STORMWATER DRAINAGE REPORT

Prepared for:

803 South Avenue, LLC

Proposed Mixed-Use Building
803 South Avenue
Block 645, Lot 12
City of Plainfield
Union County, NJ

Prepared by:

DYNAMIC ENGINEERING

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I. INTRODUCTION

The intention of this study is to analyze the stormwater drainage conditions that will occur as a result of the proposed mixed-use redevelopment that will include a 5-story multi-family building. The subject site is located at 803 South Avenue, City of Plainfield, Union County, New Jersey. The site is identified as Block 645, Lot 12 on the City of Plainfield Tax Maps. The site is currently developed with an existing auto body shop with associated concrete and gravel parking areas, an access driveway and other accompanying site improvements. The scope of this report focuses on the overall drainage conditions within the Drainage Study Area as indicated on the Drainage Area Maps included within the Appendix of this report.

The primary design constraints for this project are based on requirements established in the TODN-South Avenue Redevelopment Plan, City of Plainfield Land Use Code, and the State of New Jersey Stormwater Regulations outlined in N.J.A.C. 7:8. In general, the stormwater design will serve to maintain the existing drainage patterns while reducing post-development site runoff rates when compared to pre-development runoff conditions.

II. EXISTING SITE CONDITIONS

The subject site consists of 59,196 SF (1.36 acres). The area to be redeveloped encompasses the previously developed and disturbed portions of the site which consist of the existing building, impervious surfaces, and storage areas. Currently the majority of the stormwater runoff generated by the site and directly adjacent offsite property to the east is collected by existing inlets onsite and is ultimately conveyed to the existing underground conveyance system within South Avenue.

Based on the Union County Soil Survey, the soil types native to the site include:

UNION COUNTY SOIL SURVEY INFORMATION		
SOIL TYPE (SYMBOL)	**SOIL TYPE (NAME)**	**HYDROLOGIC SOIL GROUP**
UR	Urban Land	D
BhpBr	Birdsboro-Urban land complex, 0 to 6 percent slopes, rarely flooded	B*

*As depicted in the Soil Map located within the Appendix of this Report, the majority of on-site soils are classified as Hydrological Soil Group (HSG D). However, a small portion of the soils adjacent to the South Avenue right-of-way are classified as HSG B. This diminimis area consists of a small strip of landscaping and sidewalk area. For the purposes of providing a more simplified conservative analysis, the entire site has been modeled as HSG D in the Runoff Curve Number calculations. A copy of the Runoff Curve Number calculations are located in the Appendix of this report.

The tract has been evaluated using the following drainage sub-watershed areas as depicted on the Existing Conditions Drainage Area Map included within the Appendix of this report:

EX-DA-1: This drainage area is synonymous with the parcel boundary which contains a localized depression in the center of the site. Stormwater runoff generated by smaller storms is contained within this depression and collected via on-site inlets. Larger storms will overtop the depression and sheet flow south towards South Avenue where it will be collected via various inlets within the right-of-way. Ultimately, stormwater runoff is tributary to the existing underground stormwater system located within South Avenue. A minimum time of concentration of 6 minutes has been utilized for this drainage area.

Offsite - 1: This area consists of a portion of the offsite property adjacent to the eastern side yard property line of the subject site. The stormwater runoff generated by this area sheet flows to the west and is tributary the above-mentioned localized depression on-site. Ultimately, stormwater runoff is tributary to the existing underground stormwater system within the South Avenue right-of-way. A minimum time of concentration of 6 minutes has been utilized for this drainage area.

III. PROPOSED SITE CONDITIONS

The proposed site improvements include the construction of a 5-story mixed-use building and results in a decrease in impervious coverage of 4,574 SF (0.11 acres) when compared to existing conditions. A stormwater management basin has been designed to detain stormwater runoff generated by the roof of the proposed building in accordance with stormwater peak flow reduction requirements set forth under N.J.A.C. 7:8 and by the City of Plainfield.

The proposed site conditions have been evaluated using the following sub-watershed areas as depicted on the Proposed Conditions Drainage Area Map included in the Appendix of this report:

DA-1 Detained: This area contains the proposed building. The stormwater runoff generated by the roof will be conveyed to the proposed stormwater management basin via roof leaders. Stormwater will be detained within the underground basin and released at a controlled rate to the existing underground stormwater conveyance system located within South Avenue. A minimum time of concentration of 6 minutes has been utilized for this drainage area.

DA-1 Undetained: This area consists of the rear and side yards as well as the frontage of the proposed building. Stormwater runoff will sheet flow south and is tributary to the South Avenue right-of-way similar to existing conditions. Ultimately, the stormwater runoff is collected and conveyed to the existing underground stormwater system within South Avenue. A minimum time of concentration of 6 minutes has been utilized for this drainage area.

Offsite - 1: Similar to existing conditions, this area consists of a portion of the offsite property adjacent to the eastern side yard property line of the subject site. The stormwater runoff generated by this area sheet flows in a western direction to the DA-1 Undetained area east to the proposed building and is tributary to the South Avenue right-of-way as mentioned above. Ultimately, stormwater runoff is tributary to the existing underground stormwater system within the South Avenue right-of-way. A minimum time of concentration of ten (10) minutes has been utilized for this drainage area.

IV. DESIGN METHODOLOGY

The intention of the design of the proposed stormwater management facilities is to provide measures as required to address applicable aspects of the City of Plainfield Land Use Code, TODN-South Avenue Redevelopment Plan and N.J.A.C. 7:8. In order to prepare the stormwater management design for the subject project, extensive initial investigation of the property and a topographic survey was performed. On-site review of the tract was performed by Dynamic Engineering Consultants, PC to verify existing site conditions and land cover characteristics. Harbor Consultants, Inc. was contracted to prepare a Boundary & Topographic Survey of the subject site to depict existing conditions.

Based on our review of the existing site conditions, review of the Survey, and establishment of the Drainage Area Maps for the existing and proposed site conditions, the calculations as defined within this Report were established. A Grading Plan was also developed for the proposed site improvements with consideration to the existing drainage patterns. The plan was designed to ensure runoff from the proposed development could be directed to the proposed stormwater management facility and reduce existing peak flow rates.

Stormwater runoff rates for the site were modeled utilizing Hydroflow by Intelisolve computer software using the Urban Hydrology for Small Watershed TR-55 method for the applicable design storms. The 2-, 10- and 100-year design storms are based upon the New Jersey 24-Hour Rainfall Frequency Data for Union County as published by the USDA NRCS utilizing a Type D rainfall distribution. Curve number calculations have been included within the Appendix and are based upon HSG D as identified by the Union County Soil Survey. It's noted that a small portion of the soils adjacent to the South Avenue right-of-way are classified as HSG B. This diminimis area consists of a small strip of landscaping and sidewalk area. For the purposes of providing a more simplified conservative analysis, the entire site has been modeled as HSG D in the Runoff Curve Number calculations. A copy of the Runoff Curve Number calculations are located in the Appendix of this report. Pervious and impervious areas were modeled separate as per the NJDEP Stormwater Management Best Practices (BMP) Manual.

V. UNDERGROUND STORMWATER MANAGEMENT BASIN DESIGN

The stormwater management system has been designed to meet the applicable standards set forth by NJAC 7:8 and the City of Plainfield. Specifically, the underground basin has been designed to accommodate the 100-yr design storm while providing the requisite stormwater quantity reductions without negatively impacting downstream conditions. Software limitations with Hydroflow 2007 prevent the model from accounting for the internal wall thickness of the StormTrap system. The length and width of the basin modeled in Hydroflow 2007 were adjusted to account for the external wall thickness, and the volume of the outlet control structure. The volume provided in the model closely matches that of the StormTrap Basin and height of the StormTrap system was made to match the model.

Runoff generated by the building roof area will be collected by a roof drainage system and conveyed to the proposed underground stormwater detention basin. The basin has been designed to accommodate the 100-yr design storm. The underground detention basin consists of multiple 4'-6" SingleTrap detention basin units by StormTrap and provides a maximum storage volume of 7,201 cuft. Stormwater runoff will be detained and released at a controlled rate to the storm drainage system located within South Avenue via a 15" RCP pipe. Associated calculations are included in the Appendix of this report and details have been provided on the accompanying engineering drawings.

VI. RUNOFF RATES

The following is a comparison of the pre- and post- development runoff rates:

Existing vs. Allowable Runoff Rates				
	Total Existing (CFS)	**NJAC 7:8 Required Reduction**	**NJAC 7:8 Allowable Runoff (CFS)**	**Proposed Runoff (CFS)**
2 Year	3.39	50%	1.70	1.62
10 Year	5.23	25%	3.92	2.83
100 Year	6.74	20%	5.39	5.38

Per the above, the stormwater management system has been designed to not exceed the allowable runoff rates for the 2, 10 and 100-year design storms thus meeting the stormwater management design standards of the City and N.J.A.C. 7:8.

VII. WATER QUALITY

The project is exempt from the stormwater quality requirements of the City of Plainfield Land Use Code, TODN-South Avenue Redevelopment Plan and N.J.A.C. 7:8, as the project does not propose an increase of more than 0.25 acres of impervious coverage.

VIII. GROUNDWATER RECHARGE

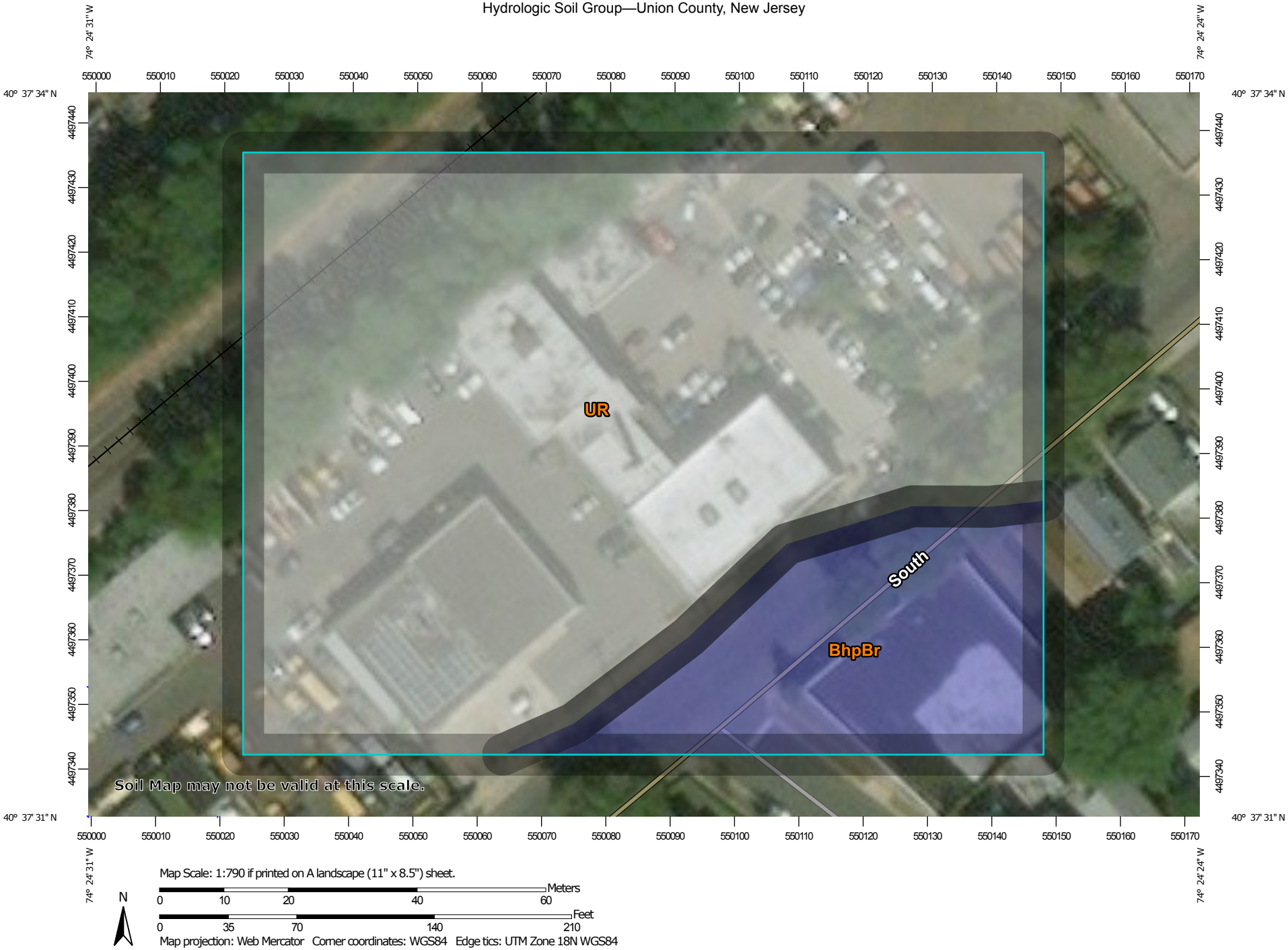
This project is located within an Urban Redevelopment area as defined within N.J.A.C. 7:8. Therefore, this project is exempt from the Groundwater Recharge requirements of the City of Plainfield Land Use Code, TODN-South Avenue Redevelopment Plan and N.J.A.C. 7:8.

IX. CONCLUSION

The proposed project has been designed in a manner so that it will not adversely impact existing drainage patterns, adjacent roadways or adjacent parcels. Further, stormwater runoff rates for the 2, 10 and 100-year design storms will comply with runoff rate reduction requirements set forth in N.J.A.C. 7:8. With that stated, it is evident that the proposed development will not have a negative impact on the existing stormwater management system on-site or within the vicinity of the subject parcel.

APPENDIX

NRCS WEB SOIL SURVEY



Map Scale: 1:790 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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 1:24,000.

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: Union County, New Jersey
Survey Area Data: Version 11, Oct 6, 2017

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

Date(s) aerial images were photographed: Dec 31, 2009—Feb 26, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BhpBr	Birdsboro-Urban land complex, 0 to 6 percent slopes, rarely flooded	B	0.5	18.1%
UR	Urban land		2.4	81.9%
Totals for Area of Interest			**2.9**	**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

RUNOFF CURVE NUMBER (CN) CALCULATIONS

DYNAMIC ENGINEERING

Existing and Proposed Drainage Area Summary and Average Curve Number(CN) Calculations

Project: Eden Property Company
Job #: 0404-99-041
Location: City of Plainfield, Union County, NJ

Computed By: JPB
Checked By: RJC
Date: 2/10/2020

Drainage Area	Impervious Area (acre)	Impervious Area (sf)	Curve Number (CN) Used	HSG B - Open Space Area (acre)	HSG D - Open Space Area (sf)	Curve Number (CN) Used	HSG D - Gravel Area (acre)	HSG D - Gravel Area (sf)	Curve Number (CN) Used	Avg. Curve Number	Total Area (acres)	Total Area (sf)	TC (Min.)
EX DA-1	1.29	56,050	98	0.07	3,146	80	0.00		91	97	1.36	59,196	10.0
Offsite-1	0.19	8,119	98	0.00	-	80	0.00	-	91	98	0.19	8,119	10.0
											1.55	67,315	
DA-1 Detained	1.13	49,100	98	0.00	-	80	0.00	-	91	98	1.13	49,100	10.0
DA-1 Undetained	0.03	1,381	98	0.20	8,715	80	0.00	-	91	82	0.23	10,096	10.0
Offsite-1	0.19	8,119	98	0.00	-	80	0.00	-	91	98	0.19	8,119	10.0
											1.55	67,315	

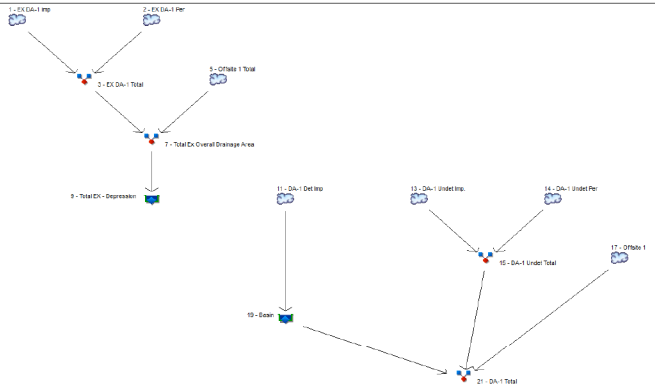
Per County Soil Survey & Report of Preliminary Geotechnical Investigation Prepared by Dynamic Earth	BhpBr	B*	Soil	Birdsboro-Urban land complex, 0 to 6 percent slopes, rarely flooded
	UR	D	Soil	Urban Land

Description	Runoff Curve Number (CN)
Impervious Surface	98
Open Space (lawn) (good)	80
Gravel	91

EXISTING AND PROPOSED HYDROGRAPHS – HYDROGRAPH SUMMARY REPORTS FOR 2YR, 10YR & 100YR DESIGN STORMS (HYDROGRAPHS CREATED USING HYDROFLOW 2007 BY INTELISOLVE COMPUTER SOFTWARE)

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

Hyd.	Origin	Description
1	SCS Runoff	EX DA-1 imp
2	SCS Runoff	EX DA-1 Per
3	Combine	EX DA-1 Total
5	SCS Runoff	Offsite 1 Total
7	Combine	Total Ex Overall Drainage Area
9	Reservoir	Total EX - Depression
11	SCS Runoff	DA-1 Det Imp
13	SCS Runoff	DA-1 Undet Imp.
14	SCS Runoff	DA-1 Undet Per
15	Combine	DA-1 Undet Total
17	SCS Runoff	Offsite 1
19	Reservoir	Basin
21	Combine	DA-1 Total

