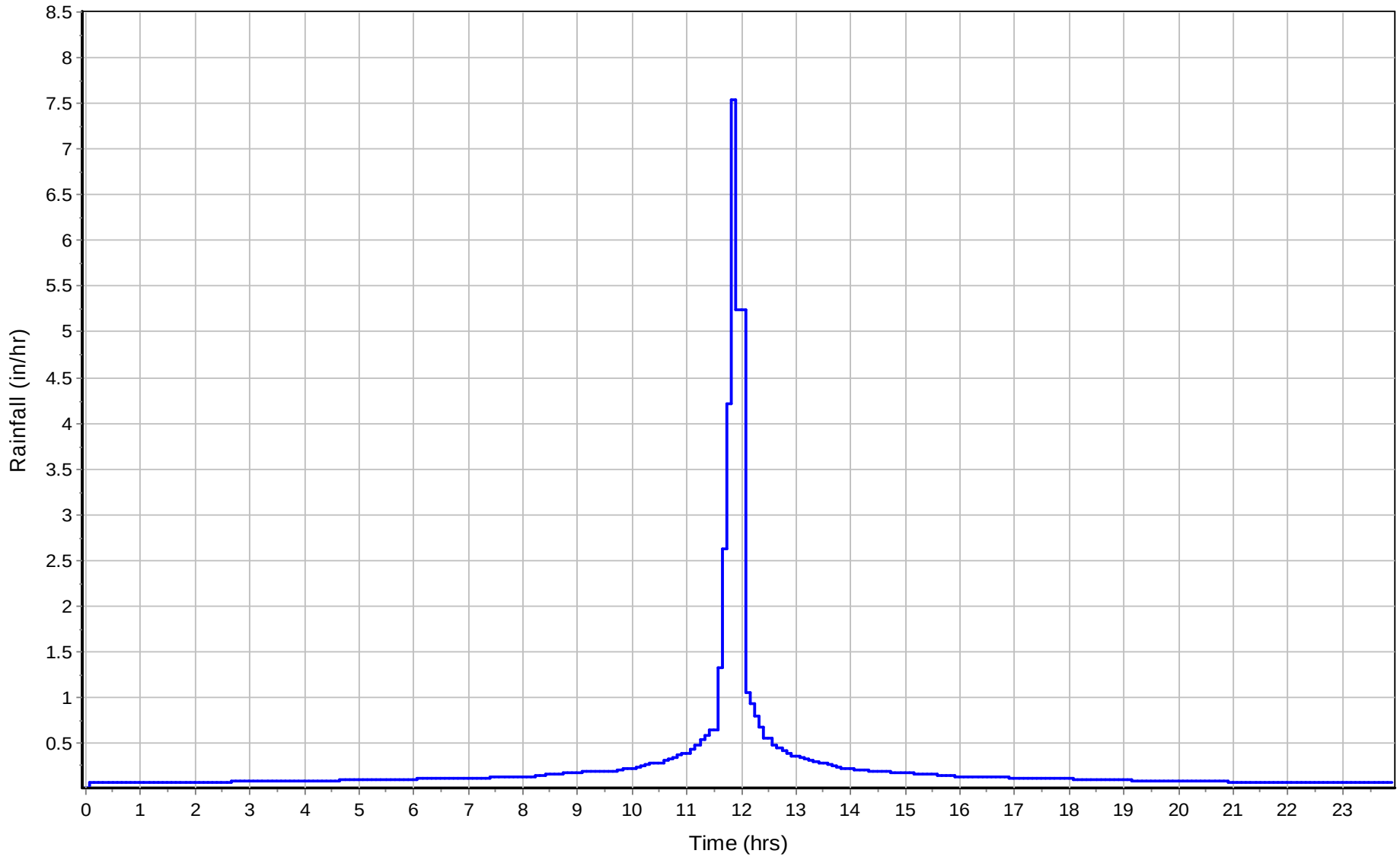
Total TOC (min) 24.69

Subbasin Runoff Results

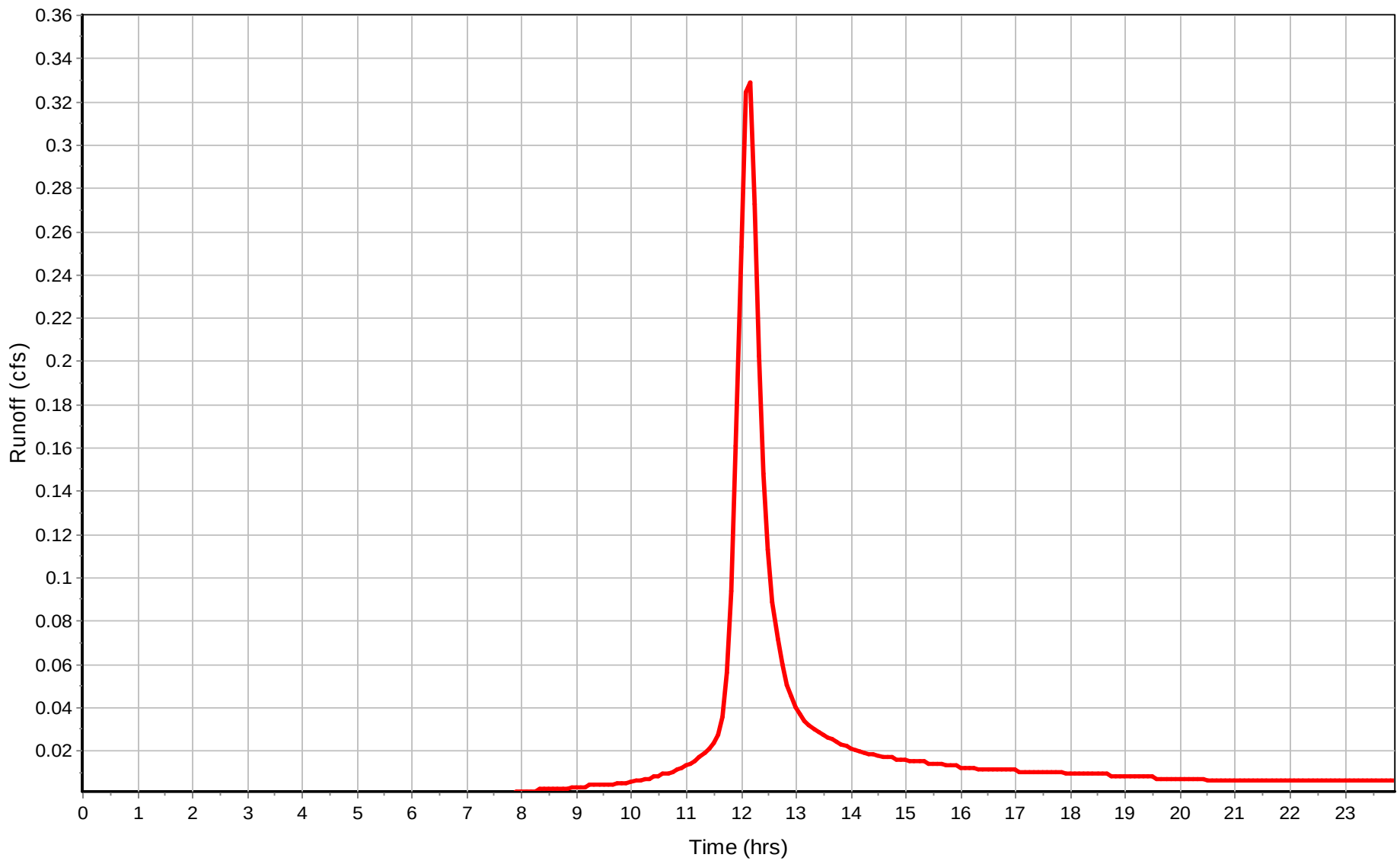
Total Rainfall (in) 5.5
Total Runoff (in) 3.33
Peak Runoff (cfs) 0.34
Weighted Curve Number 80
Time of Concentration (days hh:mm:ss) 0 00:24:41

Subbasin : SubCB-10

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-11

Input Data

Area (ac) 2.67
Peak Rate Factor 0
Weighted Curve Number 91.64
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	2.67	-	91.64
Composite Area & Weighted CN	2.67		91.64

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.6	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	8.07	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	19.63	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	55.85	0	0
Slope (%) :	1.67	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.63	0	0
Computed Flow Time (min) :	0.35	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0	0
Flow Length (ft) :	410	0	0
Channel Slope (%) :	1	0	0
Cross Section Area (ft^2) :	3.14	0	0
Wetted Perimeter (ft) :	6.3	0	0
Velocity (ft/sec) :	7.81	0	0
Computed Flow Time (min) :	0.88	0	0

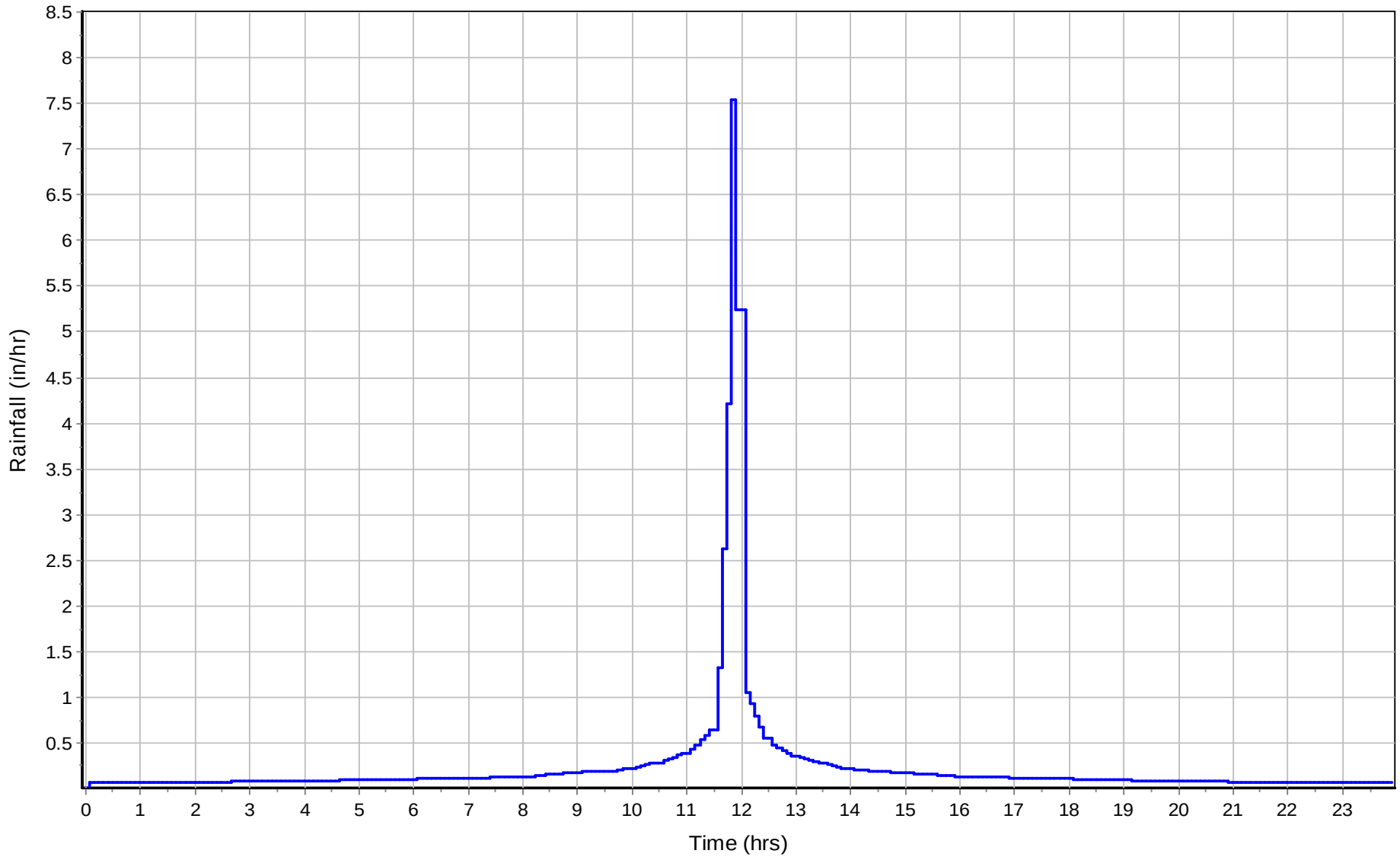
Total TOC (min) 20.86

Subbasin Runoff Results

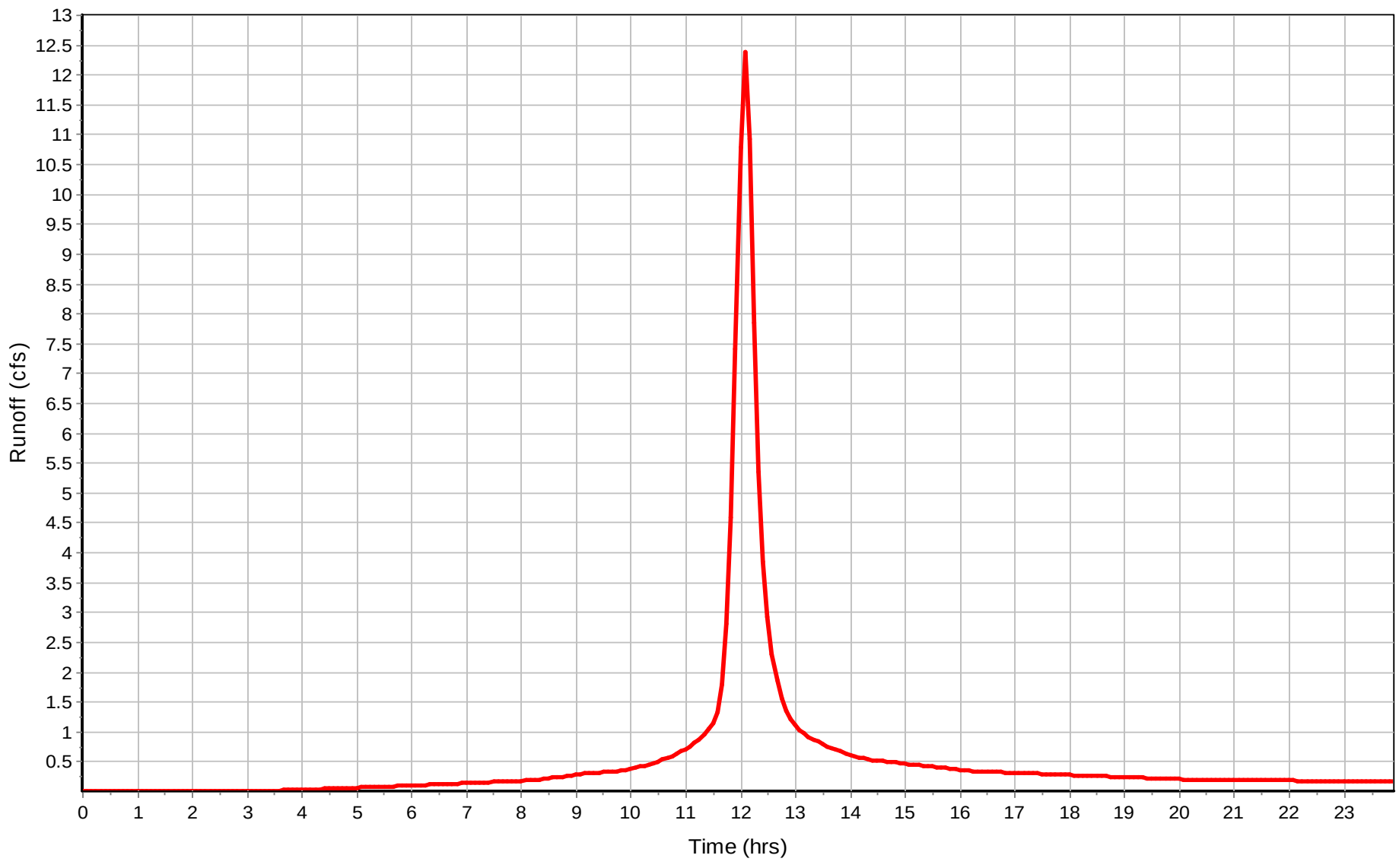
Total Rainfall (in) 5.5
Total Runoff (in) 4.54
Peak Runoff (cfs) 12.39
Weighted Curve Number 91.64
Time of Concentration (days hh:mm:ss) 0 00:20:52

Subbasin : SubCB-11

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-12

Input Data

Area (ac)	0.08
Peak Rate Factor	0
Weighted Curve Number	93.73
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.08	-	93.73
Composite Area & Weighted CN	0.08		93.73

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	92.29	0	0
Slope (%) :	0.65	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.81	0	0
Computed Flow Time (min) :	1.91	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	35.61	0	0
Slope (%) :	0.65	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	1.64	0	0
Computed Flow Time (min) :	0.36	0	0

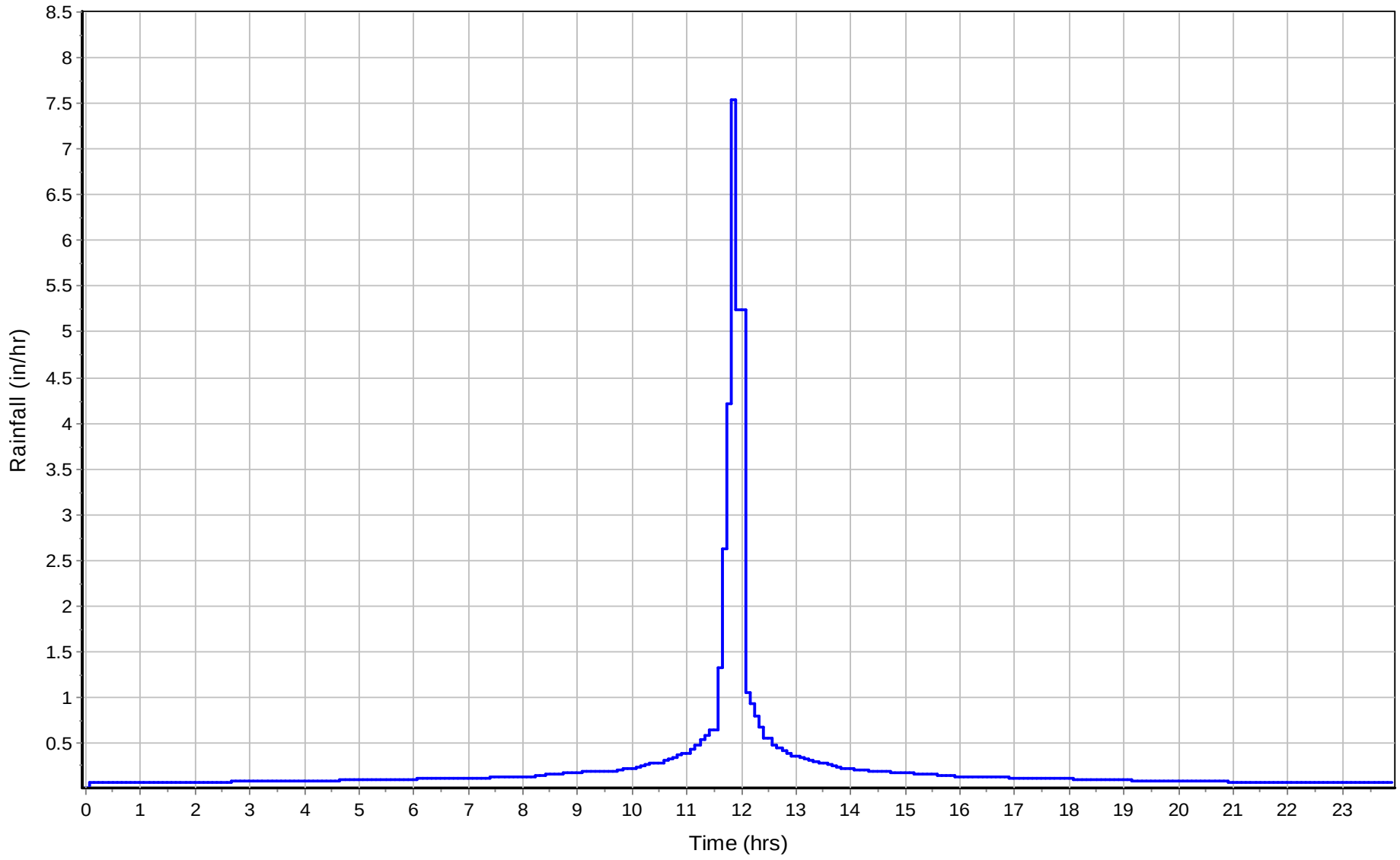
Total TOC (min) 2.27

Subbasin Runoff Results

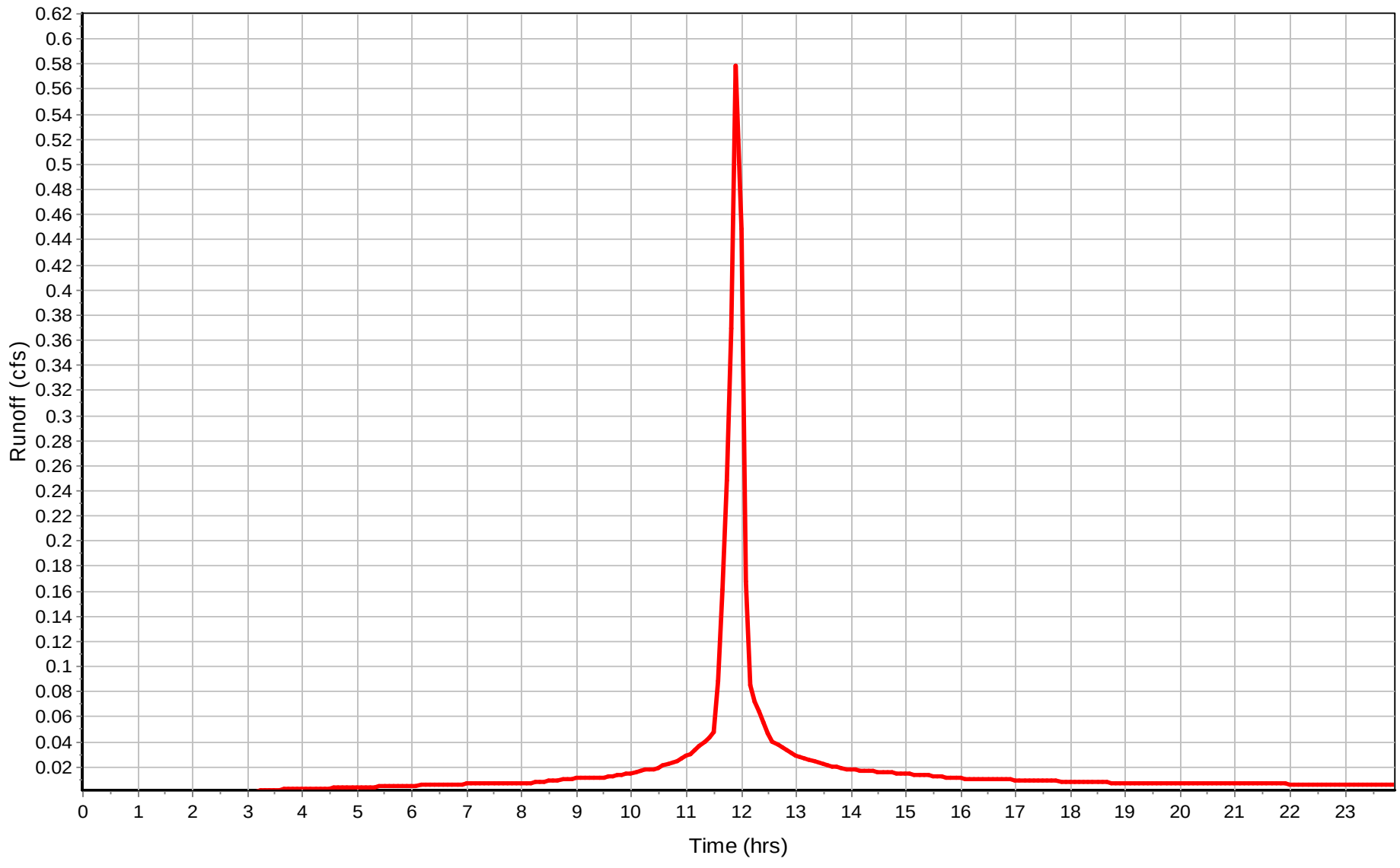
Total Rainfall (in)	5.5
Total Runoff (in)	4.77
Peak Runoff (cfs)	0.58
Weighted Curve Number	93.73
Time of Concentration (days hh:mm:ss)	0 00:02:16

Subbasin : SubCB-12

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-13

Input Data

Area (ac)	0.13
Peak Rate Factor	0
Weighted Curve Number	92.87
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.13	-	92.87
Composite Area & Weighted CN	0.13		92.87

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	47.56	0	0
Slope (%) :	1.64	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1.02	0	0
Computed Flow Time (min) :	0.77	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	136.04	0	0
Slope (%) :	0.73	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	1.74	0	0
Computed Flow Time (min) :	1.3	0	0

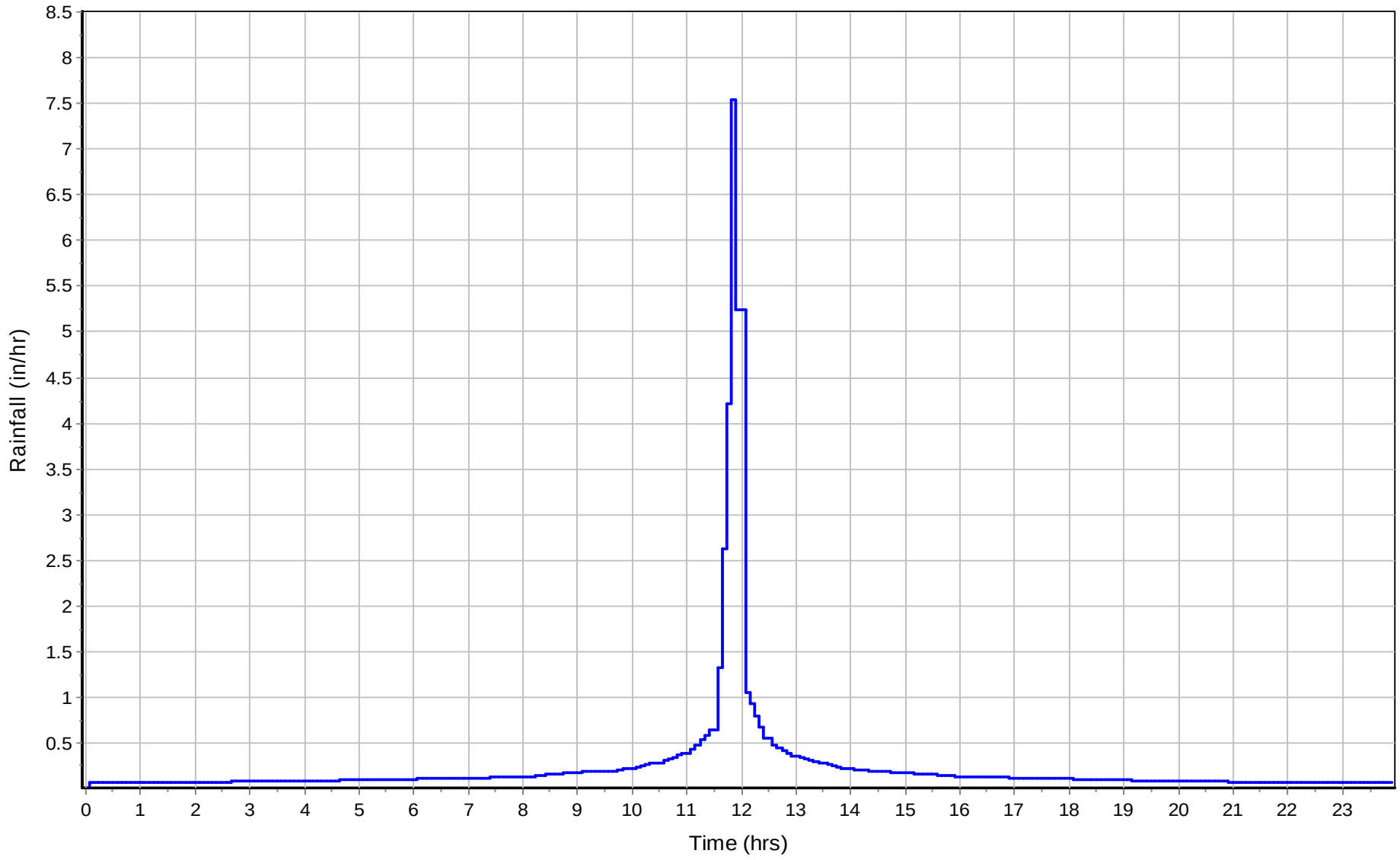
Total TOC (min) 2.08

Subbasin Runoff Results

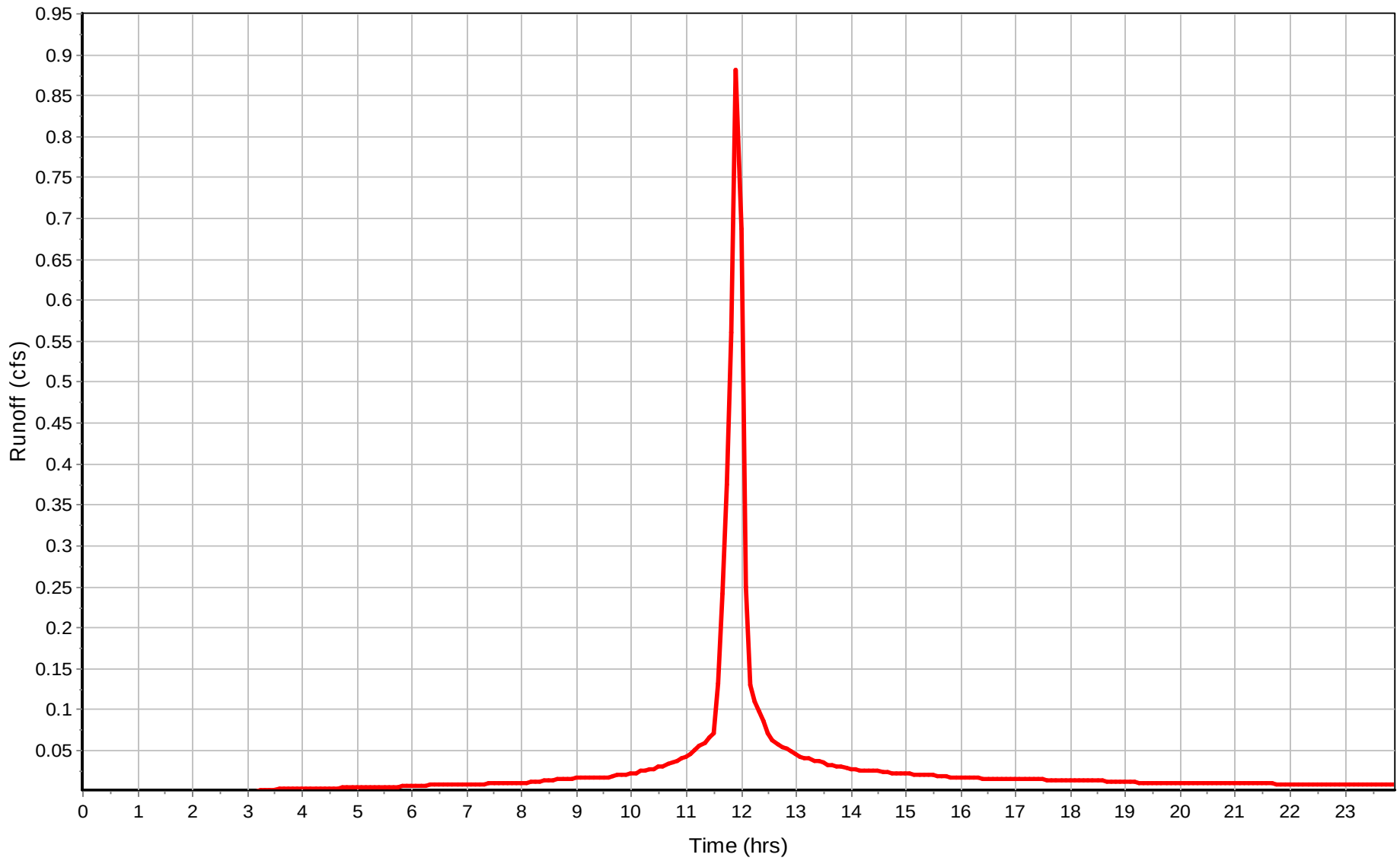
Total Rainfall (in)	5.5
Total Runoff (in)	4.67
Peak Runoff (cfs)	0.88
Weighted Curve Number	92.87
Time of Concentration (days hh:mm:ss)	0 00:02:05

Subbasin : SubCB-13

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-14

Input Data

Area (ac)		0.04
Peak Rate Factor		0
Weighted Curve Number		86.26
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.04	-	86.26
Composite Area & Weighted CN	0.04		86.26

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	99.71	0	0
Slope (%) :	0.43	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.04	0	0
Computed Flow Time (min) :	45.75	0	0

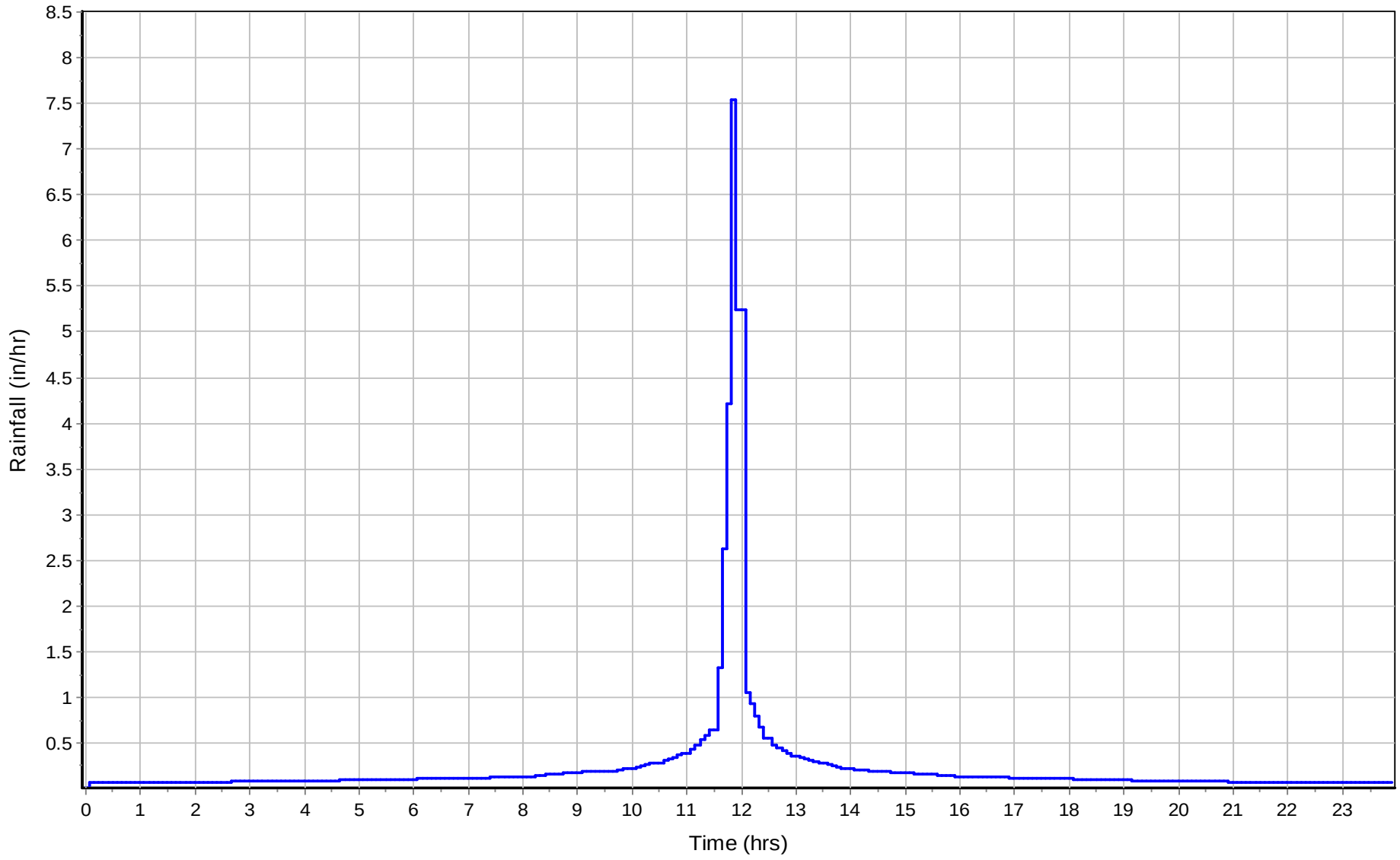
Total TOC (min) 45.75

Subbasin Runoff Results

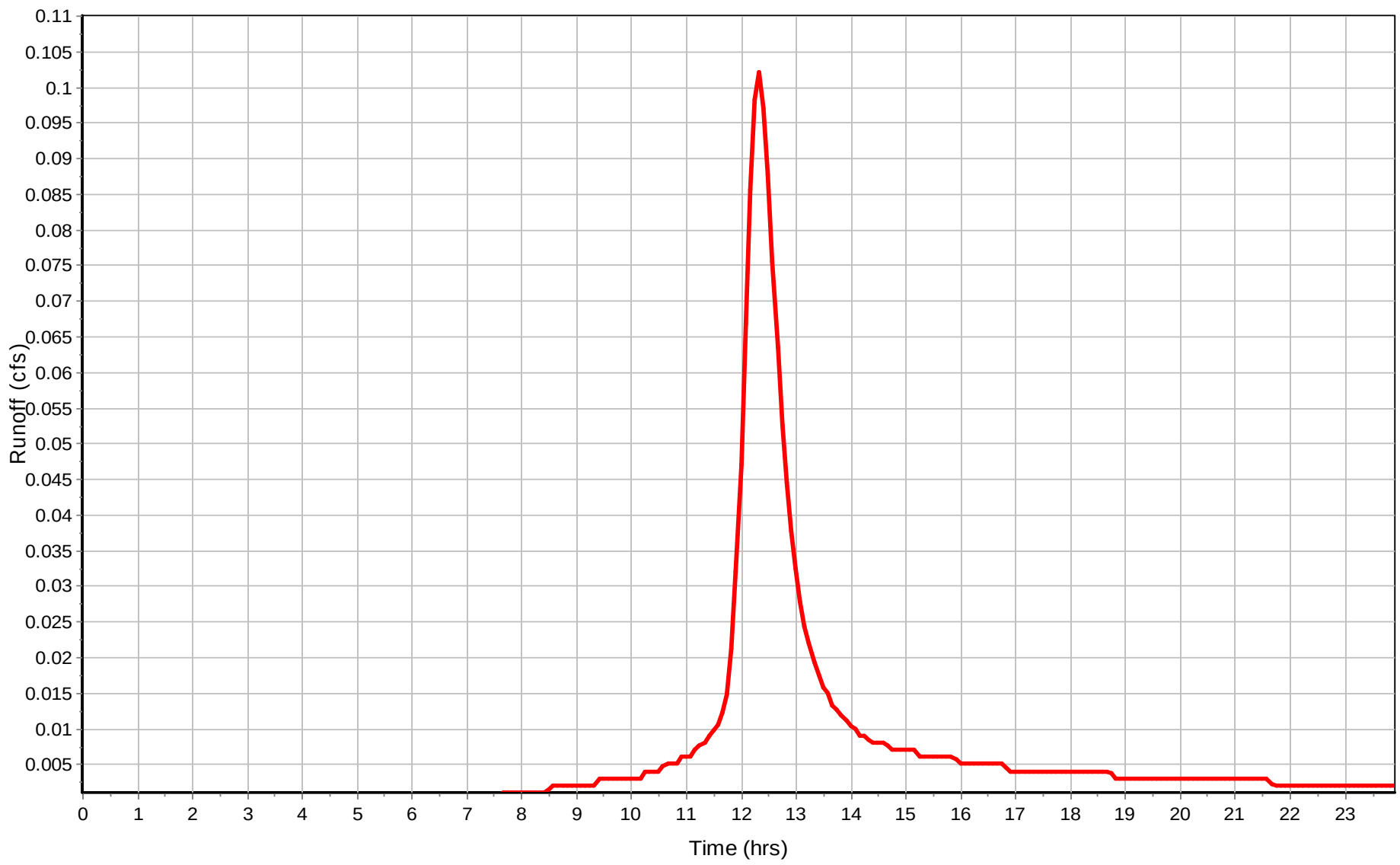
Total Rainfall (in)	5.5
Total Runoff (in)	3.93
Peak Runoff (cfs)	0.1
Weighted Curve Number	86.26
Time of Concentration (days hh:mm:ss)	0 00:45:45

Subbasin : SubCB-14

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-15

Input Data

Area (ac)		0.67
Peak Rate Factor		0
Weighted Curve Number		82.45
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.67	-	82.45
Composite Area & Weighted CN	0.67		82.45

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0.4	0
Flow Length (ft) :	100	32.18	0
Slope (%) :	0.79	1.78	0
2 yr, 24 hr Rainfall (in) :	2.4	2.4	0
Velocity (ft/sec) :	0.05	0.05	0
Computed Flow Time (min) :	35.95	10.49	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	39.46	0	0
Slope (%) :	4.59	0	0
Surface Type :	Grassed waterway	Unpaved	Unpaved
Velocity (ft/sec) :	3.21	0	0
Computed Flow Time (min) :	0.2	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0	0.03	0
Flow Length (ft) :	0	186.76	0
Channel Slope (%) :	0	1.157	0
Cross Section Area (ft^2) :	0	4	0
Wetted Perimeter (ft) :	0	6.472	0
Velocity (ft/sec) :	0	3.88	0
Computed Flow Time (min) :	0	0.8	0

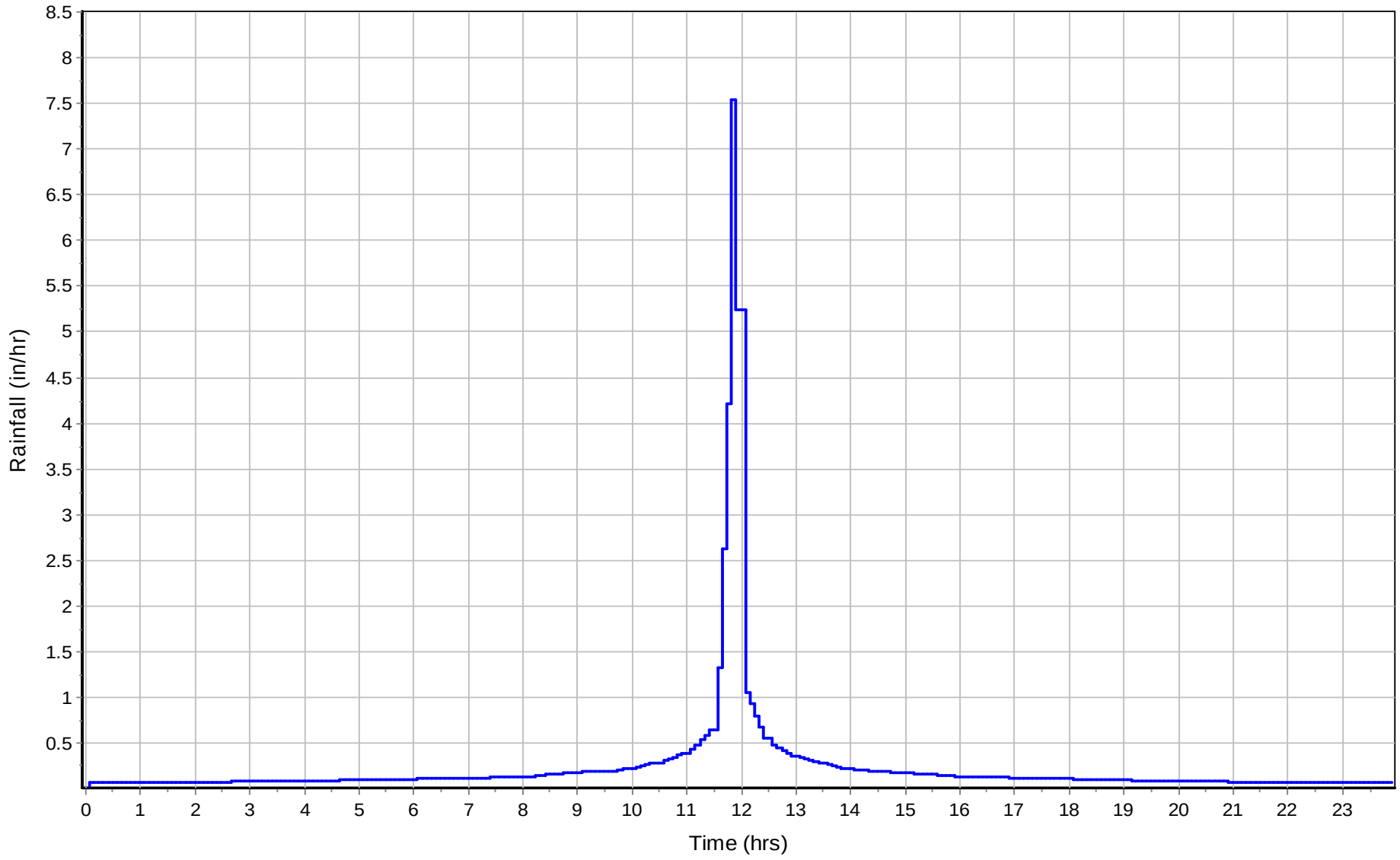
Total TOC (min) 36.16

Subbasin Runoff Results

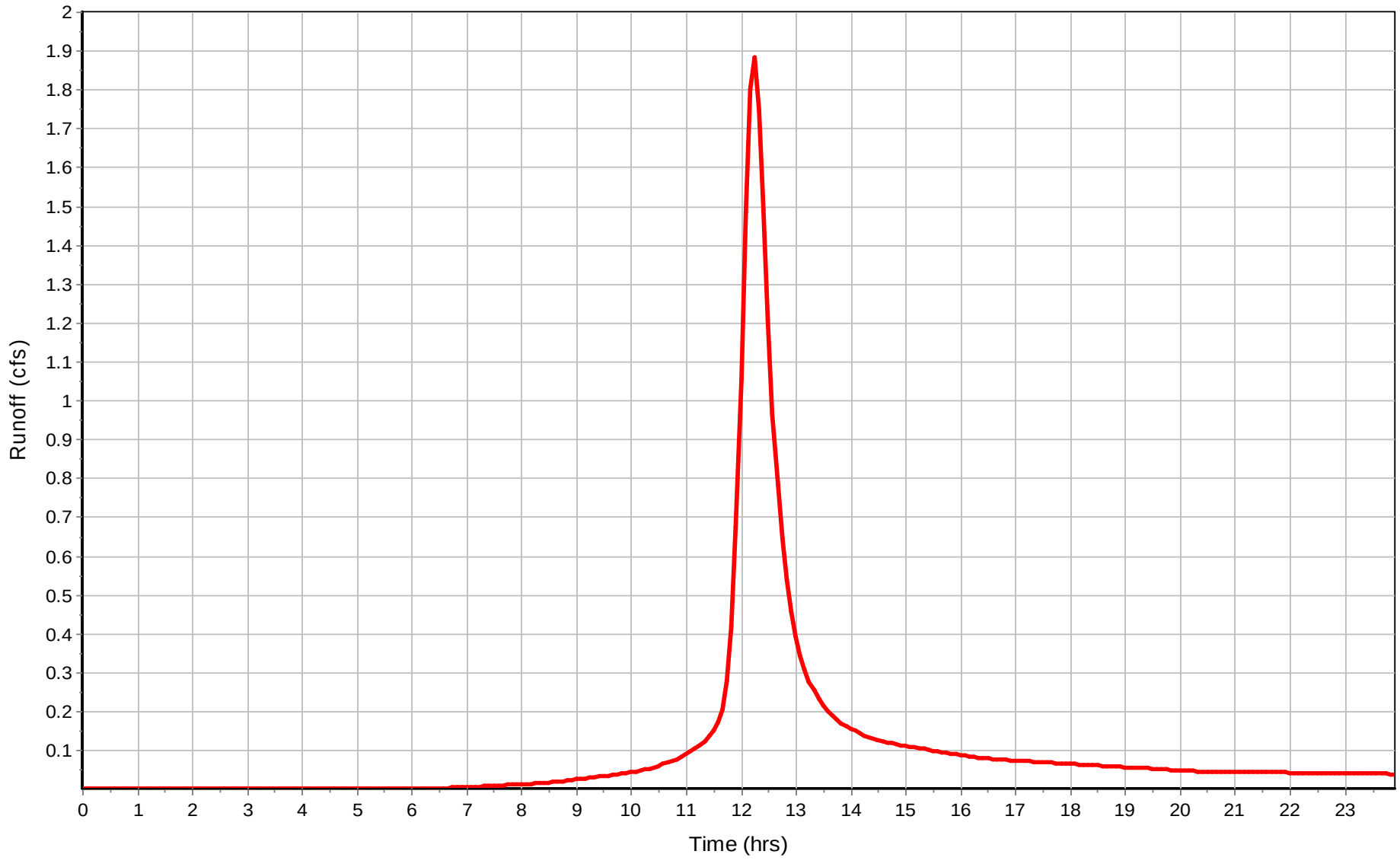
Total Rainfall (in)		5.5
Total Runoff (in)		3.57
Peak Runoff (cfs)		1.89
Weighted Curve Number		82.45
Time of Concentration (days hh:mm:ss)	0 00:36:10	

Subbasin : SubCB-15

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-16

Input Data

Area (ac)		19.34
Peak Rate Factor		0
Weighted Curve Number		85.73
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	19.34	-	85.73
Composite Area & Weighted CN	19.34		85.73

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0.4	0
Flow Length (ft) :	100	100	0
Slope (%) :	0.53	1.94	0
2 yr, 24 hr Rainfall (in) :	2.4	2.4	0
Velocity (ft/sec) :	0.04	0.07	0
Computed Flow Time (min) :	42.18	25.1	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	14	295.22	0
Slope (%) :	7.143	1.87	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	4.31	2.21	0
Computed Flow Time (min) :	0.05	2.23	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.013	0.013	0
Flow Length (ft) :	2168.38	769.29	0
Channel Slope (%) :	1.02	1.68	0
Cross Section Area (ft^2) :	7.069	12.566	0
Wetted Perimeter (ft) :	9.425	12.566	0
Velocity (ft/sec) :	9.56	14.86	0
Computed Flow Time (min) :	3.78	0.86	0

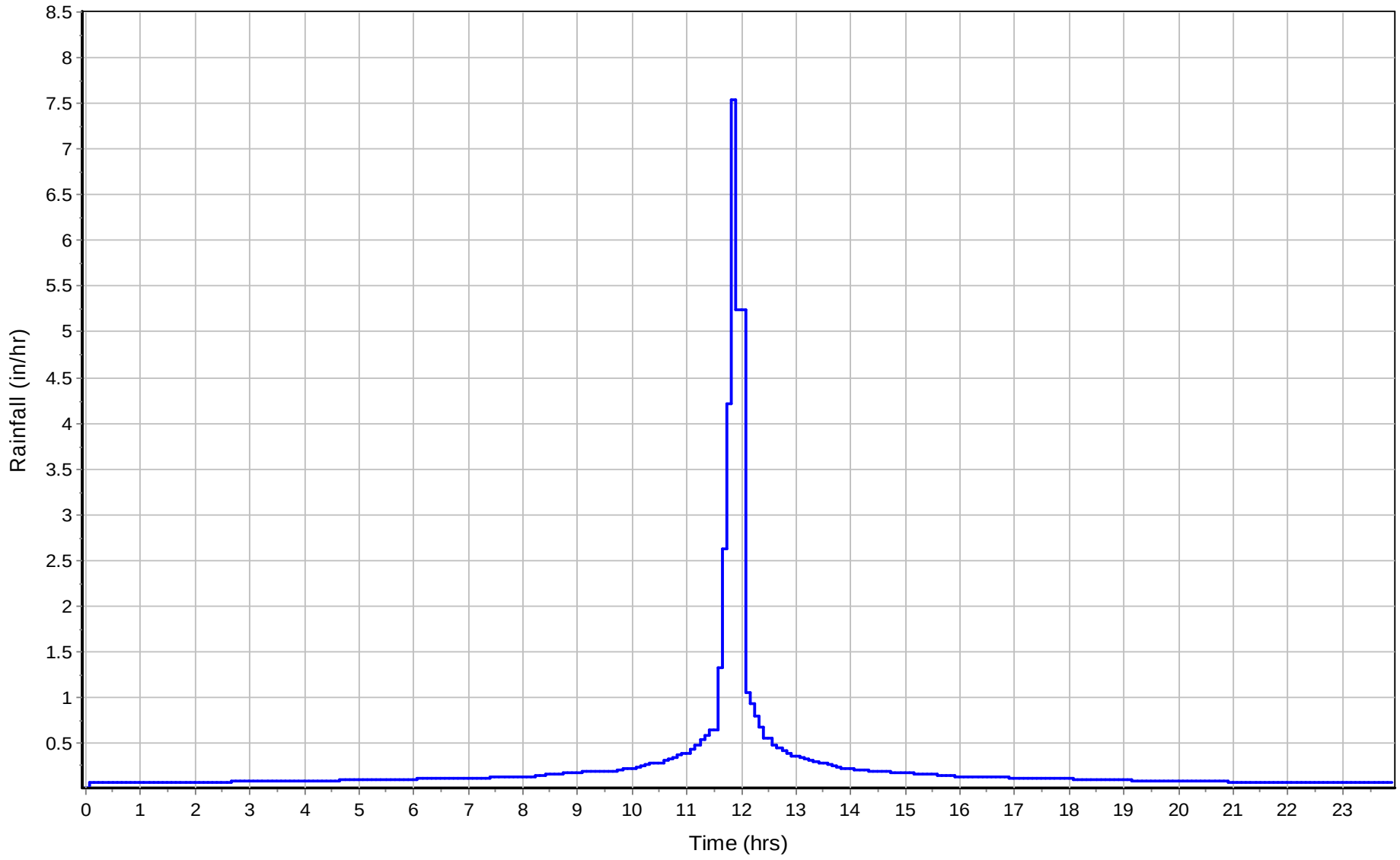
Total TOC (min) 46.01

Subbasin Runoff Results

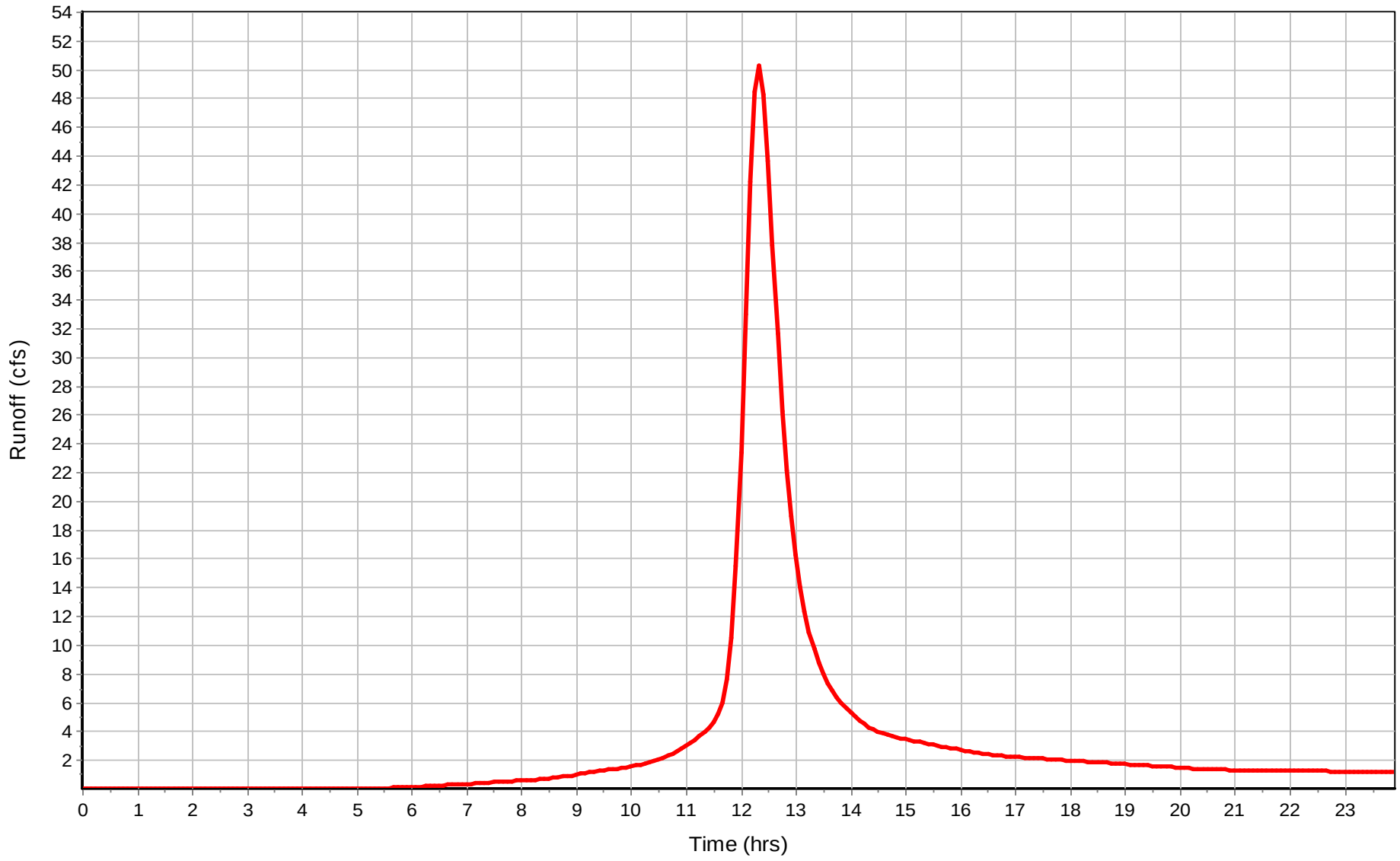
Total Rainfall (in)		5.5
Total Runoff (in)		3.91
Peak Runoff (cfs)		50.27
Weighted Curve Number		85.73
Time of Concentration (days hh:mm:ss)	0 00:46:01	

