Drainage and Water Quality System Calculations

For

Lab Land Holdings, LLC

Located on

Hoover Mason Lane

Mt. Pleasant, Tennessee

August 11, 2025
(Revised August 27, 2025)

Prepared For:
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Lab Land Holdings – Hoover Mason Lane – Mt. Pleasant, TN
Detention Summary

The subject property consists of ±3.32 acres of gently rolling terrain located on Hoover Mason Lane in Mt. Pleasant, TN. The project includes 2.50 acres disturbed for an industrial distribution facility with related appurtenances.

The existing drainage pattern of the site is directed primarily to the east across the site through a series of sheet flow and shallow drainage swales eventually entering Quality Creek off-site. In its existing condition, the natural drainage patterns of the site are primarily directed towards the east by means of overland flow, and natural draws. The general soil information indicates the native soil is primarily mined, pit, and dumped (Hydrologic Soil Group D). For existing flow characteristics see Appendix 3, *Drainage Area Map.*

The SCS Method was used to calculate runoff hydrographs for pre- and post-development conditions for the 2, 5, 10, 25, 50 and 100-year rainfall events. Rainfall information for the basin was obtained from the Intensity-Duration-Frequency Curves and Depth-Duration Data Table (Figure 2-1 of the NOAA Atlas 14 point precipitation frequency events from Mount Pleasant 2 SW 40-6340 included in this report, see Figure 3). Times of concentration for the pre-development site for is 8.9 minutes. Post development is 10.1 minutes and was used for the design of the proposed detention facility. Calculations can be found in Appendix 2.

The pre-development curve number was calculated at 80. The post development curve number has been calculated to be 85 for the proposed site. The proposed development curve number has been established based on the anticipation of the roadways, drives, and rooftop areas being 98% impervious and the transition of pervious surfaces to manicured lawns.

Stormwater management of this site will include one detention basins located as shown in the construction document. The proposed detention system for Basin A includes 43,120 c.f. in the detention basin as shown on the plans. The outlet control structures for the basin provides a controlled release of storm events while retaining smaller storms for water quality infiltration in the basins and reduction of the peak runoff of a given storm event as indicated in the summary charts below. Sediment is designed to drop and accumulate in the drainage basins and access for removal of sediment is allowed from the basin and the outlet structure. The drainage basins provide storage of the 100-year storm event at elevations indicated in the chart below (contains the 100-year storm event). Stormwater runoff flows overland across the proposed site, entering a surface drainage network that transfers the water to the detention basin. The detention basin discharge **below** the calculated pre-development rate through the design outlet structures, rectangular weirs, and outfalls into the existing ditch line as shown on the plan. The layout and configuration of the detention basin have been included in the submitted construction documents and the detail of the proposed outlet structures for the Basins are included in this document (Appendix 2). The report that follows defines the characteristics of the proposed drainage network. Note that offsite drainage that comes onto the property is captured and directed through the existing drainage

network as shown in the construction documents. A summary of each of the rainfall events, the routed flows from post-development into the water quality facilities and their respective elevations numerically for 2, 5, 10, 25, 50, and 100 year storms are represented in the following tables:

Detention Basin:

Basin A:

Storm Event	*Rainfall*	*Rainfall*	*Post-Developed*	*Pre-Developed*	*Total Proposed Runoff*	*Basin Elevation*
(YR)	IN (24-HR)	IN (6-HR)	Flow (CFS)	Flow (CFS)	CFS	FT
2	3.90	2.60	11.31	10.32	3.84	661.46
5	4.75	3.17	14.87	14.06	5.08	661.70
10	5.42	3.66	17.70	17.08	6.06	661.92
25	6.35	4.34	21.62	21.30	8.53	662.19
50	7.08	4.92	24.70	24.64	11.00	662.39
100	7.84	5.54	27.89	28.12	13.80	662.58

Introduction

A hydrologic and hydraulic analysis was performed for the proposed property located on Hoover Mason Lane, Mt. Pleasant, Tennessee (See Fig. 1, Location Map).

This analysis outlines the calculations used to size the on-site drainage network and the system's detention basin.

The proposed drainage areas contributing storm water runoff to the proposed system is shown in appendix 3, *Drainage Area Map*. The system is designed to restrict the flow rate for the post-development site to improve the quality of the runoff as it exits the site (See Appendix 3, Drainage Area Map). The detention basin and outlet structure was analyzed to satisfy these criteria. The 2-year, 5-year, 10-year, 25-year, 50-yr, and 100-yr design storm events were also modeled with the results included in this report.

The Hydroflow Hydrographs computer program was used in this analysis in order to appropriately size the outlet structure and route the design storm events through the proposed detention system.

Methods and Assumptions

The Hydroflow Hydrographs computer program, was used for the hydrologic analysis in this report.

Within the Hydroflow Hydrographs program, the drainage area was characterized by sub-basin(s) for the fully built-out post-development conditions for the tributary area to the detention system. SCS method was used within Hydroflow Hydrographs program to characterize the sub-basin using appropriate curve numbers and times of concentration (Tc). A design rainfall values were taken from the Intensity – Duration - Frequency curves established at the NOAA Atlas 14 point precipitation frequency events from Mount Pleasant 2 SW 40-6340, and shown in Figure 2, Mt. Pleasant IDF Curve.

The detention basin was modeled by entering a stage-storage-discharge relationship into Hydroflow Hydrographs. The stage-discharge-volume relationship was established based upon trial & error methods comparing the pre & post development flow values.

Sub-Basin Identification

Sub-basins were established based on hydrologic characteristics and by hydraulic junction locations. The drainage area on site was represented by two sub-basins: *pre-development & post-development.*

The *pre-development* sub-basin is the total area tributary to the system in the undeveloped condition.

The *post-development* sub-basin is the total area tributary to the system in the developed condition.

Hydraulic Characteristics

The stage – storage - discharge relationship for the detention system can be found in Figure 3. These hydraulic characteristics were used in the Hydroflow Hydrographs model to produce the results identified in this report.

Summary of Discharge

The Detention Calculation summary, located in Appendix 2*,* identifies the peak flow for the design storm events for the areas draining through the site at pre development and post development rates. The Sub-basin locations and various hydrograph modeling by SCS method model components can be identified in Appendix 1, Hydroflow Hydrographs Summary.

Outlet Condition

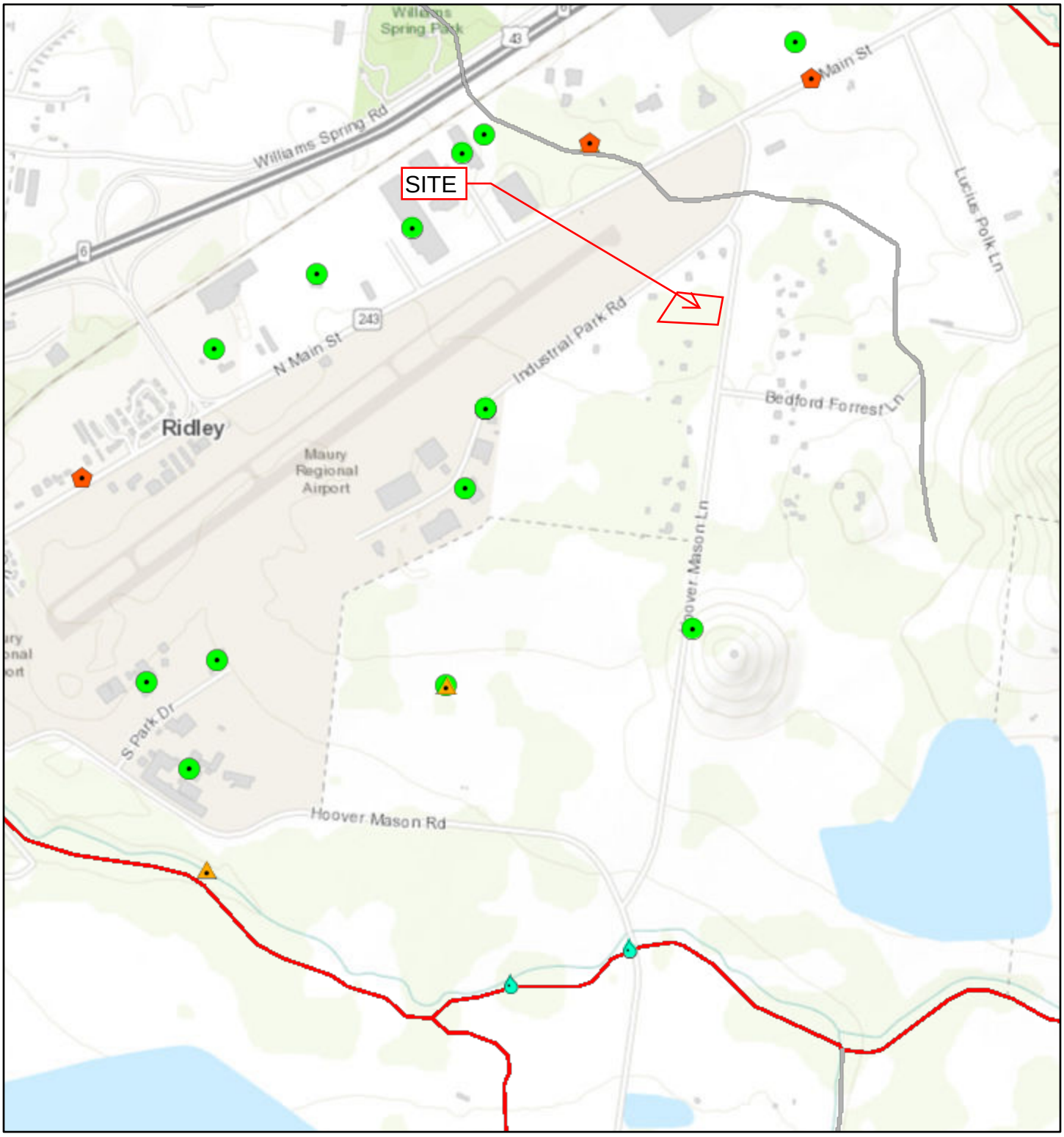
The Outlet Structure for the Detention Basin is designed to release the drainage at a rate below the pre-development rate. The structure restricts the storm water flow using a rectangular weir design with a drawdown orifice, restricting the flow until reaching the invert of the weir, then releasing the storm water runoff to an outlet pipe. The outlet structure will impede stormwater flow causing water to rise in the basins allowing suspended sediment to settle into the basins improving the quality of the runoff. Sediment is designed to drop and accumulate in the basins with access for removal of sediment from the surface. The system is designed to overflow across the emergency overflow for events in excess of the 100-year storm event and includes 1-foot of freeboard within the design. The top of the weir elevation of the outlet structure is greater than the design 100-year water surface elevation.

Conclusions

As can be seen in the summary, calculations and within Appendix 1, the drainage system provides the desired detention of the storm water runoff, using the design parameters in this report. Therefore, from the analysis presented in this report, the proposed system will improve the water quality of the runoff from the proposed development.

The post developed runoff from this site (100-year) has been ***reduced*** by **14.32** cfs by design.

ArcGIS Web Map



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0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Counties

Water Quality Assessment Waterbodies

Fully Supporting

Not Assessed

Not Supporting

Water Quality Assessment

Fully Supporting

Fully Supporting (Evaluated)

Not Assessed

Not Supporting

Not Supporting (Evaluated)

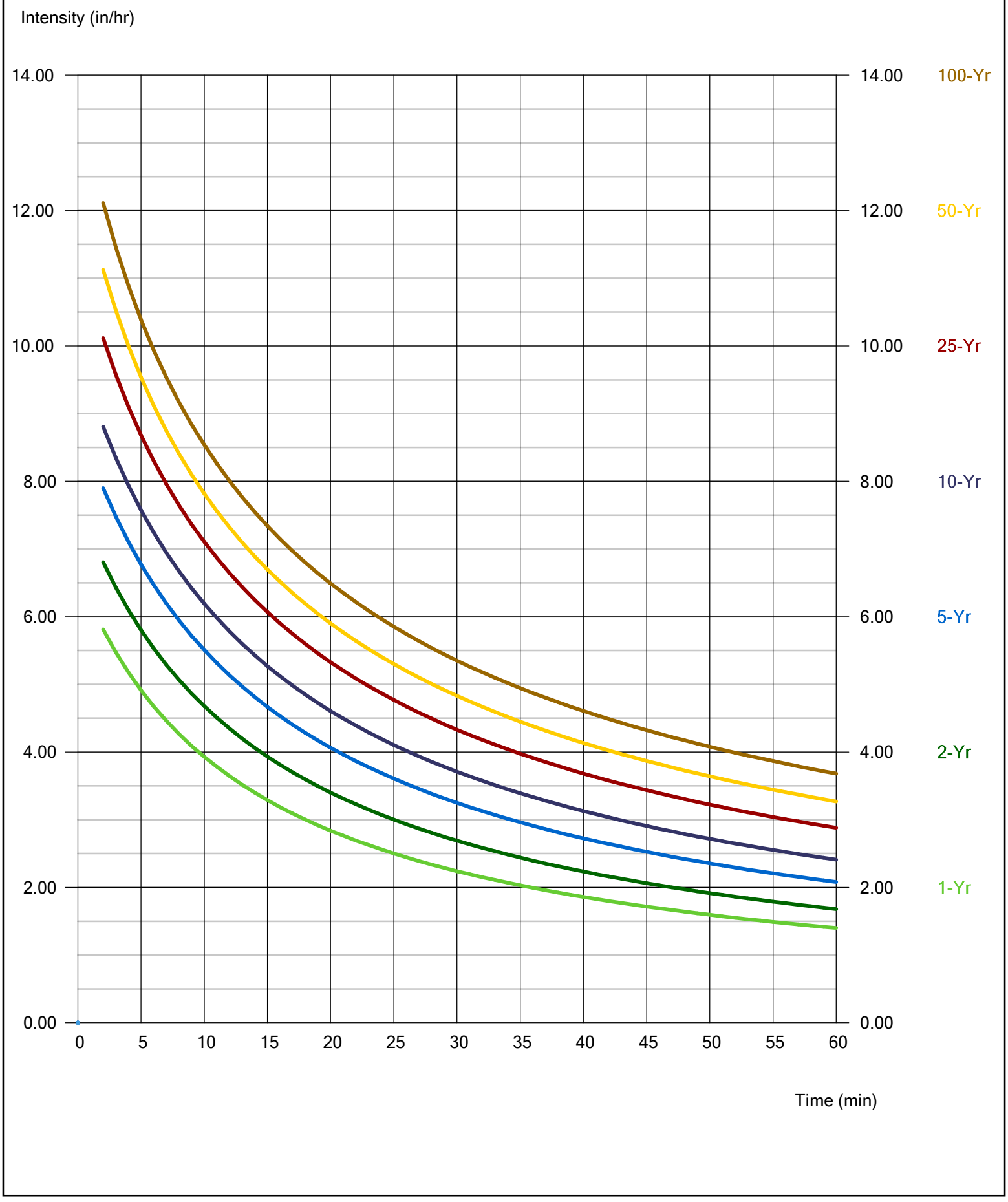
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community, Rich Cochran

ArcGIS Web AppBuilder

Rich Cochran | Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA |

Hydraflow IDF Curves

IDF file: Mt Pleasant.IDF



Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	------	7.623	10.32	-------	14.06	17.08	21.30	24.64	28.12	Existing Conditions
2	SCS Runoff	------	8.670	11.31	-------	14.87	17.70	21.62	24.70	27.89	Proposed Conditions
4	SCS Runoff	------	6.084	7.939	-------	10.44	12.42	15.17	17.33	19.58	Onsite to Detention A
5	SCS Runoff	------	1.658	2.231	-------	3.016	3.645	4.526	5.221	5.944	Offsite To Detention Basin A
6	Combine	4, 5	7.741	10.15	-------	13.41	16.00	19.60	22.43	25.37	Total to Detention Basin A
8	Reservoir	6	0.261	0.772	-------	2.170	3.811	6.226	8.230	10.84	Outfall Det. Basin A
10	SCS Runoff	------	2.821	3.724	-------	4.947	5.921	7.278	8.342	9.449	On-site Bypass
12	Combine	1, 5,	9.280	12.55	-------	17.08	20.72	25.83	29.86	34.07	Total Existing Conditions
13	Combine	8, 10,	2.921	3.836	-------	5.075	6.057	8.528	11.00	13.80	Total Proposed Conditions
15	SCS Runoff	------	3.289	4.376	-------	5.857	7.039	8.689	9.986	11.34	Max Drainage to Ditch

Pond Report

Pond No. 1 - Detention Pond A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 659.41 ft. Voids = 80.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	659.41	10	0	0
0.59	660.00	5,340	878	878
1.59	661.00	14,533	7,648	8,526
2.59	662.00	16,588	12,438	20,964
3.59	663.00	18,990	14,219	35,183
4.09	663.50	20,710	7,937	43,120

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	0.00	0.00
Span (in)	= 18.00	2.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 659.31	659.41	0.00	0.00
Length (ft)	= 16.00	0.00	0.00	0.00
Slope (%)	= 1.00	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	No	No

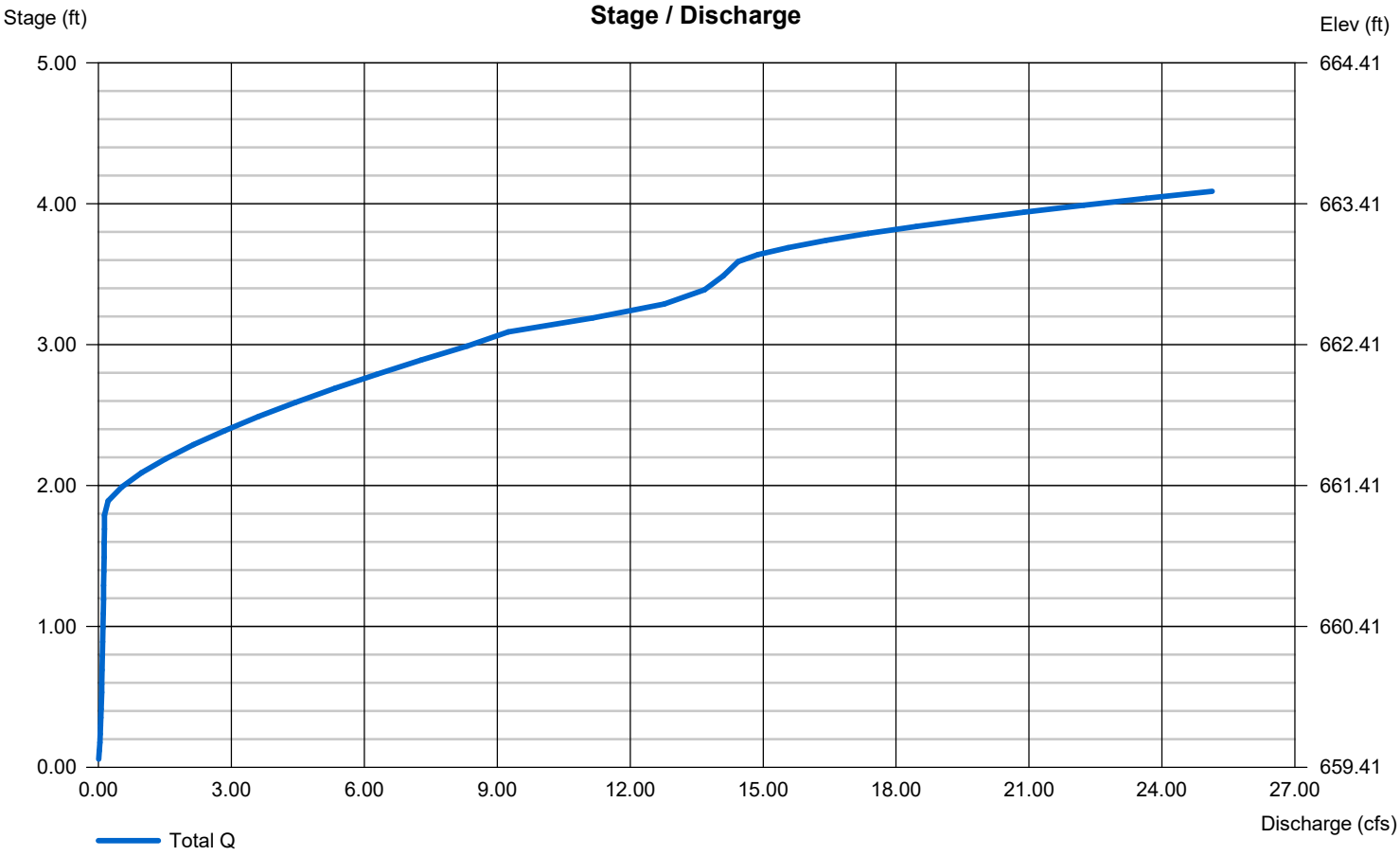
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	2.00	8.00	0.00
Crest El. (ft)	= 662.50	661.25	663.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	Ciplti	---
Multi-Stage	= Yes	Yes	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).



Appendix 1

Hydroflow Hydrographs
Model Output
Summary

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	7.623	2	720	17,453	------	------	------	Existing Conditions
2	SCS Runoff	8.670	2	720	22,482	------	------	------	Proposed Conditions
4	SCS Runoff	6.084	2	720	15,778	------	------	------	Onsite to Detention A
5	SCS Runoff	1.658	2	718	3,798	------	------	------	Offsite To Detention Basin A
6	Combine	7.741	2	720	19,576	4, 5	------	------	Total to Detention Basin A
8	Reservoir	0.261	2	892	19,561	6	661.31	12,440	Outfall Det. Basin A
10	SCS Runoff	2.821	2	716	5,701	------	------	------	On-site Bypass
12	Combine	9.280	2	720	21,251	1, 5,	------	------	Total Existing Conditions
13	Combine	2.921	2	716	25,262	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	3.289	2	716	6,641	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	10.32	2	718	23,613	------	------	------	Existing Conditions
2	SCS Runoff	11.31	2	720	29,438	------	------	------	Proposed Conditions
4	SCS Runoff	7.939	2	720	20,660	------	------	------	Onsite to Detention A
5	SCS Runoff	2.231	2	718	5,104	------	------	------	Offsite To Detention Basin A
6	Combine	10.15	2	720	25,764	4, 5	------	------	Total to Detention Basin A
8	Reservoir	0.772	2	770	25,749	6	661.46	14,187	Outfall Det. Basin A
10	SCS Runoff	3.724	2	716	7,560	------	------	------	On-site Bypass
12	Combine	12.55	2	718	28,717	1, 5,	------	------	Total Existing Conditions
13	Combine	3.836	2	716	33,309	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	4.376	2	716	8,865	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	14.06	2	718	32,249	------	------	------	Existing Conditions
2	SCS Runoff	14.87	2	720	38,997	------	------	------	Proposed Conditions
4	SCS Runoff	10.44	2	720	27,368	------	------	------	Onsite to Detention A
5	SCS Runoff	3.016	2	718	6,927	------	------	------	Offsite To Detention Basin A
6	Combine	13.41	2	720	34,295	4, 5	------	------	Total to Detention Basin A
8	Reservoir	2.170	2	738	34,280	6	661.70	17,279	Outfall Det. Basin A
10	SCS Runoff	4.947	2	716	10,136	------	------	------	On-site Bypass
12	Combine	17.08	2	718	39,176	1, 5,	------	------	Total Existing Conditions
13	Combine	5.075	2	716	44,416	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	5.857	2	716	11,957	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	17.08	2	718	39,316	------	------	------	Existing Conditions
2	SCS Runoff	17.70	2	720	46,708	------	------	------	Proposed Conditions
4	SCS Runoff	12.42	2	720	32,780	------	------	------	Onsite to Detention A
5	SCS Runoff	3.645	2	718	8,414	------	------	------	Offsite To Detention Basin A
6	Combine	16.00	2	720	41,194	4, 5	------	------	Total to Detention Basin A
8	Reservoir	3.811	2	734	41,179	6	661.92	20,017	Outfall Det. Basin A
10	SCS Runoff	5.921	2	716	12,224	------	------	------	On-site Bypass
12	Combine	20.72	2	718	47,730	1, 5,	------	------	Total Existing Conditions
13	Combine	6.057	2	716	53,403	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	7.039	2	716	14,472	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	21.30	2	718	49,394	------	------	------	Existing Conditions
2	SCS Runoff	21.62	2	720	57,587	------	------	------	Proposed Conditions
4	SCS Runoff	15.17	2	720	40,415	------	------	------	Onsite to Detention A
5	SCS Runoff	4.526	2	718	10,530	------	------	------	Offsite To Detention Basin A
6	Combine	19.60	2	720	50,945	4, 5	------	------	Total to Detention Basin A
8	Reservoir	6.226	2	732	50,930	6	662.19	23,724	Outfall Det. Basin A
10	SCS Runoff	7.278	2	716	15,183	------	------	------	On-site Bypass
12	Combine	25.83	2	718	59,923	1, 5,	------	------	Total Existing Conditions
13	Combine	8.528	2	718	66,113	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	8.689	2	716	18,042	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	24.64	2	718	57,466	------	------	------	Existing Conditions
2	SCS Runoff	24.70	2	720	66,231	------	------	------	Proposed Conditions
4	SCS Runoff	17.33	2	720	46,481	------	------	------	Onsite to Detention A
5	SCS Runoff	5.221	2	718	12,222	------	------	------	Offsite To Detention Basin A
6	Combine	22.43	2	720	58,703	4, 5	------	------	Total to Detention Basin A
8	Reservoir	8.230	2	730	58,688	6	662.39	26,530	Outfall Det. Basin A
10	SCS Runoff	8.342	2	716	17,541	------	------	------	On-site Bypass
12	Combine	29.86	2	718	69,688	1, 5,	------	------	Total Existing Conditions
13	Combine	11.00	2	718	76,229	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	9.986	2	716	20,892	------	------	------	Max Drainage to Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	28.12	2	718	65,984	------	------	------	Existing Conditions
2	SCS Runoff	27.89	2	720	75,302	------	------	------	Proposed Conditions
4	SCS Runoff	19.58	2	720	52,847	------	------	------	Onsite to Detention A
5	SCS Runoff	5.944	2	718	14,005	------	------	------	Offsite To Detention Basin A
6	Combine	25.37	2	720	66,852	4, 5	------	------	Total to Detention Basin A
8	Reservoir	10.84	2	730	66,837	6	662.58	29,266	Outfall Det. Basin A
10	SCS Runoff	9.449	2	716	20,021	------	------	------	On-site Bypass
12	Combine	34.07	2	718	79,989	1, 5,	------	------	Total Existing Conditions
13	Combine	13.80	2	718	86,858	8, 10,	------	------	Total Proposed Conditions
15	SCS Runoff	11.34	2	716	23,893	------	------	------	Max Drainage to Ditch

Hydrograph Report

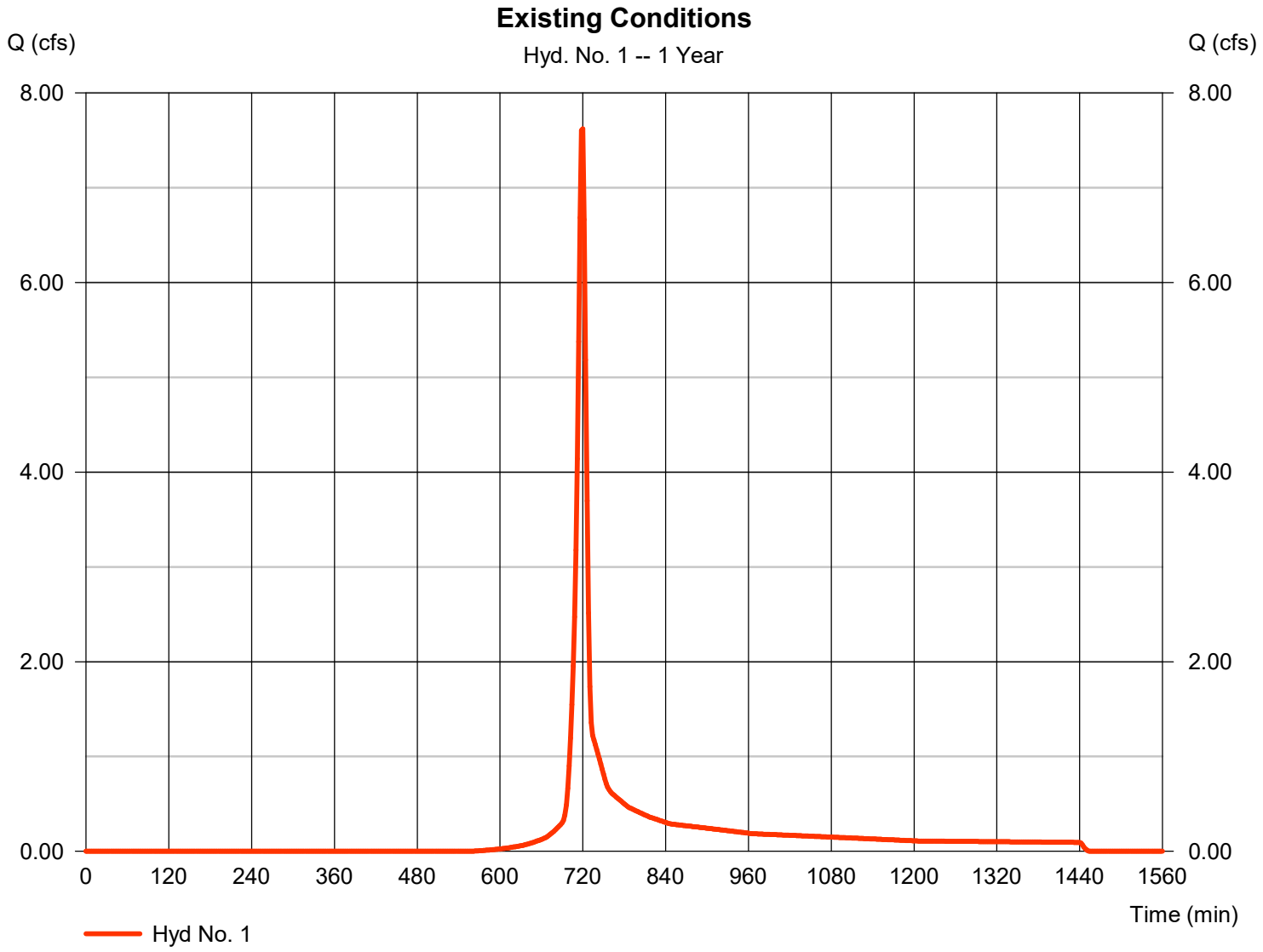
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Thursday, 08 / 28 / 2025

Hyd. No. 1

Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 7.623 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 17,453 cuft
Drainage area	= 3.320 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.91 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



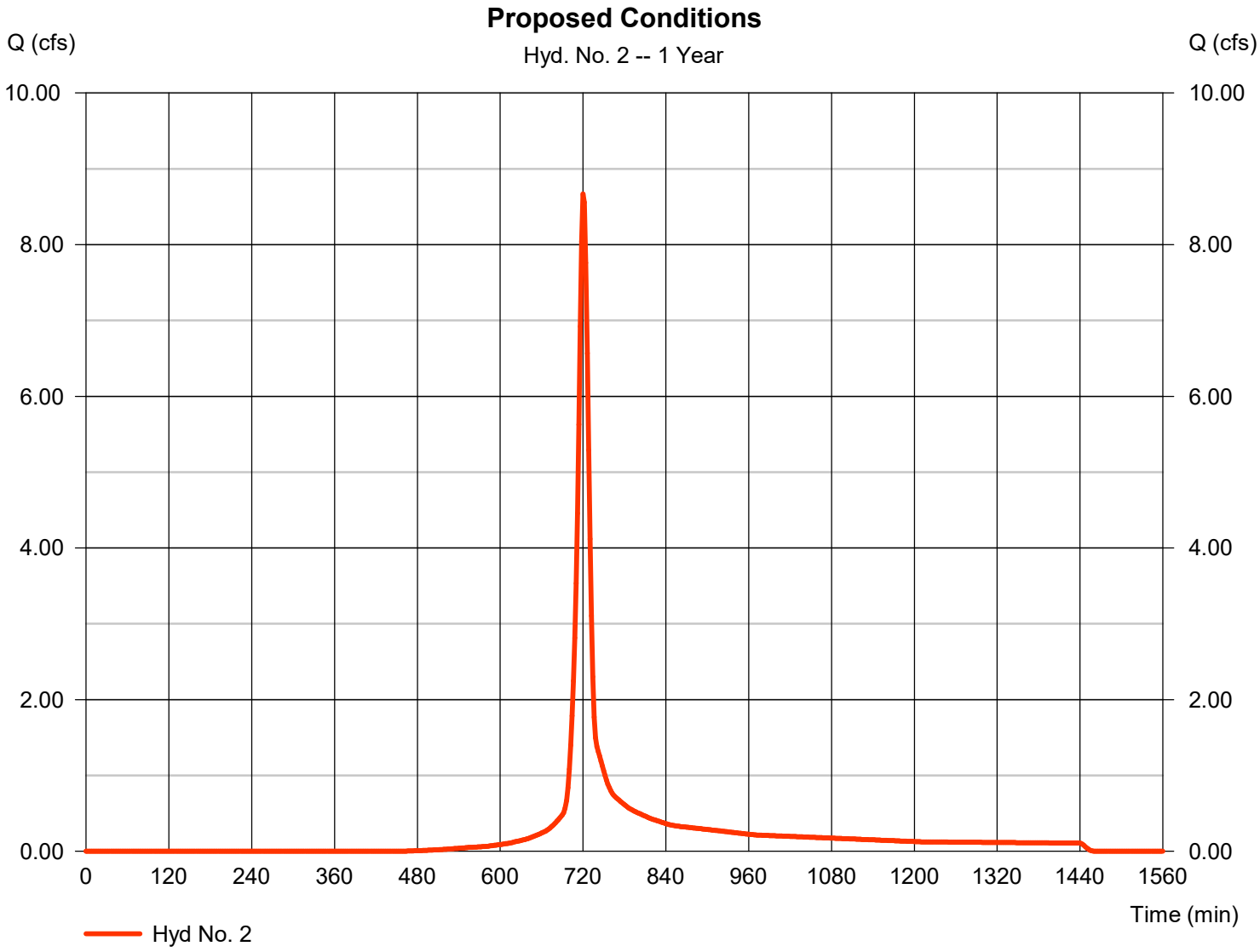
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.670 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	22,482 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	3.26 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



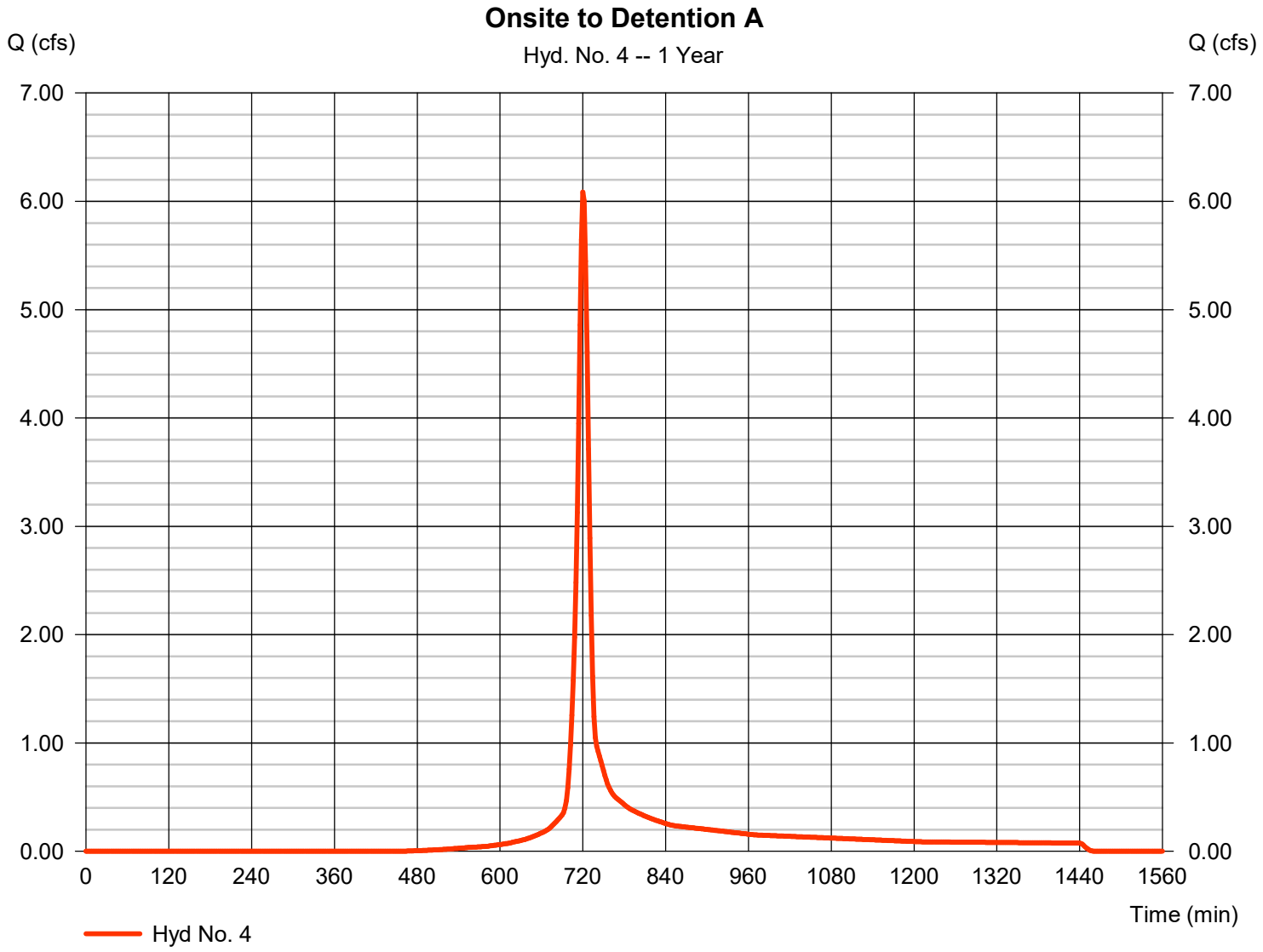
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.084 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	15,778 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	3.26 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