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

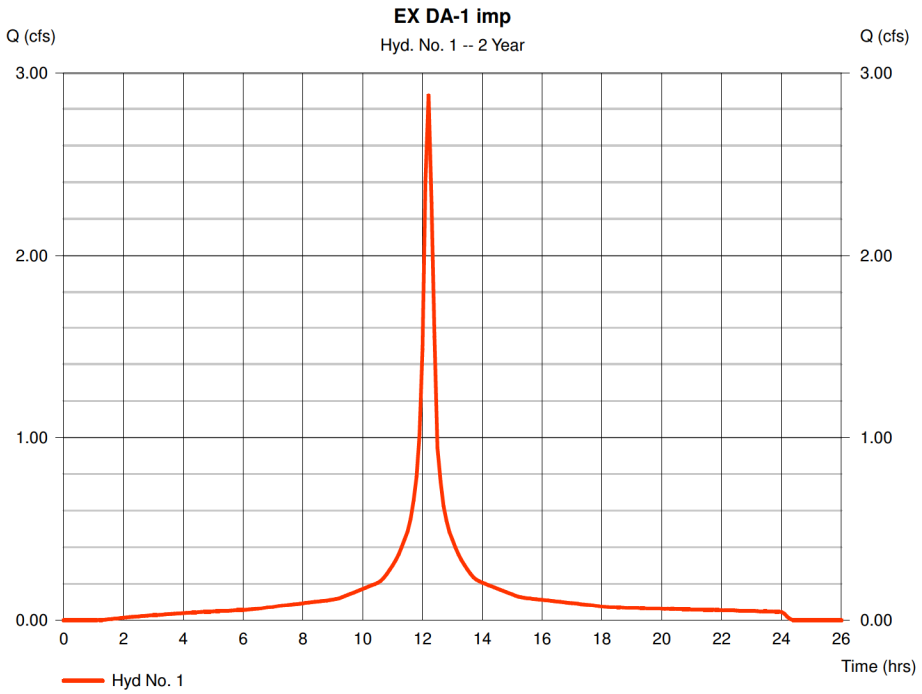
Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	2.880	-------	-------	4.421	0.000	-------	7.458	EX DA-1 imp
2	SCS Runoff	-------	-------	0.086	-------	-------	0.170	0.000	-------	0.343	EX DA-1 Per
3	Combine	1, 2	-------	2.966	-------	-------	4.592	0.000	-------	7.801	EX DA-1 Total
5	SCS Runoff	-------	-------	0.424	-------	-------	0.651	0.000	-------	1.098	Offsite 1 Total
7	Combine	3, 5,	-------	3.391	-------	-------	5.243	0.000	-------	8.899	Total Ex Overall Drainage Area
9	Reservoir	7	-------	3.390	-------	-------	5.227	0.000	-------	6.743	Total EX - Depression
11	SCS Runoff	-------	-------	2.523	-------	-------	3.873	0.000	-------	6.533	DA-1 Det Imp
13	SCS Runoff	-------	-------	0.067	-------	-------	0.103	0.000	-------	0.173	DA-1 Undet Imp.
14	SCS Runoff	-------	-------	0.247	-------	-------	0.486	0.000	-------	0.980	DA-1 Undet Per
15	Combine	13, 14	-------	0.314	-------	-------	0.589	0.000	-------	1.153	DA-1 Undet Total
17	SCS Runoff	-------	-------	0.424	-------	-------	0.651	0.000	-------	1.098	Offsite 1
19	Reservoir	11	-------	1.059	-------	-------	2.125	0.000	-------	4.088	Basin
21	Combine	15, 17, 19,	-------	1.616	-------	-------	2.831	0.000	-------	5.379	DA-1 Total

Hydrograph Report

Hyd. No. 1

EX DA-1 imp

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.880 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	13,858 cuft
Drainage area	=	1.290 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.39 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

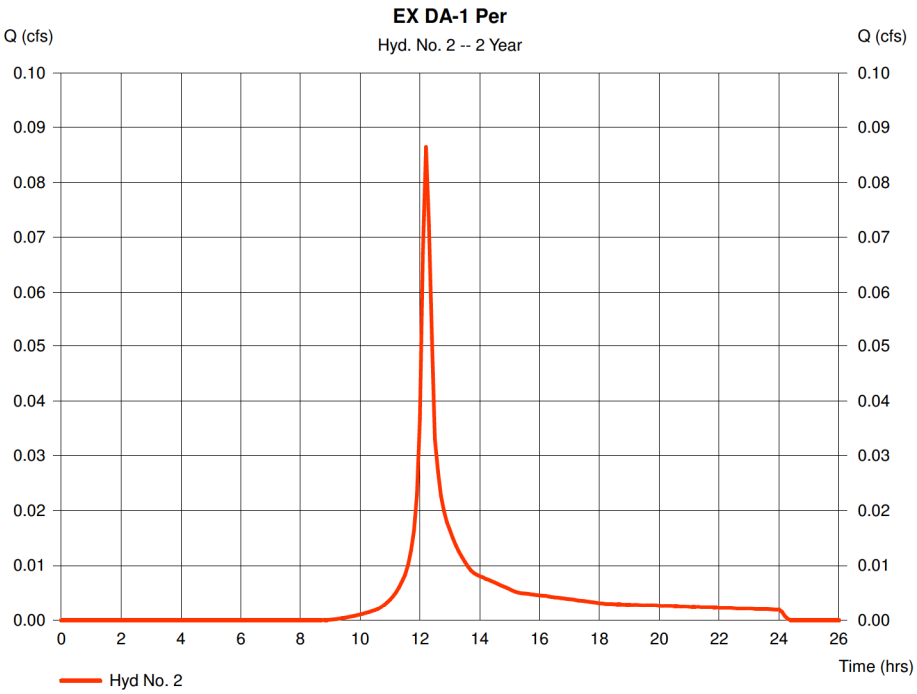


Hydrograph Report

Hyd. No. 2

EX DA-1 Per

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.086 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	369 cuft
Drainage area	=	0.070 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.39 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

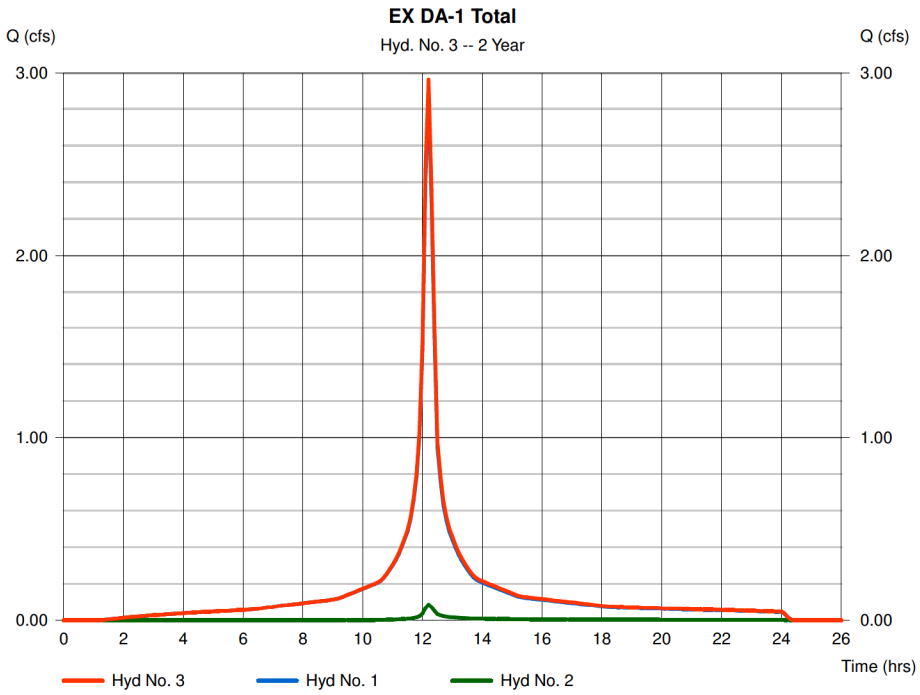


Hydrograph Report

Hyd. No. 3

EX DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 2.966 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 14,228 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.360 ac

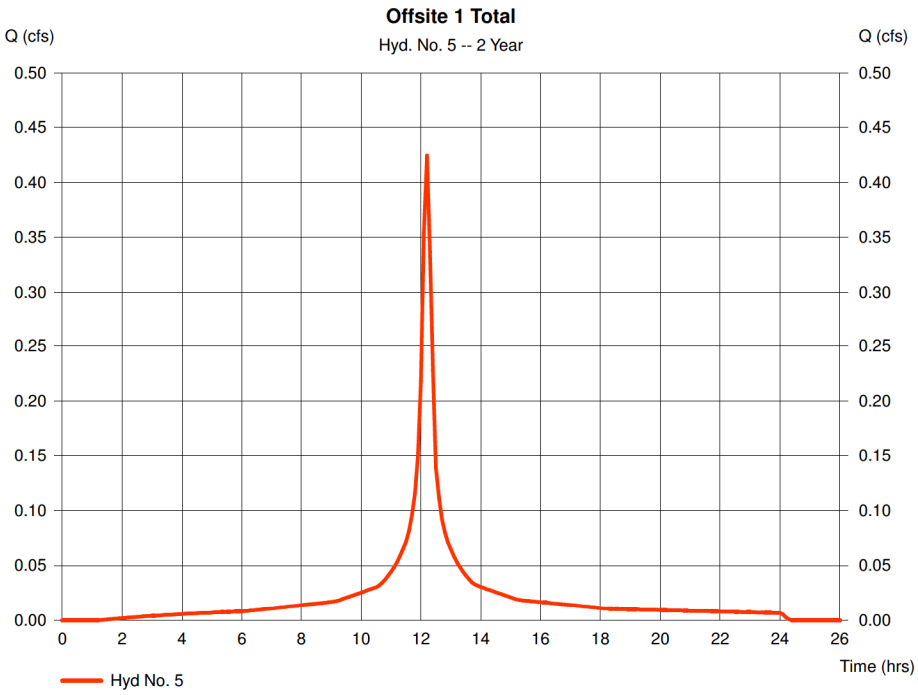


Hydrograph Report

Hyd. No. 5

Offsite 1 Total

Hydrograph type	= SCS Runoff	Peak discharge	= 0.424 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 2,041 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

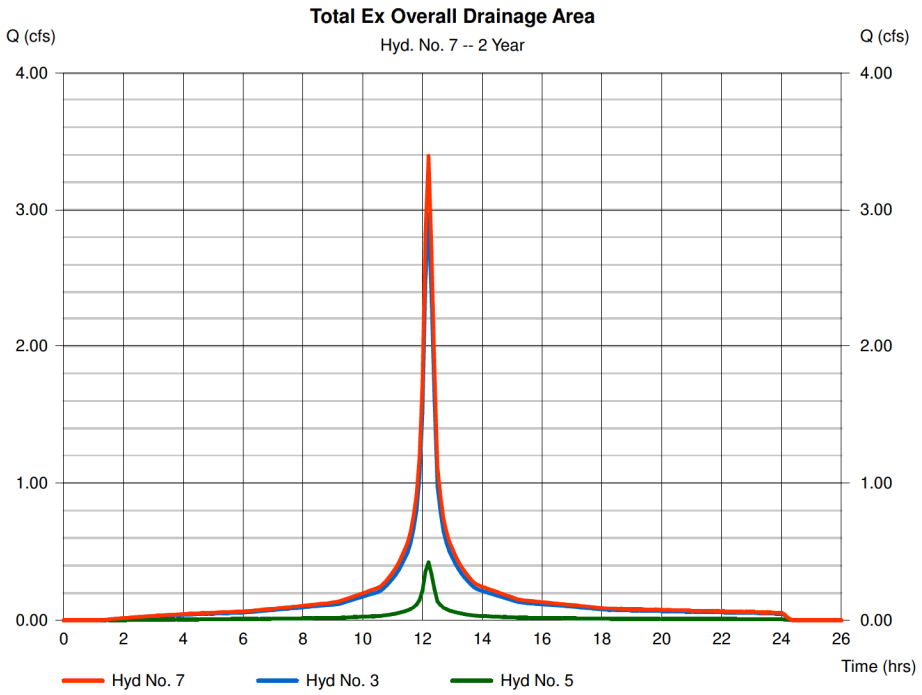


Hydrograph Report

Hyd. No. 7

Total Ex Overall Drainage Area

Hydrograph type	= Combine	Peak discharge	= 3.391 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 16,269 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 0.190 ac



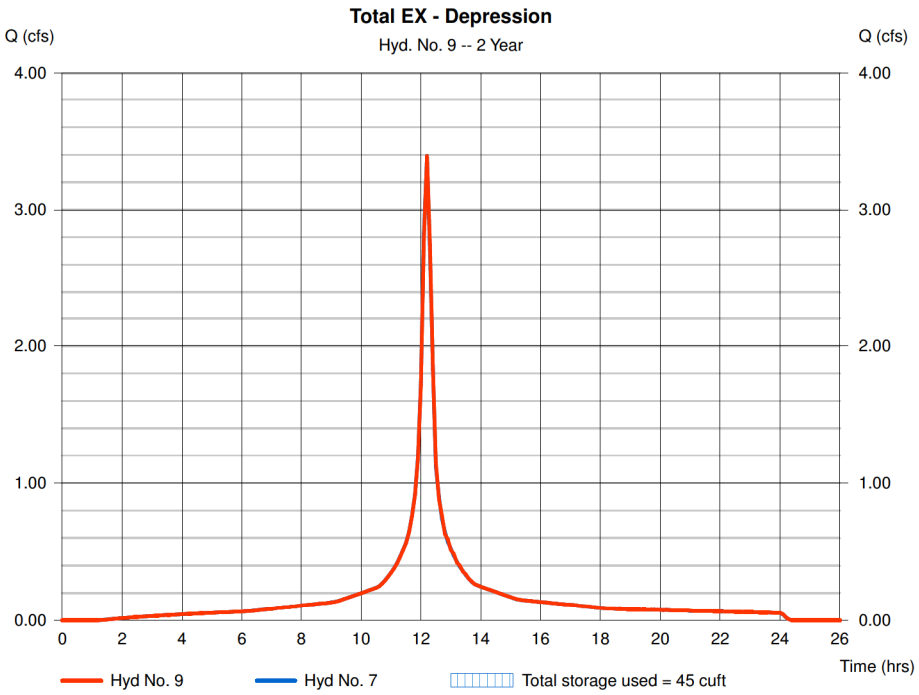
Hydrograph Report

Hyd. No. 9

Total EX - Depression

Hydrograph type	= Reservoir	Peak discharge	= 3.390 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 16,269 cuft
Inflow hyd. No.	= 7 - Total Ex Overall Drainage Area	Max. Elevation	= 104.43 ft
Reservoir name	= Existing Depression	Max. Storage	= 45 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.1 — Wednesday, Feb 19, 2020

Pond No. 3 - Existing Depression

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 103.11 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	103.11	00	0	0
3.89	107.00	103	134	134
4.14	107.25	2,621	270	404
4.39	107.50	9,827	1,460	1,864
4.64	107.75	22,844	3,971	5,835
4.89	108.00	30,850	6,686	12,521
4.99	108.10	33,074	3,195	15,716

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 103.11	0.00	0.00	0.00
Length (ft)	= 85.00	0.00	0.00	0.00
Slope (%)	= 1.70	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

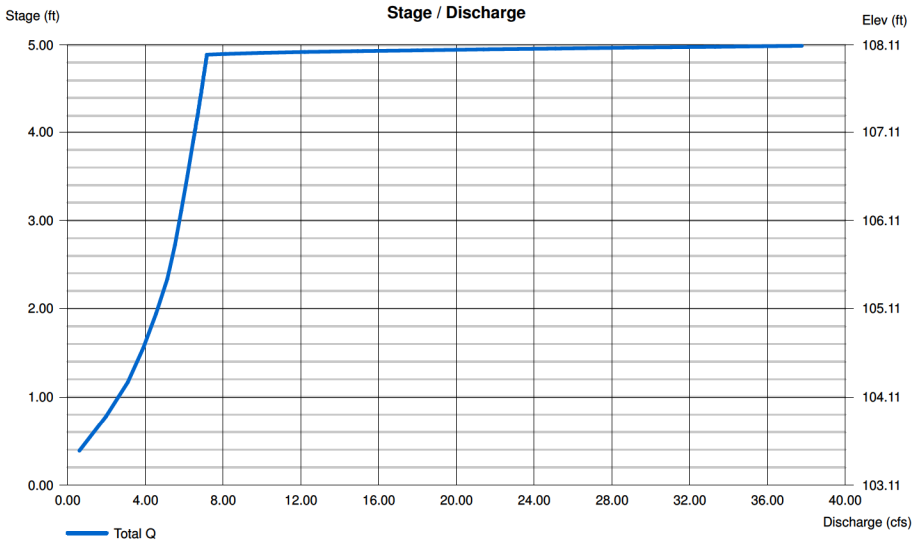
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 290.00	0.00	0.00	0.00
Crest El. (ft)	= 108.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



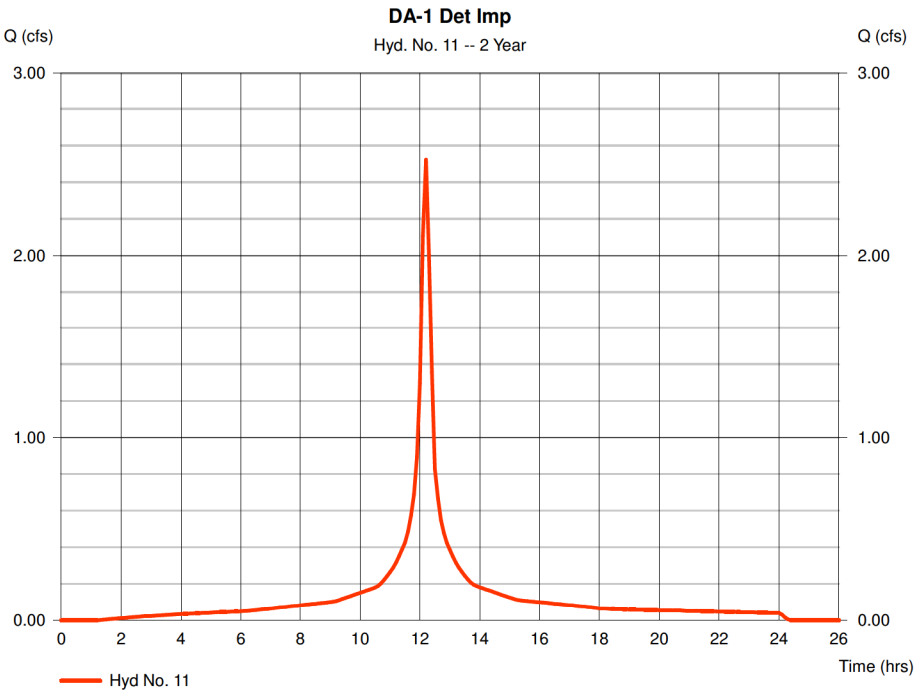
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Wednesday, Feb 19, 2020

Hyd. No. 11

DA-1 Det Imp

Hydrograph type	= SCS Runoff	Peak discharge	= 2.523 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 12,140 cuft
Drainage area	= 1.130 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

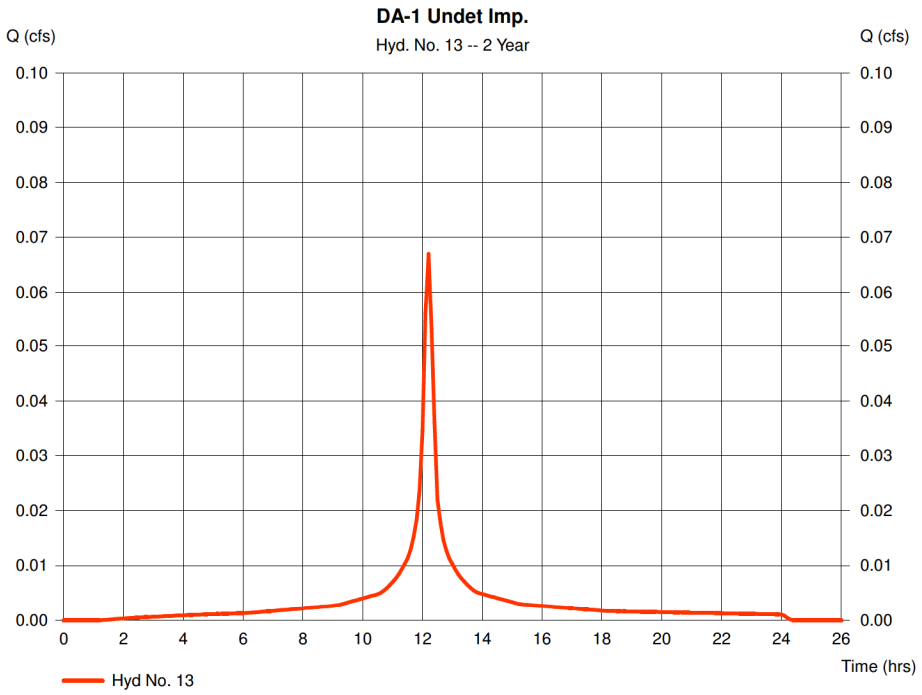


Hydrograph Report

Hyd. No. 13

DA-1 Undet Imp.

