PRELIMINARY GRADING AND DRAINAGE ENGINEERING DESIGN REPORT

PREPARED IN ACCORDANCE WITH MDEQ'S CIRCULAR DEQ-8 AND
CITY OF MISSOULA SUBDIVISION AND SXWTPQYEN MASTER PLAN REGULATIONS

for

Icon Apartment Homes at Dougherty Ranch Subdivision

Located at:

TRACT B OF CERTIFICATE OF SURVEY NO. 6850, RECORDS OF MISSOULA COUNTY, LOCATED IN THE NW1/4 OF SECTION 7, TOWNSHIP 13 NORTH, RANGE 19 WEST AND THE NE1/4 OF SECTION 12, TOWNSHIP 13 NORTH, RANGE 20 WEST, PRINCIPAL MERIDIAN MONTANA, MISSOULA COUNTY, MONTANA.

Revised: March 2023

Prepared For:
Braxton Development LLC
PO Box 11890
Bozeman, MT 59718

Prepared By:
IMEG Corp.
1817 South Ave W, Suite A
Missoula, MT 59806

1.0 GENERAL

Braxton Development LLC is proposing to develop the above-described property with 613 units on 101 lots. The buildings will consist of multiplex buildings, mansion apartments, duplexes, and villas in accordance with the required building types permitted in Title 21. In addition to the proposed buildings the project will include the Grant Creek/Flynn Lane trail connection, sidewalks, roads, parking areas and dedicated open space/parks. The project site, including road right-of-way consists of 44.75 acres. Portions of the property have been used for fallow crop farmland leases. We have analyzed approximately 3 additional acres within this drainage report which account for roads constructed adjacent to the subject property. This includes some half street improvements which are not located within the platted subdivision. The project is surrounded by undeveloped property as well as some development including Summit Beverage to the Northeast and many proposed subdivisions which are currently in review. As this property is located within the Sx^{w}tpqyen Master Plan Area, this report will follow the rules laid out in the Form Based Code (FBC), Title 21, which call for light imprint stormwater infrastructure. Refer to Section 4.1 of this report for a breakdown of light imprint infrastructure proposed for the development.

As laid out in the FBC, the goal for this area is to mitigate and treat stormwater runoff as close to the source as possible. 100-year storm mitigation will be provided on-site as close to the source of the stormwater as possible by a combination of shallow infiltration, micro bio-retention ponds and stormwater retention ponds.

The Storm Water Site Evaluation Form provided by the City of Missoula (attached in Appendix C) determined that this site is of medium priority, with 22 points. This is primarily due to the proposed development being a subdivision and over 0.5 acres in size as well as the proximity to groundwater. This report will address the Post-Development Runoff Control Requirements, meet Water Quality Control Requirements, and include a Stormwater Management Site Plan

(See Road Construction Plan Set). Refer to Section 5.0 for information regarding SWPPP on site.

2.0 DRAINAGE DESIGN CRITERIA AND METHODS USED

Per correspondence with Missoula City Public Works and Mobility, Hydraflow Hydrographs was used to calculate stormwater volumes and peak flowrates for this development. Within this program, the TR-55 model was used, based on the principles of the SCS runoff equation, to estimate runoff requirements. The flows from the 2-, 10-, and 100-year, 24-hour storm event were analyzed. For the purposes of this report, the 2-, 10- and 100-year storm calculations have been provided. Additionally, The Hydraflow Hydrographs program was used to calculate stormwater peak flows and volumes after being routed through stormwater ponds. These results have been reported as the stormwater flows which have been discharged from the site.

3.0 EXTENT OF STORM DRAINAGE

The following information pertains to on- and off-site flows that may affect the proposed development as well as conveyance for stormwater flow rates that will be increased due to the development. Detailed information on the existing and proposed drainage patterns is provided in the Drainage Basin Exhibit in Appendix A.

3.1 DELINIATION OF DRAINAGE AREAS WITHIN SUBDIVISION

3.1A EXISTING BASIN

The analyzed project consists of approximately 47.73 acres, consisting of some undeveloped land and farmland which is currently harvested for hay. For the purposes of this report, we have based our curve numbers off an entirely undeveloped site with fair condition vegetation. This property will be considered to contain nine (9) on-site drainage basins (Basins A-I) and eight (8) Road Basins (RB1-RB8) for the purposes of stormwater runoff calculations. These basins were developed because of the sites proposed grading plan. The general slope of the existing site is 1%, sloping from east to west. As stormwater runoff historically would sheet flow for a couple hundred feet before being conveyed as shallow concentrated flow across the site, there are some drainage channels that concentrate and convey water across the site. There are four discharge points along the western boundary of the subject property. These discharge locations coincide with the concentrated flow paths on the site. The site is bounded on all sides by undeveloped property. As this area is within the Master Plan, we expect all surrounding undeveloped property to be developed in the future. The total area of each existing basin can be seen in the below table.

The entire property is in the Zone X floodplain designation. A study conducted by NewFields indicates that the groundwater depth to existing grade around the property was from 6 to 18 feet. We utilized Figure 4-2 of the study “2-Year Creek Event, 2-Year Storm Discharge – Full Buildout, Excluding Flynn-Lowney Ditch” as per the City of Missoula’s recommendation. The north end of the property has the shallowest groundwater throughout the site. There are no existing waterways or wetlands located on the subject property. The following table shows the total acreage of each proposed on-site and road basin.

Existing Basin	Total Area (acres)
Basin A	4.53
Basin B	4.96
Basin C	7.94
Basin D	0.95
Basin E	3.84
Basin F	2.27
Basin G	2.73
Basin H	2.98
Basin I	6.47
Road Basin 1	2.04
Road Basin 2	0.72
Road Basin 3	1.08
Road Basin 4	2.83
Road Basin 5	1.12
Road Basin 6	1.75
Road Basin 7	0.86
Road Basin 8	0.66

Table 1: Basin Areas

3.1B DEVELOPED BASINS

The developed on-site basins were delineated based on proposed right-of-way boundaries as well as proposed drainage facilities within the development. Roads have been broken out into separate drainage basins than the proposed site, all of which have been delineated based on proposed finished grading. Within these basins we have proposed some shallow rain gardens and storm ponds to mitigate the pre- and post-development 100-year storms. Refer to Section 4.3 for stormwater runoff mitigation design details.

3.2 DELINEATION OF DRAINAGE AREAS OUTSIDE OF SUBDIVISION

With the property having an undeveloped parcel directly adjacent to it to the east, we do anticipate some stormwater discharge during large storm events to be conveyed across the eastern property line. The stormwater from the Summit Beverage Site and Veterans Way to the east is diverted to a storm pond located north of the Veterans Clinic north of Veterans Way. Therefore, the undeveloped parcel adjacent to the property is not very large and we do not anticipate there to be significant stormwater flow based on soil types and vegetation.

3.3 MODELED OFF-SITE FLOWS

Since both upstream properties (to the east) are either recently developed or proposed to be developed, we do not anticipate that any lower frequency storms will be discharged onto the property. This is due to the 10-year storm being less than the difference between the pre- and post-development 100-year storm. Therefore, the only stormwater which the subject property will see is from storms greater than the 10-year. We anticipate that this may be concentrated flow, and will ensure that this will be routed through the site without inundating any buildings

Neither property to the east of the subject property will discharge stormwater onto the site. The Sapphire Place development is being proposed to retain the entirety of the 100-year storm, and the Summit Beverage routes its stormwater to the VA Clinic to the north as a part of that subdivision stormwater design.

3.4 PROVISIONS TO PASS OFF-SITE STORMWATER FLOWS

Should the stormwater ponds for the Sapphire Place Subdivision located just east of the site become inundated in storms greater than the 100-year storm all overflow stormwater will be concentrated to swales within the Flynn Trail. No stormwater from off-site should enter the rest of the development.

4.0 PROVISIONS TO MITIGATE ON-SITE STORMWATER FLOWS

With the increase in impervious coverage in every basin aside from H, there will be increased runoff. The general stormwater mitigation plan for the Icon Apartment Homes at Dougherty Ranch Subdivision is as follows: storm ponds and rain gardens throughout the site will be proposed to mitigate the difference between the pre- and post-development 100-year storm. Refer to Section 4.3 for a detailed description of the stormwater runoff mitigation plan for each 100-year area.

Bio-retention areas are proposed within the road right-of-way to store the 2-year storm and mitigate the peak flow rate for the 10- and 100-year storms. Additional stormwater retention has been proposed on-site to account for the road rights-of-way***. No stormwater will be discharged from any point of the property greater than the pre-development 100-year storm flow rate for the closest drainage basin.***

See Section 4.2F for more information on pre- and post-development site variables. Below in Sections 4.1A-4.1C, the general plan for stormwater mitigation is laid out on the lot, corridor and neighborhood level. We will be working closely with the City of Missoula going forward to ensure that this plan will meet all the requirements of the Sx^{w}tpqyen Master Plan as well as those of the Public Works Department.

4.1 STORMWATER QUALITY CONTROL AND LIGHT IMPRINT COMPLIANCE

Stormwater quality has been addressed by mitigating stormwater during storm events as close to the source as possible. By routing stormwater runoff to rain gardens, we ensure that the first 0.5” of rainfall on impervious surfaces will be treated, which will cut down on pollutants.

The Sx^{w}tpqyen Master Plan has laid out that at least one piece of light imprint stormwater mitigation infrastructure be implemented in the lot, corridor, and neighborhood level of the subdivision. Refer to the sections below for a narrative on how the light imprint infrastructure is being implemented throughout this development.

4.1A LOT LEVEL STORMWATER MITIGATION

Rain Gardens are being proposed to treat stormwater runoff from the lots, which meets the Master Plan Requirement for Light-Imprint Stormwater. The 2-year storm for each basin will be treated by rain gardens throughout the site.

4.1B CORRIDOR LEVEL STORMWATER MITIGATION

Any initial stormwater runoff which is discharged into or generated by the roads will be mitigated by rain gardens within the road corridor. These rain gardens meet the requirement for light-imprint stormwater.

4.1C NEIGHBORHOOD LEVEL STORMWATER MITIGATION

All stormwater mitigation will occur on a lot level for the 10-year storm within proposed rain gardens and storm ponds. Any overflow will be routed through the site to be detained by proposed stormwater ponds.

4.2 CALCULATONS & DESIGN

Calculations for this report are based on the SCS Type II Rainfall Distribution and the TR-55 module within the Hydraflow Hydrographs modeling program. Calculations were made using curve numbers, basins, and time of concentration to ensure proper routing and that any proposed infrastructure is not inundated. For any variables, values, equations, or calculations not explicitly shown below in this report, refer to the attached Hydrographs Summary Report in Appendix B.

Additionally, the Hydraflow Hydrographs modeling program was used to route each drainage basin through a conceptual pond with the proposed storage volume. We calculated the peak flow and discharge volume from each basin during the 2-, 10- and 100-year storm after all the stormwater retention areas have been inundated. For the basis of calculations, basins with multiple storm ponds have been modeled as having one pond of equal storage volume. This is possible as we are not proposing any controlled discharge of any pond and instead, we have proposed each pond to overflow once fully inundated. The results of this were then used to calculate the total discharge of stormwater from the site.

To comply with the Post Development Runoff Control Requirements, stormwater from the project shall be discharged at pre-development flow rates for the 100-year storm. The post-development discharge locations are nearby the historical discharge locations for the site, however, we have proposed them to be at the intersections of proposed roads which will be extended in the future.

A stormwater quantity summary is attached in Appendix B of this report. Within this summary we have included the peak flow and volume for the pre- and post-development 2-, 10-, and 100-year storms.

4.2A HYDROLOGIC SOIL GROUP

The NRCS Soils Data was obtained from the Web Soil Survey website (located at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) found in Appendix C. The NRCS Soils Data for this site shows it to be Desmet Loam, which is Soil Group B.

4.2B CURVE NUMBERS & LAND USE DATA

As explained above, the existing on-site soil is Hydrologic Soil Group B, and is primarily grass and weeds in fair condition. The corresponding weighted Curve Number (CN) of 69 (Grass) was used for every pre-development basin in the TR-55 module. In the post-development condition, all proposed impervious infrastructure (i.e. buildings, asphalt, concrete, etc.) was accounted for in each basin. All pervious ground in the post-development condition has been determined to be primarily grass in good condition; therefore, the corresponding weighted Curve Numbers (CN) of 61 (Grass) and 98 (Impervious) were utilized for the post-development condition in the TR-55 model. See Appendix B for the data used for this site.

Curve numbers assigned for post-development drainage basins are based on total impervious coverage (buildings and asphalt/concrete) within each basin and not on composite assigned curve numbers. Curve numbers for each road basin are based off a composite assigned curve number of 80.

4.2C BASINS AND AREAS

The existing site was analyzed as four (4) drainage basins which have determined historical outfalls for the project. The site was then analyzed for the post-development condition as eight (8) on-site basins and eight (8) road basins, as described in Section 3.1B above. Basins were delineated based on the post-development grading plan.

4.2D TIME OF CONCENTRATION

Time of concentration was determined by the TR-55 model in Hydraflow Hydrographs and is calculated based on the longest flow path and watercourse slope of the pre-development and post-development conditions for the site and individual basins. It is important to note that, as per Chapter 6 of the Missoula City Public Works Standards and Specifications Manual, if the TR-55-calculated time of concentration was less than 5 minutes, the minimum time of concentration of 5 minutes was used in the calculations for that basin.

4.2E STORM DATA

The SCS Method uses 24-hour storm depths provided by Chapter 6 of the Missoula City Public Works Standards and Specifications Manual for each design recurrence interval. In this case, the 2-year, 10-year, and 100-year storm event were analyzed.

4.2F SUMMARY OF SITE VARIABLES

See the Hydrograph Reports Included in Appendix B for both the Pre- and Post-Development site conditions. In general, the curve number for all pre-development basins was 69 (Fair Condition Vegetation). For the Post-Development basins, Composite Curve Numbers were anywhere from 72 to 95, with an average of 83 for the on-site basins. All road basins have a composite curve number of 80 which is based on the road section.

4.3 RUNOFF MITIGATION

As mentioned above, the difference between the pre- and post-development 100-year storm will be stored on-site and the remaining stormwater will be discharged from the site to the west as it had historically. The overflow stormwater will be routed through the site to be discharged at multiple points along the western property boundary as shown in the drainage plan in Appendix A.

For the proposed road corridors on the site, we have proposed bio-retention ponds within some of the landscaping areas. These retention ponds will provide enough storage to fully store and infiltrate the 2-year storm as well as mitigate the 10- and 100-year peak flow for the road corridors. As discussed, and approved by the City of Missoula, we will be allowing stormwater from the roads to be discharged from the site once these bio-retention areas have been inundated. Each bio-retention area should be installed with an inlet set at the high-water elevation in order to allow stormwater to be conveyed through a pipe network should the bio-retention area become clogged. Additional stormwater runoff has been mitigated on-site to account for the stormwater discharged from the road corridors.

For the drainage basins proposed on-site, we have proposed retention ponds to mitigate the peak flow and volume from the 2- 10- and 100-year storms. These ponds work in conjunction with the bio-retention ponds within the road corridors to mitigate the 100-year storm and ensure that the project site discharges at rates below the pre-development 100-year storm.

4.3A RUNOFF RATES & VOLUME

Refer to Table 2 below for a summary of which post-development drainage basins are discharged to which road location. Additionally, a Storm Drainage Summary Table is included within Appendix B. This is a summary of the pre- and post-development peak flow and volume generated for the 2-, 10- and 100-year storms. The table has been broken up into three color coded sections which represent the post-development basins which discharge to each corresponding pre-development basin with the same color. ***Additionally, below is Table 3 which portrays the pre-development peak flow and volume discharged from the site as well as the***

post-development peak flow and volume discharged from the site at the three locations proposed. These locations proposed can be found on the drainage basin exhibit and are located at the three road intersections at the western boundary of the site.

Discharge Location A (Veterans Way)	Discharge Location B (Abner Grier Road)	Discharge Location C (Pine Butte Blvd)
Basin C	Basin A	Road Basin 6
Basin D	Basin B	-
Road Basin 1	Basin E	-
Road Basin 2	Basin F	-
Road Basin 3	Basin G	-
Road Basin 8	Basin H	-
-	Basin I	-
-	Road Basin 4	-
-	Road Basin 5	-
-	Road Basin 7	-

Table 2: Post-Development Basin Discharge Locations

Drainage Basins	**2-Year Peak Flow (CFS)**	**2-Year Volume (CF)**	**10-Year Peak Flow (CFS)**	**10-Year Volume (CF)**	**100-Year Peak Flow (CFS)**	**100-Year Volume (CF)**
Pre-Development Discharge Point A (Existing Basin 1)	0.05	1,786	0.5	8,635	2.42	25,519
Post-Development Discharge Point A (Veterans Way)	**N/A**	**N/A**	**0.02**	**263**	**1.60**	**10,840**
Pre-Development Discharge Point B (Existing Basins 2 & 3)	0.02	684	0.53	8,926	2.66	26,377
Post-Development Discharge Point B (Abner Grier Road)	**N/A**	**N/A**	**0.06**	**487**	**2.58**	**26,390**
Pre-Development Discharge Point C (Existing Basin 4)	0.023	788	0.38	5,600	2.05	16548
Post-Development Discharge Point C (Pine Butte Boulevard)	**N/A**	**N/A**	**0.02**	**177**	**0.29**	**2,619**

Table 3: Post-Development Basin Stormwater Discharge Summary

All post-development stormwater runoff (peak flow and volume) for each discharge location is less than the pre-development stormwater runoff (peak flow and volume) for the existing discharge locations. The total stormwater peak flow and volume for the pre-development site was 7.13 CFS and 68,444 CF. The total stormwater peak flow and volume which will be

discharged from the subject property for the post-development site was 4.47 CFS and 39,849 CF, which is less than the pre-development site.

4.3B INFILTRATION

Tetra Tech was contracted to perform 5 infiltration tests throughout the subject property. Each infiltration test was conducted at a depth of 3.5 feet below the existing ground elevation. We will be proposing shallow infiltration, which will maintain 4' of separation from groundwater. Each shallow infiltrator is within the 300' radius to each bore hole with a few exceptions. In some instances, a proposed shallow infiltrator was located outside the 300' radius; although, for simplicity we will use the slowest infiltration rate for all infiltrators in our calculations. The findings from these infiltration tests can be found within the Percolation Test Results located in Appendix D. The following infiltration rates for each bore hole are shown in the table below.

Bore Hole	Infiltration Flow Rate (CFS)
3	0.013
7	0.005
6	0.006
8	0.032
9	0.013

Table 4: Infiltration Flow Rate Summary

Since these infiltration rates are slow, we will not be using infiltration to mitigate the peak flow rate/volume of storm events. Instead, infiltration will be used to ensure that the rain gardens and stormwater ponds will infiltrate within the standard 48-hour timeframe. Conservatively, we will use the lowest infiltration rate recorded to determine the speed at which ponds will drain. The slowest infiltration rate was Bore Hole 7 which is 3.3 in/hr. Applying a factor of safety of 3 gives us an infiltration rate of 1.1 in/hr. ***The deepest pond we have proposed is 36 inches deep, which should infiltrate within approximately 39.6 hours after the 100-year storm event.***

Infiltration will consist of stormwater infiltrating through the vegetation in the storm ponds and rain gardens. These should be set close to the elevation at which the infiltration tests were run and therefore, should be an accurate representation of how fast these ponds should drain.

4.3C 100-YEAR RUNOFF MITIGATION AND STORAGE

The basins within the subject property will utilize rain gardens and storm ponds to mitigate the difference between the pre- and post-development 100-year storm. There will be minimal stormwater ponding within parking areas during the 100-year storm. Rain gardens are located throughout the project site and will be constructed at variable depths throughout the development. Photos of rain gardens within landscape islands have been included in the Drainage Basin Exhibit in Appendix A. Refer to the Drainage Basin Exhibit in Appendix A while referencing the proposed rain garden/storm pond locations and the calculations within Appendix B for storage provided per basin. We expect the 10-year storm to be fully retained and infiltrated and the pre-development 100-year storm volumes/peak flow rate will be discharged from the site. Peak flows which are discharged from the site will be less than the pre-development 100-year storm.

4.3D INUNDATION

Naturally, the site will become inundated once the proposed retention facilities to mitigate the difference between the pre- and post-development 100- storm have been exceeded. See the

attached Time of Concentration Exhibit in Appendix A for outfall locations for each basin. Storm pipe networks will be proposed where appropriate to convey stormwater overflow away from buildings.

Once inundated, stormwater will be discharged from the site at the three locations shown on the proposed drainage basin exhibit. Stormwater will overflow from catch basins along the western property line. We will install spreaders along the western boundary of the property to ensure that the overflow from the site is spread out and not totally concentrated once discharged from the catch basins.

4.4 DOWN-GRADIENT ANALYSIS

The overall post-development flowpath for the 100-year storm overflow (pre-development 100-year rate) is from east to west. There will be multiple outfalls along the western property line, refer to the drainage basin sheet in Appendix A for all outfall locations of the basins. These outfalls are more or less in the general vicinity of the historical outfalls for the project. We are proposing three outfalls which is one less than the four existing outfalls. Peak flows for basin outfalls will be less than the pre-development 100-year storm.

As only half street improvements are being installed as a part of this project for the westernmost road, swales will need to be installed to the west of this road in order to daylight storm piping and convey the overflow stormwater for the 10- and 100-year storms. Catch basins can be installed and connected to in the future on the west side of the road when the roads are extended.

5.0 EROSION CONTROL & STORMWATER POLLUTION PREVENTION PLAN

A Stormwater Pollution Prevention Plan (SWPPP) will be required through the Montana Department of Environmental Quality (MDEQ), it will be the responsibility of the Contractor (or owner if previously agreed upon) to prepare, obtain, and administrate a SWPPP and any other erosion control permits required by City of Missoula. Erosion and sediment control in the form of BMP's or stabilized surface throughout the project area will minimize the potential for pollutants to leave the site.
Throughout the project site during construction, all stormwater inlets will be protected as per City Standard 651 to ensure that no sediment is discharged into the drywell sumps. Additionally, Perimeter Control will be installed as per City Standard 652 along the downstream property boundary. In this case, the western property boundary will have perimeter control installed. Any other areas where sediment may be discharged from the site along perimeter boundaries will have perimeter control installed. Temporary Gravel Construction Accesses shall be installed off Flynn Lane as per City Standard 650. See the Road Plans for the SWPPP Sheet for the site.

5.1 STORMWATER INFRASTRUCTURE MAINTENANCE

Maintenance will be required for the stormwater infrastructure proposed both onsite and within the road right-of-way. Maintenance of the infrastructure should be completed by the property owner for all infrastructure on-site and by the City for all infrastructure within the road right-of-way. The following is a stormwater infrastructure maintenance schedule for the proposed infrastructure:

- Concrete gutter pans or flowlines in the concrete should be swept or cleaned of debris and sediment on a quarterly or as needed basis.
- Building gutters and downspouts should be cleaned seasonally to prevent debris from entering the storm drain pipes that carry drainage from downspouts to the infiltration area.
- Storm drain pipes should be flushed or jetted on as needed basis when clogging becomes apparent.

- Sediment chambers in catch basins and drywell sumps should be cleared on an as needed basis.
- Inspect rain gardens and bio swales for vegetation cover and bare areas on a quarterly basis.
- Inspect inlets and outlets for trash, obstructions, and vegetation on a quarterly basis or after storm events.
- Inspect water levels in rain gardens after storm events.
- Inspect pond areas and interior of catch basins for sediment on an annual basis.

An agreement between the property owner and the city will be required to delegate maintenance taks for adjacent stormwater.

6.0 CONCLUSIONS

This drainage report has been prepared in accordance with Chapter 6 of the Missoula City Public Works Standards and Specifications Manual and the Swtpqyen Master Plan. This report shows that a stormwater design to mitigate the post-development 100-year storm is possible on-site. The proposed rain gardens and storm ponds will ensure that the roads are not inundated during the 2-year storm and no curbs are overtopped during the 10-year storm. In addition, no buildings will be inundated during the 100-year storm. Other existing drainage patterns in non-disturbed or off-site areas will be maintained. All construction will be in accordance with the Construction Plans, Montana Public Works Standard Specifications (MPWSS), and City of Missoula requirements.

Prepared by:
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Mike Mayen, E.I.

Reviewed by:
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Jason Rice, P.E.

Appendix A:

Stormwater Mitigation Plan with Basins
Groundwater Depth Exhibit
Drywell Sump Infiltration Rate Exhibit

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PLOT DATE: 3/6/2023 8:44 PM

REVISIONS	DATE
REVISED LOT LAYOUTS	3/6/2023

DESIGNED: MM
DRAFTED: MM
CHECKED: JR
DATE: APR 2022

LOCATION: PARCEL TRACT 5 OF COS 6758 SEC 7, T13N, R19W, PMM MISSOULA COUNTY, MONTANA

PREPARED FOR: BRAXTON DEVELOPMENT GROUP SOLUTIONS

PROJECT NAME: ICON APARTMENTS

SHEET TITLE: EXISTING DRAINAGE BASIN SITE DISCHARGE EXHIBIT

PROJECT NO. 21001343

SHEET: 1 OF 3

PRELIMINARY

DWG LOCATION: J:\FILES\ACTIVE\PROJECTS\2021\21001343\DESIGN\CIVIL\DRAFTING\1_DRAWINGS\AUTOCAD\SHEETS\21001343-DRAINAGE BASIN.DWG

LEGEND

POST-DEVELOPMENT BASIN "A"
TOTAL AREA = 197,114 SF
IMPERVIOUS AREA = 157,970 SF

POST-DEVELOPMENT BASIN "B"
TOTAL AREA = 216,143 SF
IMPERVIOUS AREA = 104,564 SF

POST-DEVELOPMENT BASIN "C"
TOTAL AREA = 345,879 SF
IMPERVIOUS AREA = 282,405 SF

POST-DEVELOPMENT BASIN "D"
TOTAL AREA = 41,575 SF
IMPERVIOUS AREA = 27,703 SF

POST-DEVELOPMENT BASIN "E"
TOTAL AREA = 167,475 SF
IMPERVIOUS AREA = 101,038 SF

POST-DEVELOPMENT BASIN "F"
TOTAL AREA = 99,032 SF
IMPERVIOUS AREA = 40,000 SF

POST-DEVELOPMENT BASIN "G"
TOTAL AREA = 119,009 SF
IMPERVIOUS AREA = 104,980 SF

POST-DEVELOPMENT BASIN "H"
TOTAL AREA = 130,117 SF
IMPERVIOUS AREA = 6,568 SF

POST-DEVELOPMENT BASIN "I"
TOTAL AREA = 281,981 SF
IMPERVIOUS AREA = 200,021 SF

POST-DEVELOPMENT ROAD BASIN 1
TOTAL AREA = 88,662 SF

POST-DEVELOPMENT ROAD BASIN 2
TOTAL AREA = 31,363 SF

POST-DEVELOPMENT ROAD BASIN 3
TOTAL AREA = 47,044 SF

POST-DEVELOPMENT ROAD BASIN 4
TOTAL AREA = 123,275 SF

POST-DEVELOPMENT ROAD BASIN 5
TOTAL AREA = 48,787 SF

POST-DEVELOPMENT ROAD BASIN 6
TOTAL AREA = 76,230 SF

POST-DEVELOPMENT ROAD BASIN 7
TOTAL AREA = 37,462 SF

POST-DEVELOPMENT ROAD BASIN 8
TOTAL AREA = 28,749 SF

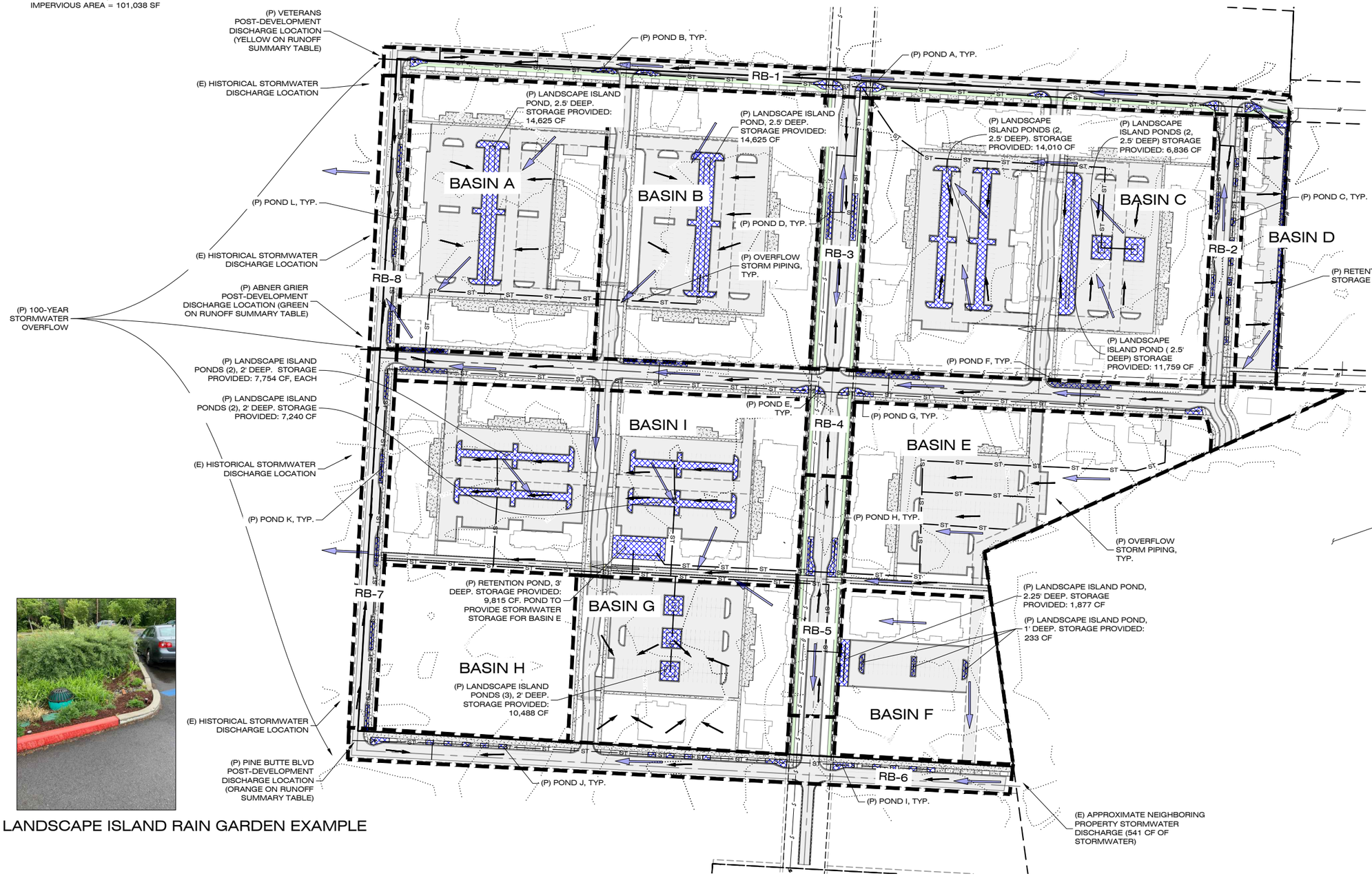
PROPOSED STORAGE AREAS

PROPOSED 10-YEAR LOCAL FLOW DIRECTION

PROPOSED 100-YEAR OVERFLOW DIRECTION

N

100 0 100 200
SCALE IN FEET



LANDSCAPE ISLAND RAIN GARDEN EXAMPLE

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PLOT DATE: 3/6/2023 8:54 PM

REVISIONS	DATE
REVISED LOT LAYOUTS	3/6/2023

DESIGNED: MM
DRAFTED: MM
CHECKED: JR
DATE: APR 2022

LOCATION: PARCEL TRACT 5 OF COS 6758 SEC 7, T13N, R19W, PMM MISSOULA COUNTY, MONTANA

PREPARED FOR: BRAXTON DEVELOPMENT GROUP

PROJECT NAME: ICON APARTMENTS

SHEET TITLE: PROPOSED DRAINAGE BASIN EXHIBIT

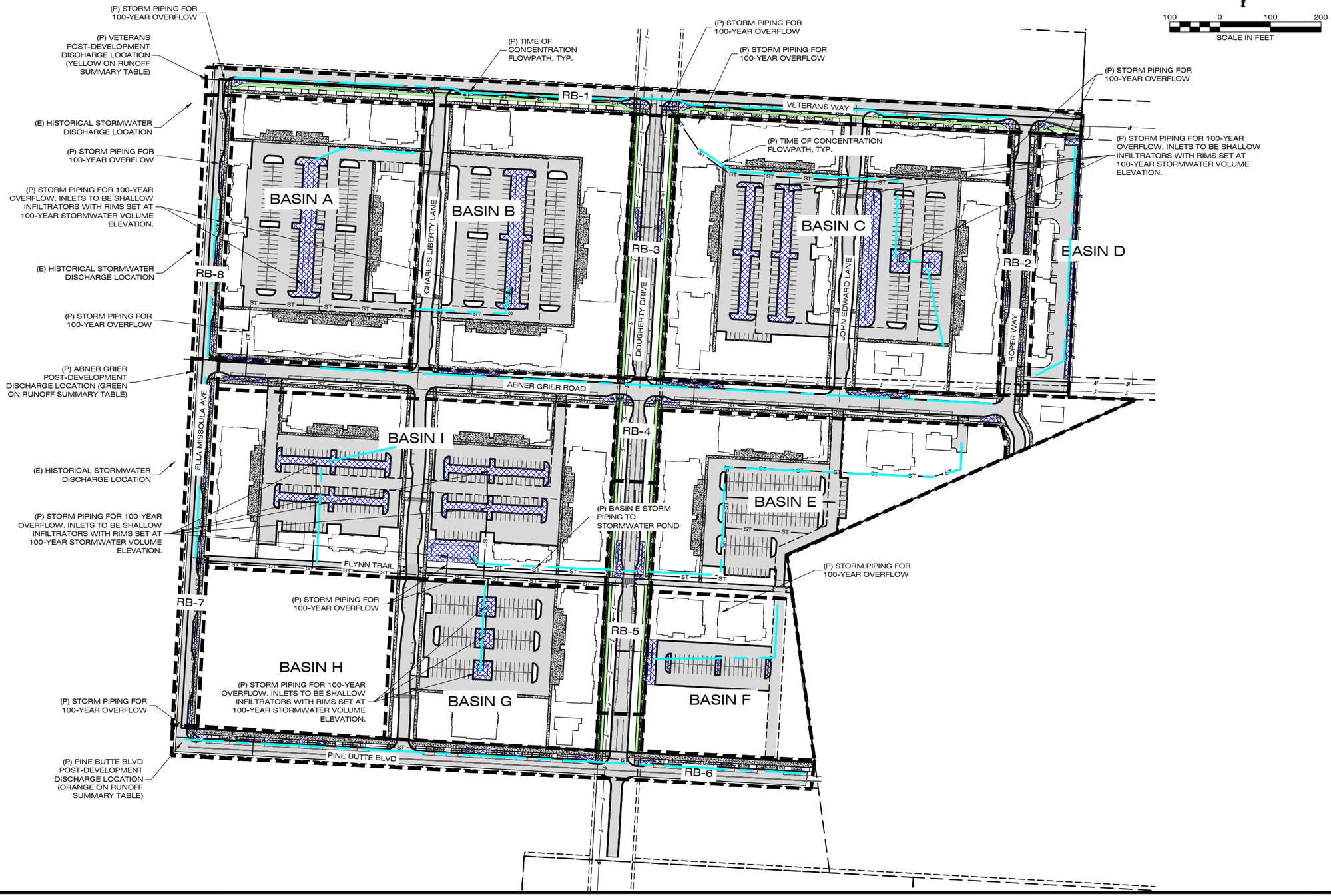
PROJECT NO.: 21001343

SHEET: 2 OF 3

PRELIMINARY

DWG LOCATION: J:\FILES\ACTIVE\PROJECTS\2021\21001343\CIVIL\DRAFTING\1_DRAWINGS\AUTOCAD\EXHIBITS\21001343-DRAINAGE BASIN.DWG

NOTE: CATCH BASINS TO BE INSTALLED A ROAD LOW POINTS WITH STORM PIPING TO OUTFALL LOCATION TO THE WEST. NO PONDING SHALL OCCUR IN THE ROADWAY DURING ANY STORM EVENT



IMEG
1817 SOUTH AVE W, STE. A
MISSOULA, MT
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PH: 406.721.0142
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PLOT DATE: 3/6/2023 9:05 PM

REVISIONS	DATE
REVISED LOT LAYOUTS	3/6/2023

DESIGNED: MM
DRAFTED: MM
CHECKED: JR
DATE: APR 2022

LOCATION: PARCEL TRACT 5 OF COS 6758
SEC 7, T13N, R19W, PMM
MISSOULA COUNTY, MONTANA

PREPARED FOR: BRAXTON DEVELOPMENT GROUP

PROJECT NAME: ICON APARTMENTS

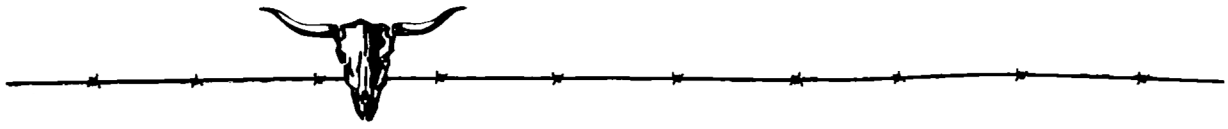
SHEET TITLE: PROPOSED TIME OF CONCENTRATION & OVERFLOW EXHIBIT

PROJECT NO. 21001343

SHEET: 3 OF 3

PRELIMINARY

DWG LOCATION: J:\PLES\ACTIVE\PROJECTS\2021\21001343\DESIGN\CIVIL_DRAFTING_DRAWINGS\AUTOCAD\EXHIBITS\21001343-DRAINAGE BASIN.DWG



Appendix B:

Hydraflow Hydrographs Summary Report
Hydraflow Hydrographs Pond Routing Summary Report
Storm Drainage Summary
Typical Pond Volume Calculations

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	3.708	2	718	7,430	------	------	------	Post-Development Basin A
2	SCS Runoff	0.901	2	718	2,390	------	------	------	Post-Development Basin B
3	SCS Runoff	6.500	2	718	13,022	------	------	------	Post-Development Basin C
4	SCS Runoff	0.455	2	718	932	------	------	------	Post-Development Basin D
5	SCS Runoff	1.220	2	718	2,690	------	------	------	Post-Develpment Basin E
6	SCS Runoff	0.117	2	720	604	------	------	------	Post-Development Basin F
7	SCS Runoff	2.951	2	716	5,984	------	------	------	Post_Development Basin G
8	SCS Runoff	0.000	2	n/a	0	------	------	------	Post-Development Basin H
9	SCS Runoff	3.481	2	718	7,053	------	------	------	Post-Development Basin I
10	Reservoir	0.000	2	n/a	0	1	2.36	7,430	Basin A Discharge
11	Reservoir	0.000	2	n/a	0	2	1.16	2,390	Basin B Discharge
12	Reservoir	0.000	2	n/a	0	3	2.33	13,022	Basin C Pond
13	Reservoir	0.000	2	n/a	0	4	1.31	932	Basin D Discharge
14	Reservoir	0.000	2	n/a	0	5	1.55	2,690	Basin E Discharge
15	Reservoir	0.000	2	n/a	0	6	1.28	604	Basin F DIscharge
16	Reservoir	0.000	2	n/a	0	7	2.20	5,984	Basin G Discharge
17	Reservoir	0.000	2	n/a	0	9	1.97	7,053	Basin I Discharge

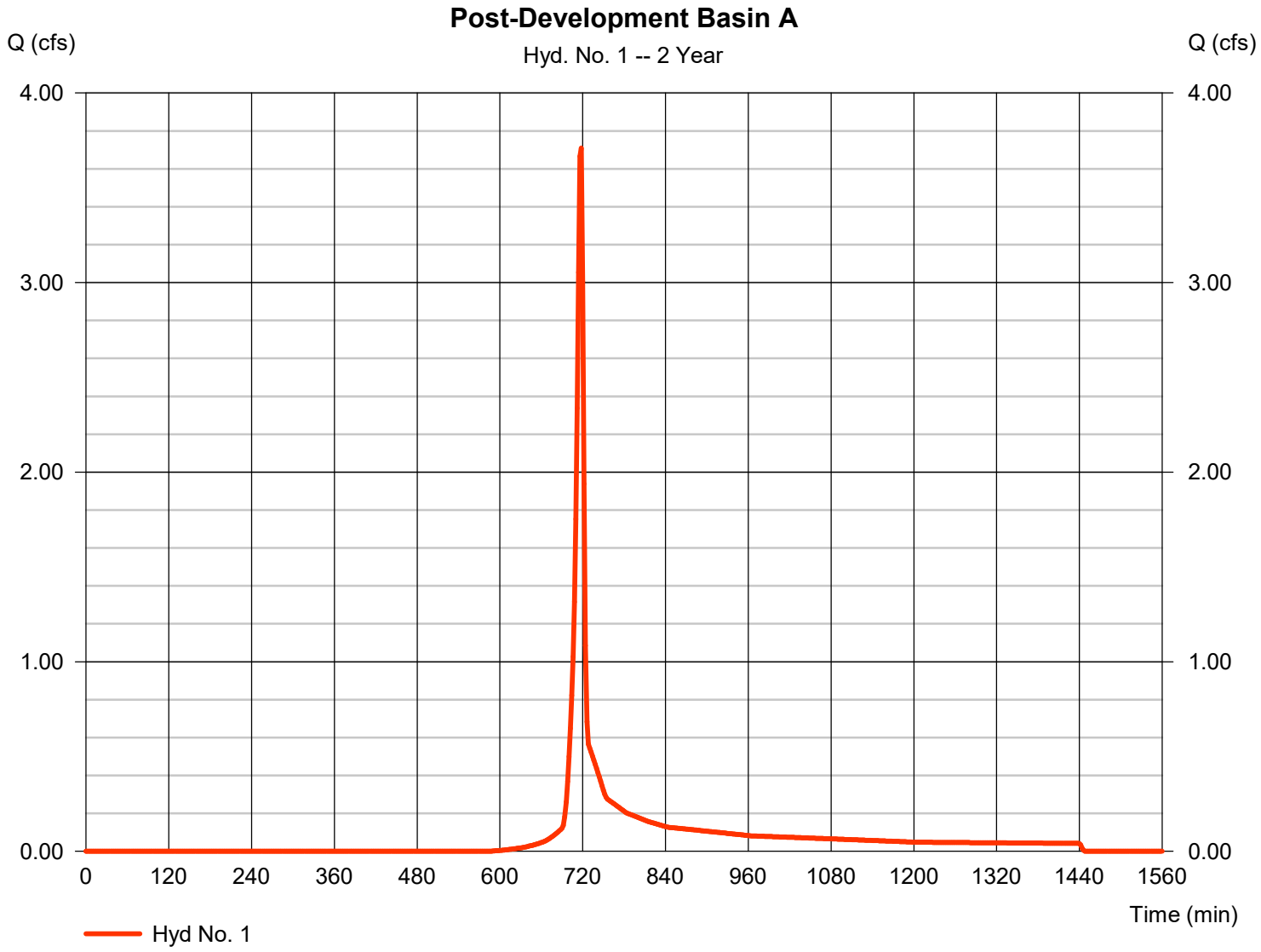
Hydrograph Report

Hyd. No. 1

Post-Development Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.708 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	7,430 cuft
Drainage area	=	4.530 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.630 x 98) + (0.900 x 61)] / 4.530