Subbasin : SubCB-16

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-17

Input Data

Area (ac)		0.3
Peak Rate Factor		0
Weighted Curve Number		80.97
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.3	-	80.97
Composite Area & Weighted CN	0.3		80.97

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.26	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	29.83	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	106.14	0	0
Slope (%) :	3.769	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	3.13	0	0
Computed Flow Time (min) :	0.57	0	0

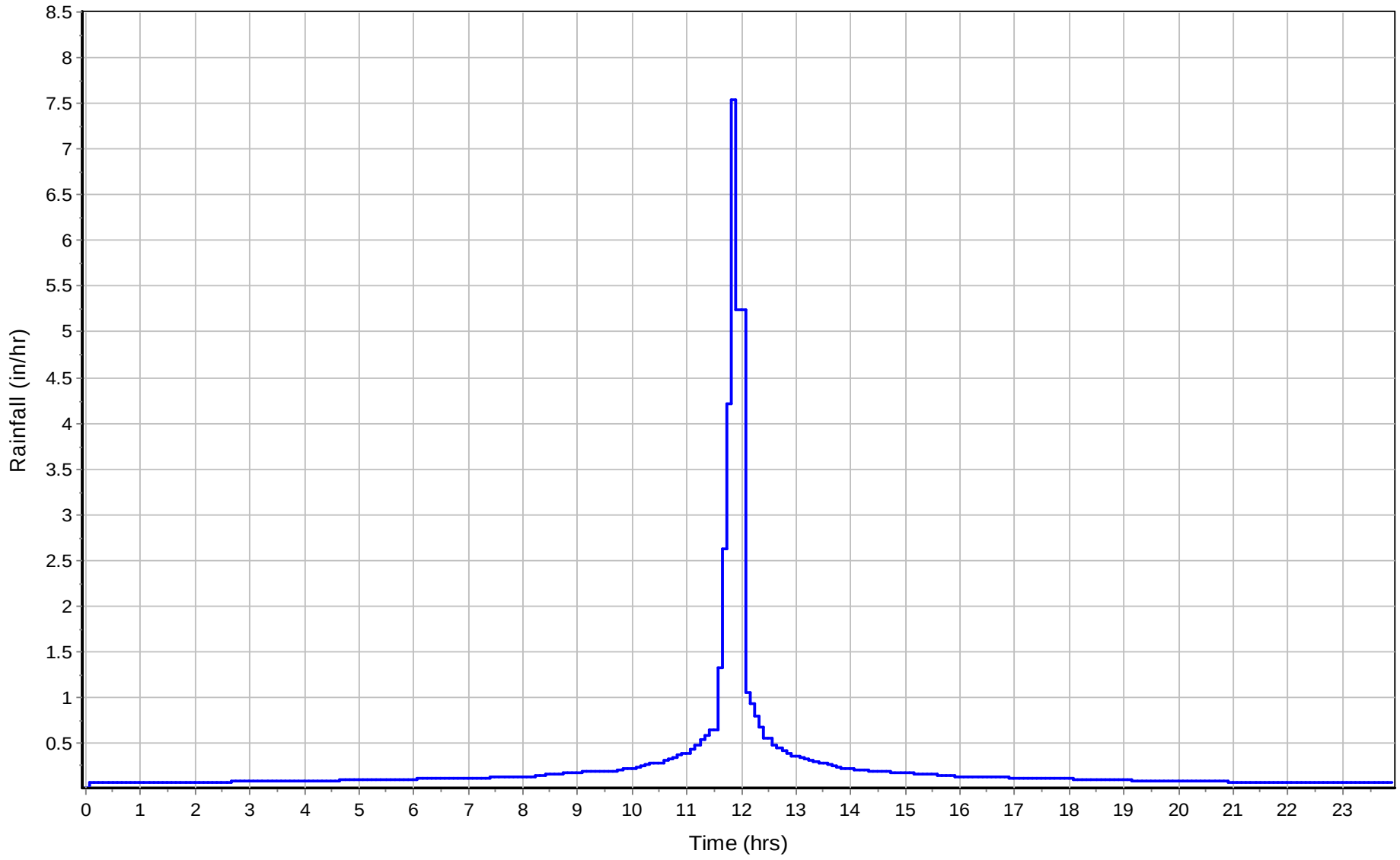
Total TOC (min) 30.39

Subbasin Runoff Results

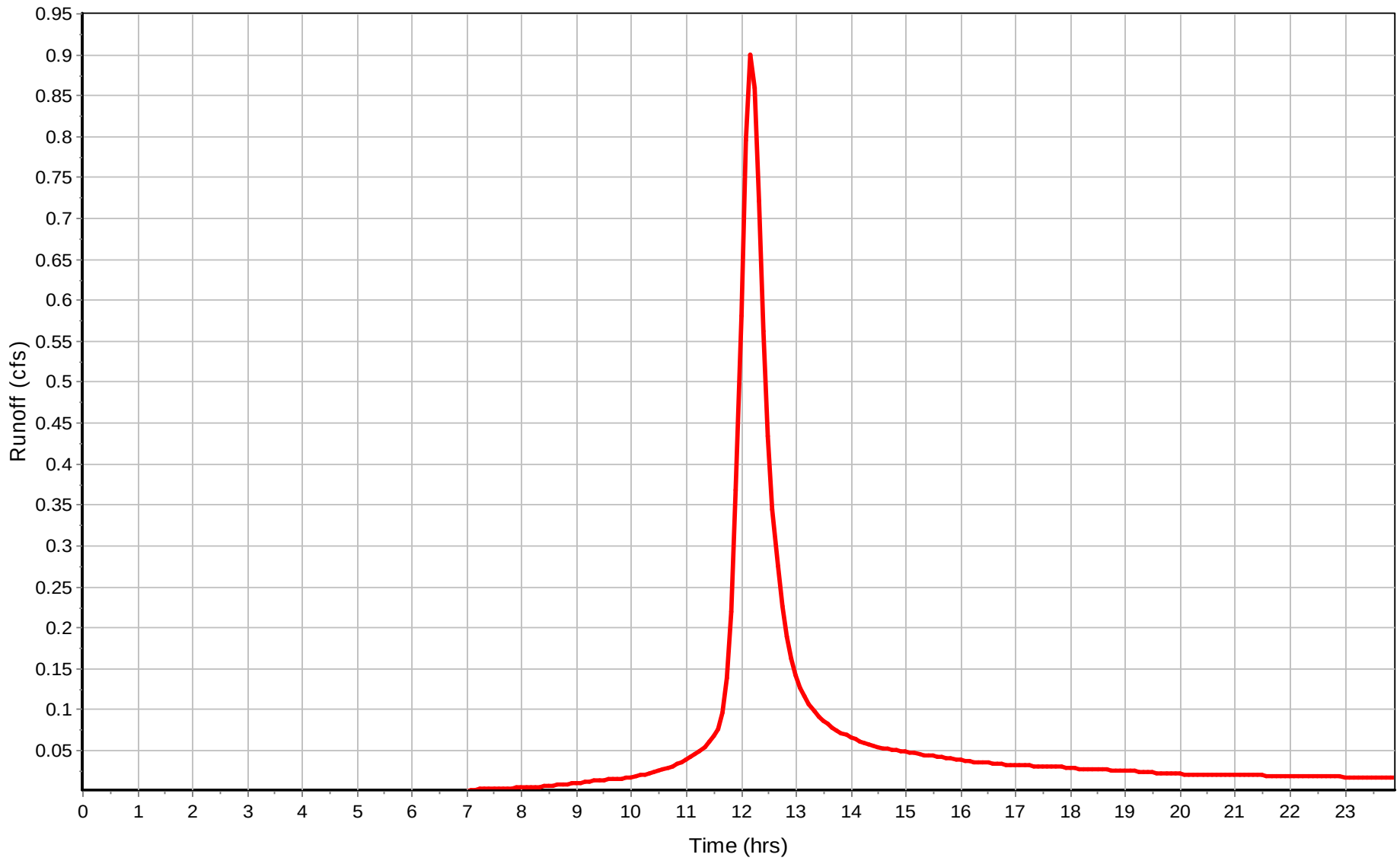
Total Rainfall (in)		5.5
Total Runoff (in)		3.43
Peak Runoff (cfs)		0.91
Weighted Curve Number		80.97
Time of Concentration (days hh:mm:ss)	0 00:30:23	

Subbasin : SubCB-17

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-18

Input Data

Area (ac)		12.35
Peak Rate Factor		0
Weighted Curve Number		85.31
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	12.35	-	85.31
Composite Area & Weighted CN	12.35		85.31

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0.4	0
Flow Length (ft) :	100	100	0
Slope (%) :	1.94	1.3	0
2 yr, 24 hr Rainfall (in) :	2.4	2.4	0
Velocity (ft/sec) :	0.07	0.06	0
Computed Flow Time (min) :	25.1	29.46	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	269.94	131.79	0
Slope (%) :	1.09	2.853	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.68	2.73	0
Computed Flow Time (min) :	2.68	0.8	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0.012	0
Flow Length (ft) :	1125.27	1397.72	0
Channel Slope (%) :	1.06	0.977	0
Cross Section Area (ft^2) :	4.909	4.909	0
Wetted Perimeter (ft) :	7.854	7.854	0
Velocity (ft/sec) :	9.35	8.97	0
Computed Flow Time (min) :	2.01	2.6	0

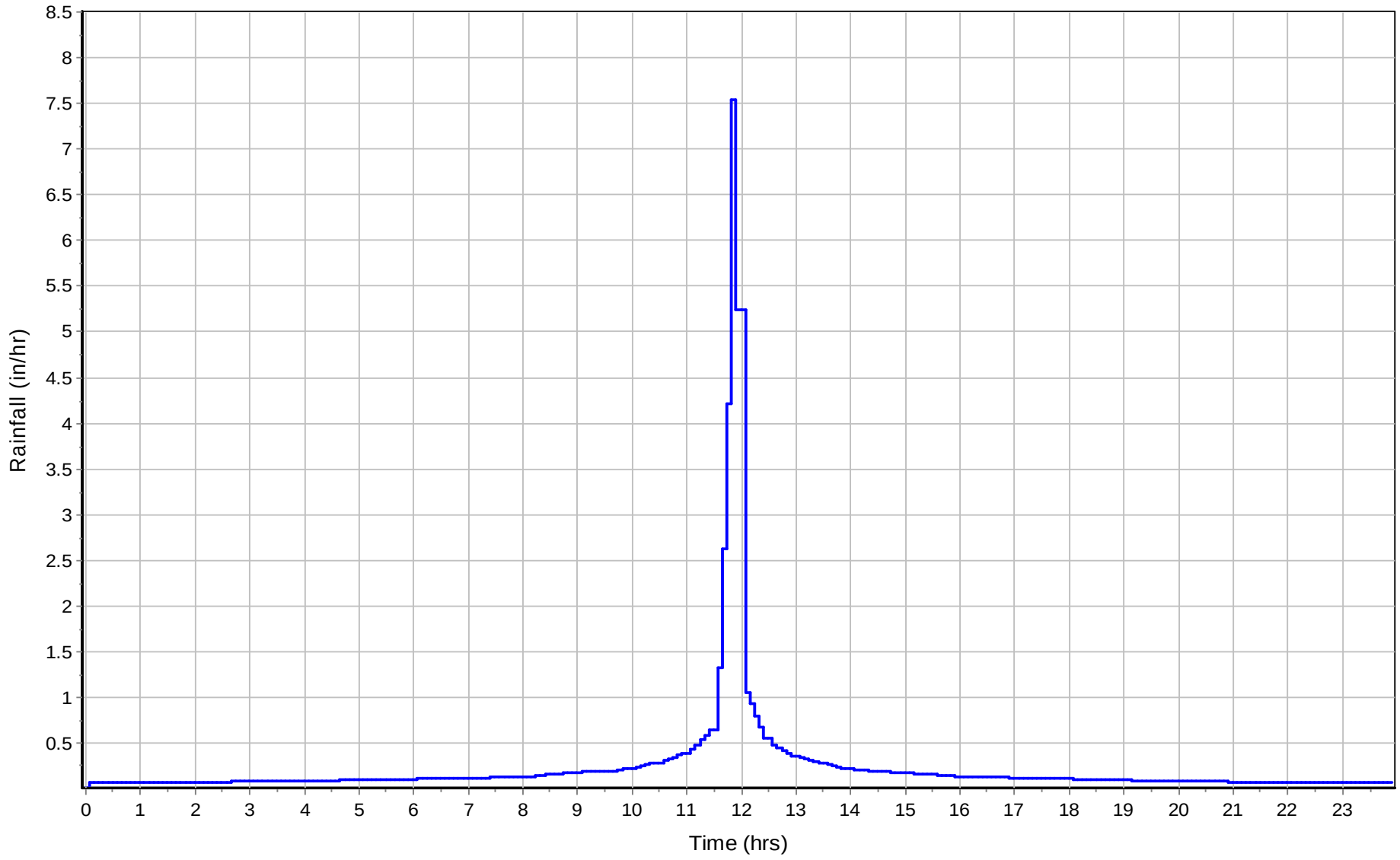
Total TOC (min) 32.86

Subbasin Runoff Results

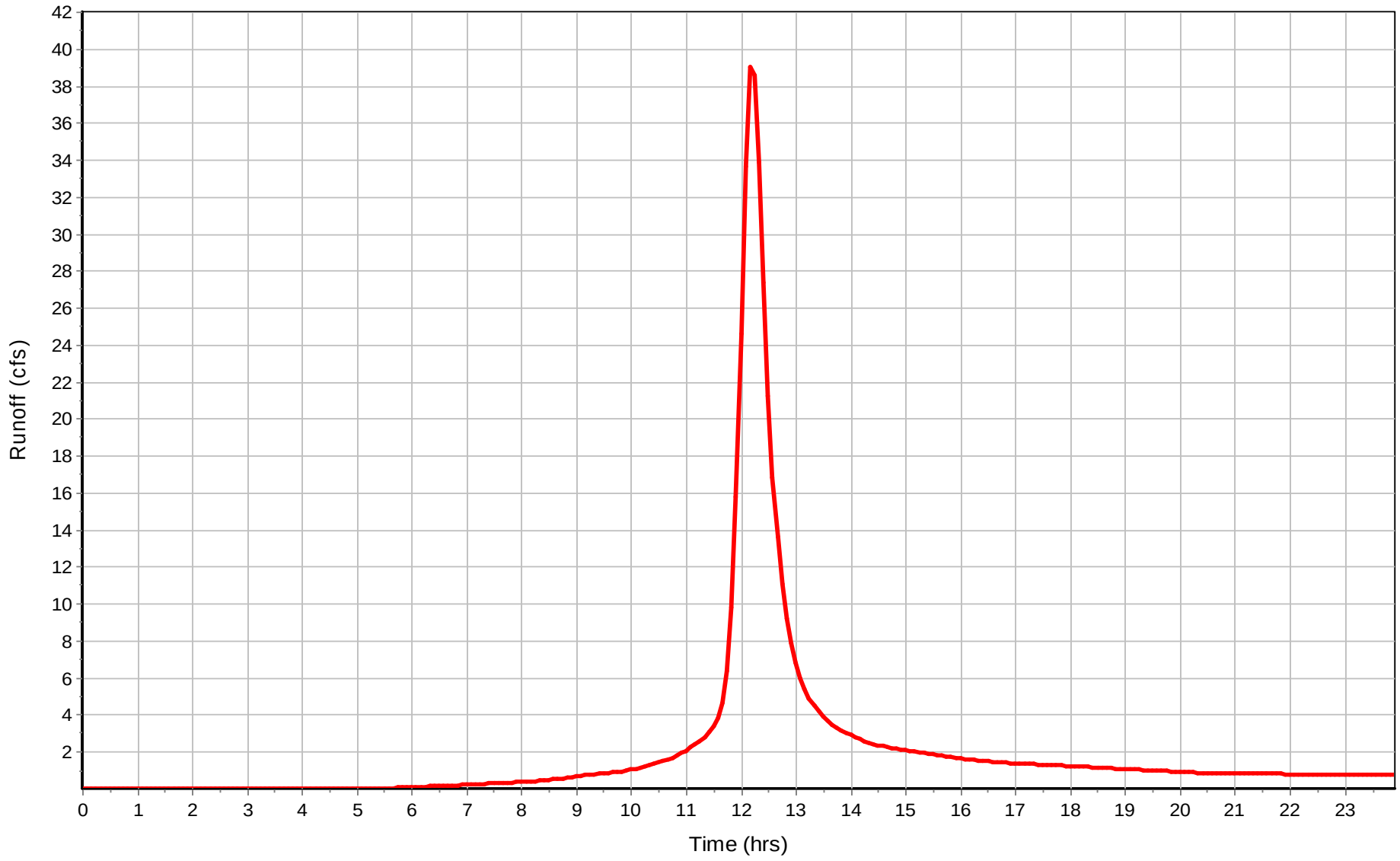
Total Rainfall (in)	5.5
Total Runoff (in)	3.87
Peak Runoff (cfs)	39.65
Weighted Curve Number	85.31
Time of Concentration (days hh:mm:ss)	0 00:32:52

Subbasin : SubCB-18

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-19

Input Data

Area (ac)		0.3
Peak Rate Factor		0
Weighted Curve Number		86.66
Rain Gage ID	Rain Gage-01	

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.3	-	86.66
Composite Area & Weighted CN	0.3		86.66

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.94	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.07	0	0
Computed Flow Time (min) :	25.1	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	32.19	0	0
Slope (%) :	1.305	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.84	0	0
Computed Flow Time (min) :	0.29	0	0

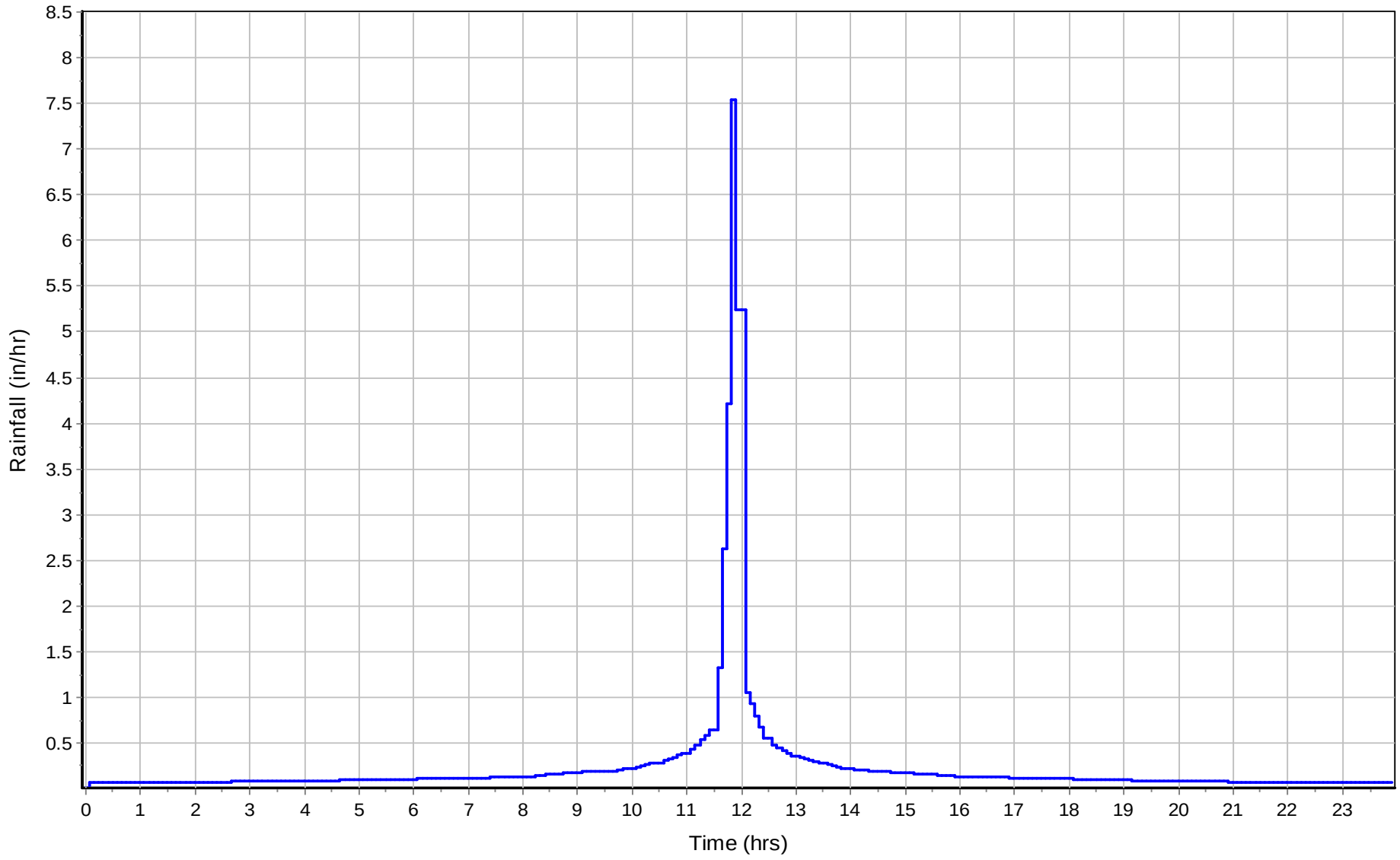
Total TOC (min) 25.39

Subbasin Runoff Results

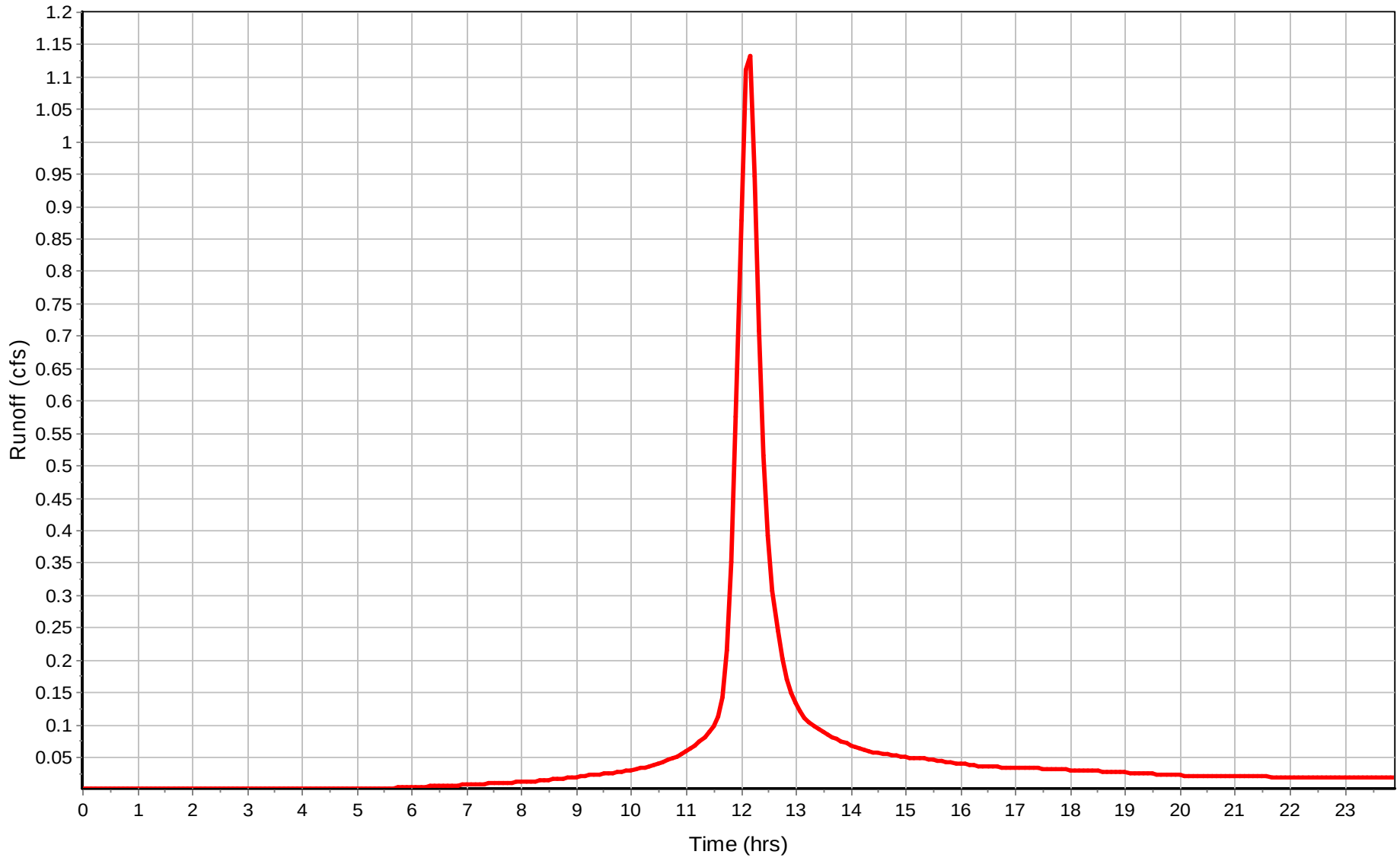
Total Rainfall (in)		5.5
Total Runoff (in)		4
Peak Runoff (cfs)		1.15
Weighted Curve Number		86.66
Time of Concentration (days hh:mm:ss)	0 00:25:23	

Subbasin : SubCB-19

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-2

Input Data

Area (ac)		0.29
Peak Rate Factor		0
Weighted Curve Number		97.91
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.29	-	97.91
Composite Area & Weighted CN	0.29		97.91

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0.01	0
Flow Length (ft) :	100	100	0
Slope (%) :	0.51	0.04	0
2 yr, 24 hr Rainfall (in) :	2.4	2.4	0
Velocity (ft/sec) :	0.74	0.27	0
Computed Flow Time (min) :	2.24	6.2	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	76.93	54.93	0
Slope (%) :	0.936	3.659	0
Surface Type :	Paved	Paved	Unpaved
Velocity (ft/sec) :	1.97	3.89	0
Computed Flow Time (min) :	0.65	0.24	0

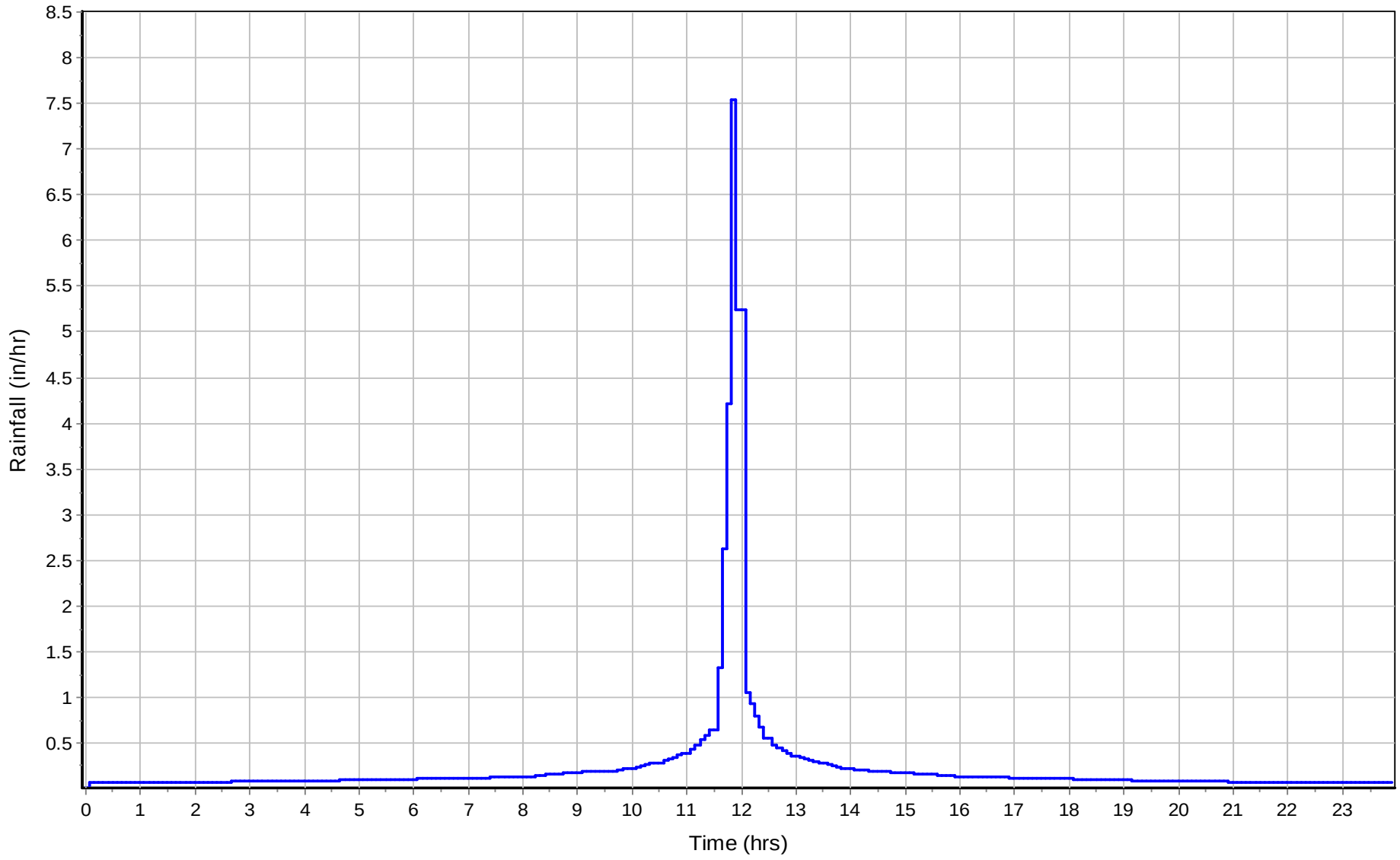
Total TOC (min) 6.43

Subbasin Runoff Results

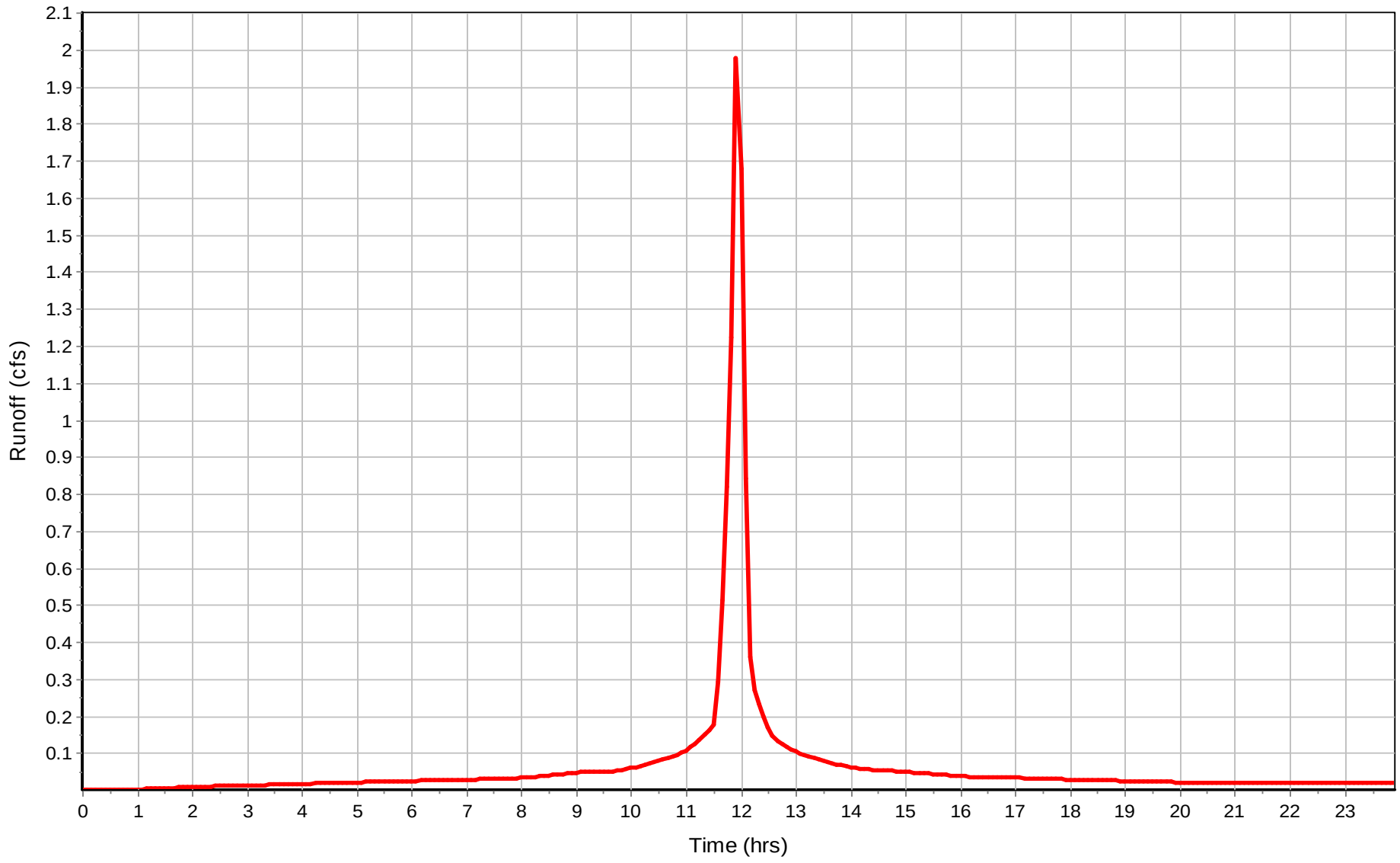
Total Rainfall (in)		5.5
Total Runoff (in)		5.25
Peak Runoff (cfs)		2
Weighted Curve Number		97.91
Time of Concentration (days hh:mm:ss)	0 00:06:26	

Subbasin : SubCB-2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-20

Input Data

Area (ac)		0.14
Peak Rate Factor		0
Weighted Curve Number		93.18
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.14	-	93.18
Composite Area & Weighted CN	0.14		93.18

Time of Concentration

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	100.735	0	0
Slope (%) :	0.943	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	1.97	0	0
Computed Flow Time (min) :	0.85	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0	0
Flow Length (ft) :	20.21	0	0
Channel Slope (%) :	7.52	0	0
Cross Section Area (ft^2) :	19.635	0	0
Wetted Perimeter (ft) :	15.708	0	0
Velocity (ft/sec) :	39.51	0	0
Computed Flow Time (min) :	0.01	0	0

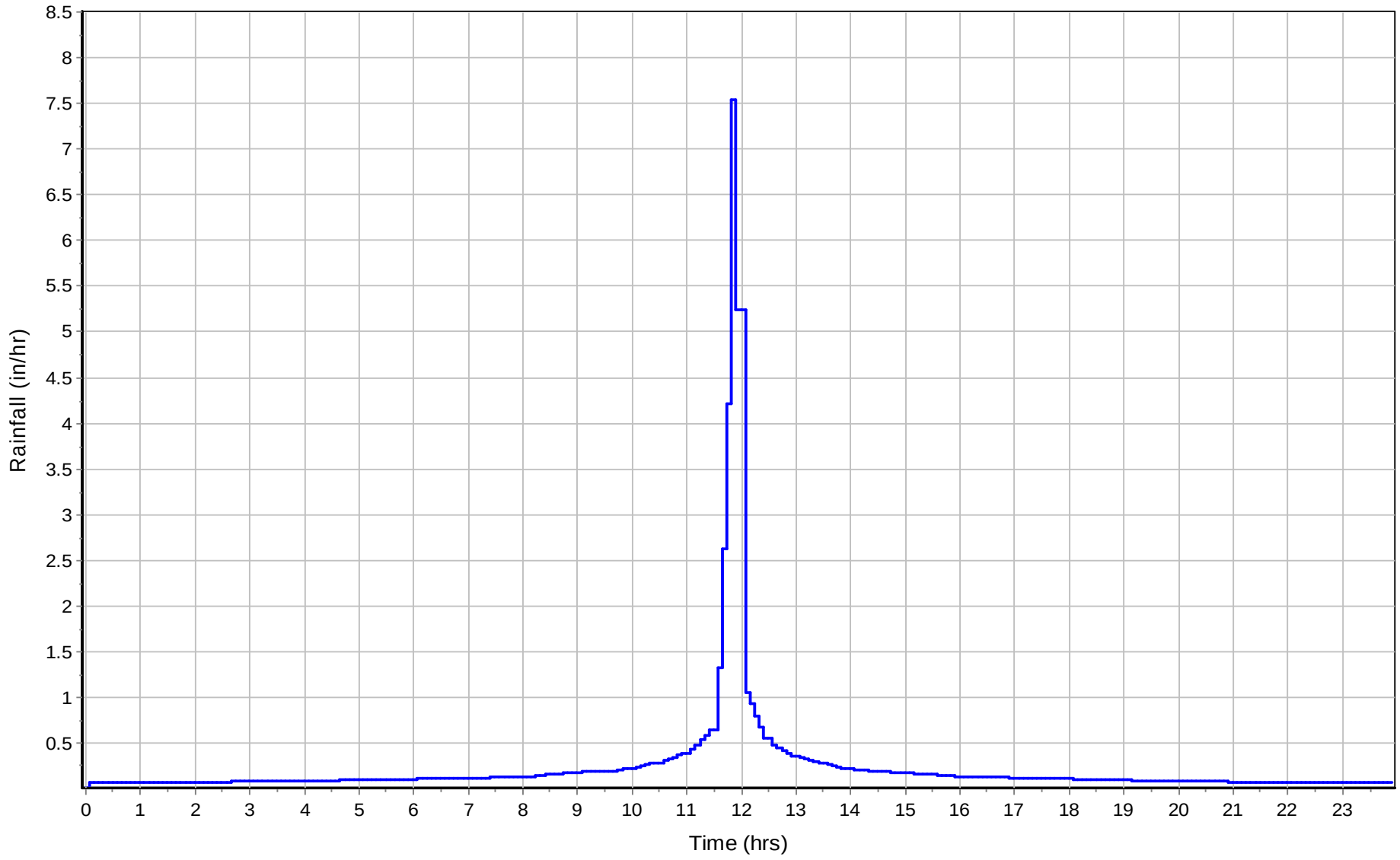
Total TOC (min) 0.86

Subbasin Runoff Results

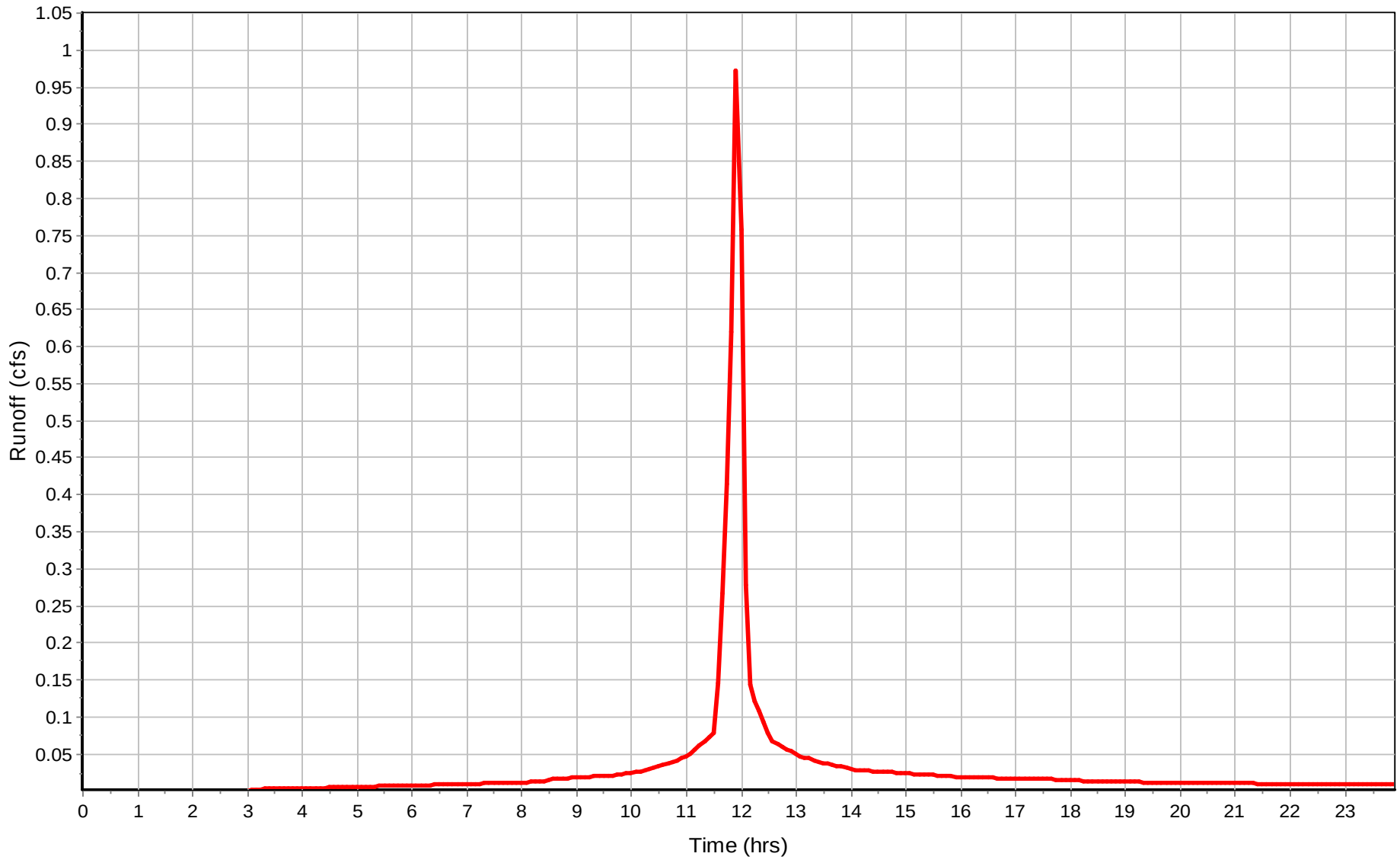
Total Rainfall (in)		5.5
Total Runoff (in)		4.71
Peak Runoff (cfs)		0.97
Weighted Curve Number		93.18
Time of Concentration (days hh:mm:ss)	0 00:00:52	

Subbasin : SubCB-20

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-21

Input Data

Area (ac)		26.42
Peak Rate Factor		0
Weighted Curve Number		85.09
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	26.42	-	85.09
Composite Area & Weighted CN	26.42		85.09

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0.4	0
Flow Length (ft) :	100	100	0
Slope (%) :	0.3	1.53	0
2 yr, 24 hr Rainfall (in) :	2.4	2.4	0
Velocity (ft/sec) :	0.03	0.06	0
Computed Flow Time (min) :	52.96	27.6	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	34.7	460.16	0
Slope (%) :	2.8	1.52	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.7	1.99	0
Computed Flow Time (min) :	0.21	3.85	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.03	0.03	0
Flow Length (ft) :	2569.44	1729.12	0
Channel Slope (%) :	1.24	1.49	0
Cross Section Area (ft^2) :	12	12	0
Wetted Perimeter (ft) :	10.944	10.944	0
Velocity (ft/sec) :	5.88	6.45	0
Computed Flow Time (min) :	7.28	4.47	0

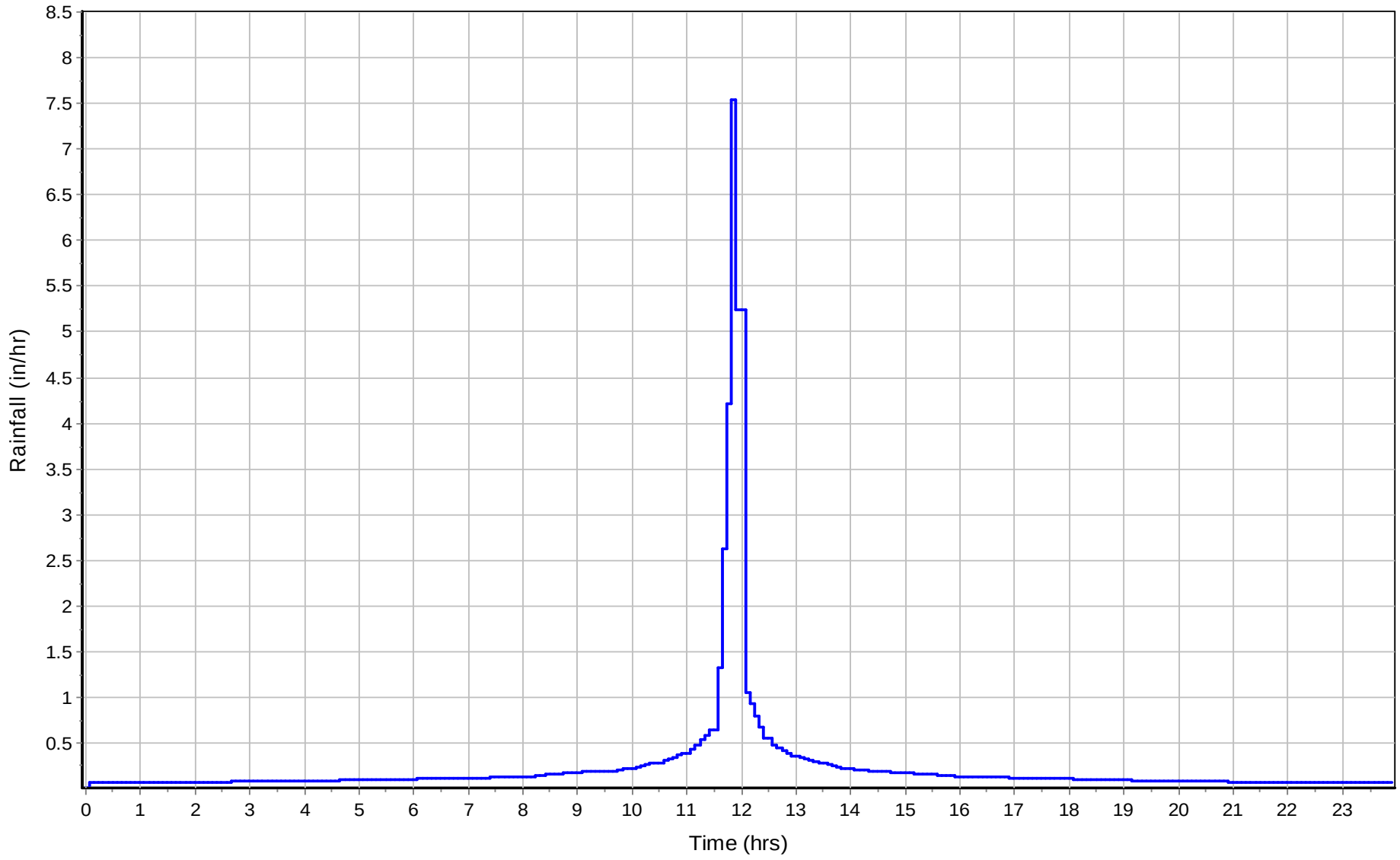
Total TOC (min) 60.46

Subbasin Runoff Results

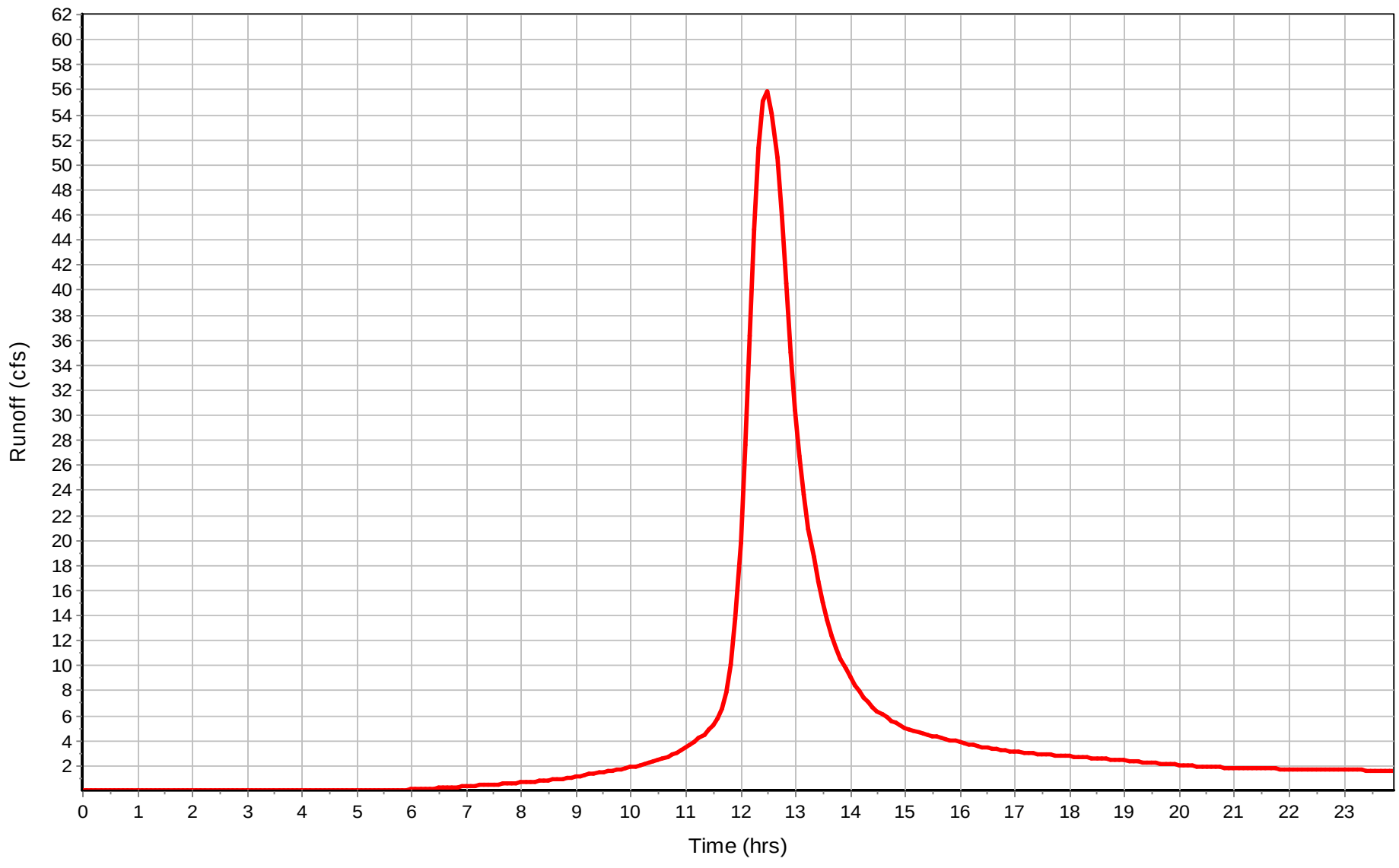
Total Rainfall (in)		5.5
Total Runoff (in)		3.84
Peak Runoff (cfs)		56
Weighted Curve Number		85.09
Time of Concentration (days hh:mm:ss)	0 01:00:28	

Subbasin : SubCB-21

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-22 (TwinOaks)

Input Data

Area (ac)	19.17
Peak Rate Factor	0
Weighted Curve Number	87.47
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	19.17	-	87.47
Composite Area & Weighted CN	19.17		87.47

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.55	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.07	0	0
Computed Flow Time (min) :	22.5	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	470.57	0	0
Slope (%) :	1.59	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.03	0	0
Computed Flow Time (min) :	3.86	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0	0
Flow Length (ft) :	1561.81	0	0
Channel Slope (%) :	1.189	0	0
Cross Section Area (ft^2) :	12.566	0	0
Wetted Perimeter (ft) :	12.566	0	0
Velocity (ft/sec) :	13.54	0	0
Computed Flow Time (min) :	1.92	0	0

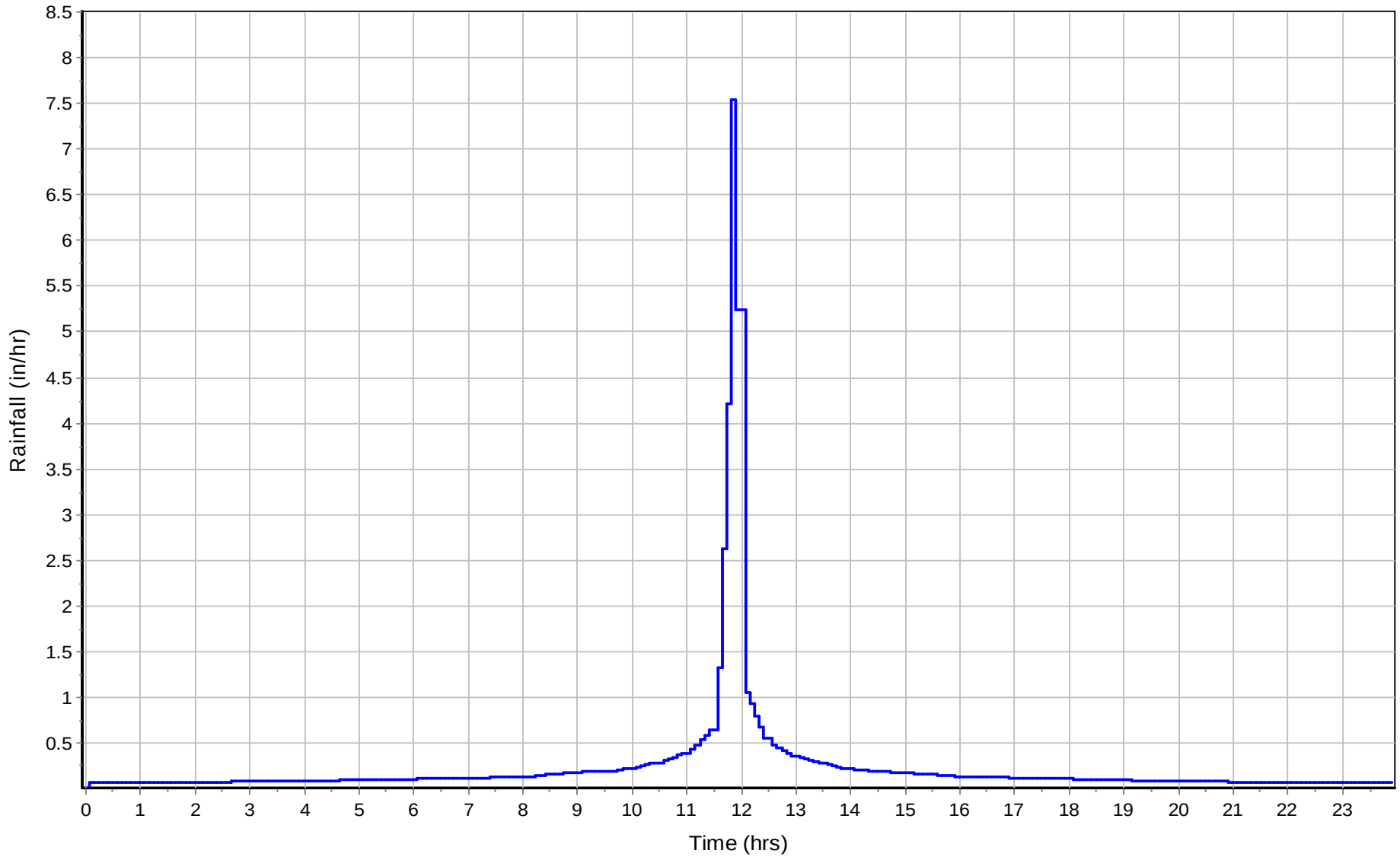
Total TOC (min) 28.29

Subbasin Runoff Results

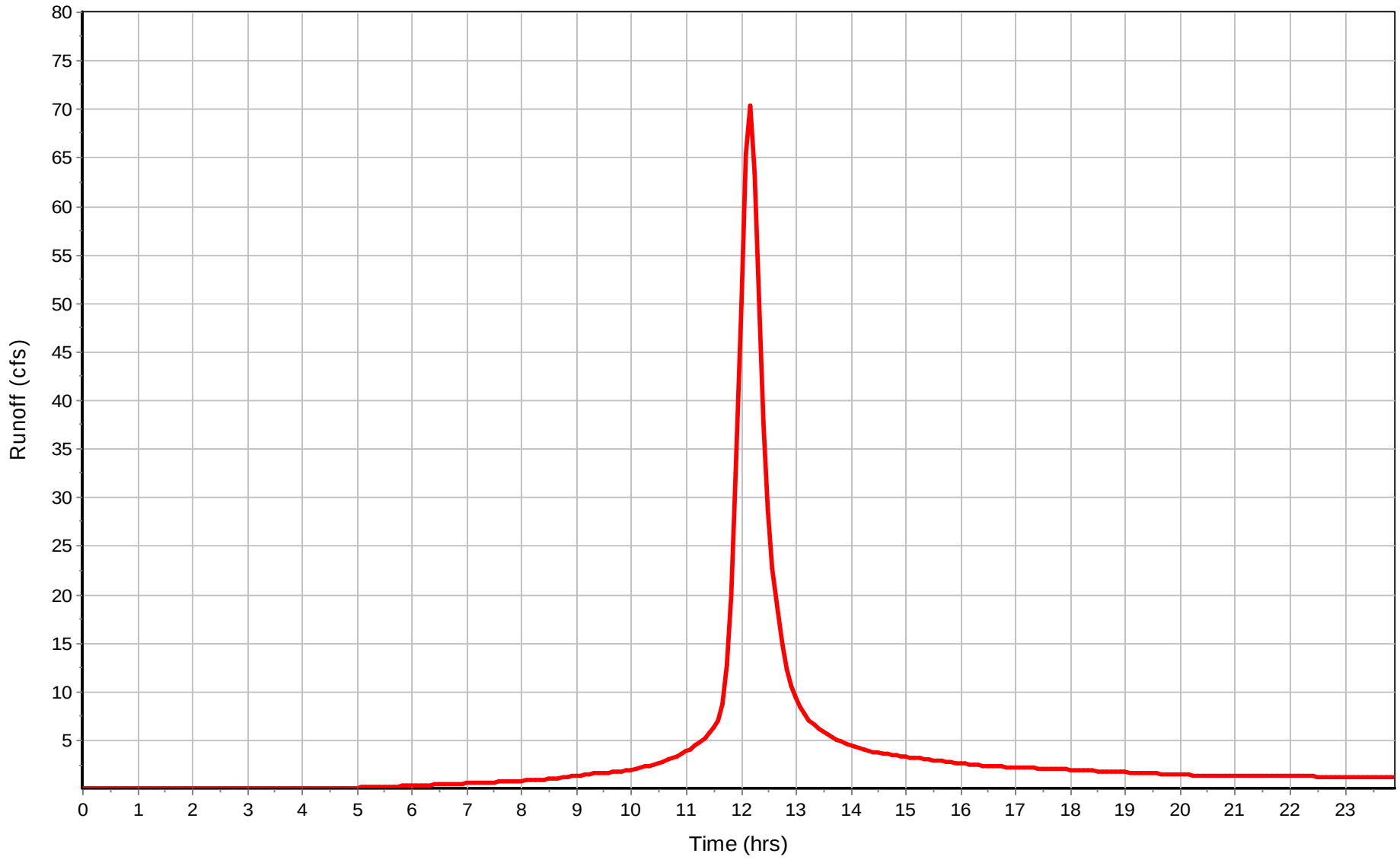
Total Rainfall (in)	5.5
Total Runoff (in)	4.09
Peak Runoff (cfs)	70.6
Weighted Curve Number	87.47
Time of Concentration (days hh:mm:ss)	0 00:28:17