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.067 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	322 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.39 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

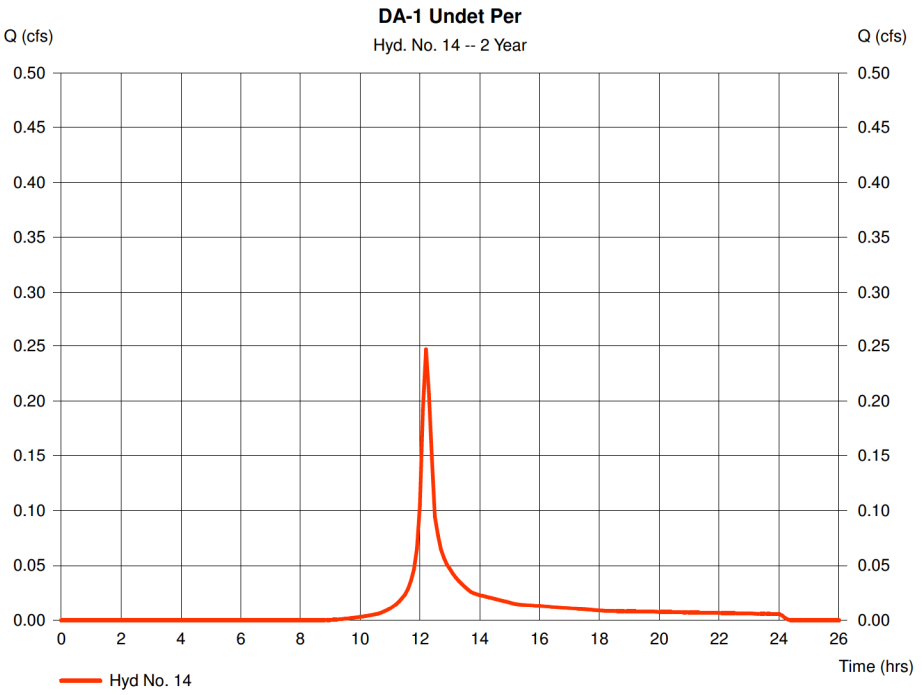


Hydrograph Report

Hyd. No. 14

DA-1 Undet Per

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.247 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	1,055 cuft
Drainage area	=	0.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.39 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

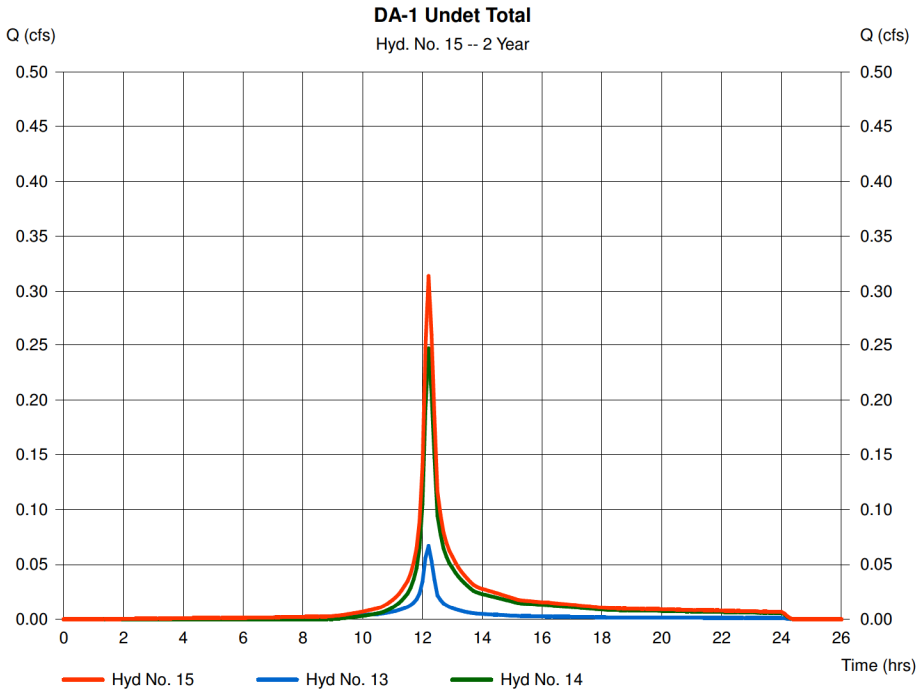


Hydrograph Report

Hyd. No. 15

DA-1 Undet Total

Hydrograph type	= Combine	Peak discharge	= 0.314 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 1,377 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 0.230 ac

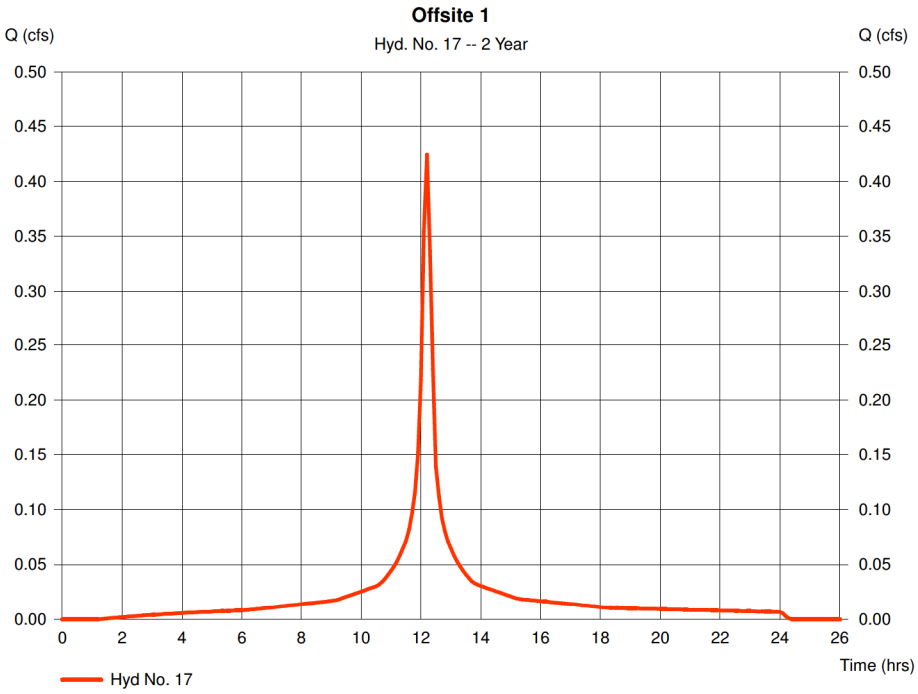


Hydrograph Report

Hyd. No. 17

Offsite 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.424 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 2,041 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484



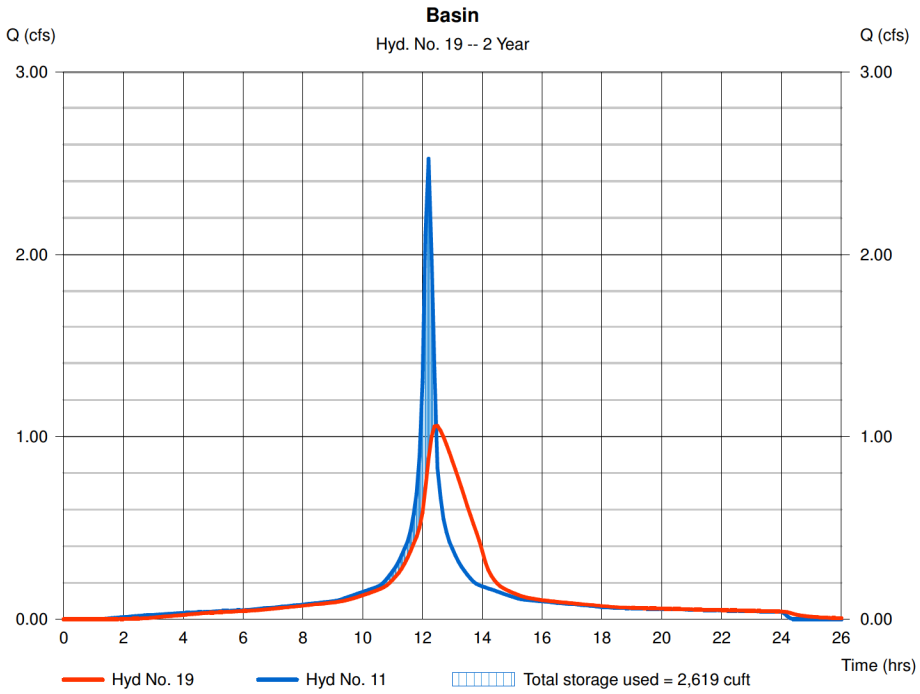
Hydrograph Report

Hyd. No. 19

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	1.059 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.50 hrs
Time interval	=	6 min	Hyd. volume	=	12,129 cuft
Inflow hyd. No.	=	11 - DA-1 Det Imp	Max. Elevation	=	104.78 ft
Reservoir name	=	underground basin	Max. Storage	=	2,619 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - underground basin

Pond Data

UG Chambers - Invert elev. = 103.00 ft, Rise x Span = 4.50 x 20.00 ft, Barrel Len = 80.00 ft, No. Barrels = 1, Slope = 0.30%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	103.00	n/a	0	0
0.47	103.47	n/a	567	567
0.95	103.95	n/a	759	1,325
1.42	104.42	n/a	759	2,084
1.90	104.90	n/a	759	2,842
2.37	105.37	n/a	759	3,601
2.84	105.84	n/a	759	4,359
3.32	106.32	n/a	759	5,118
3.79	106.79	n/a	759	5,876
4.27	107.27	n/a	759	6,635
4.74	107.74	n/a	567	7,201

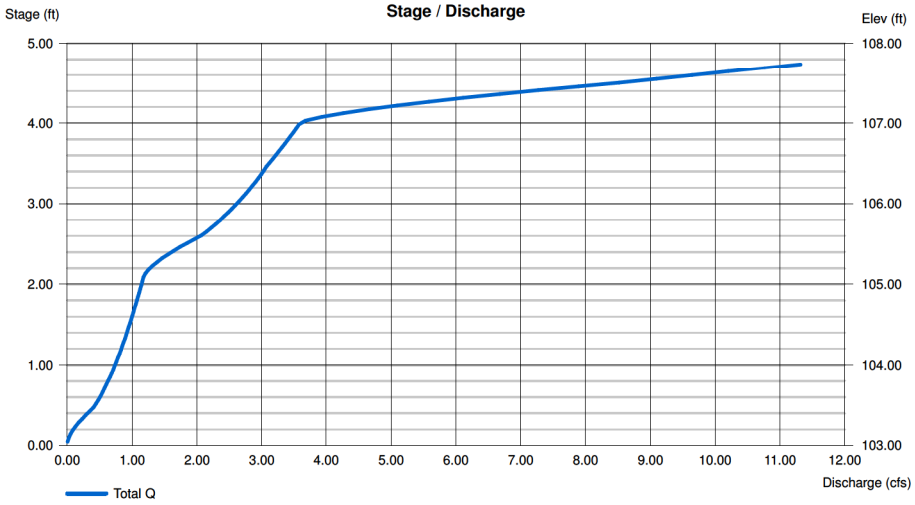
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 16.00	6.00	6.00	0.00
Span (in)	= 16.00	6.00	8.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 103.00	103.00	105.10	0.00
Length (ft)	= 6.00	1.00	1.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 107.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

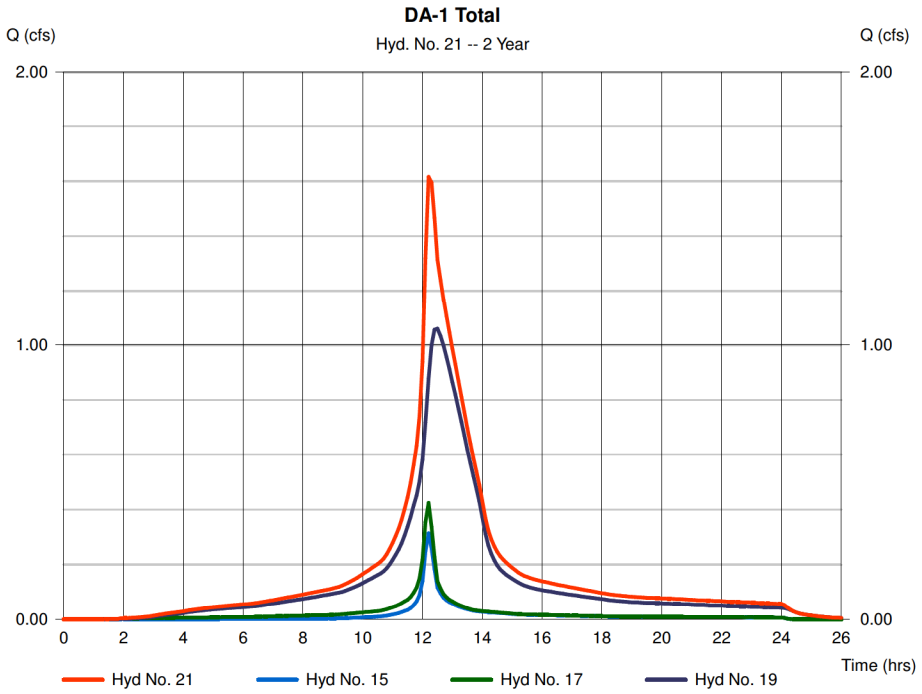


Hydrograph Report

Hyd. No. 21

DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 1.616 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 15,547 cuft
Inflow hyds.	= 15, 17, 19	Contrib. drain. area	= 0.190 ac

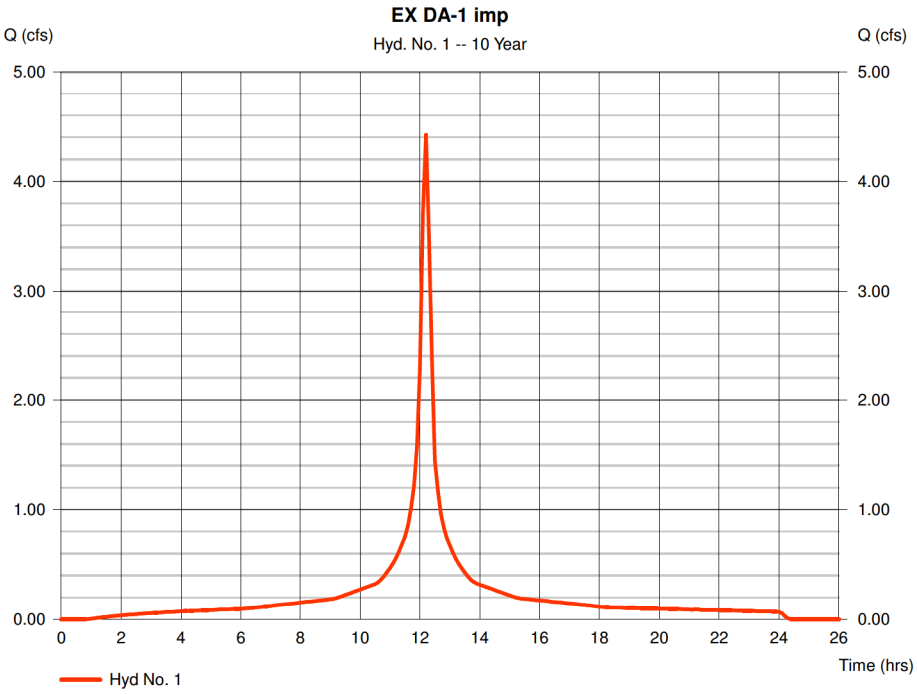


Hydrograph Report

Hyd. No. 1

EX DA-1 imp

Hydrograph type	= SCS Runoff	Peak discharge	= 4.421 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 21,656 cuft
Drainage area	= 1.290 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

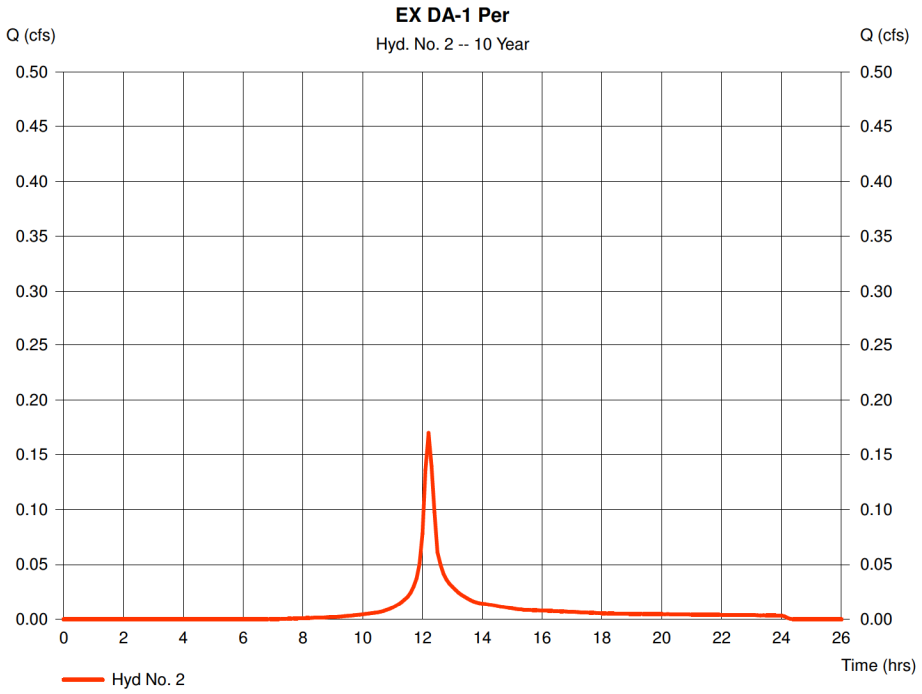


Hydrograph Report

Hyd. No. 2

EX DA-1 Per

Hydrograph type	= SCS Runoff	Peak discharge	= 0.170 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 725 cuft
Drainage area	= 0.070 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