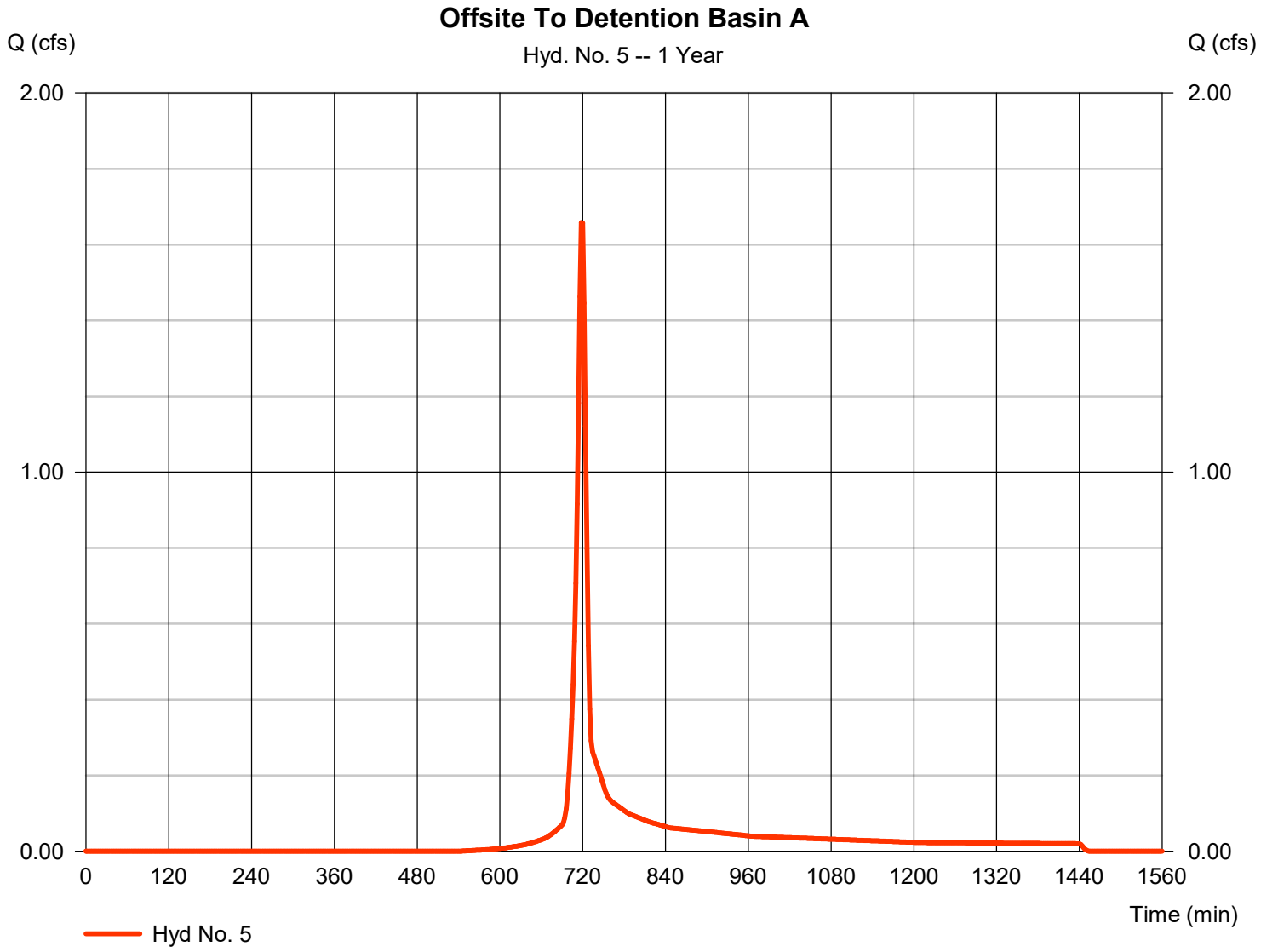
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.658 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	3,798 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	3.26 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

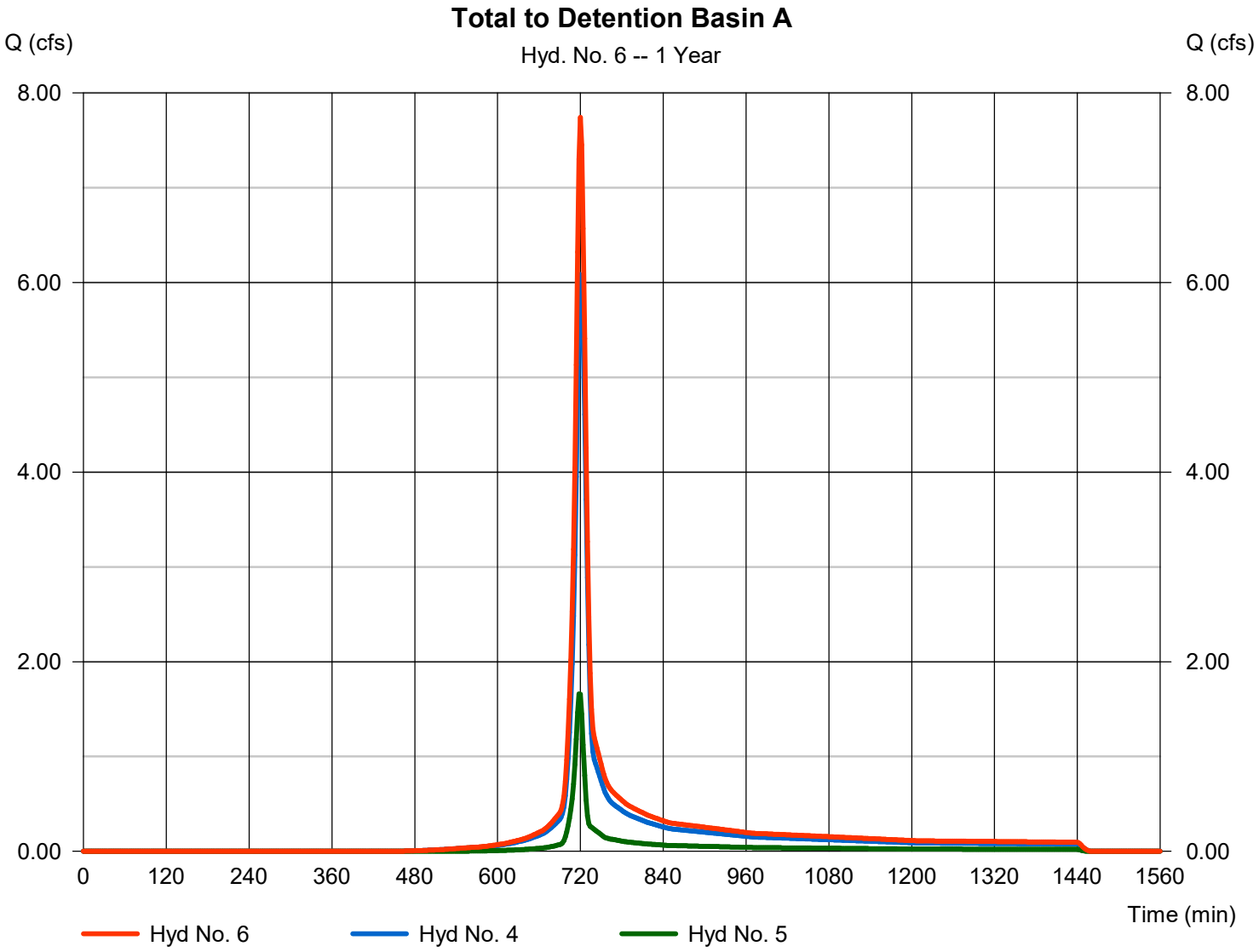


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	=	Combine	Peak discharge	=	7.741 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	19,576 cuft
Inflow hyds.	=	4, 5	Contrib. drain. area	=	3.020 ac



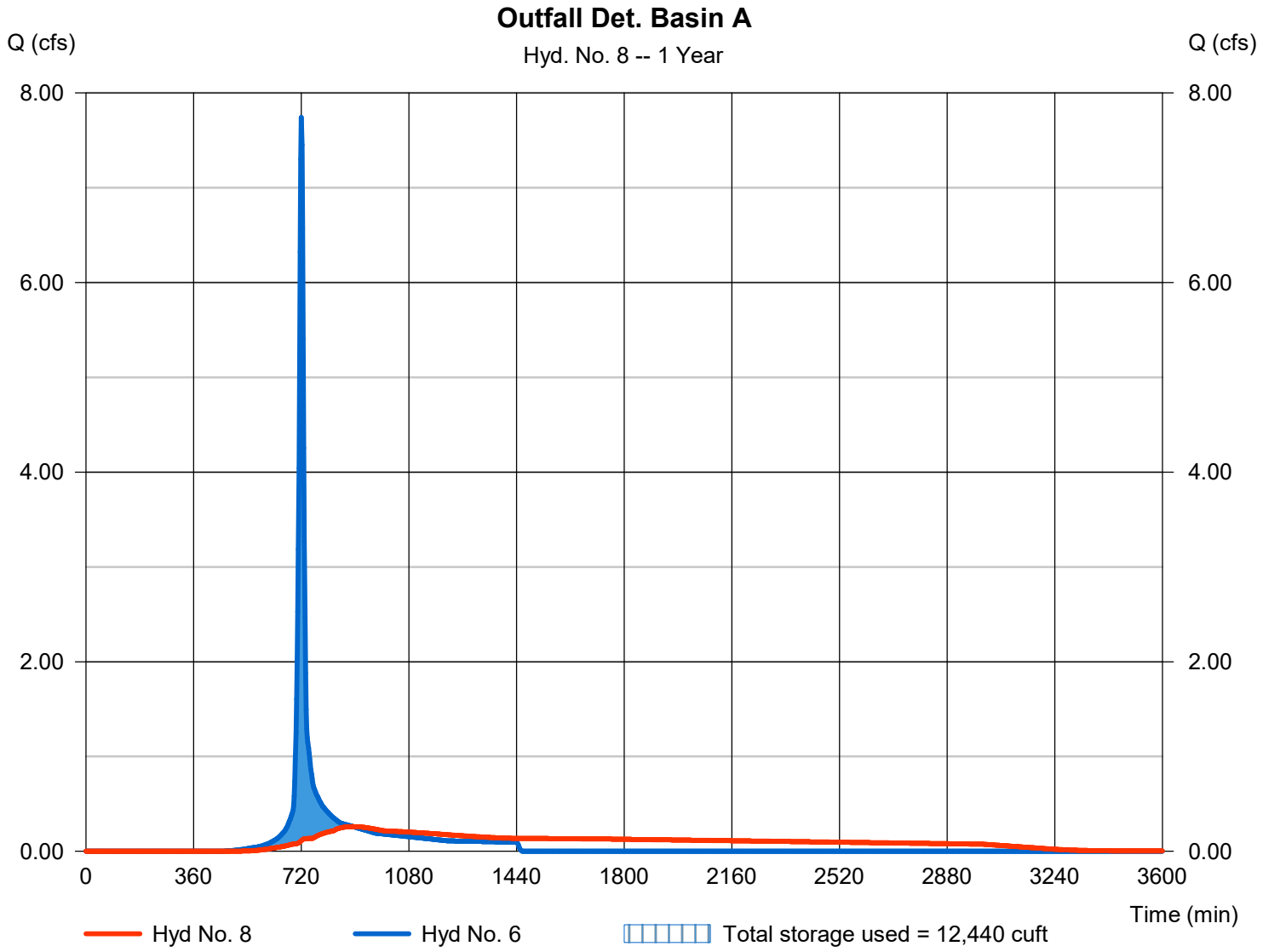
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	0.261 cfs
Storm frequency	=	1 yrs	Time to peak	=	892 min
Time interval	=	2 min	Hyd. volume	=	19,561 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	661.31 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	12,440 cuft

Storage Indication method used.



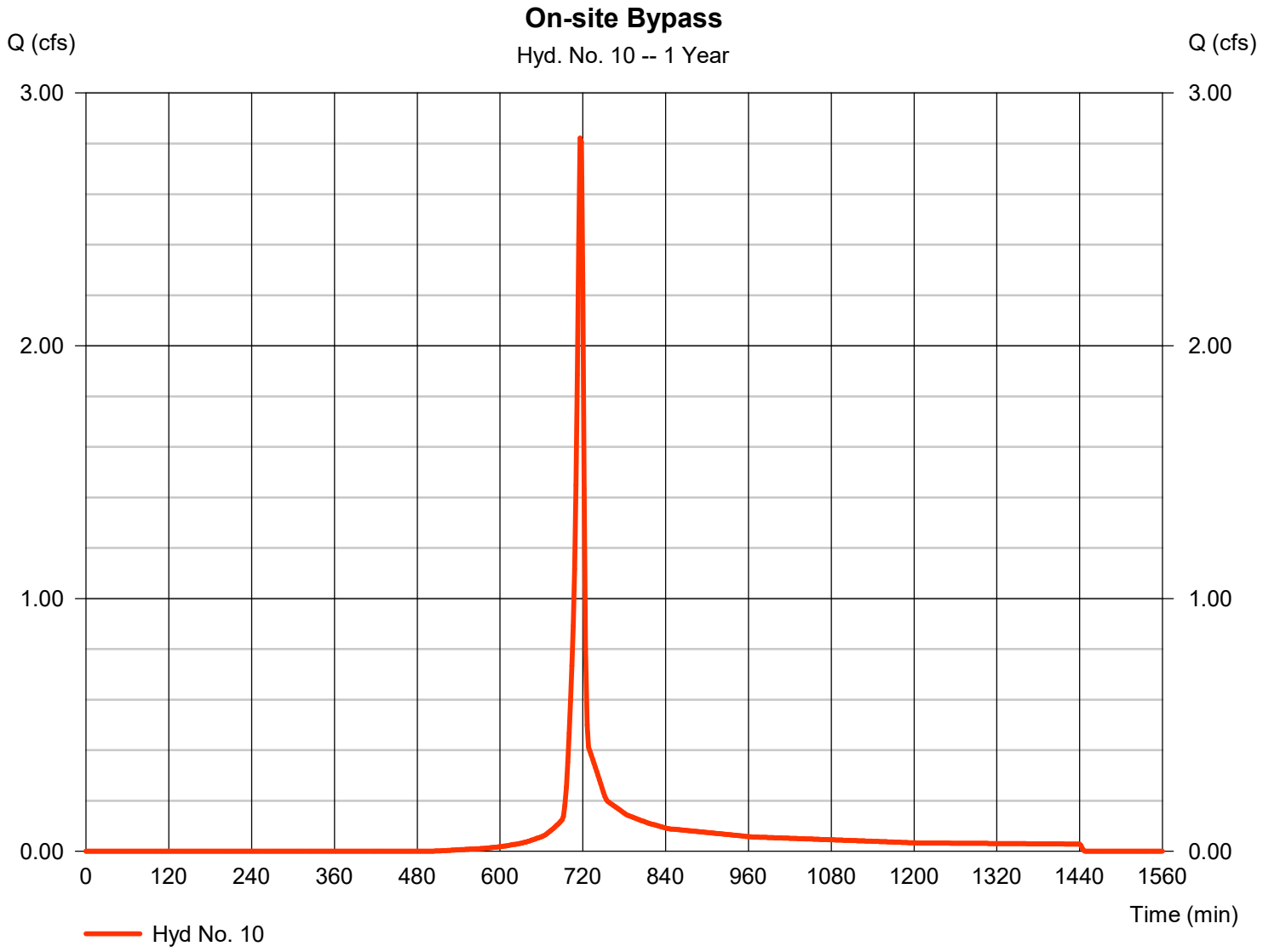
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.821 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	5,701 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.26 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

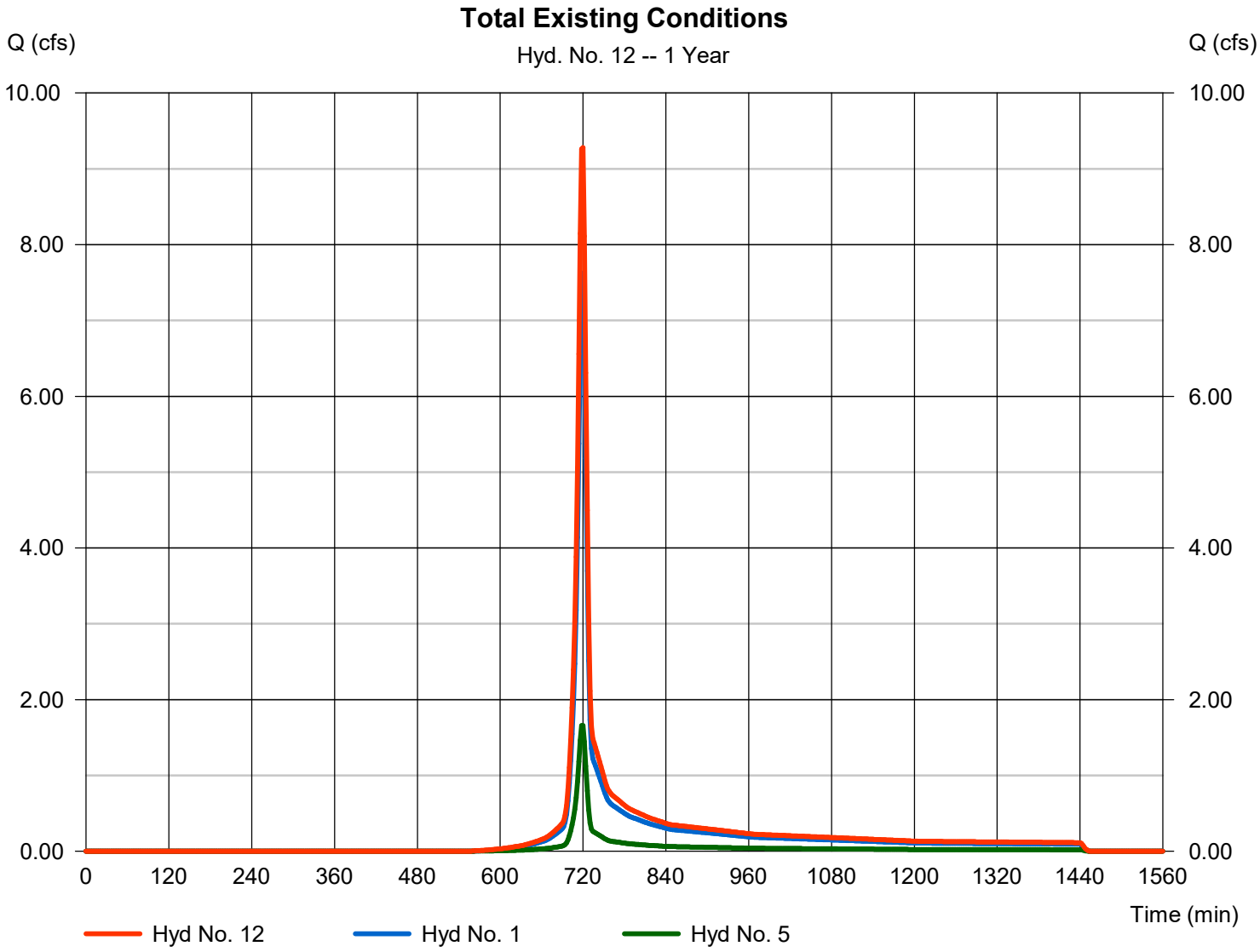


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 9.280 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 21,251 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

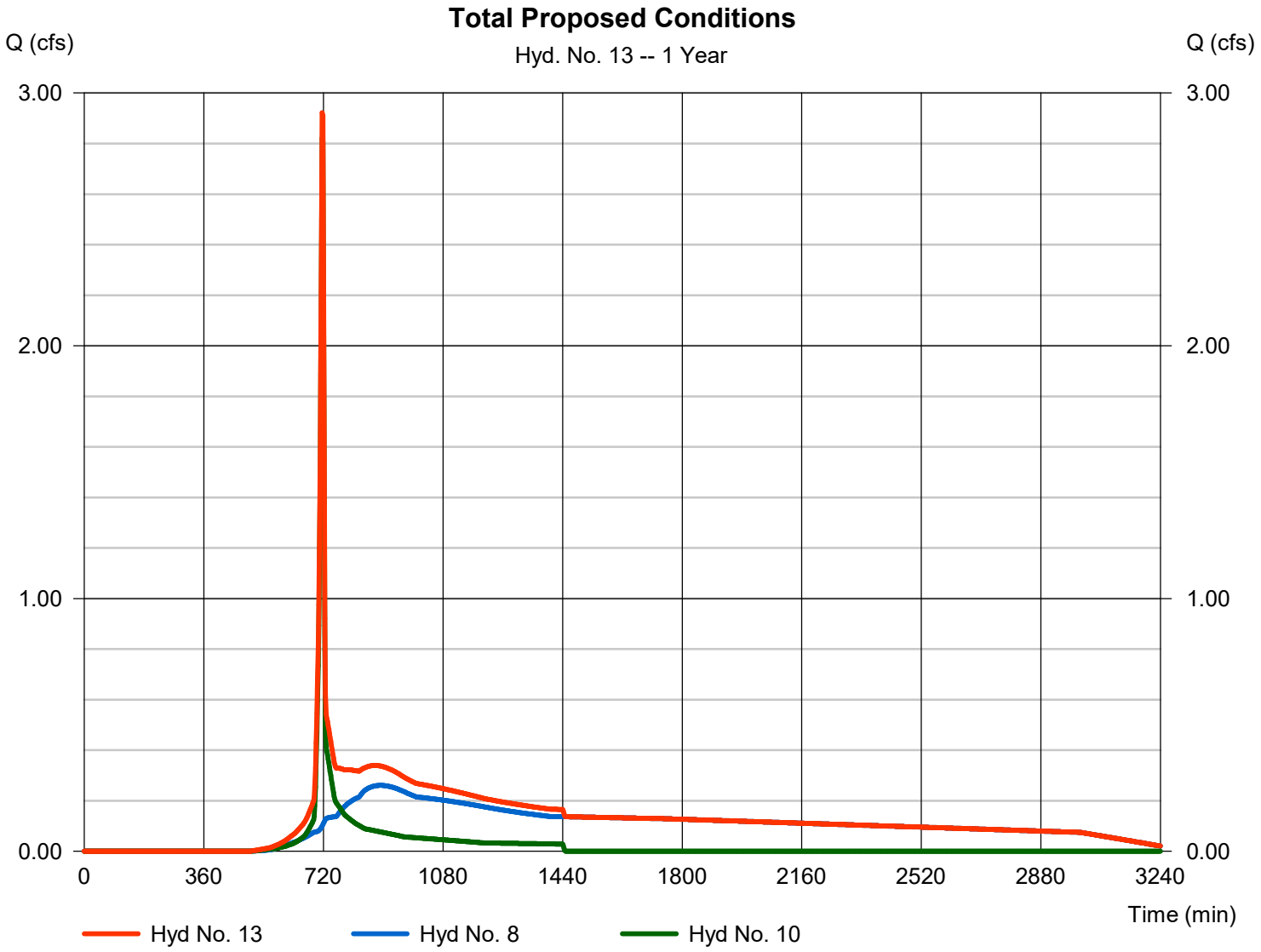


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 2.921 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 25,262 cuft
Inflow hyds.	= 8, 10	Contrib. drain. area	= 1.010 ac



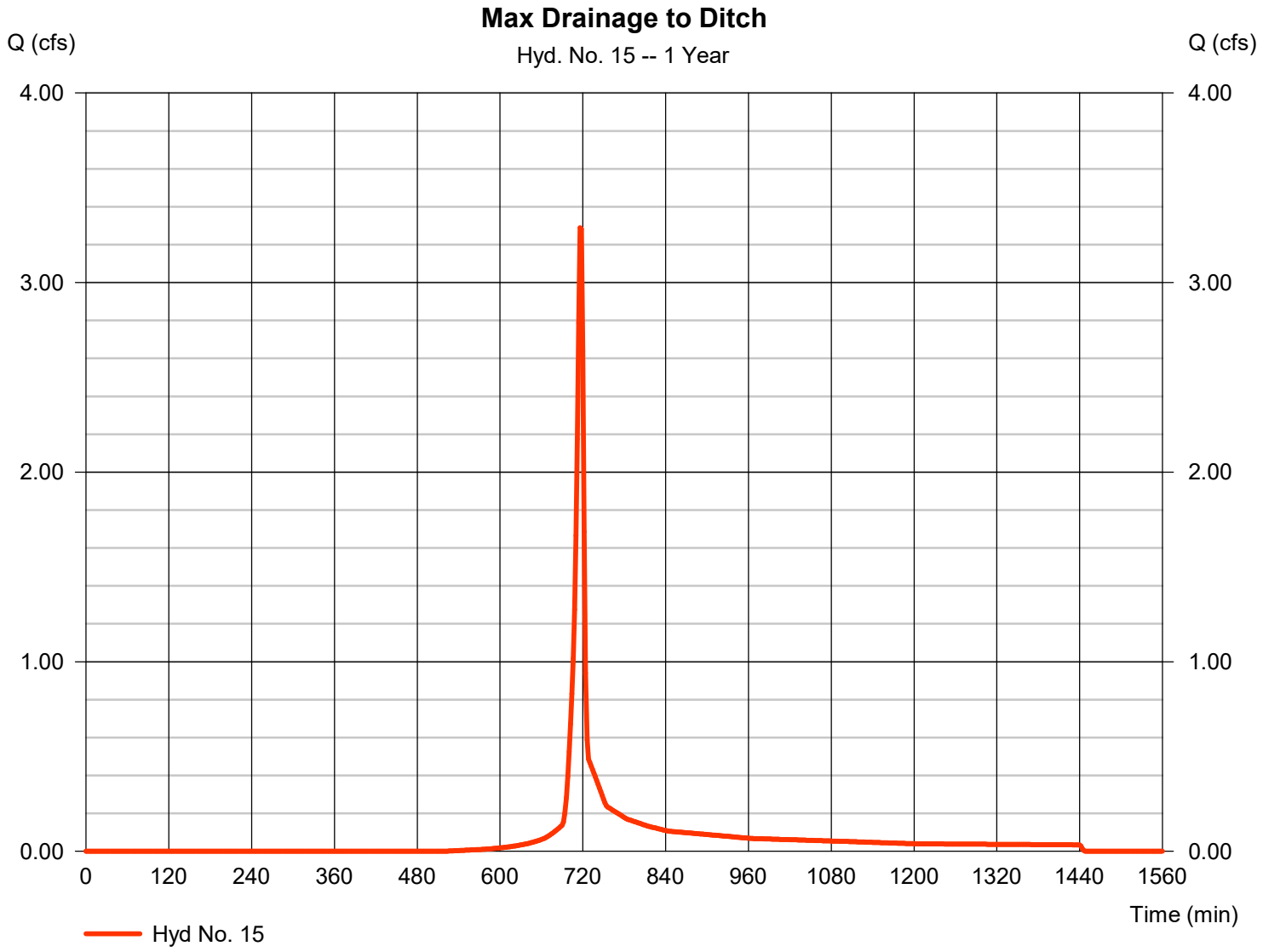
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.289 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	6,641 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.26 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



Hydrograph Report

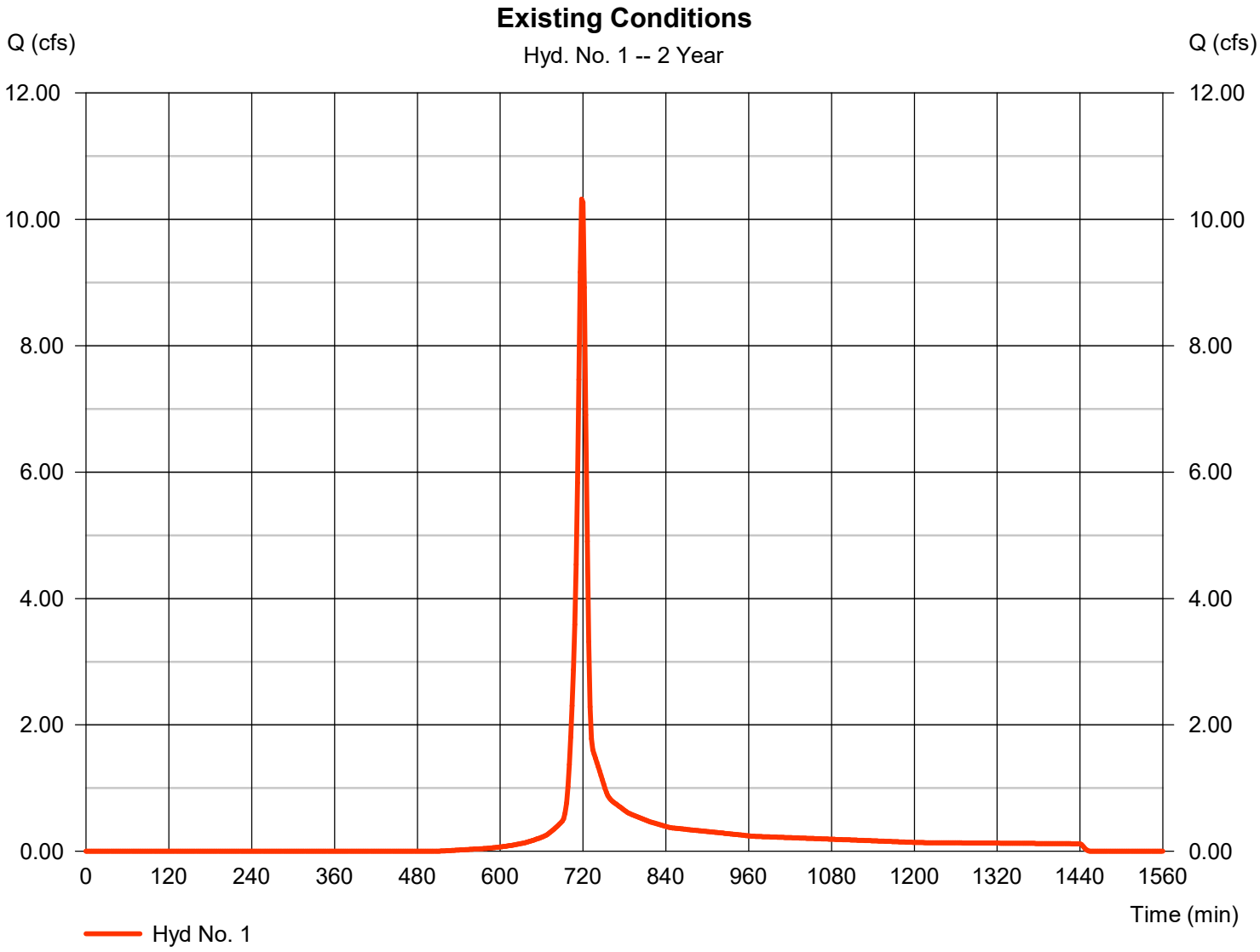
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Thursday, 08 / 28 / 2025

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.32 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	23,613 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



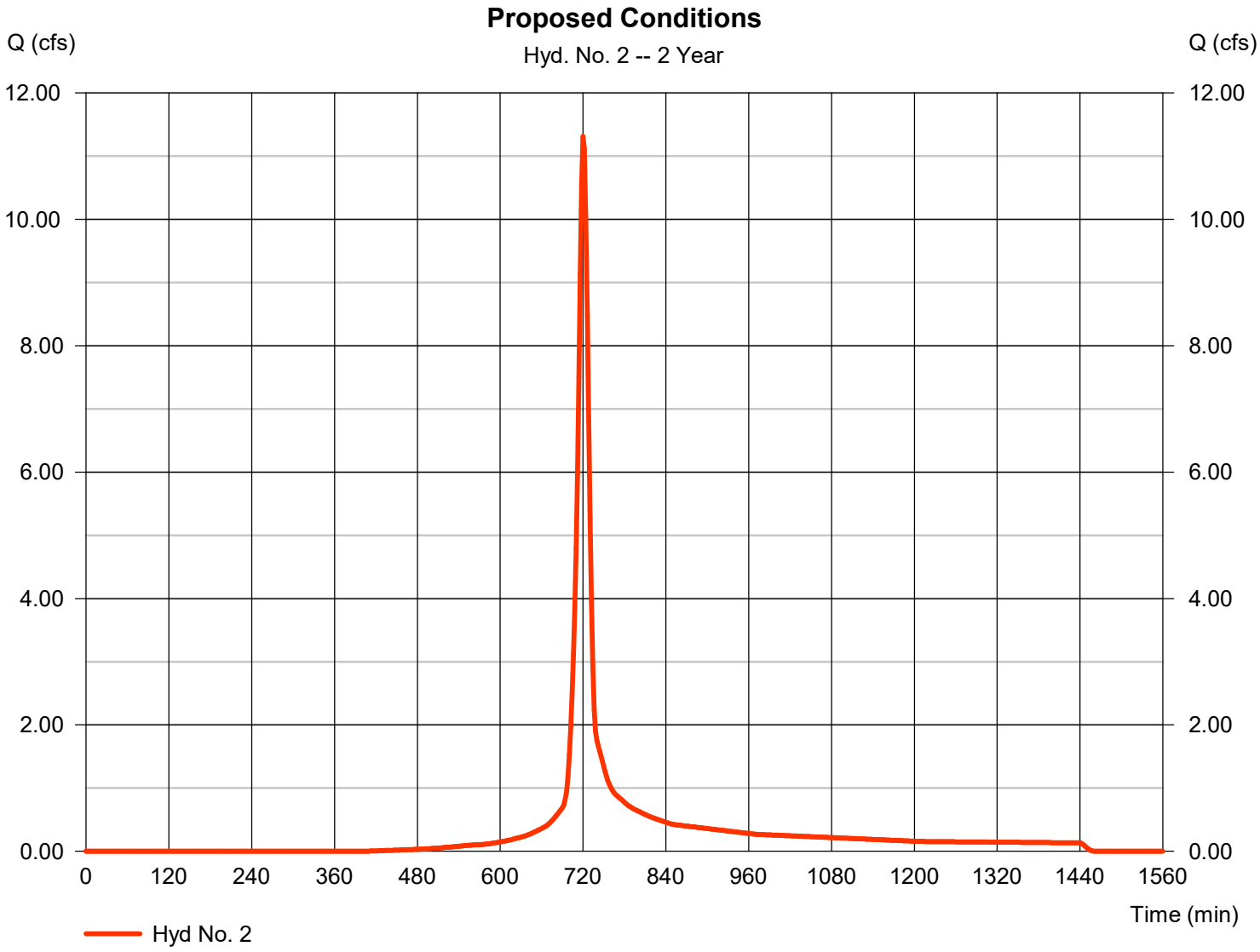
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.31 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	29,438 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



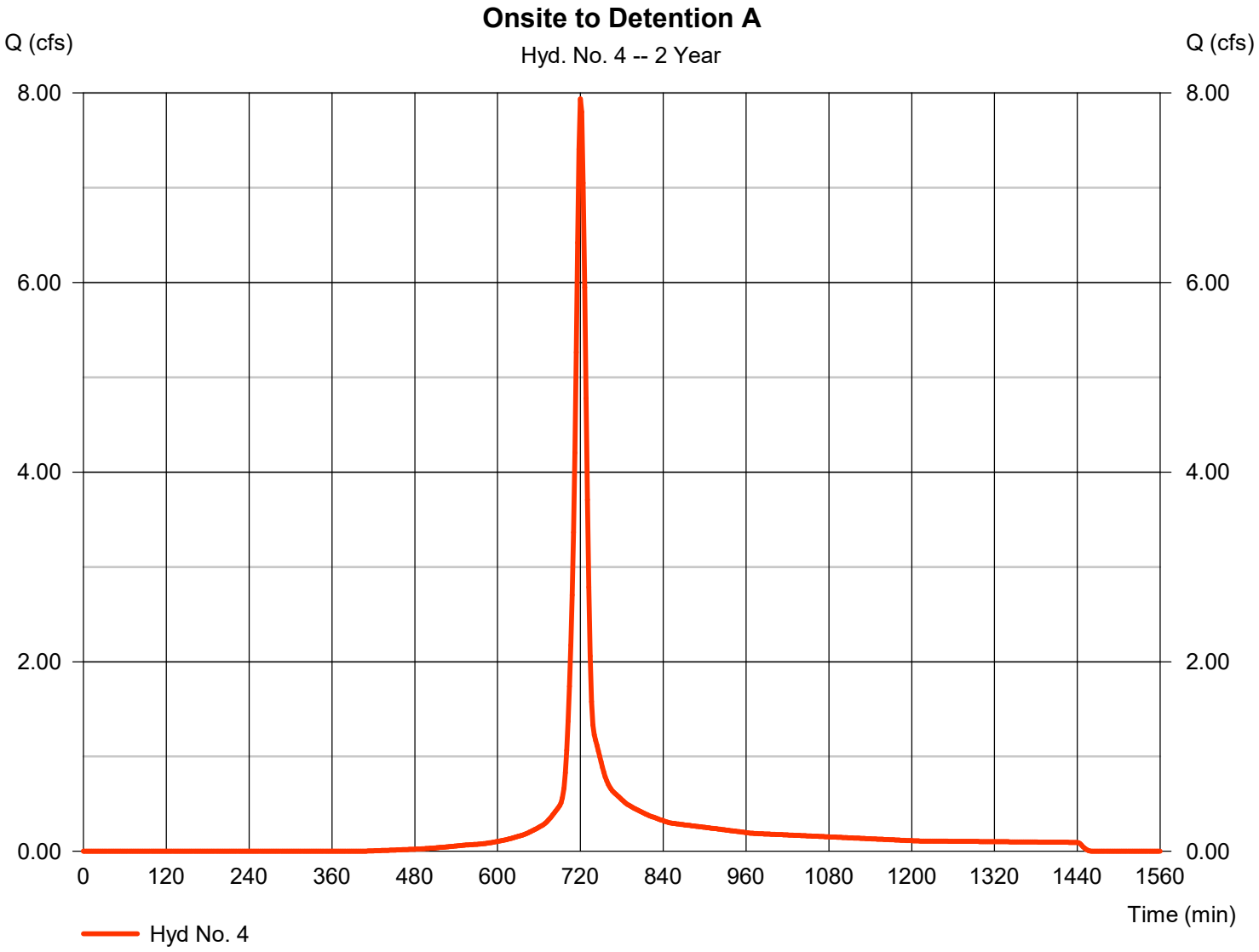
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.939 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	20,660 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



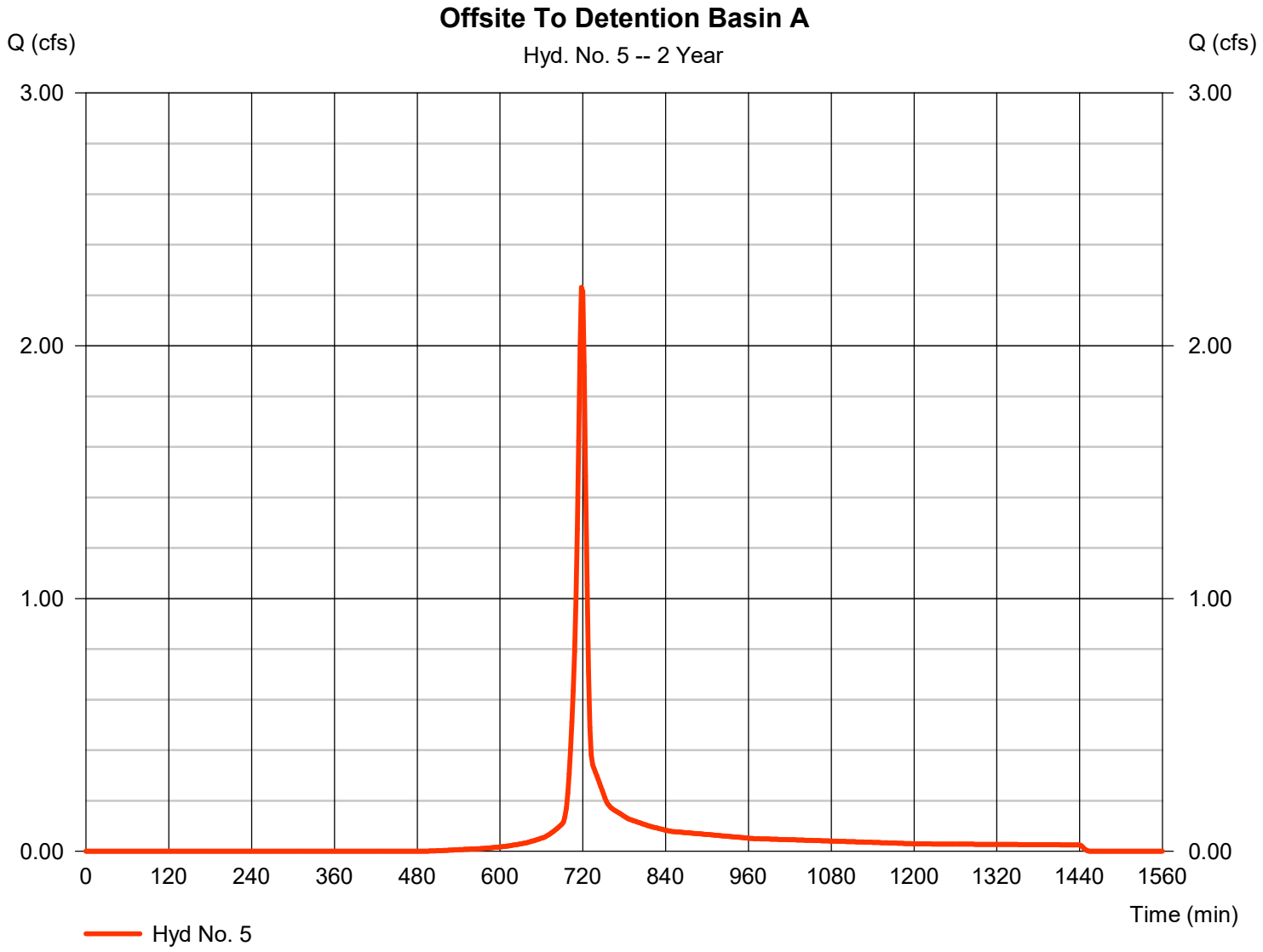
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.231 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	5,104 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