Subbasin : SubCB-22 (TwinOaks)

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-23

Input Data

Area (ac)		26.94
Peak Rate Factor		0
Weighted Curve Number		80.83
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	26.94	-	80.83
Composite Area & Weighted CN	26.94		80.83

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.6	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.42	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.04	0	0
Computed Flow Time (min) :	39.33	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	483.43	0	0
Slope (%) :	0.43	0	0
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.33	0	0
Computed Flow Time (min) :	24.42	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	2642.15	0	0
Channel Slope (%) :	0.823	0	0
Cross Section Area (ft^2) :	2.5	0	0
Wetted Perimeter (ft) :	4.606	0	0
Velocity (ft/sec) :	3	0	0
Computed Flow Time (min) :	14.69	0	0

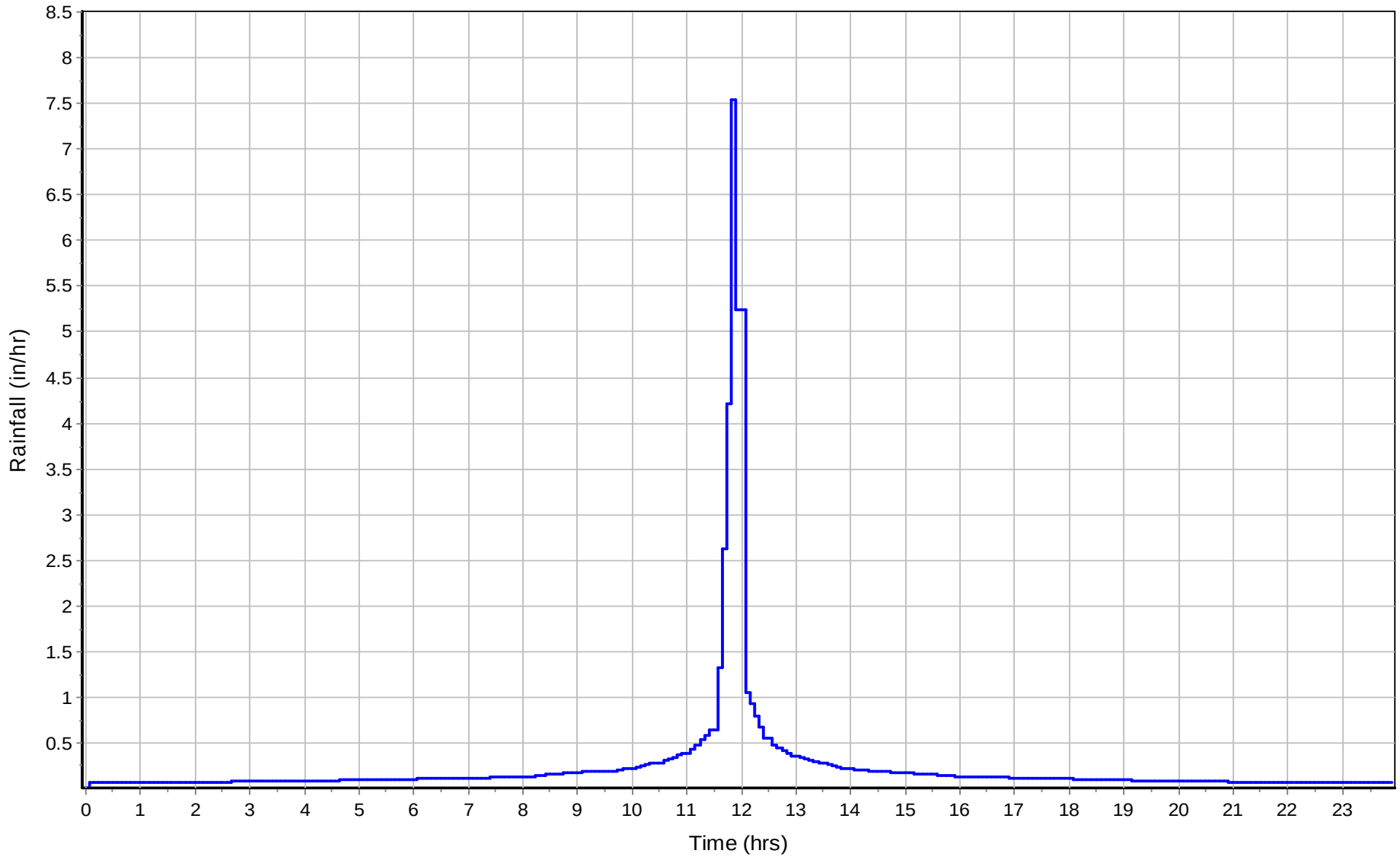
Total TOC (min) 78.44

Subbasin Runoff Results

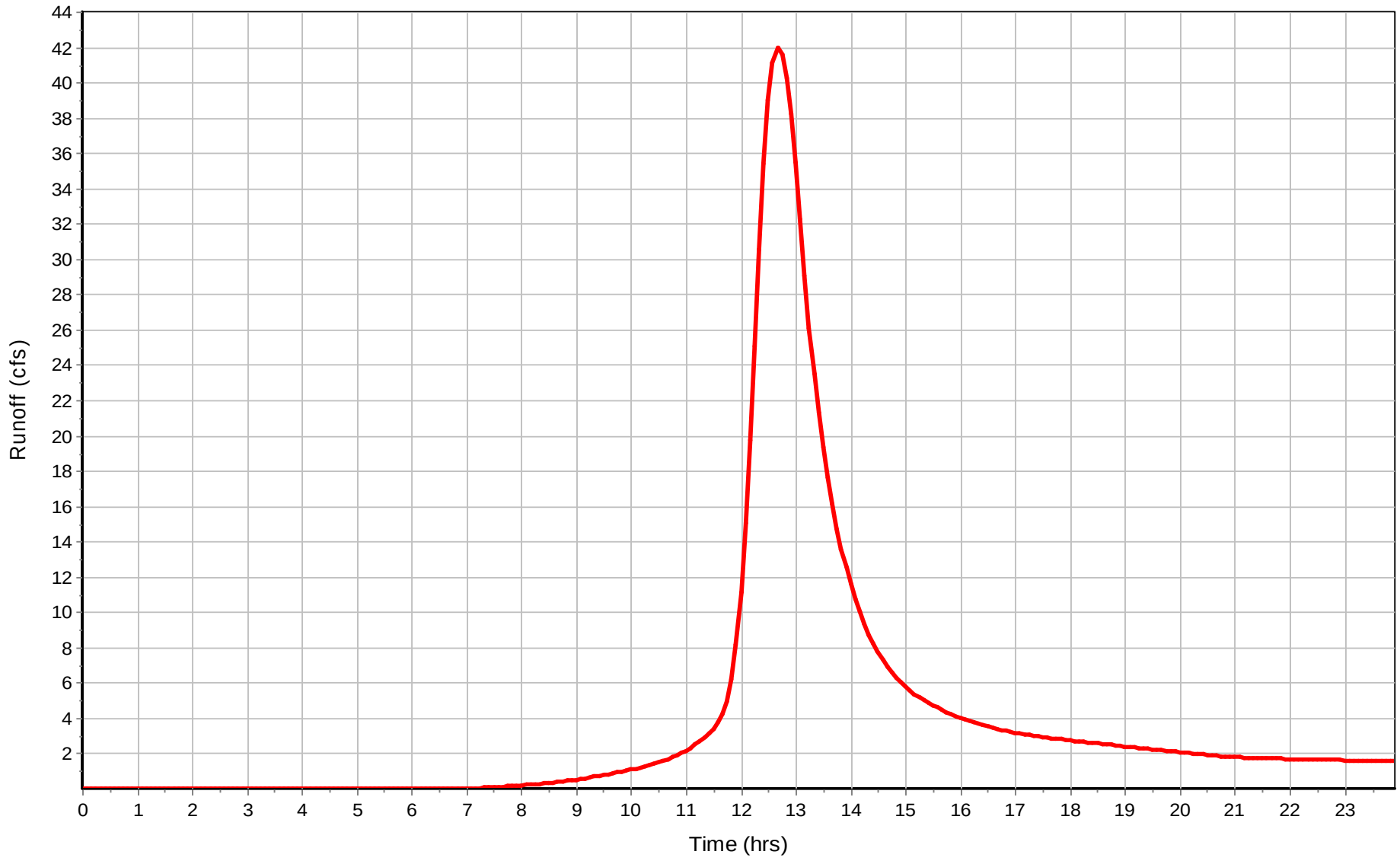
Total Rainfall (in)		5.5
Total Runoff (in)		3.41
Peak Runoff (cfs)		42.08
Weighted Curve Number		80.83
Time of Concentration (days hh:mm:ss)	0 01:18:26	

Subbasin : SubCB-23

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-24

Input Data

Area (ac)		0.23
Peak Rate Factor		0
Weighted Curve Number		88.68
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.23	-	88.68
Composite Area & Weighted CN	0.23		88.68

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.015	0	0
Flow Length (ft) :	66.7	0	0
Slope (%) :	6	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1.33	0	0
Computed Flow Time (min) :	0.84	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	156.46	0	0
Channel Slope (%) :	0.98	0	0
Cross Section Area (ft^2) :	12	0	0
Wetted Perimeter (ft) :	9.657	0	0
Velocity (ft/sec) :	5.68	0	0
Computed Flow Time (min) :	0.46	0	0

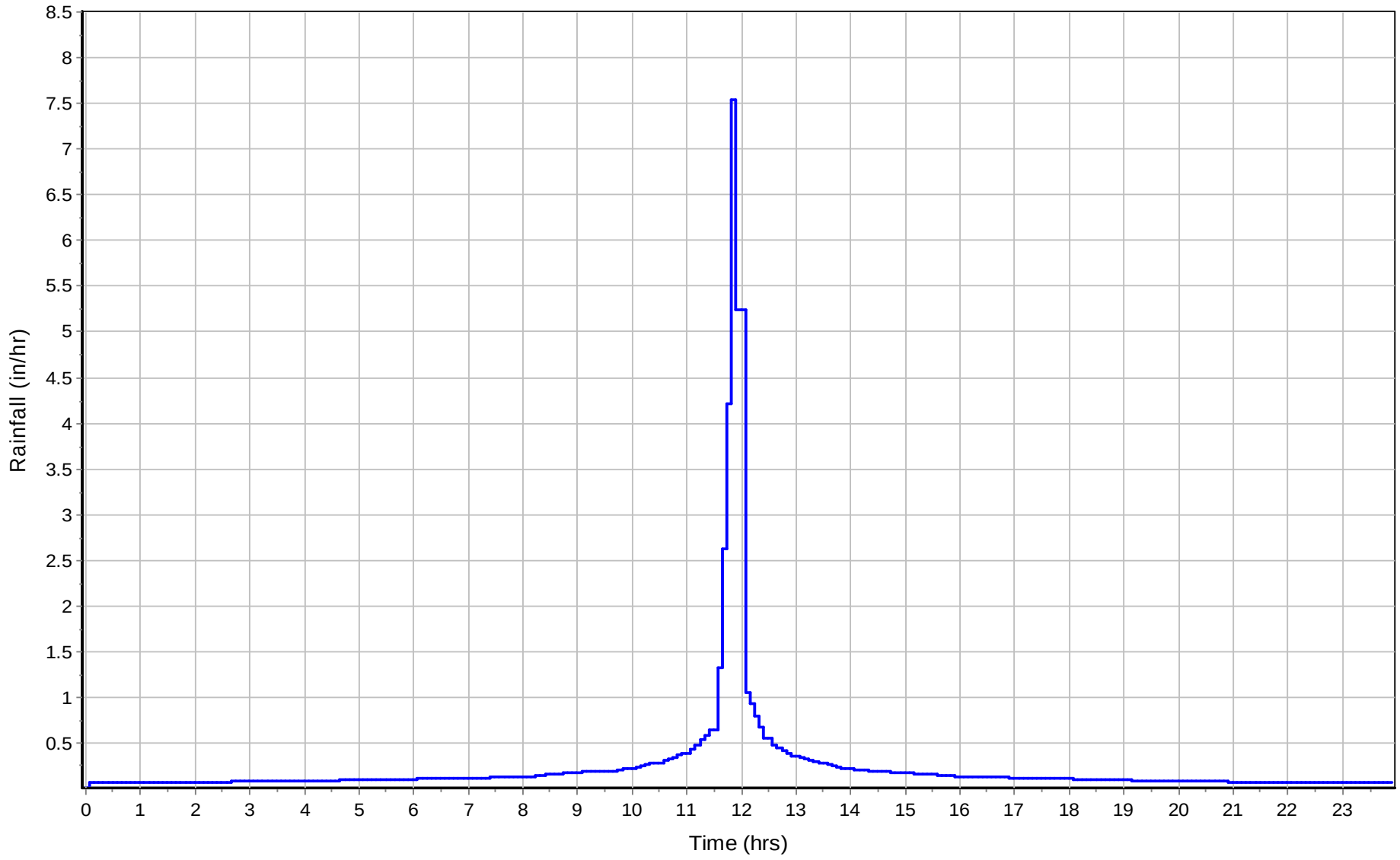
Total TOC (min) 1.29

Subbasin Runoff Results

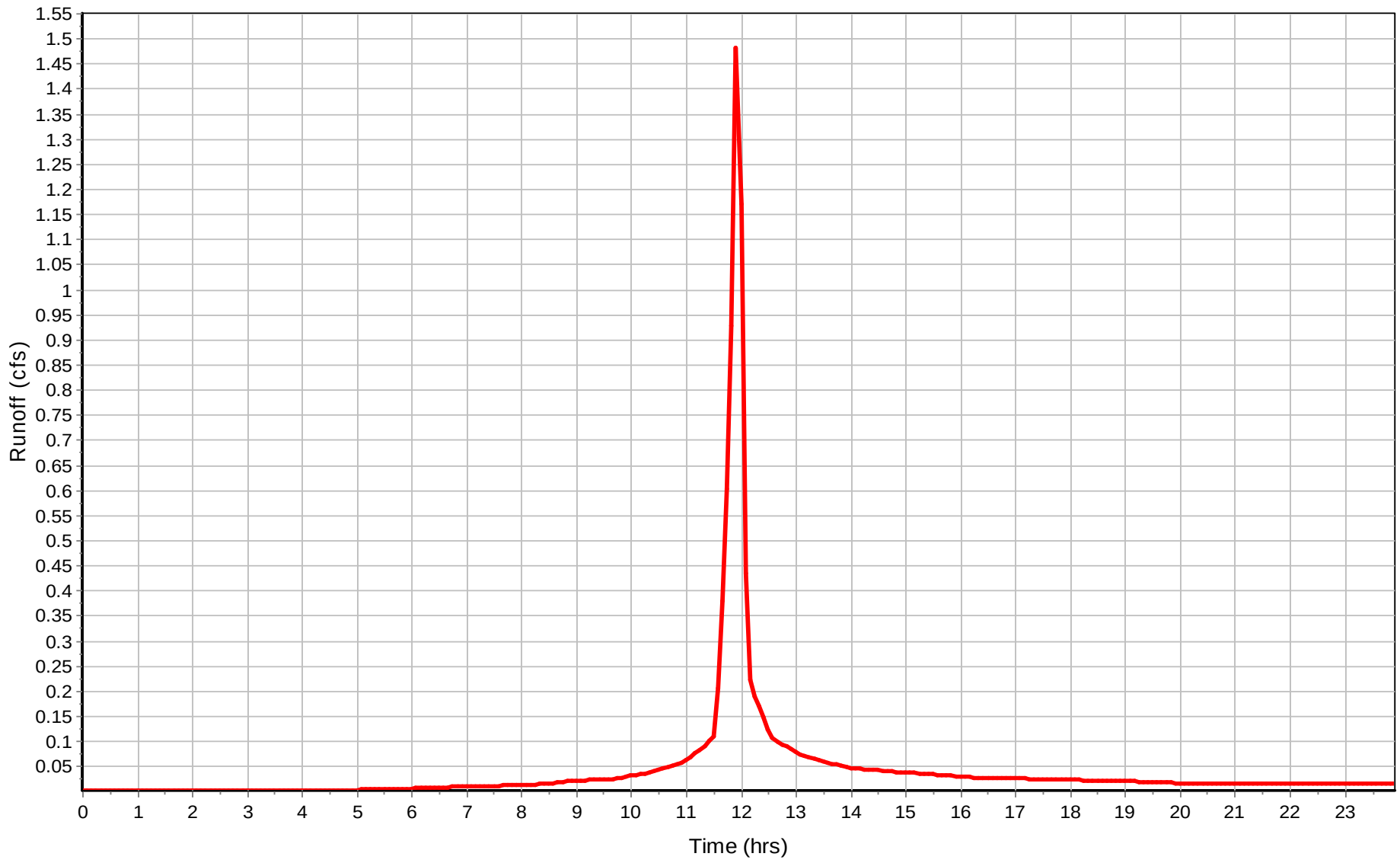
Total Rainfall (in)		5.5
Total Runoff (in)		4.22
Peak Runoff (cfs)		1.48
Weighted Curve Number		88.68
Time of Concentration (days hh:mm:ss)	0 00:01:17	

Subbasin : SubCB-24

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-25

Input Data

Area (ac)		0.43
Peak Rate Factor		0
Weighted Curve Number		84.87
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.43	-	84.87
Composite Area & Weighted CN	0.43		84.87

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5.62	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.4	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	150.16	0	0
Slope (%) :	2.48	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.54	0	0
Computed Flow Time (min) :	0.99	0	0

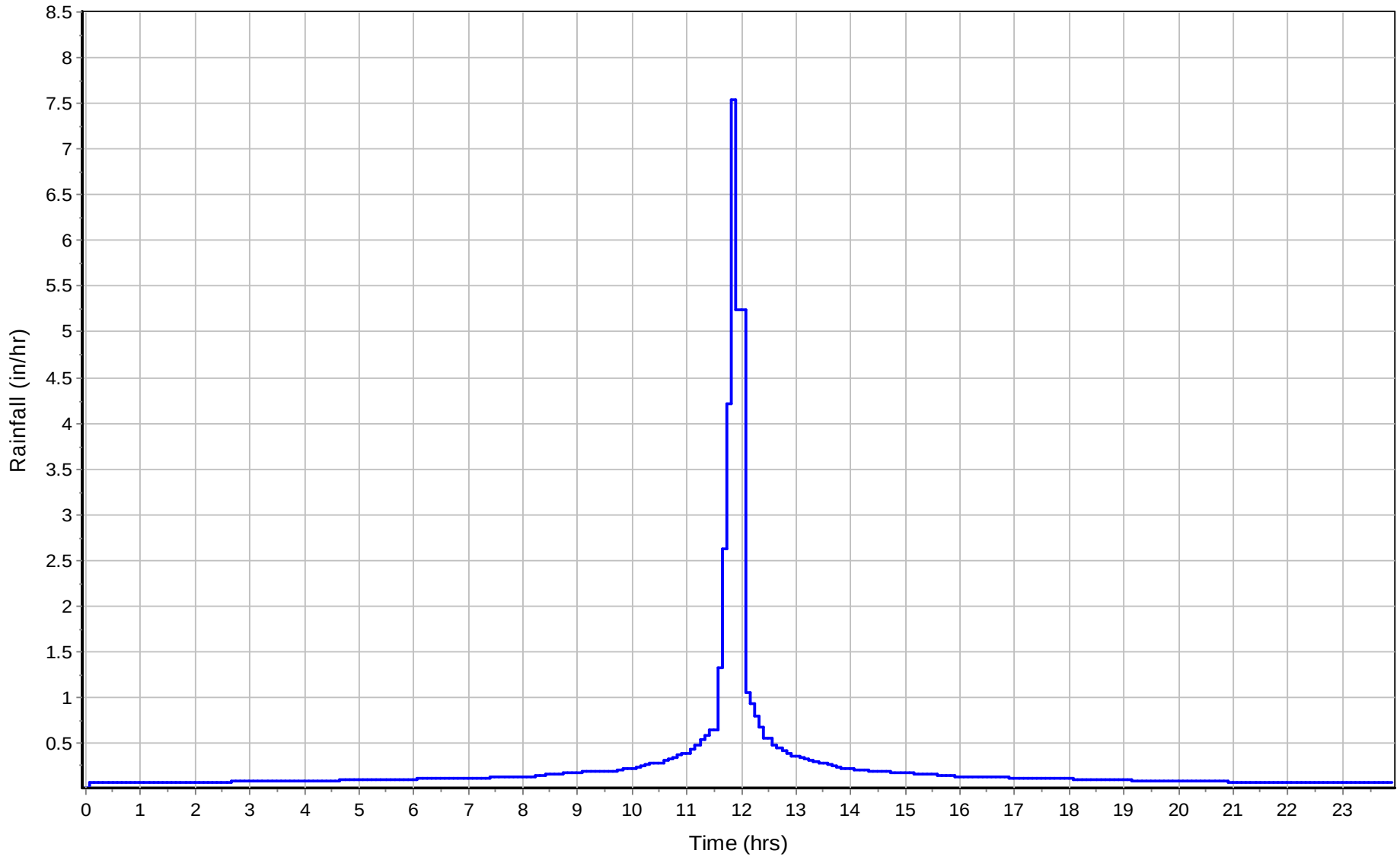
Total TOC (min) 17.39

Subbasin Runoff Results

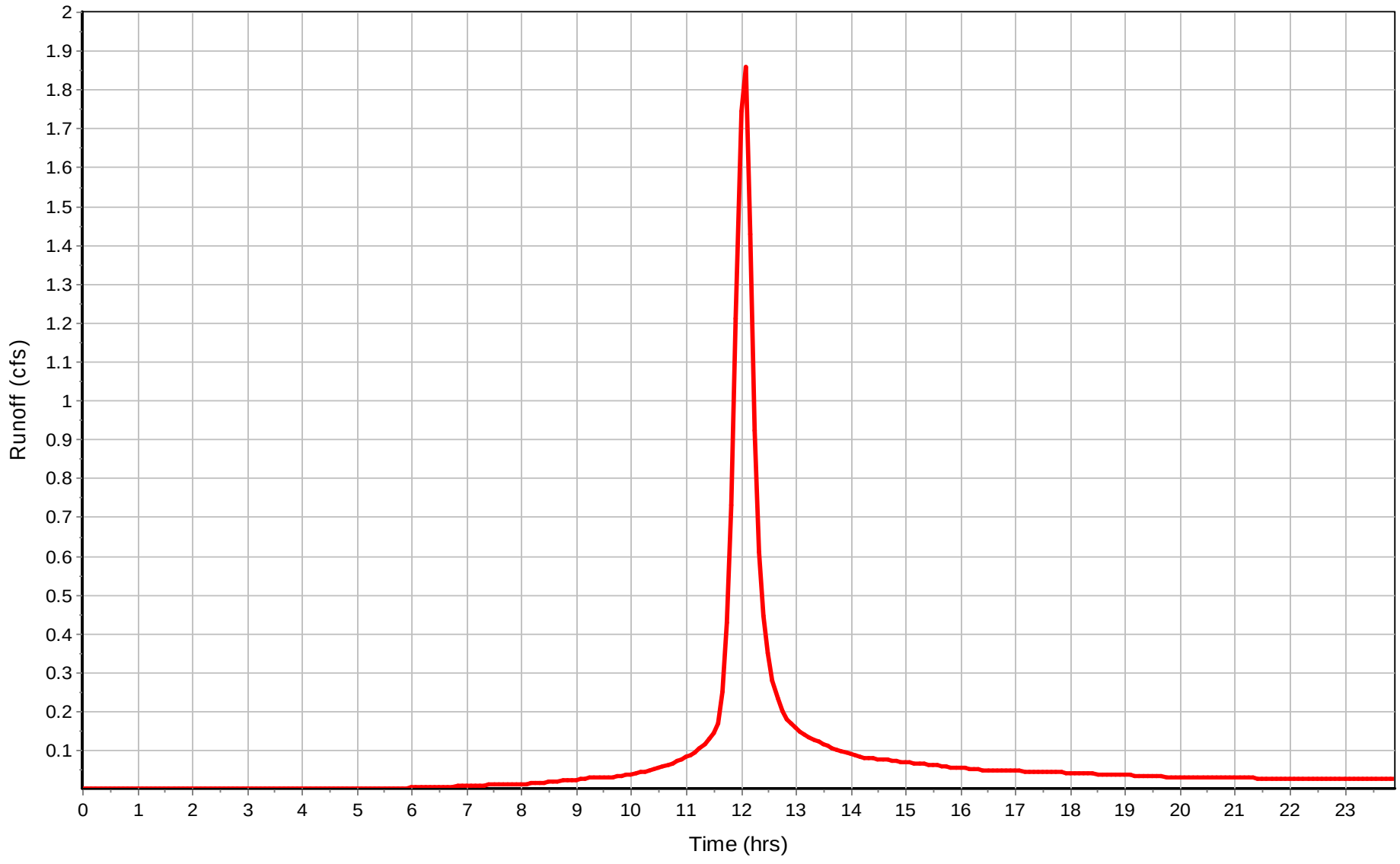
Total Rainfall (in)		5.5
Total Runoff (in)		3.82
Peak Runoff (cfs)		1.89
Weighted Curve Number		84.87
Time of Concentration (days hh:mm:ss)	0 00:17:23	

Subbasin : SubCB-25

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-26

Input Data

Area (ac)		0.95
Peak Rate Factor		0
Weighted Curve Number		84.72
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.95	-	84.72
Composite Area & Weighted CN	0.95		84.72

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5.37	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.7	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	211.17	0	0
Slope (%) :	2.45	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.53	0	0
Computed Flow Time (min) :	1.39	0	0

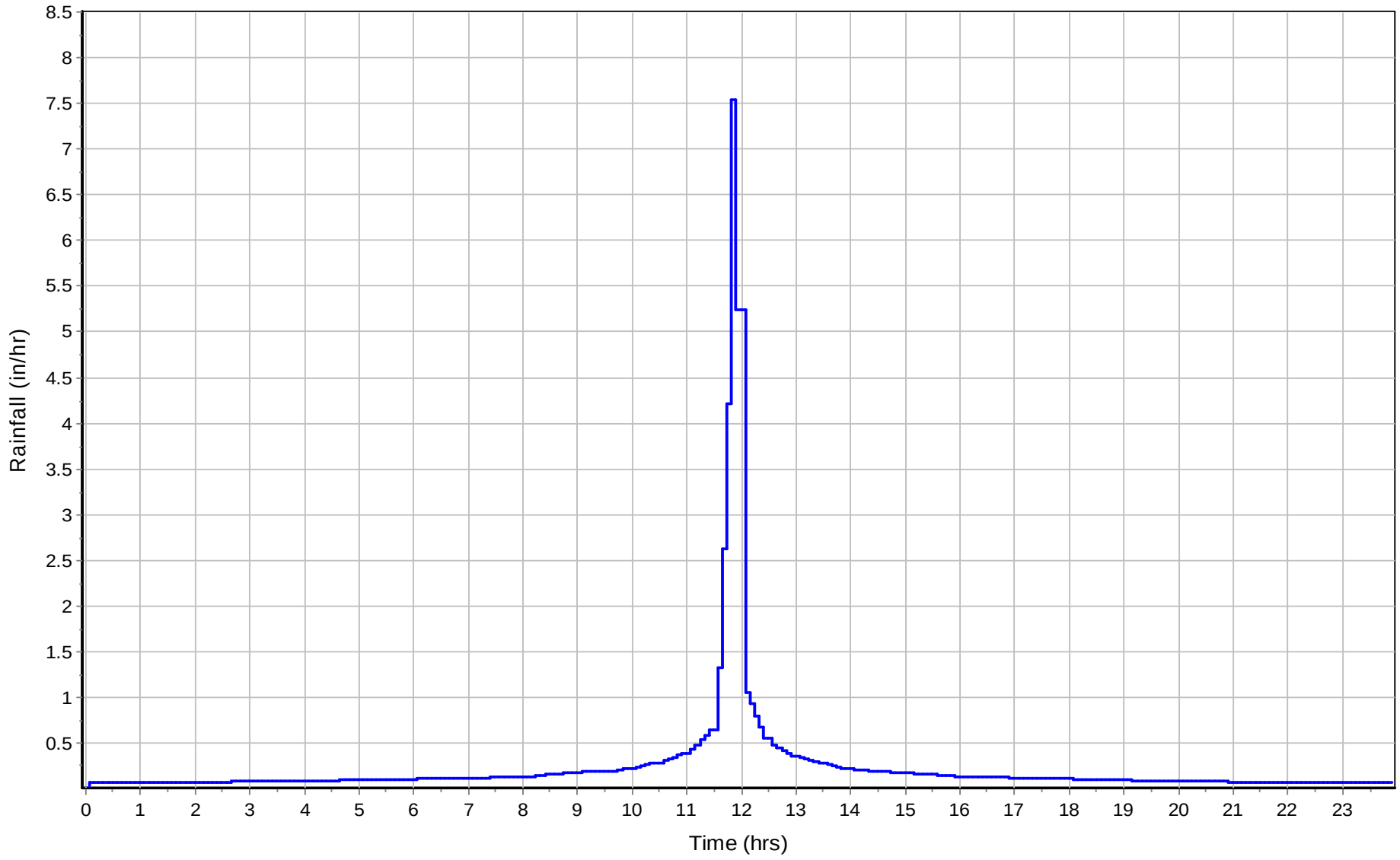
Total TOC (min) 18.09

Subbasin Runoff Results

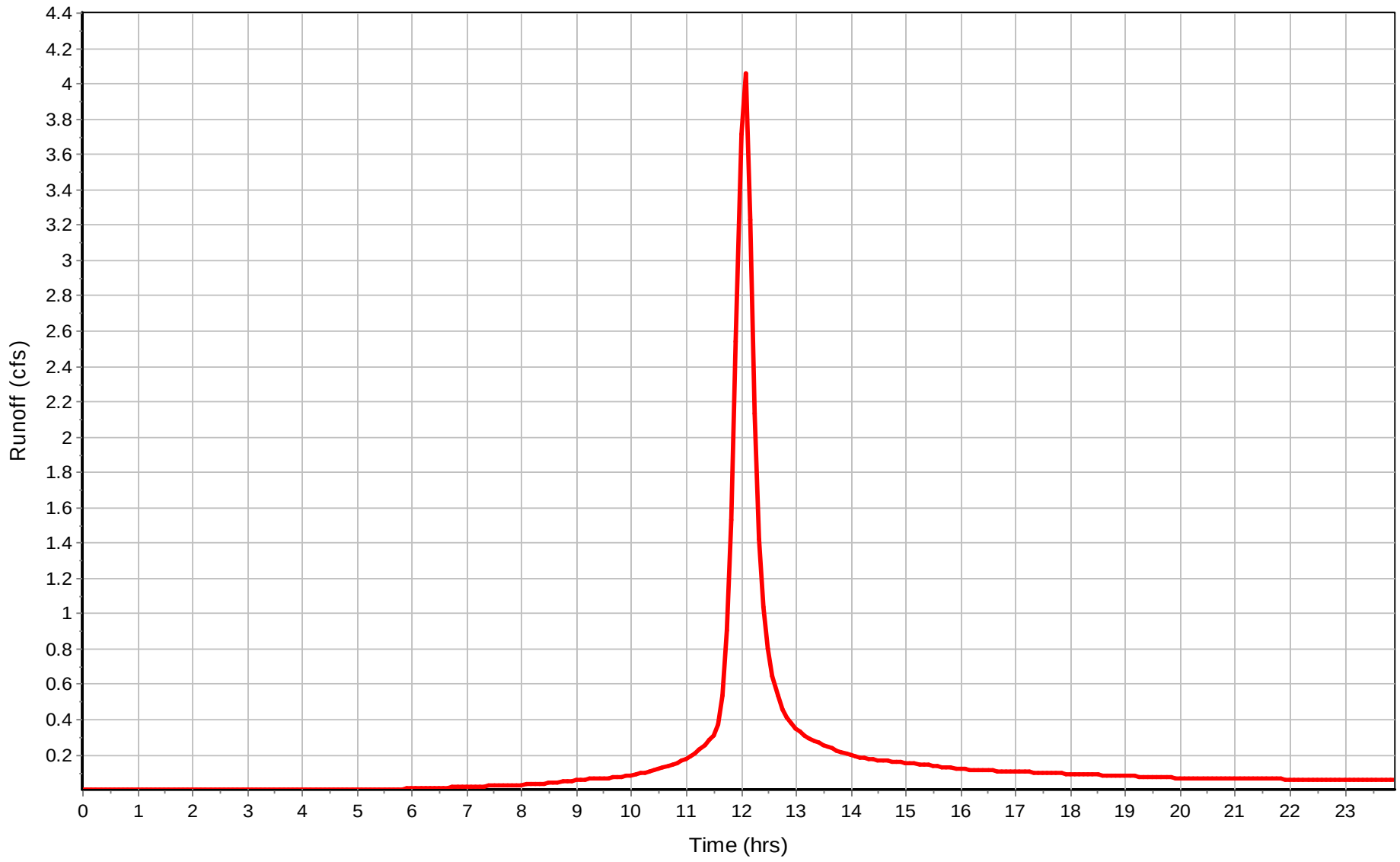
Total Rainfall (in)		5.5
Total Runoff (in)		3.8
Peak Runoff (cfs)		4.09
Weighted Curve Number		84.72
Time of Concentration (days hh:mm:ss)	0 00:18:05	

Subbasin : SubCB-26

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-27

Input Data

Area (ac)		0.86
Peak Rate Factor		0
Weighted Curve Number		84.8
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.86	-	84.8
Composite Area & Weighted CN	0.86		84.8

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	4.87	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	17.37	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	201.17	0	0
Slope (%) :	1.72	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.12	0	0
Computed Flow Time (min) :	1.58	0	0

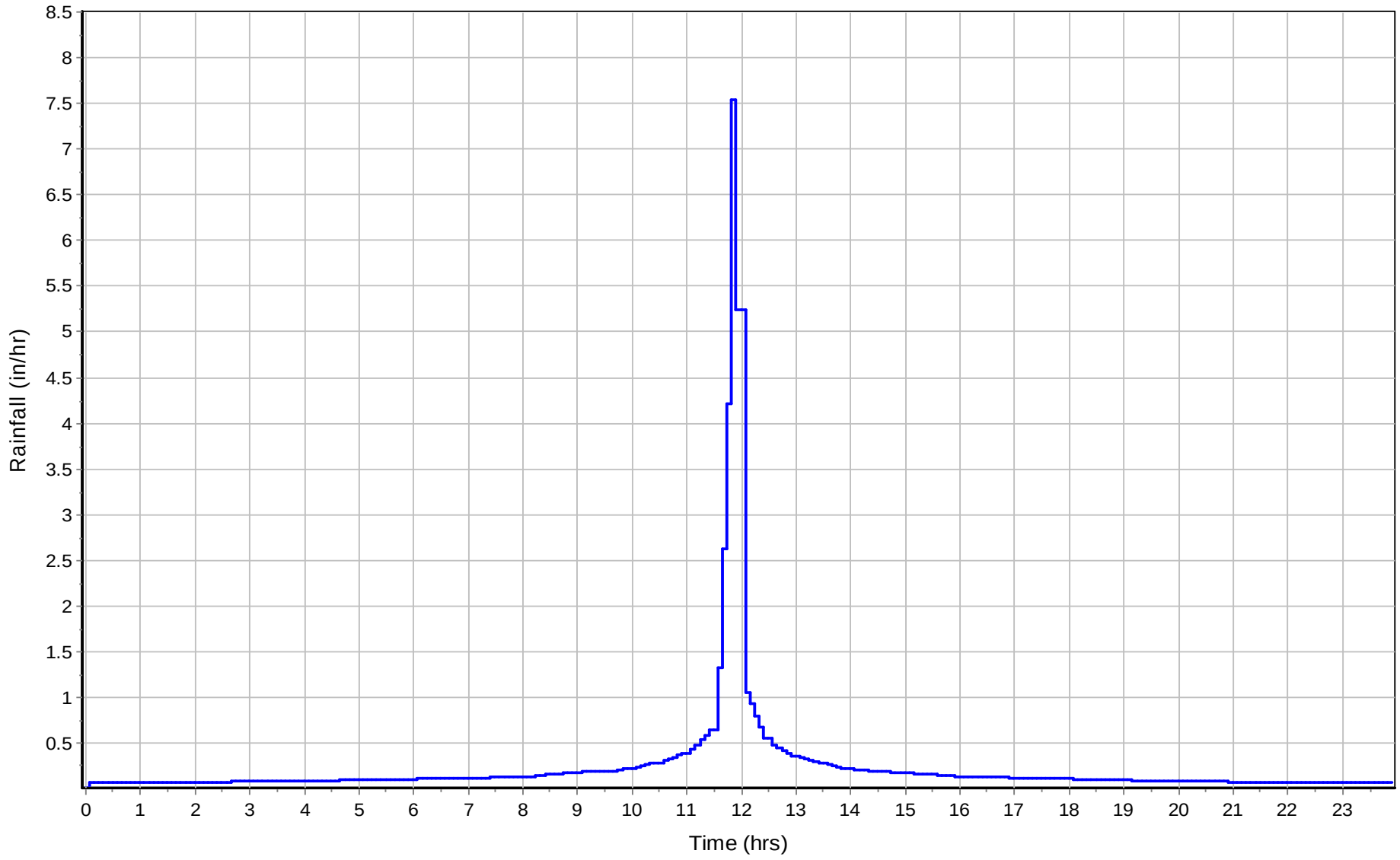
Total TOC (min) 18.95

Subbasin Runoff Results

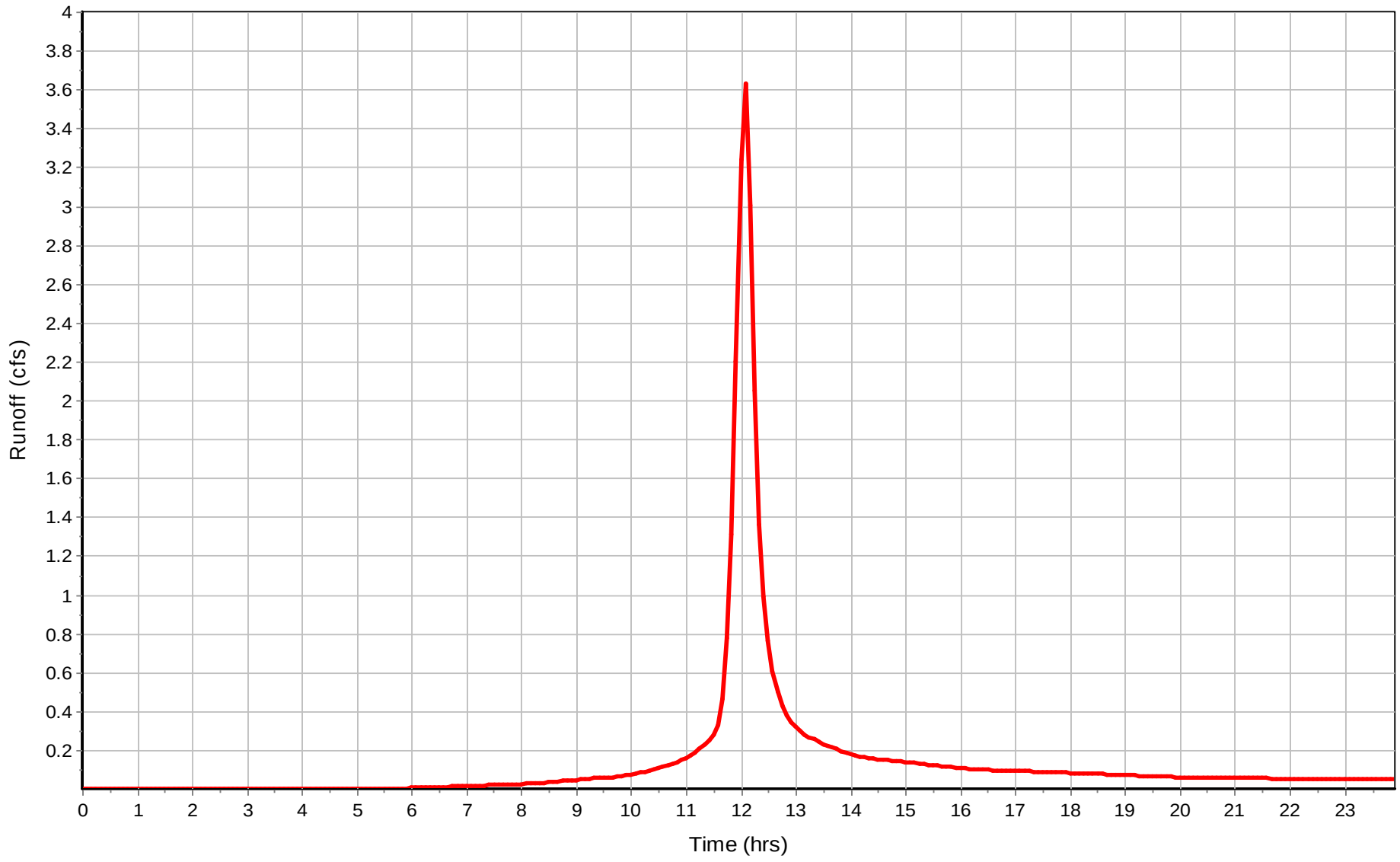
Total Rainfall (in)		5.5
Total Runoff (in)		3.81
Peak Runoff (cfs)		3.64
Weighted Curve Number		84.8
Time of Concentration (days hh:mm:ss)	0 00:18:57	

Subbasin : SubCB-27

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-28

Input Data

Area (ac)		1.44
Peak Rate Factor		0
Weighted Curve Number		84.55
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	1.44	-	84.55
Composite Area & Weighted CN	1.44		84.55

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.5	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.69	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	26.33	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	246.52	0	0
Slope (%) :	0.92	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.55	0	0
Computed Flow Time (min) :	2.65	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.027	0	0
Flow Length (ft) :	72.78	0	0
Channel Slope (%) :	2.47	0	0
Cross Section Area (ft^2) :	6	0	0
Wetted Perimeter (ft) :	10.246	0	0
Velocity (ft/sec) :	6.07	0	0
Computed Flow Time (min) :	0.2	0	0

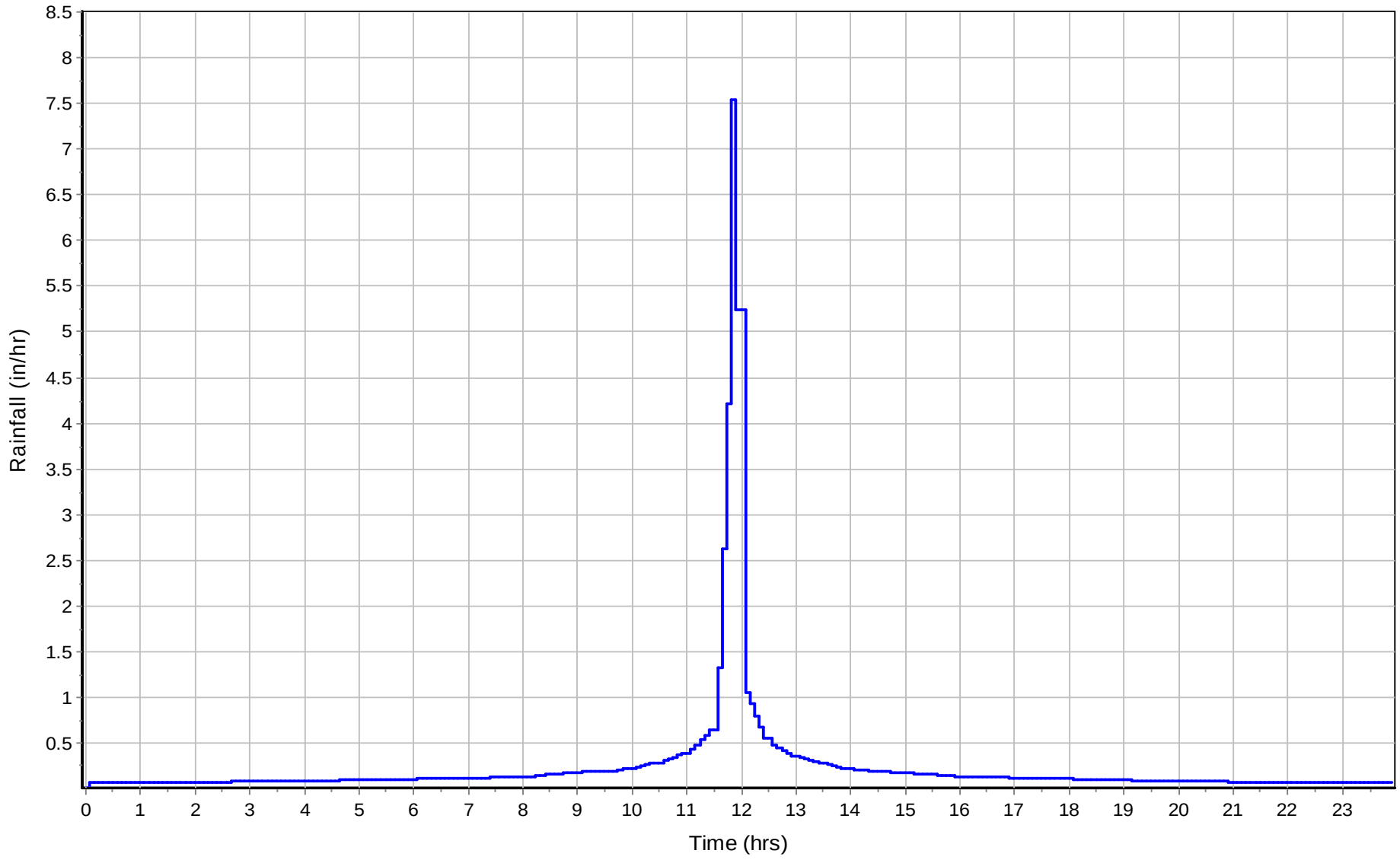
Total TOC (min) 29.18

Subbasin Runoff Results

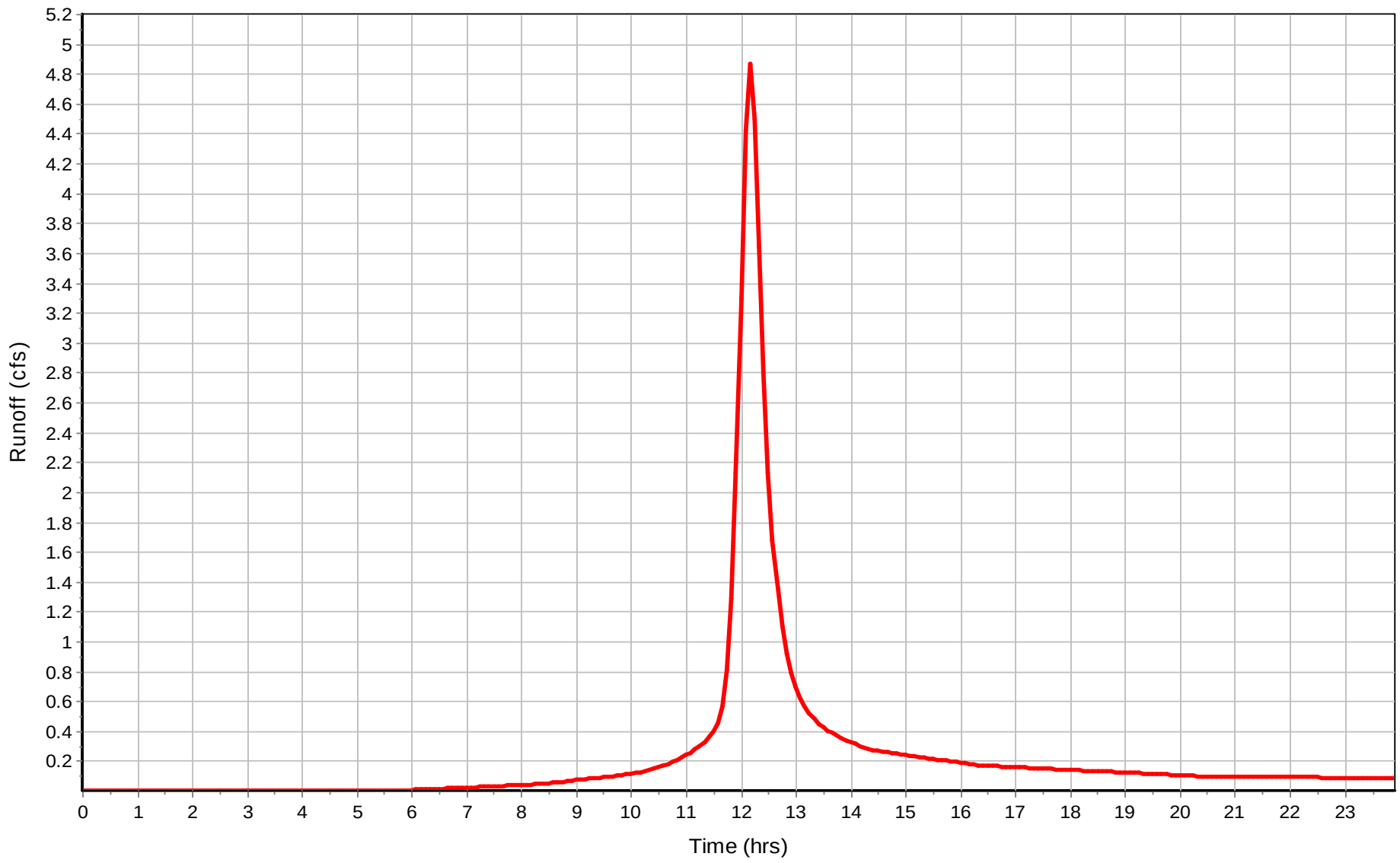
Total Rainfall (in)		5.5
Total Runoff (in)		3.79
Peak Runoff (cfs)		4.87
Weighted Curve Number		84.55
Time of Concentration (days hh:mm:ss)	0 00:29:11	

Subbasin : SubCB-28

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-29

Input Data

Area (ac)		0.41
Peak Rate Factor		0
Weighted Curve Number		84.49
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.41	-	84.49
Composite Area & Weighted CN	0.41		84.49

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.07	0	0
Computed Flow Time (min) :	24.8	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	142.19	0	0
Slope (%) :	2.13	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.35	0	0
Computed Flow Time (min) :	1.01	0	0

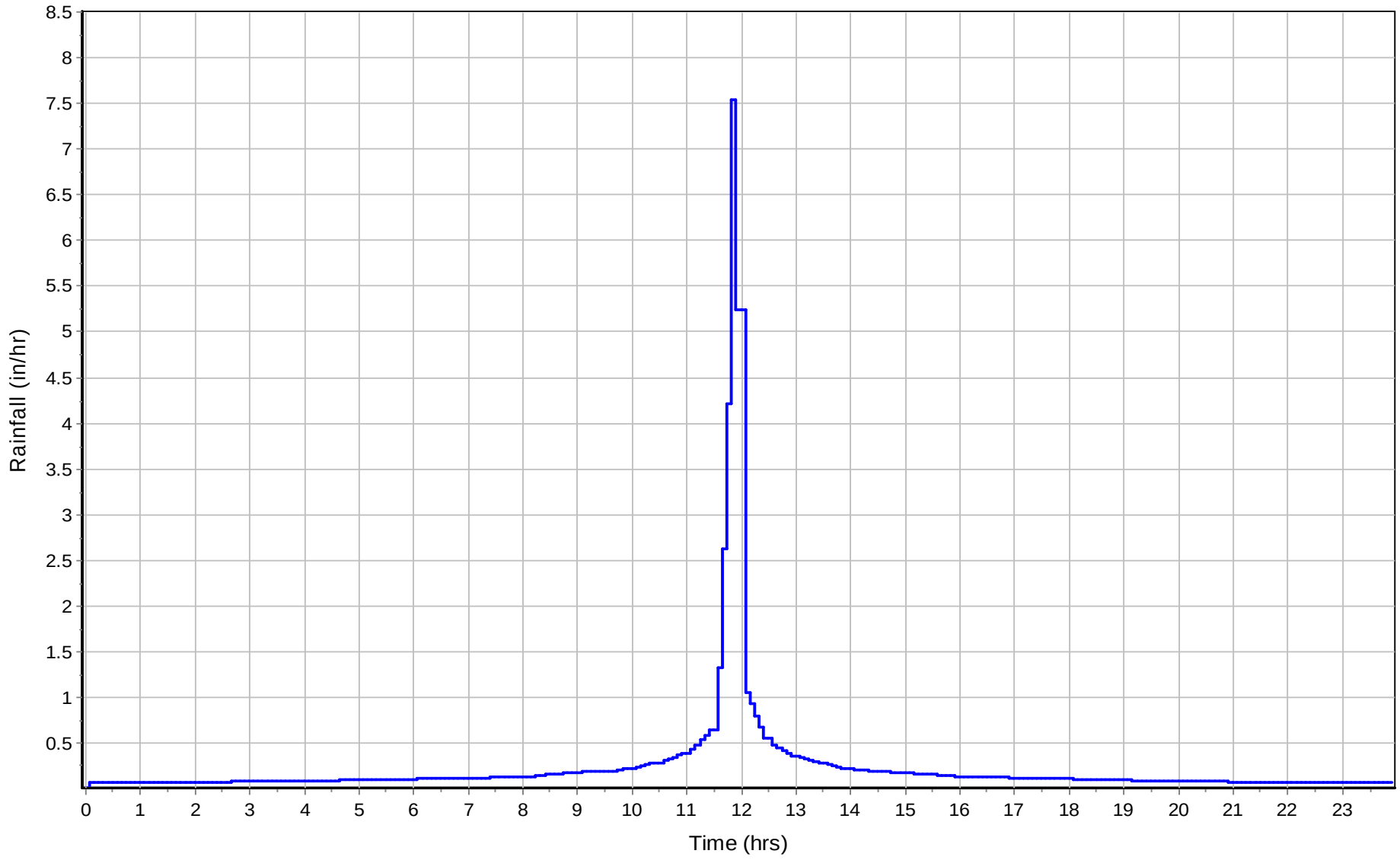
Total TOC (min) 25.80

Subbasin Runoff Results

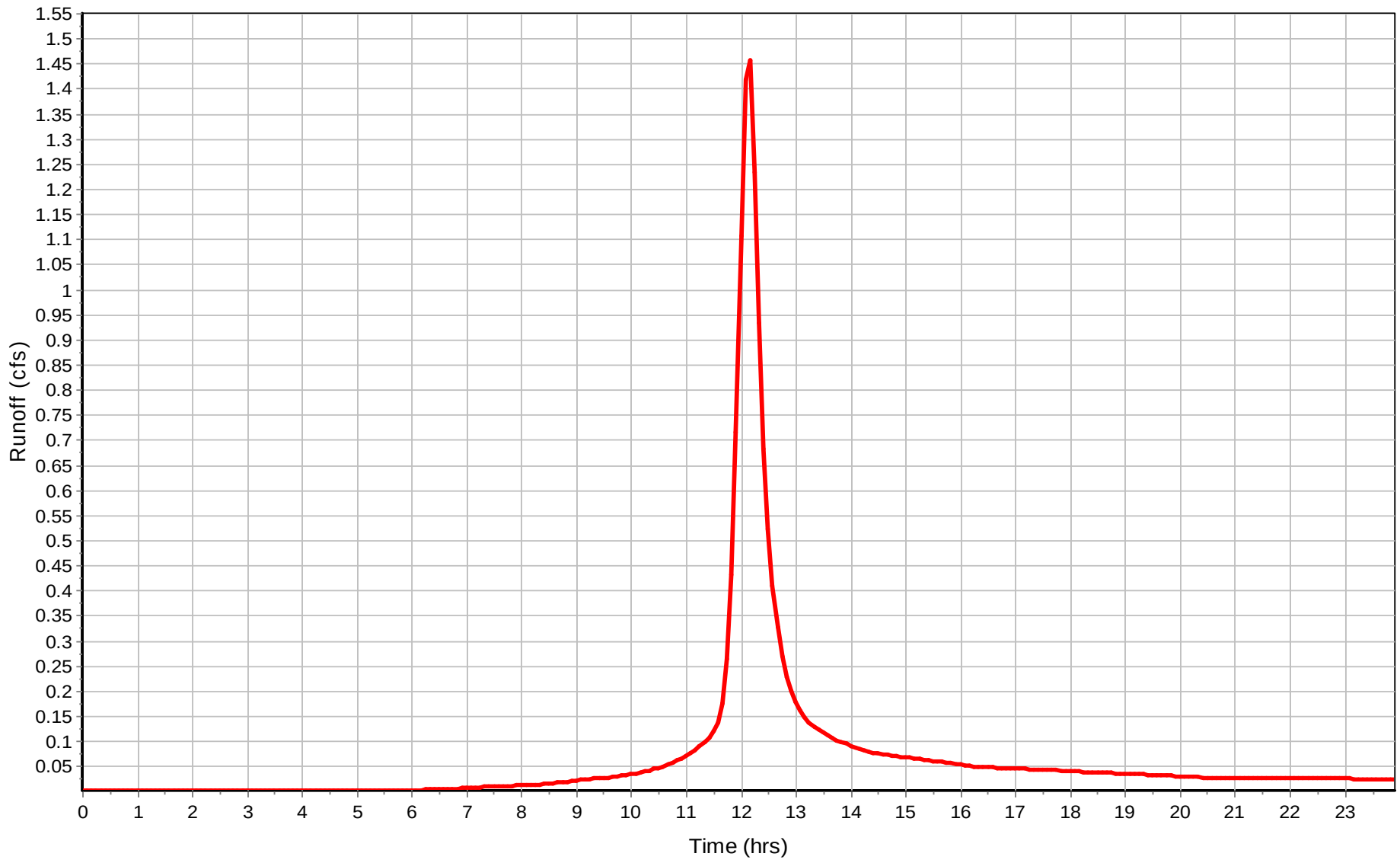
Total Rainfall (in)		5.5
Total Runoff (in)		3.78
Peak Runoff (cfs)		1.48
Weighted Curve Number		84.49
Time of Concentration (days hh:mm:ss)	0 00:25:48	

