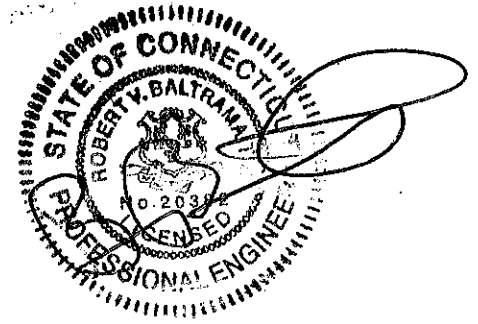


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East Hampton
Land Use Office

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**STORM WATER ANALYSIS
LONG HILL ESTATES
Rev. June 2, 2021**

The existing property at 53 Long Hill Road is 20.29 acres in size and located on the south side of Long Hill Road just west of West High Street (State Route 66) in East Hampton, Connecticut. The site is presently undeveloped and the ground cover is primarily forested. The topography slopes generally from south to north with a drainage divide approximately in the center of the property.

The proposed development will consist of eight (8) single family residential homes on new lots of varying sizes. Lot sizes range from approximately 60,000 SF to 125,000 SF. The shape and size of the proposed lots is a function of providing code compliant domestic wells, protective radii, primary sub-surface sewage disposal systems and future reserve areas.

Hydraflow Hydrographs® (HH) software was used to generate computer models of the pre- and post-development scenarios. HH utilizes the methodologies set forth in the Technical Release No. 55 (TR-55) and Technical Release No. 20 (TR-20) computer model, originally developed by the Soil Conservation Service (SCS) now called the Natural Resources Conservation Service (NRCS) as well as Rational and Modified Rational Methods. The HH software predicts runoff rates based upon several factors including land use, hydrologic soil type, vegetative cover, watershed area, time of concentration rainfall data and the attenuation effects due to ponds and structures.

Presently, under *pre-development conditions*, approximately half of the site drains northeasterly to a wetland system that traverses through the northeast corner of the site and drains to an existing culvert under Long Hill Road (Analysis Point A). The remaining portion of the site drains north westerly to a roadside swale (Analysis Point B) or simply drains overland as sheetflow across the west border (Analysis Point C).

Under *post-development conditions*, the existing drainage areas will be altered but the size of the areas draining to each analysis point will be similar.

When the SCS is utilized, runoff curve numbers (CN) were developed for each drainage area for existing and post-development conditions based on existing land coverage in the sub watersheds and the underlying soils, as identified in the Soil Survey of New London County, Connecticut. The following runoff coefficients were used based on the hydrologic classification of area soils which are of hydrologic class 'C' with some class 'B' to the south:

<u>Land Cover</u>	<u>CN</u>
Roofs	98
Pavements	98
Grass	74
Woods (C)	70
Woods (B)	55

When the Modified Rational method is utilized, weighted runoff coefficients were determined for each drainage area utilizing the following values from Section 6 of the Town of East Hampton Street Standards:

<u>Land Cover</u>	<u>"C"</u>
Roofs	0.90
Pavements	0.90
Lawns (Flat)	0.17
Lawns (Steep)	0.35
Woods	0.20

Drainage areas for pre- and post-development scenarios were developed and are shown on Plan Sheet DA-1 entitled "Pre and Post Drainage Area Plan" contained in the plan set.

The times-of-concentration (Tc) were determined for both the pre- and post-development conditions using accepted practices that consider the characteristic of the watershed, its slope and travel length; a minimum time-of-concentration (Tc) of 5 minutes is utilized. Given the relatively small drainage areas, hydrographs were developed using Modified Rational methodology to determine peak flow rates and to route peak flows through the proposed stormwater management areas. To measure storm volumes, hydrographs were developed using SCS methodology. Rainfall data was taken from NOAA 14 published rainfall values; the associated 24-hour rainfall totals utilized are 3.34", 5.13", 6.25" and 7.97" for the 2-, 10-, 25- and 100-year storms, respectively.

The following table summarizes each existing and post-development drainage area:

Watershed	Area (Acres)	Tc (min)	Runoff "C"/ CN	Description
ex-POI-A	10.3	29	0.20 /69	Existing runoff east to culvert (Point A)
ex-POI-B	3.1	24	0.20 /70	Existing runoff west to roadside (Point B)
ex-POI-C	6.9	22	0.20 /67	Existing runoff west overland (Point C)
PR-DA-1	1.2	14	0.30 /73	Post Dev runoff east to culvert (Point A)
PR-DA-2	0.9	14	0.39 /77	Post Dev runoff east to culvert (Point A)
PR-DA-6	0.9	22	0.34 /72	Post Dev runoff east to culvert (Point A)
PR-DA-7	4.4	29	0.22 /67	Post Dev runoff east to culvert (Point A)
PR-DA-8A	3.5	24	0.22 /71	Post Dev runoff east to culvert (Point A)
PR-DA-8B	0.1	9	0.30 /74	Post Dev runoff east to culvert (Point A)
PR-DA-3	1.3	19	0.27 /72	Post Dev runoff west to road side (Point B)
PR-DA-9A	0.1	14	0.29 /73	Post Dev runoff west to road side (Point B)
PR-DA-4	1.7	19	0.27 /72	Post Dev runoff west overland (Point C)
PR-DA-5	3.0	22	0.25 /68	Post Dev runoff west overland (Point C)
PR-DA-10A	0.2	10	0.20 /70	Post Dev runoff west overland (Point C)
PR-DA-10B	2.5	22	0.20 /64	Post Dev runoff west overland (Point C)

Not surprisingly, the developed site is anticipated to increase the peak runoff rates and volumes from the site. To mitigate this impact, sub-surface storm water infiltration systems are proposed to accommodate rooftop water from EACH of the proposed dwellings. Each system is designed to fully accommodate the anticipated volume for a 100-year, 24-hour storm (SCS method). Each system will consist of approximately 60 feet of (12"x30") HDPE infiltration chambers on a crushed stone bed providing 243 cubic feet of storage. Appendix sheets B-1 thru B-3 contain runoff volume and storage calculations.

While this first mitigation significantly reduces the post-development impact, we would still expect an increase in peak runoff rates and volumes associated with the paved driveways and creation of lawns and other developed areas. To further mitigate this impact, the site will be developed with a series of raingardens/ bioretention areas constructed as mild depressions in the topography. These storm water management areas are designed to hold enough volume of post development runoff to meet or reduce the pre-development volume. The following table summarizes the volume holding capacity of the raingardens:

Raingarden	Serves	Volume (Cu. Ft.)	Drains To
SWM 1	Lot 7	2,021	Runoff east to culvert (Point A)
SWM 2	Lot 5	1,417	Runoff east to culvert (Point A)
SWM 3	Lot 4	1,953	Runoff west to road side (Point B)
SWM 4	Lot 1	6,250	Runoff west to road side (Point B)
SWM 5	Lot 2	3,888	Runoff west overland (Point C)
SWM 6	Lot 6	8,206	Runoff east to culvert (Point A)
SWM 7	Lot 6	6,531	Runoff east to culvert (Point A)
Total Volume		30,266	

As summarized above, the proposed raingarden/ bioretention areas offer 30,266 cubic feet (0.69 acre-feet) of on-site storage. With each of eight rooftop infiltration systems providing 243 cubic feet of additional storage, the total project storage for post-development storm water is 32,210 (0.74 acre-feet).

The raingardens were modeled as "ponds" in the HH software and post-development hydrographs were routed through the applicable ponds. The effect of the ponds will serve to greatly reduce post-development peak runoff rates and volumes. As summarized below, the mitigation measures including the rooftop infiltrators and the proposed raingarden/ bioretention areas, will fully mitigate the storm water impacts of development:

Watershed	Existing		Proposed (No Detention)		Proposed (with Detention)	
	Rate (cfs)	Volume (cu. ft.)	Rate (cfs)	Volume (cu. ft.)	Rate (cfs)	Volume (cu. ft.)
East to culvert (Point A)	12.7	19,463	13.7	22,744	6.6	10,110
West to roadside (Point B)	4.3	5,070	3.0	2,699	1.3	1,020
West overland (Point C)	9.6	11,285	11.0	14,152	5.2	7,216

Post-development hydrographs, including runoff coefficient calculations, time of concentration calculations and pond reports for the 100-year storm event are contained in Appendix A. A summary table is provided also detailing the 2-, 10-, and 25-year storms.

The maintenance of the rooftop infiltrators and raingarden/ bioretention areas will be the perpetual responsibility of the assigned property owners.

Water Quality Volume and Ground Recharge Volume

The CTDEEP Stormwater Quality Manual defines the water quality volume (WQV) as the amount of stormwater runoff from any given storm that should be captured and treated in order to remove a majority of stormwater pollutants on an average annual basis. The recommended WQV, which results in the capture and treatment of the entire runoff volume for 90 percent of the average annual storm events, is equivalent to the runoff associated with the first one-inch of rainfall. The WQV is calculated using the following equation:

$$\text{WQV} = (1")(R)(A) / 12 \text{ where:}$$

WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = $0.05 + 0.009(I)$
I = percent impervious cover
A = site area in acres

Based on the development plans, the impervious coverage for the site will be approximately 4.5 percent. Solving for the above equation, the recommended WQV is 0.15 acre-feet (6,632 CF).

The groundwater recharge criterion contained in the SWQM is intended to maintain pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff. The objective of the groundwater recharge criterion is to maintain water table levels, stream baseflow, and wetland moisture levels. The groundwater recharge volume (GRV) is the post-development design recharge volume (i.e., on a storm event basis) required to minimize the loss of annual pre-development groundwater recharge. The GRV is determined as a function of annual pre-development recharge for site-specific soils or surficial materials, average annual rainfall volume, and amount of impervious cover on a site. The GRV is calculated using the following equation:

$$\text{GRV} = (D)(A)(I) / 12 \text{ where:}$$

GRV = groundwater recharge volume (ac-ft)
D = depth of runoff to be recharged (inches)
(SWQM Table 7-4)
A = site area (acres)
I = post-development site imperviousness

Solving for the above equation, the recommended GRV is .007 acre-feet (331 CF).

The water quality volume and groundwater recharge volume provided by the site greatly exceeds the CTDEEP recommended values. WQV and GRV calculations are depicted on Appendix sheet C-1.

Roadside Culverts

To accommodate the existing roadside swale, the developer proposes to install culverts to convey swale flows under the driveways serving Lot 1, Lot 4 and Lot 7. Drainage calculations were performed to evaluate the performance of each culvert for a 10-year design storm using information and methodology contained in Hydraulic Engineering Circular HEC Number 5, Hydraulic Charts for the Selection of Highway Culverts, HEC Number 10, Capacity Charts for the Hydraulic Design of Highway Culverts, and HEC Number 13, Hydraulic Design of Improved Inlets for Culverts.

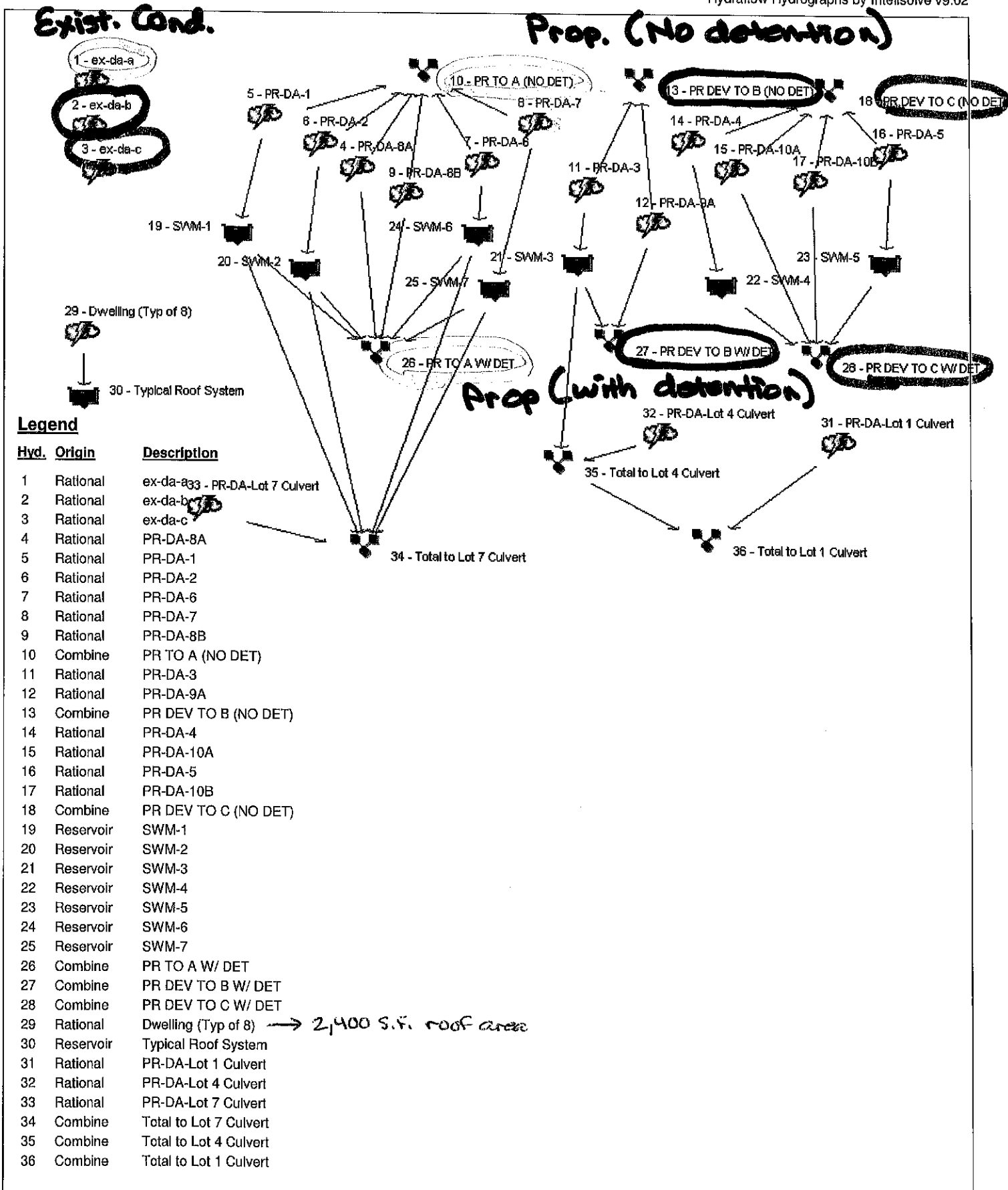
The anticipated 10-year design flow at each culvert is relatively small given the proximity of the roadway highpoint and the site stormwater retained by rooftop infiltrator systems and raingardens. The following table summarizes the performance of each proposed culvert for a 10-year storm:

	15" RCP w/ Flared Ends				Q ₁₀ (cfs)	Depth (Feet)	Velocity (fps)
	INV _{up}	INV _{dn}	Length (ft)	Slope (ft/ft)			
Driveway Lot 1	286.10	285.40	36	0.0194	0.8	0.5	5.1
Driveway Lot 4	288.75	288.00	32	0.0234	0.5	0.4	4.8
Driveway Lot 7	289.40	289.25	26	0.0058	1.7	0.7	4.1

Based on the calculations contained as Appendix sheet D-1 thru D-3, the proposed 15" RCP culverts are more than adequate to accommodate the design flows and flow velocities are not significant.

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.02



Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.02

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	Rational	-----	-----	5.475	-----	-----	8.408	10.15	11.34	12.72	ex-da-a
2	Rational	-----	-----	1.868	-----	-----	2.875	3.454	3.873	4.333	ex-da-b
3	Rational	-----	-----	4.158	-----	-----	6.399	7.687	8.621	9.645	ex-da-c
4	Rational	-----	-----	2.314	-----	-----	3.560	4.277	4.797	5.366	PR-DA-8A
5	Rational	-----	-----	1.402	-----	-----	2.185	2.548	2.893	3.203	PR-DA-1
6	Rational	-----	-----	1.264	-----	-----	1.963	2.305	2.611	2.897	PR-DA-2
7	Rational	-----	-----	0.892	-----	-----	1.371	1.650	1.849	2.070	PR-DA-6
8	Rational	-----	-----	2.318	-----	-----	3.559	4.298	4.791	5.383	PR-DA-7
9	Rational	-----	-----	0.126	-----	-----	0.197	0.228	0.259	0.286	PR-DA-8B
10	Combine	4, 5, 6, 7, 8, 9	-----	5.909	-----	-----	9.108	10.89	12.23	13.67	PR TO A (NO DET)
11	Rational	-----	-----	1.179	-----	-----	1.821	2.170	2.444	2.725	PR-DA-3
12	Rational	-----	-----	0.132	-----	-----	0.204	0.242	0.273	0.304	PR-DA-9A
13	Combine	11, 12	-----	1.304	-----	-----	2.014	2.399	2.702	3.012	PR DEV TO B (NO DET)
14	Rational	-----	-----	1.561	-----	-----	2.409	2.871	3.233	3.605	PR-DA-4
15	Rational	-----	-----	0.176	-----	-----	0.276	0.319	0.363	0.401	PR-DA-10A
16	Rational	-----	-----	2.179	-----	-----	3.350	4.031	4.517	5.057	PR-DA-5
17	Rational	-----	-----	1.389	-----	-----	2.134	2.572	2.879	3.226	PR-DA-10B
18	Combine	14, 15, 16, 17	-----	4.741	-----	-----	7.297	8.761	9.826	10.99	PR DEV TO C (NO DET)
19	Reservoir	5	-----	0.000	-----	-----	0.000	0.000	0.000	0.276	SWM-1
20	Reservoir	6	-----	0.000	-----	-----	0.000	0.519	0.950	1.321	SWM-2
21	Reservoir	11	-----	0.000	-----	-----	0.077	0.570	0.901	1.225	SWM-3
22	Reservoir	14	-----	0.000	-----	-----	0.000	0.000	0.000	0.000	SWM-4
23	Reservoir	16	-----	0.000	-----	-----	0.880	1.763	2.339	2.963	SWM-5
24	Reservoir	7	-----	0.000	-----	-----	0.000	0.000	0.000	0.000	SWM-6
25	Reservoir	8	-----	0.000	-----	-----	0.000	1.250	1.956	2.728	SWM-7
26	Combine	4, 9, 19, 20, 24, 25	-----	2.339	-----	-----	3.599	4.322	5.437	6.614	PR TO A W/ DET
27	Combine	12, 21,	-----	0.132	-----	-----	0.204	0.622	0.992	1.343	PR DEV TO B W/ DET
28	Combine	15, 17, 22, 23,	-----	1.389	-----	-----	2.134	3.231	4.181	5.208	PR DEV TO C W/ DET
29	Rational	-----	-----	0.189	-----	-----	0.295	0.342	0.389	0.430	Dwelling (Typ of 8)
30	Reservoir	29	-----	0.000	-----	-----	0.000	0.000	0.000	0.000	Typical Roof System
31	Rational	-----	-----	0.208	-----	-----	0.325	0.376	0.428	0.473	PR-DA-Lot 1 Culvert
32	Rational	-----	-----	0.253	-----	-----	0.395	0.457	0.520	0.575	PR-DA-Lot 4 Culvert
33	Rational	-----	-----	0.546	-----	-----	0.854	0.987	1.124	1.241	PR-DA-Lot 7 Culvert
34	Combine	19, 20, 24, 25, 33	-----	0.546	-----	-----	0.854	1.250	1.956	2.728	Total to Lot 7 Culvert

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.02

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	
35	Combine	21, 32,	-----	0.253	-----	-----	0.395	0.570	0.901	1.225	Total to Lot 4 Culvert
36	Combine	31, 35	-----	0.461	-----	-----	0.720	0.833	0.948	1.225	Total to Lot 1 Culvert

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

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	Rational	12.72	1	17	19,463	---	----	----	ex-da-a	
2	Rational	4.333	1	13	5,070	---	----	----	ex-da-b	
3	Rational	9.645	1	13	11,285	---	----	----	ex-da-c	
4	Rational	5.366	1	13	6,278	---	----	----	PR-DA-8A	
5	Rational	3.203	1	6	1,729	---	----	----	PR-DA-1	
6	Rational	2.897	1	7	1,825	---	----	----	PR-DA-2	
7	Rational	2.070	1	14	2,608	---	----	----	PR-DA-6	
8	Rational	5.383	1	21	10,174	---	----	----	PR-DA-7	
9	Rational	0.286	1	5	129	---	----	----	PR-DA-8B	
10	Combine	13.67	1	13	22,744	4, 5, 6, 7, 8, 9	----	----	PR TO A (NO DET)	
11	Rational	2.725	1	10	2,452	---	----	----	PR-DA-3	
12	Rational	0.304	1	9	246	---	----	----	PR-DA-9A	
13	Combine	3.012	1	10	2,699	11, 12	----	----	PR DEV TO B (NO DET)	
14	Rational	3.605	1	10	3,245	---	----	----	PR-DA-4	
15	Rational	0.401	1	5	180	---	----	----	PR-DA-10A	
16	Rational	5.057	1	14	6,372	---	----	----	PR-DA-5	
17	Rational	3.226	1	15	4,354	---	----	----	PR-DA-10B	
18	Combine	10.99	1	14	14,152	14, 15, 16, 17	----	----	PR DEV TO C (NO DET)	
19	Reservoir	0.276	1	16	86	5	292.55	1,600	SWM-1	
20	Reservoir	1.321	1	14	513	6	296.14	1,302	SWM-2	
21	Reservoir	1.225	1	20	774	11	292.13	1,709	SWM-3	
22	Reservoir	0.000	1	11	0	14	282.24	3,025	SWM-4	
23	Reservoir	2.963	1	25	2,682	16	316.24	3,850	SWM-5	
24	Reservoir	0.000	1	42	0	7	344.70	2,142	SWM-6	
25	Reservoir	2.728	1	39	3,104	8	342.97	6,448	SWM-7	
26	Combine	6.614	1	13	10,110	4, 9, 19, 20, 24, 25	----	----	PR TO A W/ DET	
27	Combine	1.343	1	20	1,020	12, 21,	----	----	PR DEV TO B W/ DET	
28	Combine	5.208	1	24	7,216	15, 17, 22, 23,	----	----	PR DEV TO C W/ DET	
29	Rational	0.430	1	5	193	---	----	----	Dwelling (Typ of 8)	
30	Reservoir	0.000	1	n/a	0	29	100.87	182	Typical Roof System	
31	Rational	0.473	1	5	213	---	----	----	PR-DA-Lot 1 Culvert	
32	Rational	0.575	1	5	259	---	----	----	PR-DA-Lot 4 Culvert	
33	Rational	1.241	1	5	558	---	----	----	PR-DA-Lot 7 Culvert	
34	Combine	2.728	1	39	4,261	19, 20, 24, 25, 33	----	----	Total to Lot 7 Culvert	
long hill model 3 rational tcs.gpw					Return Period: 100 Year			Tuesday, Jun 1, 2021		

Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

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
35	Combine	1,225	1	20	1,032	21, 32,	----	----	Total to Lot 4 Culvert
36	Combine	1,225	1	20	1,245	31, 35	----	----	Total to Lot 1 Culvert
long hill model 3 rational tcs.gpw					Return Period: 100 Year		Tuesday, Jun 1, 2021		

Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

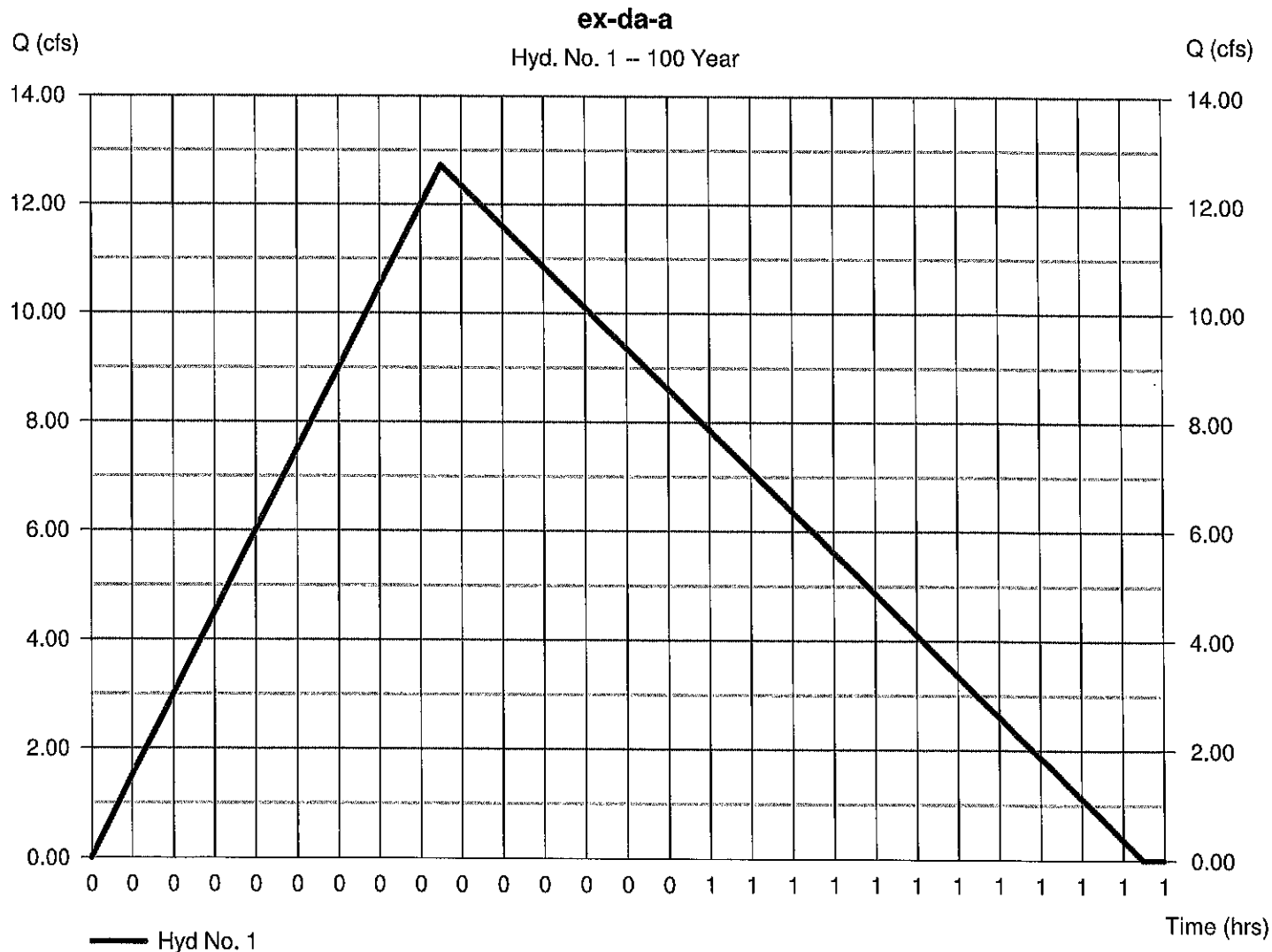
Tuesday, Jun 1, 2021

Hyd. No. 1

ex-da-a

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 10.300 ac
Intensity = 6.175 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 12.72 cfs
Time to peak = 0.28 hrs
Hyd. volume = 19,463 cuft
Runoff coeff. = 0.2
Tc by User = 17.00 min
Asc/Rec limb fact = 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

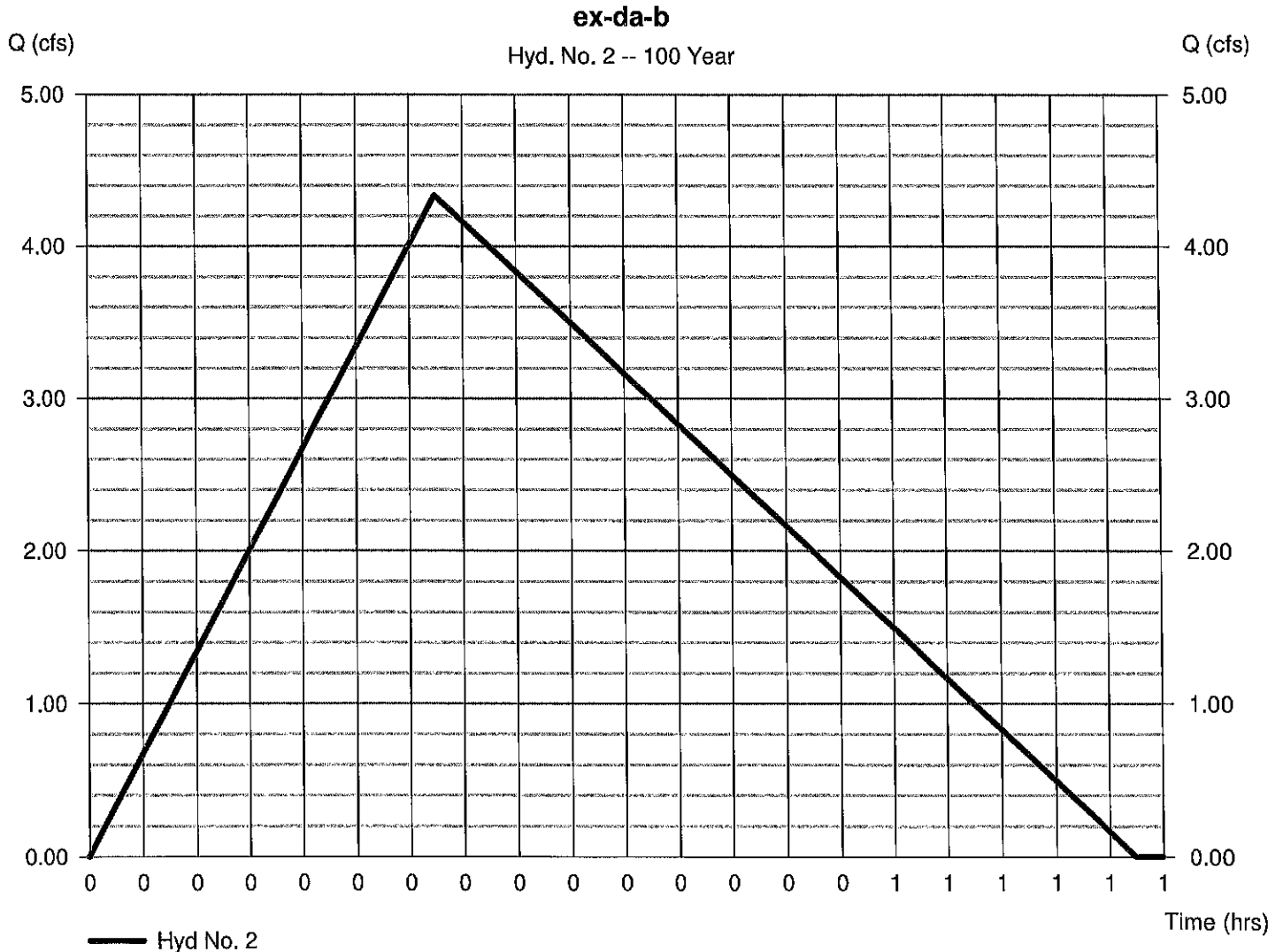
Tuesday, Jun 1, 2021

Hyd. No. 2

ex-da-b

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 3.100 ac
 Intensity = 6.989 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 4.333 cfs
 Time to peak = 0.22 hrs
 Hyd. volume = 5,070 cuft
 Runoff coeff. = 0.2
 Tc by User = 13.00 min
 Asc/Rec limb fact = 1/2



Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

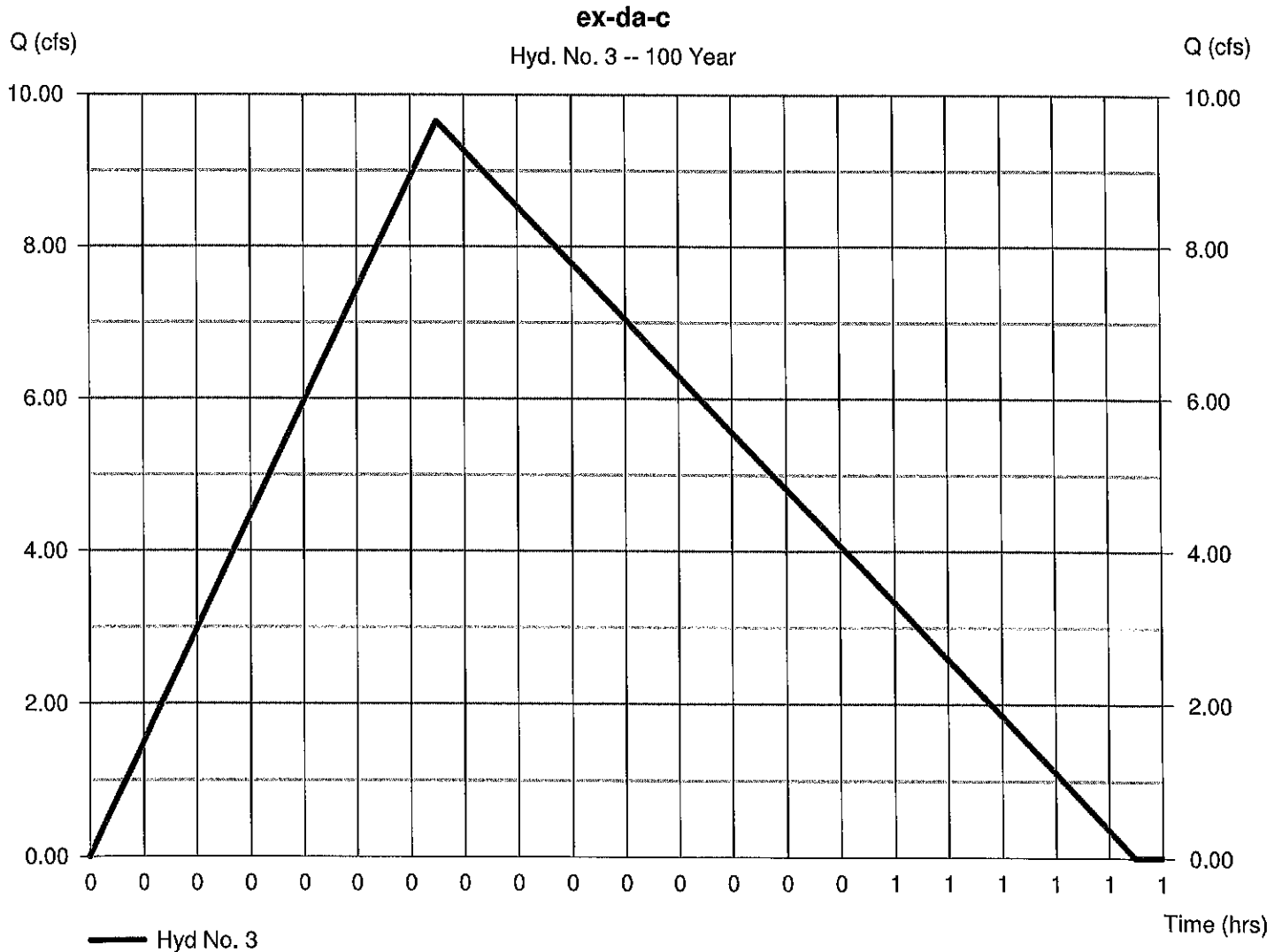
Tuesday, Jun 1, 2021

Hyd. No. 3

ex-da-c

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 6.900 ac
 Intensity = 6.989 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 9.645 cfs
 Time to peak = 0.22 hrs
 Hyd. volume = 11,285 cuft
 Runoff coeff. = 0.2
 Tc by User = 13.00 min
 Asc/Rec limb fact = 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

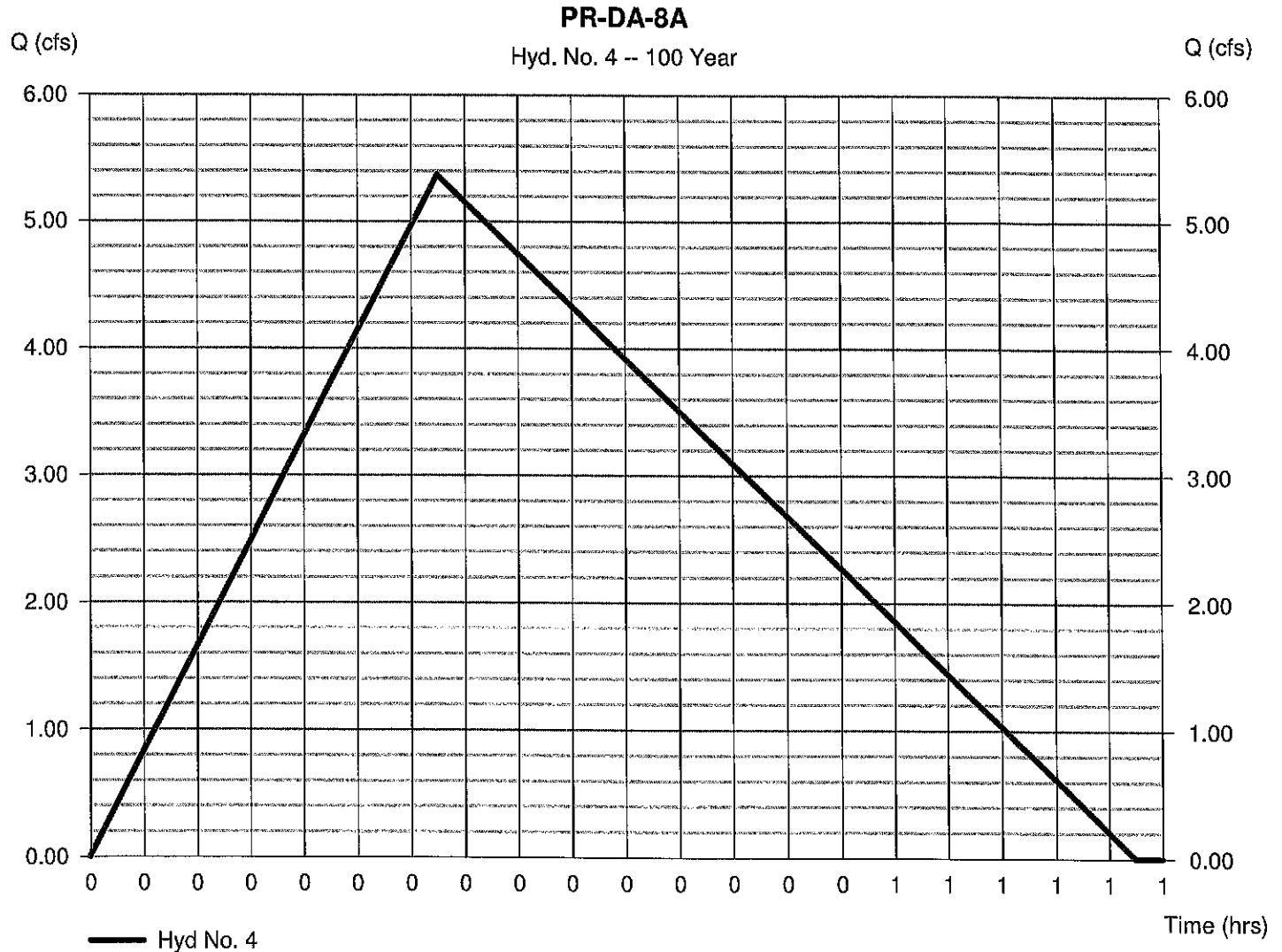
Hyd. No. 4

PR-DA-8A

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 3.490 ac
 Intensity = 6.989 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 5.366 cfs
 Time to peak = 0.22 hrs
 Hyd. volume = 6,278 cuft
 Runoff coeff. = 0.22*
 Tc by User = 13.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.450 x 0.35) + (3.040 x 0.20)] / 3.490



Hydrograph Report

Hydraflow Hydrographs by Intelsolve v9.02

Tuesday, Jun 1, 2021

Hyd. No. 5

PR-DA-1

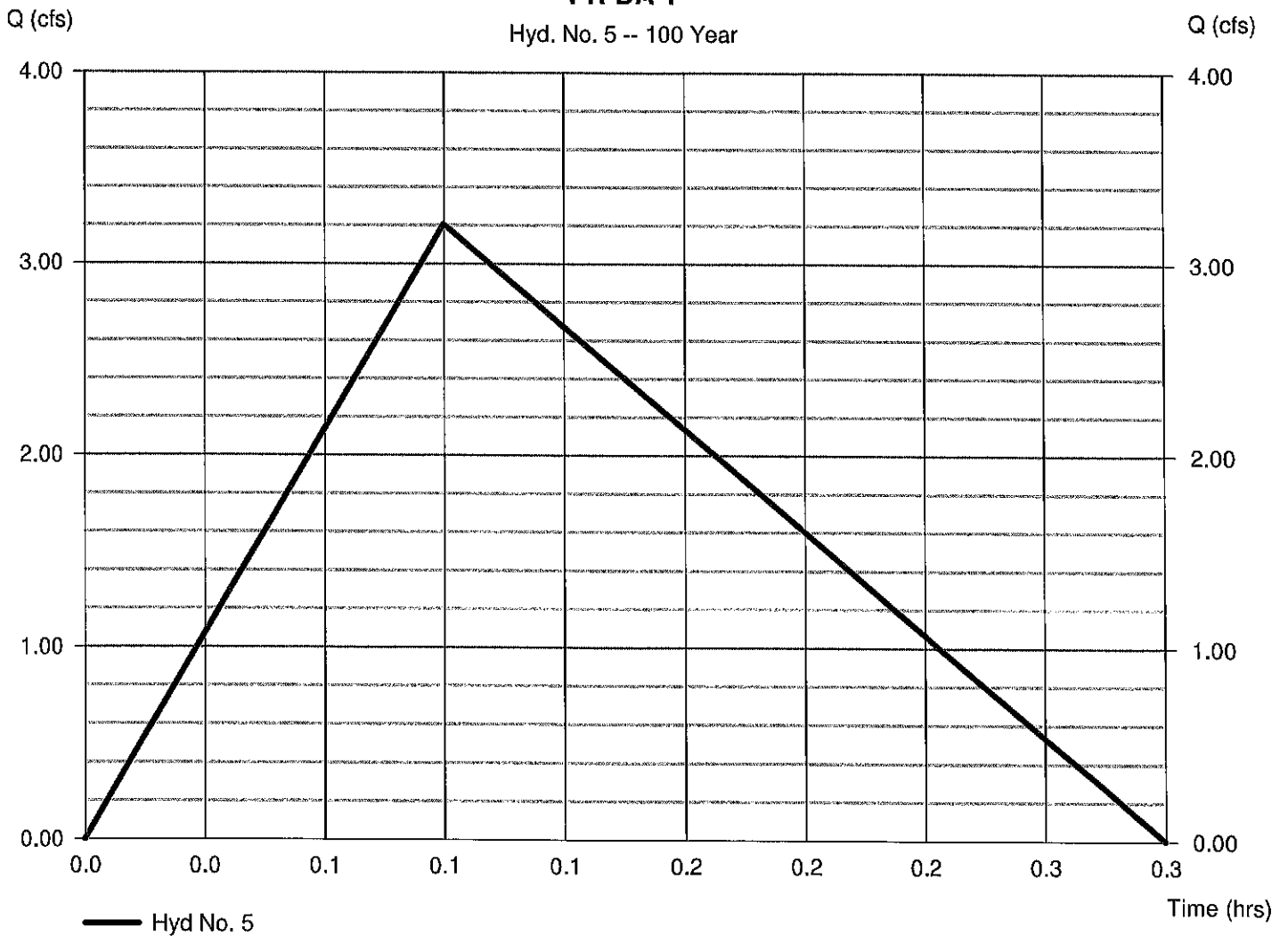
Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 1.170 ac
 Intensity = 9.124 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 3.203 cfs
 Time to peak = 0.10 hrs
 Hyd. volume = 1,729 cuft
 Runoff coeff. = 0.3*
 Tc by User = 6.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.080 x 0.90) + (0.430 x 0.35) + (0.660 x 0.20)] / 1.170