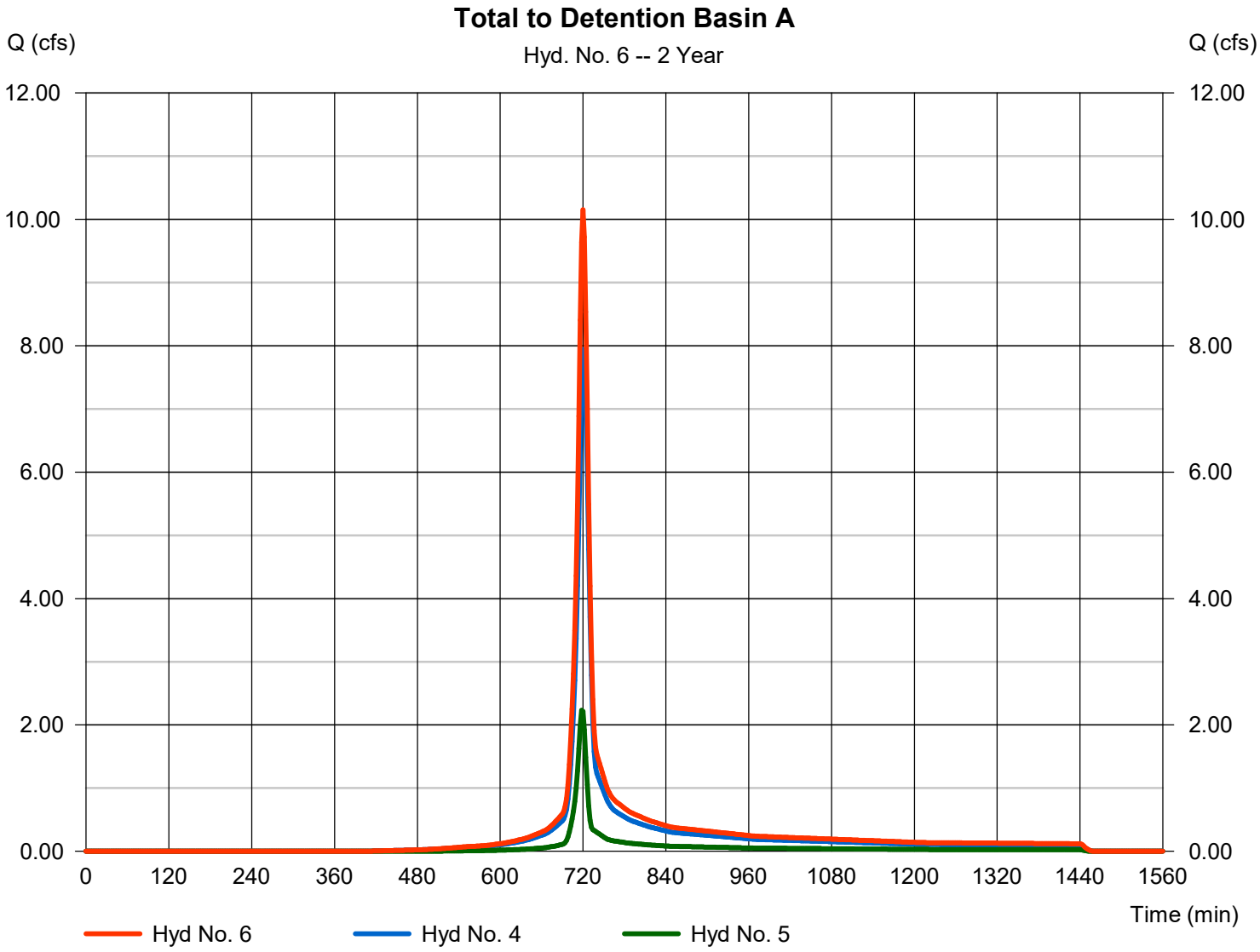


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	= Combine	Peak discharge	= 10.15 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 25,764 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 3.020 ac



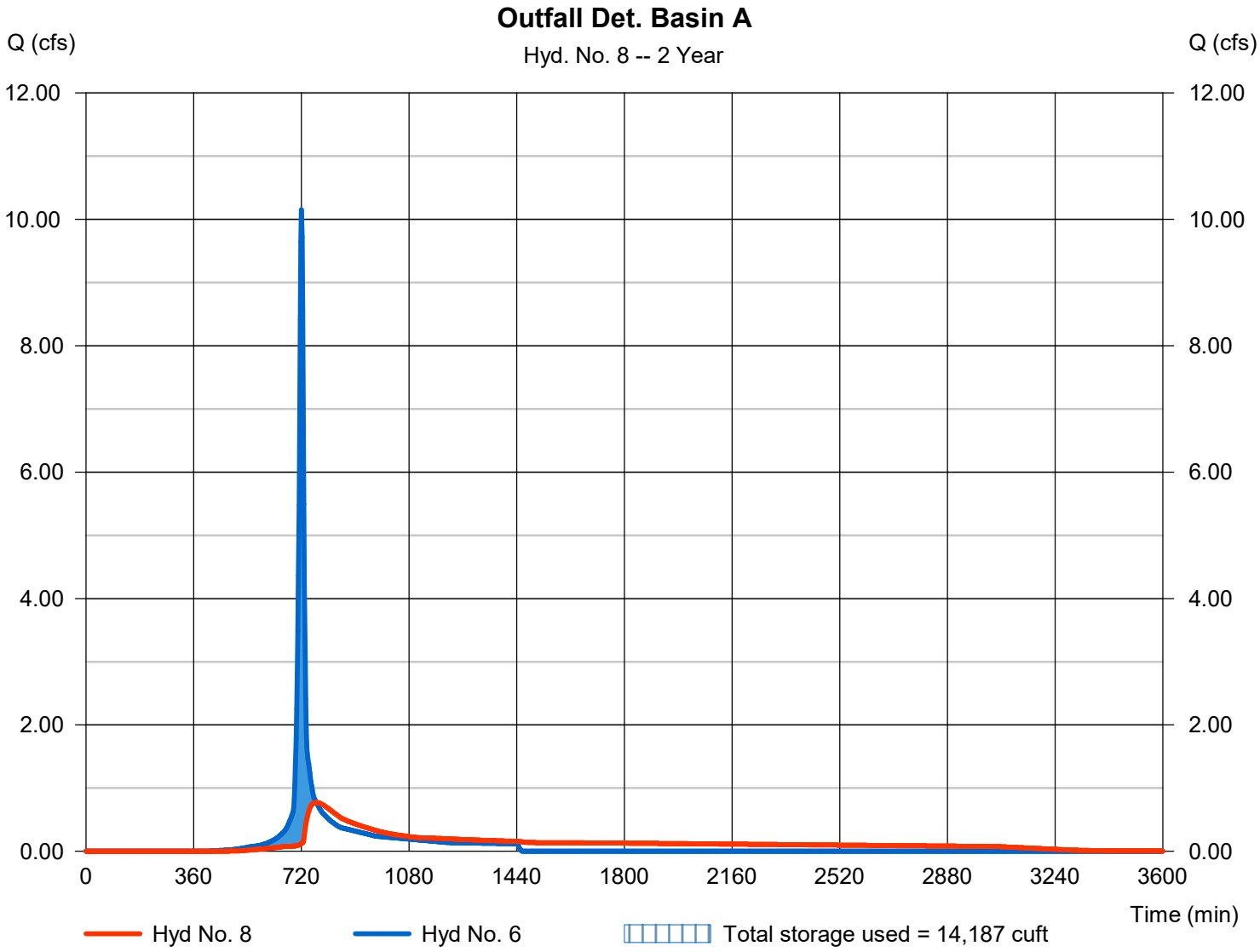
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	0.772 cfs
Storm frequency	=	2 yrs	Time to peak	=	770 min
Time interval	=	2 min	Hyd. volume	=	25,749 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	661.46 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	14,187 cuft

Storage Indication method used.



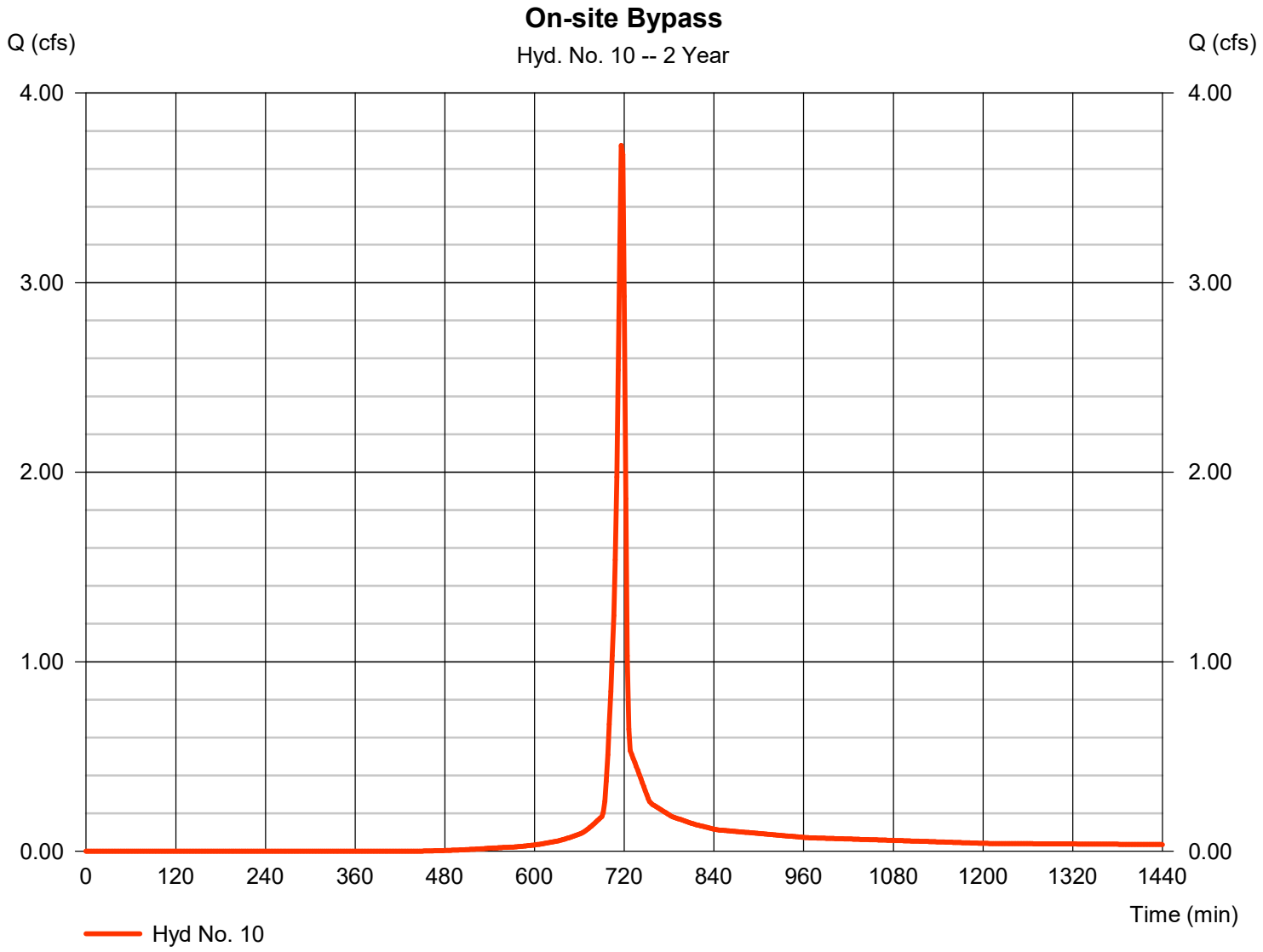
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.724 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	7,560 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

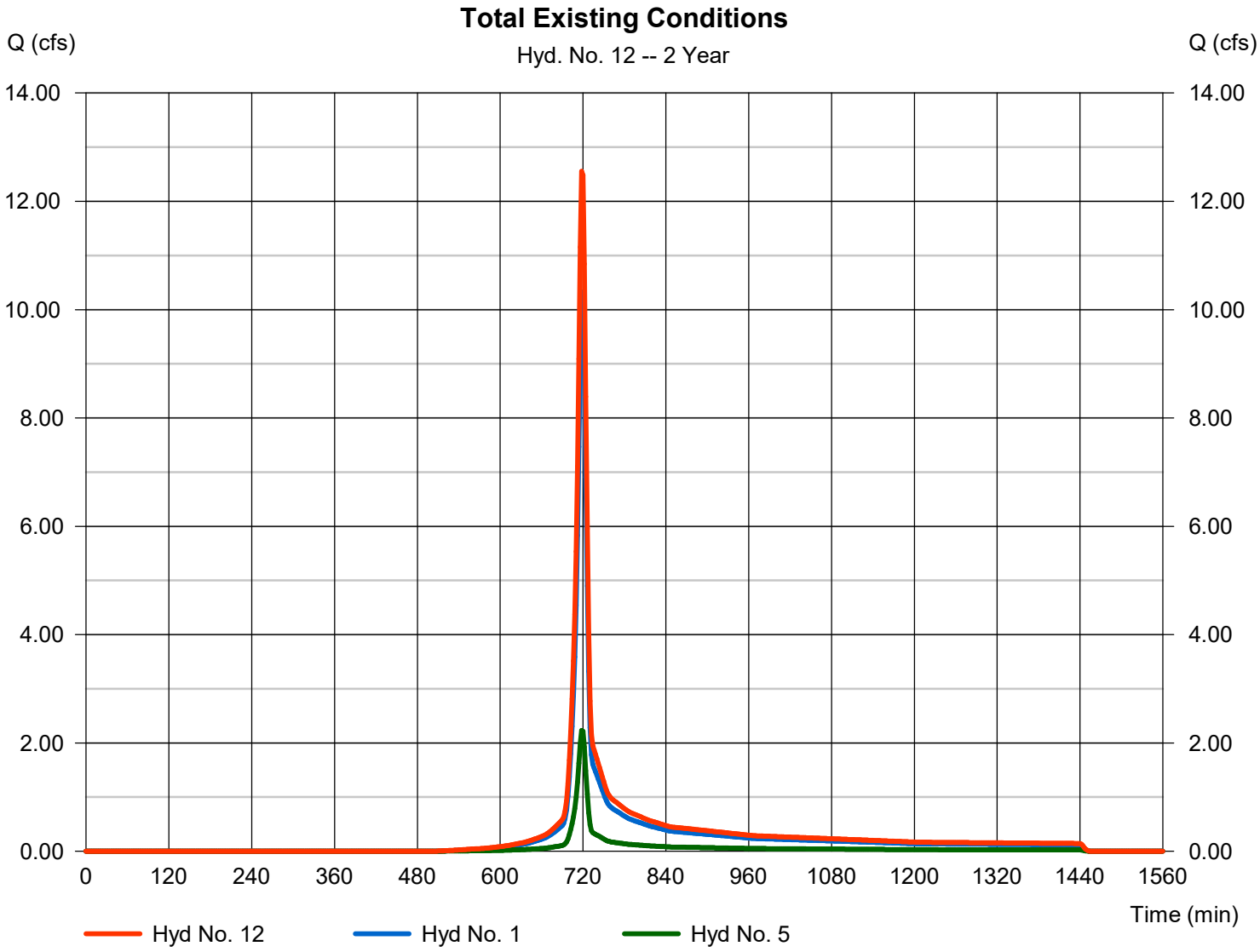


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 12.55 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 28,717 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

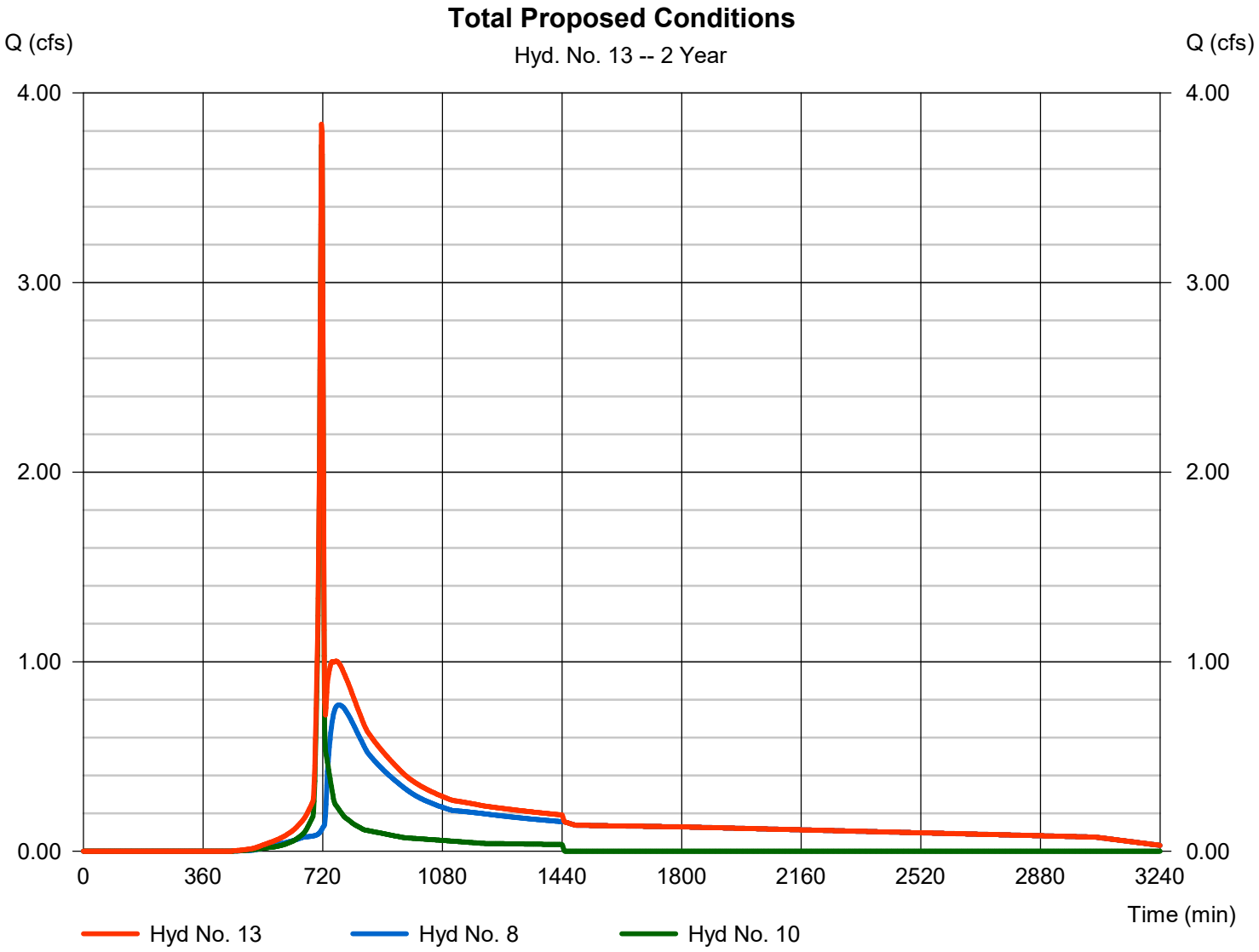


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 3.836 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 33,309 cuft
Inflow hyds.	= 8, 10	Contrib. drain. area	= 1.010 ac



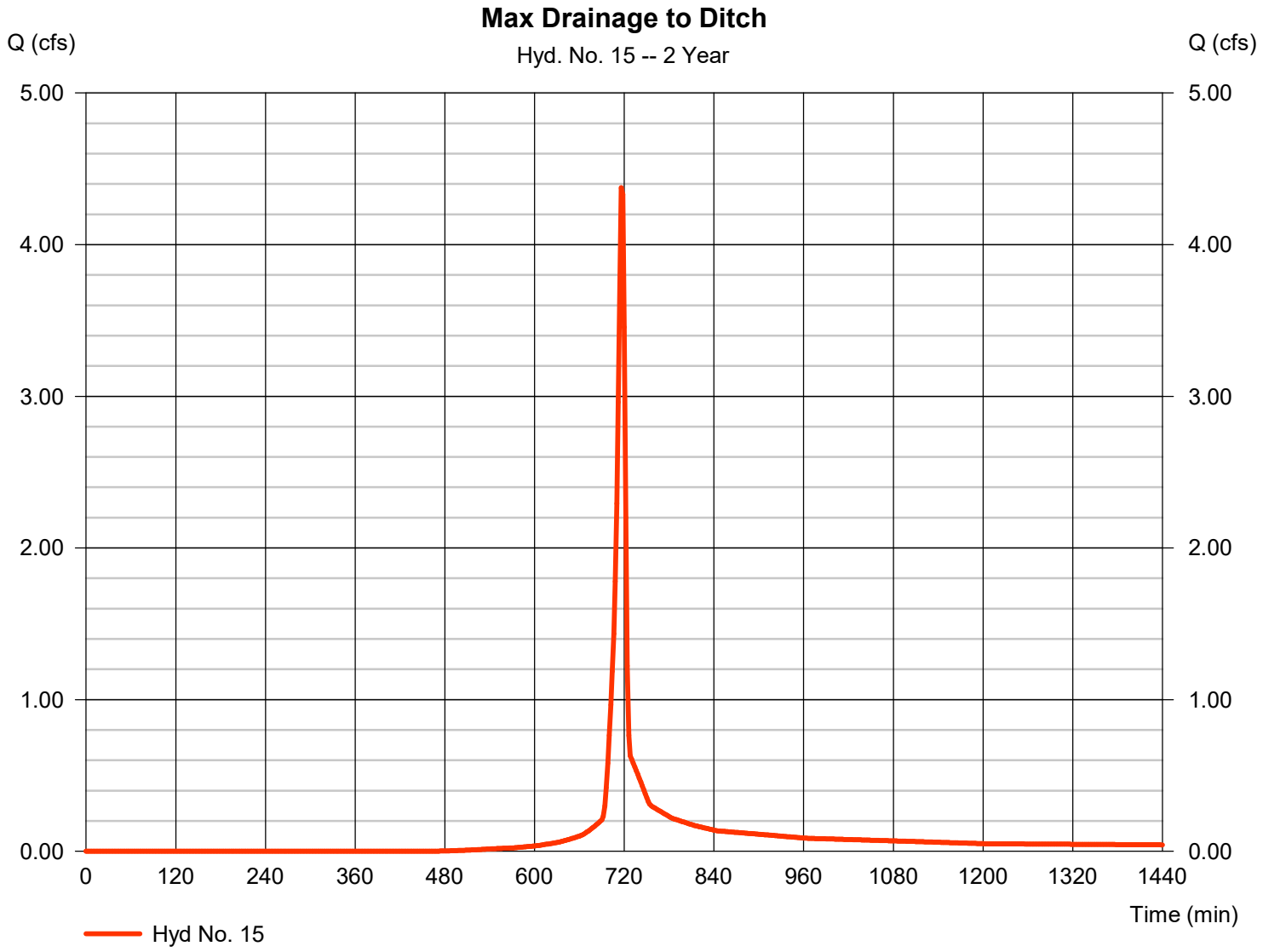
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.376 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	8,865 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



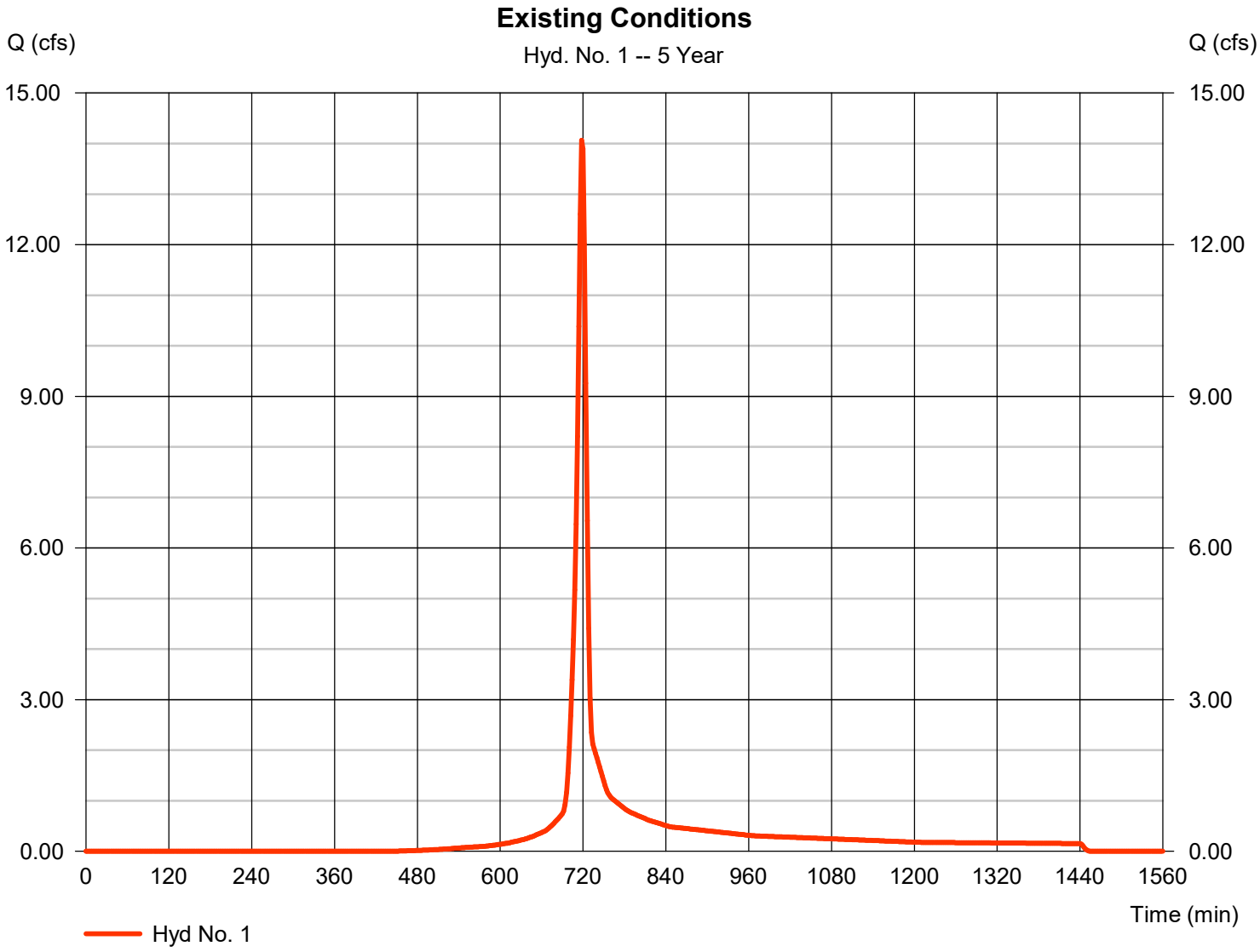
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.06 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	32,249 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



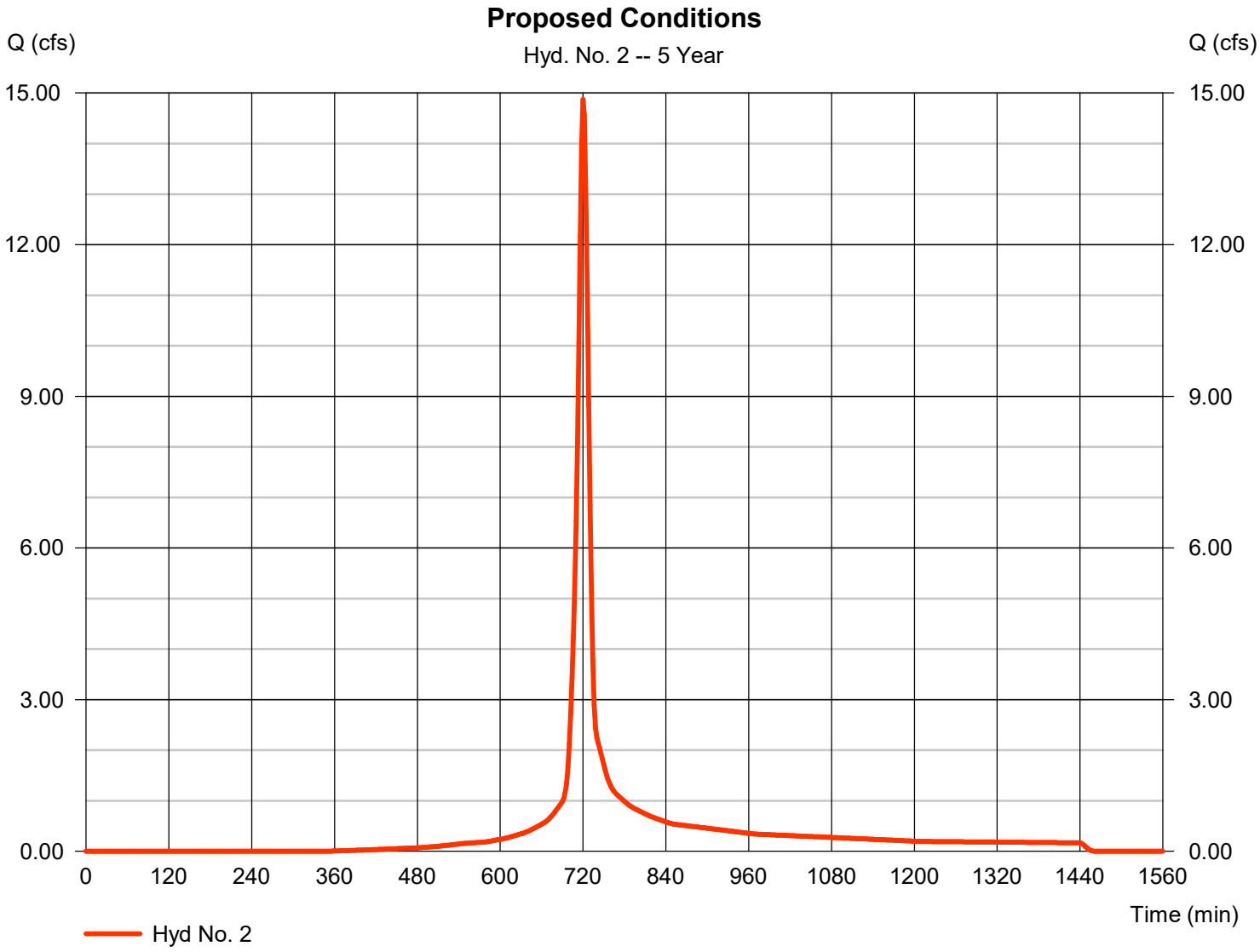
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.87 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	38,997 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



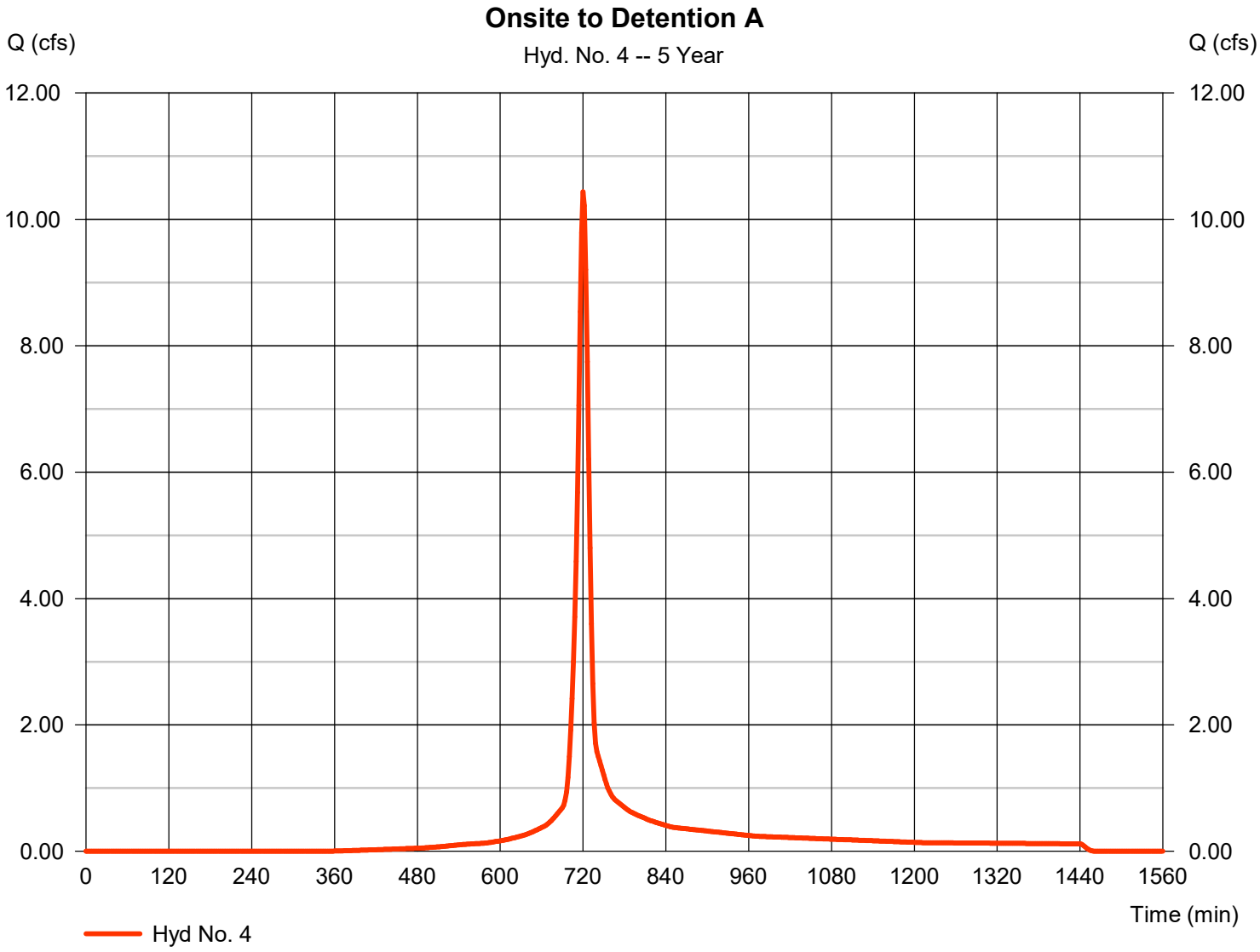
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.44 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	27,368 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



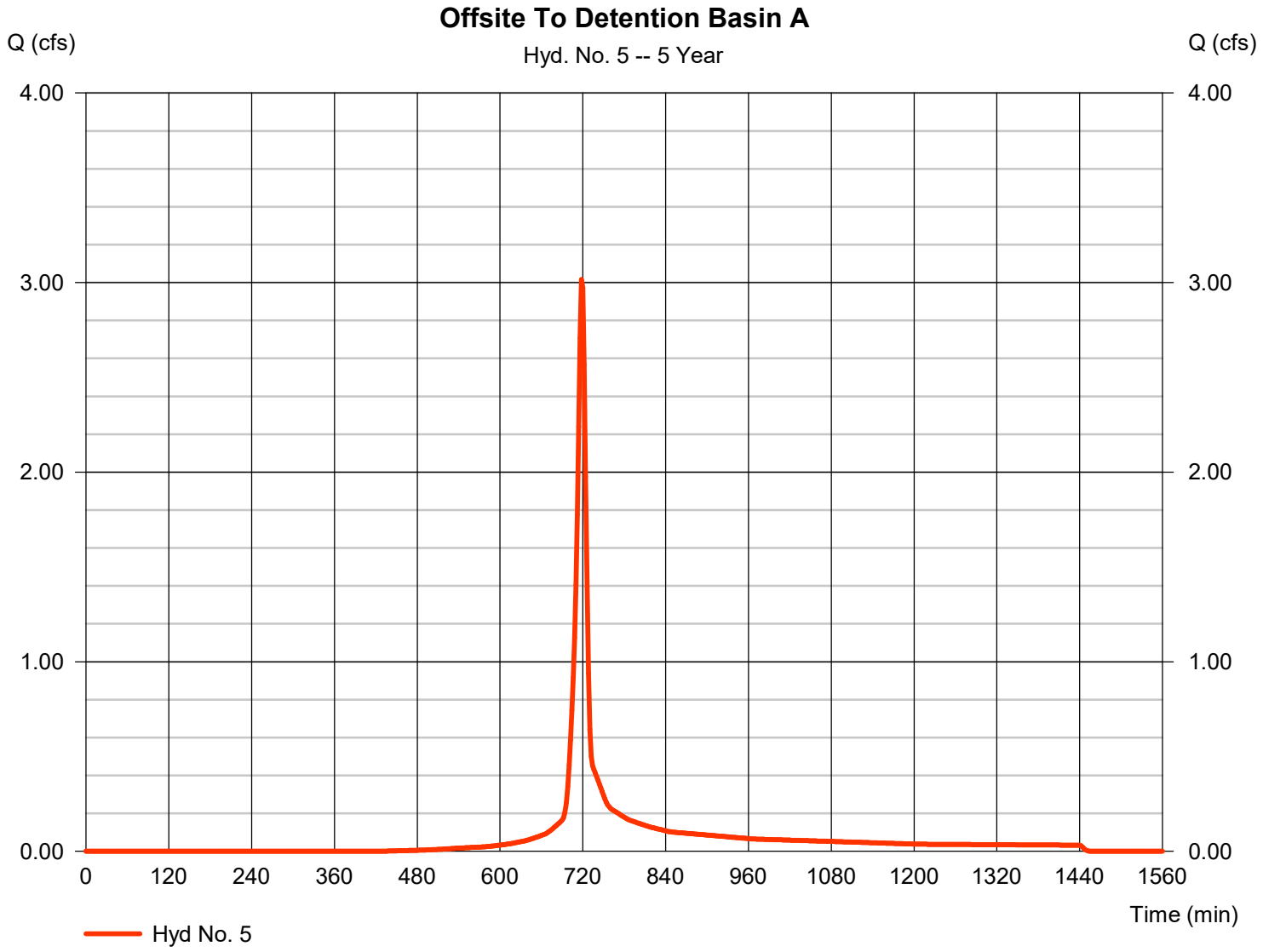
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.016 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,927 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