Subbasin : SubCB-29

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-3

Input Data

Area (ac)		0.11
Peak Rate Factor		0
Weighted Curve Number		97.06
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
-	0.11	-	97.06
Composite Area & Weighted CN	0.11		97.06

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.05	0	0
Flow Length (ft) :	70.66	0	0
Slope (%) :	2.83	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.38	0	0
Computed Flow Time (min) :	3.1	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	53.84	0	0
Slope (%) :	2.1	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.34	0	0
Computed Flow Time (min) :	0.38	0	0

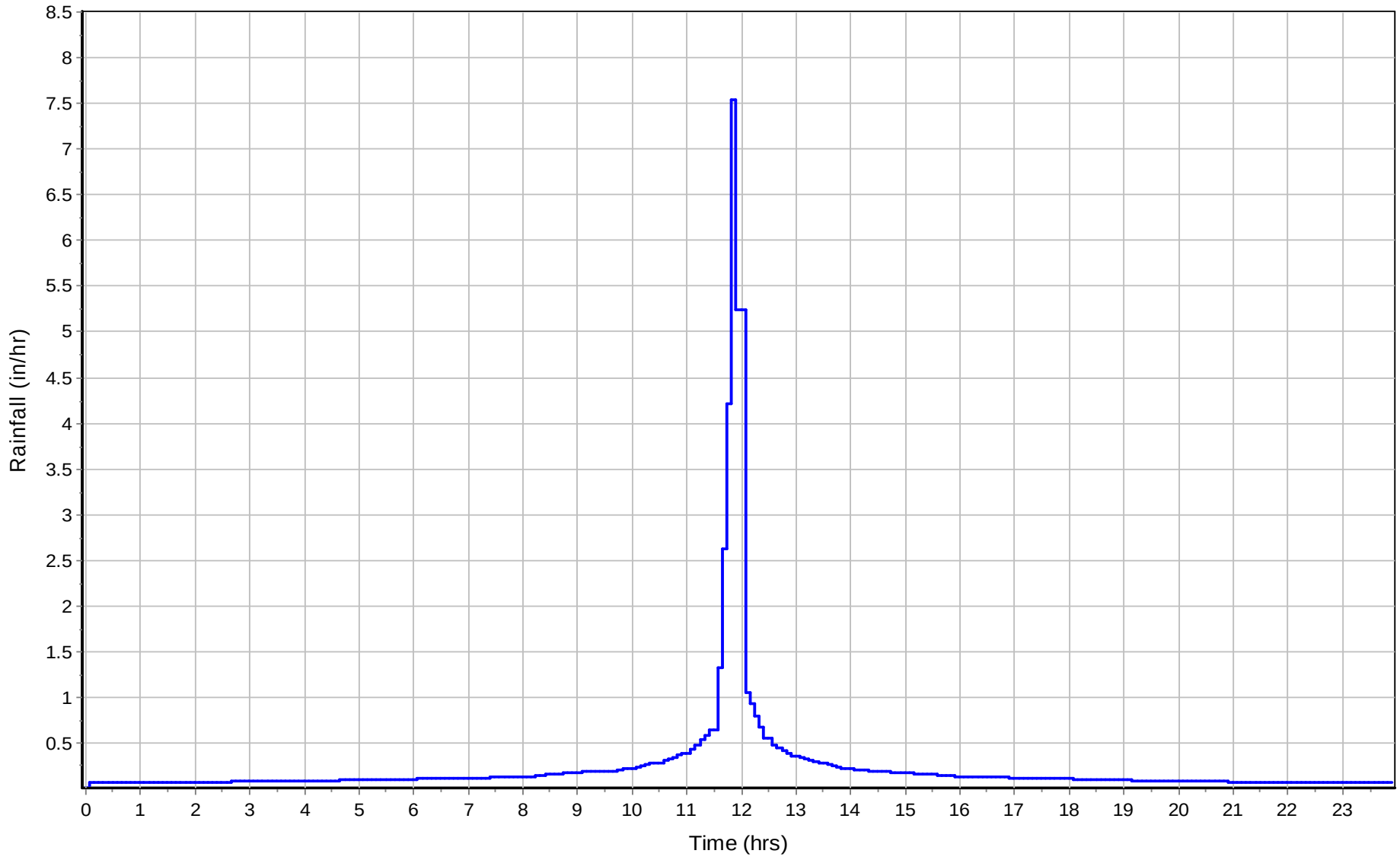
Total TOC (min) 3.48

Subbasin Runoff Results

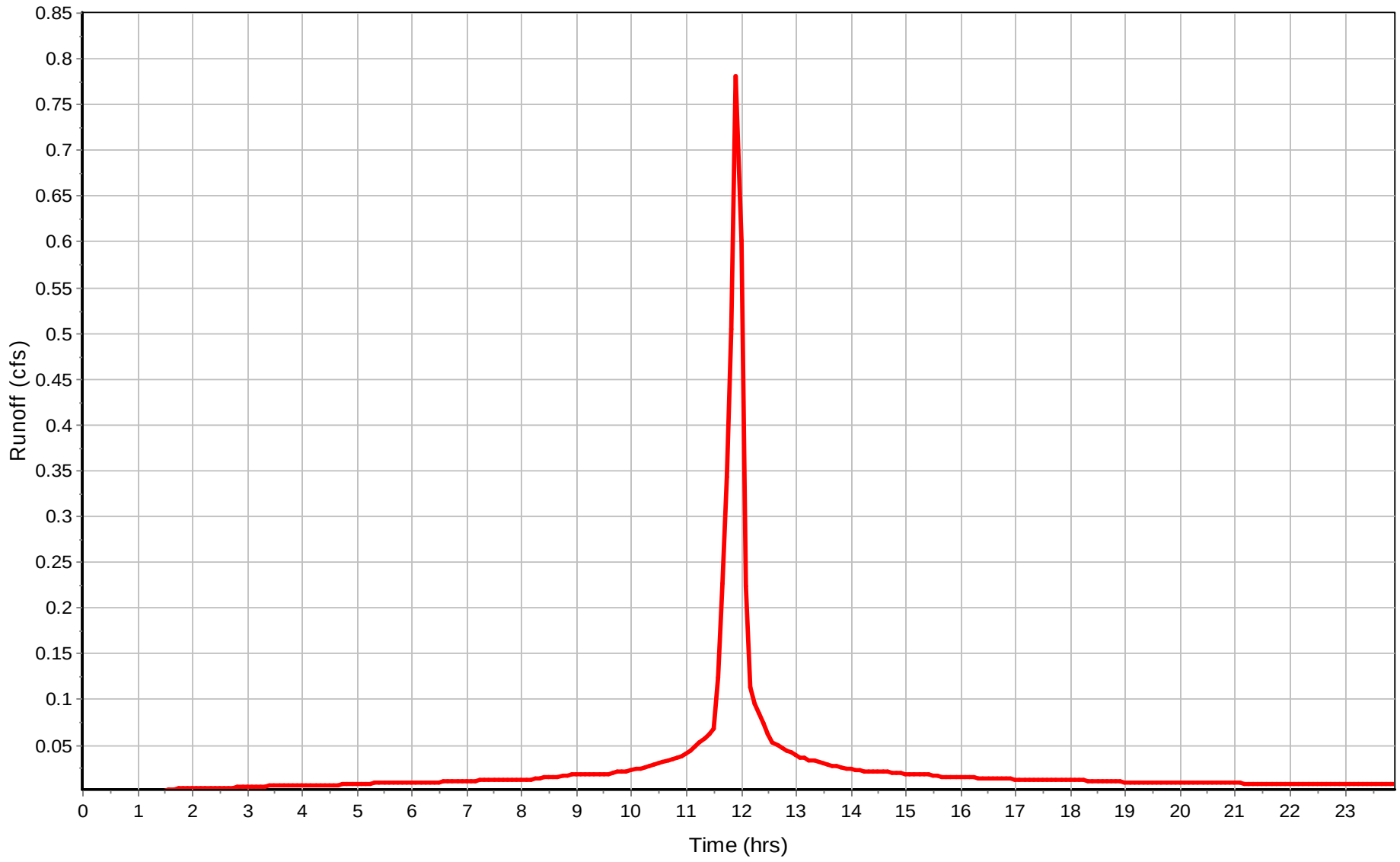
Total Rainfall (in)		5.5
Total Runoff (in)		5.15
Peak Runoff (cfs)		0.78
Weighted Curve Number		97.06
Time of Concentration (days hh:mm:ss)	0 00:03:29	

Subbasin : SubCB-3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-30 (humane basin)

Input Data

Area (ac)		12.29
Peak Rate Factor		0
Weighted Curve Number		87.92
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
-	12.29	-	87.92
Composite Area & Weighted CN	12.29		87.92

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.5	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.7	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.05	0	0
Computed Flow Time (min) :	31.63	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	340.7735	0	0
Slope (%) :	2.78	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.69	0	0
Computed Flow Time (min) :	2.11	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	807.91	0	0
Channel Slope (%) :	0.5	0	0
Cross Section Area (ft^2) :	5	0	0
Wetted Perimeter (ft) :	8.325	0	0
Velocity (ft/sec) :	2.5	0	0
Computed Flow Time (min) :	5.39	0	0

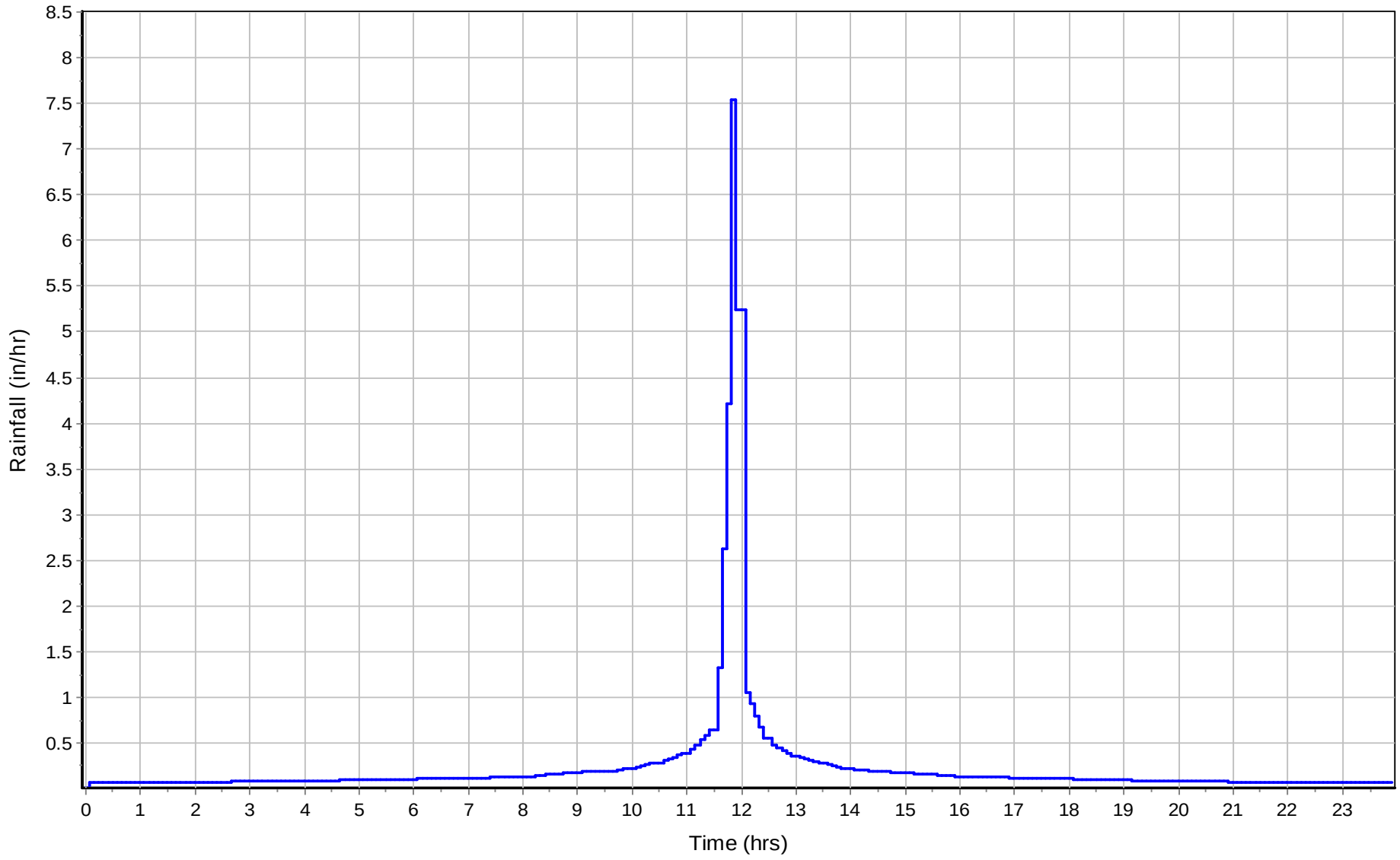
Total TOC (min) 39.13

Subbasin Runoff Results

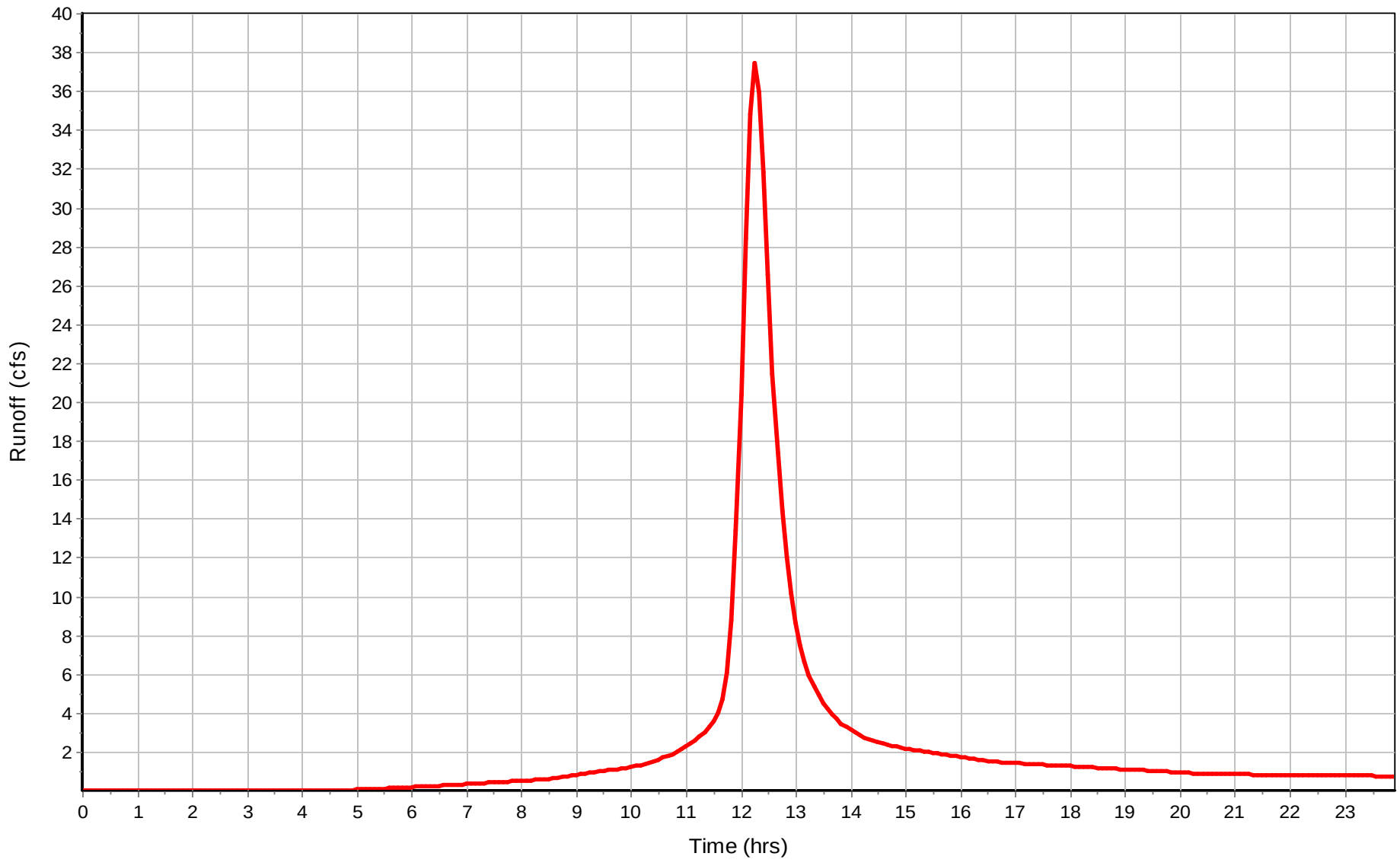
Total Rainfall (in)		5.5
Total Runoff (in)		4.14
Peak Runoff (cfs)		37.5
Weighted Curve Number		87.92
Time of Concentration (days hh:mm:ss)	0 00:39:08	

Subbasin : SubCB-30 (humane basin)

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-31

Input Data

Area (ac)		4.41
Peak Rate Factor		0
Weighted Curve Number		84.94
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	4.41	-	84.94
Composite Area & Weighted CN	4.41		84.94

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	29.92	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	390.38	0	0
Slope (%) :	0.6	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0	0
Computed Flow Time (min) :	5.21	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.027	0	0
Flow Length (ft) :	559.72	0	0
Channel Slope (%) :	1	0	0
Cross Section Area (ft^2) :	5	0	0
Wetted Perimeter (ft) :	8.325	0	0
Velocity (ft/sec) :	3.93	0	0
Computed Flow Time (min) :	2.37	0	0

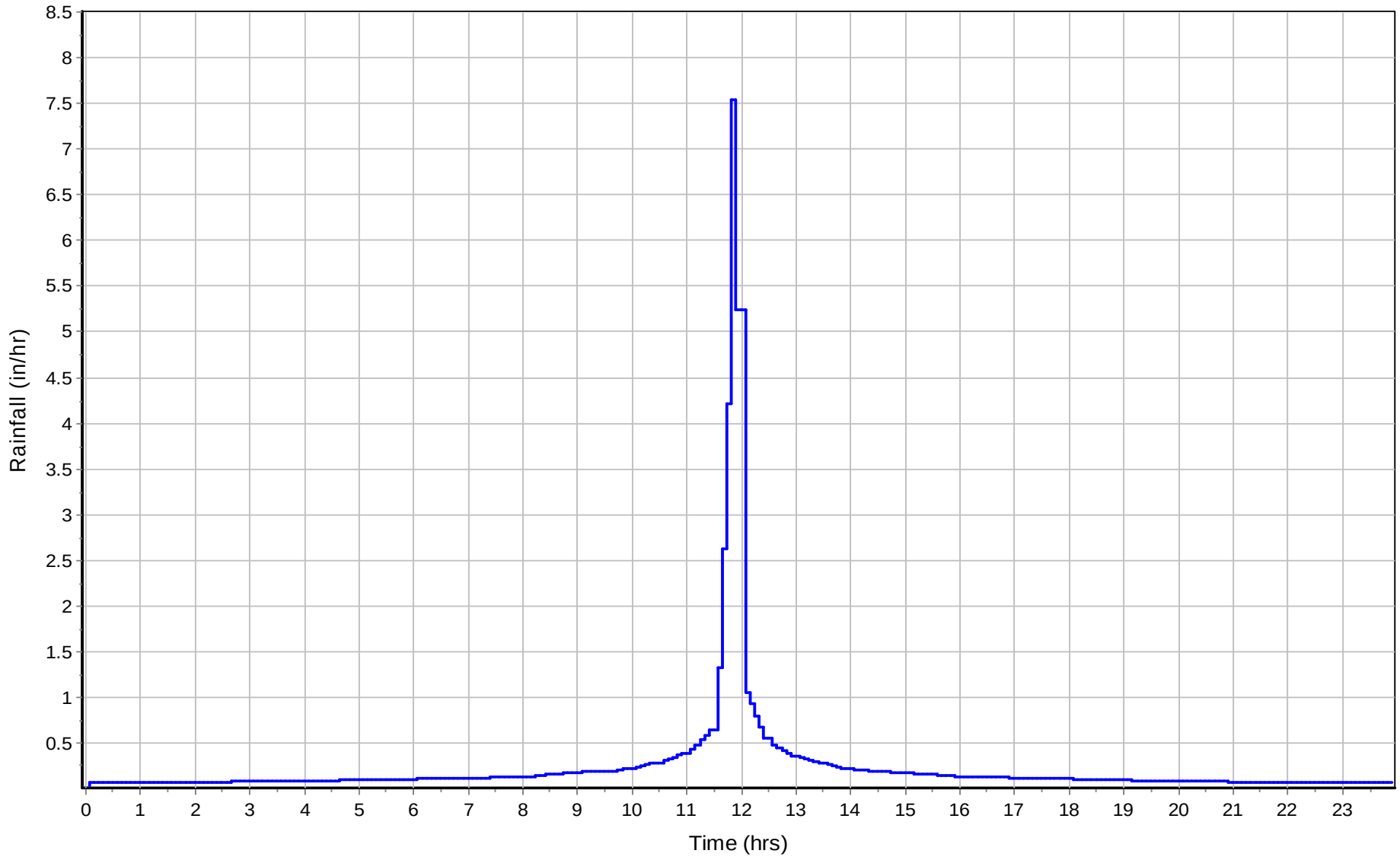
Total TOC (min) 37.50

Subbasin Runoff Results

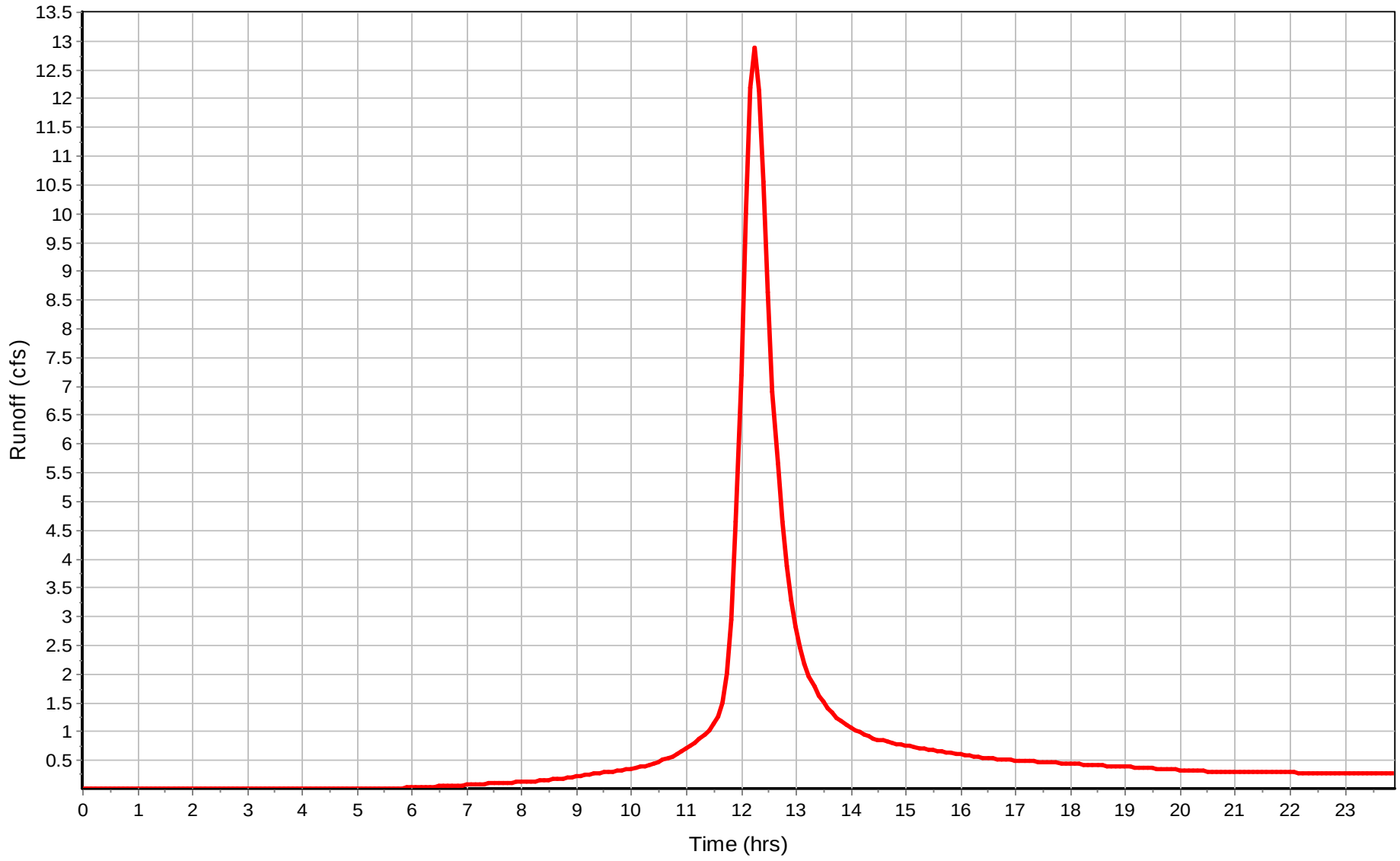
Total Rainfall (in)		5.5
Total Runoff (in)		3.83
Peak Runoff (cfs)		12.92
Weighted Curve Number		84.94
Time of Concentration (days hh:mm:ss)	0 00:37:30	

Subbasin : SubCB-31

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-32

Input Data

Area (ac)		0.21
Peak Rate Factor		0
Weighted Curve Number		84.74
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
-	0.21	-	84.74
Composite Area & Weighted CN	0.21		84.74

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.07	0	0
Computed Flow Time (min) :	24.8	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	121.39	0	0
Slope (%) :	3.47	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	3.01	0	0
Computed Flow Time (min) :	0.67	0	0

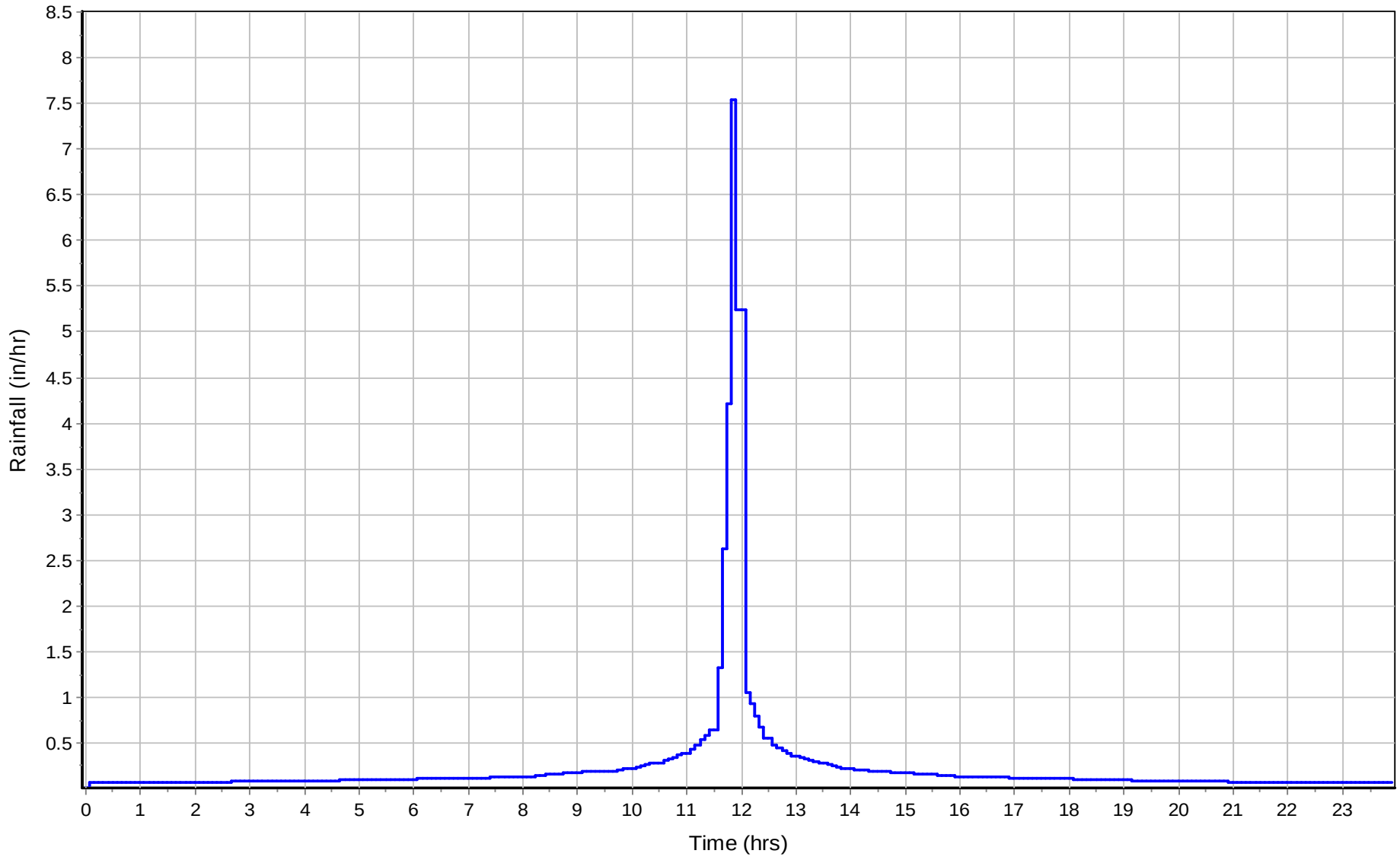
Total TOC (min) 25.47

Subbasin Runoff Results

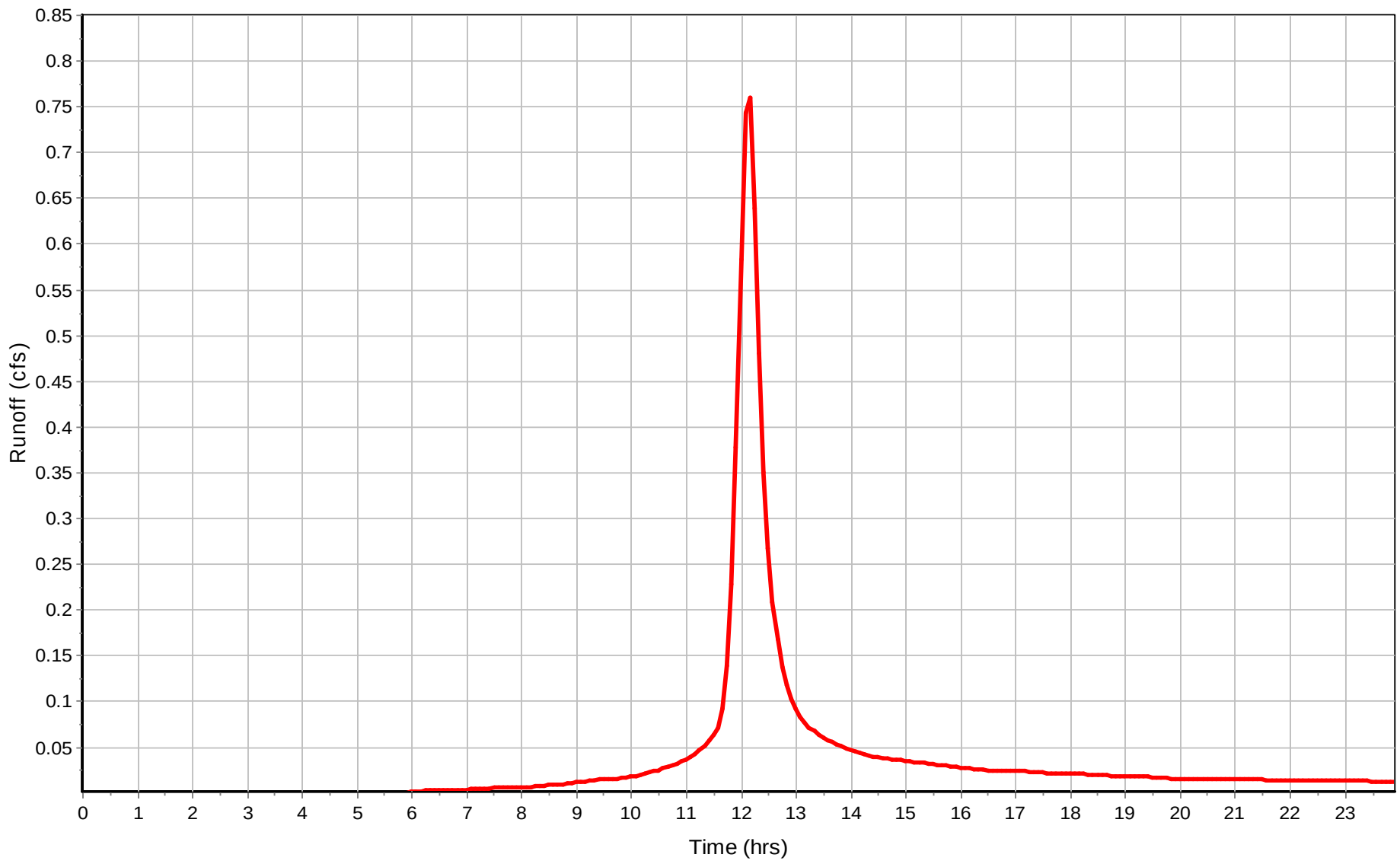
Total Rainfall (in)		5.5
Total Runoff (in)		3.8
Peak Runoff (cfs)		0.77
Weighted Curve Number		84.74
Time of Concentration (days hh:mm:ss)	0 00:25:28	

Subbasin : SubCB-32

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-33

Input Data

Area (ac)		1.46
Peak Rate Factor		0
Weighted Curve Number		80.64
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	1.46	-	80.64
Composite Area & Weighted CN	1.46		80.64

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.8	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	21.67	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	311.55	0	0
Slope (%) :	1.35	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	2.78	0	0

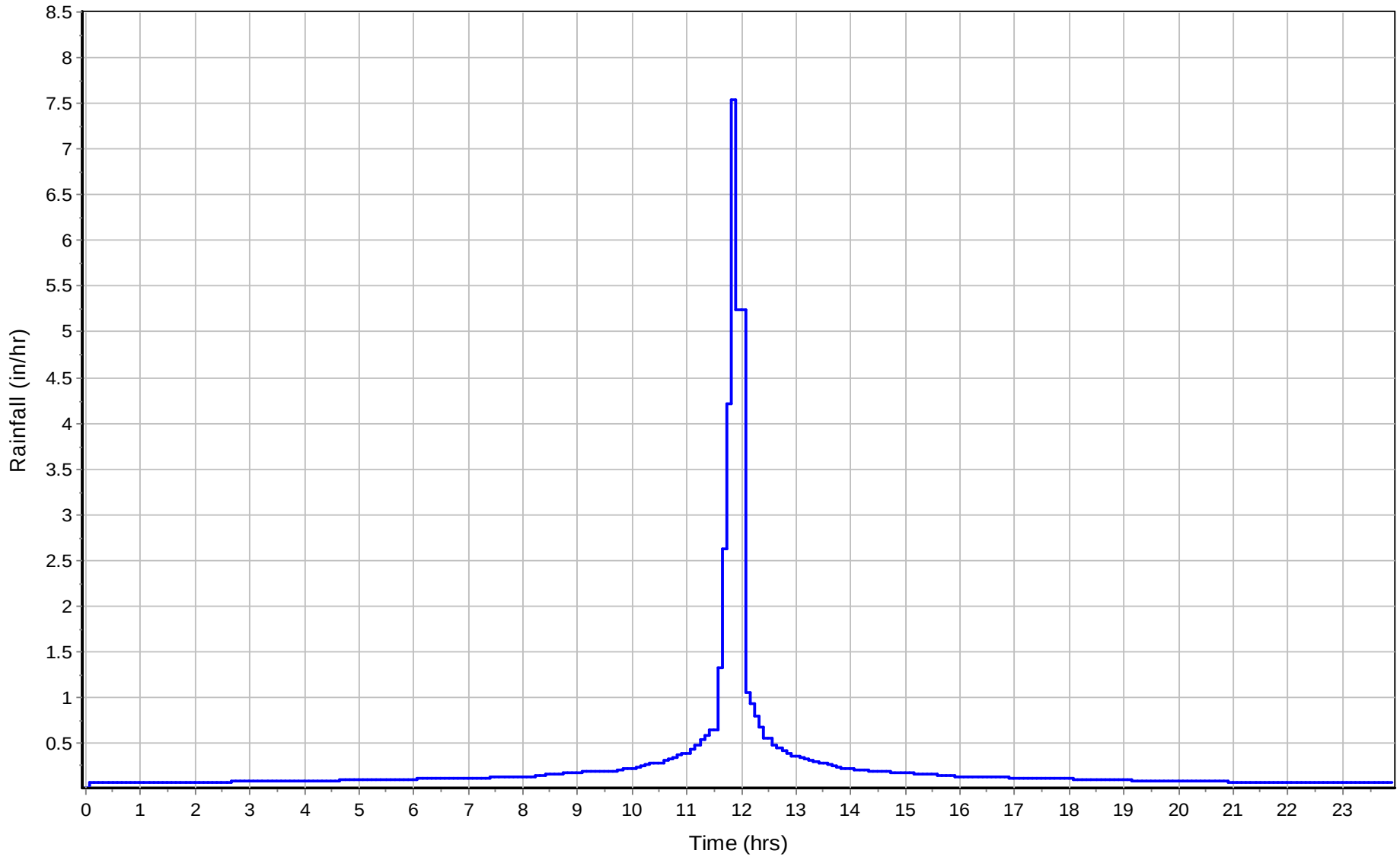
Total TOC (min) 24.45

Subbasin Runoff Results

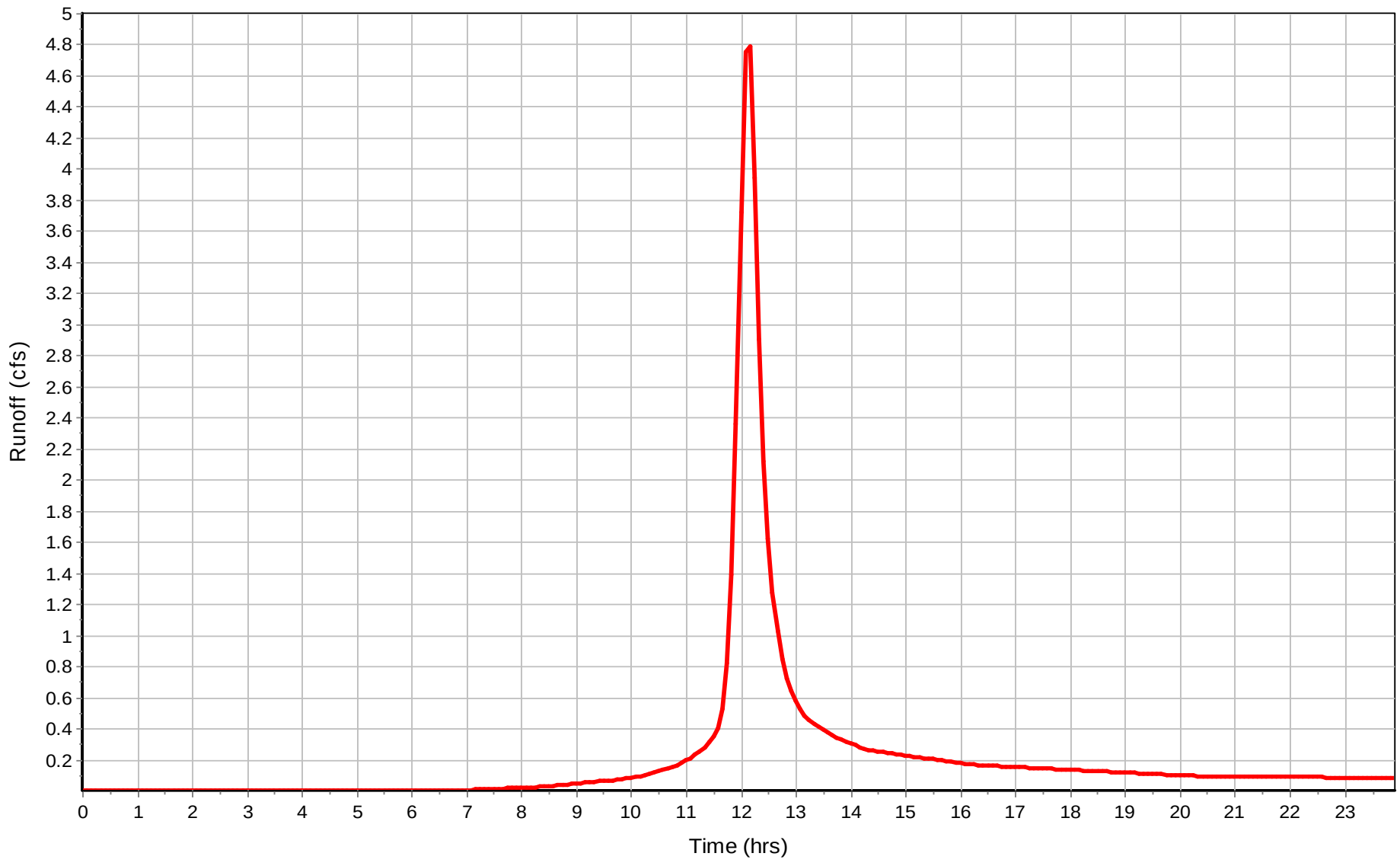
Total Rainfall (in)		5.5
Total Runoff (in)		3.4
Peak Runoff (cfs)		4.92
Weighted Curve Number		80.64
Time of Concentration (days hh:mm:ss)	0 00:24:27	

Subbasin : SubCB-33

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-34

Input Data

Area (ac)		1.12
Peak Rate Factor		0
Weighted Curve Number		93.91
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	1.12	-	93.91
Composite Area & Weighted CN	1.12		93.91

Time of Concentration

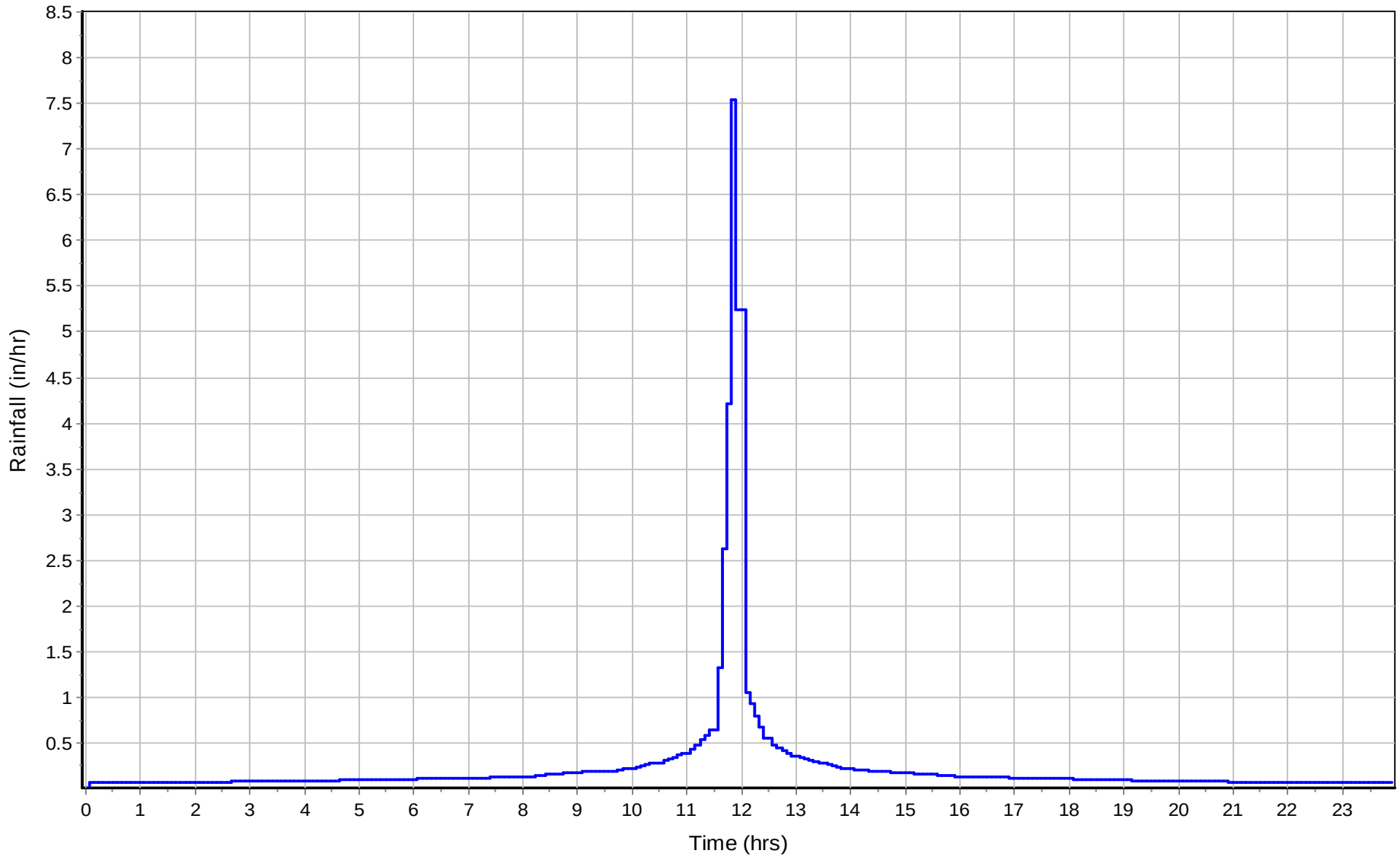
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

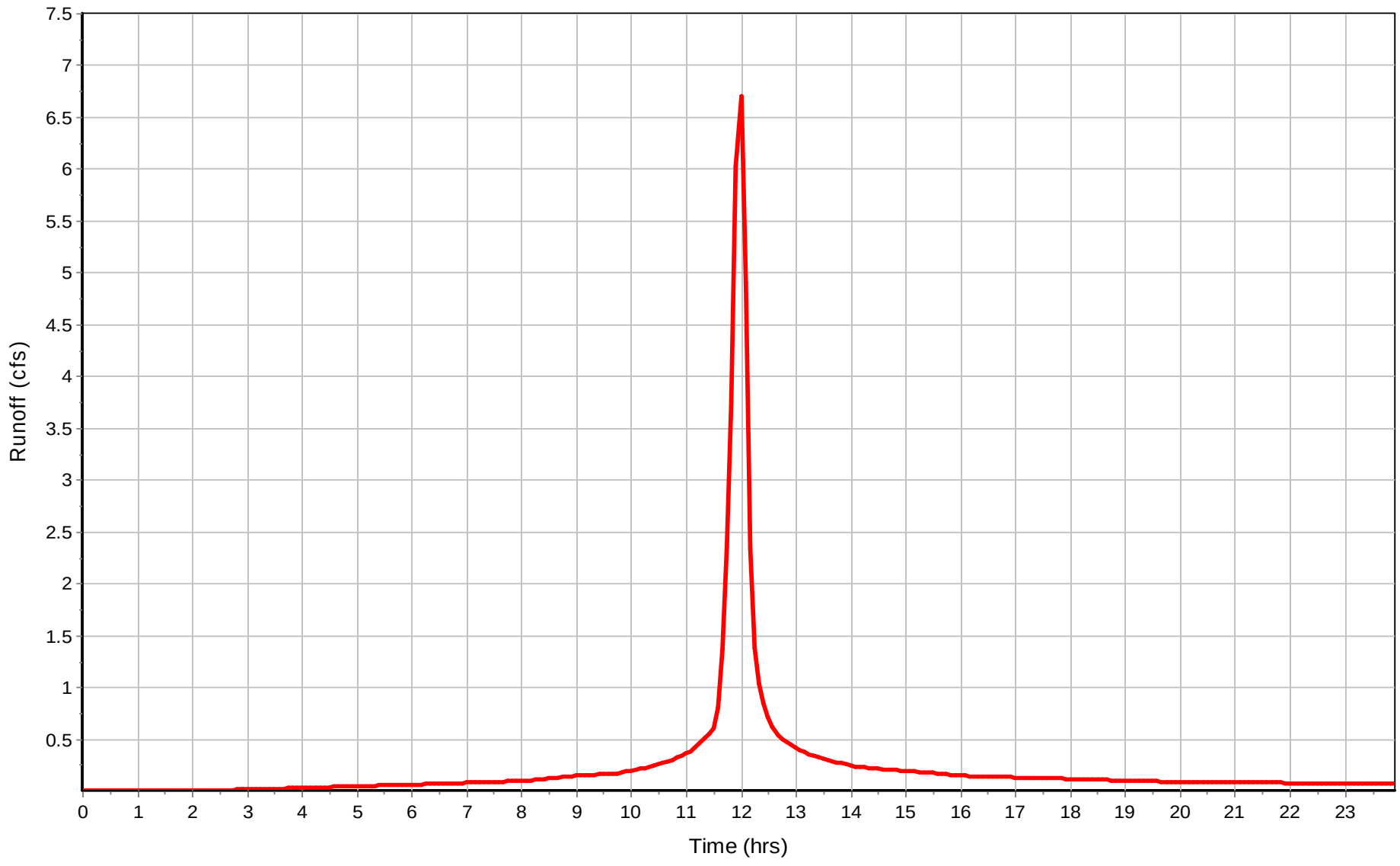
Total Rainfall (in)		5.5
Total Runoff (in)		4.79
Peak Runoff (cfs)		6.83
Weighted Curve Number		93.91
Time of Concentration (days hh:mm:ss)	0 00:10:00	

Subbasin : SubCB-34

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-35

Input Data

Area (ac)	0.6
Peak Rate Factor	0
Weighted Curve Number	88.55
Rain Gage ID	Rain Gage-01

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.6	-	88.55
Composite Area & Weighted CN	0.6		88.55

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	83.93	0	0
Slope (%) :	8.4	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.12	0	0
Computed Flow Time (min) :	12.14	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0	0
Flow Length (ft) :	39.77	0	0
Channel Slope (%) :	2.84	0	0
Cross Section Area (ft^2) :	0.7854	0	0
Wetted Perimeter (ft) :	3.1416	0	0
Velocity (ft/sec) :	8.3	0	0
Computed Flow Time (min) :	0.08	0	0