PR-DA-1

Hyd. No. 5 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

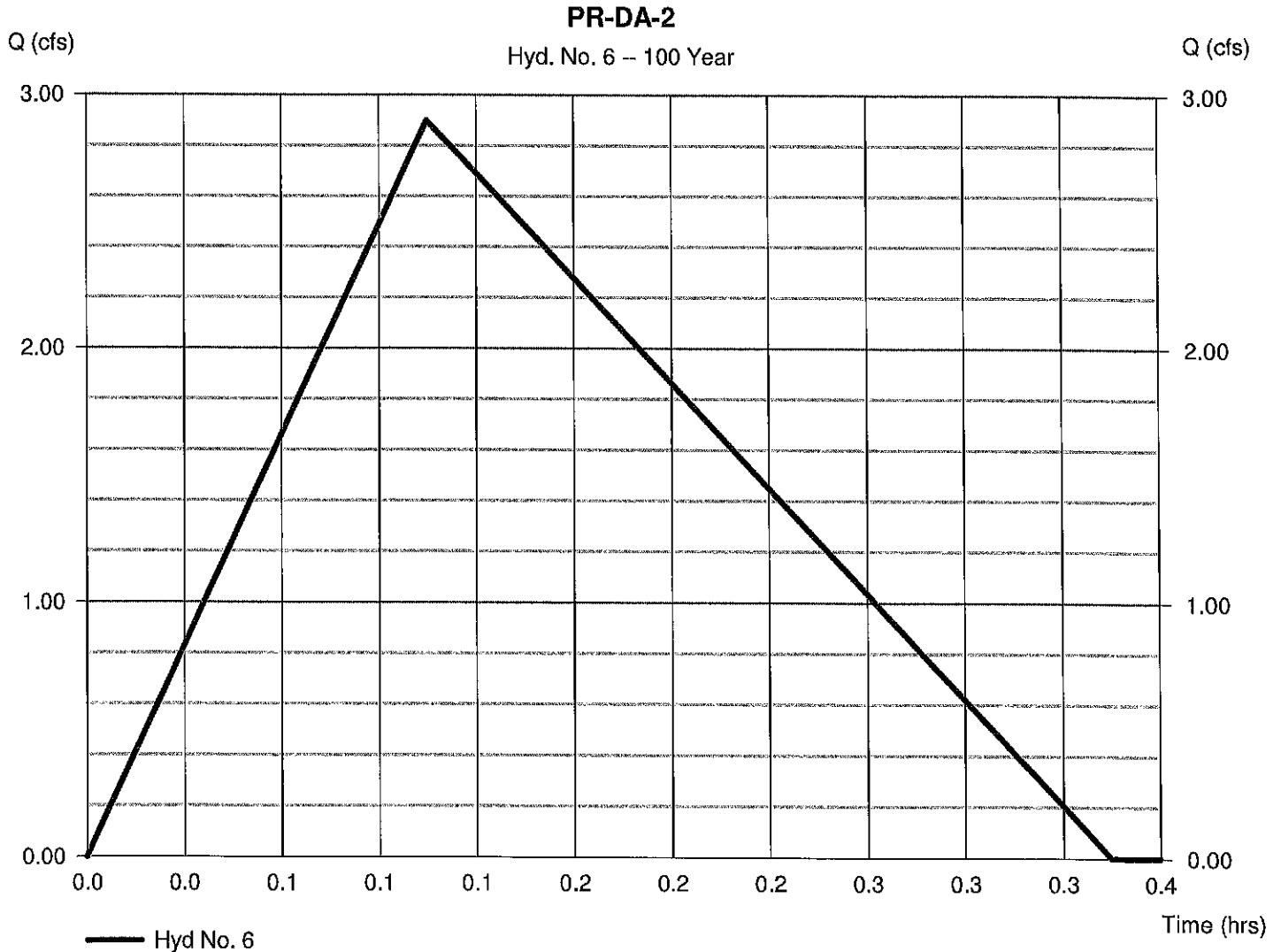
Hyd. No. 6

PR-DA-2

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.850 ac
Intensity = 8.739 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 2.897 cfs
Time to peak = 0.12 hrs
Hyd. volume = 1,825 cuft
Runoff coeff. = 0.39*
Tc by User = 7.00 min
Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.150 x 0.90) + (0.390 x 0.35) + (0.310 x 0.20)] / 0.850



Hydrograph Report

Hydraflow Hydrographs by Intelsolve v9.02

Tuesday, Jun 1, 2021

Hyd. No. 7

PR-DA-6

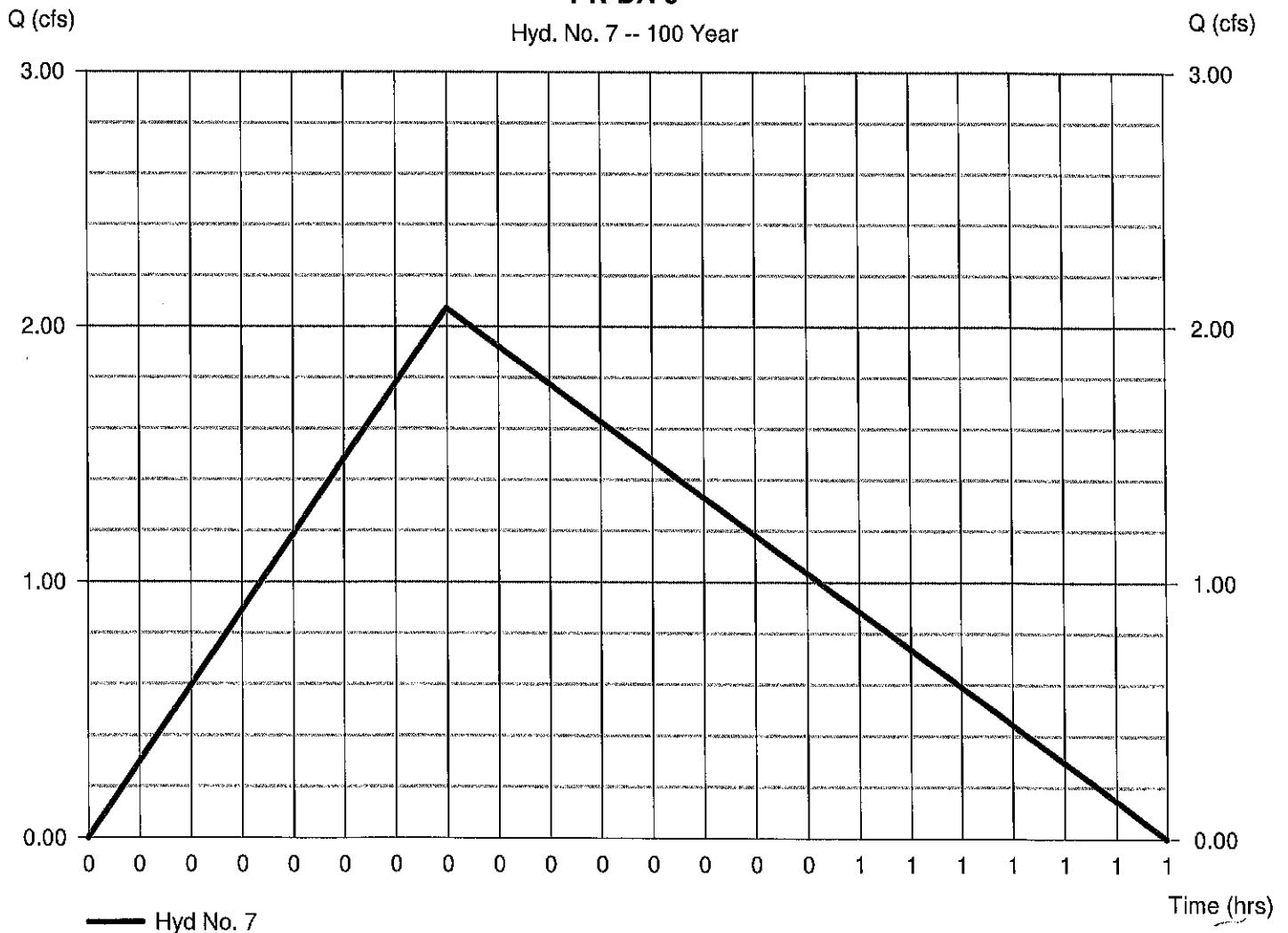
Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 0.900 ac
 Intensity = 6.765 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 2.070 cfs
 Time to peak = 0.23 hrs
 Hyd. volume = 2,608 cuft
 Runoff coeff. = 0.34*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.100 x 0.90) + (0.400 x 0.35) + (0.400 x 0.20)] / 0.900

PR-DA-6

Hyd. No. 7 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

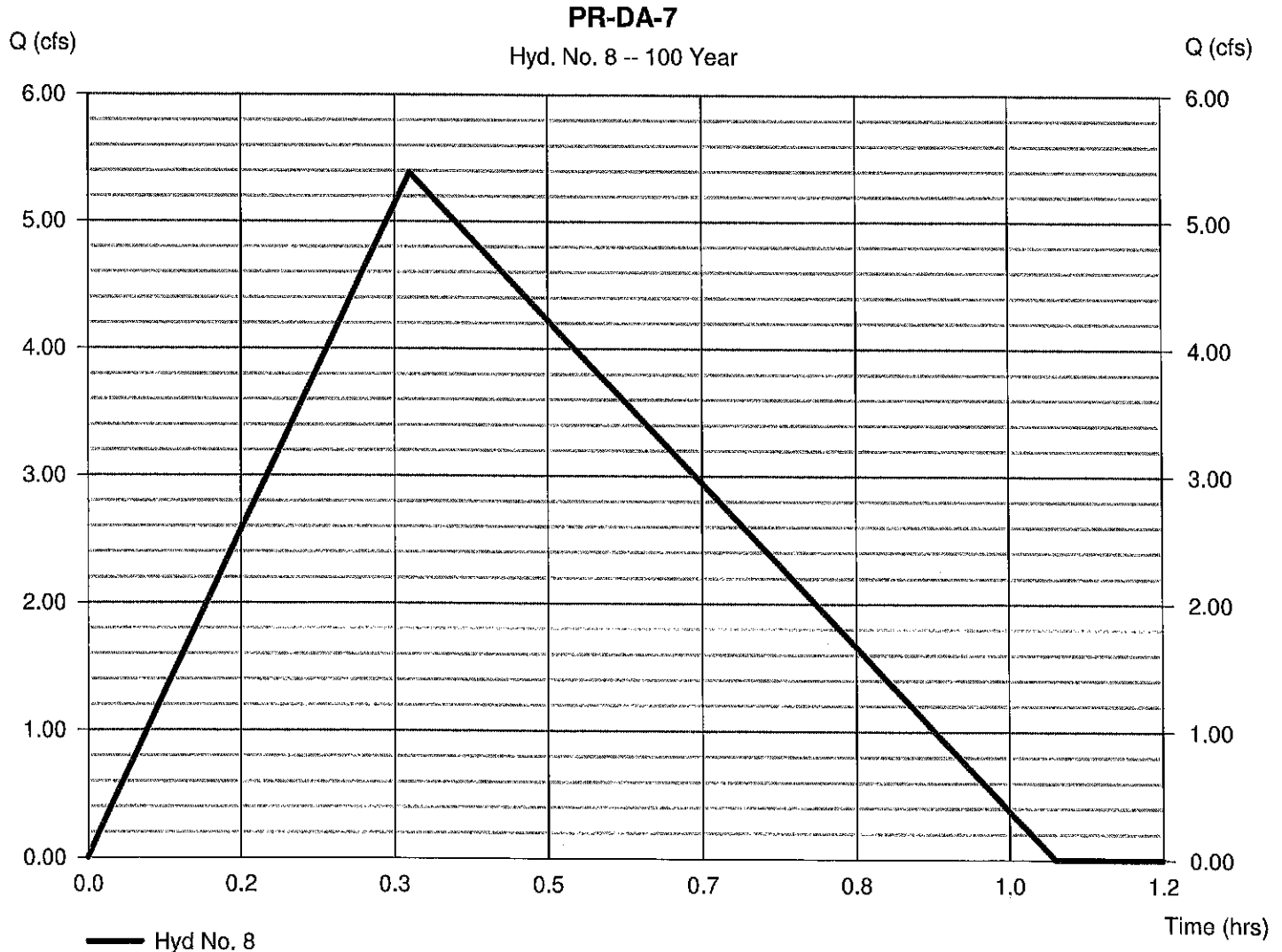
Hyd. No. 8

PR-DA-7

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 4.420 ac
 Intensity = 5.536 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 5.383 cfs
 Time to peak = 0.35 hrs
 Hyd. volume = 10,174 cuft
 Runoff coeff. = 0.22*
 Tc by User = 21.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.060 x 0.90) + (0.270 x 0.35) + (4.090 x 0.20)] / 4.420



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

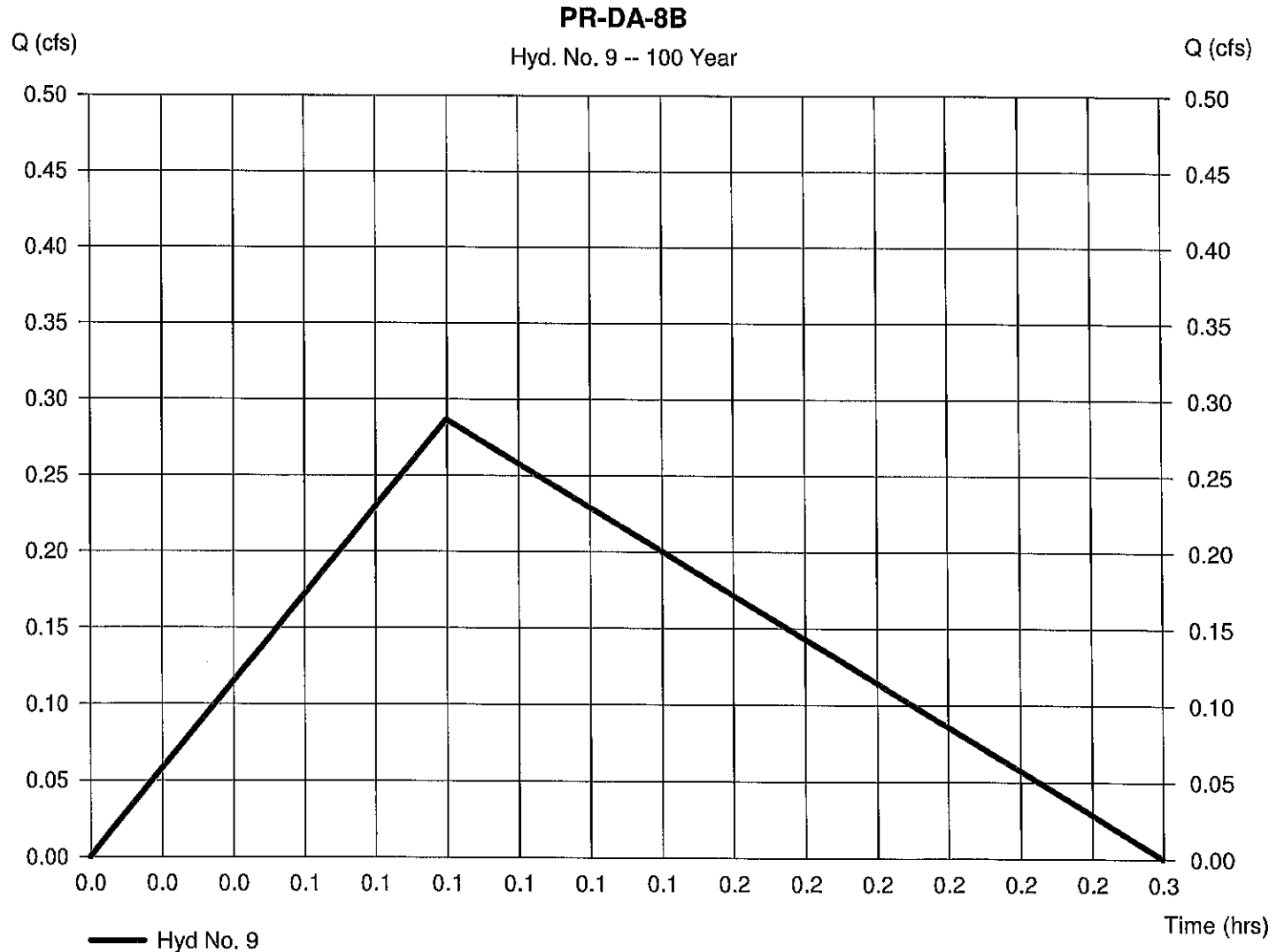
Hyd. No. 9

PR-DA-8B

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.100 ac
Intensity = 9.546 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 0.286 cfs
Time to peak = 0.08 hrs
Hyd. volume = 129 cuft
Runoff coeff. = 0.3*
Tc by User = 5.00 min
Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.020 x 0.35) + (0.010 x 0.90) + (0.070 x 0.20)] / 0.100



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

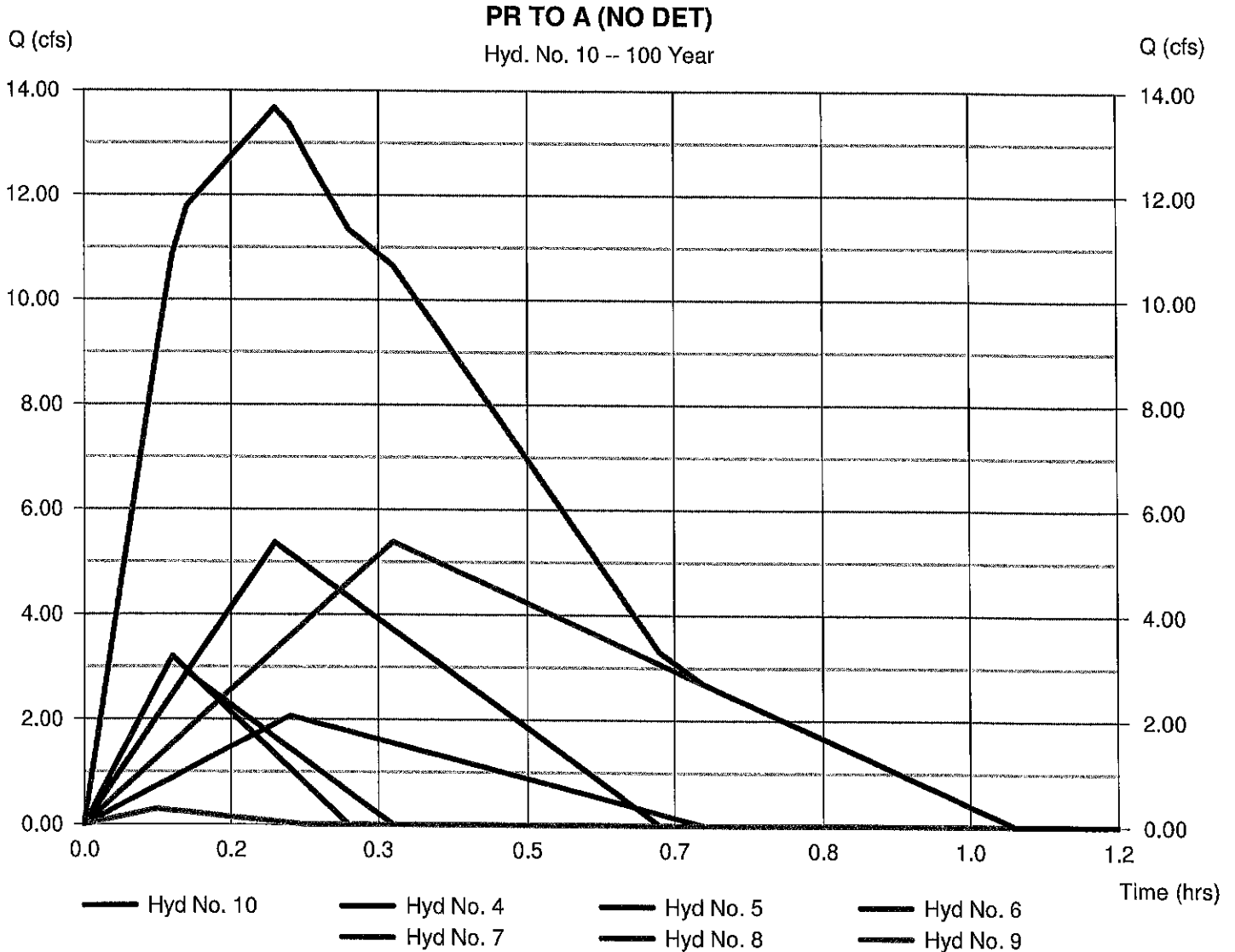
Tuesday, Jun 1, 2021

Hyd. No. 10

PR TO A (NO DET)

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 4, 5, 6, 7, 8, 9

Peak discharge = 13.67 cfs
Time to peak = 0.22 hrs
Hyd. volume = 22,744 cuft
Contrib. drain. area = 10.930 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

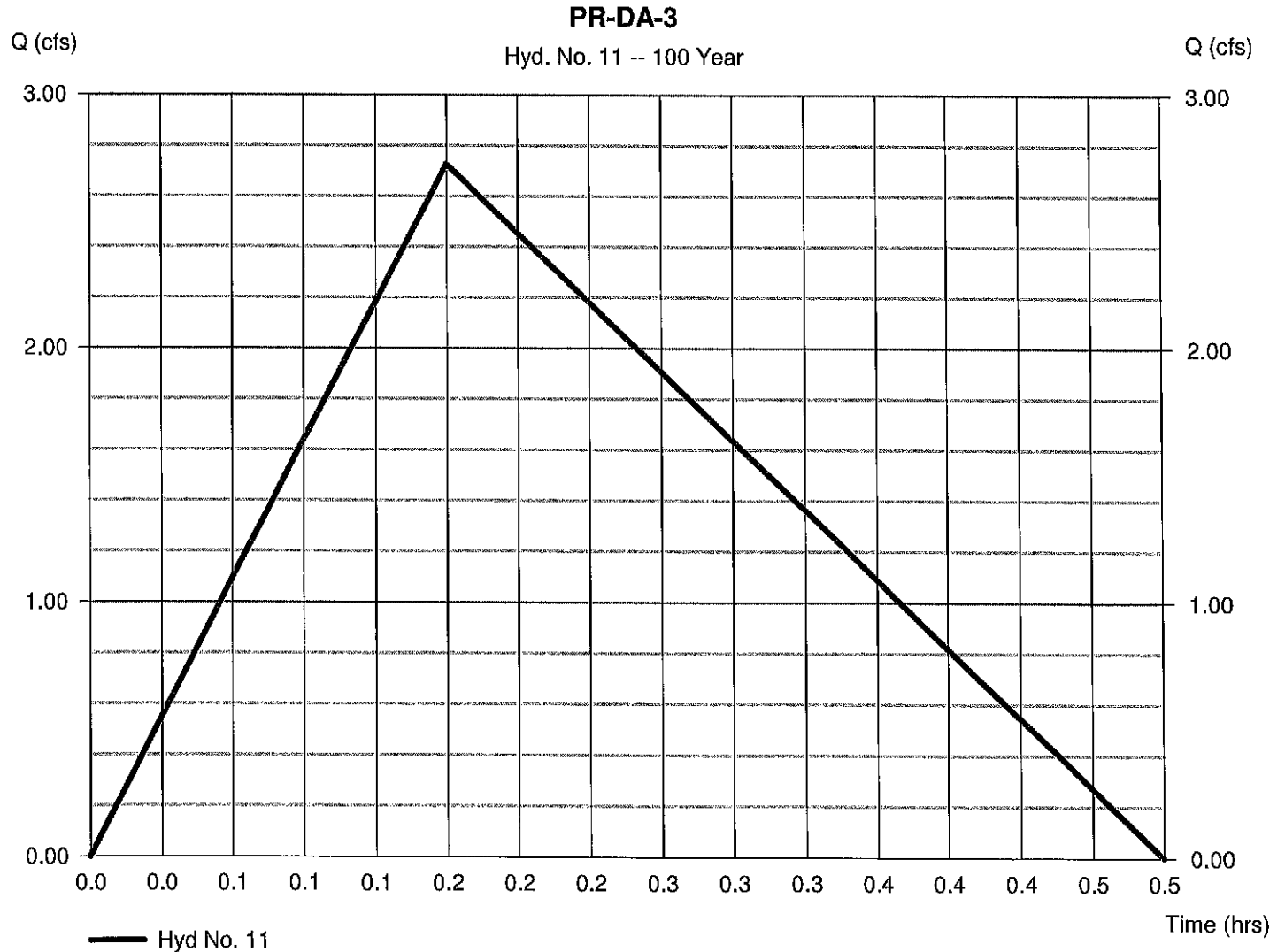
Hyd. No. 11

PR-DA-3

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 1.300 ac
 Intensity = 7.763 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 2.725 cfs
 Time to peak = 0.17 hrs
 Hyd. volume = 2,452 cuft
 Runoff coeff. = 0.27*
 Tc by User = 10.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.050 x 0.90) + (0.400 x 0.35) + (0.850 x 0.20)] / 1.300



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

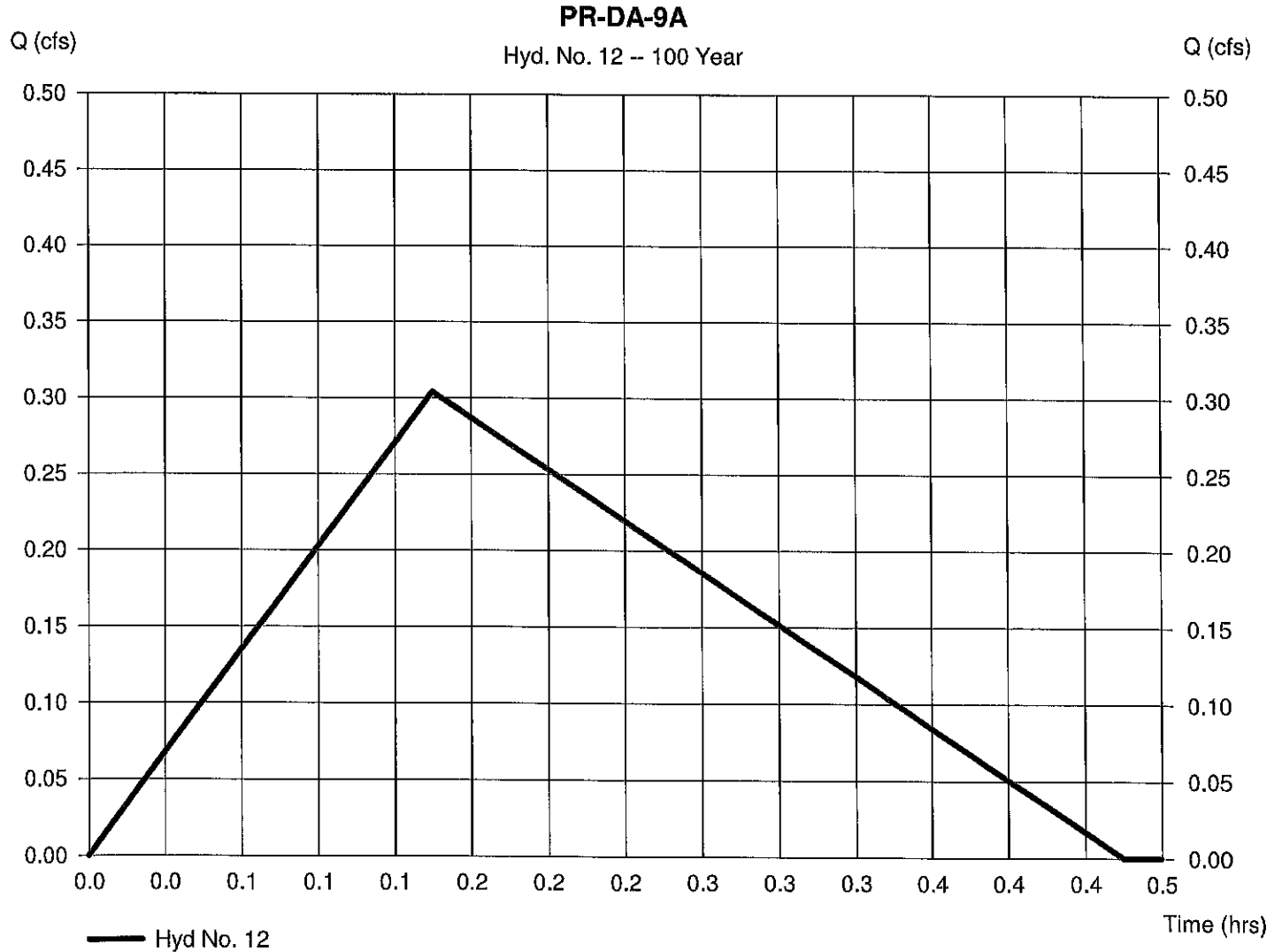
Hyd. No. 12

PR-DA-9A

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.130 ac
Intensity = 8.062 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 0.304 cfs
Time to peak = 0.15 hrs
Hyd. volume = 246 cuft
Runoff coeff. = 0.29*
Tc by User = 9.00 min
Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.010 x 0.90) + (0.030 x 0.35) + (0.090 x 0.20)] / 0.130



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

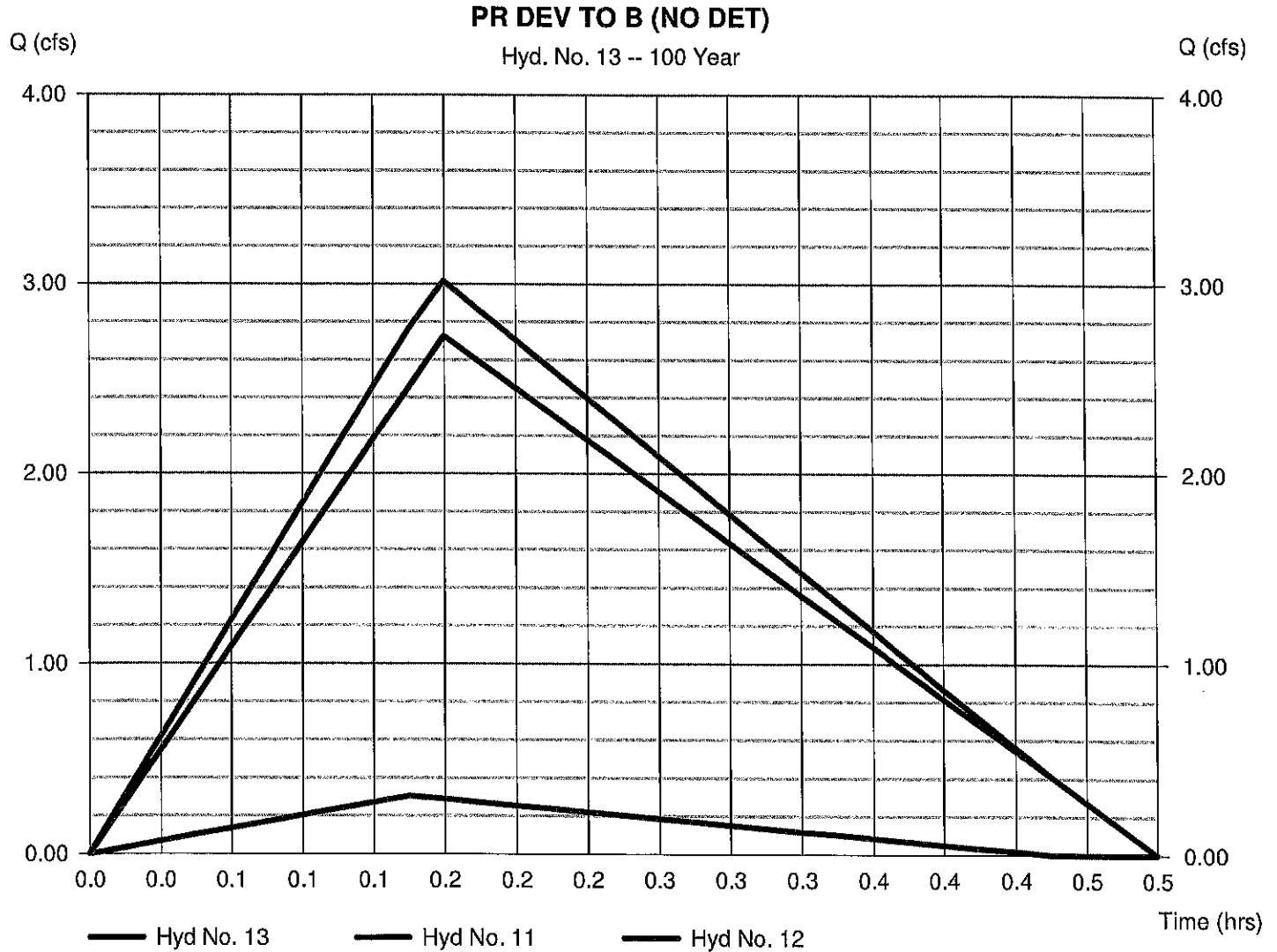
Tuesday, Jun 1, 2021

Hyd. No. 13

PR DEV TO B (NO DET)

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 11, 12

Peak discharge = 3.012 cfs
Time to peak = 0.17 hrs
Hyd. volume = 2,699 cuft
Contrib. drain. area = 1.430 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

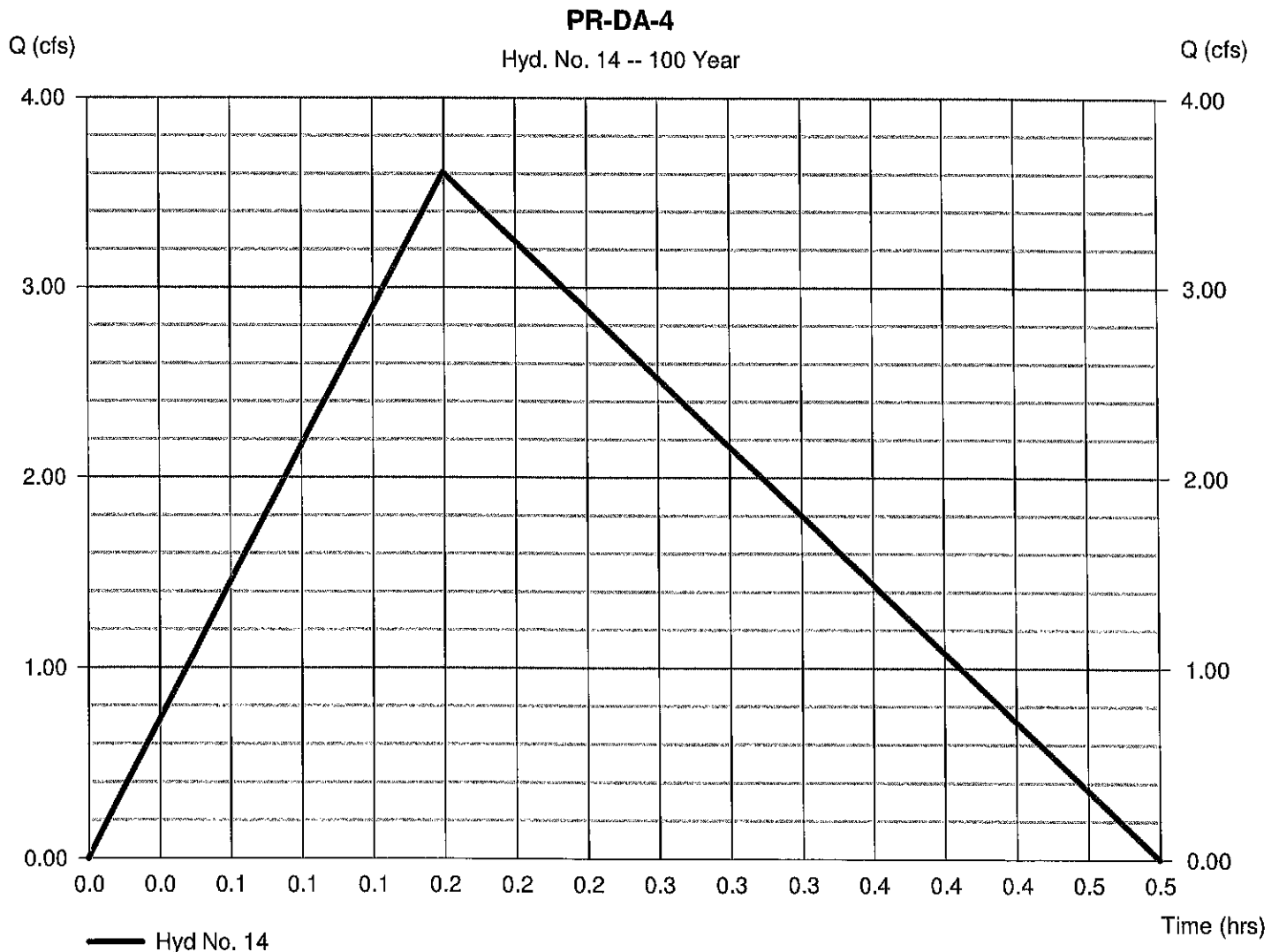
Hyd. No. 14

PR-DA-4

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 1.720 ac
 Intensity = 7.763 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 3.605 cfs
 Time to peak = 0.17 hrs
 Hyd. volume = 3,245 cuft
 Runoff coeff. = 0.27*
 Tc by User = 10.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.070 x 0.90) + (0.500 x 0.35) + (1.150 x 0.20)] / 1.720



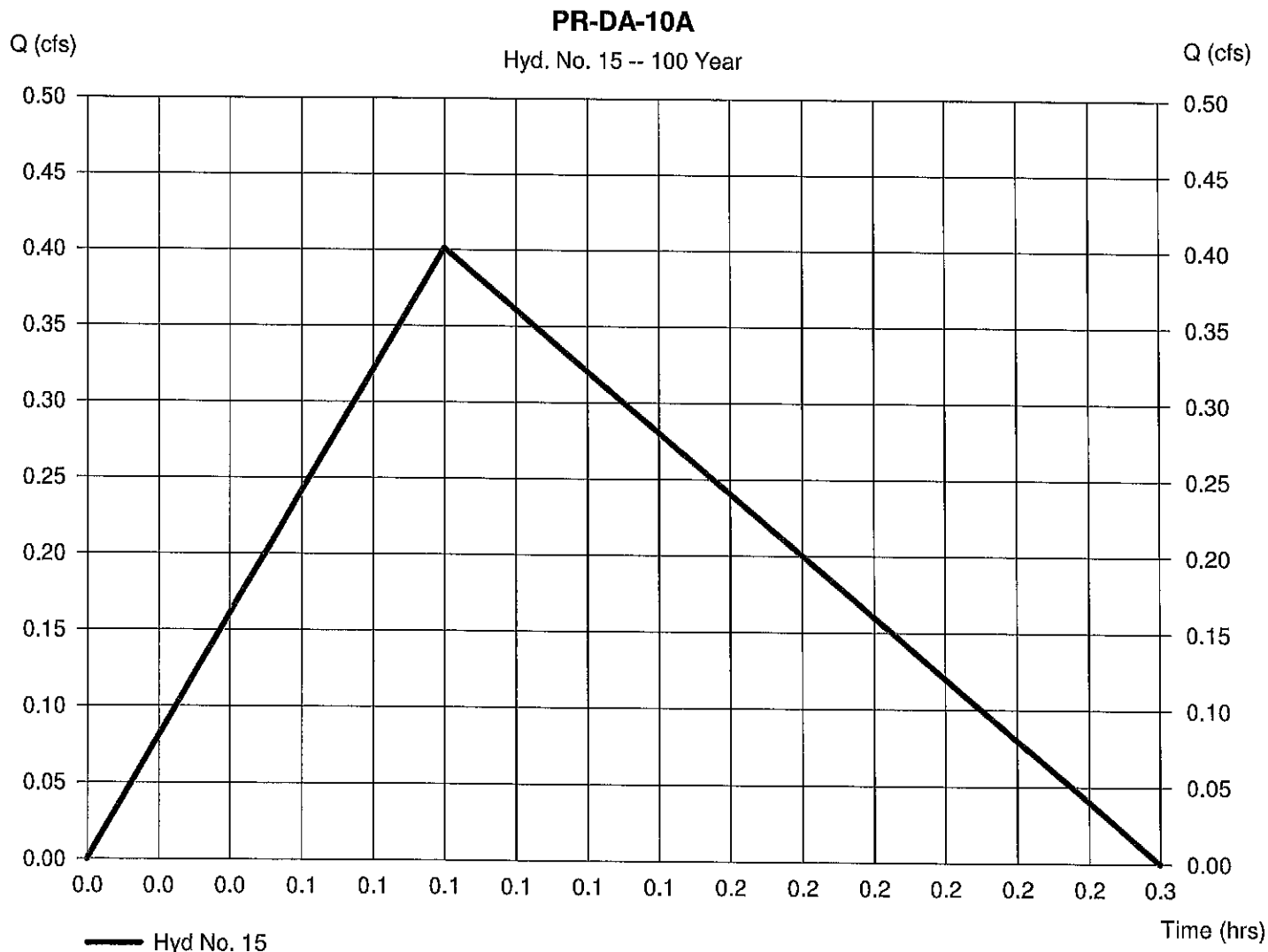
Hydrograph Report

Hyd. No. 15

PR-DA-10A

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.210 ac
Intensity = 9.546 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 0.401 cfs
Time to peak = 0.08 hrs
Hyd. volume = 180 cuft
Runoff coeff. = 0.2
Tc by User = 5.00 min
Asc/Rec limb fact = 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