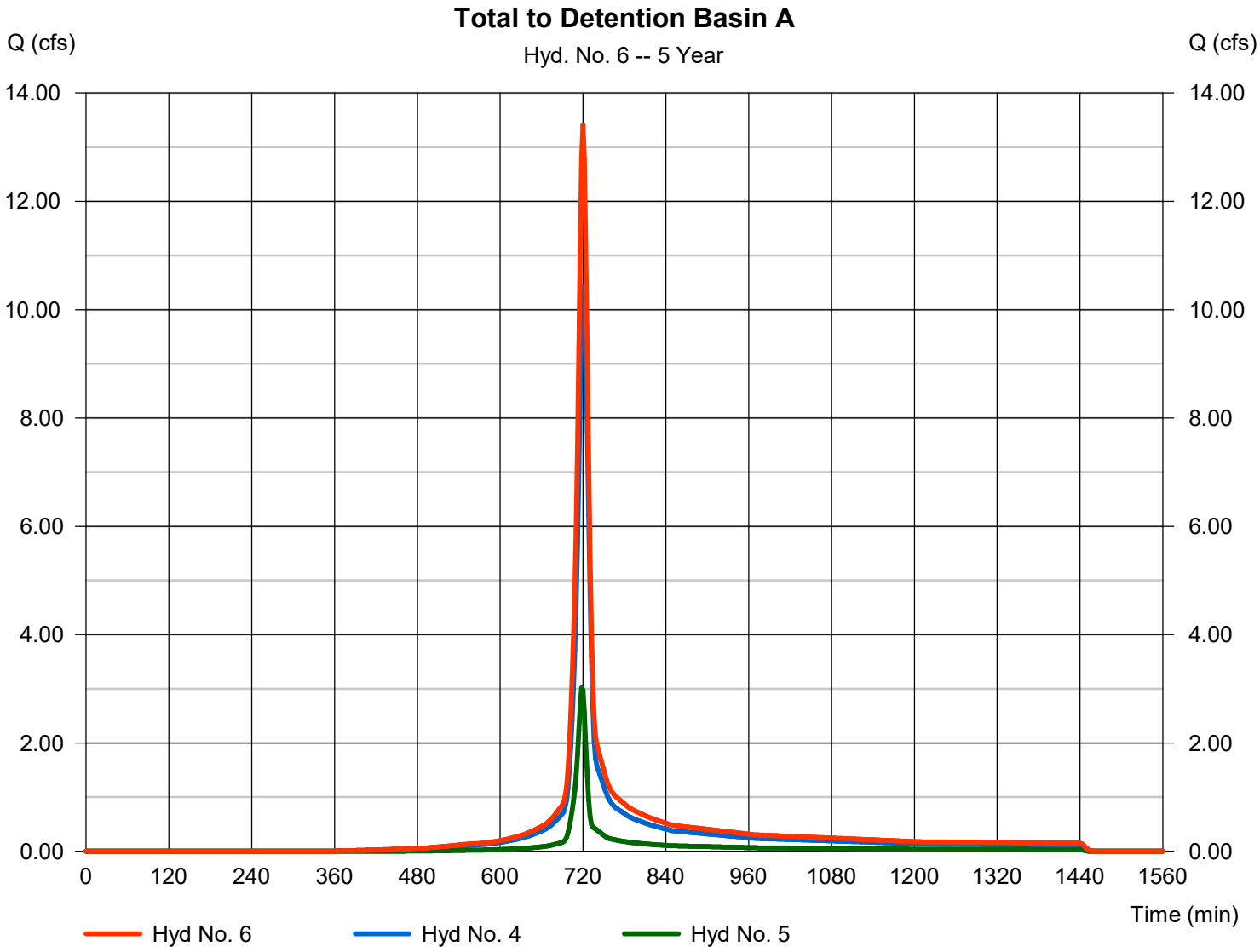


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	=	Combine	Peak discharge	=	13.41 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	34,295 cuft
Inflow hyds.	=	4, 5	Contrib. drain. area	=	3.020 ac



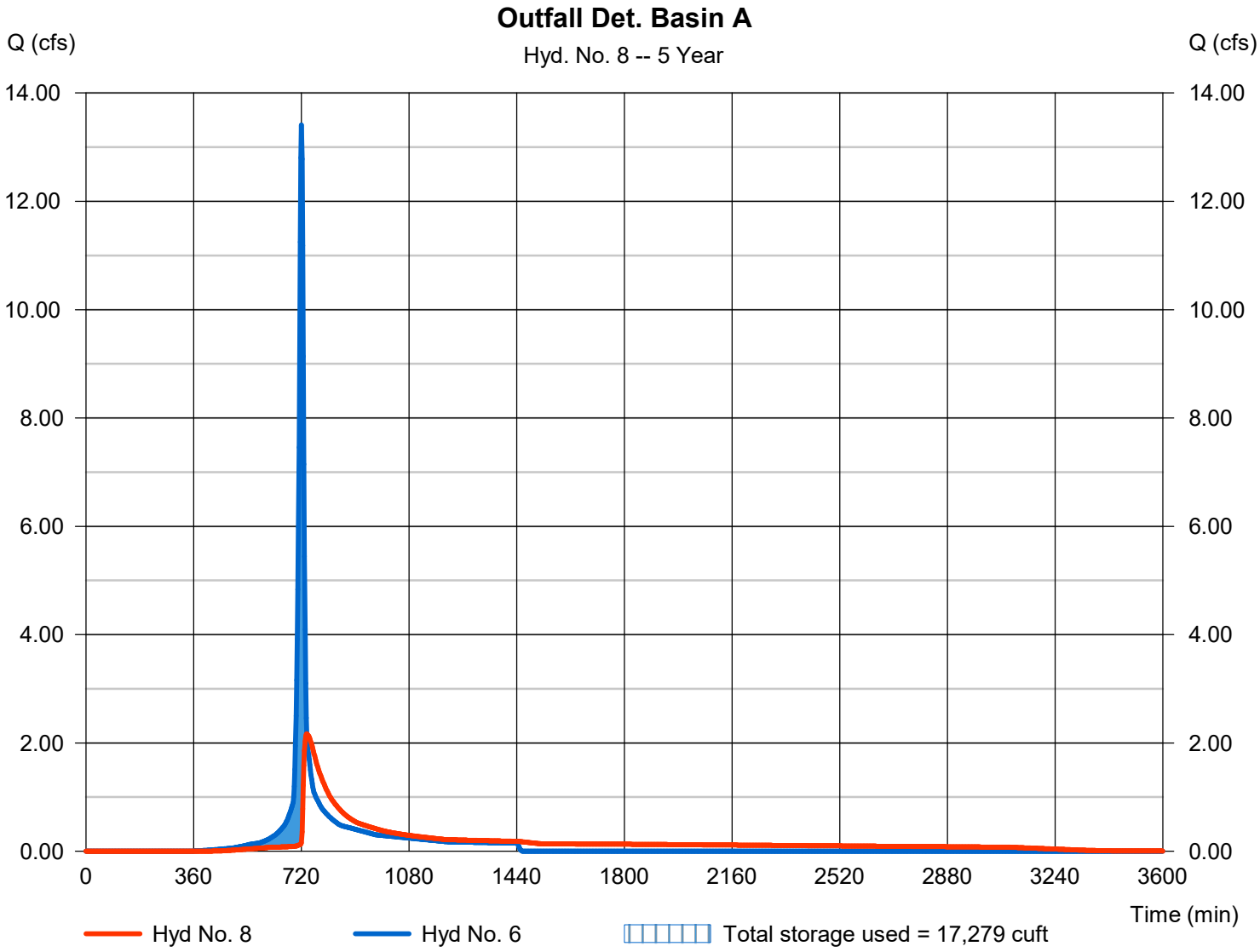
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	2.170 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	34,280 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	661.70 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	17,279 cuft

Storage Indication method used.



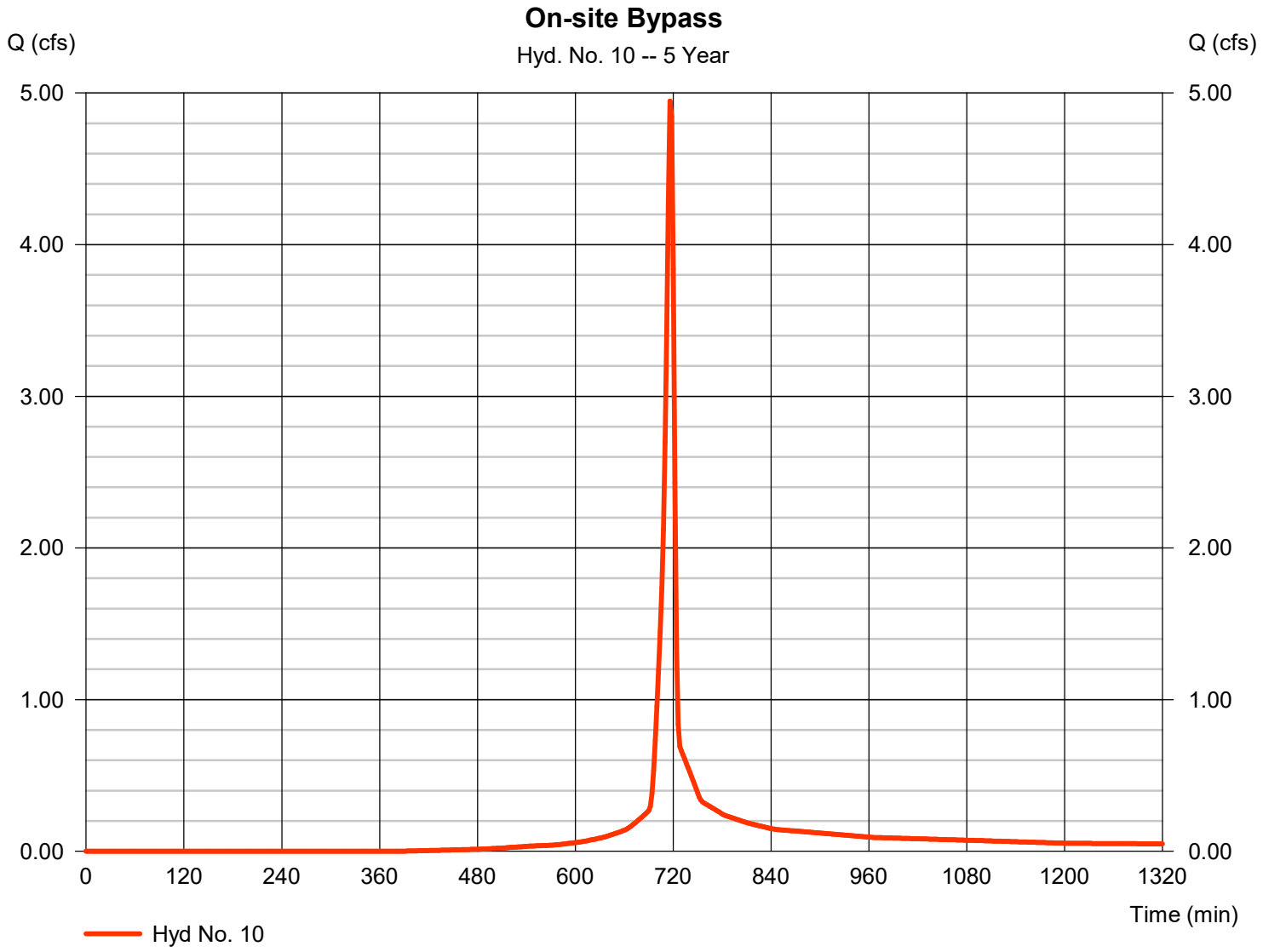
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.947 cfs
Storm frequency	=	5 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	10,136 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

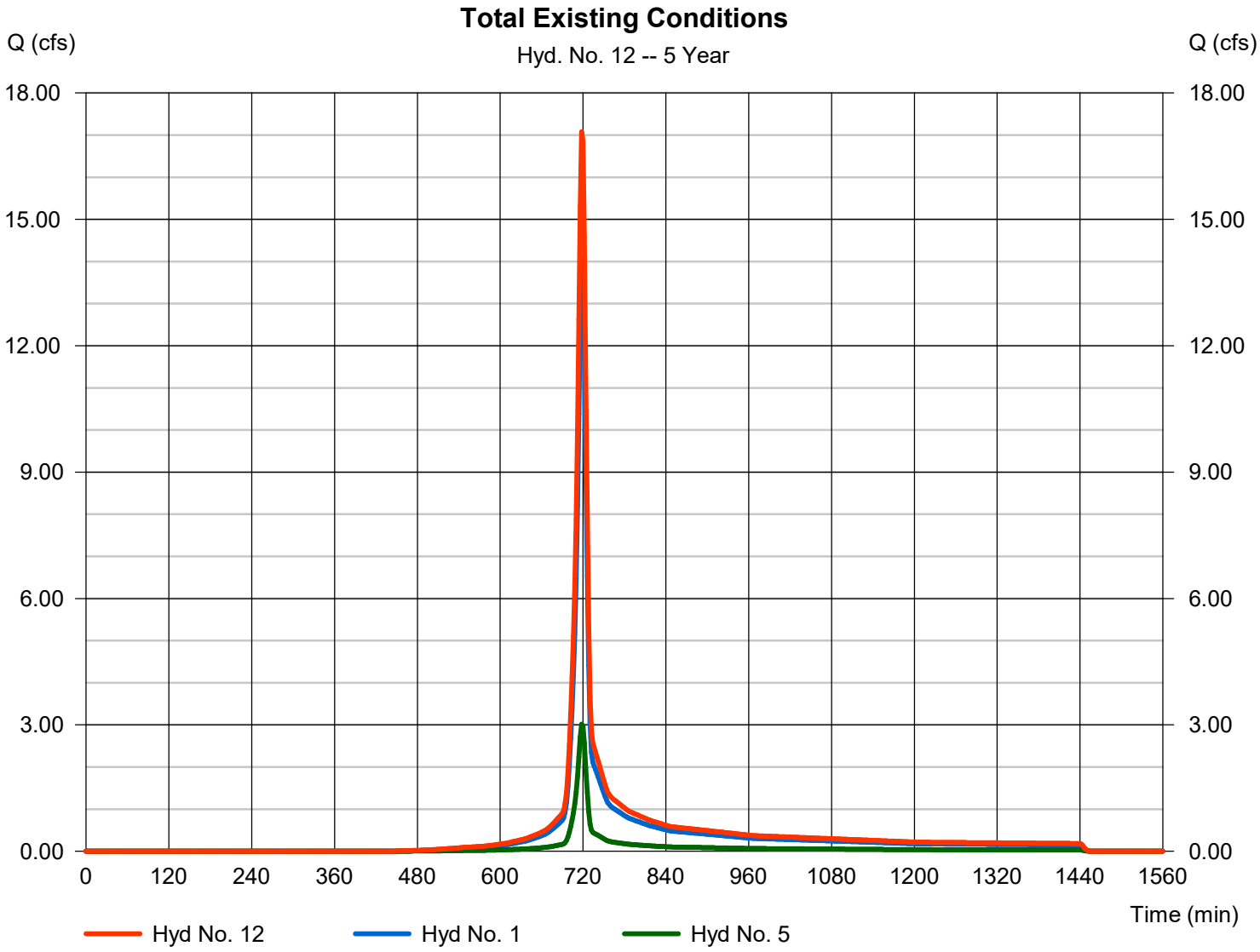


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 17.08 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 39,176 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

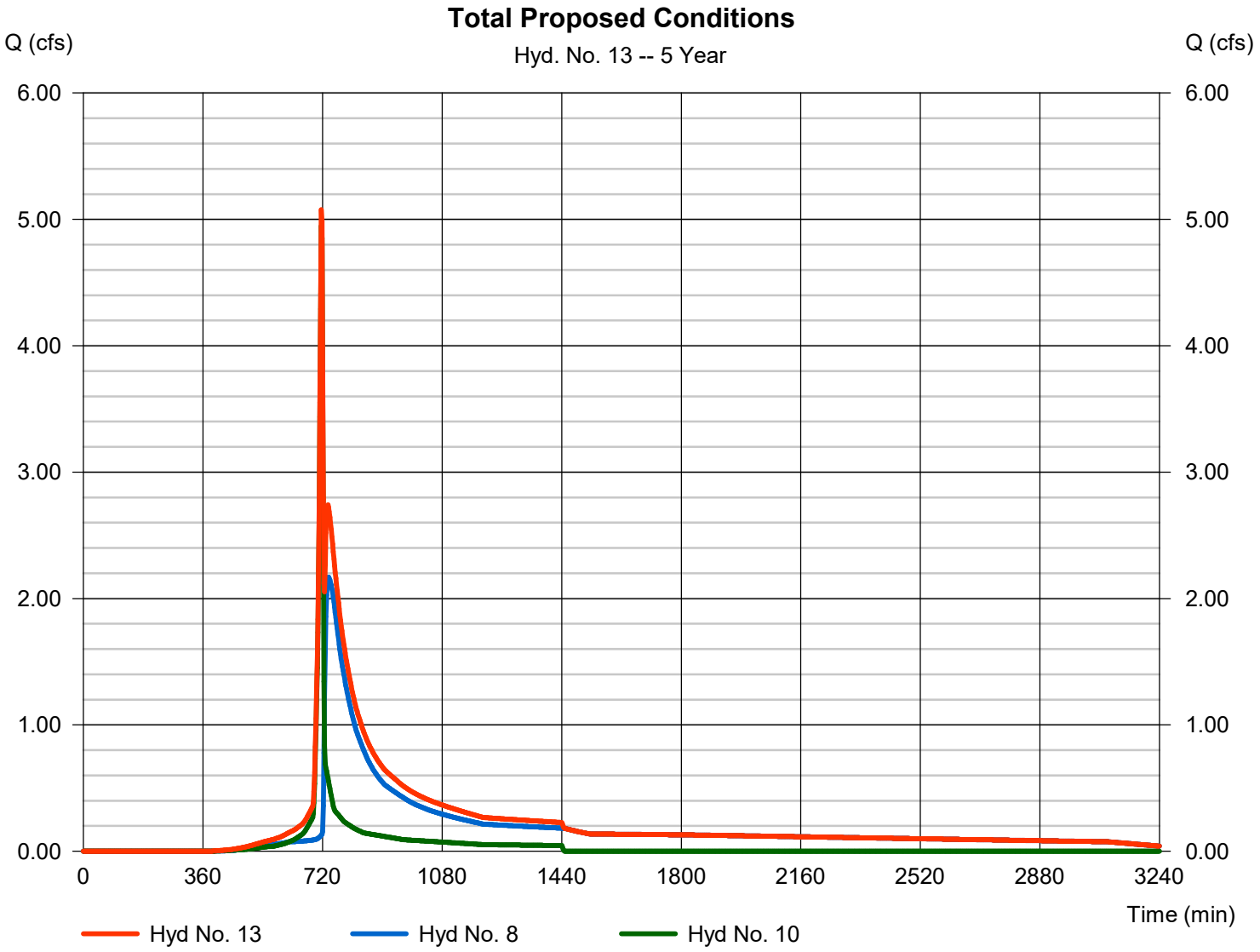


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 5.075 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 44,416 cuft
Inflow hyds.	= 8, 10	Contrib. drain. area	= 1.010 ac



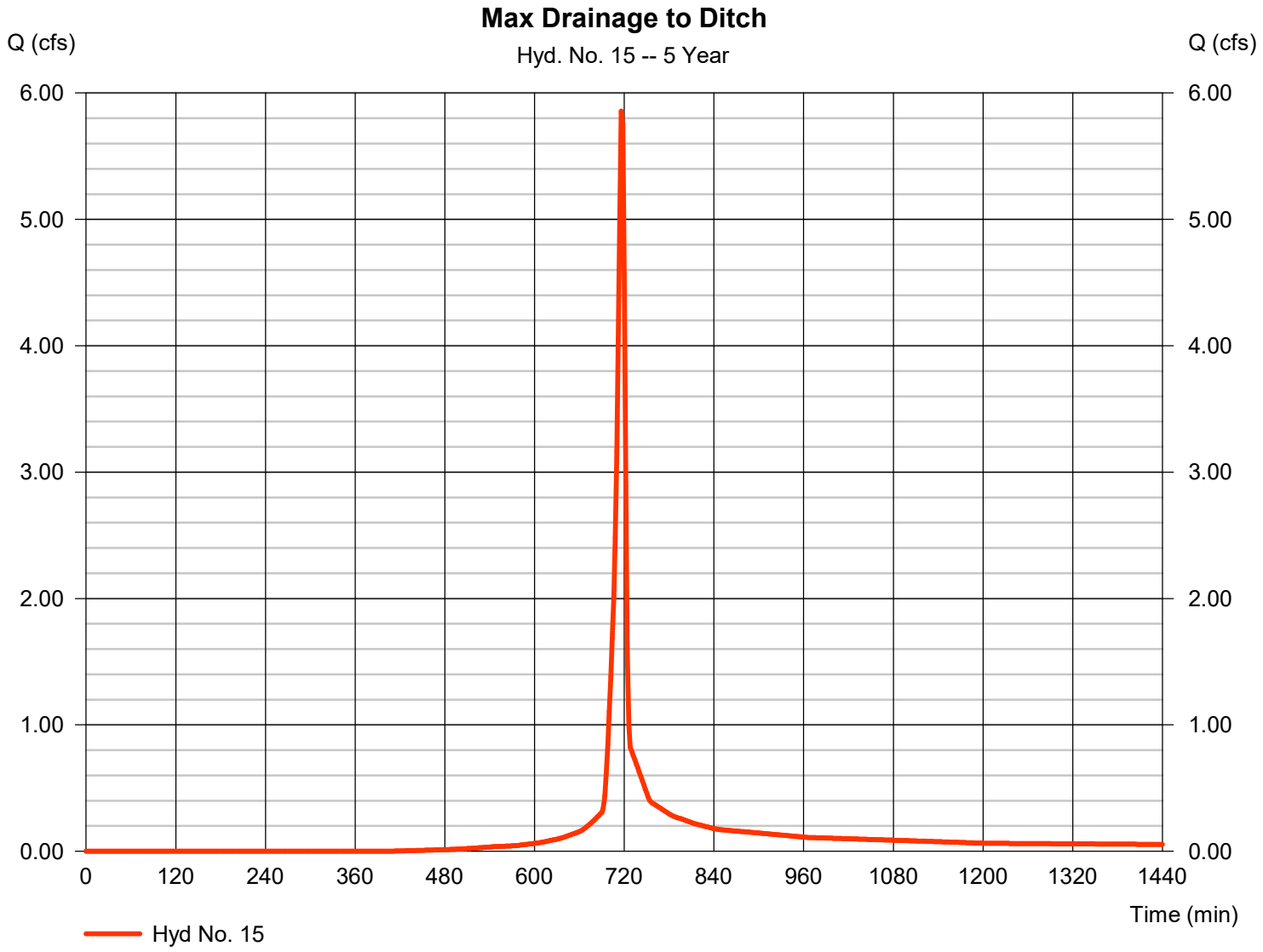
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.857 cfs
Storm frequency	=	5 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	11,957 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.75 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



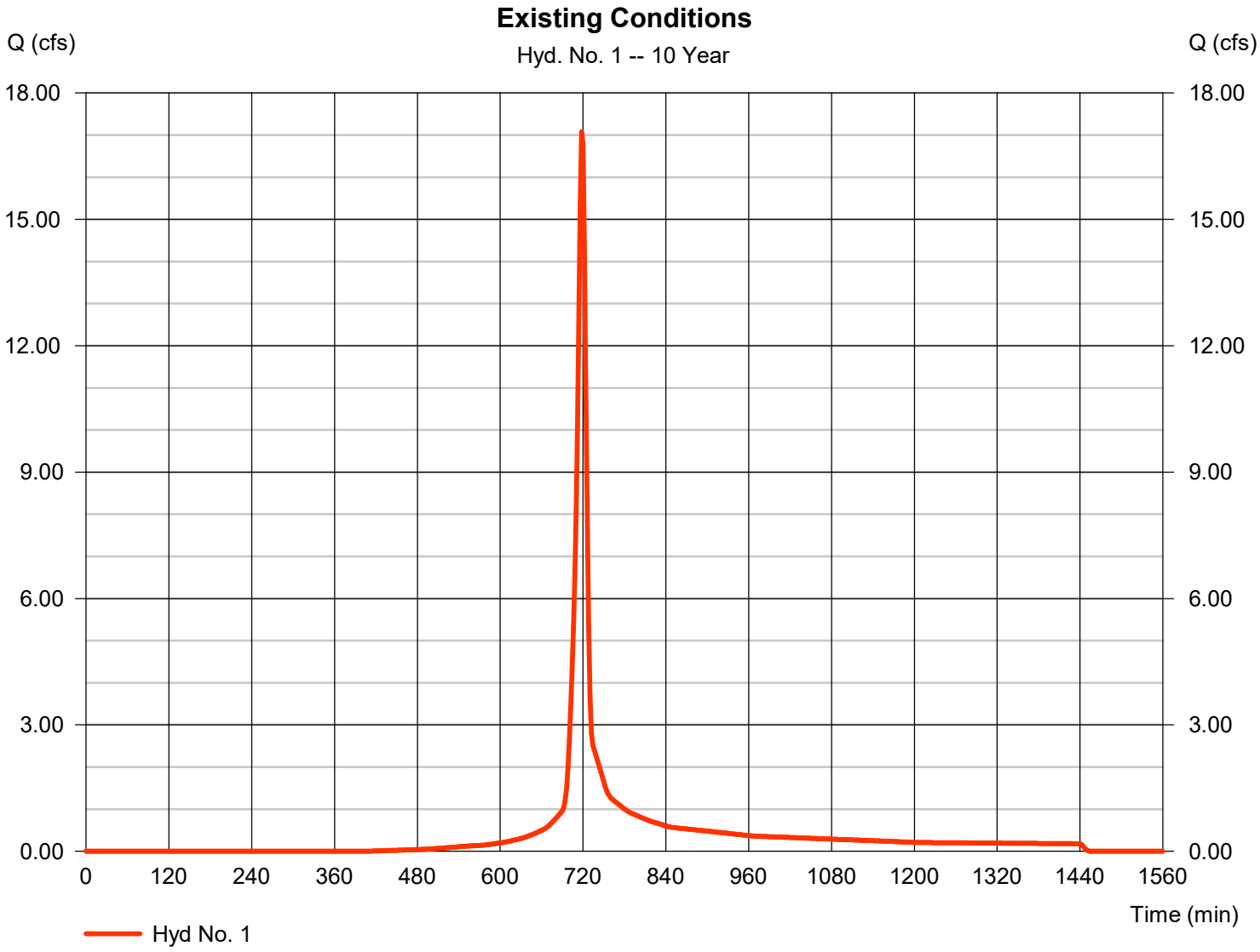
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	39,316 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



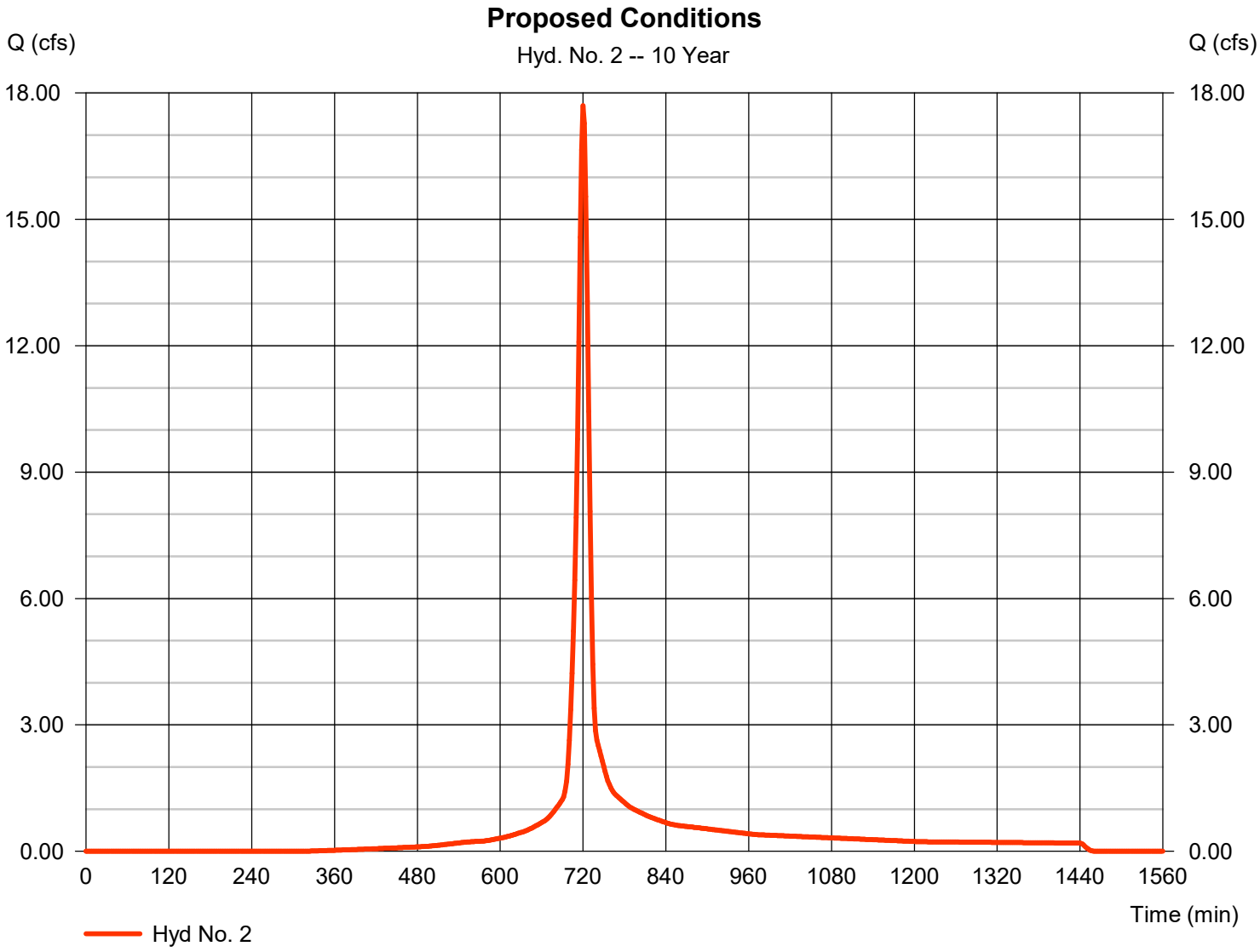
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.70 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	46,708 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



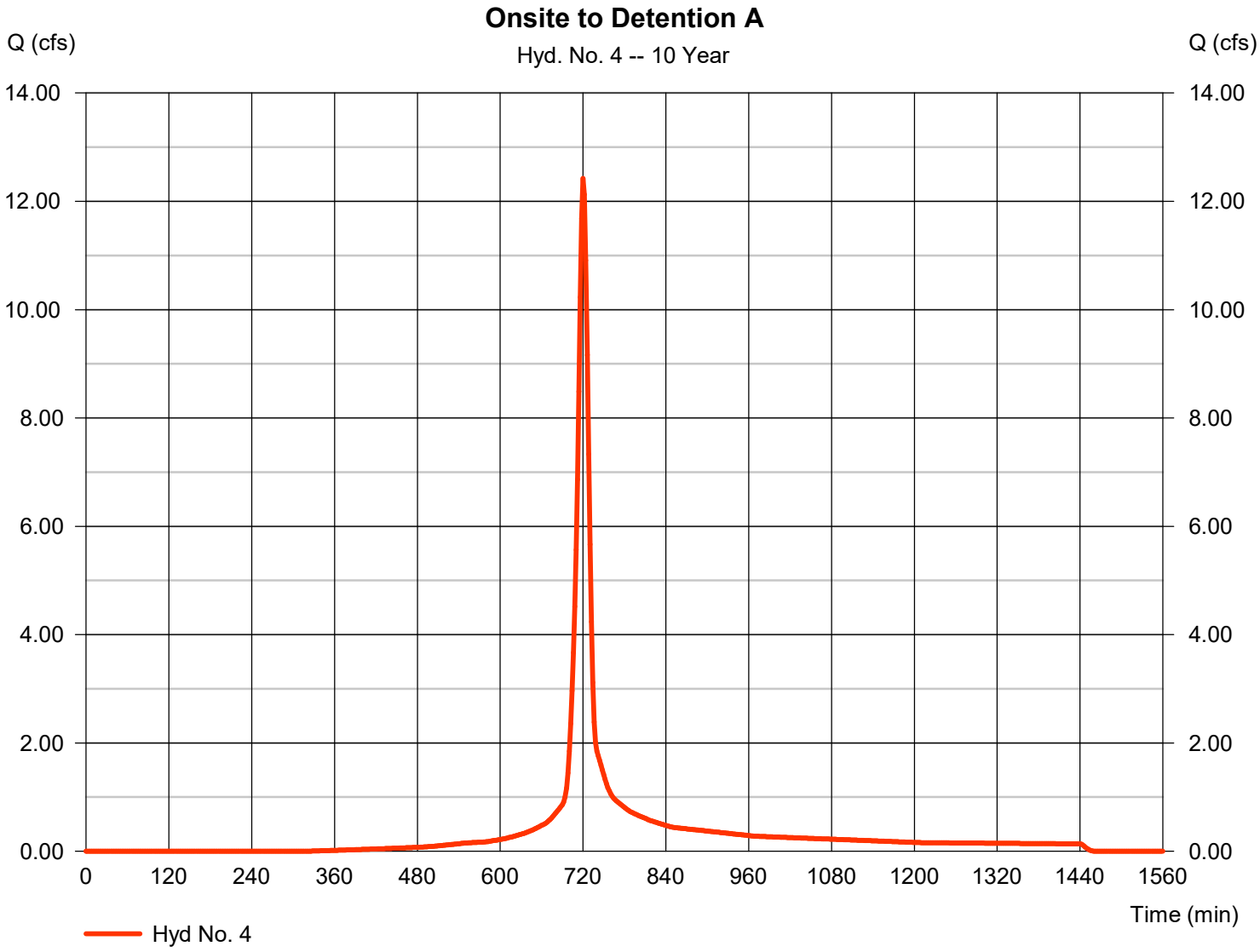
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.42 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	32,780 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



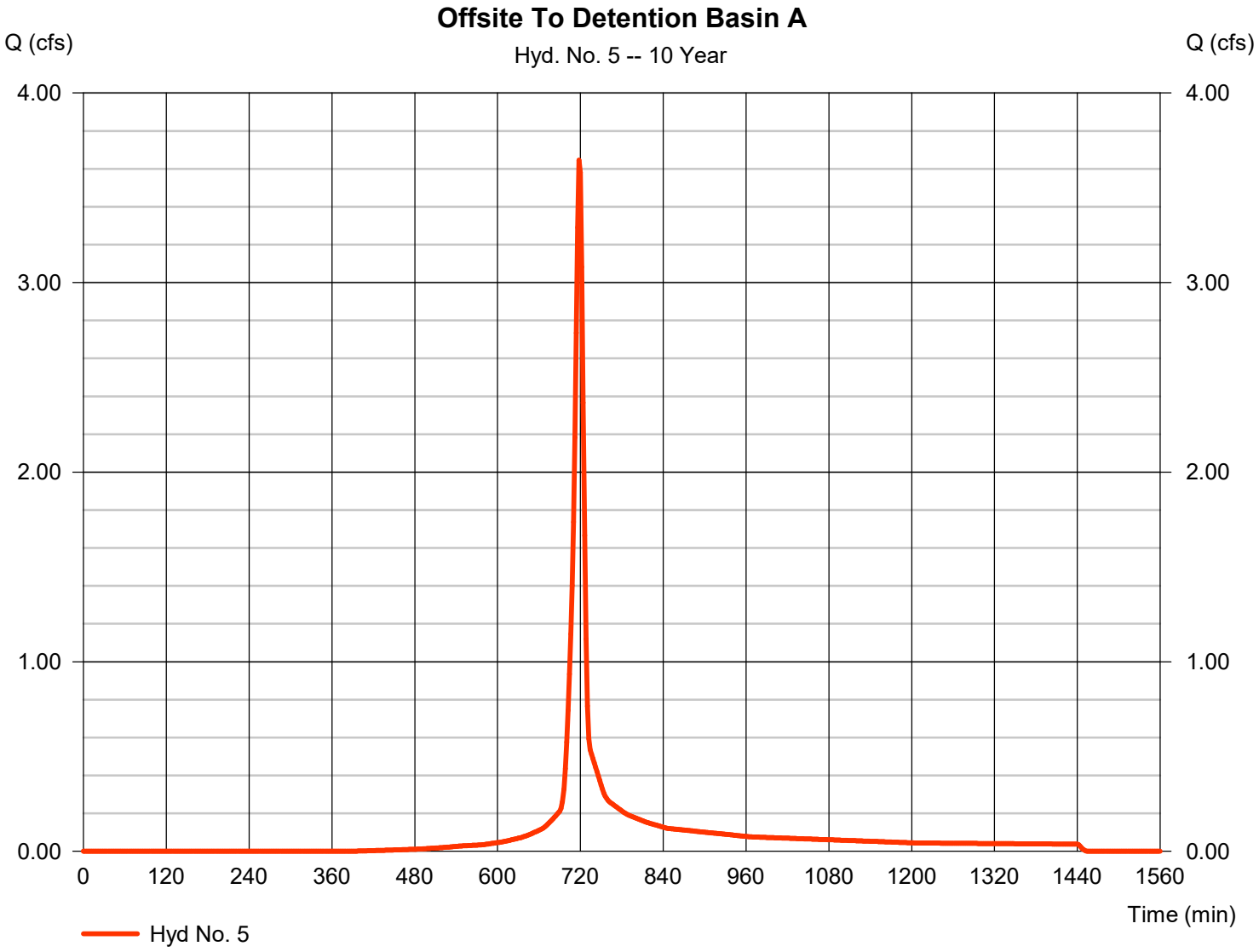
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.645 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	8,414 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