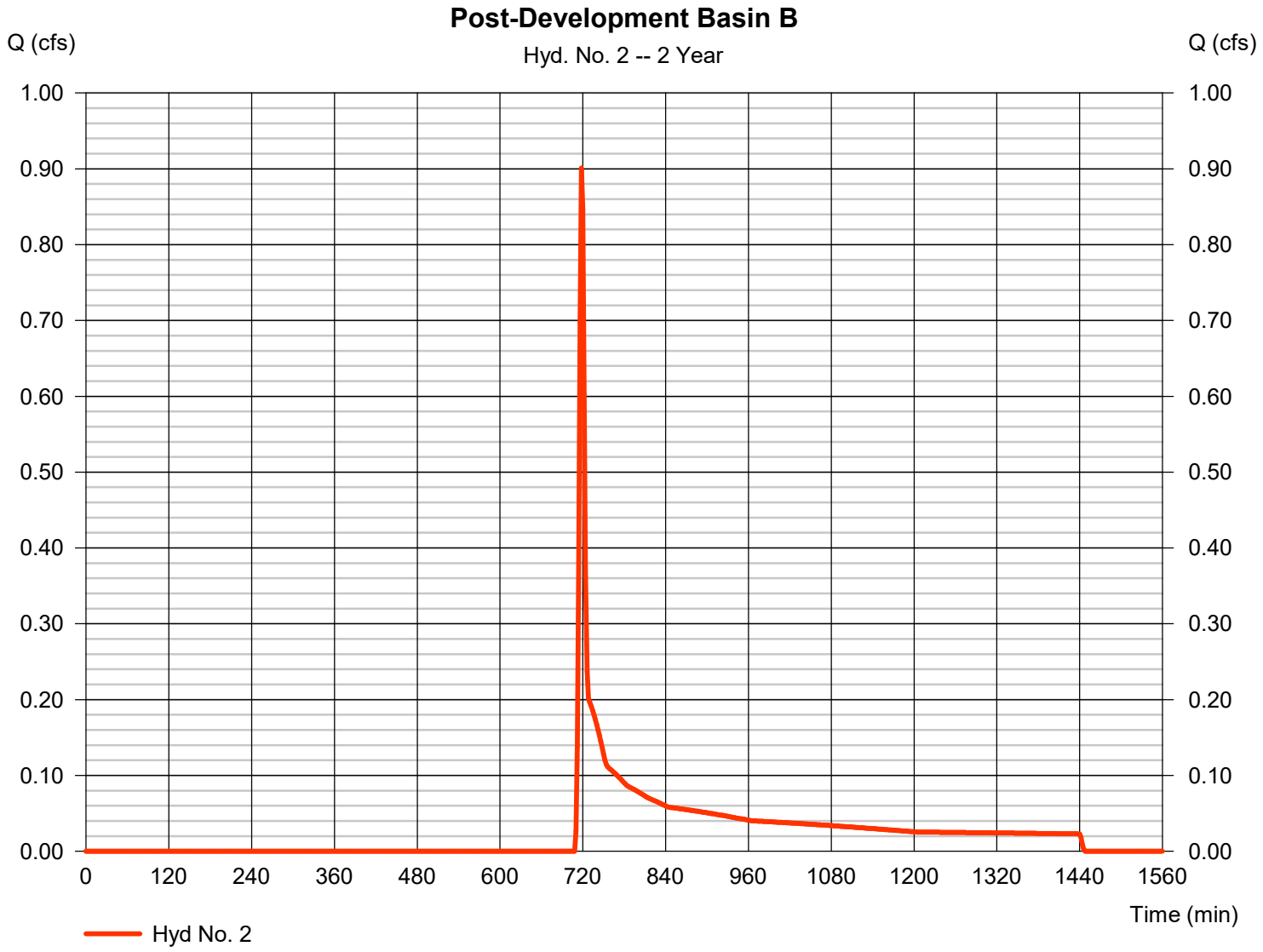
Hydrograph Report

Hyd. No. 2

Post-Development Basin B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.901 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	2,390 cuft
Drainage area	=	4.960 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.530 x 98) + (2.430 x 61)] / 4.960



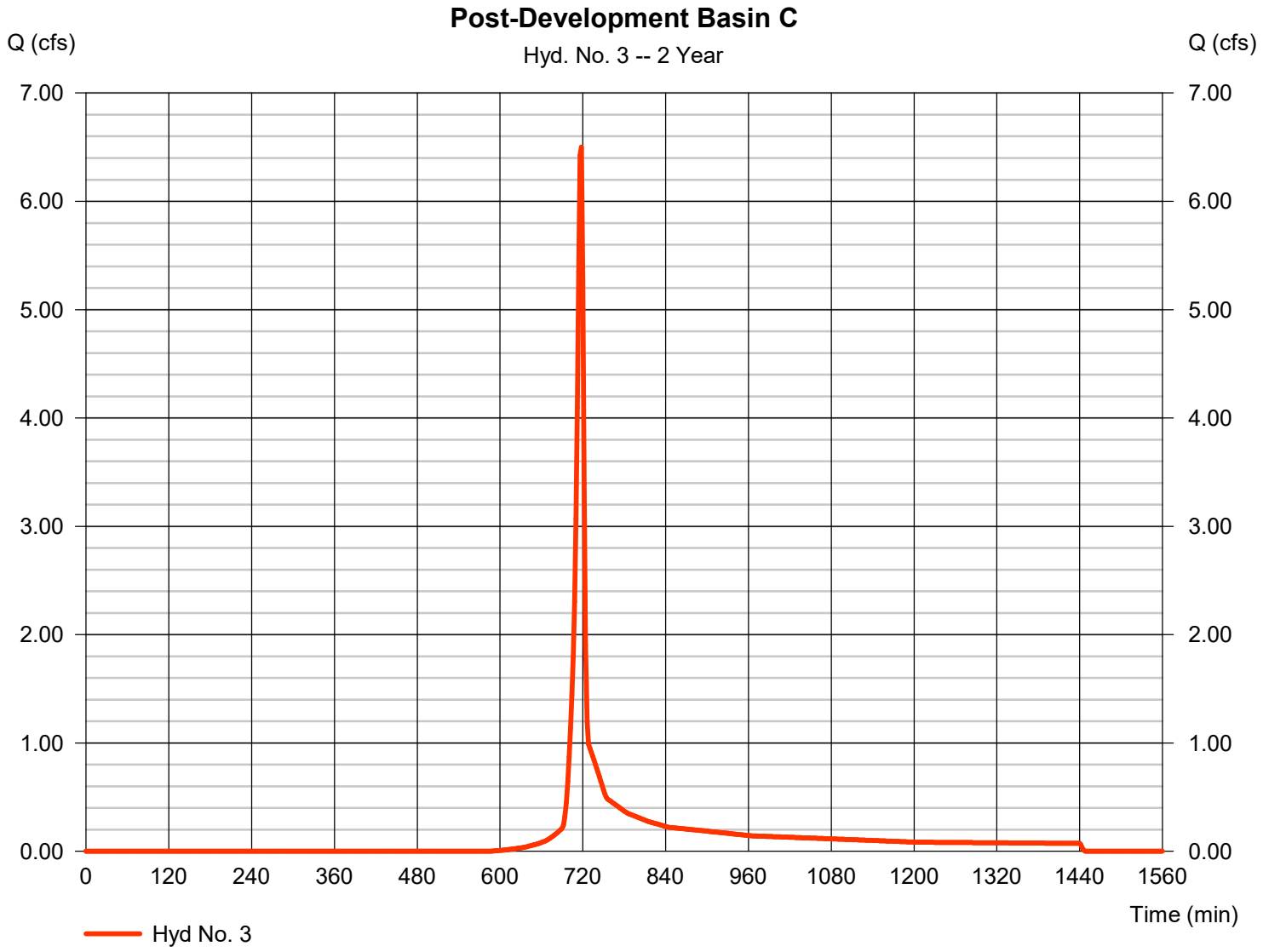
Hydrograph Report

Hyd. No. 3

Post-Development Basin C

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.500 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	13,022 cuft
Drainage area	=	7.940 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(6.470 x 98) + (1.470 x 61)] / 7.940



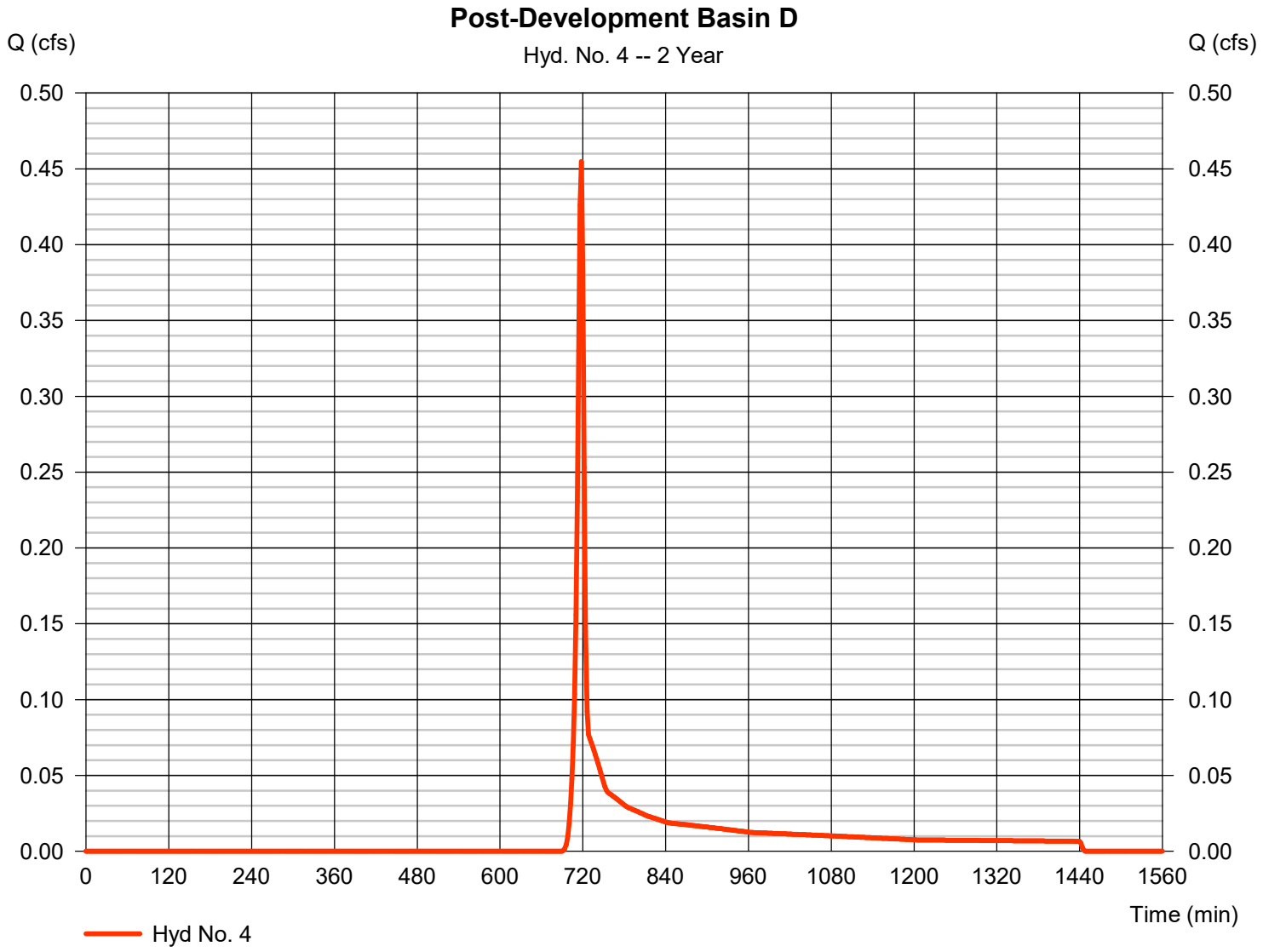
Hydrograph Report

Hyd. No. 4

Post-Development Basin D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.455 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	932 cuft
Drainage area	=	0.950 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.640 x 98) + (0.310 x 61)] / 0.950



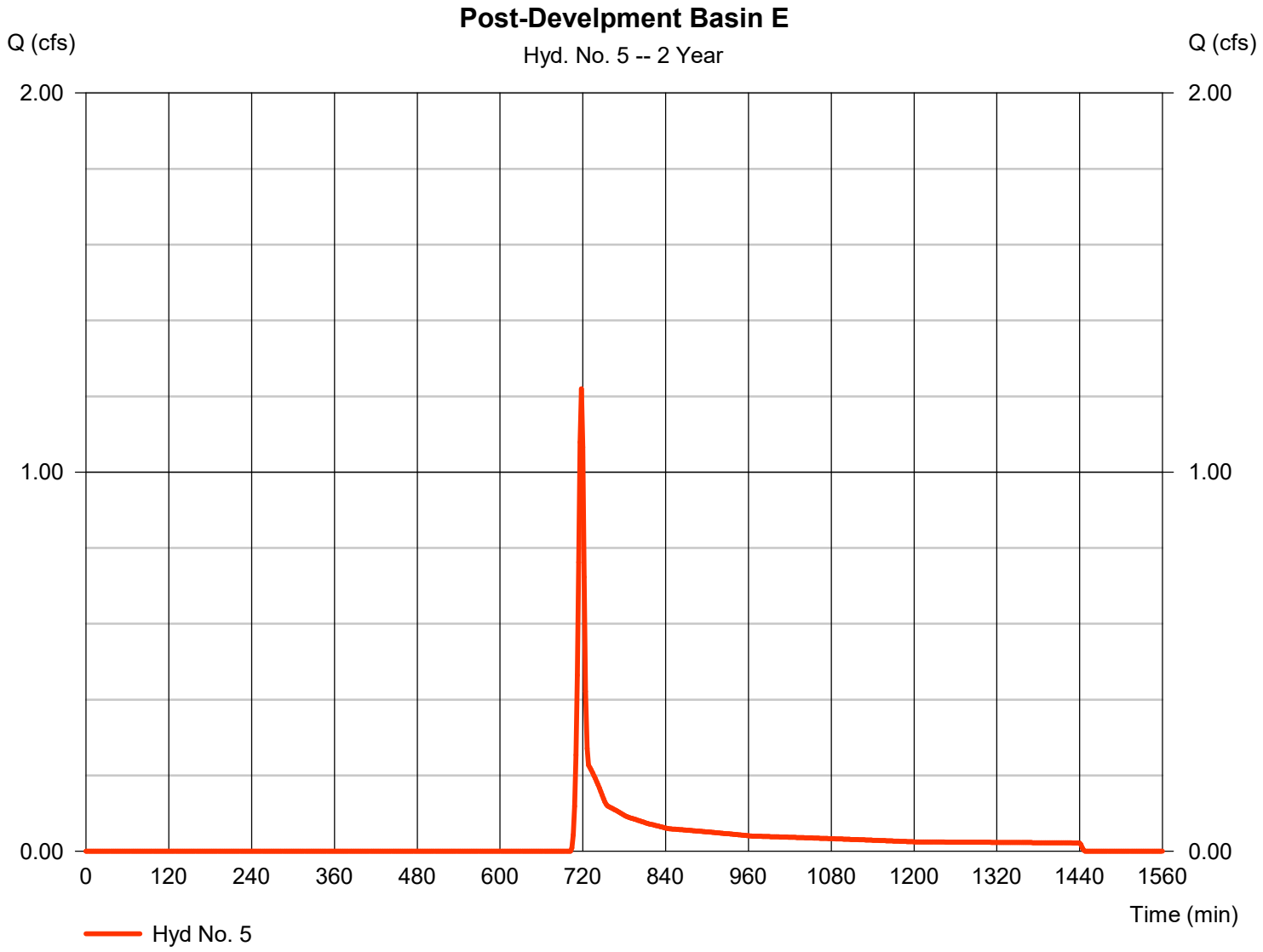
Hydrograph Report

Hyd. No. 5

Post-Develpment Basin E

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.220 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	2,690 cuft
Drainage area	=	3.840 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.320 x 98) + (1.520 x 61)] / 3.840



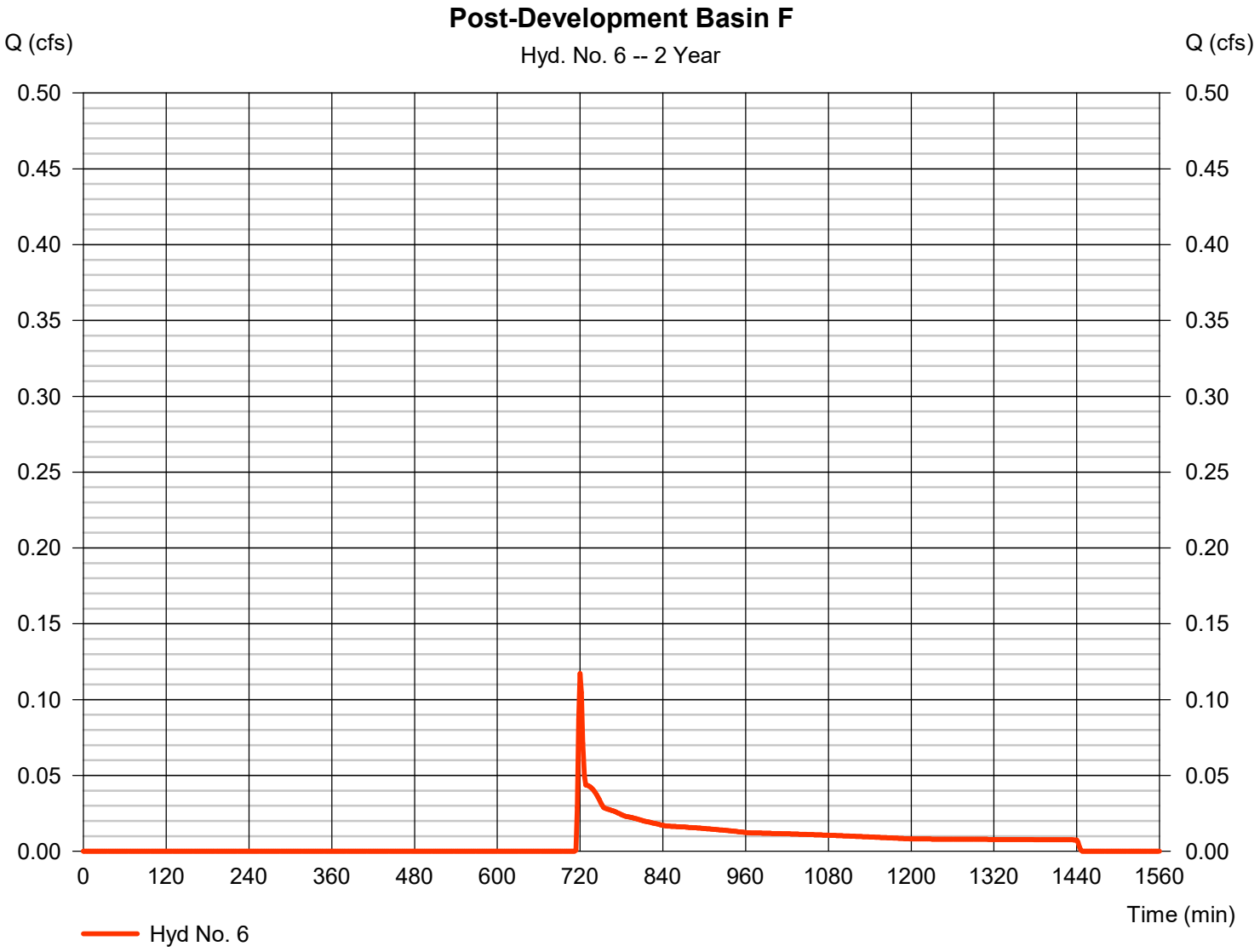
Hydrograph Report

Hyd. No. 6

Post-Development Basin F

Hydrograph type	= SCS Runoff	Peak discharge	= 0.117 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 604 cuft
Drainage area	= 2.270 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.920 x 98) + (1.350 x 61)] / 2.270



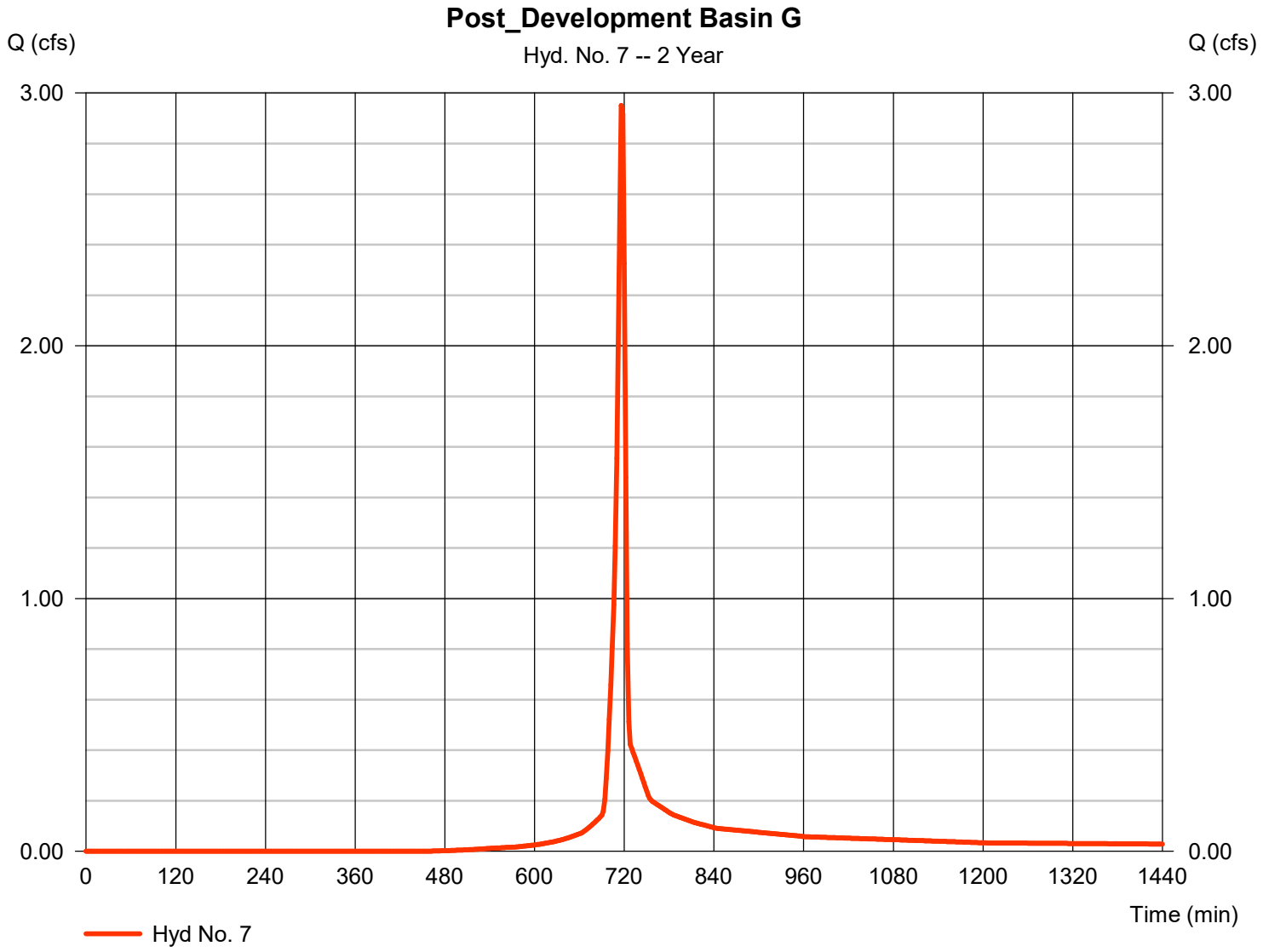
Hydrograph Report

Hyd. No. 7

Post_Development Basin G

Hydrograph type	= SCS Runoff	Peak discharge	= 2.951 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 5,984 cuft
Drainage area	= 2.720 ac	Curve number	= 94*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.410 x 98) + (0.310 x 61)] / 2.720



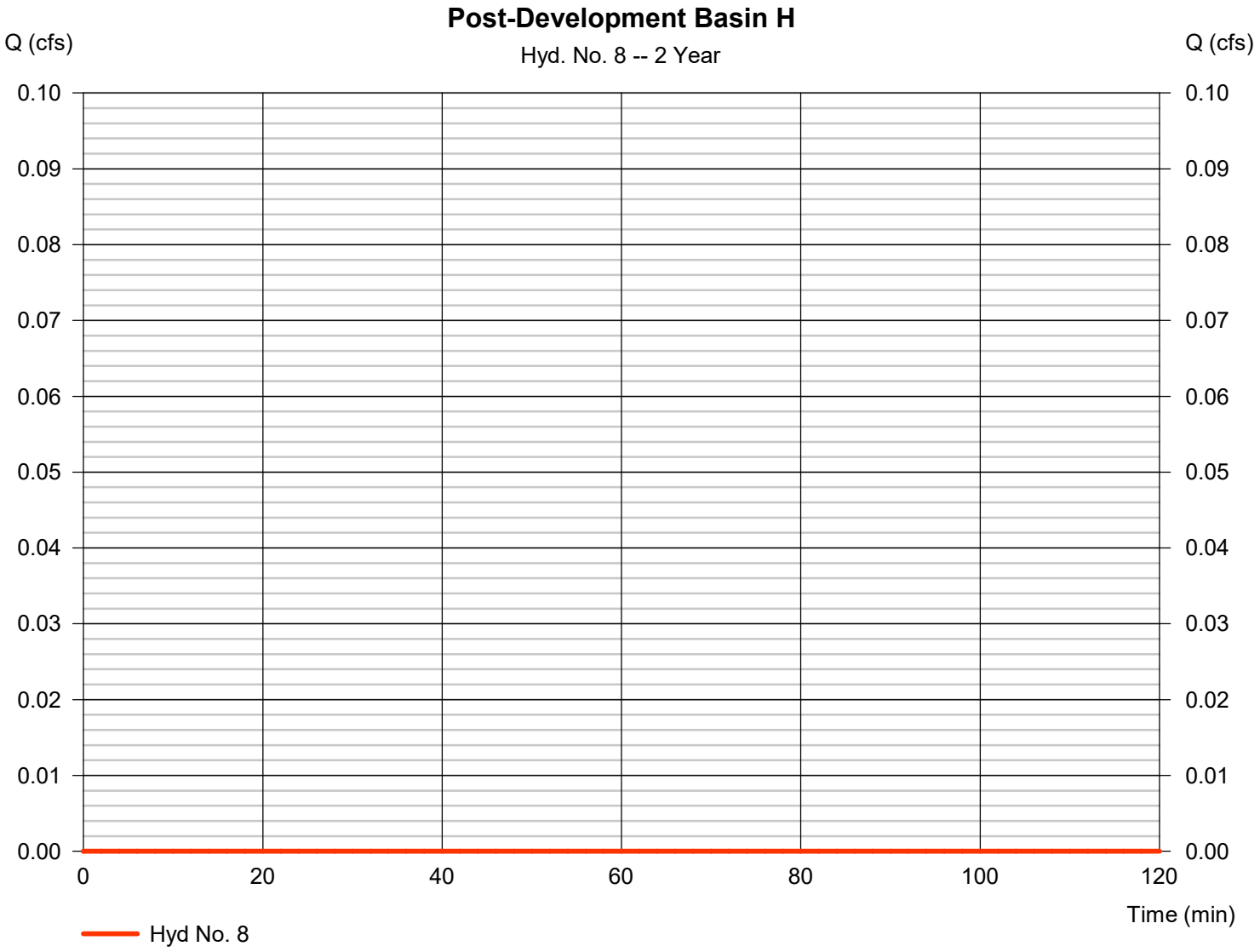
Hydrograph Report

Hyd. No. 8

Post-Development Basin H

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 2.990 ac	Curve number	= 63*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 98) + (2.840 x 61)] / 2.990



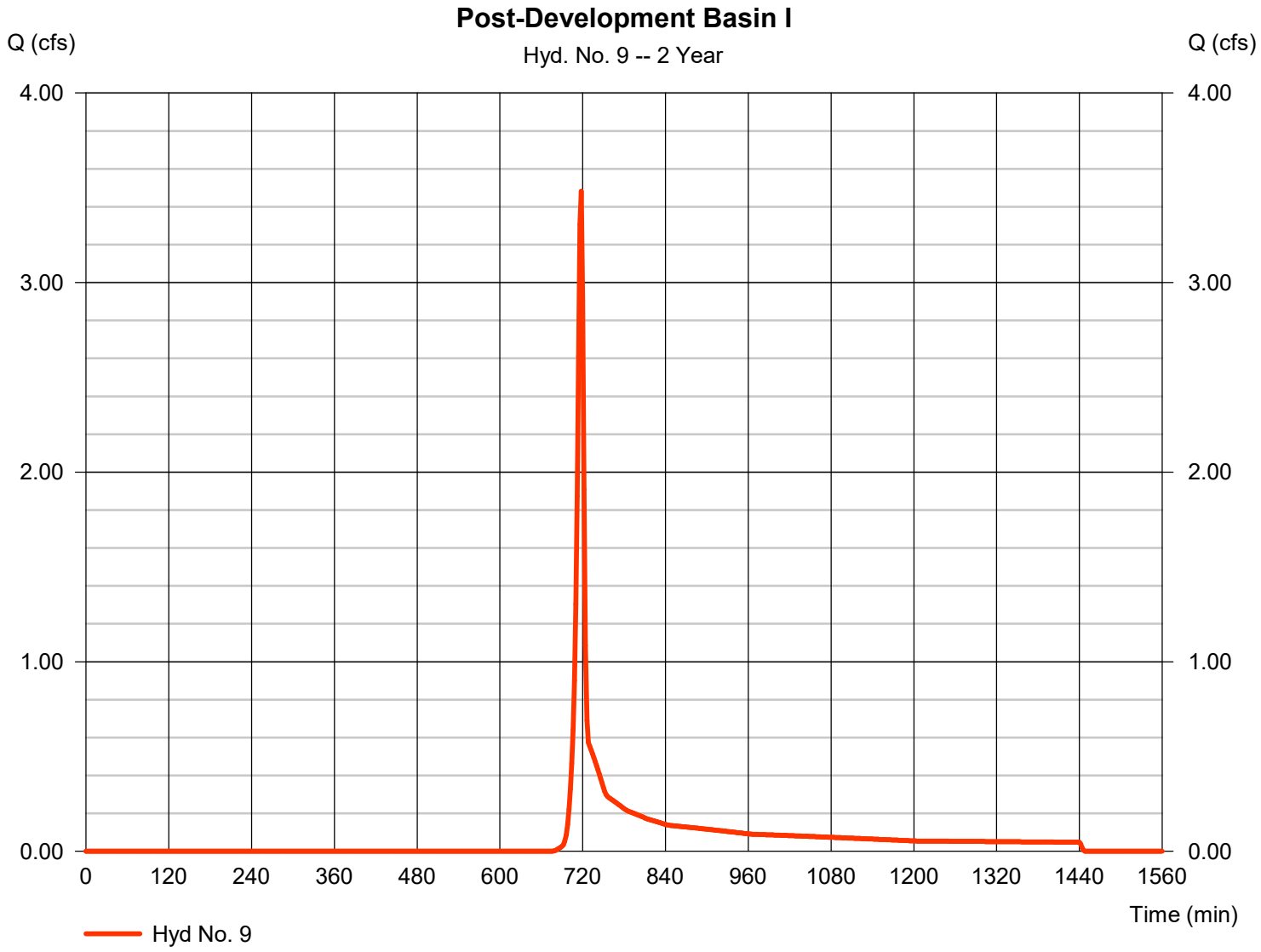
Hydrograph Report

Hyd. No. 9

Post-Development Basin I

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.481 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	7,053 cuft
Drainage area	=	6.460 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.600 x 98) + (1.860 x 61)] / 6.460



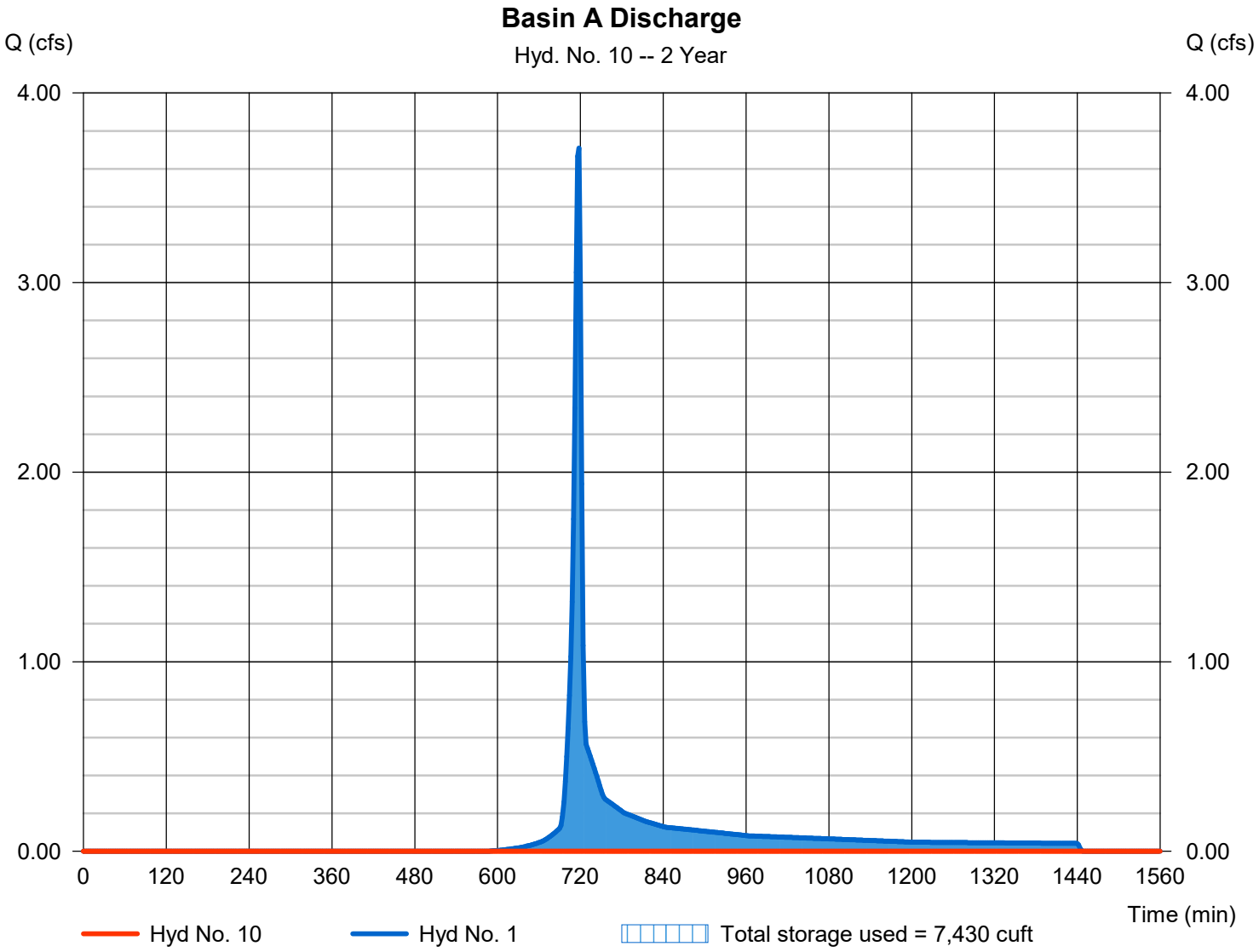
Hydrograph Report

Hyd. No. 10

Basin A Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - Post-Development Basin A	Max. Elevation	=	2.36 ft
Reservoir name	=	Basin A Pond	Max. Storage	=	7,430 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - Basin A Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	5,460	5,460
2.00	3.00	n/a	5,460	10,920
3.00	4.00	n/a	3,705	14,625
3.05	4.05	n/a	5	14,630

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

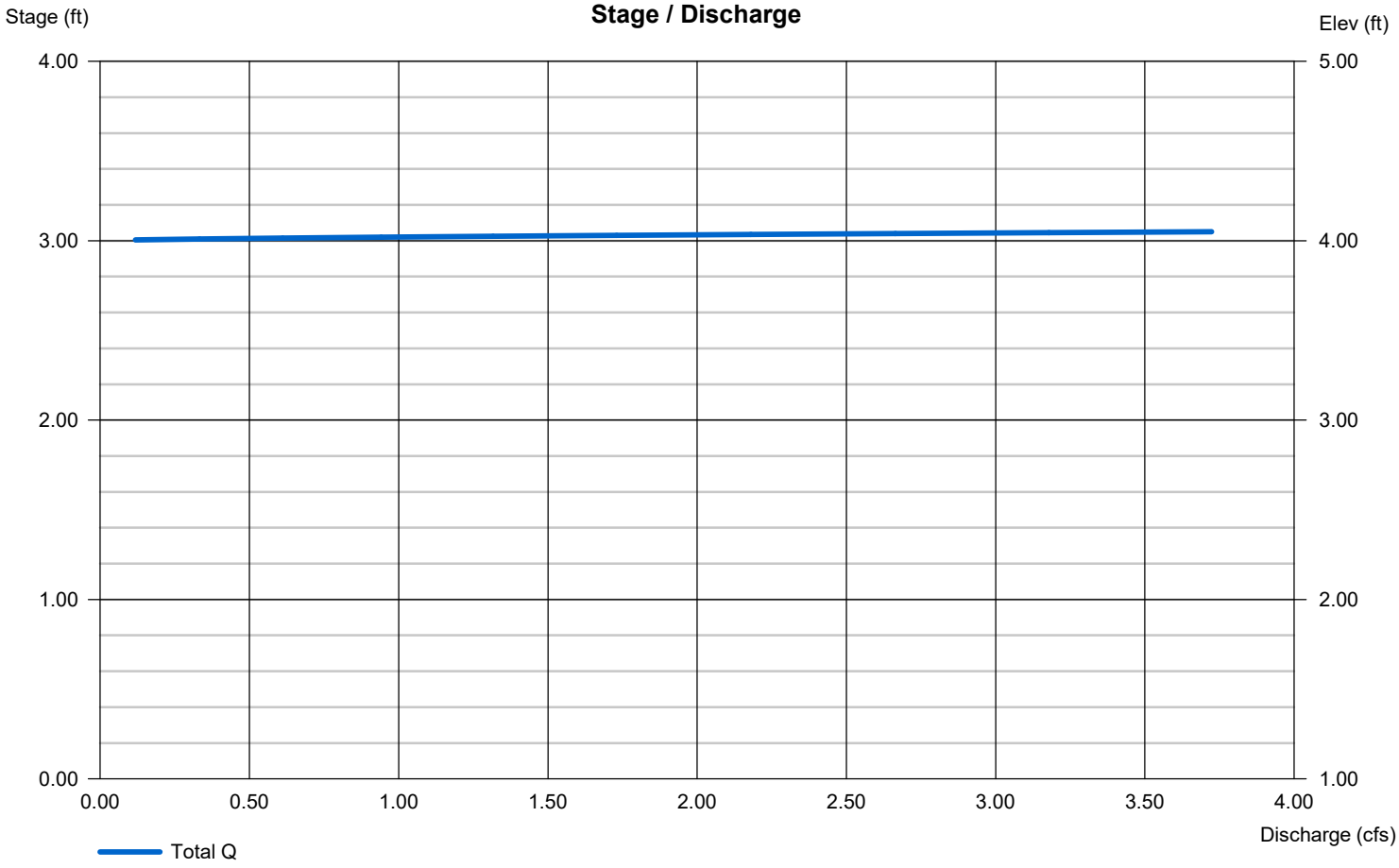
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 4.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



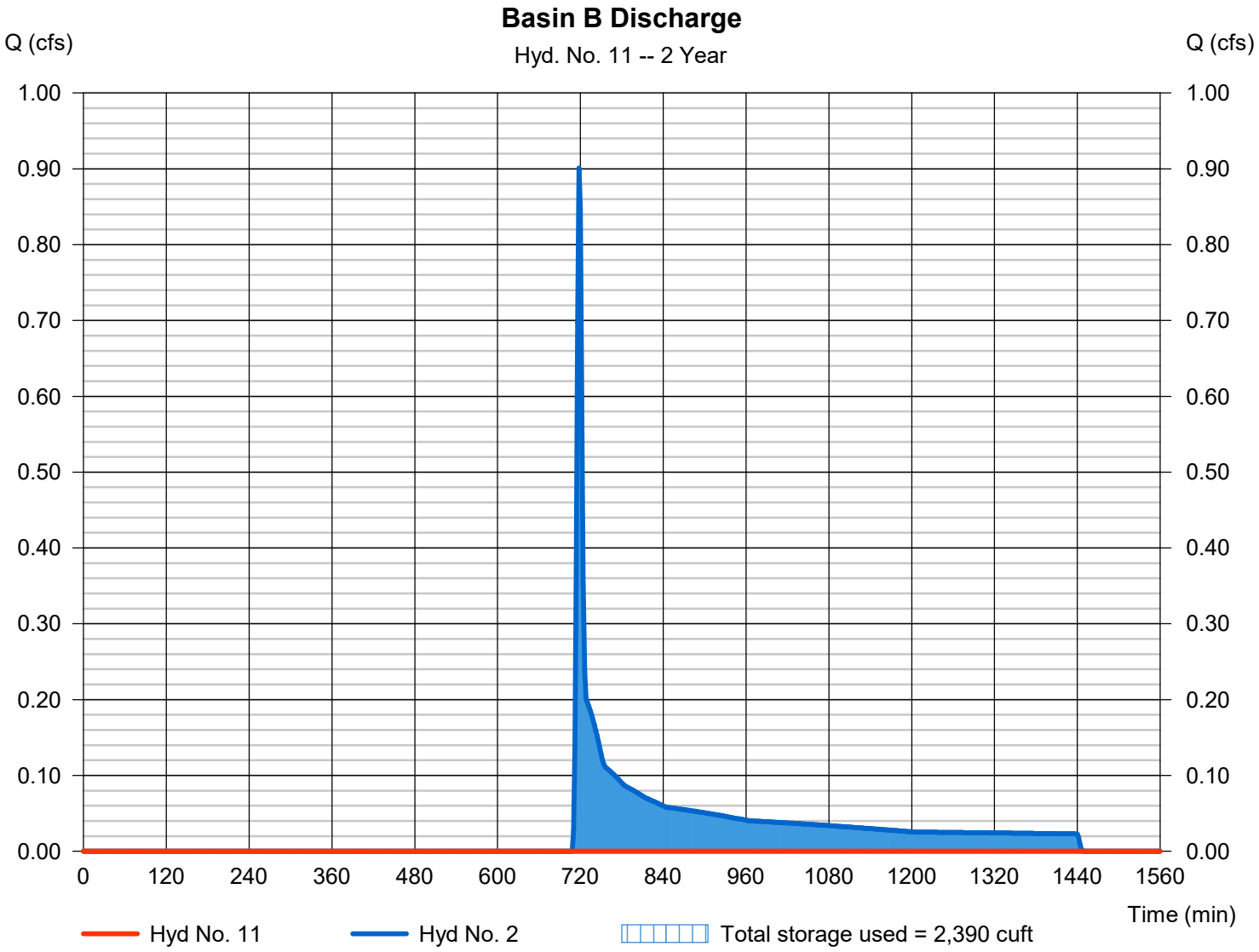
Hydrograph Report

Hyd. No. 11

Basin B Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	2 - Post-Development Basin B	Max. Elevation	=	1.16 ft
Reservoir name	=	Basin B Pond	Max. Storage	=	2,390 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Basin B Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	14,625	14,625
1.05	2.05	n/a	5	14,630

