STORMWATER MANAGEMENT ANALYSIS

For

1204 Park Avenue Associates LLC.

Proposed

CVS pharmacy™

Block 729, Lot 1
Park Avenue (CR 531) & Randolph Road
City of Plainfield
Union County
New Jersey

Prepared by:

DYNAMIC ENGINEERING

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APPENDIX

I. SITE DESCRIPTION

The project area consists of Block 729, Lot 1 in the City of Plainfield, Union County, New Jersey. The project tract is currently developed with a parking lot. The proposed project consists of subdividing the property into two (2) lots with a 14,823 SF CVS Pharmacy with drive-thru pharmacy window. Additional site improvements include constructing new driveways, parking areas, landscaping, lighting and other related site improvements. The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey as prepared by Dynamic Survey, LLC.

II. DESIGN OVERVIEW

This report has been prepared to define and analyze the stormwater drainage conditions that would occur as a result of the redevelopment of the parcel into a proposed CVS Pharmacy on Block 729, Lot 1 in the City of Plainfield, Union County, New Jersey.

The scope of the study includes the proposed 14,823 SF CVS Pharmacy, associated driveways, parking areas, landscaping and other related site improvements as shown on the accompanying engineering drawings.

The proposed redevelopment within the limit of disturbance proposes a net decrease in impervious coverage and therefore, reduces the stormwater runoff volume and peak rate of runoff from the development for the 2, 10, 25 and 100 year storm events. Runoff peak flows and peak volumes will be reduced to the existing stormwater conveyance systems. No structural stormwater management measures are provided as the net proposed impervious area is decreased in the proposed condition. The water quantity rates and volumes are demonstrated to meet the requirements of NJAC 7:8.

A hydrological evaluation is provided for the 2, 10, 25, and 100 year storm events utilizing the Urban Hydrology for Small Watershed TR55 method. It is the intention of the design of this site to comply with the Stormwater Management Best Management Practices.

III. EXISTING DRAINAGE CONDITIONS

The existing site conditions have been evaluated using the following drainage sub-watershed areas as depicted on the Existing Drainage Area Map included within the Appendix of this report:

Study Area – Randolph Road: This area encompasses a portion of the on-site study area on which the proposed CVS Pharmacy will be developed. This area consists of impervious areas and open space areas.

Under existing conditions, stormwater runoff from this area is ultimately tributary to the existing stormwater conveyance system within Randolph Road.

Study Area – Laramie Road: This area consists of the remainder of the subject site containing impervious coverage and open space areas. Under existing conditions, stormwater runoff from this area is ultimately tributary to the existing stormwater conveyance system within Laramie Road.

Based on the Union County soils survey information, 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	C
BhpBr	Birdboro-Urban land complex, 0 to 6 percent slopes, rarely flooded	B

IV. PROPOSED DRAINAGE CONDITIONS

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

Study Area – Randolph Road: This area consists of the proposed CVS Pharmacy building, driveways, parking areas, and open space areas. Stormwater runoff generated by this area is ultimately tributary to the existing stormwater conveyance system within Randolph Road.

Study Area - Laramie Road: This area consists of the remainder of the subject site containing impervious coverage and open space areas. Stormwater runoff from this area is ultimately tributary to the stormwater conveyance system within Laramie Road.

V. DESIGN METHODOLOGY

The intention of the design of the proposed stormwater management facilities for this project is to provide measures as required to address applicable aspects of the City of Plainfield Land Use Ordinance and NJAC 7:8. In order to prepare the stormwater calculations for the subject project, extensive initial investigation of the property and topography was performed. On-site review of the tract was performed by Dynamic Engineering Consultants, PC to verify existing site conditions and land cover characteristics. Dynamic Survey, LLC, was contracted to prepare the ALTA/NSPS Land Title Survey with topography for the existing site and surrounding watershed areas.

Based on our review of the existing site conditions and the Topographic Survey, the Drainage Area Maps for the existing and proposed site conditions as defined within this report were established. A grading plan was developed for the proposed site improvements with consideration to the existing drainage patterns.

The overall stormwater management design for the subject tract has been evaluated by Dynamic Engineering Consultants to ensure that the overall development satisfies the stormwater criteria set forth in the NJAC 7:8 and the City of Plainfield Land Use Ordinance.

VI. RUNOFF RATE REDUCTION PERFORMANCE

Pre-Development and Post-Development Peak Runoff Results Summary for Study Area Laramie Road

	EXISTING RUNOFF RATE (CFS)	PROPOSED RUNOFF RATE (CFS)	TOTAL REDUCTION (CFS)
2-Year	2.801	2.765	0.036
10-Year	4.431	4.395	0.036
25-Year	5.589	5.555	0.034
100-Year	7.704	7.673	0.031

Pre-Development and Post-Development Peak Runoff Results Summary for Study Area Randolph Road

	EXISTING RUNOFF RATE (CFS)	PROPOSED RUNOFF RATE (CFS)	TOTAL REDUCTION (CFS)
2-Year	3.516	3.402	0.114
10-Year	5.550	5.428	0.122
25-Year	6.991	6.869	0.122
100-Year	9.617	9.499	0.118

The proposed redevelopment will reduce the overall impervious coverage and therefore, reduces the stormwater runoff volume and peak rate of runoff from the development for the 2, 10, 25 and 100 year storm events. As shown in the Hydrograph Summary Reports within the appendix of this report, the post development runoff hydrographs for this drainage area do not exceed at any point in time, the pre-development runoff hydrographs for the 2, 10, 25 and 100 year storms. Therefore, the overall development

satisfies the applicable stormwater criteria set forth in the City of Plainfield Land Use Ordinance and NJAC 7:8.

VII. WATER QUALITY

The subject redevelopment project does not result in a ¼ acre or more of new impervious coverage; and therefore, the State's Stormwater Runoff Water Quality Standards, set forth by NJAC 7:8, would not be applicable to this project.

VIII. GROUNDWATER RECHARGE

As previously stated, under proposed conditions, overall impervious coverage will be reduced; therefore, the proposed project meets groundwater recharge requirements.

IX. CONCLUSION

The proposed overall development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways, or adjacent parcels.

The proposed redevelopment reduces the overall impervious coverage and therefore, reduces the stormwater runoff volume and peak rate of runoff from the development for the 2, 10, 25 and 100 year storm events. With this stated, it is evident that the proposed development will not have a negative impact on the existing drainage pattern, water quality, or groundwater recharge on site or within the vicinity of the subject parcel.

APPENDIX

NRCS WEB SOIL SURVEY

Hydrologic Soil Group—Union County, New Jersey

Map Scale: 1:1,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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	0.2	4.9%
UR	Urban land		3.0	95.1%
Totals for Area of Interest			**3.2**	**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.

RUNOFF COEFFICIENT (CN) CALCULATIONS – EXISTING

DYNAMIC ENGINEERING

EXISTING DRAINAGE AREA SUMMARY AND AVERAGE CURVE NUMBER(CN) CALCULATIONS

Project: Proposed CVS
Job #: 2340-99-008
Location: Plainfield, NJ

Computed By: JV
Checked By: KK
Date: 2/14/2020

Drainage Area	Impervious Area (acre)	Impervious Area (sf)	Curve Number (CN) Used	HSG B - Open Space Area (acre)	HSG B - Open Space Area (sf)	Curve Number (CN) Used	HSG C - Open Space Area (acre)	HSG C - Open Space Area (sf)	Curve Number (CN) Used	Avg. Perv. Curve Number	Total PerviousArea (acres)	Total Area (acres)	TC (Min.)
SA Laramie Road	1.11	48,507	98	0.04	1,571	61	0.15	6,489	74	71	0.19	1.30	10
SA Randolph Road	1.38	60,180	98	0.00	-	61	0.23	9,926	74	74	0.23	1.61	10
Total	2.50	108587.00		0.04	1571.00		0.38	16415.00			0.41	2.91	

Per County Soil Survey -	BhpBr	HSG	B	Soil	Birdsboro - Urban Land
Per County Soil Survey -	UR	HSG	C	Soil	Urban Land

Description	Runoff Curve Number (CN) (HSG B)	Runoff Curve Number (CN) (HSG C)
Impervious Surface	98	98
Open Space (lawn) (good)	61	74
Woods (good)	55	70

RUNOFF COEFFICIENT (CN) CALCULATIONS – PROPOSED

DYNAMIC ENGINEERING

PROPOSED DRAINAGE AREA SUMMARY AND AVERAGE CURVE NUMBER(CN) CALCULATIONS

Project: Proposed CVS
Job #: 2340-99-008
Location: Plainfield, NJ

Computed By: JV
Checked By: KK
Date: 2/14/2020

Drainage Area	Impervious Area (acre)	Impervious Area (sf)	Curve Number (CN) Used	HSG B - Open Space Area (acre)	HSG B - Open Space Area (sf)	Curve Number (CN) Used	HSG C - Open Space Area (acre)	HSG C - Open Space Area (sf)	Curve Number (CN) Used	Avg. Perv. Curve Number	Total PerviousArea (acres)	Total Area (acres)	TC (Min.)
SA Laramie Road	1.08	46,934	98	0.04	1,571	61	0.19	8,093	74	72	0.22	1.30	10
SA Randolph Road	1.30	56,483	98	0.00	-	61	0.31	13,592	74	74	0.31	1.61	10
Total	2.37	103417.00		0.04	1571.00		0.50	21685.00			0.53	2.91	

Per County Soil Survey -	BhpBr	HSG	B	Soil	Birdsboro - Urban Land
Per County Soil Survey -	UR	HSG	C	Soil	Urban Land

Description	Runoff Curve Number (CN) (HSG B)	Runoff Curve Number (CN) (HSG C)
Impervious Surface	98	98
Open Space (lawn) (good)	61	74
Woods (good)	55	70

HYDROGRAPH SUMMARY REPORTS – EXISTING AND PROPOSED CONDITIONS 2 YR. 10 YR. 25 YR & 100 YR.

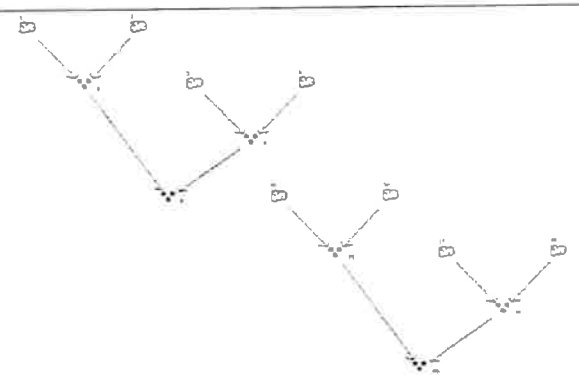
Hydraflow Table of Contents

Ex and Prop 2, 10, 25 & 100.gpw

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Feb 14, 2020

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Ex SA Laramine Road (Imp)
2	SCS Runoff	Ex SA Laramie Road (Perv)
3	Combine	Ex SA Laramie Road - Total
5	SCS Runoff	Ex SA Randolph Road (Imp)
6	SCS Runoff	Ex SA Randolph Road (Perv)
7	Combine	Ex SA Randolph Road - Total
9	Combine	Ex Total
11	SCS Runoff	Prop SA Laramie Road (Imp)
12	SCS Runoff	Prop SA Laramie Road (Perv)
13	Combine	Prop SA Laramie Road - Total
15	SCS Runoff	Prop SA Randolph Road (Imp)
16	SCS Runoff	Prop SA Randolph Road (Perv)
17	Combine	Prop SA Randolph Road - Total
19	Combine	Prop Total

Hydrograph Return Period Recap

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	----	----	2.650	----	----	4.069	5.062	----	6.883	Ex SA Laramine Road (Imp)
2	SCS Runoff	----	----	0.151	----	----	0.363	0.527	----	0.841	Ex SA Laramie Road (Perv)
3	Combine	1, 2	----	2.801	----	----	4.431	5.589	----	7.704	Ex SA Laramie Road - Total
5	SCS Runoff	----	----	3.295	----	----	5.058	6.293	----	8.532	Ex SA Randolph Road (Imp)
6	SCS Runoff	----	----	0.221	----	----	0.492	0.698	----	1.085	Ex SA Randolph Road (Perv)
7	Combine	5, 6	----	3.516	----	----	5.550	6.991	----	9.617	Ex SA Randolph Road - Total
9	Combine	3, 7,	----	6.317	----	----	9.982	12.58	----	17.32	Ex Total
11	SCS Runoff	----	----	2.579	----	----	3.959	4.925	----	6.677	Prop SA Laramie Road (Imp)
12	SCS Runoff	----	----	0.187	----	----	0.437	0.630	----	0.996	Prop SA Laramie Road (Perv)
13	Combine	11, 12	----	2.785	----	----	4.395	5.555	----	7.673	Prop SA Laramie Road - Total
15	SCS Runoff	----	----	3.104	----	----	4.785	5.928	----	8.037	Prop SA Randolph Road (Imp)
16	SCS Runoff	----	----	0.298	----	----	0.663	0.940	----	1.462	Prop SA Randolph Road (Perv)
17	Combine	15, 16	----	3.402	----	----	5.428	6.869	----	9.499	Prop SA Randolph Road - Total
19	Combine	13, 17,	----	6.187	----	----	9.823	12.42	----	17.17	Prop Total

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	2.650	5	730	11,925	—	----	----	Ex SA Laramine Road (Imp)
2	SCS Runoff	0.151	5	730	843	—	----	----	Ex SA Laramie Road (Perv)
3	Combine	2.801	5	730	12,568	1, 2	----	----	Ex SA Laramie Road - Total
5	SCS Runoff	3.295	5	730	14,625	—	----	----	Ex SA Randolph Road (Imp)
6	SCS Runoff	0.221	5	730	912	—	----	----	Ex SA Randolph Road (Perv)
7	Combine	3.516	5	730	15,737	5, 6	----	----	Ex SA Randolph Road - Total
9	Combine	6.317	5	730	28,305	3, 7,	----	----	Ex Total
11	SCS Runoff	2.579	5	730	11,802	—	----	----	Prop SA Laramie Road (Imp)
12	SCS Runoff	0.187	5	730	786	—	----	----	Prop SA Laramie Road (Perv)
13	Combine	2.765	5	730	12,368	11, 12	----	----	Prop SA Laramie Road - Total
15	SCS Runoff	3.104	5	730	13,986	—	----	----	Prop SA Randolph Road (Imp)
16	SCS Runoff	0.298	5	730	1,229	—	----	----	Prop SA Randolph Road (Perv)
17	Combine	3.402	5	730	15,195	15, 16	----	----	Prop SA Randolph Road - Total
19	Combine	6.167	5	730	27,583	13, 17,	----	----	Prop Total

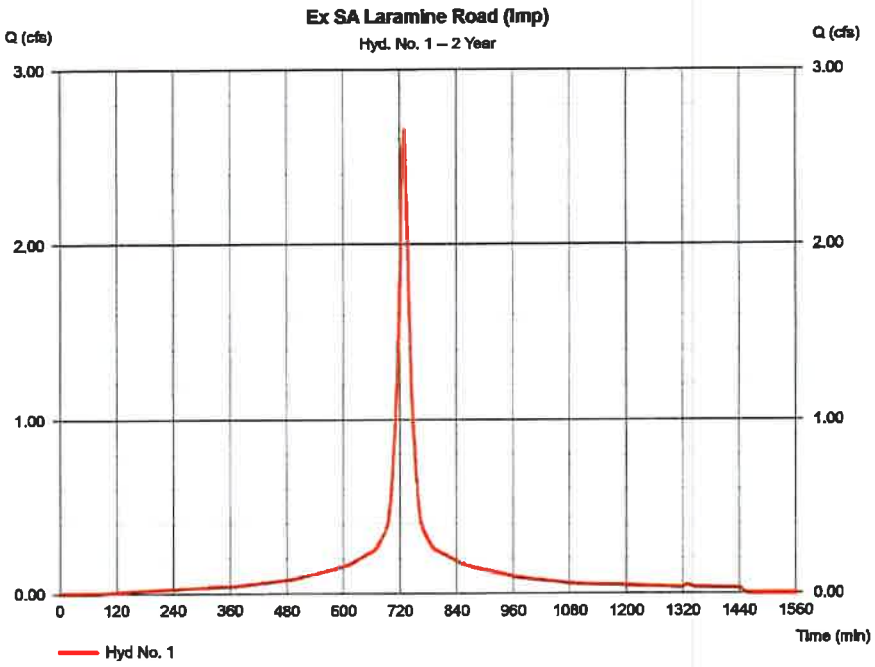
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1 — Friday, Feb 14, 2020

Hyd. No. 1

Ex SA Laramine Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.650 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 11,925 cuft
Drainage area	= 1.110 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

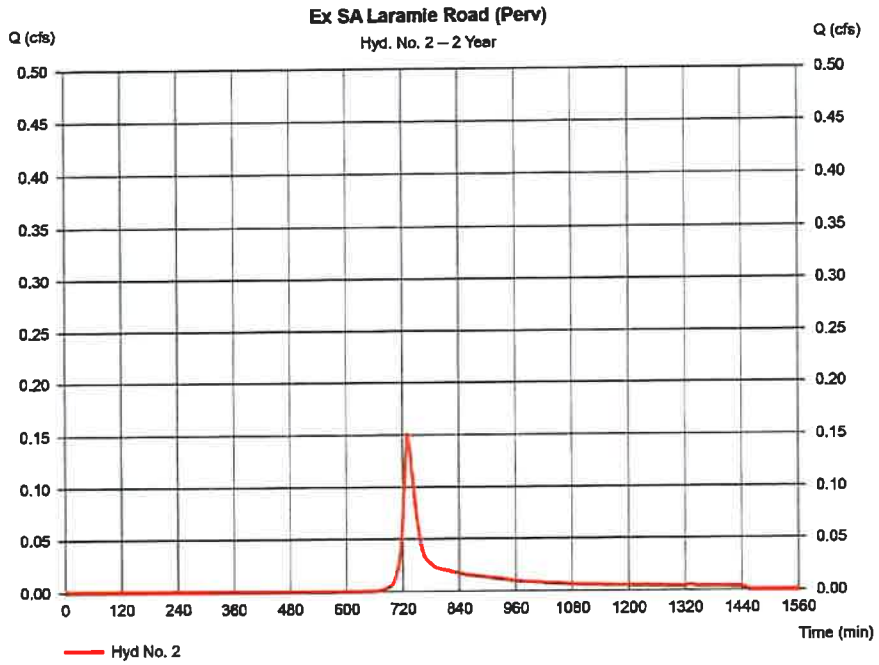


Hydrograph Report

Hyd. No. 2

Ex SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.151 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 643 cuft
Drainage area	= 0.190 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