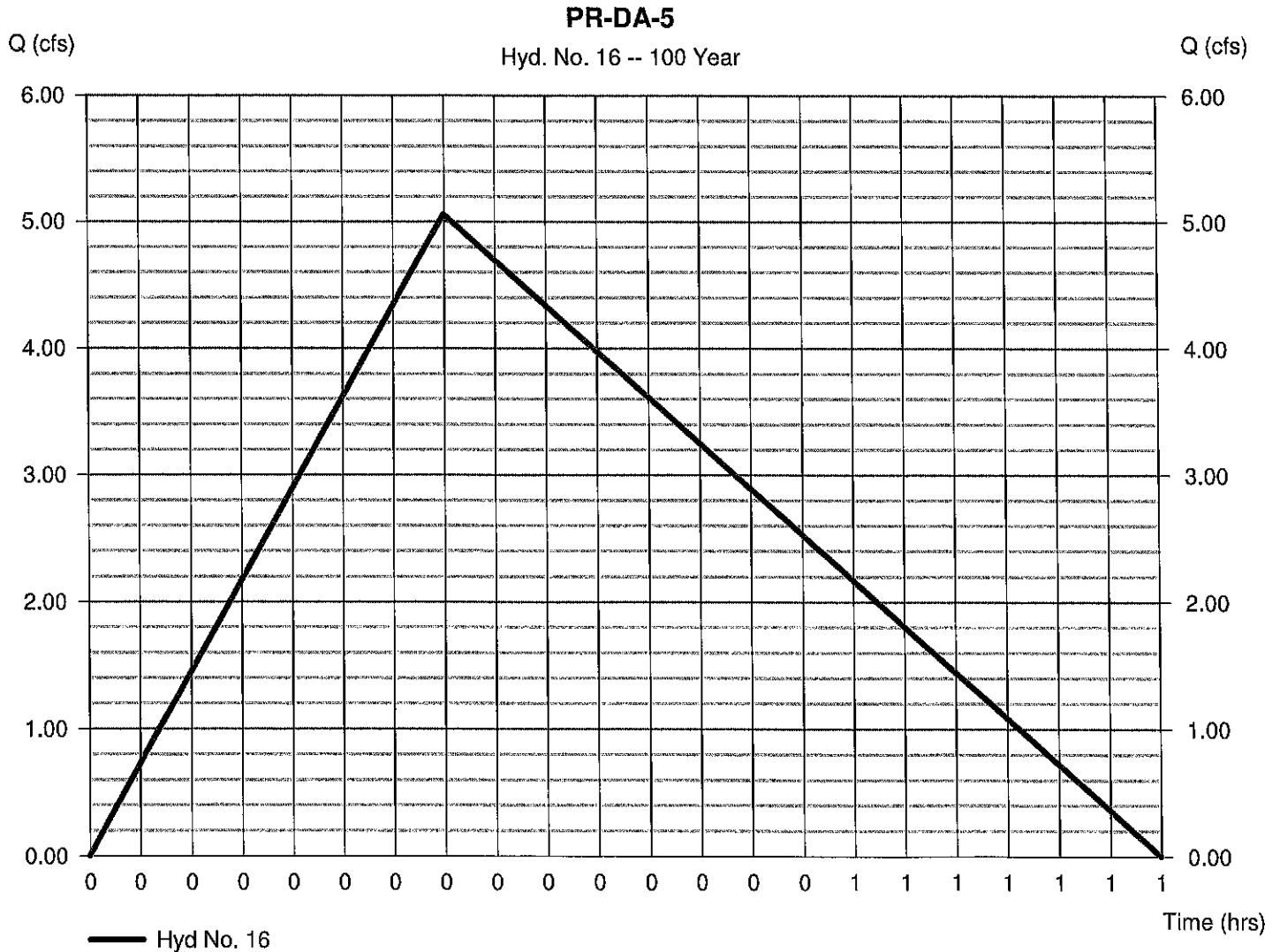
Hyd. No. 16

PR-DA-5

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 2.990 ac
 Intensity = 6.765 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 5.057 cfs
 Time to peak = 0.23 hrs
 Hyd. volume = 6,372 cuft
 Runoff coeff. = 0.25*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.120 x 0.90) + (0.510 x 0.35) + (2.360 x 0.20)] / 2.990



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

Hyd. No. 17

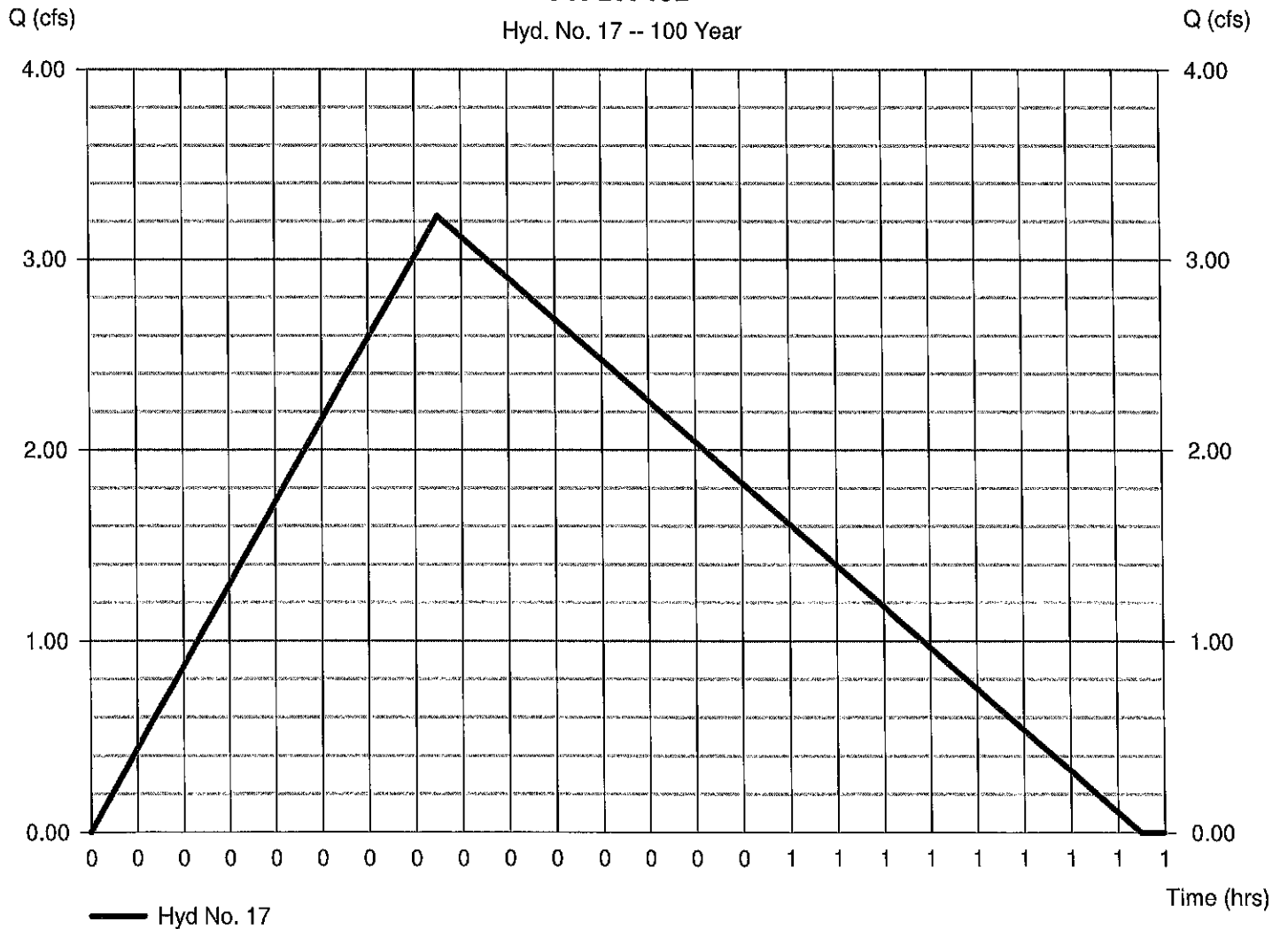
PR-DA-10B

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 2.460 ac
 Intensity = 6.556 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 3.226 cfs
 Time to peak = 0.25 hrs
 Hyd. volume = 4,354 cuft
 Runoff coeff. = 0.2
 Tc by User = 15.00 min
 Asc/Rec limb fact = 1/2

PR-DA-10B

Hyd. No. 17 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

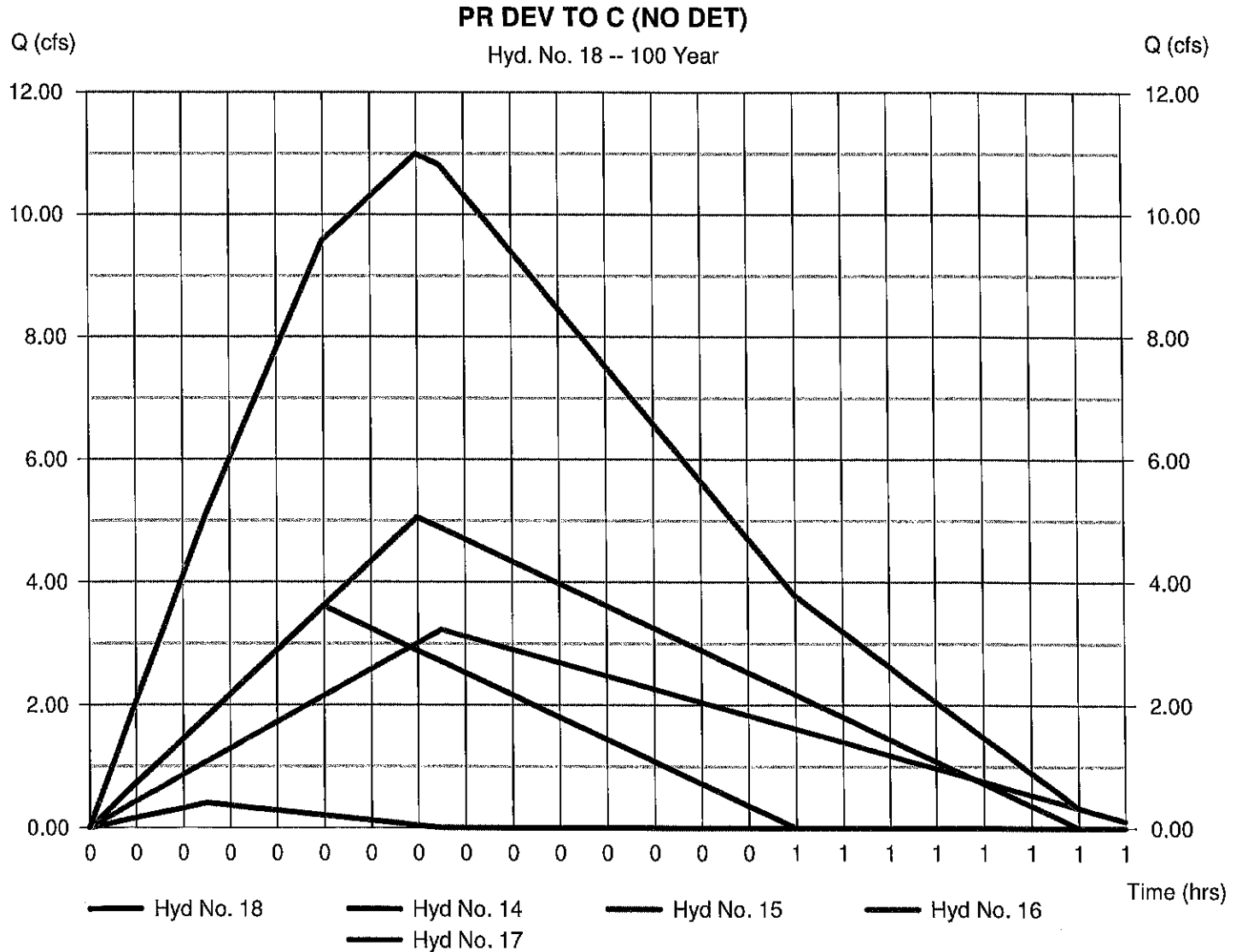
Tuesday, Jun 1, 2021

Hyd. No. 18

PR DEV TO C (NO DET)

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 14, 15, 16, 17

Peak discharge = 10.99 cfs
Time to peak = 0.23 hrs
Hyd. volume = 14,152 cuft
Contrib. drain. area = 7.380 ac



Hydrograph Report

Hydrallow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

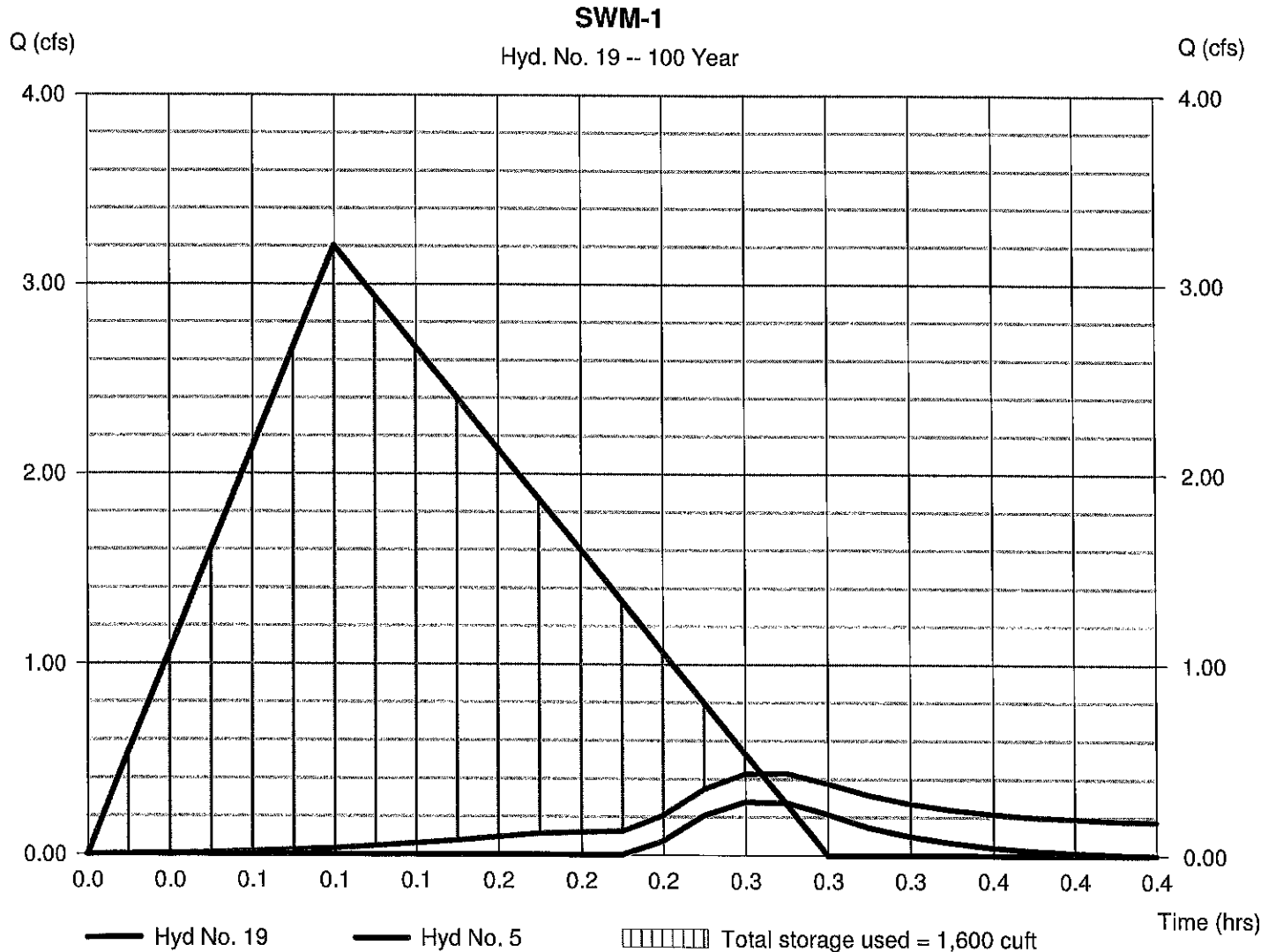
Hyd. No. 19

SWM-1

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 5 - PR-DA-1
 Reservoir name = SWM-1

Peak discharge = 0.276 cfs
 Time to peak = 0.27 hrs
 Hyd. volume = 86 cuft
 Max. Elevation = 292.55 ft
 Max. Storage = 1,600 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 1 - SWM-1

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 291.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	291.00	435	0	0
0.50	291.50	795	303	303
1.00	292.00	1,257	509	812
1.50	292.50	1,508	690	1,502
1.60	292.60	2,600	203	1,705
1.75	292.75	1,650	316	2,021

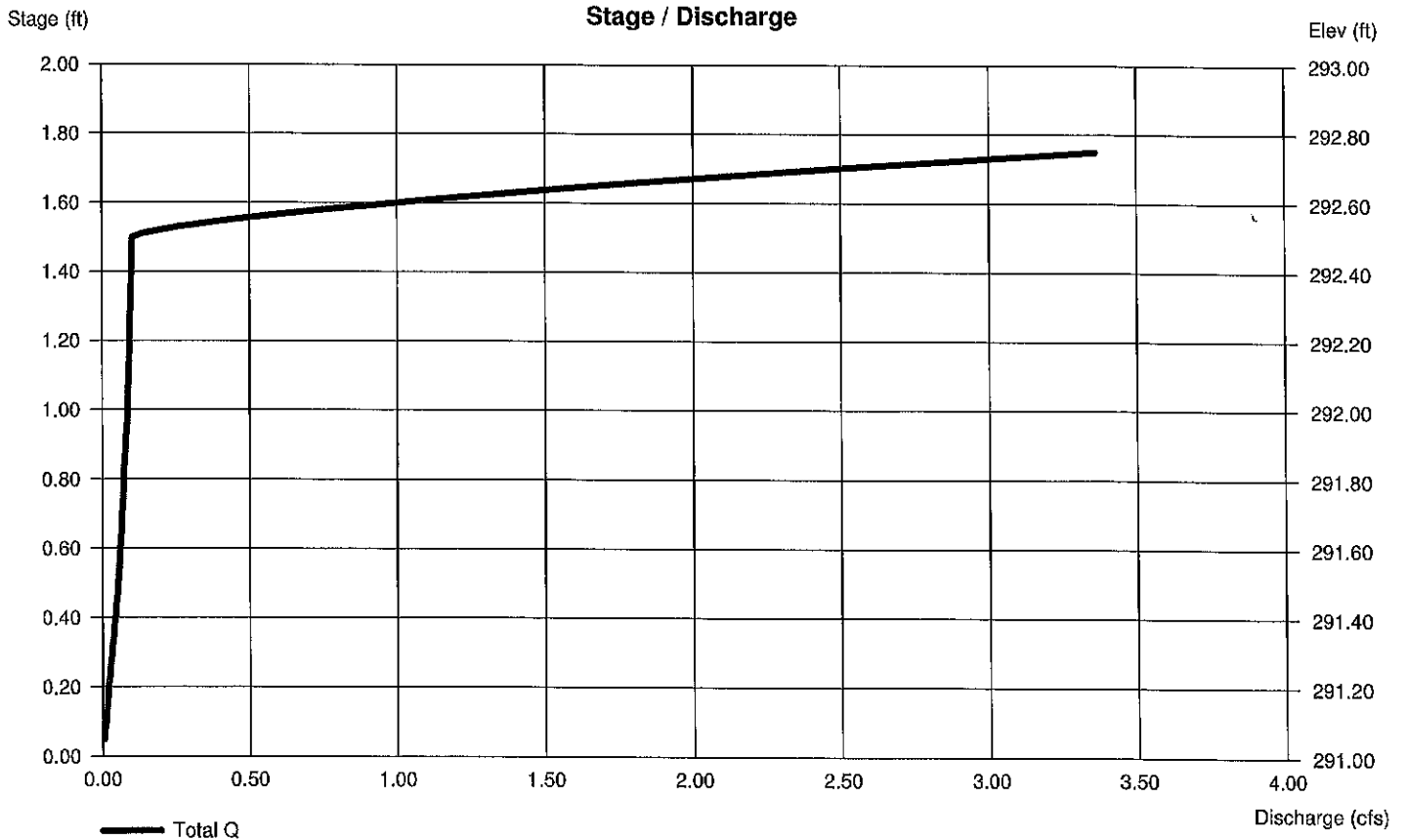
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	40.00	0.00	0.00
Crest El. (ft)	= 292.50	292.75	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(In/hr)	= 3.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under Inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

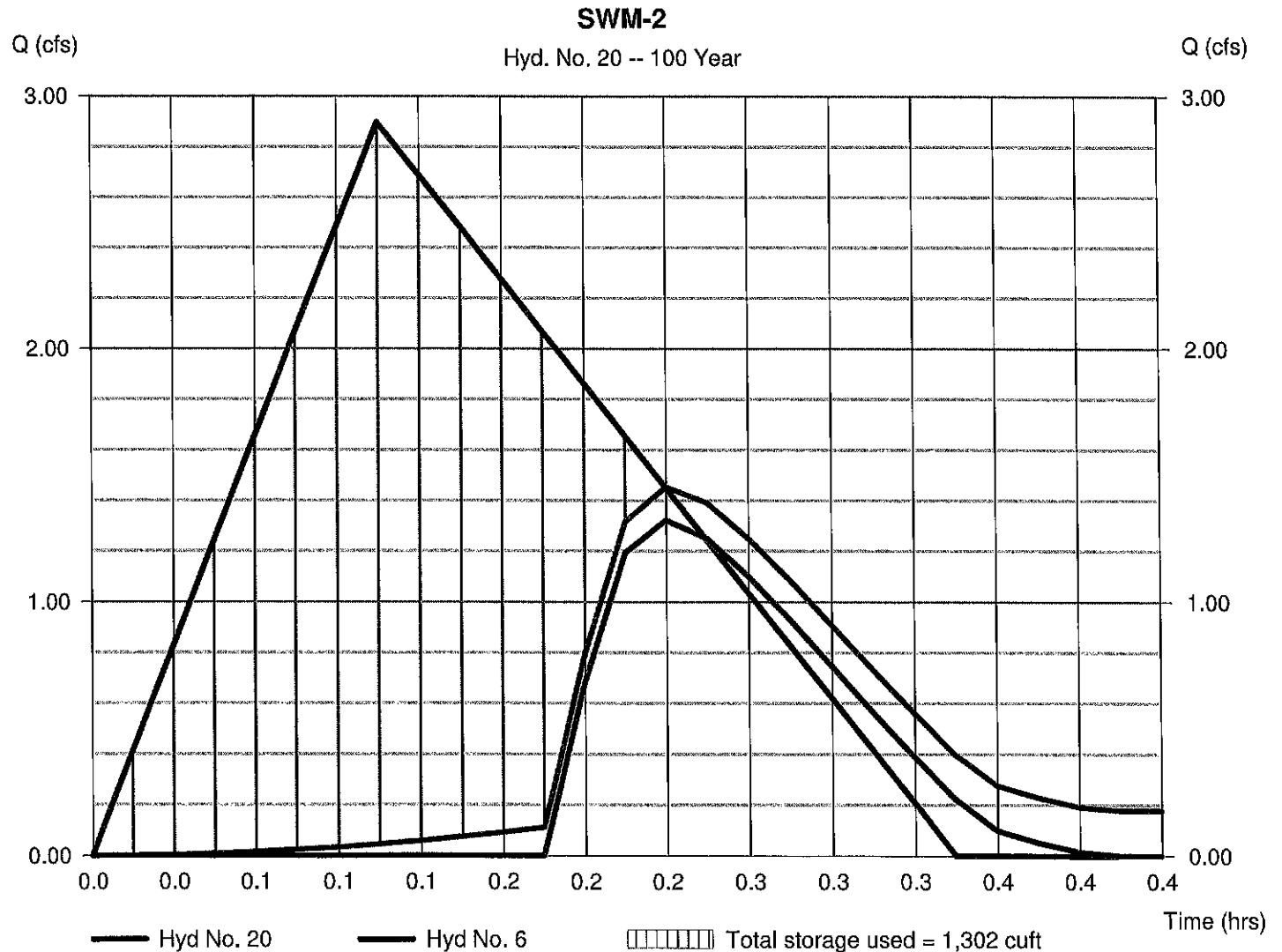
Hyd. No. 20

SWM-2

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 6 - PR-DA-2
 Reservoir name = SWM-2

Peak discharge = 1.321 cfs
 Time to peak = 0.23 hrs
 Hyd. volume = 513 cuft
 Max. Elevation = 296.14 ft
 Max. Storage = 1,302 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 2 - SWM-2

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 294.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	294.00	375	0	0
0.50	294.50	475	212	212
1.00	295.00	550	256	468
2.00	296.00	850	695	1,162
2.25	296.25	1,200	255	1,417

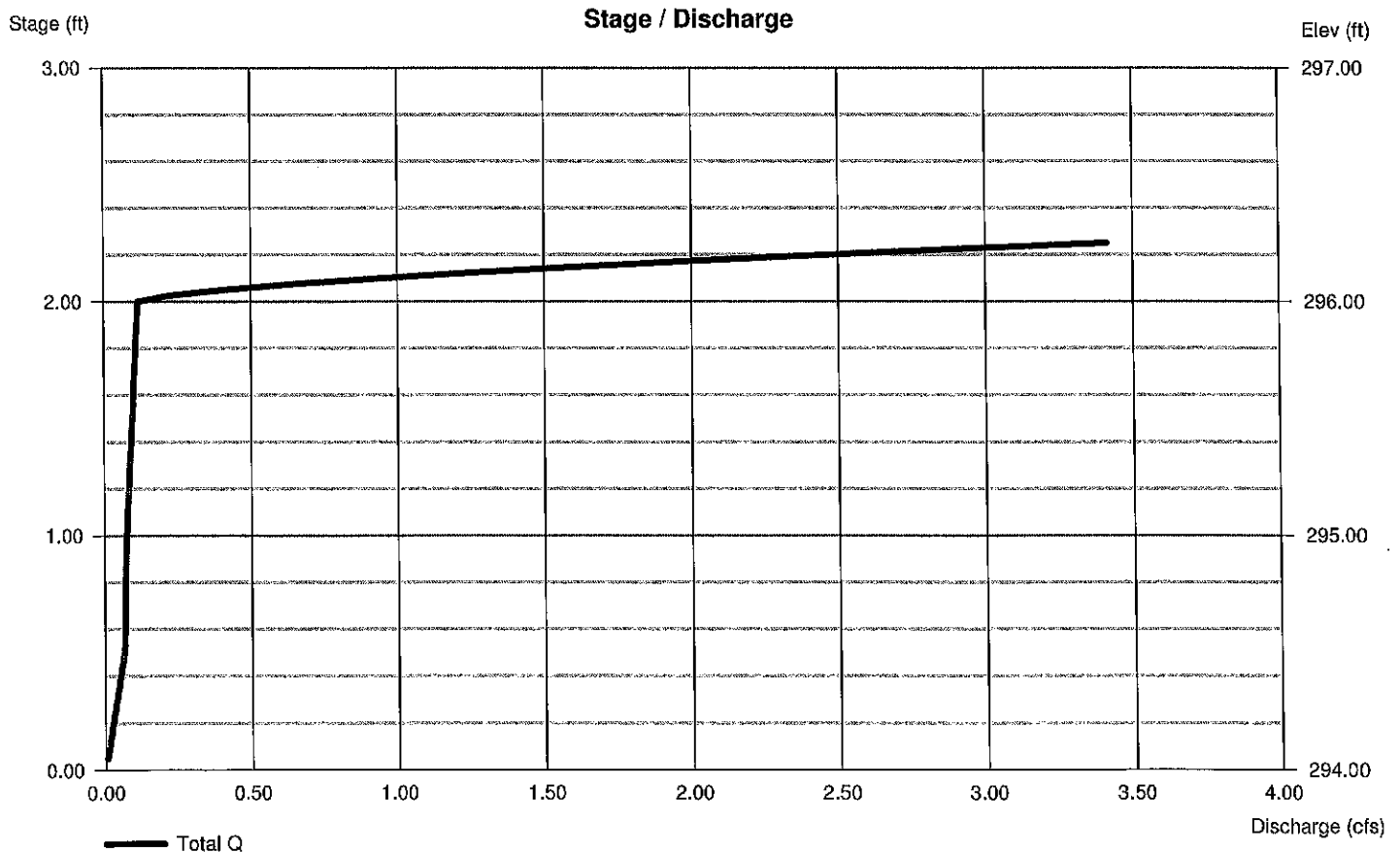
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	50.00	0.00	0.00
Crest El. (ft)	= 296.00	296.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under Inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

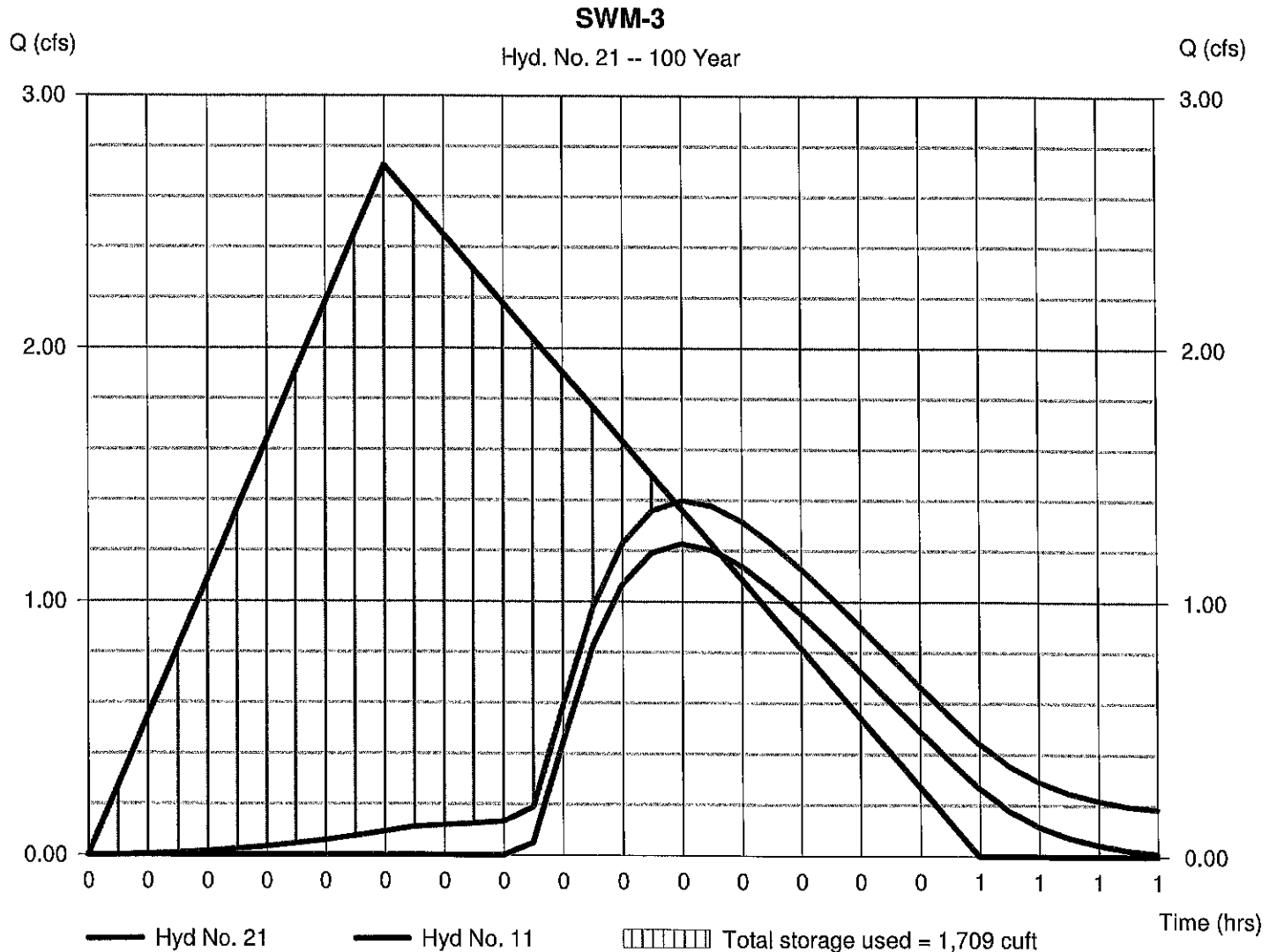
Hyd. No. 21

SWM-3

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - PR-DA-3
 Reservoir name = SWM-3

Peak discharge = 1.225 cfs
 Time to peak = 0.33 hrs
 Hyd. volume = 774 cuft
 Max. Elevation = 292.13 ft
 Max. Storage = 1,709 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 3 - SWM-3

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 291.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	291.00	1,139	0	0
1.00	292.00	1,807	1,460	1,460
1.10	292.10	1,950	188	1,648
1.20	292.20	2,050	200	1,848
1.25	292.25	2,175	106	1,953

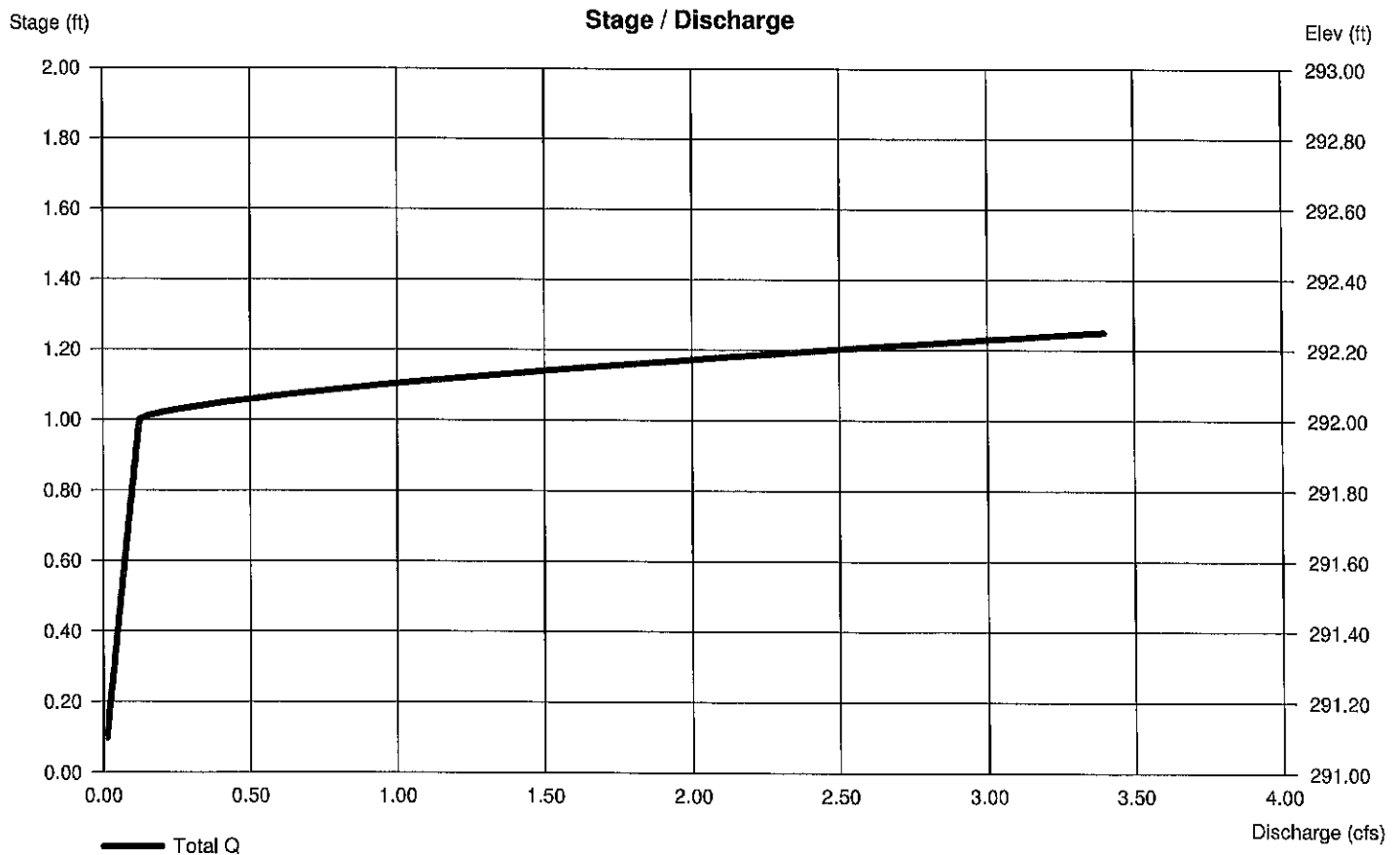
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 292.00	292.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 3.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



A-29

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

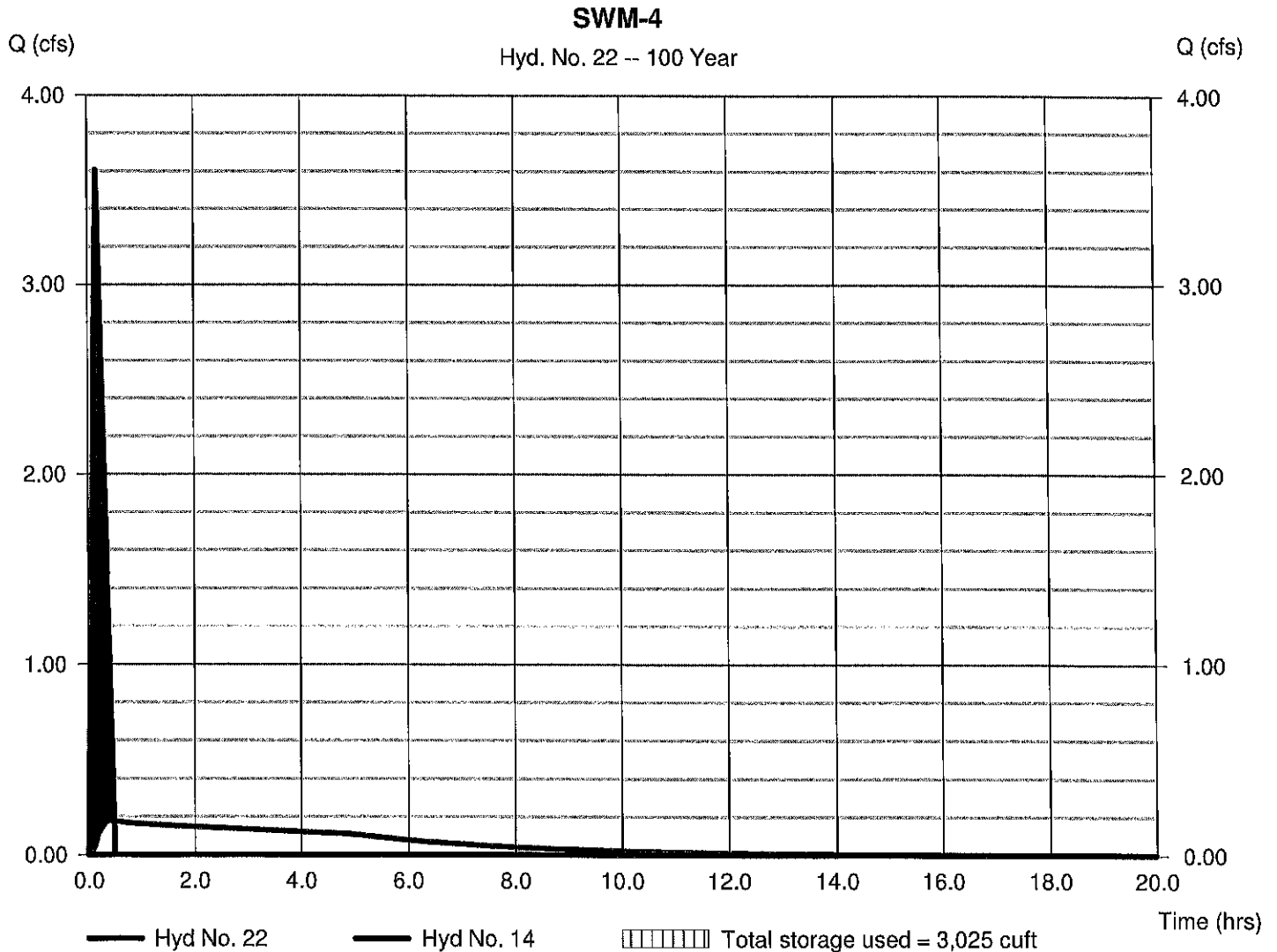
Hyd. No. 22

SWM-4

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 14 - PR-DA-4
 Reservoir name = SWM-4

Peak discharge = 0.000 cfs
 Time to peak = 0.18 hrs
 Hyd. volume = 0 cuft
 Max. Elevation = 282.24 ft
 Max. Storage = 3,025 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydratlow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 4 - SWM-4

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 281.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	281.00	1,970	0	0
1.00	282.00	2,668	2,310	2,310
2.00	283.00	3,443	3,047	5,357
2.10	283.25	3,575	351	5,708
2.25	283.25	3,650	542	6,250

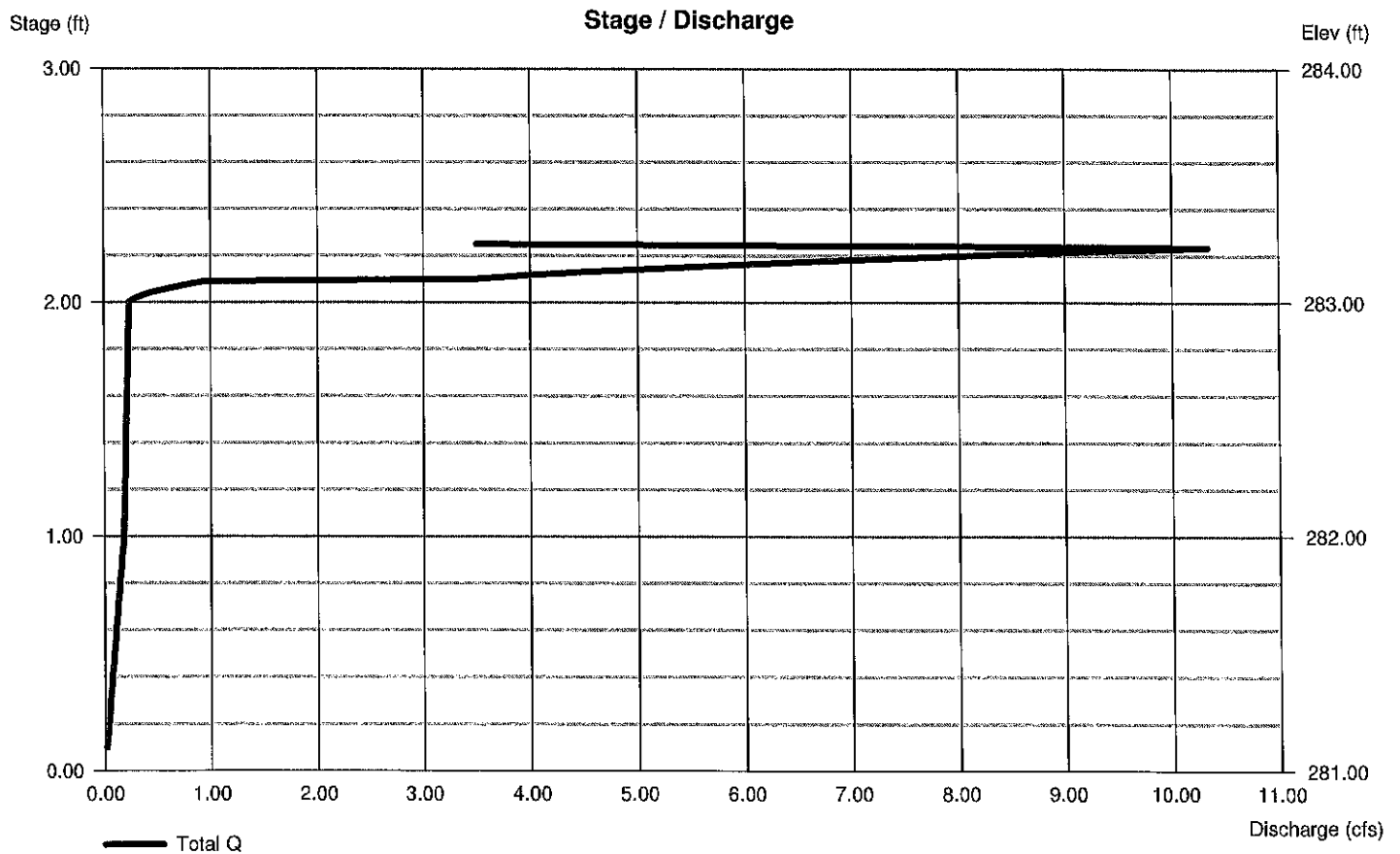
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 283.00	283.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(In/hr)	= 3.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