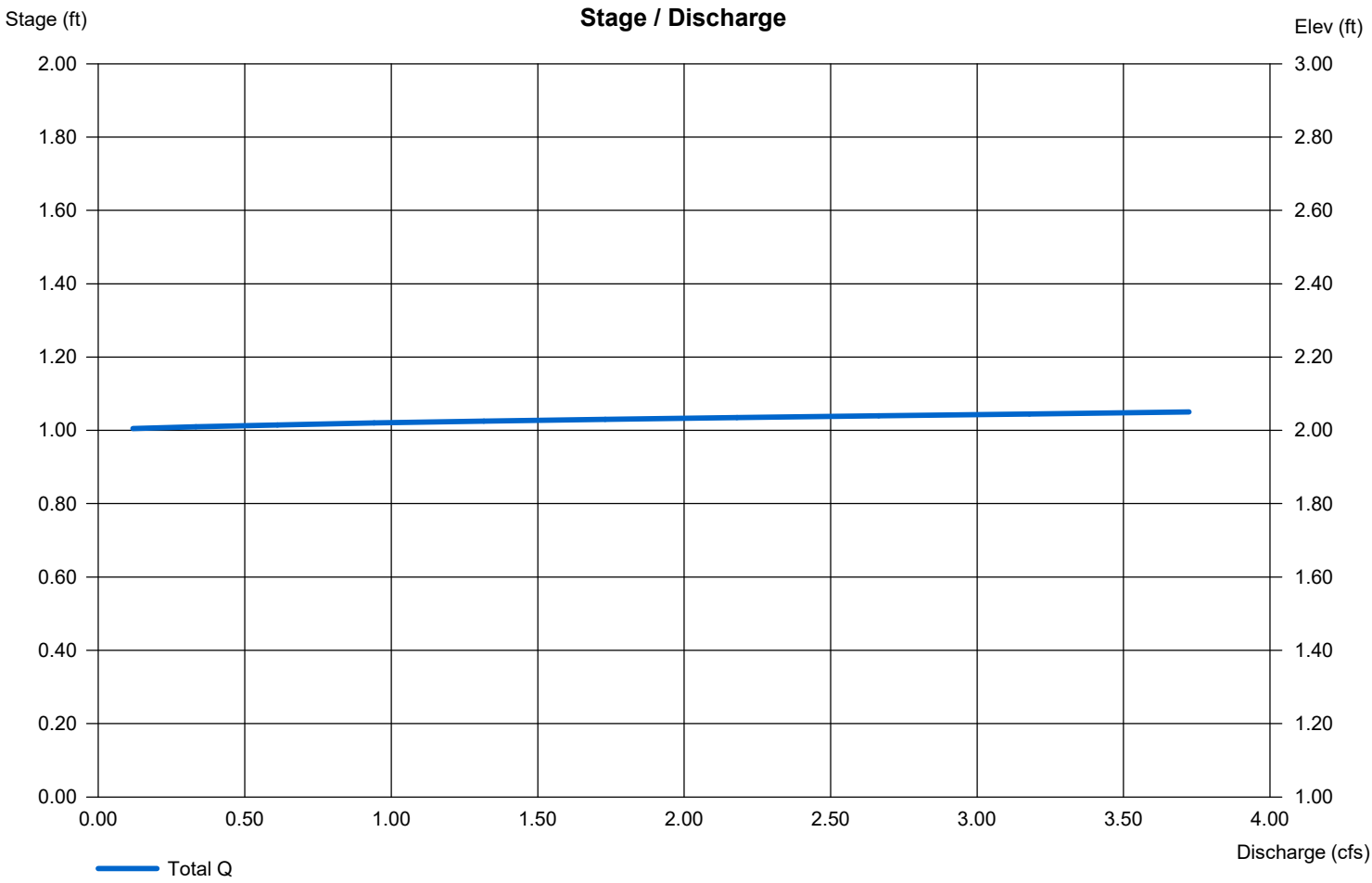
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



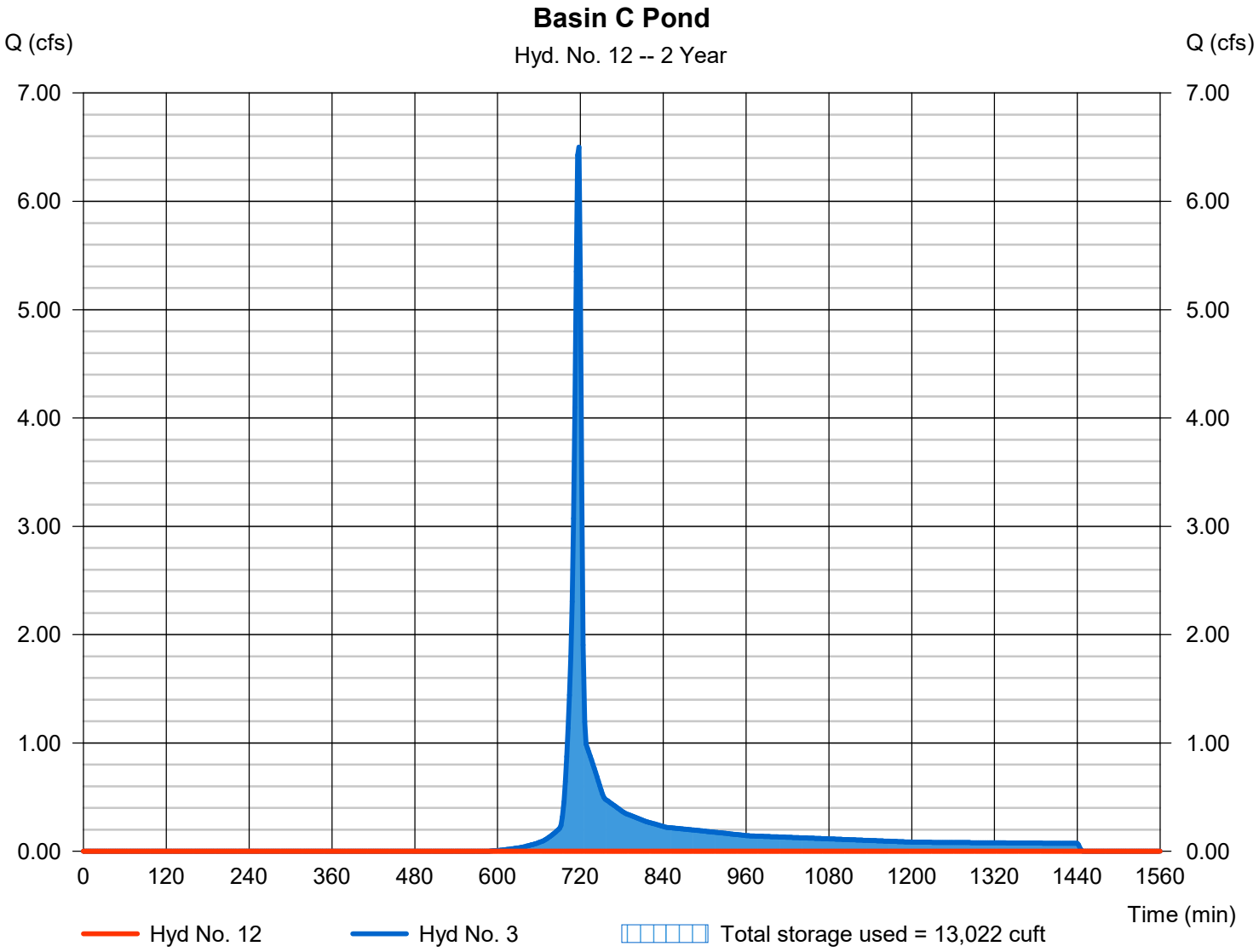
Hydrograph Report

Hyd. No. 12

Basin C Pond

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - Post-Development Basin C	Max. Elevation	=	2.33 ft
Reservoir name	=	Basin C Pond	Max. Storage	=	13,022 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Basin C Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	9,825	9,825
2.00	3.00	n/a	9,825	19,650
3.00	4.00	n/a	12,955	32,605
3.05	4.05	n/a	5	32,610

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

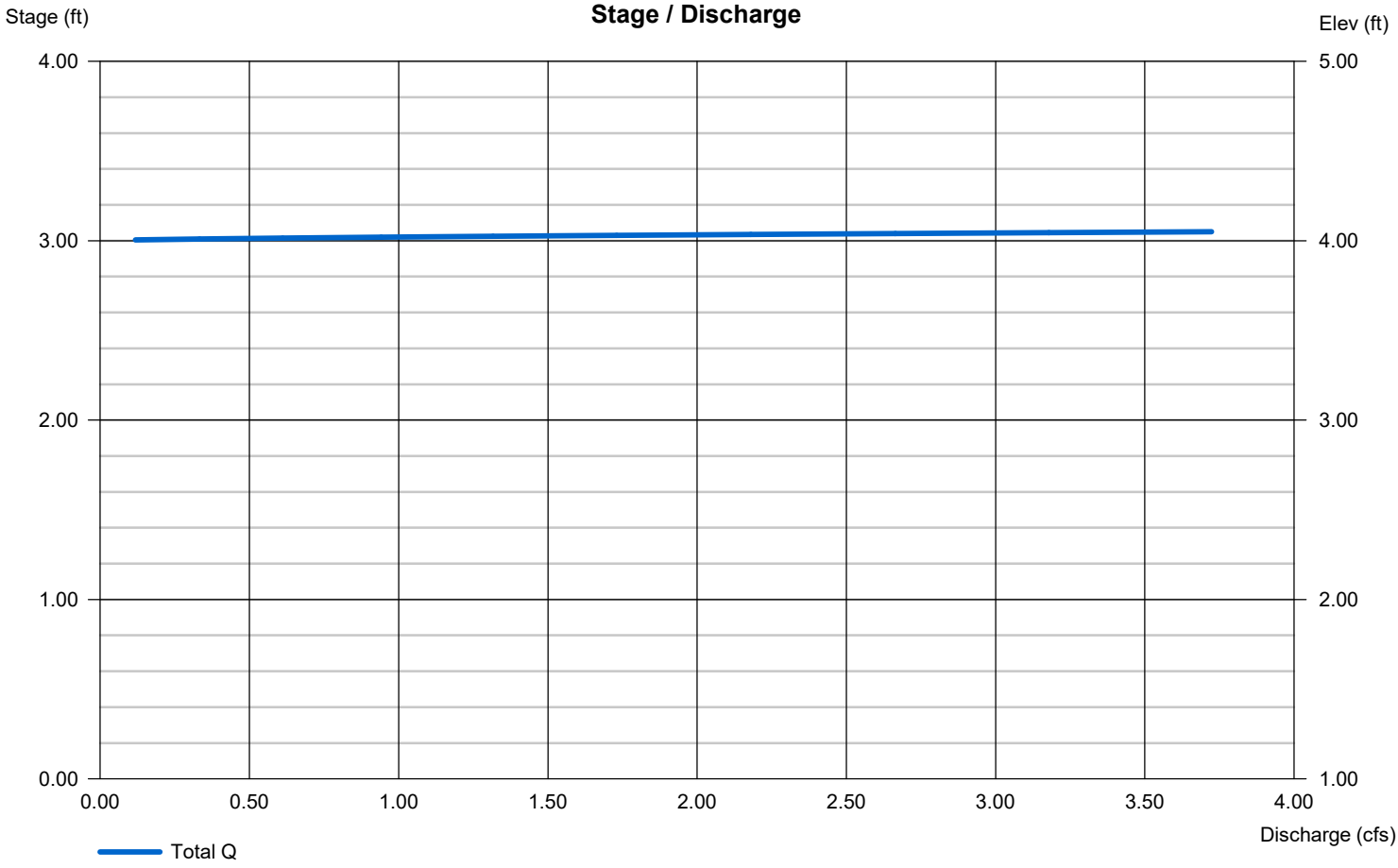
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 4.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



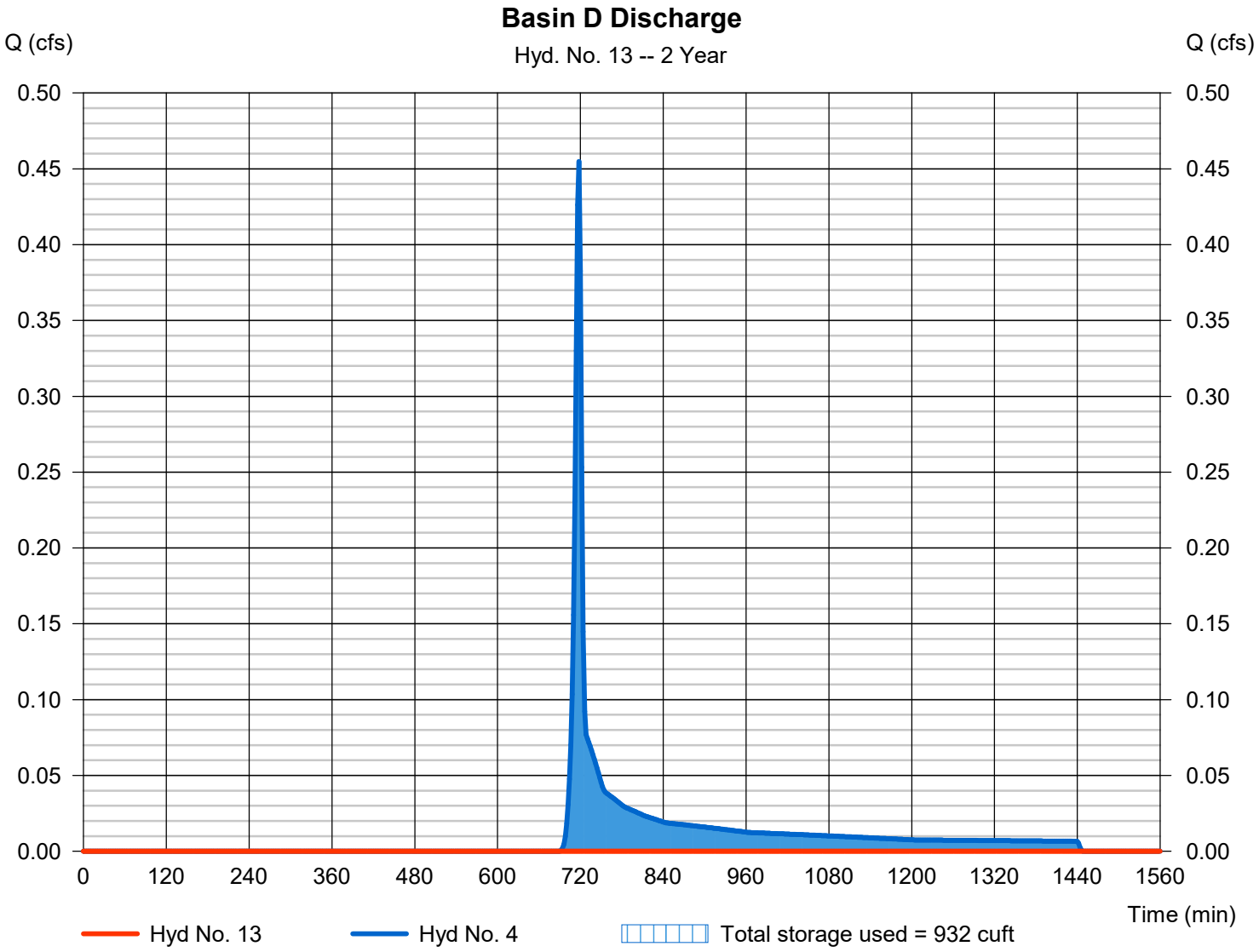
Hydrograph Report

Hyd. No. 13

Basin D Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	4 - Post-Development Basin D	Max. Elevation	=	1.31 ft
Reservoir name	=	Basin D Pond	Max. Storage	=	932 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - Basin D Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	3,032	3,032
1.05	2.05	n/a	8	3,040

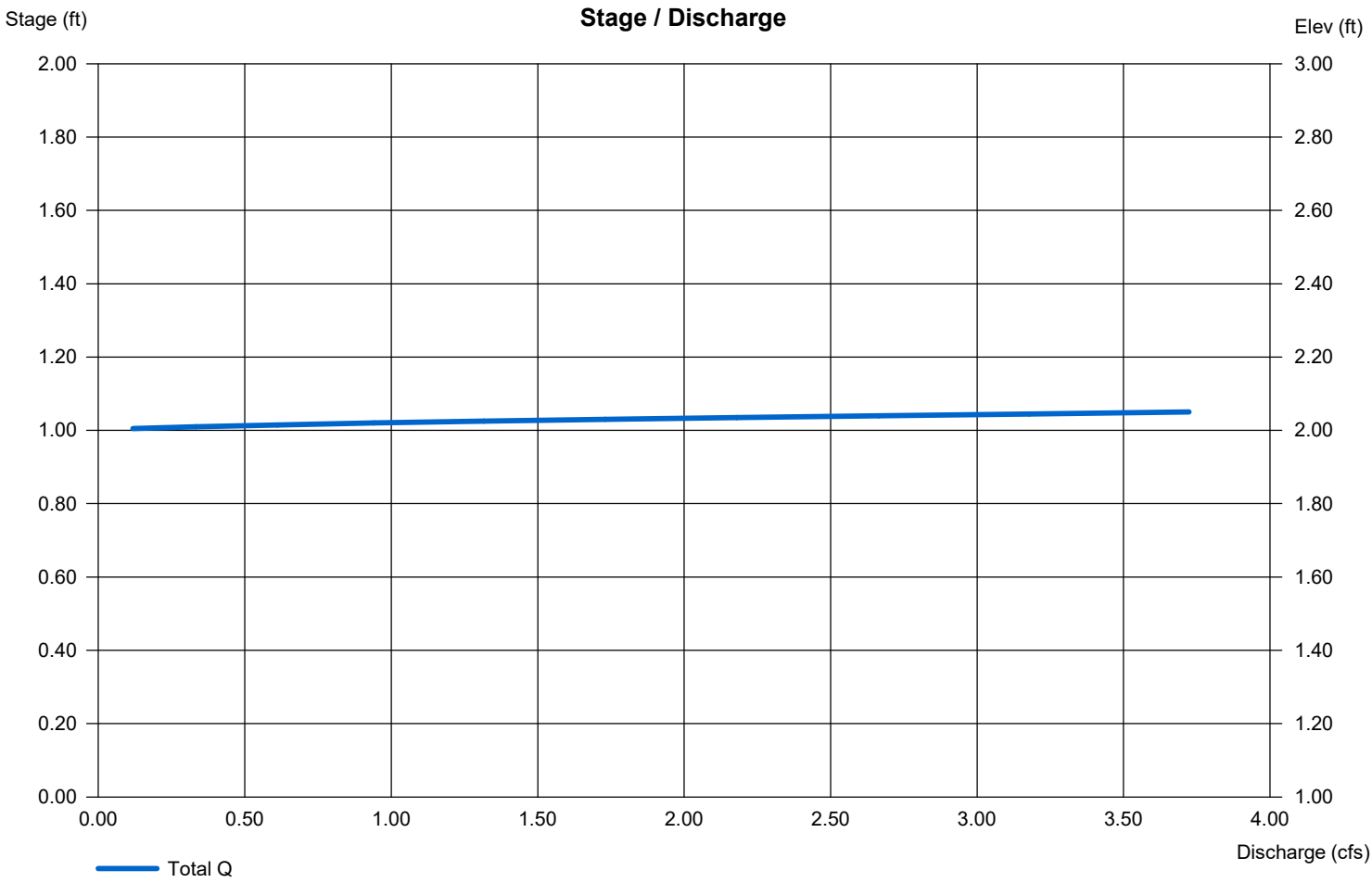
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



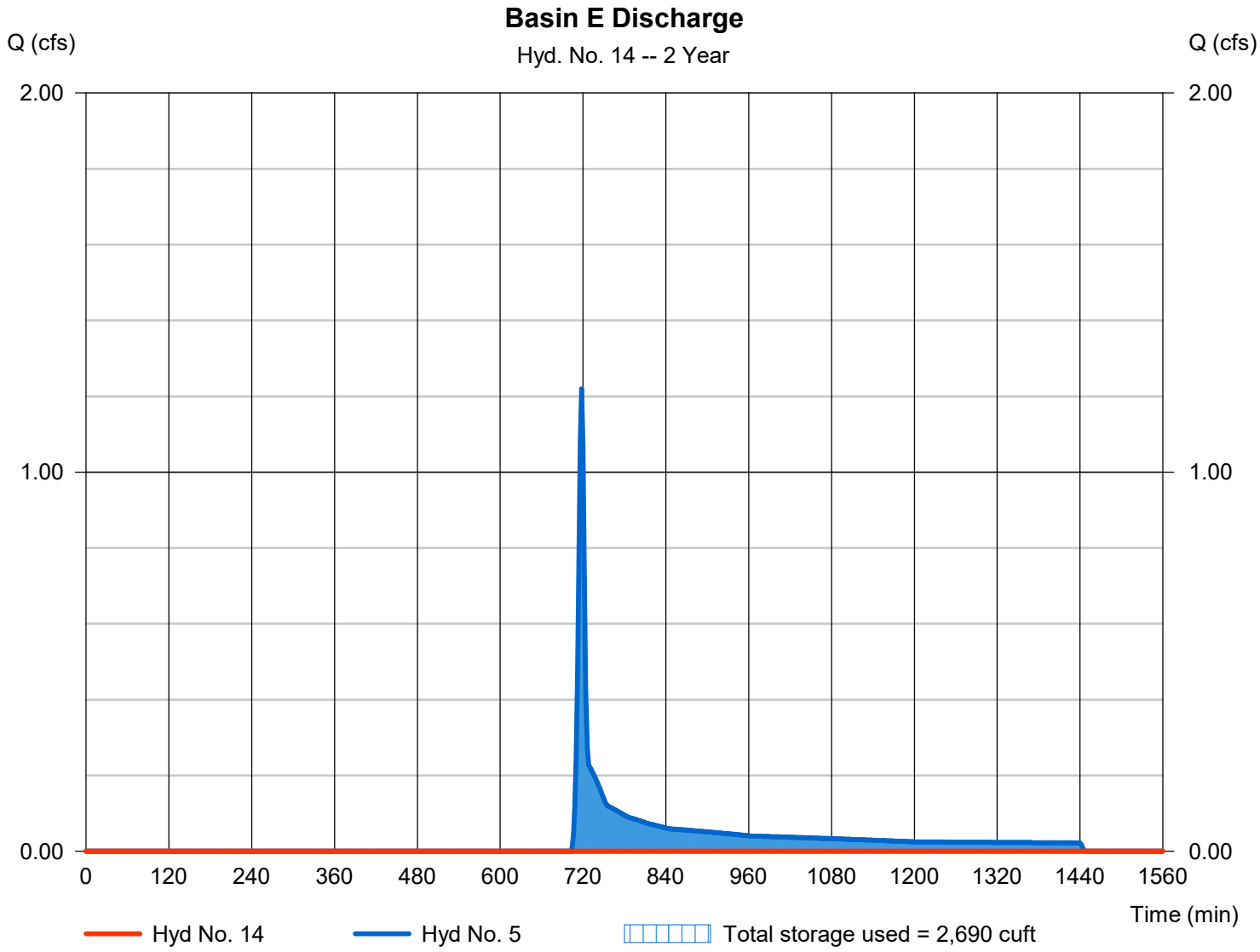
Hydrograph Report

Hyd. No. 14

Basin E Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	5 - Post-Develpment Basin E	Max. Elevation	=	1.55 ft
Reservoir name	=	Basin E Pond	Max. Storage	=	2,690 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - Basin E Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	4,869	4,869
2.00	3.00	n/a	4,946	9,815
2.05	3.05	n/a	5	9,820

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

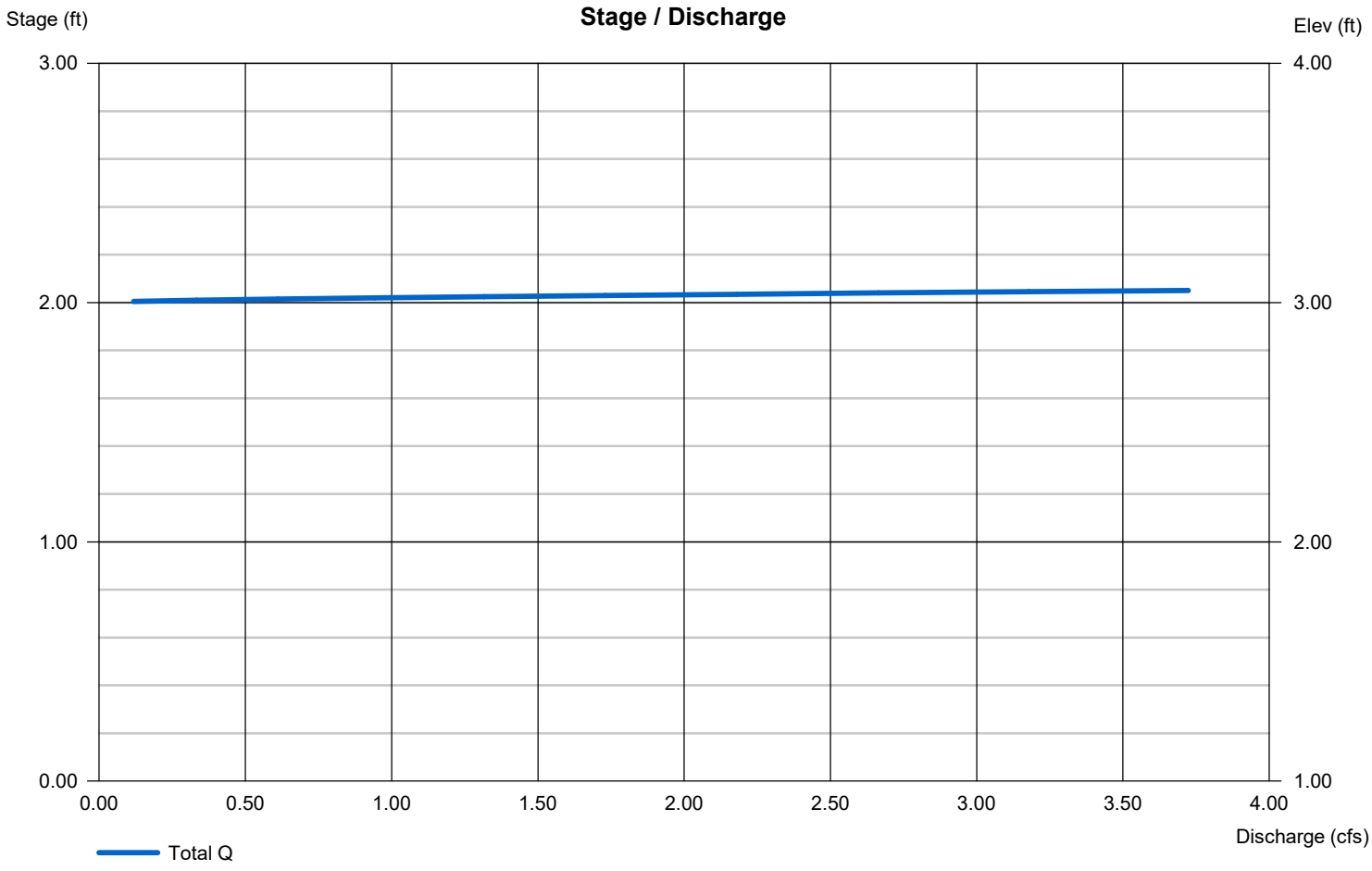
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



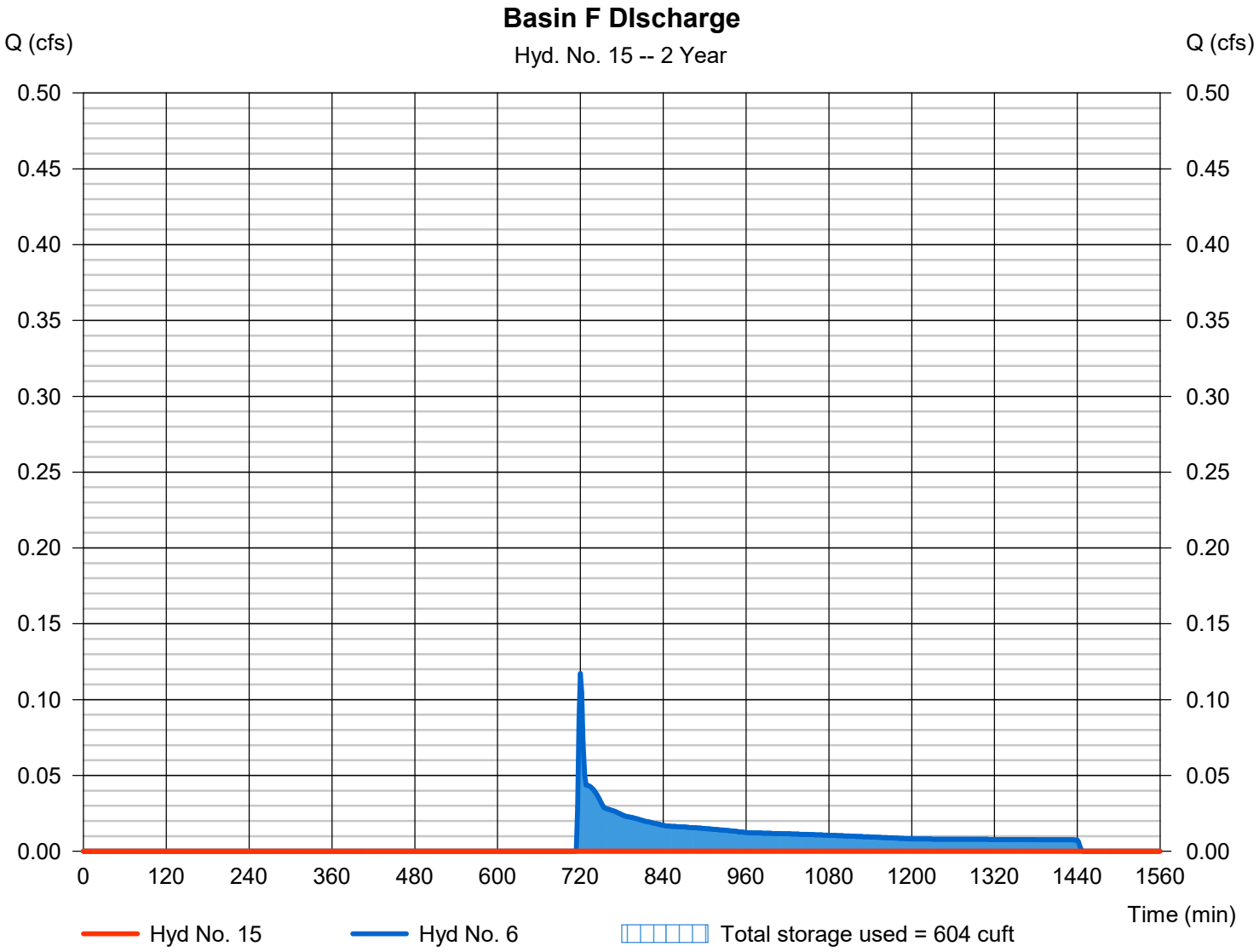
Hydrograph Report

Hyd. No. 15

Basin F DIscharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	6 - Post-Development Basin F	Max. Elevation	=	1.28 ft
Reservoir name	=	Basin F Pond	Max. Storage	=	604 cuft

Storage Indication method used.



Pond No. 6 - Basin F Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	2,119	2,119
1.05	2.05	n/a	6	2,125

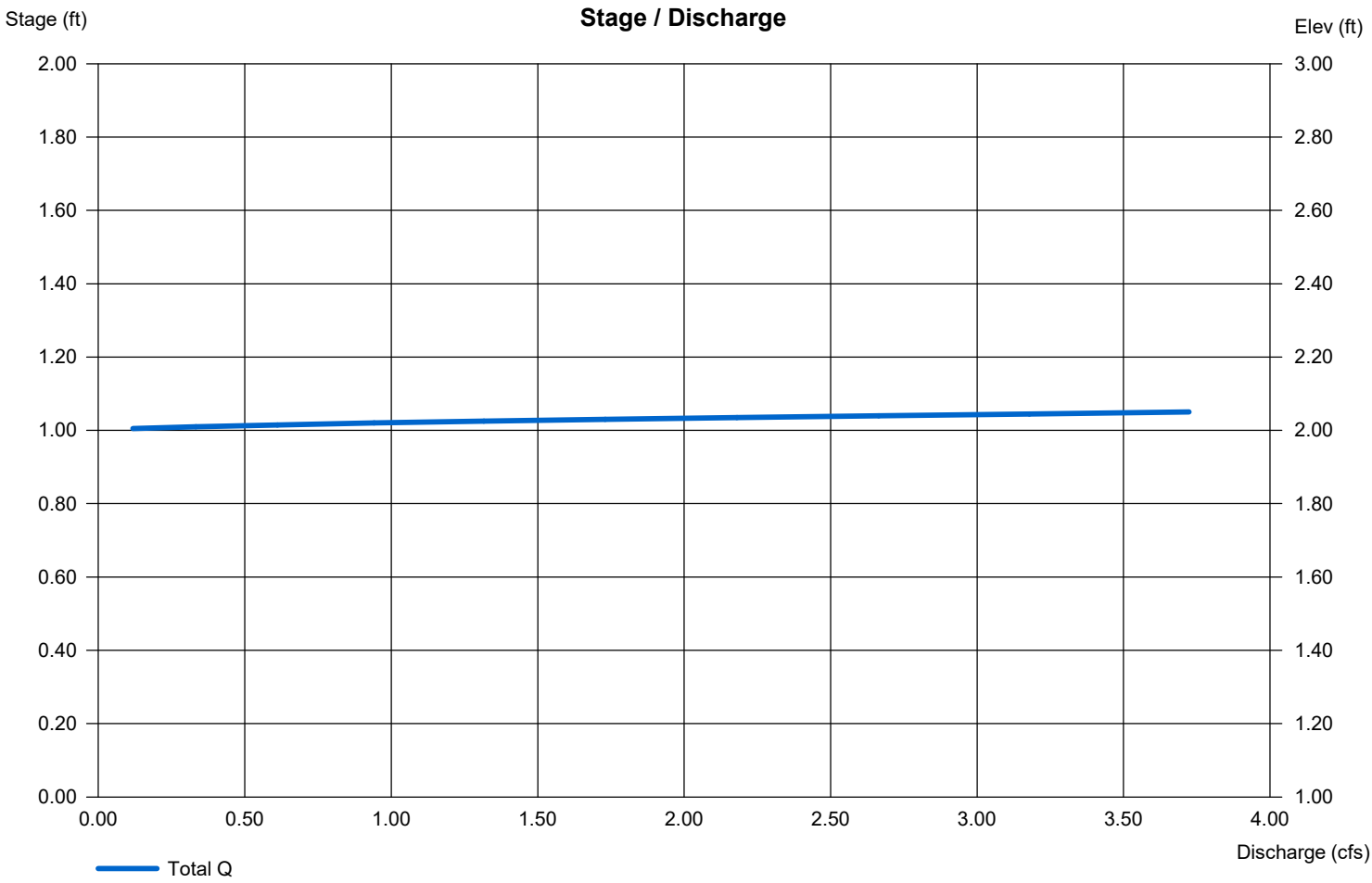
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



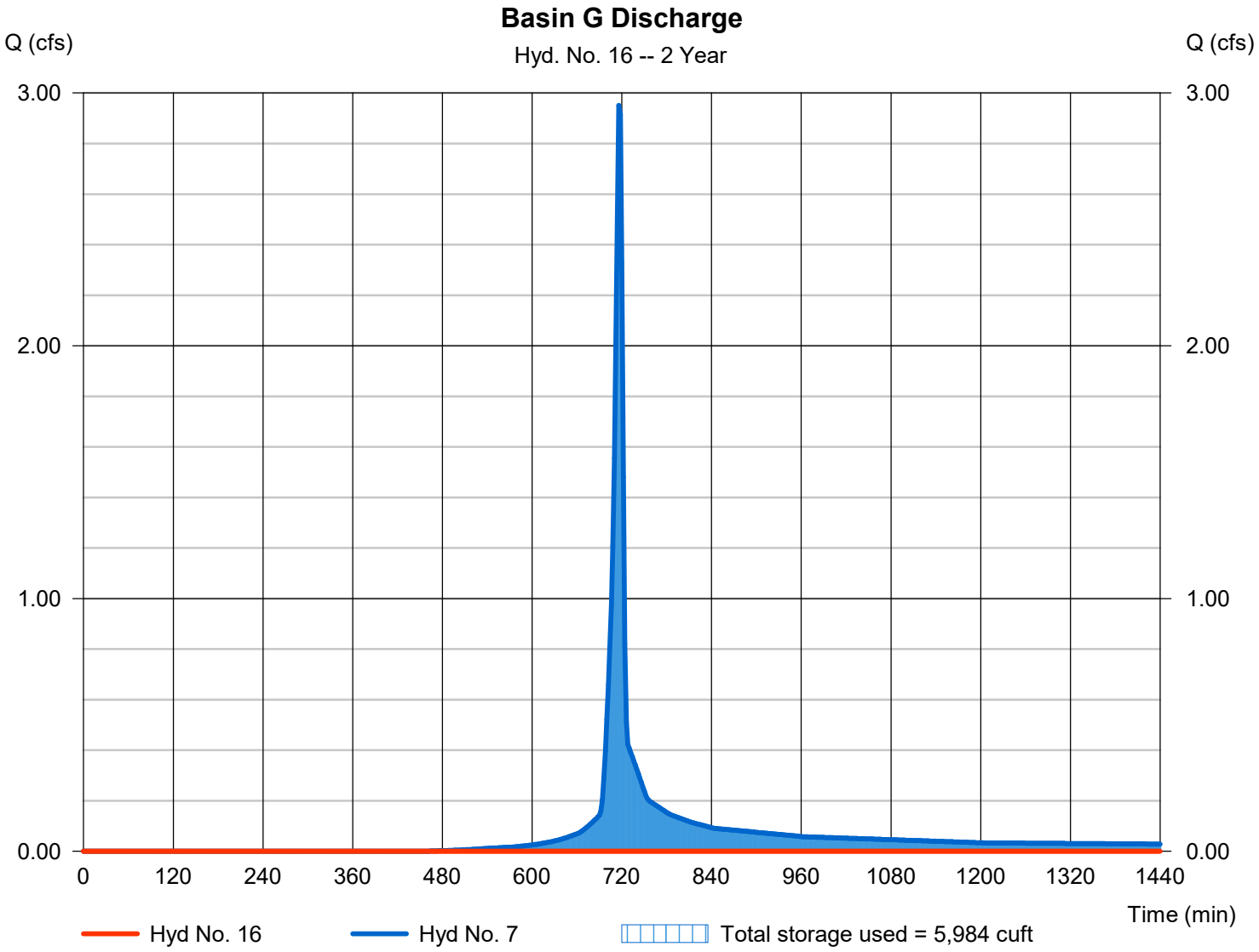
Hydrograph Report

Hyd. No. 16

Basin G Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	7 - Post_Development Basin G	Max. Elevation	=	2.20 ft
Reservoir name	=	Basin G Pond	Max. Storage	=	5,984 cuft

Storage Indication method used.