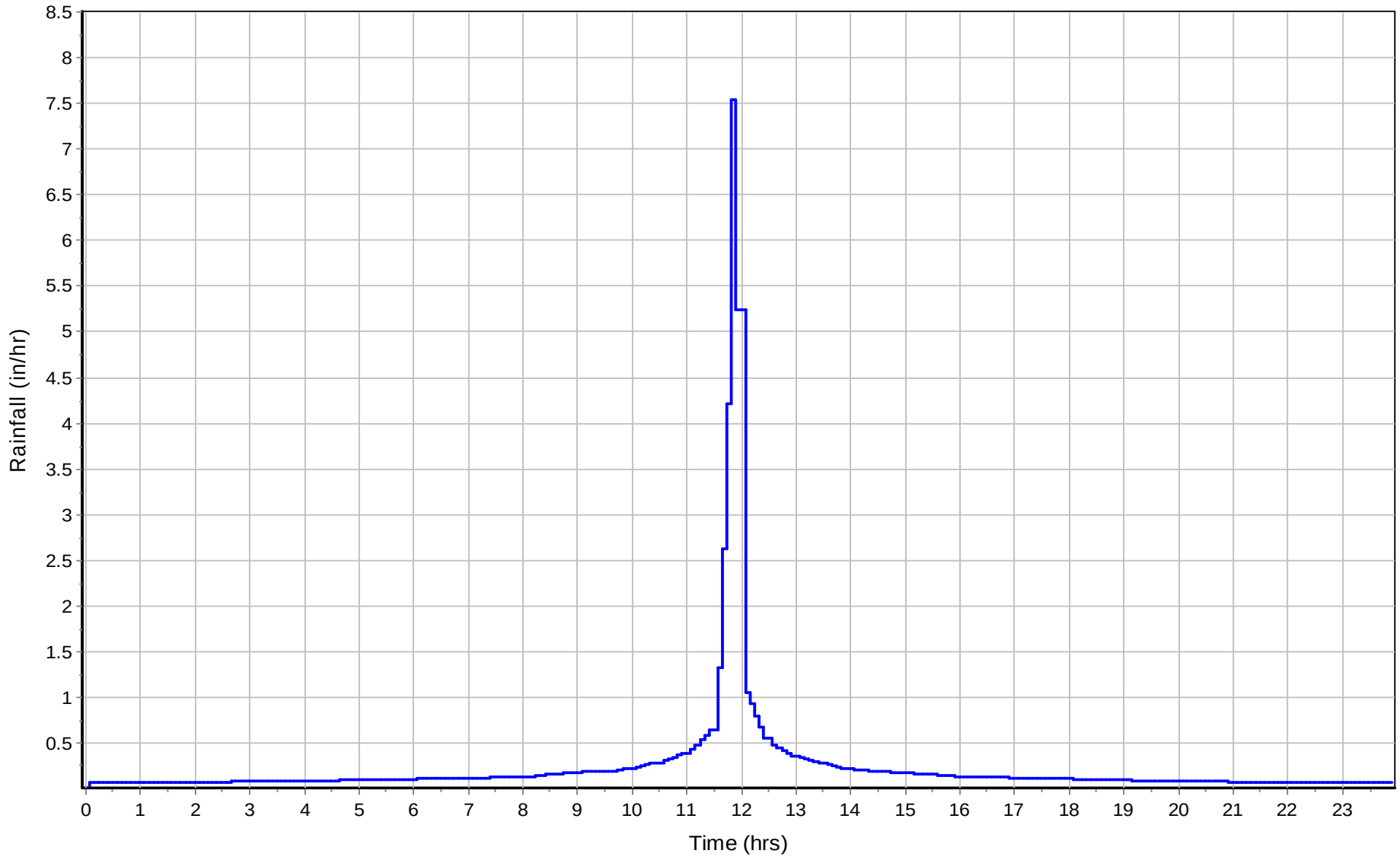
Total TOC (min) 12.22

Subbasin Runoff Results

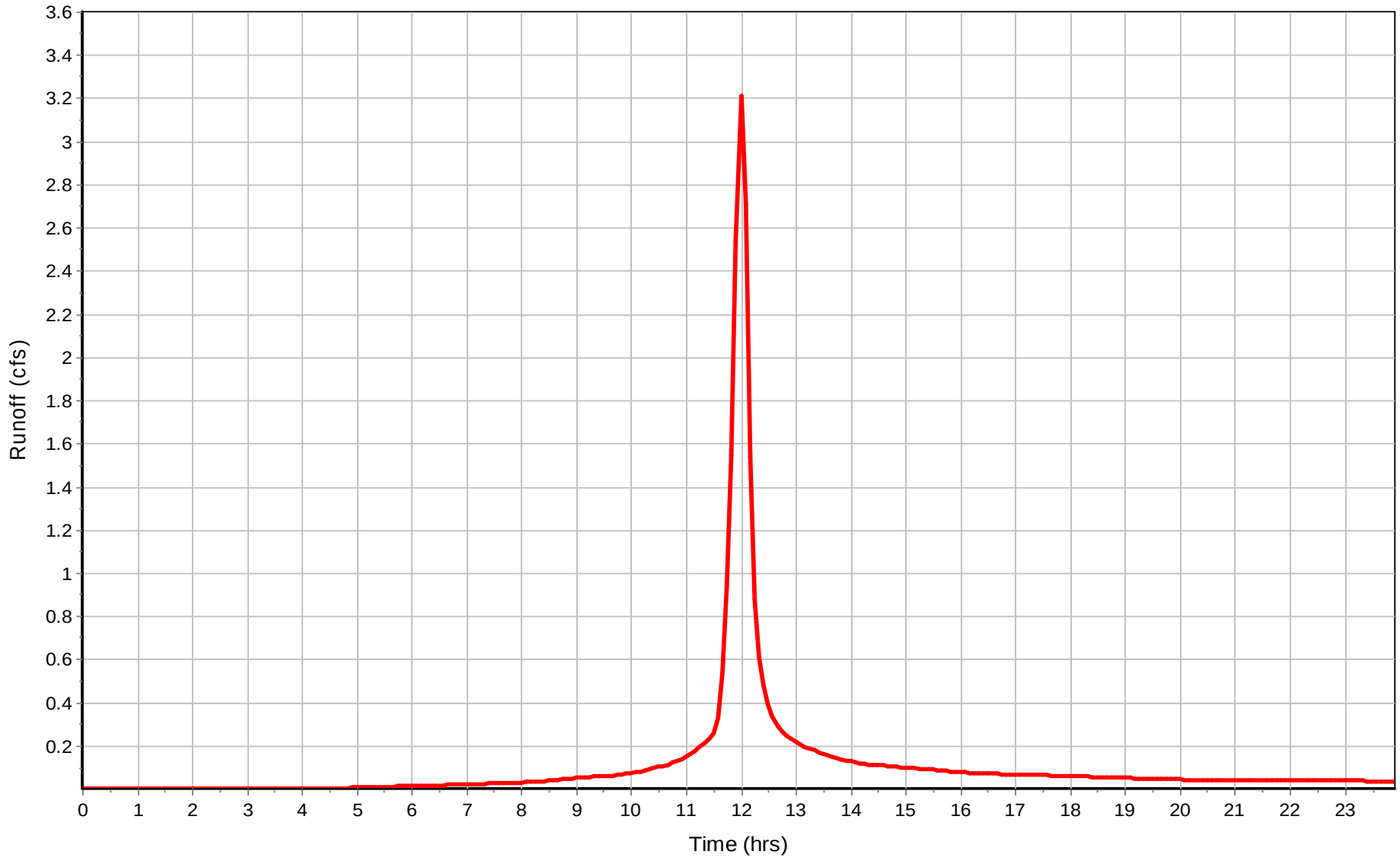
Total Rainfall (in)	5.5
Total Runoff (in)	4.2
Peak Runoff (cfs)	3.21
Weighted Curve Number	88.55
Time of Concentration (days hh:mm:ss)	0 00:12:13

Subbasin : SubCB-35

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-36

Input Data

Area (ac)		0.2
Peak Rate Factor		0
Weighted Curve Number		98
Rain Gage ID	Rain Gage-01	

Composite Curve Number

Soil/Surface Description	32 Area (acres)	Soil Group	Curve Number
-	0.2	-	98
Composite Area & Weighted CN	0.2		98

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	74.03	0	0
Slope (%) :	4.66	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	13.9	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	26.1	0	0
Slope (%) :	0.58	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	1.55	0	0
Computed Flow Time (min) :	0.28	0	0

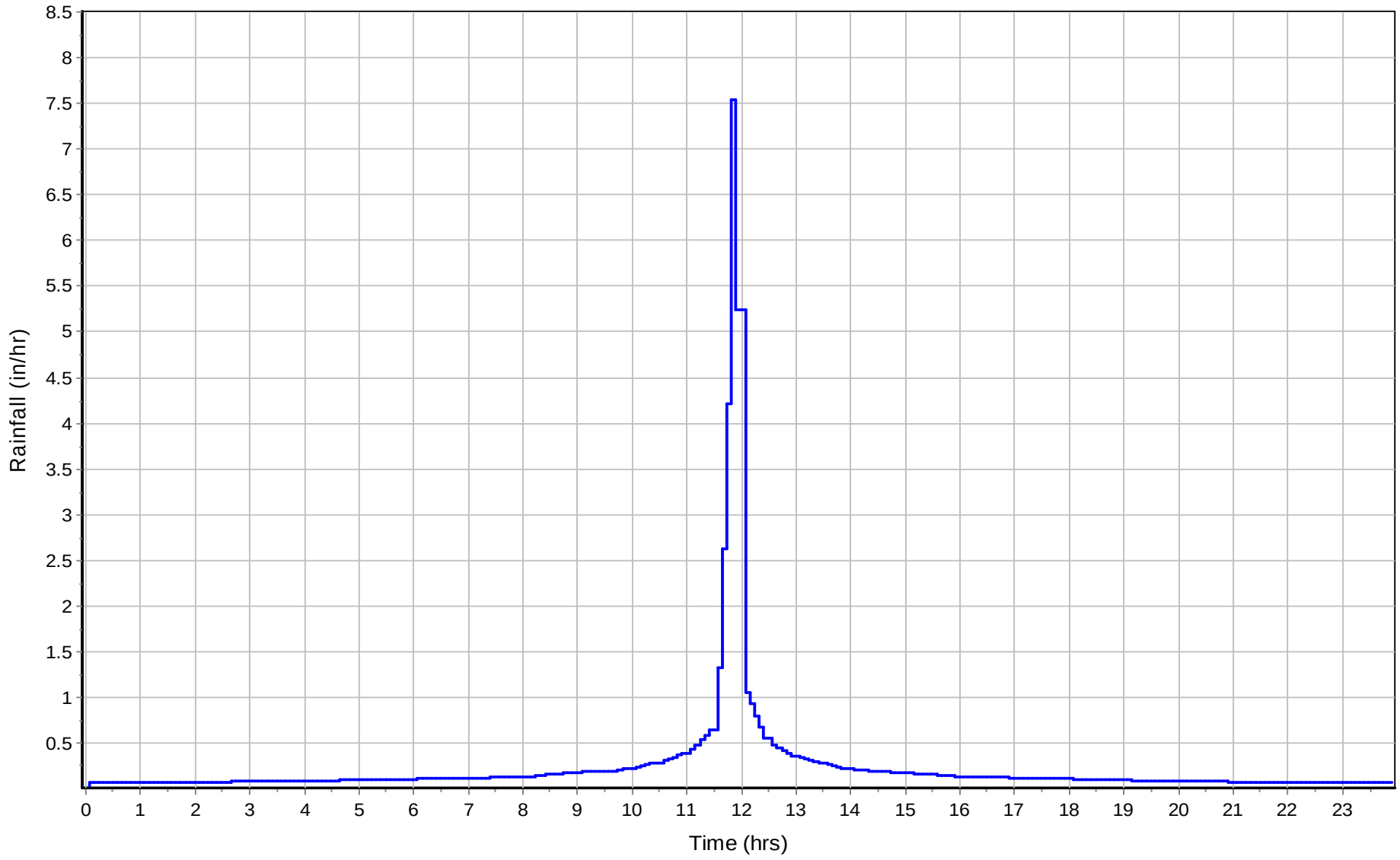
Total TOC (min) 14.18

Subbasin Runoff Results

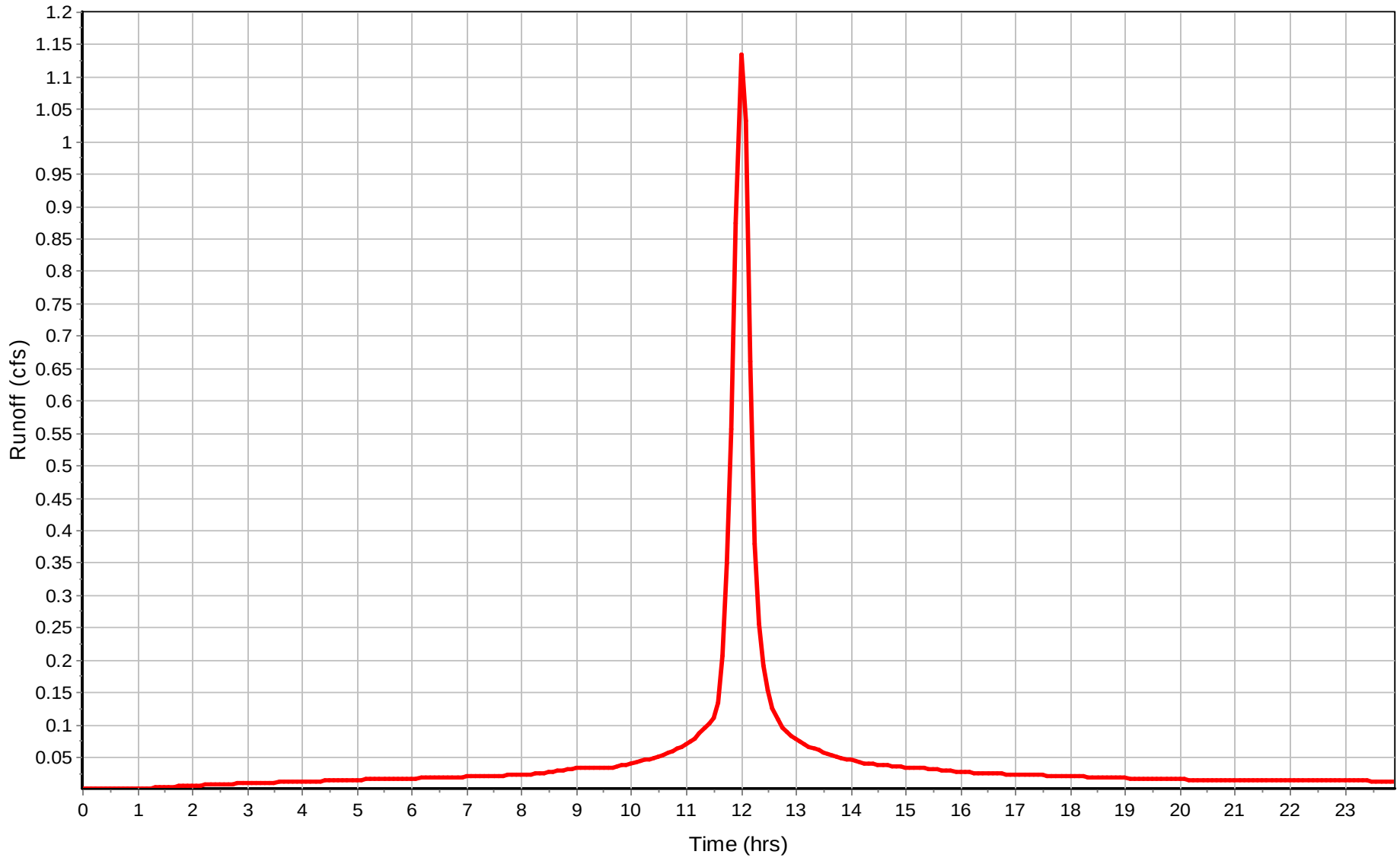
Total Rainfall (in)		5.5
Total Runoff (in)		5.26
Peak Runoff (cfs)		1.15
Weighted Curve Number		98
Time of Concentration (days hh:mm:ss)	0 00:14:11	

Subbasin : SubCB-36

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-37

Input Data

Area (ac)		10.56
Peak Rate Factor		0
Weighted Curve Number		87.09
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	10.56	-	87.09
Composite Area & Weighted CN	10.56		87.09

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.15	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.05	0	0
Computed Flow Time (min) :	30.94	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	639.2684	0	0
Slope (%) :	1.41	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.92	0	0
Computed Flow Time (min) :	5.55	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.012	0	0
Flow Length (ft) :	856.31	0	0
Channel Slope (%) :	0.92	0	0
Cross Section Area (ft^2) :	0.7854	0	0
Wetted Perimeter (ft) :	3.1416	0	0
Velocity (ft/sec) :	4.73	0	0
Computed Flow Time (min) :	3.02	0	0

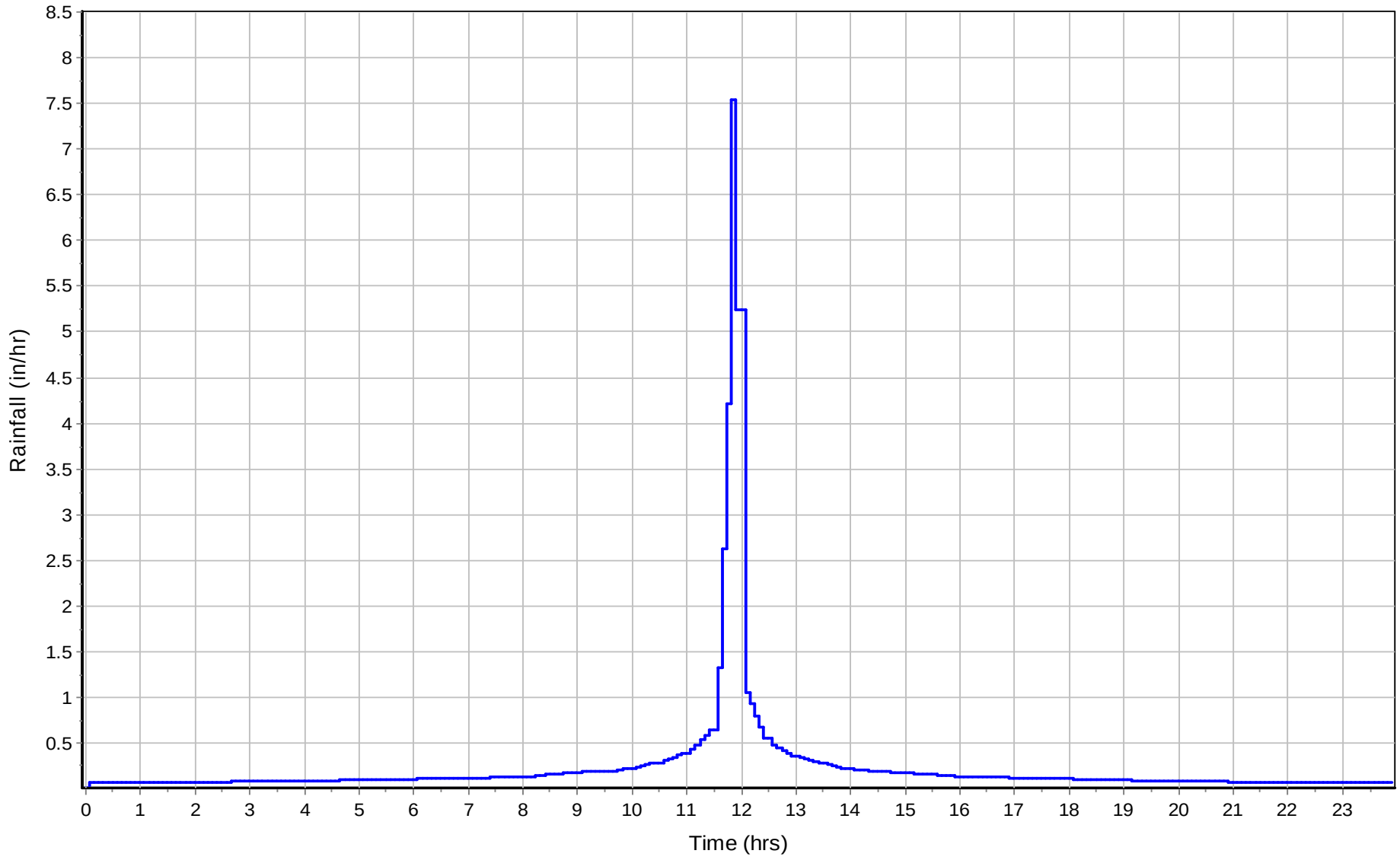
Total TOC (min) 39.51

Subbasin Runoff Results

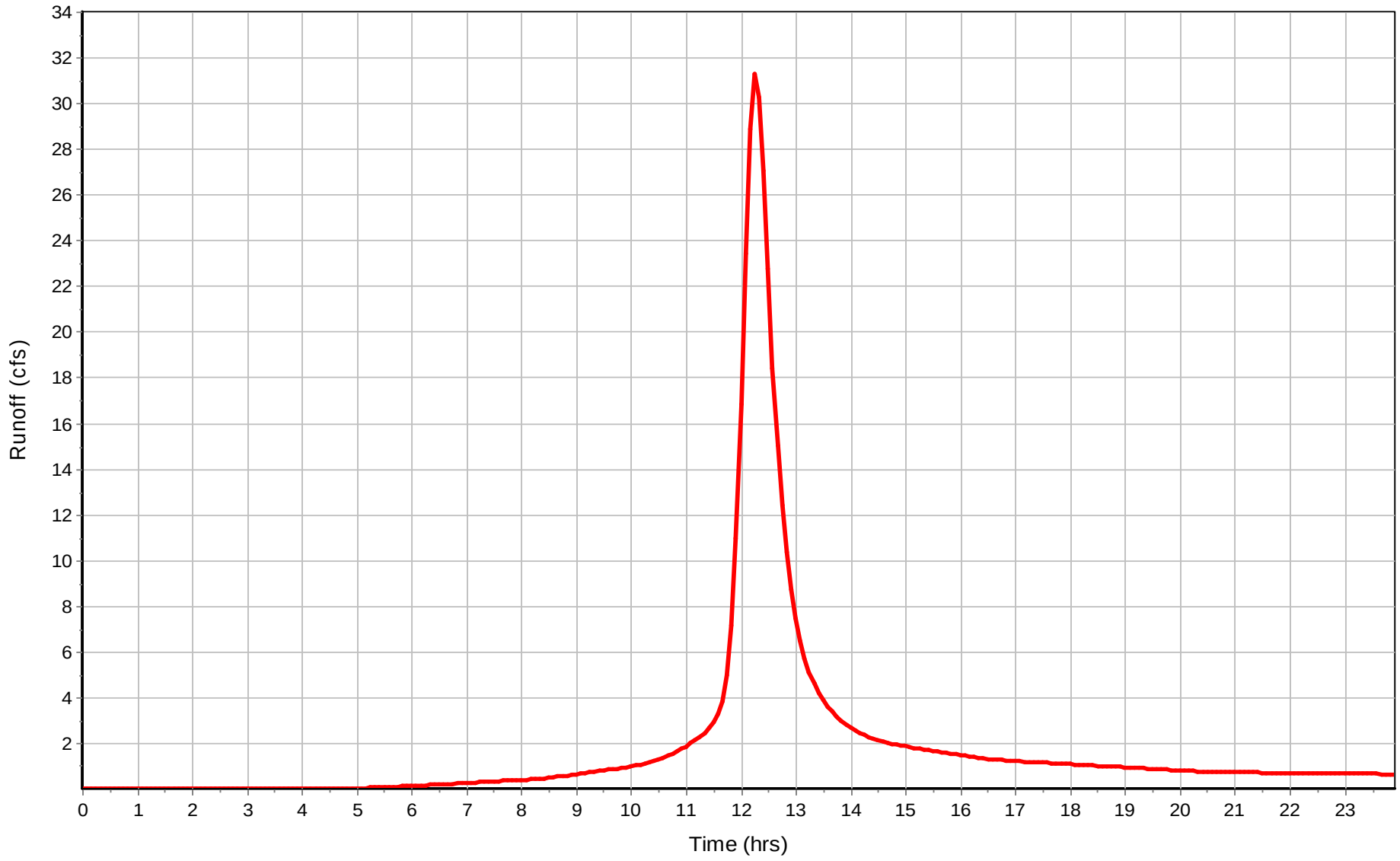
Total Rainfall (in)		5.5
Total Runoff (in)		4.05
Peak Runoff (cfs)		31.4
Weighted Curve Number		87.09
Time of Concentration (days hh:mm:ss)	0 00:39:31	

Subbasin : SubCB-37

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-38

Input Data

Area (ac)		0.11
Peak Rate Factor		0
Weighted Curve Number		89.98
Rain Gage ID	Rain Gage-01	

Composite Curve Number

Soil/Surface Description	32 Area (acres)	Soil Group	Curve Number
-	0.11	-	89.98
Composite Area & Weighted CN	0.11		89.98

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	68.85	0	0
Slope (%) :	0.131	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.4	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	23.88	0	0
Slope (%) :	3.52	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	3.81	0	0
Computed Flow Time (min) :	0.1	0	0

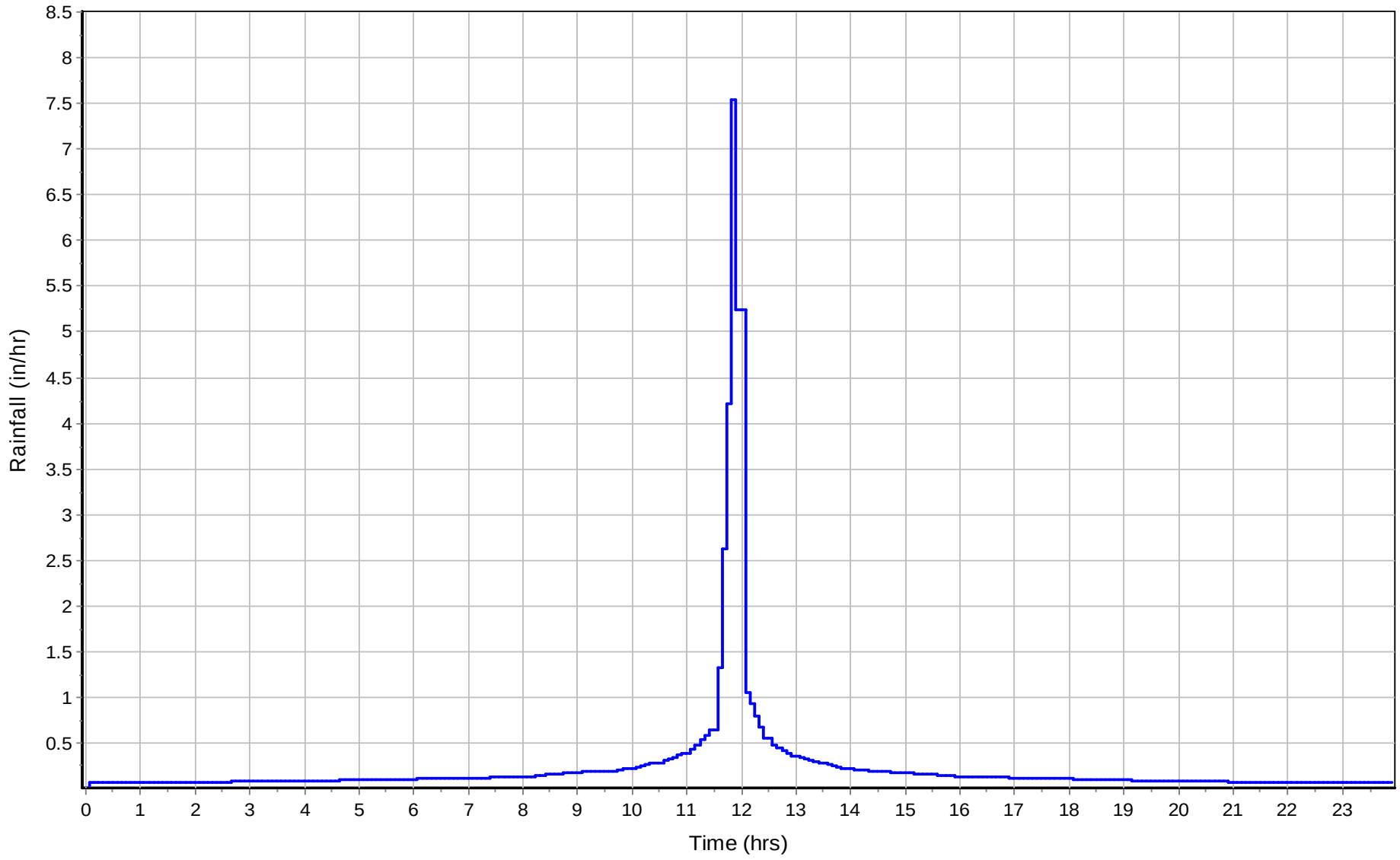
Total TOC (min) 2.97

Subbasin Runoff Results

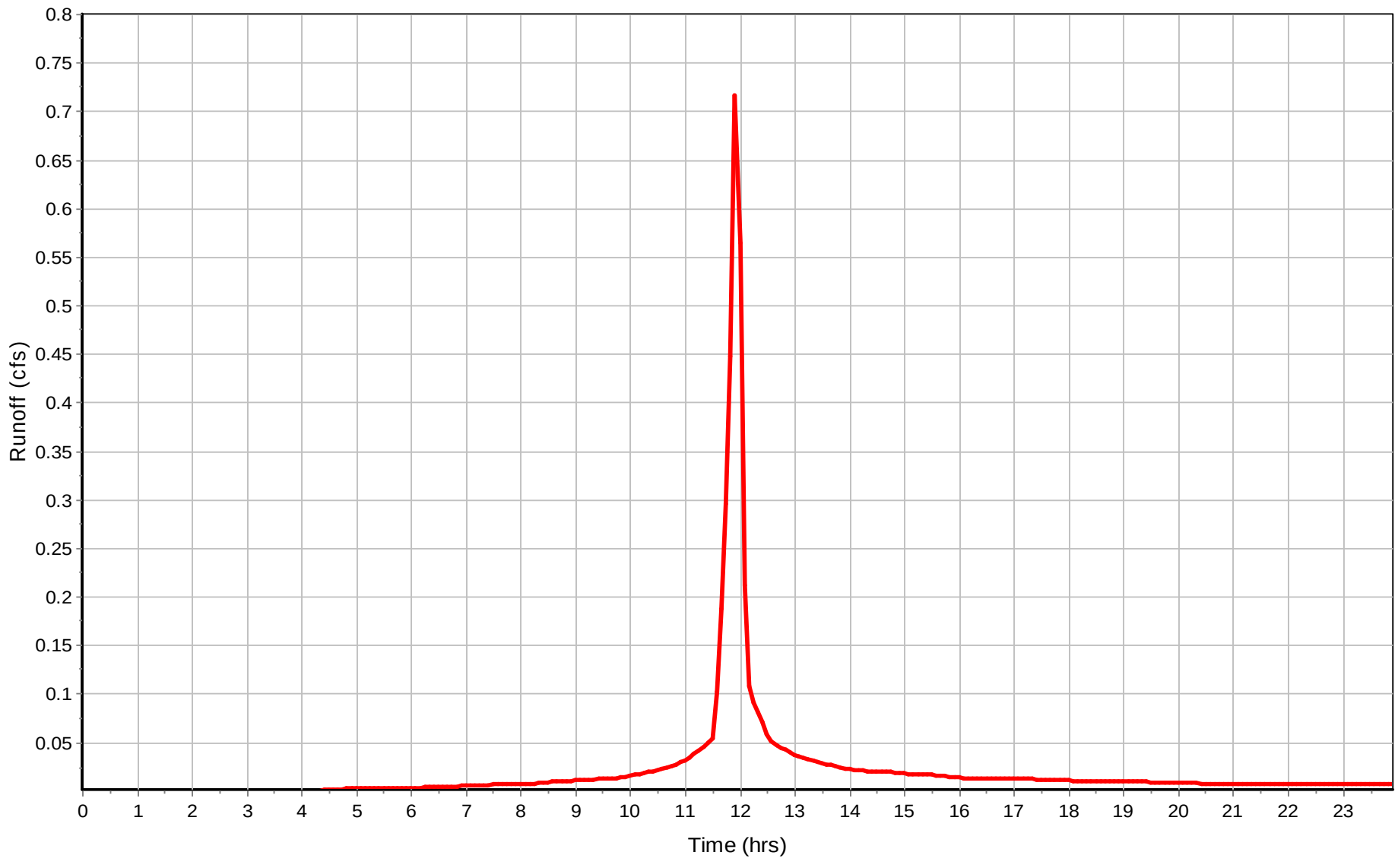
Total Rainfall (in)		5.5
Total Runoff (in)		4.35
Peak Runoff (cfs)		0.72
Weighted Curve Number		89.98
Time of Concentration (days hh:mm:ss)	0 00:02:58	

Subbasin : SubCB-38

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-39 (Darrow Basin)

Input Data

Area (ac)		3.11
Peak Rate Factor		0
Weighted Curve Number		88.56
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	3.11	-	88.56
Composite Area & Weighted CN	3.11		88.56

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.56	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	27.39	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	204.02	0	0
Slope (%) :	2.48	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.54	0	0
Computed Flow Time (min) :	1.34	0	0

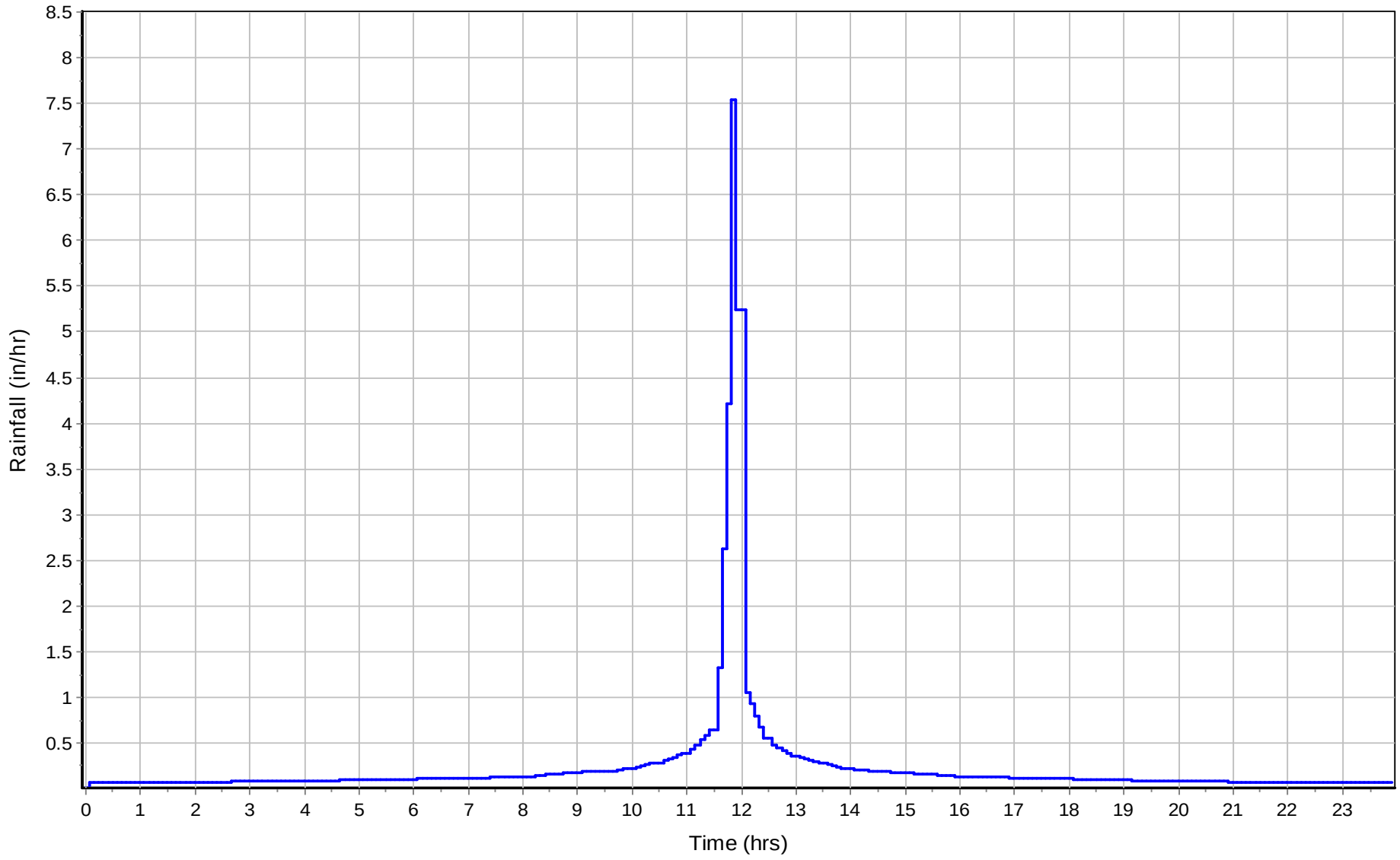
Total TOC (min) 28.73

Subbasin Runoff Results

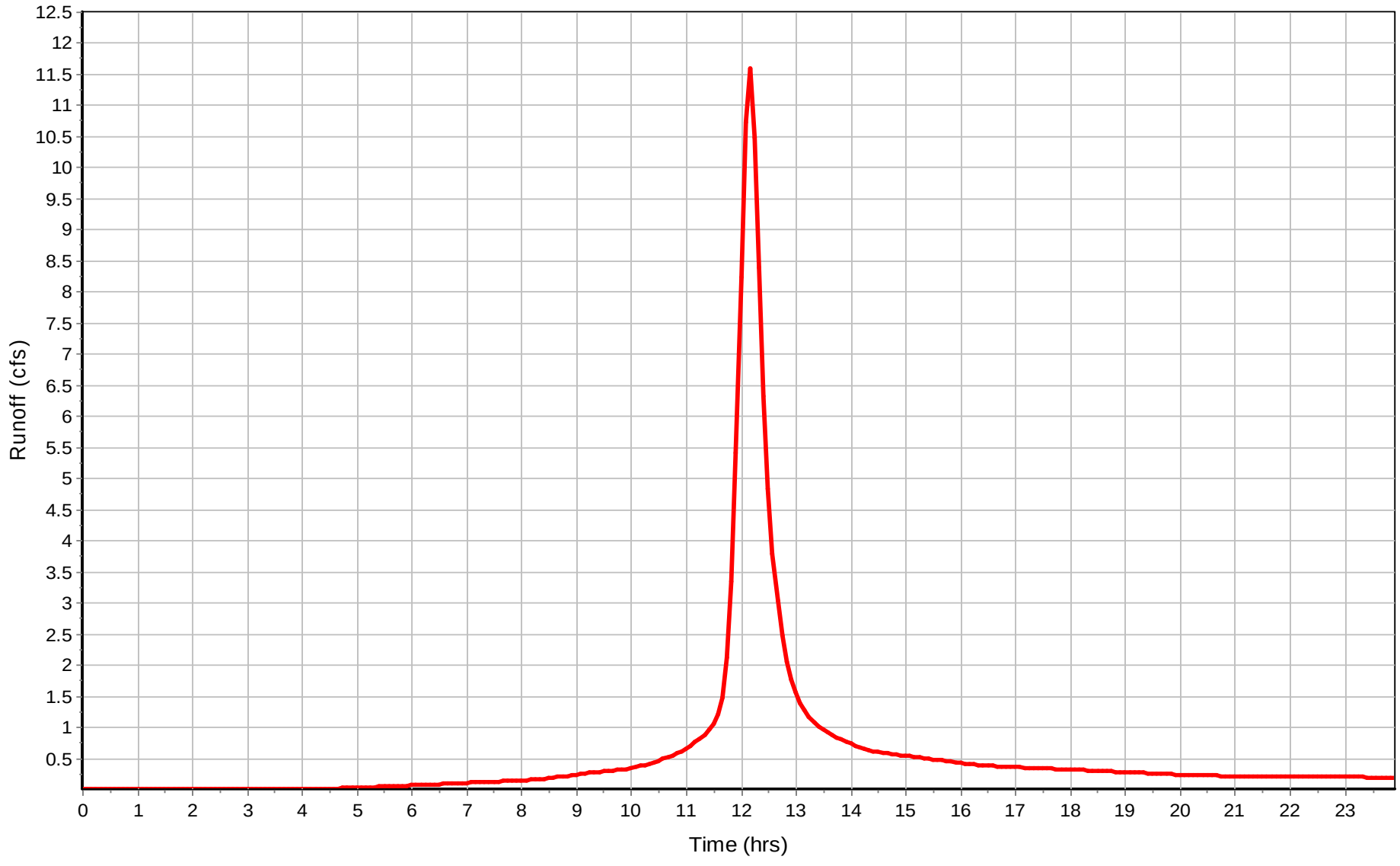
Total Rainfall (in)		5.5
Total Runoff (in)		4.21
Peak Runoff (cfs)		11.62
Weighted Curve Number		88.56
Time of Concentration (days hh:mm:ss)	0 00:28:44	

Subbasin : SubCB-39 (Darrow Basin)

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-4

Input Data

Area (ac)		0.32
Peak Rate Factor		0
Weighted Curve Number		94.15
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.32	-	94.15
Composite Area & Weighted CN	0.32		94.15

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	0.83	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.9	0	0
Computed Flow Time (min) :	1.84	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	112.67	0	0
Slope (%) :	1.48	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.47	0	0
Computed Flow Time (min) :	0.76	0	0

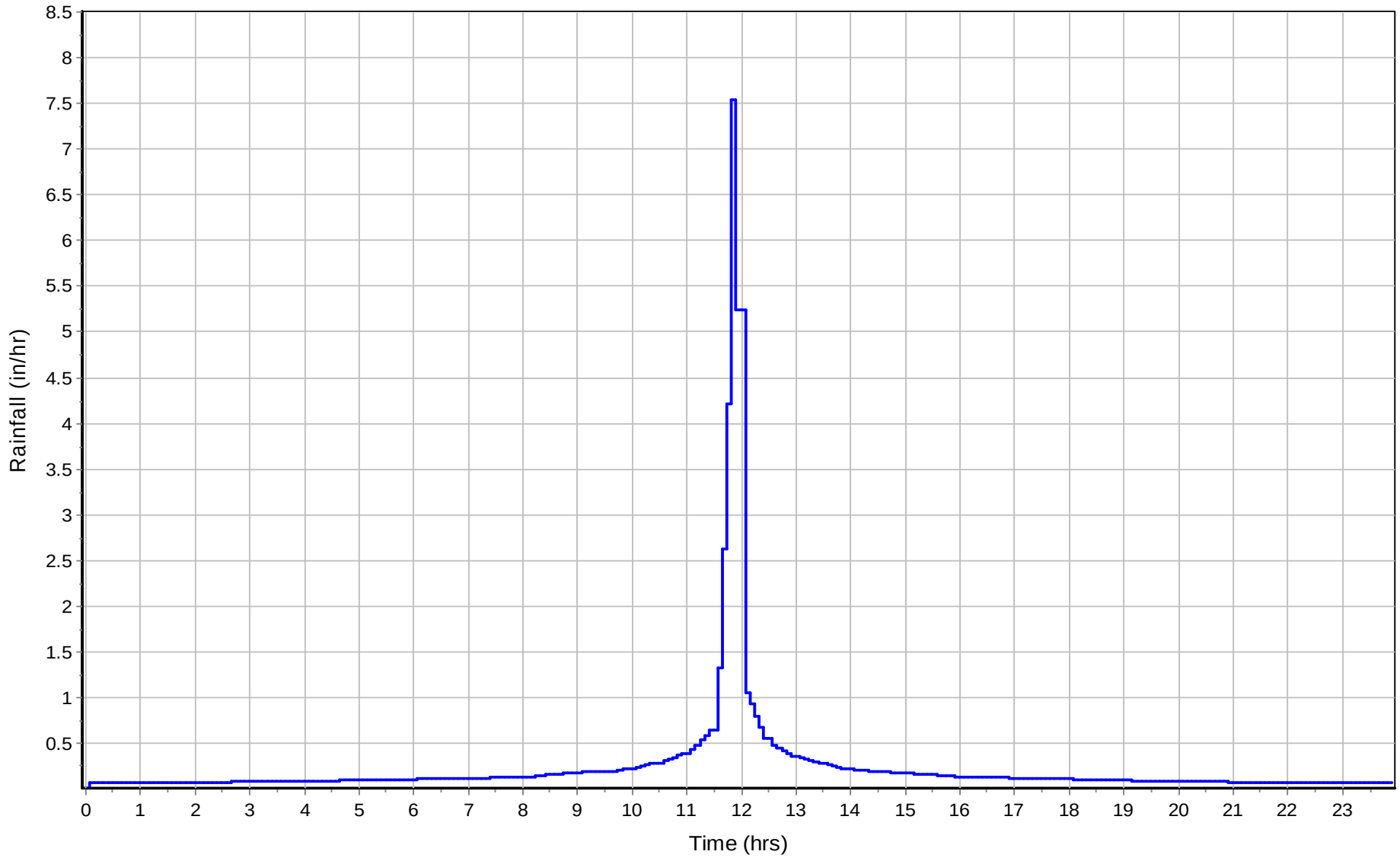
Total TOC (min) 2.60

Subbasin Runoff Results

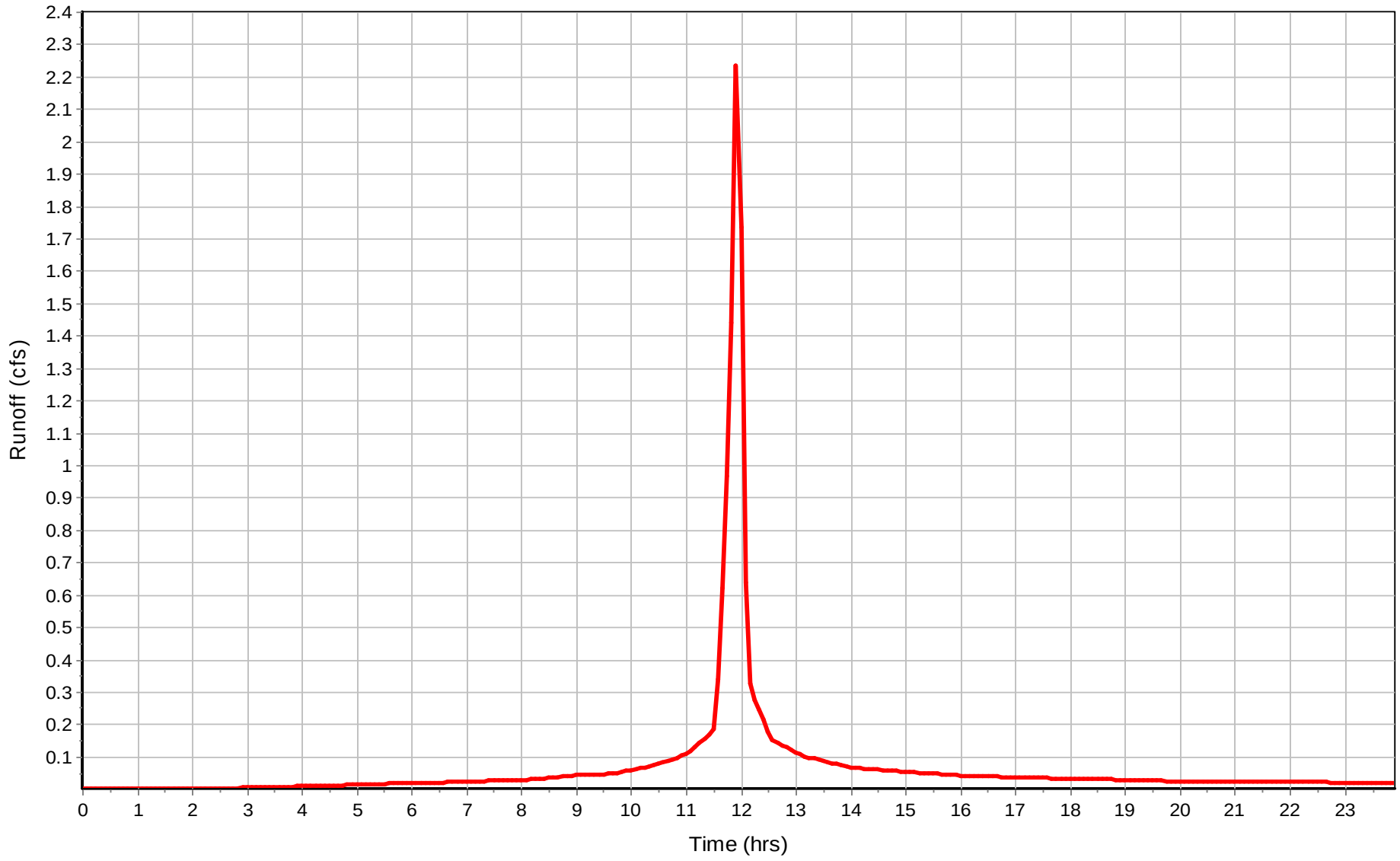
Total Rainfall (in)		5.5
Total Runoff (in)		4.82
Peak Runoff (cfs)		2.24
Weighted Curve Number		94.15
Time of Concentration (days hh:mm:ss)	0 00:02:36	

Subbasin : SubCB-4

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-40

Input Data

Area (ac)		0.25
Peak Rate Factor		0
Weighted Curve Number		89.42
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.25	-	89.42
Composite Area & Weighted CN	0.25		89.42

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	91.94	0	0
Slope (%) :	1.28	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1.06	0	0
Computed Flow Time (min) :	1.45	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	80.65	0	0
Slope (%) :	1.59	0	0
Surface Type :	Grassed waterway	Unpaved	Unpaved
Velocity (ft/sec) :	1.89	0	0
Computed Flow Time (min) :	0.71	0	0

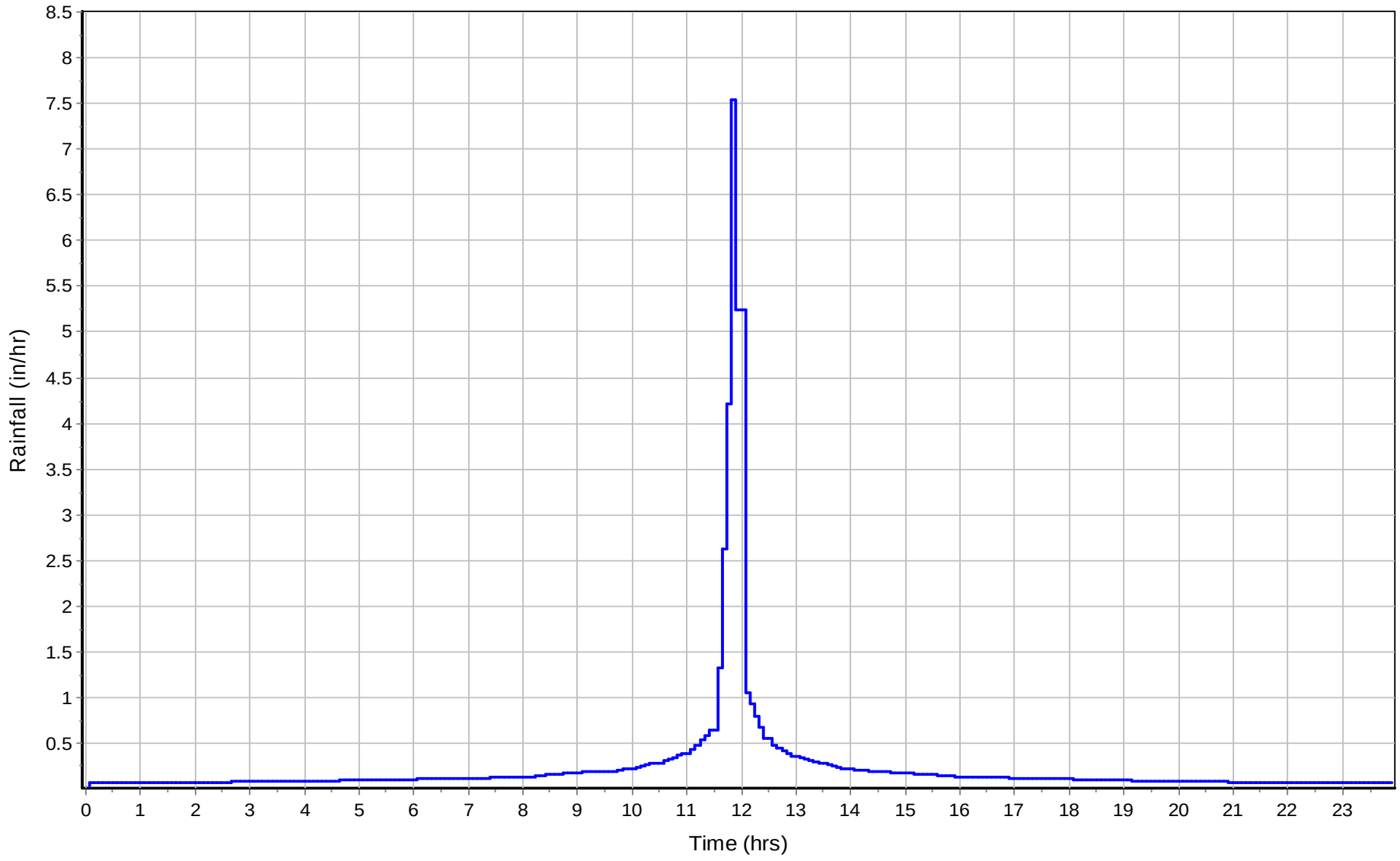
Total TOC (min) 2.16

Subbasin Runoff Results

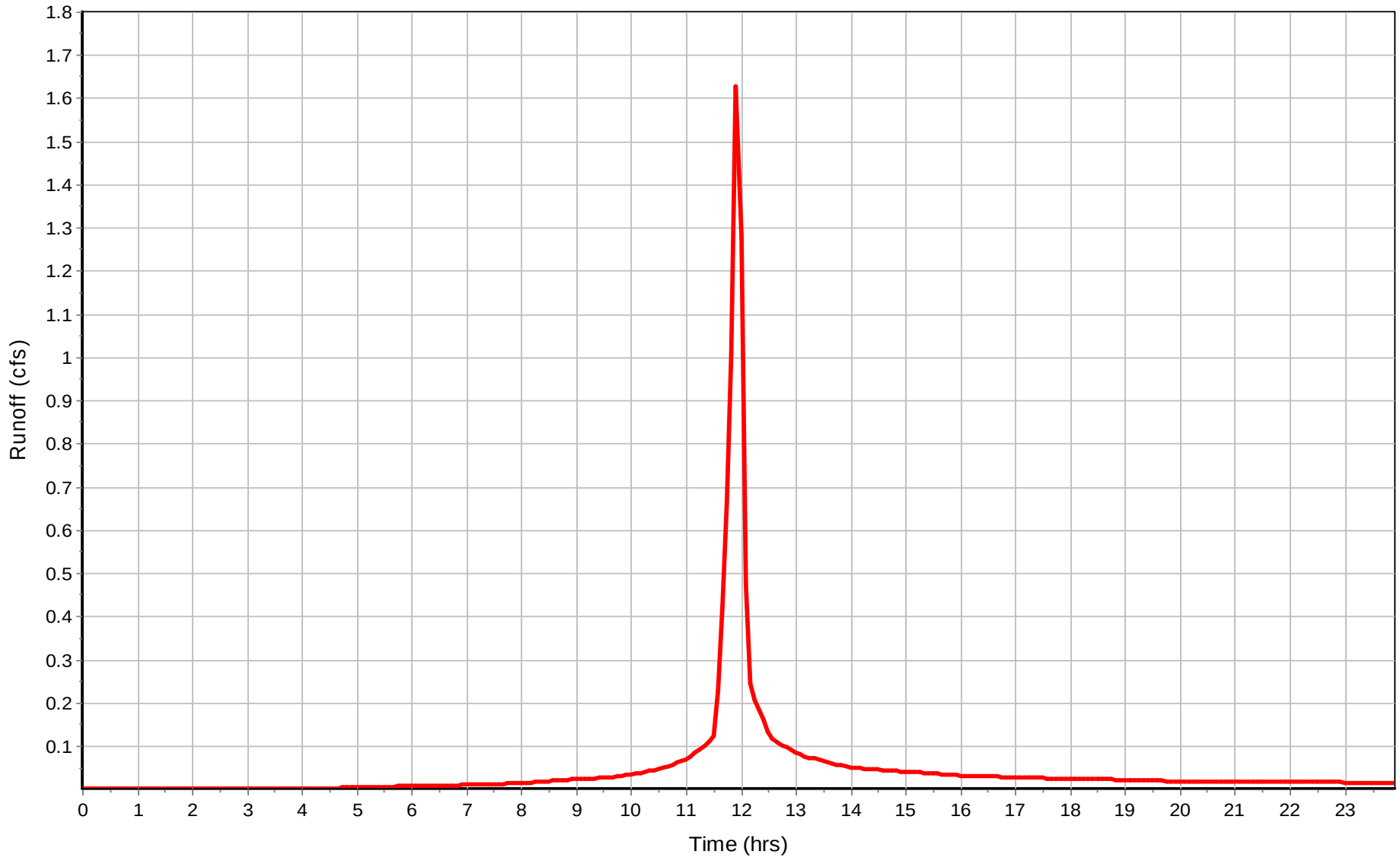
Total Rainfall (in)		5.5
Total Runoff (in)		4.3
Peak Runoff (cfs)		1.63
Weighted Curve Number		89.42
Time of Concentration (days hh:mm:ss)	0 00:02:10	

Subbasin : SubCB-40

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-41

Input Data

Area (ac)		0.11
Peak Rate Factor		0
Weighted Curve Number		89.18
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.11	-	89.18
Composite Area & Weighted CN	0.11		89.18

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	72.01	0	0
Slope (%) :	0.25	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.52	0	0
Computed Flow Time (min) :	2.29	0	0