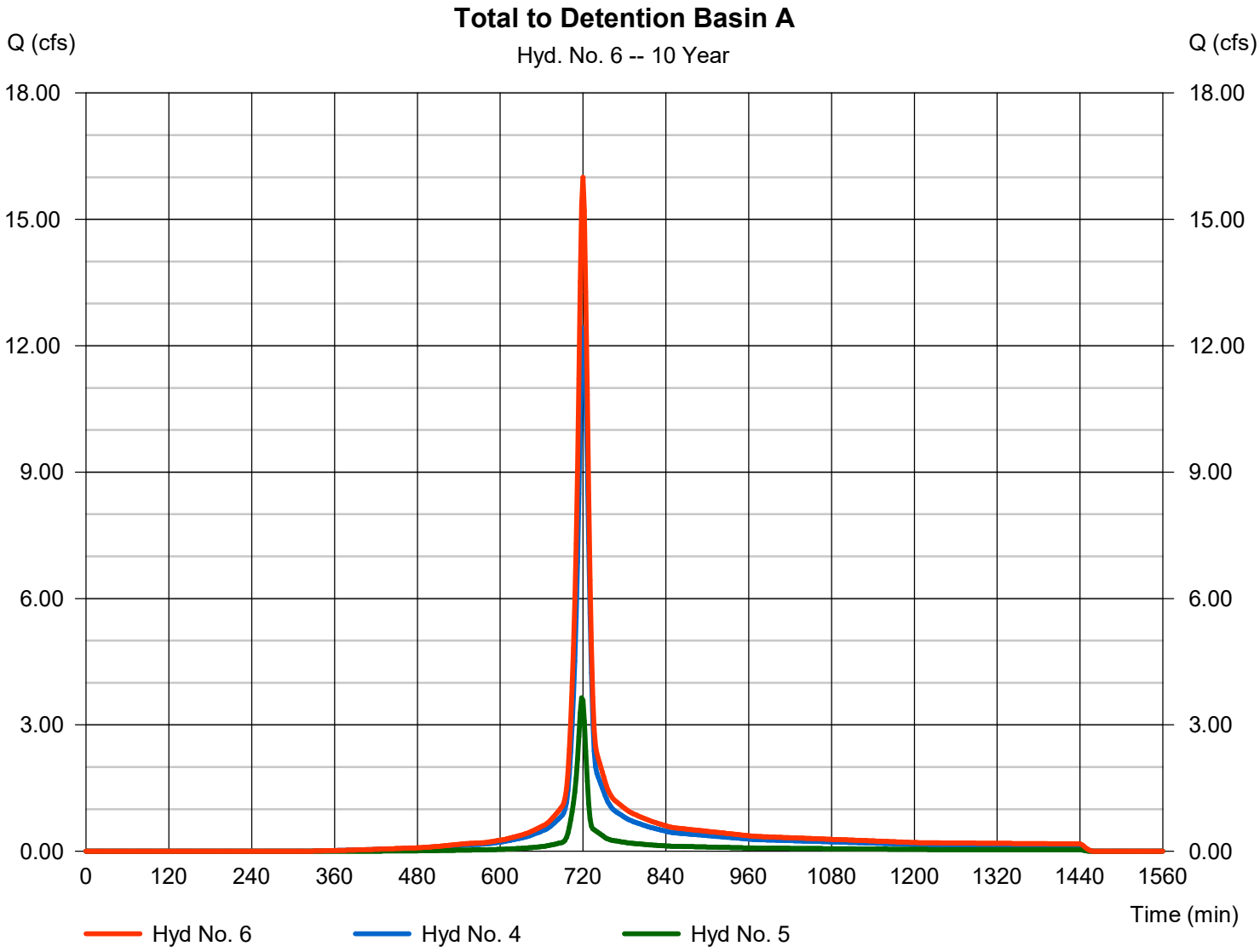


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	= Combine	Peak discharge	= 16.00 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 41,194 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 3.020 ac



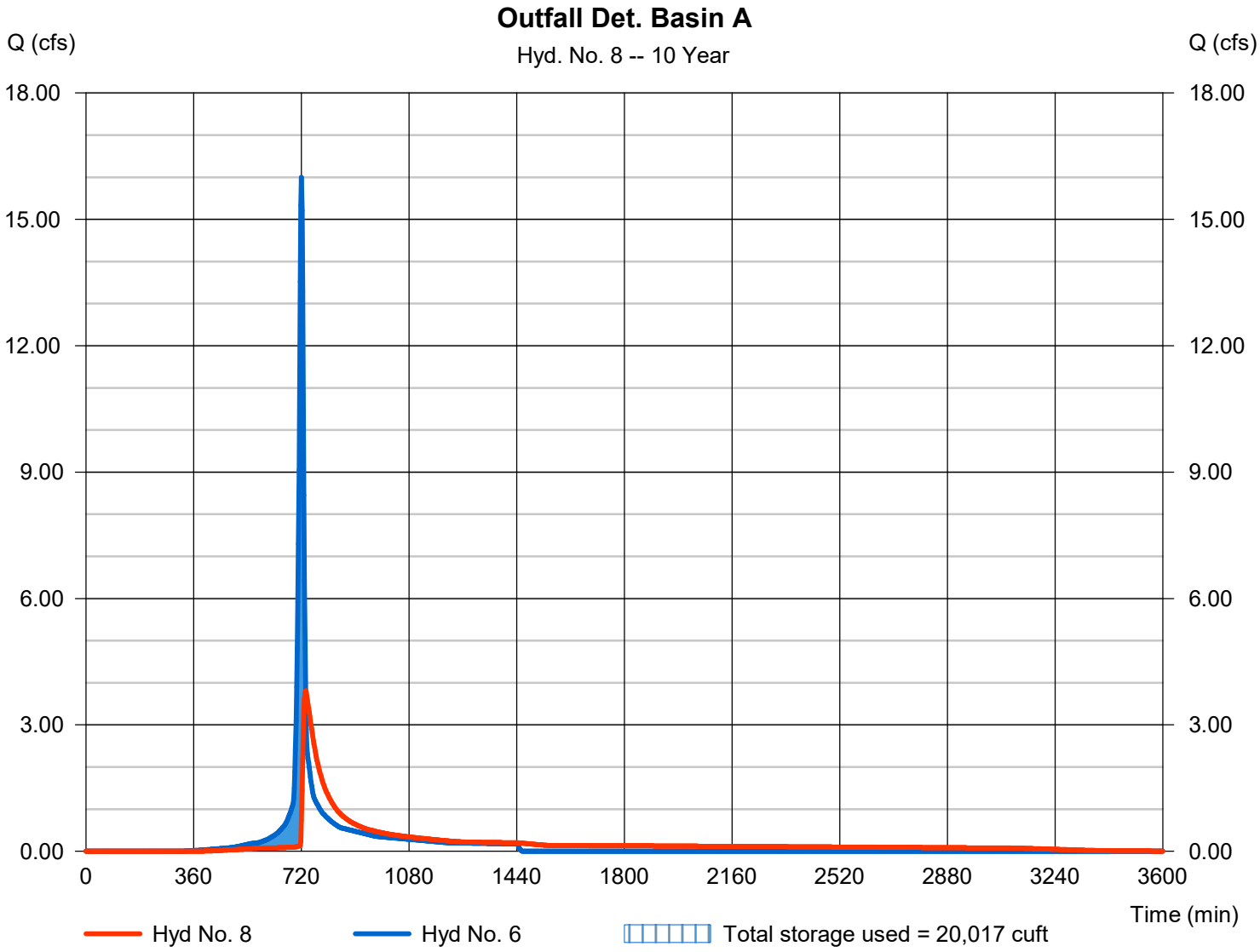
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	3.811 cfs
Storm frequency	=	10 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	41,179 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	661.92 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	20,017 cuft

Storage Indication method used.



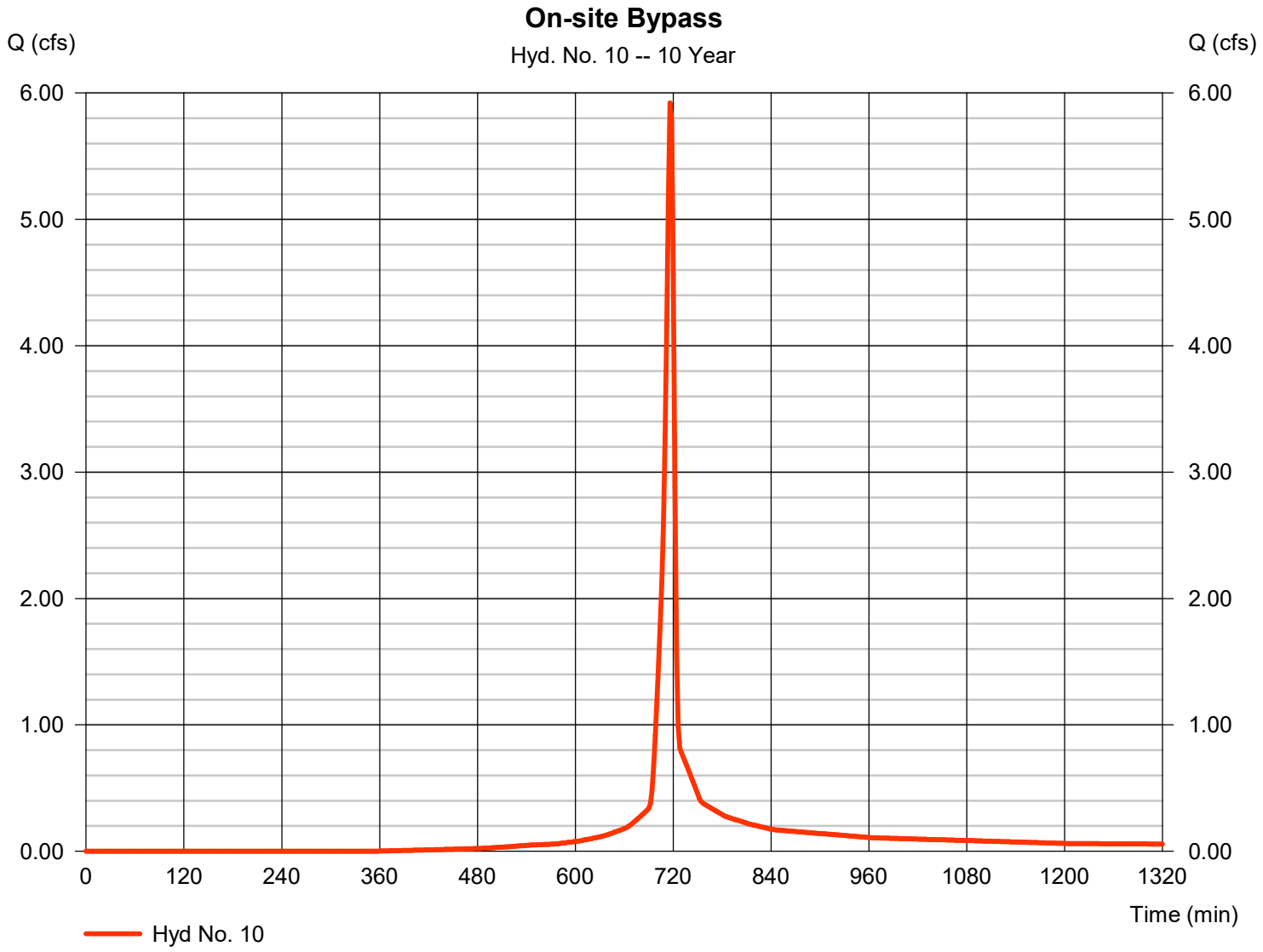
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.921 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	12,224 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

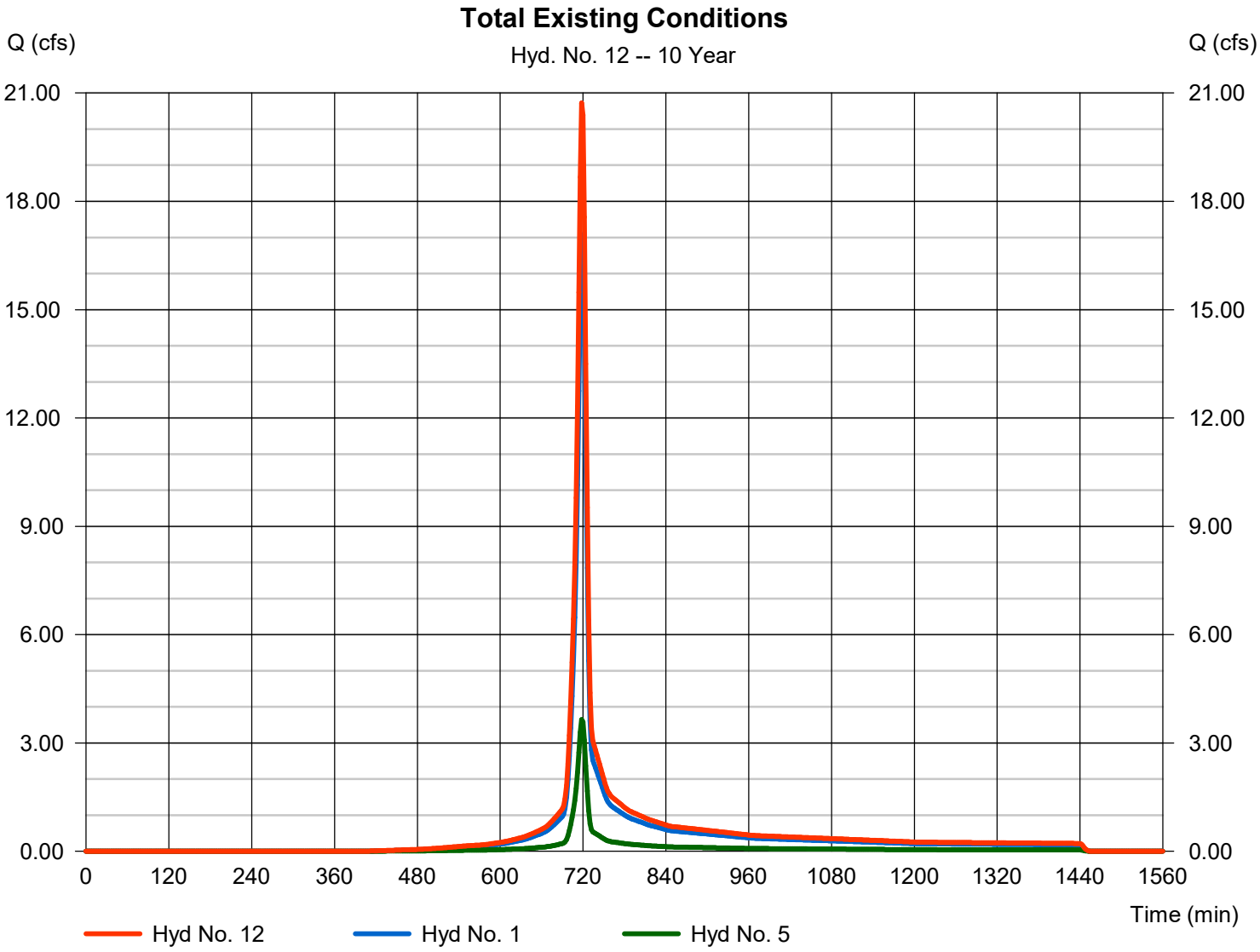


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 20.72 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 47,730 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

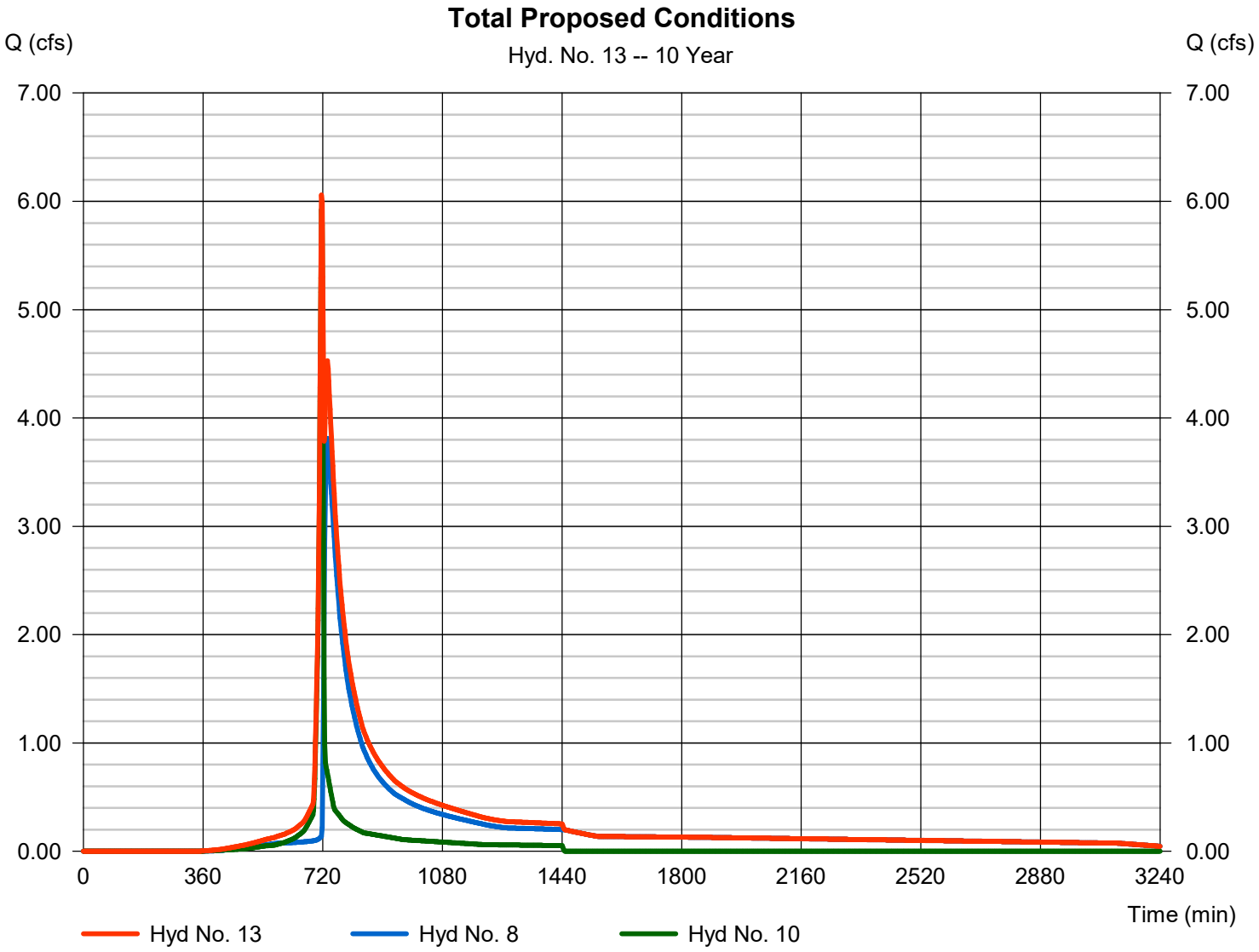


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 6.057 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 53,403 cuft
Inflow hyds.	= 8, 10	Contrib. drain. area	= 1.010 ac



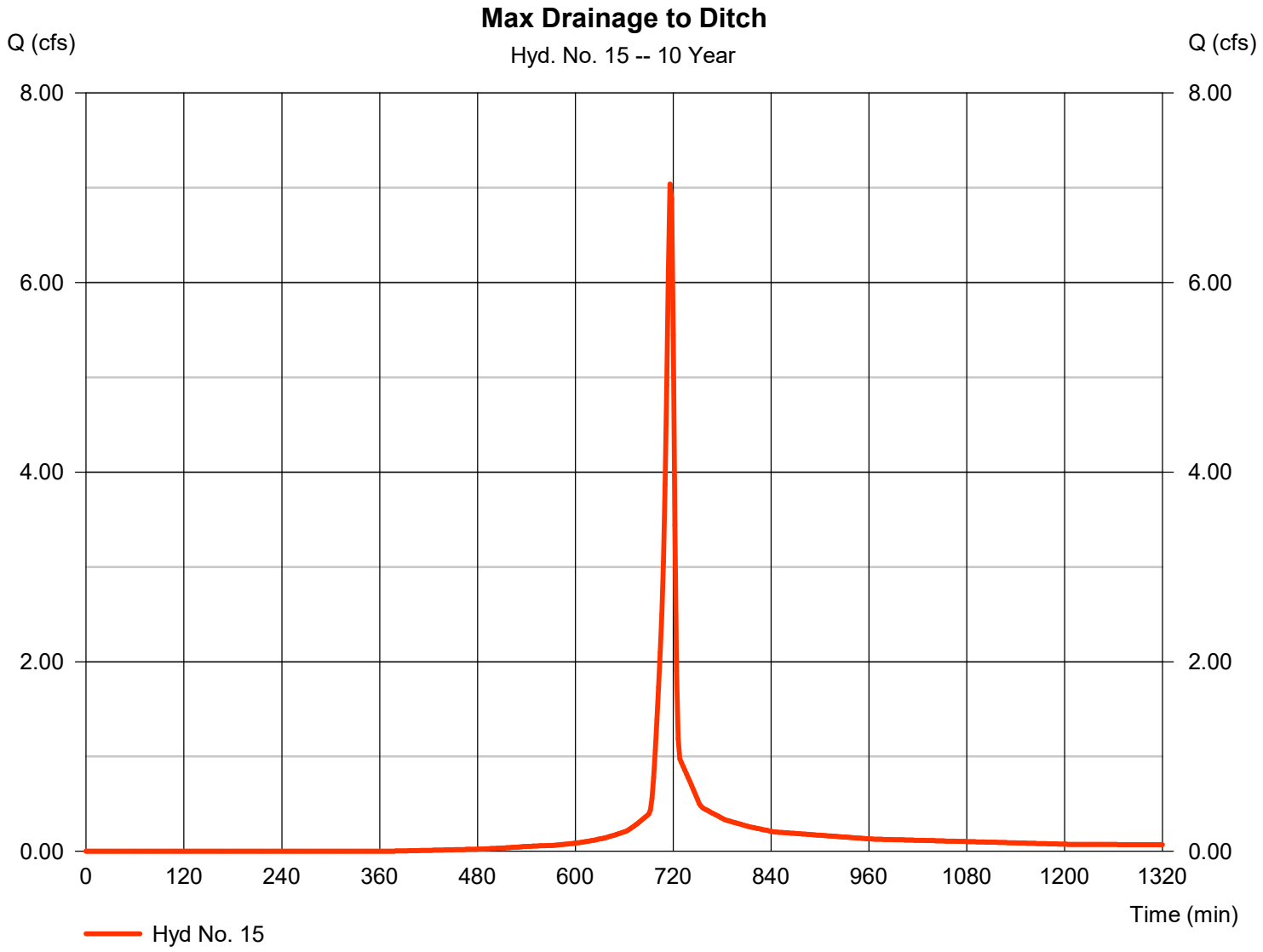
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.039 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	14,472 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.42 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



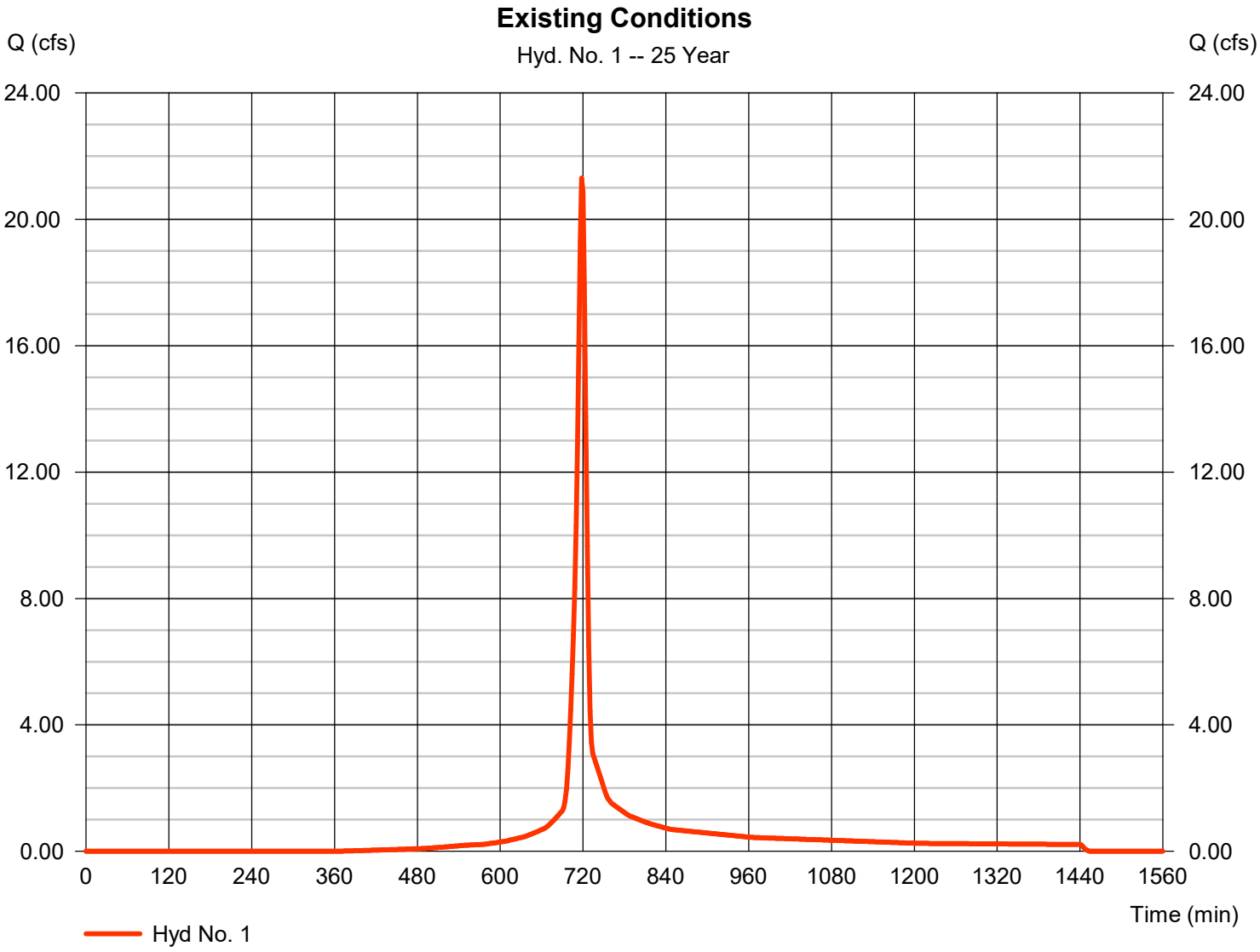
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.30 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	49,394 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



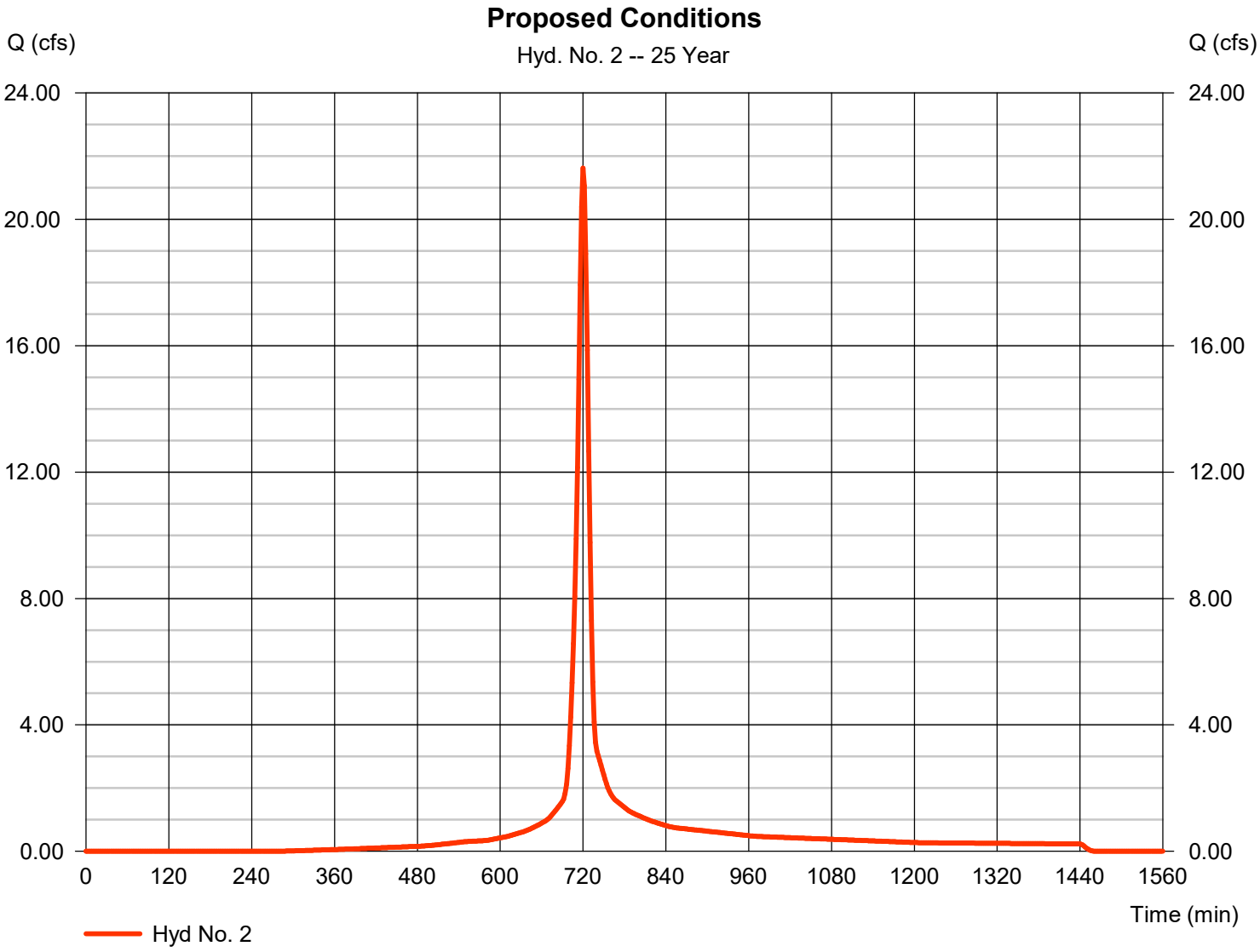
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.62 cfs
Storm frequency	=	25 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	57,587 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



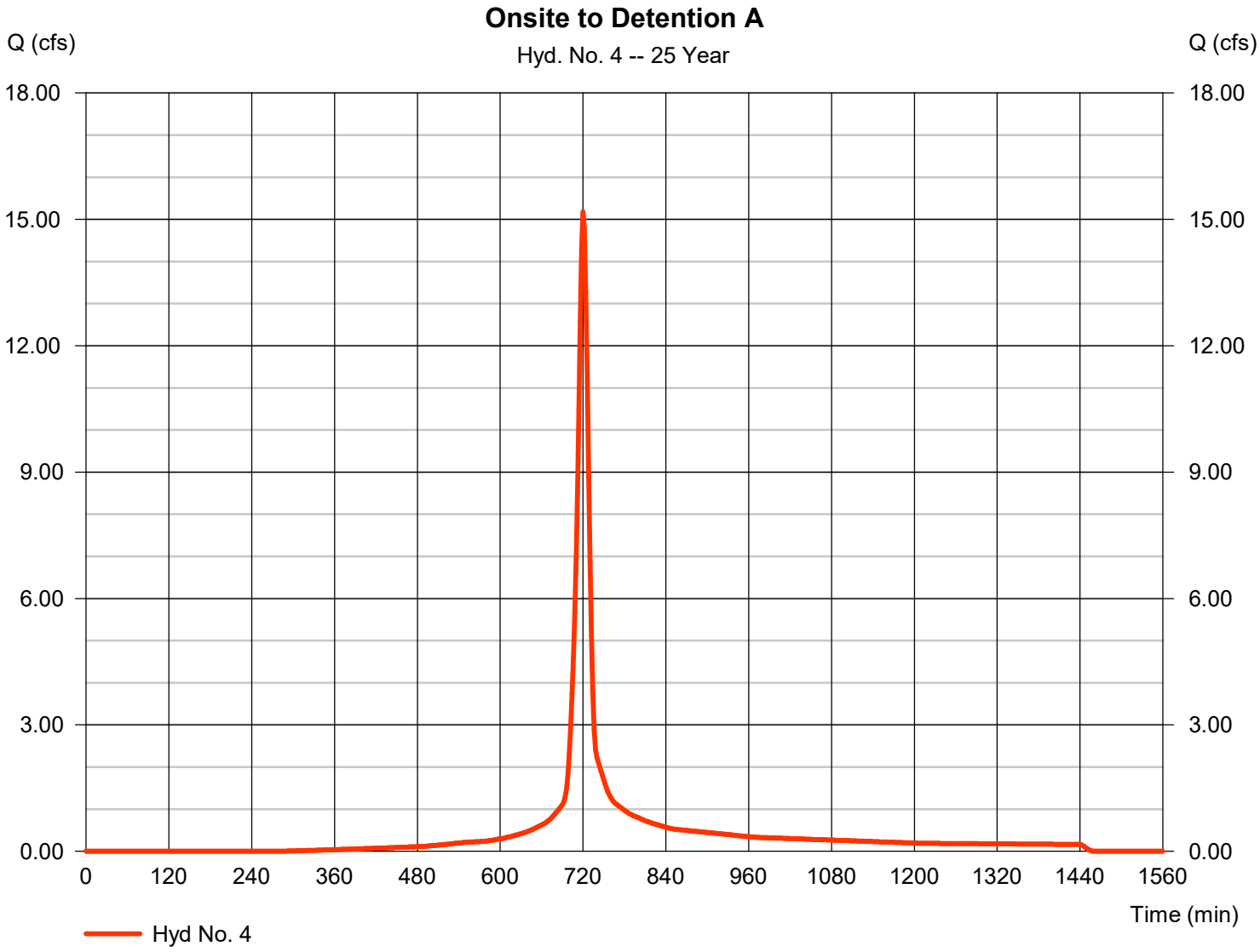
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.17 cfs
Storm frequency	=	25 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	40,415 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



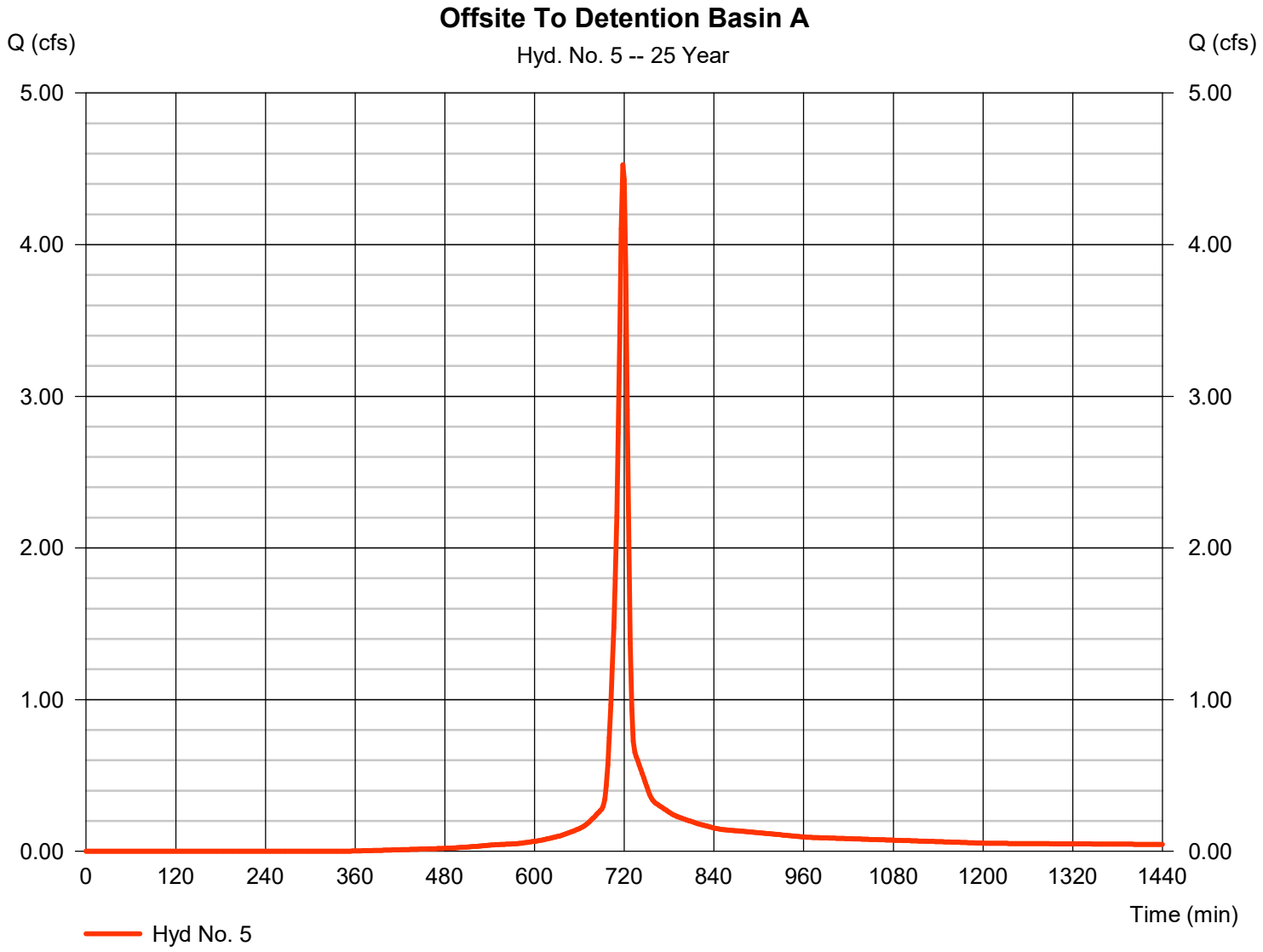
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.526 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	10,530 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

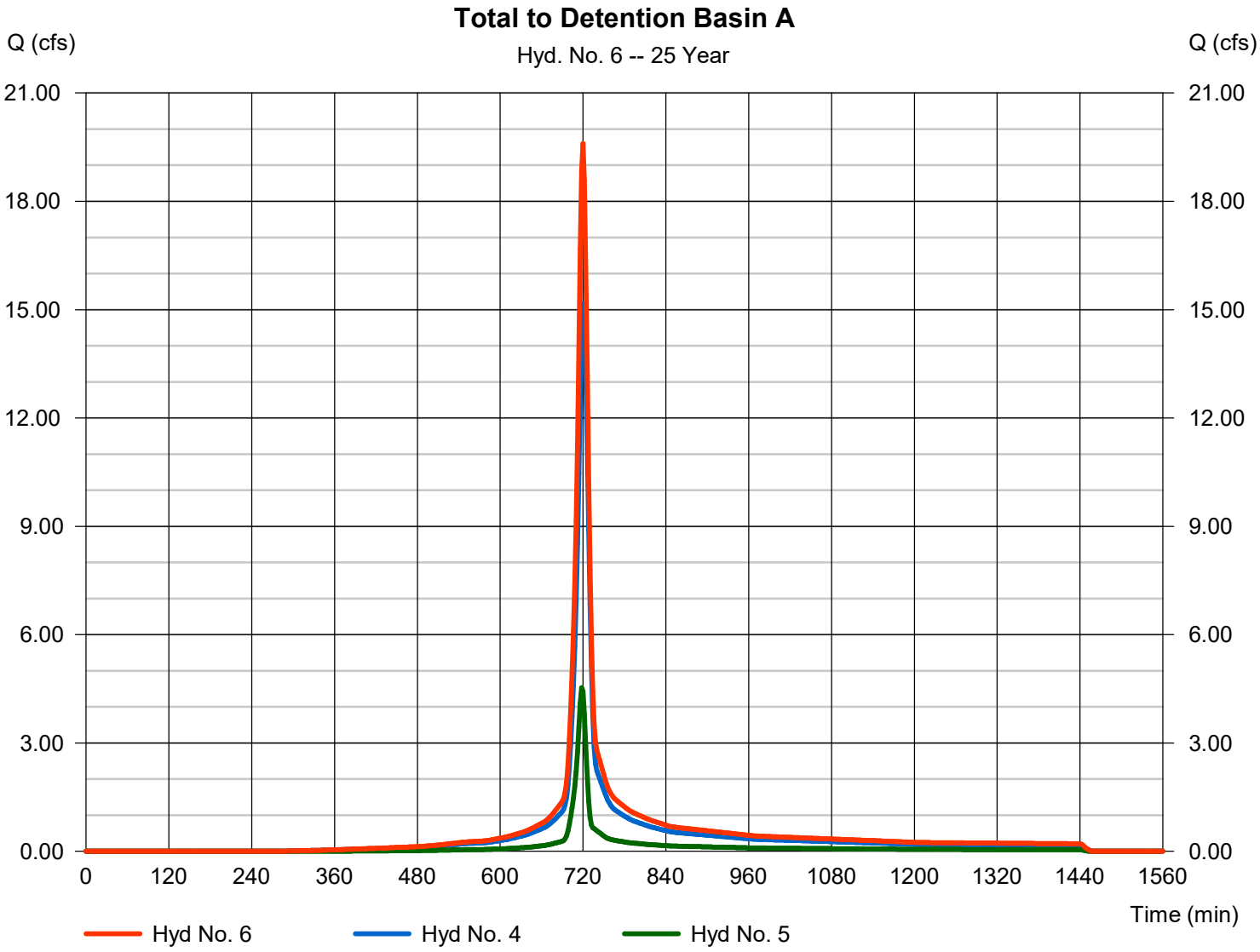


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	=	Combine	Peak discharge	=	19.60 cfs
Storm frequency	=	25 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	50,945 cuft
Inflow hyds.	=	4, 5	Contrib. drain. area	=	3.020 ac



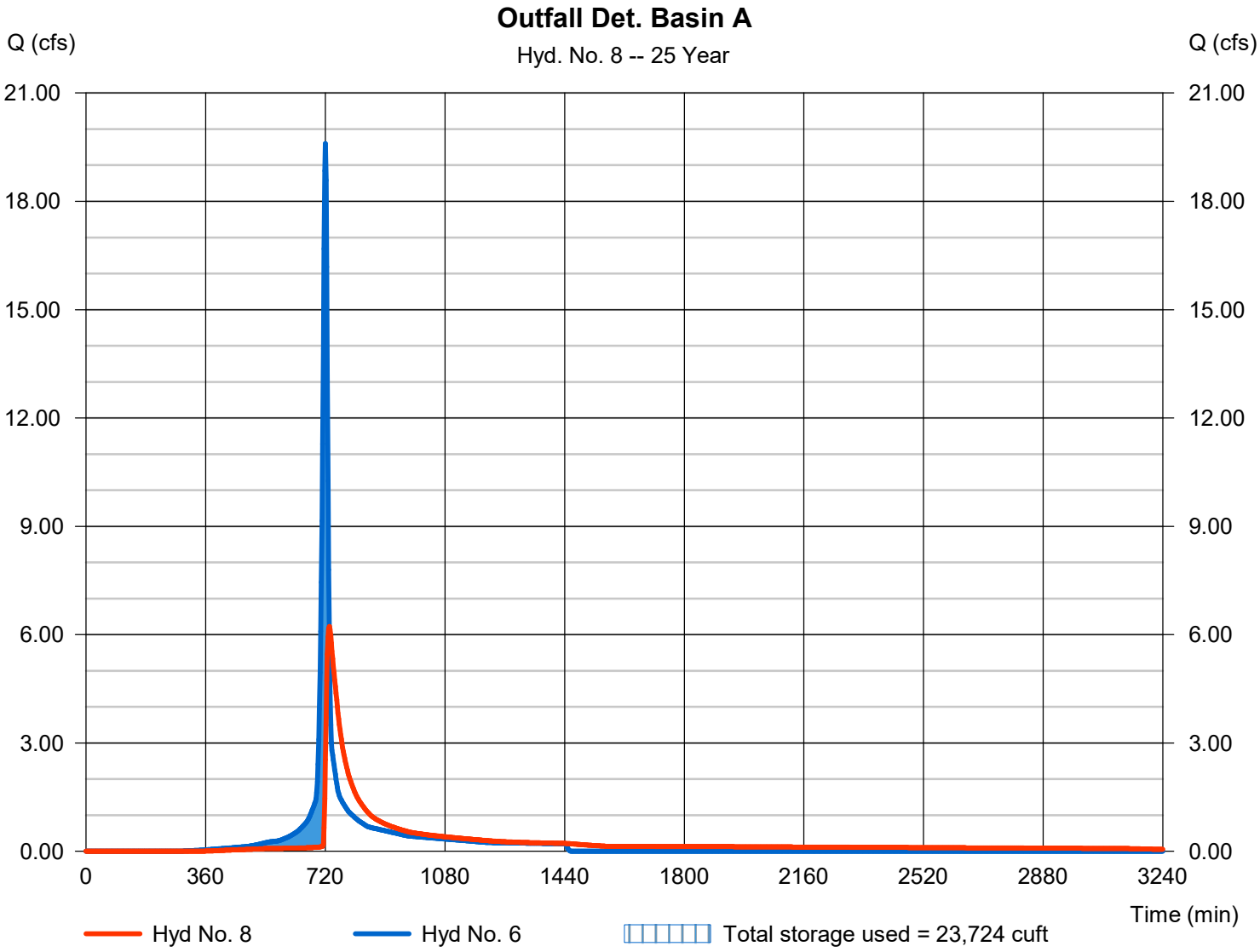
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	6.226 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	50,930 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	662.19 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	23,724 cuft

Storage Indication method used.