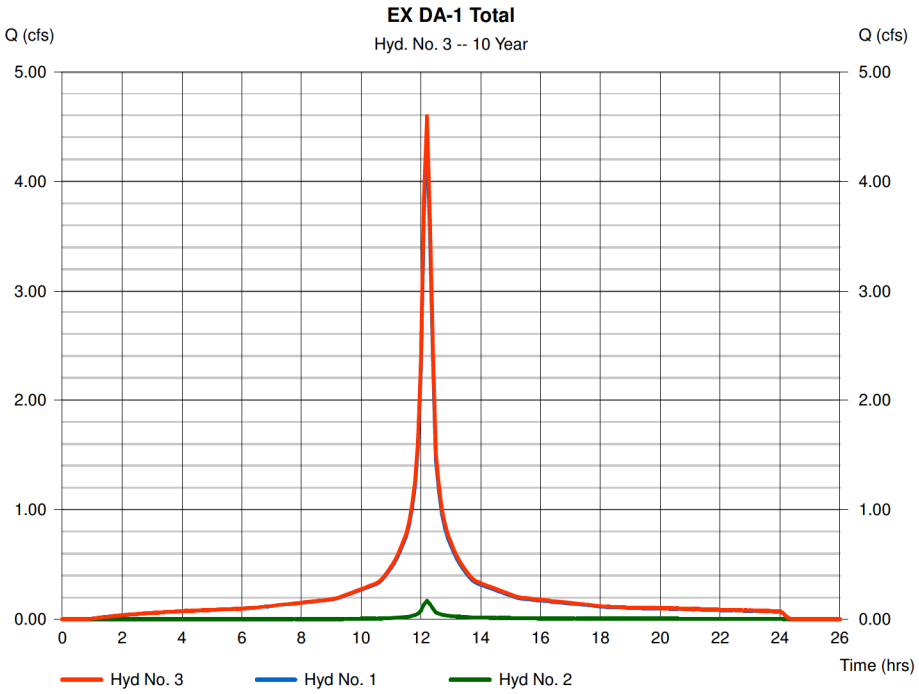


Hydrograph Report

Hyd. No. 3

EX DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 4.592 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 22,380 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.360 ac

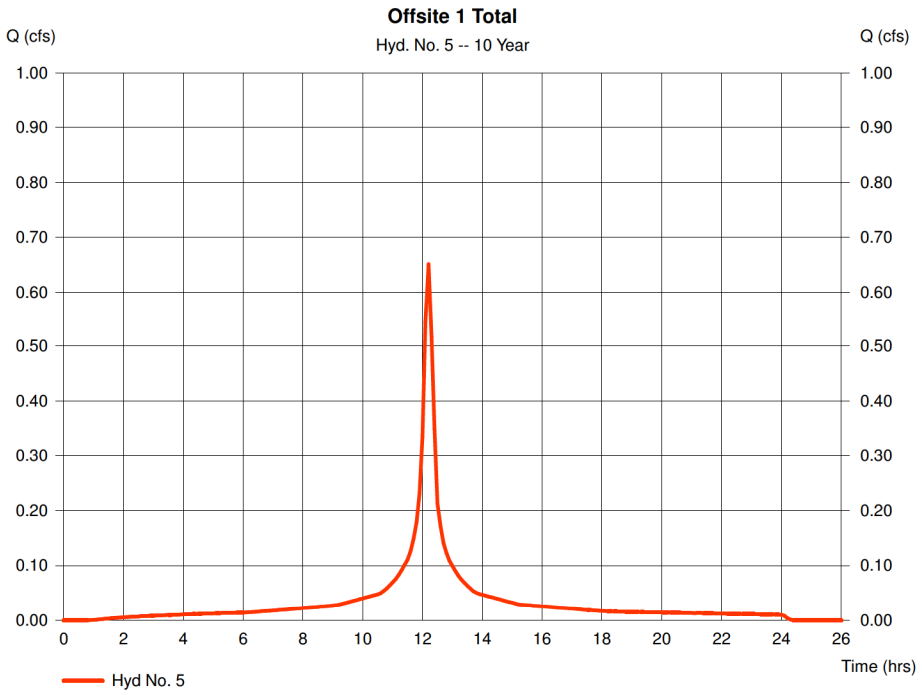


Hydrograph Report

Hyd. No. 5

Offsite 1 Total

Hydrograph type	= SCS Runoff	Peak discharge	= 0.651 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 3,190 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

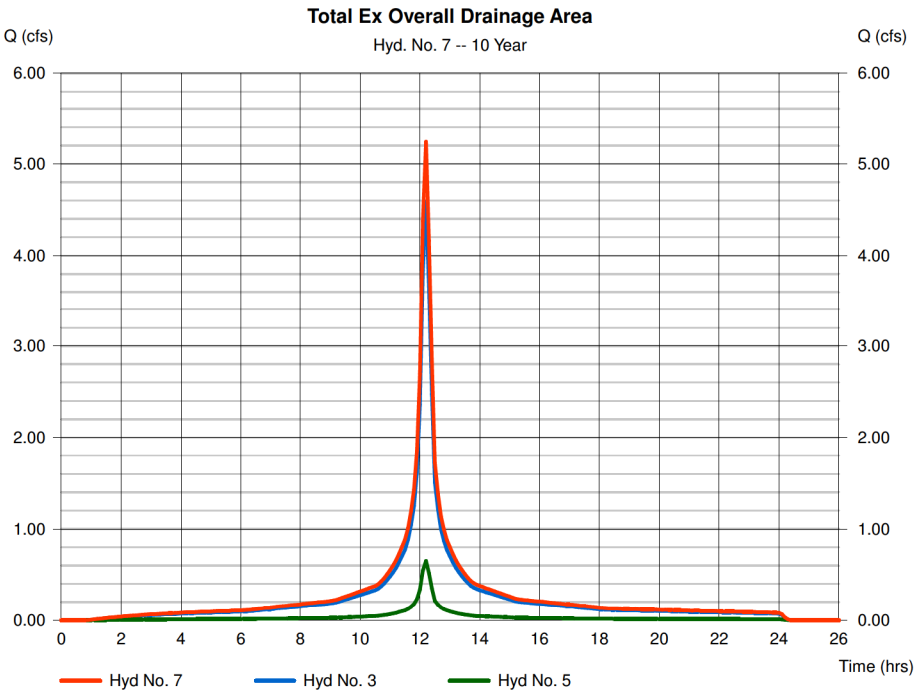


Hydrograph Report

Hyd. No. 7

Total Ex Overall Drainage Area

Hydrograph type	= Combine	Peak discharge	= 5.243 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 25,570 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 0.190 ac



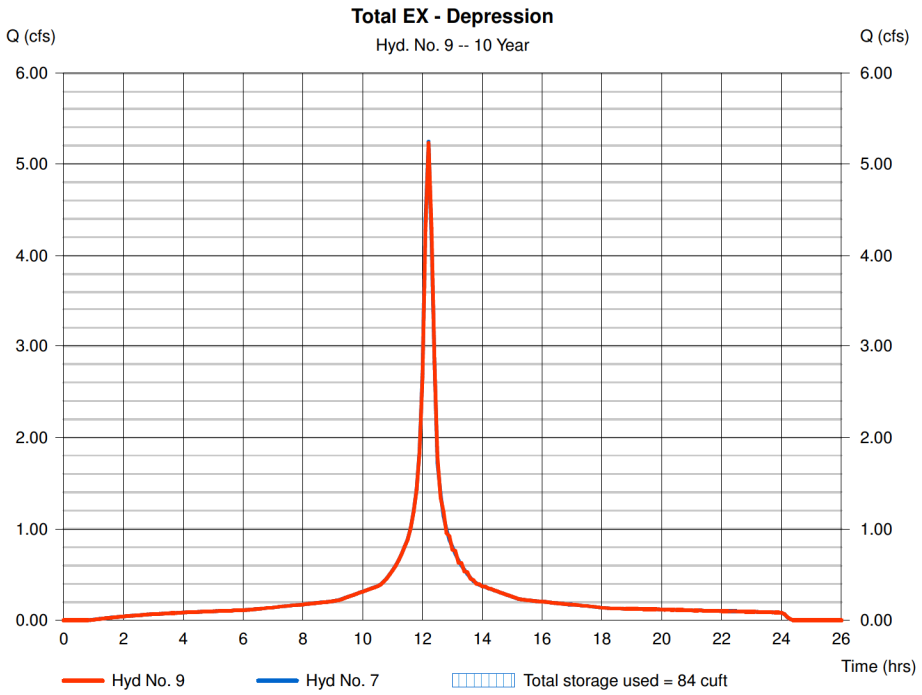
Hydrograph Report

Hyd. No. 9

Total EX - Depression

Hydrograph type	=	Reservoir	Peak discharge	=	5.227 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	25,570 cuft
Inflow hyd. No.	=	7 - Total Ex Overall Drainage Area	Max. Elevation	=	105.63 ft
Reservoir name	=	Existing Depression	Max. Storage	=	84 cuft

Storage Indication method used.

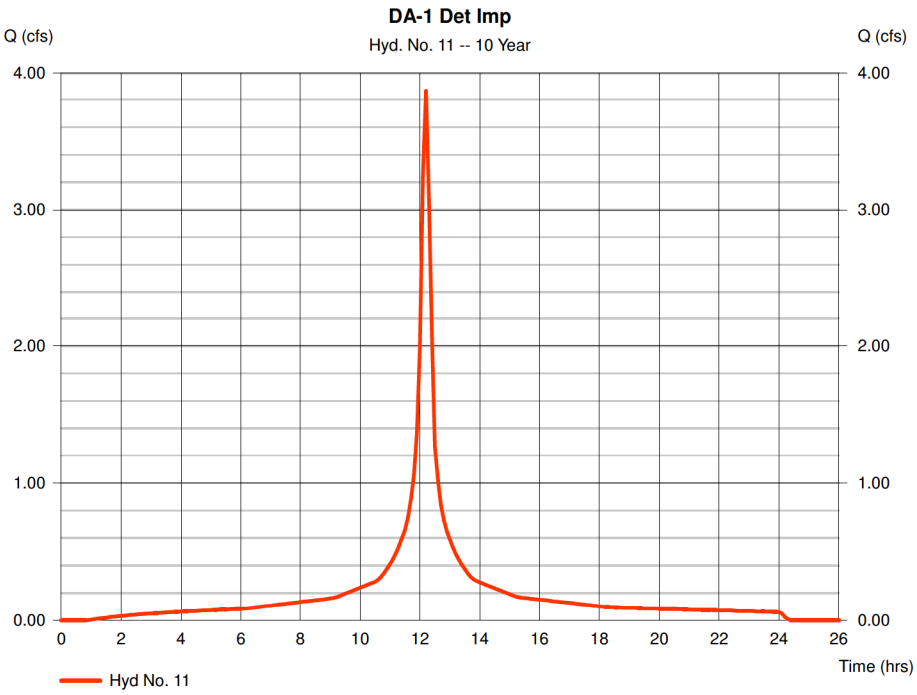


Hydrograph Report

Hyd. No. 11

DA-1 Det Imp

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.873 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	18,970 cuft
Drainage area	=	1.130 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.17 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

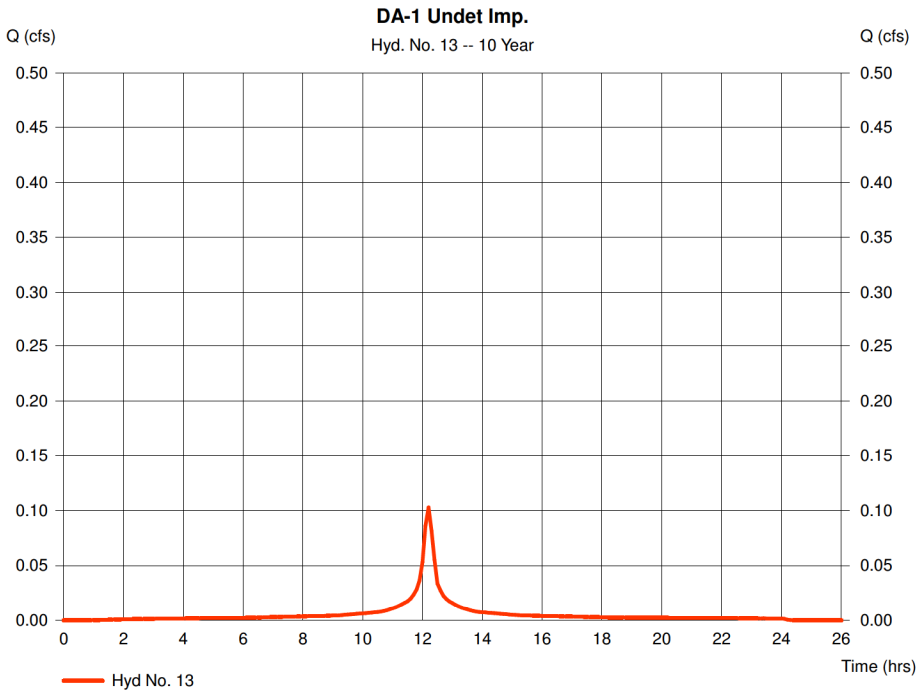


Hydrograph Report

Hyd. No. 13

DA-1 Undet Imp.

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.103 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	504 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.17 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

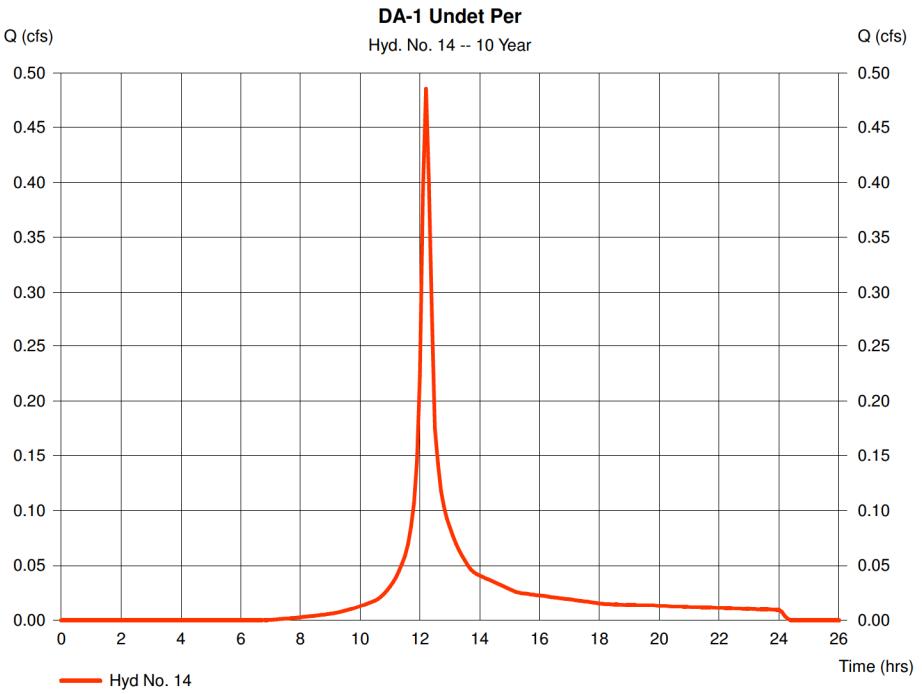


Hydrograph Report

Hyd. No. 14

DA-1 Undet Per

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.486 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	2,070 cuft
Drainage area	=	0.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.17 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

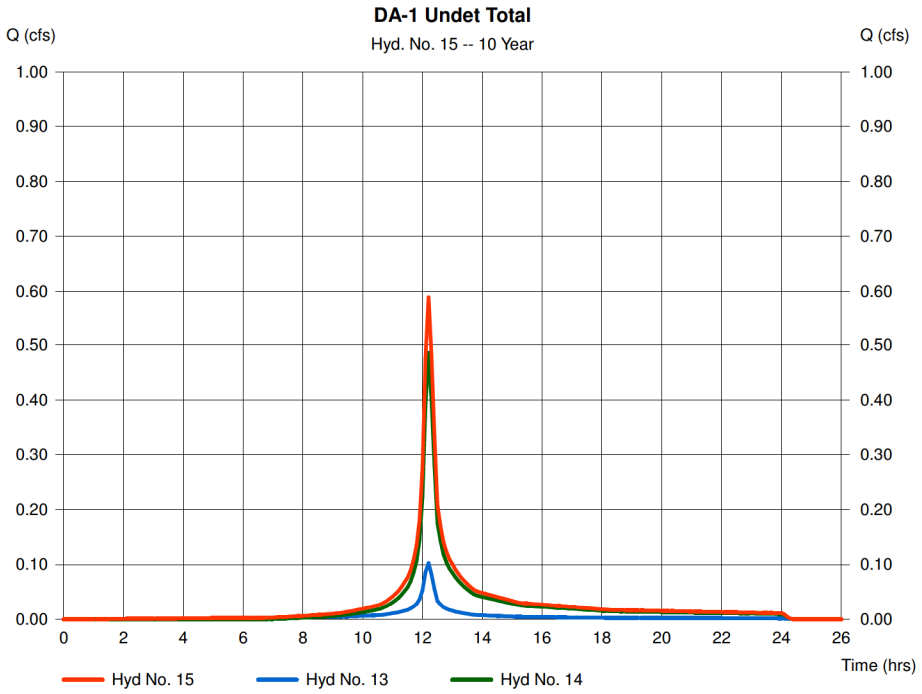


Hydrograph Report

Hyd. No. 15

DA-1 Undet Total

Hydrograph type	= Combine	Peak discharge	= 0.589 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 2,574 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 0.230 ac