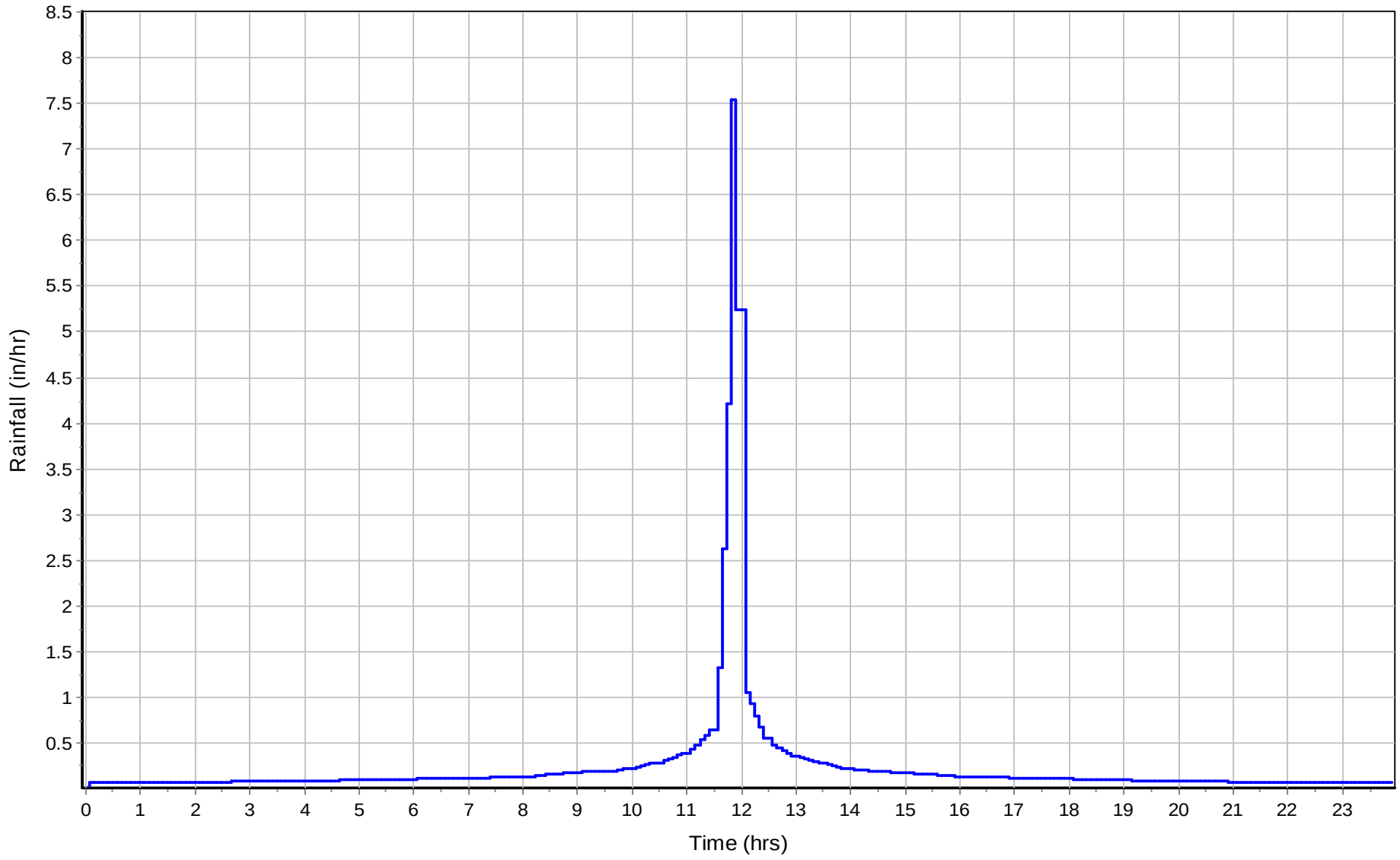
Total TOC (min) 2.29

Subbasin Runoff Results

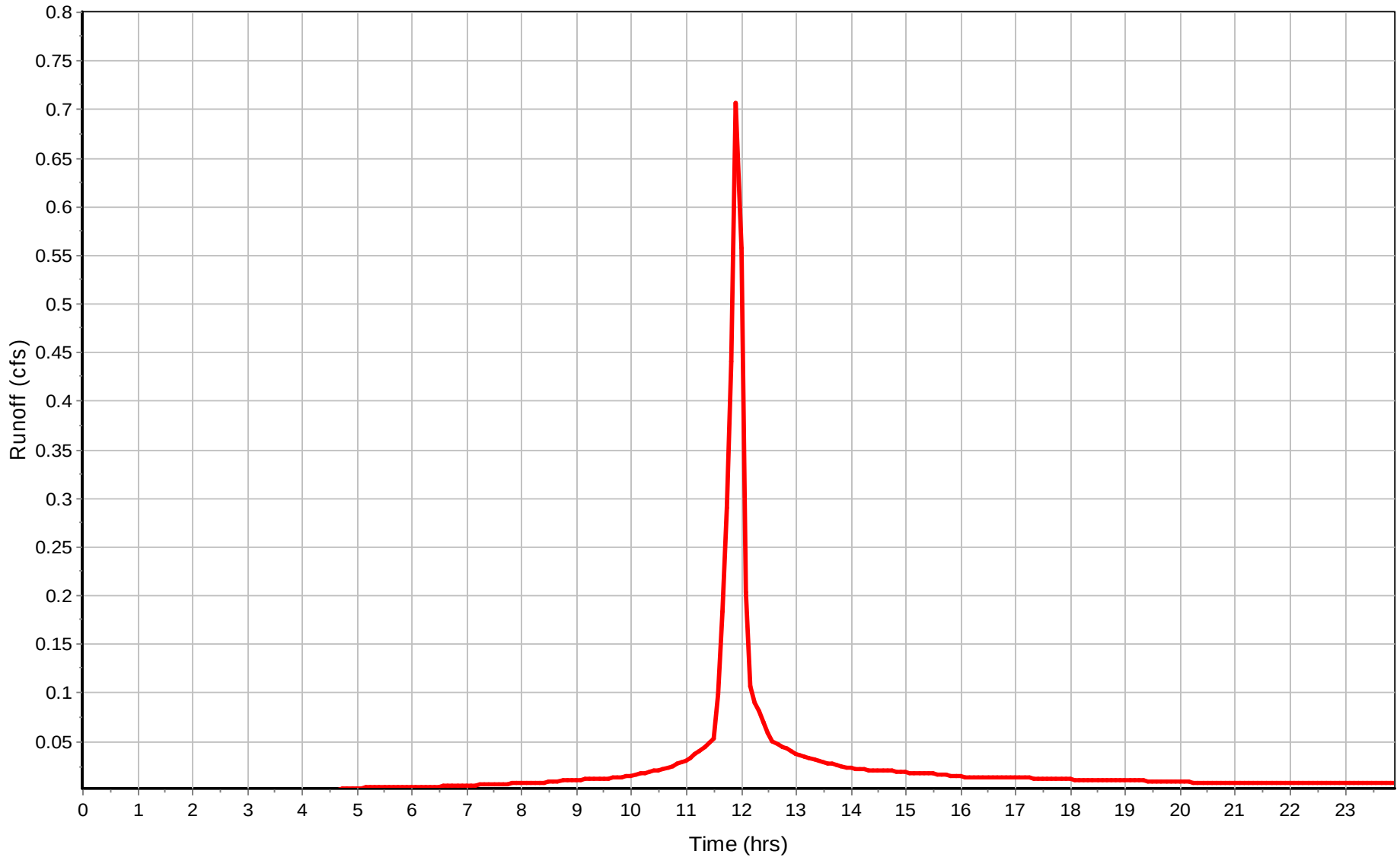
Total Rainfall (in)	5.5
Total Runoff (in)	4.27
Peak Runoff (cfs)	0.71
Weighted Curve Number	89.18
Time of Concentration (days hh:mm:ss)	0 00:02:17

Subbasin : SubCB-41

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-42

Input Data

Area (ac)		0.16
Peak Rate Factor		0
Weighted Curve Number		97.17
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.16	-	97.17
Composite Area & Weighted CN	0.16		97.17

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.08	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1	0	0
Computed Flow Time (min) :	1.66	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	267.11	0	0
Slope (%) :	1.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.46	0	0
Computed Flow Time (min) :	1.81	0	0

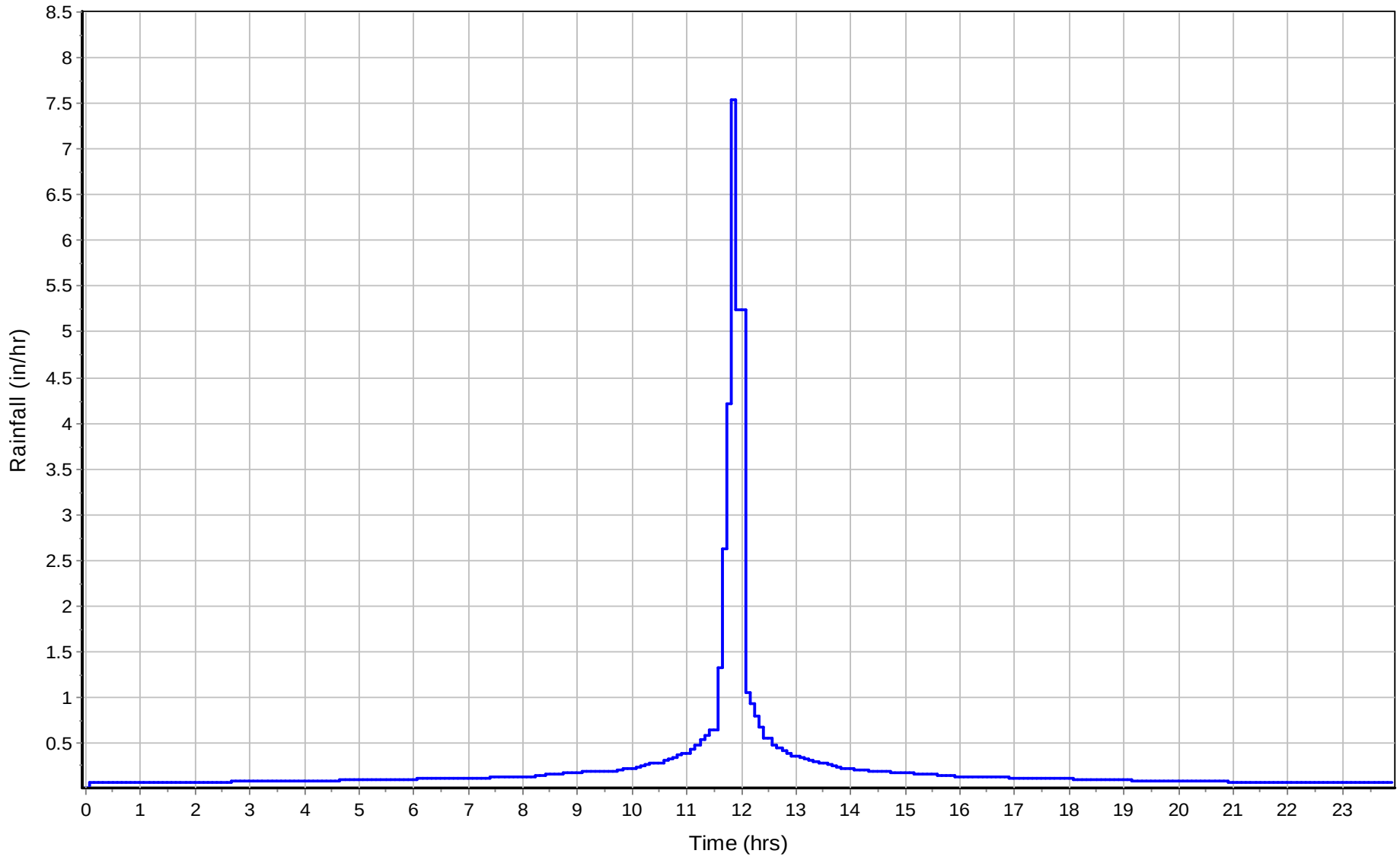
Total TOC (min) 3.47

Subbasin Runoff Results

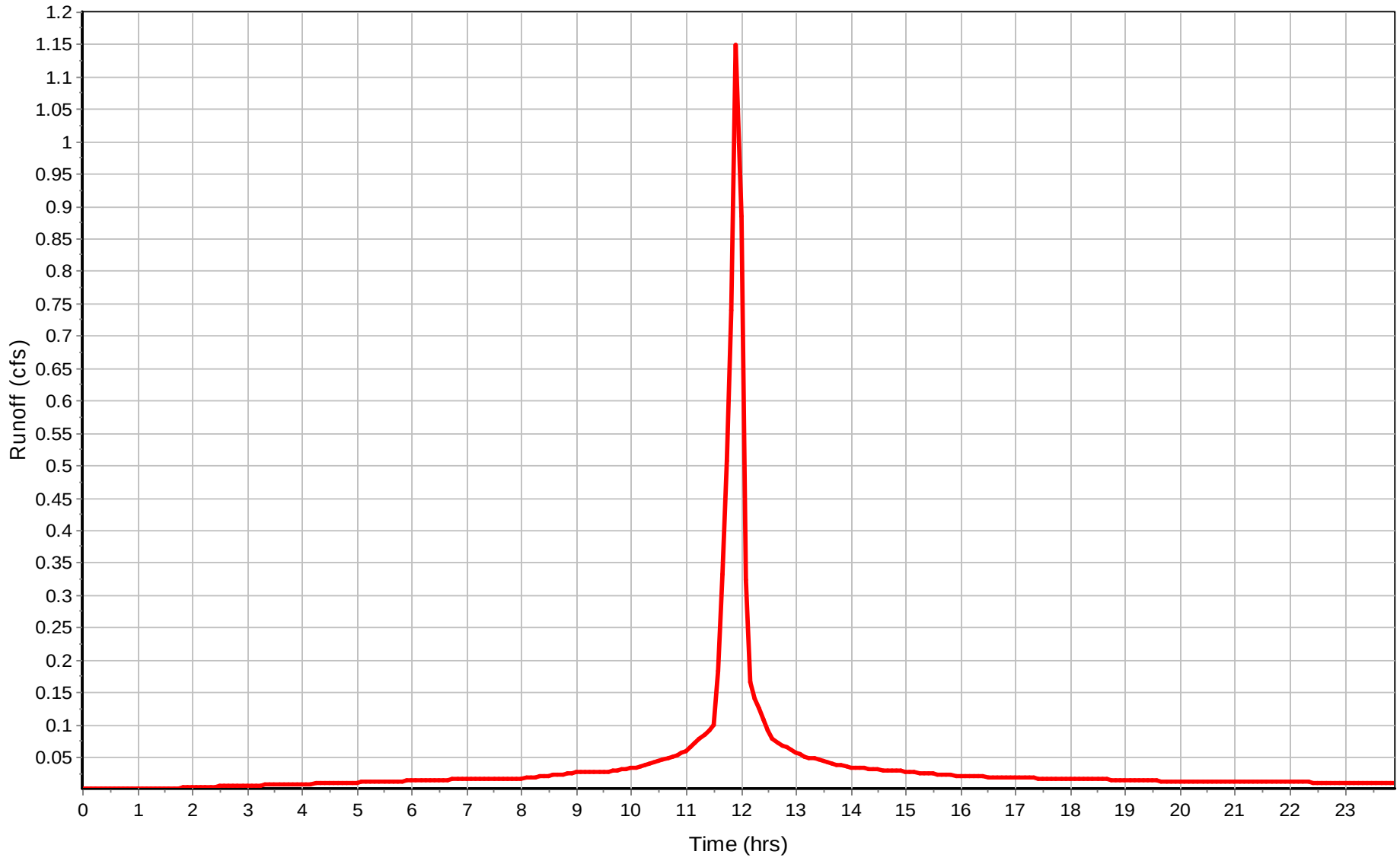
Total Rainfall (in)		5.5
Total Runoff (in)		5.16
Peak Runoff (cfs)		1.15
Weighted Curve Number		97.17
Time of Concentration (days hh:mm:ss)	0 00:03:28	

Subbasin : SubCB-42

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-43

Input Data

Area (ac)		0.33
Peak Rate Factor		0
Weighted Curve Number		94.21
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.33	-	94.21
Composite Area & Weighted CN	0.33		94.21

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.08	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1	0	0
Computed Flow Time (min) :	1.66	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	323.78	0	0
Slope (%) :	1.31	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.33	0	0
Computed Flow Time (min) :	2.32	0	0

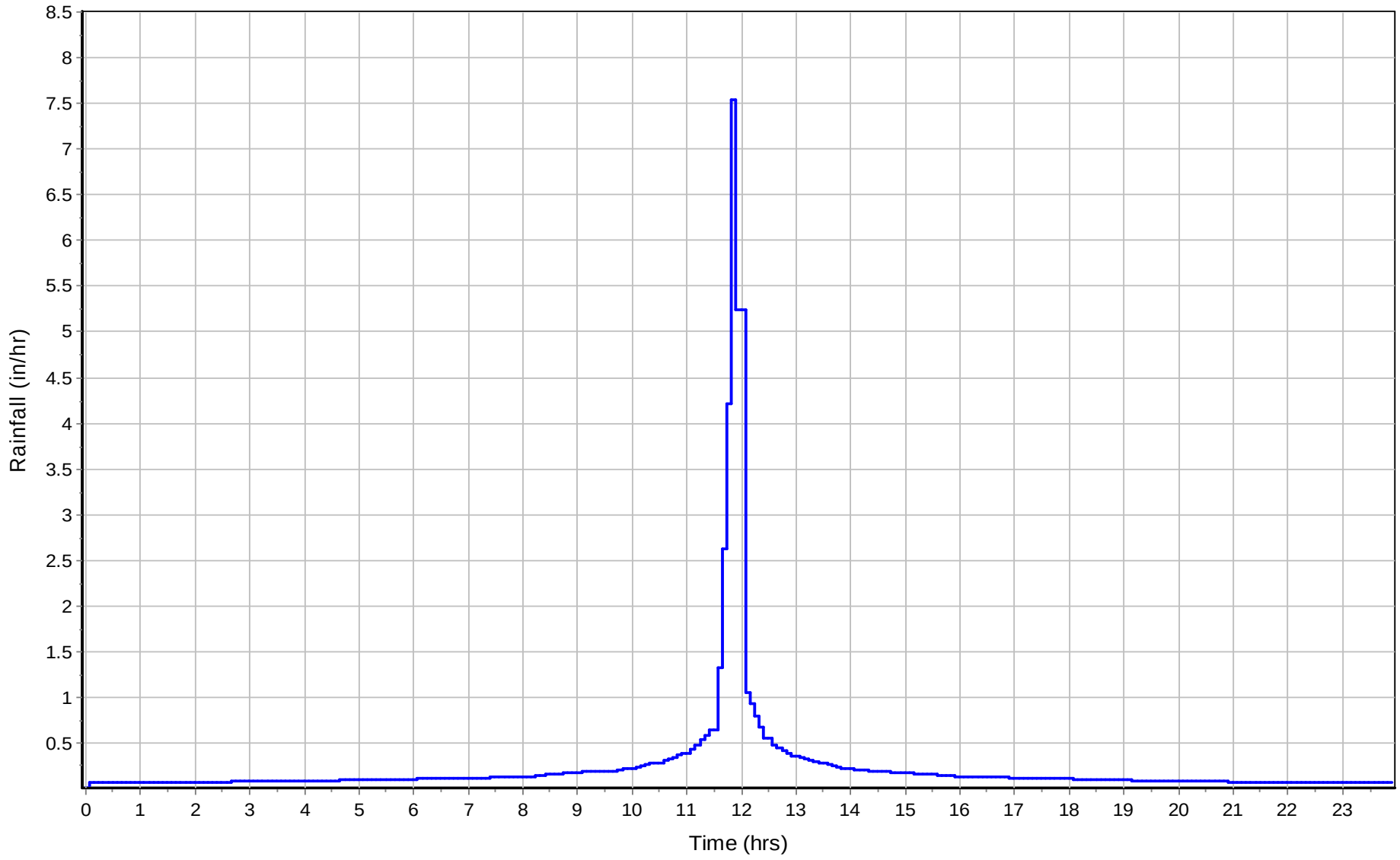
Total TOC (min) 3.97

Subbasin Runoff Results

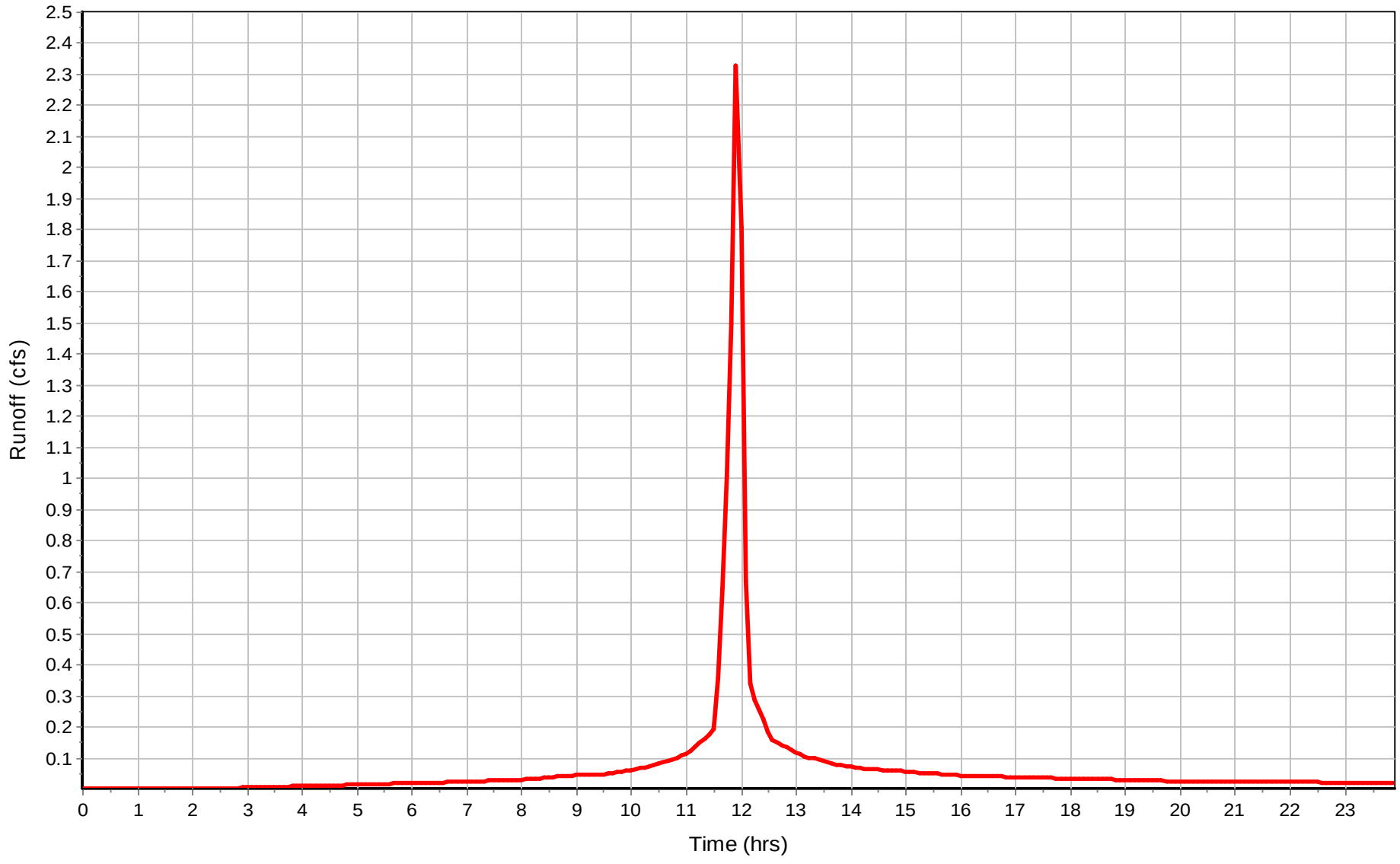
Total Rainfall (in)		5.5
Total Runoff (in)		4.83
Peak Runoff (cfs)		2.33
Weighted Curve Number		94.21
Time of Concentration (days hh:mm:ss)	0 00:03:58	

Subbasin : SubCB-43

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-44

Input Data

Area (ac)		0.64
Peak Rate Factor		0
Weighted Curve Number		94.42
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.64	-	94.42
Composite Area & Weighted CN	0.64		94.42

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	53.49	0	0
Slope (%) :	4.51	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	10.86	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	356.1	0	0
Slope (%) :	0.79	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	1.81	0	0
Computed Flow Time (min) :	3.28	0	0

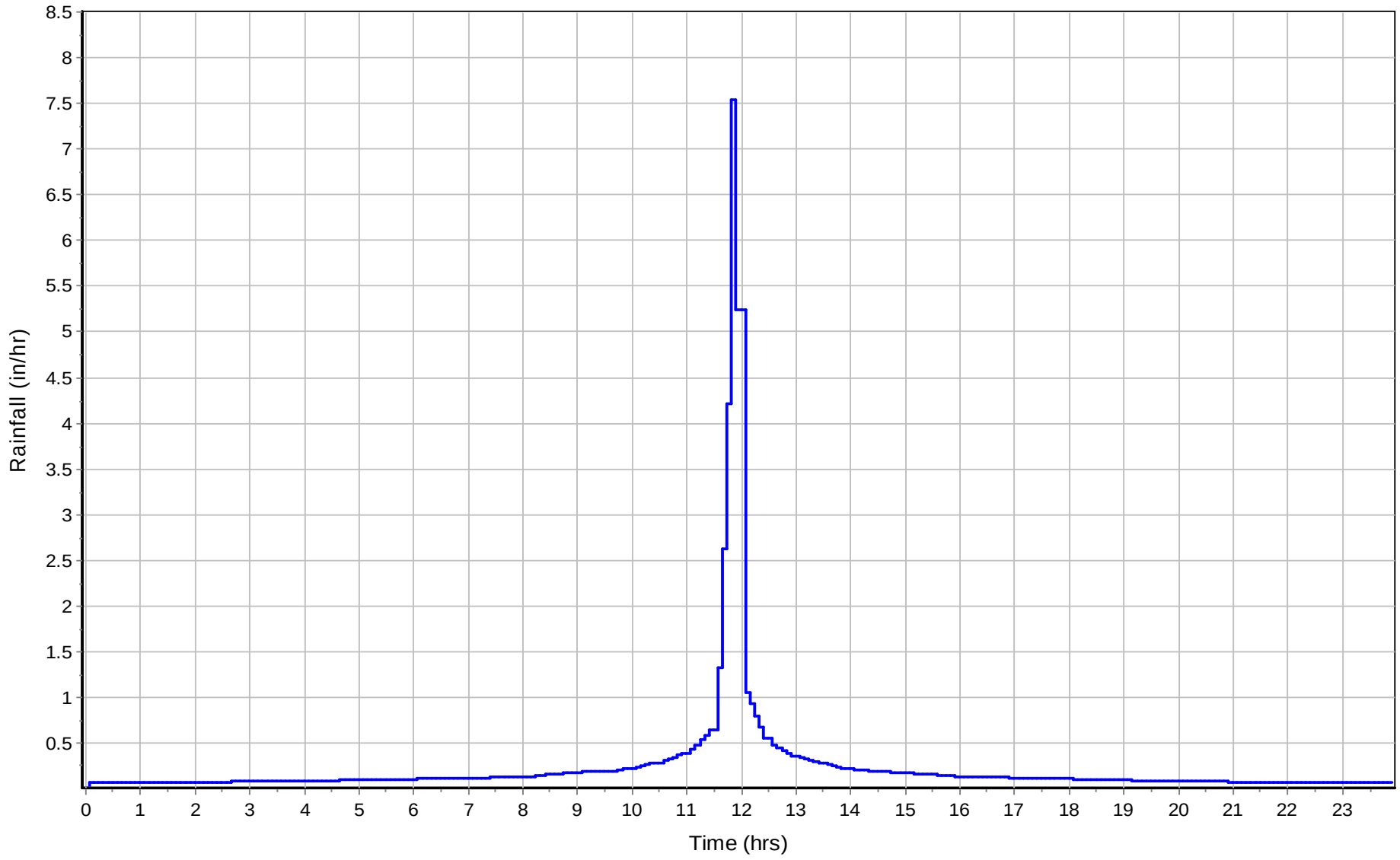
Total TOC (min) 14.14

Subbasin Runoff Results

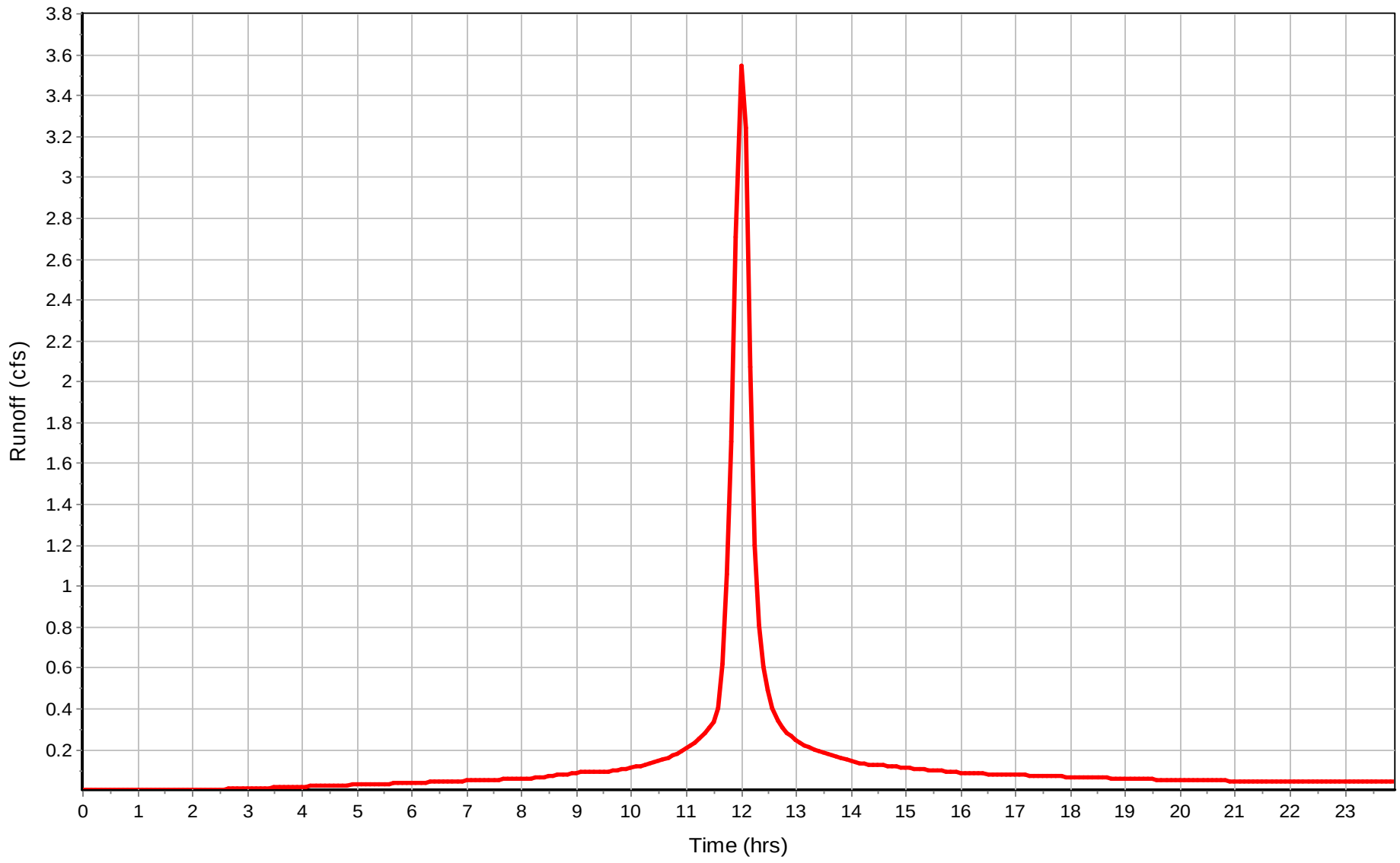
Total Rainfall (in)		5.5
Total Runoff (in)		4.85
Peak Runoff (cfs)		3.59
Weighted Curve Number		94.42
Time of Concentration (days hh:mm:ss)	0 00:14:08	

Subbasin : SubCB-44

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-5

Input Data

Area (ac)		0.71
Peak Rate Factor		0
Weighted Curve Number		93.3
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.71	-	93.3
Composite Area & Weighted CN	0.71		93.3

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	96.4	0	0
Slope (%) :	1.753	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1.21	0	0
Computed Flow Time (min) :	1.33	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.013	0	0
Flow Length (ft) :	191.1	0	0
Channel Slope (%) :	1	0	0
Cross Section Area (ft^2) :	3.1416	0	0
Wetted Perimeter (ft) :	6.283	0	0
Velocity (ft/sec) :	7.22	0	0
Computed Flow Time (min) :	0.44	0	0

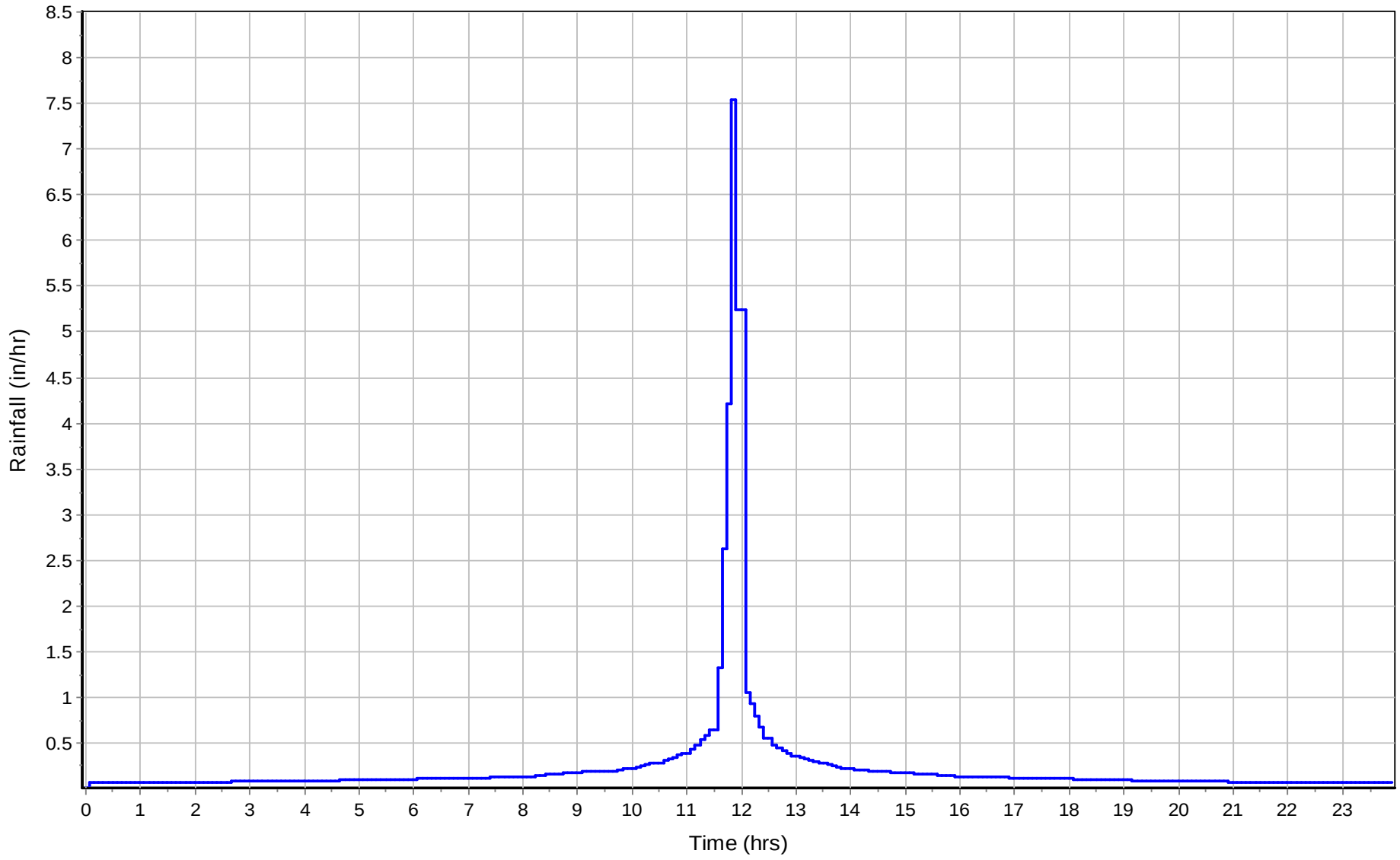
Total TOC (min) 1.77

Subbasin Runoff Results

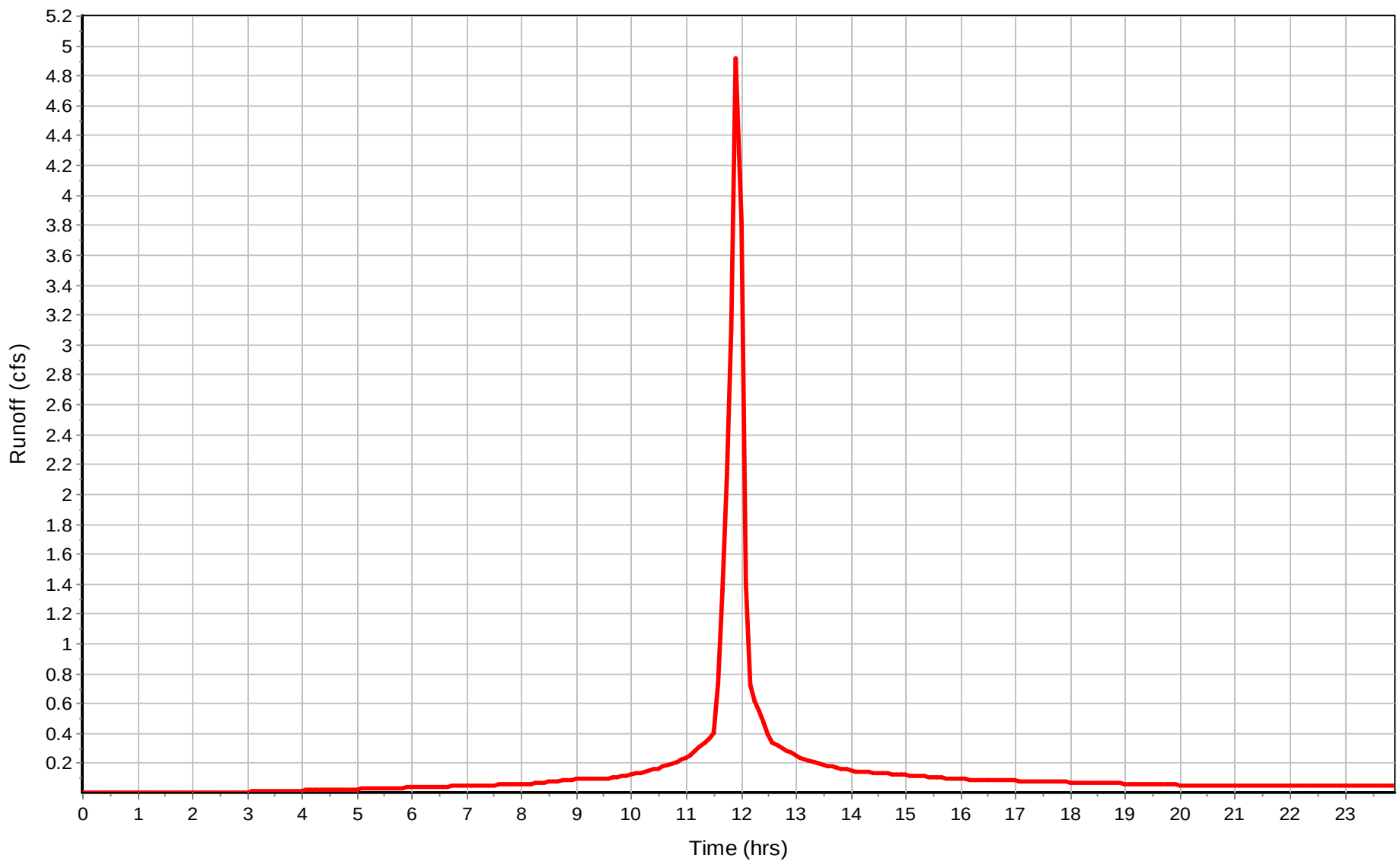
Total Rainfall (in)	5.5
Total Runoff (in)	4.72
Peak Runoff (cfs)	4.91
Weighted Curve Number	93.3
Time of Concentration (days hh:mm:ss)	0 00:01:46

Subbasin : SubCB-5

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-6

Input Data

Area (ac)		0.24
Peak Rate Factor		0
Weighted Curve Number		96.83
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.24	-	96.83
Composite Area & Weighted CN	0.24		96.83

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	70.79	0	0
Slope (%) :	1.14	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.96	0	0
Computed Flow Time (min) :	1.23	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	173.04	0	0
Slope (%) :	1.02	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.05	0	0
Computed Flow Time (min) :	1.41	0	0

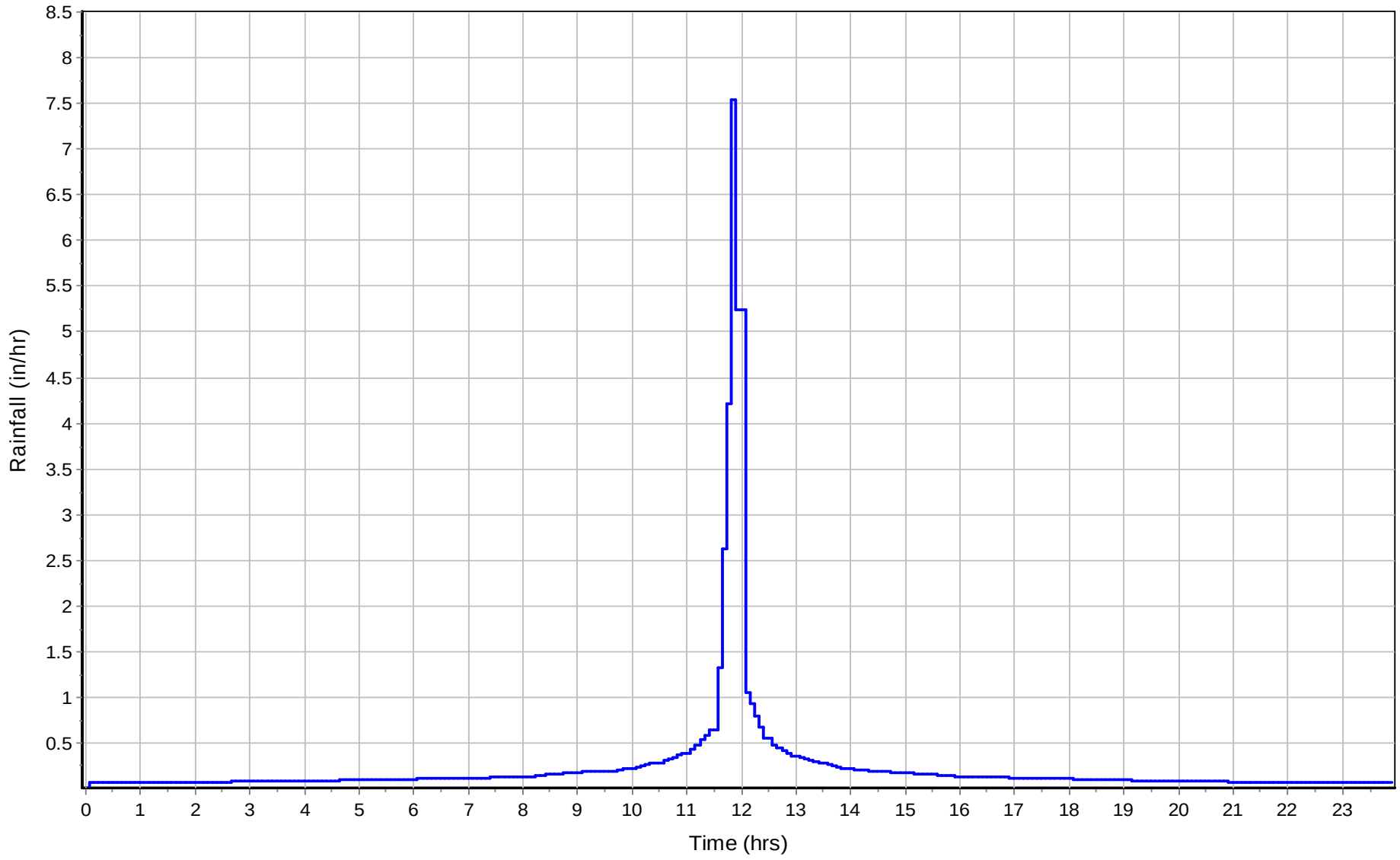
Total TOC (min) 2.64

Subbasin Runoff Results

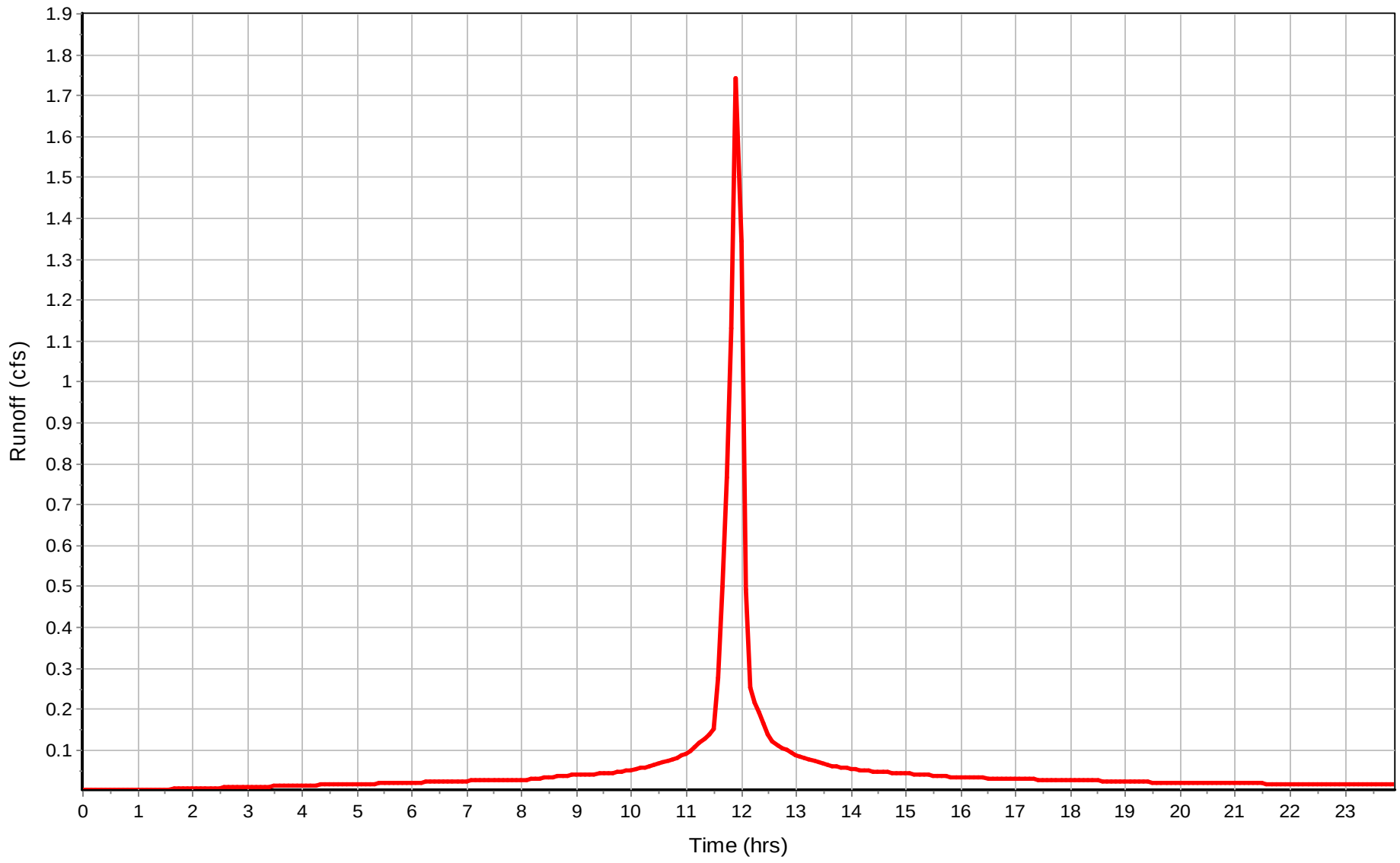
Total Rainfall (in)		5.5
Total Runoff (in)		5.13
Peak Runoff (cfs)		1.74
Weighted Curve Number		96.83
Time of Concentration (days hh:mm:ss)	0 00:02:38	

Subbasin : SubCB-6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-7

Input Data

Area (ac)		0.17
Peak Rate Factor		0
Weighted Curve Number		93.92
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.17	-	93.92
Composite Area & Weighted CN	0.17		93.92

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	55.66	0	0
Slope (%) :	5.43	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	1.71	0	0
Computed Flow Time (min) :	0.54	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	153.21	0	0
Slope (%) :	1.02	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.05	0	0
Computed Flow Time (min) :	1.25	0	0

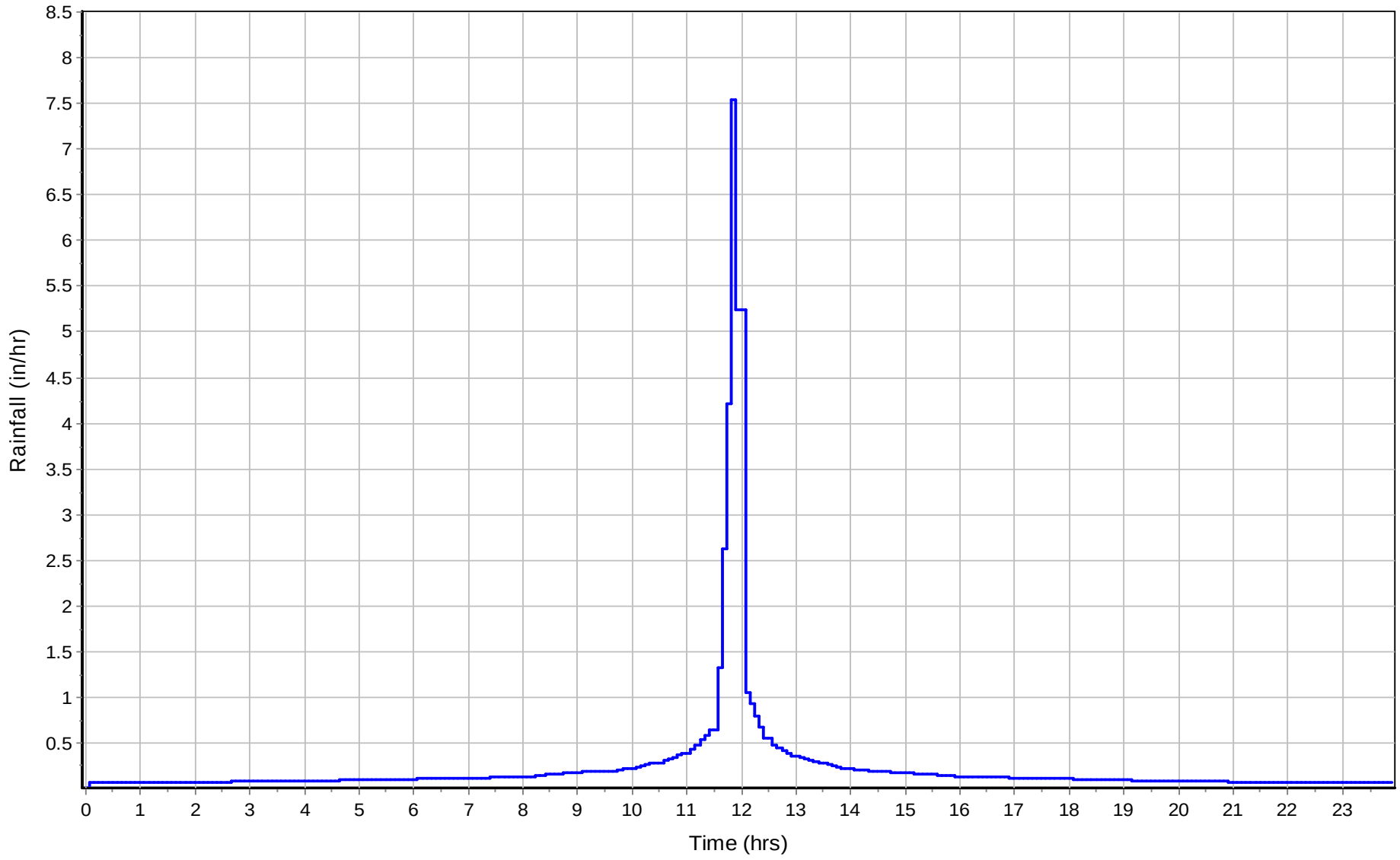
Total TOC (min) 1.79

Subbasin Runoff Results

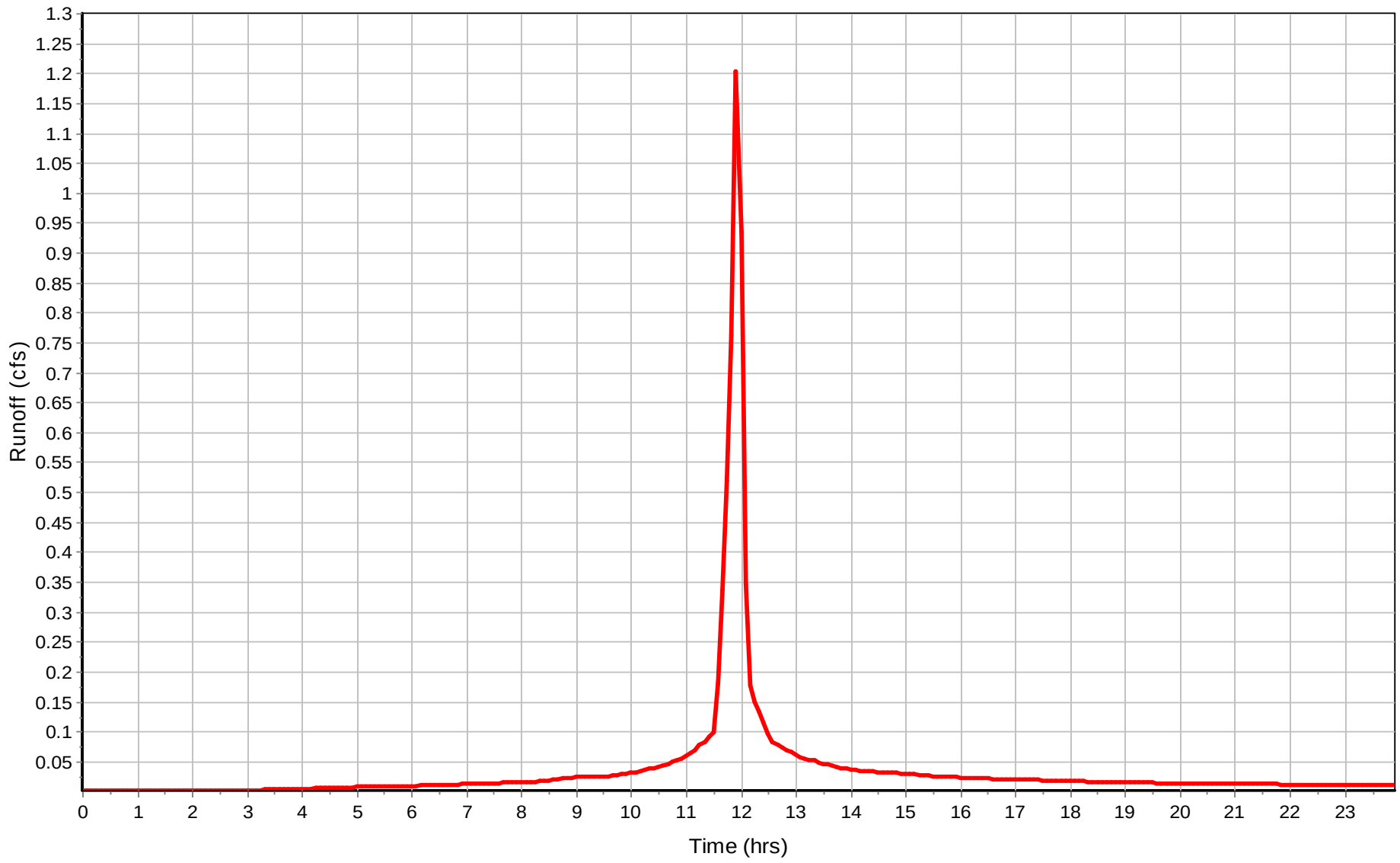
Total Rainfall (in)		5.5
Total Runoff (in)		4.79
Peak Runoff (cfs)		1.2
Weighted Curve Number		93.92
Time of Concentration (days hh:mm:ss)	0 00:01:47	

Subbasin : SubCB-7

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-8

Input Data

Area (ac)		0.07
Peak Rate Factor		0
Weighted Curve Number		80
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32	Area	Soil	Curve
Soil/Surface Description	(acres)	Group	Number
-	0.07	-	80
Composite Area & Weighted CN	0.07		80

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	68.94	0	0
Slope (%) :	0.2	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.02	0	0
Computed Flow Time (min) :	46.25	0	0