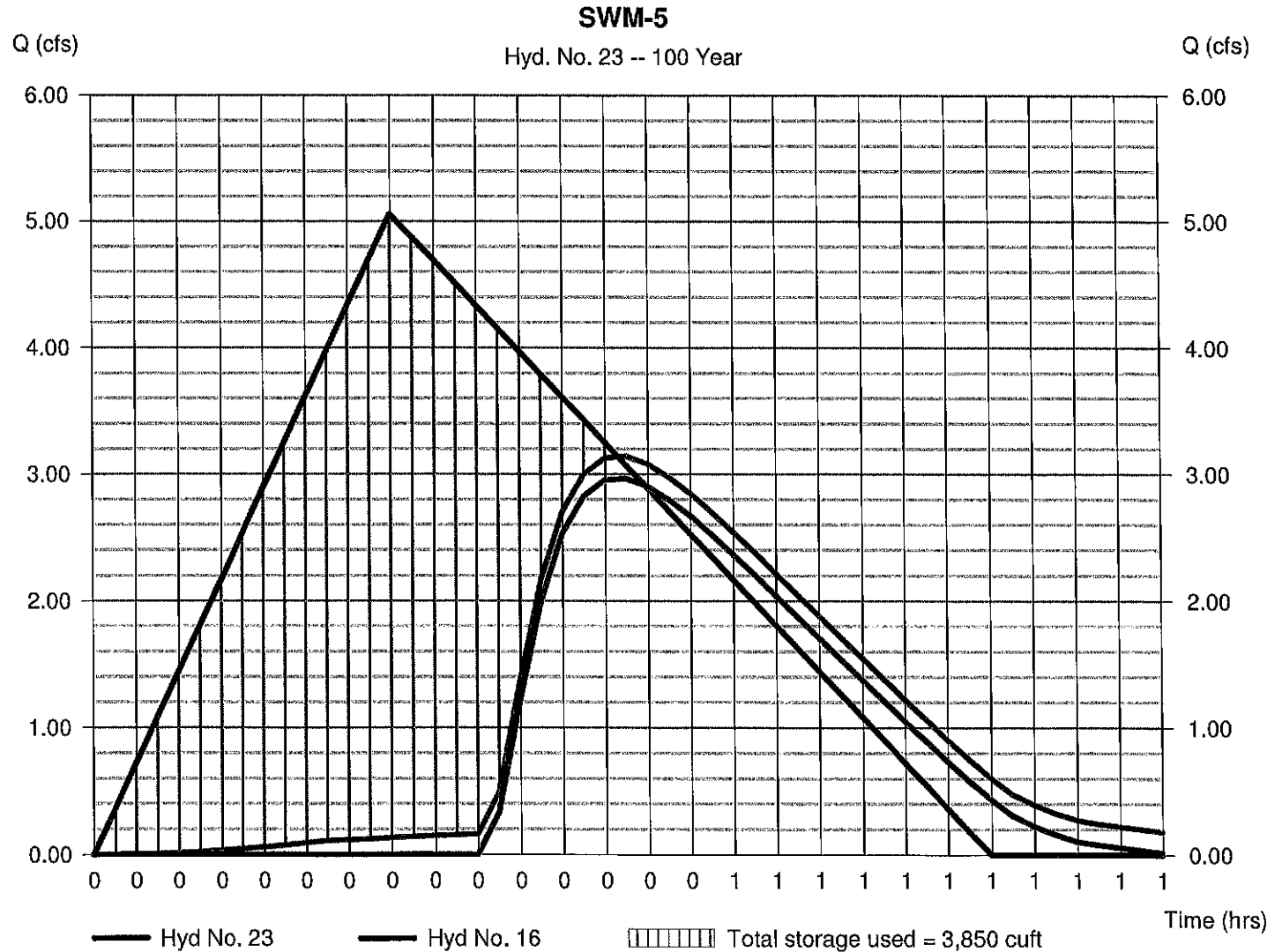
Hyd. No. 23

SWM-5

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 16 - PR-DA-5
 Reservoir name = SWM-5

Peak discharge = 2.963 cfs
 Time to peak = 0.42 hrs
 Hyd. volume = 2,682 cuft
 Max. Elevation = 316.24 ft
 Max. Storage = 3,850 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 5 - SWM-5

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 314.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	314.00	984	0	0
1.00	315.00	1,612	1,285	1,285
2.00	316.00	2,381	1,984	3,269
2.25	316.25	2,572	619	3,888

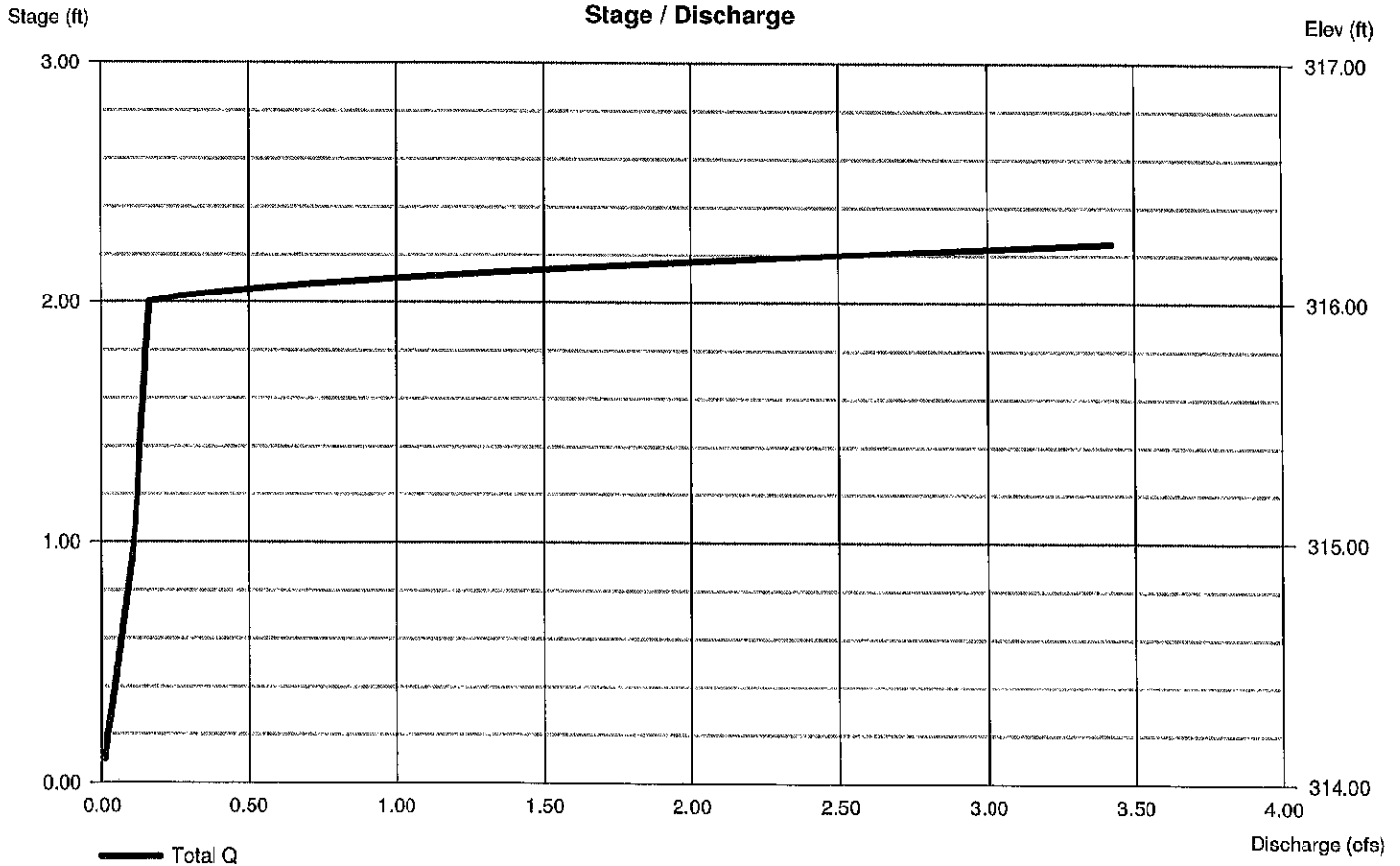
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 316.00	316.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil. (In/hr)	= 3.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

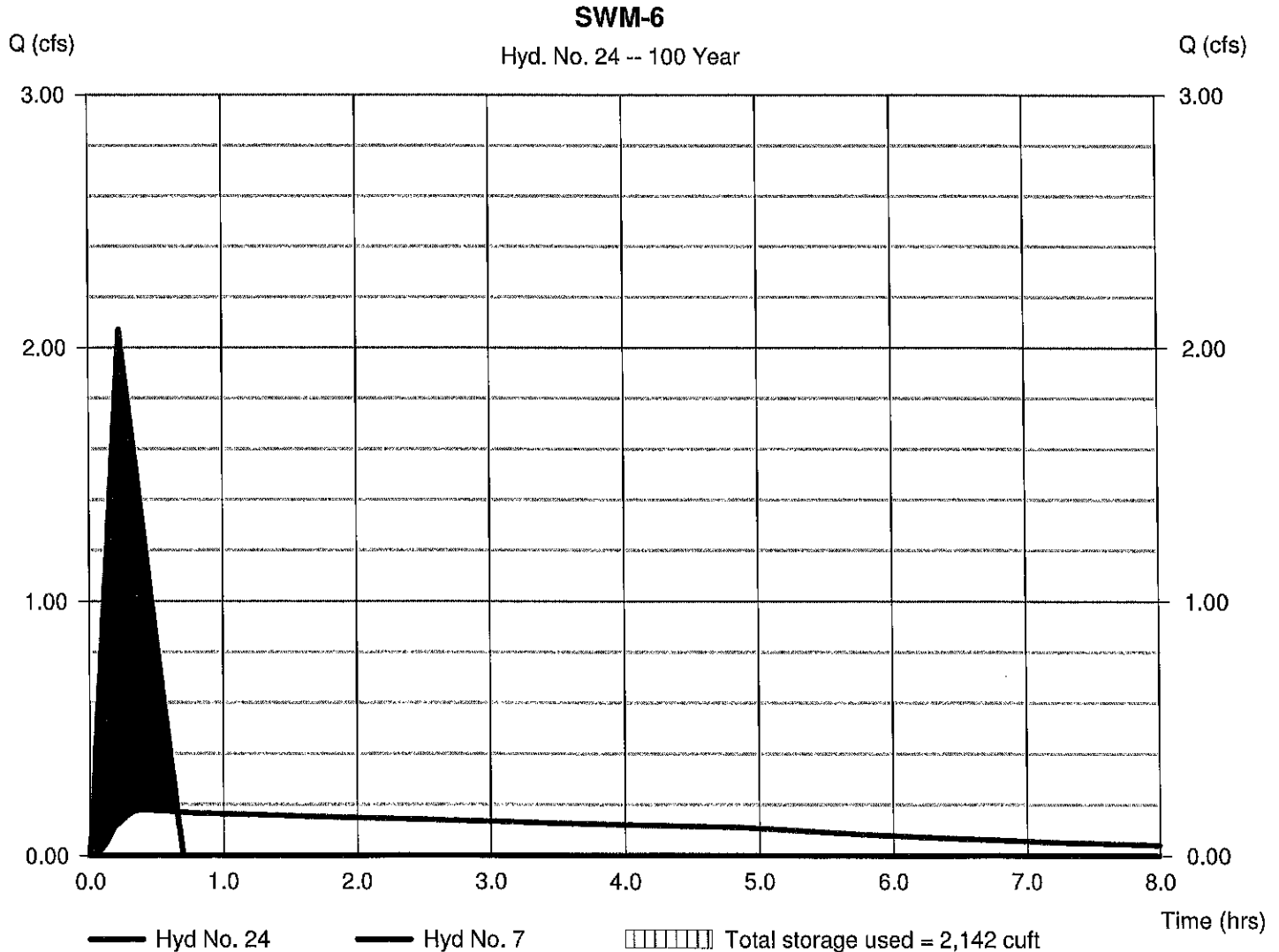
Hyd. No. 24

SWM-6

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 7 - PR-DA-6
 Reservoir name = SWM-6

Peak discharge = 0.000 cfs
 Time to peak = 0.70 hrs
 Hyd. volume = 0 cuft
 Max. Elevation = 344.70 ft
 Max. Storage = 2,142 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 6 - SWM-6

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 344.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	344.00	2,650	0	0
1.00	345.00	3,510	3,070	3,070
2.00	346.00	4,427	3,959	7,029
2.10	346.50	4,700	456	7,485
2.25	346.25	4,910	721	8,206

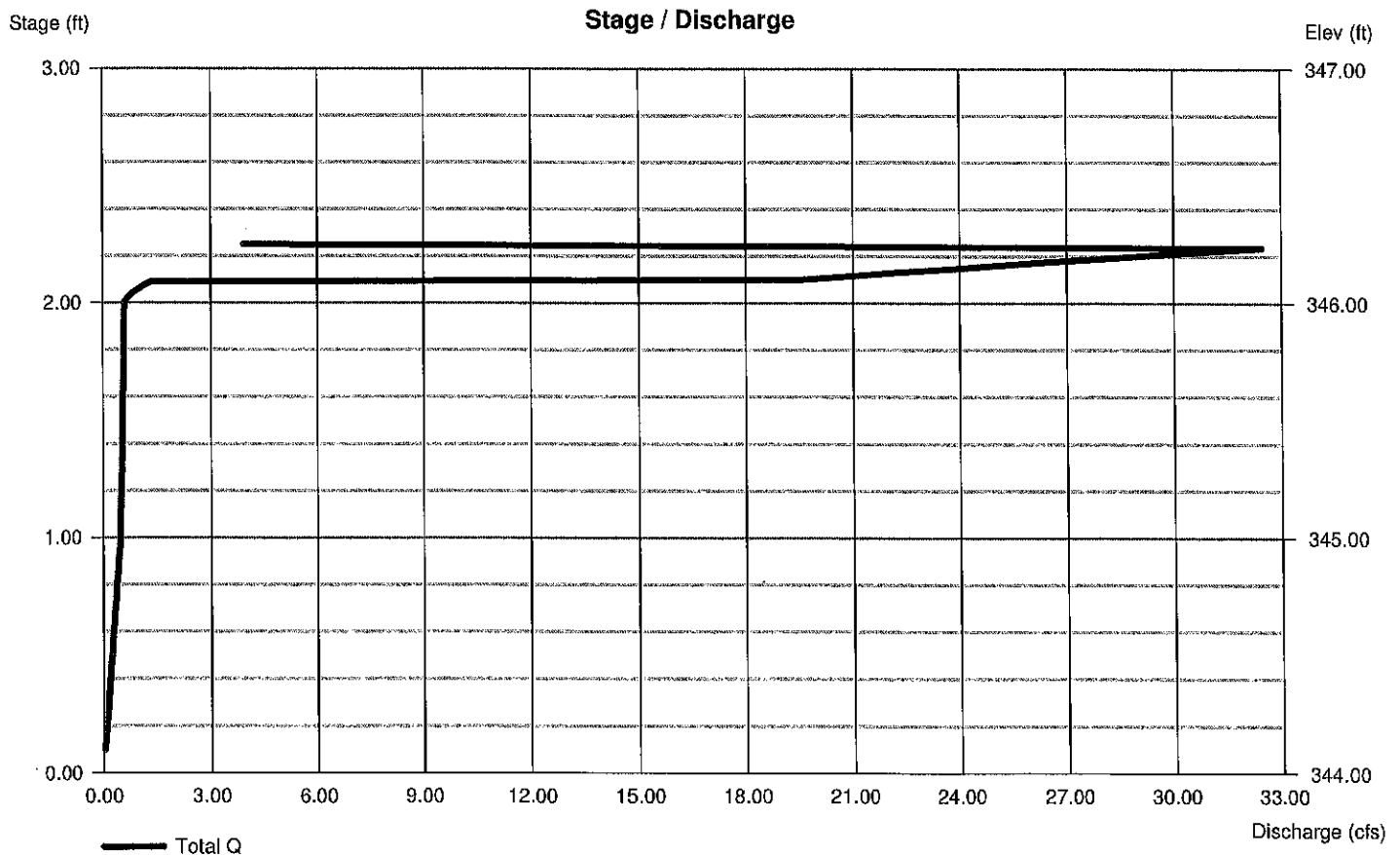
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 346.00	346.25	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

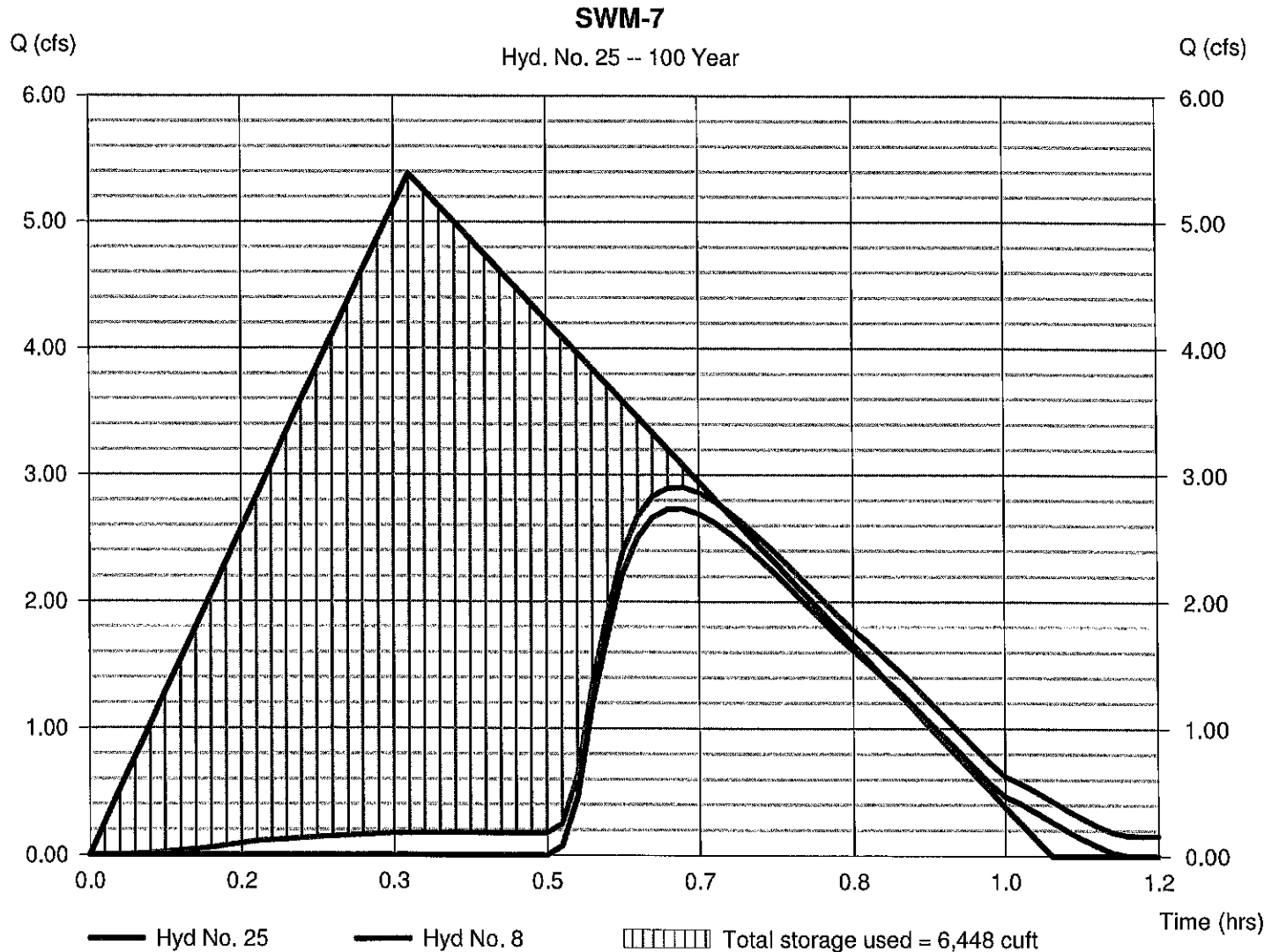
Hyd. No. 25

SWM-7

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 8 - PR-DA-7
 Reservoir name = SWM-7

Peak discharge = 2.728 cfs
 Time to peak = 0.65 hrs
 Hyd. volume = 3,104 cuft
 Max. Elevation = 342.97 ft
 Max. Storage = 6,448 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydratlow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 7 - SWM-7

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 340.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	340.00	1,108	0	0
1.00	341.00	1,860	1,468	1,468
2.00	342.00	2,675	2,255	3,723
2.10	342.10	2,750	271	3,994
3.00	343.00	2,890	2,537	6,531

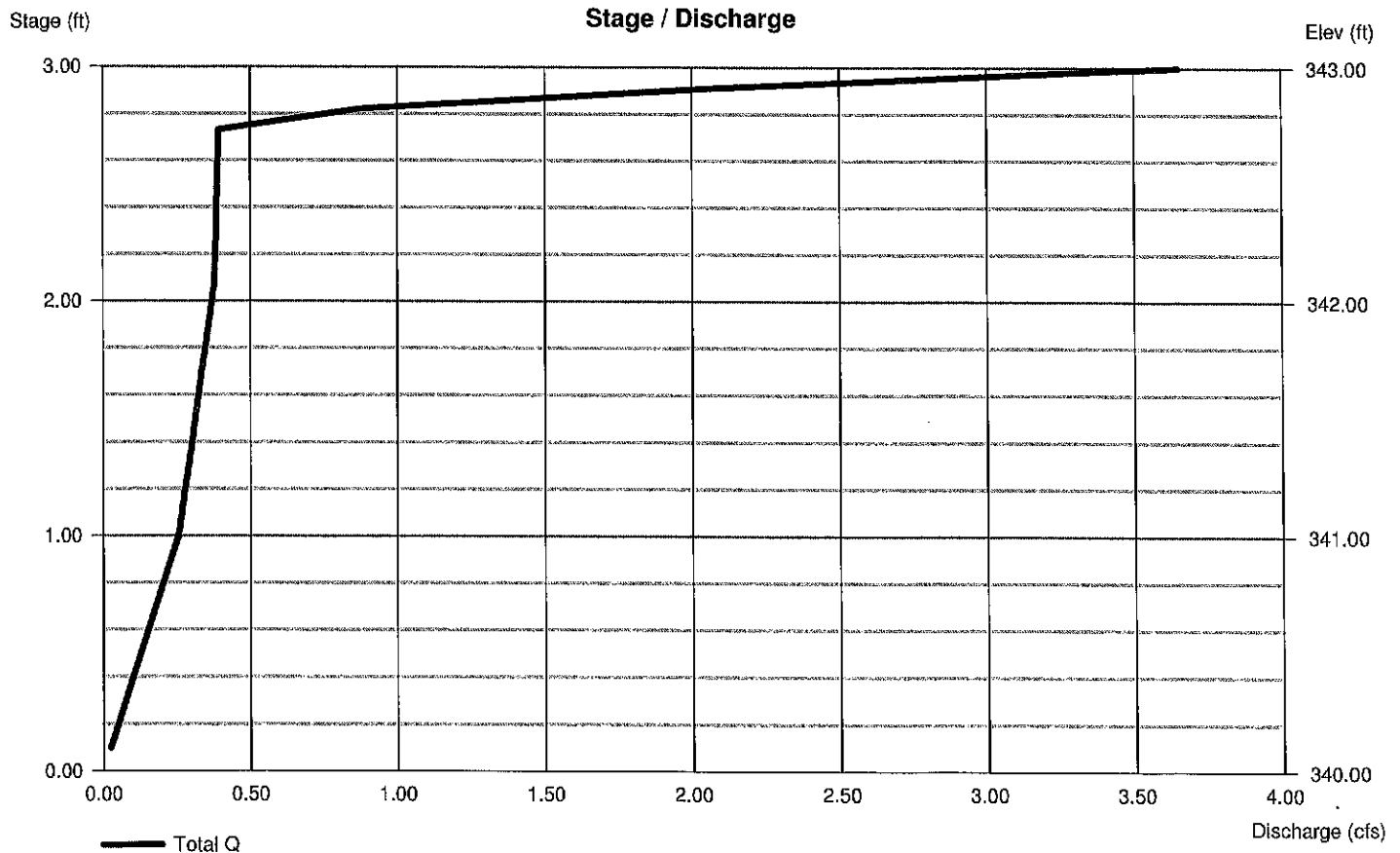
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (In)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 342.75	343.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil. (in/hr)	= 6,000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

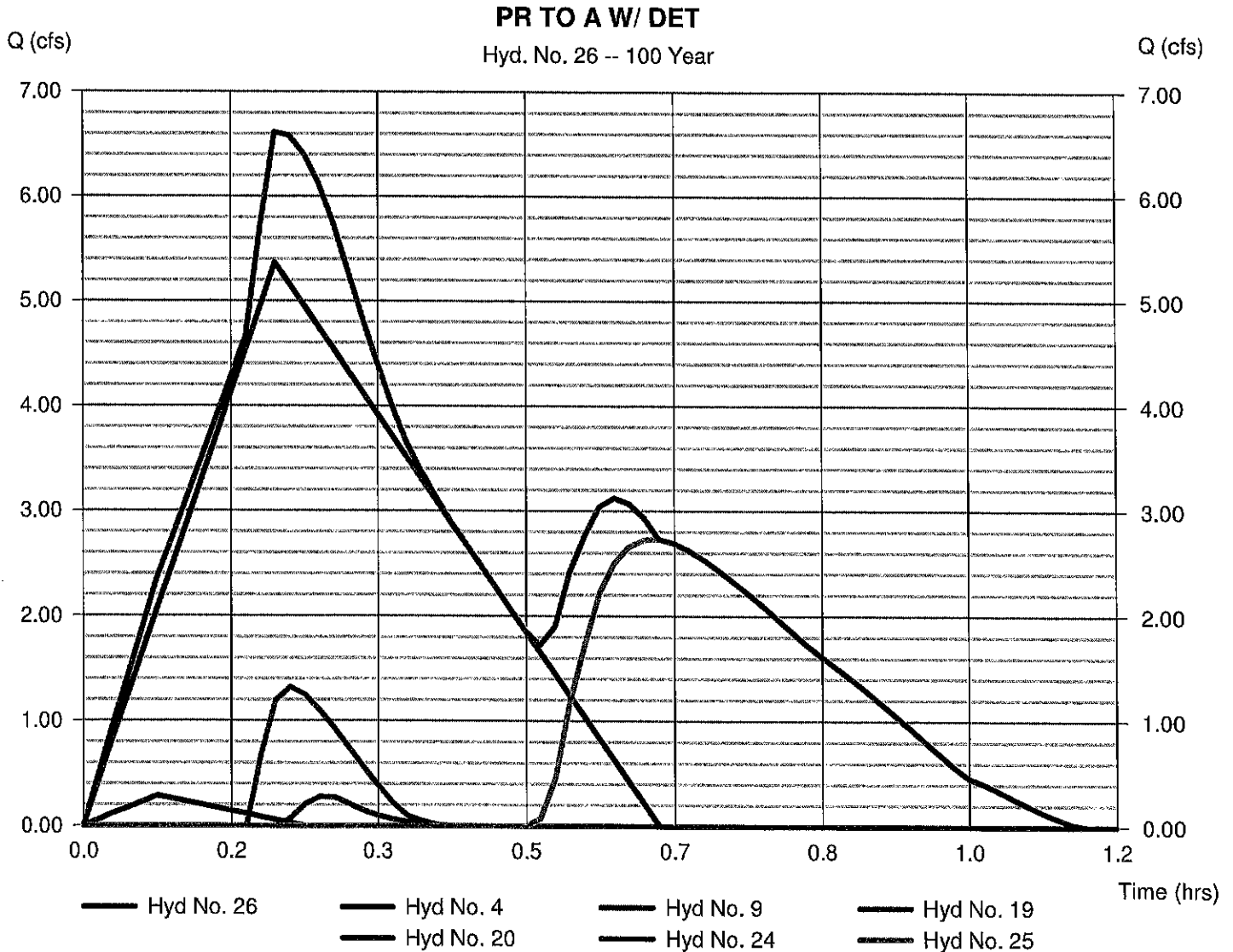
Tuesday, Jun 1, 2021

Hyd. No. 26

PR TO A W/ DET

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyds. = 4, 9, 19, 20, 24, 25

Peak discharge = 6.614 cfs
 Time to peak = 0.22 hrs
 Hyd. volume = 10,110 cuft
 Contrib. drain. area = 3.590 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

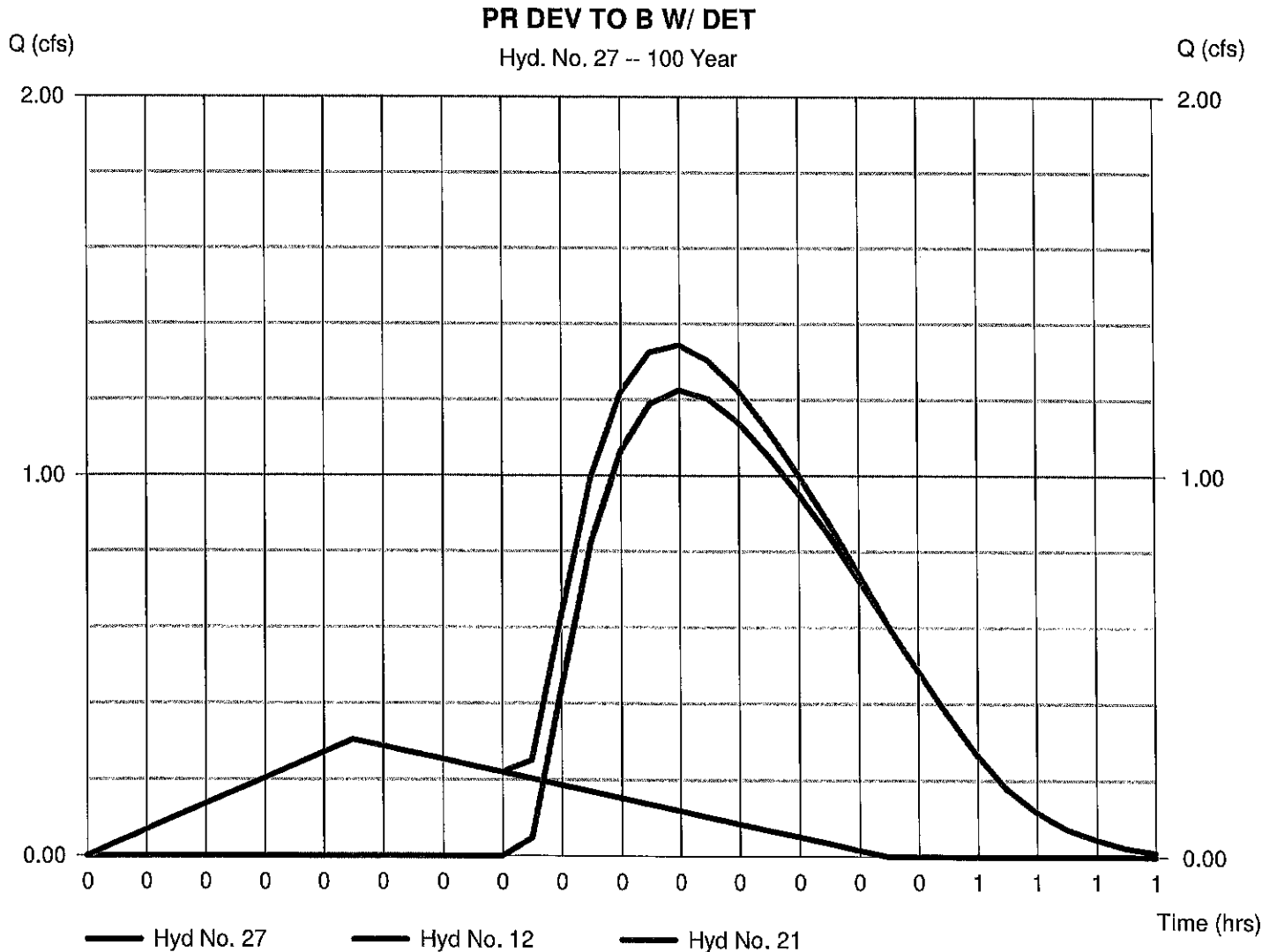
Tuesday, Jun 1, 2021

Hyd. No. 27

PR DEV TO B W/ DET

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 12, 21

Peak discharge = 1.343 cfs
Time to peak = 0.33 hrs
Hyd. volume = 1,020 cuft
Contrib. drain. area = 0.130 ac



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

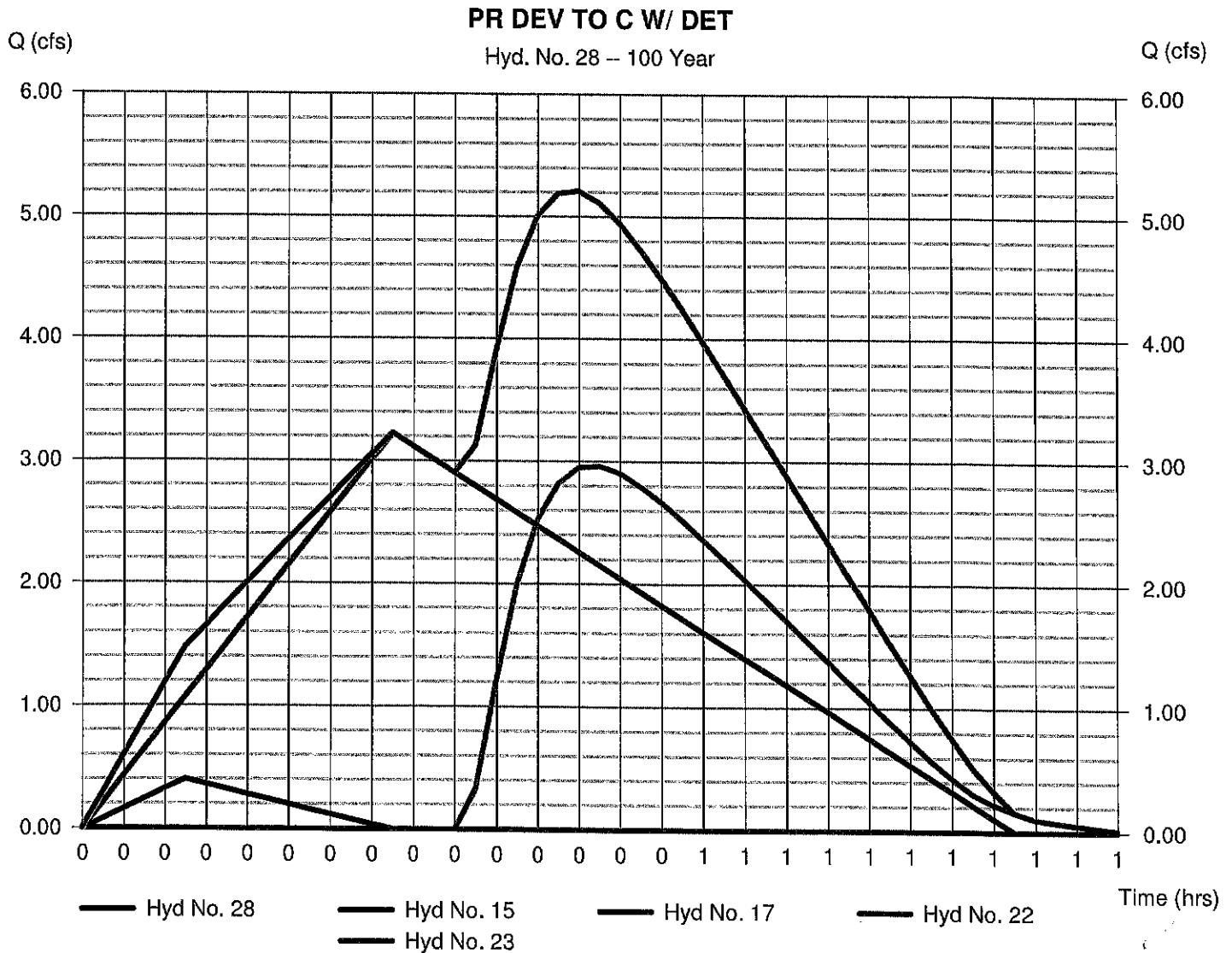
Tuesday, Jun 1, 2021

Hyd. No. 28

PR DEV TO C W/ DET

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyds. = 15, 17, 22, 23

Peak discharge = 5.208 cfs
 Time to peak = 0.40 hrs
 Hyd. volume = 7,216 cuft
 Contrib. drain. area = 2.670 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

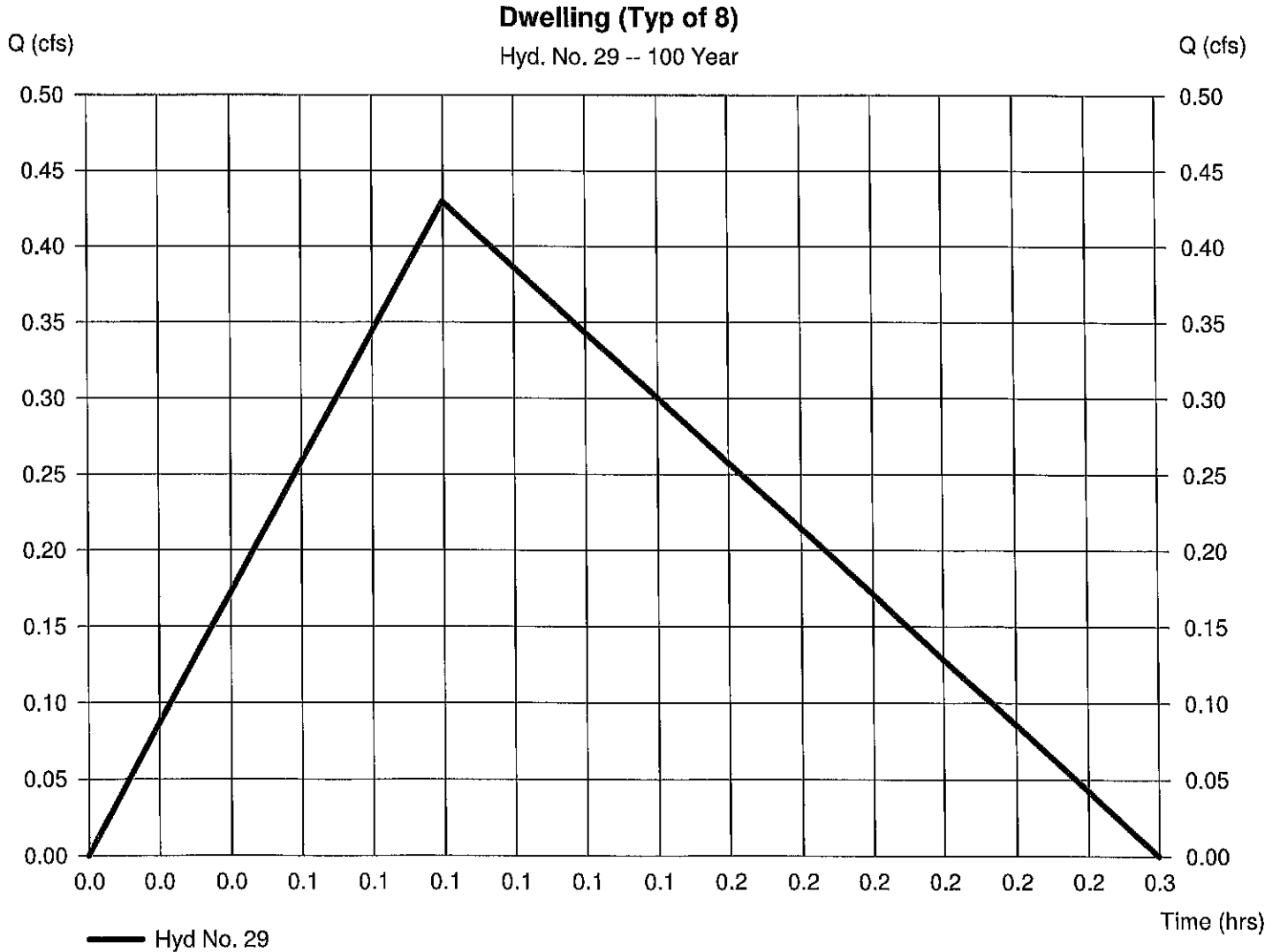
Tuesday, Jun 1, 2021

Hyd. No. 29

Dwelling (Typ of 8)

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.050 ac
Intensity = 9.546 in/hr
IDF Curve = MIDDLESEX.IDF

Peak discharge = 0.430 cfs
Time to peak = 0.08 hrs
Hyd. volume = 193 cuft
Runoff coeff. = 0.9
Tc by User = 5.00 min
Asc/Rec limb fact = 1/2