Pond Report

Pond No. 8 - Basin G Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	4,869	4,869
2.00	3.00	n/a	5,619	10,488
2.05	3.05	n/a	5	10,493

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

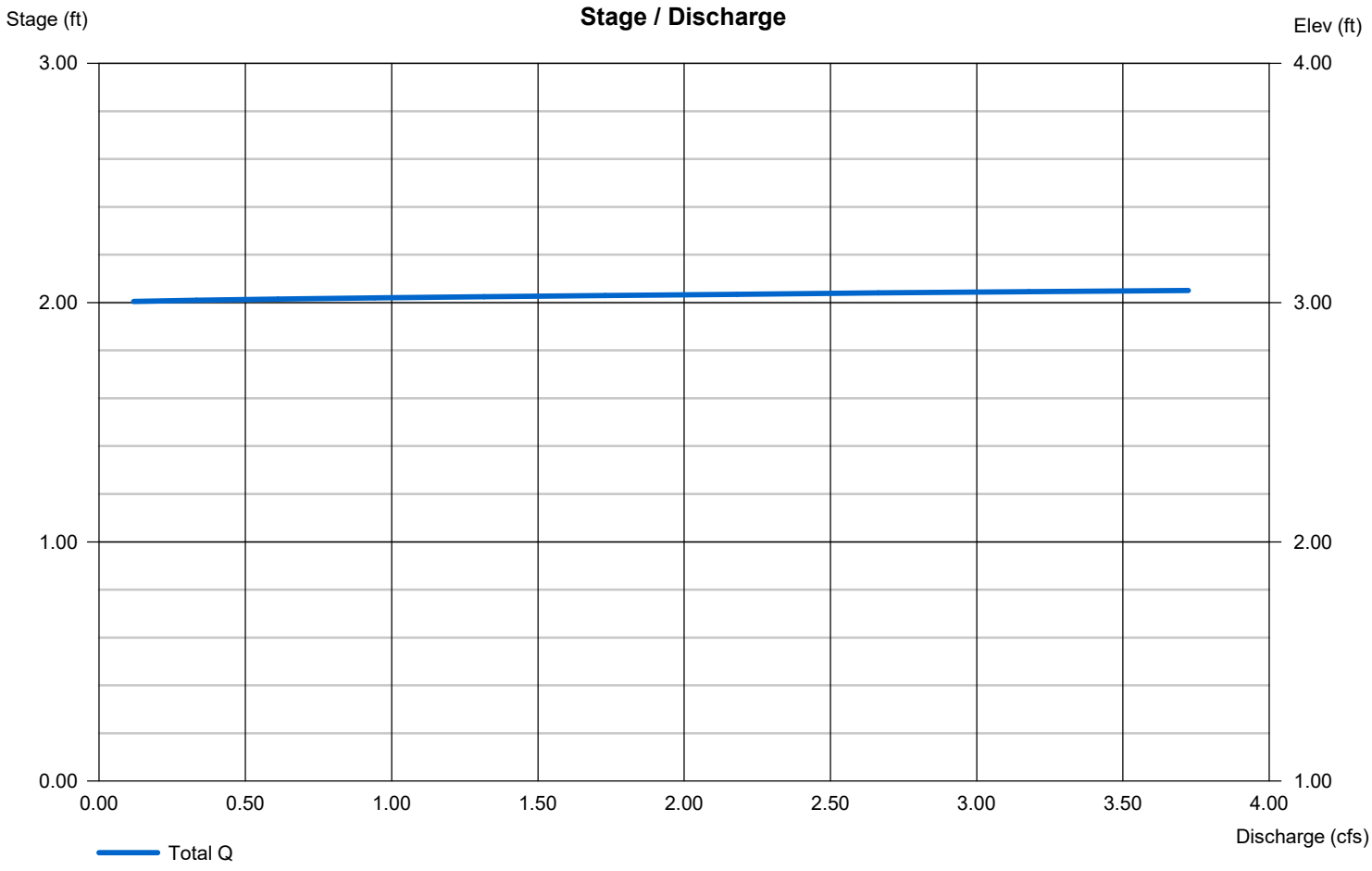
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



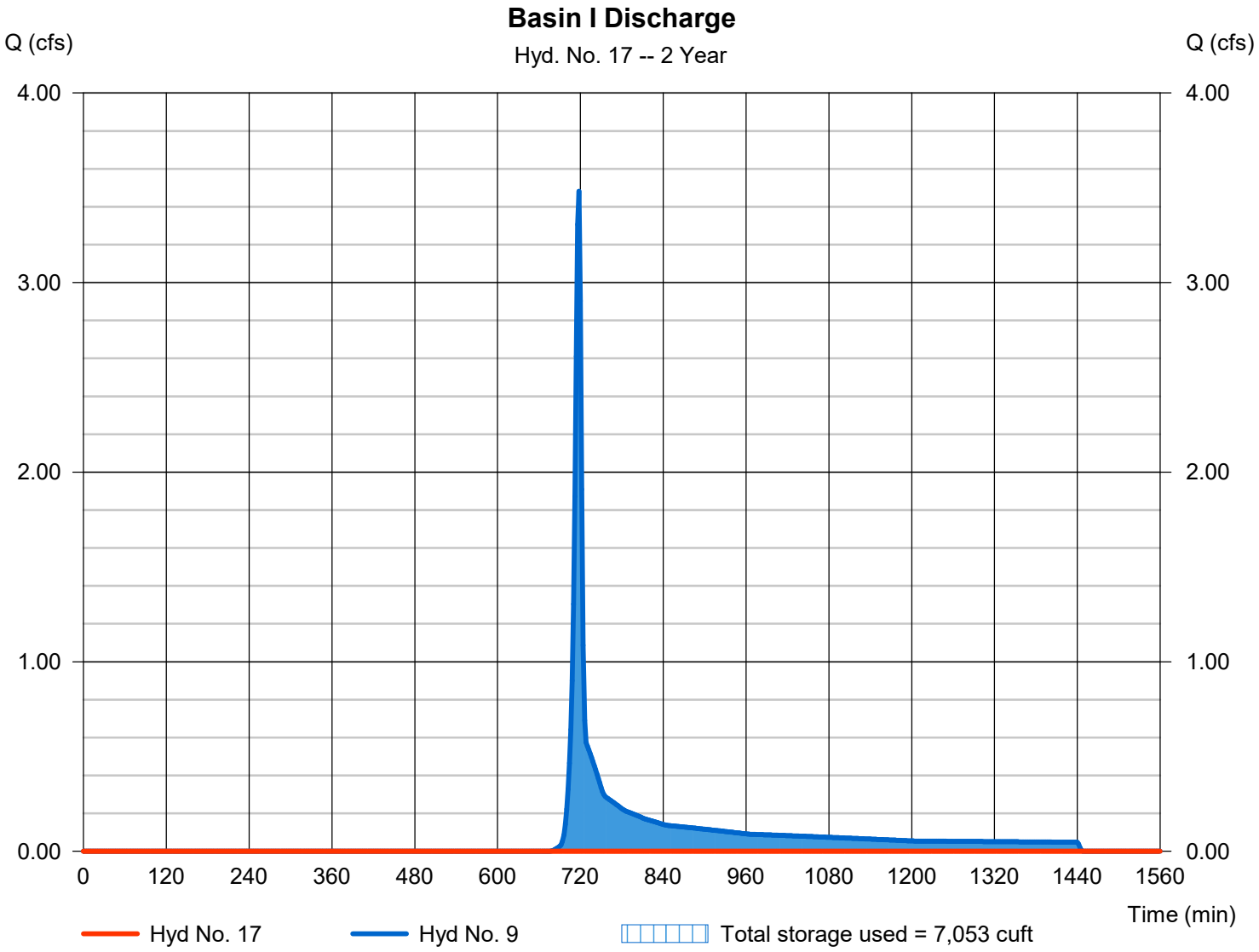
Hydrograph Report

Hyd. No. 17

Basin I Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	9 - Post-Development Basin I	Max. Elevation	=	1.97 ft
Reservoir name	=	Basin I Pond	Max. Storage	=	7,053 cuft

Storage Indication method used.



Pond No. 7 - Basin I Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	7,256	7,256
2.00	3.00	n/a	7,738	14,994
2.05	3.05	n/a	5	14,999

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

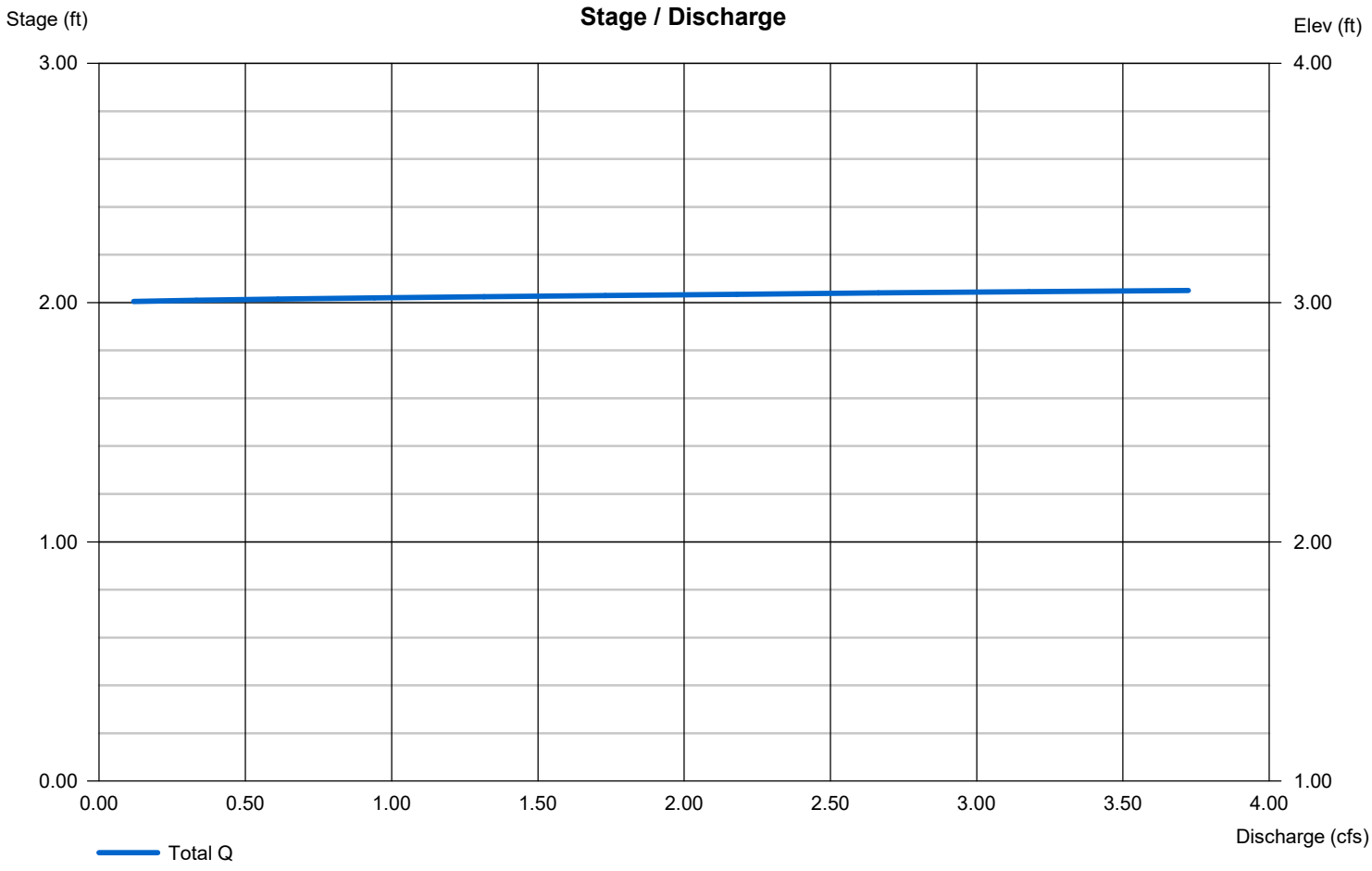
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



Hydrograph 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	6.648	2	716	13,446	------	------	------	Post-Development Basin A
2	SCS Runoff	2.976	2	718	6,205	------	------	------	Post-Development Basin B
3	SCS Runoff	11.65	2	716	23,568	------	------	------	Post-Development Basin C
4	SCS Runoff	0.972	2	718	1,943	------	------	------	Post-Development Basin D
5	SCS Runoff	3.068	2	718	6,194	------	------	------	Post-Develpment Basin E
6	SCS Runoff	0.838	2	718	1,952	------	------	------	Post-Development Basin F
7	SCS Runoff	4.855	2	716	10,013	------	------	------	Post_Development Basin G
8	SCS Runoff	0.011	2	808	377	------	------	------	Post-Development Basin H
9	SCS Runoff	7.130	2	718	14,264	------	------	------	Post-Development Basin I
10	Reservoir	0.000	2	n/a	0	1	3.68	13,446	Basin A Discharge
11	Reservoir	0.000	2	n/a	0	2	1.42	6,205	Basin B Discharge
12	Reservoir	0.000	2	n/a	0	3	3.30	23,568	Basin C Pond
13	Reservoir	0.000	2	n/a	0	4	1.64	1,943	Basin D Discharge
14	Reservoir	0.000	2	n/a	0	5	2.27	6,194	Basin E Discharge
15	Reservoir	0.000	2	n/a	0	6	1.92	1,952	Basin F DIscharge
16	Reservoir	0.000	2	n/a	0	7	2.92	10,013	Basin G Discharge
17	Reservoir	0.000	2	n/a	0	9	2.91	14,264	Basin I Discharge

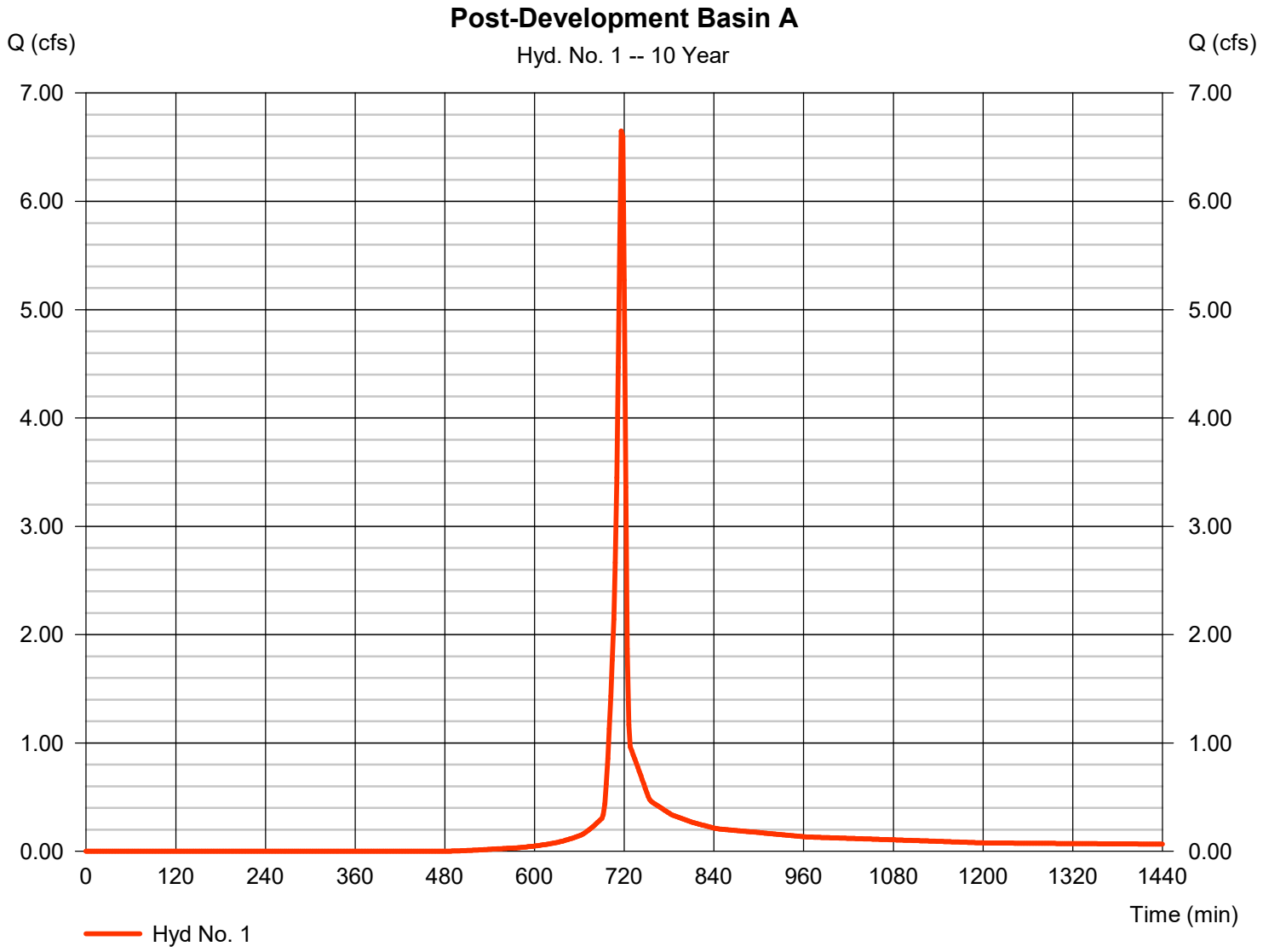
Hydrograph Report

Hyd. No. 1

Post-Development Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.648 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	13,446 cuft
Drainage area	=	4.530 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.630 x 98) + (0.900 x 61)] / 4.530



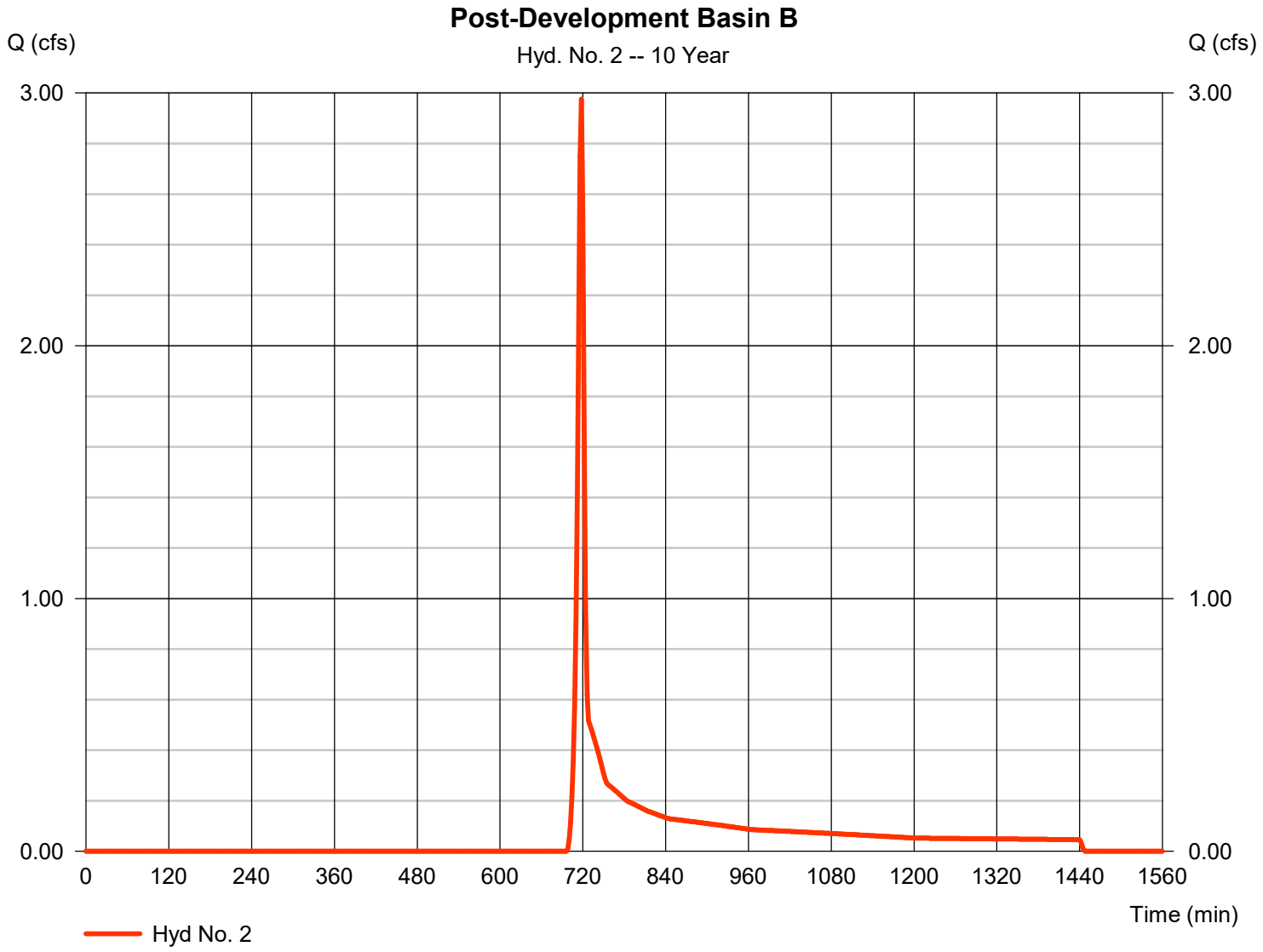
Hydrograph Report

Hyd. No. 2

Post-Development Basin B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.976 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,205 cuft
Drainage area	=	4.960 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.530 x 98) + (2.430 x 61)] / 4.960



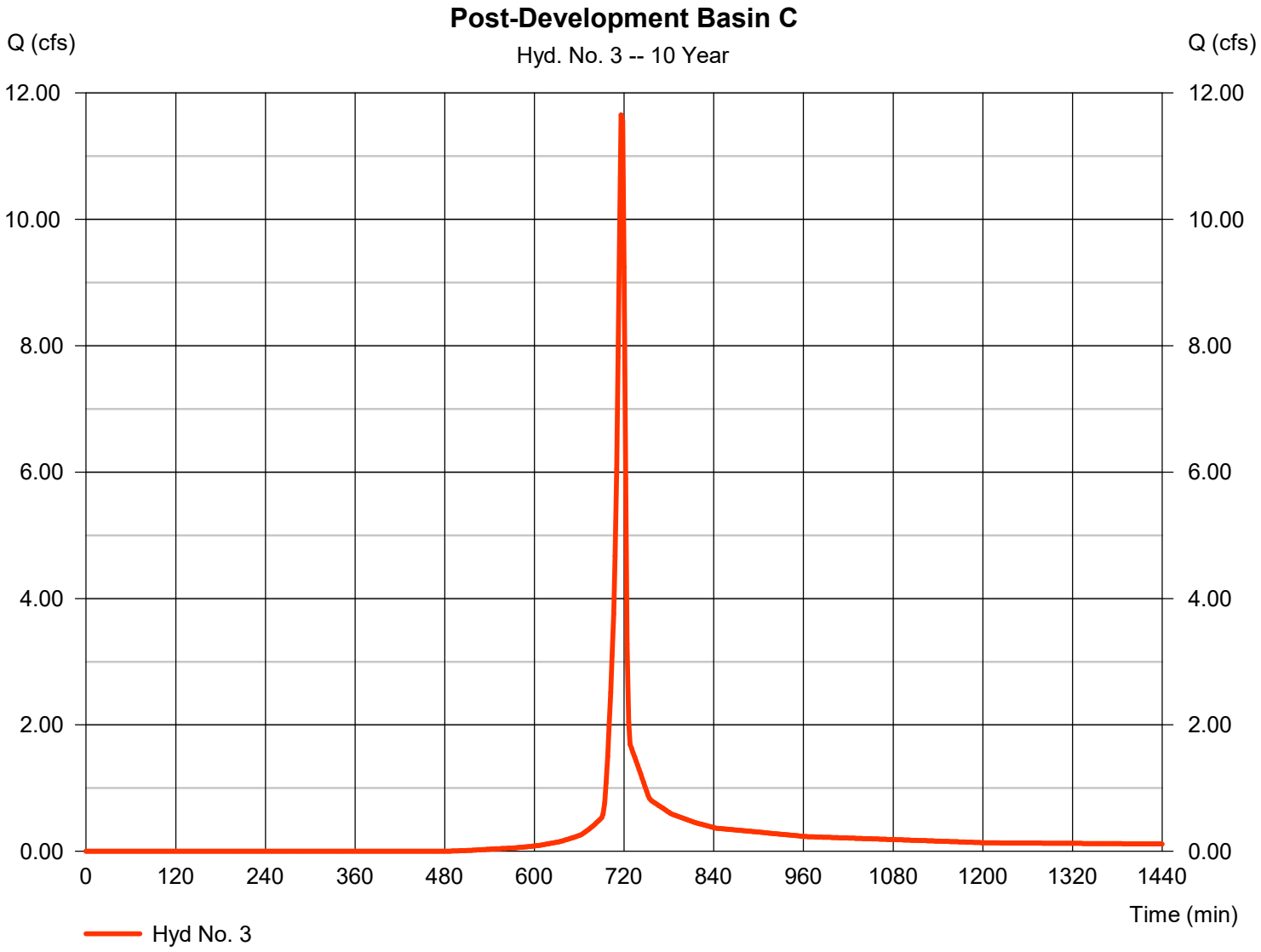
Hydrograph Report

Hyd. No. 3

Post-Development Basin C

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.65 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	23,568 cuft
Drainage area	=	7.940 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(6.470 x 98) + (1.470 x 61)] / 7.940



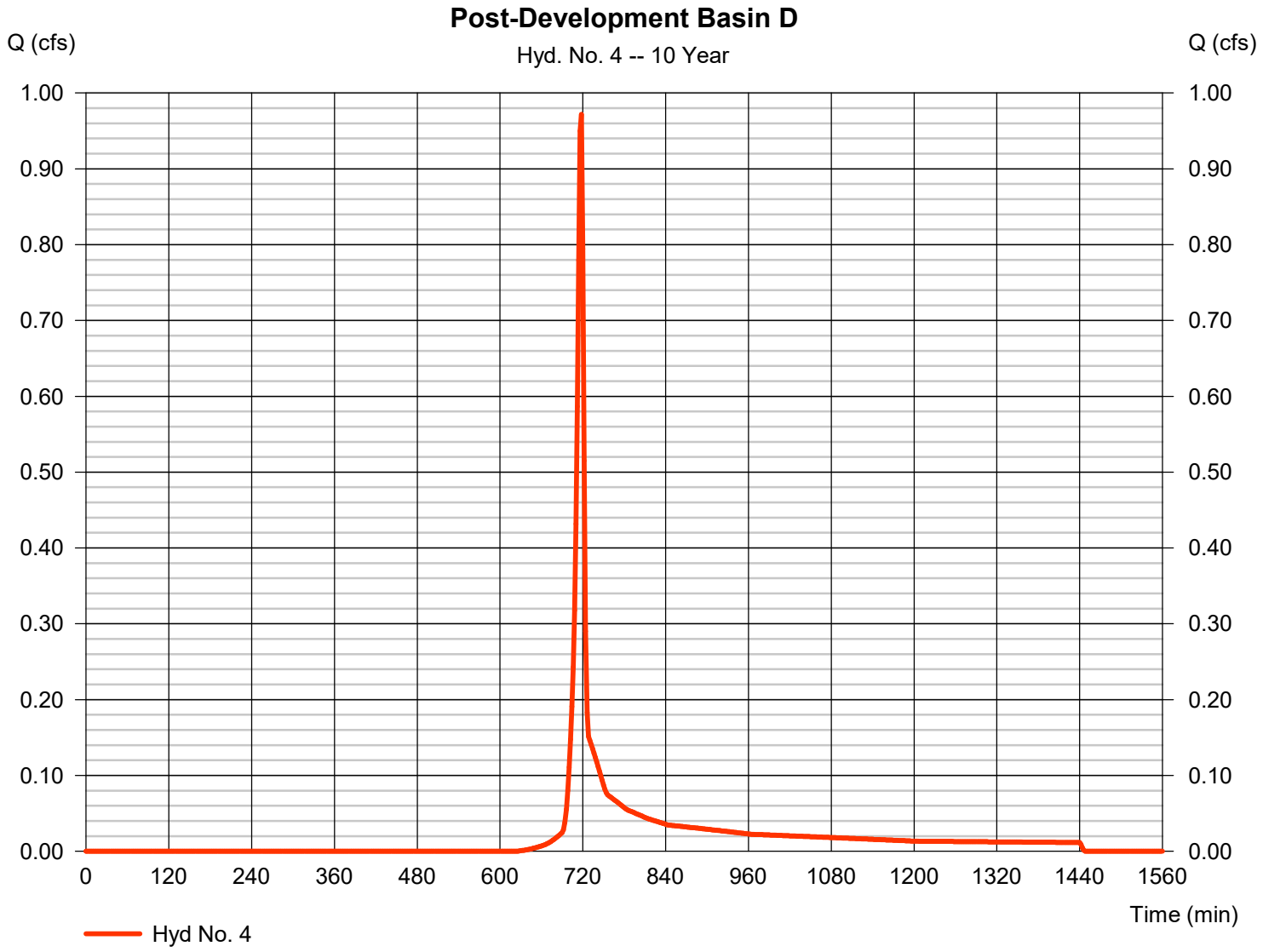
Hydrograph Report

Hyd. No. 4

Post-Development Basin D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.972 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	1,943 cuft
Drainage area	=	0.950 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.640 x 98) + (0.310 x 61)] / 0.950



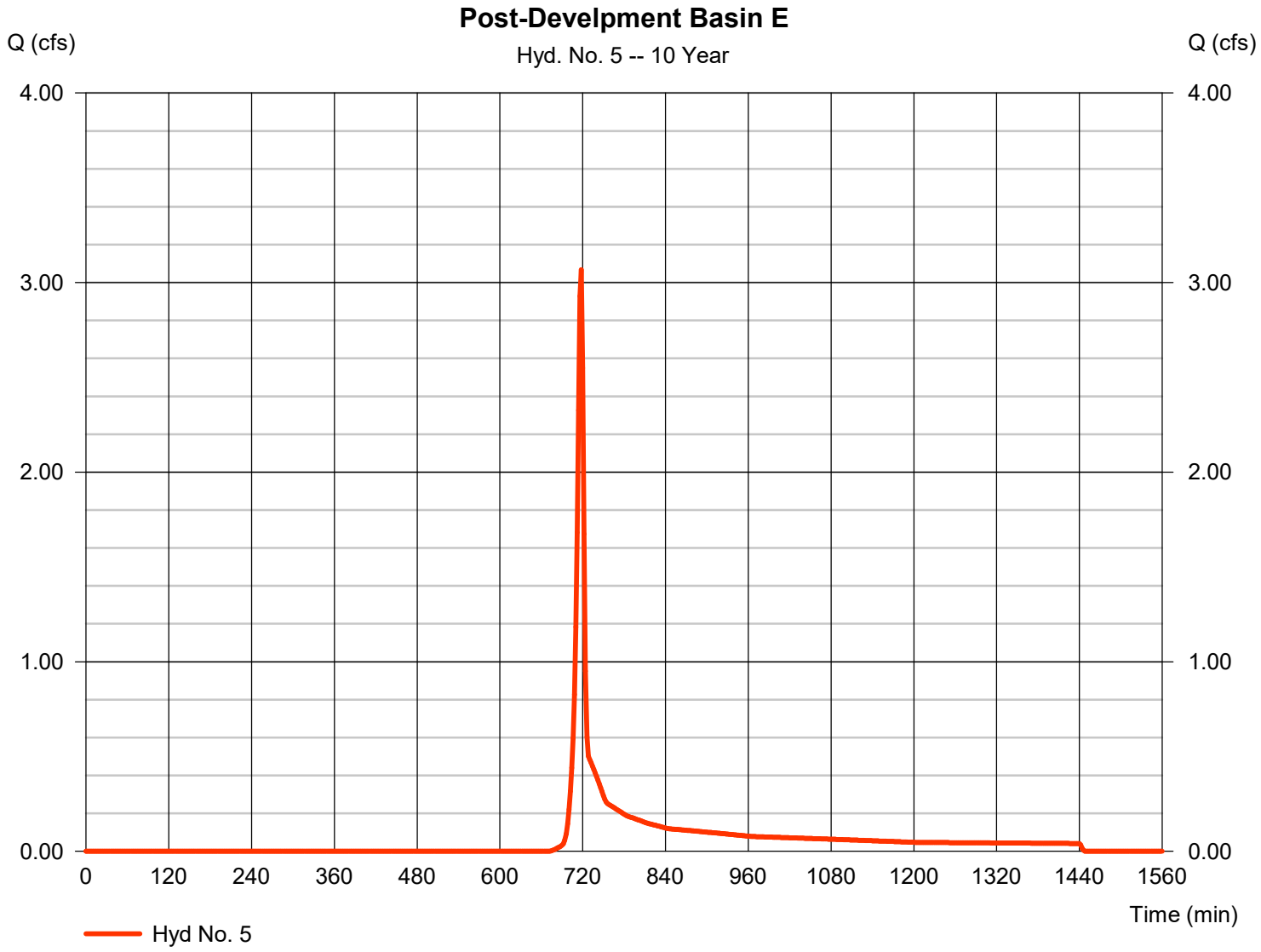
Hydrograph Report

Hyd. No. 5

Post-Develpment Basin E

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.068 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,194 cuft
Drainage area	=	3.840 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.320 x 98) + (1.520 x 61)] / 3.840



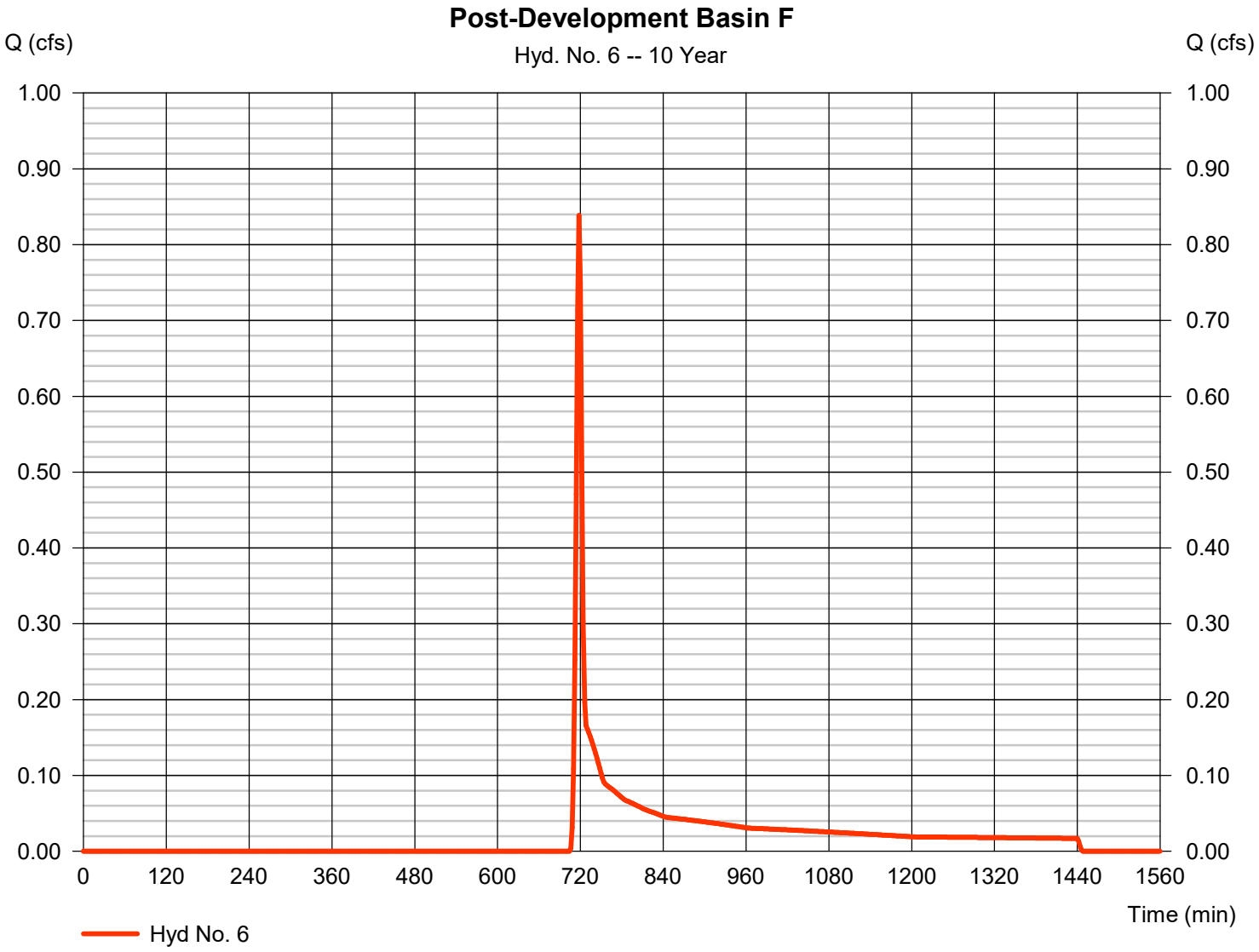
Hydrograph Report

Hyd. No. 6

Post-Development Basin F

Hydrograph type	= SCS Runoff	Peak discharge	= 0.838 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 1,952 cuft
Drainage area	= 2.270 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.920 x 98) + (1.350 x 61)] / 2.270



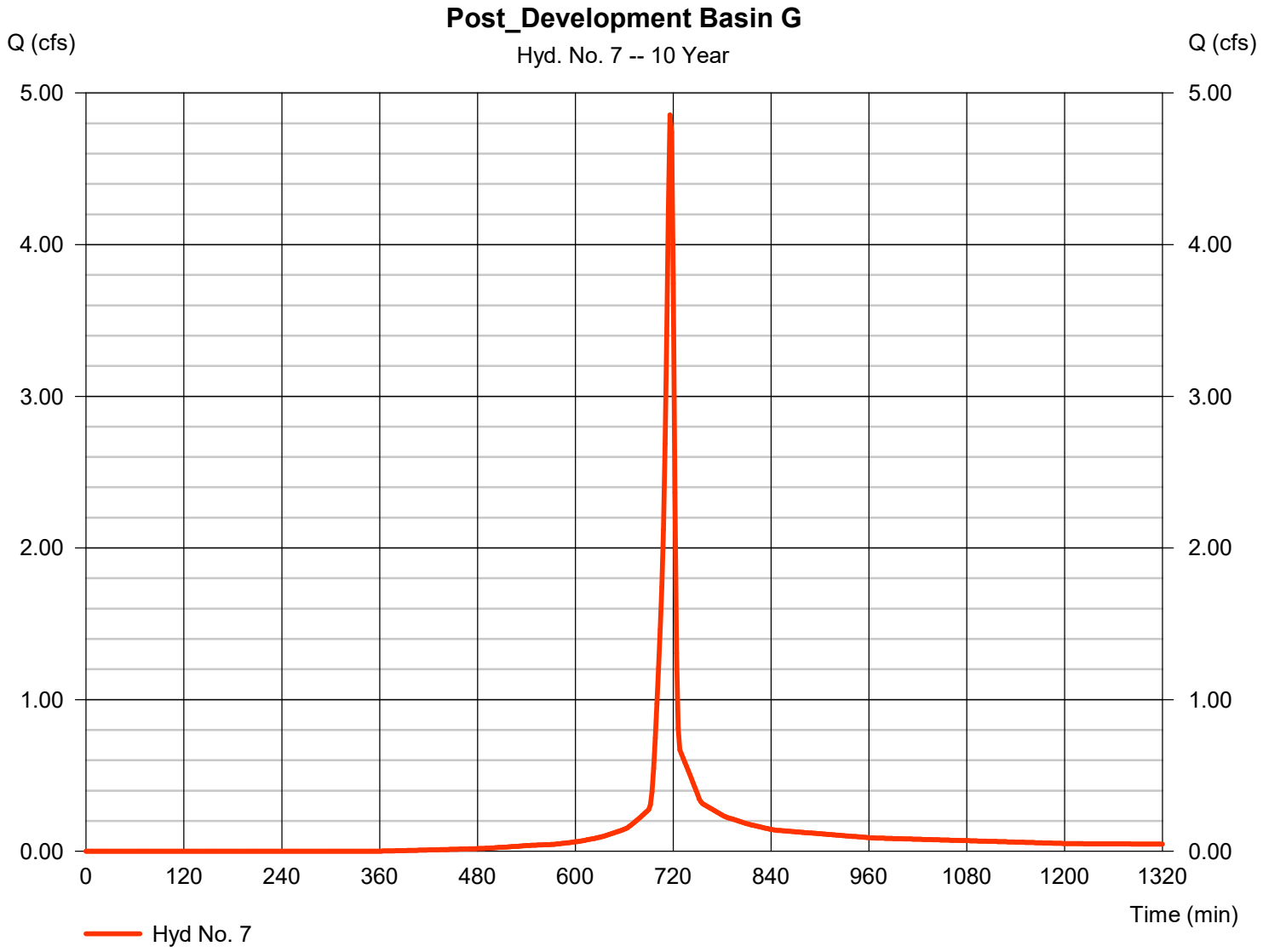
Hydrograph Report

Hyd. No. 7

Post_Development Basin G

Hydrograph type	= SCS Runoff	Peak discharge	= 4.855 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 10,013 cuft
Drainage area	= 2.720 ac	Curve number	= 94*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.410 x 98) + (0.310 x 61)] / 2.720



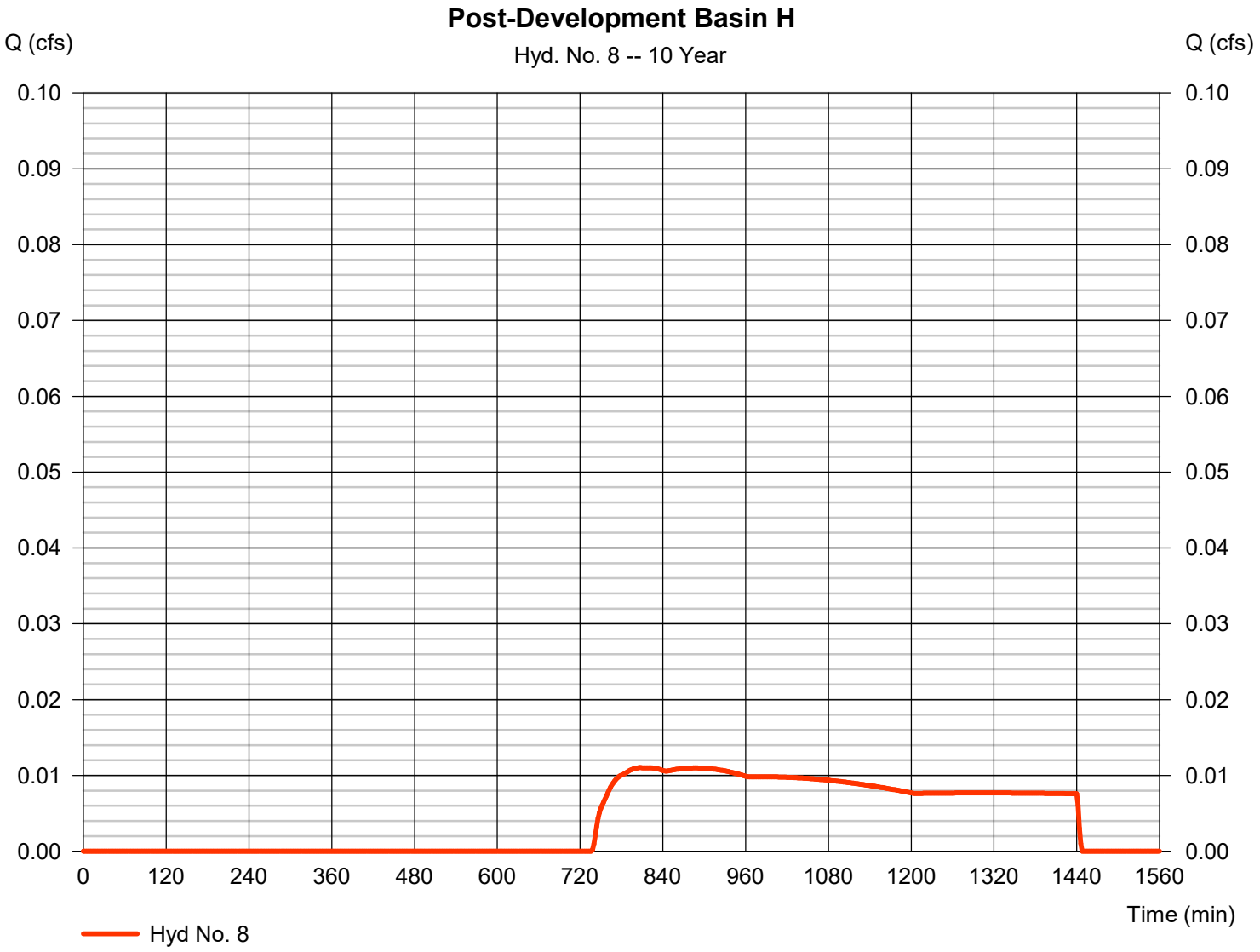
Hydrograph Report

Hyd. No. 8

Post-Development Basin H

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.011 cfs
Storm frequency	=	10 yrs	Time to peak	=	808 min
Time interval	=	2 min	Hyd. volume	=	377 cuft
Drainage area	=	2.990 ac	Curve number	=	63*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.66 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.150 x 98) + (2.840 x 61)] / 2.990