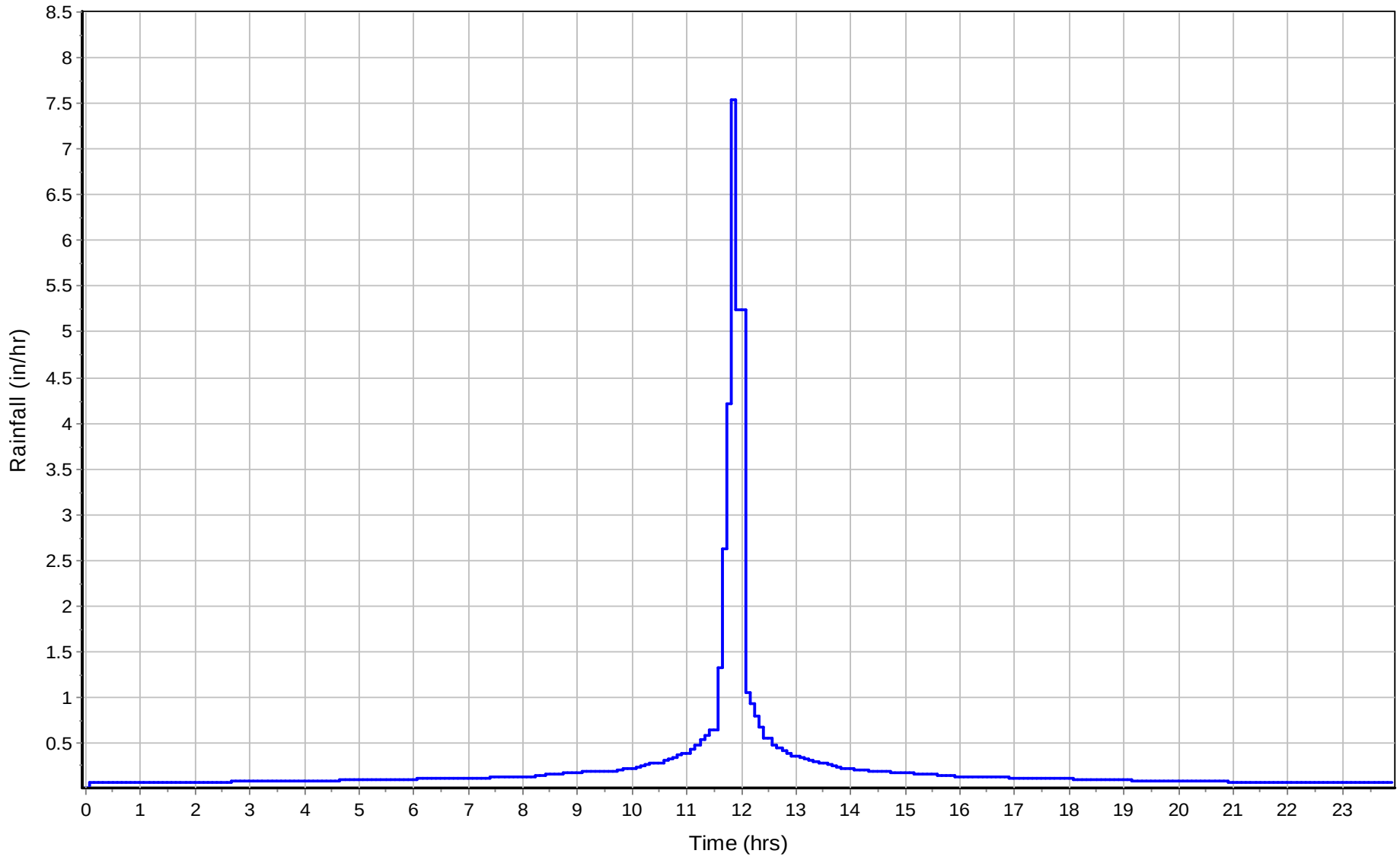
Total TOC (min) 46.25

Subbasin Runoff Results

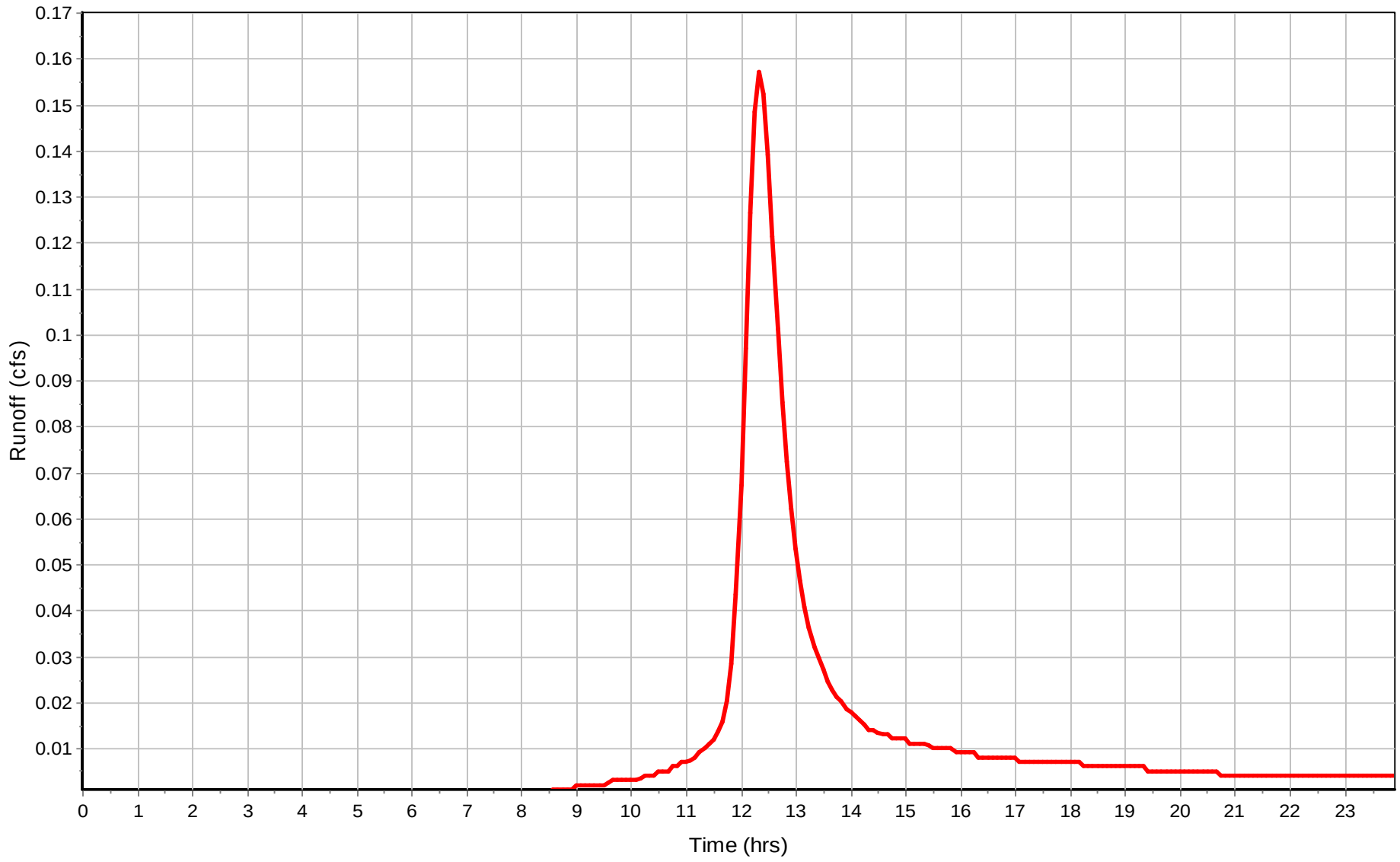
Total Rainfall (in)		5.5
Total Runoff (in)		3.32
Peak Runoff (cfs)		0.16
Weighted Curve Number		80
Time of Concentration (days hh:mm:ss)	0 00:46:15	

Subbasin : SubCB-8

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubCB-9

Input Data

Area (ac)		0.09
Peak Rate Factor		0
Weighted Curve Number		94.97
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.09	-	94.97
Composite Area & Weighted CN	0.09		94.97

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	0.79	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.89	0	0
Computed Flow Time (min) :	1.88	0	0

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	59.3	0	0
Slope (%) :	1.52	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.51	0	0
Computed Flow Time (min) :	0.39	0	0

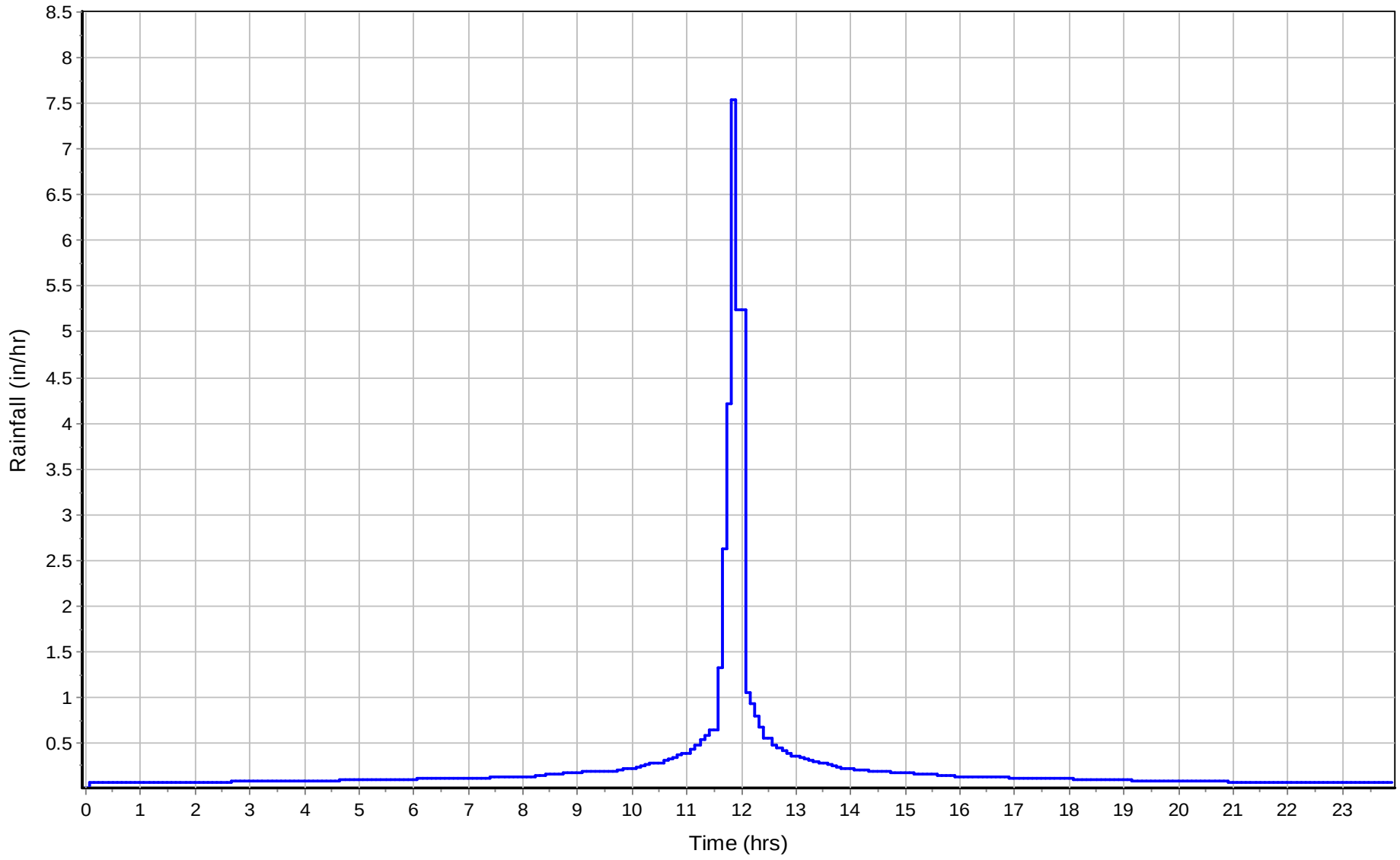
Total TOC (min) 2.27

Subbasin Runoff Results

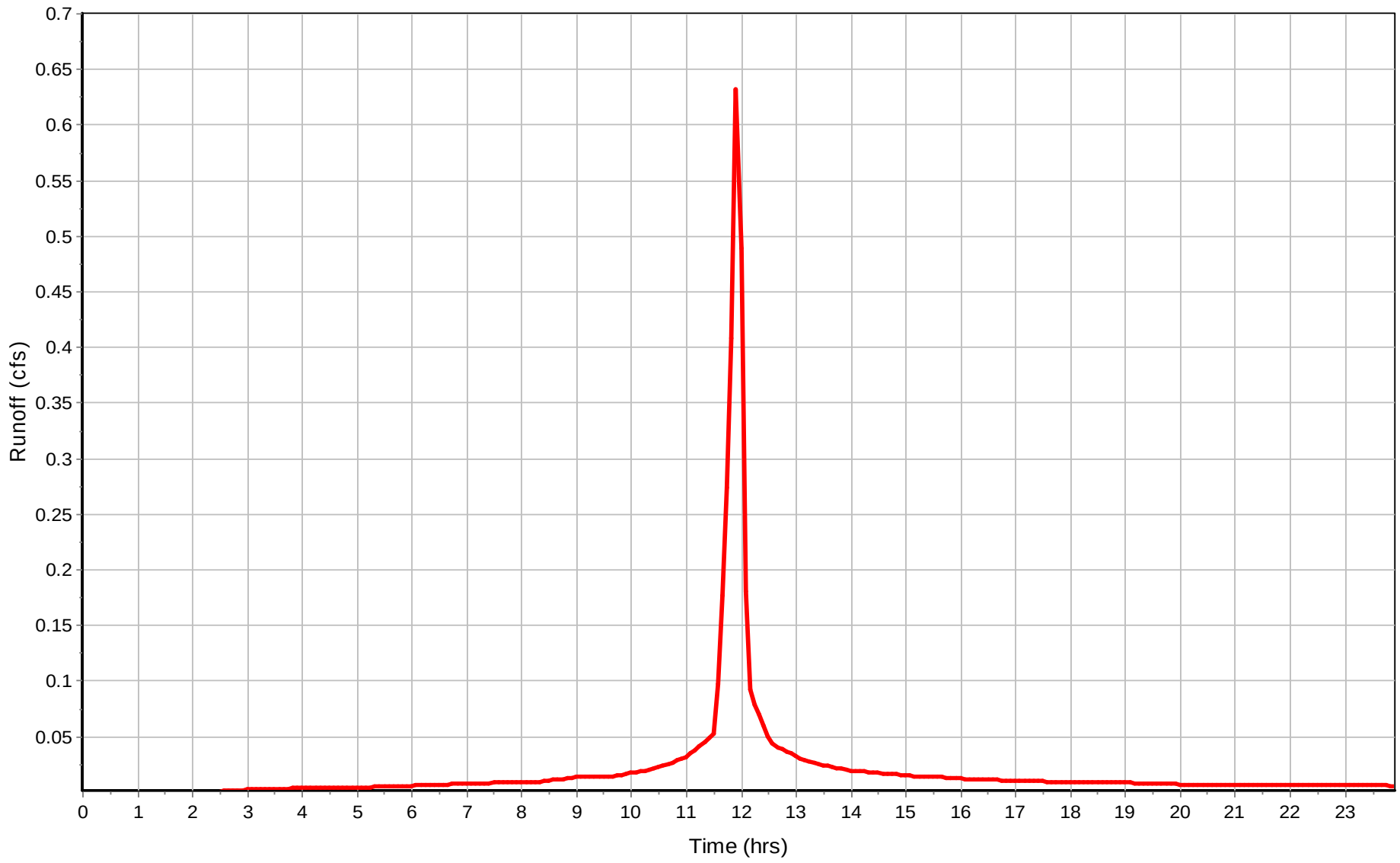
Total Rainfall (in)		5.5
Total Runoff (in)		4.91
Peak Runoff (cfs)		0.63
Weighted Curve Number		94.97
Time of Concentration (days hh:mm:ss)	0 00:02:16	

Subbasin : SubCB-9

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubDitch 2

Input Data

Area (ac)		2.97
Peak Rate Factor		0
Weighted Curve Number		86.29
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	2.97	-	86.29
Composite Area & Weighted CN	2.97		86.29

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.04	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	3.12	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.51	0	0
Computed Flow Time (min) :	3.29	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	787.62	0	0
Channel Slope (%) :	3.12	0	0
Cross Section Area (ft^2) :	5.5	0	0
Wetted Perimeter (ft) :	8.385	0	0
Velocity (ft/sec) :	6.62	0	0
Computed Flow Time (min) :	1.98	0	0

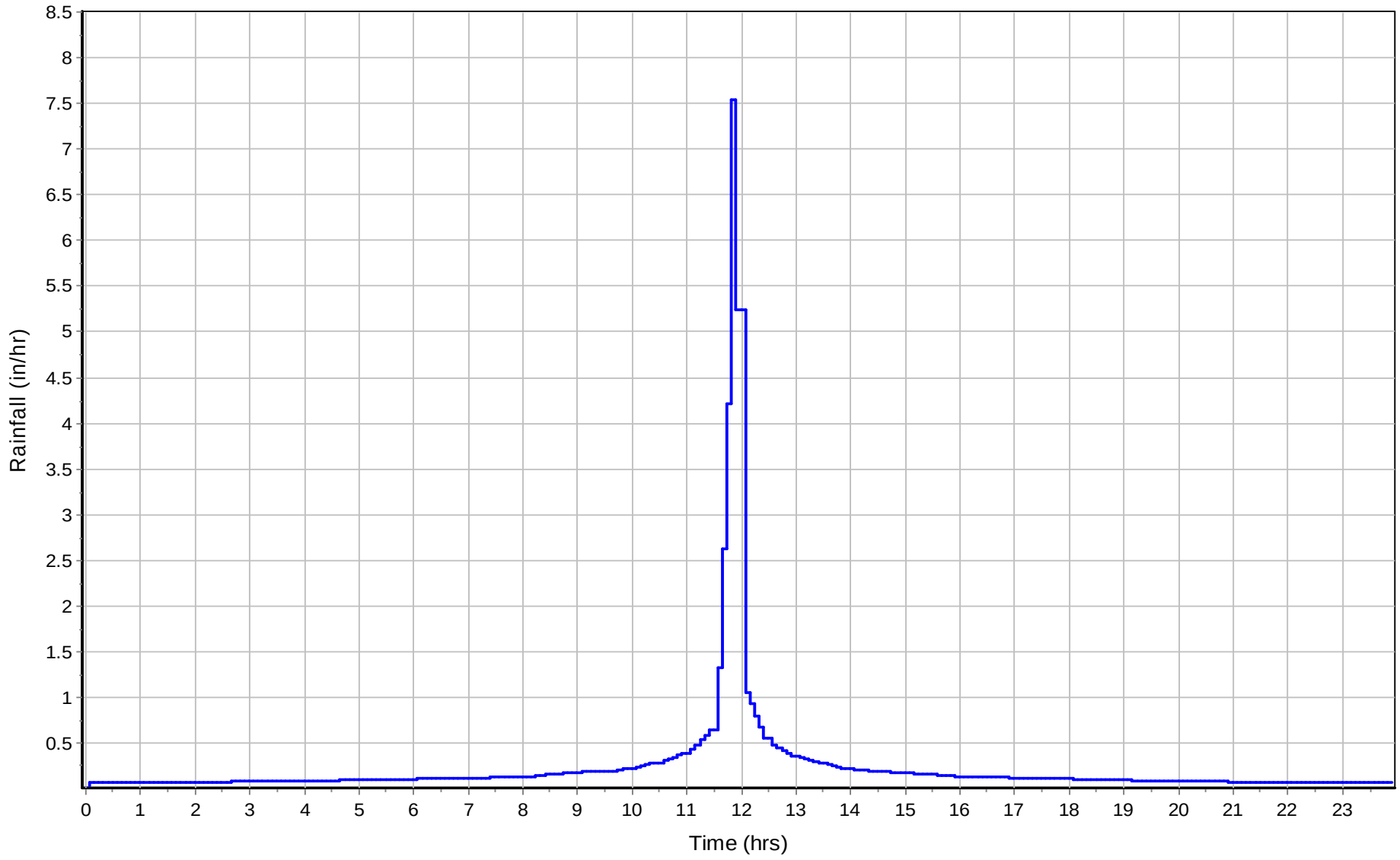
Total TOC (min) 5.27

Subbasin Runoff Results

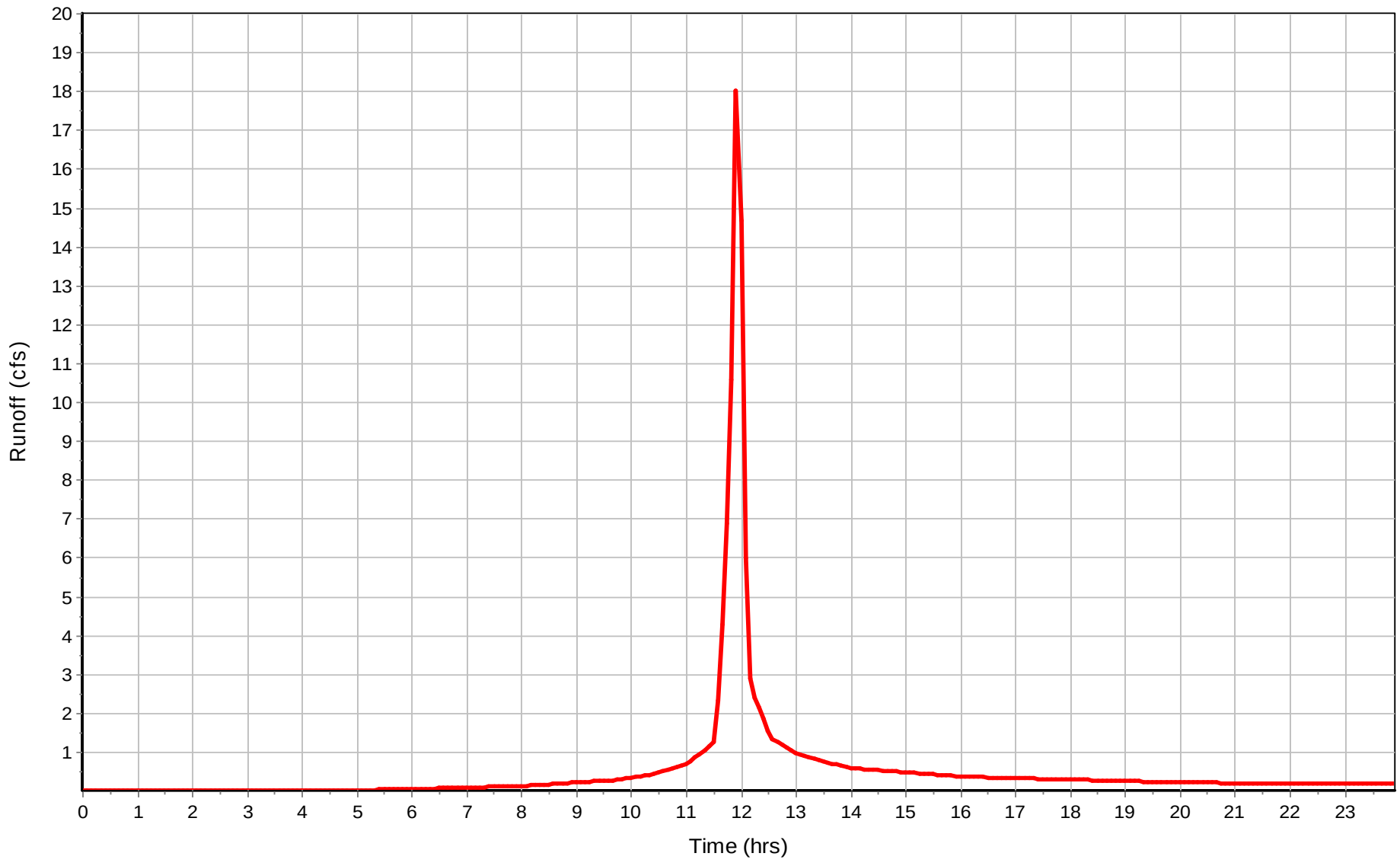
Total Rainfall (in)	5.5
Total Runoff (in)	3.97
Peak Runoff (cfs)	18.07
Weighted Curve Number	86.29
Time of Concentration (days hh:mm:ss)	0 00:05:16

Subbasin : SubDitch 2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : SubDitch 3

Input Data

Area (ac)		0.49
Peak Rate Factor		0
Weighted Curve Number		83.29
Rain Gage ID	Rain Gage-01	

Composite Curve Number

32

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.49	-	83.29
Composite Area & Weighted CN	0.49		83.29

Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	3.84	0	0
2 yr, 24 hr Rainfall (in) :	2.4	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	19.1	0	0

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	96	0	0
Channel Slope (%) :	1.08	0	0
Cross Section Area (ft^2) :	5.5	0	0
Wetted Perimeter (ft) :	8.385	0	0
Velocity (ft/sec) :	0.39	0	0
Computed Flow Time (min) :	4.11	0	0

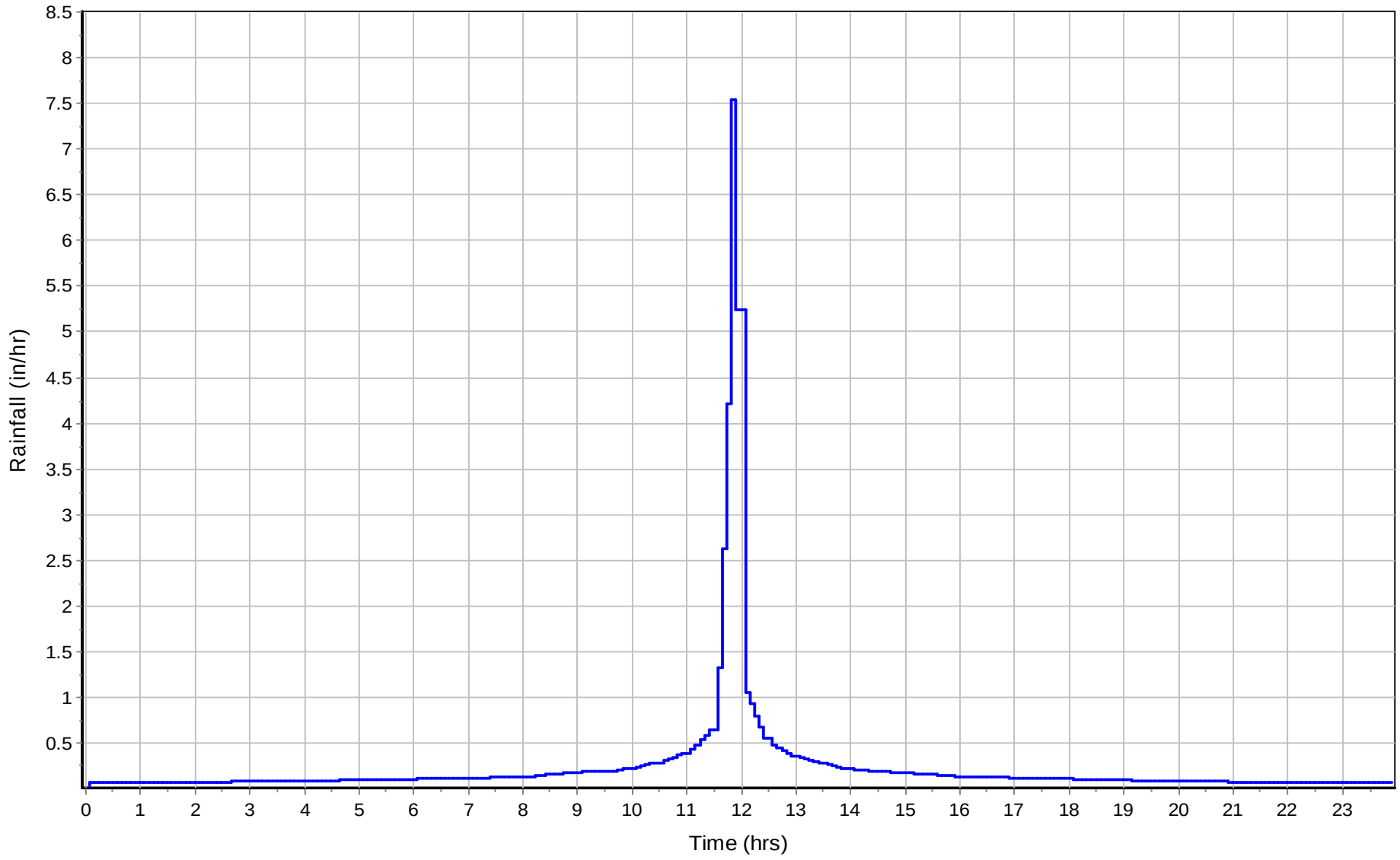
Total TOC (min) 23.21

Subbasin Runoff Results

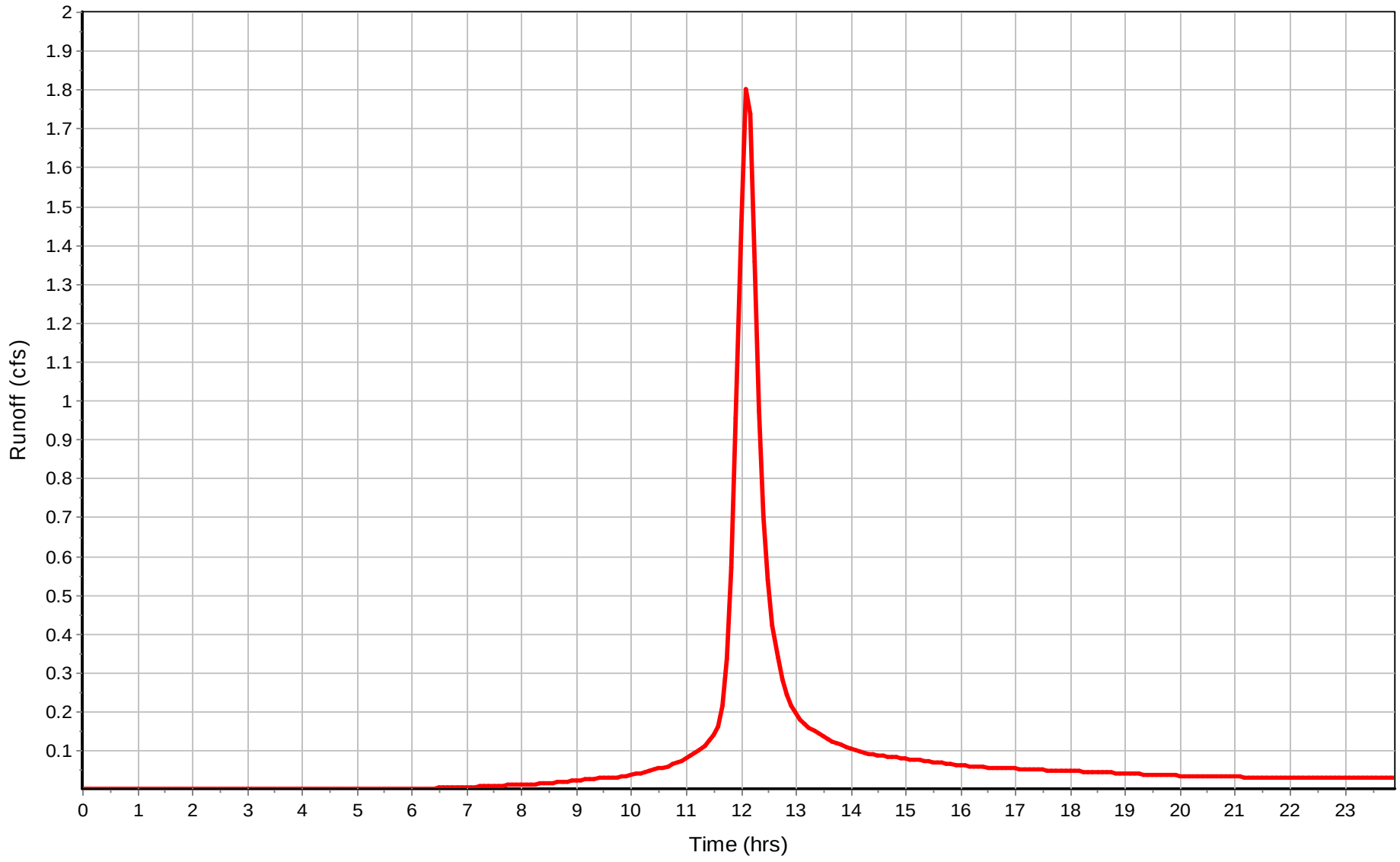
Total Rainfall (in)		5.5
Total Runoff (in)		3.66
Peak Runoff (cfs)		1.83
Weighted Curve Number		83.29
Time of Concentration (days hh:mm:ss)	0 00:23:13	

Subbasin : SubDitch 3

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	CB 16	1131.94	1135.86	3.92	1131.94	0.00	0.00	-1135.86	0.00	0.00
2	CB-1	1115.20	1118.50	3.30	1115.20	0.00	0.00	-1118.50	0.00	0.00
3	CB-10	1111.47	1115.20	3.73	1110.95	-0.52	0.00	-1115.20	0.00	0.00
4	CB-11	1111.47	1115.57	4.10	1109.74	-1.73	0.00	-1115.57	0.00	0.00
5	CB-12	1111.47	1115.17	3.70	1111.47	0.00	0.00	-1115.17	0.00	0.00
6	CB-13	1110.73	1115.23	4.50	1110.73	0.00	0.00	-1115.23	0.00	0.00
7	CB-14	1112.69	1116.26	3.57	1112.69	0.00	0.00	-1116.26	0.00	0.00
8	CB-15	1113.00	1114.67	1.67	1113.00	0.00	0.00	-1114.67	0.00	0.00
9	CB-17	1130.84	1132.60	1.76	1130.84	0.00	0.00	-1132.60	0.00	0.00
10	CB-18	1115.25	1121.67	6.42	1115.25	0.00	0.00	-1121.67	0.00	0.00
11	CB-2	1114.03	1119.28	5.25	1114.03	0.00	0.00	-1119.28	0.00	0.00
12	CB20	1115.56	1121.75	6.19	1115.56	0.00	0.00	-1121.75	0.00	0.00
13	CB-21	1119.47	1125.19	5.72	1119.47	0.00	0.00	-1125.19	0.00	0.00
14	CB-22	1123.13	1127.38	4.25	1123.13	0.00	0.00	-1127.38	0.00	0.00
15	CB-23	1128.07	1131.25	3.17	1128.07	0.00	0.00	-1131.25	0.00	0.00
16	CB-24	1121.38	1125.47	4.09	1121.38	0.00	0.00	-1125.47	0.00	0.00
17	CB-25	1118.87	1124.65	5.78	1118.87	0.00	0.00	-1124.65	0.00	0.00
18	CB-26	1117.45	1123.45	6.00	1117.45	0.00	0.00	-1123.45	0.00	0.00
19	CB-27	1115.95	1121.87	5.92	1115.95	0.00	0.00	-1121.87	0.00	0.00
20	CB-28	1114.42	1119.93	5.51	1114.42	0.00	0.00	-1119.93	0.00	0.00
21	CB-3	1113.87	1117.87	4.00	1113.87	0.00	0.00	-1117.87	0.00	0.00
22	CB-30	1110.52	1116.77	6.25	0.00	-1110.52	0.00	-1116.77	0.00	0.00
23	CB-31	1112.00	1115.40	3.40	1112.00	0.00	0.00	-1115.40	0.00	0.00
24	CB-32	1111.54	1118.79	7.25	1111.54	0.00	0.00	-1118.79	0.00	0.00
25	CB-34	1111.94	1116.34	4.40	1111.94	0.00	0.00	-1116.34	0.00	0.00
26	CB-35	1111.69	1116.39	4.70	1111.69	0.00	0.00	-1116.39	0.00	0.00
27	CB-36	1112.12	1118.00	5.88	1112.12	0.00	0.00	-1118.00	0.00	0.00
28	CB-37	1113.61	1118.81	5.20	1113.61	0.00	0.00	-1118.81	0.00	0.00
29	CB-38	1114.06	1118.16	4.10	1114.06	0.00	0.00	-1118.16	0.00	0.00
30	CB-39	1115.41	1119.11	3.70	1115.41	0.00	0.00	-1119.11	0.00	0.00
31	CB-4	1113.04	1118.71	5.67	1113.04	0.00	0.00	-1118.71	0.00	0.00
32	CB-40	1114.72	1119.00	4.28	1114.72	0.00	0.00	-1119.00	0.00	0.00
33	CB-41	1117.36	1121.00	3.64	1117.36	0.00	0.00	-1121.00	0.00	0.00
34	CB42	1111.88	1115.28	3.40	1111.88	0.00	0.00	-1115.28	0.00	0.00
35	CB-43	1111.42	1114.77	3.35	1111.42	0.00	0.00	-1114.77	0.00	0.00
36	CB44	1110.87	1114.77	3.90	1110.87	0.00	0.00	-1114.77	0.00	0.00
37	CB-5	1112.31	1117.73	5.42	1112.31	0.00	0.00	-1117.73	0.00	0.00
38	CB-6	1113.00	1117.23	4.23	1113.00	0.00	0.00	-1117.23	0.00	0.00
39	CB-7	1111.90	1116.43	4.53	1111.90	0.00	0.00	-1116.43	0.00	0.00
40	CB-8	1111.85	1116.86	5.01	1111.85	0.00	0.00	-1116.86	0.00	0.00
41	CB-9	1111.47	1115.42	3.95	1111.25	-0.22	0.00	-1115.42	0.00	0.00
42	CreekInv	1109.24	1113.04	3.80	1110.20	0.96	1113.04	0.00	0.00	0.00
43	Ditch1	1121.99	1124.31	2.32	0.00	-1121.99	1124.99	0.68	0.00	0.00
44	5-Jun	1136.54	1138.05	1.51	1136.54	0.00	1138.05	0.00	0.00	0.00
45	MH-1	1109.79	0.00	-1109.79	1109.79	0.00	0.00	0.00	0.00	0.00
46	MH-2	1109.54	1118.10	8.56	1109.54	0.00	0.00	-1118.10	0.00	0.00
47	MH-3	1109.78	1116.72	6.94	1109.78	0.00	0.00	-1116.73	0.00	0.00
48	Out-1Pipe - (225)	1127.00	1129.00	2.00	0.00	-1127.00	1129.00	0.00	0.00	0.00
49	Out-1Pipe - (230)	1111.36	1117.37	6.01	1111.36	0.00	0.00	-1117.37	0.00	0.00
50	Structure - (141)	1117.08	1121.73	4.65	0.00	-1117.08	0.00	-1121.73	0.00	0.00
51	Structure - (148)	1118.24	1123.29	5.05	1118.24	0.00	0.00	-1123.29	0.00	0.00
52	Structure - (150)	1120.21	1123.99	3.78	1120.21	0.00	0.00	-1123.99	0.00	0.00
53	Structure - (153)	1121.60	1126.24	4.64	1121.60	0.00	0.00	-1126.24	0.00	0.00
54	Structure - (155)	1123.40	1128.06	4.66	1123.40	0.00	0.00	-1128.06	0.00	0.00
55	Structure - (157)	1127.98	1131.73	3.75	1127.98	0.00	0.00	-1131.73	0.00	0.00
56	Structure - (158)	1129.74	1133.75	4.01	1129.74	0.00	0.00	-1133.75	0.00	0.00
57	Structure - (159)	1130.11	1132.94	2.83	1130.11	0.00	0.00	-1132.94	0.00	0.00
58	Structure - (162)	1130.20	1134.06	3.86	1130.20	0.00	0.00	-1134.06	0.00	0.00
59	Structure - (164)	1130.39	1135.09	4.70	1130.39	0.00	0.00	-1135.09	0.00	0.00
60	Structure - (220)	1115.00	1117.80	2.80	1112.27	-2.73	0.00	-1117.80	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB 16	50.24	50.24	1135.86	3.92	0.00	0.00	1132.26	0.32	0 12:13	0 12:25	2.85	26.00
2	CB-1	1.85	1.85	1118.50	3.30	0.00	0.00	1115.81	0.61	0 11:21	0 12:15	1.01	145.00
3	CB-10	3.60	0.33	1115.20	3.73	0.00	0.00	1112.50	1.03	0 10:48	0 12:00	2.52	183.00
4	CB-11	13.03	12.39	1115.57	4.10	0.00	0.00	1112.87	1.40	0 10:18	0 12:10	7.59	295.00
5	CB-12	1.45	0.58	1113.22	1.75	0.00	1.95	1112.38	0.91	0 10:35	0 00:00	0.00	0.00
6	CB-13	2.09	0.88	1115.23	4.50	0.00	0.00	1110.98	0.25	0 11:58	0 12:20	0.29	38.00
7	CB-14	1.98	0.10	1113.28	0.59	0.00	2.98	1112.84	0.15	0 12:20	0 00:00	0.00	0.00
8	CB-15	1.88	1.88	1113.52	0.52	0.00	1.14	1113.08	0.08	0 12:20	0 00:00	0.00	0.00
9	CB-17	0.90	0.90	1131.16	0.32	0.00	1.44	1130.89	0.05	0 12:15	0 00:00	0.00	0.00
10	CB-18	41.16	39.03	1121.67	6.42	0.00	0.00	1119.77	4.52	0 08:48	0 12:15	57.96	912.00
11	CB-2	2.11	1.98	1116.20	2.17	0.00	3.08	1115.57	1.54	0 11:35	0 00:00	0.00	0.00
12	CB20	16.53	0.97	1117.66	2.10	0.00	4.08	1117.07	1.51	0 11:51	0 00:00	0.00	0.00
13	CB-21	82.57	55.86	1125.19	5.72	0.00	0.00	1121.13	1.66	0 12:11	0 12:33	12.04	47.00
14	CB-22	23.66	0.00	1124.46	1.33	0.00	2.92	1123.43	0.30	0 12:15	0 00:00	0.00	0.00
15	CB-23	41.95	41.95	1131.25	3.18	0.00	0.00	1129.01	0.94	0 11:33	0 12:45	53.94	316.00
16	CB-24	27.37	1.48	1125.76	4.38	0.00	0.71	1125.61	4.23	0 11:41	0 00:00	0.00	0.00
17	CB-25	61.57	1.86	1121.87	3.00	0.00	2.78	1119.48	0.61	0 12:14	0 00:00	0.00	0.00
18	CB-26	64.62	4.06	1119.89	2.44	0.00	3.56	1118.00	0.55	0 12:14	0 00:00	0.00	0.00
19	CB-27	67.61	3.63	1121.87	5.92	0.00	0.00	1116.57	0.62	0 12:10	0 12:14	0.75	15.00
20	CB-28	69.36	4.86	1117.14	2.72	0.00	2.79	1115.01	0.59	0 12:14	0 00:00	0.00	0.00
21	CB-3	0.78	0.78	1114.02	0.15	0.00	3.85	1113.89	0.02	0 12:00	0 00:00	0.00	0.00
22	CB-30	105.49	37.45	1116.77	6.25	0.00	0.00	1113.63	3.11	0 10:08	0 12:15	160.34	636.00
23	CB-31	12.88	12.88	1115.40	3.40	0.00	0.00	1113.56	1.56	0 10:27	0 12:20	10.93	464.00
24	CB-32	0.76	0.76	1111.93	0.39	0.00	6.86	1111.60	0.06	0 12:15	0 00:00	0.00	0.00
25	CB-34	6.70	6.70	1116.34	4.40	0.00	0.00	1112.14	0.20	0 11:51	0 12:05	0.87	24.00
26	CB-35	41.03	3.21	1114.19	2.50	0.00	2.20	1112.17	0.48	0 12:20	0 00:00	0.00	0.00
27	CB-36	40.90	1.13	1118.00	5.88	0.00	0.00	1112.64	0.52	0 12:13	0 12:20	0.49	14.00
28	CB-37	40.55	31.26	1115.17	1.56	0.00	3.64	1113.99	0.38	0 12:20	0 00:00	0.00	0.00
29	CB-38	10.98	0.72	1114.95	0.89	0.00	3.86	1114.35	0.29	0 12:05	0 00:00	0.00	0.00
30	CB-39	3.27	0.00	1119.11	3.70	0.00	0.00	1115.94	0.53	0 13:45	0 14:11	0.73	102.00
31	CB-4	5.08	2.23	1118.71	5.67	0.00	0.00	1113.31	0.27	0 11:50	0 12:00	0.47	20.00
32	CB-40	10.43	1.63	1116.22	1.50	0.00	2.78	1115.56	0.84	0 13:50	0 00:00	0.00	0.00
33	CB-41	8.87	0.71	1118.16	0.80	0.00	2.84	1117.43	0.07	0 12:10	0 00:00	0.00	0.00
34	CB42	1.15	1.15	1112.07	0.19	0.00	3.21	1111.91	0.03	0 12:00	0 00:00	0.00	0.00
35	CB-43	4.98	2.33	1114.77	3.35	0.00	0.00	1111.94	0.52	0 11:50	0 12:00	0.24	19.00
36	CB44	3.54	3.54	1111.52	0.65	0.00	3.25	1110.96	0.09	0 12:05	0 00:00	0.00	0.00
37	CB-5	8.85	4.91	1117.73	5.42	0.00	0.00	1112.99	0.68	0 11:41	0 12:00	1.85	34.00
38	CB-6	1.74	1.74	1113.65	0.65	0.00	3.58	1113.08	0.08	0 12:00	0 00:00	0.00	0.00
39	CB-7	1.20	1.20	1116.43	4.53	0.00	0.00	1112.05	0.15	0 11:53	0 12:00	0.07	14.00
40	CB-8	2.89	0.16	1112.90	1.05	0.00	3.96	1112.09	0.24	0 11:54	0 00:00	0.00	0.00
41	CB-9	0.63	0.63	1112.11	0.64	0.00	3.31	1111.55	0.08	0 12:00	0 00:00	0.00	0.00
42	CreekInv	49.27	0.00	1113.04	3.80	0.00	0.00	1111.86	2.62	0 11:01	0 12:03	76.71	690.00
43	Ditch1	54.65	36.42	1124.31	2.32	0.00	0.00	1122.36	0.37	0 11:54	0 12:25	25.86	80.00
44	5-Jun	53.55	53.55	1143.15	6.61	0.00	0.00	1136.96	0.42	0 12:00	0 12:20	15.77	52.00
45	MH-1	7.37	0.00	1112.43	2.64	0.00	0.36	1111.66	1.87	0 10:24	0 00:00	0.00	0.00
46	MH-2	46.73	0.00	1114.00	4.46	0.00	4.10	1113.08	3.54	0 11:02	0 00:00	0.00	0.00
47	MH-3	48.40	0.00	1116.72	6.94	0.00	0.00	1111.51	1.73	0 12:02	0 12:14	4.68	33.00
48	Out-1Pipe - (225)	3.59	0.00	1128.00	1.00	0.00	1.00	1127.45	0.45	0 11:41	0 00:00	0.00	0.00
49	Out-1Pipe - (230)	5.54	4.79	1117.37	6.01	0.00	0.00	1111.51	0.15	0 12:14	0 12:15	0.00	1.00
50	Structure - (141)	16.07	0.00	1118.58	1.50	0.00	3.15	1117.49	0.41	0 11:51	0 00:00	0.00	0.00
51	Structure - (148)	2.20	0.00	1118.71	0.47	0.00	4.57	1118.51	0.27	0 12:04	0 00:00	0.00	0.00
52	Structure - (150)	2.21	0.00	1120.73	0.52	0.00	3.26	1120.51	0.30	0 12:04	0 00:00	0.00	0.00
53	Structure - (153)	2.22	0.00	1122.12	0.52	0.00	4.12	1121.90	0.30	0 12:03	0 00:00	0.00	0.00
54	Structure - (155)	2.23	0.00	1125.49	2.09	0.00	2.58	1125.26	1.86	0 12:03	0 00:00	0.00	0.00
55	Structure - (157)	2.24	0.00	1128.87	0.89	0.00	2.86	1128.58	0.60	0 12:02	0 00:00	0.00	0.00
56	Structure - (158)	2.26	0.00	1130.52	0.78	0.00	3.23	1130.15	0.41	0 12:02	0 00:00	0.00	0.00
57	Structure - (159)	2.29	0.00	1131.11	1.00	0.00	1.83	1130.56	0.45	0 12:02	0 00:00	0.00	0.00
58	Structure - (162)	2.69	0.00	1136.81	6.61	0.00	0.00	1130.95	0.75	0 11:58	0 12:15	0.22	43.00
59	Structure - (164)	11.42	0.00	1135.09	4.70	0.00	0.00	1132.84	2.45	0 11:57	0 13:21	30.48	723.00
60	Structure - (220)	8.86	0.00	1115.77	0.77	0.00	2.03	1115.07	0.07	0 12:10	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (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
1	Creek	1106.59	1109.24	0.00	1106.56	0.00	2.68	0.2400	Rectangular	1.500	3.000	0.0250	0.5000	0.0000	0.0000	0.00	No
2	Ditch3	179.15	1121.99	0.00	1119.92	2.37	2.07	1.1600	Trapezoidal	1.000	8.000	0.0320	0.0000	0.0000	0.0000	0.00	No
3	Link-06	159.58	1127.00	0.00	1125.47	4.09	1.53	0.9600	Trapezoidal	1.000	12.000	0.0320	0.0000	0.0000	0.0000	0.00	No
4	Link-07	1834.55	1136.54	0.00	1121.99	0.00	14.55	0.7900	Trapezoidal	1.000	7.300	0.0320	0.0000	0.0000	0.0000	0.00	No

Channel Results

SN	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)	Froude Number	Reported Condition
1	Creek	10.87	0 11:06	10.87	1.00	2.42	7.62	1.50	1.00	684.00		
2	Ditch3	20.73	0 11:54	20.73	1.00	3.78	0.79	1.00	1.00	79.00		
3	Link-06	3.68	0 11:41	33.22	0.11	1.90	1.40	0.29	0.29	0.00		
4	Link-07	18.23	0 12:05	18.23	1.00	3.44	8.89	1.00	1.00	47.00		

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-01	89.38	1110.52	0.00	1110.43	0.64	0.09	0.1000	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
2	Link-02	13.34	1111.88	0.00	1109.79	0.00	2.09	15.6700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
3	Link-04	426.69	1111.36	0.00	1109.78	0.00	1.58	0.3700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
4	Link-05	69.55	1117.55	0.00	1117.08	0.00	0.47	0.6800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	2
5	Pipe - (106)	42.44	1121.38	0.00	1120.64	1.17	0.74	1.7400	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
6	Pipe - (107)	114.78	1123.13	0.00	1121.38	0.00	1.75	1.5200	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
7	Pipe - (109)	98.22	1119.47	0.00	1118.87	0.00	0.60	0.6100	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
8	Pipe - (111)	160.05	1118.87	0.00	1117.45	0.00	1.42	0.8900	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
9	Pipe - (112)	184.17	1117.45	0.00	1115.95	0.00	1.50	0.8100	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
10	Pipe - (113)	221.97	1115.95	0.00	1114.42	0.00	1.53	0.6900	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
11	Pipe - (114)	63.63	1114.42	0.00	1111.57	0.00	2.85	4.4800	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12	Pipe - (116)	36.55	1111.57	0.00	1111.54	0.00	0.03	0.0800	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13	Pipe - (117)	75.50	1111.57	0.00	1110.52	0.00	1.05	1.3900	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14	Pipe - (118)	278.45	1112.00	0.00	1112.00	2.46	0.00	0.0000	CIRCULAR	24.000	24.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
15	Pipe - (122)	30.89	1110.87	0.00	1110.34	0.80	0.53	1.7200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
16	Pipe - (126)	40.20	1109.78	0.00	1109.54	0.00	0.24	0.6000	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17	Pipe - (127)	67.63	1109.79	0.00	1109.54	0.00	0.25	0.3700	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18	Pipe - (130)	16.85	1111.42	0.00	1111.25	1.47	0.17	1.0000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
19	Pipe - (131)	30.54	1111.94	0.00	1111.77	0.35	0.17	0.5600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
20	Pipe - (138)	193.20	1111.69	0.00	1109.78	0.00	1.91	0.9900	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
21	Pipe - (139)	60.42	1112.12	0.00	1111.69	0.00	0.43	0.7100	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
22	Pipe - (141)	90.06	1113.61	0.00	1112.12	0.00	1.49	1.6500	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
23	Pipe - (143)	20.12	1114.06	0.00	1113.61	0.00	0.45	2.2400	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
24	Pipe - (144)	87.78	1114.72	0.00	1114.06	0.00	0.66	0.7500	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
25	Pipe - (145)	45.85	1115.41	0.00	1115.22	0.50	0.19	0.4100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
26	Pipe - (146)	25.00	1115.00	0.00	1114.72	0.00	0.28	1.1200	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
27	Pipe - (150)	66.96	1116.76	1.20	1115.58	0.33	1.18	1.7600	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
28	Pipe - (151)	20.21	1117.08	0.00	1115.56	0.00	1.52	7.5200	CIRCULAR	30.000	30.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
29	Pipe - (154)	120.38	1119.67	2.12	1117.36	0.00	2.31	1.9200	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
30	Pipe - (156)	61.34	1115.25	0.00	1115.25	0.00	0.00	0.0000	CIRCULAR	24.000	24.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
31	Pipe - (157)	189.33	1118.24	0.00	1116.45	1.20	1.79	0.9500	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
32	Pipe - (159)	199.61	1120.21	0.00	1118.24	0.00	1.97	0.9900	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
33	Pipe - (162)	215.23	1121.60	0.00	1120.21	0.00	1.39	0.6500	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
34	Pipe - (164)	199.59	1123.40	0.00	1121.60	0.00	1.80	0.9000	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
35	Pipe - (166)	299.82	1127.98	0.00	1124.98	1.58	3.00	1.0000	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
36	Pipe - (167)	210.46	1129.74	0.00	1128.23	0.25	1.51	0.7200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
37	Pipe - (168)	84.40	1130.11	0.00	1129.74	0.00	0.37	0.4400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
38	Pipe - (171)	25.29	1130.20	0.00	1130.11	0.00	0.09	0.3600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
39	Pipe - (172)	60.26	1130.84	0.00	1129.91	-0.29	0.93	1.5400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
40	Pipe - (173)	75.12	1130.39	0.00	1129.91	-0.29	0.48	0.6400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
41	Pipe - (174)	44.65	1131.94	0.00	1130.59	0.20	1.35	3.0200	CIRCULAR	24.000	24.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
42	Pipe - (208)	212.53	1117.36	0.00	1115.00	0.00	2.36	1.1100	CIRCULAR	30.000	30.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
43	Pipe - (209)	24.77	1113.00	0.00	1112.76	0.07	0.24	0.9700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
44	Pipe - (211)	169.78	1112.69	0.00	1110.73	0.00	1.96	1.1500	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
45	Pipe - (212)	38.45	1111.47	0.00	1111.47	0.00	0.00	0.0000	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
46	Pipe - (213)	71.86	1111.47	0.00	1111.47	0.00	0.00	0.0000	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
47	Pipe - (216)	4.63	1111.47	0.00	1111.47	0.00	0.00	0.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
48	Pipe - (217)	140.54	1111.86	0.01	1111.47	0.00	0.39	0.2800	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
49	Pipe - (218)	2.83	1111.90	0.00	1111.90	0.05	0.00	0.0000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
50	Pipe - (219)	130.31	1112.31	0.00	1111.86	0.01	0.45	0.3500	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
51	Pipe - (220)	63.99	1113.00	0.00	1112.73	0.42	0.27	0.4200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
52	Pipe - (221)	79.13	1113.04	0.00	1112.73	0.42	0.31	0.3900	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
53	Pipe - (222)	4.10	1113.87	0.00	1113.13	0.09	0.74	18.0300	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
54	Pipe - (223)	121.11	1114.03	0.00	1113.13	0.09	0.90	0.7400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
55	Pipe - (224)	67.59	1115.20	0.00	1115.20	1.17	0.00	0.0000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
56	Pipe - (225)	124.01	1128.07	0.00	1127.00	0.00	1.07	0.8700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
57	Pipe - (230)	175.91	1111.54	0.00	1111.36	0.00	0.18	0.1000	CIRCULAR	36.000	36.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
58	Pipe_12-CR	24.83	1111.47	0.00	1109.85	0.61	1.62	6.5200	CIRCULAR	21.000	21.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
59	Pipe_13-CR	21.92	1110.73	0.00	1110.70	1.46	0.03	0.1400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
60	Pipe_M2-CR	64.02	1109.54	0.00	1109.24	0.00	0.30	0.4700	CIRCULAR	36.000	36.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	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)	Froude Number	Reported Condition
1	Link-01	6.73	0 10:23	6.22	1.08	2.32	0.64	2.00	1.00	620.00		SURCHARGED
2	Link-02	1.15	0 12:00	14.10	0.08	10.82	0.02	0.19	0.19	0.00		Calculated
3	Link-04	5.64	0 12:15	5.54	1.02	3.67	1.94	1.31	0.88	0.00		> CAPACITY
4	Link-05	16.07	0 11:51	14.97	1.07	4.93	0.24	1.50	1.00	97.00		SURCHARGED
5	Pipe - (106)	27.38	0 12:10	32.36	0.85	11.55	0.06	1.40	0.71	0.00		Calculated
6	Pipe - (107)	23.66	0 12:16	30.26	0.78	10.66	0.18	1.33	0.67	0.00		Calculated
7	Pipe - (109)	60.36	0 12:55	56.47	1.07	9.30	0.18	3.00	1.00	41.00		SURCHARGED
8	Pipe - (111)	61.31	0 12:14	68.06	0.90	11.14	0.24	2.13	0.74	0.00		Calculated
9	Pipe - (112)	64.58	0 12:14	65.21	0.99	10.70	0.29	2.35	0.81	0.00		Calculated
10	Pipe - (113)	64.51	0 12:14	59.99	1.08	9.90	0.37	2.85	0.95	0.00		> CAPACITY
11	Pipe - (114)	69.34	0 12:14	152.92	0.45	21.10	0.05	1.41	0.47	0.00		Calculated
12	Pipe - (116)	0.00	0 00:00	20.70	0.00	0.00		0.00	0.00	0.00		Calculated
13	Pipe - (117)	70.77	0 12:14	85.21	0.83	13.48	0.09	2.08	0.70	0.00		Calculated
14	Pipe - (118)	0.46	0 18:37	0.43	1.08	0.16	29.00	2.00	1.00	429.00		SURCHARGED
15	Pipe - (122)	3.54	0 12:05	4.67	0.76	6.54	0.08	0.65	0.65	0.00		Calculated
16	Pipe - (126)	36.96	0 12:33	34.33	1.08	8.09	0.08	2.50	1.00	29.00		SURCHARGED
17	Pipe - (127)	7.37	0 12:00	43.93	0.17	4.61	0.24	0.83	0.28	0.00		Calculated
18	Pipe - (130)	3.84	0 11:51	3.56	1.08	5.22	0.05	1.00	1.00	16.00		SURCHARGED
19	Pipe - (131)	2.80	0 11:52	2.66	1.05	3.97	0.13	1.00	1.00	22.00		SURCHARGED
20	Pipe - (138)	40.43	0 12:20	44.18	0.92	10.43	0.31	1.86	0.75	0.00		Calculated
21	Pipe - (139)	40.34	0 12:23	37.49	1.08	8.85	0.11	2.50	1.00	3.00		SURCHARGED
22	Pipe - (141)	40.53	0 12:20	57.16	0.71	12.63	0.12	1.56	0.62	0.00		Calculated
23	Pipe - (143)	10.98	0 12:05	66.45	0.17	10.00	0.03	0.69	0.28	0.00		Calculated
24	Pipe - (144)	10.43	0 12:05	38.53	0.27	6.67	0.22	0.89	0.36	0.00		Calculated
25	Pipe - (145)	2.66	0 15:14	2.48	1.07	3.68	0.21	1.00	1.00	84.00		SURCHARGED
26	Pipe - (146)	8.86	0 12:10	47.03	0.19	7.35	0.06	0.73	0.29	0.00		Calculated
27	Pipe - (150)	16.46	0 11:51	58.99	0.28	10.34	0.11	0.89	0.36	0.00		Calculated
28	Pipe - (151)	16.06	0 11:51	121.85	0.13	17.24	0.02	0.59	0.25	0.00		Calculated
29	Pipe - (154)	8.67	0 12:10	15.75	0.55	9.12	0.22	0.79	0.53	0.00		Calculated
30	Pipe - (156)	0.99	0 09:02	0.91	1.08	0.33	3.10	2.00	1.00	896.00		SURCHARGED
31	Pipe - (157)	2.19	0 12:05	10.21	0.21	4.61	0.68	0.47	0.31	0.00		Calculated
32	Pipe - (159)	2.20	0 12:04	10.44	0.21	4.69	0.71	0.46	0.31	0.00		Calculated
33	Pipe - (162)	2.21	0 12:04	8.44	0.26	4.04	0.89	0.52	0.35	0.00		Calculated
34	Pipe - (164)	2.22	0 12:03	6.13	0.36	4.62	0.72	0.51	0.42	0.00		Calculated
35	Pipe - (166)	2.23	0 12:03	6.46	0.34	4.82	1.04	0.50	0.40	0.00		Calculated
36	Pipe - (167)	2.24	0 12:02	3.02	0.74	4.27	0.82	0.63	0.64	0.00		Calculated
37	Pipe - (168)	2.26	0 12:02	2.36	0.96	3.50	0.40	0.76	0.78	0.00		Calculated
38	Pipe - (171)	2.29	0 12:34	2.13	1.08	3.14	0.13	1.00	1.00	32.00		SURCHARGED
39	Pipe - (172)	0.90	0 12:15	3.98	0.23	4.09	0.25	0.32	0.32	0.00		Calculated
40	Pipe - (173)	1.94	0 12:04	1.79	1.08	2.59	0.48	1.00	1.00	715.00		SURCHARGED
41	Pipe - (174)	42.39	0 12:16	39.34	1.08	14.45	0.05	2.00	1.00	20.00		SURCHARGED
42	Pipe - (208)	8.86	0 12:10	43.25	0.20	6.93	0.51	0.77	0.31	0.00		Calculated
43	Pipe - (209)	1.88	0 12:20	3.51	0.54	4.54	0.09	0.52	0.52	0.00		Calculated
44	Pipe - (211)	1.98	0 12:20	3.83	0.52	4.92	0.58	0.51	0.51	0.00		Calculated
45	Pipe - (212)	0.95	0 10:33	0.88	1.08	0.43	1.49	1.75	1.00	279.00		SURCHARGED
46	Pipe - (213)	0.69	0 11:03	0.64	1.08	0.31	3.86	1.75	1.00	166.00		SURCHARGED
47	Pipe - (216)	0.63	0 12:00	1.67	0.38	0.88	0.09	0.64	0.43	0.00		Calculated
48	Pipe - (217)	2.86	0 12:07	5.99	0.48	3.37	0.70	0.73	0.49	0.00		Calculated
49	Pipe - (218)	0.72	0 12:06	0.67	1.08	0.98	0.05	1.00	1.00	12.00		SURCHARGED
50	Pipe - (219)	2.26	0 11:42	2.09	1.08	3.21	0.68	1.00	1.00	32.00		SURCHARGED
51	Pipe - (220)	1.73	0 12:00	2.31	0.75	3.24	0.33	0.64	0.64	0.00		Calculated
52	Pipe - (221)	2.41	0 11:51	2.23	1.08	3.43	0.38	1.00	1.00	17.00		SURCHARGED
53	Pipe - (222)	0.78	0 12:00	15.13	0.05	10.14	0.01	0.15	0.15	0.00		Calculated
54	Pipe - (223)	2.09	0 12:00	3.07	0.68	4.22	0.48	0.60	0.61	0.00		Calculated
55	Pipe - (224)	0.15	0 11:33	0.14	1.08	0.21	5.36	1.00	1.00	132.00		SURCHARGED
56	Pipe - (225)	3.59	0 11:40	3.32	1.08	4.93	0.42	1.00	1.00	306.00		SURCHARGED
57	Pipe - (230)	0.76	0 12:15	21.34	0.04	1.44	2.04	0.39	0.13	0.00		Calculated
58	Pipe_12-CR	1.45	0 12:00	40.47	0.04	7.96	0.05	0.23	0.13	0.00		Calculated
59	Pipe_13-CR	1.41	0 12:35	1.32	1.07	1.96	0.19	1.00	1.00	36.00		SURCHARGED
60	Pipe_M2-CR	46.60	0 12:03	49.46	0.94	8.02	0.13	2.26	0.77	0.00		Calculated