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

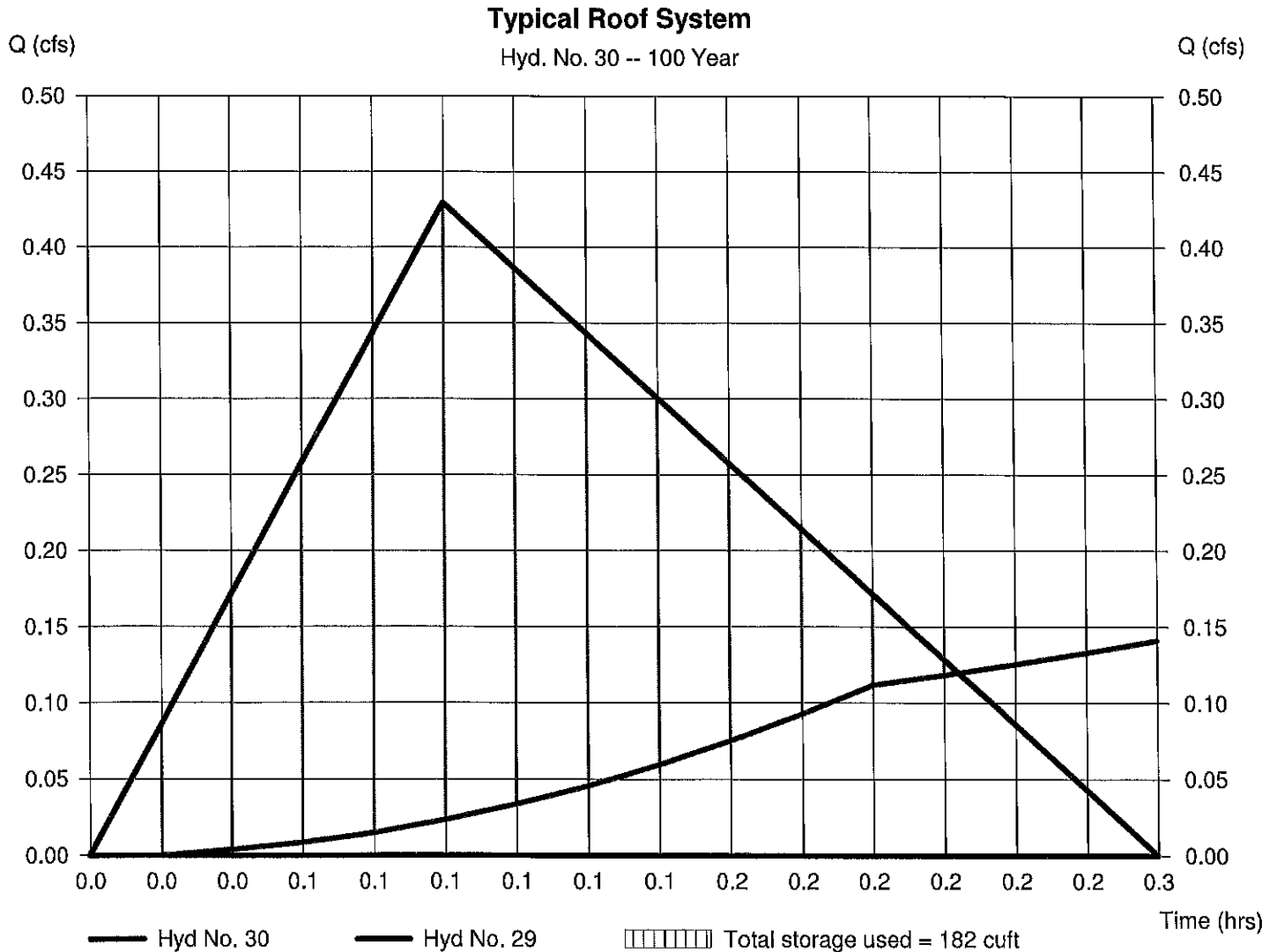
Tuesday, Jun 1, 2021

Hyd. No. 30

Typical Roof System

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 29 - Dwelling (Typ of 8)	Max. Elevation	= 100.87 ft
Reservoir name	= Rooftop System	Max. Storage	= 182 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

Pond No. 8 - Rooftop System

Pond Data

UG Chambers - Invert elev. = 100.00 ft, Rise x Span = 1.00 x 2.83 ft, Barrel Len = 60.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
 Encasement - Invert elev. = 99.50 ft, Width = 3.83 ft, Height = 1.50 ft, Voids = 30.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	99.50	n/a	0	0
0.15	99.65	n/a	10	10
0.30	99.80	n/a	10	21
0.45	99.95	n/a	10	31
0.60	100.10	n/a	22	53
0.75	100.25	n/a	28	81
0.90	100.40	n/a	27	108
1.05	100.55	n/a	26	134
1.20	100.70	n/a	24	159
1.35	100.85	n/a	22	180
1.50	101.00	n/a	17	197

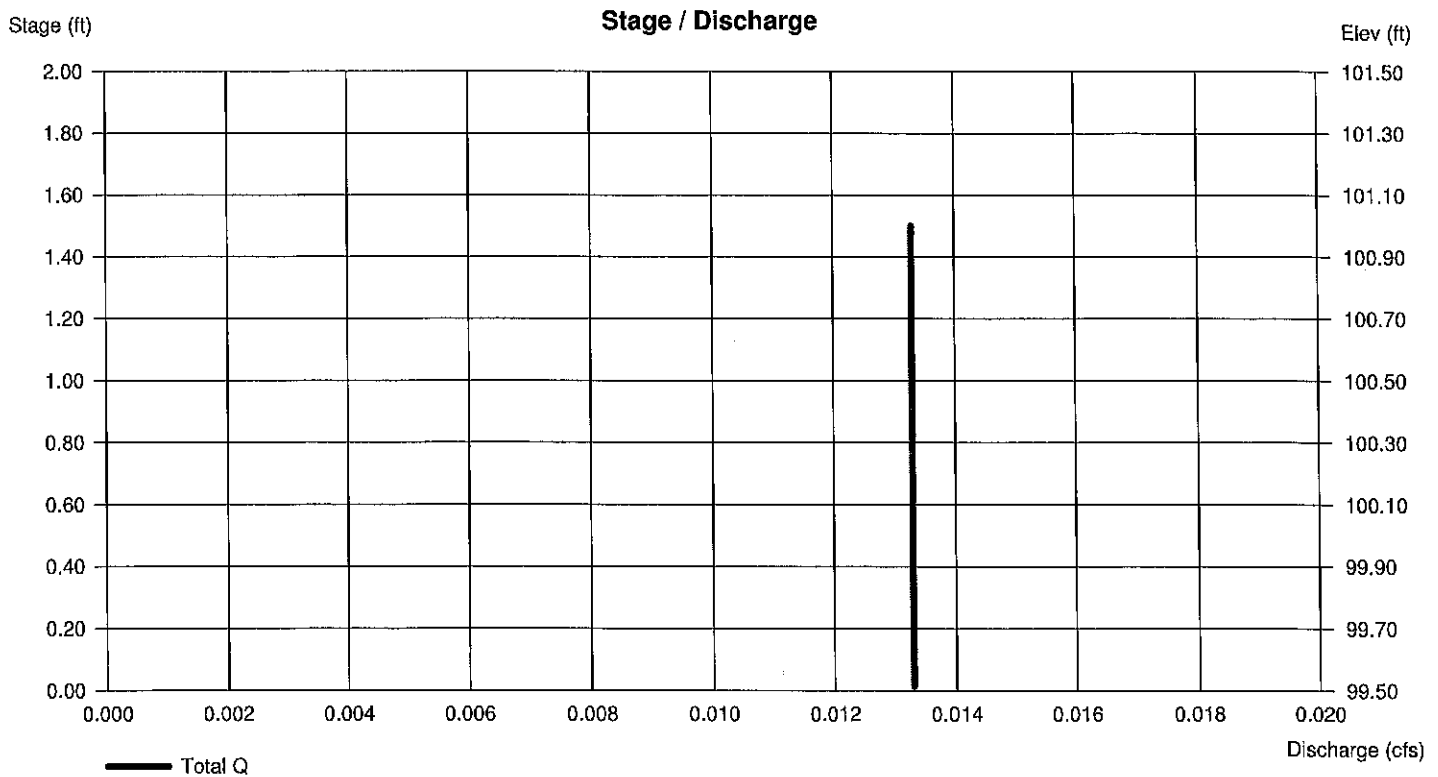
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (In)	= 0.00	0.00	0.00	0.00
Span (In)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil. (in/hr)	= 2.500 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

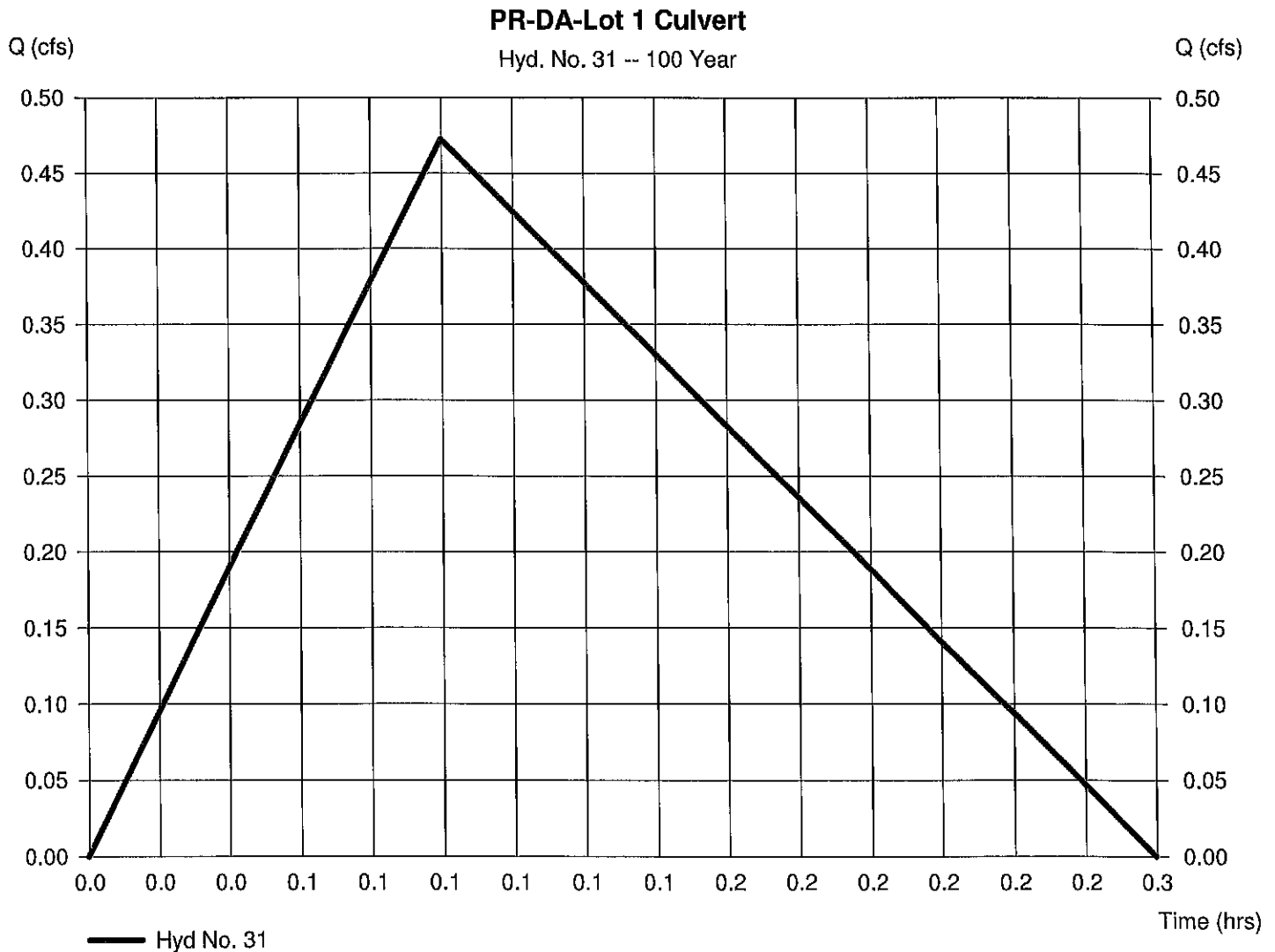
Tuesday, Jun 1, 2021

Hyd. No. 31

PR-DA-Lot 1 Culvert

Hydrograph type	= Rational	Peak discharge	= 0.473 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 213 cuft
Drainage area	= 0.150 ac	Runoff coeff.	= 0.33*
Intensity	= 9.546 in/hr	Tc by User	= 5.00 min
IDF Curve	= MIDDLESEX.IDF	Asc/Rec limb fact	= 1/2

* Composite (Area/C) = [(0.030 x 0.90) + (0.050 x 0.17) + (0.070 x 0.20)] / 0.150



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

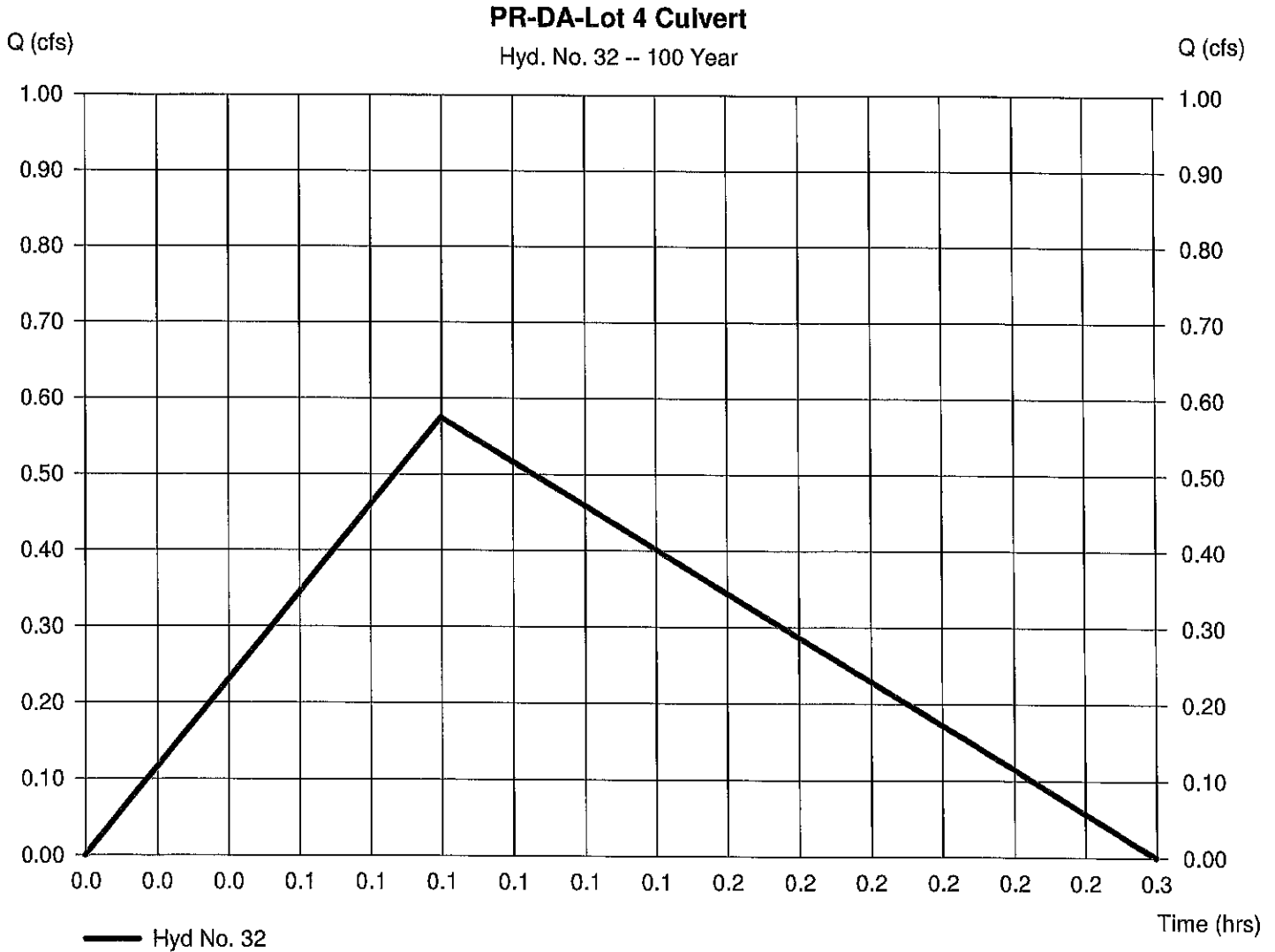
Hyd. No. 32

PR-DA-Lot 4 Culvert

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 0.140 ac
 Intensity = 9.546 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 0.575 cfs
 Time to peak = 0.08 hrs
 Hyd. volume = 259 cuft
 Runoff coeff. = 0.43*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.050 x 0.90) + (0.090 x 0.17)] / 0.140



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

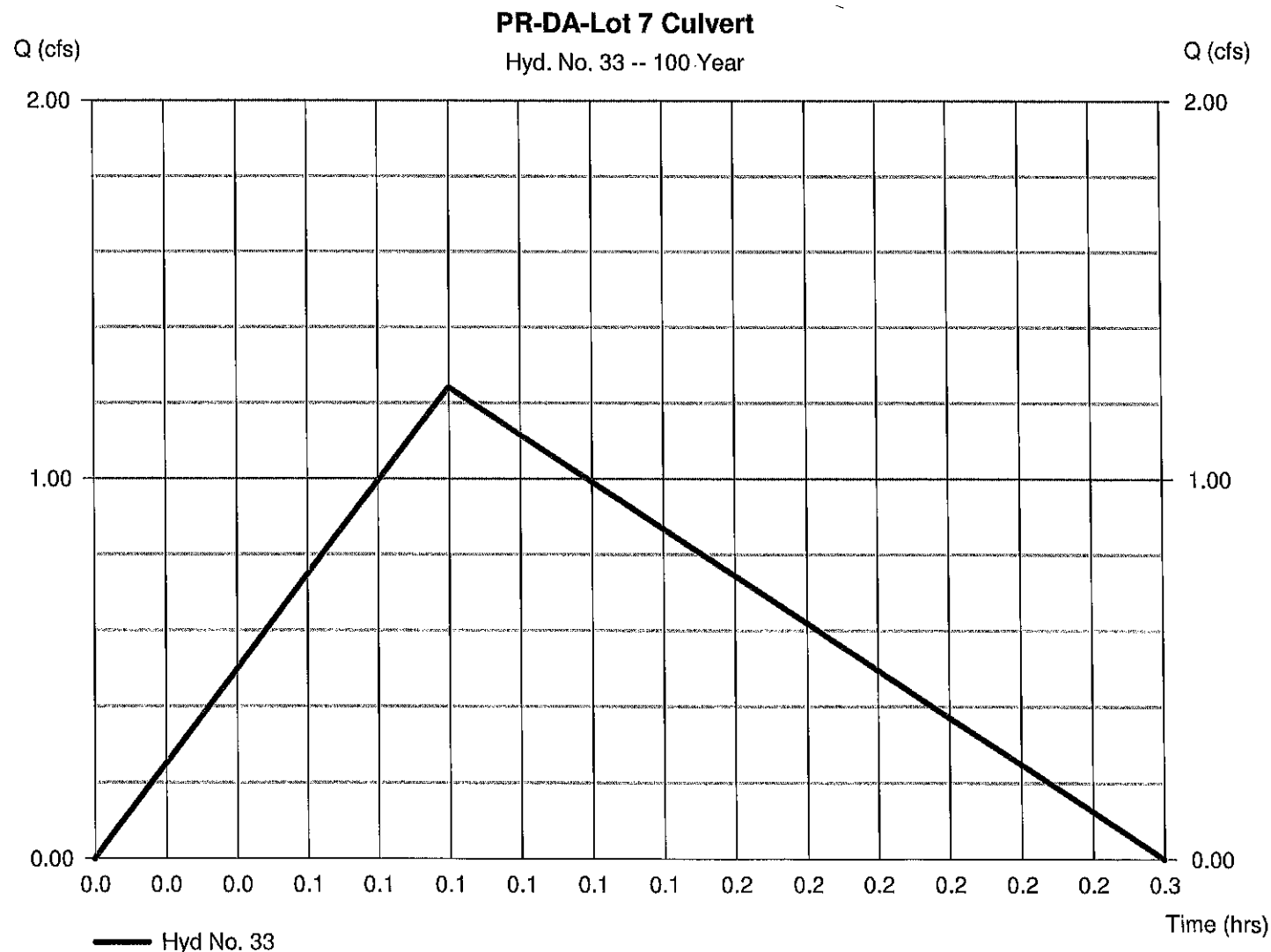
Hyd. No. 33

PR-DA-Lot 7 Culvert

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 0.260 ac
 Intensity = 9.546 in/hr
 IDF Curve = MIDDLESEX.IDF

Peak discharge = 1.241 cfs
 Time to peak = 0.08 hrs
 Hyd. volume = 558 cuft
 Runoff coeff. = 0.5*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/2

* Composite (Area/C) = [(0.090 x 0.90) + (0.080 x 0.40) + (0.090 x 0.20)] / 0.260



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

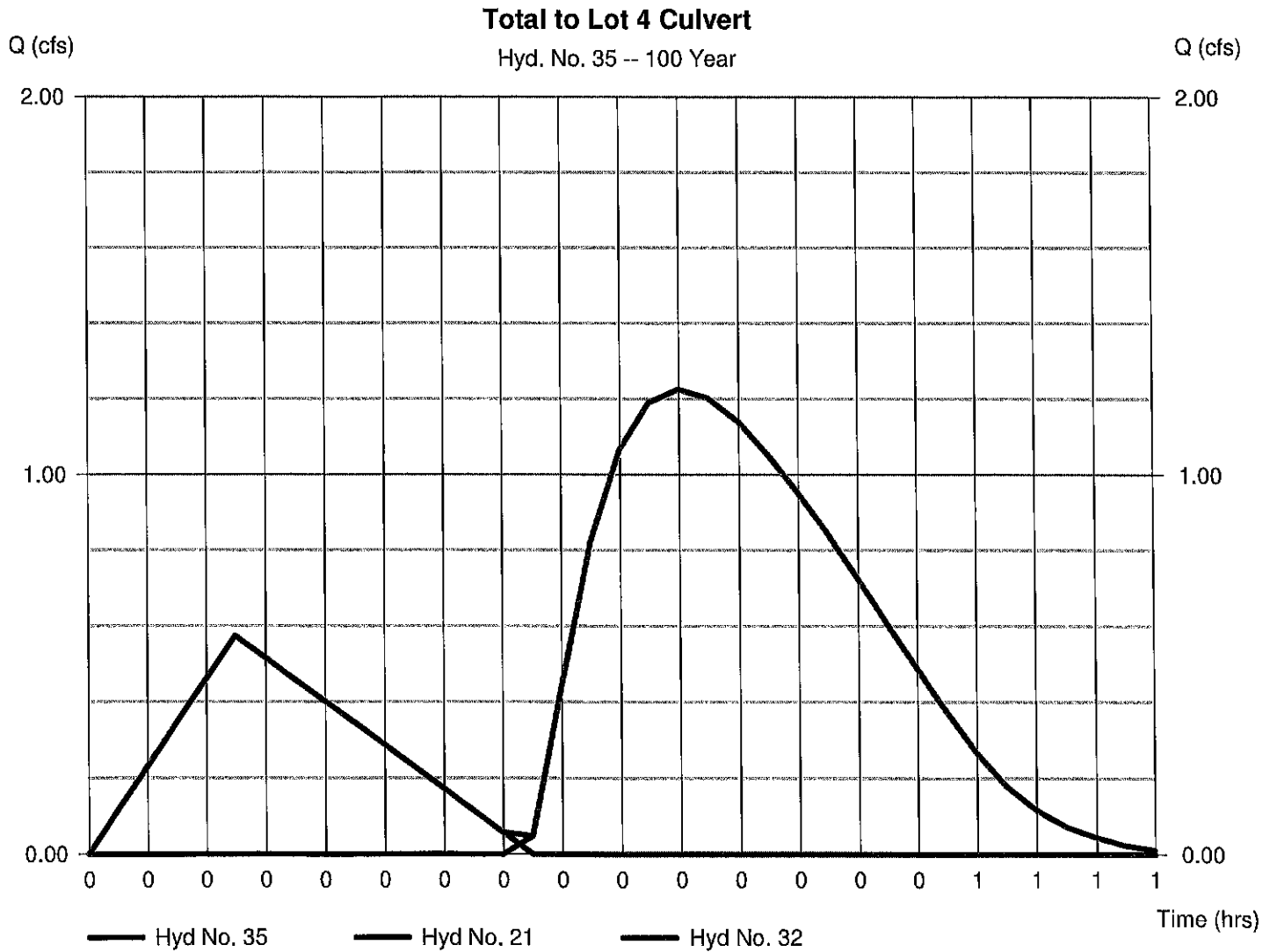
Tuesday, Jun 1, 2021

Hyd. No. 35

Total to Lot 4 Culvert

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 21, 32

Peak discharge = 1.225 cfs
Time to peak = 0.33 hrs
Hyd. volume = 1,032 cuft
Contrib. drain. area = 0.140 ac



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

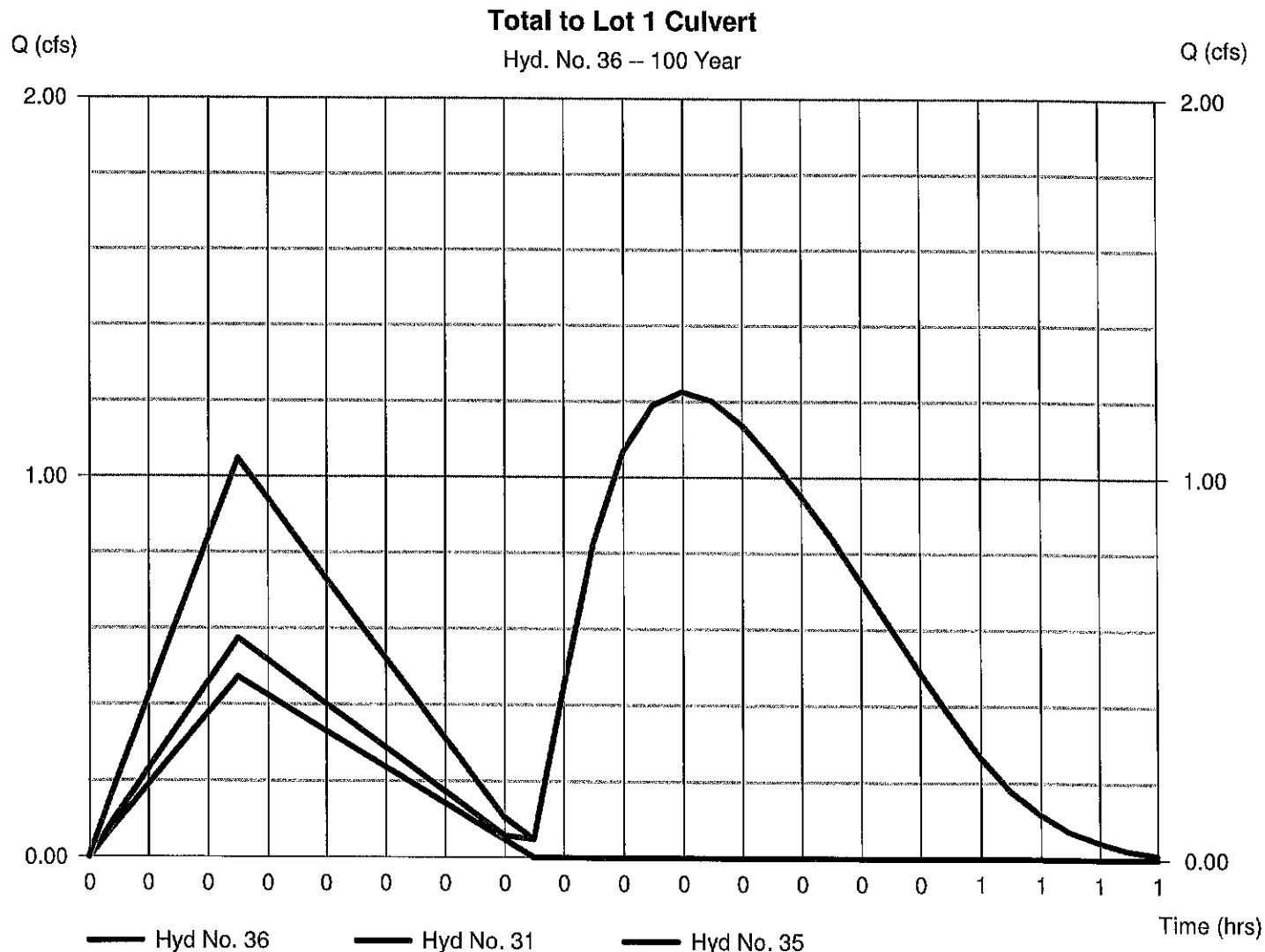
Tuesday, Jun 1, 2021

Hyd. No. 36

Total to Lot 1 Culvert

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 31, 35

Peak discharge = 1.225 cfs
Time to peak = 0.33 hrs
Hyd. volume = 1,245 cuft
Contrib. drain. area = 0.150 ac



Pond Reports
For SWM-1,2,3,4,5,6 and 7

For
2-, 10-, 25- and 50-Year Storm Events
(100-Year included in Report)

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

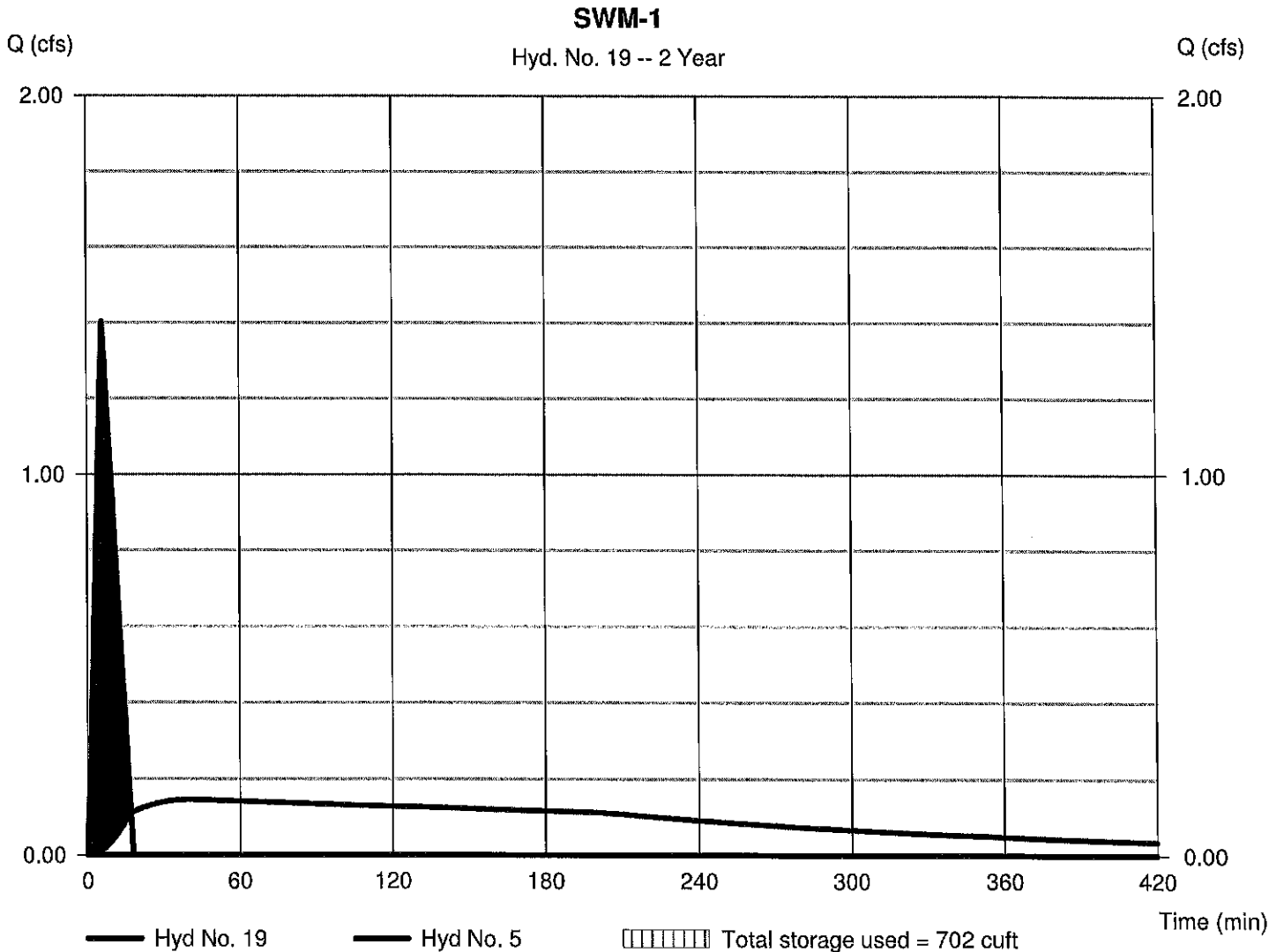
Hyd. No. 19

SWM-1

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 1 min
 Inflow hyd. No. = 5 - PR-DA-1
 Reservoir name = SWM-1

Peak discharge = 0.000 cfs
 Time to peak = 171 min
 Hyd. volume = 0 cuft
 Max. Elevation = 291.89 ft
 Max. Storage = 702 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

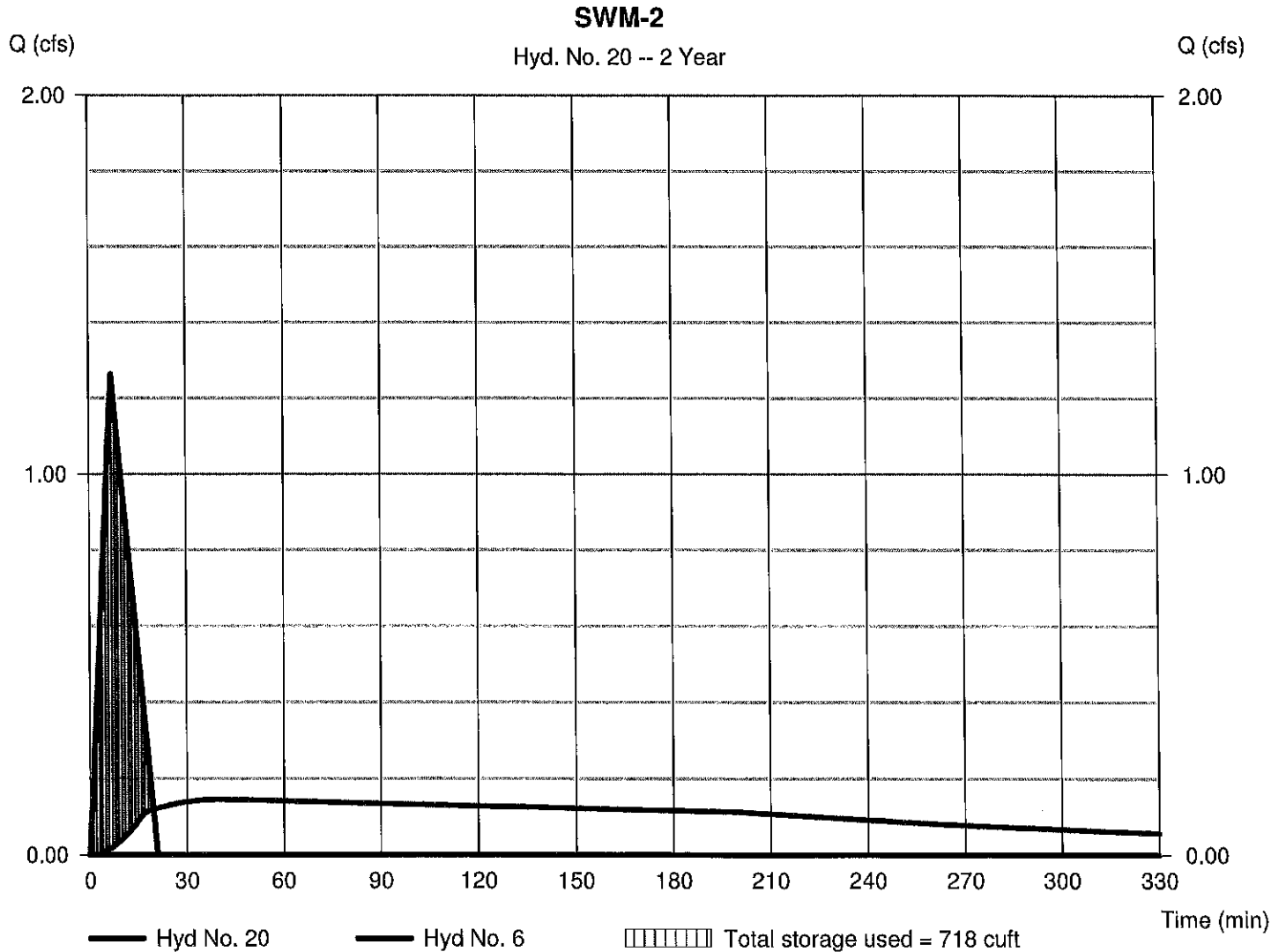
Hyd. No. 20

SWM-2

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 6 - PR-DA-2
Reservoir name = SWM-2

Peak discharge = 0.000 cfs
Time to peak = 176 min
Hyd. volume = 0 cuft
Max. Elevation = 295.36 ft
Max. Storage = 718 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

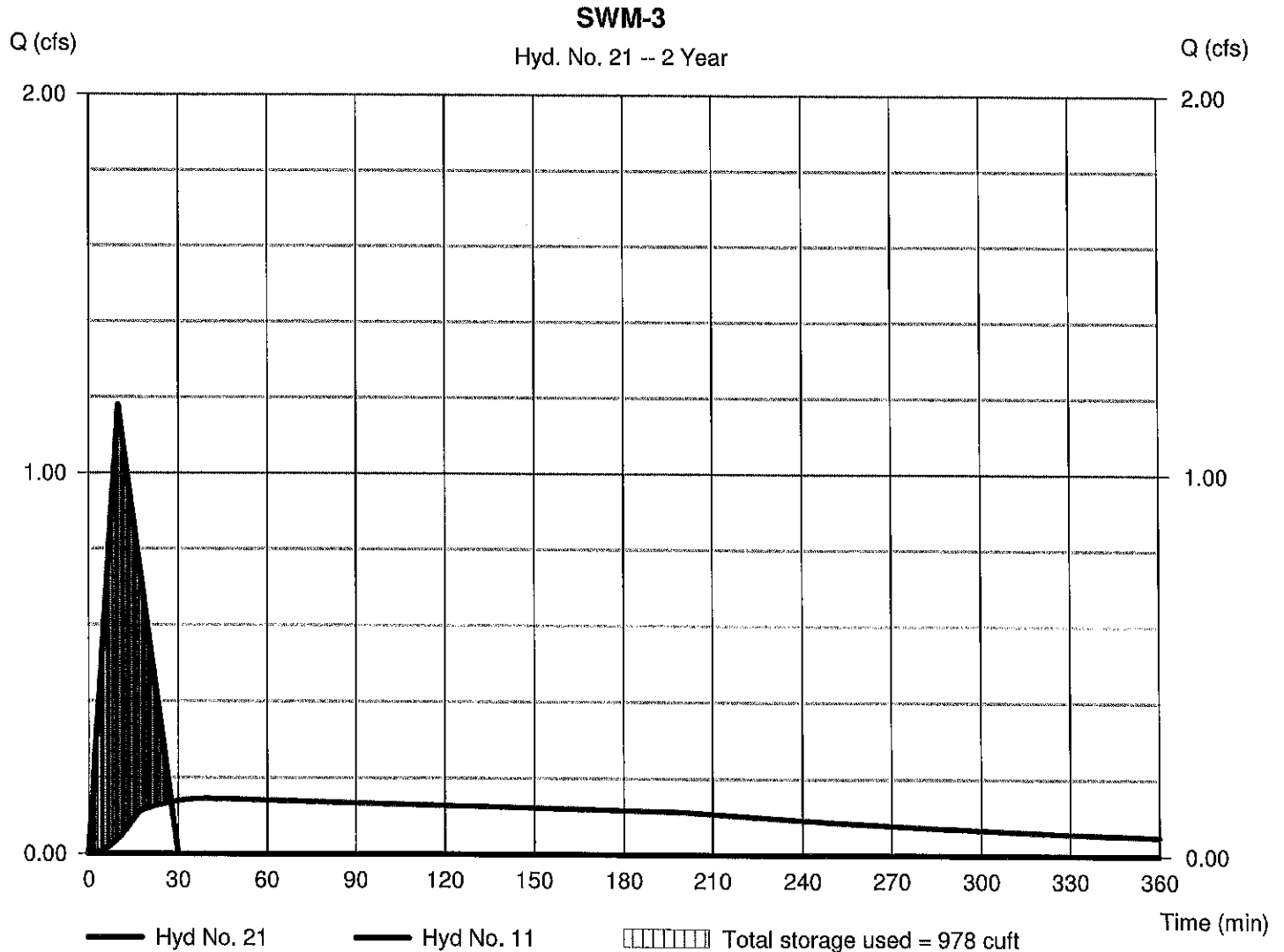
Hyd. No. 21

SWM-3

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 11 - PR-DA-3
Reservoir name = SWM-3

Peak discharge = 0.000 cfs
Time to peak = 25 min
Hyd. volume = 0 cuft
Max. Elevation = 291.67 ft
Max. Storage = 978 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

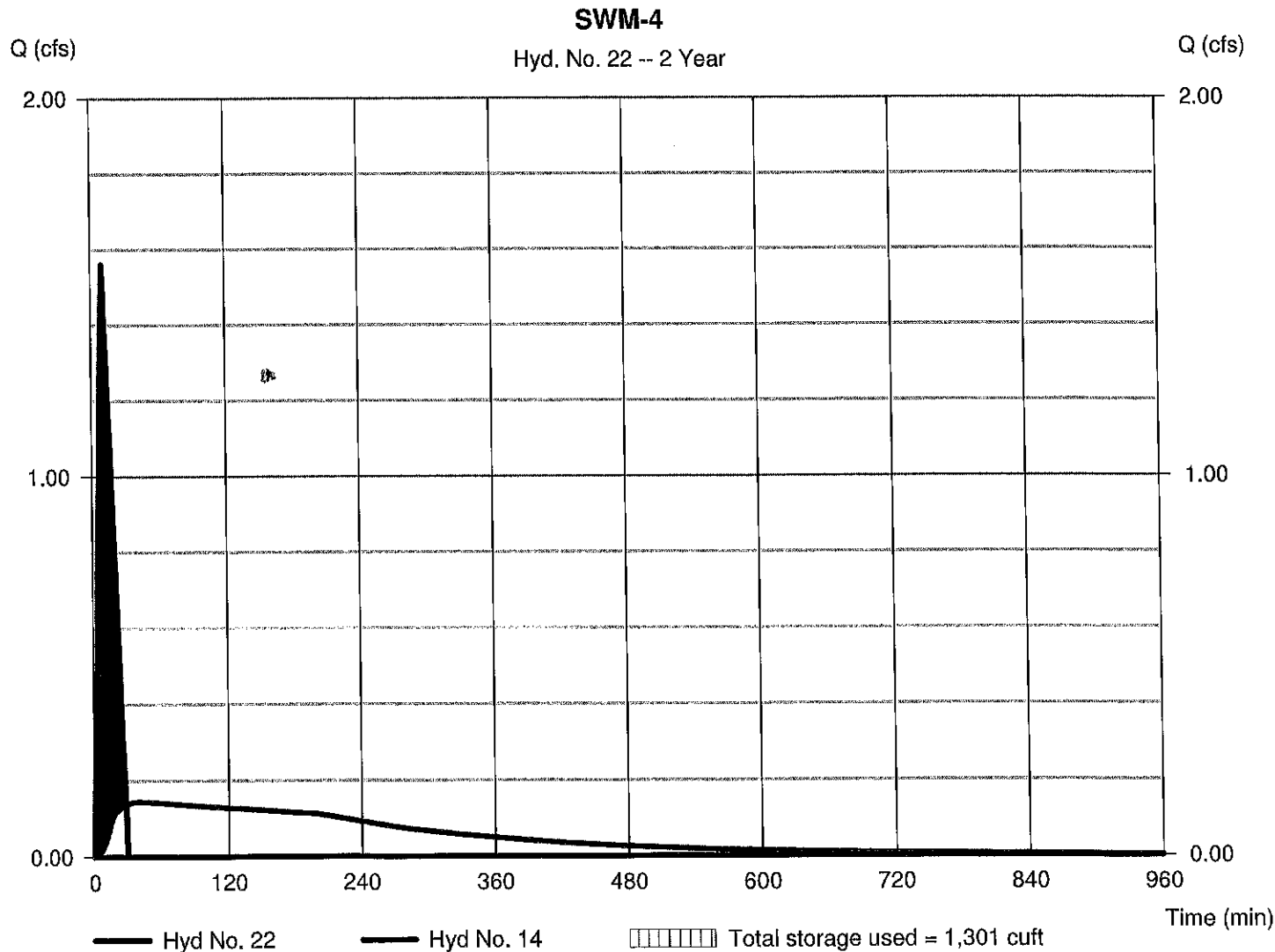
Hyd. No. 22

SWM-4

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 1 min
 Inflow hyd. No. = 14 - PR-DA-4
 Reservoir name = SWM-4