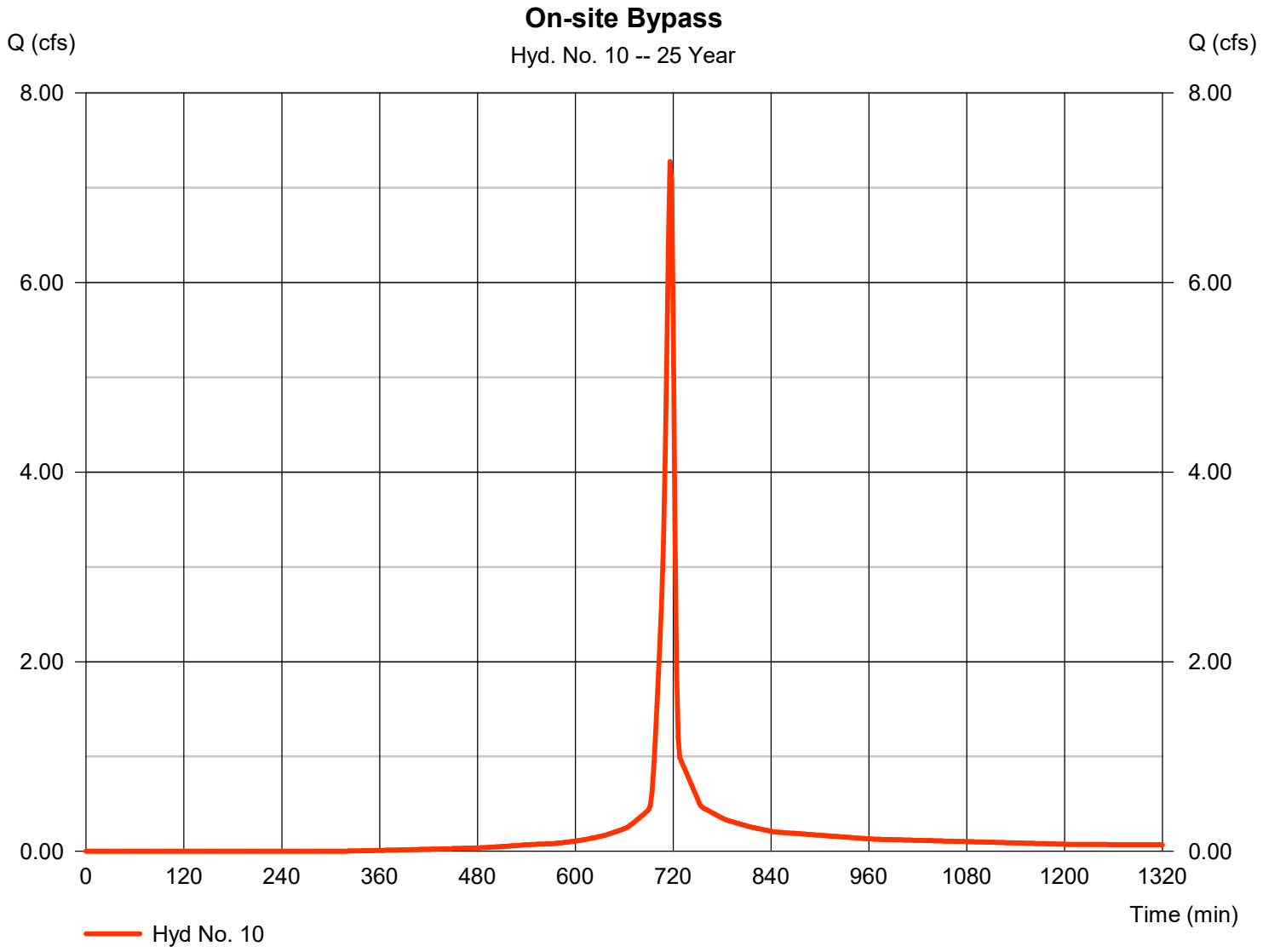
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.278 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	15,183 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

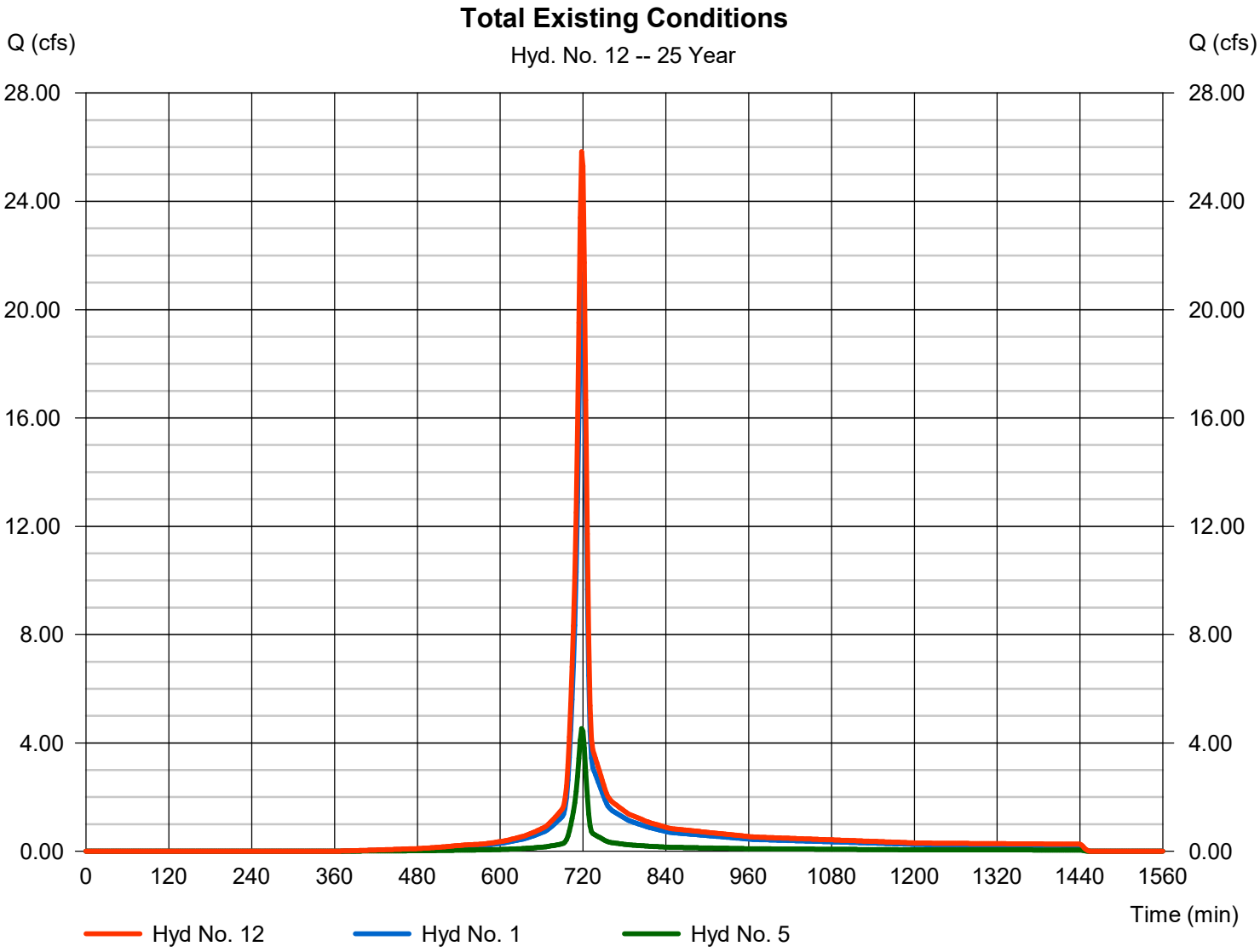


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 25.83 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 59,923 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

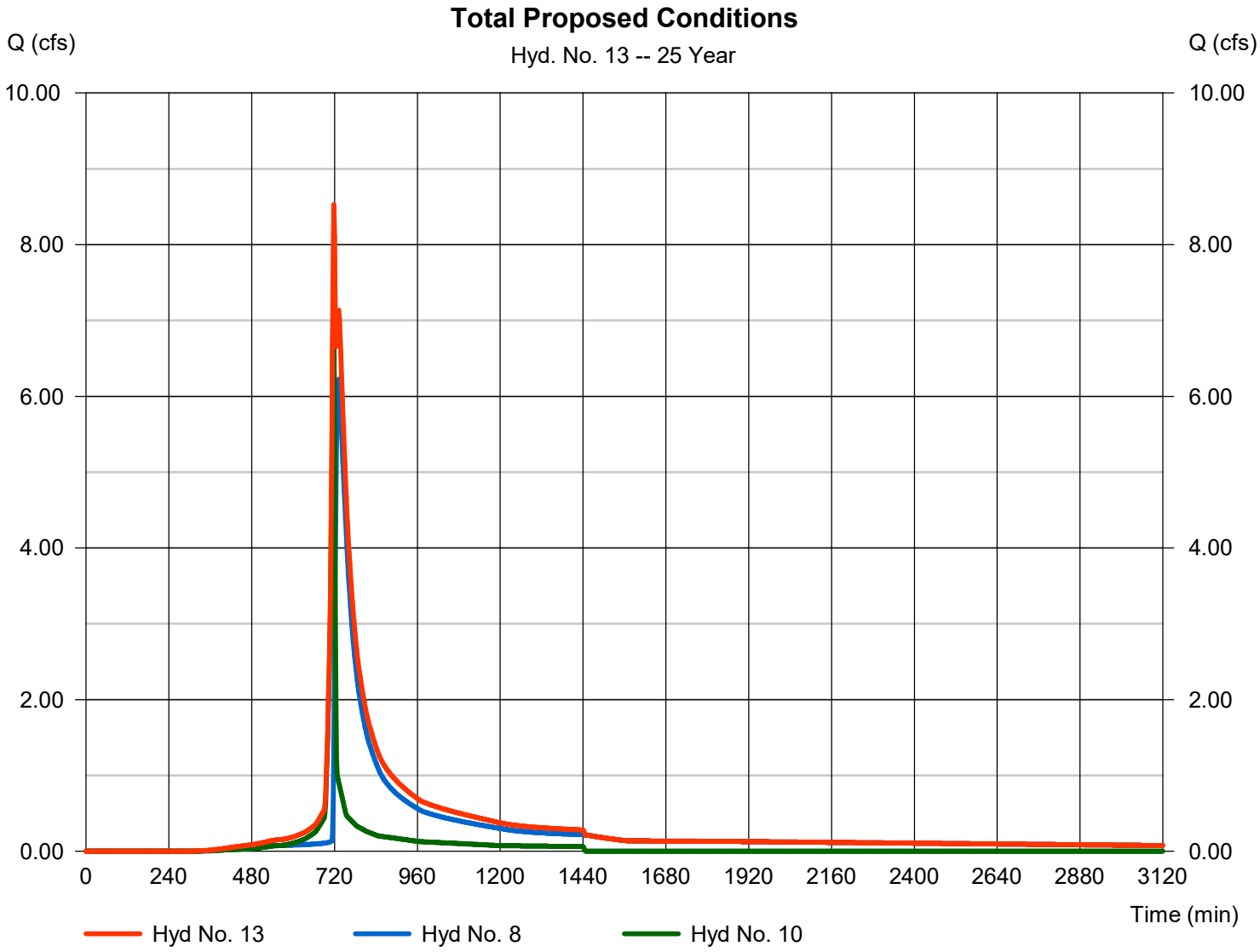


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	=	Combine	Peak discharge	=	8.528 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	66,113 cuft
Inflow hyds.	=	8, 10	Contrib. drain. area	=	1.010 ac



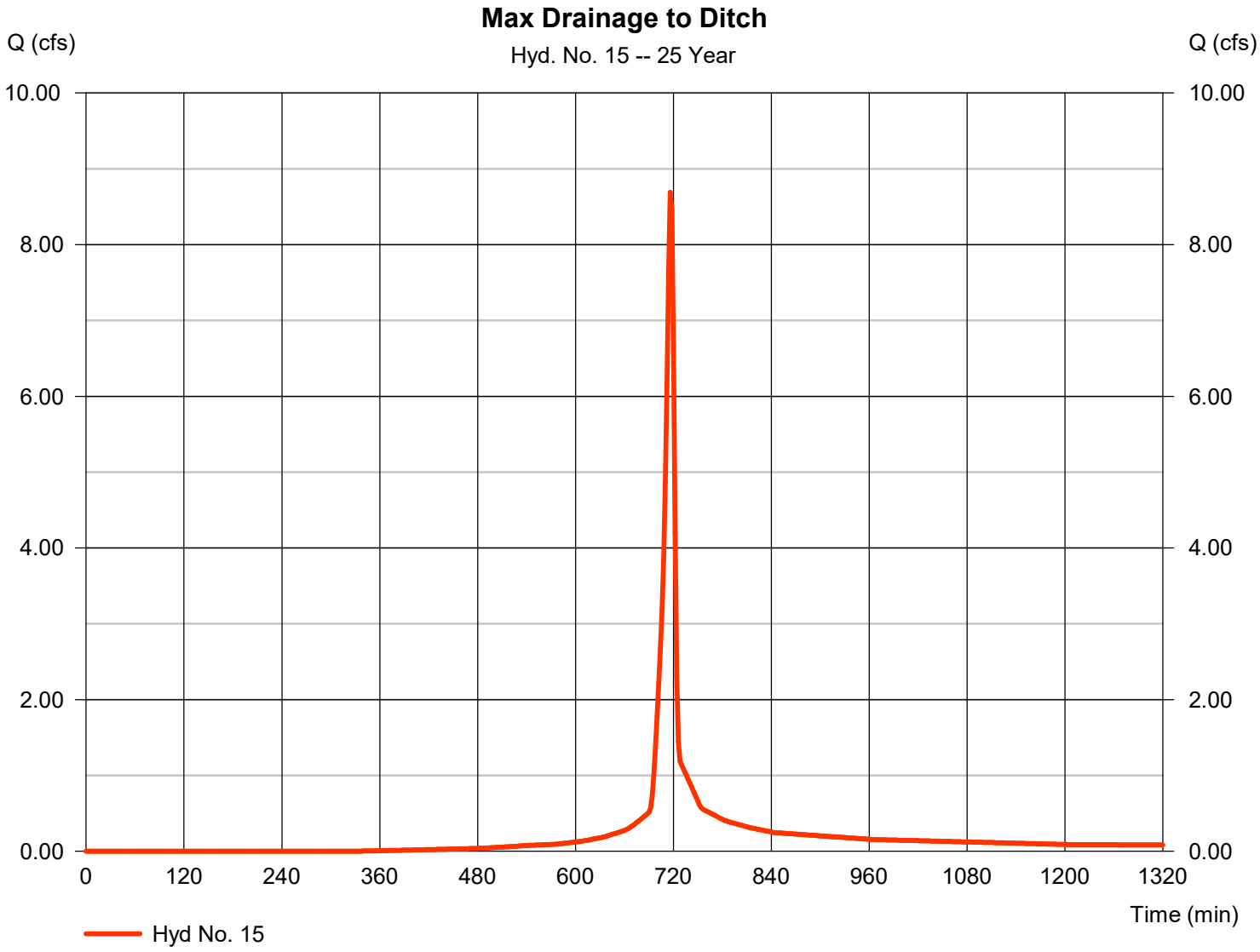
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.689 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	18,042 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



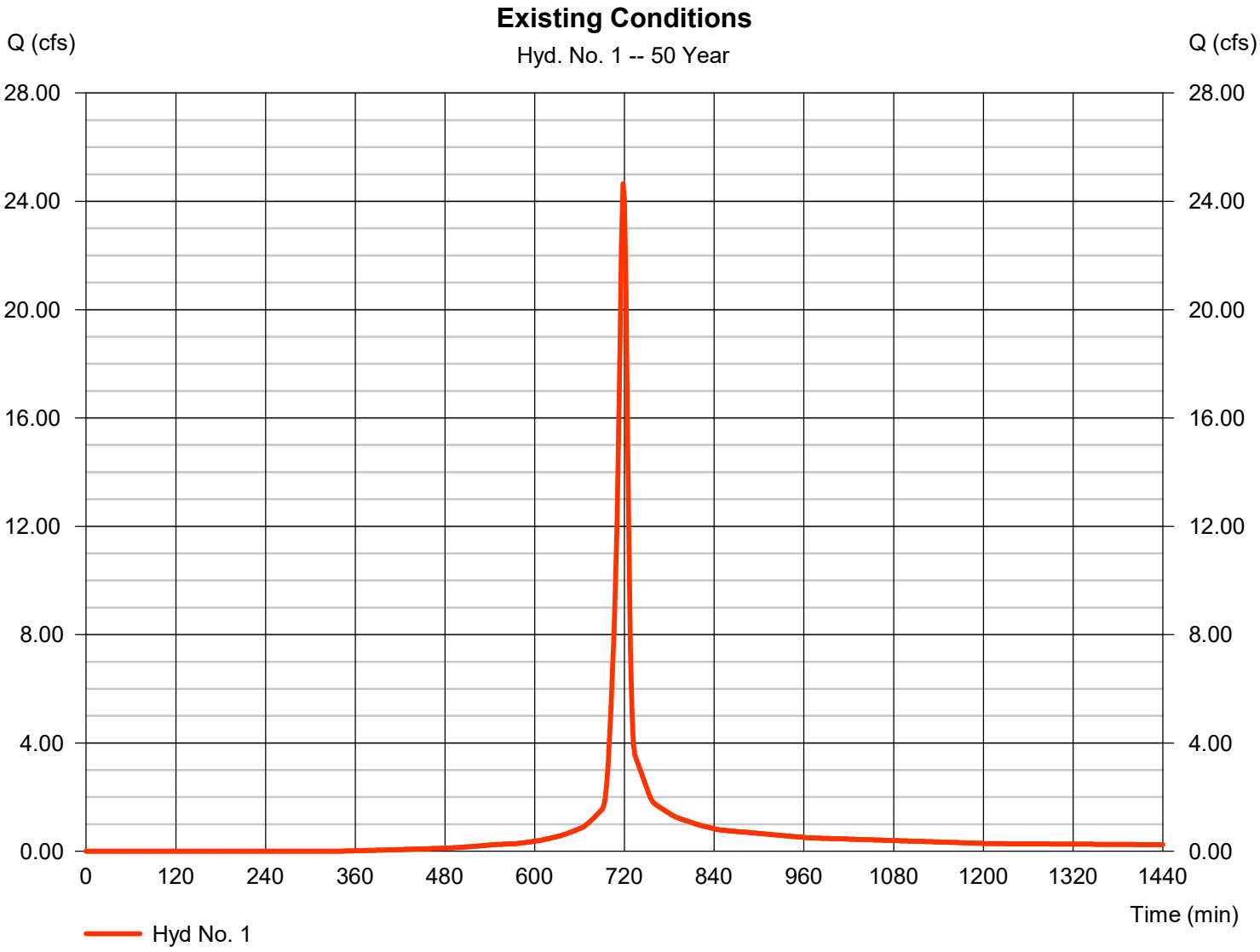
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.64 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	57,466 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



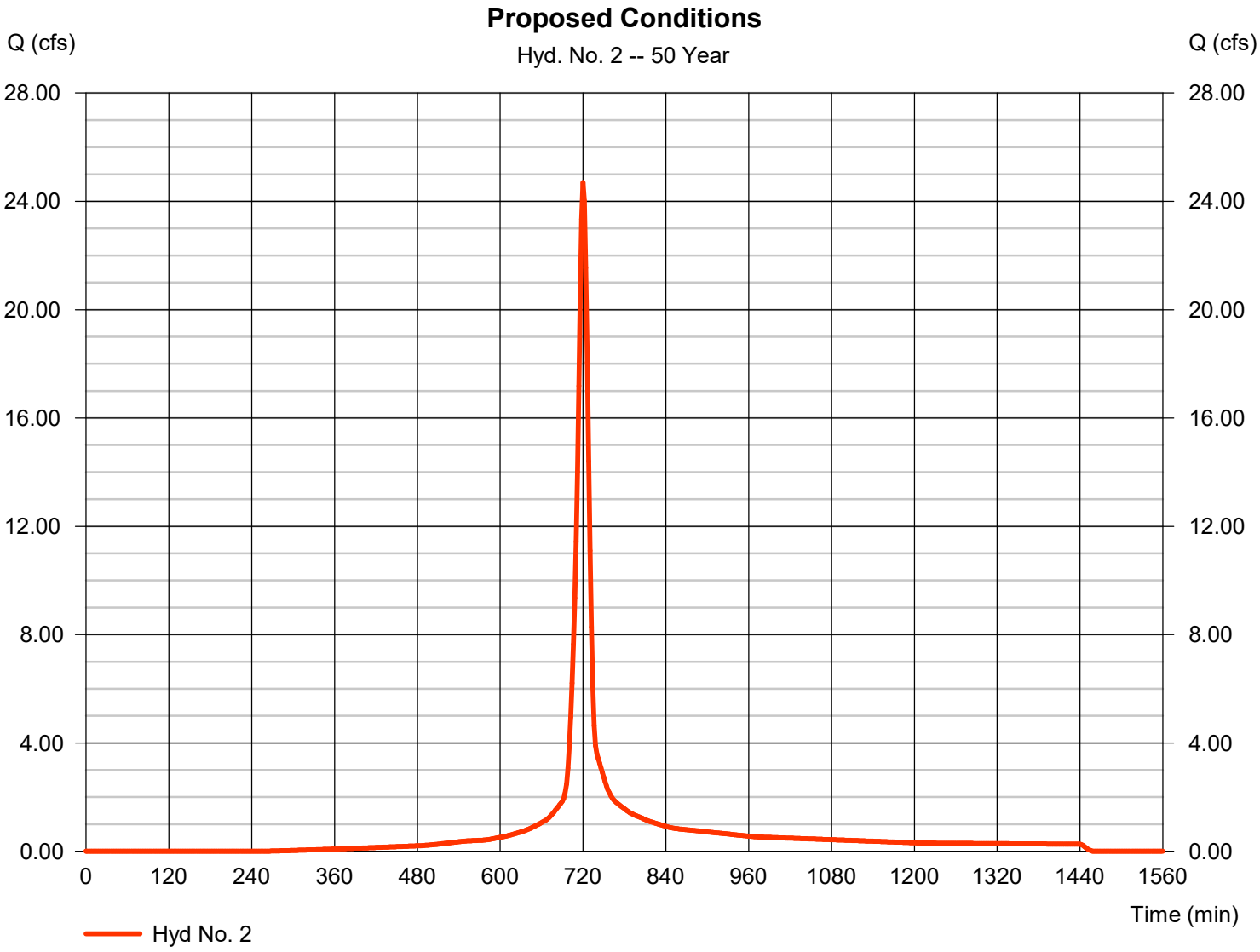
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.70 cfs
Storm frequency	=	50 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	66,231 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



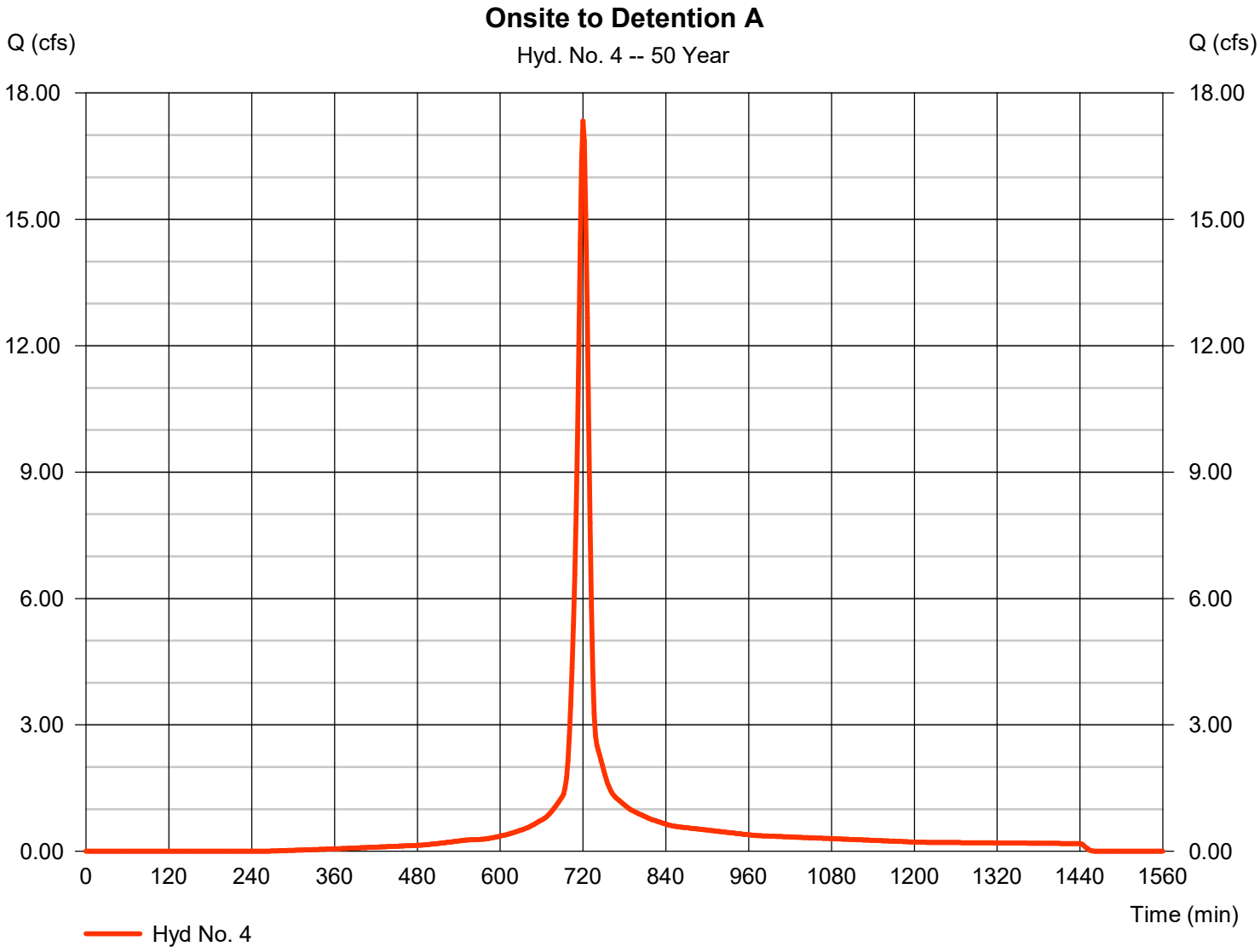
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.33 cfs
Storm frequency	=	50 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	46,481 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



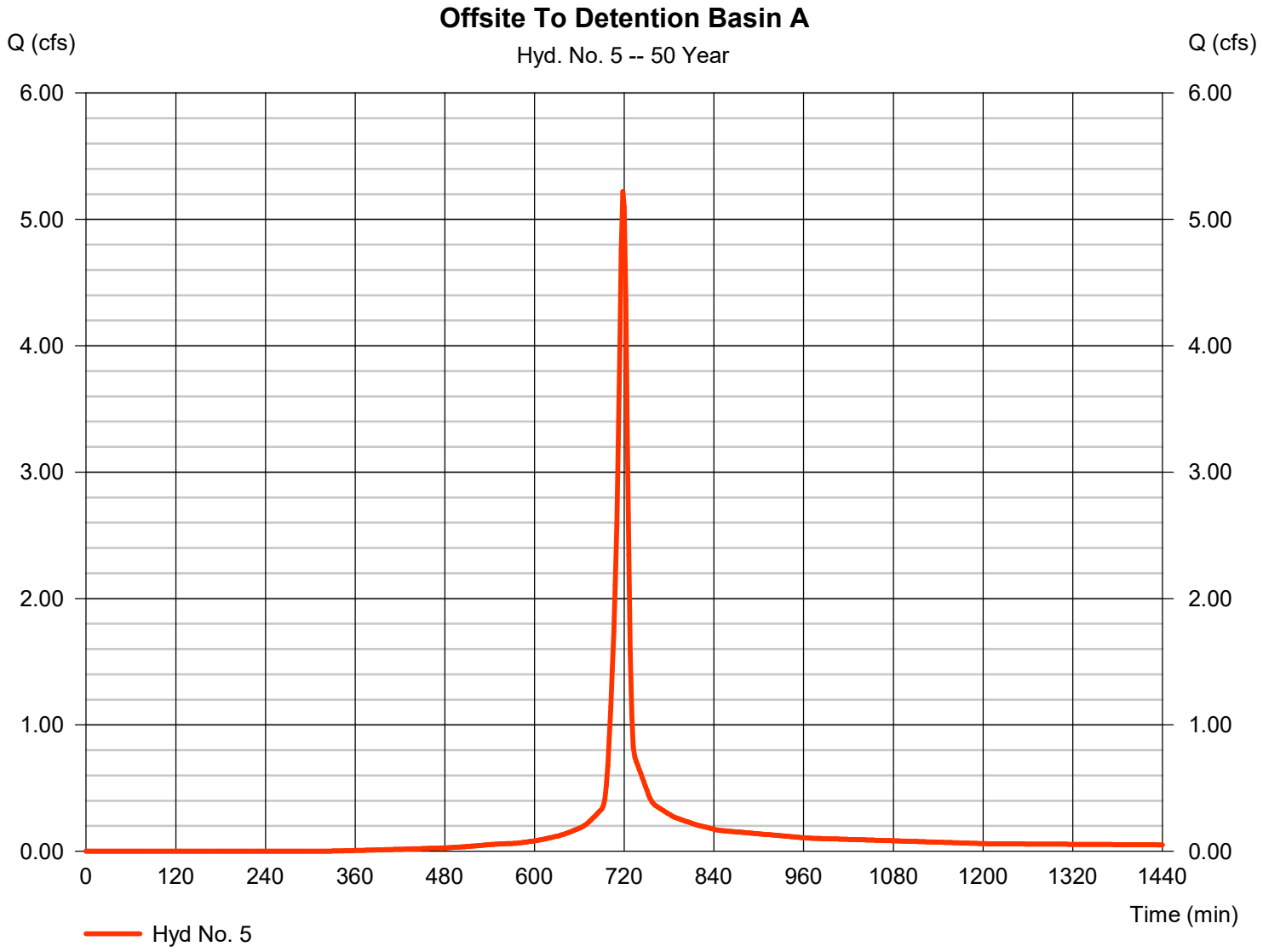
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.221 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	12,222 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

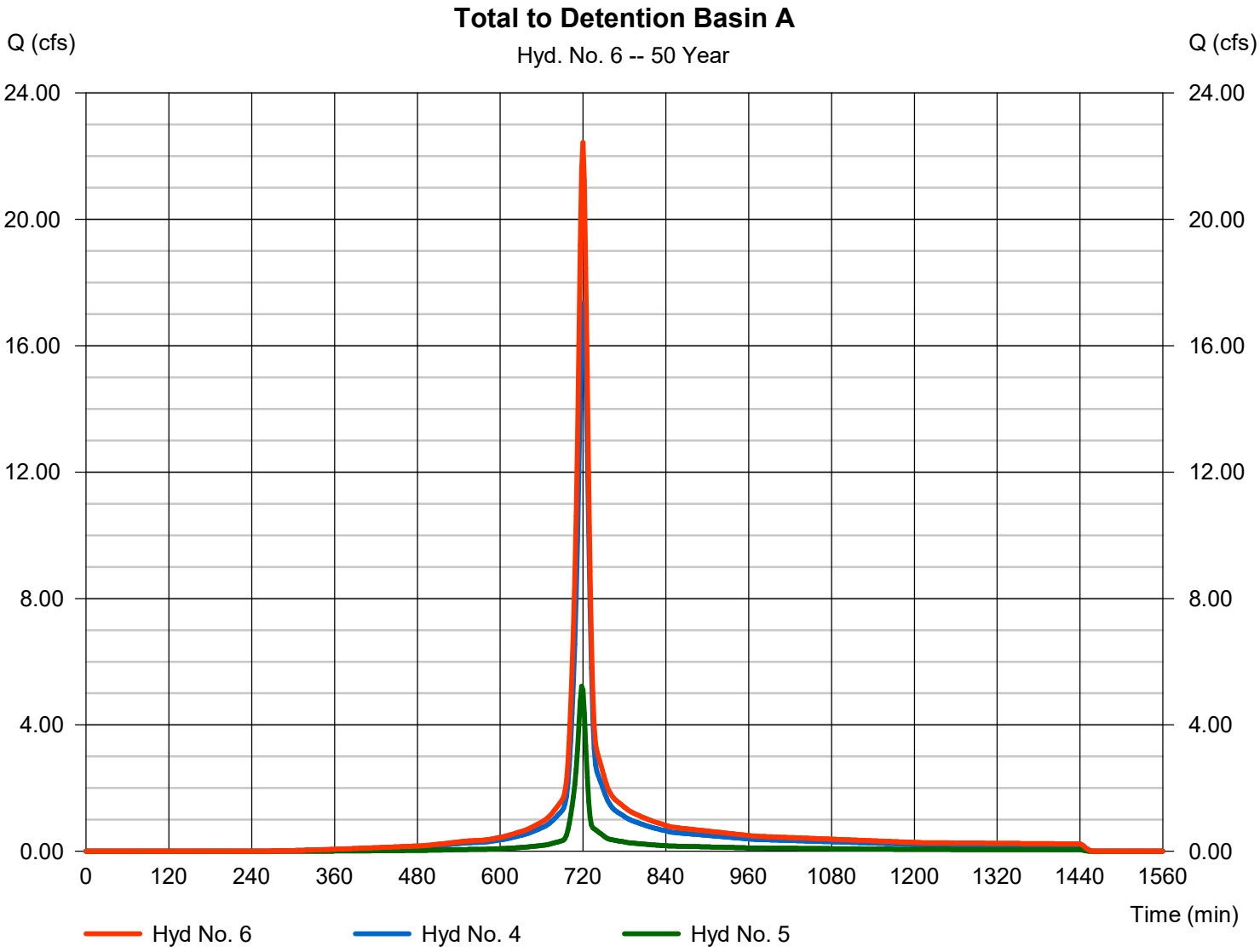


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	=	Combine	Peak discharge	=	22.43 cfs
Storm frequency	=	50 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	58,703 cuft
Inflow hyds.	=	4, 5	Contrib. drain. area	=	3.020 ac



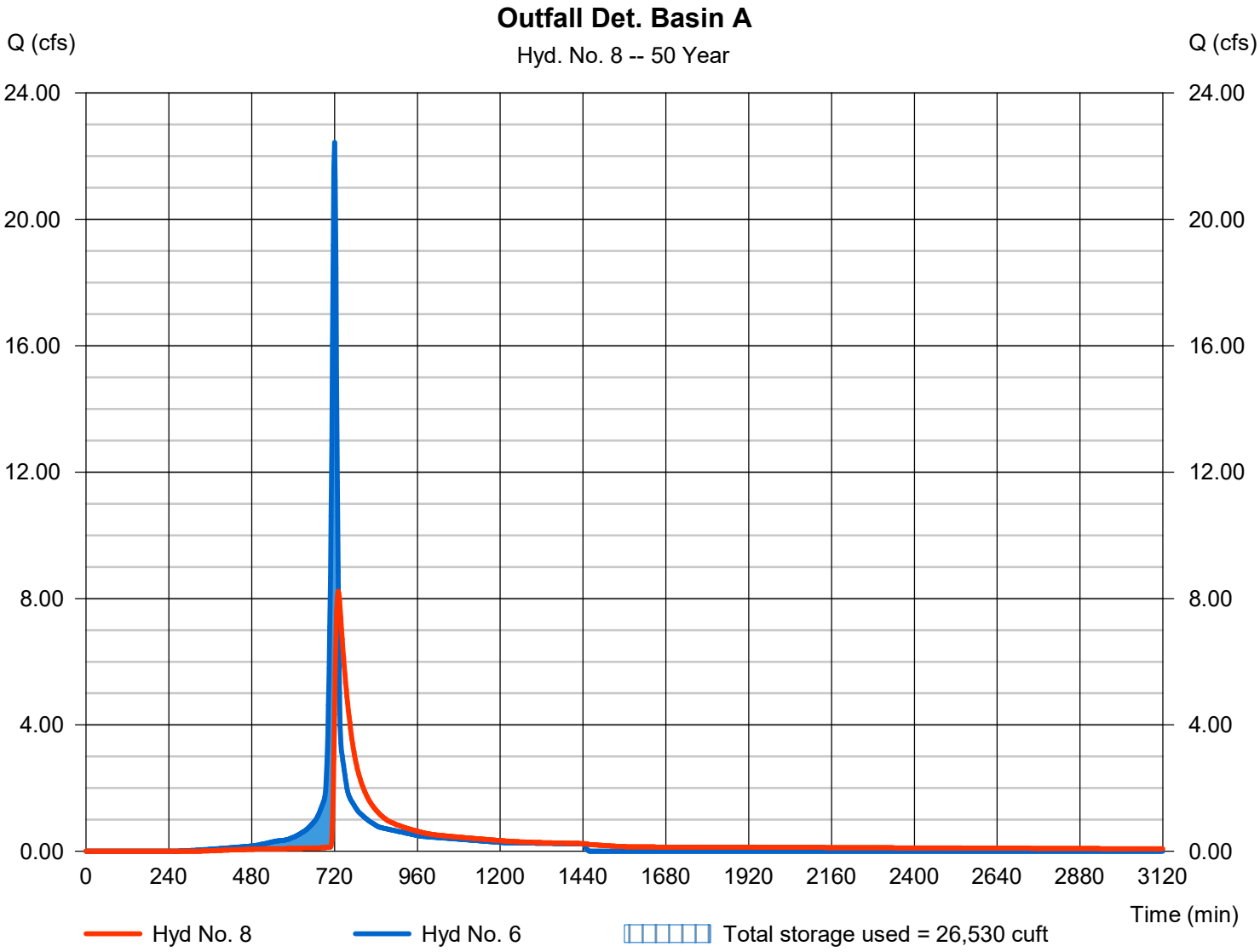
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	8.230 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	58,688 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	662.39 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	26,530 cuft

Storage Indication method used.