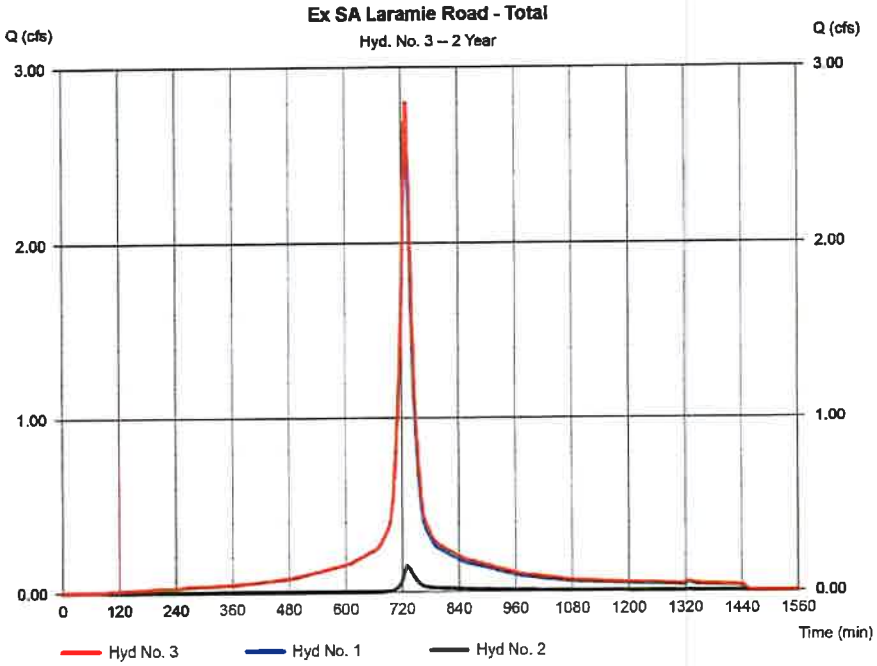


Hydrograph Report

Hyd. No. 3

Ex SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 2.801 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 12,568 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.300 ac

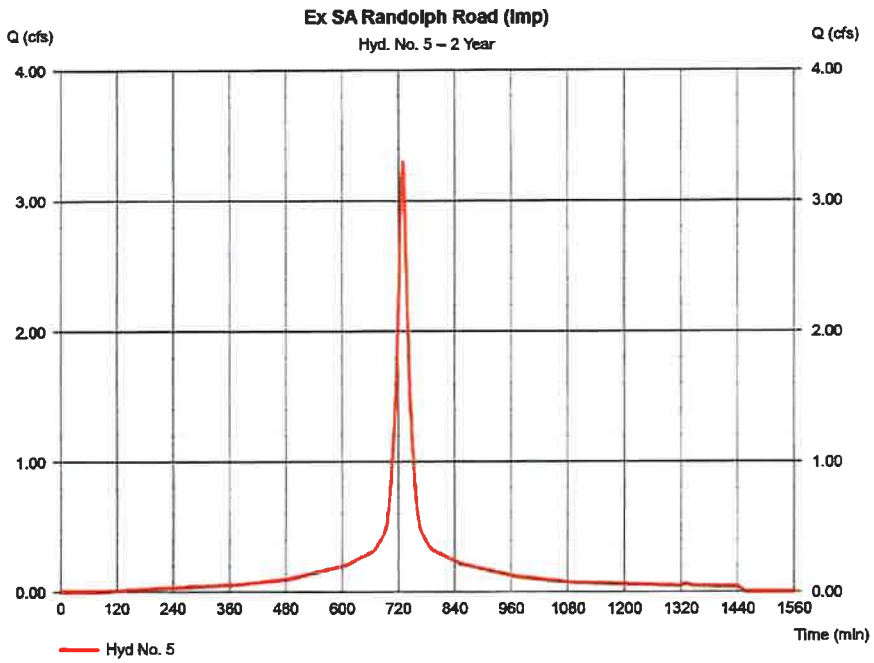


Hydrograph Report

Hyd. No. 5

Ex SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 3.295 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 14,825 cuft
Drainage area	= 1.380 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

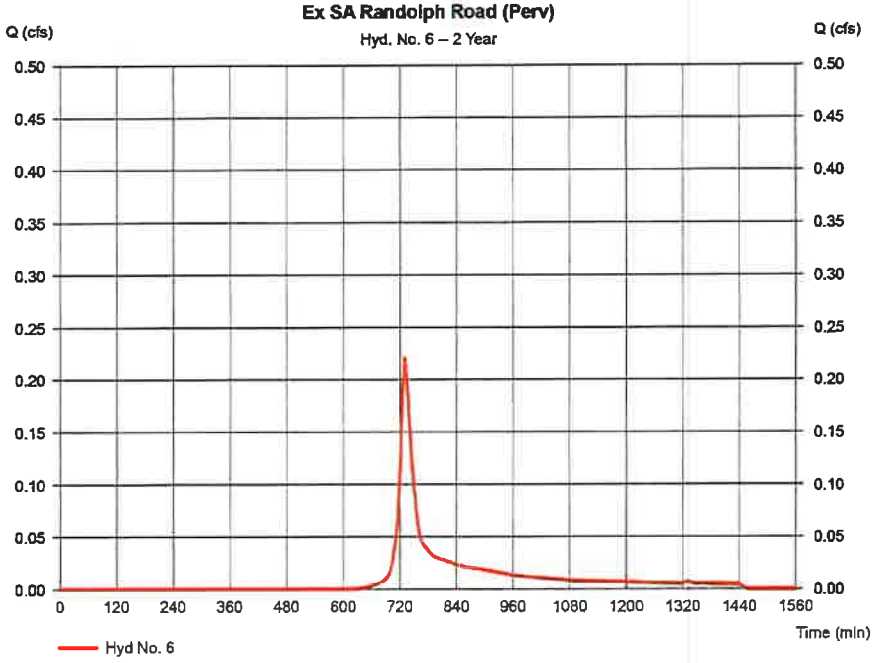


Hydrograph Report

Hyd. No. 6

Ex SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.221 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 912 cuft
Drainage area	= 0.230 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

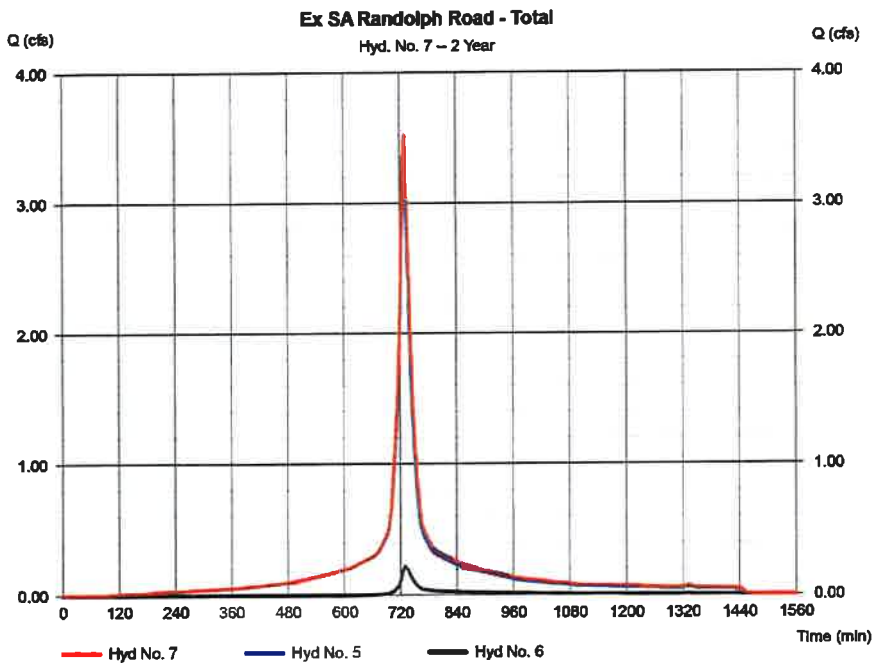


Hydrograph Report

Hyd. No. 7

Ex SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 3.516 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 15,737 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 1.610 ac

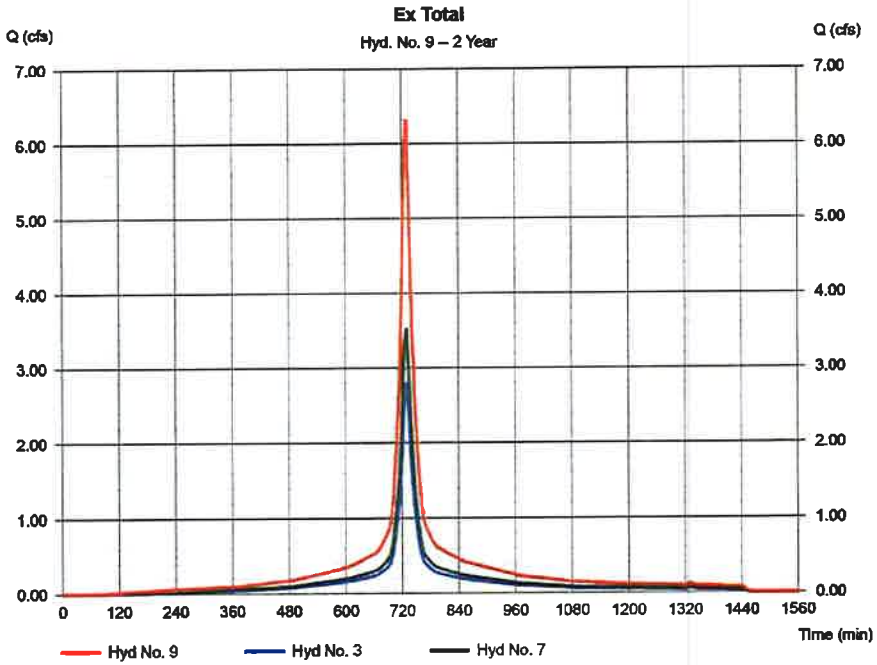


Hydrograph Report

Hyd. No. 9

Ex Total

Hydrograph type	= Combine	Peak discharge	= 6.317 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 28,305 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.000 ac

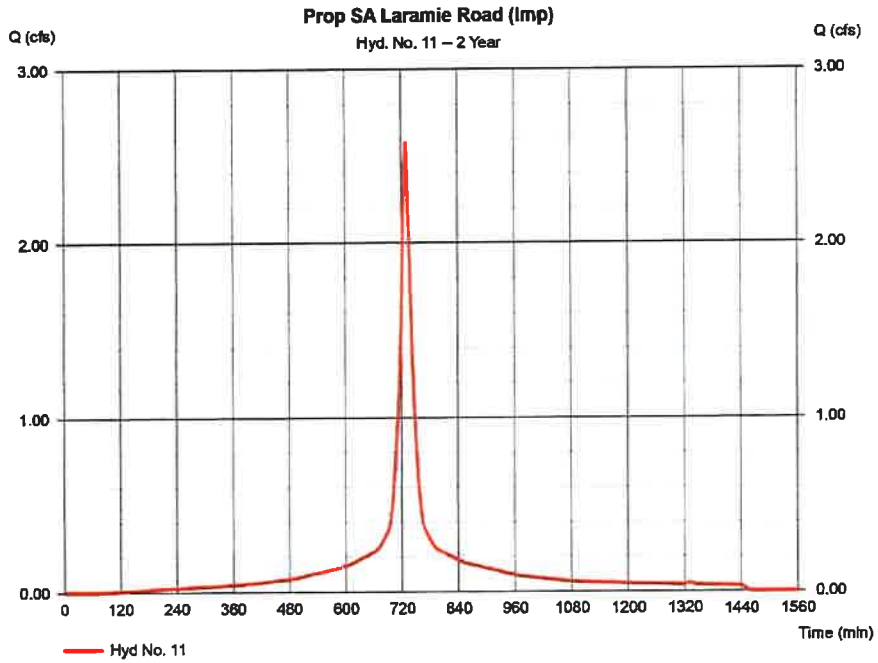


Hydrograph Report

Hyd. No. 11

Prop SA Laramie Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.579 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 11,602 cuft
Drainage area	= 1.080 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

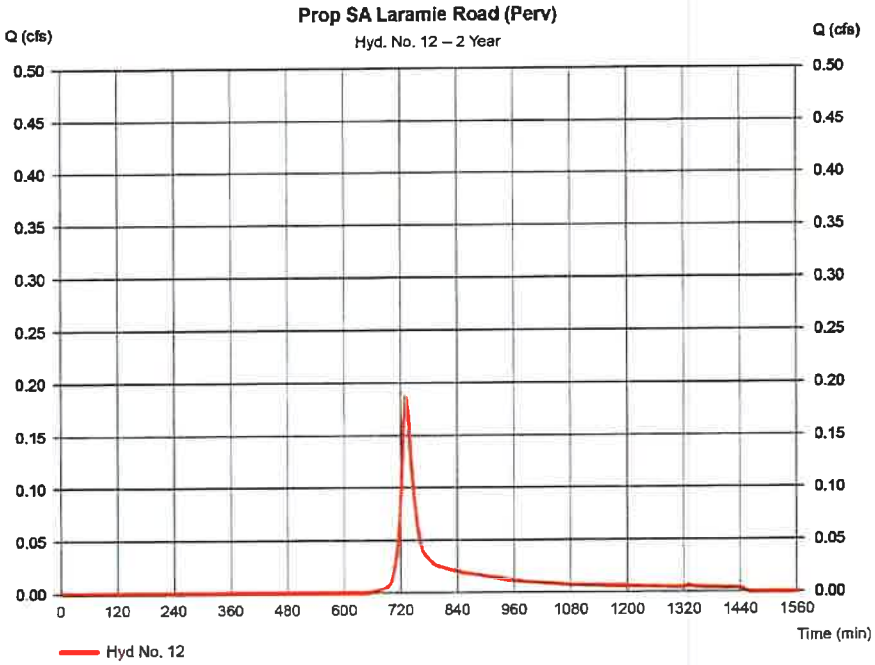


Hydrograph Report

Hyd. No. 12

Prop SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.187 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 786 cuft
Drainage area	= 0.220 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

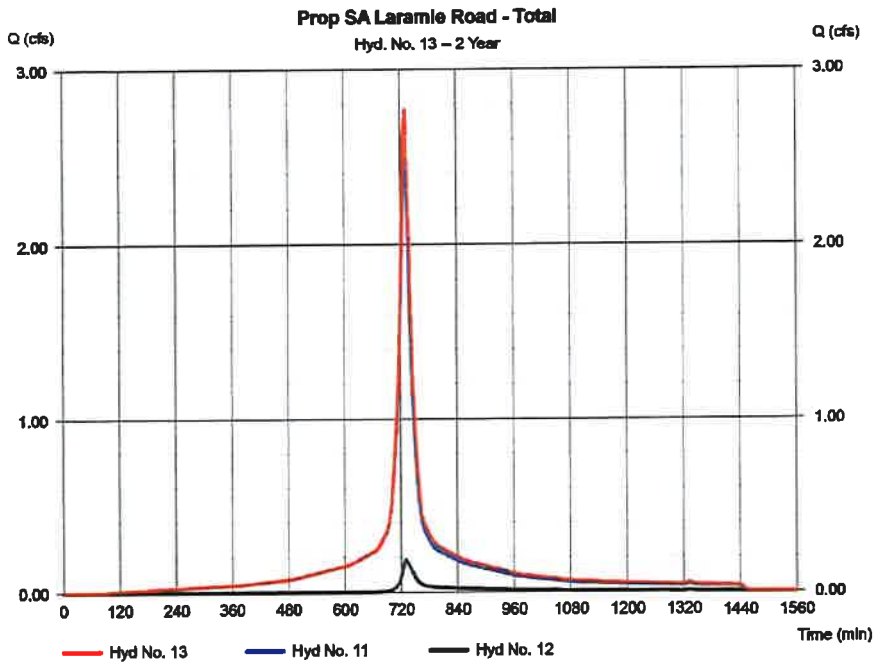


Hydrograph Report

Hyd. No. 13

Prop SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 2.765 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 12,388 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 1.300 ac