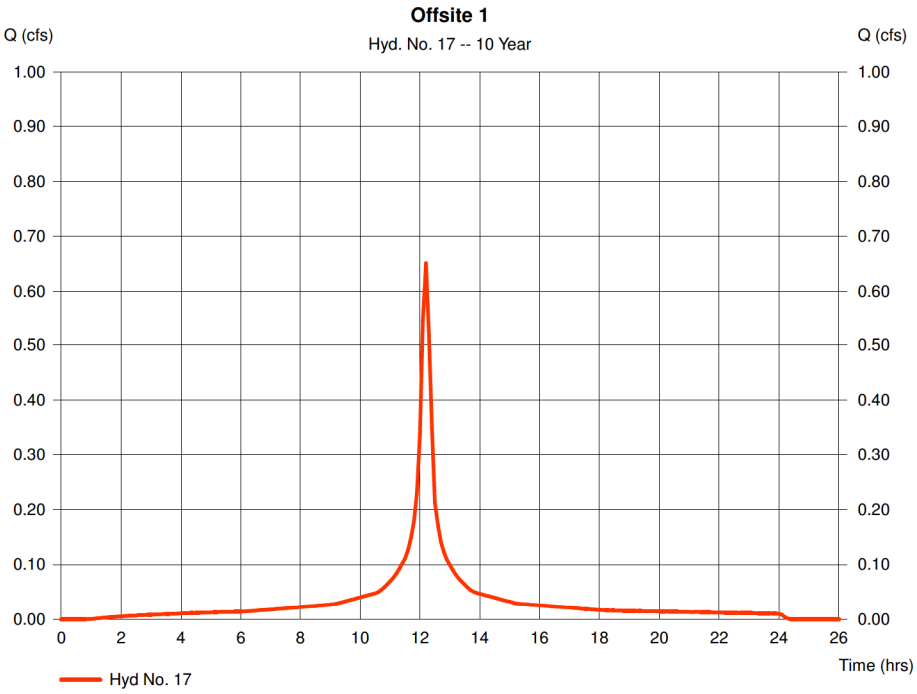


Hydrograph Report

Hyd. No. 17

Offsite 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.651 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 3,190 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484



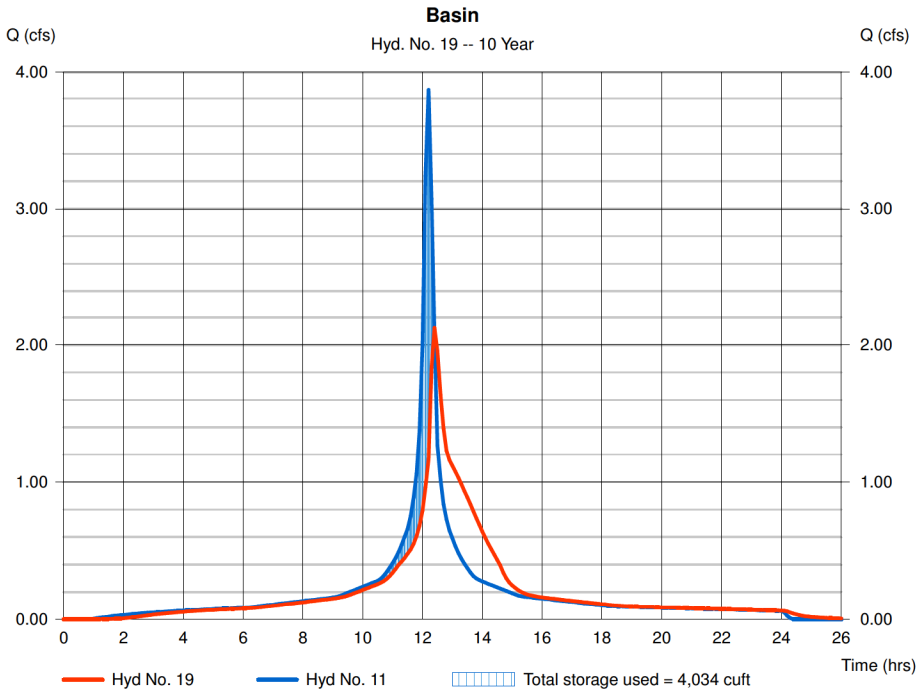
Hydrograph Report

Hyd. No. 19

Basin

Hydrograph type	= Reservoir	Peak discharge	= 2.125 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 6 min	Hyd. volume	= 18,960 cuft
Inflow hyd. No.	= 11 - DA-1 Det Imp	Max. Elevation	= 105.65 ft
Reservoir name	= underground basin	Max. Storage	= 4,034 cuft

Storage Indication method used.

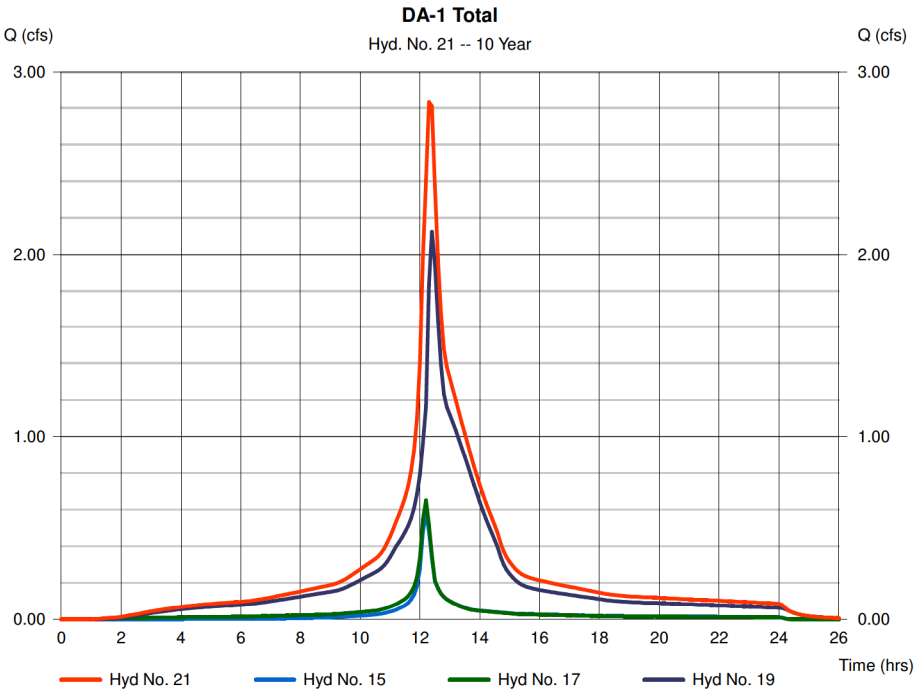


Hydrograph Report

Hyd. No. 21

DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 2.831 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.30 hrs
Time interval	= 6 min	Hyd. volume	= 24,723 cuft
Inflow hyds.	= 15, 17, 19	Contrib. drain. area	= 0.190 ac

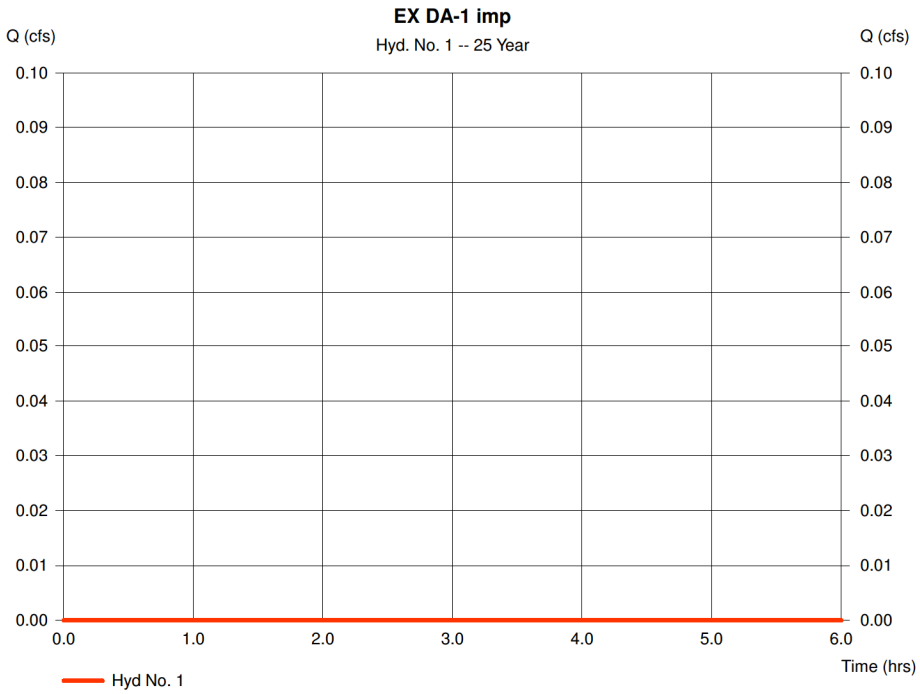


Hydrograph Report

Hyd. No. 1

EX DA-1 imp

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Drainage area	= 1.290 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 0.00 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

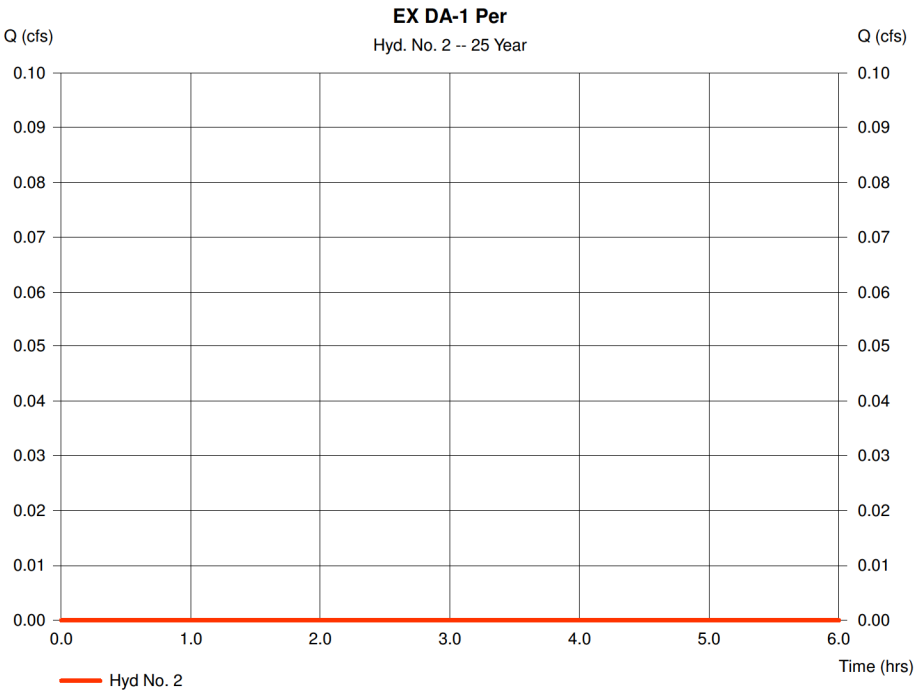


Hydrograph Report

Hyd. No. 2

EX DA-1 Per

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Drainage area	= 0.070 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 0.00 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

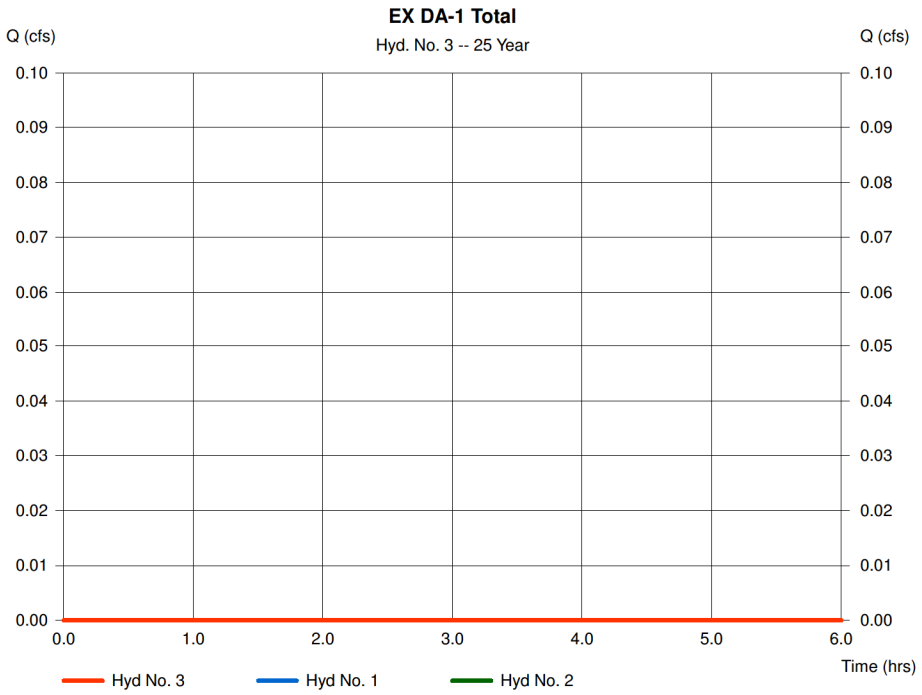


Hydrograph Report

Hyd. No. 3

EX DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.360 ac

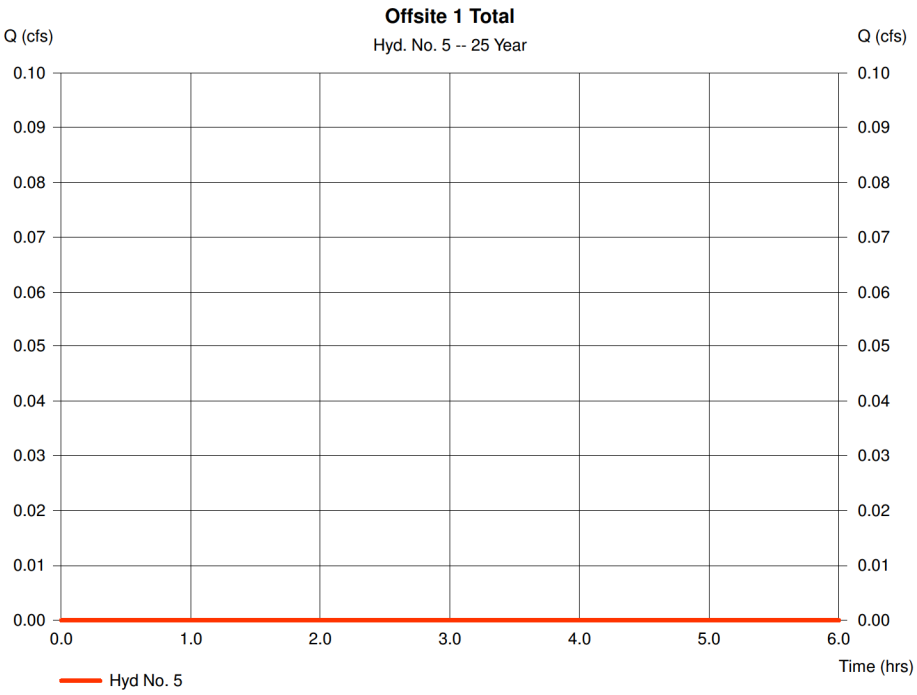


Hydrograph Report

Hyd. No. 5

Offsite 1 Total

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 0.00 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

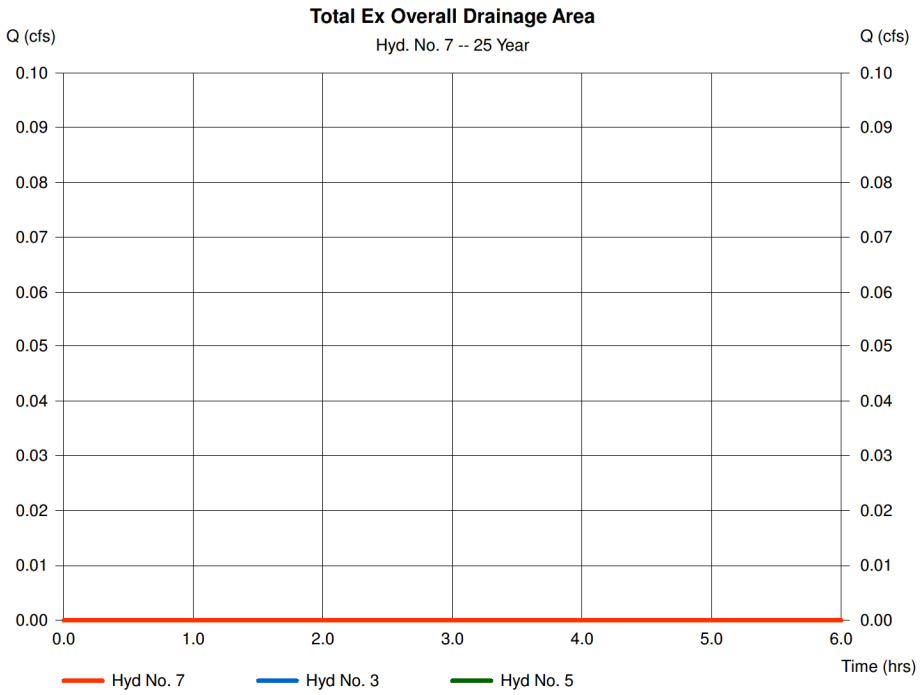


Hydrograph Report

Hyd. No. 7

Total Ex Overall Drainage Area

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 0.190 ac



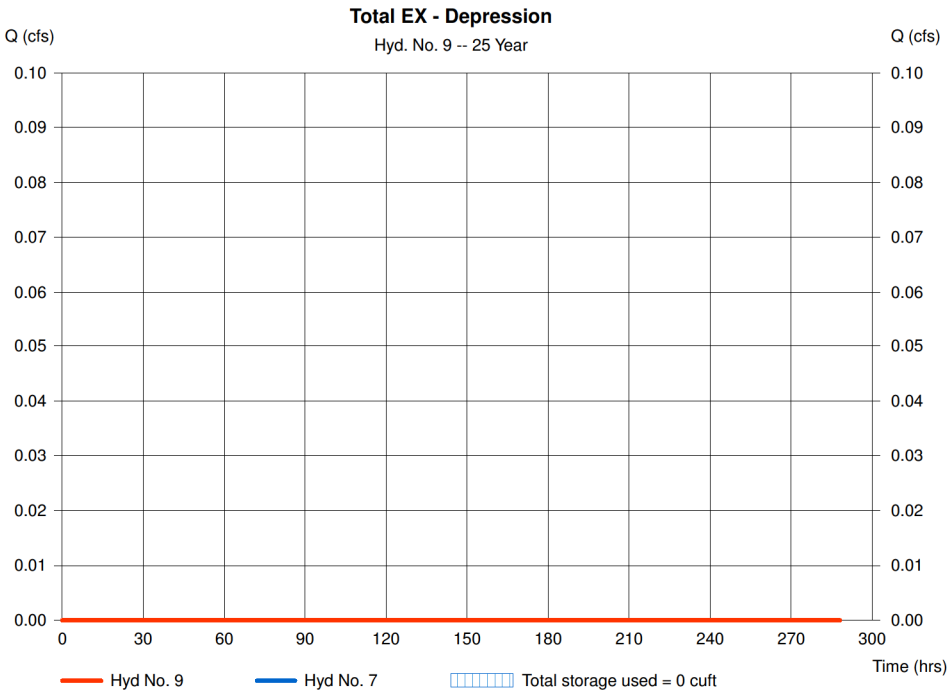
Hydrograph Report

Hyd. No. 9

Total EX - Depression

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 7 - Total Ex Overall Drainage Area	Max. Elevation	= 103.11 ft
Reservoir name	= Existing Depression	Max. Storage	= 0 cuft

Storage Indication method used.