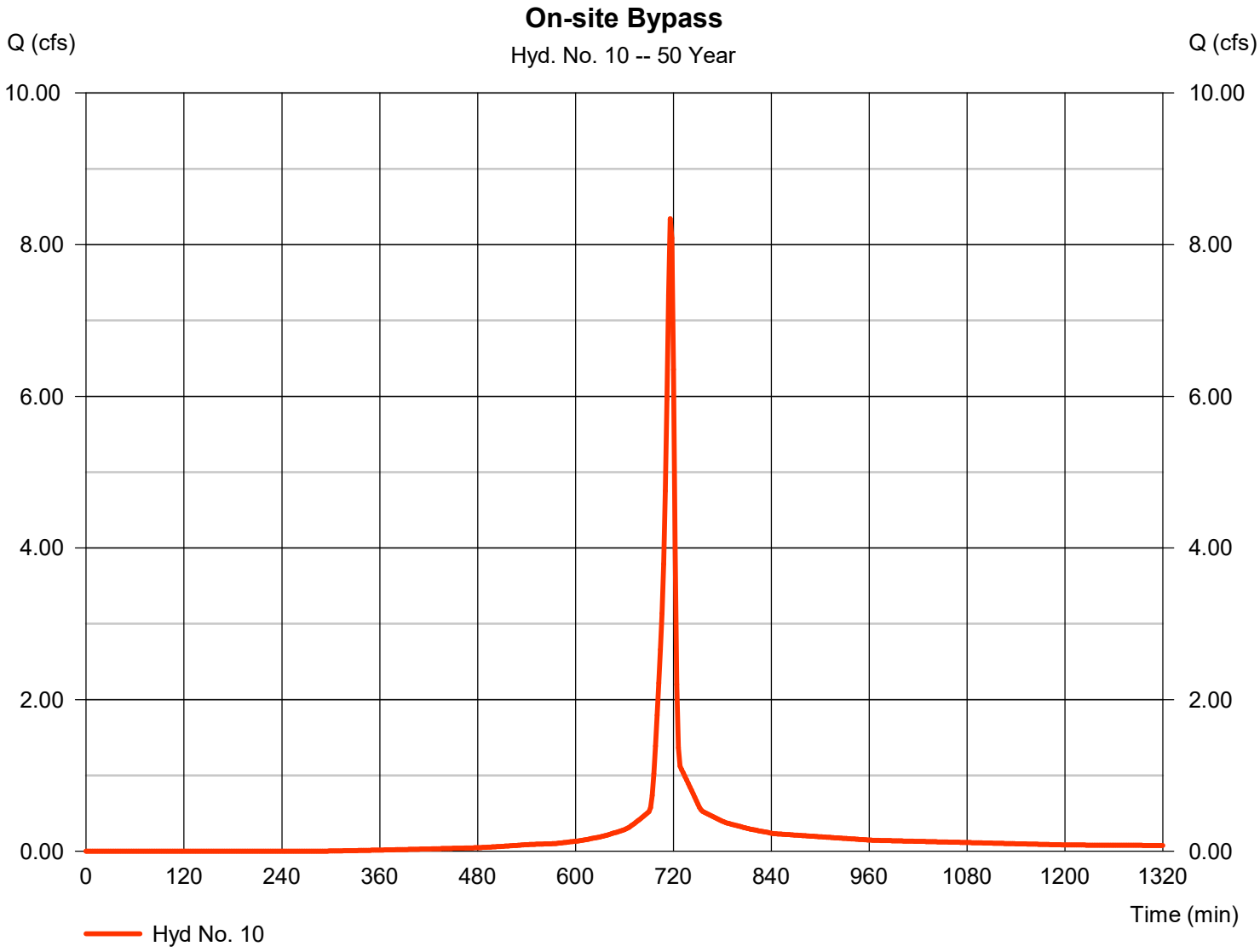
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.342 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	17,541 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

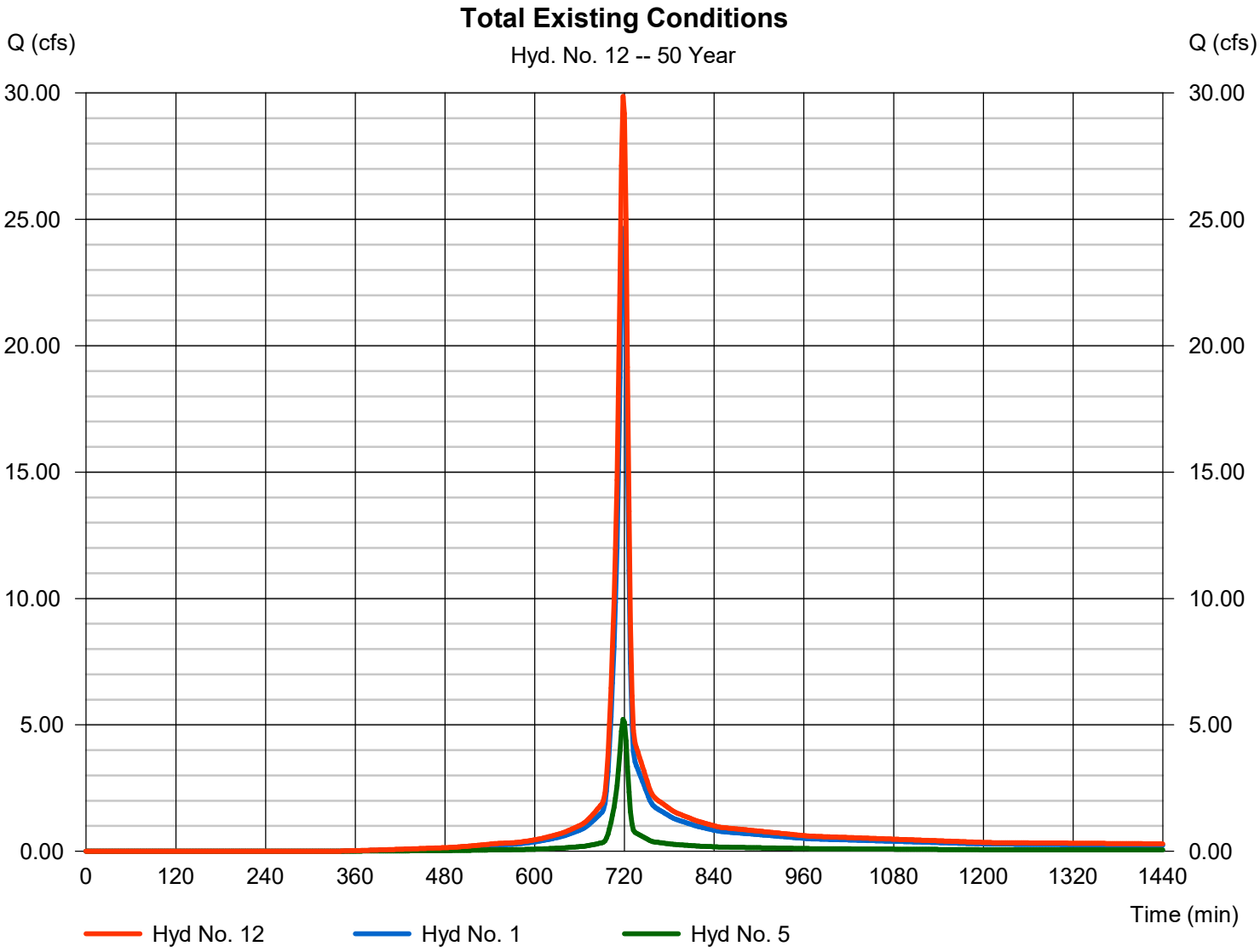


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 29.86 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 69,688 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

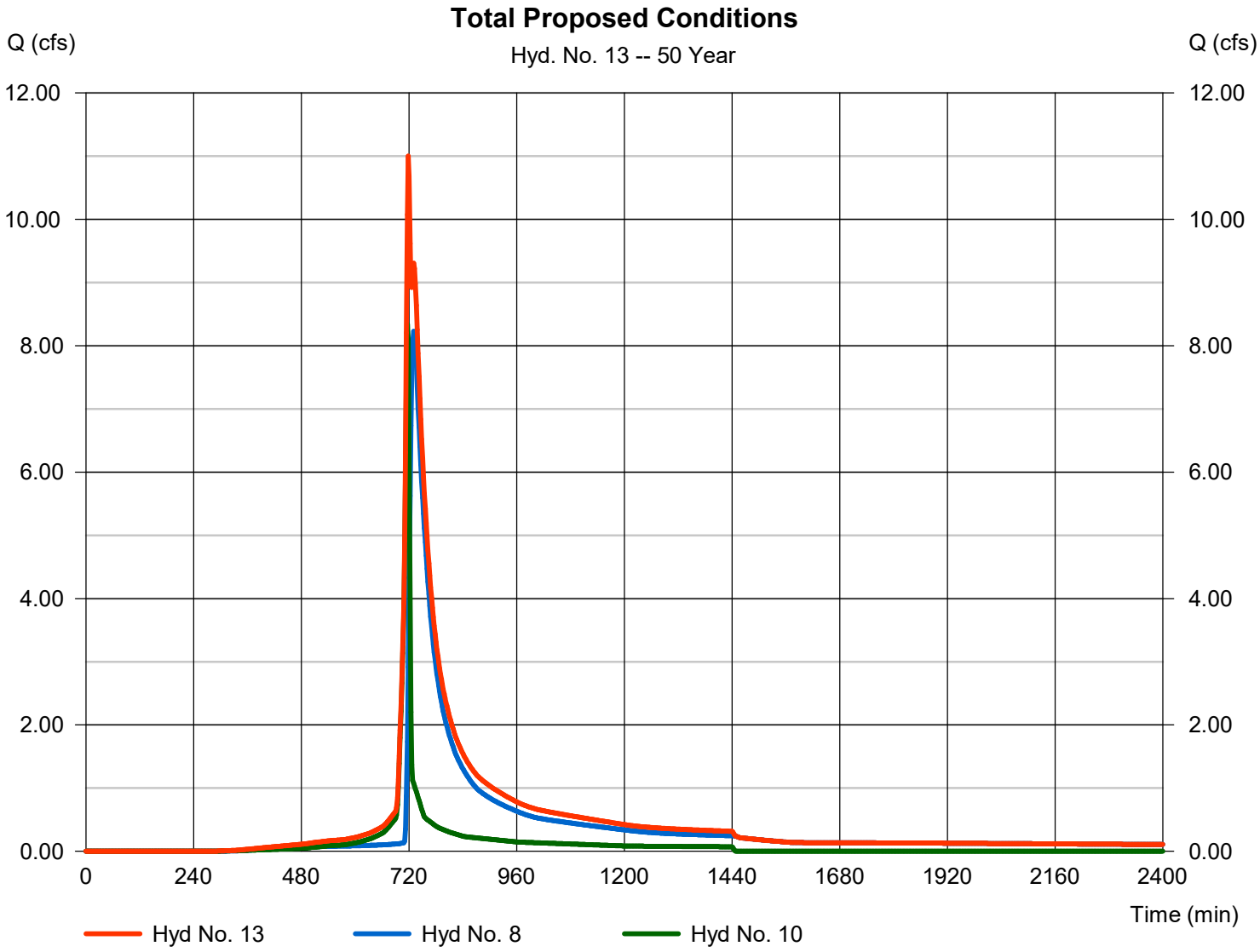


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 11.00 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 76,229 cuft
Inflow hyds.	= 8, 10	Contrib. drain. area	= 1.010 ac



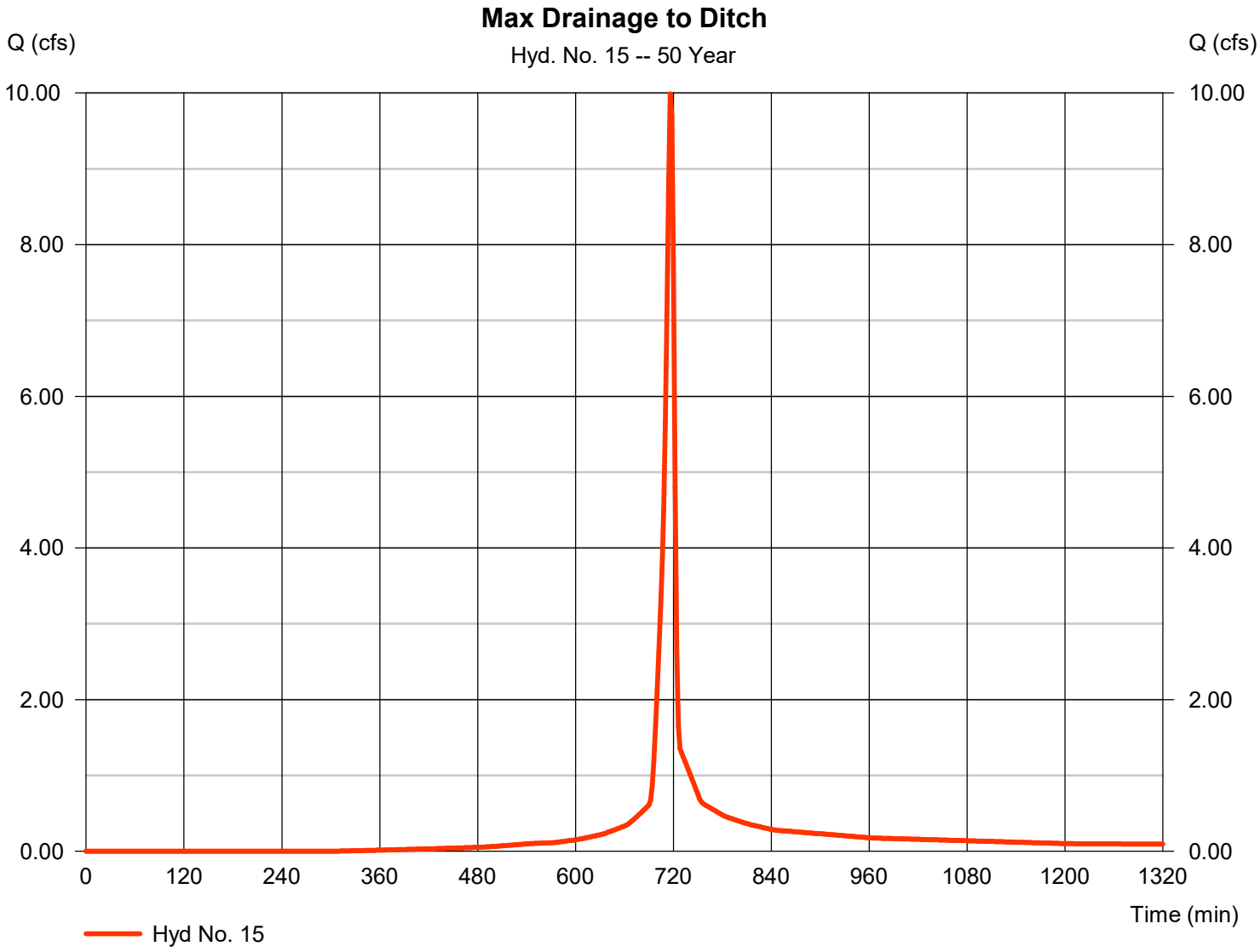
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.986 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	20,892 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.08 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



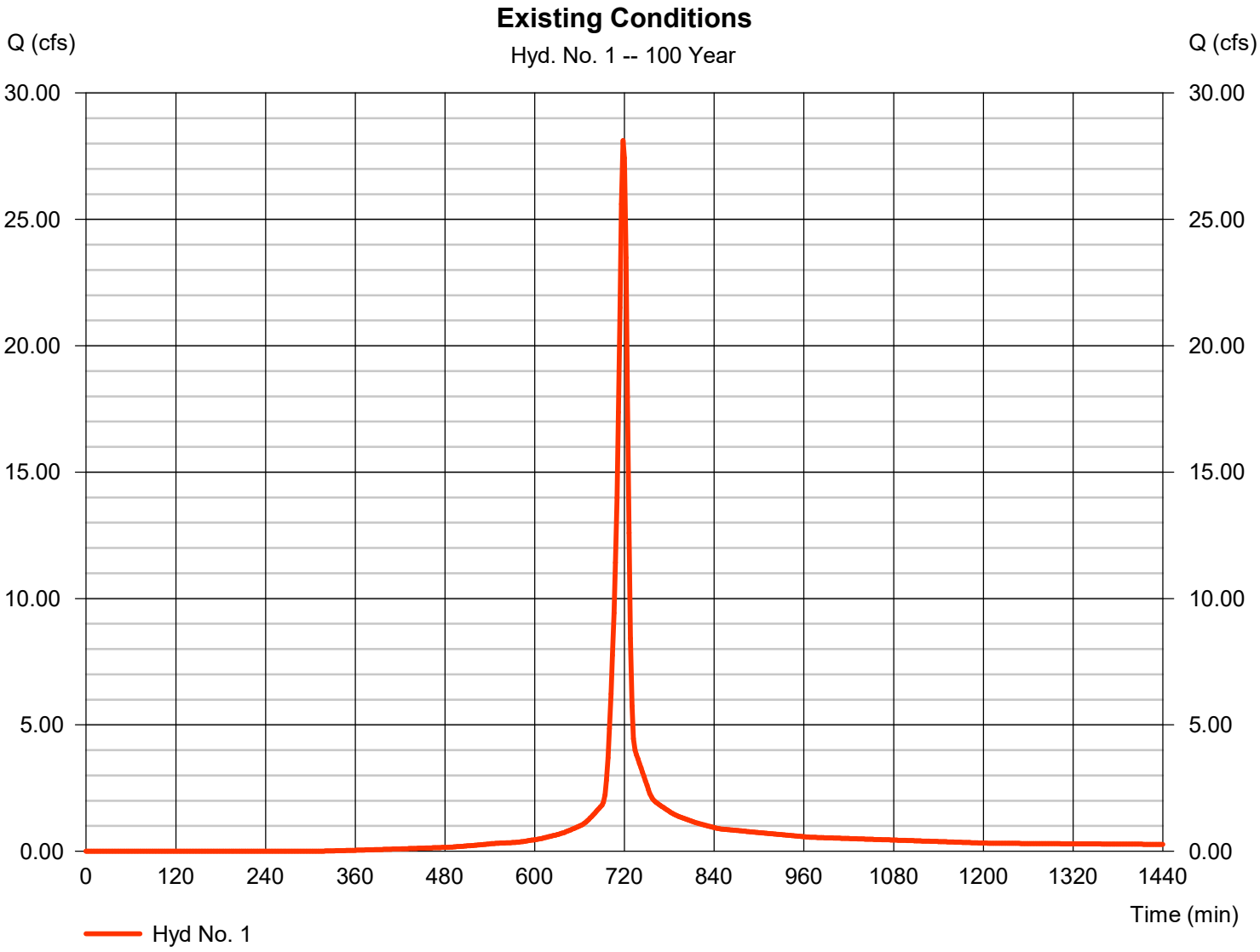
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.12 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	65,984 cuft
Drainage area	=	3.320 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.91 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = + (3.320 x 80)] / 3.320



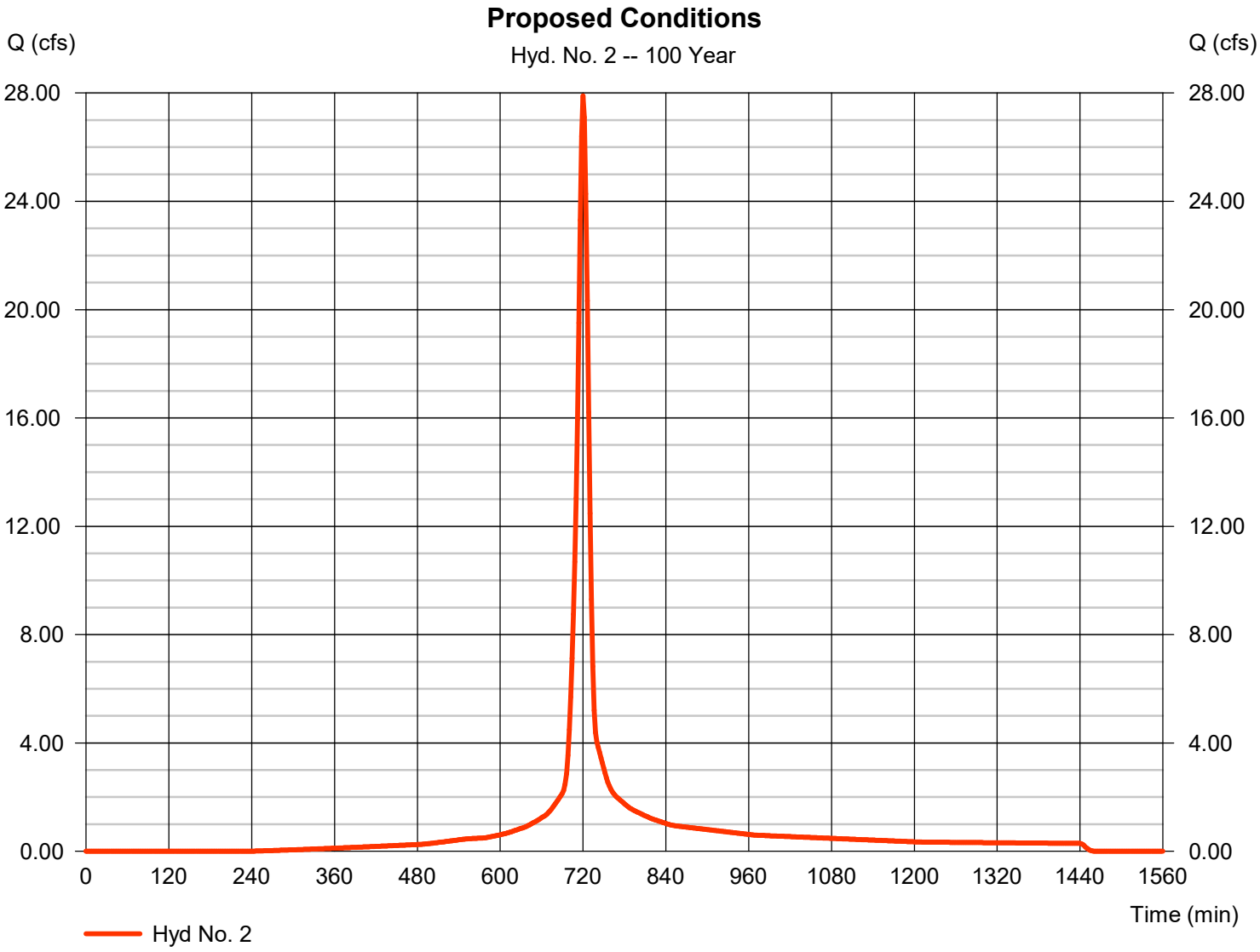
Hydrograph Report

Hyd. No. 2

Proposed Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	27.89 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	75,302 cuft
Drainage area	=	3.320 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.05 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.890 x 98) + (2.430 x 80)] / 3.320



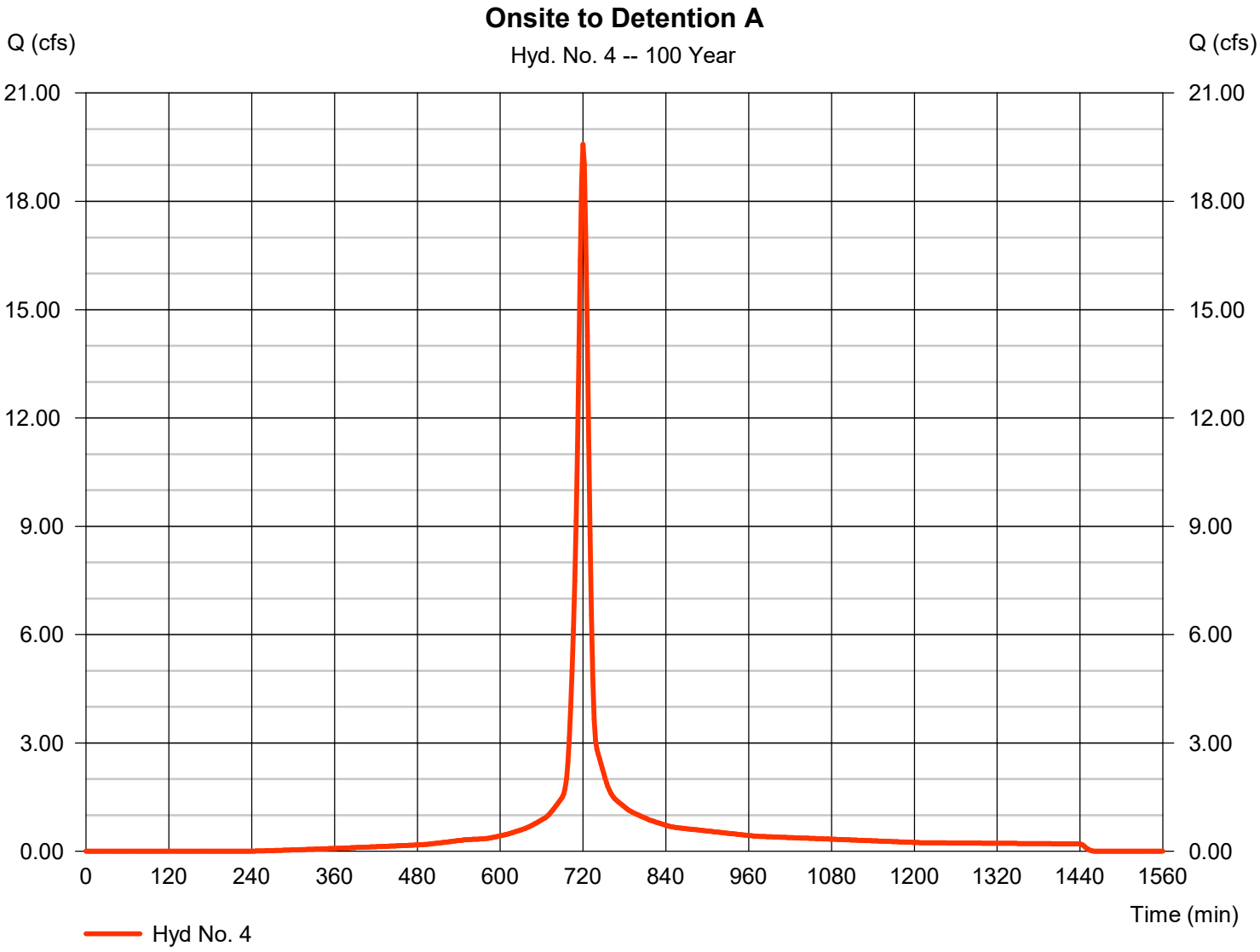
Hydrograph Report

Hyd. No. 4

Onsite to Detention A

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.58 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	52,847 cuft
Drainage area	=	2.330 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.10 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.700 x 98) + (1.630 x 80)] / 2.330



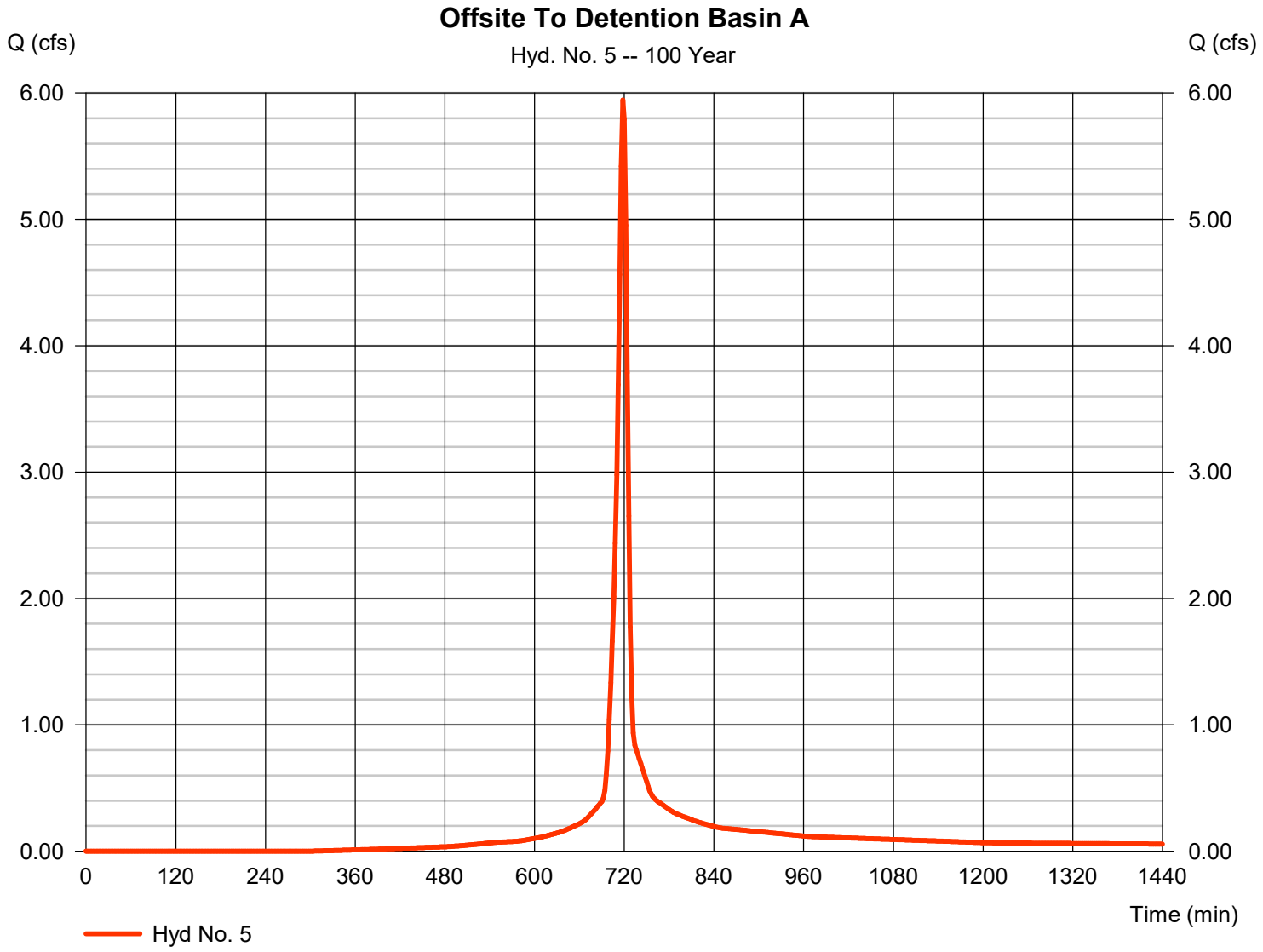
Hydrograph Report

Hyd. No. 5

Offsite To Detention Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.944 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	14,005 cuft
Drainage area	=	0.690 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.50 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 98) + (0.660 x 80)] / 0.690

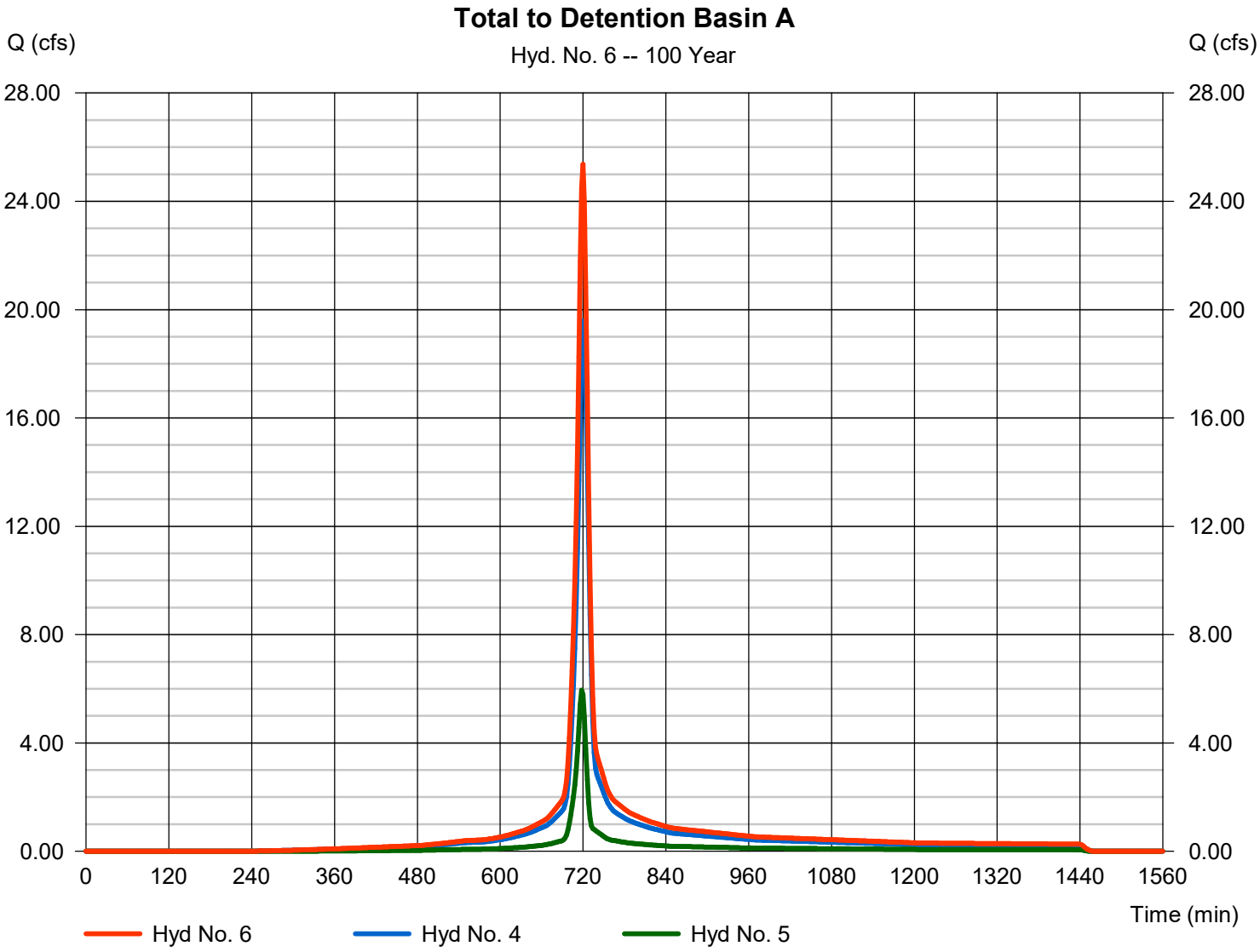


Hydrograph Report

Hyd. No. 6

Total to Detention Basin A

Hydrograph type	= Combine	Peak discharge	= 25.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 66,852 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 3.020 ac



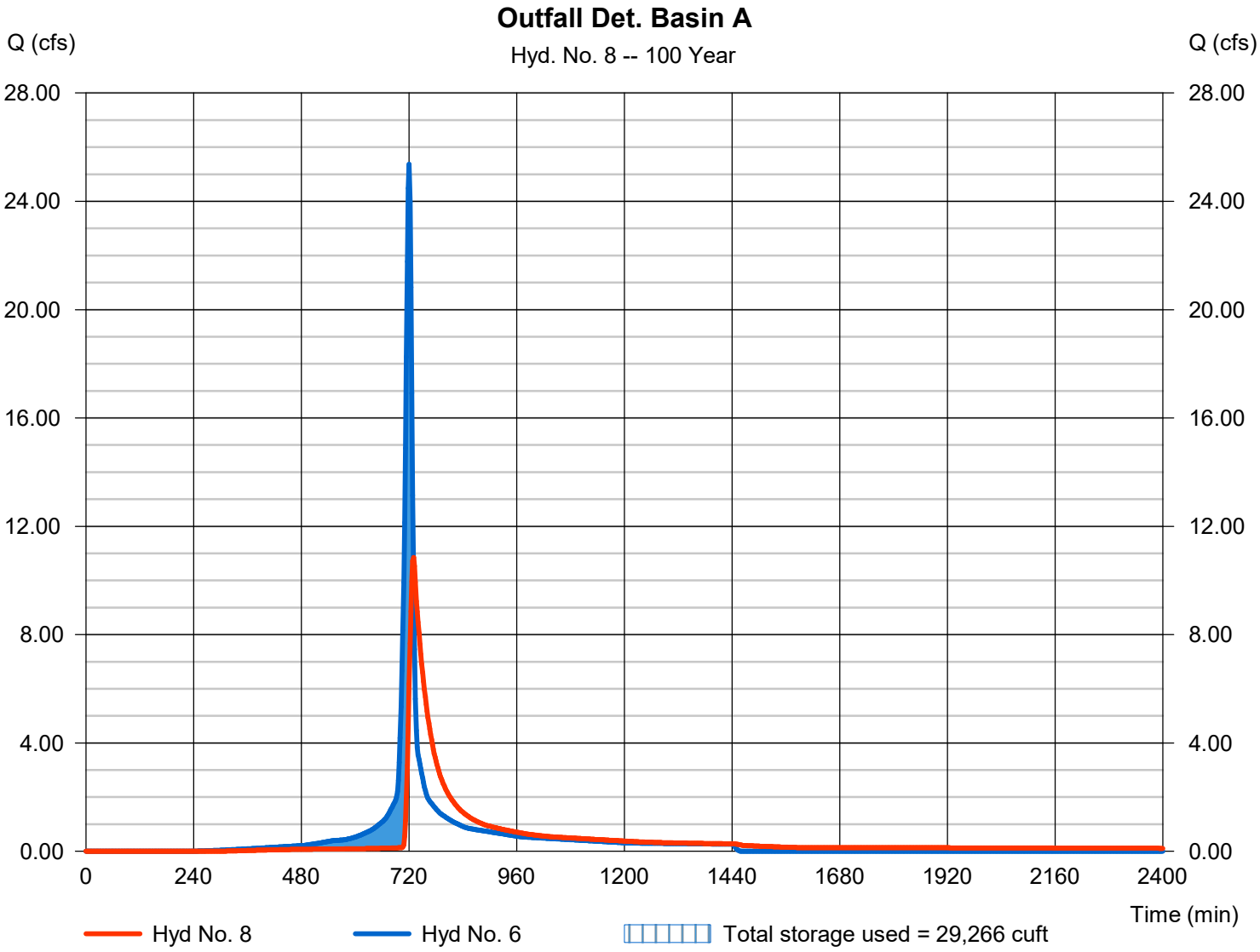
Hydrograph Report

Hyd. No. 8

Outfall Det. Basin A

Hydrograph type	=	Reservoir	Peak discharge	=	10.84 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	66,837 cuft
Inflow hyd. No.	=	6 - Total to Detention Basin A	Max. Elevation	=	662.58 ft
Reservoir name	=	Detention Pond A	Max. Storage	=	29,266 cuft

Storage Indication method used.