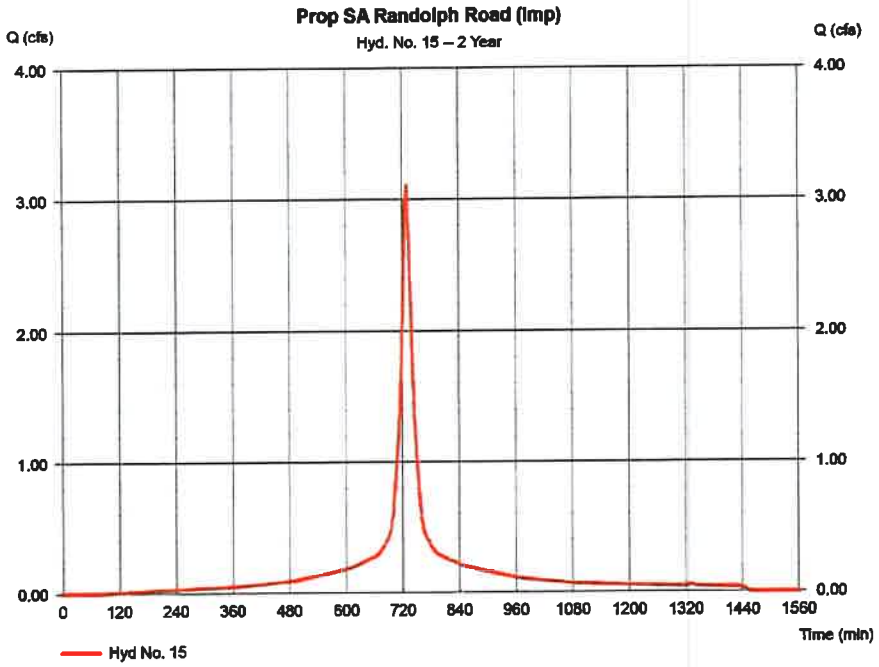


Hydrograph Report

Hyd. No. 15

Prop SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 3.104 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 13,966 cuft
Drainage area	= 1.300 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

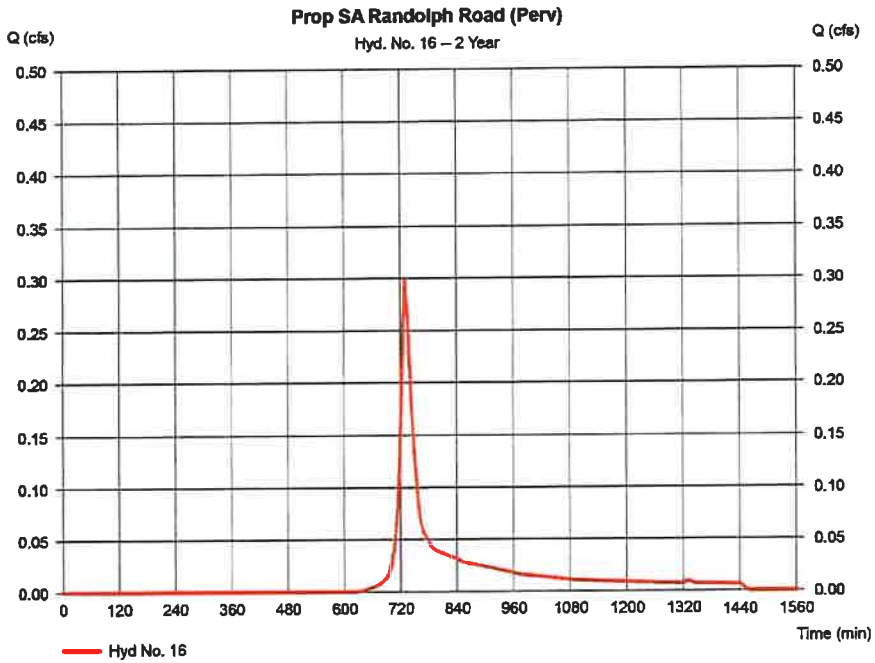


Hydrograph Report

Hyd. No. 16

Prop SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.298 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,229 cuft
Drainage area	= 0.310 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

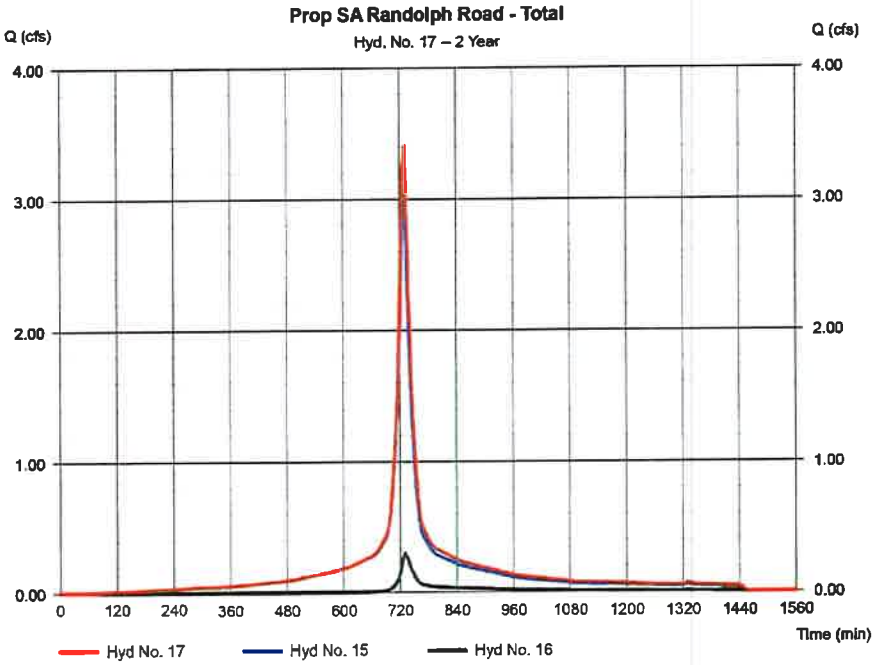


Hydrograph Report

Hyd. No. 17

Prop SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 3.402 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 15,195 cuft
Inflow hyds.	= 15, 16	Contrib. drain. area	= 1.610 ac

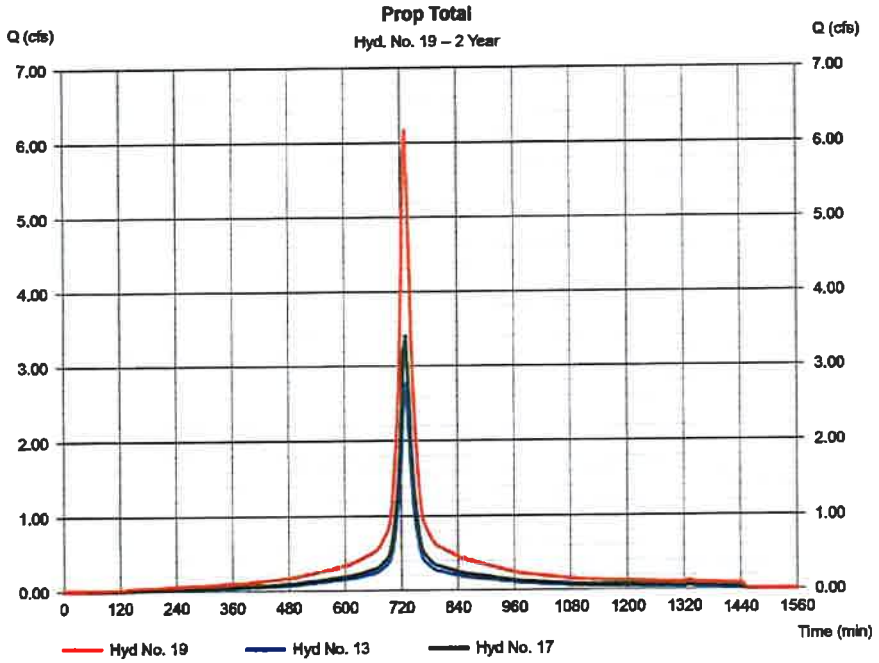


Hydrograph Report

Hyd. No. 19

Prop Total

Hydrograph type	= Combine	Peak discharge	= 6.167 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 27,583 cuft
Inflow hyds.	= 13, 17	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

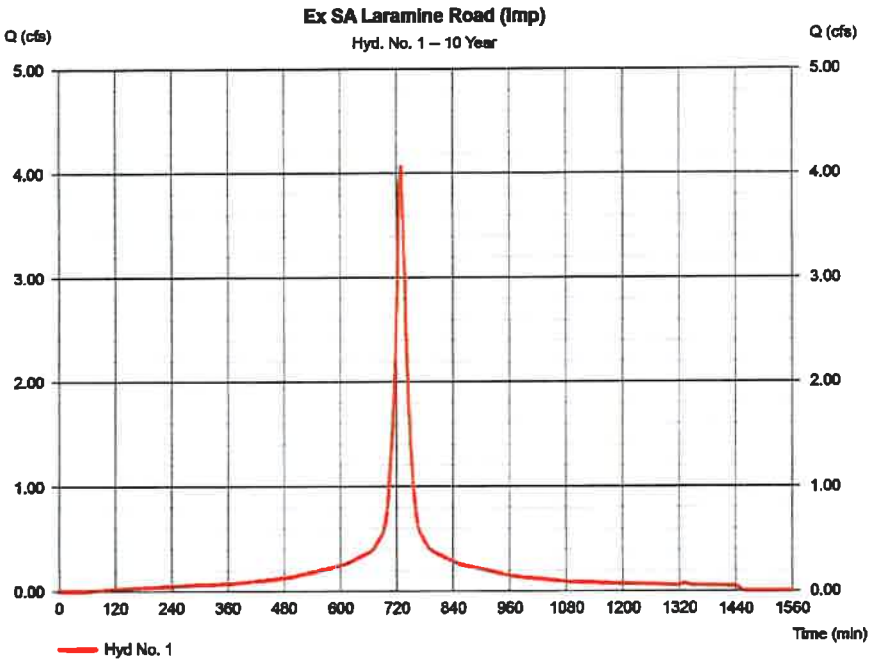
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	4.089	5	730	18,634	—	—	—	Ex SA Laramie Road (Imp)
2	SCS Runoff	0.363	5	730	1,452	—	—	—	Ex SA Laramie Road (Perv)
3	Combine	4.431	5	730	20,086	1, 2	—	—	Ex SA Laramie Road - Total
5	SCS Runoff	5.058	5	730	23,166	—	—	—	Ex SA Randolph Road (Imp)
6	SCS Runoff	0.482	5	730	1,957	—	—	—	Ex SA Randolph Road (Perv)
7	Combine	5.550	5	730	25,124	5, 6	—	—	Ex SA Randolph Road - Total
9	Combine	9.982	5	730	45,210	3, 7,	—	—	Ex Total
11	SCS Runoff	3.959	5	730	18,130	—	—	—	Prop SA Laramie Road (Imp)
12	SCS Runoff	0.437	5	730	1,744	—	—	—	Prop SA Laramie Road (Perv)
13	Combine	4.395	5	730	19,874	11, 12	—	—	Prop SA Laramie Road - Total
15	SCS Runoff	4.765	5	730	21,823	—	—	—	Prop SA Randolph Road (Imp)
16	SCS Runoff	0.663	5	730	2,638	—	—	—	Prop SA Randolph Road (Perv)
17	Combine	5.428	5	730	24,461	15, 16	—	—	Prop SA Randolph Road - Total
19	Combine	9.823	5	730	44,336	13, 17,	—	—	Prop Total

Hydrograph Report

Hyd. No. 1

Ex SA Laramine Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 4.069 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 18,634 cuft
Drainage area	= 1.110 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

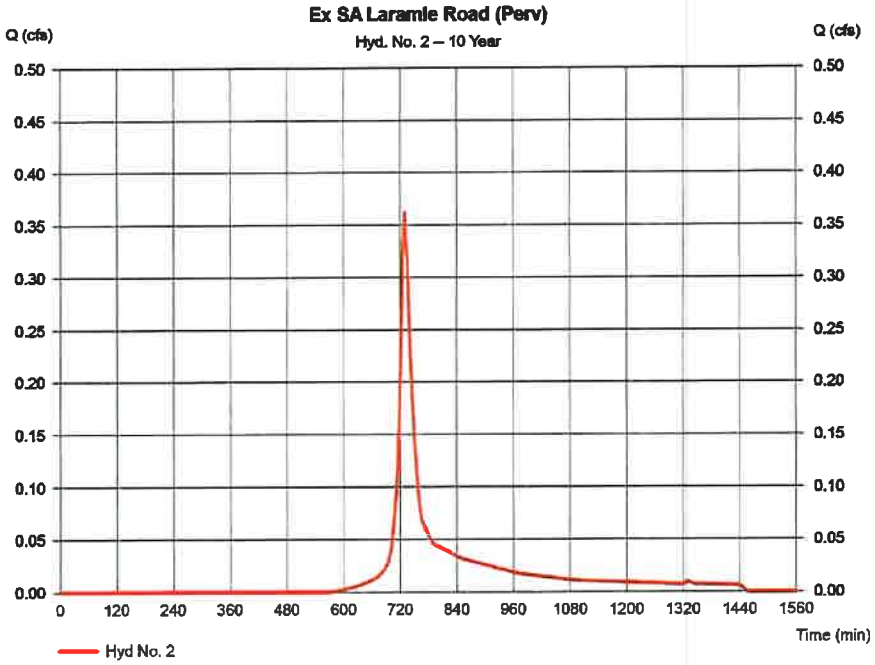


Hydrograph Report

Hyd. No. 2

Ex SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.363 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,452 cuft
Drainage area	= 0.190 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

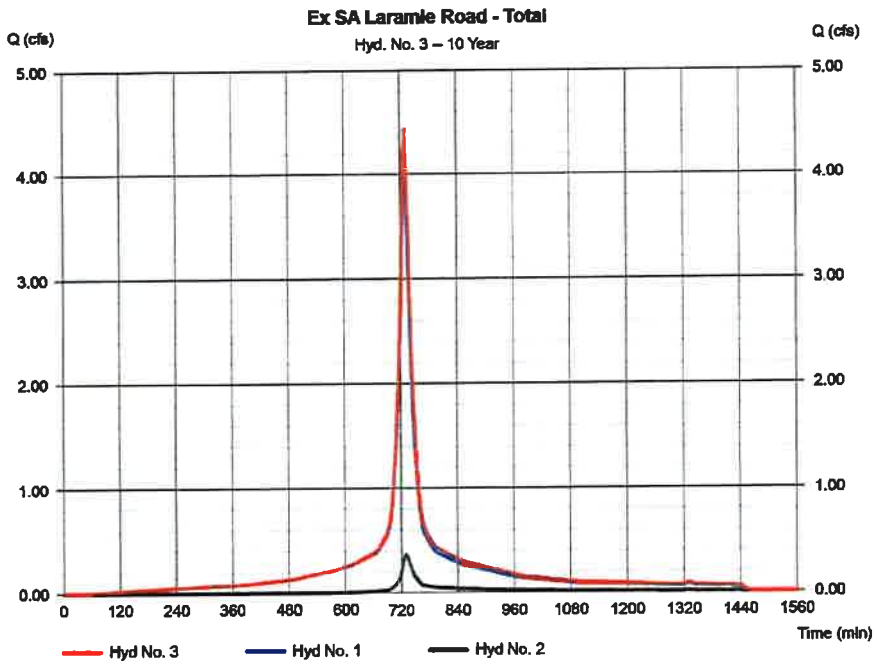


Hydrograph Report

Hyd. No. 3

Ex SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 4.431 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 20,086 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.300 ac

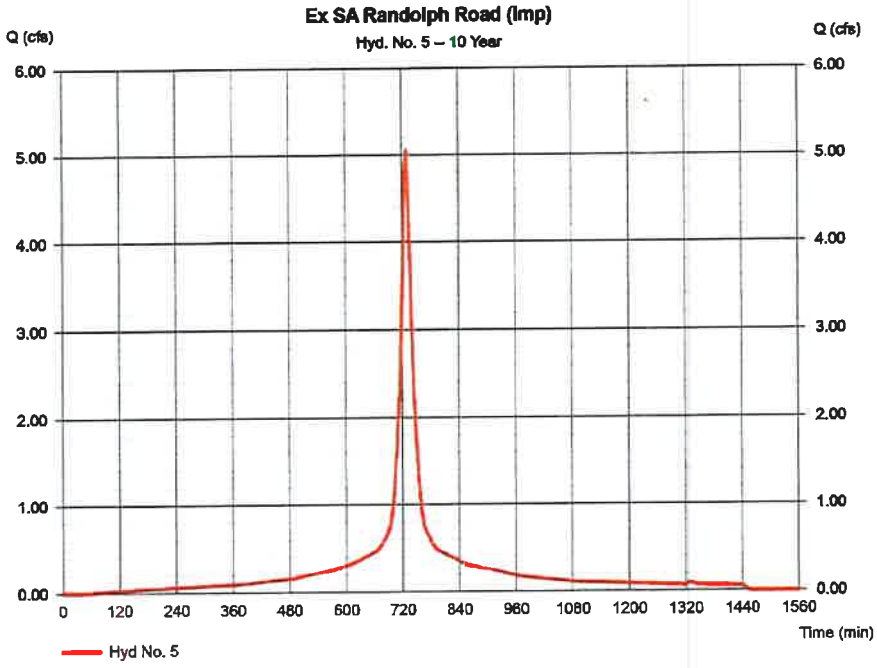


Hydrograph Report

Hyd. No. 5

Ex SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.058 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 23,166 cuft
Drainage area	= 1.380 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

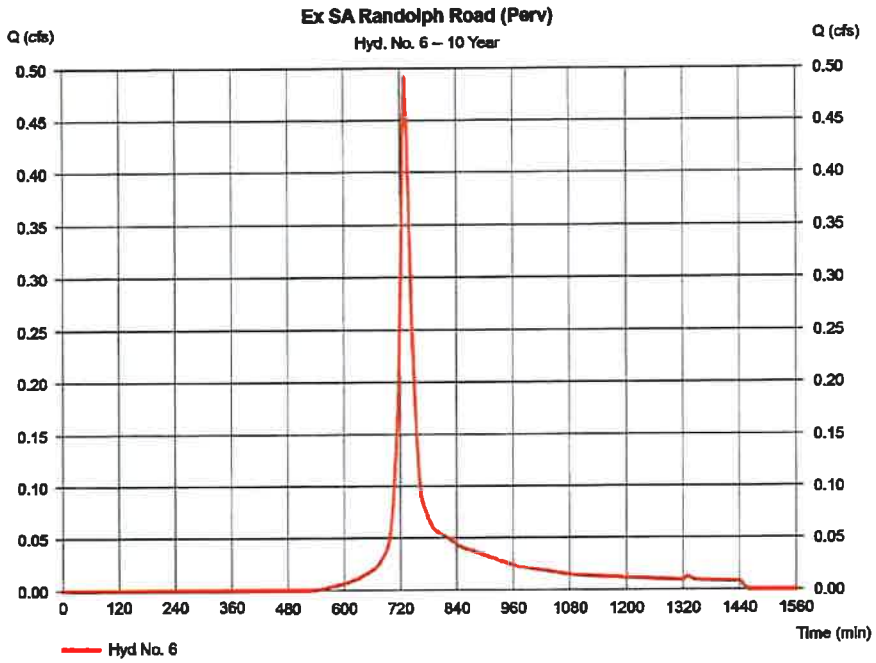


Hydrograph Report

Hyd. No. 6

Ex SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.492 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,957 cuft
Drainage area	= 0.230 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