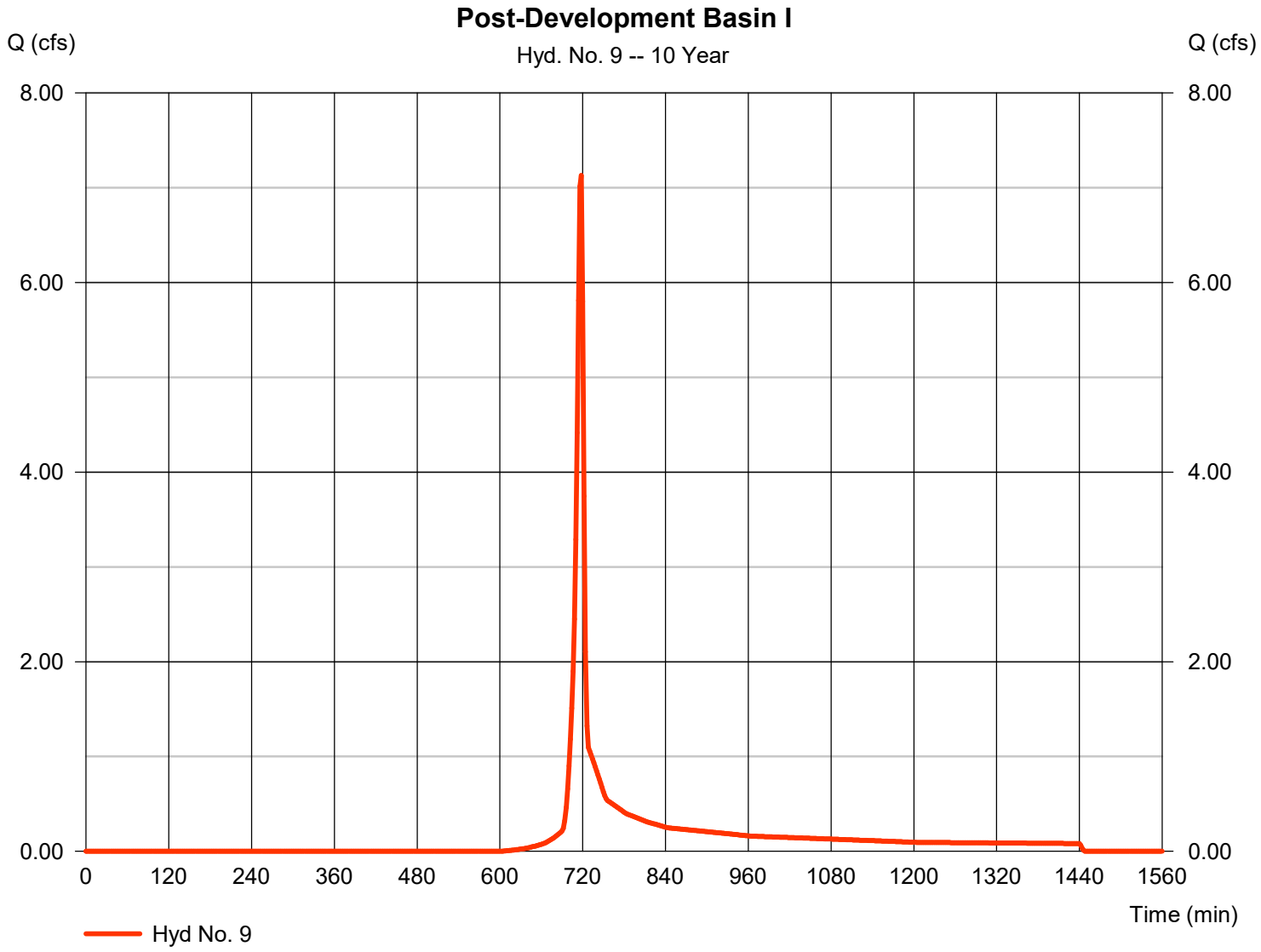
Hydrograph Report

Hyd. No. 9

Post-Development Basin I

Hydrograph type	= SCS Runoff	Peak discharge	= 7.130 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 14,264 cuft
Drainage area	= 6.460 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(4.600 x 98) + (1.860 x 61)] / 6.460



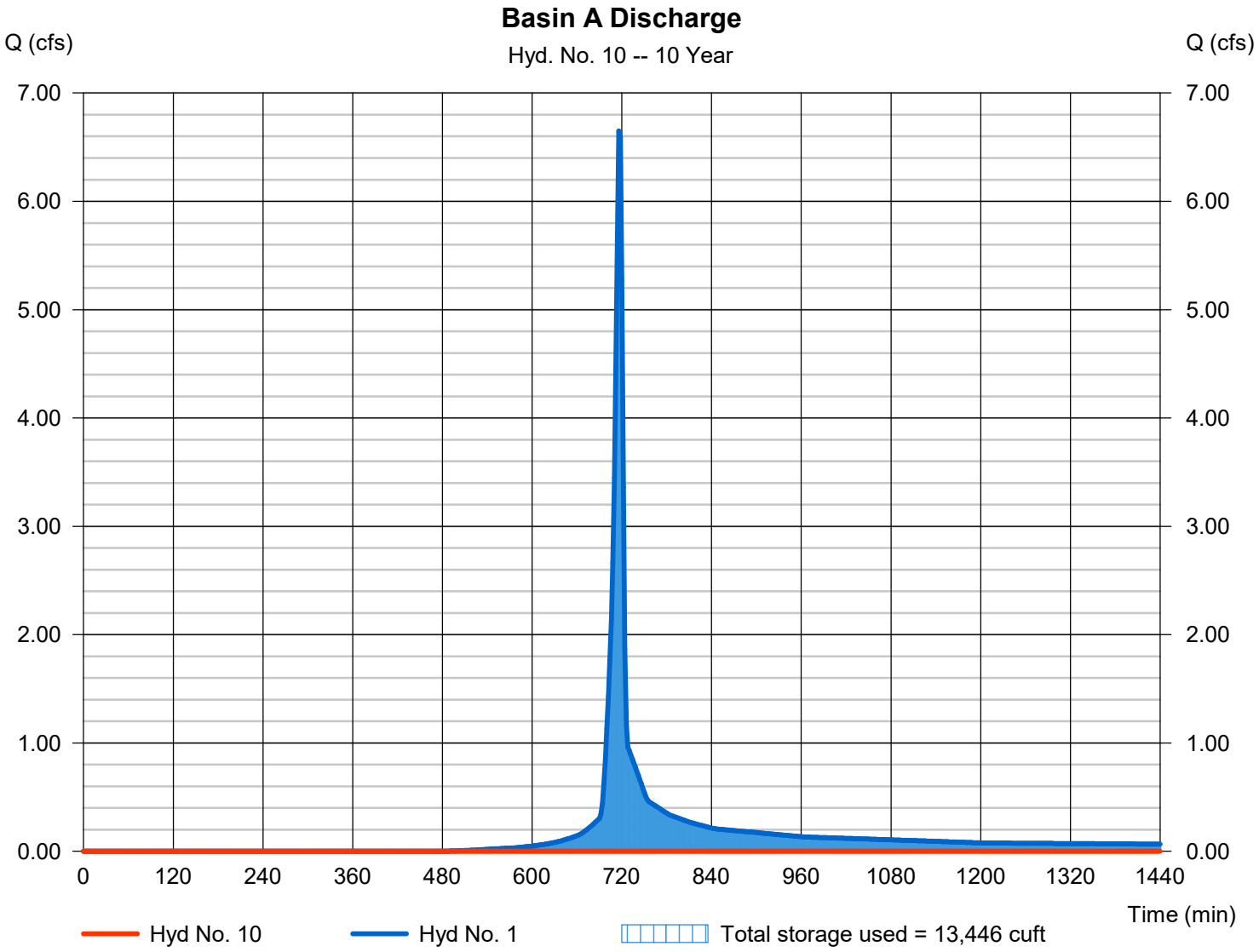
Hydrograph Report

Hyd. No. 10

Basin A Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - Post-Development Basin A	Max. Elevation	=	3.68 ft
Reservoir name	=	Basin A Pond	Max. Storage	=	13,446 cuft

Storage Indication method used.



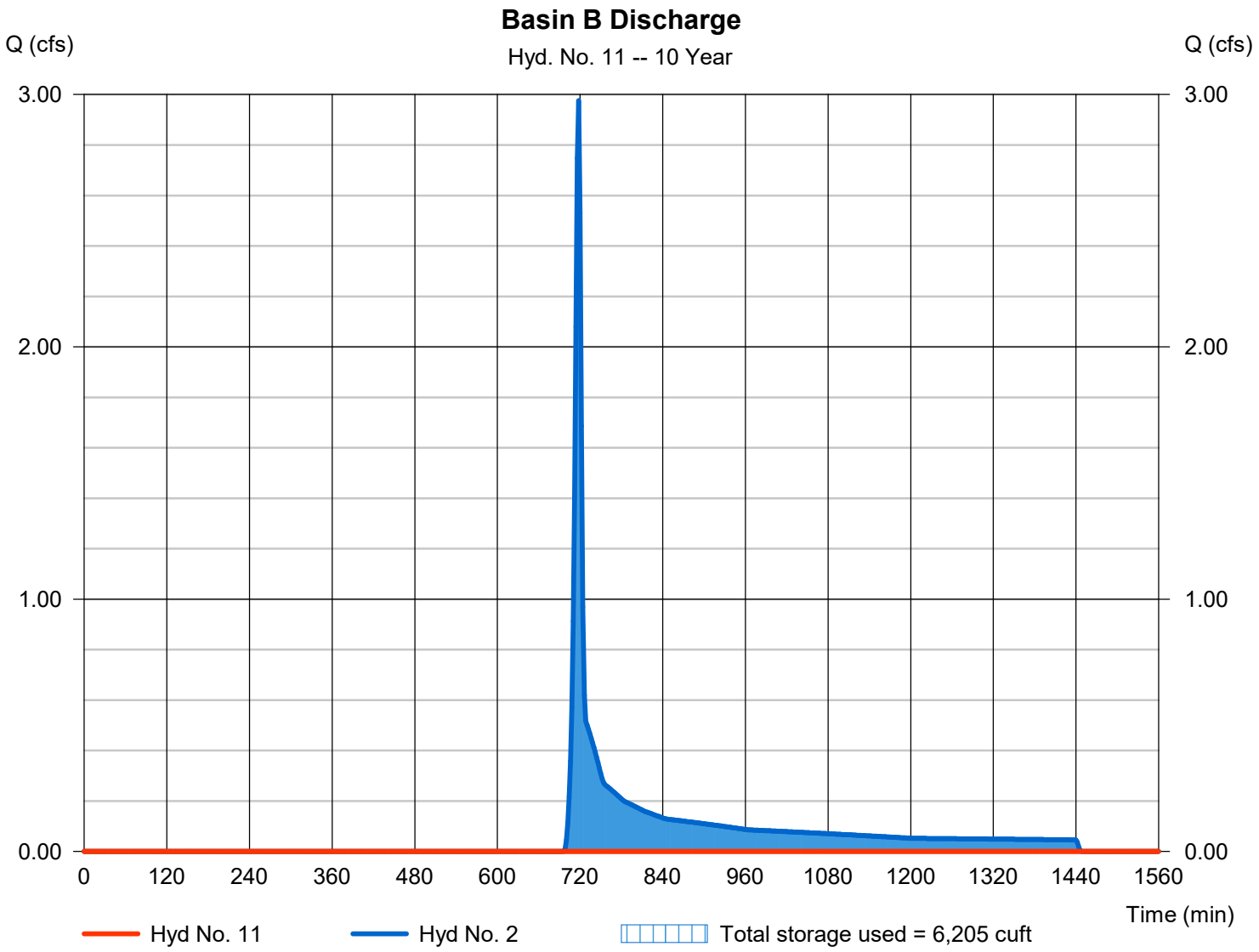
Hydrograph Report

Hyd. No. 11

Basin B Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	2 - Post-Development Basin B	Max. Elevation	=	1.42 ft
Reservoir name	=	Basin B Pond	Max. Storage	=	6,205 cuft

Storage Indication method used.



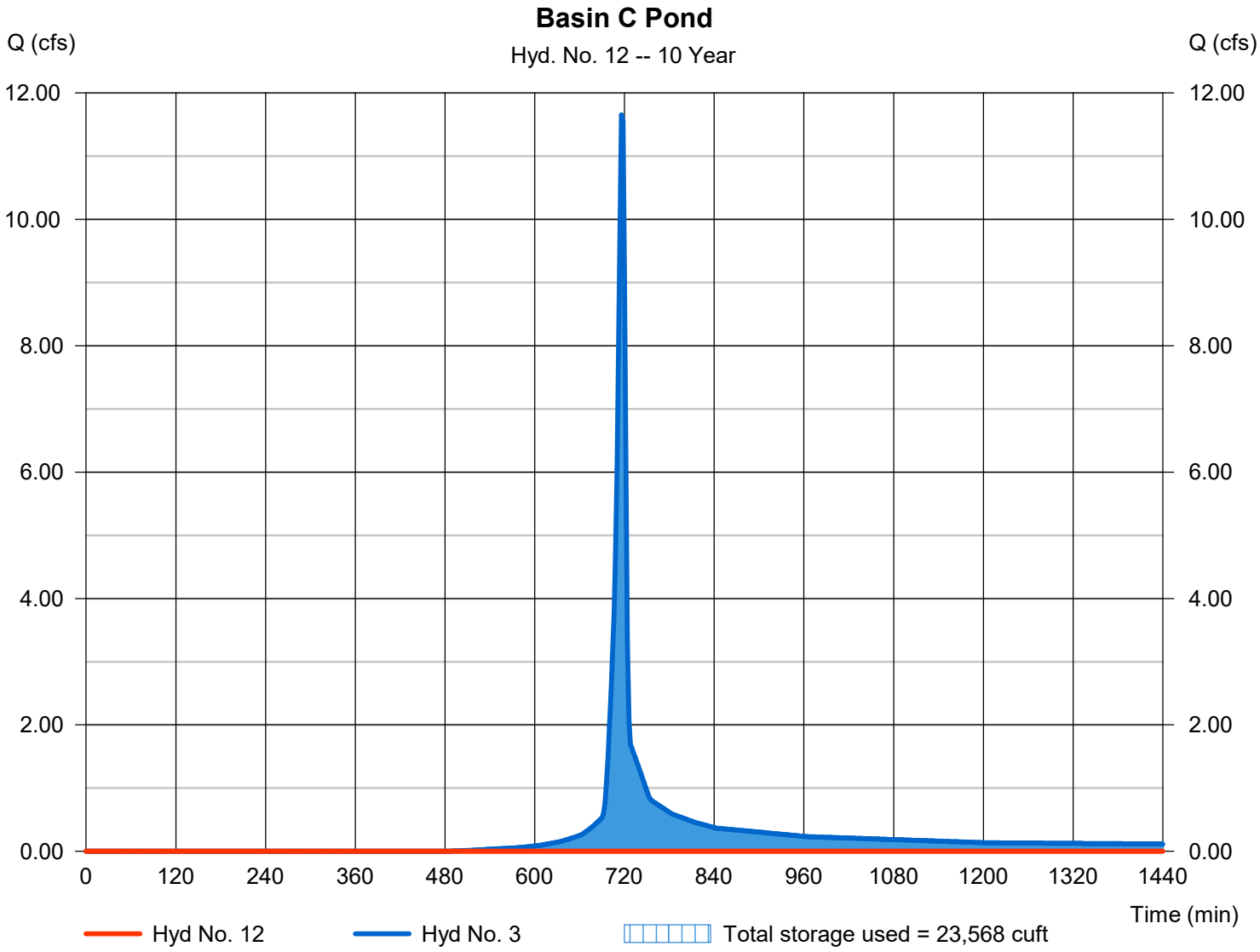
Hydrograph Report

Hyd. No. 12

Basin C Pond

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - Post-Development Basin C	Max. Elevation	=	3.30 ft
Reservoir name	=	Basin C Pond	Max. Storage	=	23,568 cuft

Storage Indication method used.



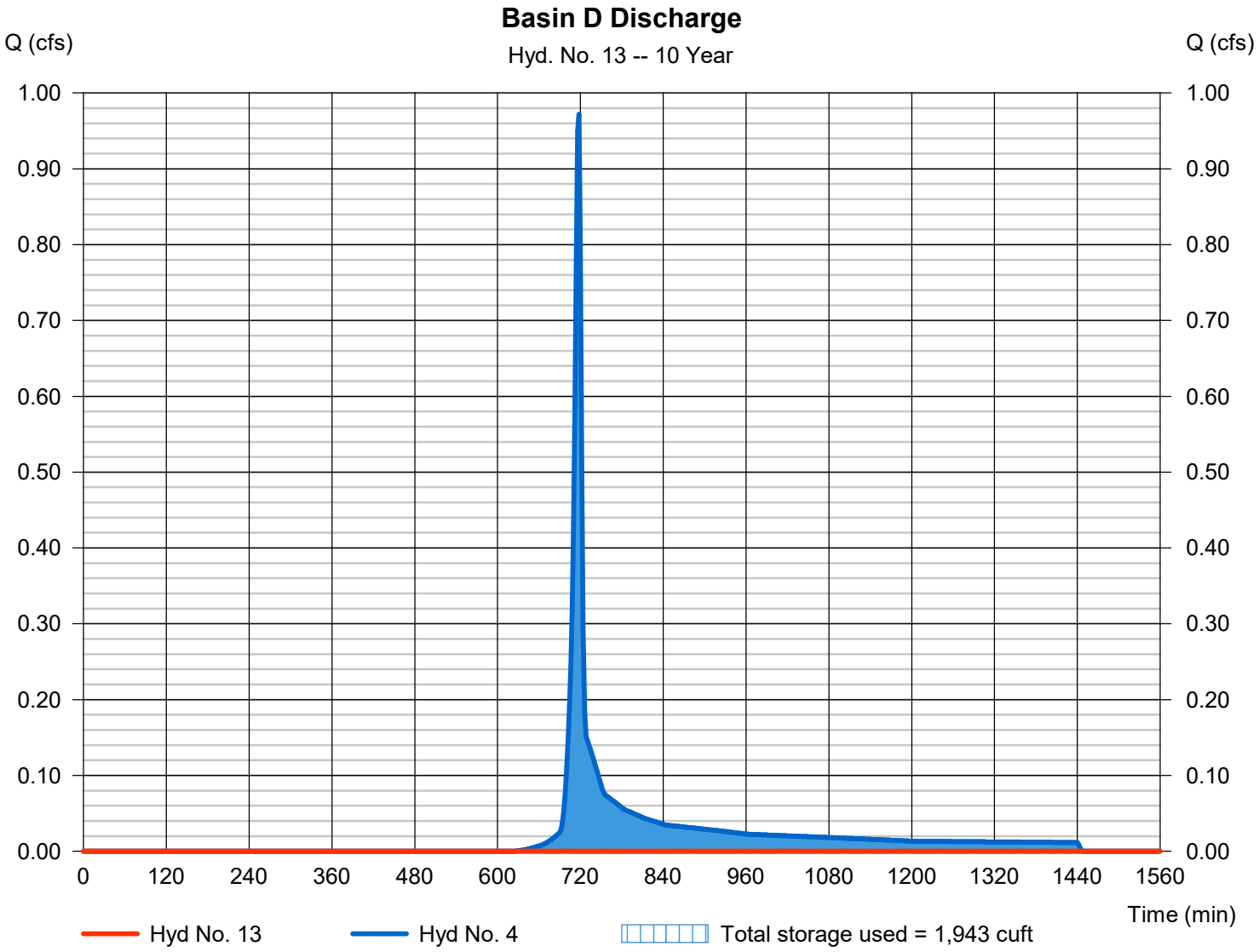
Hydrograph Report

Hyd. No. 13

Basin D Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	4 - Post-Development Basin D	Max. Elevation	=	1.64 ft
Reservoir name	=	Basin D Pond	Max. Storage	=	1,943 cuft

Storage Indication method used.



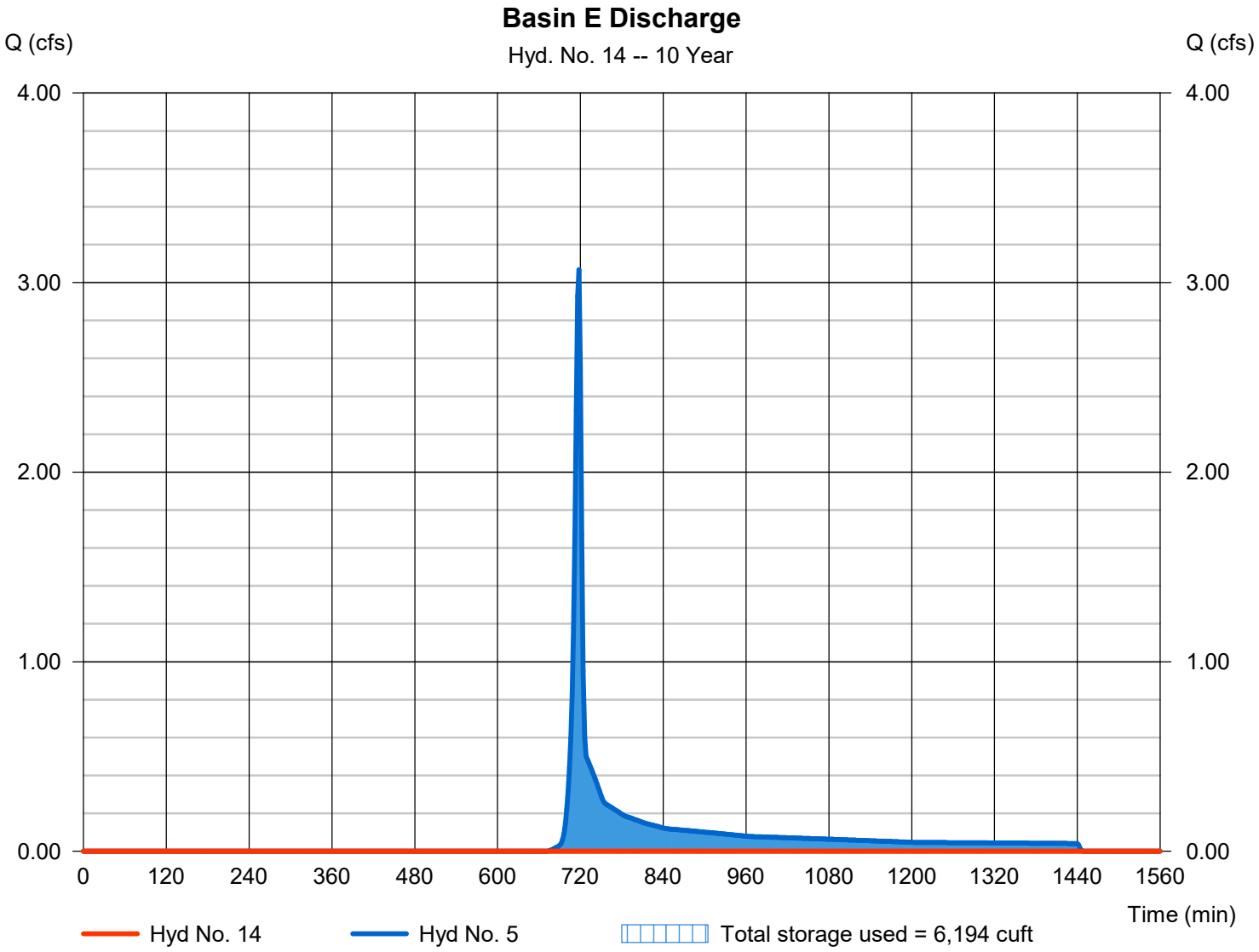
Hydrograph Report

Hyd. No. 14

Basin E Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	5 - Post-Develpment Basin E	Max. Elevation	=	2.27 ft
Reservoir name	=	Basin E Pond	Max. Storage	=	6,194 cuft

Storage Indication method used.



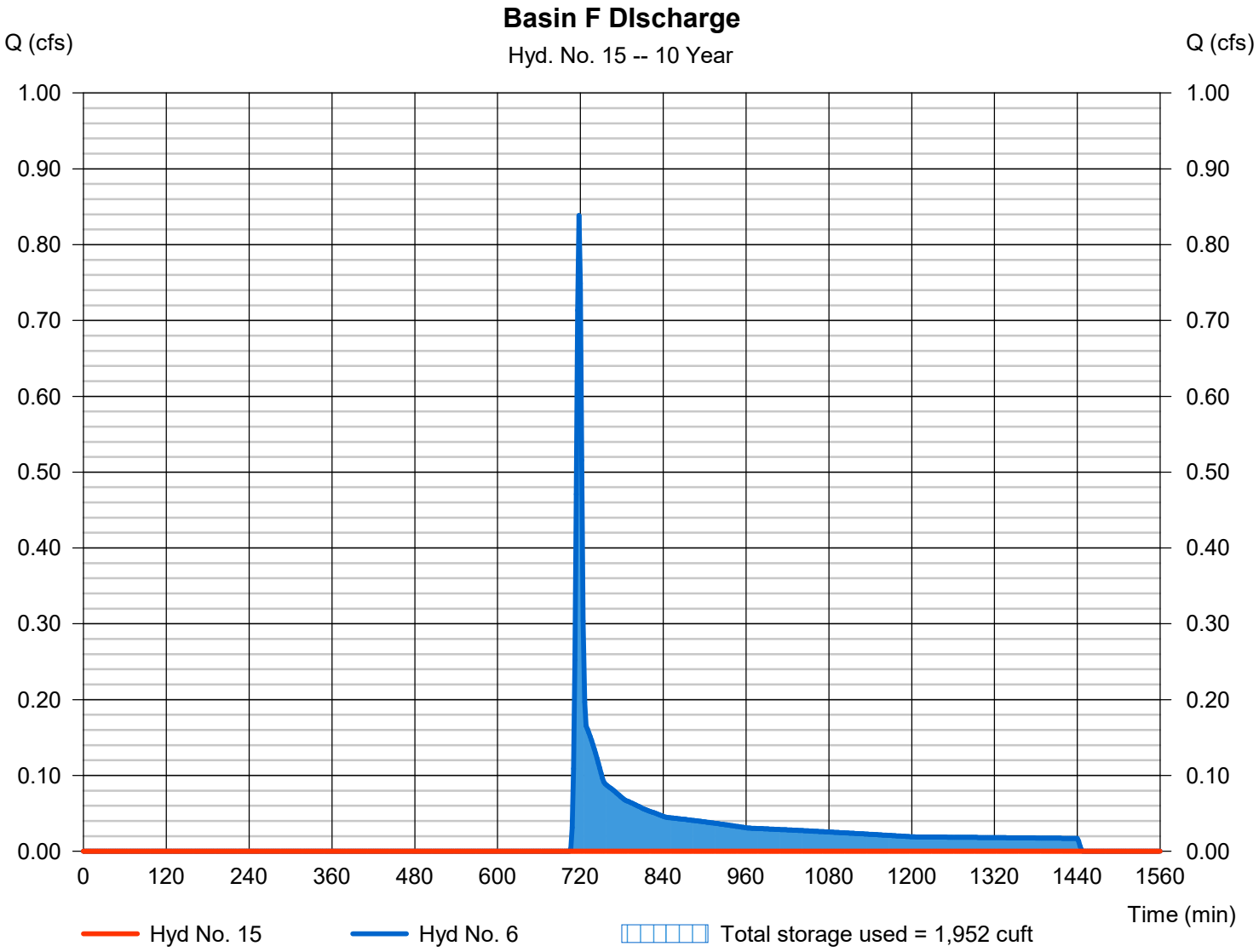
Hydrograph Report

Hyd. No. 15

Basin F DIscharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	6 - Post-Development Basin F	Max. Elevation	=	1.92 ft
Reservoir name	=	Basin F Pond	Max. Storage	=	1,952 cuft

Storage Indication method used.



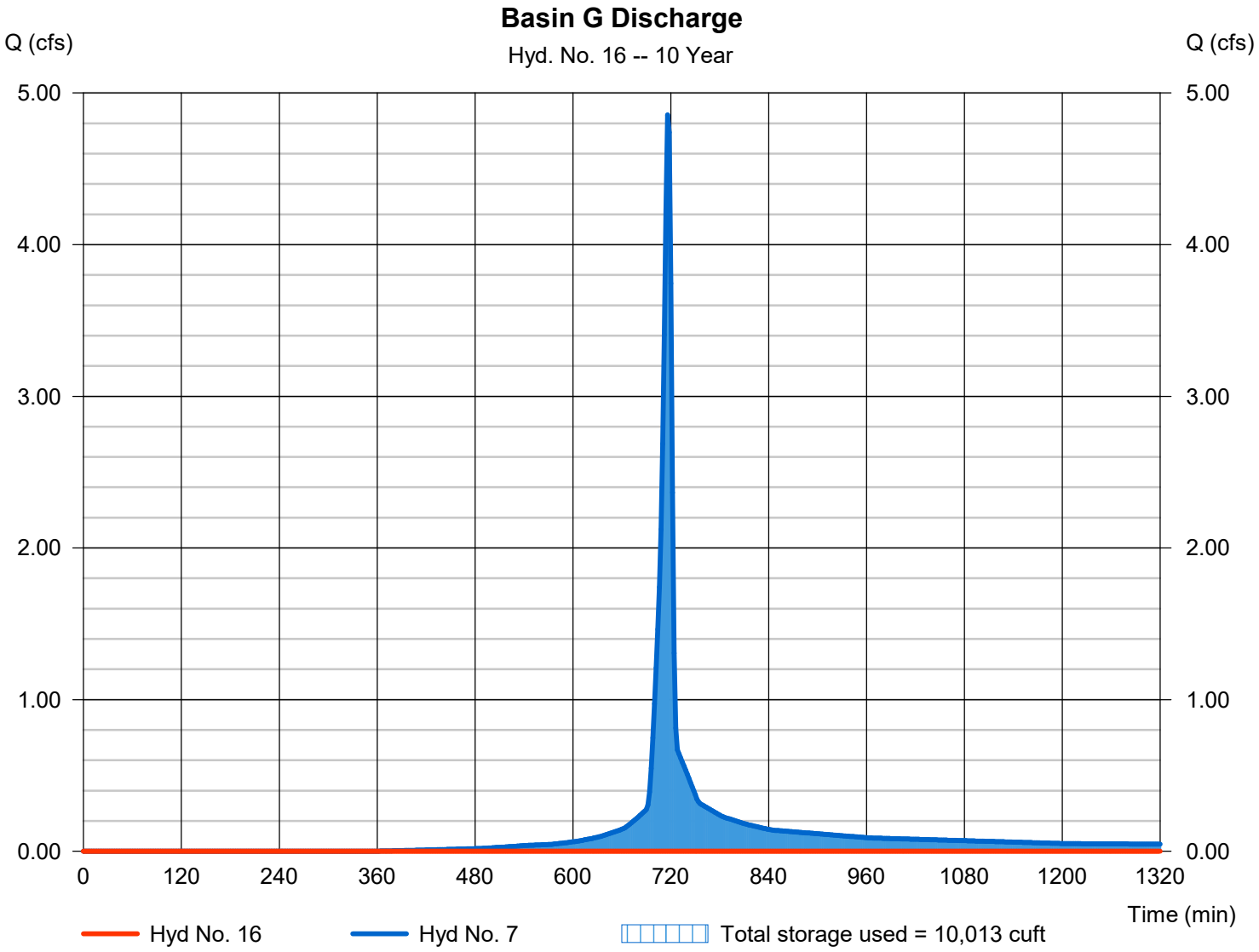
Hydrograph Report

Hyd. No. 16

Basin G Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	7 - Post_Development Basin G	Max. Elevation	=	2.92 ft
Reservoir name	=	Basin G Pond	Max. Storage	=	10,013 cuft

Storage Indication method used.



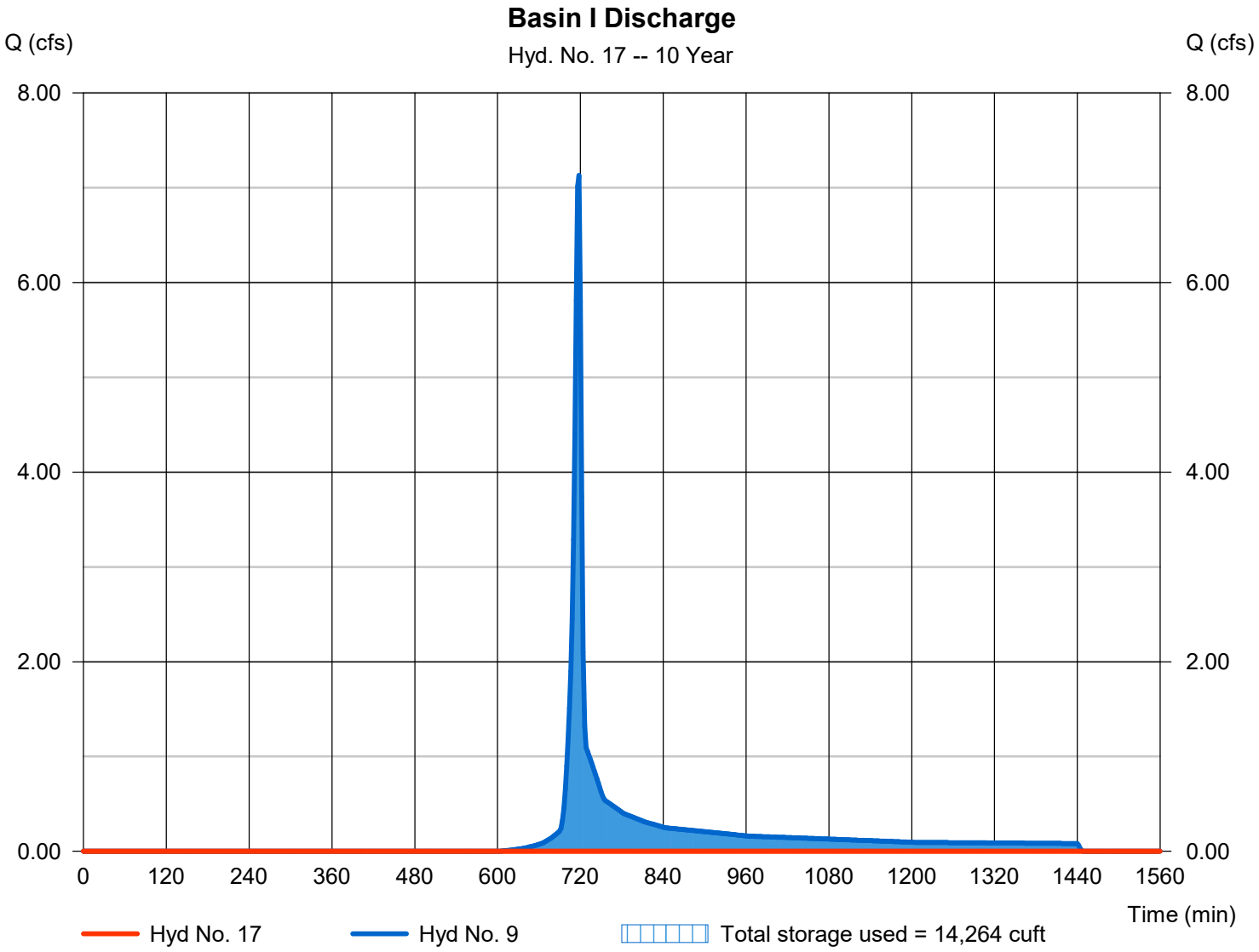
Hydrograph Report

Hyd. No. 17

Basin I Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	9 - Post-Development Basin I	Max. Elevation	=	2.91 ft
Reservoir name	=	Basin I Pond	Max. Storage	=	14,264 cuft

Storage Indication method used.