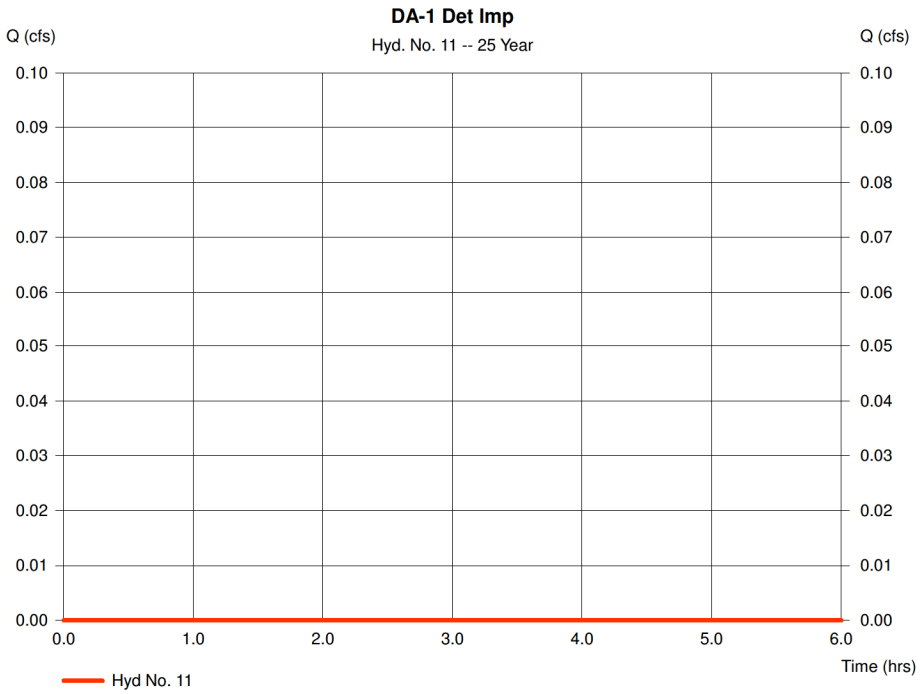


Hydrograph Report

Hyd. No. 11

DA-1 Det Imp

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Drainage area	=	1.130 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	0.00 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

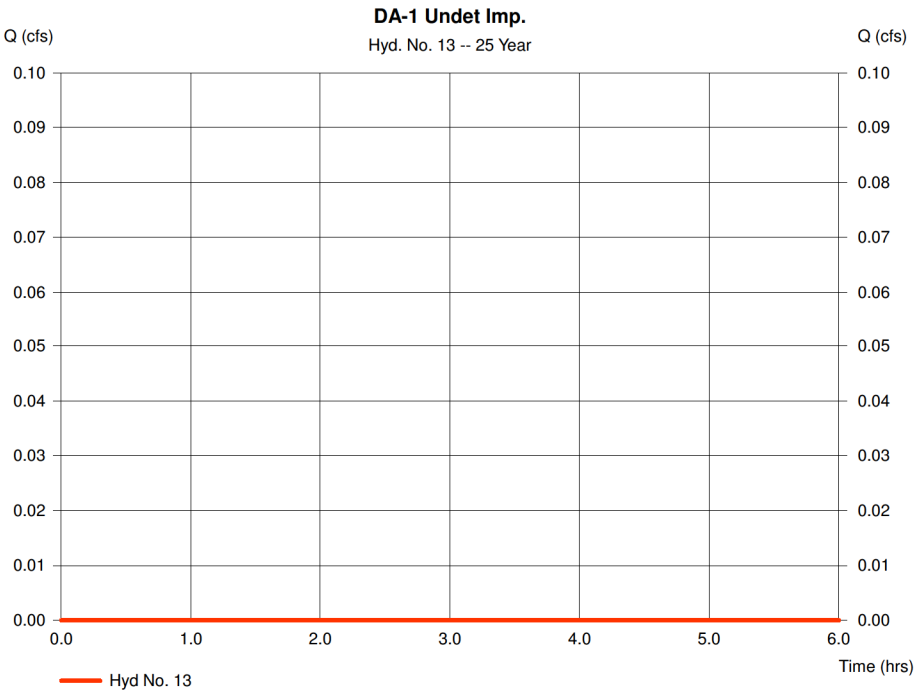


Hydrograph Report

Hyd. No. 13

DA-1 Undet Imp.

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	0.00 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

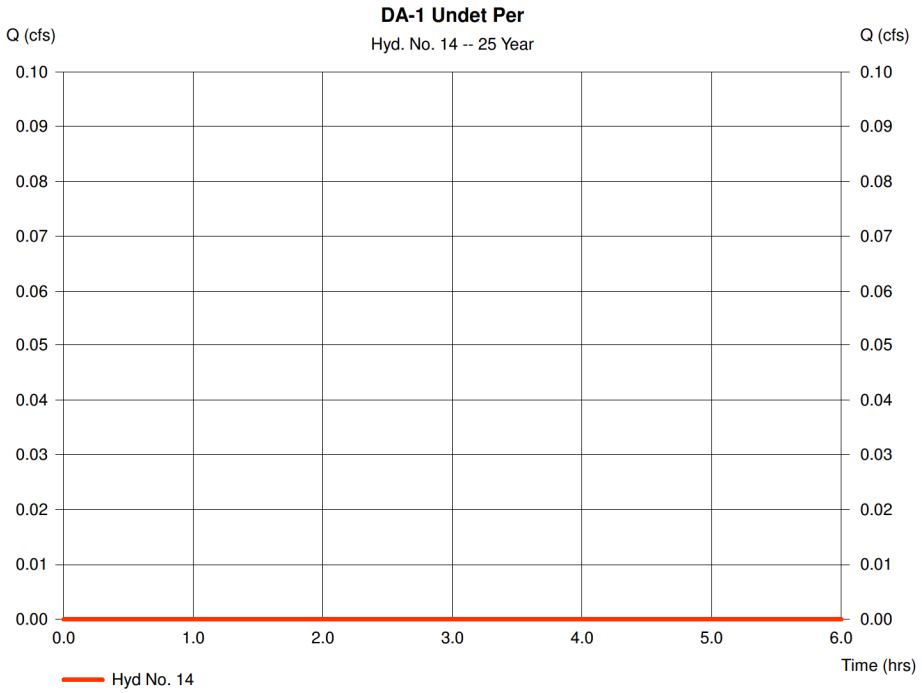


Hydrograph Report

Hyd. No. 14

DA-1 Undet Per

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Drainage area	= 0.200 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 0.00 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

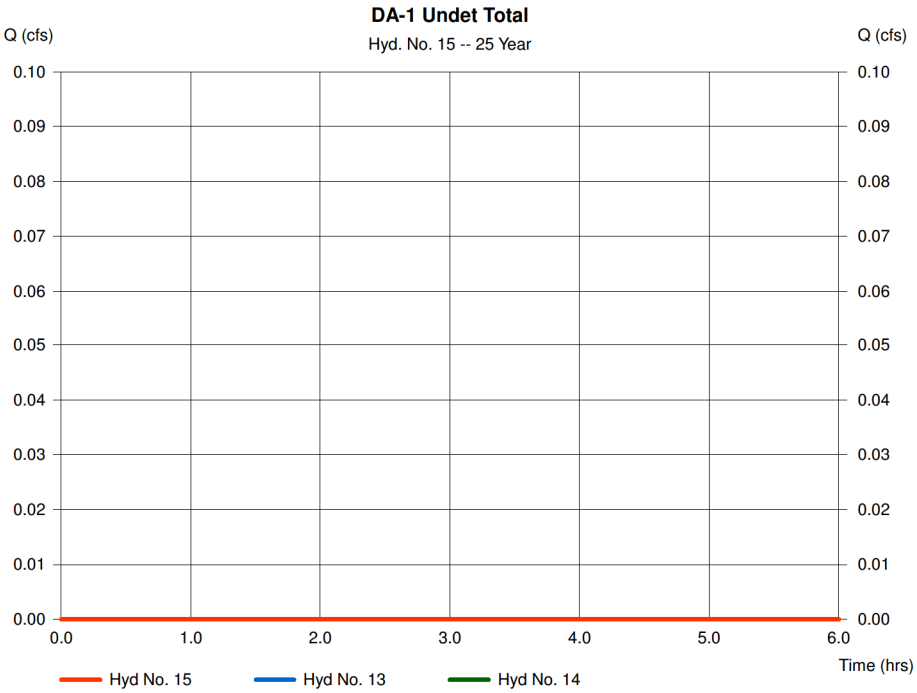


Hydrograph Report

Hyd. No. 15

DA-1 Undet Total

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 0.230 ac

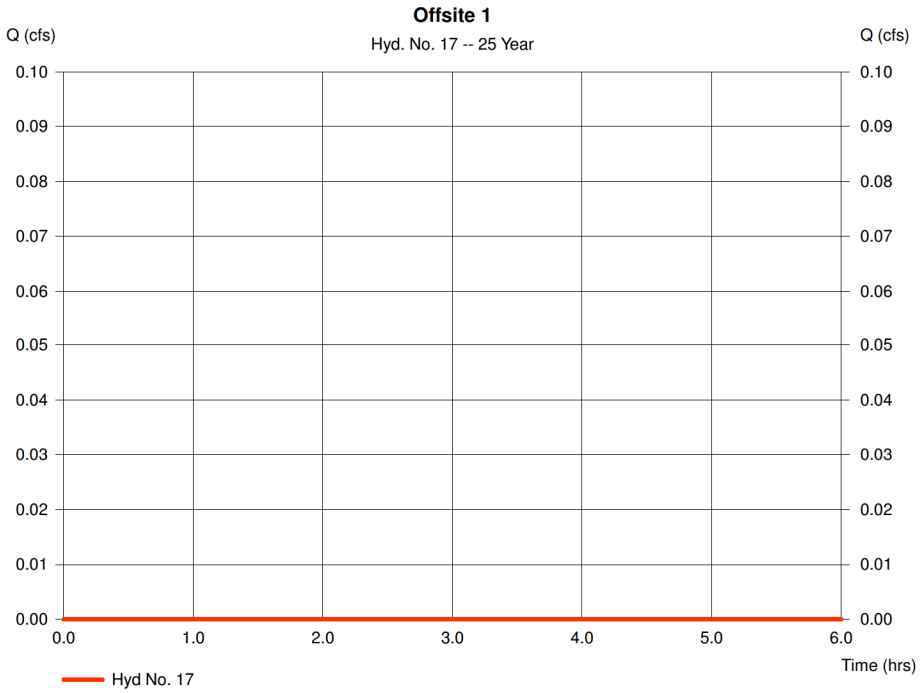


Hydrograph Report

Hyd. No. 17

Offsite 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Drainage area	=	0.190 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	0.00 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484



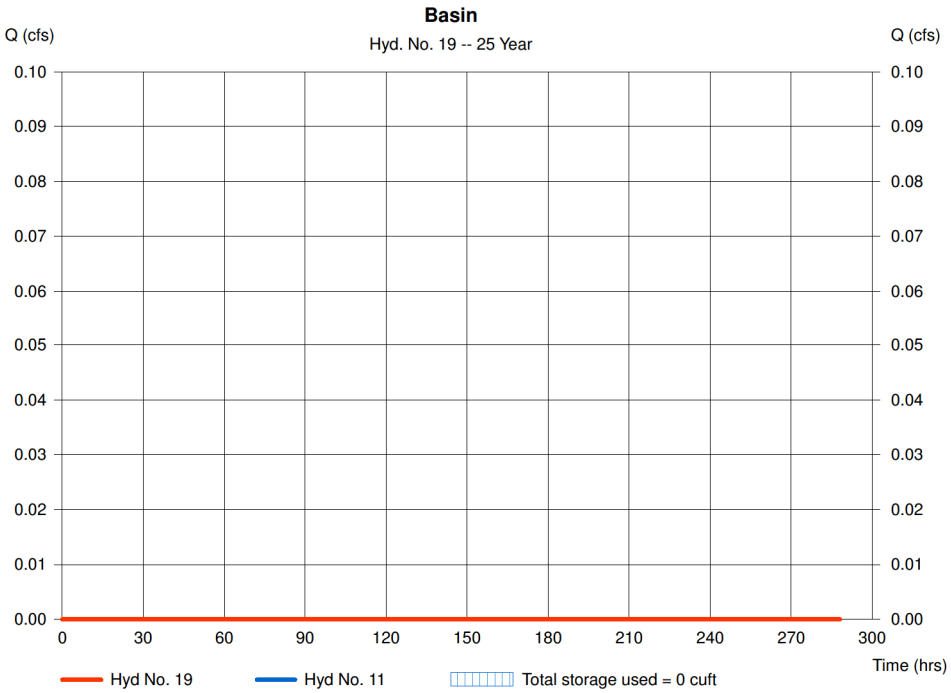
Hydrograph Report

Hyd. No. 19

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	6 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	11 - DA-1 Det Imp	Max. Elevation	=	103.00 ft
Reservoir name	=	underground basin	Max. Storage	=	0 cuft

Storage Indication method used.

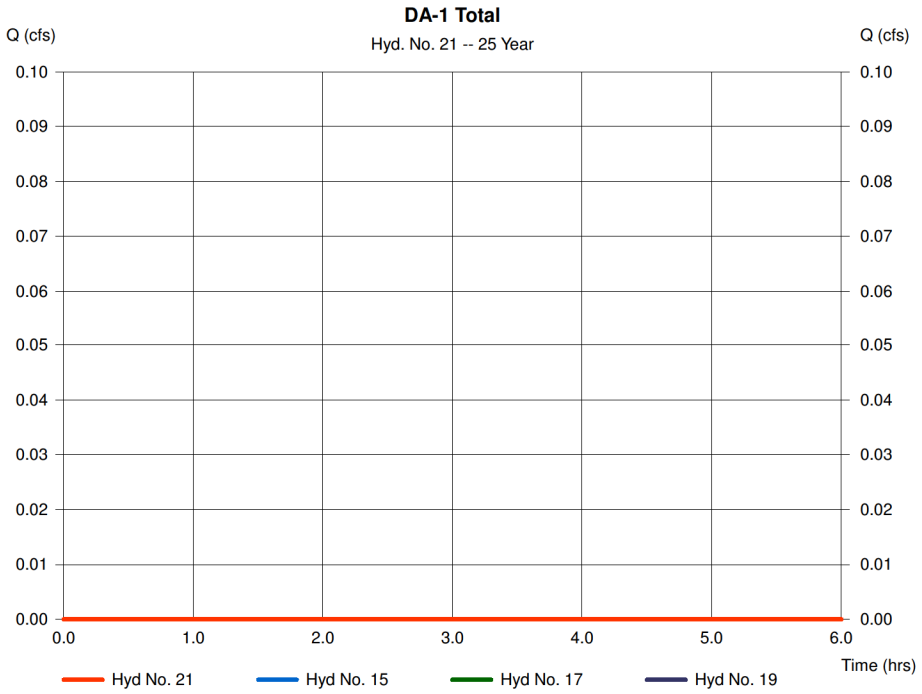


Hydrograph Report

Hyd. No. 21

DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 6 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 15, 17, 19	Contrib. drain. area	= 0.190 ac

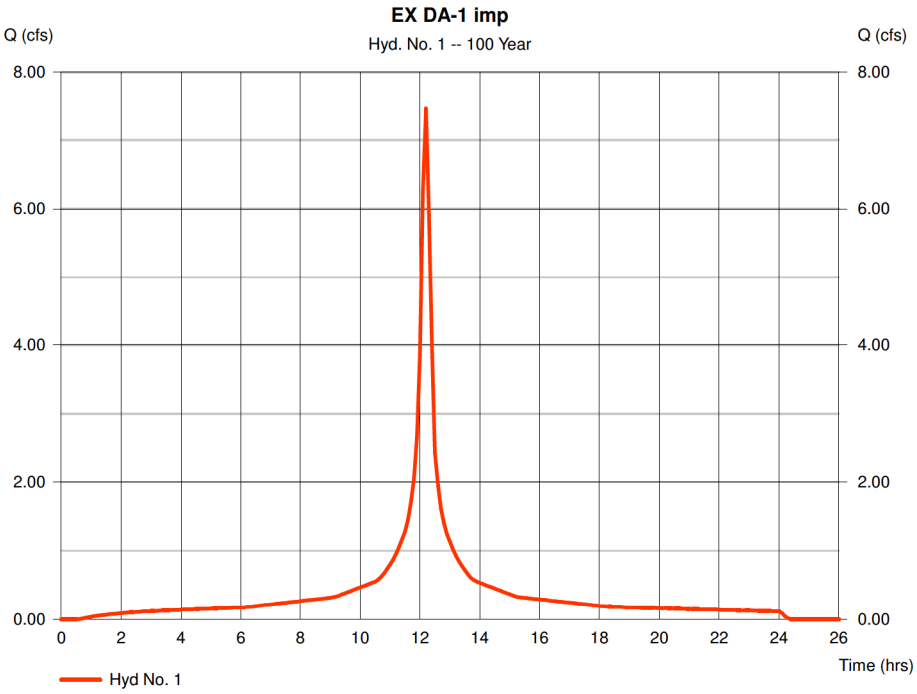


Hydrograph Report

Hyd. No. 1

EX DA-1 imp

Hydrograph type	= SCS Runoff	Peak discharge	= 7.458 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 37,095 cuft
Drainage area	= 1.290 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

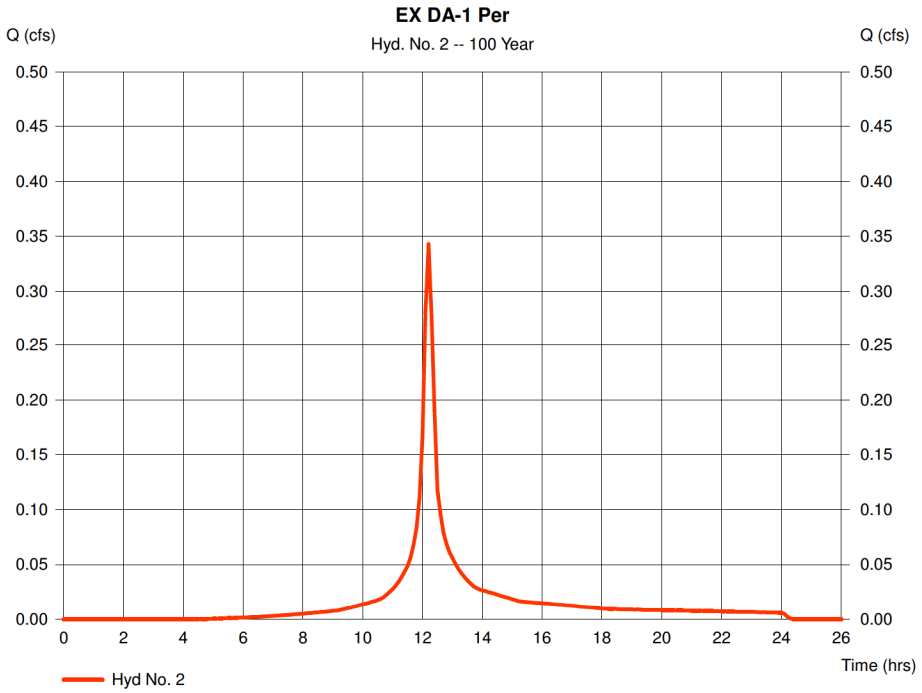


Hydrograph Report

Hyd. No. 2

EX DA-1 Per

Hydrograph type	= SCS Runoff	Peak discharge	= 0.343 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 1,495 cuft
Drainage area	= 0.070 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