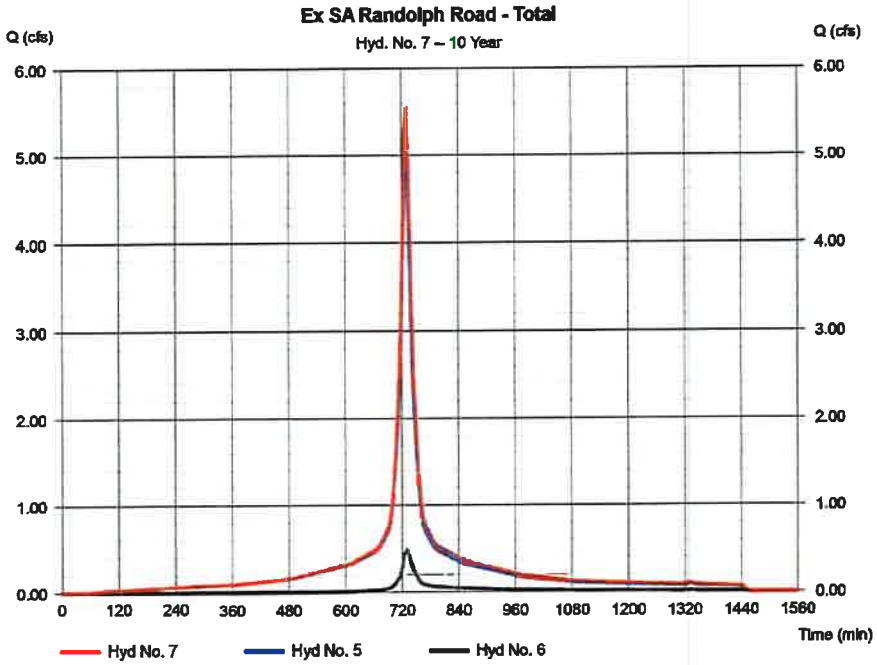


Hydrograph Report

Hyd. No. 7

Ex SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 5.550 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 25,124 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 1.610 ac

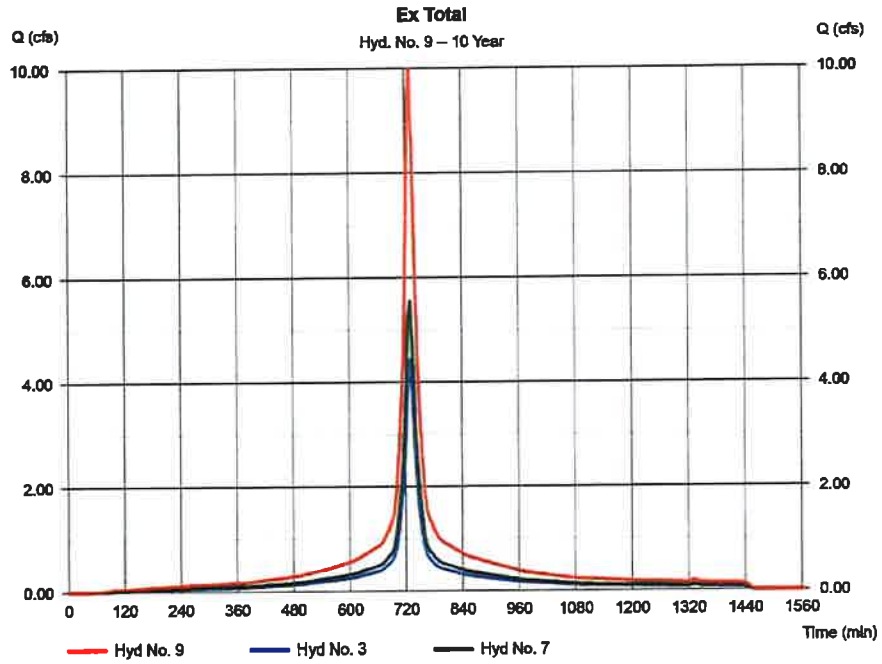


Hydrograph Report

Hyd. No. 9

Ex Total

Hydrograph type	= Combine	Peak discharge	= 9.982 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 45,210 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.000 ac

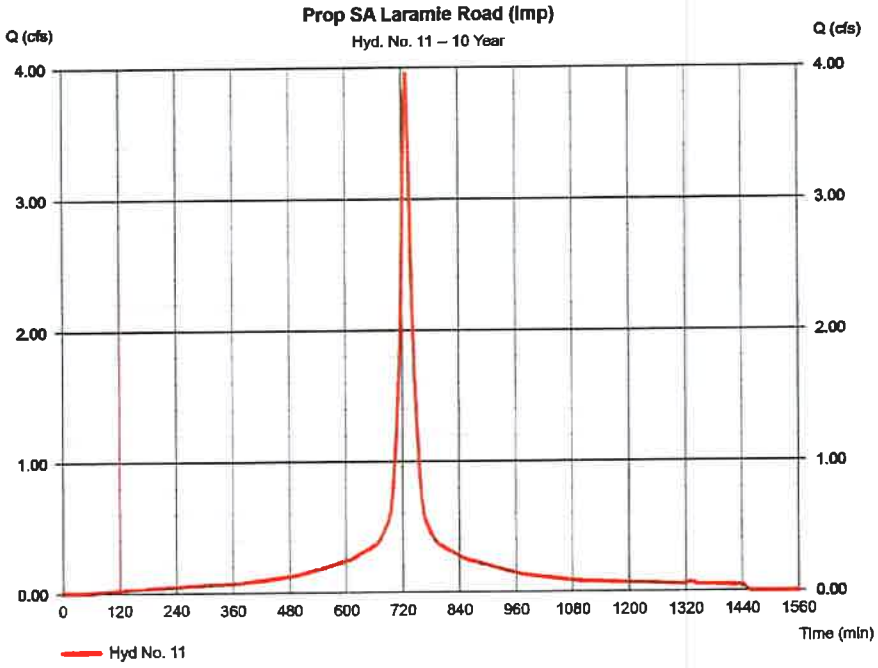


Hydrograph Report

Hyd. No. 11

Prop SA Laramie Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 3.959 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 18,130 cuft
Drainage area	= 1.080 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

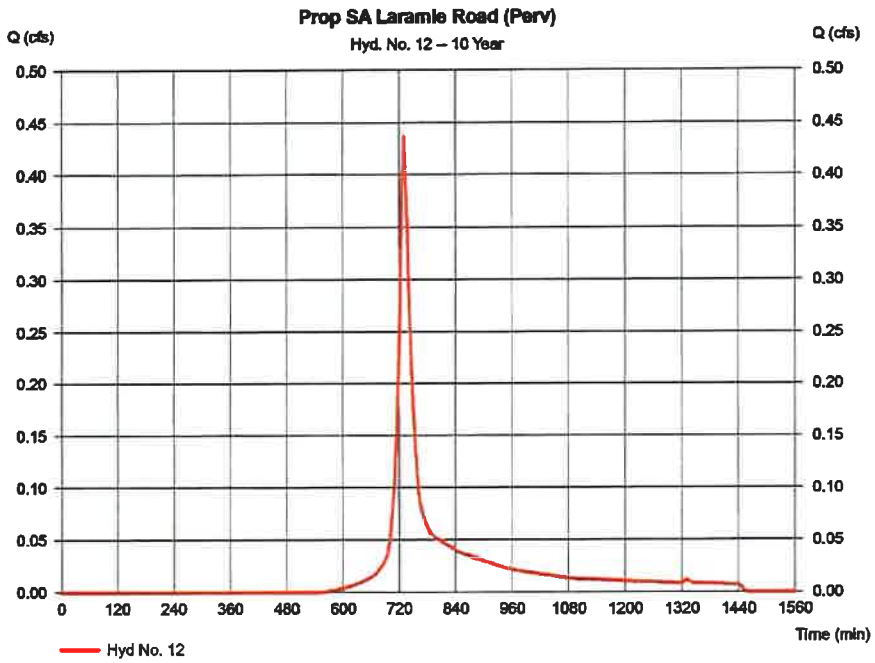


Hydrograph Report

Hyd. No. 12

Prop SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.437 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,744 cuft
Drainage area	= 0.220 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

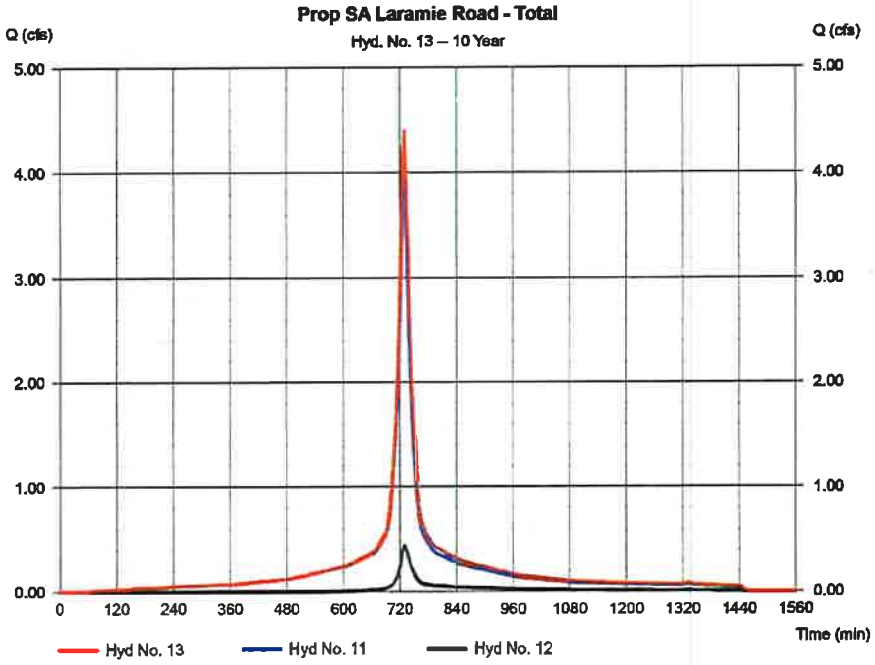


Hydrograph Report

Hyd. No. 13

Prop SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 4.395 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 19,874 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 1.300 ac

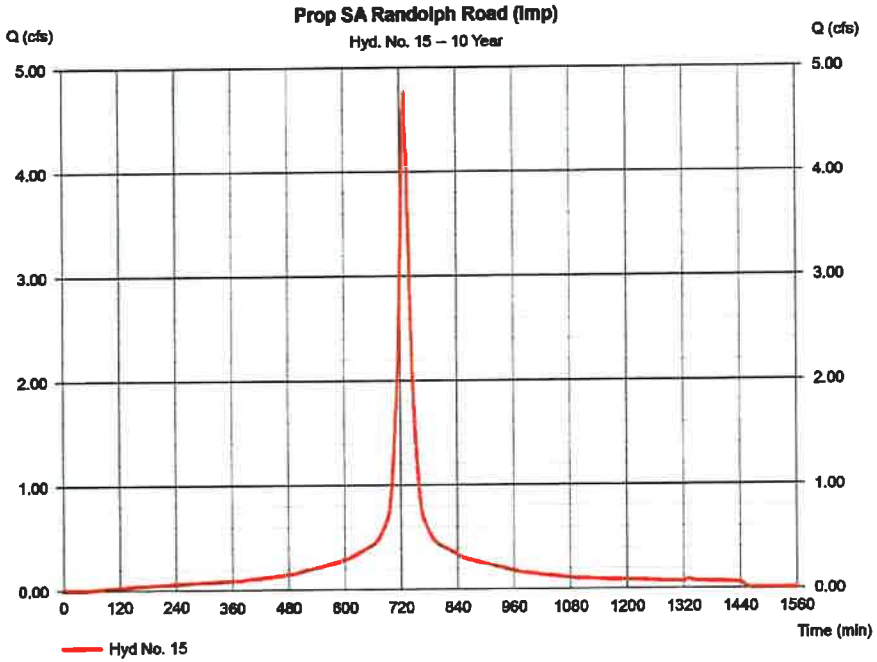


Hydrograph Report

Hyd. No. 15

Prop SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 4.765 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 21,823 cuft
Drainage area	= 1.300 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

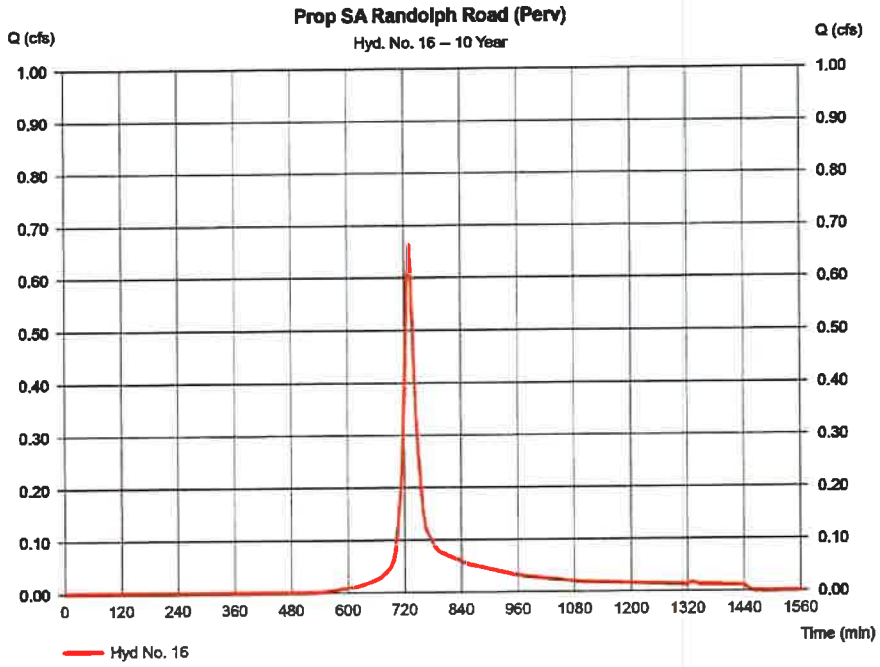


Hydrograph Report

Hyd. No. 16

Prop SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.663 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,638 cuft
Drainage area	= 0.310 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

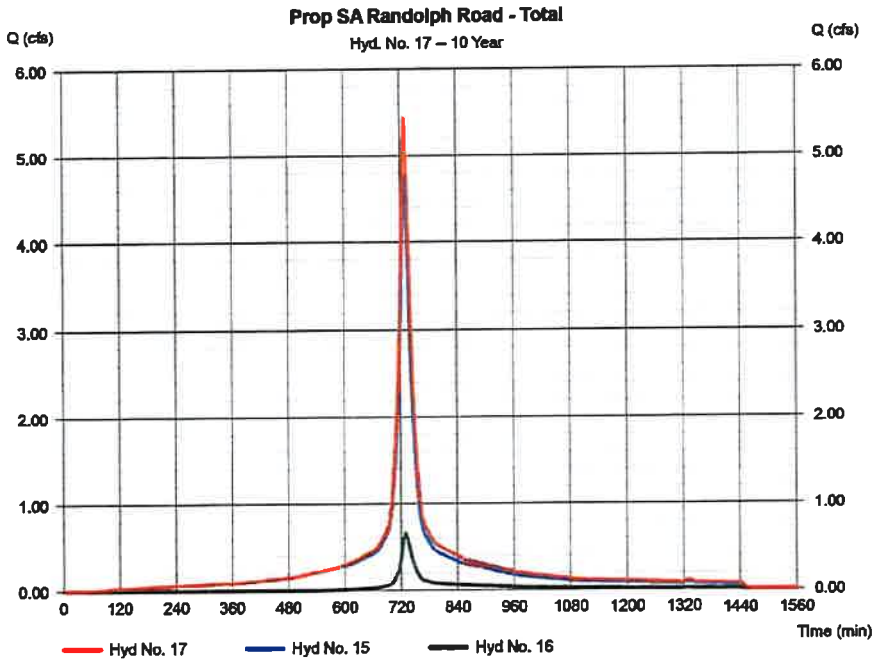


Hydrograph Report

Hyd. No. 17

Prop SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 5.428 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 24,461 cuft
Inflow hyds.	= 15, 16	Contrib. drain. area	= 1.610 ac