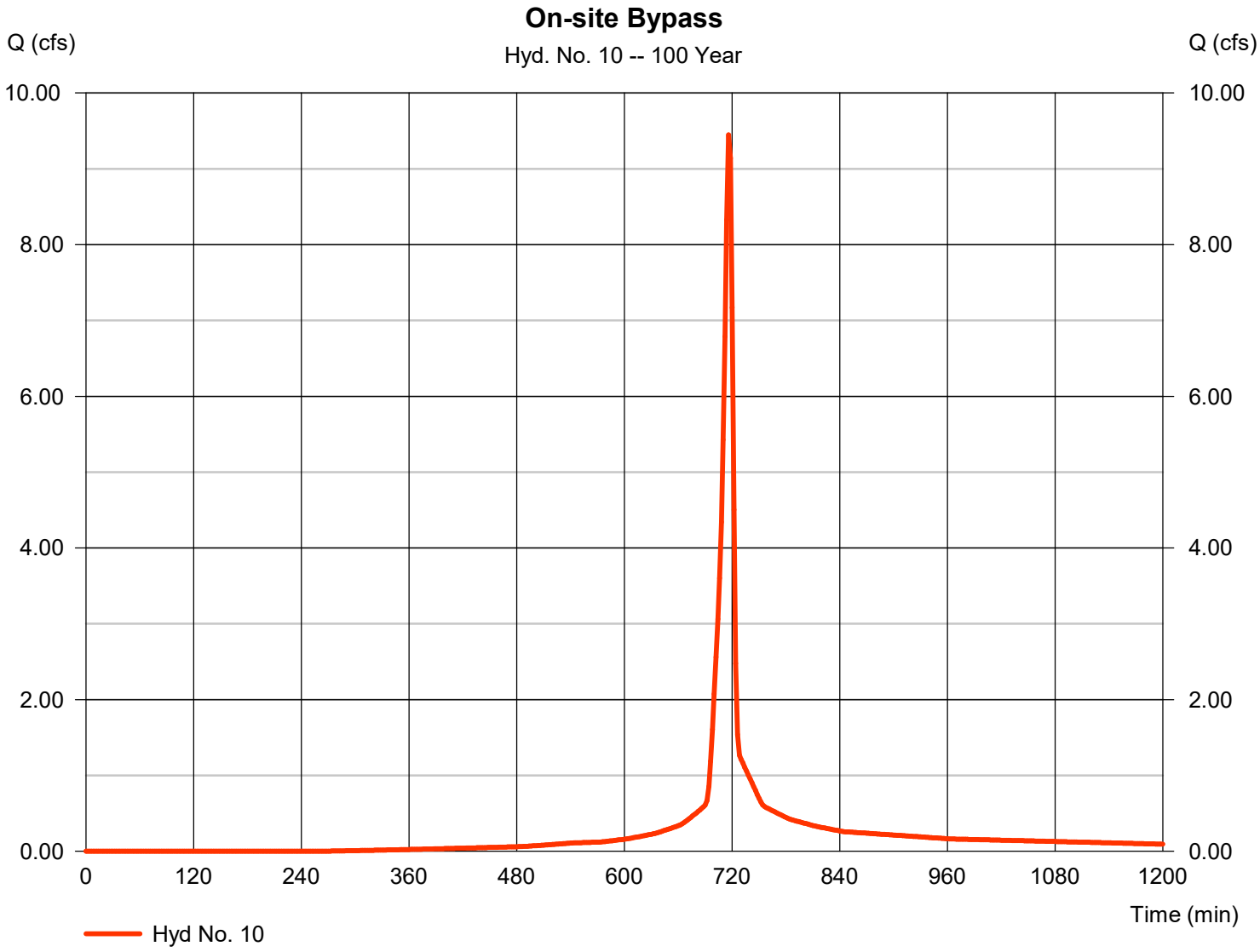
Hydrograph Report

Hyd. No. 10

On-site Bypass

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.449 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	20,021 cuft
Drainage area	=	1.010 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.180 x 98) + (0.830 x 80)] / 1.010

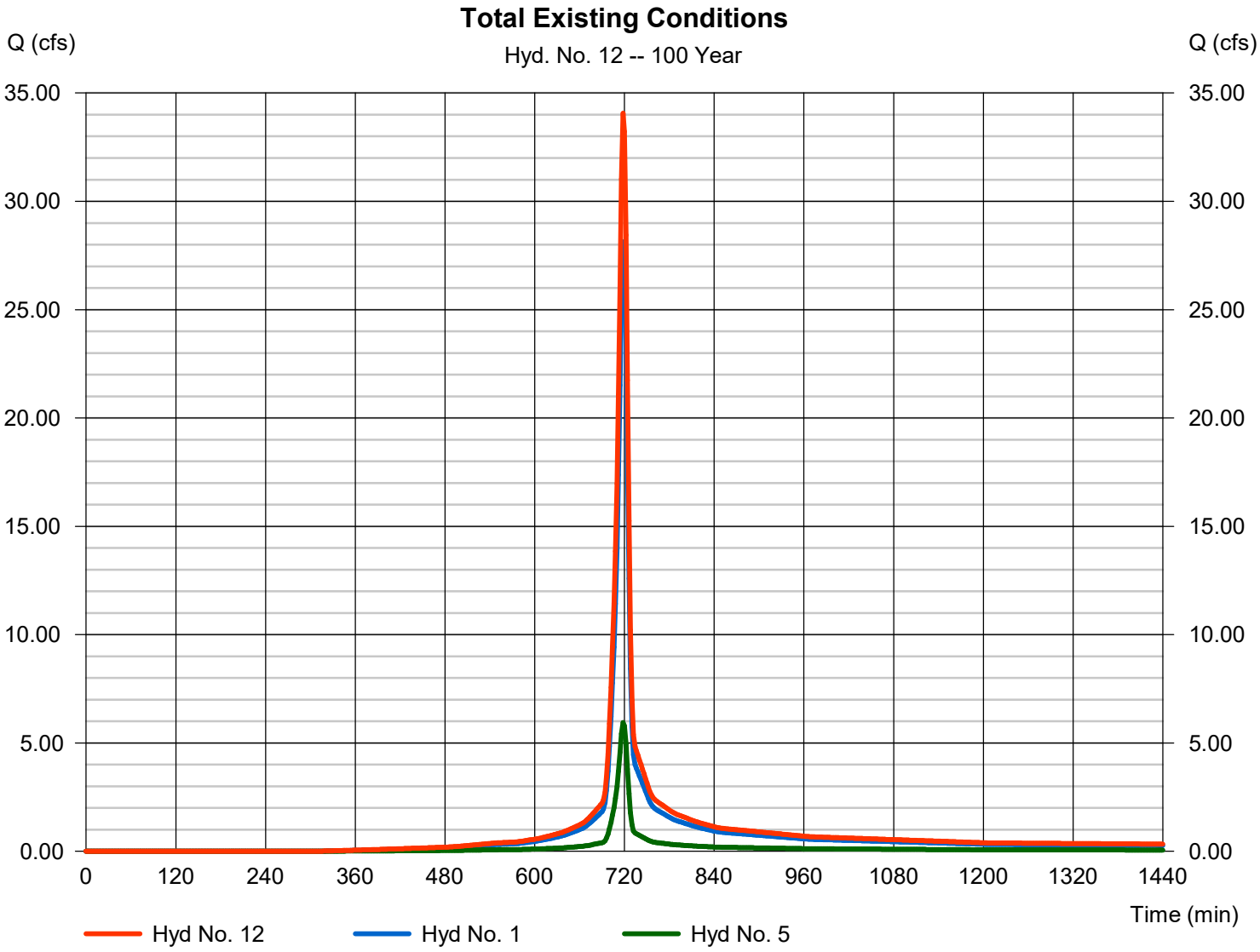


Hydrograph Report

Hyd. No. 12

Total Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 34.07 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 79,989 cuft
Inflow hyds.	= 1, 5	Contrib. drain. area	= 4.010 ac

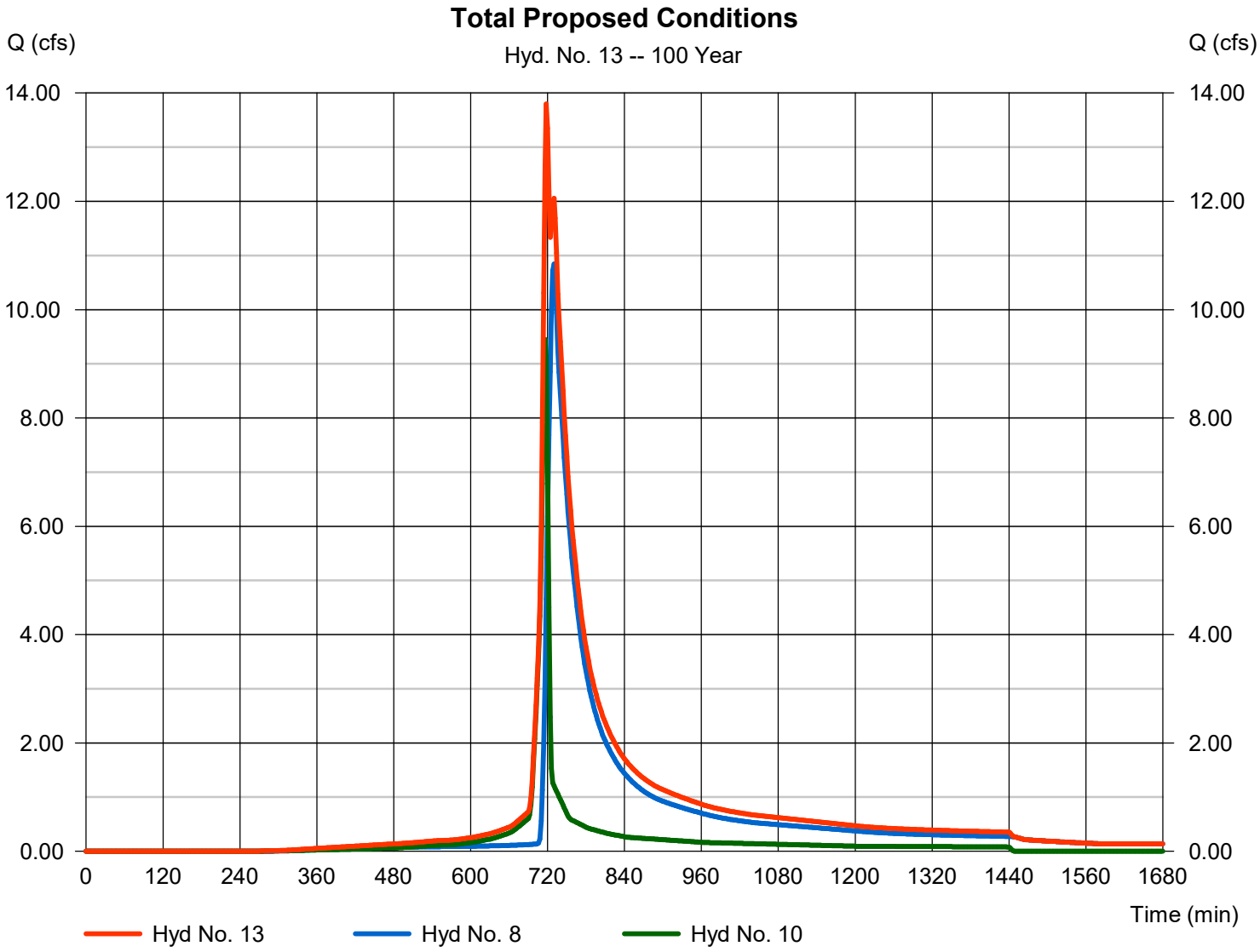


Hydrograph Report

Hyd. No. 13

Total Proposed Conditions

Hydrograph type	=	Combine	Peak discharge	=	13.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	86,858 cuft
Inflow hyds.	=	8, 10	Contrib. drain. area	=	1.010 ac



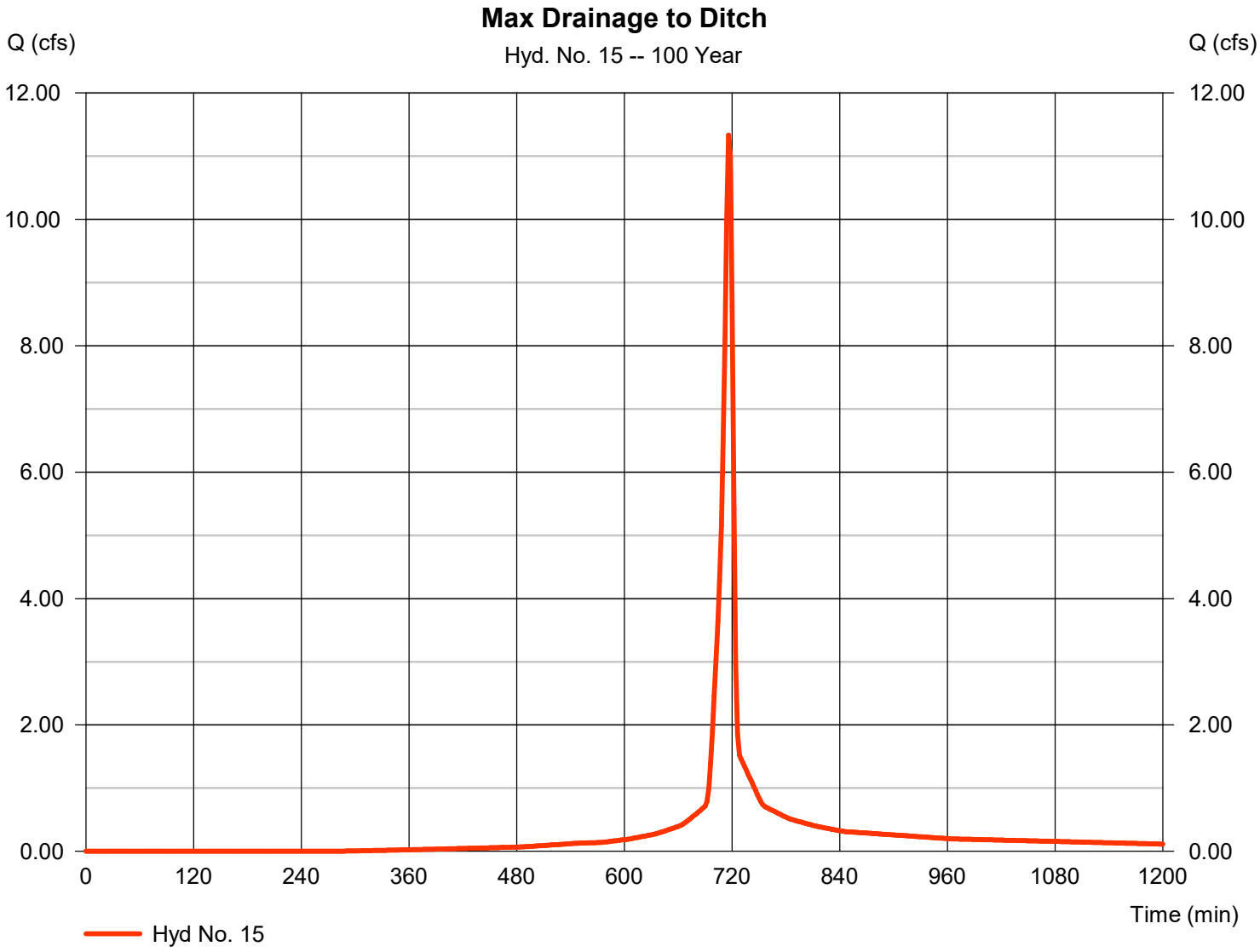
Hydrograph Report

Hyd. No. 15

Max Drainage to Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.34 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	23,893 cuft
Drainage area	=	1.230 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.84 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

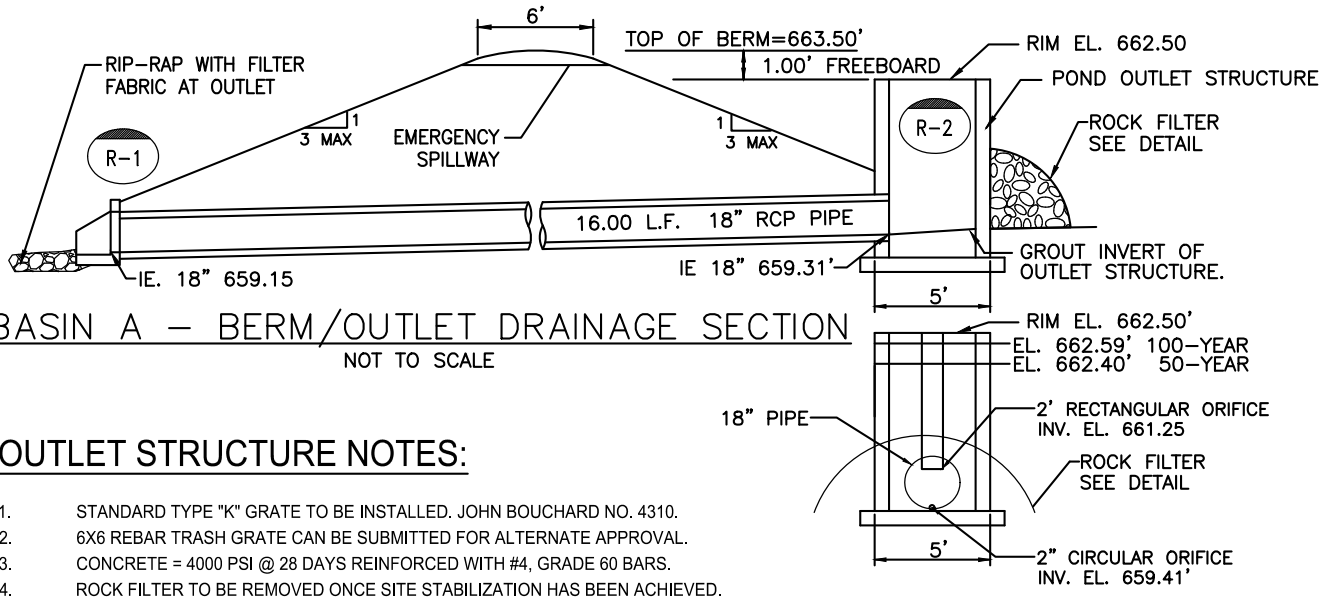
* Composite (Area/CN) = [(0.130 x 98) + (1.100 x 80)] / 1.230



Appendix 2

Stormwater Calculations
Summary and Outlet Detail

DETENTION BASIN A DETAILS

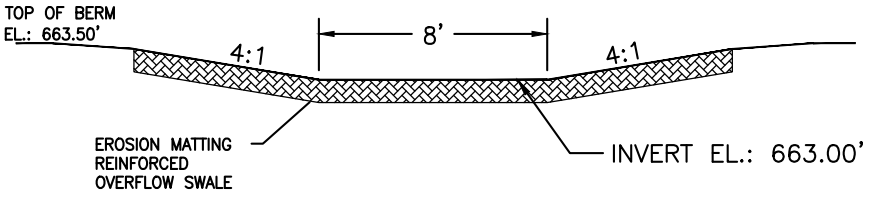


BASIN A – BERM/OUTLET DRAINAGE SECTION

NOT TO SCALE

OUTLET STRUCTURE NOTES:

1. STANDARD TYPE "K" GRATE TO BE INSTALLED. JOHN BOUCHARD NO. 4310.
2. 6X6 REBAR TRASH GRATE CAN BE SUBMITTED FOR ALTERNATE APPROVAL.
3. CONCRETE = 4000 PSI @ 28 DAYS REINFORCED WITH #4, GRADE 60 BARS.
4. ROCK FILTER TO BE REMOVED ONCE SITE STABILIZATION HAS BEEN ACHIEVED.
5. EMERGENCY SPILLWAY TO BE REINFORCED WITH N.A.G. SC150 & SECURED WITH STAPLES.



EMERGENCY SPILLWAY

NOT TO SCALE

TR55 Tc Worksheet

Hyd. No. 1

Existing Conditions

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.90		0.00		0.00		
Land slope (%)	= 4.66		0.00		0.00		
Travel Time (min)	**= 6.33**	**+**	**0.00**	**+**	**0.00**	**=**	**6.33**
Shallow Concentrated Flow							
Flow length (ft)	= 57.56		226.94		192.00		
Watercourse slope (%)	= 12.58		3.57		2.84		
Surface description	= Unpaved		Unpaved		Unpaved		
Average velocity (ft/s)	=5.72		3.05		2.72		
Travel Time (min)	**= 0.17**	**+**	**1.24**	**+**	**1.18**	**=**	**2.59**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 8.91 min

TR55 Tc Worksheet

Hyd. No. 2

Proposed Conditions

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.90		0.00		0.00		
Land slope (%)	= 4.66		0.00		0.00		
Travel Time (min)	**= 6.33**	**+**	**0.00**	**+**	**0.00**	**=**	**6.33**
Shallow Concentrated Flow							
Flow length (ft)	= 52.53		0.00		120.72		
Watercourse slope (%)	= 13.78		0.00		0.50		
Surface description	= Unpaved		Paved		Unpaved		
Average velocity (ft/s)	=5.99		0.00		1.14		
Travel Time (min)	**= 0.15**	**+**	**0.00**	**+**	**1.76**	**=**	**1.91**
Channel Flow							
X sectional flow area (sqft)	= 1.24		0.00		0.00		
Wetted perimeter (ft)	= 4.47		0.00		0.00		
Channel slope (%)	= 2.89		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=3.57						
			0.00				
					0.00		
Flow length (ft)	({0})388.9		0.0		0.0		
Travel Time (min)	**= 1.82**	**+**	**0.00**	**+**	**0.00**	**=**	**1.82**

Total Travel Time, Tc ..... 10.05 min

TR55 Tc Worksheet

Hyd. No. 5

Offsite To Detention Basin A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.90		0.00		0.00		
Land slope (%)	= 3.22		0.00		0.00		
Travel Time (min)	**= 7.34**	**+**	**0.00**	**+**	**0.00**	**=**	**7.34**
Shallow Concentrated Flow							
Flow length (ft)	= 57.50		0.00		0.00		
Watercourse slope (%)	= 10.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=5.23		0.00		0.00		
Travel Time (min)	**= 0.18**	**+**	**0.00**	**+**	**0.00**	**=**	**0.18**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 7.52 min

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Aug 27 2025

Max Capacity of Ditch

Trapezoidal

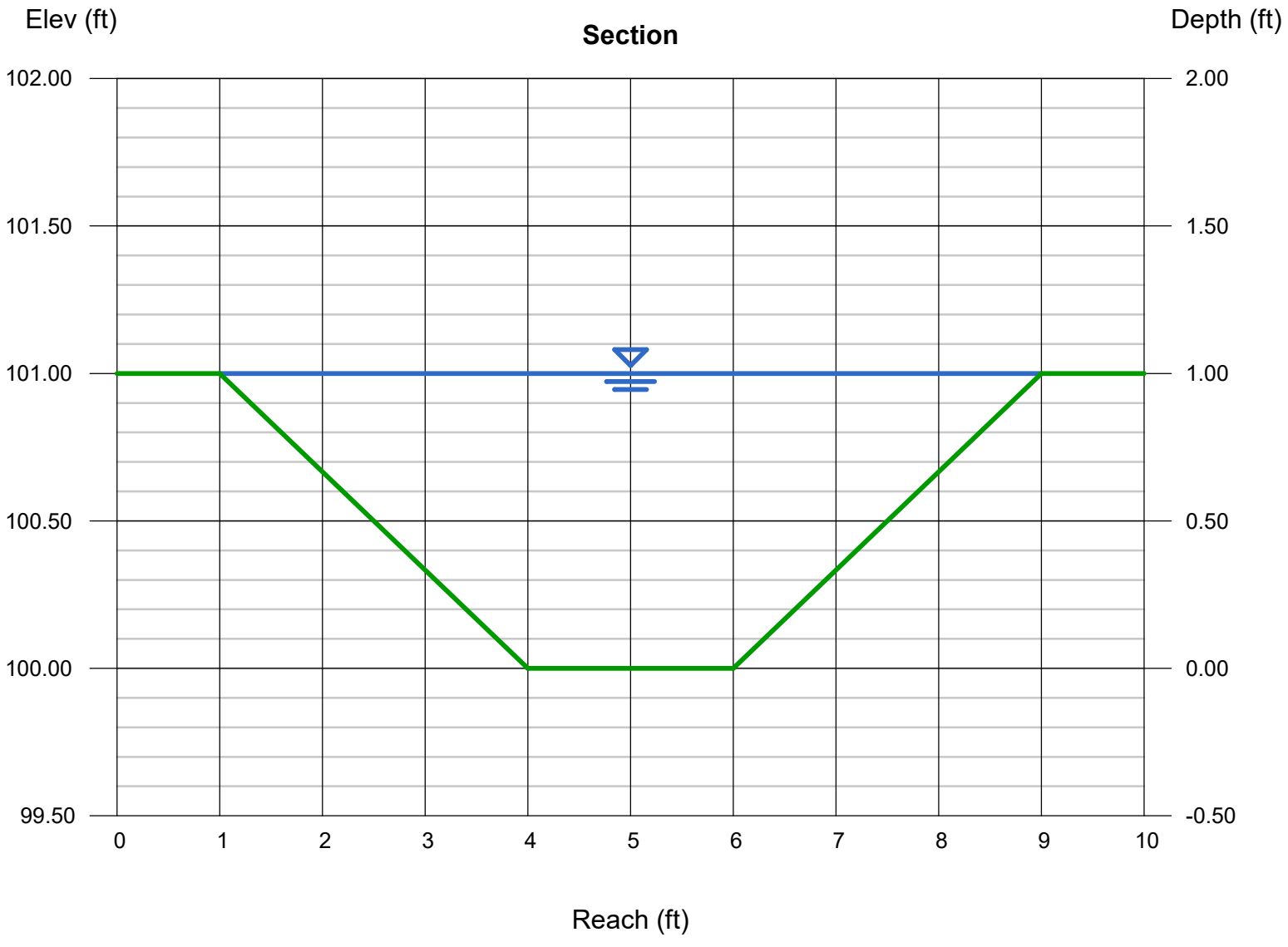
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 17.63
Area (sqft)	= 5.00
Velocity (ft/s)	= 3.53
Wetted Perim (ft)	= 8.32
Crit Depth, Yc (ft)	= 0.89
Top Width (ft)	= 8.00
EGL (ft)	= 1.19



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Maury County, Tennessee

August 11, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,010 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Maury County, Tennessee
Survey Area Data: Version 19, Sep 12, 2024

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

Date(s) aerial images were photographed: Mar 20, 2021—Jun 14, 2021

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bm	Burgin silt loam, phosphatic phase (Eagleville)	0.0	0.4%
Ga	Godwin silt loam	0.4	11.7%
Mb	Maury silt loam, eroded gently sloping phase	0.3	8.0%
Mp	Mines, Pits, and Dumps	2.7	79.9%
Totals for Area of Interest		**3.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Maury County, Tennessee

Bm—Burgin silt loam, phosphatic phase (Eagleville)

Map Unit Setting

National map unit symbol: kq51
Elevation: 610 to 2,090 feet
Mean annual precipitation: 48 to 63 inches
Mean annual air temperature: 45 to 72 degrees F
Frost-free period: 154 to 189 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eagleville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eagleville

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Parent material: Clayey alluvium derived from limestone

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 35 inches: clay
R - 35 to 45 inches: bedrock

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F123XY005TN - Floodplains
Hydric soil rating: No

Ga—Godwin silt loam

Map Unit Setting

National map unit symbol: kq66

Elevation: 600 to 1,000 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 220 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Godwin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Godwin

Setting

Landform: Hillslopes
Landform position (three-dimensional): Base slope
Parent material: Clayey alluvium derived from limestone

Typical profile

H1 - 0 to 18 inches: silt loam
H2 - 18 to 30 inches: silty clay loam
H3 - 30 to 60 inches: clay

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F123XY005TN - Floodplains
Hydric soil rating: No

Mb—Maury silt loam, eroded gently sloping phase

Map Unit Setting

National map unit symbol: kq72
Elevation: 540 to 930 feet
Mean annual precipitation: 46 to 60 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Maury and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maury

Setting

Landform: Hillslopes
Landform position (three-dimensional): Crest
Parent material: Loess over clayey residuum and/or alluvium derived from limestone

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 26 inches: silty clay loam
H3 - 26 to 40 inches: silty clay
H4 - 40 to 60 inches: clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F123XY001TN - Limestone Uplands
Hydric soil rating: No

Mp—Mines, Pits, and Dumps

Map Unit Composition

Mines: 40 percent
Pits: 30 percent
Dumps: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

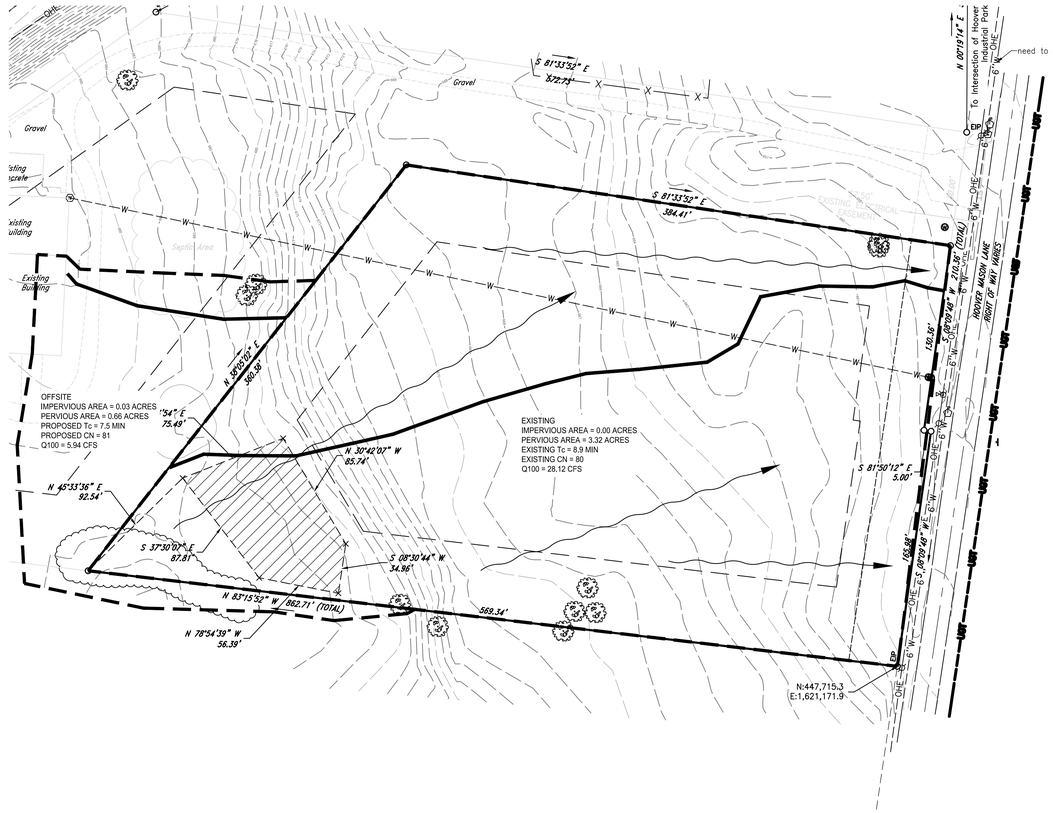
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

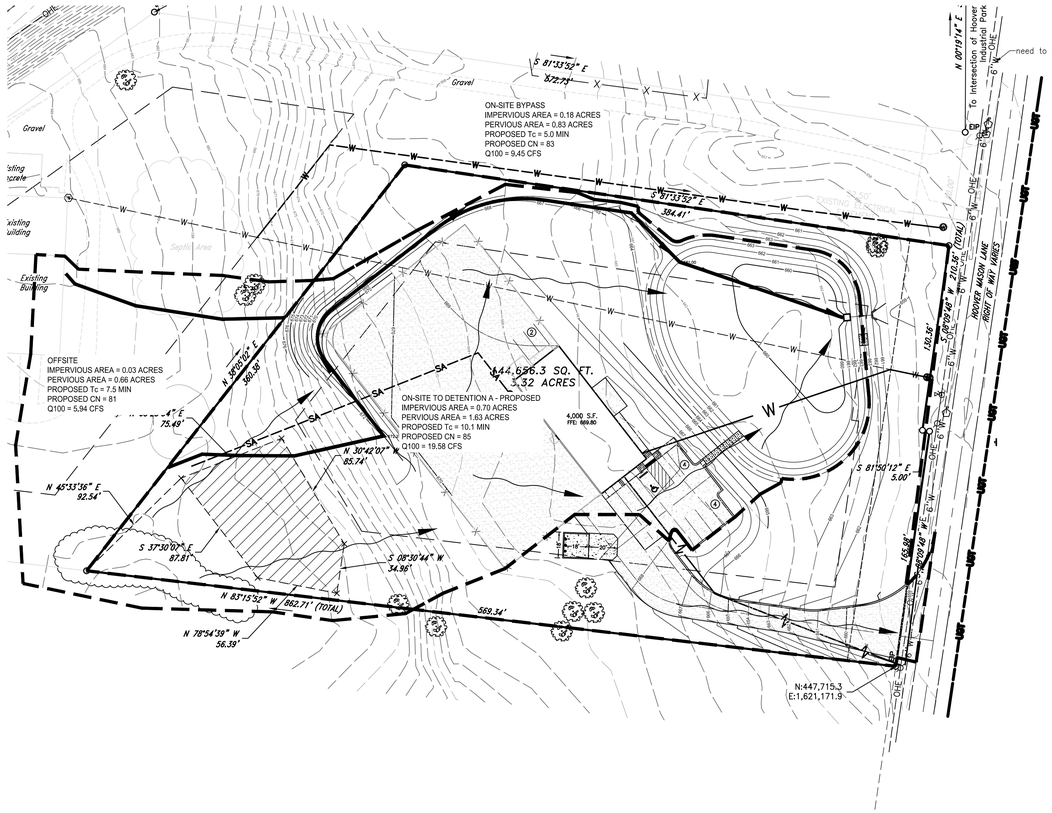
Appendix 3

Drainage Map

DRAINAGE MAP



EXISTING CONDITIONS



PROPOSED CONDITIONS

GRAPHIC SCALE

50 0 25 50 100 150

(IN FEET)
1 inch = 50 ft.

TN GRID NORTH

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
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Client
LAB LAND HOLDINGS, LLC
2411 DARKS MILL ROAD
COLUMBIA, TN 38401
(763) 229-9407

REVISIONS	DATE
Addressed Staff Comments	8/27/25

LAB LAND HOLDINGS, LLC (HELIOS)

6920 HOOVER MASON LANE
MOUNT PLEASANT, MAURY COUNTY, TENNESSEE 38474
DRAINAGE MAP

Drawn: bo
Checked: gv
Approved: GV
Date: 8/11/2025

Job. no. 25526
Scale:
Vertical: N/A
Horizontal:

JEREMY W. GERALD
LICENSED PROFESSIONAL ENGINEER
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RELEASED FOR CONSTRUCTION WHEN APPROVED BY MUNICIPALITY

MP-1

FILE: I:\WES_Engineers_Surveyors 2025\25526 – Hoover Mason – Helios\Dwg\Engineering\25526_Hoover Mason base.dwg