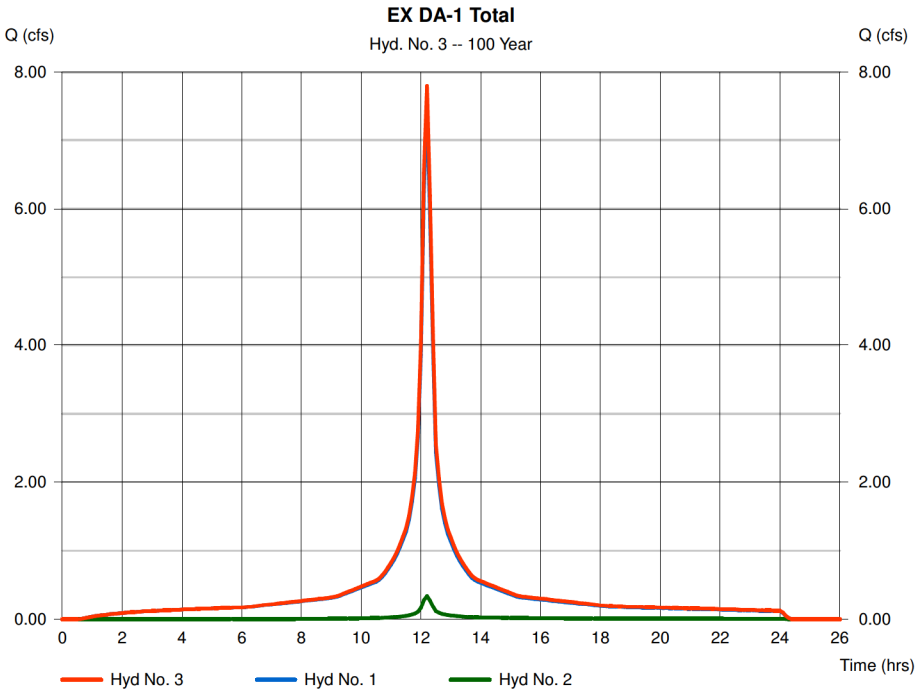


Hydrograph Report

Hyd. No. 3

EX DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 7.801 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 38,590 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.360 ac

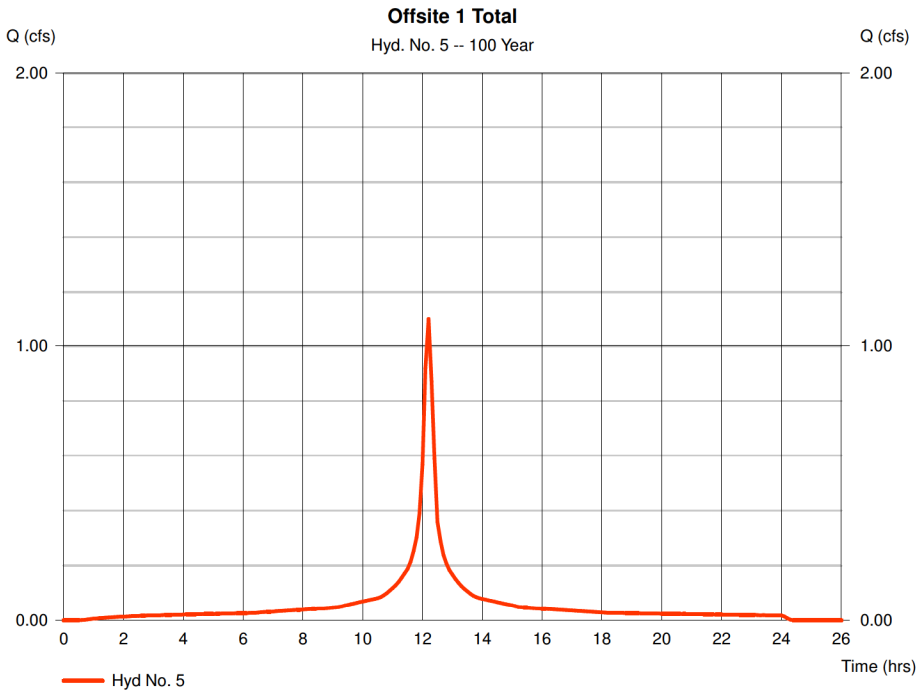


Hydrograph Report

Hyd. No. 5

Offsite 1 Total

Hydrograph type	= SCS Runoff	Peak discharge	= 1.098 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 5,464 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484

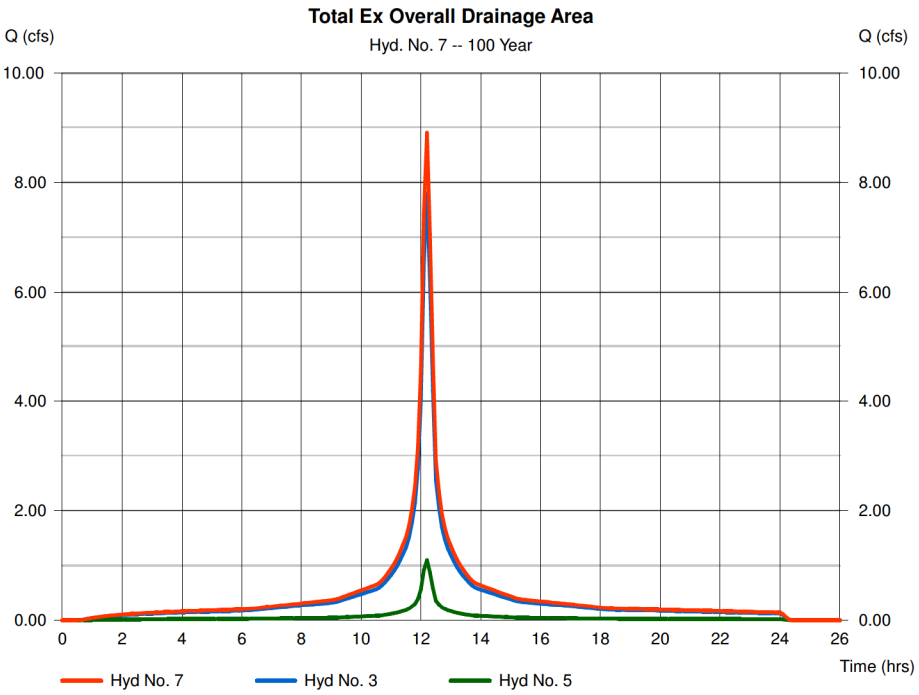


Hydrograph Report

Hyd. No. 7

Total Ex Overall Drainage Area

Hydrograph type	= Combine	Peak discharge	= 8.899 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 44,053 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 0.190 ac



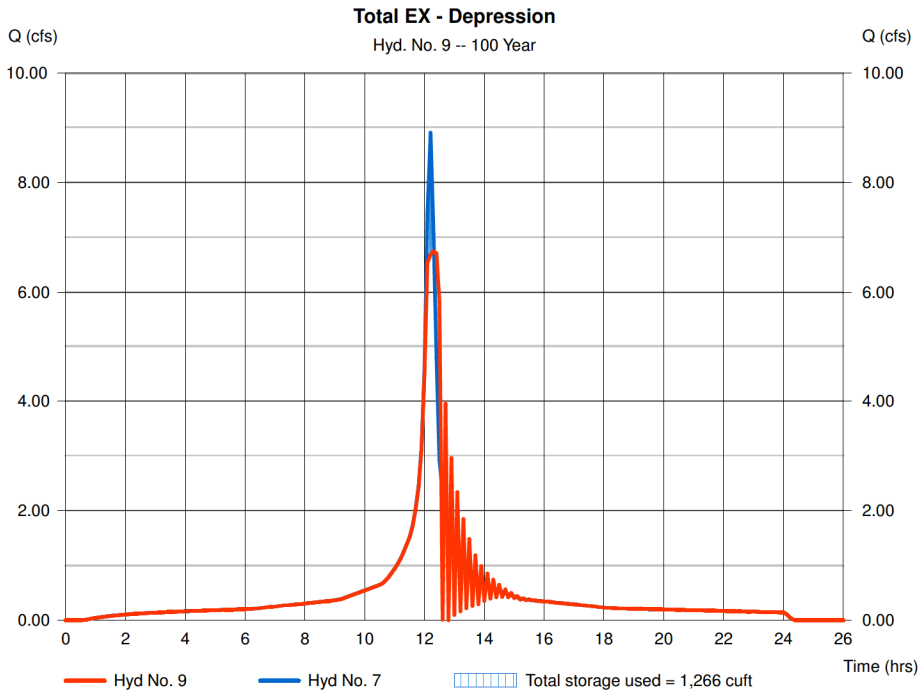
Hydrograph Report

Hyd. No. 9

Total EX - Depression

Hydrograph type	=	Reservoir	Peak discharge	=	6.743 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	6 min	Hyd. volume	=	44,060 cuft
Inflow hyd. No.	=	7 - Total Ex Overall Drainage Area	Max. Elevation	=	107.41 ft
Reservoir name	=	Existing Depression	Max. Storage	=	1,266 cuft

Storage Indication method used.

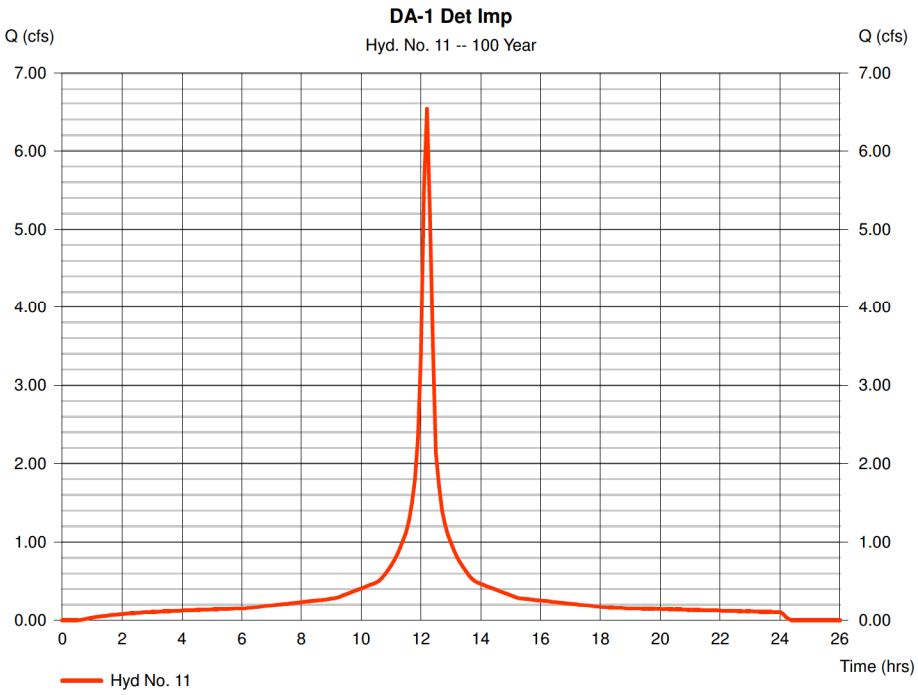


Hydrograph Report

Hyd. No. 11

DA-1 Det Imp

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.533 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	32,494 cuft
Drainage area	=	1.130 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.69 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

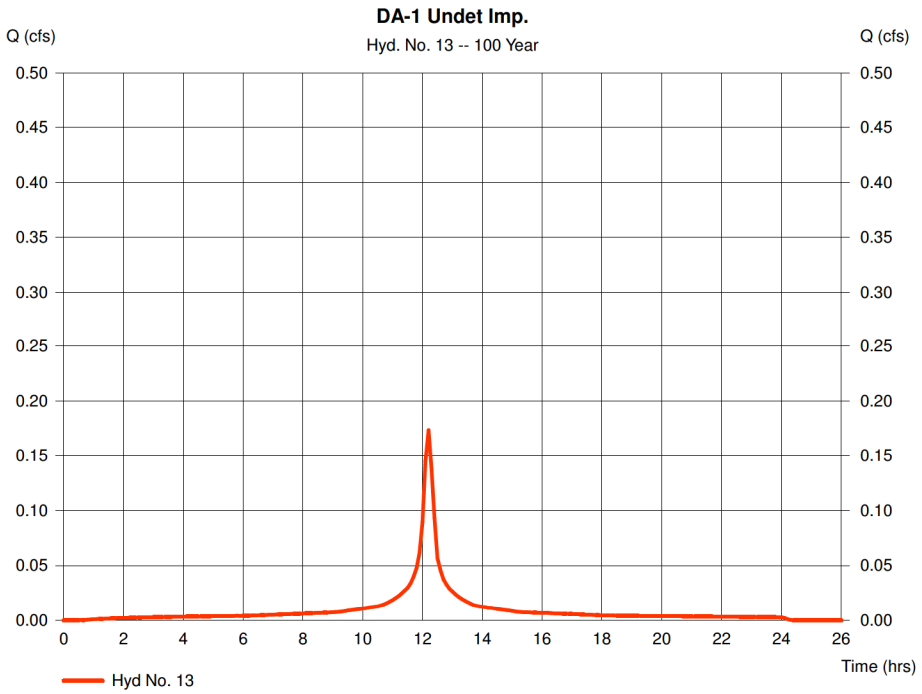


Hydrograph Report

Hyd. No. 13

DA-1 Undet Imp.

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.173 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	863 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.69 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

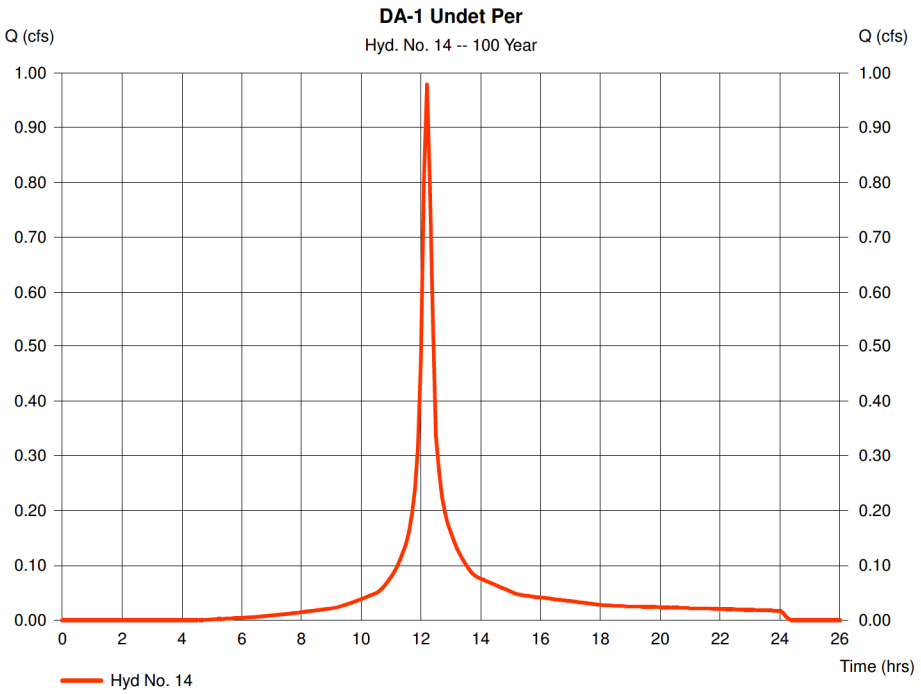


Hydrograph Report

Hyd. No. 14

DA-1 Undet Per

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.980 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	6 min	Hyd. volume	=	4,271 cuft
Drainage area	=	0.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.69 in	Distribution	=	Custom
Storm duration	=	NOAA Atlas 14 Type-D.cds	Shape factor	=	484

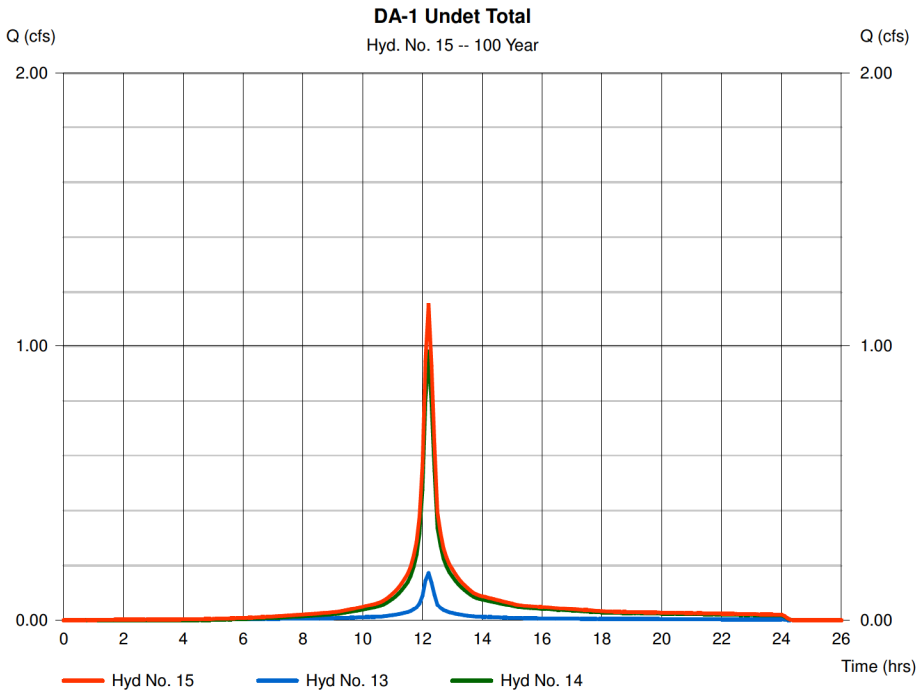


Hydrograph Report

Hyd. No. 15

DA-1 Undet Total

Hydrograph type	= Combine	Peak discharge	= 1.153 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 5,133 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 0.230 ac