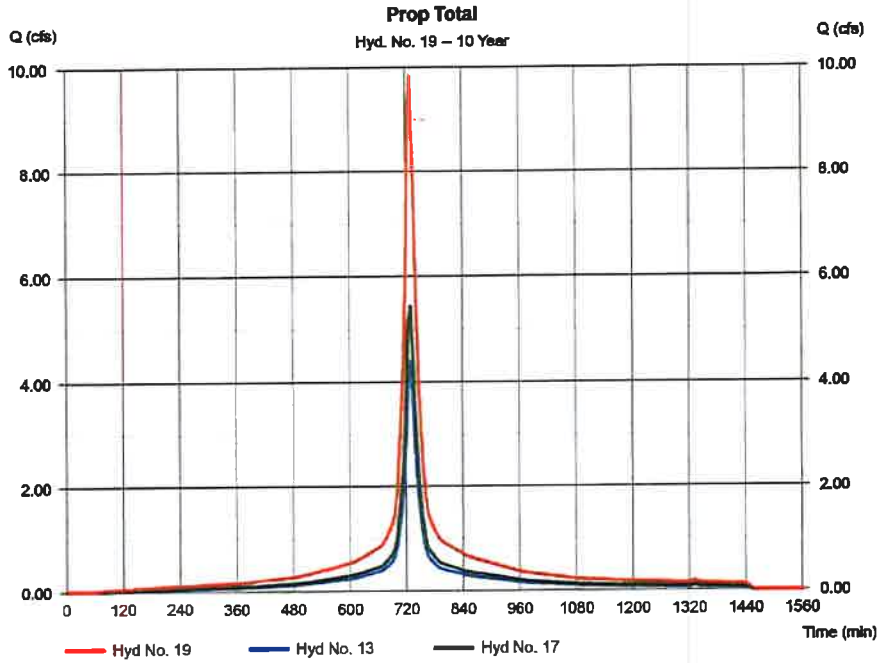


Hydrograph Report

Hyd. No. 19

Prop Total

Hydrograph type	= Combine	Peak discharge	= 9.823 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 44,336 cuft
Inflow hyds.	= 13, 17	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

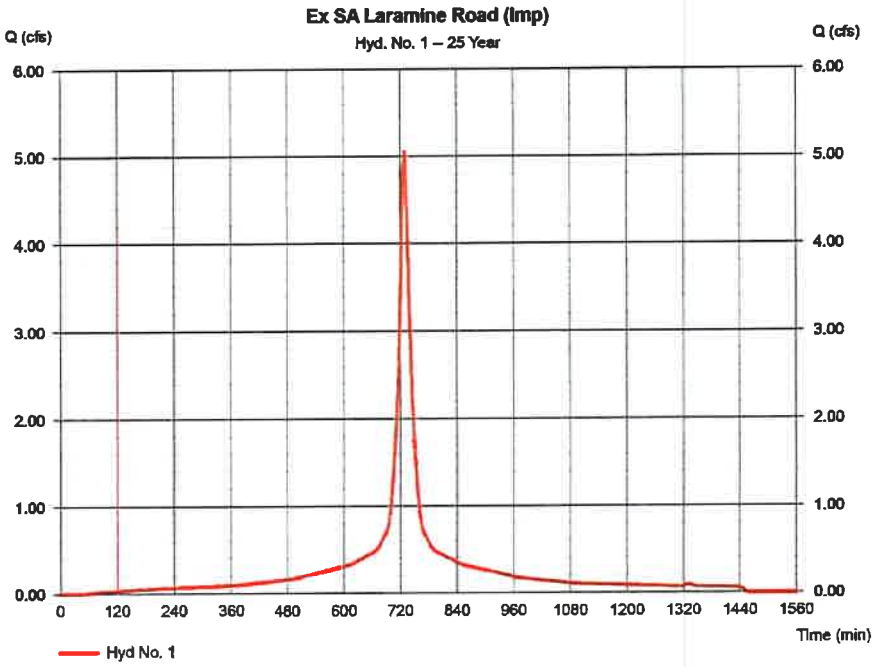
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.062	5	730	23,350	—	—	—	Ex SA Laramine Road (Imp)
2	SCS Runoff	0.527	5	730	2,095	—	—	—	Ex SA Laramie Road (Perv)
3	Combine	5.569	5	730	25,445	1, 2	—	—	Ex SA Laramie Road - Total
5	SCS Runoff	8.293	5	730	29,030	—	—	—	Ex SA Randolph Road (Imp)
6	SCS Runoff	0.698	5	730	2,772	—	—	—	Ex SA Randolph Road (Perv)
7	Combine	8.991	5	730	31,802	5, 6	—	—	Ex SA Randolph Road - Total
9	Combine	12.58	5	730	57,247	3, 7,	—	—	Ex Total
11	SCS Runoff	4.925	5	730	22,719	—	—	—	Prop SA Laramie Road (Imp)
12	SCS Runoff	0.630	5	730	2,501	—	—	—	Prop SA Laramie Road (Perv)
13	Combine	5.555	5	730	25,220	11, 12	—	—	Prop SA Laramie Road - Total
15	SCS Runoff	5.928	5	730	27,347	—	—	—	Prop SA Randolph Road (Imp)
16	SCS Runoff	0.940	5	730	3,736	—	—	—	Prop SA Randolph Road (Perv)
17	Combine	6.869	5	730	31,083	15, 16	—	—	Prop SA Randolph Road - Total
19	Combine	12.42	5	730	56,302	13, 17,	—	—	Prop Total

Hydrograph Report

Hyd. No. 1

Ex SA Laramine Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.062 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 23,350 cuft
Drainage area	= 1.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

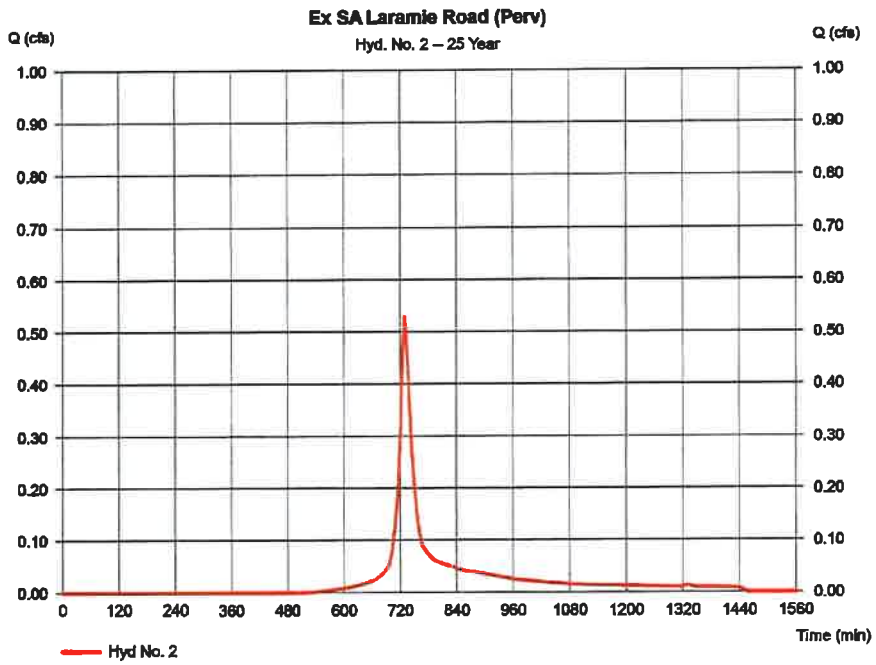


Hydrograph Report

Hyd. No. 2

Ex SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.527 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,095 cuft
Drainage area	= 0.190 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

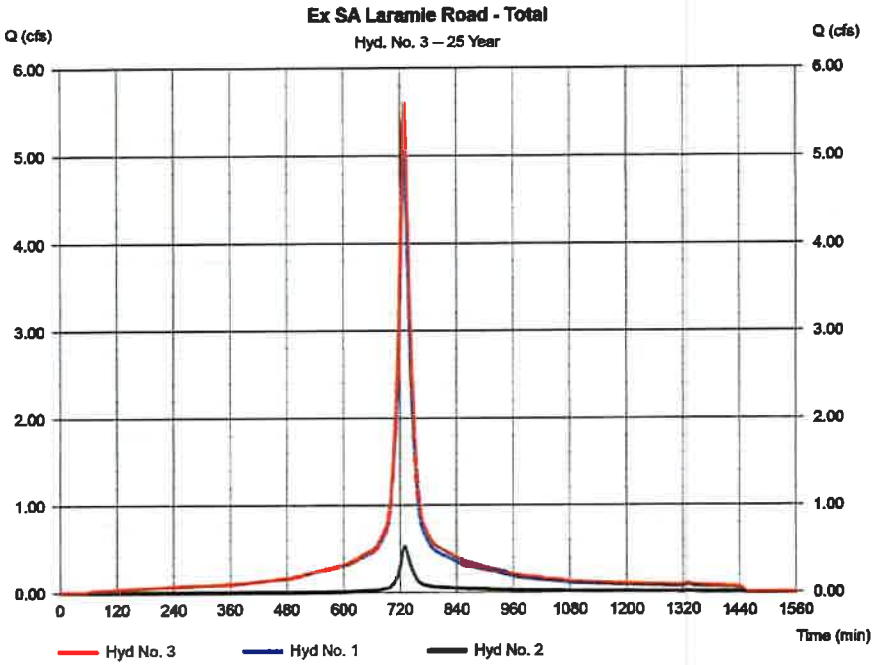


Hydrograph Report

Hyd. No. 3

Ex SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 5.589 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 25,445 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.300 ac

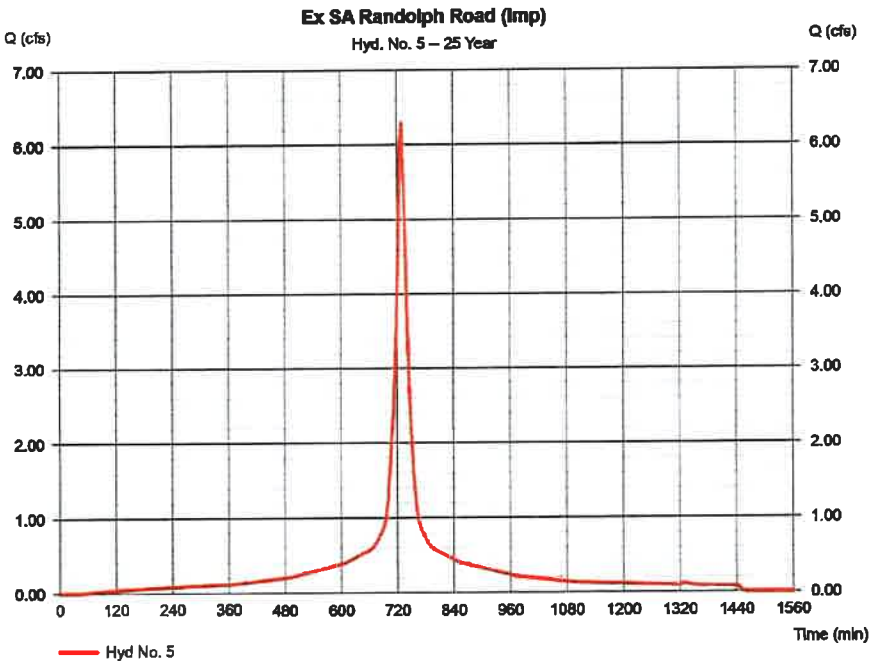


Hydrograph Report

Hyd. No. 5

Ex SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 6.293 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 29,030 cuft
Drainage area	= 1.380 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

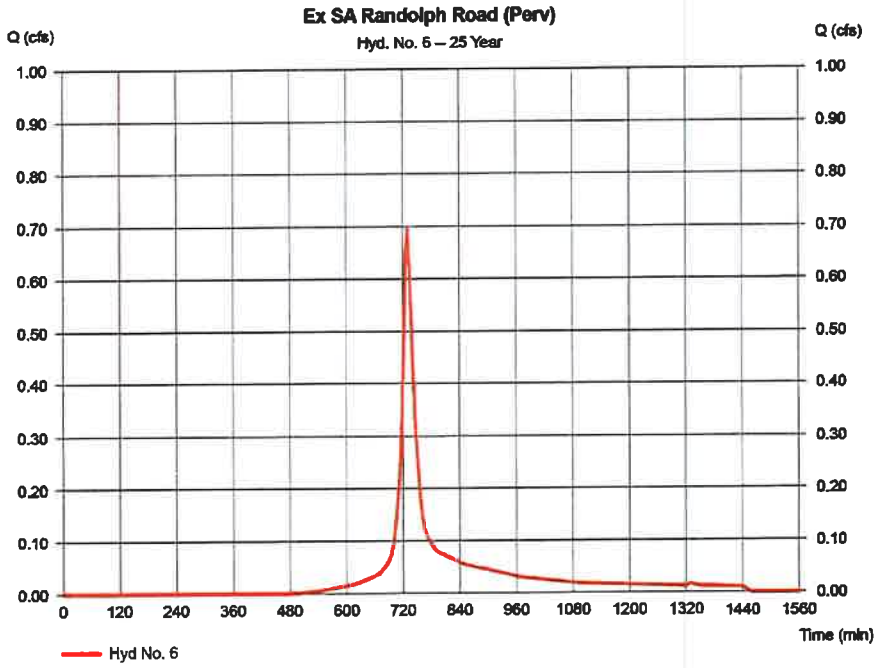


Hydrograph Report

Hyd. No. 6

Ex SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.698 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,772 cuft
Drainage area	= 0.230 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

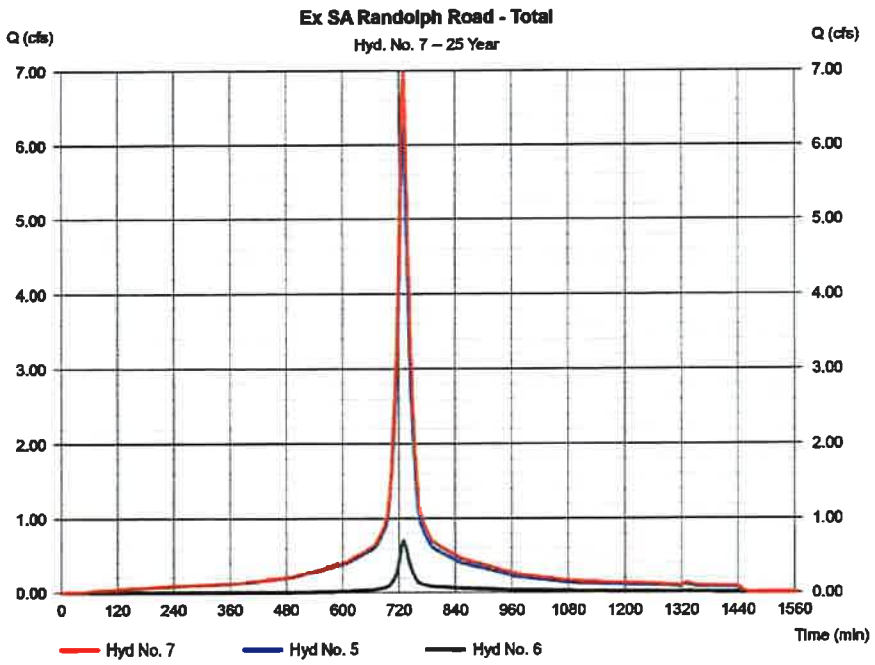


Hydrograph Report

Hyd. No. 7

Ex SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 6.991 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 31,802 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 1.610 ac

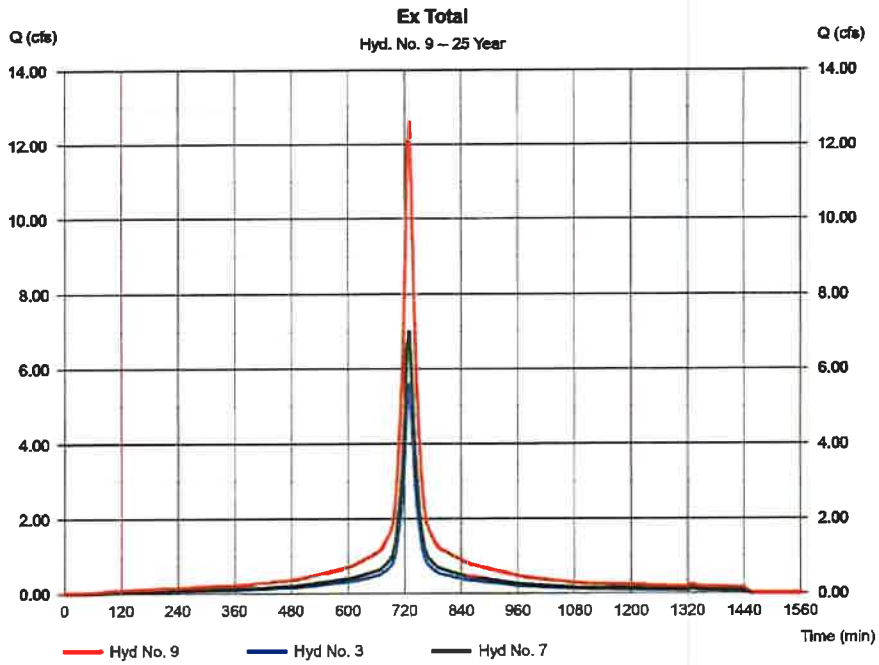


Hydrograph Report

Hyd. No. 9

Ex Total

Hydrograph type	= Combine	Peak discharge	= 12.58 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 57,247 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.000 ac

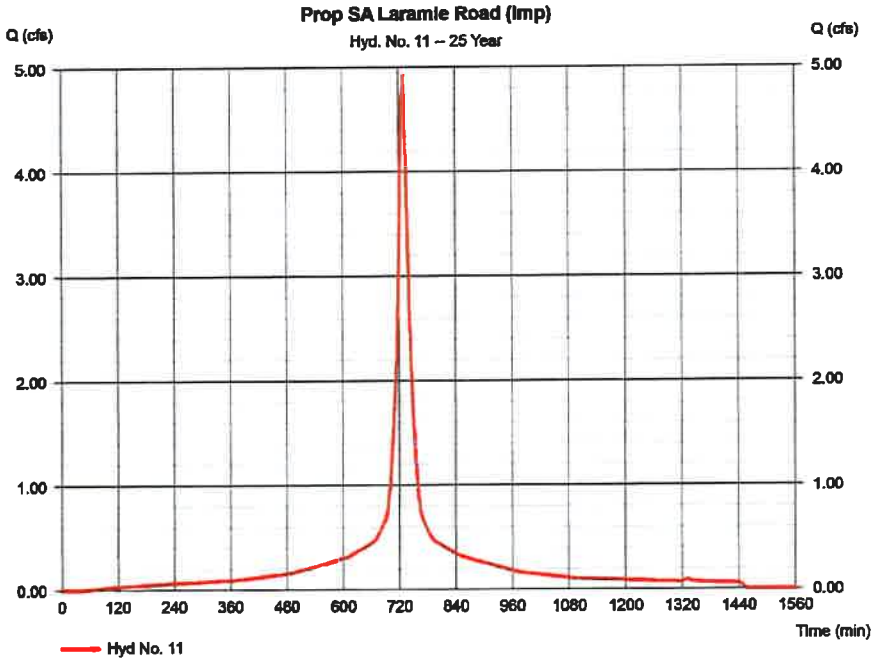


Hydrograph Report

Hyd. No. 11

Prop SA Laramie Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 4.925 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 22,719 cuft
Drainage area	= 1.080 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