Peak discharge = 0.000 cfs
 Time to peak = 23 min
 Hyd. volume = 0 cuft
 Max. Elevation = 281.56 ft
 Max. Storage = 1,301 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

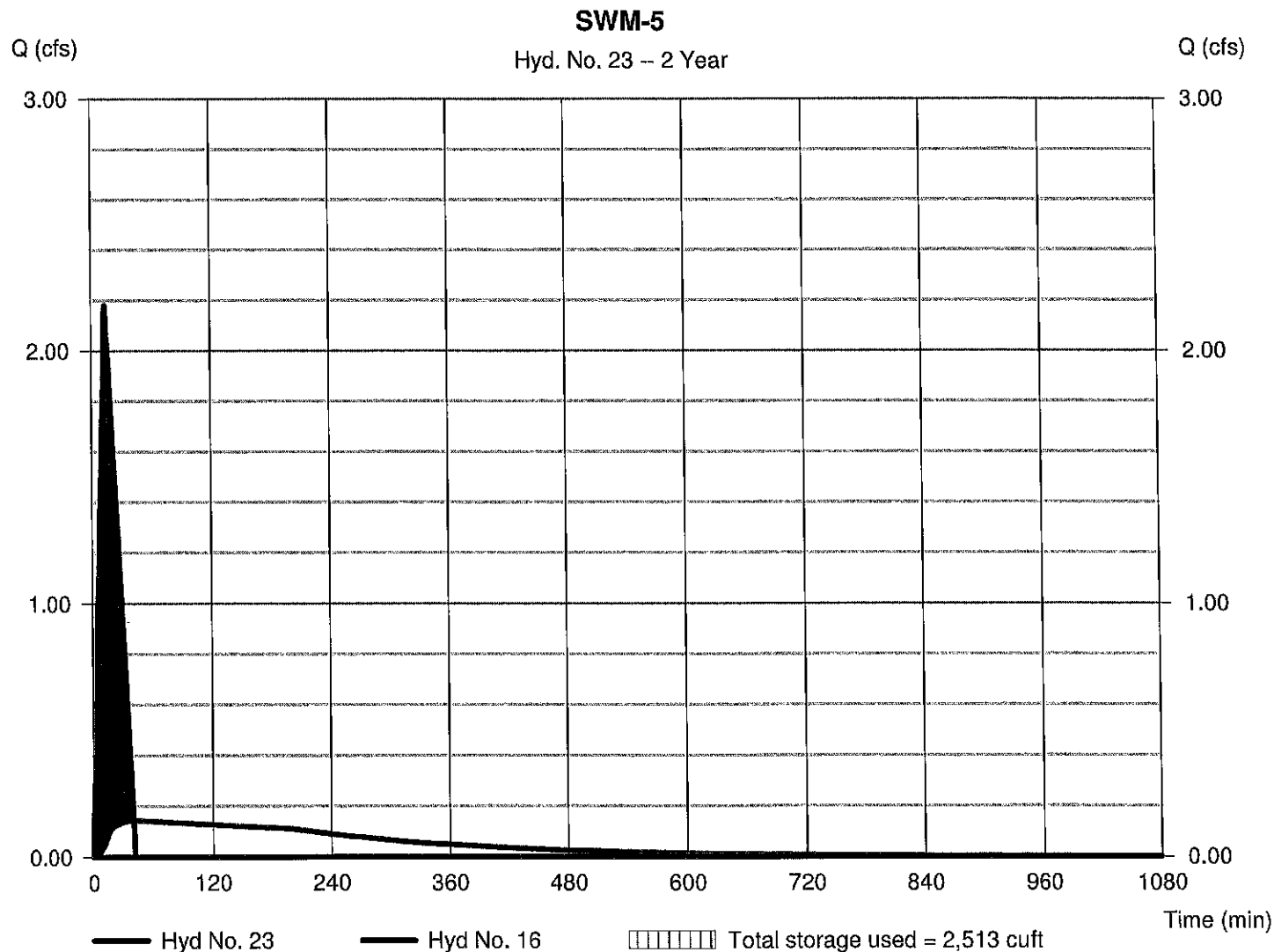
Hyd. No. 23

SWM-5

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 1 min
 Inflow hyd. No. = 16 - PR-DA-5
 Reservoir name = SWM-5

Peak discharge = 0.000 cfs
 Time to peak = 331 min
 Hyd. volume = 0 cuft
 Max. Elevation = 315.62 ft
 Max. Storage = 2,513 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Tuesday, Jun 1, 2021

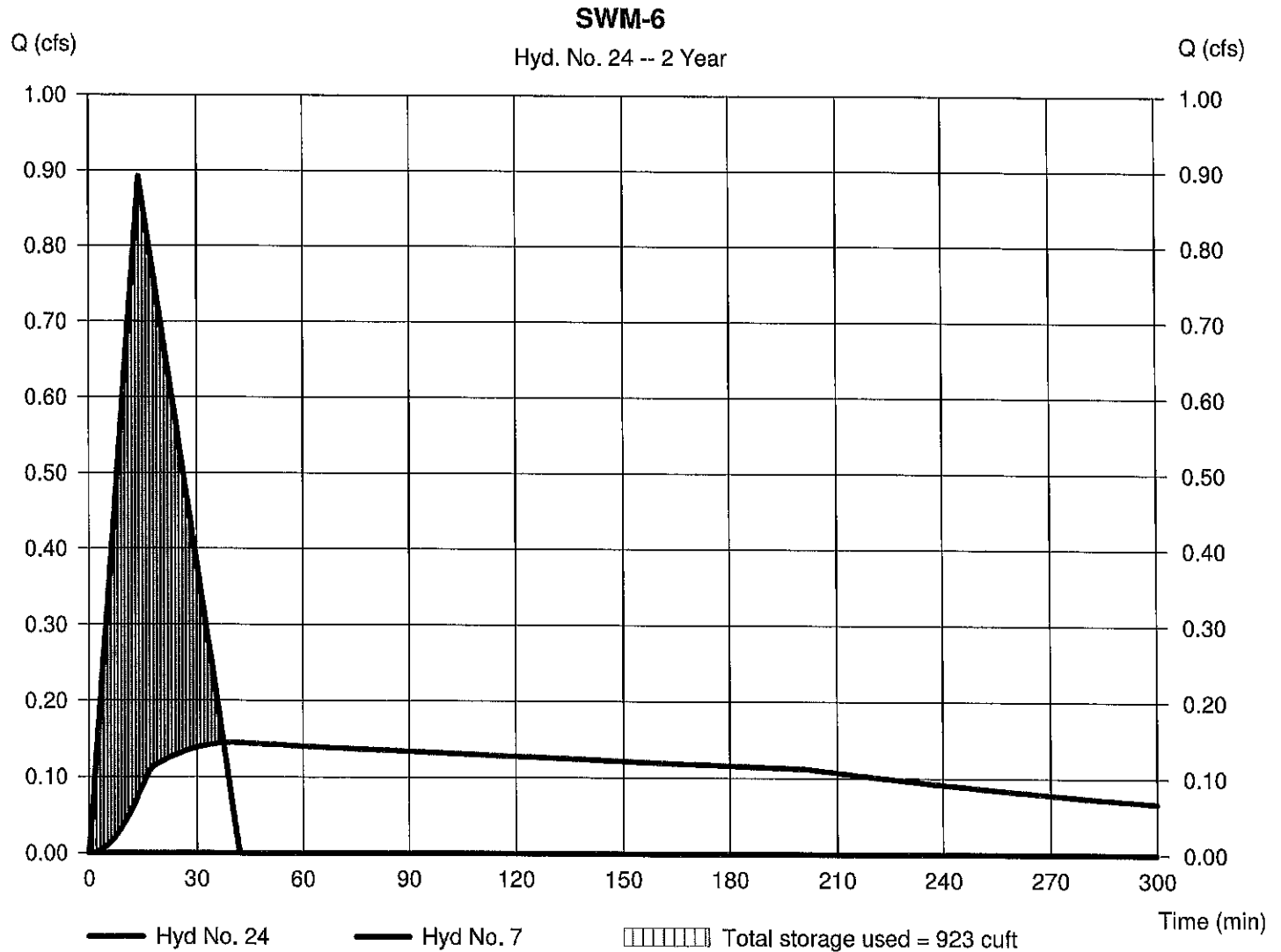
Hyd. No. 24

SWM-6

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 7 - PR-DA-6
Reservoir name = SWM-6

Peak discharge = 0.000 cfs
Time to peak = 29 min
Hyd. volume = 0 cuft
Max. Elevation = 344.30 ft
Max. Storage = 923 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

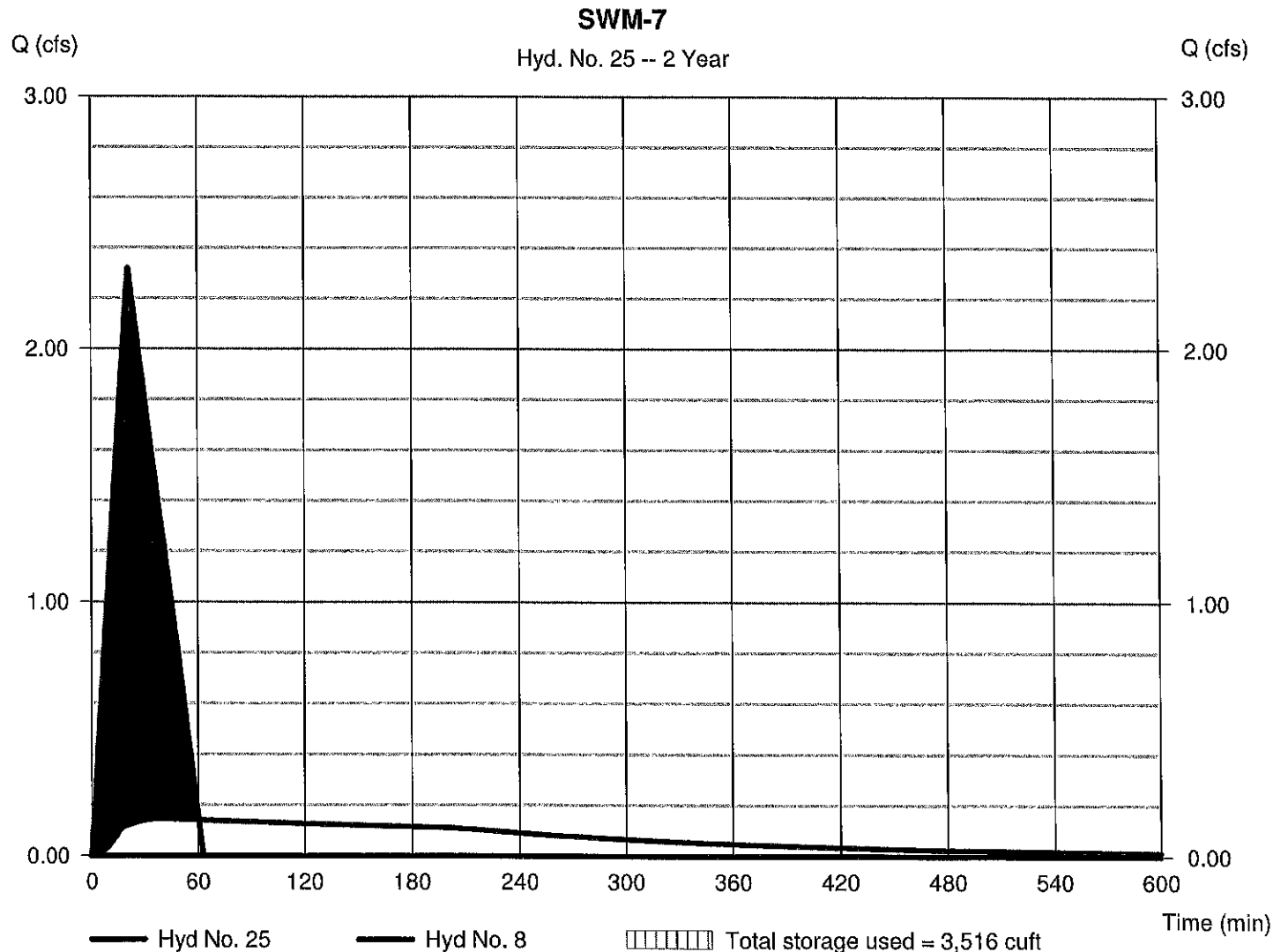
Hyd. No. 25

SWM-7

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 8 - PR-DA-7
Reservoir name = SWM-7

Peak discharge = 0.000 cfs
Time to peak = 184 min
Hyd. volume = 0 cuft
Max. Elevation = 341.91 ft
Max. Storage = 3,516 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

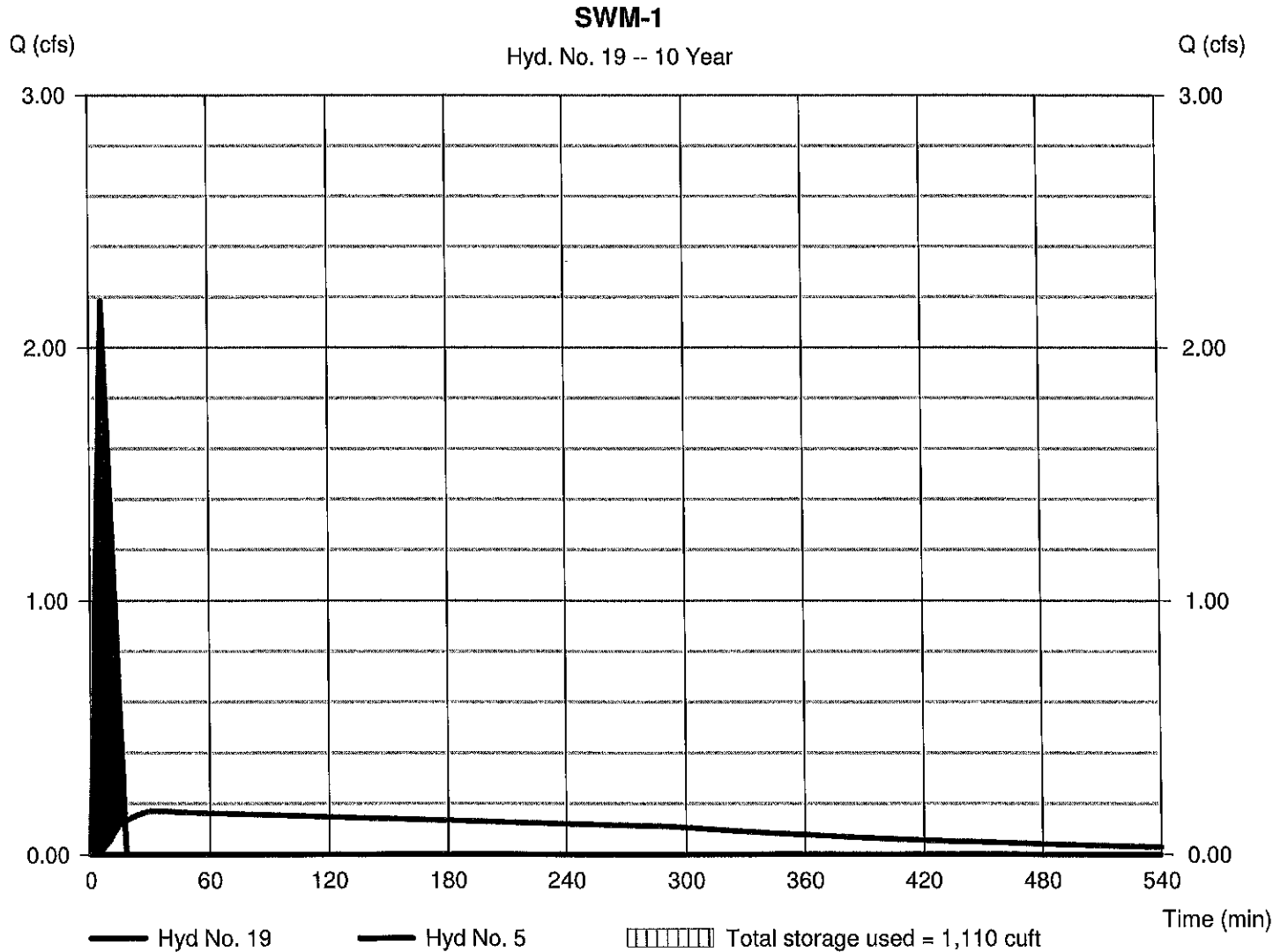
Hyd. No. 19

SWM-1

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyd. No. = 5 - PR-DA-1
Reservoir name = SWM-1

Peak discharge = 0.000 cfs
Time to peak = 249 min
Hyd. volume = 0 cuft
Max. Elevation = 292.22 ft
Max. Storage = 1,110 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

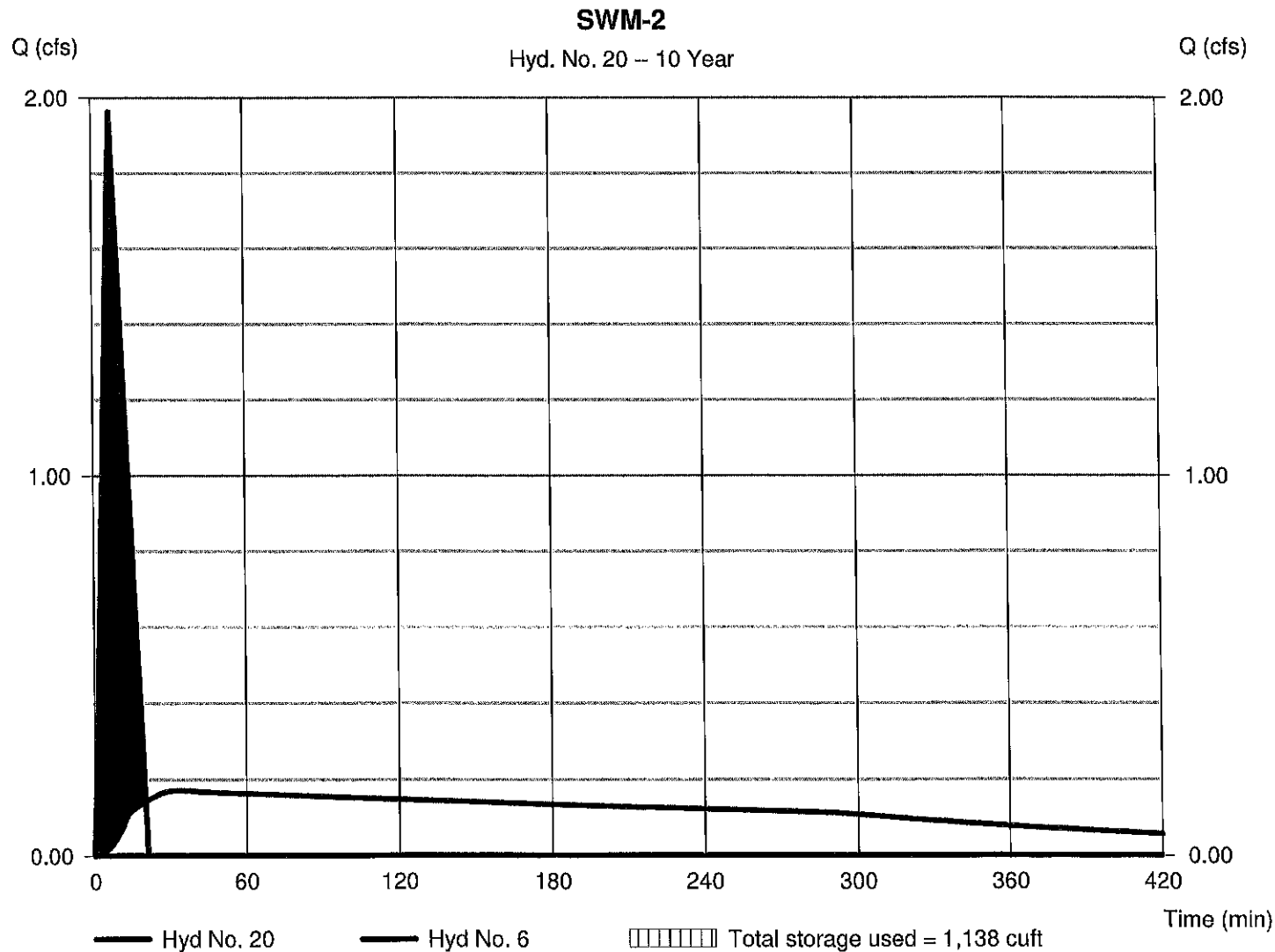
Hyd. No. 20

SWM-2

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 6 - PR-DA-2
 Reservoir name = SWM-2

Peak discharge = 0.000 cfs
 Time to peak = 206 min
 Hyd. volume = 0 cuft
 Max. Elevation = 295.97 ft
 Max. Storage = 1,138 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

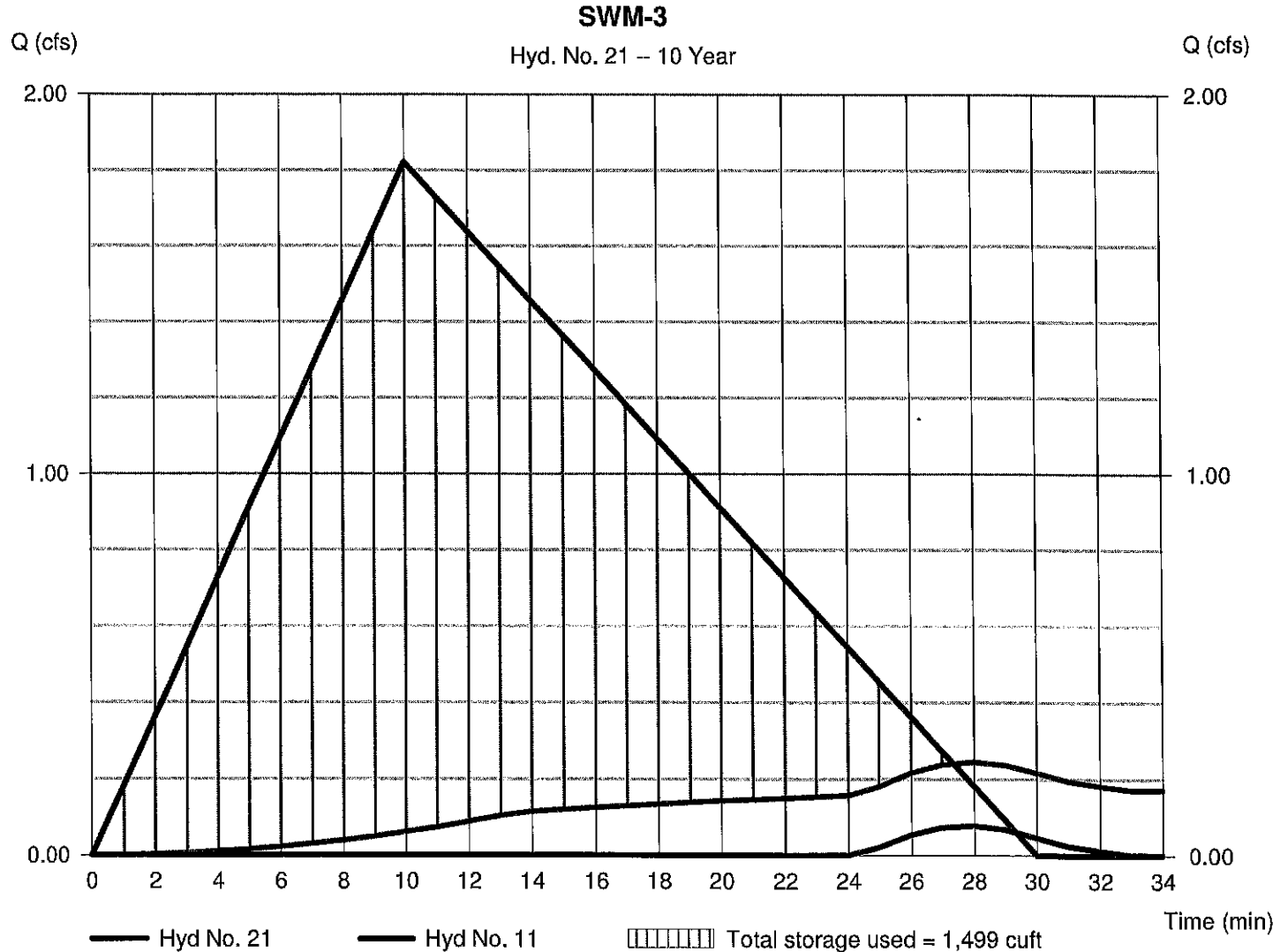
Hyd. No. 21

SWM-3

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - PR-DA-3
 Reservoir name = SWM-3

Peak discharge = 0.077 cfs
 Time to peak = 28 min
 Hyd. volume = 22 cuft
 Max. Elevation = 292.02 ft
 Max. Storage = 1,499 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

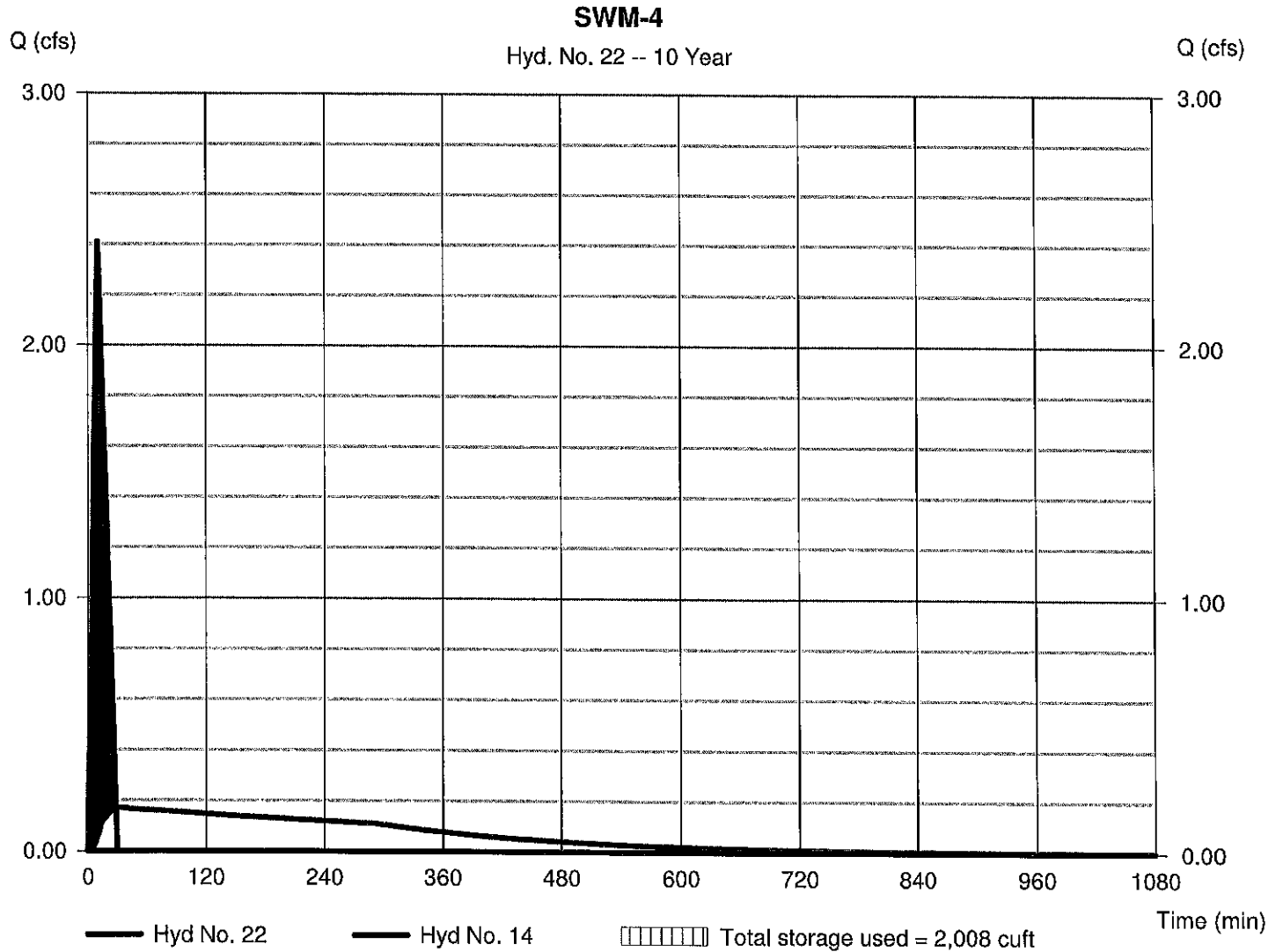
Hyd. No. 22

SWM-4

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 14 - PR-DA-4
 Reservoir name = SWM-4

Peak discharge = 0.000 cfs
 Time to peak = 87 min
 Hyd. volume = 0 cuft
 Max. Elevation = 281.87 ft
 Max. Storage = 2,008 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

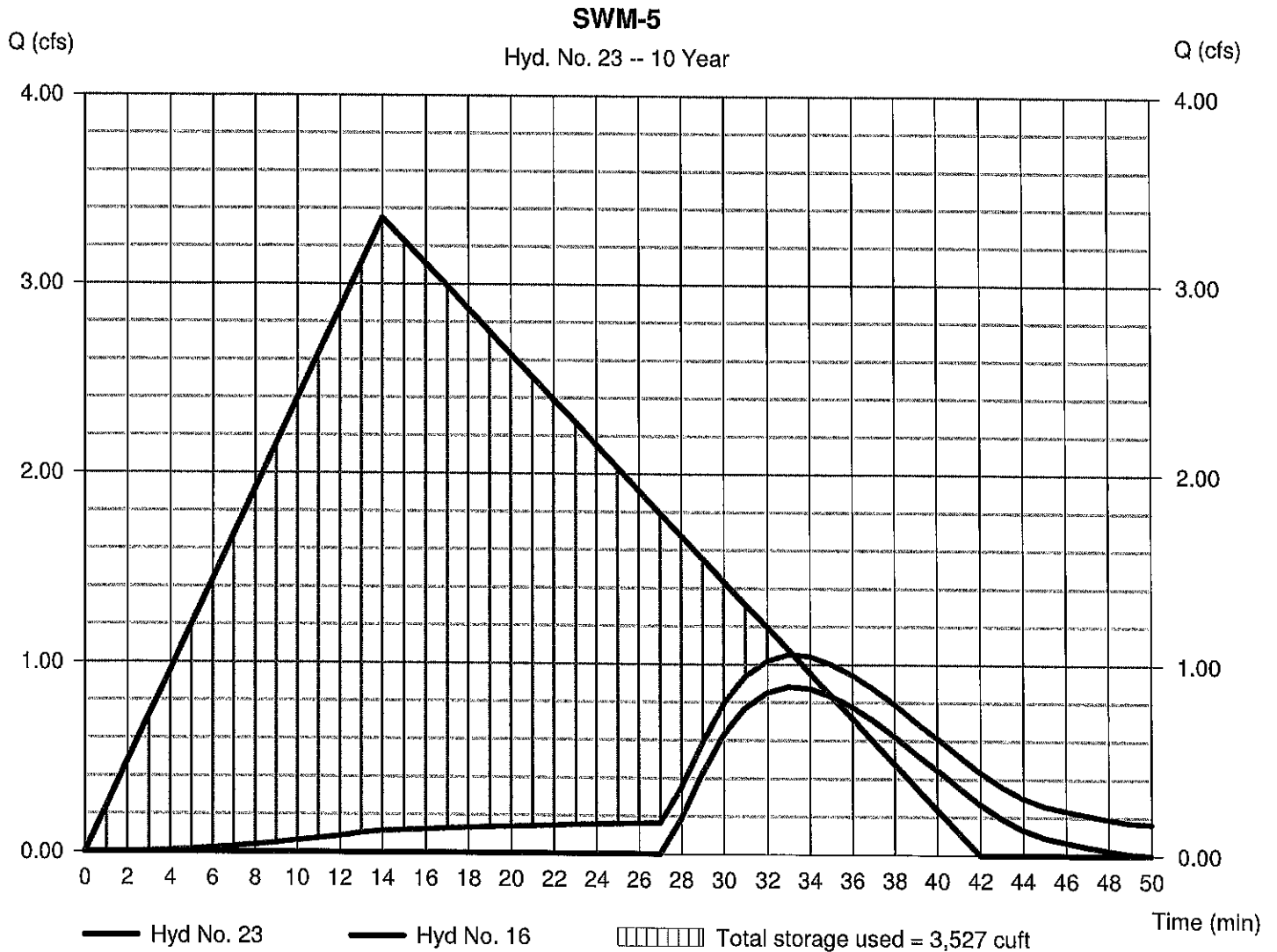
Hyd. No. 23

SWM-5

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 16 - PR-DA-5
 Reservoir name = SWM-5

Peak discharge = 0.880 cfs
 Time to peak = 33 min
 Hyd. volume = 581 cuft
 Max. Elevation = 316.10 ft
 Max. Storage = 3,527 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

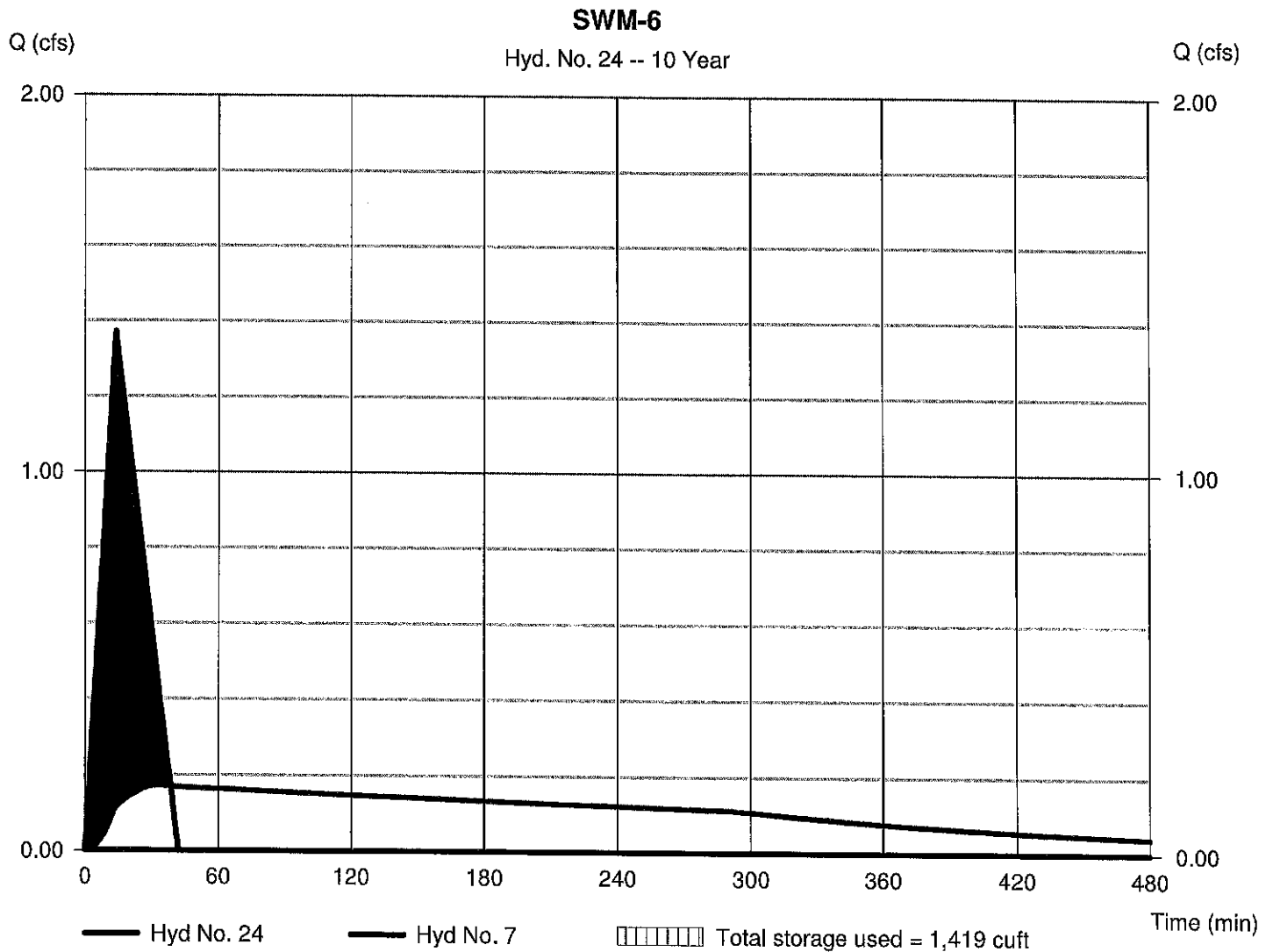
Hyd. No. 24

SWM-6

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyd. No. = 7 - PR-DA-6
Reservoir name = SWM-6

Peak discharge = 0.000 cfs
Time to peak = 24 min
Hyd. volume = 0 cuft
Max. Elevation = 344.46 ft
Max. Storage = 1,419 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

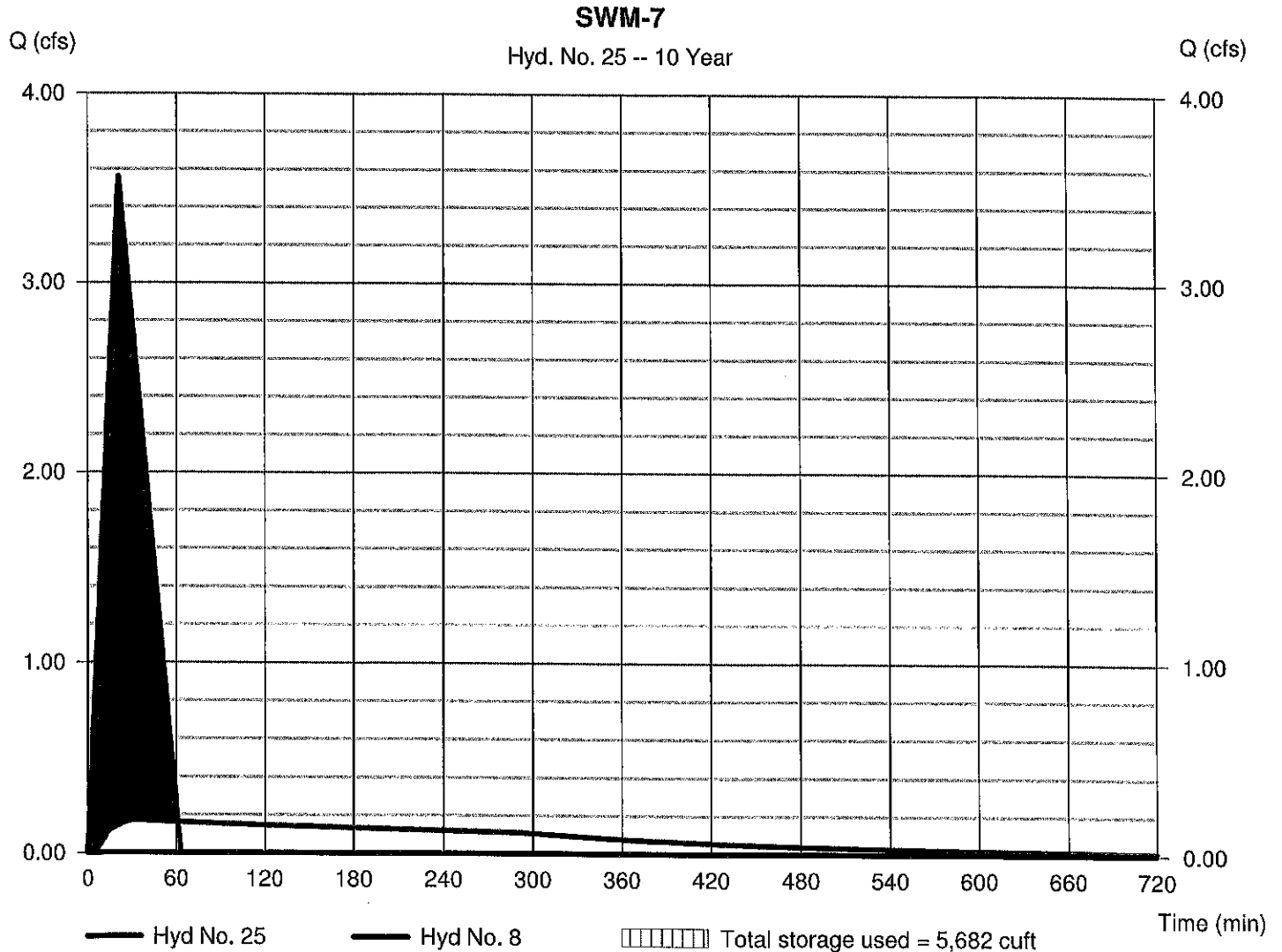
Hyd. No. 25

SWM-7

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 8 - PR-DA-7
 Reservoir name = SWM-7

Peak discharge = 0.000 cfs
 Time to peak = 297 min
 Hyd. volume = 0 cuft
 Max. Elevation = 342.70 ft
 Max. Storage = 5,682 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