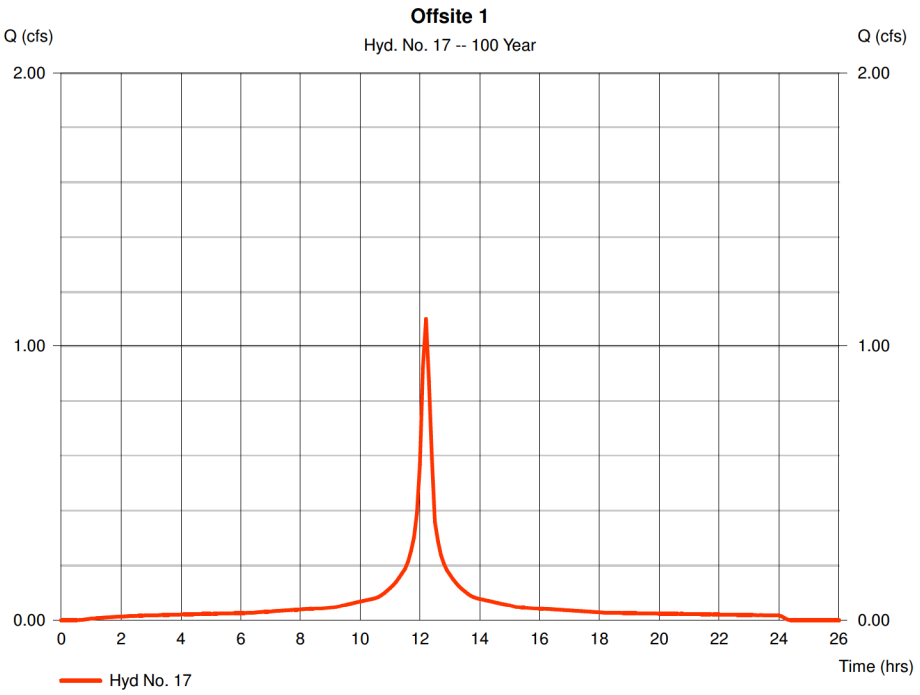


Hydrograph Report

Hyd. No. 17

Offsite 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.098 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 6 min	Hyd. volume	= 5,464 cuft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Custom
Storm duration	= NOAA Atlas 14 Type-D.cds	Shape factor	= 484



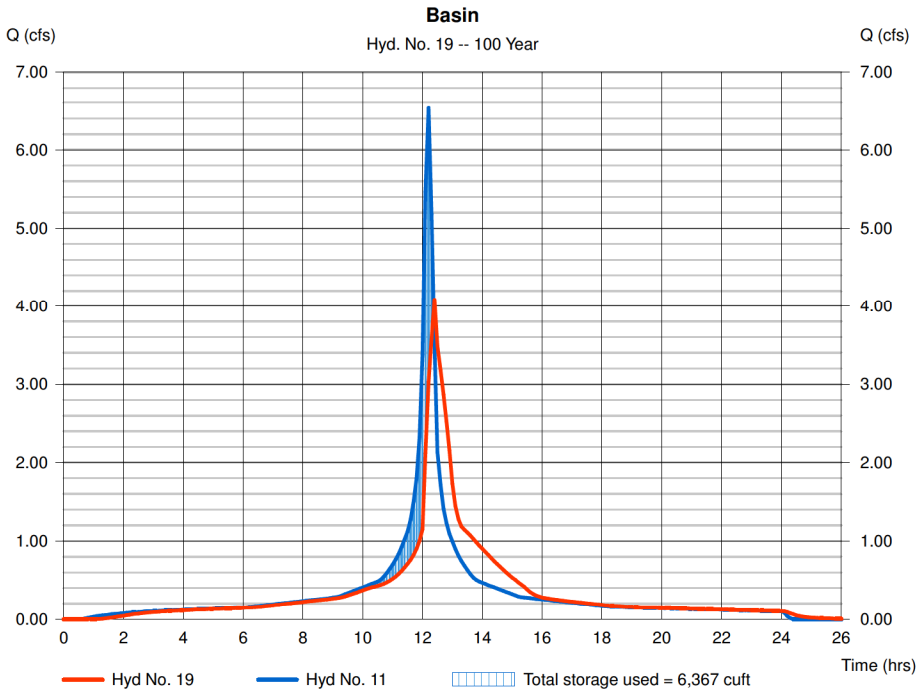
Hydrograph Report

Hyd. No. 19

Basin

Hydrograph type	= Reservoir	Peak discharge	= 4.088 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.40 hrs
Time interval	= 6 min	Hyd. volume	= 32,484 cuft
Inflow hyd. No.	= 11 - DA-1 Det Imp	Max. Elevation	= 107.16 ft
Reservoir name	= underground basin	Max. Storage	= 6,367 cuft

Storage Indication method used.

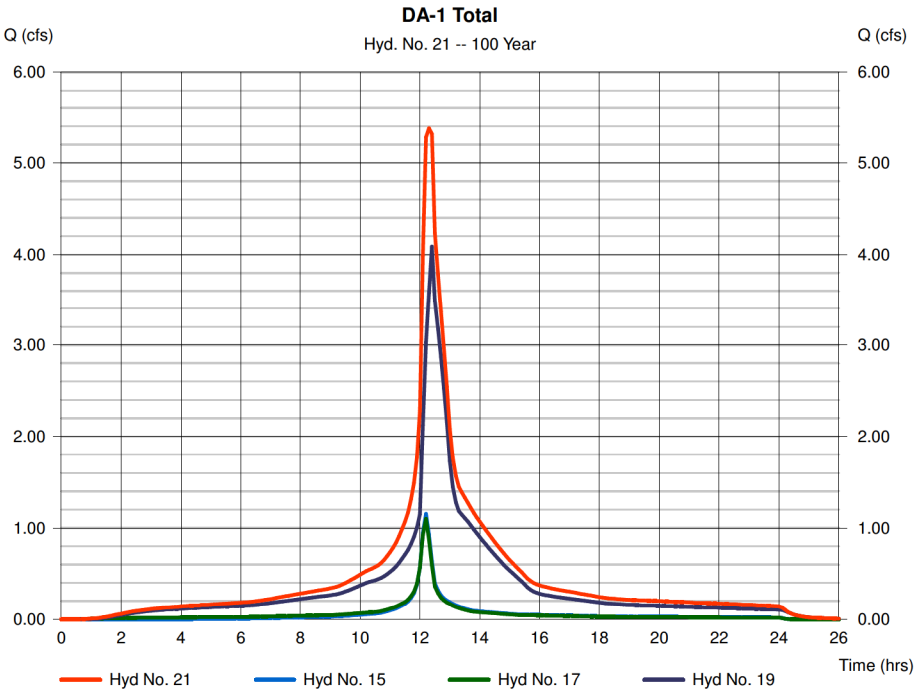


Hydrograph Report

Hyd. No. 21

DA-1 Total

Hydrograph type	= Combine	Peak discharge	= 5.379 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.30 hrs
Time interval	= 6 min	Hyd. volume	= 43,081 cuft
Inflow hyds.	= 15, 17, 19	Contrib. drain. area	= 0.190 ac



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STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)

DYNAMIC ENGINEERING

Stormwater Collection System Calculations

Project: Eden Property Company
Job #: 0404-99-041
Location: City of Plainfield, NJ
Design Storm: 100 YR

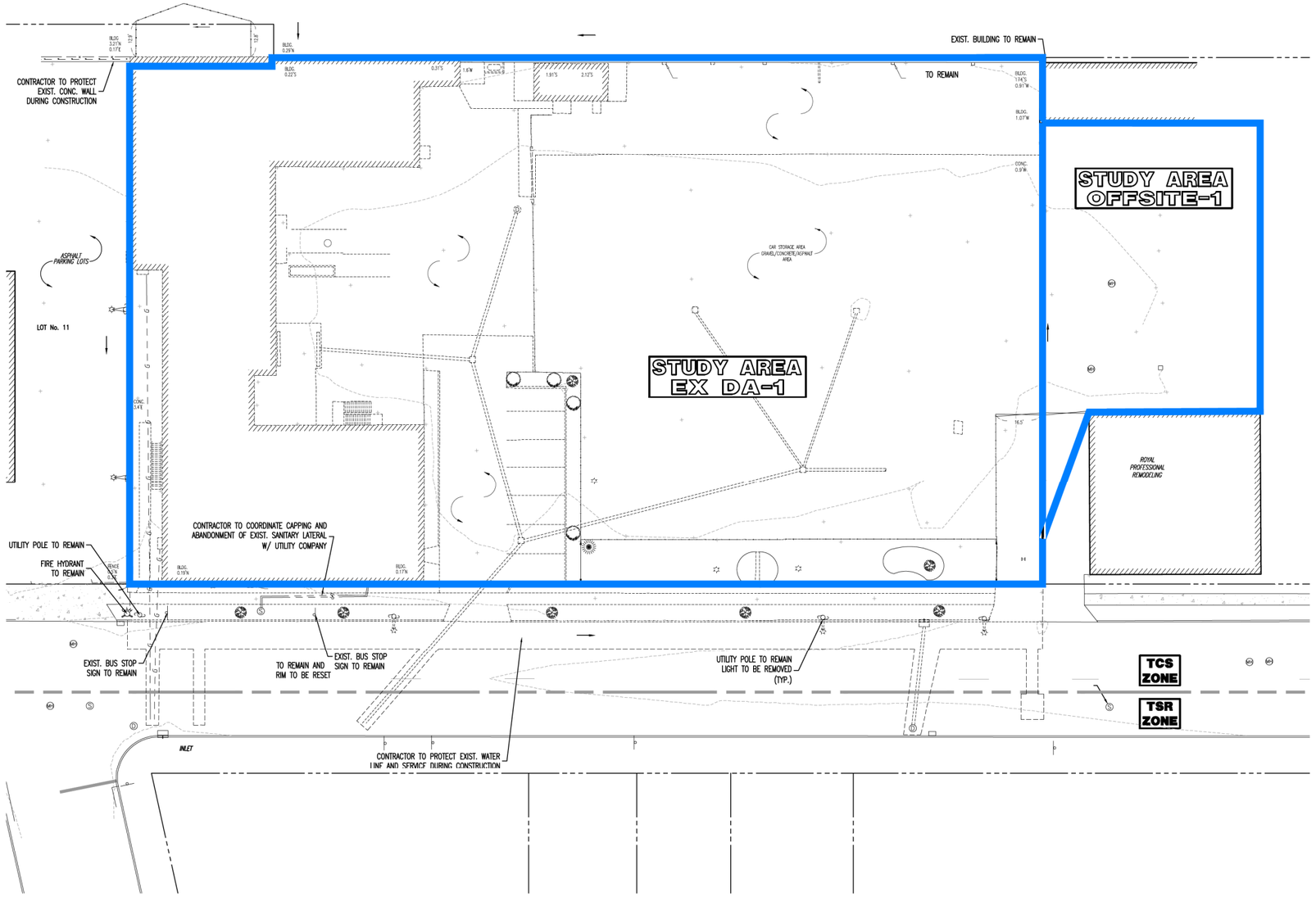
Computed By: ZZ
Checked By: RJC
Date: 1/2/2020

NOTES:
1) Design method used is Rational Method
2) Refer to Weighted Runoff Coefficient table for calculation of incremental areas and C values

PIPE SECTION		SUBCATCHMENT AREA	INCREMENTAL		CUMULATIVE	TIME OF CONCENTRATION			I	PEAK RUNOFF		PIPING INPUT			PIPING DATA			
FROM	TO	Area (Acres)	"C"	A x C Ac	A x C (acres)	Tc to Inlet (min)	Tc in Pipe (min.)	Final Tc (min)	(In/Hr)	Q to Inlet (CFS)	Q cum. for Pipe (CFS)	Dia. (In)	Length (Ft)	Man. "n"	Slope (ft/ft)	Pipe Capacity (cfs)	Full Pipe Velocity (fps)	Actual Pipe Velocity (fps)
Basin	MH 101	0.39	0.99	0.39	0.39	6.00	0.01	6.00	9.10	3.55	3.55	15	6.0	0.013	0.0200	9.13	7.44	6.65
MH 101	MH 102	0.00	0.99	0.00	0.39	6.00	0.04	6.01	9.10	0.00	3.55	18	14.0	0.013	0.0100	10.50	5.94	4.95

DRAINAGE AREA MAPS

THIS PLAN TO BE UTILIZED FOR STORMWATER/DRAINAGE ANALYSIS PURPOSES ONLY



GRAPHIC SCALE

−20 0 10 20 40 80

(IN FEET)

1 INCH = 20 FT.

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

DYNAMIC ENGINEERING

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Allen, Texas T: 972.534.2100 | Austin, Texas T:512.646.2646 | Houston, Texas T: 281.789.6400
Delray Beach, Florida T: 561.921.8070

TITLE: EXISTING DRAINAGE AREA MAP

PROJECT: **EDEN PROPERTY COMPANY**
PROPOSED MIXED USE BUILDING
BLOCK 645, LOT 12
803 SOUTH AVENUE
CITY OF PLAINFIELD, UNION COUNTY, NEW JERSEY

JOB No:	0404-99-041
DATE:	02/18/2020
DRAWN BY:	JPB
SCALE:	(H) 1"=20' (V)
DESIGNED BY:	RJC
CHECKED BY:	BWS
SHEET No:	1 OF 2
CONSTRUCTION CHECK	DATE
CONSTRUCTION CHECK	DATE
DEC Client Code:	0404
Rev. #	0

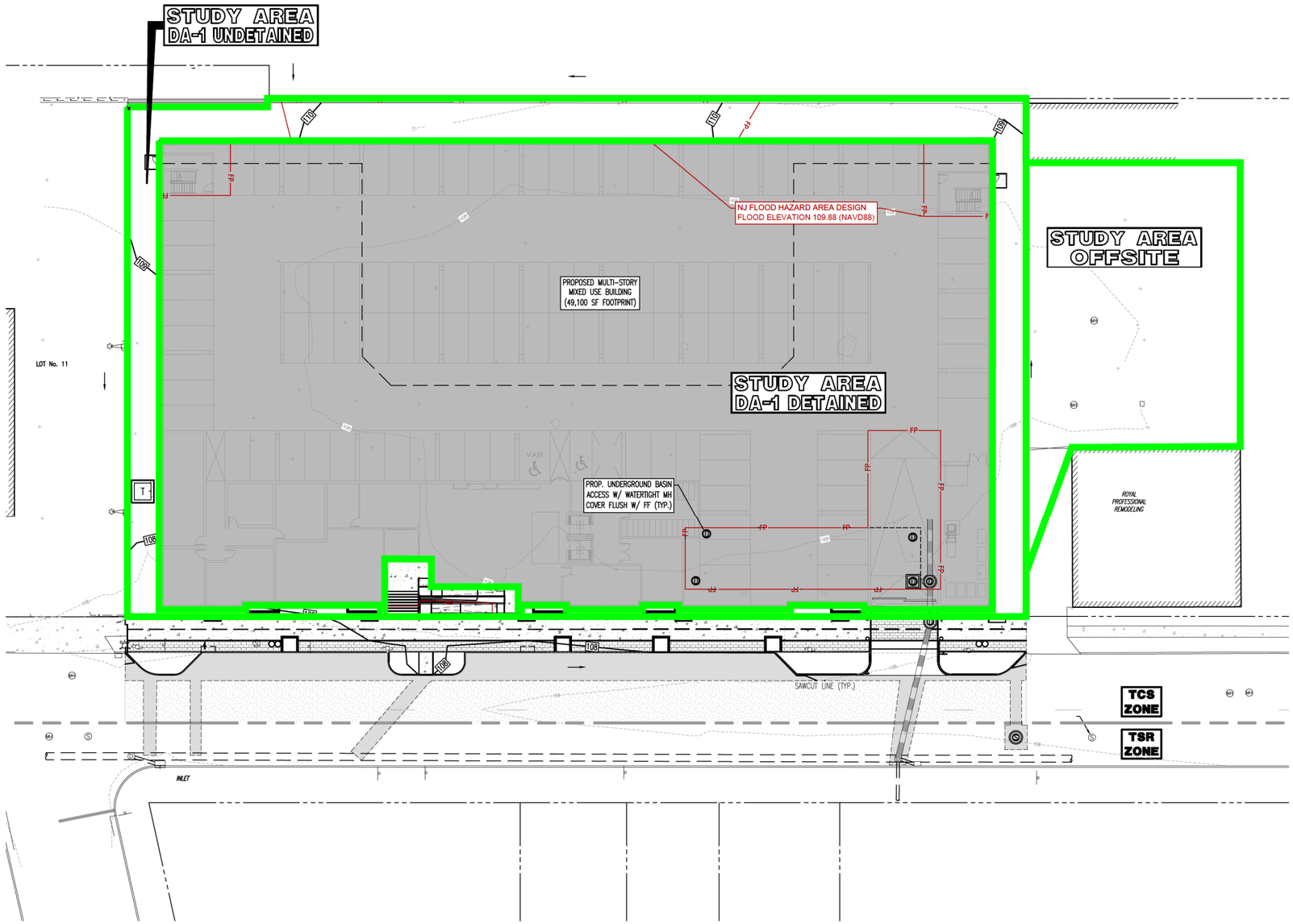
BRETT W. SKAPINETZ
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 41985

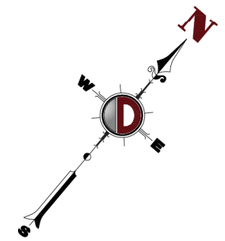
JOSEPH C. SPARONE
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 47204

By | Comments | Date | Rev.

Plotted: 02/19/20 — 12:20 PM By: jgeoffroy — Product Ver: 23.1 (LMS Tech)
File: P:\DEC/PC/ PROJECTS\0404 Eden Property Co\99-041 South Avenue, Plainfield\Dwg\DA Maps\0404099041EDAM0.dwg, ——> 01 EXISTING DRAINAGE AREA MAP

THIS PLAN TO BE UTILIZED FOR STORMWATER/DRAINAGE ANALYSIS PURPOSES ONLY





GRAPHIC SCALE

-20 0 10 20 40 80

(IN FEET)

1 INCH = 20 FT.

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

DYNAMIC ENGINEERING

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Allen, Texas T: 972.534.2100 | Austin, Texas T:512.646.2444 | Houston, Texas T: 281.789.6400
Delray Beach, Florida T: 561.921.8570

TITLE: PROPOSED DRAINAGE AREA MAP

PROJECT: **EDEN PROPERTY COMPANY**
PROPOSED MIXED USE BUILDING
BLOCK 645, LOT 12
803 SOUTH AVENUE
CITY OF PLAINFIELD, UNION COUNTY, NEW JERSEY

JOB No: 0404-99-041
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