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	10.63	2	716	21,763	------	------	------	Post-Development Basin A
2	SCS Runoff	6.234	2	718	12,496	------	------	------	Post-Development Basin B
3	SCS Runoff	18.63	2	716	38,145	------	------	------	Post-Development Basin C
4	SCS Runoff	1.709	2	718	3,447	------	------	------	Post-Development Basin D
5	SCS Runoff	5.831	2	718	11,666	------	------	------	Post-Develpment Basin E
6	SCS Runoff	2.132	2	718	4,367	------	------	------	Post-Development Basin F
7	SCS Runoff	7.290	2	716	15,366	------	------	------	Post_Development Basin G
8	SCS Runoff	0.436	2	720	1,782	------	------	------	Post-Development Basin H
9	SCS Runoff	12.29	2	716	24,828	------	------	------	Post-Development Basin I
10	Reservoir	0.888	2	782	7,138	1	4.02	14,627	Basin A Discharge
11	Reservoir	0.000	2	n/a	0	2	1.85	12,496	Basin B Discharge
12	Reservoir	0.328	2	1016	5,540	3	4.01	32,606	Basin C Pond
13	Reservoir	0.047	2	1110	415	4	2.00	3,032	Basin D Discharge
14	Reservoir	0.116	2	1060	1,851	5	3.00	9,815	Basin E Discharge
15	Reservoir	0.242	2	766	2,248	6	2.01	2,120	Basin F DIscharge
16	Reservoir	0.503	2	768	4,878	7	3.01	10,489	Basin G Discharge
17	Reservoir	0.877	2	766	9,834	9	3.02	14,996	Basin I Discharge

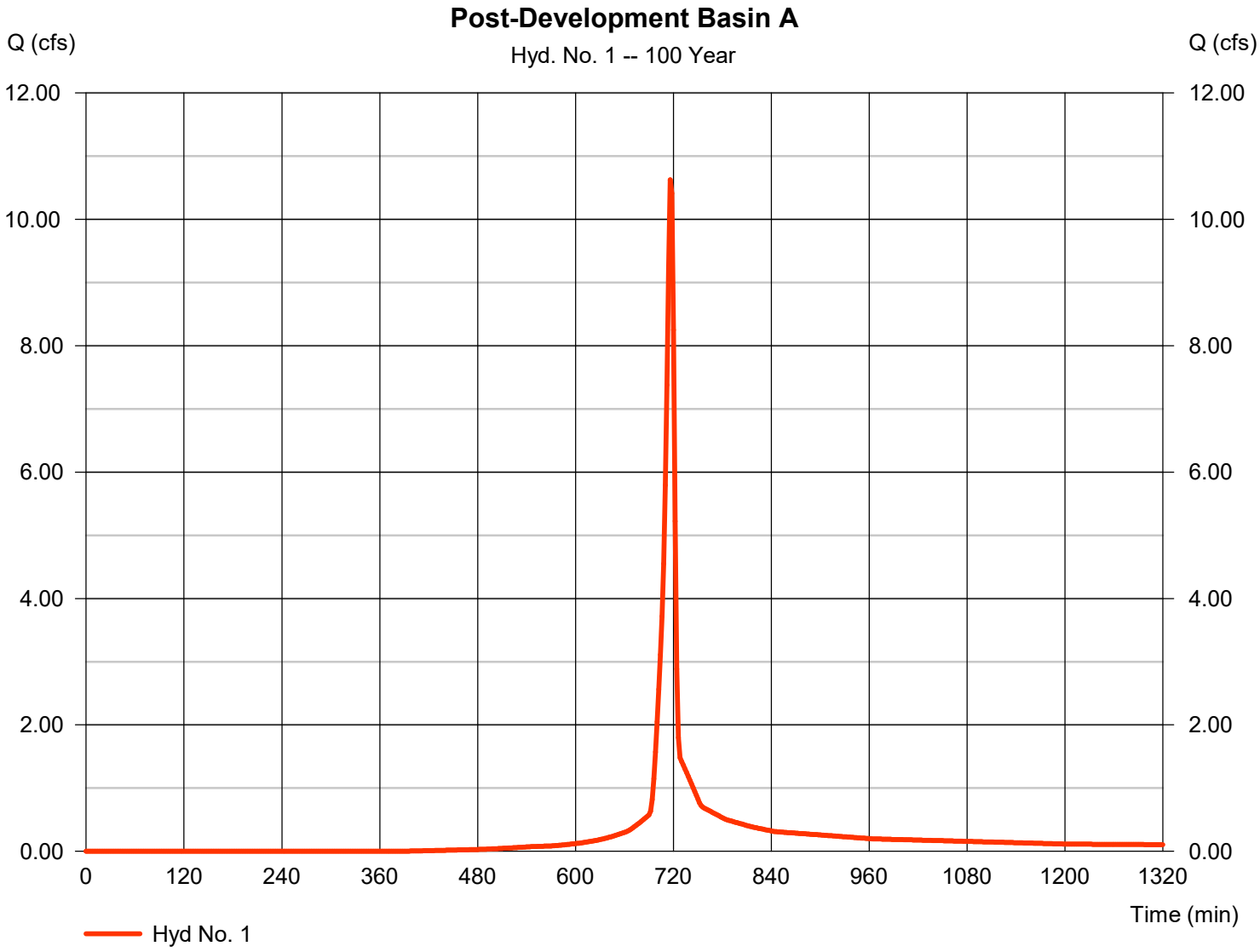
Hydrograph Report

Hyd. No. 1

Post-Development Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.63 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	21,763 cuft
Drainage area	=	4.530 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.630 x 98) + (0.900 x 61)] / 4.530



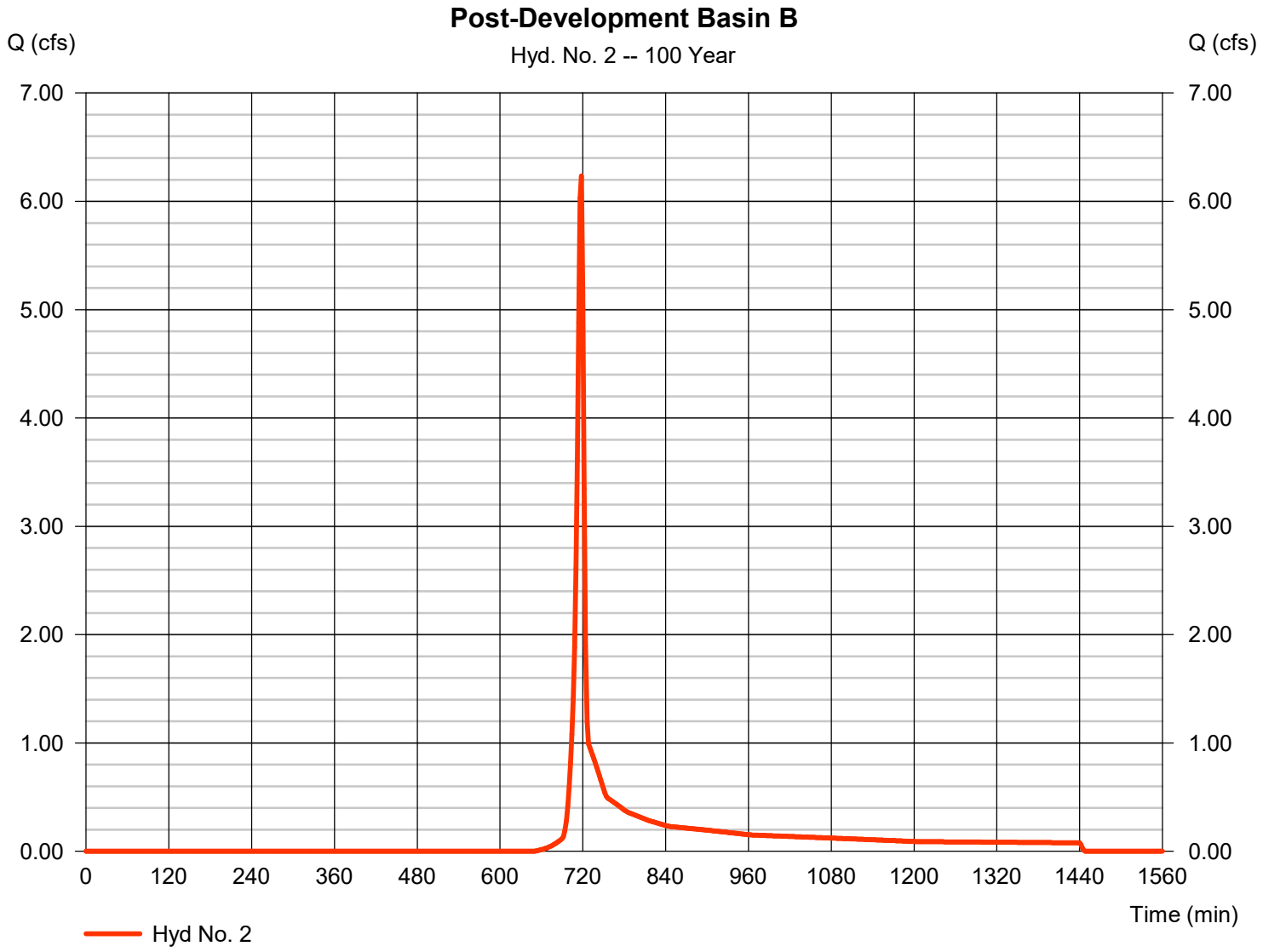
Hydrograph Report

Hyd. No. 2

Post-Development Basin B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.234 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	12,496 cuft
Drainage area	=	4.960 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.530 x 98) + (2.430 x 61)] / 4.960



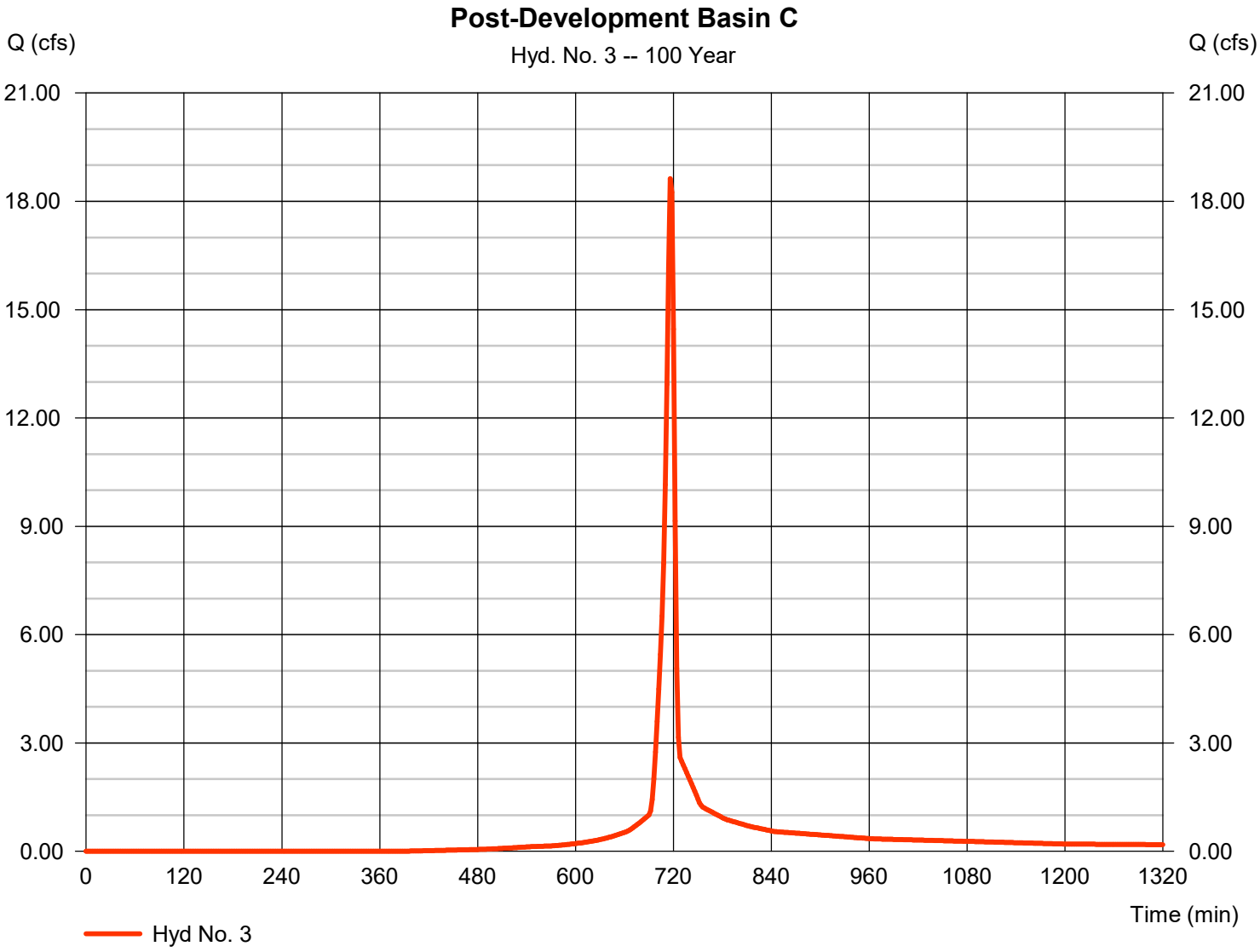
Hydrograph Report

Hyd. No. 3

Post-Development Basin C

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.63 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	38,145 cuft
Drainage area	=	7.940 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(6.470 x 98) + (1.470 x 61)] / 7.940



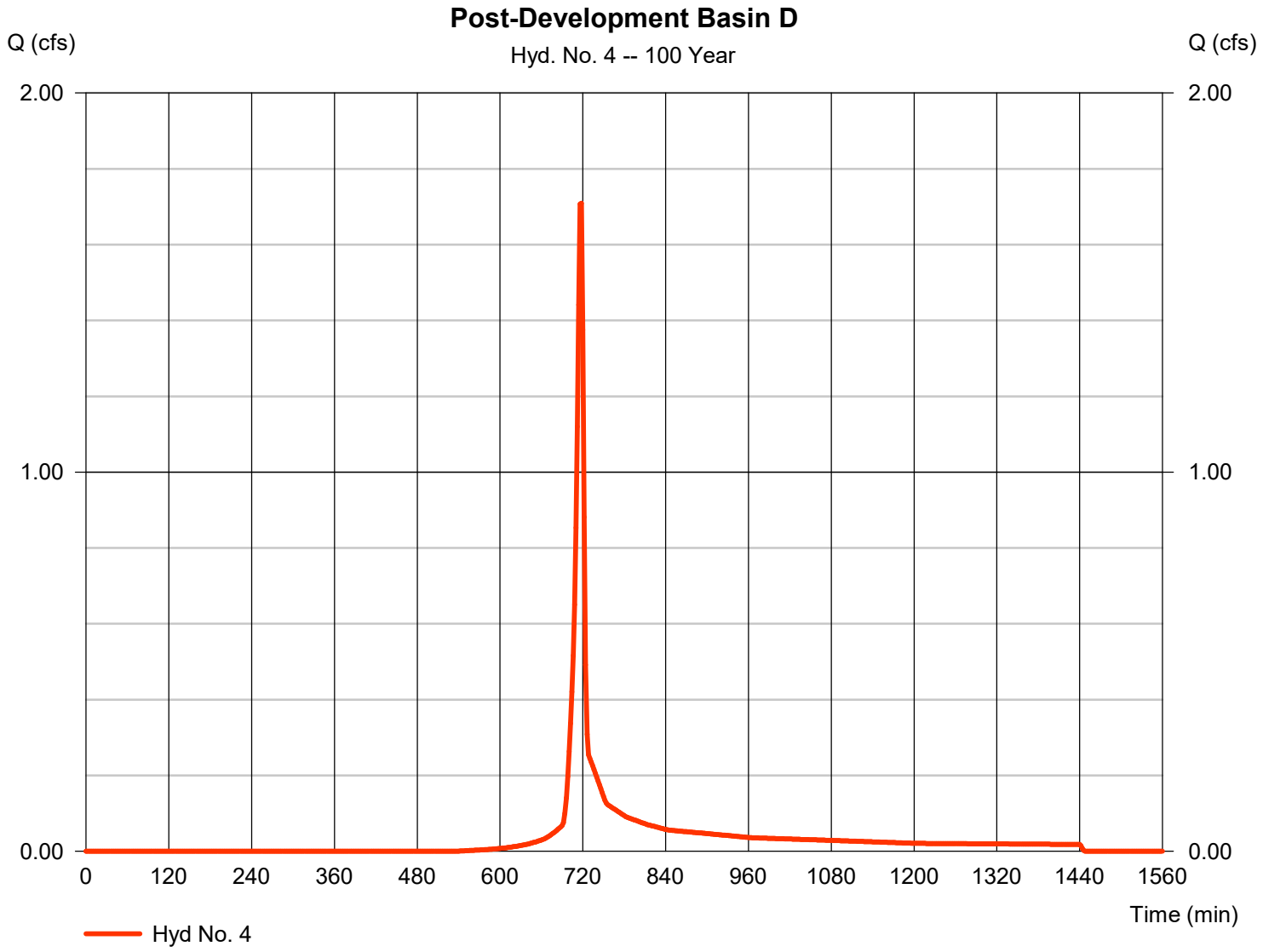
Hydrograph Report

Hyd. No. 4

Post-Development Basin D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.709 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	3,447 cuft
Drainage area	=	0.950 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.640 x 98) + (0.310 x 61)] / 0.950



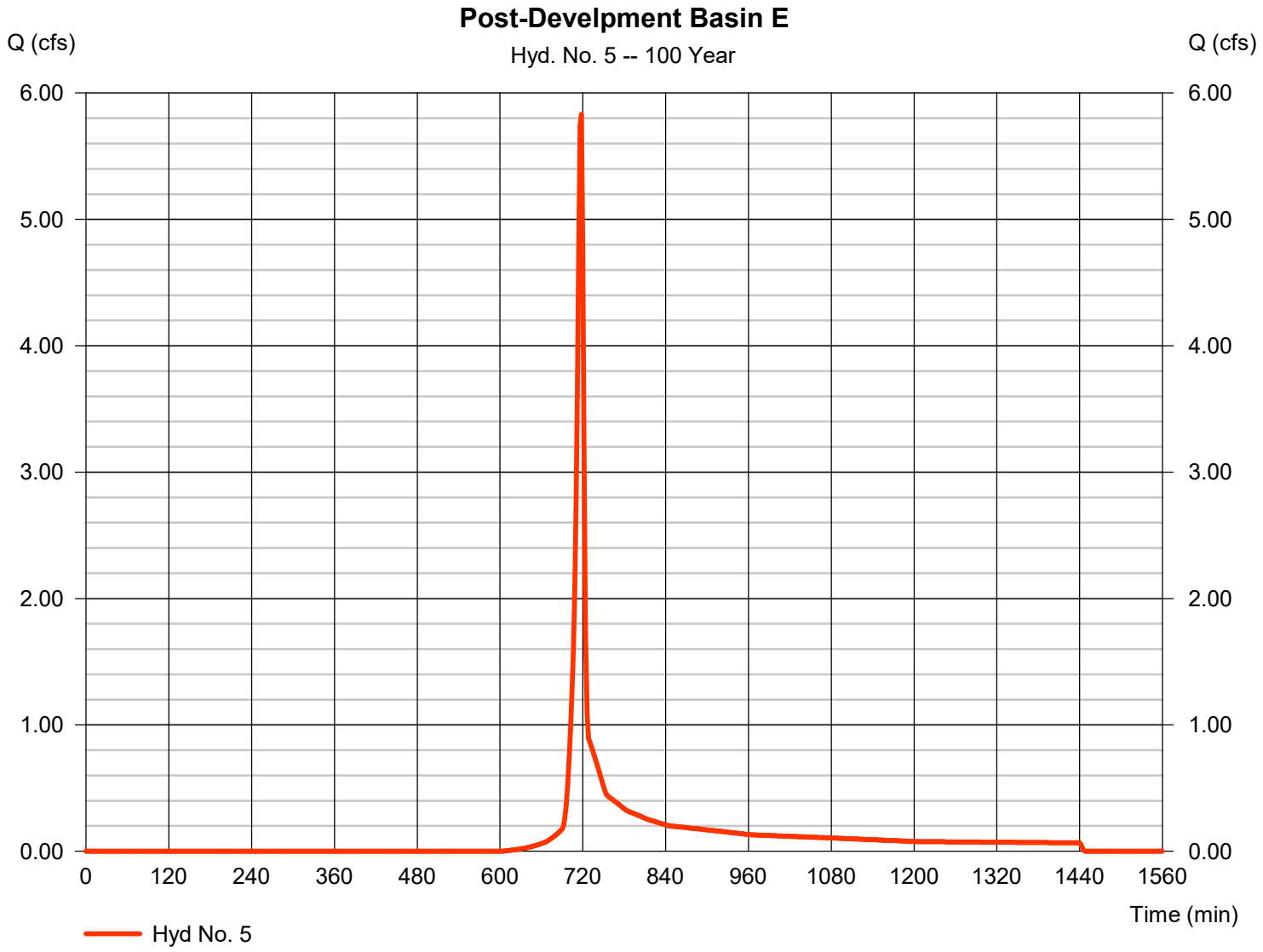
Hydrograph Report

Hyd. No. 5

Post-Develpment Basin E

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.831 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	11,666 cuft
Drainage area	=	3.840 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.320 x 98) + (1.520 x 61)] / 3.840



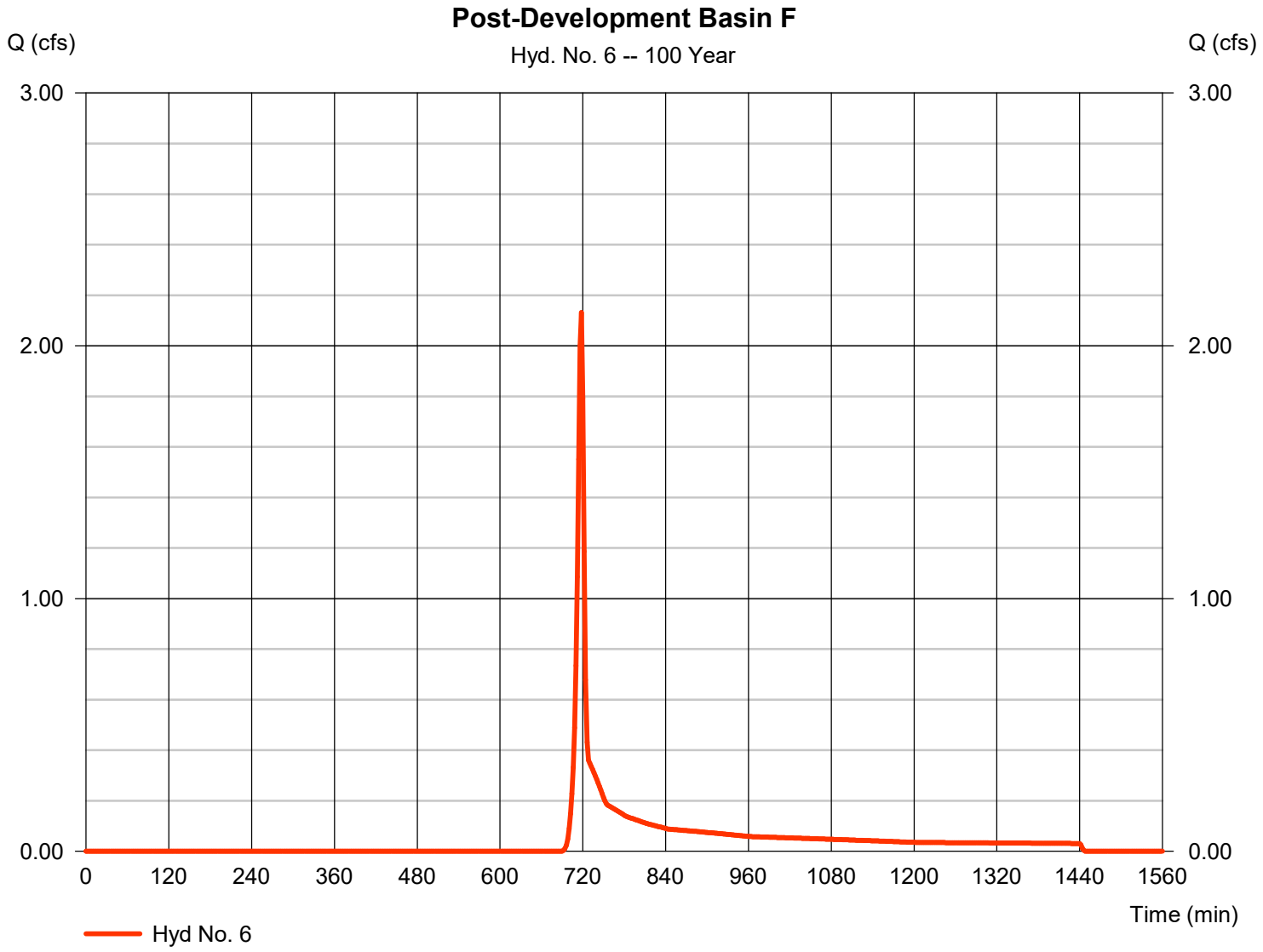
Hydrograph Report

Hyd. No. 6

Post-Development Basin F

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.132 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	4,367 cuft
Drainage area	=	2.270 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.920 x 98) + (1.350 x 61)] / 2.270



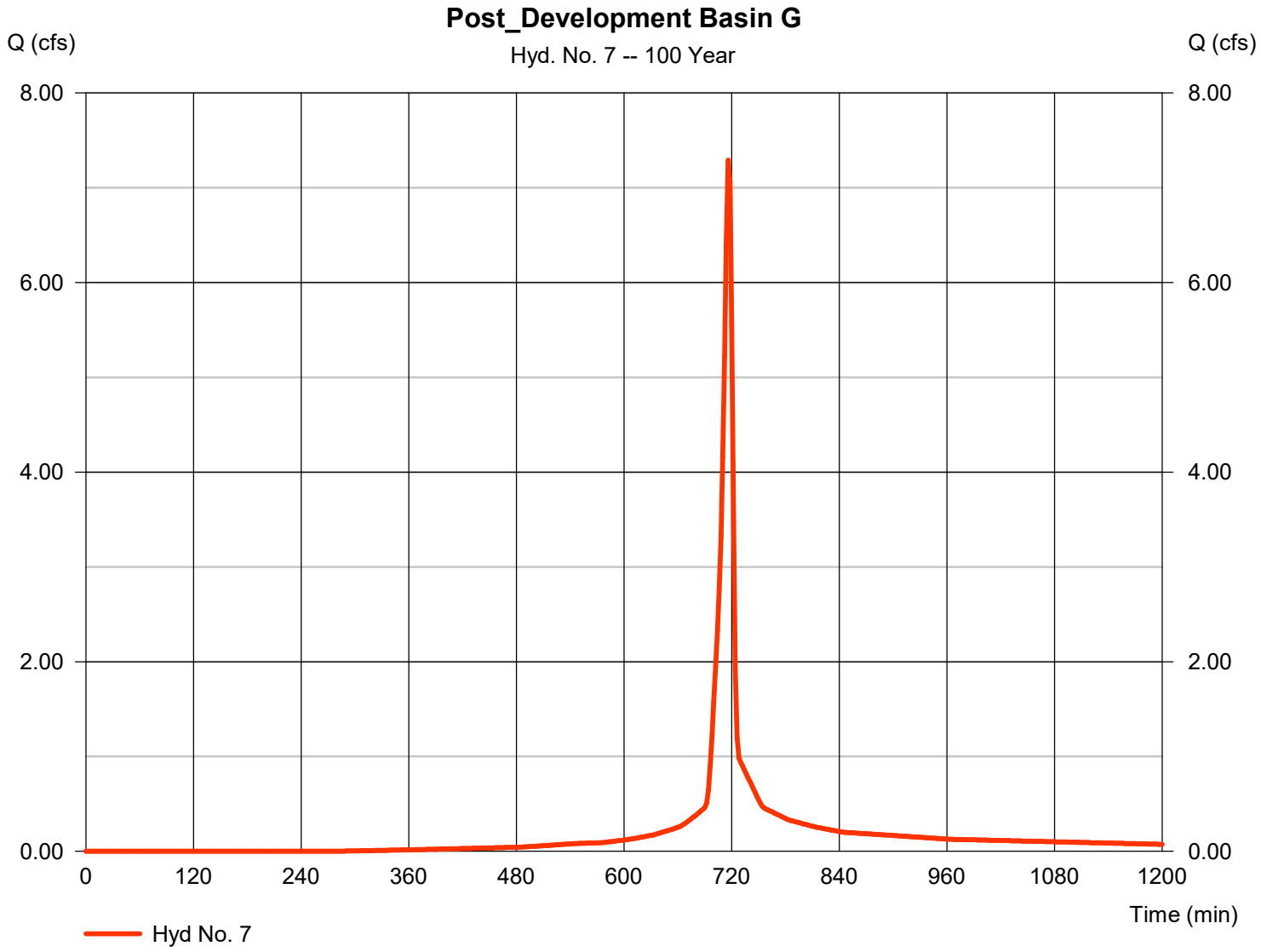
Hydrograph Report

Hyd. No. 7

Post_Development Basin G

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.290 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	15,366 cuft
Drainage area	=	2.720 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.410 x 98) + (0.310 x 61)] / 2.720



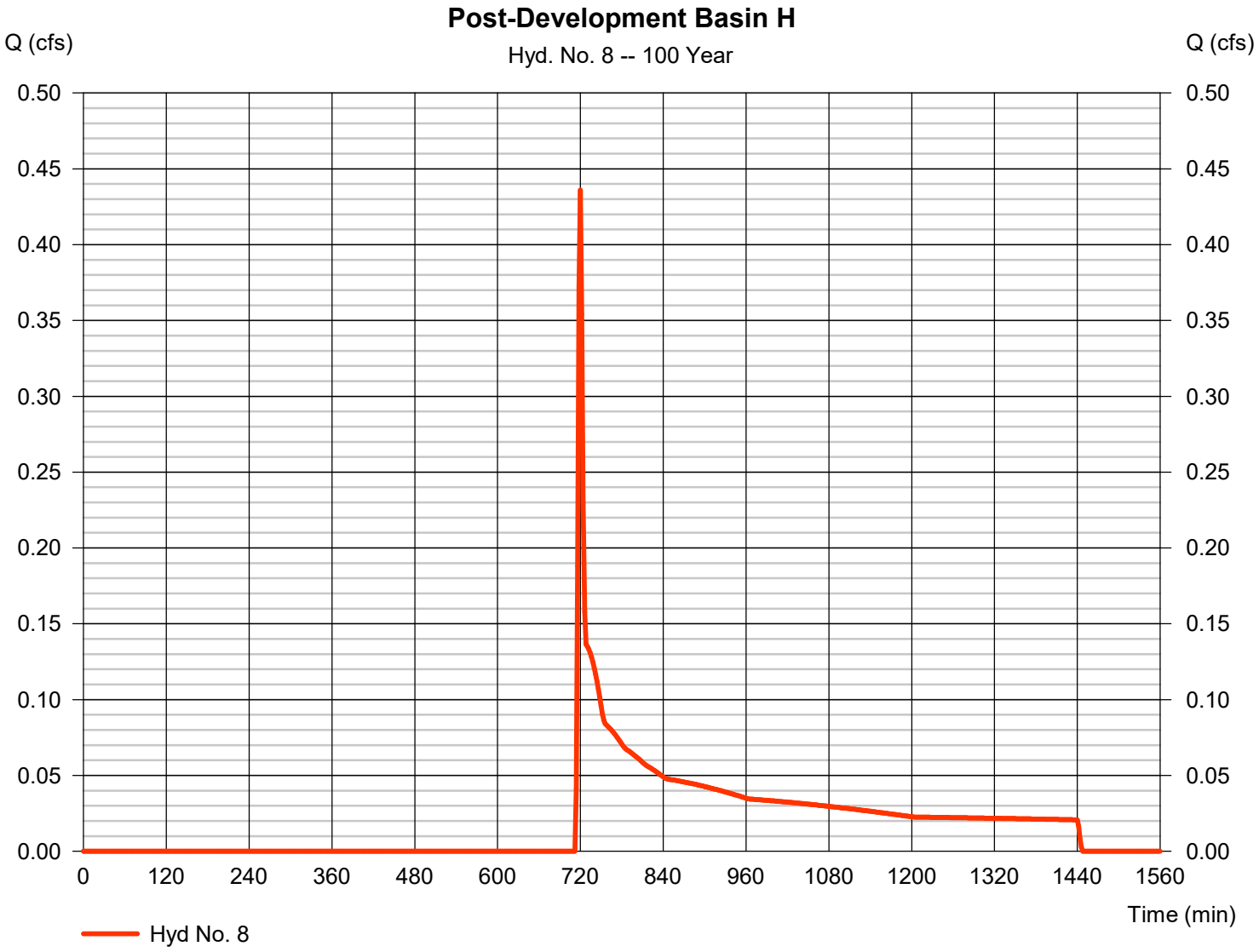
Hydrograph Report

Hyd. No. 8

Post-Development Basin H

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.436 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	1,782 cuft
Drainage area	=	2.990 ac	Curve number	=	63*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.150 x 98) + (2.840 x 61)] / 2.990



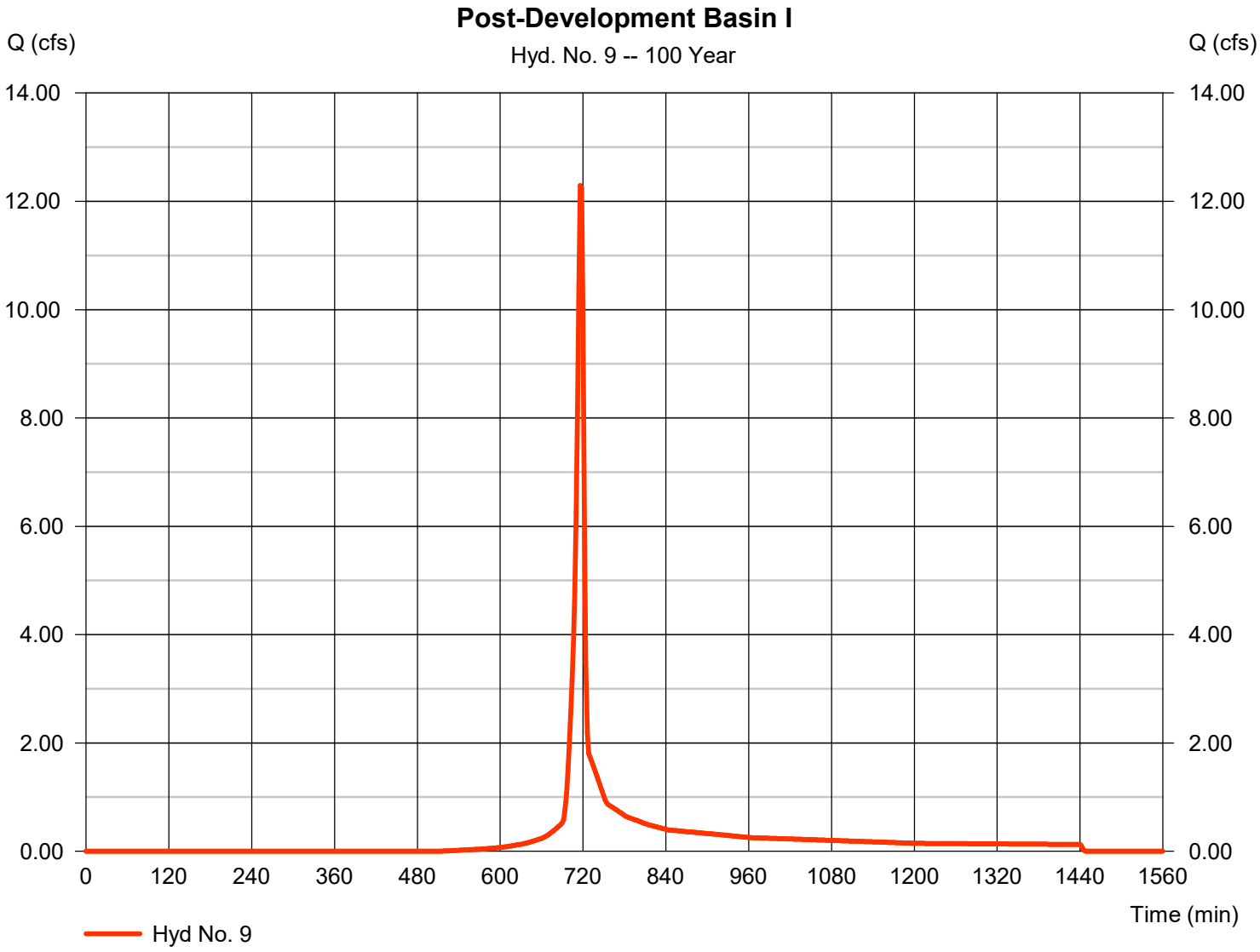
Hydrograph Report

Hyd. No. 9

Post-Development Basin I

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.29 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	24,828 cuft
Drainage area	=	6.460 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.600 x 98) + (1.860 x 61)] / 6.460



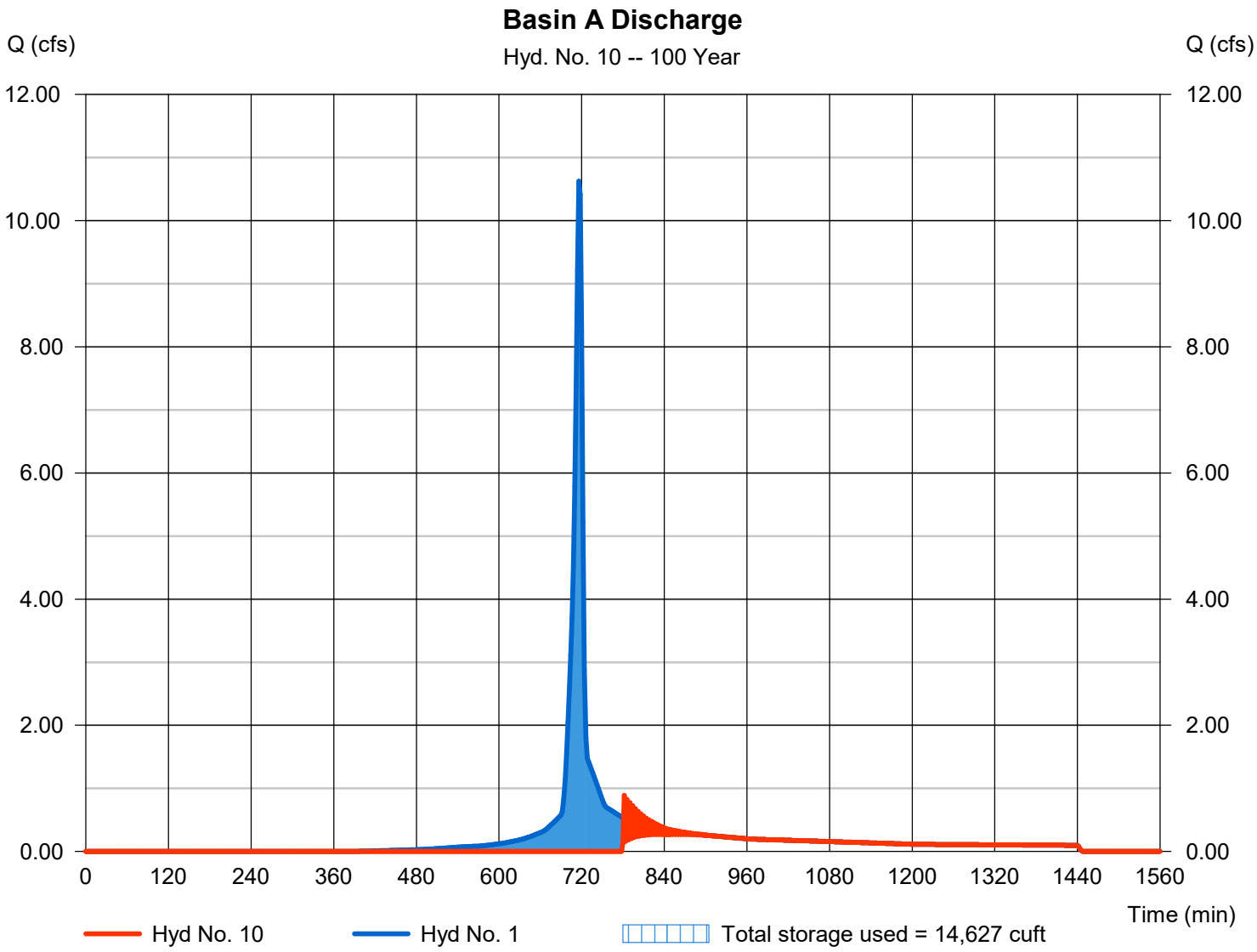
Hydrograph Report

Hyd. No. 10

Basin A Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.888 cfs
Storm frequency	=	100 yrs	Time to peak	=	782 min
Time interval	=	2 min	Hyd. volume	=	7,138 cuft
Inflow hyd. No.	=	1 - Post-Development Basin A	Max. Elevation	=	4.02 ft
Reservoir name	=	Basin A Pond	Max. Storage	=	14,627 cuft

Storage Indication method used.



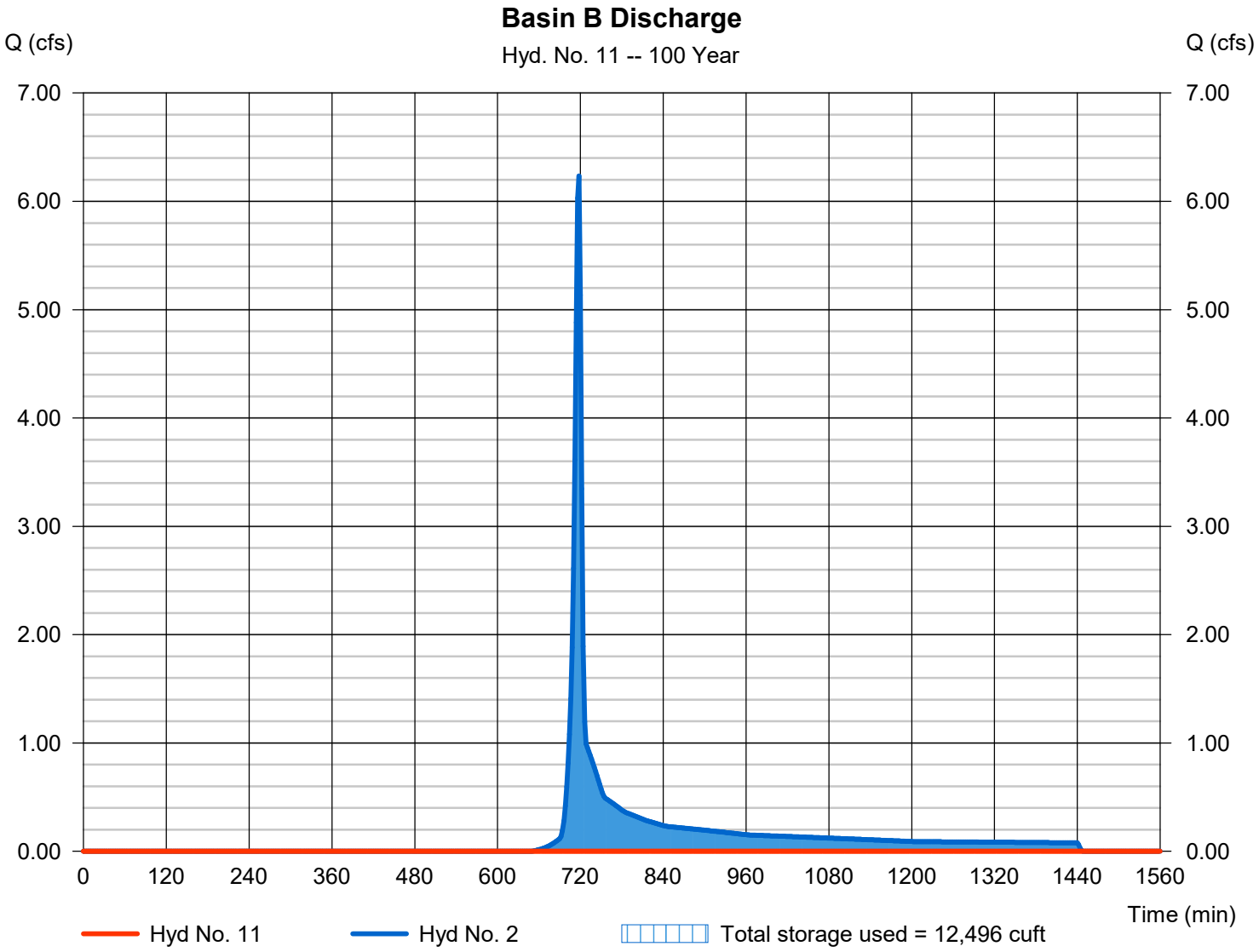
Hydrograph Report

Hyd. No. 11

Basin B Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	100 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	2 - Post-Development Basin B	Max. Elevation	=	1.85 ft
Reservoir name	=	Basin B Pond	Max. Storage	=	12,496 cuft

Storage Indication method used.



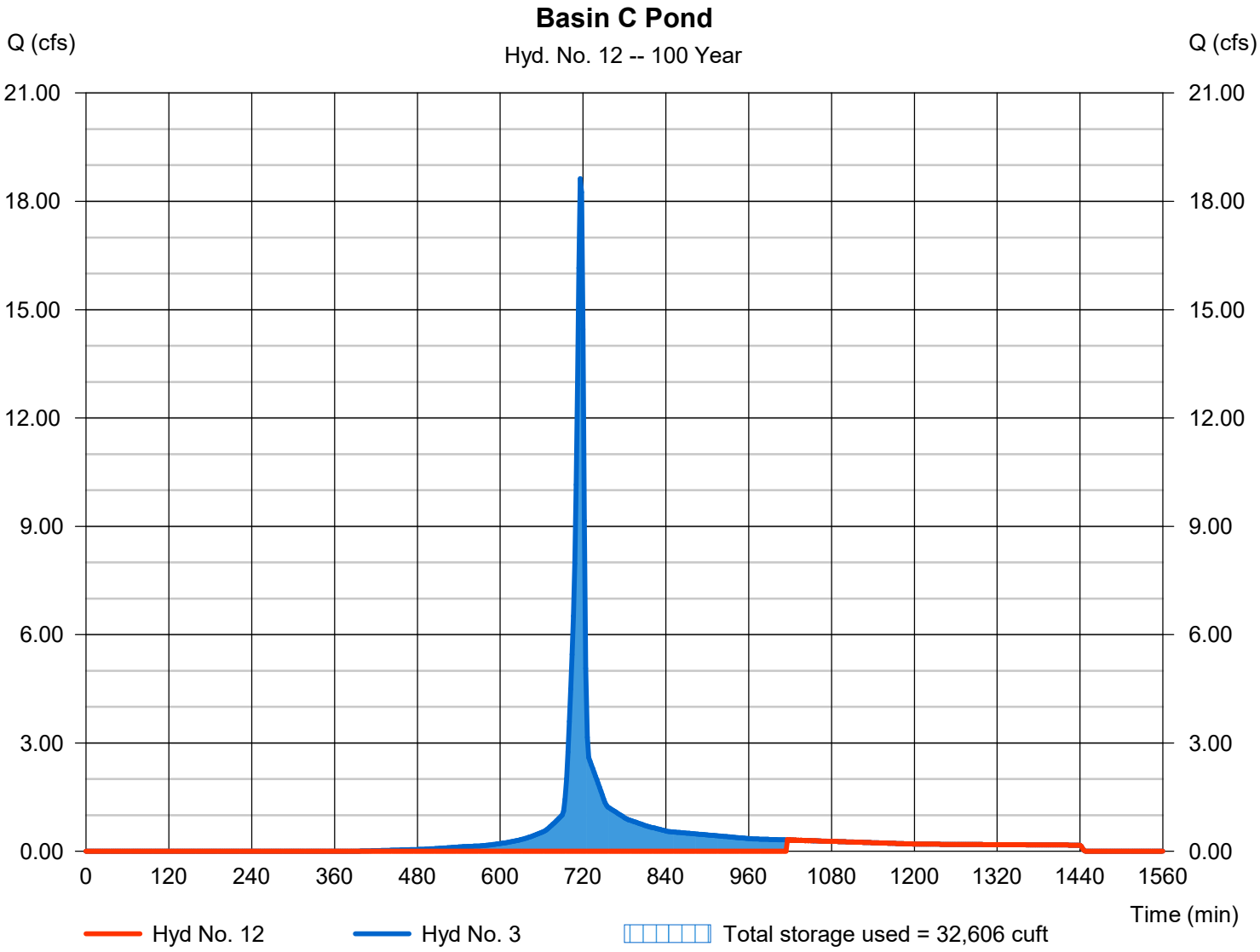
Hydrograph Report

Hyd. No. 12

Basin C Pond

Hydrograph type	=	Reservoir	Peak discharge	=	0.328 cfs
Storm frequency	=	100 yrs	Time to peak	=	1016 min
Time interval	=	2 min	Hyd. volume	=	5,540 cuft
Inflow hyd. No.	=	3 - Post-Development Basin C	Max. Elevation	=	4.01 ft
Reservoir name	=	Basin C Pond	Max. Storage	=	32,606 cuft

Storage Indication method used.