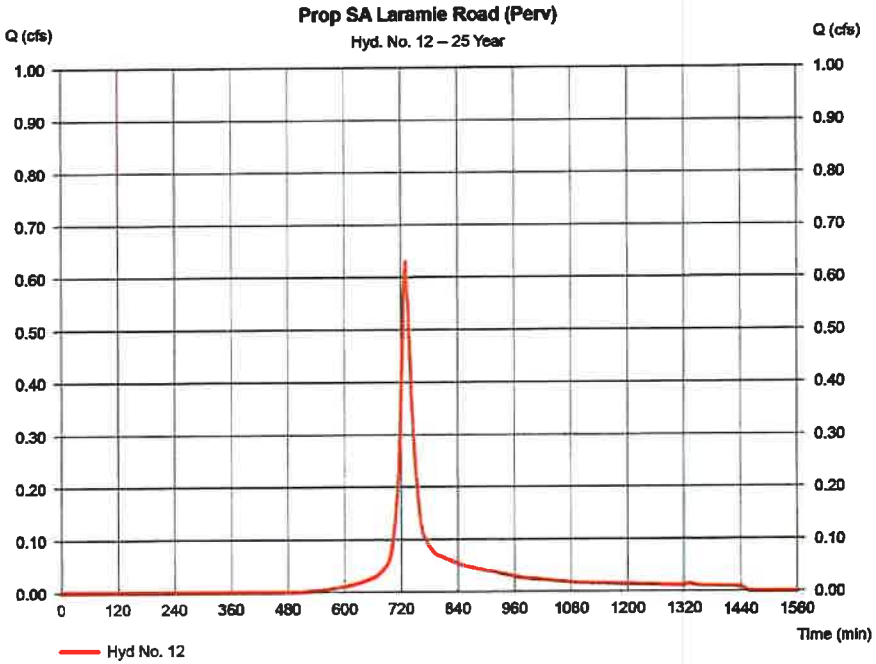


Hydrograph Report

Hyd. No. 12

Prop SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.630 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,501 cuft
Drainage area	= 0.220 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

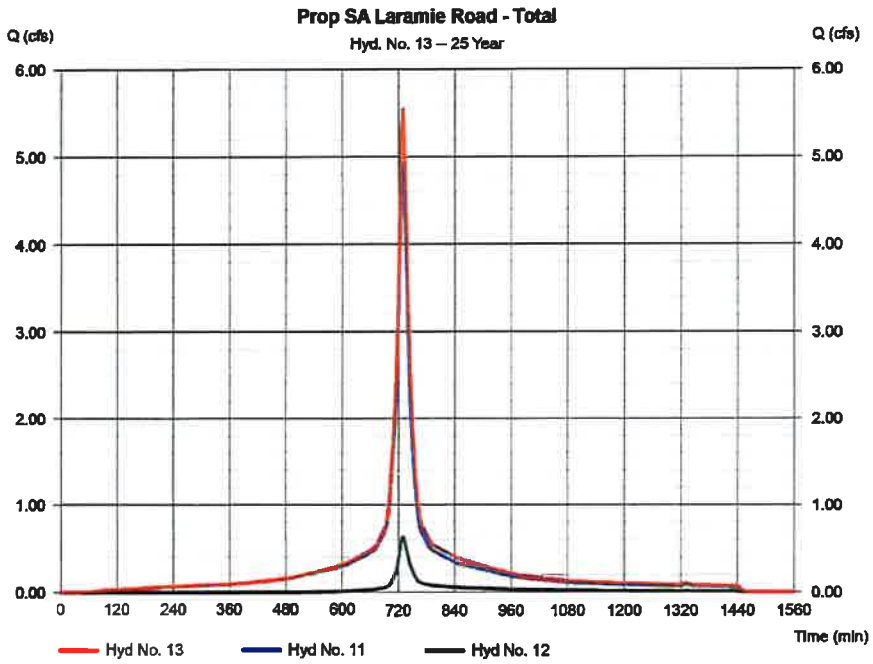


Hydrograph Report

Hyd. No. 13

Prop SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 5.555 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 25,220 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 1.300 ac

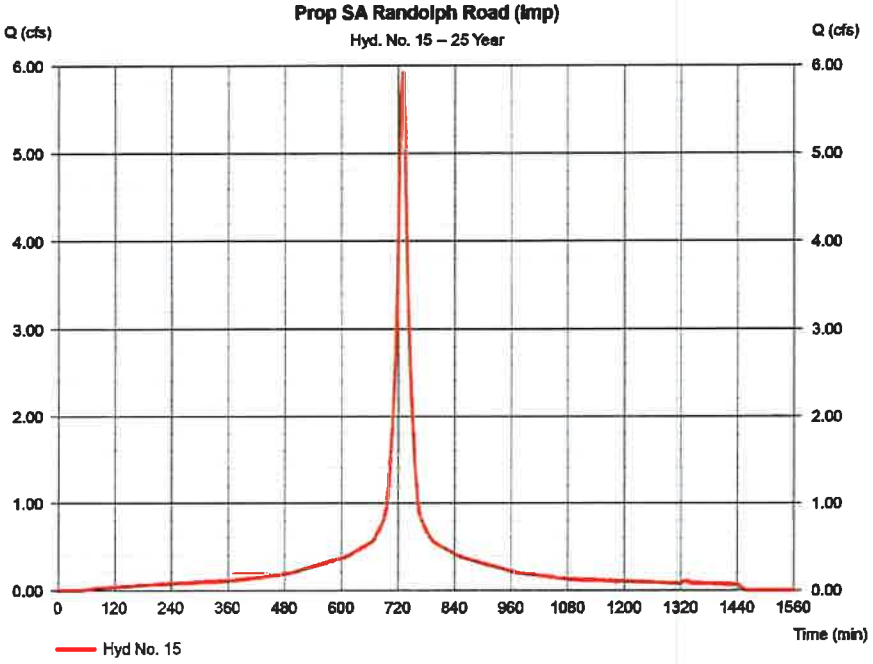


Hydrograph Report

Hyd. No. 15

Prop SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.928 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 27,347 cuft
Drainage area	= 1.300 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

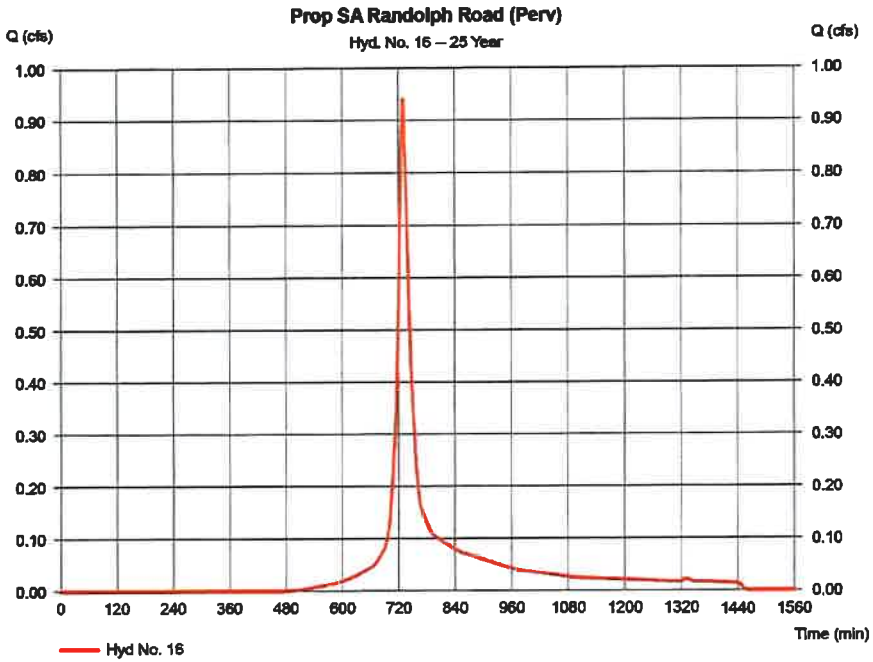


Hydrograph Report

Hyd. No. 16

Prop SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.940 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 3,736 cuft
Drainage area	= 0.310 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

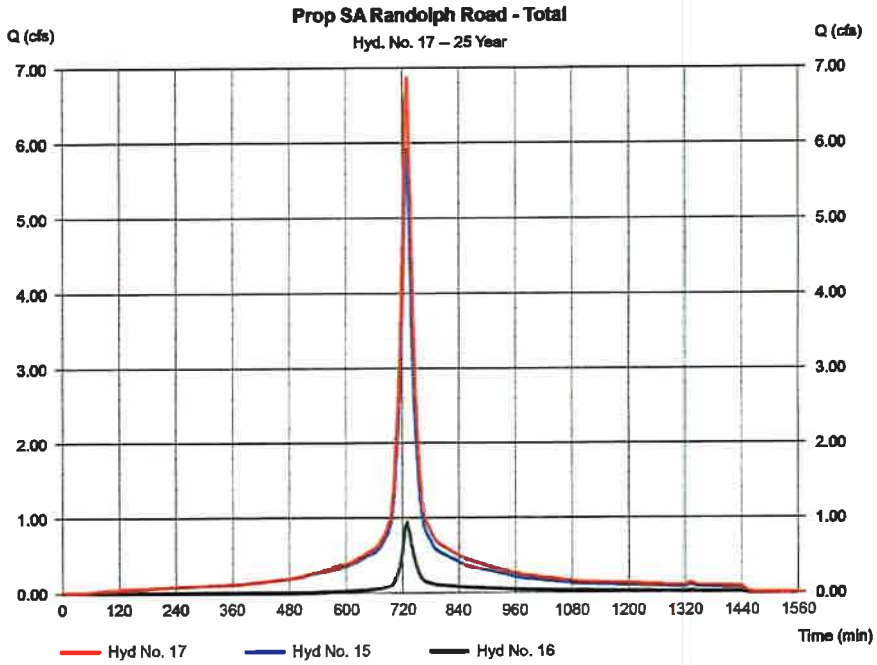


Hydrograph Report

Hyd. No. 17

Prop SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 6.869 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 31,083 cuft
Inflow hyds.	= 15, 16	Contrib. drain. area	= 1.610 ac

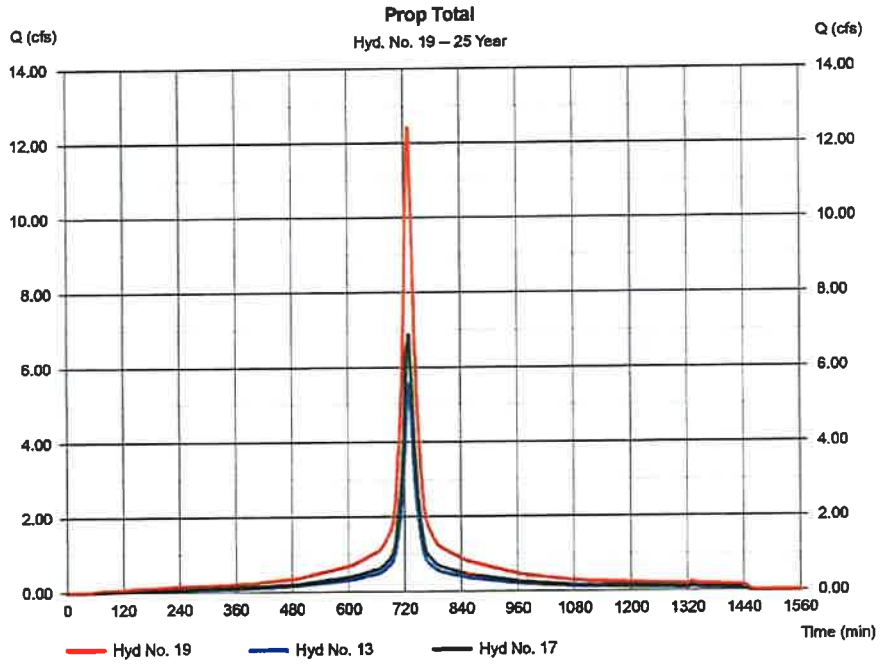


Hydrograph Report

Hyd. No. 19

Prop Total

Hydrograph type	= Combine	Peak discharge	= 12.42 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 56,302 cuft
Inflow hyds.	= 13, 17	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

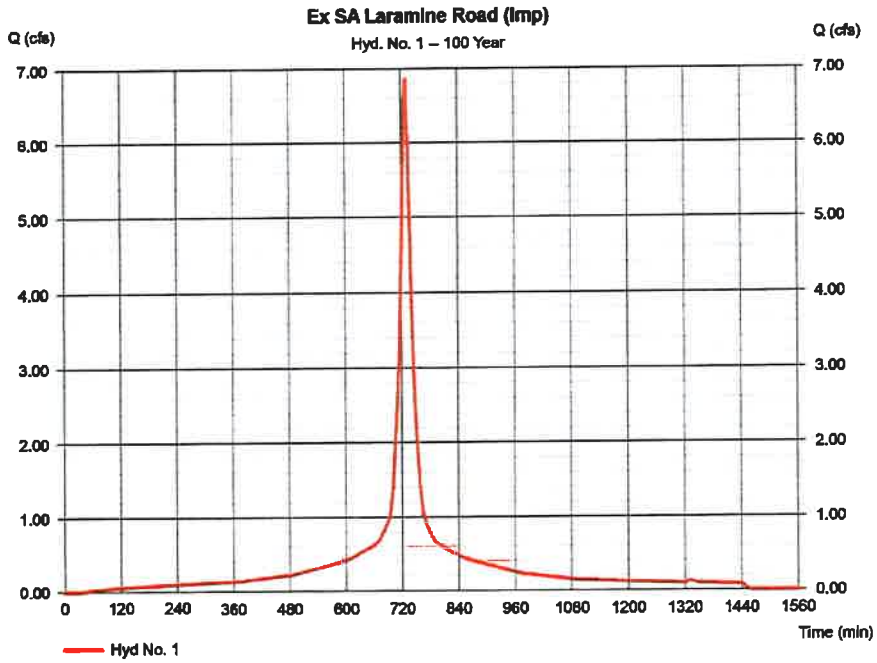
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	6.863	5	730	31,919	—	—	—	Ex SA Laramine Road (Imp)
2	SCS Runoff	0.841	5	730	3,352	—	—	—	Ex SA Laramie Road (Perv)
3	Combine	7.704	5	730	35,271	1, 2	—	—	Ex SA Laramie Road - Total
5	SCS Runoff	8.532	5	730	39,683	—	—	—	Ex SA Randolph Road (Imp)
6	SCS Runoff	1.085	5	730	4,342	—	—	—	Ex SA Randolph Road (Perv)
7	Combine	9.617	5	730	44,025	5, 6	—	—	Ex SA Randolph Road - Total
9	Combine	17.32	5	730	79,295	3, 7,	—	—	Ex Total
11	SCS Runoff	8.677	5	730	31,056	—	—	—	Prop SA Laramie Road (Imp)
12	SCS Runoff	0.996	5	730	3,972	—	—	—	Prop SA Laramie Road (Perv)
13	Combine	7.573	5	730	35,028	11, 12	—	—	Prop SA Laramie Road - Total
15	SCS Runoff	8.037	5	730	37,382	—	—	—	Prop SA Randolph Road (Imp)
16	SCS Runoff	1.462	5	730	5,852	—	—	—	Prop SA Randolph Road (Perv)
17	Combine	9.499	5	730	43,234	15, 16	—	—	Prop SA Randolph Road - Total
19	Combine	17.17	5	730	78,262	13, 17,	—	—	Prop Total

Hydrograph Report

Hyd. No. 1

Ex SA Laramine Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 6.863 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 31,919 cuft
Drainage area	= 1.110 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

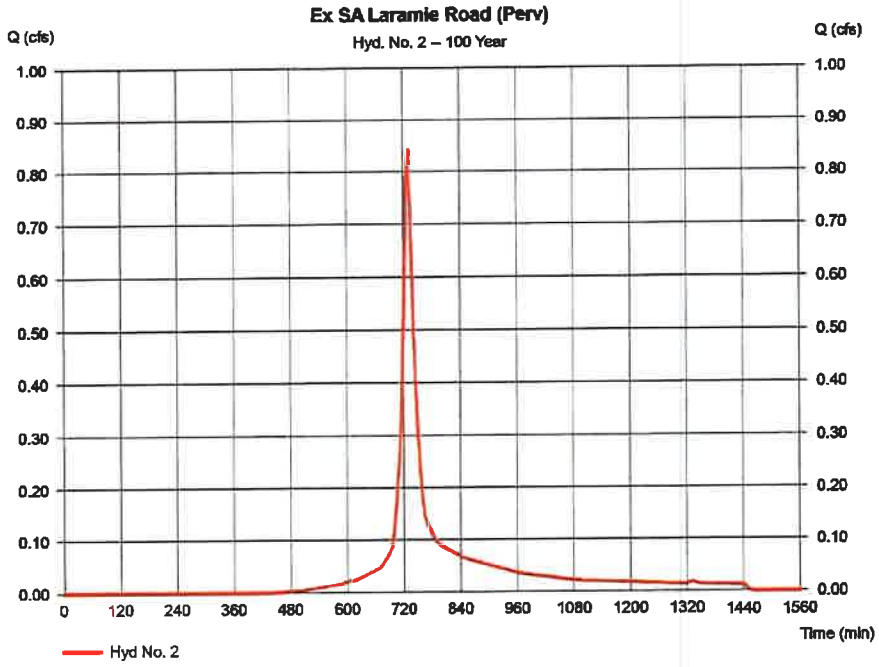


Hydrograph Report

Hyd. No. 2

Ex SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.841 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 3,352 cuft
Drainage area	= 0.190 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