A-64

Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

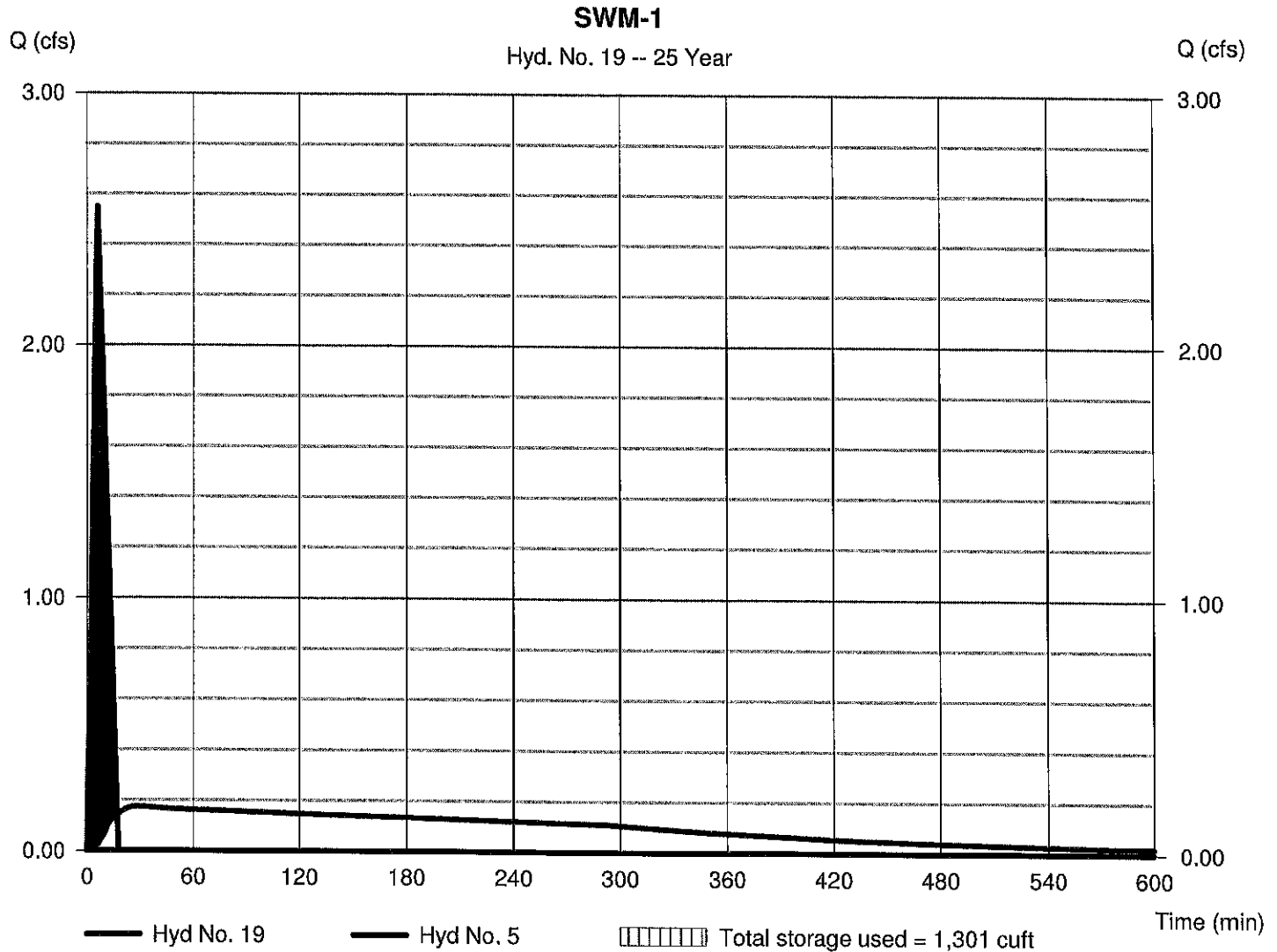
Hyd. No. 19

SWM-1

Hydrograph type = Reservoir
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyd. No. = 5 - PR-DA-1
Reservoir name = SWM-1

Peak discharge = 0.000 cfs
Time to peak = 281 min
Hyd. volume = 0 cuft
Max. Elevation = 292.36 ft
Max. Storage = 1,301 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

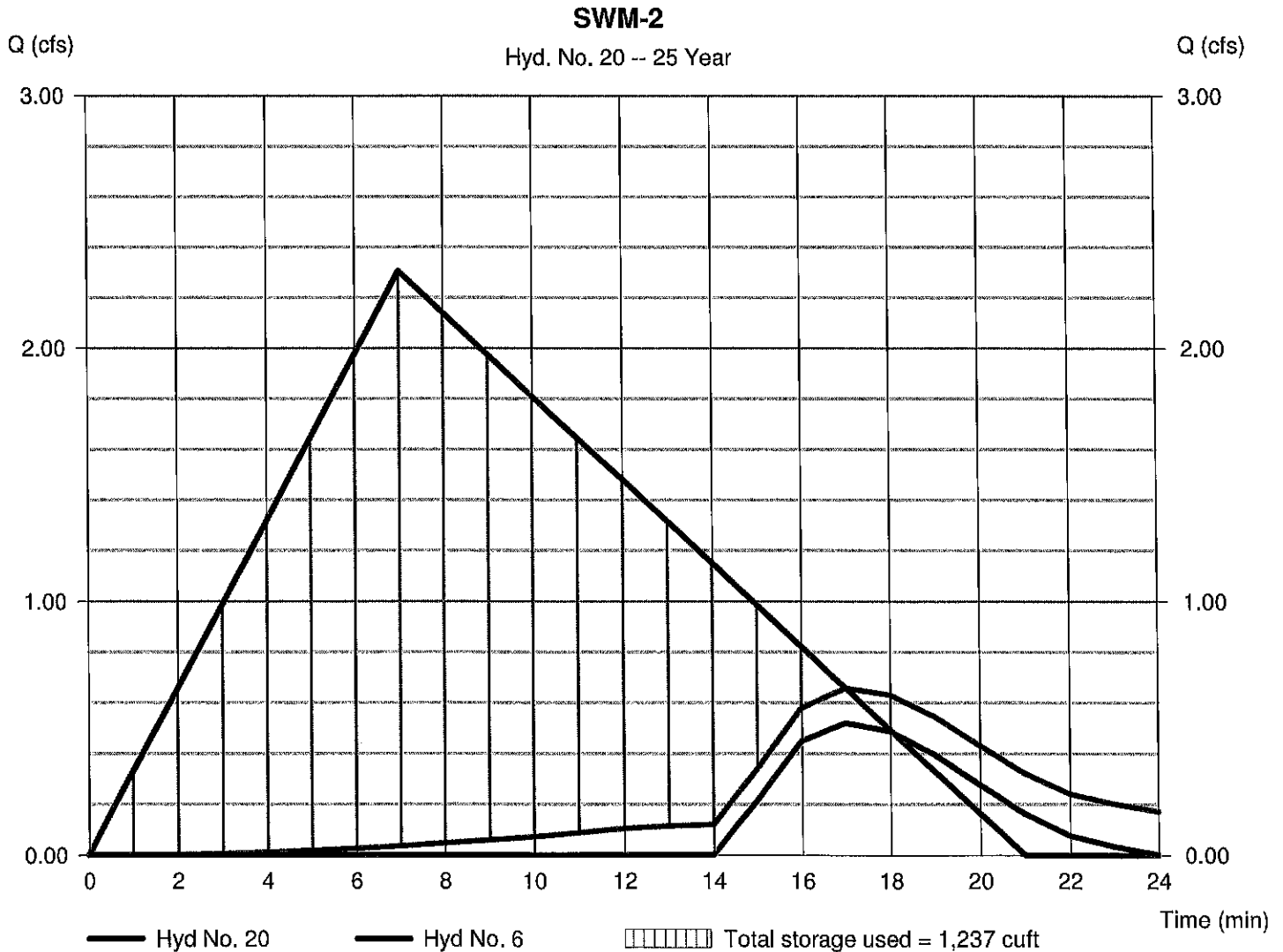
Hyd. No. 20

SWM-2

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 6 - PR-DA-2
 Reservoir name = SWM-2

Peak discharge = 0.519 cfs
 Time to peak = 17 min
 Hyd. volume = 156 cuft
 Max. Elevation = 296.07 ft
 Max. Storage = 1,237 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

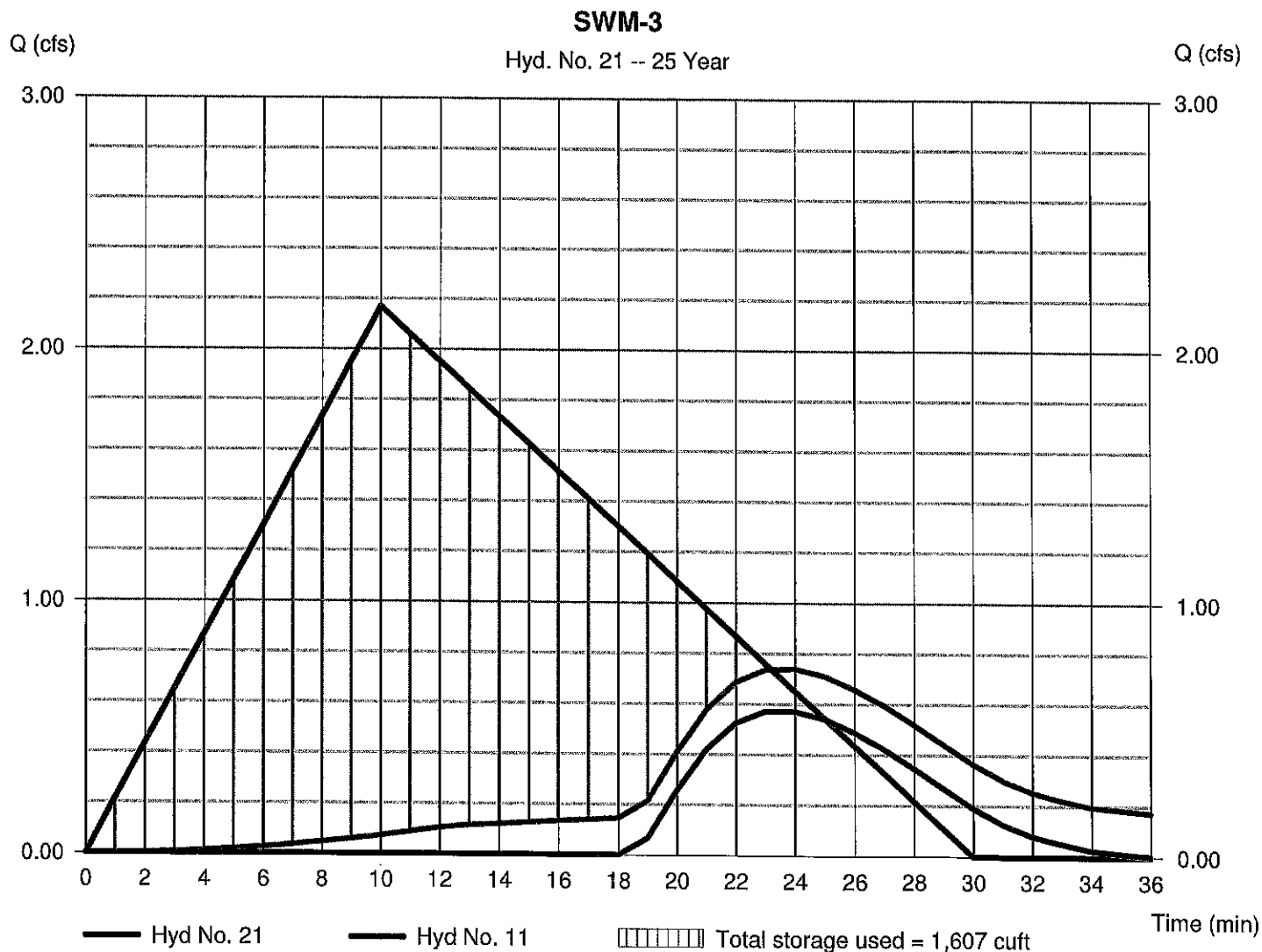
Hyd. No. 21

SWM-3

Hydrograph type = Reservoir
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyd. No. = 11 - PR-DA-3
Reservoir name = SWM-3

Peak discharge = 0.570 cfs
Time to peak = 24 min
Hyd. volume = 296 cuft
Max. Elevation = 292.08 ft
Max. Storage = 1,607 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

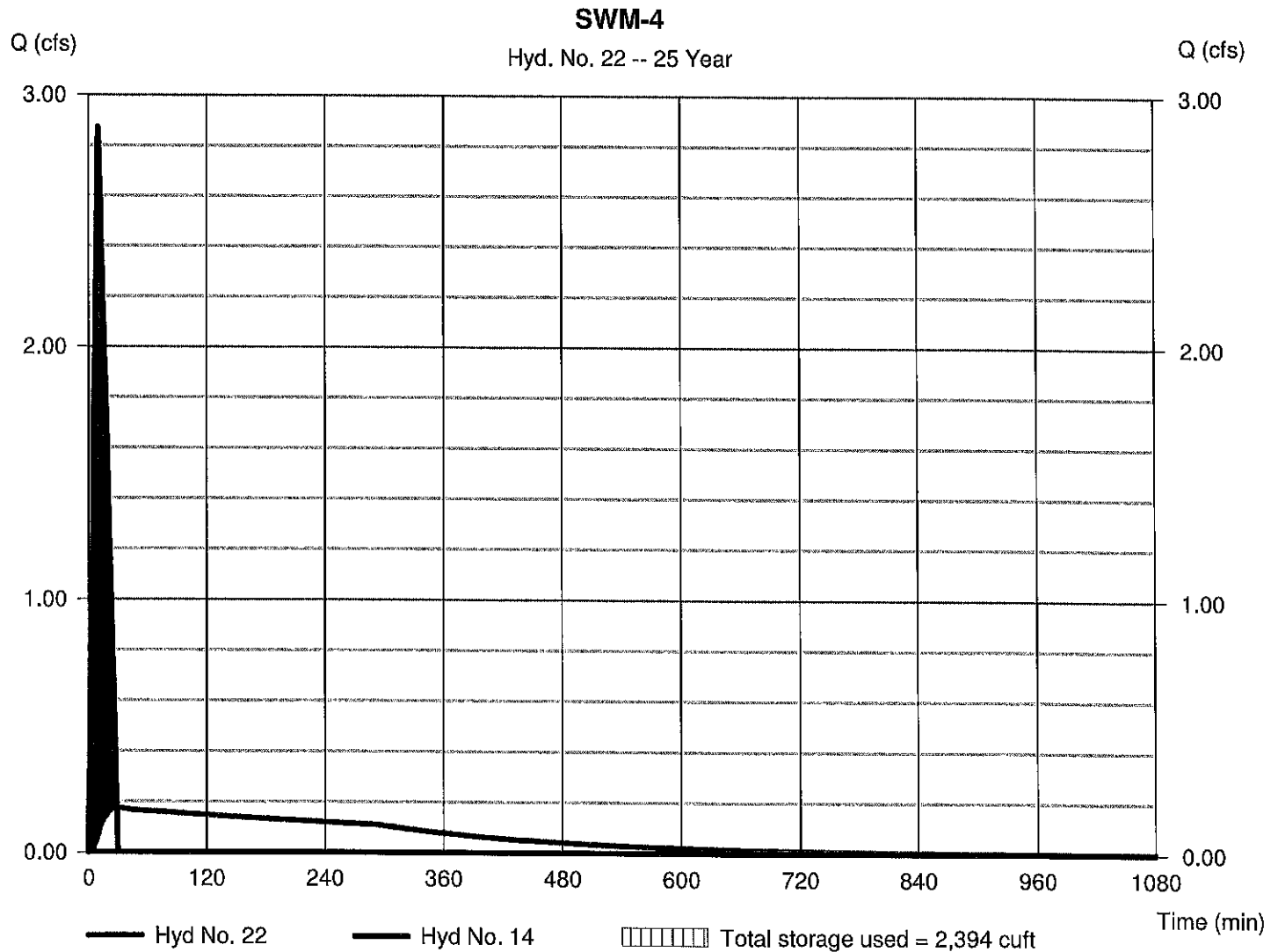
Hyd. No. 22

SWM-4

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 14 - PR-DA-4
 Reservoir name = SWM-4

Peak discharge = 0.000 cfs
 Time to peak = 131 min
 Hyd. volume = 0 cuft
 Max. Elevation = 282.03 ft
 Max. Storage = 2,394 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

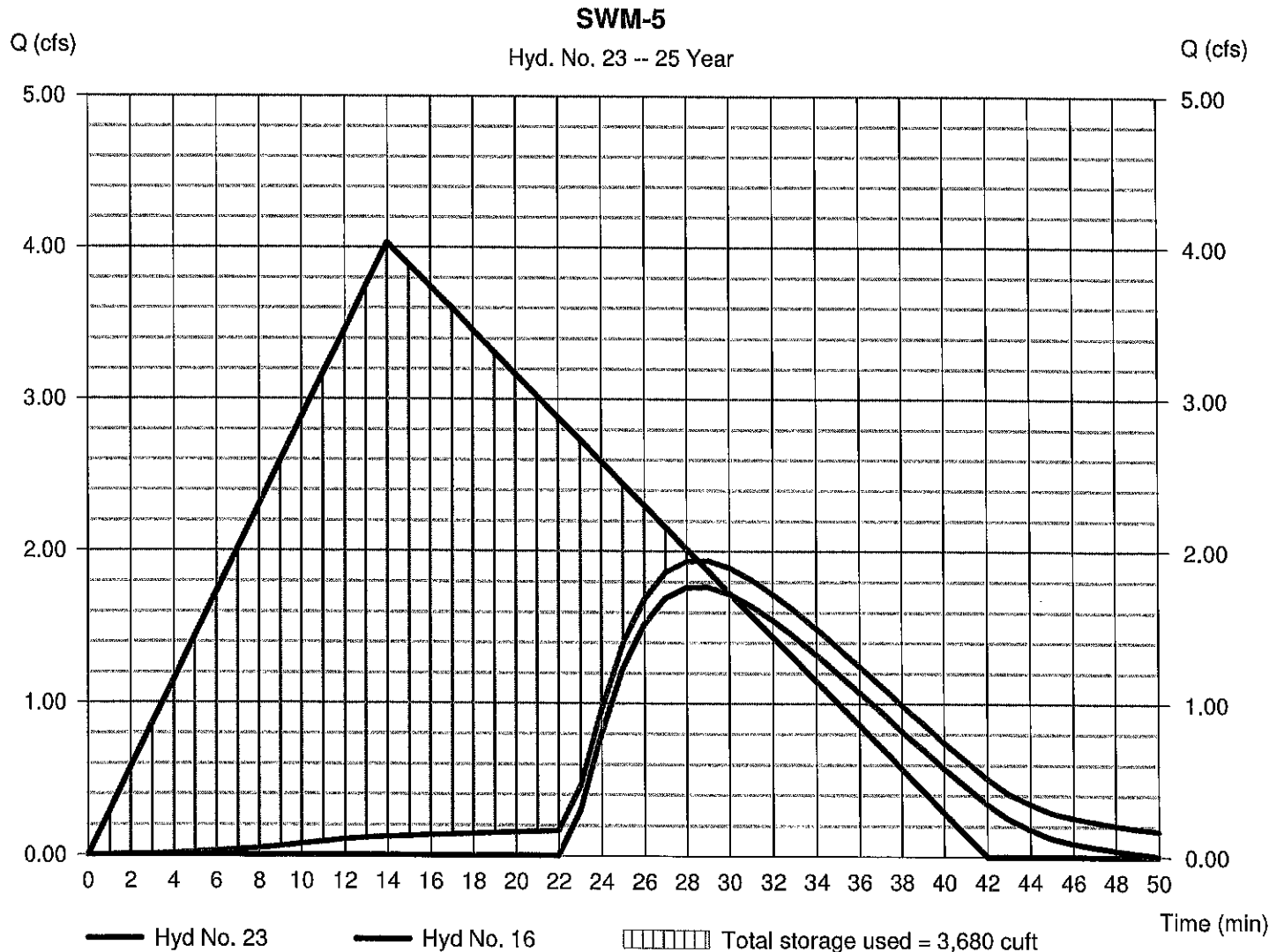
Hyd. No. 23

SWM-5

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 16 - PR-DA-5
 Reservoir name = SWM-5

Peak discharge = 1.763 cfs
 Time to peak = 29 min
 Hyd. volume = 1,415 cuft
 Max. Elevation = 316.17 ft
 Max. Storage = 3,680 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

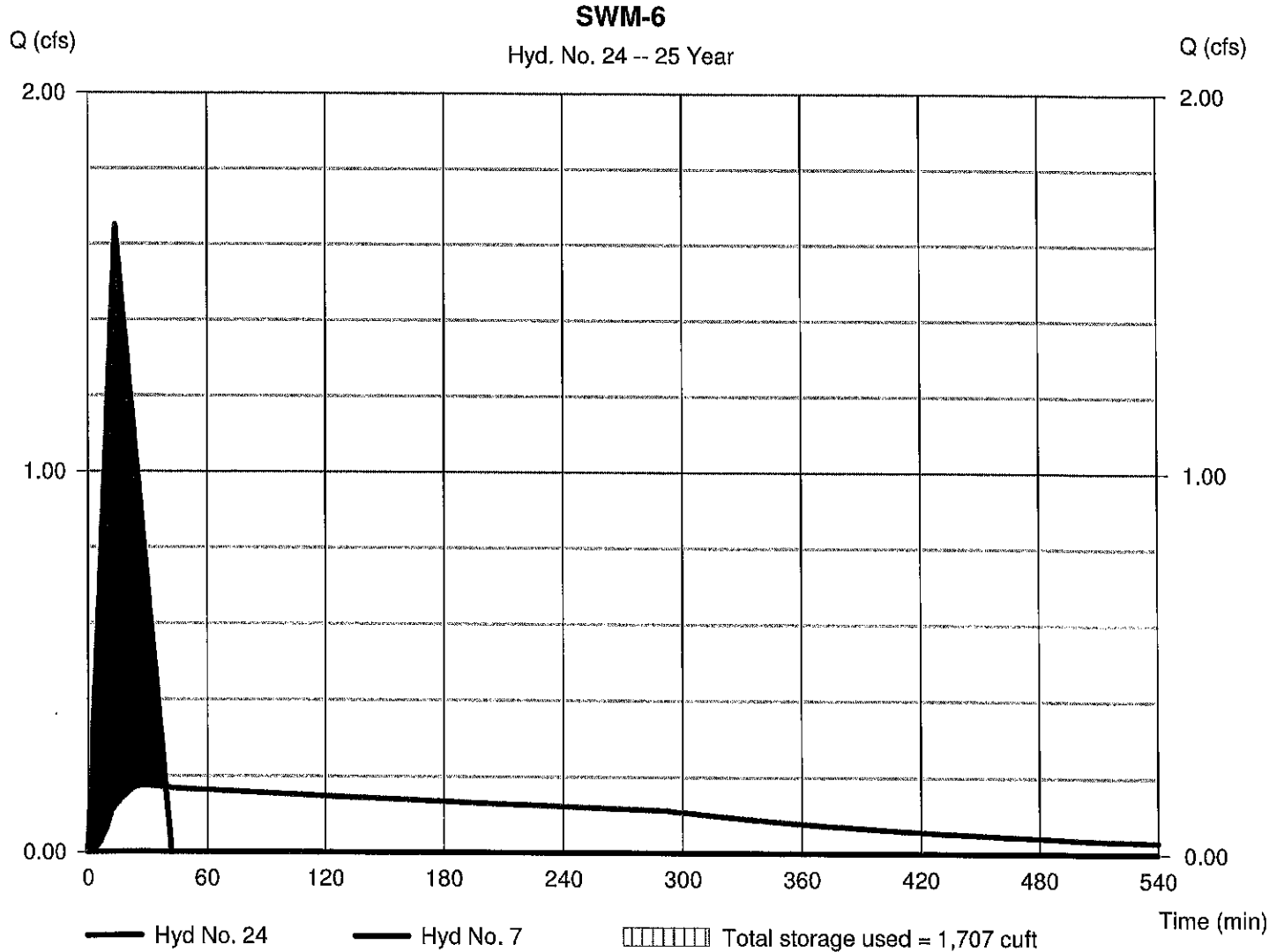
Hyd. No. 24

SWM-6

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 7 - PR-DA-6
 Reservoir name = SWM-6

Peak discharge = 0.000 cfs
 Time to peak = 22 min
 Hyd. volume = 0 cuft
 Max. Elevation = 344.56 ft
 Max. Storage = 1,707 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydratlow Hydrographs by Intelsolve v9.02

Tuesday, Jun 1, 2021

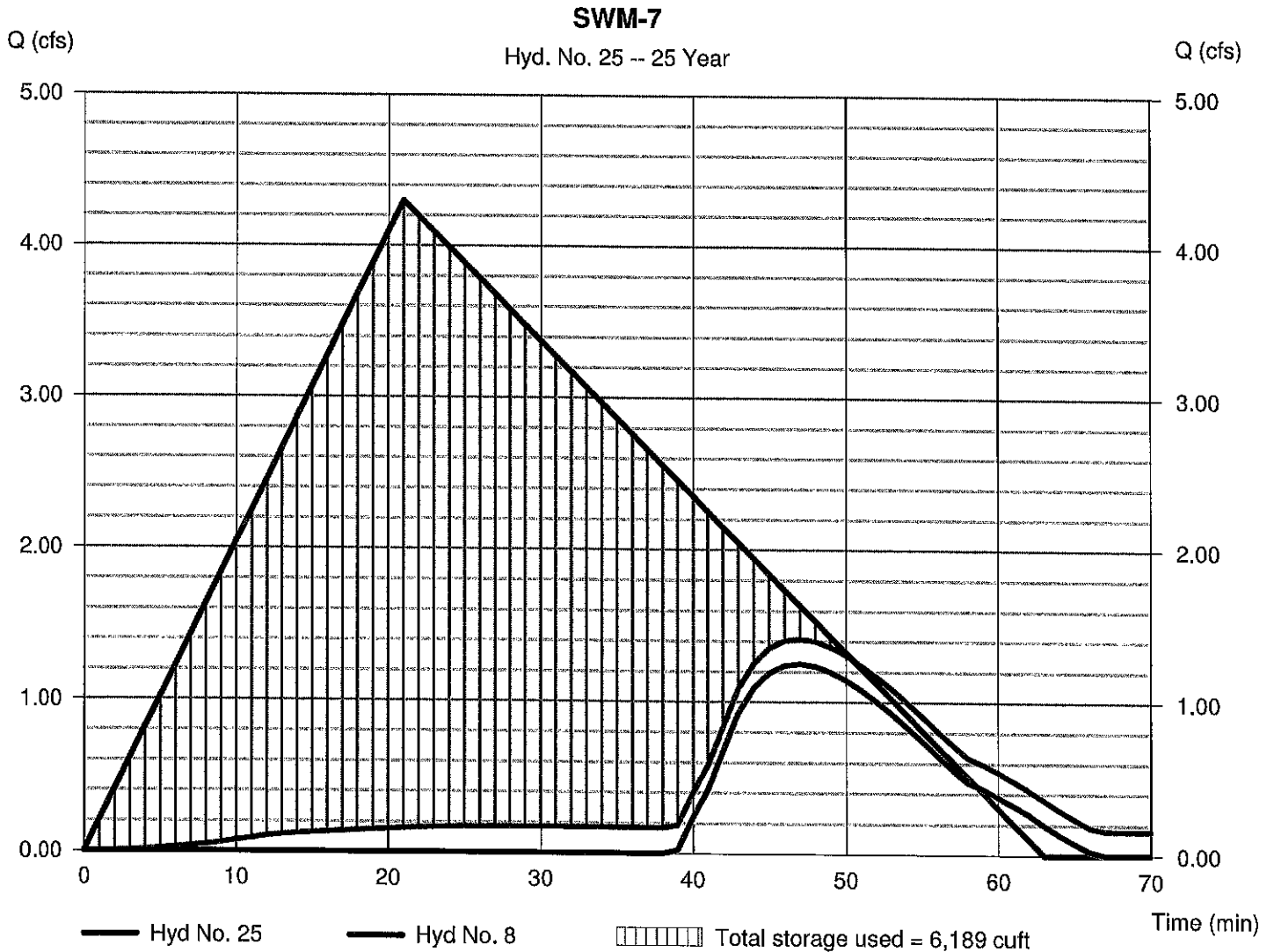
Hyd. No. 25

SWM-7

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 8 - PR-DA-7
 Reservoir name = SWM-7

Peak discharge = 1.250 cfs
 Time to peak = 47 min
 Hyd. volume = 1,122 cuft
 Max. Elevation = 342.88 ft
 Max. Storage = 6,189 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

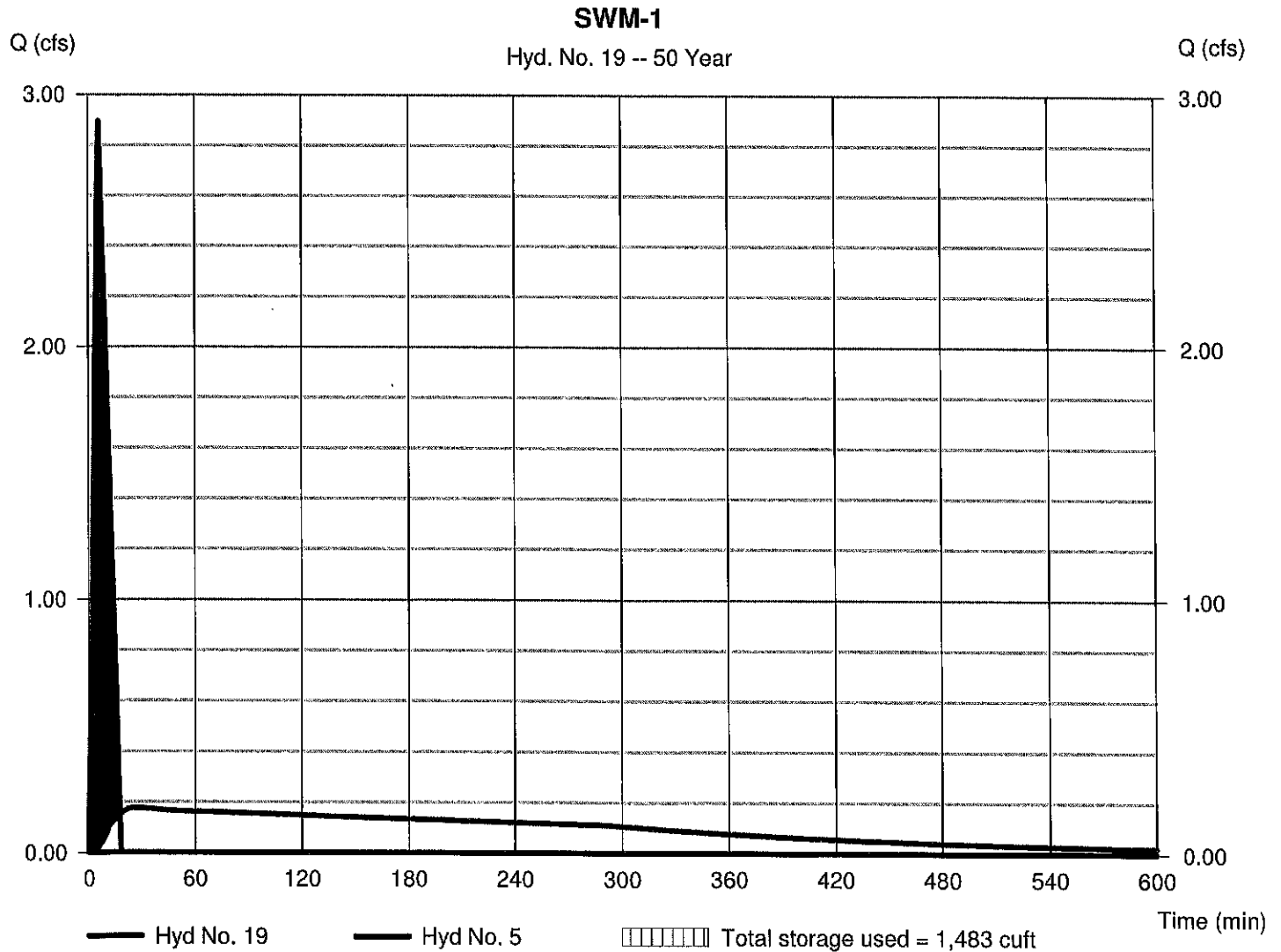
Hyd. No. 19

SWM-1

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyd. No. = 5 - PR-DA-1
 Reservoir name = SWM-1

Peak discharge = 0.000 cfs
 Time to peak = 243 min
 Hyd. volume = 0 cuft
 Max. Elevation = 292.49 ft
 Max. Storage = 1,483 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

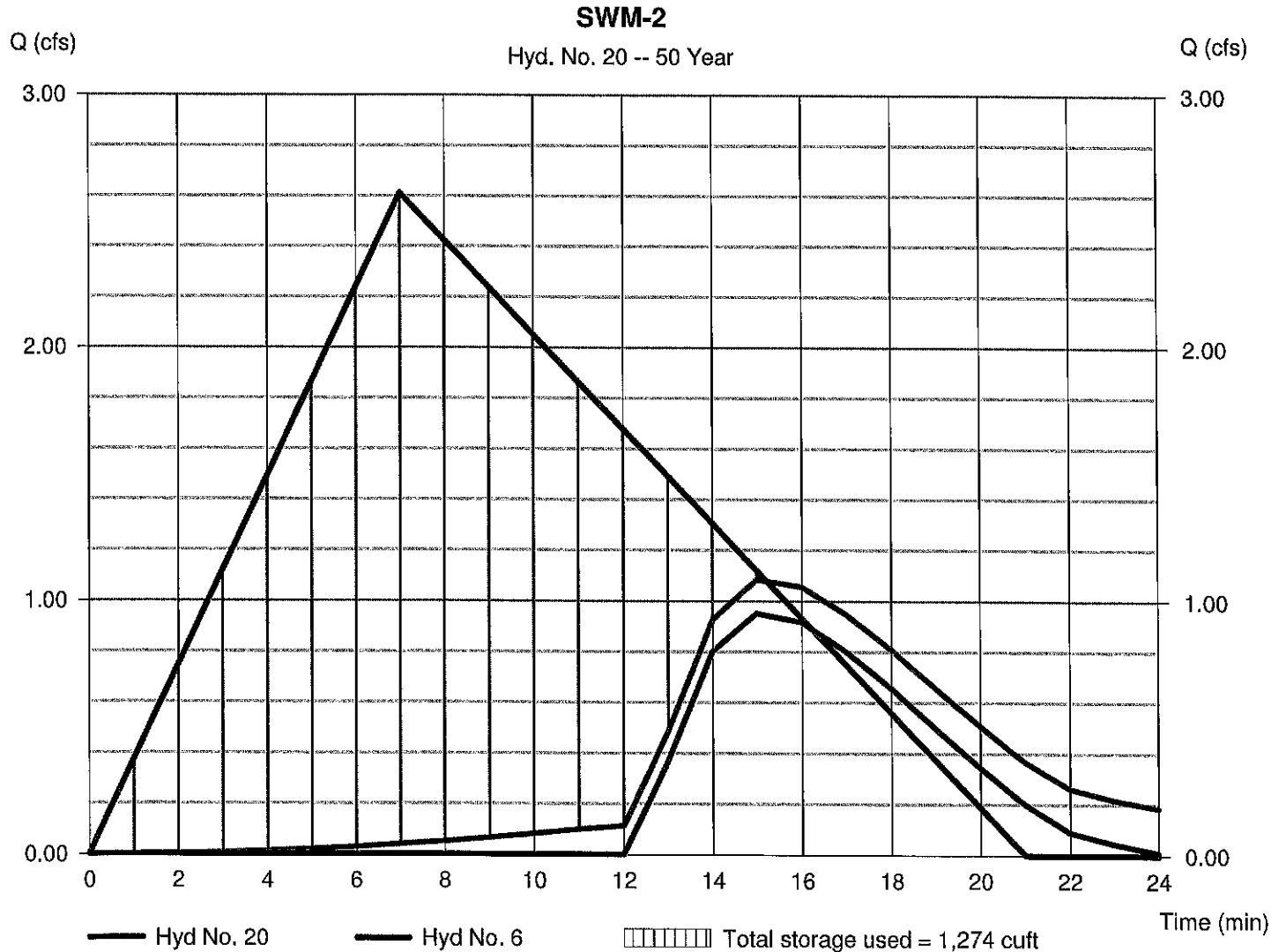
Hyd. No. 20

SWM-2

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyd. No. = 6 - PR-DA-2
 Reservoir name = SWM-2

Peak discharge = 0.950 cfs
 Time to peak = 15 min
 Hyd. volume = 340 cuft
 Max. Elevation = 296.11 ft
 Max. Storage = 1,274 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

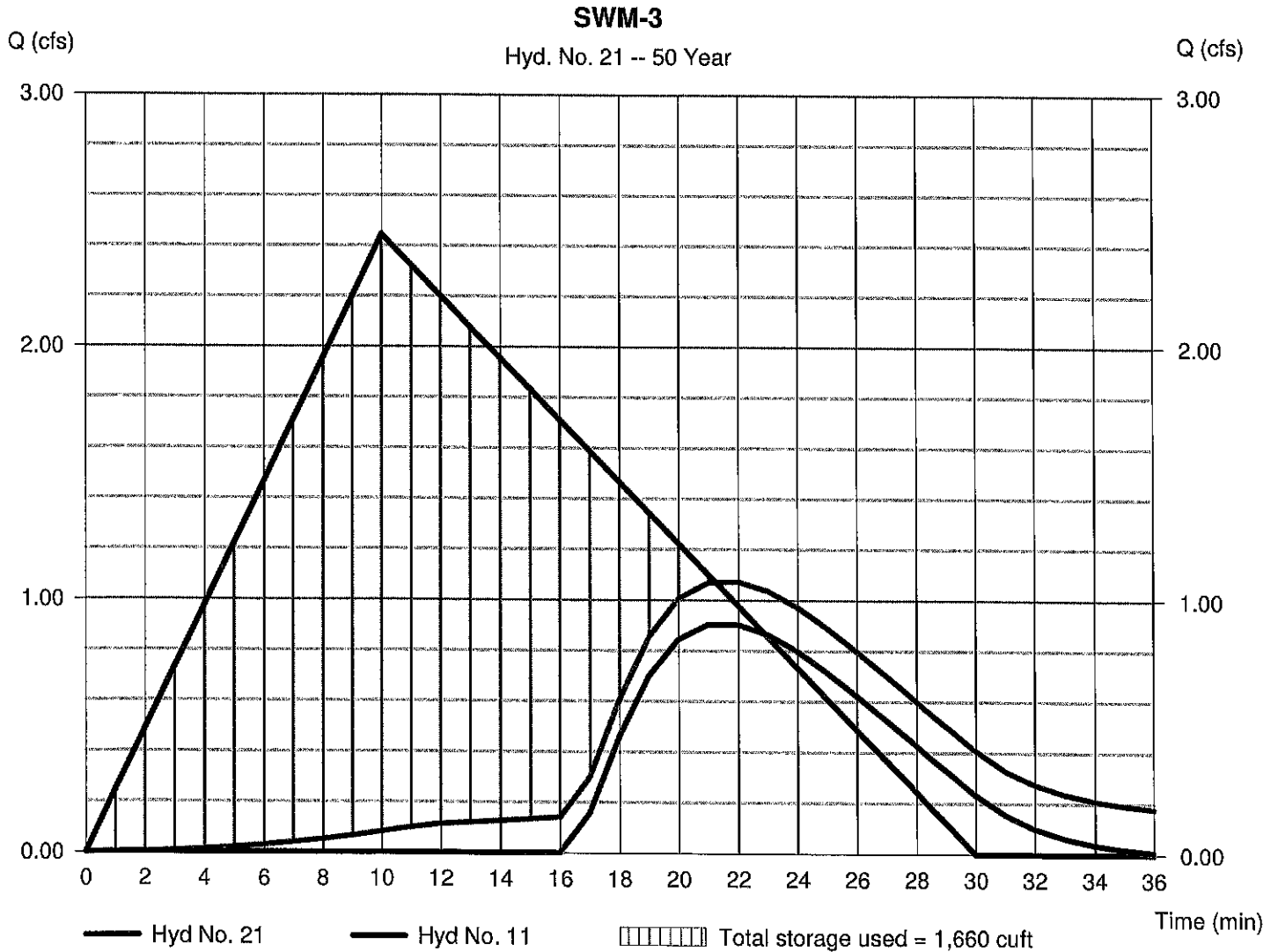
Hyd. No. 21

SWM-3

Hydrograph type = Reservoir
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyd. No. = 11 - PR-DA-3
Reservoir name = SWM-3

Peak discharge = 0.901 cfs
Time to peak = 22 min
Hyd. volume = 530 cuft
Max. Elevation = 292.11 ft
Max. Storage = 1,660 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellsolve v9.02

Tuesday, Jun 1, 2021

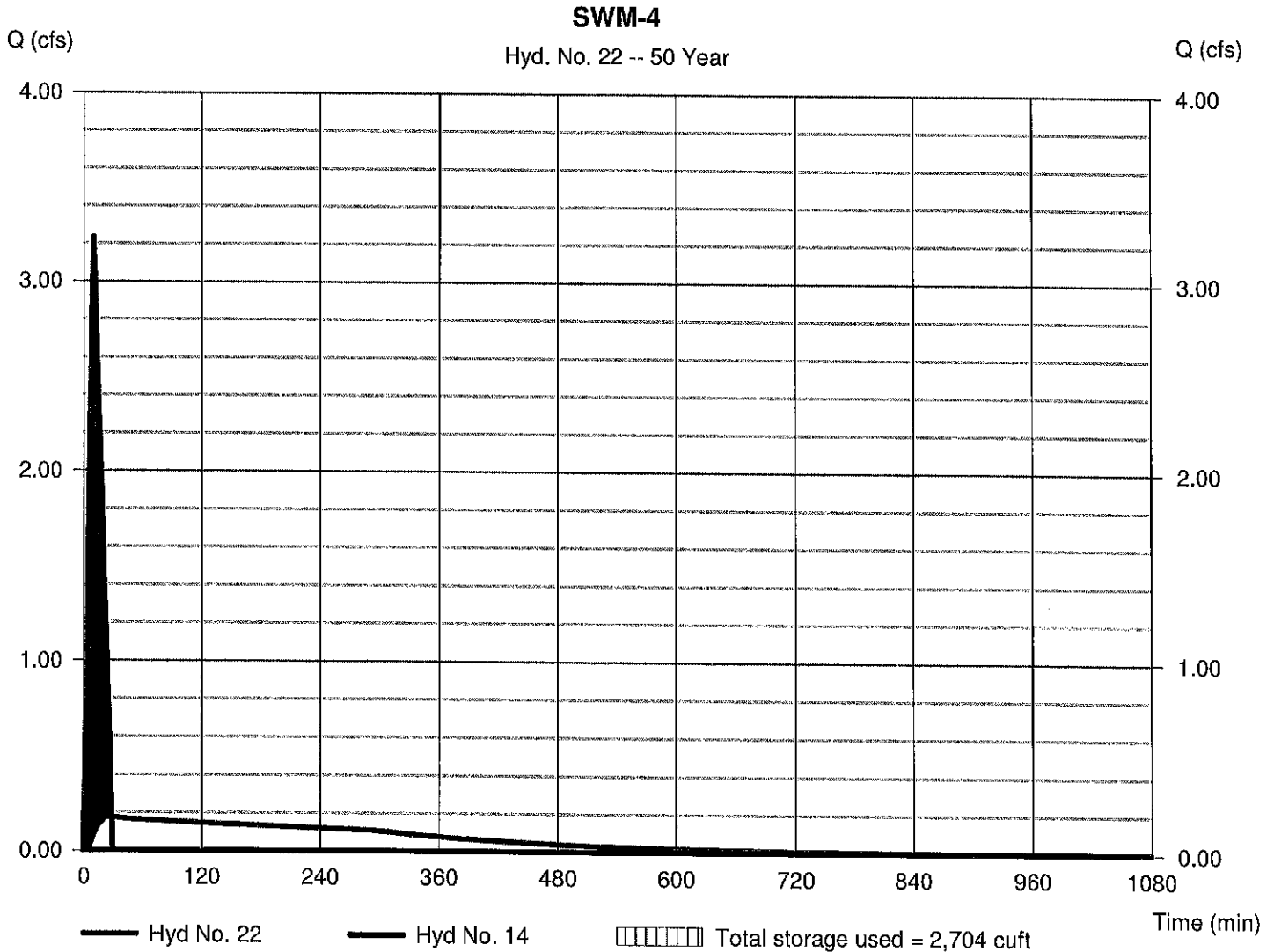
Hyd. No. 22

SWM-4

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyd. No. = 14 - PR-DA-4
 Reservoir name = SWM-4