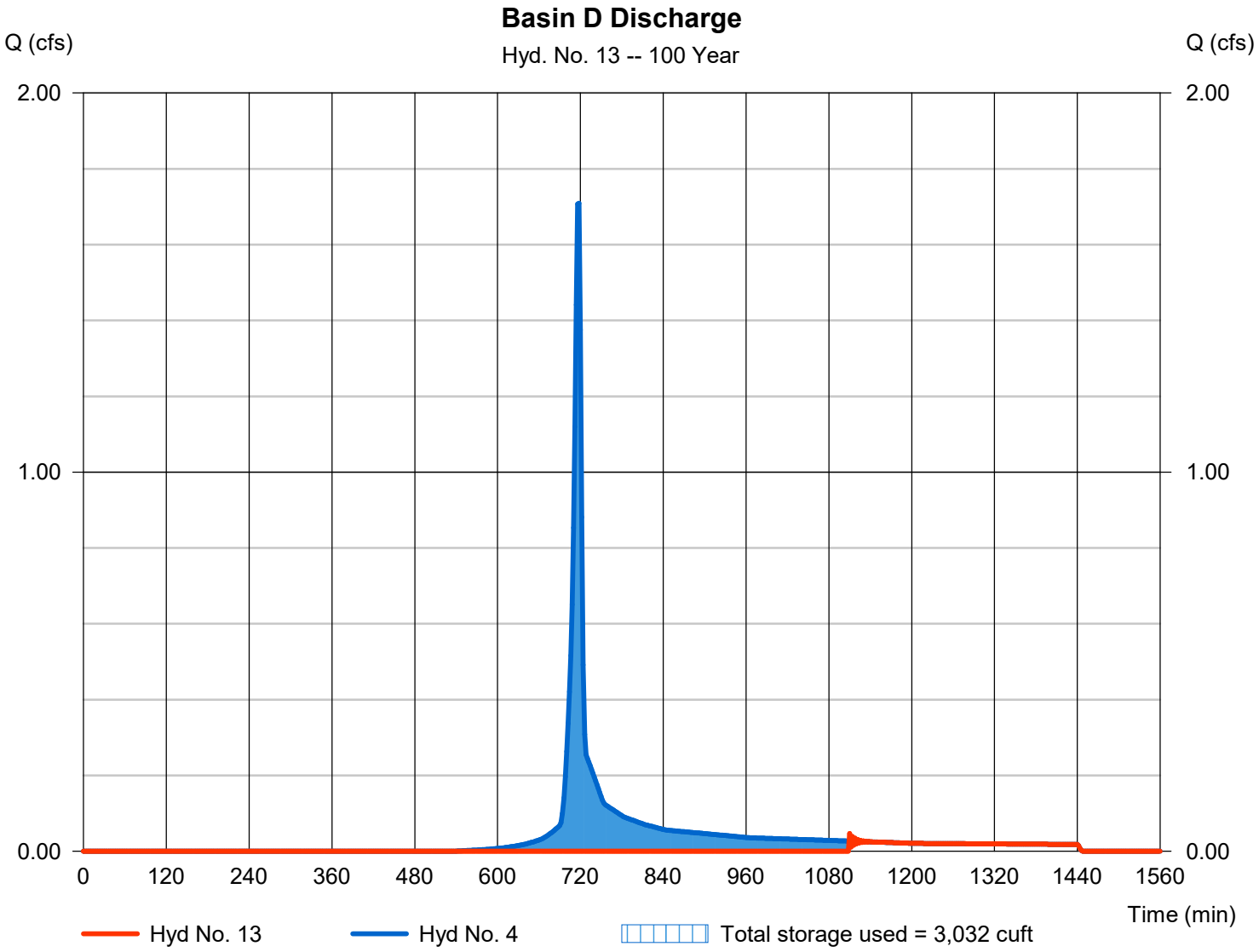
Hydrograph Report

Hyd. No. 13

Basin D Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.047 cfs
Storm frequency	=	100 yrs	Time to peak	=	1110 min
Time interval	=	2 min	Hyd. volume	=	415 cuft
Inflow hyd. No.	=	4 - Post-Development Basin D	Max. Elevation	=	2.00 ft
Reservoir name	=	Basin D Pond	Max. Storage	=	3,032 cuft

Storage Indication method used.



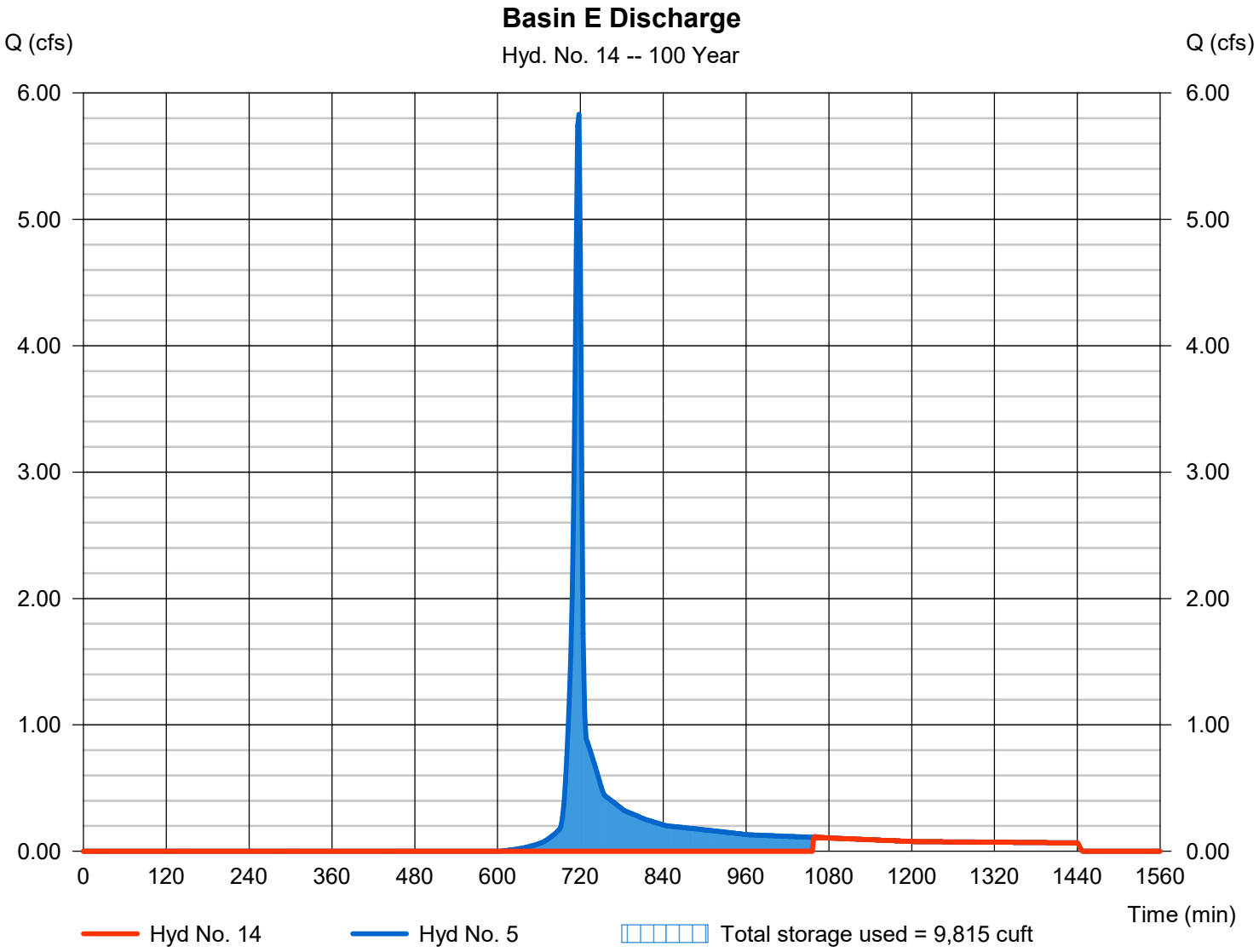
Hydrograph Report

Hyd. No. 14

Basin E Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.116 cfs
Storm frequency	=	100 yrs	Time to peak	=	1060 min
Time interval	=	2 min	Hyd. volume	=	1,851 cuft
Inflow hyd. No.	=	5 - Post-Develpment Basin E	Max. Elevation	=	3.00 ft
Reservoir name	=	Basin E Pond	Max. Storage	=	9,815 cuft

Storage Indication method used.



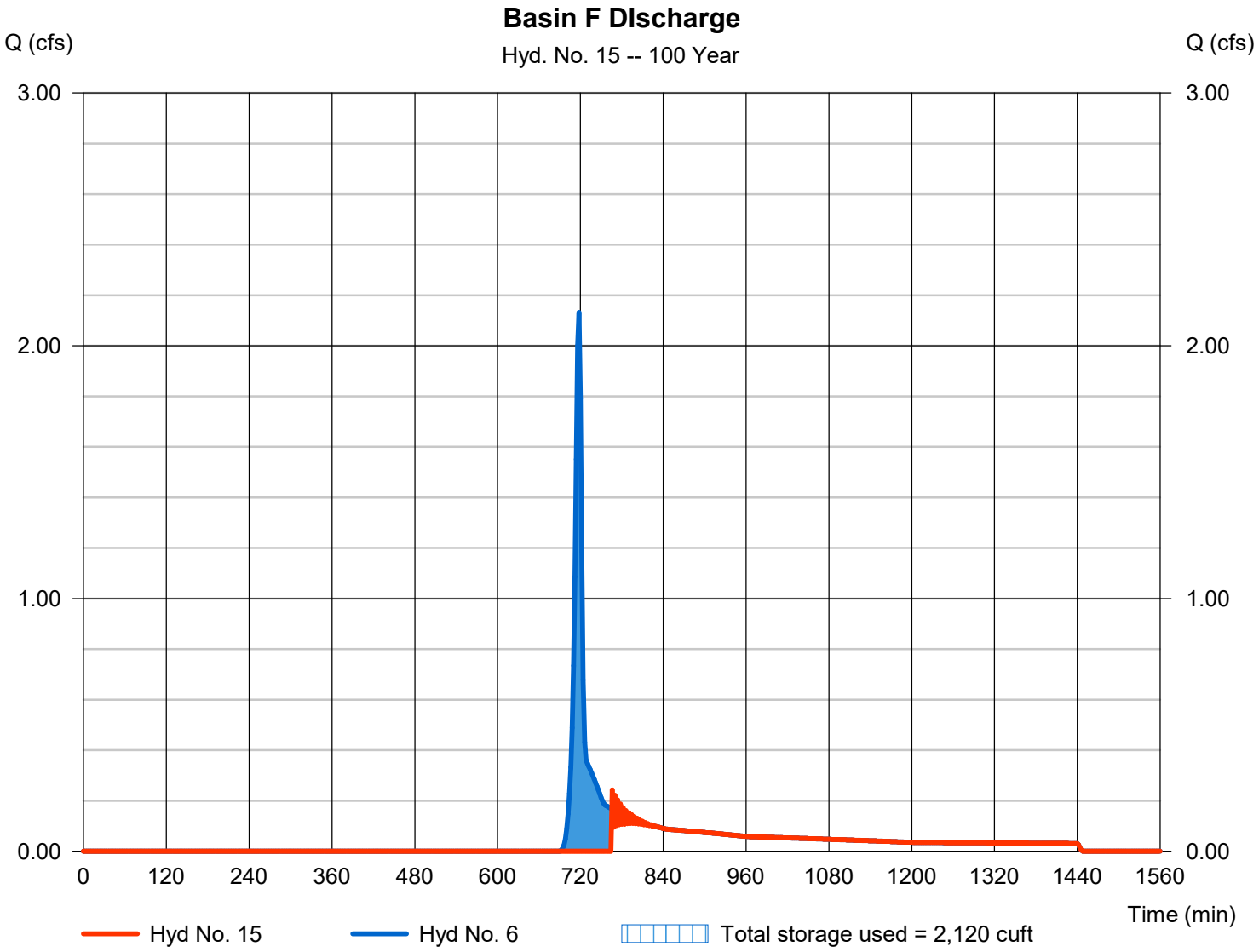
Hydrograph Report

Hyd. No. 15

Basin F DIscharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.242 cfs
Storm frequency	=	100 yrs	Time to peak	=	766 min
Time interval	=	2 min	Hyd. volume	=	2,248 cuft
Inflow hyd. No.	=	6 - Post-Development Basin F	Max. Elevation	=	2.01 ft
Reservoir name	=	Basin F Pond	Max. Storage	=	2,120 cuft

Storage Indication method used.



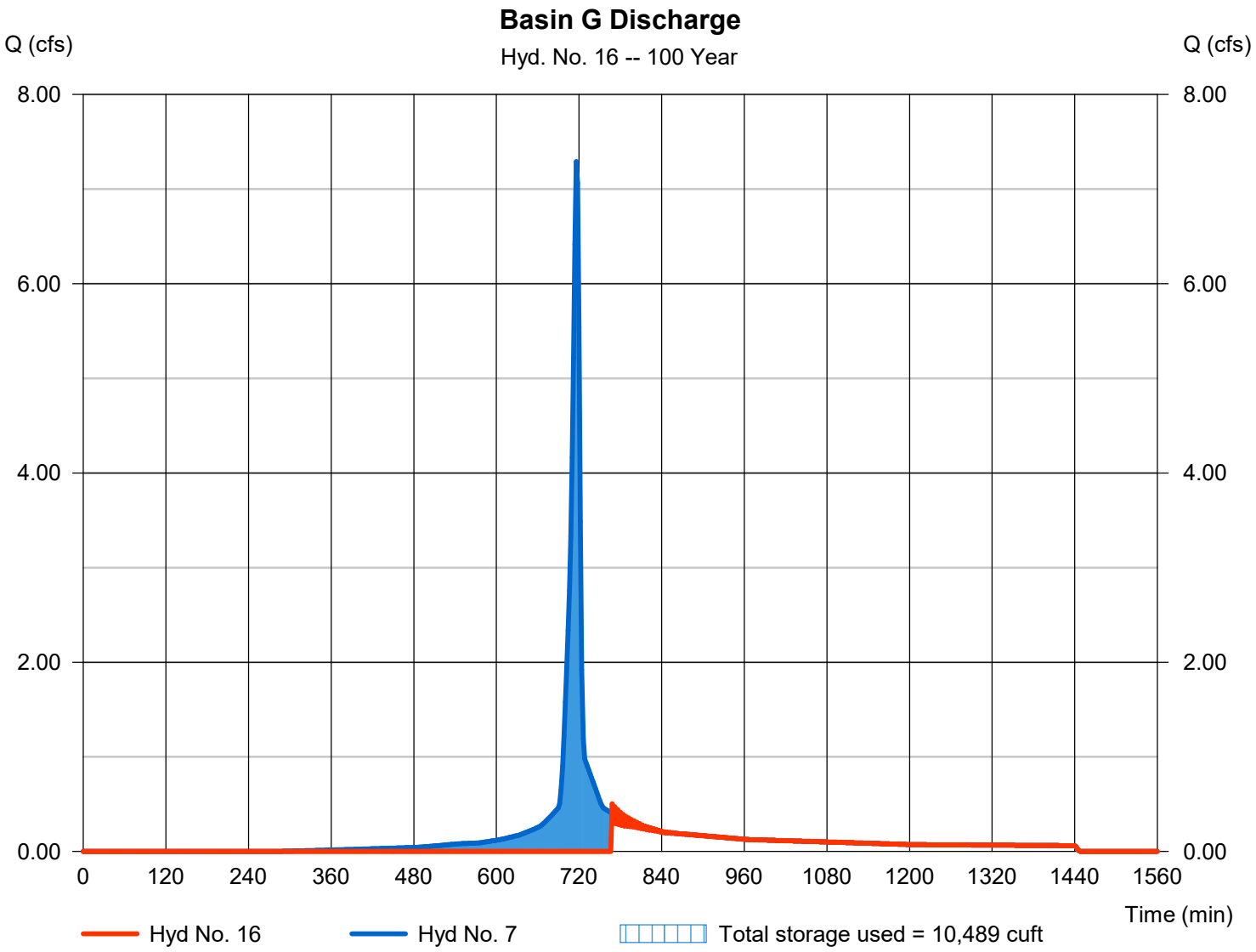
Hydrograph Report

Hyd. No. 16

Basin G Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.503 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	2 min	Hyd. volume	=	4,878 cuft
Inflow hyd. No.	=	7 - Post_Development Basin G	Max. Elevation	=	3.01 ft
Reservoir name	=	Basin G Pond	Max. Storage	=	10,489 cuft

Storage Indication method used.



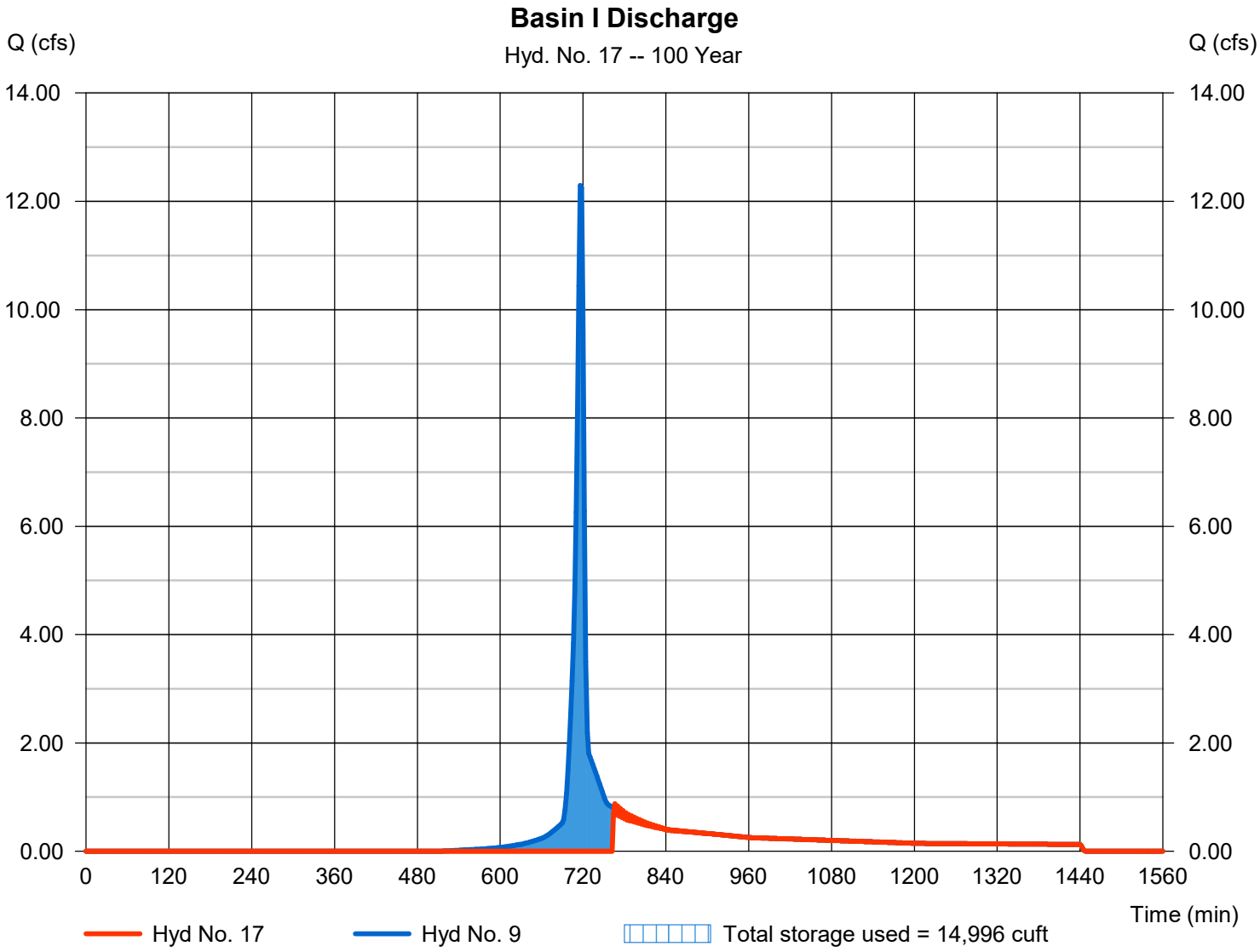
Hydrograph Report

Hyd. No. 17

Basin I Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.877 cfs
Storm frequency	=	100 yrs	Time to peak	=	766 min
Time interval	=	2 min	Hyd. volume	=	9,834 cuft
Inflow hyd. No.	=	9 - Post-Development Basin I	Max. Elevation	=	3.02 ft
Reservoir name	=	Basin I Pond	Max. Storage	=	14,996 cuft

Storage Indication method used.



Hydrograph Summary Report

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

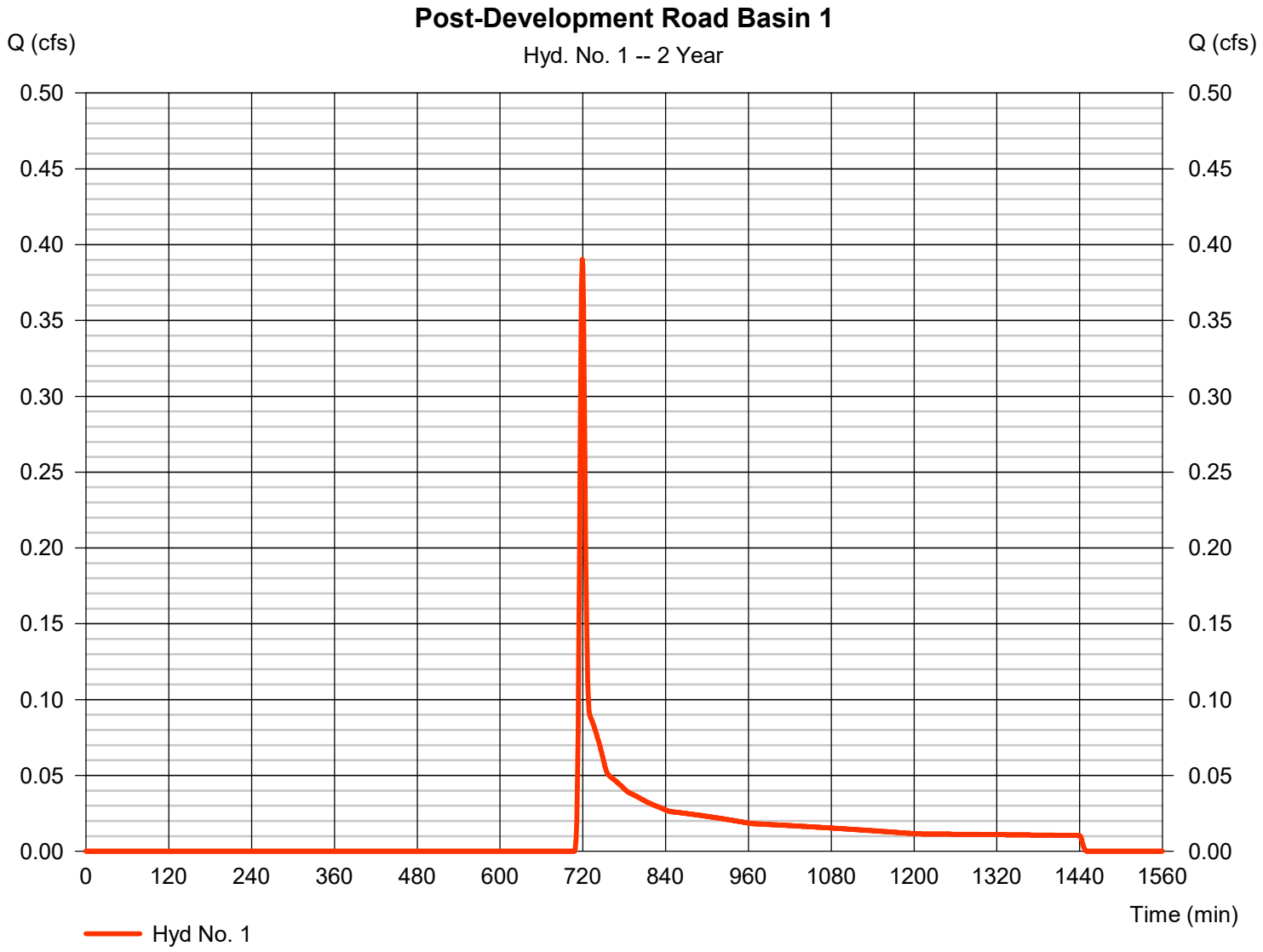
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.390	1	719	1,081	------	------	------	Post-Development Road Basin 1
2	SCS Runoff	0.138	1	719	382	------	------	------	Post-Development Road Basin 2
3	SCS Runoff	0.207	1	719	572	------	------	------	Post-Development Road Basin 3
4	SCS Runoff	0.541	1	719	1,500	------	------	------	Post-Development Road Basin 4
5	SCS Runoff	0.214	1	719	594	------	------	------	Post-Development Road Basin 5
6	SCS Runoff	0.335	1	719	928	------	------	------	Post-Development Road Basin 6
7	SCS Runoff	0.165	1	719	456	------	------	------	Post-Development Road Basin 7
8	SCS Runoff	0.126	1	719	350	------	------	------	Post-Development Road Basin 8
9	Reservoir	0.000	1	n/a	0	1	1.70	1,081	Road Basin 1 Discharge
10	Reservoir	0.000	1	n/a	0	2	1.37	382	Road Basin 2 Discharge
11	Reservoir	0.000	1	n/a	0	3	1.37	572	Road Basin 3 Discharge
12	Reservoir	0.000	1	n/a	0	4	1.95	1,500	Road Basin 4 Discharge
13	Reservoir	0.000	1	n/a	0	5	1.56	594	Road Basin 5 Discharge
14	Reservoir	0.000	1	n/a	0	6	1.42	928	Road Basin 6 Discharge
15	Reservoir	0.000	1	n/a	0	7	1.42	456	Road Basin 7 Discharge
16	Reservoir	0.000	1	n/a	0	8	1.54	350	Road Basin 8 Discharge

Hydrograph Report

Hyd. No. 1

Post-Development Road Basin 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.390 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 1,081 cuft
Drainage area	= 2.040 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

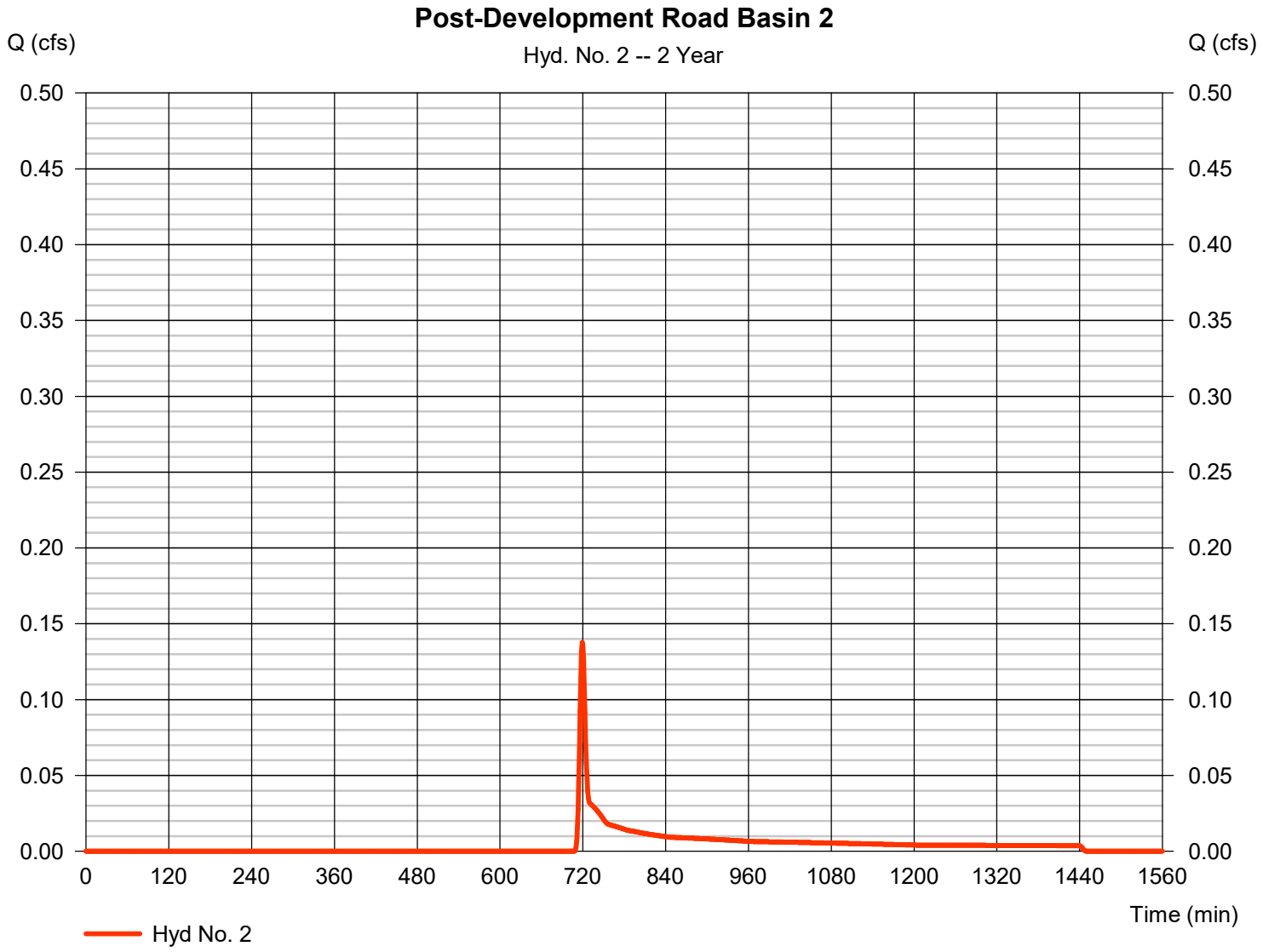


Hydrograph Report

Hyd. No. 2

Post-Development Road Basin 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.138 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 382 cuft
Drainage area	= 0.720 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

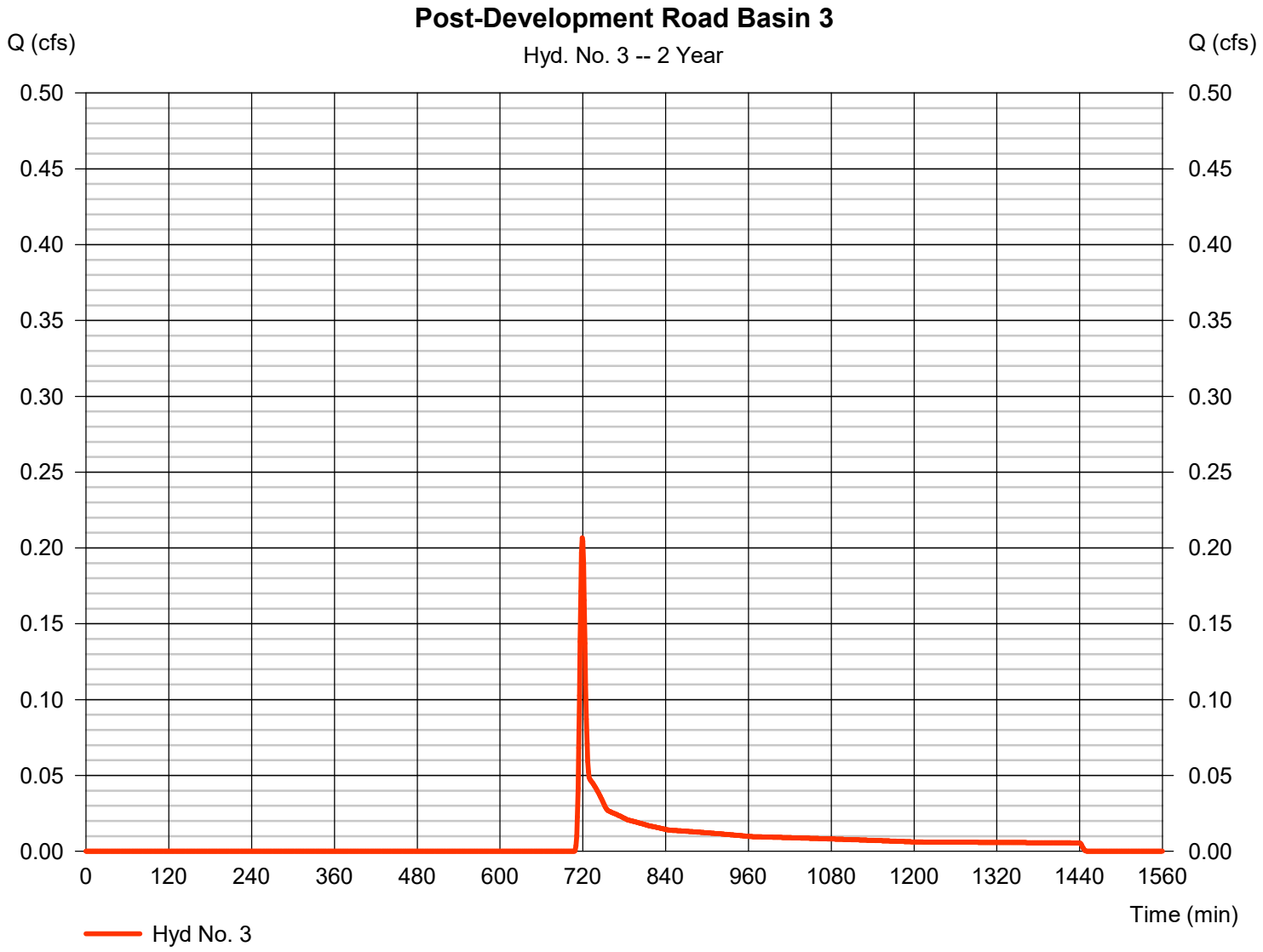


Hydrograph Report

Hyd. No. 3

Post-Development Road Basin 3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.207 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 572 cuft
Drainage area	= 1.080 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

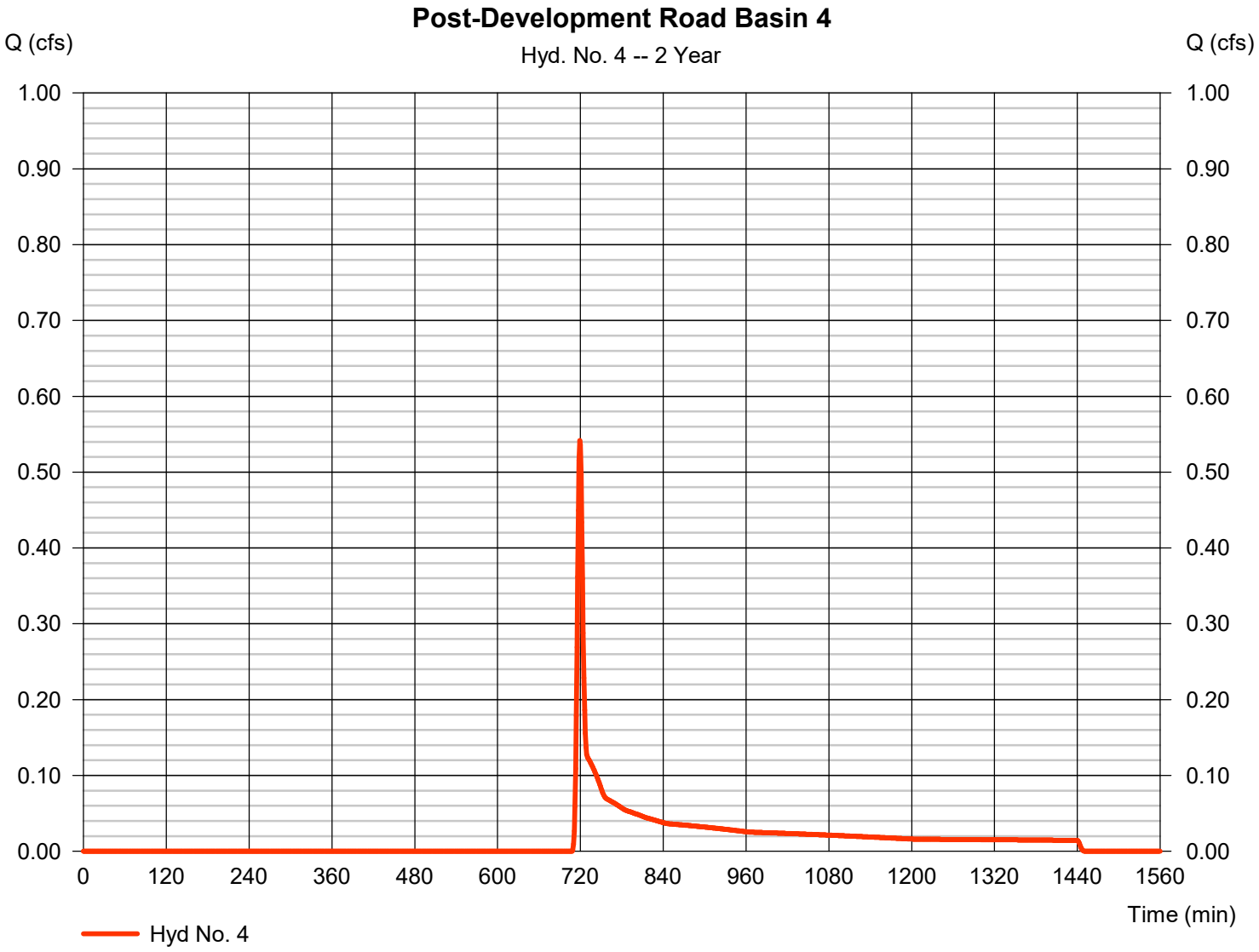


Hydrograph Report

Hyd. No. 4

Post-Development Road Basin 4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.541 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 1,500 cuft
Drainage area	= 2.830 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

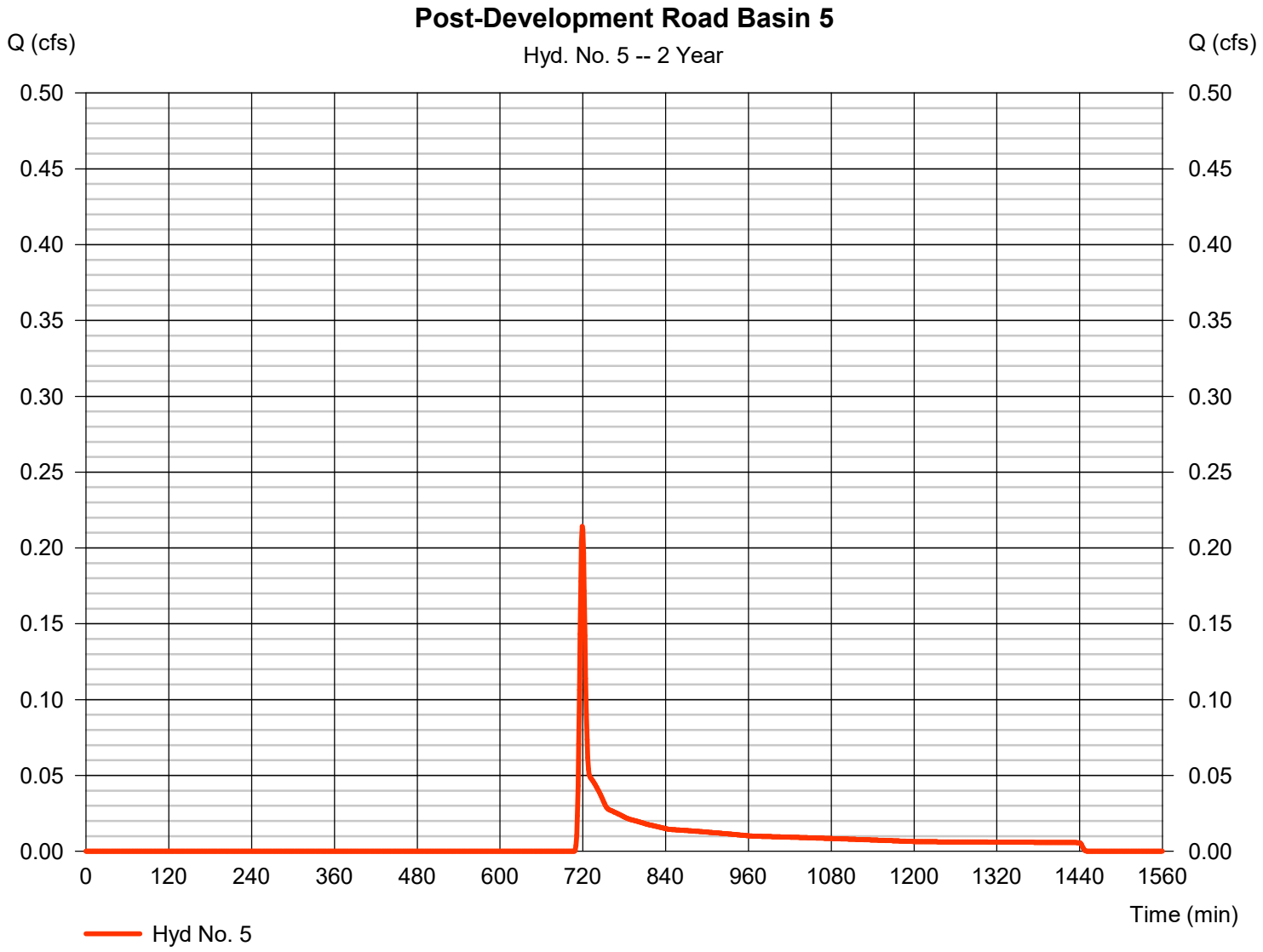


Hydrograph Report

Hyd. No. 5

Post-Development Road Basin 5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.214 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 594 cuft
Drainage area	= 1.120 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