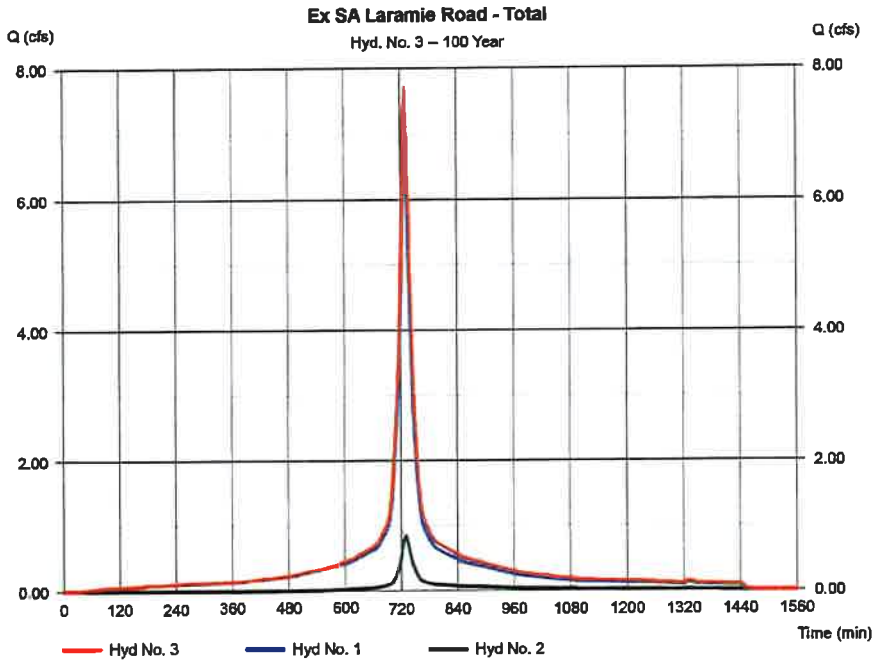


Hydrograph Report

Hyd. No. 3

Ex SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 7.704 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 35,271 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.300 ac

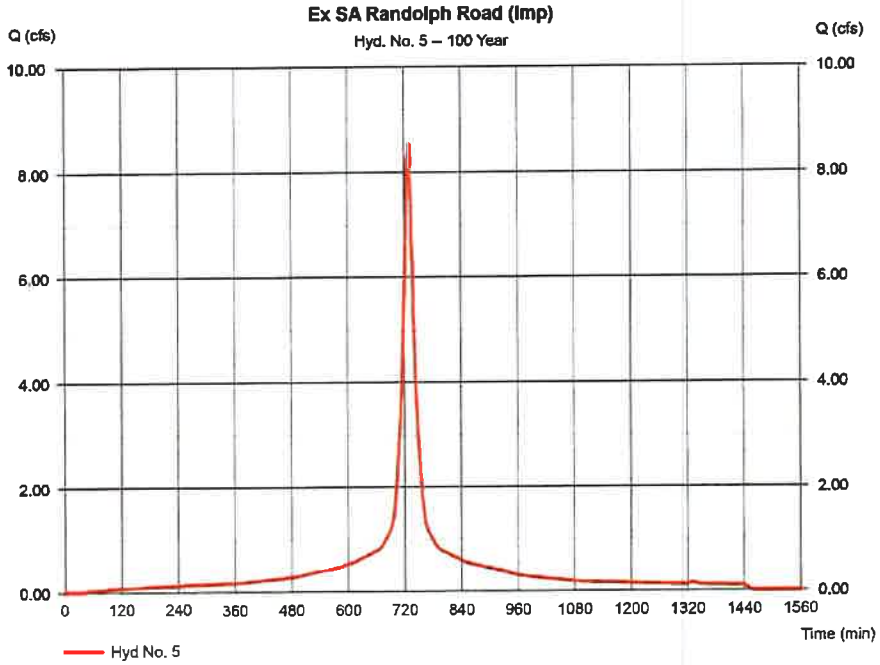


Hydrograph Report

Hyd. No. 5

Ex SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 8.532 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 39,683 cuft
Drainage area	= 1.380 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

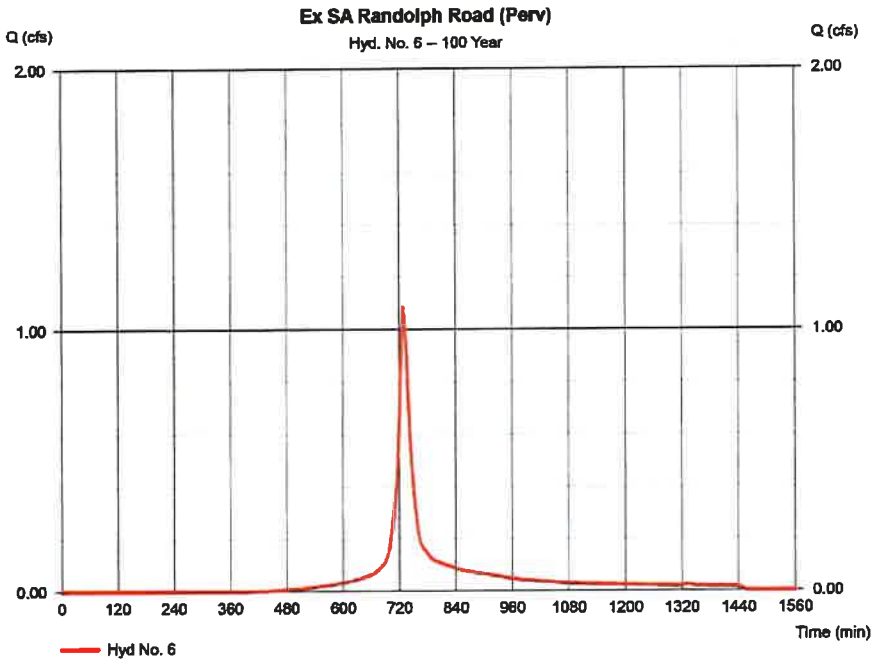


Hydrograph Report

Hyd. No. 6

Ex SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.085 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 4,342 cuft
Drainage area	= 0.230 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

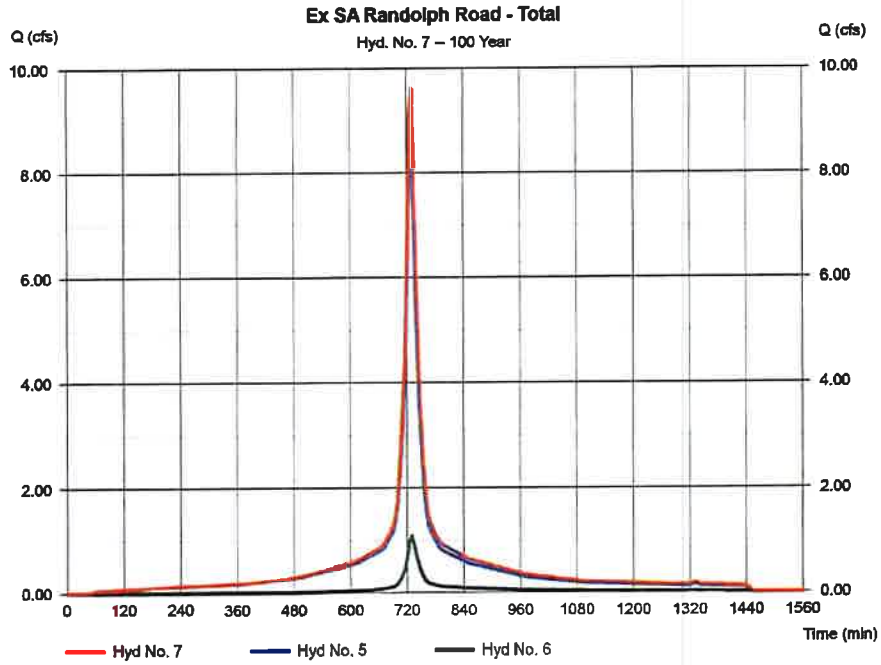


Hydrograph Report

Hyd. No. 7

Ex SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 9.617 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 44,025 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 1.610 ac

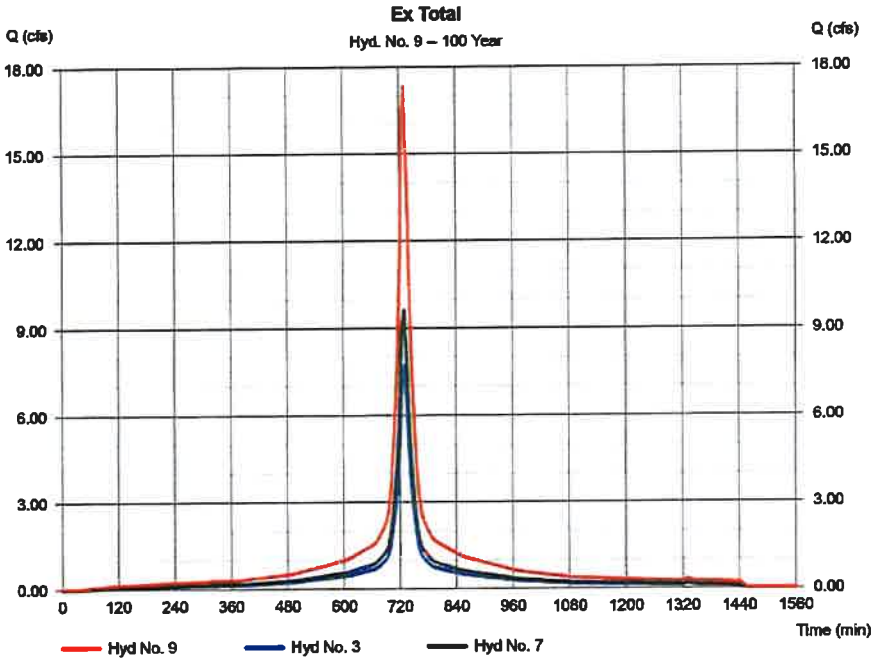


Hydrograph Report

Hyd. No. 9

Ex Total

Hydrograph type	= Combine	Peak discharge	= 17.32 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 79,295 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.000 ac

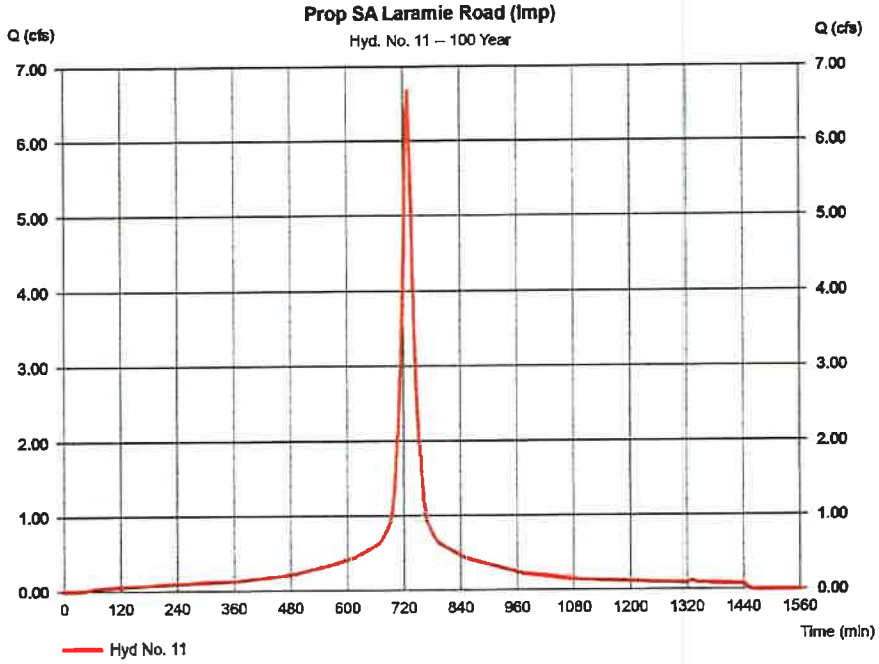


Hydrograph Report

Hyd. No. 11

Prop SA Laramie Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 6.677 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 31,056 cuft
Drainage area	= 1.080 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

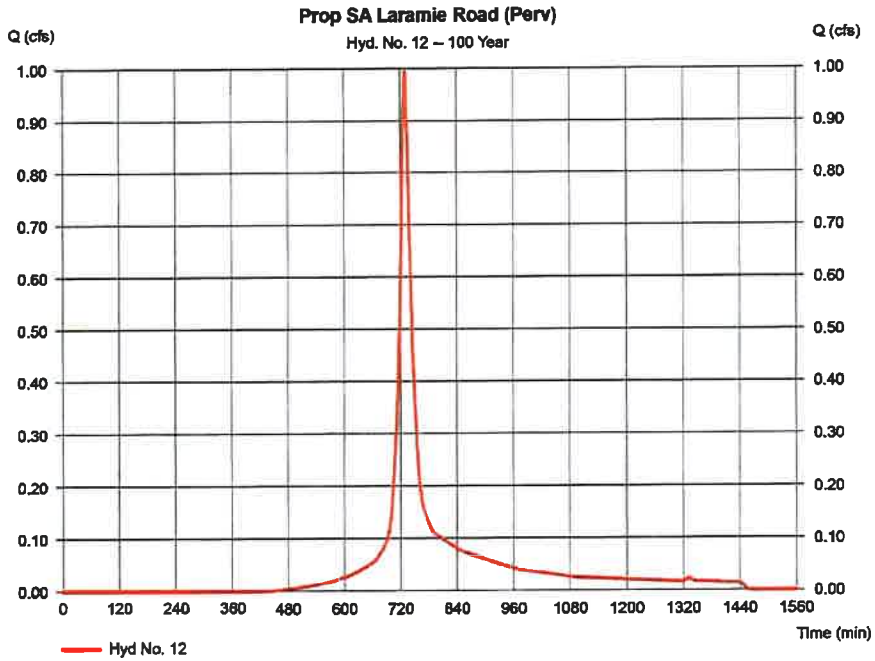


Hydrograph Report

Hyd. No. 12

Prop SA Laramie Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.996 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 3,972 cuft
Drainage area	= 0.220 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

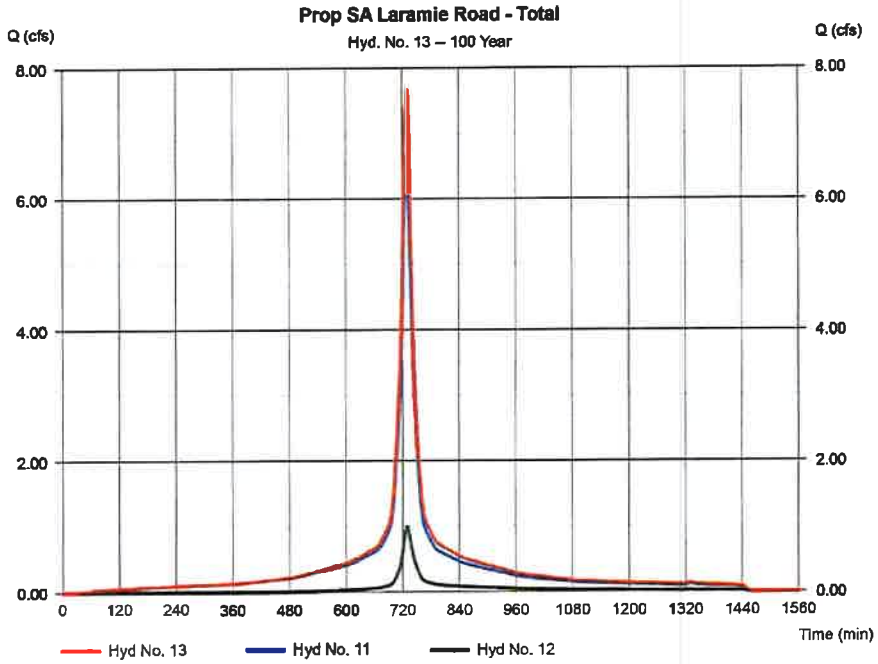


Hydrograph Report

Hyd. No. 13

Prop SA Laramie Road - Total

Hydrograph type	= Combine	Peak discharge	= 7.673 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 35,028 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 1.300 ac

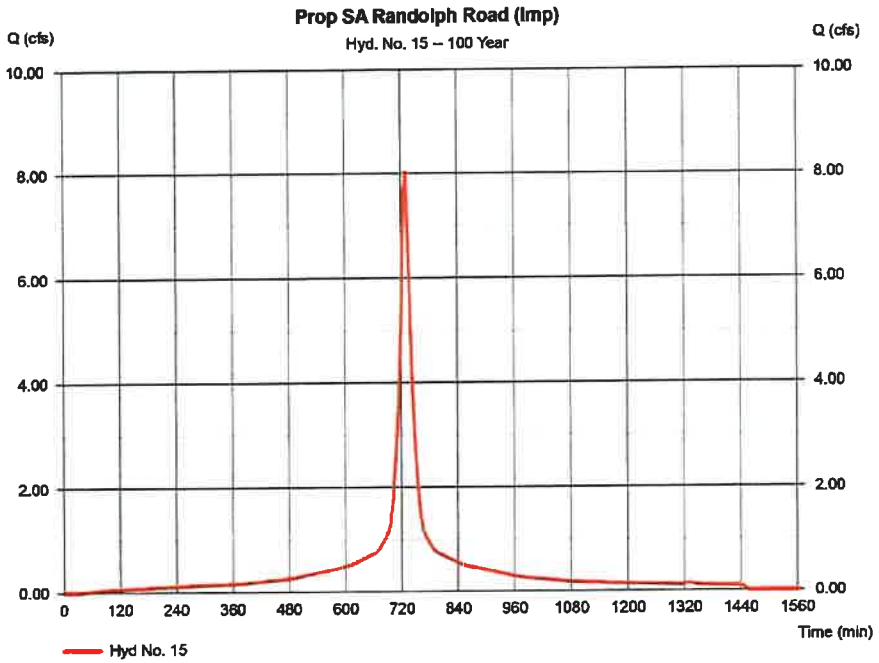


Hydrograph Report

Hyd. No. 15

Prop SA Randolph Road (Imp)