Storage Nodes

Storage Node : DarrowBasin

Input Data

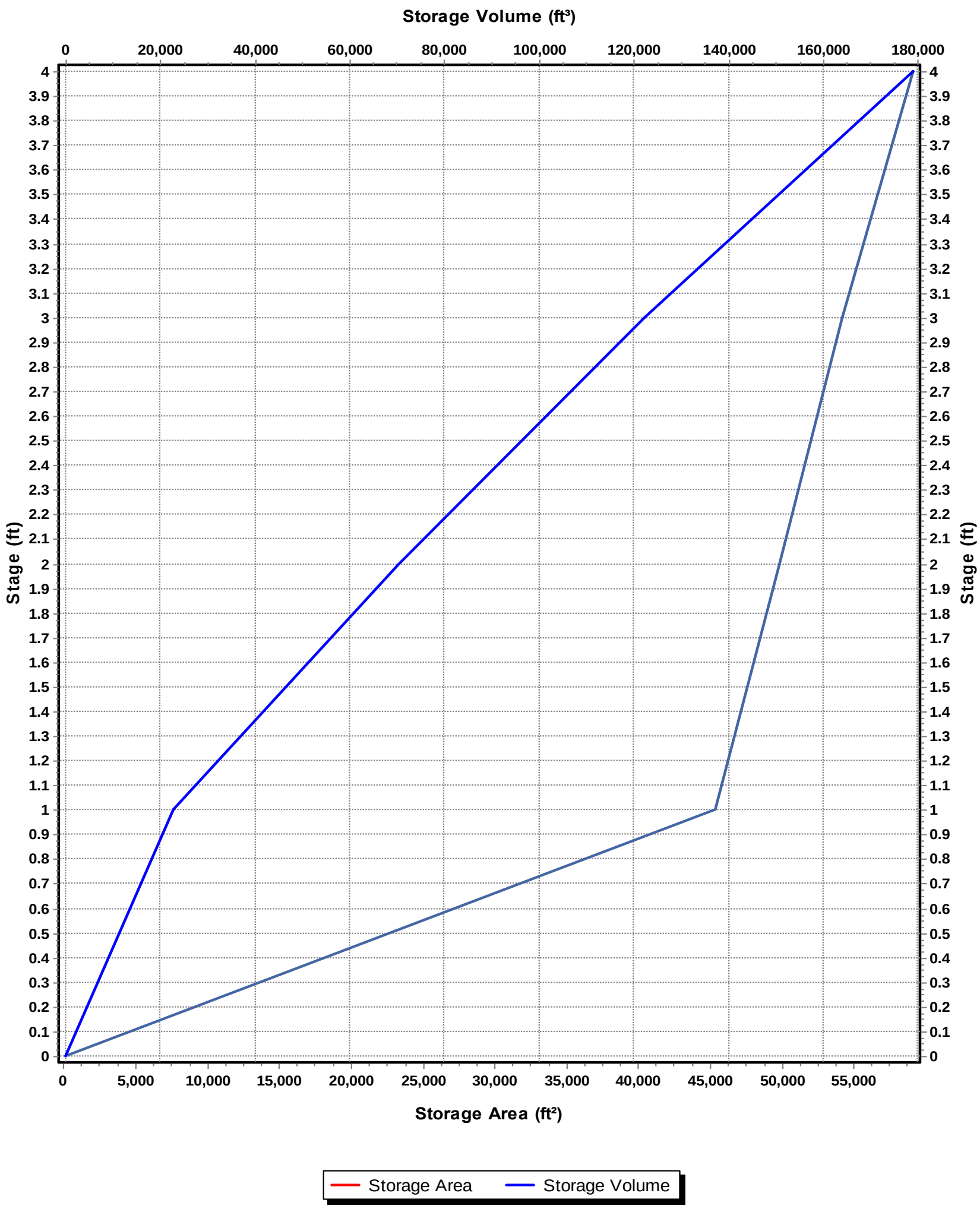
Invert Elevation (ft)	1115.25
Max (Rim) Elevation (ft)	1120.00
Max (Rim) Offset (ft)	4.75
Initial Water Elevation (ft)	1115.25
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : DarrowBasin

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	143.83	0
1	45363.56	22753.7
2	49829.18	70350.07
3	54229.03	122379.18
4	59153.31	179070.35

Storage Area Volume Curves



Storage Node : DarrowBasin (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	Darrow	Trapezoidal	No	1119.00	3.75	12.00	1.00	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	D3	Side	CIRCULAR	No	3.00			1115.56	0.61
2	D4	Side	CIRCULAR	No	4.00			1116.66	0.61
3	DG	Bottom	Rectangular	No		23.00	16.00	1119.11	0.63

Output Summary Results

Peak Inflow (cfs)	27.61
Peak Lateral Inflow (cfs)	11.58
Peak Outflow (cfs)	10.78
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	1119.32
Max HGL Depth Attained (ft)	4.07
Average HGL Elevation Attained (ft)	1117.34
Average HGL Depth Attained (ft)	2.09
Time of Max HGL Occurrence (days hh:mm)	0 14:10
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 : MarwellBasin

Input Data

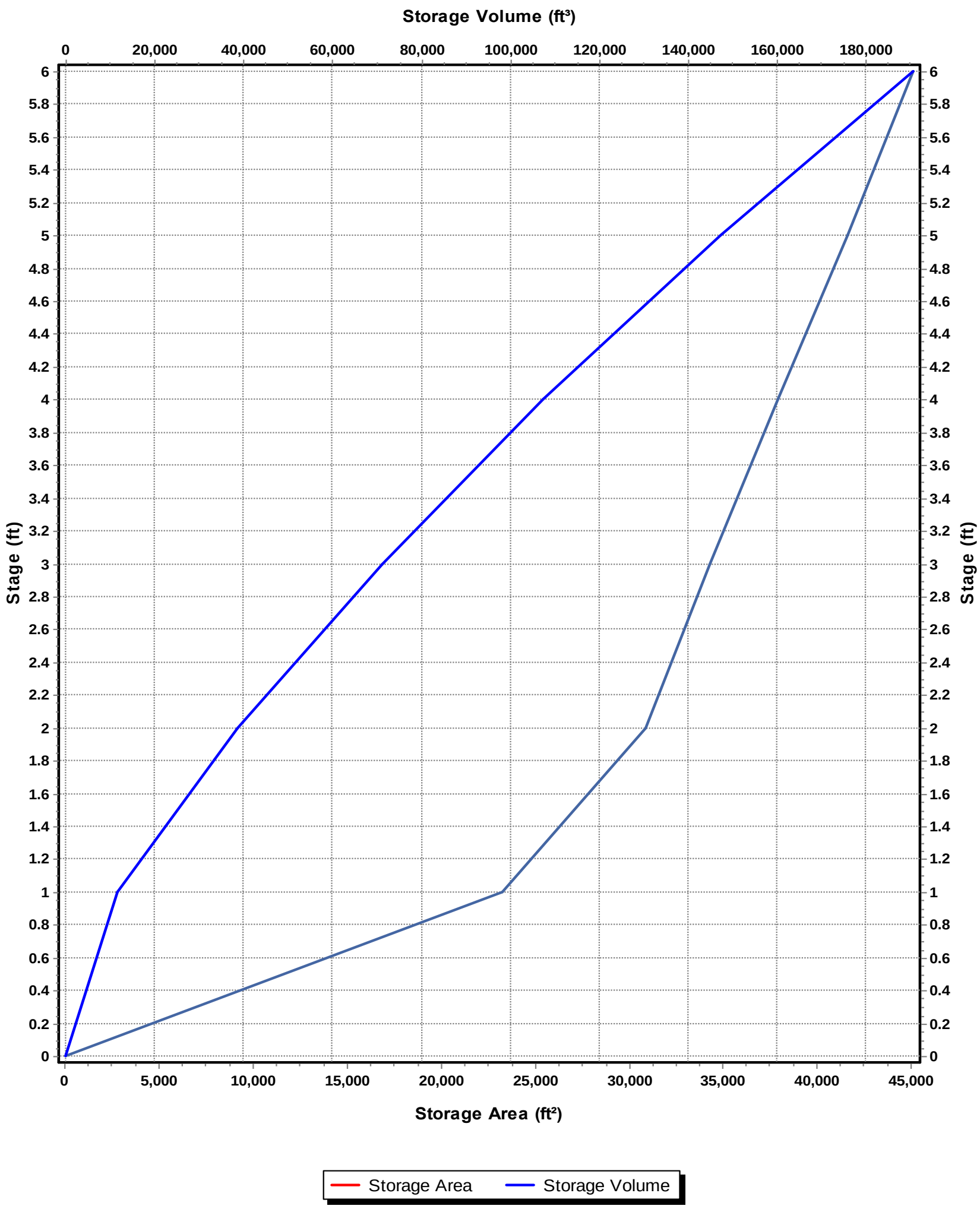
Invert Elevation (ft)	1130.39
Max (Rim) Elevation (ft)	1137.00
Max (Rim) Offset (ft)	6.61
Initial Water Elevation (ft)	1130.39
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : MarwellBasin

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	37.44	0
1	23239.39	11638.42
2	30890.36	38703.3
3	34331.42	71314.19
4	37912.83	107436.32
5	41634.57	147210.02
6	45129.66	190592.14

Storage Area Volume Curves



Storage Node : MarwellBasin (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	Marwell	V-Notch	No	1136.67	6.28	14.00	0.33	2.40
2	Marwell2	Trapezoidal	No	1136.68	6.29	40.00	0.32	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	M8	Side	CIRCULAR	No	8.00			1130.59	0.61
2	MG	Bottom	Rectangular	No		23.00	16.00	1135.09	0.63

Output Summary Results

Peak Inflow (cfs)	50.08
Peak Lateral Inflow (cfs)	10.11
Peak Outflow (cfs)	11.42
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	1135.59
Max HGL Depth Attained (ft)	5.2
Average HGL Elevation Attained (ft)	1132.76
Average HGL Depth Attained (ft)	2.37
Time of Max HGL Occurrence (days hh:mm)	0 13:20
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 : TwinOaksPond

Input Data

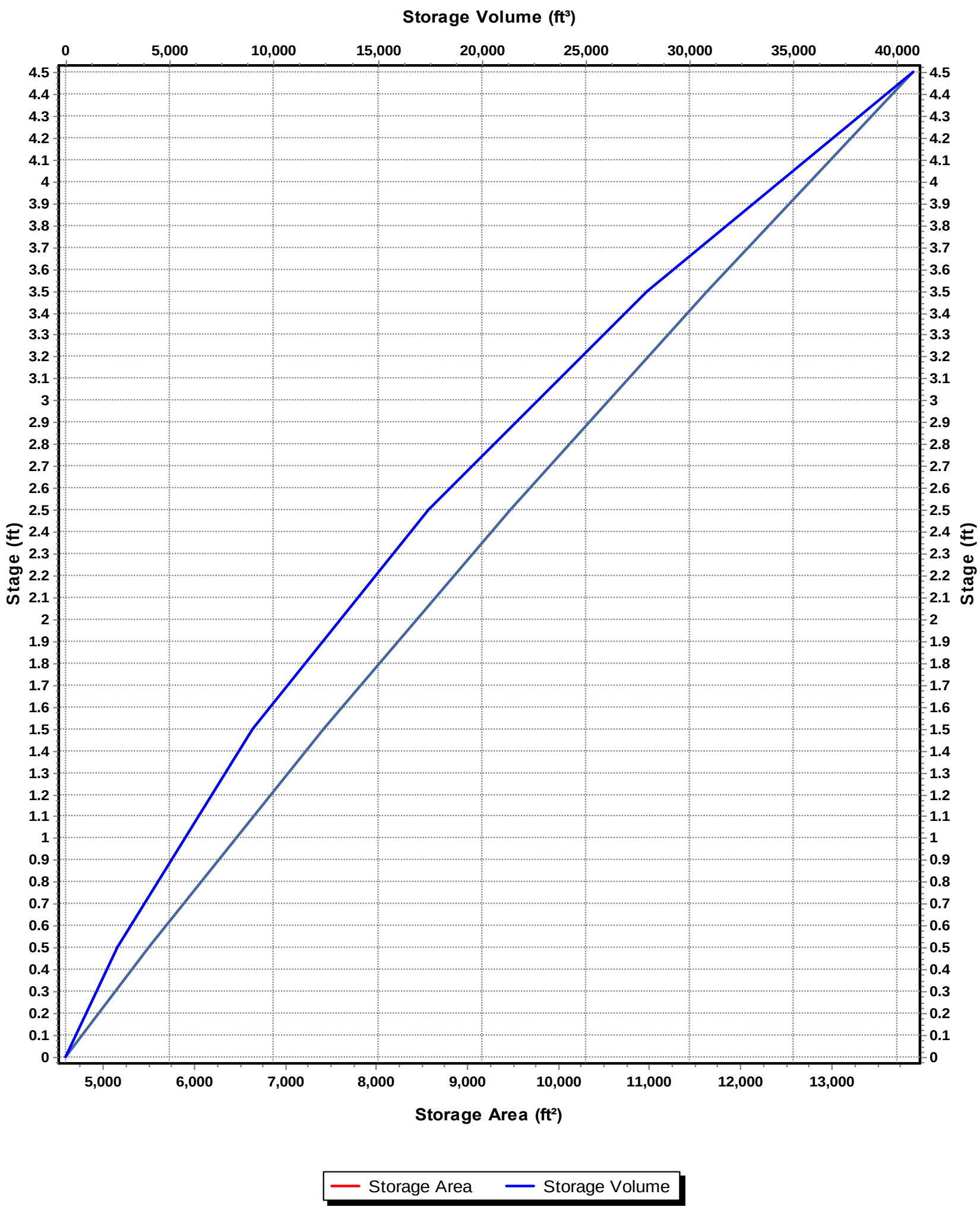
Invert Elevation (ft)	1123.50
Max (Rim) Elevation (ft)	1128.00
Max (Rim) Offset (ft)	4.50
Initial Water Elevation (ft)	1123.50
Initial Water Depth (ft)	0.00
Ponded Area (ft^2)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Twin Oaks Pond

Stage (ft)	Storage Area (ft^2)	Storage Volume (ft^3)
0	4589	0
0.5	5499	2522
1.5	7421	8982
2.5	9478	17431.5
3.5	11641	27991
4.5	13904	40763.5

Storage Area Volume Curves



Storage Node : TwinOaksPond (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	TwinOaksPondOF	Trapezoidal	No	1127.49	3.99	5.00	0.51	3.33

Outflow Orifices

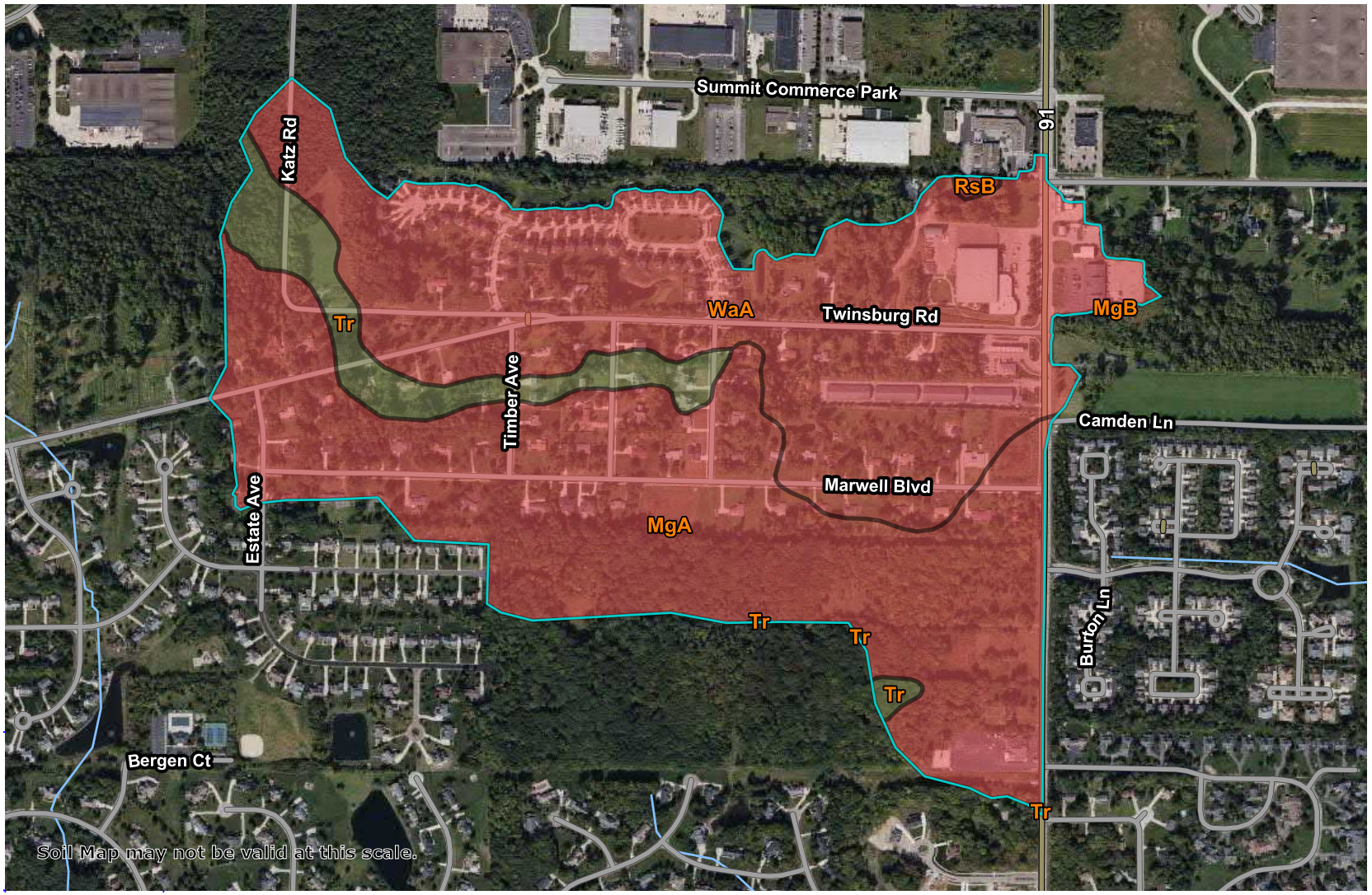
SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	TO1.25	Side	CIRCULAR	No	1.25			1123.50	0.61
2	TO18	Side	CIRCULAR	No	18.00			1123.90	0.61
3	TOG	Bottom	Rectangular	No		23.00	16.00	1127.50	0.63

Output Summary Results

Peak Inflow (cfs)	70.33
Peak Lateral Inflow (cfs)	70.33
Peak Outflow (cfs)	34.55
Peak Exfiltration Flow Rate (cfm)	0
Max HGL Elevation Attained (ft)	1128
Max HGL Depth Attained (ft)	4.5
Average HGL Elevation Attained (ft)	1124.44
Average HGL Depth Attained (ft)	0.94
Time of Max HGL Occurrence (days hh:mm)	0 12:16
Total Exfiltration Volume (1000-ft^3)	0
Total Flooded Volume (ac-in)	7.85
Total Time Flooded (min)	22
Total Retention Time (sec)	0

Attachment 2: Hydrologic Soils Report

Hydrologic Soil Group—Summit County, Ohio
(Drainage Area)



Map Scale: 1:9,180 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Summit County, Ohio
Survey Area Data: Version 21, Aug 29, 2024

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

Date(s) aerial images were photographed: Sep 12, 2020—Sep 21, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MgA	Mahoning silt loam, 0 to 2 percent slopes	D	90.0	46.4%
MgB	Mahoning silt loam, 2 to 6 percent slopes	D	0.0	0.0%
RsB	Rittman silt loam, 2 to 6 percent slopes	D	0.4	0.2%
Tr	Trumbull silt loam, 0 to 2 percent slopes	C/D	14.2	7.3%
WaA	Wadsworth silt loam, 0 to 2 percent slopes	D	89.4	46.1%
Totals for Area of Interest			**194.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

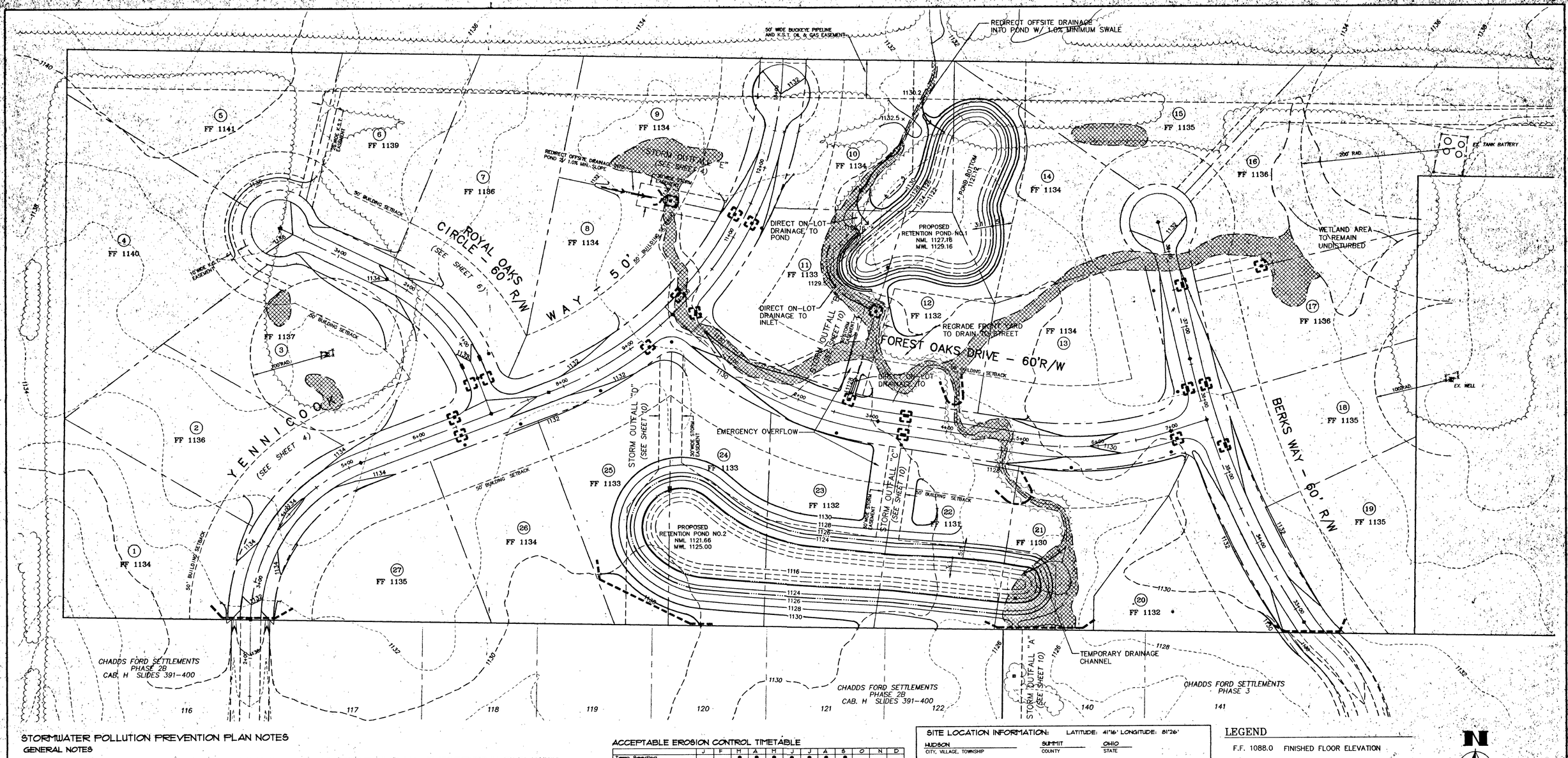
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Attachment 3: Chadds Ford Subdivision Plan Sheets



STORMWATER POLLUTION PREVENTION PLAN NOTES

GENERAL NOTES

1. CONSTRUCT IN ACCORDANCE WITH THESE PLANS, THE OHIO DEPARTMENT OF TRANSPORTATION (ODOT) STANDARD CONSTRUCTION DRAWING MC-11, AND THE OHIO WATER MANAGEMENT AND SEDIMENT CONTROL MANUAL FOR URBANIZING AREAS. THE IMPLEMENTATION OF SOIL EROSION AND SEDIMENT CONTROL SHALL ALSO CONFORM TO THE REQUIREMENTS OF THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA) UNDER NPDES PERMIT # OHR020991. IF CONFLICTS EXIST REGARDING THE SOIL AND SEDIMENT CONTROL PRACTICES, THE MORE RESTRICTIVE SHALL APPLY.
2. STABILIZATION OF DISTURBED AREAS. DISTURBED AREAS SHALL HAVE SOIL STABILIZATION APPLIED WITHIN SEVEN (7) DAYS IF THEY ARE TO REMAIN DORMANT (UNDISTURBED) FOR MORE THAN FORTY-FIVE (45) DAYS. FOR AREAS WITHIN FIFTY (50) FEET OF ANY LIVE STREAM, SOIL STABILIZATION PRACTICES SHALL BE INITIATED WITHIN TWO (2) DAYS ON ALL INACTIVE, DISTURBED AREAS. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DISTURBED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. WHEN SEASONAL CONDITIONS PROHIBIT THE APPLICATION OF TEMPORARY OR PERMANENT SEEDING, NON-VEGETATIVE SOIL STABILIZATION PRACTICES SUCH AS MULCHING AND MATTING SHALL BE USED.
3. INSTALL ALL EROSION CONTROL ITEMS BEFORE ANY CLEARING AND GRUBBING OR EARTHWORK IS BEGUN.
4. PROTECT UNDISTURBED AREAS THROUGHOUT CONSTRUCTION. DO NOT STORE EQUIPMENT, VEHICLES OR MATERIALS IN THESE PROTECTED AREAS. DO NOT DISTURB THESE AREAS UNTIL HOMESITE CONTROLS ARE IN PLACE.
5. SEEDING AND MULCHING FOR PERMANENT COVER SHALL BE AS SPECIFIED IN ODOT SECTION 659.
6. FERTILIZATION SHALL BE AS SPECIFIED IN ODOT SECTION 659.
7. TOPSOILING SHALL BE AS SPECIFIED IN ODOT SECTION 651 & 652.
8. EXCELSIOR MATTING SHALL BE PROVIDED FOR ALL SWALES GREATER THAN 15% SLOPE AND AS SPECIFIED IN ODOT SECTION 668.
9. SILT FENCE SHALL BE AS SPECIFIED IN ODOT SECTION 712.09, TYPE C.
10. ROCK CHANNEL SHALL BE AS SPECIFIED IN ODOT SECTION 601.07-.08.
11. NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORMWATER RUNOFF.
12. OFF-SITE VEHICLE TRACKING OF SEDIMENTS WILL BE MINIMIZED. CONSTRUCTION VEHICLES ARE LIMITED TO THE CONSTRUCTION HAUL ROAD NOTED ON THE DRAWINGS.
13. PONDS WILL NOT BE USED FOR TEMPORARY EROSION CONTROL.
14. OTHER EROSION CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS.
15. THE BUILDER IS RESPONSIBLE FOR EROSION CONTROL ON EACH LOT.

MAINTENANCE AND INSPECTION:

PERMANENT RECORDS OF MAINTENANCE AND INSPECTION MUST BE MAINTAINED THROUGHOUT CONSTRUCTION A MINIMUM OF ONCE EVERY 7 DAYS AND AFTER STORM EVENTS GREATER THAN .05 INCH IN A 24 HOUR PERIOD. PROVIDE NAME OF INSPECTOR, MAJOR OBSERVATIONS, DATE OF INSPECTION, CERTIFICATION OF COMPLIANCE AND CORRECTIVE MEASURES TAKEN.

REPAIRS:

ANY EROSION CONTROL MEASURES, STRUCTURES, DEVICES, OR RELATED ITEMS IN NEED OF REPAIR WILL BE MADE WITHIN 7 DAYS.

ACCEPTABLE EROSION CONTROL TIMETABLE

	J	F	M	A	M	J	J	A	S	O	N	D
Temp. Seeding			●	●	●	●	●	●	●			
Perm. Seeding			●	●	●	●	●	●	●			
Landscaping				●	●					●	●	●
Mulching	●	●	●	●	●	●	●	●	●	●	●	●
Maintenance	●	●	●	●	●	●	●	●	●	●	●	●

SCHEDULE OF MAJOR CONSTRUCTION OPERATIONS 1994 YEAR

	J	F	M	A	M	J	J	A	S	O	N	D
Clearing								●	●			
Rough Grading									●			
Temp. Erosion Control								●				
Stormwater Detention Pond								●	●			
Utilities										●		
Fine Grading										●		
Paving										●		
Topsoil & Seeding												
Landscape												
Temp. Erosion Control Maintenance			●	●	●	●	●	●	●	●	●	●

SITE DESCRIPTION (MARK ONE)

SUBDIVISION (X) SINGLE FAMILY
COMMERCIAL ( )
RESIDENTIAL ( )
P.U.D. ( )
OTHER ( )

TOTAL AREA	32.98 AC.
PRE-DEV. RUNOFF COEFF.	.033
AREA TO BE CLEARED	7.8 AC.
AREA TO BE EXCAVATED	7.8 AC.
POST DEV. RUNOFF COEFF.	.06

SOIL TYPES:

MAHONING SILT LOAM	75% OF SITE	22% EXCAVATED
TRUMBULL SILT LOAM	25% OF SITE	29% EXCAVATED

SITE LOCATION INFORMATION: LATITUDE: 41°16' LONGITUDE: 81°26'

HUDSON — CITY, VILLAGE, TOWNSHIP
SUMMIT — COUNTY
OHIO — STATE

BRANDYWINE CREEK — NAME OF WATERSHED/IMMEDIATE RECEIVING WATER(S)

YENNICOOK AND BERKS WAY, HUDSON, OHIO — SITE ADDRESS
44230 — ZIP CODE

PRESTIGE AND PREMIER HOMES — DEVELOPER
(216) 650-2033 — PHONE

17 WEST STREETSBORO ST. HUDSON, OHIO 44236 — DEVELOPER ADDRESS

BENCH MARK #1

SANITARY MANHOLE (HDCR) RIM AT INTERSECTION OF YENNICOOK WAY AND HAYMARKET WAY.

ELEVATION 1124.66

BENCH MARK #2

SANITARY MANHOLE RIM AT STA. 32+36.83, 16.72'RT. BERKS WAY.

ELEVATION 1130.13

LEGEND

- F.F. 1088.0 — FINISHED FLOOR ELEVATION
- ---1089--- — EXISTING CONTOUR
- 1086 — PROPOSED CONTOUR
- CONSTRUCTION AND DELIVERY AREA MAINTAIN AGGREGATE SURFACE IN THIS AREA
- INLET PROTECTION
- SILT FENCE
- PROPOSED SWALE
- WETLAND FILL = 0.90 ACRES

N

0 60 120
GRAPHIC SCALE (IN FEET)

RECEIVED SEP 26 1996 ENVIRONMENTAL DESIGN GROUP, INC.

REVISIONS			
REVISED PER CITY ENGINEER REVIEW	8/8/94	DSGN BY	D.J.M./D.A.G.
REVISED PER CITY OF AKRON DEPT. OF PUBLIC SERVICE REVIEW	8/8/94	DRN BY	D.R.G.
		TRCD BY	
		CKD BY	
		APPD BY	D.J.M.

PLOT SCALE 1=1 | FILE NO. CF003

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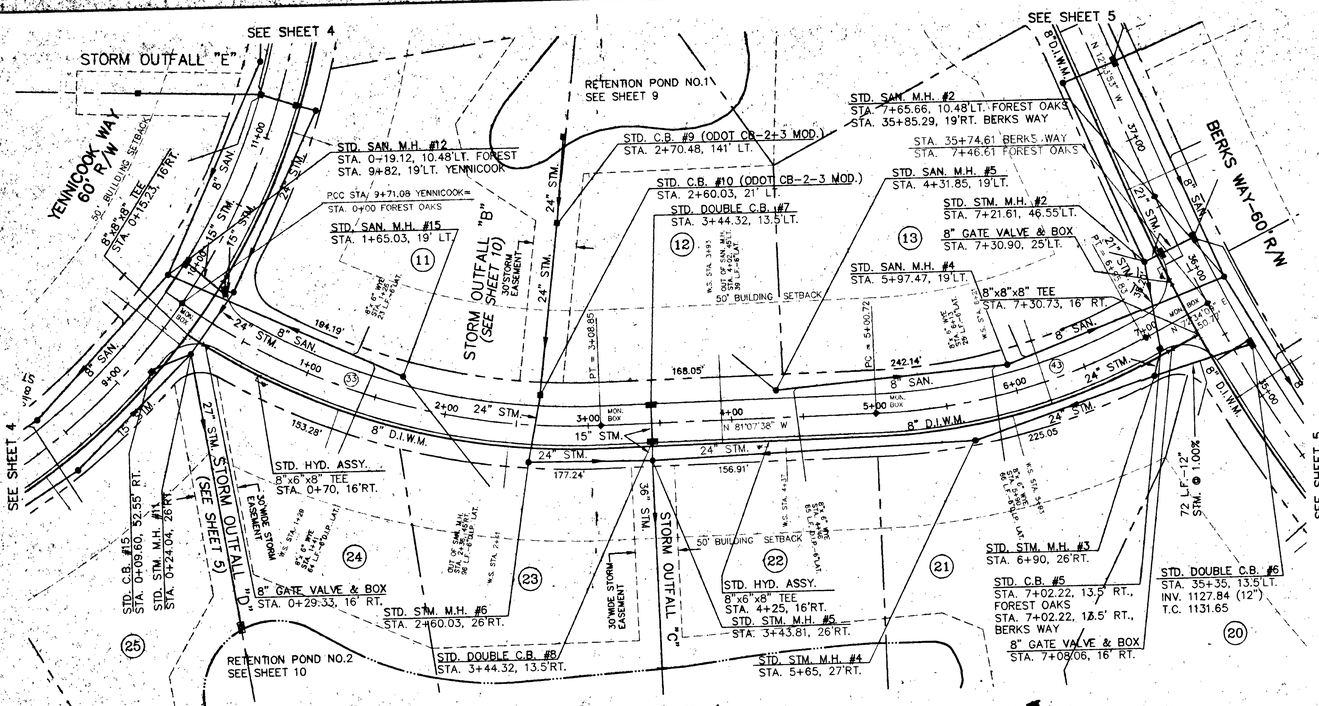
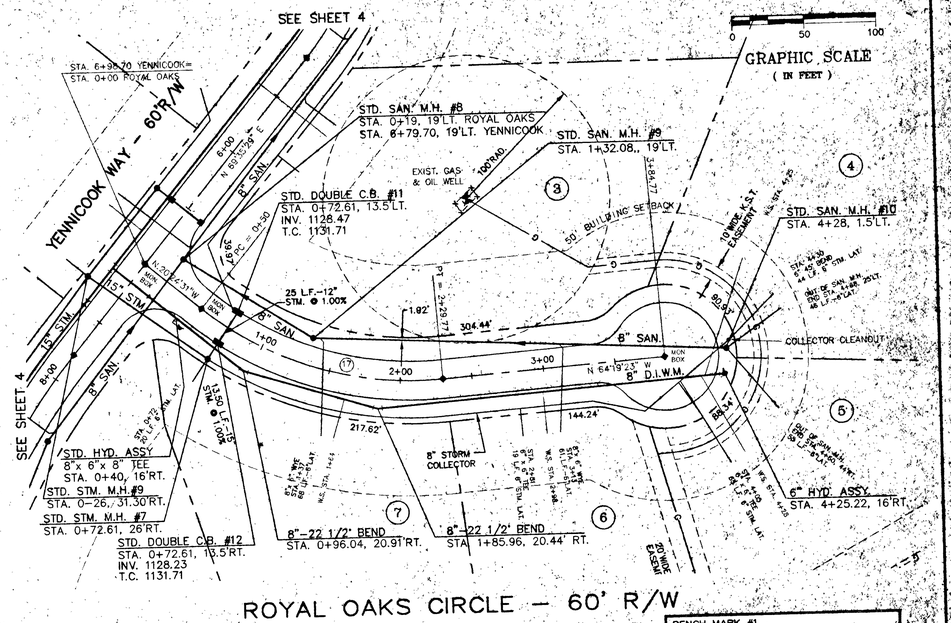
PRESTIGE AND PREMIER COMPANIES
17 WEST STREETSBORO ST.
HUDSON, OHIO 44236

CHADDS FORD SETTLEMENTS ADDITION

GRADING AND STORMWATER POLLUTION PREVENTION PLAN

SCALE : 1"=60'
PROJECT NO : 365301
SHEET NO : 3 OF 14





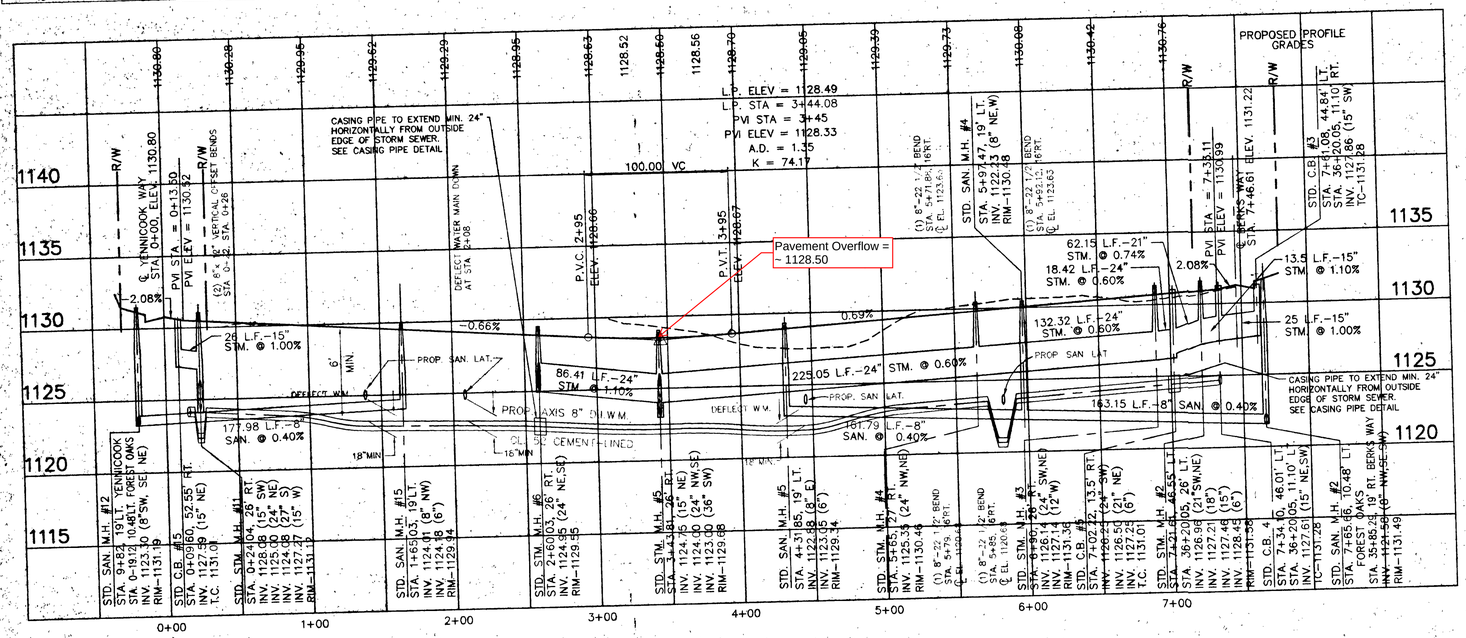
NOTE:
1. PIPE LENGTHS SHOWN FOR THE SANITARY SEWER ARE HORIZONTAL DISTANCES CALCULATED TO THE CENTER OF THE MANHOLE.

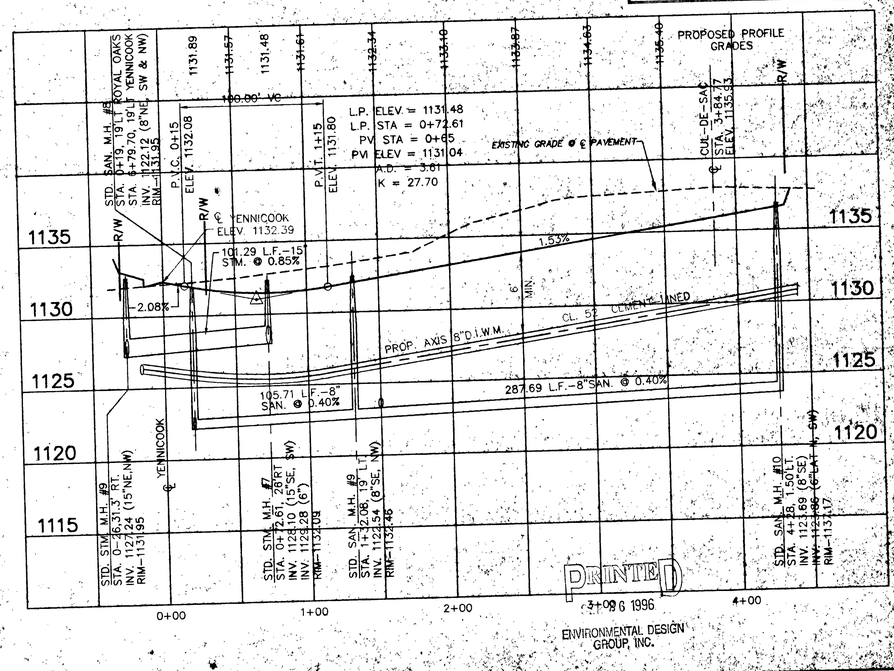
BENCH MARK #1
SANITARY MANHOLE (HDCR) RIM AT INTERSECTION OF YENNICOOK WAY AND HAYMARKET WAY.
ELEVATION 1124.86

BENCH MARK #2
SANITARY MANHOLE RIM AT STA. 32+36.83, 16.72'RT. BERKS WAY.
ELEVATION 1130.13

CENTERLINE CURVE DATA

CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
17	234.55'	179.78'	94.56'	175.41'	N 42°21'57" W	43°54.55"
33	472.90'	308.85'	160.18'	303.39'	N 62°25'03" W	37°25.11"
43	425.00'	195.11'	99.31'	193.40'	S 85°43'15" W	26°18.13"





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REVISIONS			
REVISED PER CITY OF CLEVELAND WATER COMMENTS	10/6/95		
REVISED PER CITY ENGINEER REVIEW	8/8/94	DSGN BY	D.A.G.
REVISED PER CITY OF AKRON DEPT. OF PUBLIC SERVICE REVIEW	8/8/94	DRN BY	D.R.G.
REVISED PER D.O.E.S. REVIEW	8/12/94	TRCD BY	

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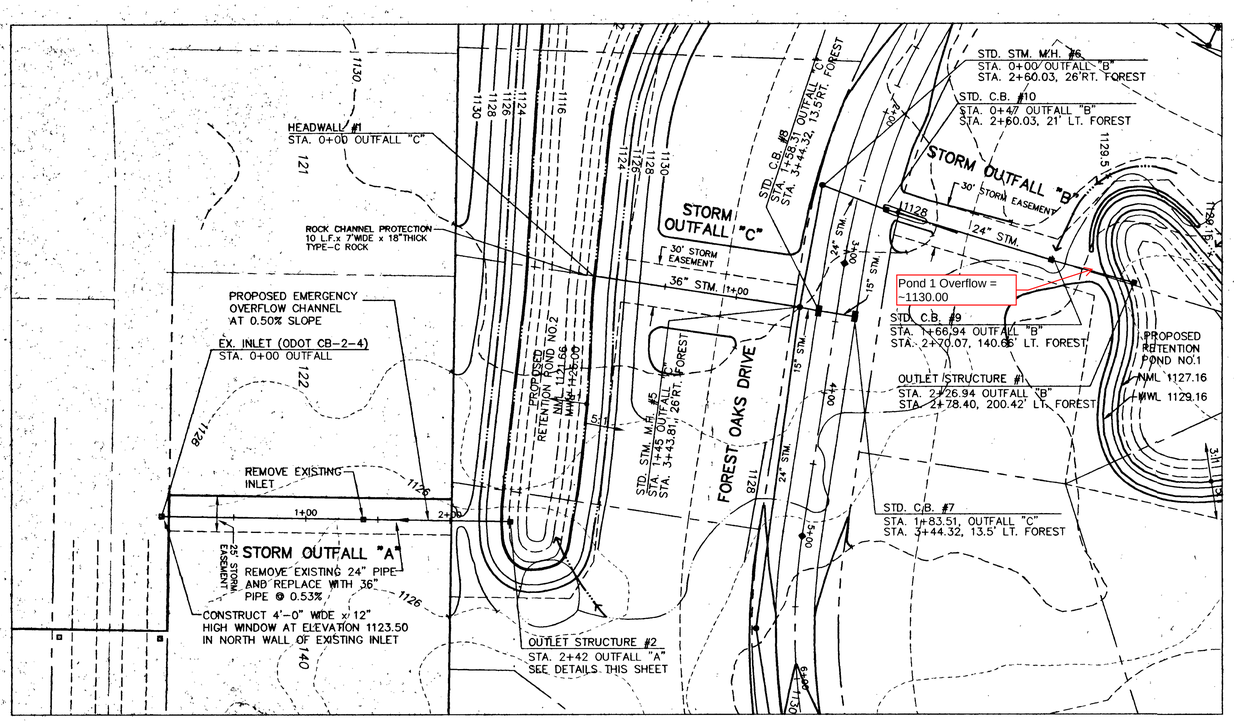
HUDSON, OHIO 44236

CHADDS FORD SETTLEMENTS ADDITION

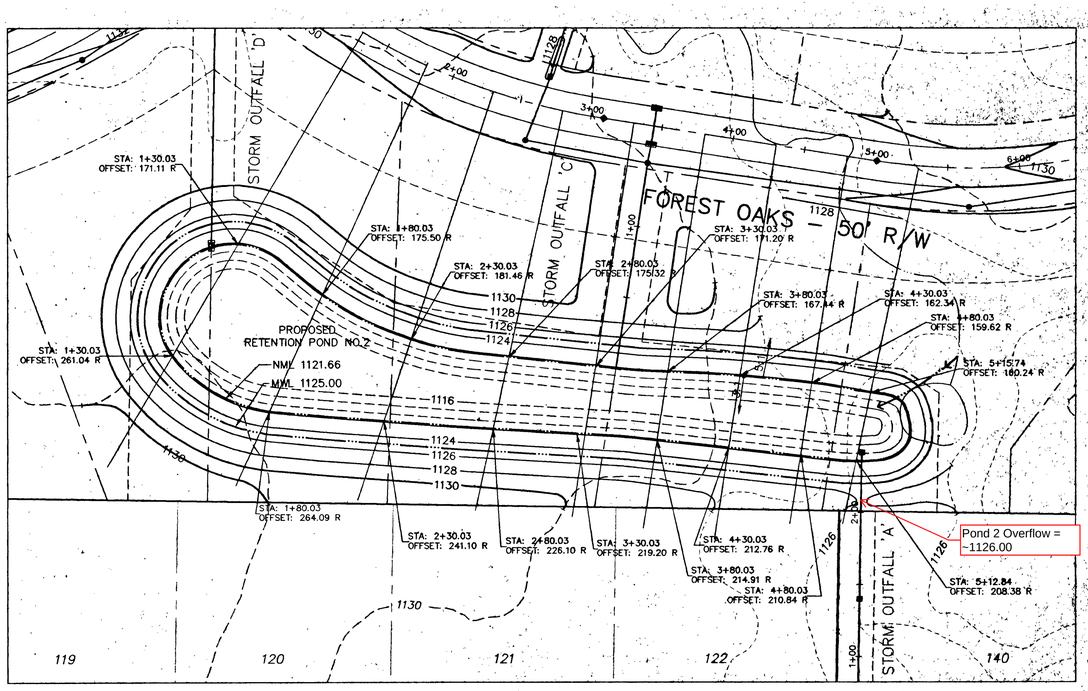
PLAN AND PROFILE
ROYAL OAKS CIR. & FOREST OAKS CIR.

SCALE : HORIZ. 1"=50'
VERT. 1"=5'
PROJECT NO. : 365301
SHEET NO : 6 OF 14

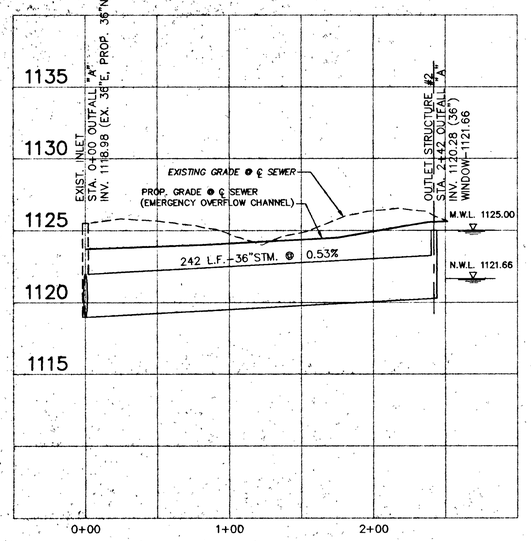
5901\DC006 Mon, Feb 5 '14 11:48 1996 Environmental Design Group, Inc.



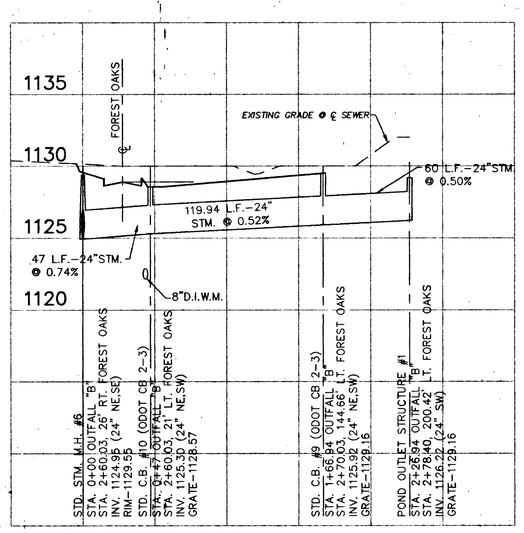
STORM OUTFALL "A","B" & "C" PLAN
SCALE: 1"=50'



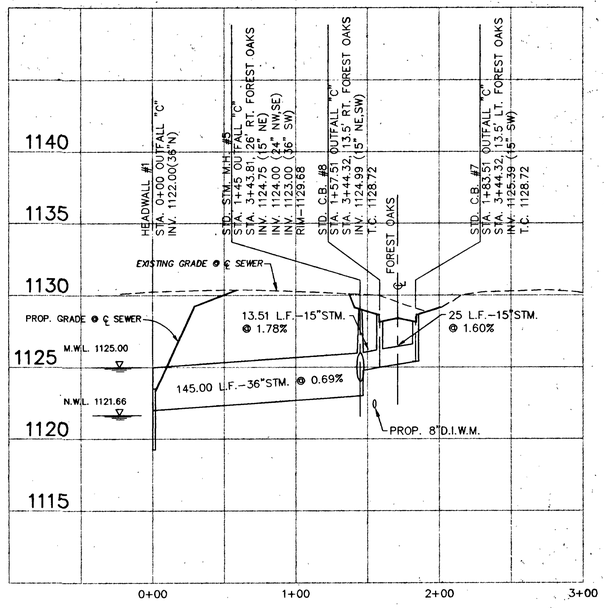
POND NO. 2 LAYOUT PLAN
SCALE: 1"=50'



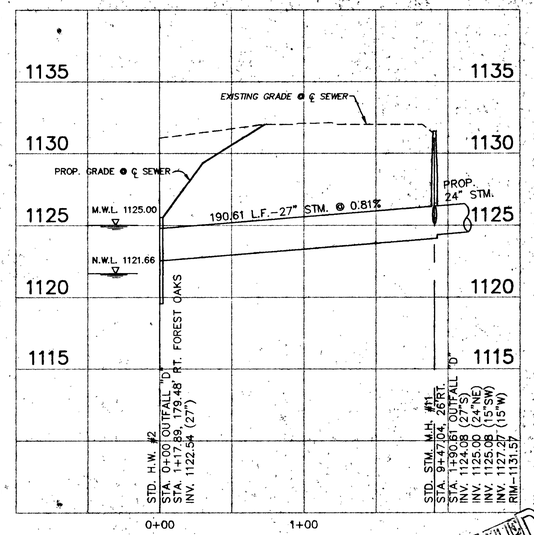
STORM OUTFALL "A" PROFILE
SCALE: HORIZ. 1"=50'
VERT. 1"=5'



STORM OUTFALL "B" PROFILE
SCALE: HORIZ. 1"=50'
VERT. 1"=5'



STORM OUTFALL "C" PROFILE
SCALE: HORIZ. 1"=50'
VERT. 1"=5'



STORM OUTFALL "D" PROFILE
SCALE: HORIZ. 1"=50'
VERT. 1"=5'

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REVISED PER D.O.E.S. REVIEW	8/12/94	TRCD BY		
		CKD BY		
		APPD BY	D.J.M.	

PLOT SCALE: 1=1
FILE NO. 07009

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HUDSON, OHIO 44236

CHADDS FORD SETTLEMENTS
ADDITION

RETENTION POND AND
STORM OUTFALL PLANS

SCALE : AS SHOWN
PROJECT NO : 365301
SHEET NO : 10 OF 14