Peak discharge = 0.000 cfs
 Time to peak = 13 min
 Hyd. volume = 0 cuft
 Max. Elevation = 282.13 ft
 Max. Storage = 2,704 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

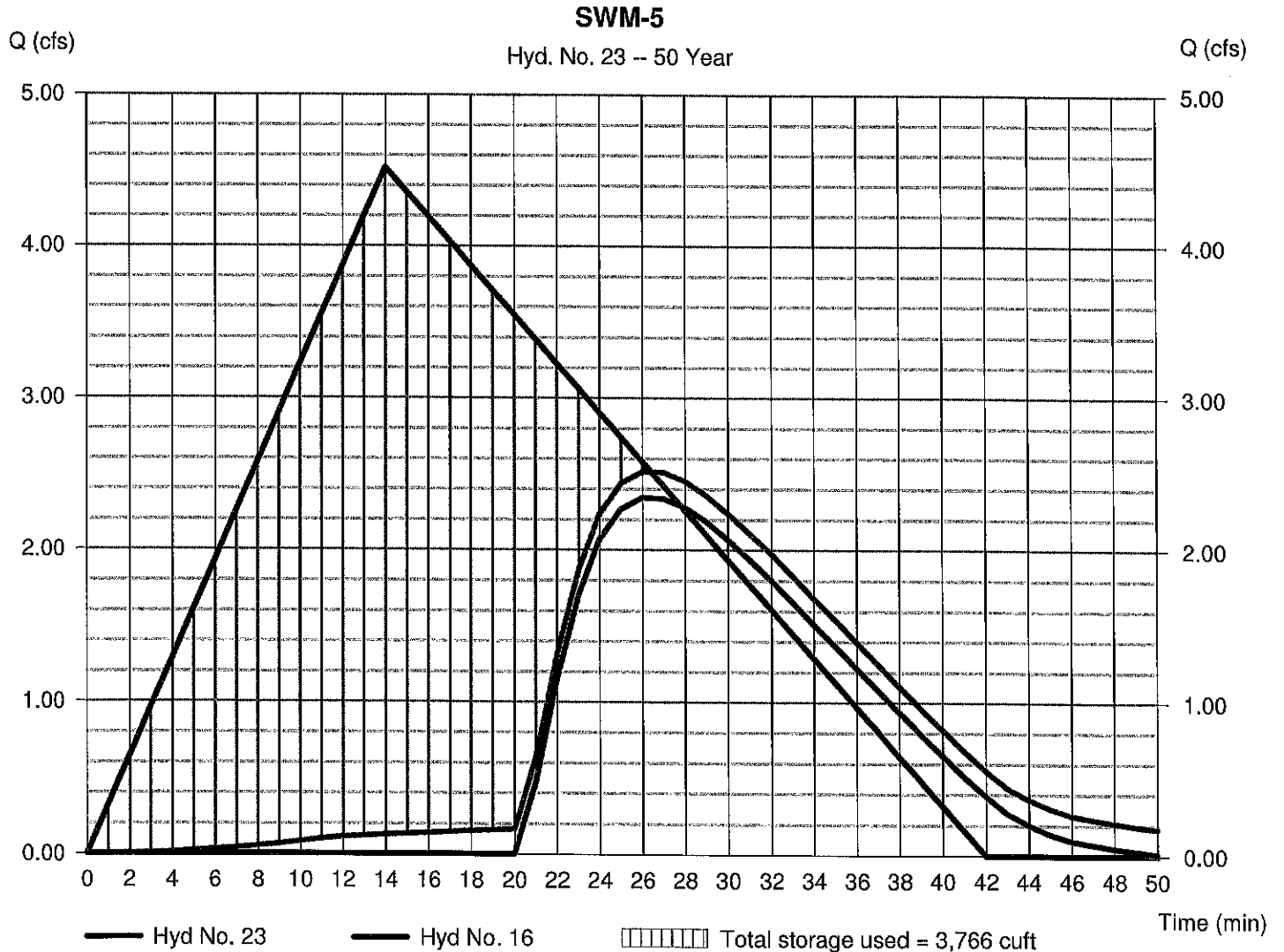
Hyd. No. 23

SWM-5

Hydrograph type = Reservoir
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyd. No. = 16 - PR-DA-5
Reservoir name = SWM-5

Peak discharge = 2.339 cfs
Time to peak = 26 min
Hyd. volume = 2,013 cuft
Max. Elevation = 316.20 ft
Max. Storage = 3,766 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, Jun 1, 2021

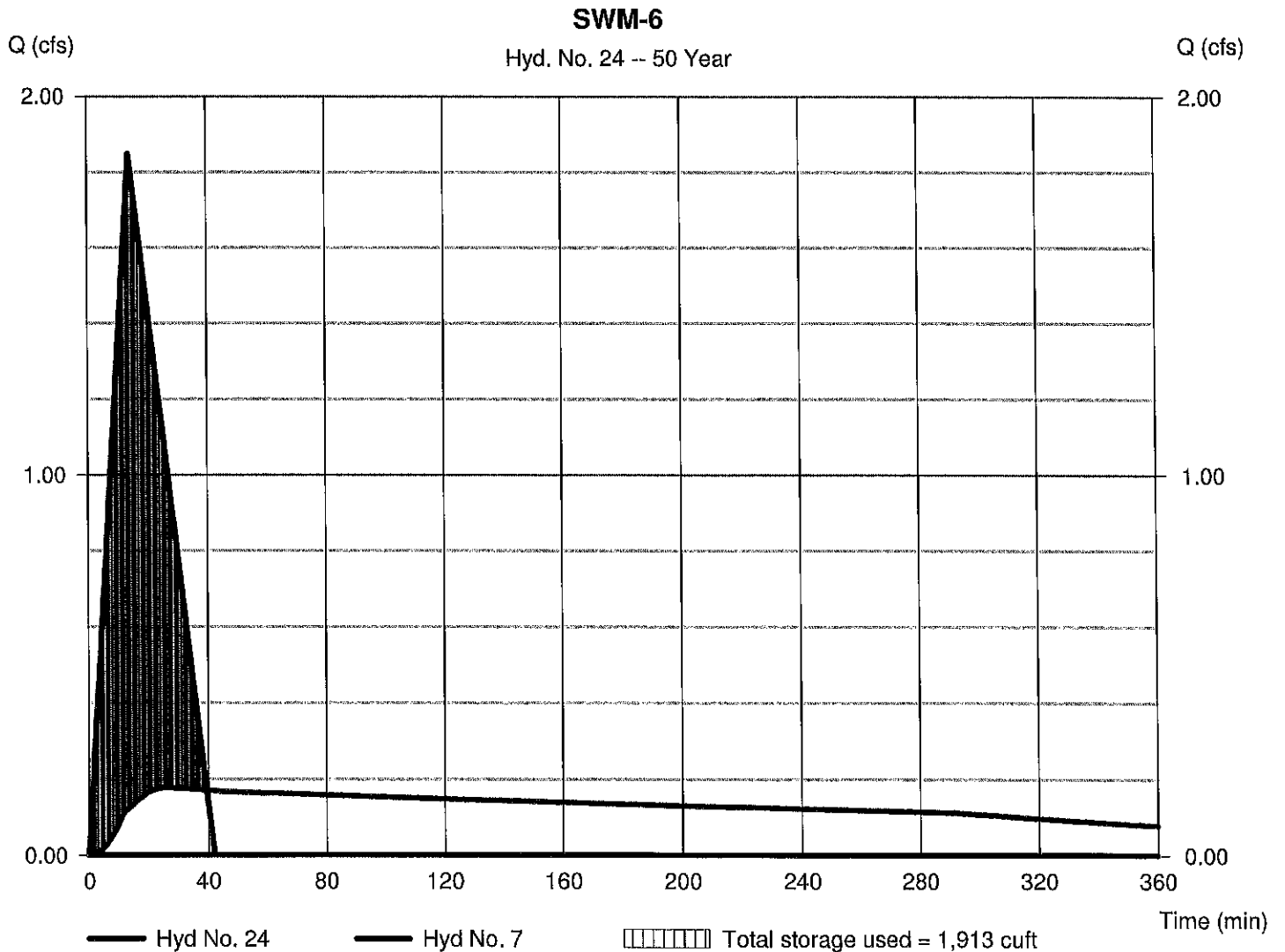
Hyd. No. 24

SWM-6

Hydrograph type = Reservoir
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyd. No. = 7 - PR-DA-6
Reservoir name = SWM-6

Peak discharge = 0.000 cfs
Time to peak = 46 min
Hyd. volume = 0 cuft
Max. Elevation = 344.62 ft
Max. Storage = 1,913 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Tuesday, Jun 1, 2021

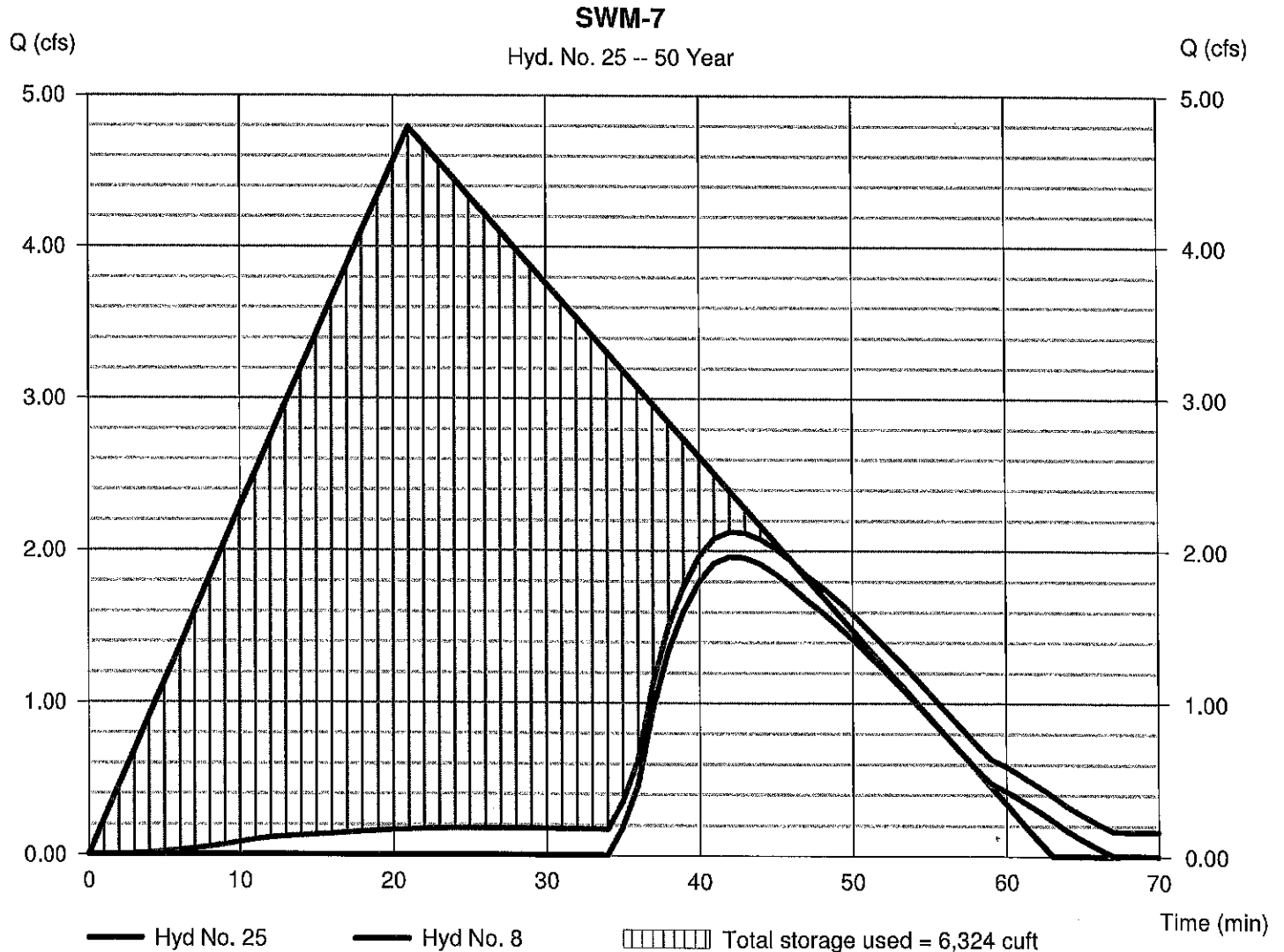
Hyd. No. 25

SWM-7

Hydrograph type = Reservoir
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyd. No. = 8 - PR-DA-7
Reservoir name = SWM-7

Peak discharge = 1.956 cfs
Time to peak = 42 min
Hyd. volume = 2,018 cuft
Max. Elevation = 342.93 ft
Max. Storage = 6,324 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydraflow Rainfall Report

Hydraflow Hydrographs by Intellisolve v9.02

Tuesday, May 11, 2021

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	38.5600	10.7000	0.8053	-----
3	0.0000	0.0000	0.0000	-----
5	41.1200	8.8000	0.7600	-----
10	45.9700	8.5000	0.7477	-----
25	119.5095	15.0000	0.9201	-----
50	114.7309	13.2000	0.8912	-----
100	155.7025	15.1000	0.9304	-----

File name: MIDDLESEX.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.20	3.36	2.82	2.45	2.17	1.95	1.78	1.63	1.51	1.41	1.33	1.25
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.59	4.42	3.70	3.20	2.83	2.55	2.33	2.14	1.99	1.86	1.75	1.65
10	6.57	5.19	4.34	3.76	3.33	3.00	2.74	2.52	2.35	2.19	2.06	1.95
25	7.59	6.18	5.23	4.54	4.01	3.60	3.27	2.99	2.76	2.57	2.40	2.25
50	8.64	6.96	5.85	5.06	4.46	4.00	3.63	3.32	3.07	2.85	2.66	2.50
100	9.55	7.76	6.56	5.68	5.02	4.50	4.08	3.74	3.45	3.20	2.99	2.80

Tc = time in minutes. Values may exceed 60.

Precip. file name: middlesex.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.34	0.00	5.13	6.25	7.11	7.68	7.97
SCS 6-Hr	0.00	2.35	0.00	2.95	3.45	4.00	4.55	5.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10



NOAA Atlas 14, Volume 10, Version 3
 Location name: East Hampton, Connecticut, USA*
 Latitude: 41.5624°, Longitude: -72.5404°
 Elevation: 378.96 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

PF tabular

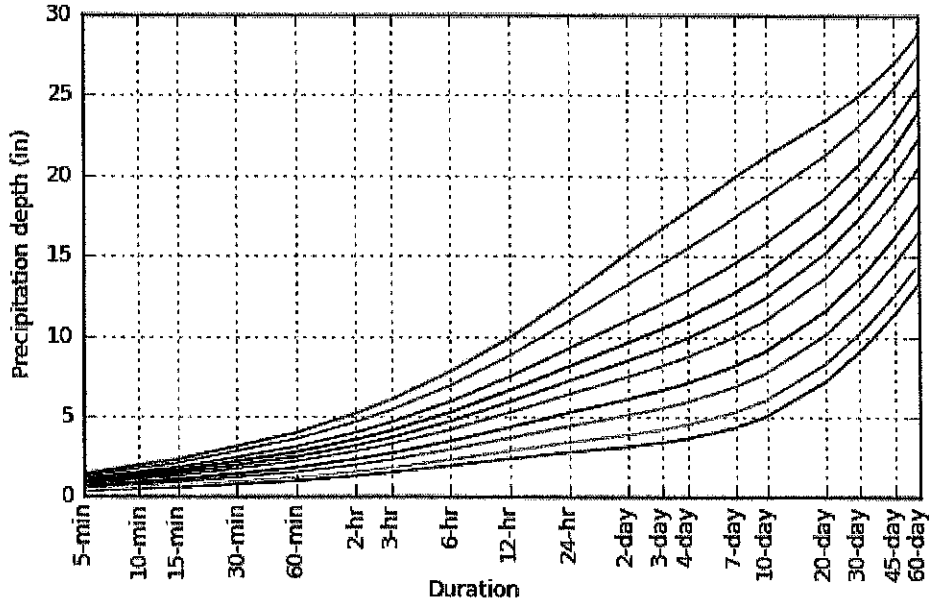
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.334 (0.260-0.416)	0.405 (0.315-0.506)	0.521 (0.404-0.653)	0.618 (0.476-0.779)	0.751 (0.561-0.988)	0.851 (0.622-1.14)	0.956 (0.679-1.33)	1.07 (0.723-1.53)	1.24 (0.804-1.82)	1.38 (0.873-2.07)
10-min	0.473 (0.368-0.590)	0.574 (0.446-0.716)	0.739 (0.573-0.926)	0.876 (0.675-1.10)	1.06 (0.794-1.40)	1.21 (0.882-1.62)	1.36 (0.962-1.88)	1.52 (1.02-2.16)	1.76 (1.14-2.59)	1.95 (1.24-2.93)
15-min	0.556 (0.433-0.694)	0.675 (0.525-0.843)	0.869 (0.674-1.09)	1.03 (0.794-1.30)	1.25 (0.934-1.65)	1.42 (1.04-1.91)	1.59 (1.13-2.22)	1.79 (1.21-2.54)	2.07 (1.34-3.04)	2.30 (1.45-3.44)
30-min	0.760 (0.592-0.949)	0.922 (0.717-1.15)	1.19 (0.921-1.49)	1.41 (1.08-1.77)	1.71 (1.27-2.25)	1.94 (1.42-2.60)	2.17 (1.54-3.02)	2.44 (1.64-3.47)	2.82 (1.83-4.15)	3.13 (1.98-4.69)
60-min	0.964 (0.751-1.20)	1.17 (0.909-1.46)	1.50 (1.17-1.88)	1.78 (1.37-2.25)	2.16 (1.62-2.85)	2.45 (1.79-3.29)	2.75 (1.96-3.83)	3.09 (2.08-4.39)	3.57 (2.31-5.25)	3.97 (2.51-5.94)
2-hr	1.28 (1.01-1.59)	1.54 (1.21-1.91)	1.96 (1.53-2.44)	2.31 (1.80-2.89)	2.79 (2.10-3.65)	3.15 (2.33-4.21)	3.53 (2.53-4.90)	3.98 (2.69-5.61)	4.63 (3.01-6.74)	5.17 (3.28-7.68)
3-hr	1.50 (1.18-1.85)	1.79 (1.41-2.21)	2.28 (1.79-2.82)	2.68 (2.09-3.33)	3.23 (2.44-4.21)	3.64 (2.70-4.85)	4.08 (2.94-5.64)	4.60 (3.12-6.46)	5.37 (3.50-7.79)	6.02 (3.83-8.90)
6-hr	1.91 (1.52-2.34)	2.29 (1.82-2.81)	2.91 (2.31-3.58)	3.42 (2.70-4.23)	4.13 (3.15-5.34)	4.65 (3.48-6.15)	5.22 (3.79-7.17)	5.89 (4.01-8.20)	6.90 (4.51-9.93)	7.76 (4.95-11.4)
12-hr	2.37 (1.90-2.88)	2.85 (2.29-3.47)	3.65 (2.92-4.45)	4.30 (3.42-5.28)	5.21 (4.01-6.69)	5.88 (4.43-7.72)	6.61 (4.83-9.02)	7.47 (5.11-10.3)	8.78 (5.76-12.5)	9.89 (6.33-14.4)
24-hr	2.78 (2.25-3.35)	3.39 (2.75-4.09)	4.38 (3.54-5.31)	5.21 (4.18-6.35)	6.35 (4.93-8.10)	7.19 (5.46-9.38)	8.10 (5.98-11.0)	9.22 (6.33-12.6)	10.9 (7.19-15.5)	12.4 (7.96-17.9)
2-day	3.12 (2.56-3.74)	3.86 (3.16-4.62)	5.06 (4.13-6.09)	6.06 (4.91-7.33)	7.44 (5.83-9.46)	8.45 (6.49-11.0)	9.57 (7.15-13.0)	11.0 (7.57-14.9)	13.2 (8.72-18.5)	15.2 (9.76-21.6)
3-day	3.39 (2.79-4.04)	4.20 (3.45-5.01)	5.52 (4.52-6.61)	6.62 (5.39-7.96)	8.13 (6.40-10.3)	9.23 (7.12-12.0)	10.5 (7.85-14.2)	12.0 (8.31-16.3)	14.5 (9.60-20.3)	16.7 (10.8-23.7)
4-day	3.63 (3.00-4.32)	4.49 (3.71-5.34)	5.90 (4.85-7.04)	7.06 (5.77-8.47)	8.67 (6.85-10.9)	9.84 (7.62-12.7)	11.1 (8.39-15.0)	12.8 (8.87-17.3)	15.4 (10.2-21.5)	17.8 (11.5-25.1)
7-day	4.32 (3.60-5.10)	5.28 (4.39-6.24)	6.85 (5.68-8.13)	8.15 (6.71-9.72)	9.95 (7.90-12.4)	11.3 (8.75-14.4)	12.7 (9.59-17.0)	14.5 (10.1-19.4)	17.4 (11.6-24.0)	19.9 (12.9-28.0)
10-day	5.01 (4.19-5.89)	6.03 (5.04-7.10)	7.69 (6.40-9.09)	9.07 (7.50-10.8)	11.0 (8.74-13.6)	12.4 (9.63-15.7)	13.9 (10.5-18.4)	15.8 (11.0-21.0)	18.7 (12.4-25.7)	21.2 (13.7-29.6)
20-day	7.19 (6.08-8.40)	8.29 (7.00-9.69)	10.1 (8.48-11.8)	11.6 (9.65-13.6)	13.6 (10.9-16.7)	15.1 (11.8-18.9)	16.8 (12.6-21.7)	18.6 (13.1-24.5)	21.2 (14.2-28.9)	23.4 (15.2-32.5)
30-day	9.04 (7.69-10.5)	10.2 (8.64-11.8)	12.0 (10.2-14.0)	13.6 (11.4-15.9)	15.7 (12.6-19.0)	17.3 (13.5-21.4)	18.9 (14.2-24.1)	20.7 (14.6-27.1)	23.1 (15.5-31.2)	24.9 (16.3-34.4)
45-day	11.4 (9.71-13.1)	12.5 (10.7-14.5)	14.5 (12.3-16.8)	16.1 (13.6-18.8)	18.3 (14.7-22.0)	20.0 (15.6-24.4)	21.7 (16.2-27.2)	23.3 (16.5-30.3)	25.4 (17.2-34.1)	26.9 (17.6-36.9)
60-day	13.3 (11.4-15.3)	14.5 (12.4-16.7)	16.5 (14.1-19.1)	18.2 (15.4-21.1)	20.4 (16.5-24.5)	22.2 (17.4-27.0)	23.9 (17.9-29.9)	25.5 (18.2-33.1)	27.5 (18.6-36.7)	28.8 (18.8-39.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

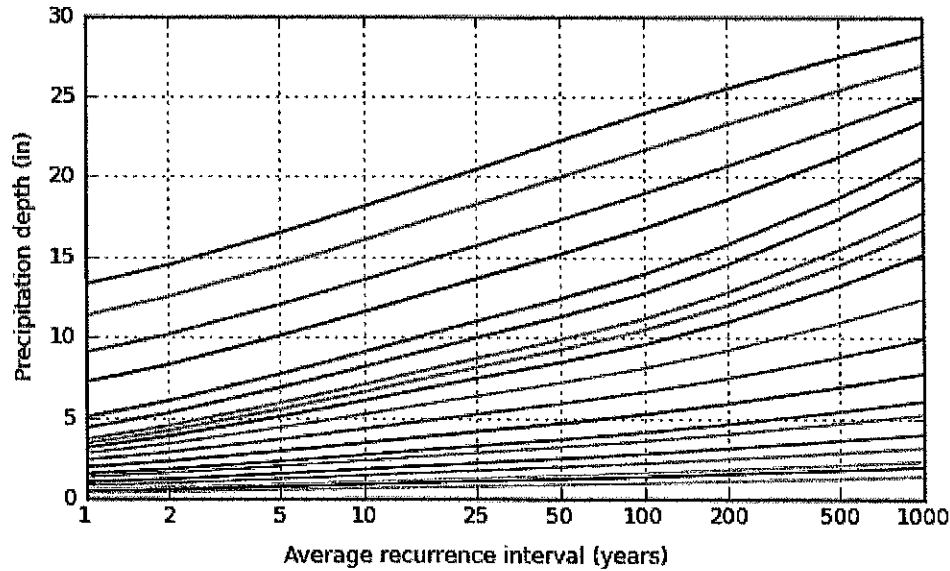
[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 41.5624°, Longitude: -72.5404°



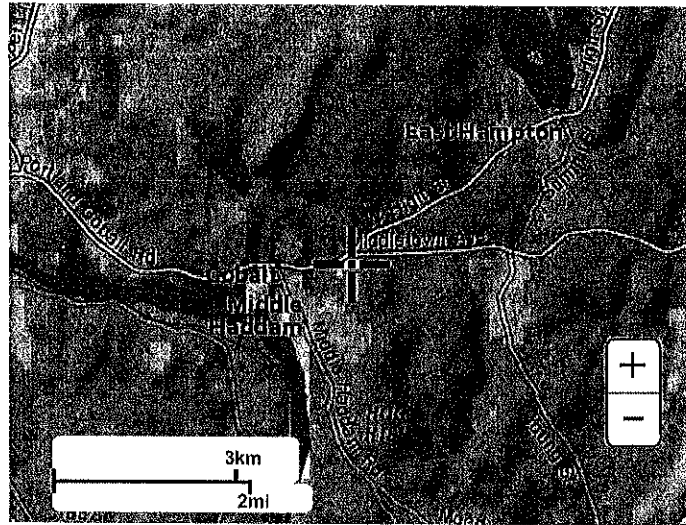
Average recurrence interval (years)
1
2
6
10
25
50
100
200
500
1000



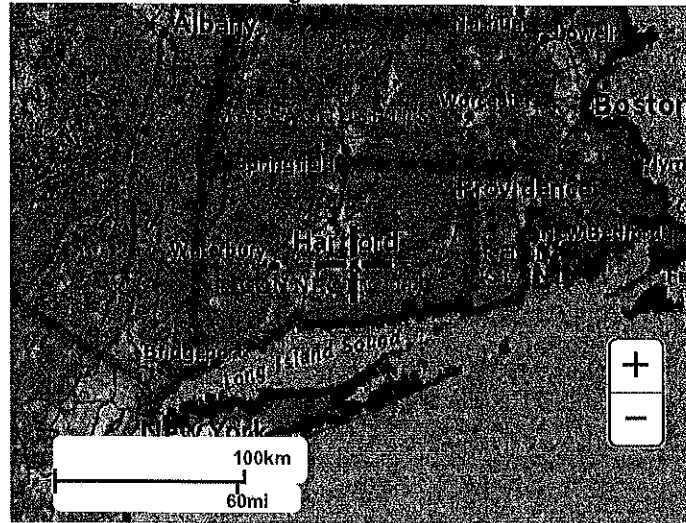
Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

Maps & aeriels

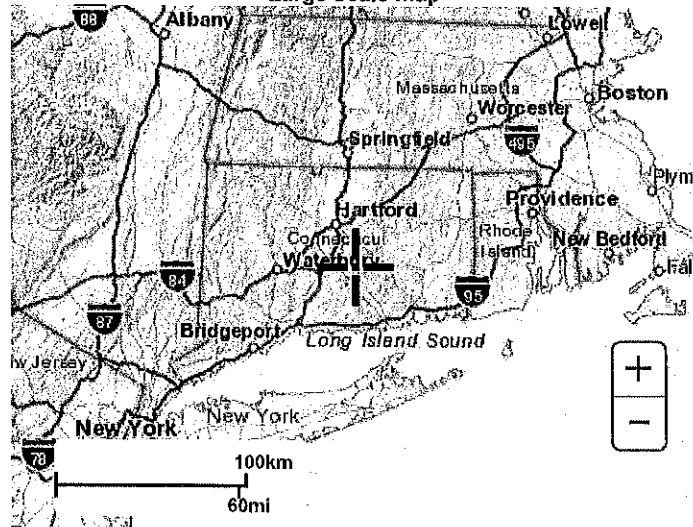
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

Wednesday, May 12, 2021

Hyd. No. 15

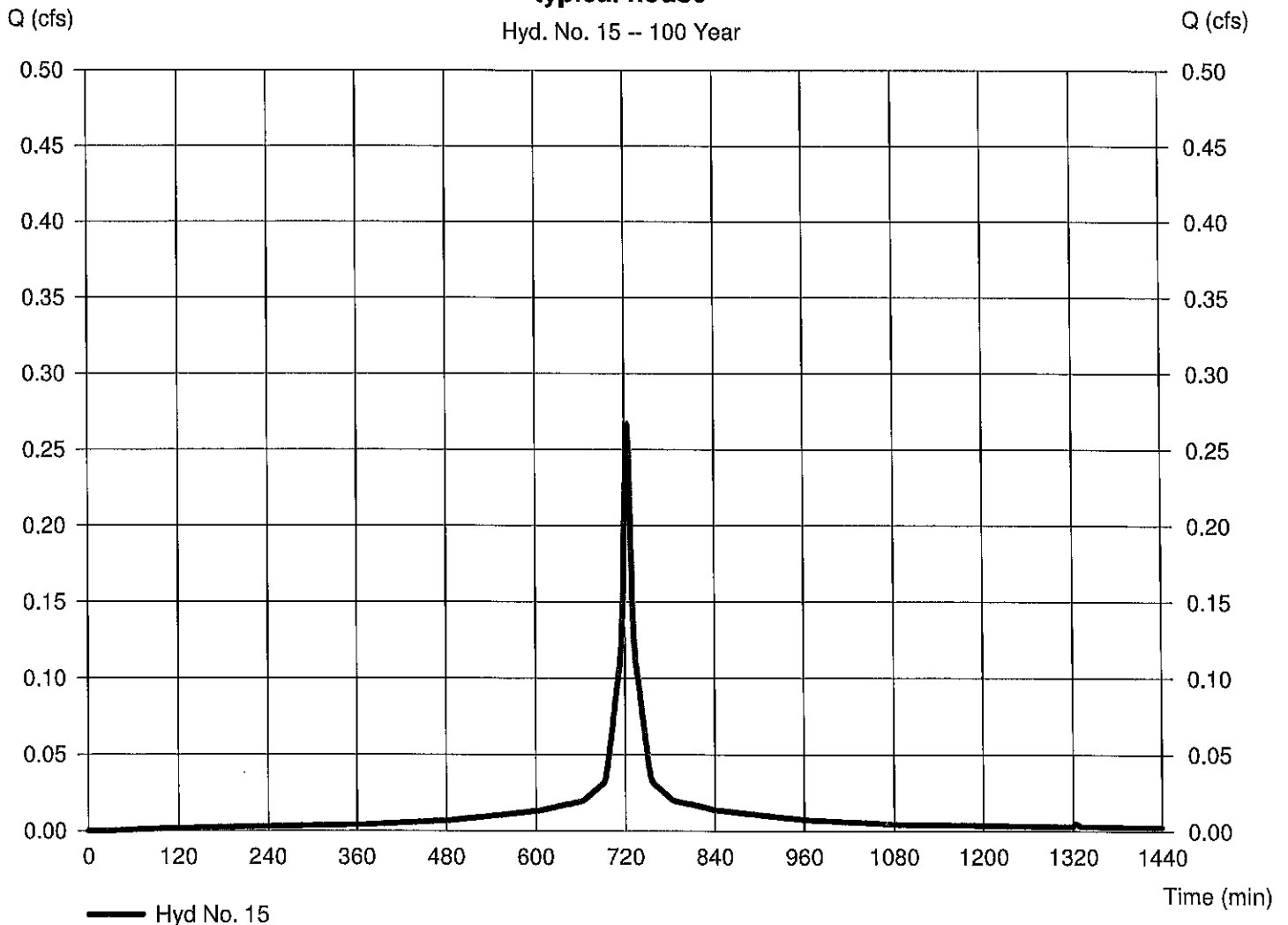
typical house

Hydrograph type	= SCS Runoff	Peak discharge	= 0.267 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 955 cuft
Drainage area	= 0.033 ac = 1500 SF	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.97 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

footprint

typical house

Hyd. No. 15 -- 100 Year



— Hyd. No. 15

Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Wednesday, May 12, 2021

Pond No. 2 - Rooftop System

Pond Data

UG Chambers - Invert elev. = 100.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 60.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 99.50 ft, Width = 5.00 ft, Height = 1.50 ft, Voids = 33.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	99.50	n/a	0	0
0.15	99.65	n/a	15	15
0.30	99.80	n/a	15	30
0.45	99.95	n/a	15	45
0.60	100.10	n/a	27	71
0.75	100.25	n/a	33	104
0.90	100.40	n/a	32	136
1.05	100.55	n/a	31	167
1.20	100.70	n/a	29	196
1.35	100.85	n/a	26	222
1.50	101.00	n/a	21	243

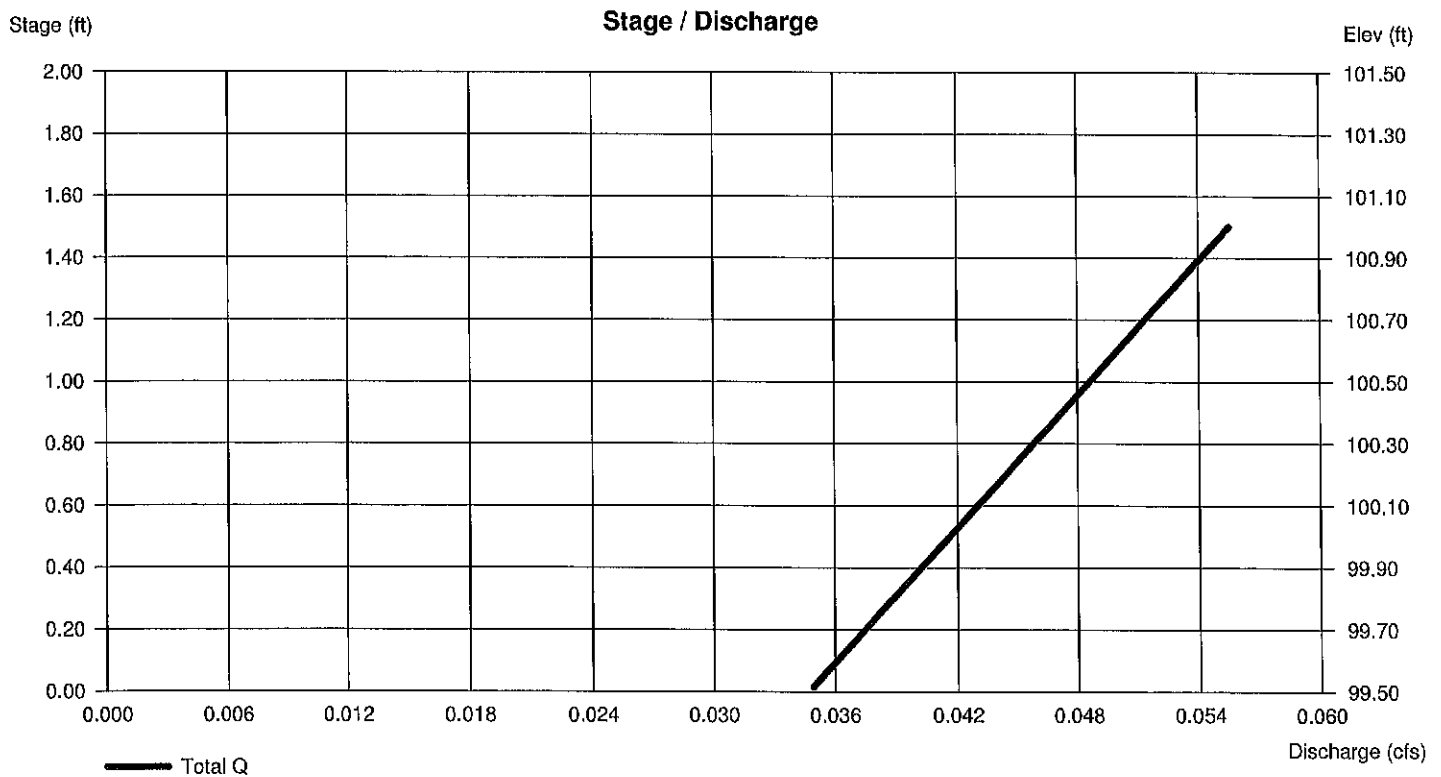
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil. (in/hr)	= 5.000	(by Wet area)		
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



$$WQV = 1" (R) (A) / 12$$

$$R = .05 + .009 (I)$$

$$I = 4.5\%$$

$$R = .05 + .009 (4.5) \\ = .0905$$

$$= 1" (.0905) (20.29) / 12$$

$$= 0.15 \text{ ac-ft} = 6,632 \text{ CU.FT.}$$

$$GRV = (D) (A) (I) / 12$$

$$= (0.1) (20.29) (.045) / 12$$

$$= .007 \text{ ac-ft} = 331 \text{ CU.FT.}$$

Available Storage = 27,622 CU.FT.

Far Exceeds recommended WQV & GRV

NEWINGTON, CT
124 Costello Road
(860) 666-5634

GROTON, CT
86 Bridge Street
(860) 405-0146

BRIDGEPORT, CT
9 Island Brook Ave.
(203) 384-9402

NEW MILFORD, CT
506 Danbury Road
(860) 354-0223

CANTON, MA
2 Whitman Road
(781) 828-1350

NORTH HARWICH, MA
518 Depot Street
(508) 430-1696

WORCESTER, MA
57 Southwest Cutoff
(508) 754-2027

WATERTOWN, NY
800 Starbuck Ave.
(315) 782-3785

CLIFTON PARK, NY
612 Pierce Road
(518) 877-3086

NORTHEAST
PLANT DIVISION
(877) 754-2107

PROPOSED CULVERT UNDER DRIVE TO LOT 1

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	36
Invert (Downstream End)	285.4
Invert (Upstream End)	286.1
Culvert Slope (ft/ft)	0.0194
Starting Flow Rate (cfs)	0.5
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	1.5
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate (cfs)	TW Depth (ft)	Headwater		Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
		Inlet Control	Outlet Control				
0.5	0	0.36	0	0.18	0.28	0.18	4.42
0.6	0	0.4	0	0.2	0.3	0.2	4.7
0.7	0	0.43	0	0.22	0.33	0.22	4.91
0.8	0	0.46	0	0.23	0.35	0.23	5.1
0.9	0	0.49	0	0.25	0.37	0.25	5.28
1	0	0.52	0	0.26	0.39	0.26	5.43
1.1	0	0.55	0	0.27	0.41	0.27	5.62
1.2	0	0.58	0	0.28	0.43	0.28	5.74
1.3	0	0.61	0	0.29	0.45	0.29	5.88
1.4	0	0.63	0	0.31	0.47	0.31	6
1.5	0	0.66	0	0.32	0.48	0.32	6.14

← 10yr
6" @ inlet

PROPOSED CULVERT UNDER DRIVE TO LOT 4

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	32
Invert (Downstream End)	288
Invert (Upstream End)	288.75
Culvert Slope (ft/ft)	0.0234
Starting Flow Rate (cfs)	0.3
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	1.3
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate (cfs)	TW Depth (ft)	Headwater		Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
		Inlet Control	Outlet Control				
0.3	0	0.27	0	0.14	0.21	0.14	4.06
0.4	0	0.32	0	0.16	0.25	0.16	4.42
0.5	0	0.36	0	0.18	0.28	0.18	4.76
0.6	0	0.4	0	0.19	0.3	0.19	4.99
0.7	0	0.43	0	0.21	0.33	0.21	5.23
0.8	0	0.46	0	0.22	0.35	0.22	5.45
0.9	0	0.49	0	0.23	0.37	0.23	5.66
1	0	0.52	0	0.25	0.39	0.25	5.83
1.1	0	0.55	0	0.26	0.41	0.26	5.97
1.2	0	0.58	0	0.27	0.43	0.27	6.13
1.3	0	0.61	0	0.28	0.45	0.28	6.29

← 10-year
5" @ inlet

PROPOSED CULVERT UNDER DRIVE TO LOT 7

PROGRAM INPUT DATA

Description	Value
Culvert Diameter (ft)	1.25
FHWA Chart Number	1
FHWA Scale Number (Type of Entrance)	3
Manning's Roughness Coefficient	0.011
Entrance Loss Coefficient	0.5
Culvert Length (feet)	26
Invert (Downstream End)	289.25
Invert (Upstream End)	289.4
Culvert Slope (ft/ft)	0.0058
Starting Flow Rate (cfs)	1
Incremental Flow Rate (cfs)	0.1
Ending Flow Rate (cfs)	2
Starting Tailwater Depth (ft)	0
Incremental TW Depth (ft)	0
Ending TW Depth (ft)	0

COMPUTATION RESULTS

Flow Rate (cfs)	TW Depth (ft)	Headwater		Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
		Inlet Control	Outlet Control				
1	0	0.53	0	0.35	0.39	0.35	3.54
1.1	0	0.56	0	0.37	0.41	0.37	3.63
1.2	0	0.59	0	0.39	0.43	0.39	3.72
1.3	0	0.62	0	0.4	0.45	0.4	3.81
1.4	0	0.64	0	0.42	0.47	0.42	3.89
1.5	0	0.67	0	0.43	0.48	0.43	3.97
1.6	0	0.69	0	0.45	0.5	0.45	4.03
1.7	0	0.72	0	0.46	0.52	0.46	4.11
1.8	0	0.74	0	0.48	0.53	0.48	4.17
1.9	0	0.76	0	0.49	0.55	0.49	4.22
2	0	0.79	0	0.51	0.56	0.51	4.29

← 10-year
8 1/2" @ inlet