Hydrograph type	= SCS Runoff	Peak discharge	= 8.037 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 37,382 cuft
Drainage area	= 1.300 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	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

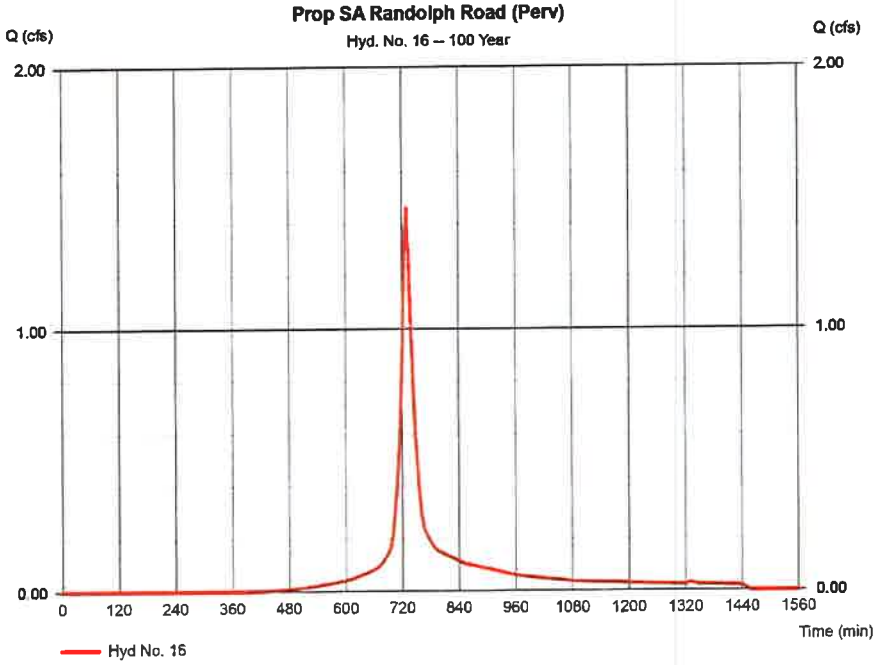


Hydrograph Report

Hyd. No. 16

Prop SA Randolph Road (Perv)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.462 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 5,852 cuft
Drainage area	= 0.310 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.69 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

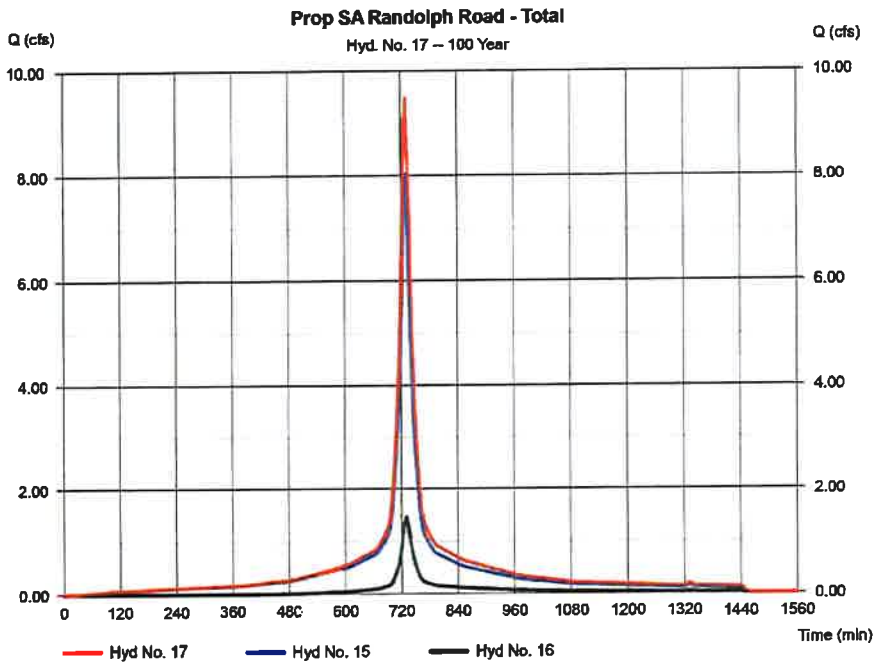


Hydrograph Report

Hyd. No. 17

Prop SA Randolph Road - Total

Hydrograph type	= Combine	Peak discharge	= 9.499 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 43,234 cuft
Inflow hyds.	= 15, 16	Contrib. drain. area	= 1.610 ac

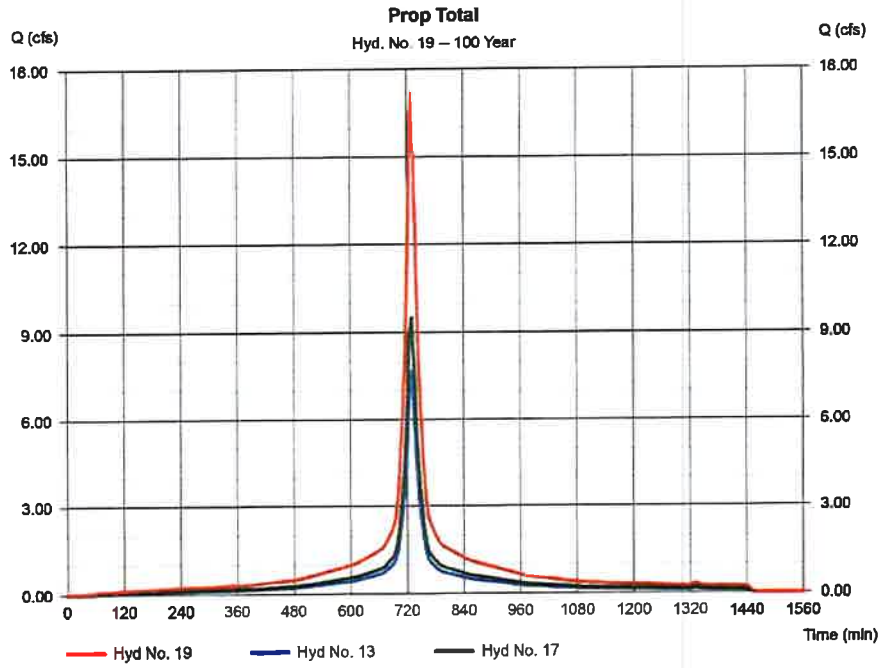


Hydrograph Report

Hyd. No. 19

Prop Total

Hydrograph type	= Combine	Peak discharge	= 17.17 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 78,262 cuft
Inflow hyds.	= 13, 17	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	39.0824	9.5000	0.8528	—
2	45.6943	10.7000	0.8185	—
3	0.0000	0.0000	0.0000	—
5	99.7061	14.8000	0.9304	—
10	249.7597	21.8001	1.0961	—
25	115.7547	14.9000	0.8980	—
50	7.3699	0.1000	0.2544	—
100	403.8513	25.1001	1.1108	—

File name: TRENTON.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.00	3.10	2.55	2.18	1.91	1.70	1.54	1.40	1.29	1.20	1.12	1.05
2	4.80	3.83	3.21	2.77	2.45	2.20	2.00	1.84	1.70	1.59	1.49	1.40
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.20	5.03	4.24	3.67	3.24	2.90	2.63	2.40	2.22	2.06	1.92	1.80
10	6.80	5.63	4.80	4.17	3.69	3.30	2.98	2.72	2.50	2.31	2.14	2.00
25	7.89	6.45	5.47	4.78	4.23	3.80	3.46	3.17	2.93	2.73	2.55	2.40
50	4.87	4.09	3.69	3.44	3.25	3.10	2.98	2.88	2.80	2.72	2.66	2.60
100	9.20	7.78	6.69	5.87	5.22	4.70	4.27	3.91	3.60	3.33	3.10	2.90

Tc = time in minutes. Values may exceed 60.

Precip. file name: Union County.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.38	0.00	0.00	5.17	6.42	0.00	8.69
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)

DYNAMIC ENGINEERING

Stormwater Collection System Calculations

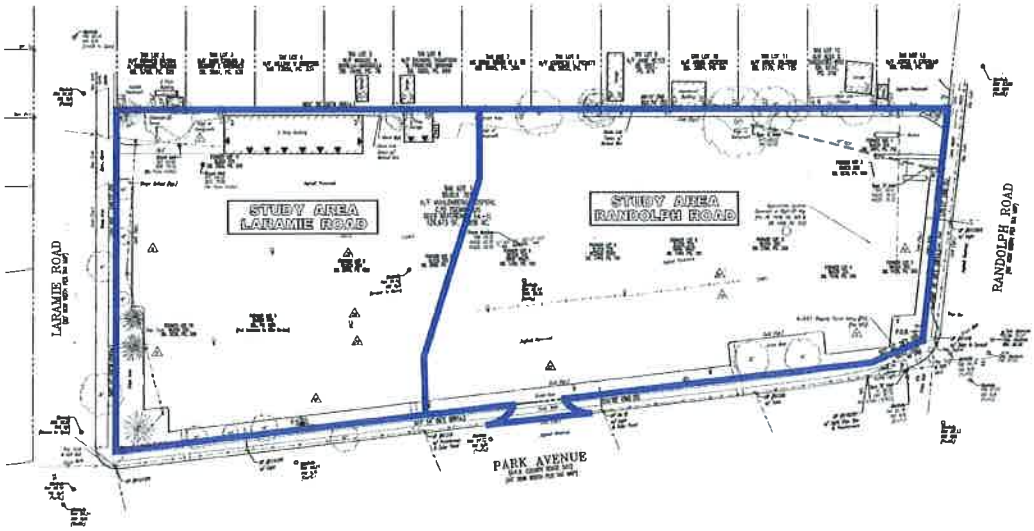
Project: Proposed CVS
Job #: 2340-99-629
Location: Plainfield, NJ
Design Storm: 25 Year

Computed By: JMV
Checked By: KK
Date: 2/14/2020

NOTES:
1) Design method used is Rational Method, unless otherwise noted
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 (M/M)	Pipe Capacity (cfs)	Pipe Velocity (fps)
IN #1	IN #8	0.09	0.83	0.07	0.07	10.00	0.46	10.00	6.80	0.48	0.48	15	102.0	0.013	0.0050	4.57	3.73
IN #8	IN #7	0.18	0.82	0.15	0.22	10.00	0.50	10.46	6.80	1.02	1.50	15	111.0	0.013	0.0050	4.57	3.73
IN #7	IN #6	0.11	0.73	0.08	0.30	10.00	0.50	10.96	6.68	0.53	2.00	15	111.0	0.013	0.0050	4.57	3.73
IN #6	DMH 1	0.17	0.74	0.13	0.43	10.00	0.14	11.46	6.56	0.85	2.82	15	31.0	0.013	0.0050	4.57	3.73
IN #2	IN #3	0.43	0.85	0.37	0.37	10.00	0.27	10.00	6.80	2.52	2.52	15	60.0	0.013	0.0050	4.57	3.73
IN #3	IN #4	0.11	0.77	0.08	0.45	10.00	0.52	10.27	6.80	0.54	3.06	15	116.0	0.013	0.0050	4.57	3.73
Roof	IN #4	0.34	0.95	0.32	0.32	10.00	0.25	10.00	6.80	2.18	2.18	10	40.0	0.010	0.0100	2.85	5.23
IN #4	IN #5	0.04	0.80	0.03	0.80	10.00	0.50	10.79	6.68	0.20	5.34	18	127.0	0.013	0.0050	7.43	4.21
IN #5	DMH 1	0.14	0.78	0.11	0.91	10.00	0.12	11.29	6.56	0.72	5.97	18	30.0	0.013	0.0050	7.43	4.21

DRAINAGE AREA MAPS



CVS pharmacy

13K CORNER ENTRY, RUNF-OUT
DRIVE-THRU (RIGHT) MEDIUM
STORE NUMBER: 11370

CS PROJECT NUMBER122324

DYNAMIC ENGINEERING

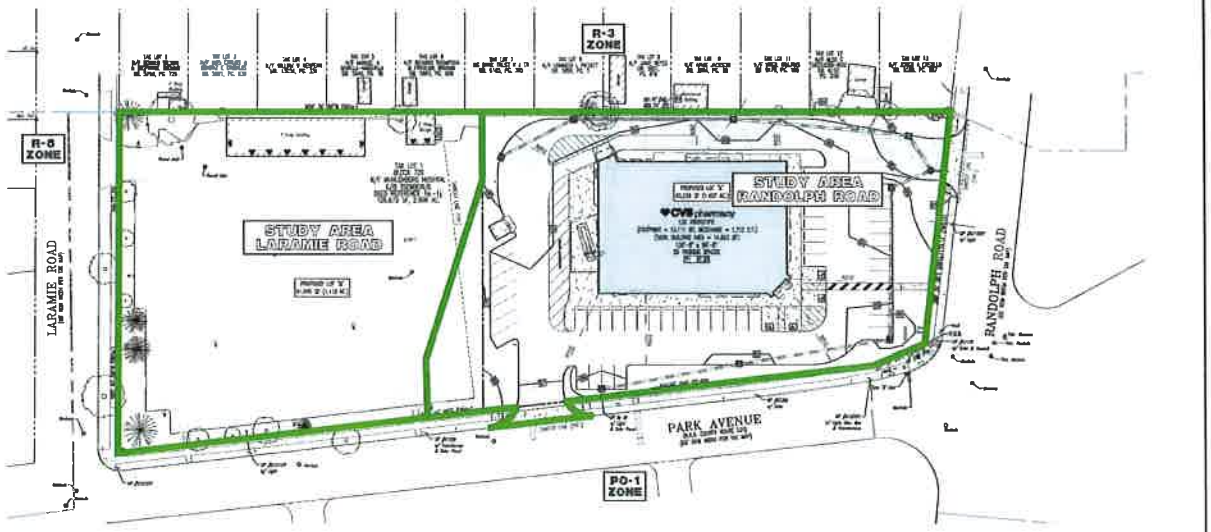
KYLE C. KAVINSKI
PROFESSIONAL ENGINEER

ROBERT P. FREUD
PROFESSIONAL ENGINEER

OWNER:
1304 PARK AVENUE ASSOCIATES LLC

EXISTING DRAINAGE AREA MAP

1



CVS pharmacy

13K CORNER ENTRY, DRIVE-THRU
DRIVE-THRU (RIGHT) VESTIBULE
STORE NUMBER: 11370

CS PROJECT NUMBER:122324

DYNAMIC ENGINEERING

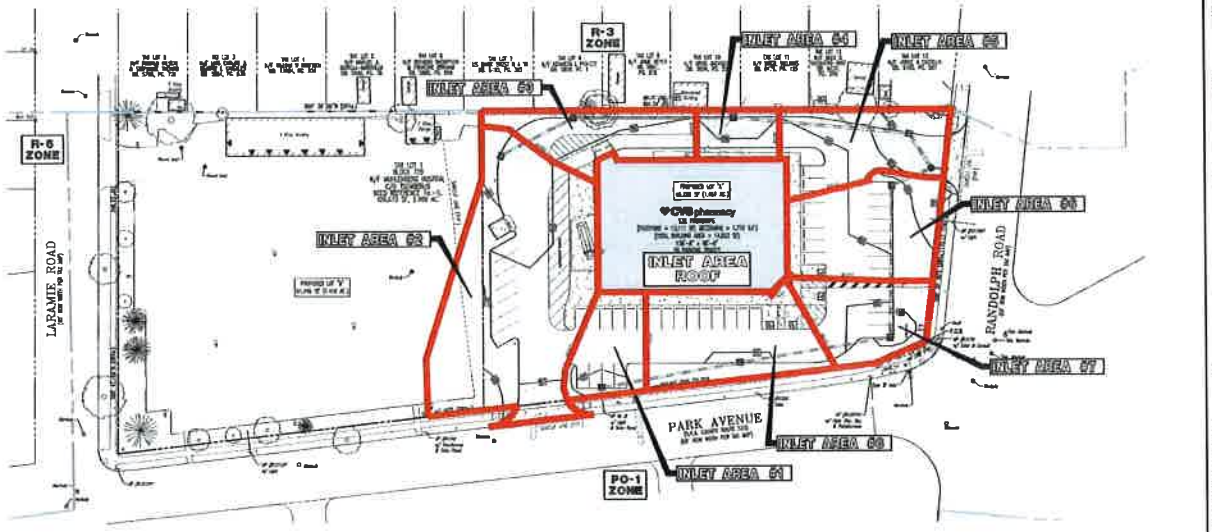
KYLE C. KAVINSKI
PROFESSIONAL ENGINEER

ROBERT P. FREUD
PROFESSIONAL ENGINEER

1284 PARK AVENUE ASSOCIATES LLC

PROPOSED DRAINAGE AREA MAP

2



CVS pharmacy

13K CORNER ENTRY, BUMP-OUT
DRIVE-THRU (RIGHT) W/LANE
STORE NUMBER: 11370

CS PROJECT NUMBER:122324

DYNAMIC ENGINEERING

KYLE C. KAVINSKI

ROBERT P. FREUD

1234 PARK AVENUE ASSOCIATES LLC

PROPOSED INLET AREA MAP

3