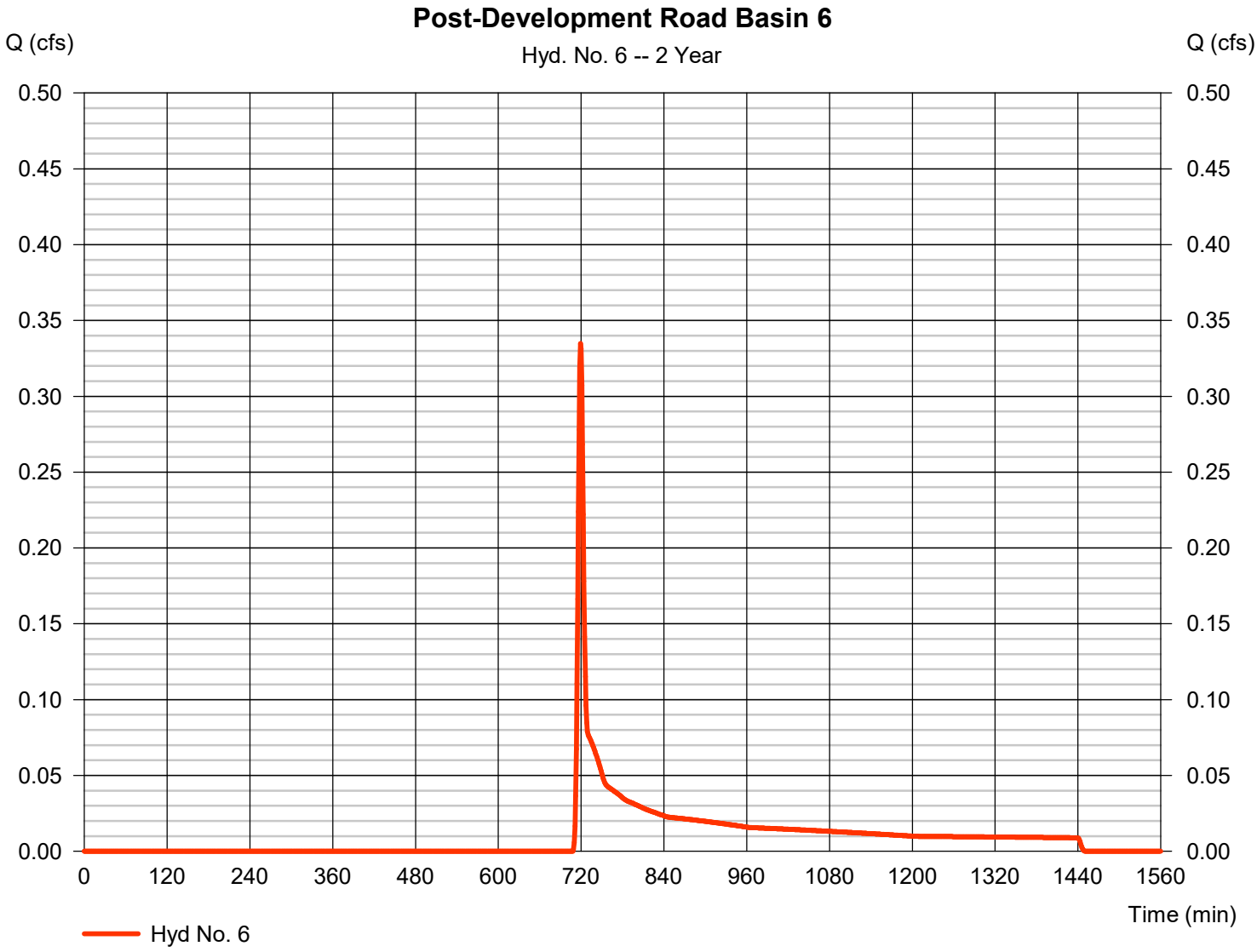


Hydrograph Report

Hyd. No. 6

Post-Development Road Basin 6

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.335 cfs
Storm frequency	=	2 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	928 cuft
Drainage area	=	1.750 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

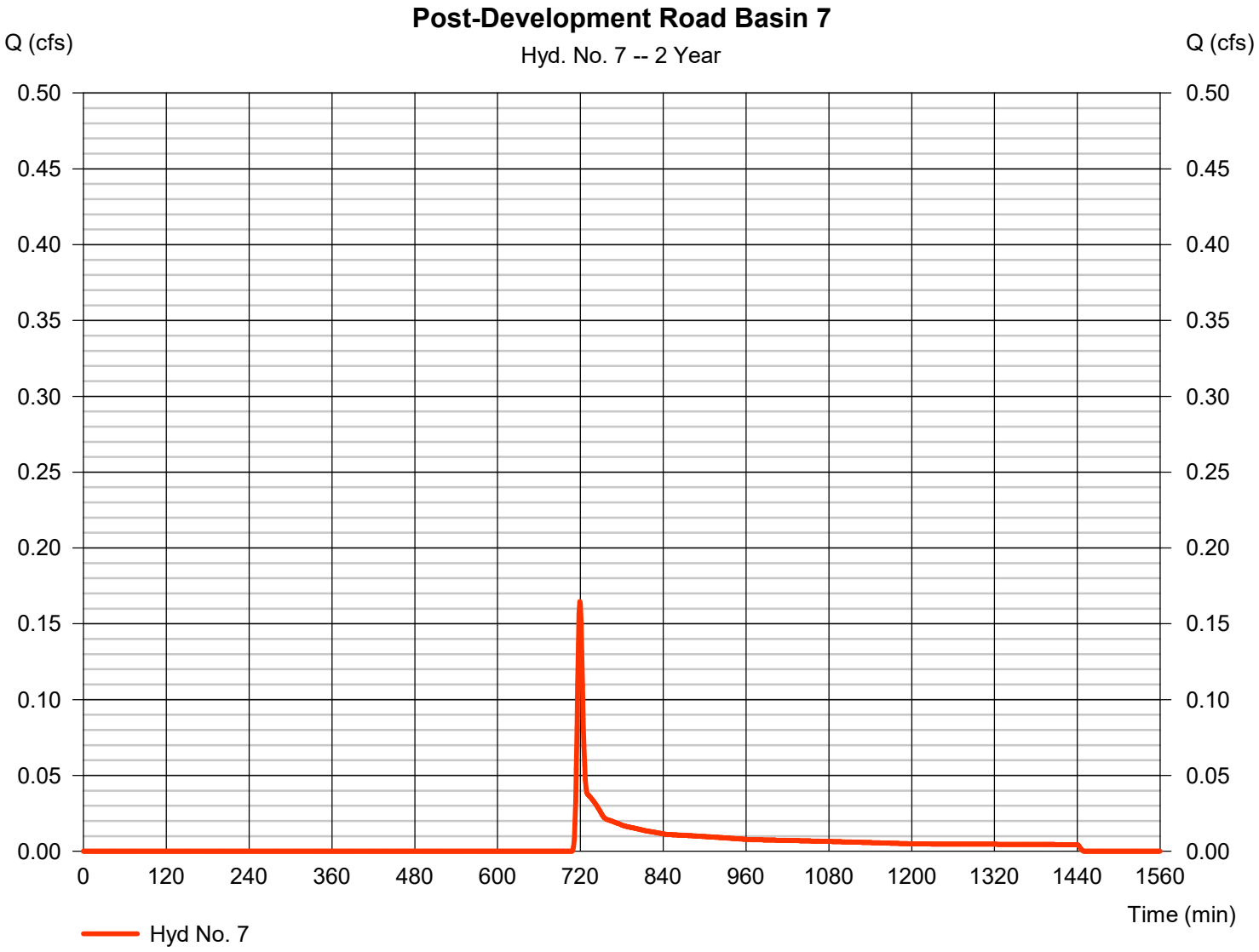


Hydrograph Report

Hyd. No. 7

Post-Development Road Basin 7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.165 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 456 cuft
Drainage area	= 0.860 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

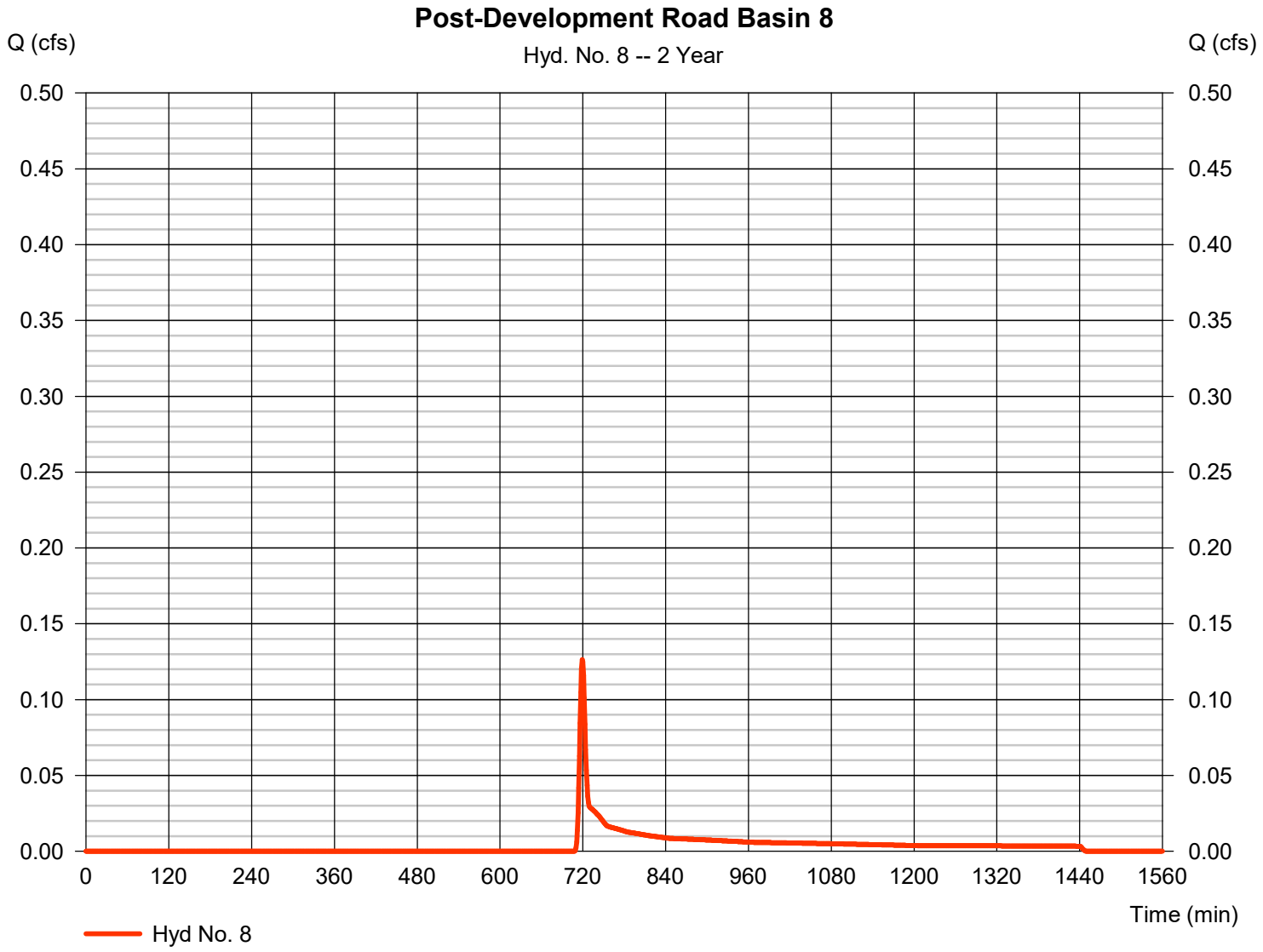


Hydrograph Report

Hyd. No. 8

Post-Development Road Basin 8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.126 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 350 cuft
Drainage area	= 0.660 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



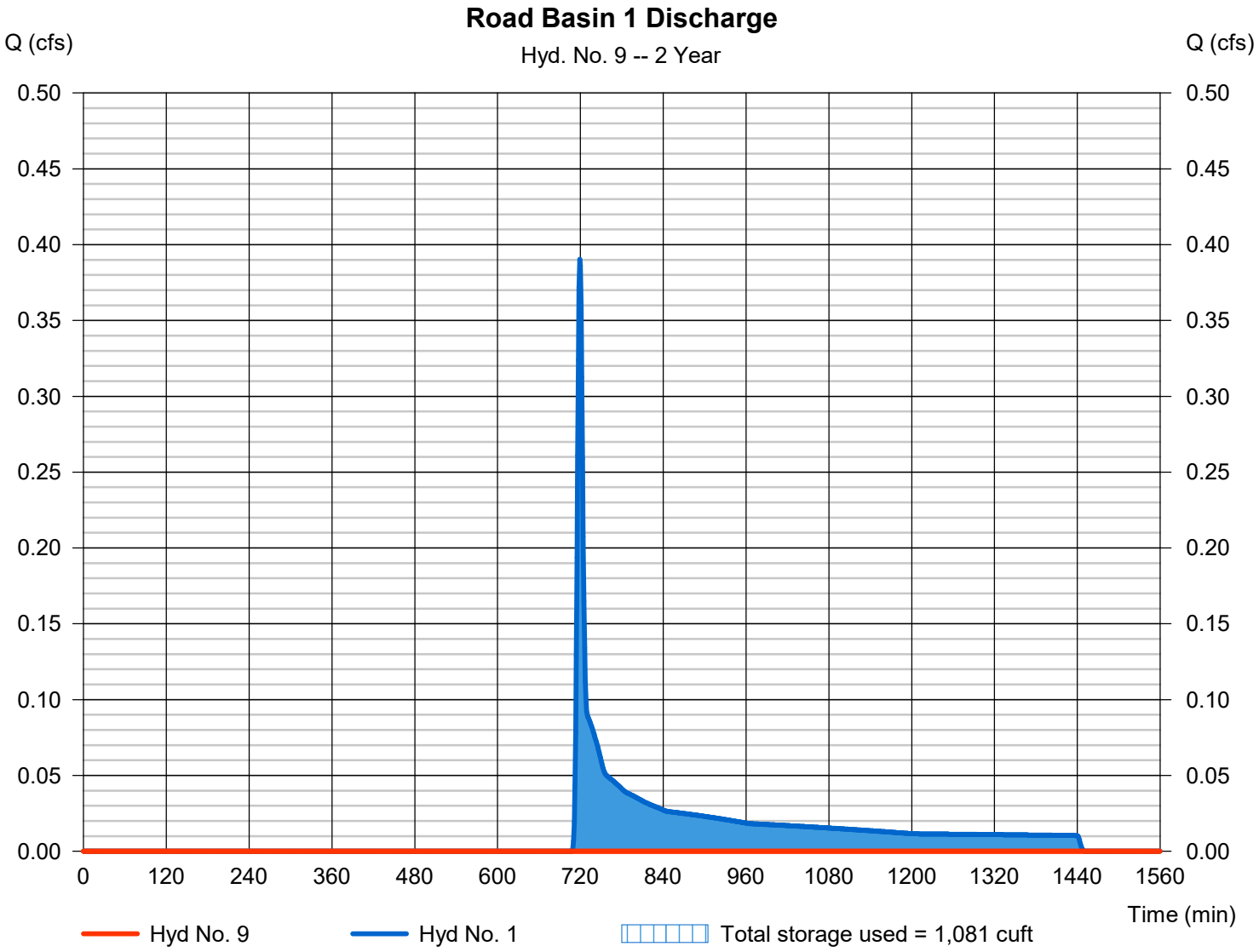
Hydrograph Report

Hyd. No. 9

Road Basin 1 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - Post-Development Road Basin 1	Max. Elevation	=	1.70 ft
Reservoir name	=	Road Basin 1 Storage	Max. Storage	=	1,081 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Road Basin 1 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,545	1,545
2.00	3.00	n/a	1,359	2,904
2.05	3.05	n/a	6	2,910

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

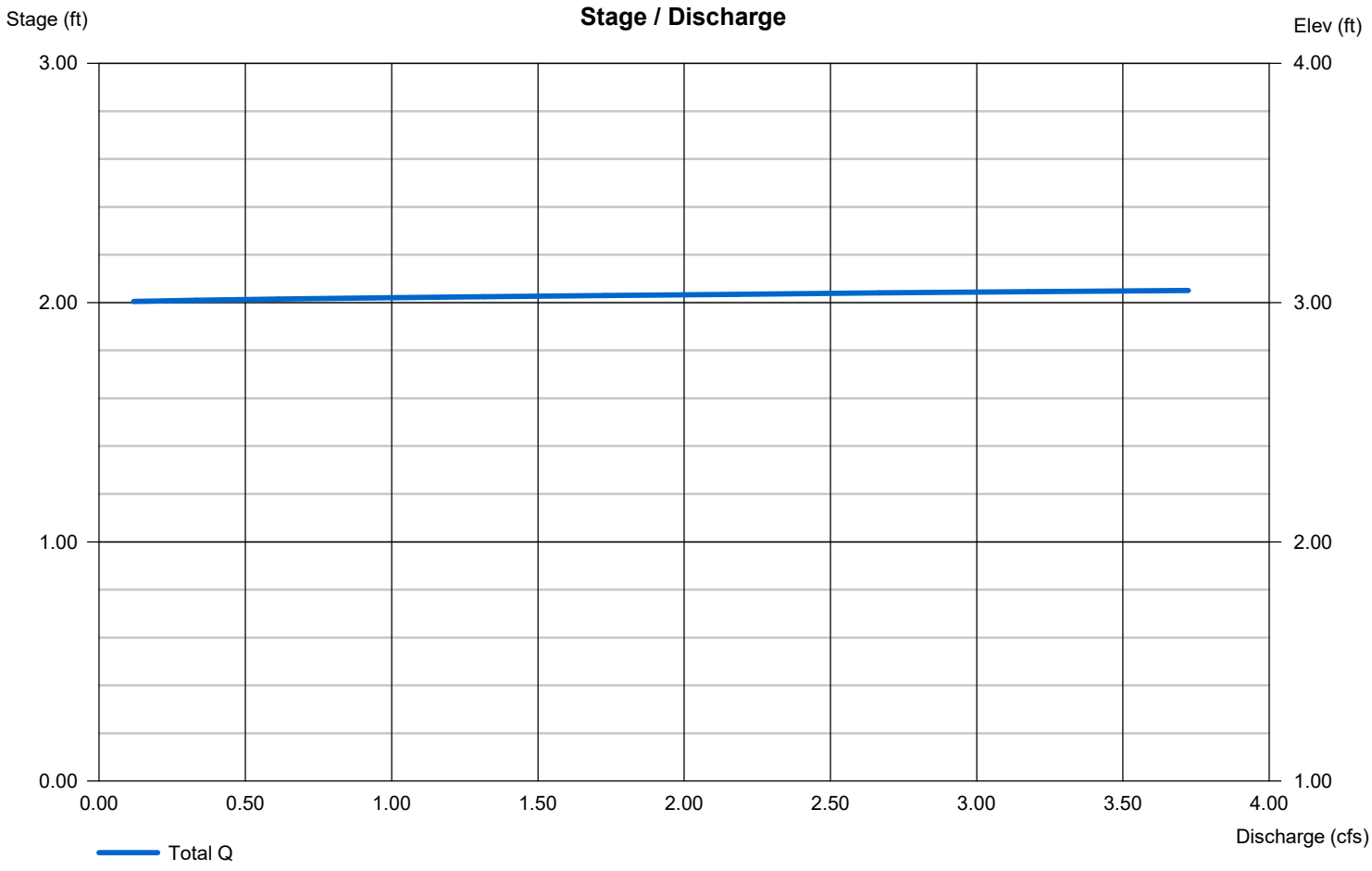
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



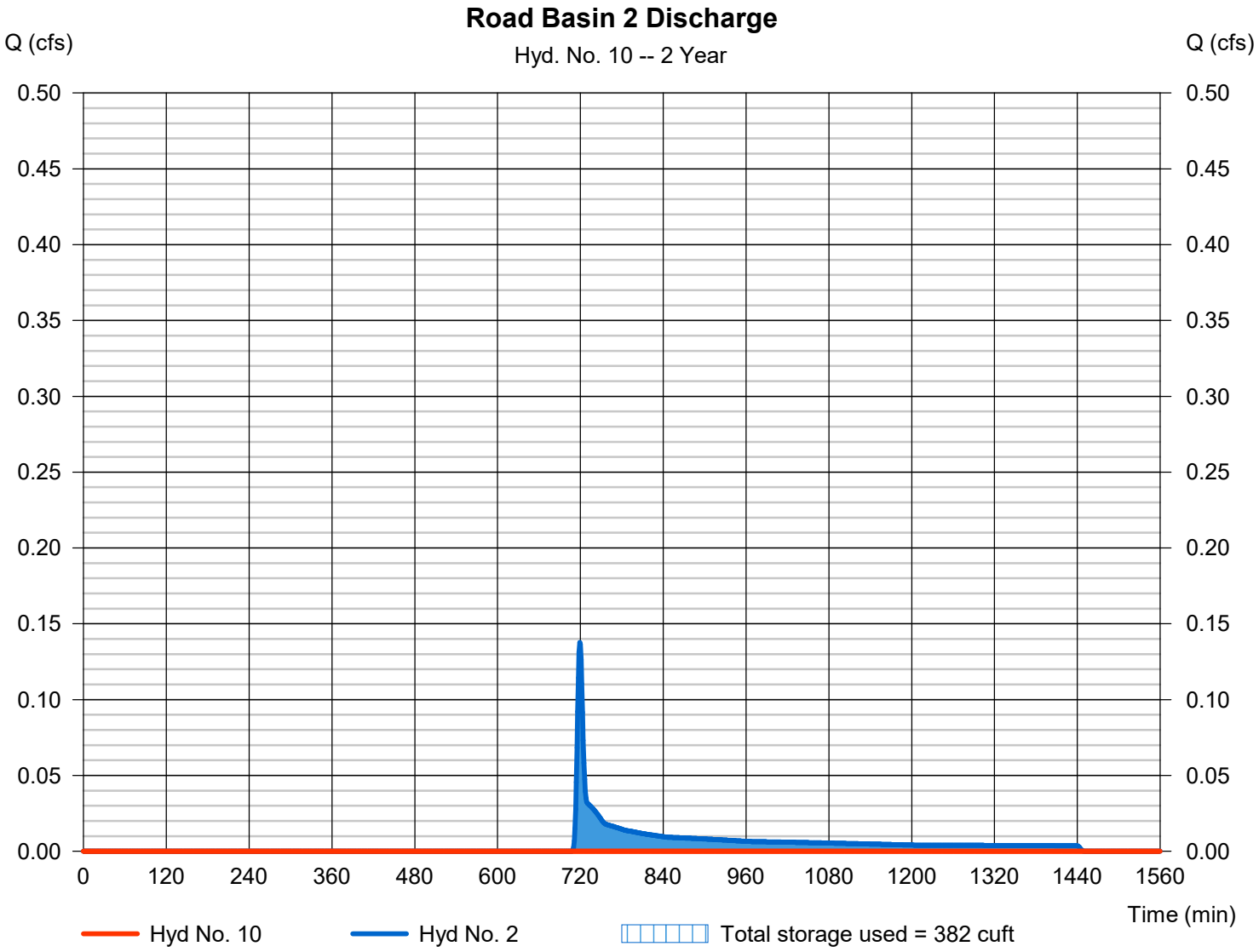
Hydrograph Report

Hyd. No. 10

Road Basin 2 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	2 - Post-Development Road Basin 2	Max. Elevation	=	1.37 ft
Reservoir name	=	Road Basin 2 Storage	Max. Storage	=	382 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - Road Basin 2 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,043	1,043
1.05	2.05	n/a	4	1,047

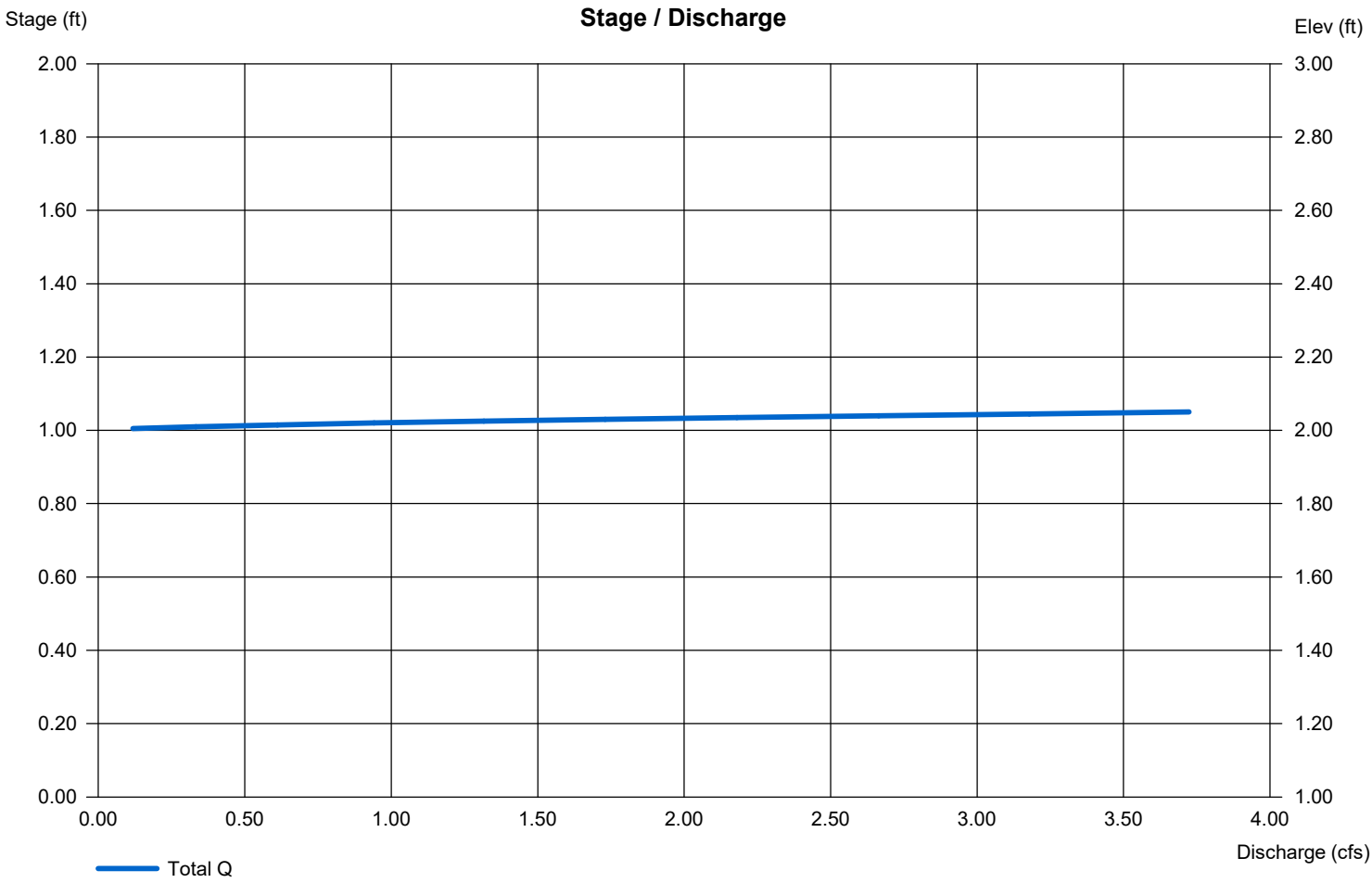
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



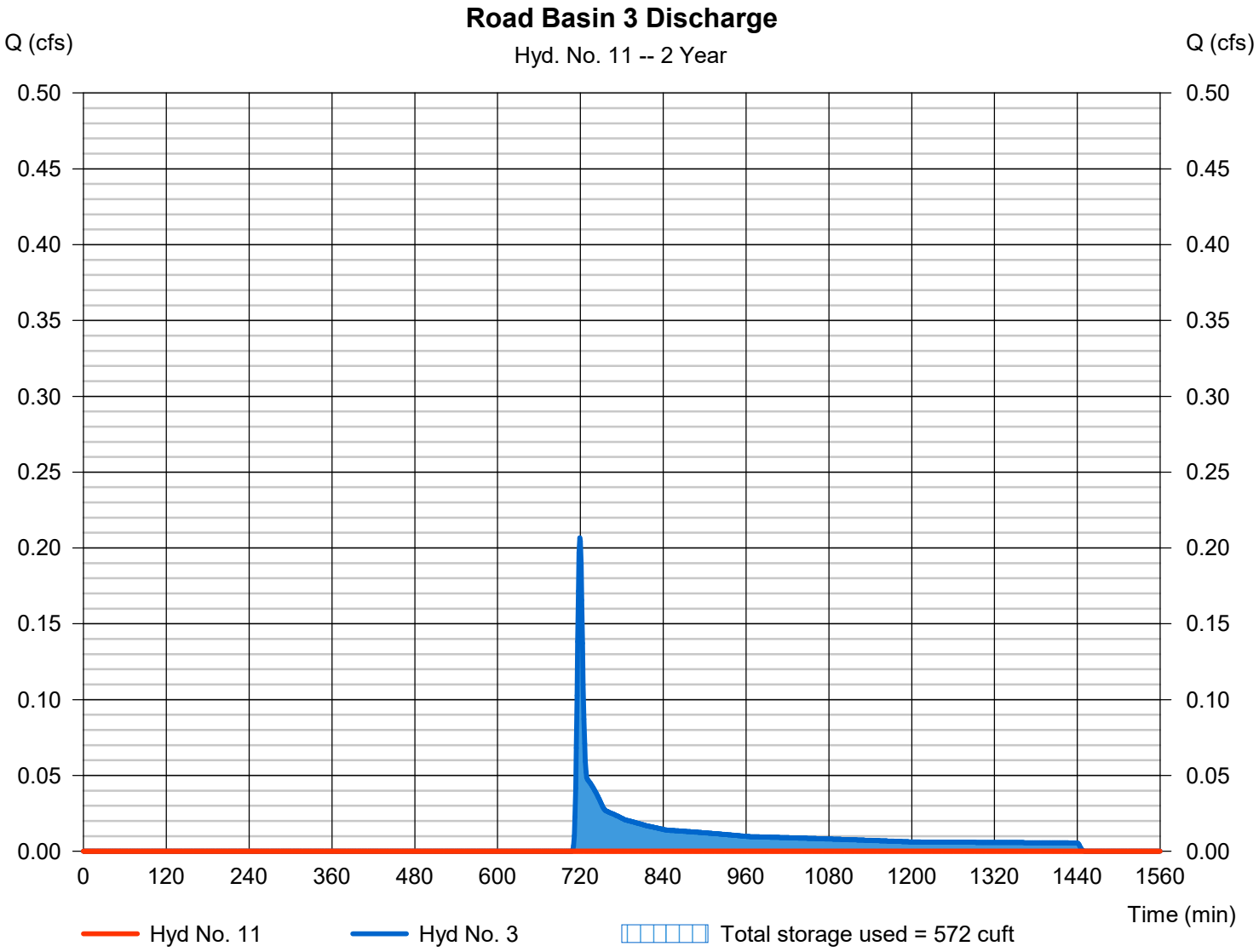
Hydrograph Report

Hyd. No. 11

Road Basin 3 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - Post-Development Road Basin 3	Max. Elevation	=	1.37 ft
Reservoir name	=	Road Basin 3 Storage	Max. Storage	=	572 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Road Basin 3 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,555	1,555
2.00	3.00	n/a	1,555	3,110
2.05	3.05	n/a	5	3,115

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

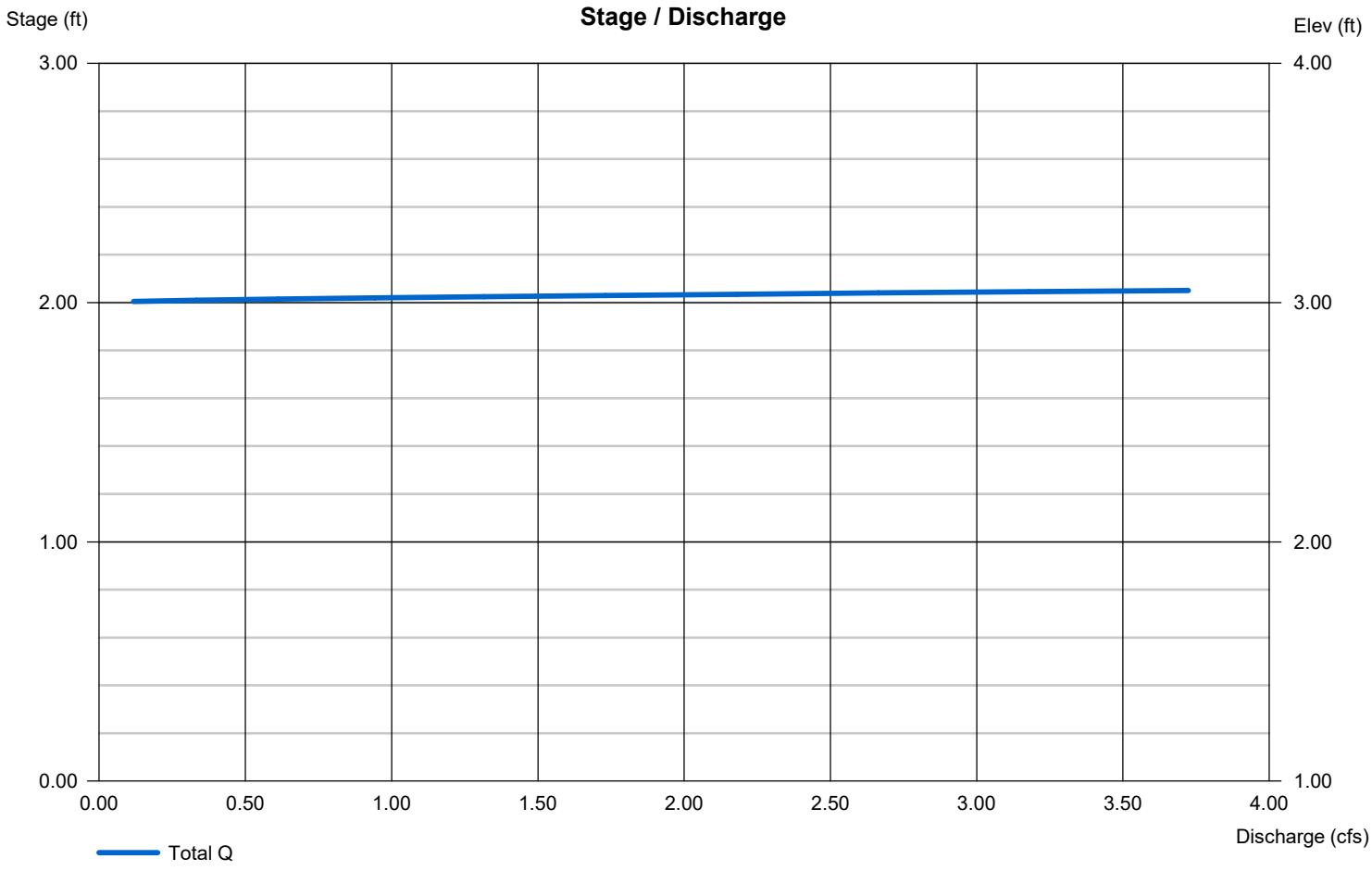
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



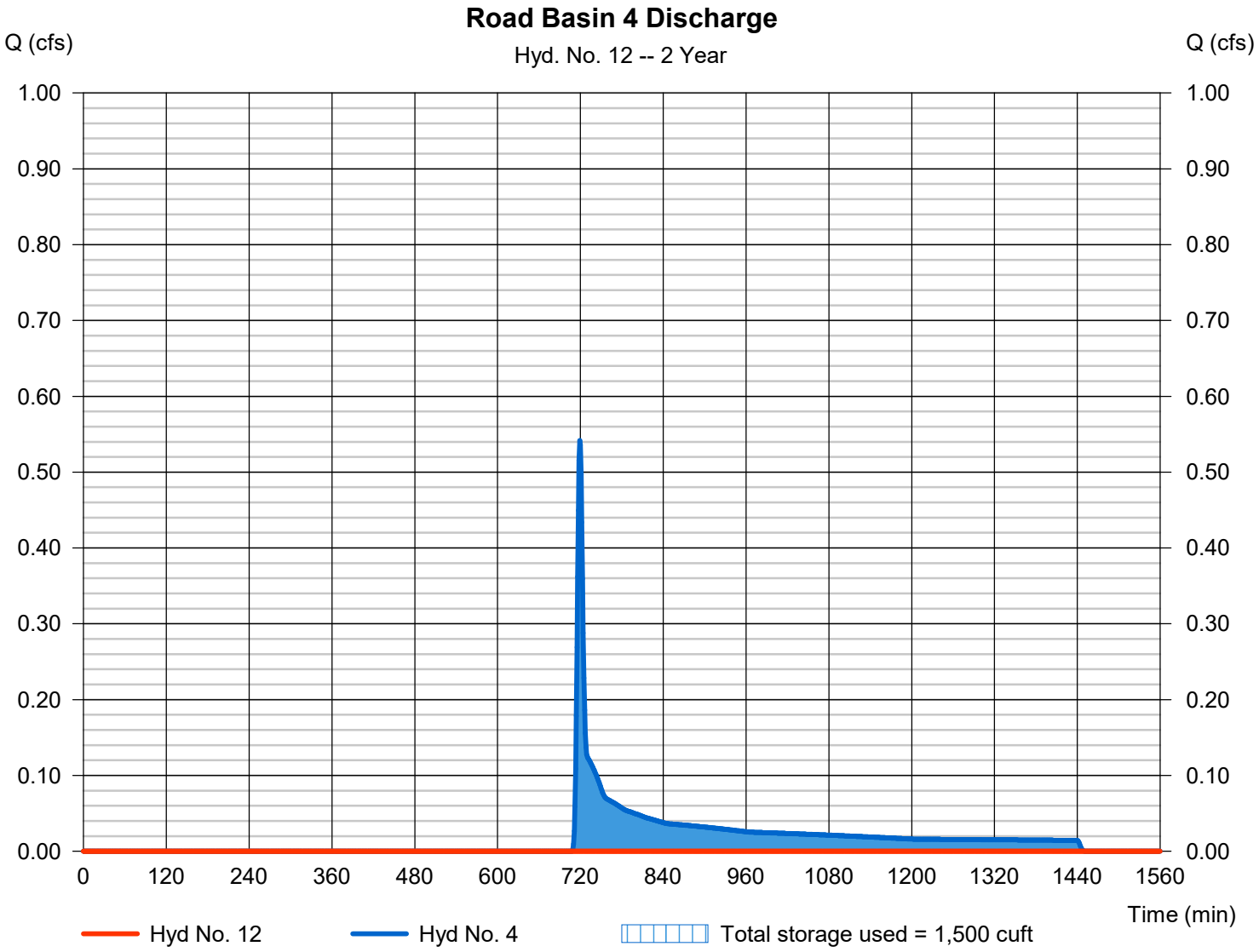
Hydrograph Report

Hyd. No. 12

Road Basin 4 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	4 - Post-Development Road Basin 4	Max. Elevation	=	1.95 ft
Reservoir name	=	Road BAsin 4 Storage	Max. Storage	=	1,500 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - Road BAsin 4 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,575	1,575
2.00	3.00	n/a	2,451	4,026
3.05	4.05	n/a	5	4,031

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

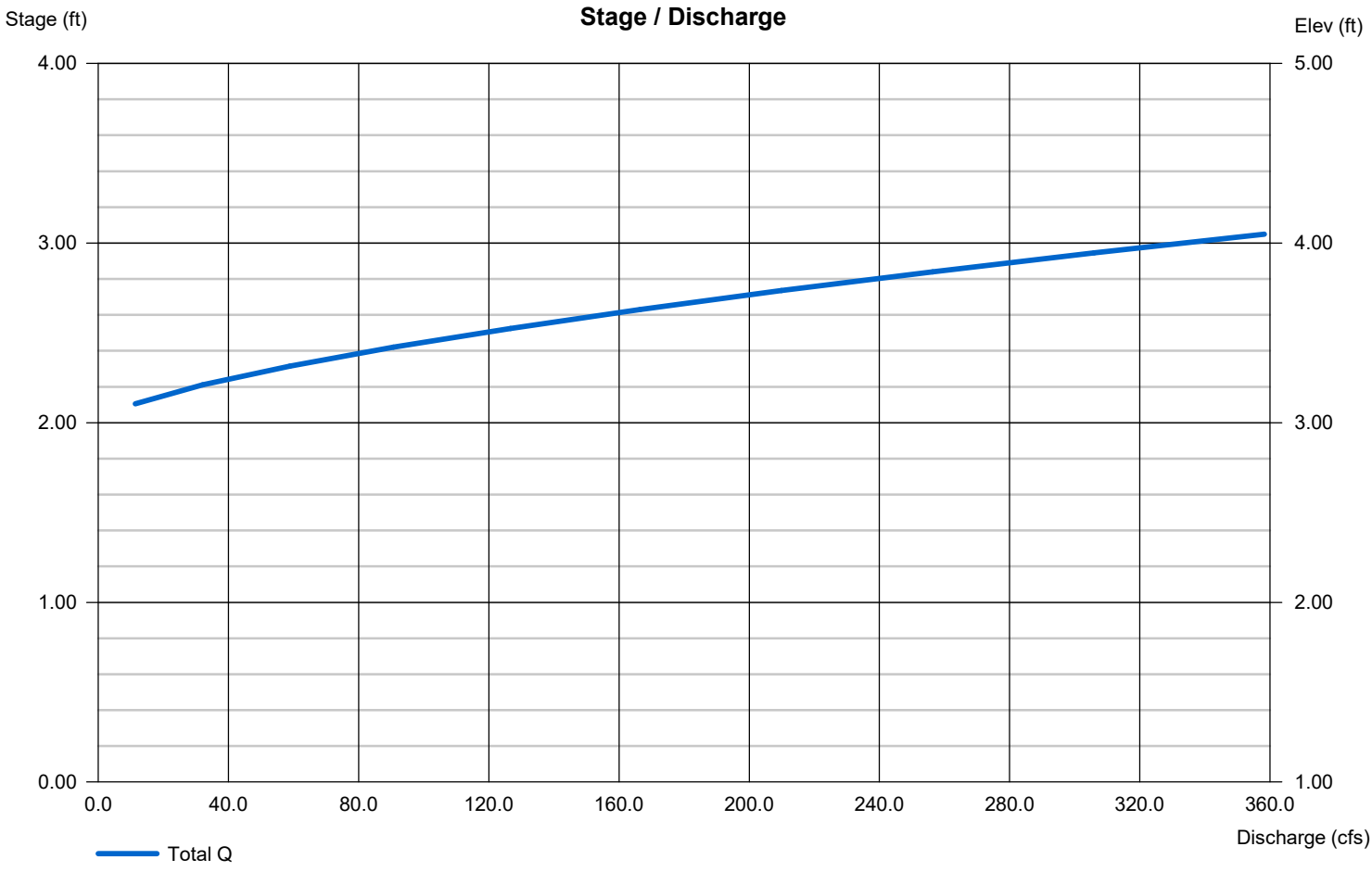
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



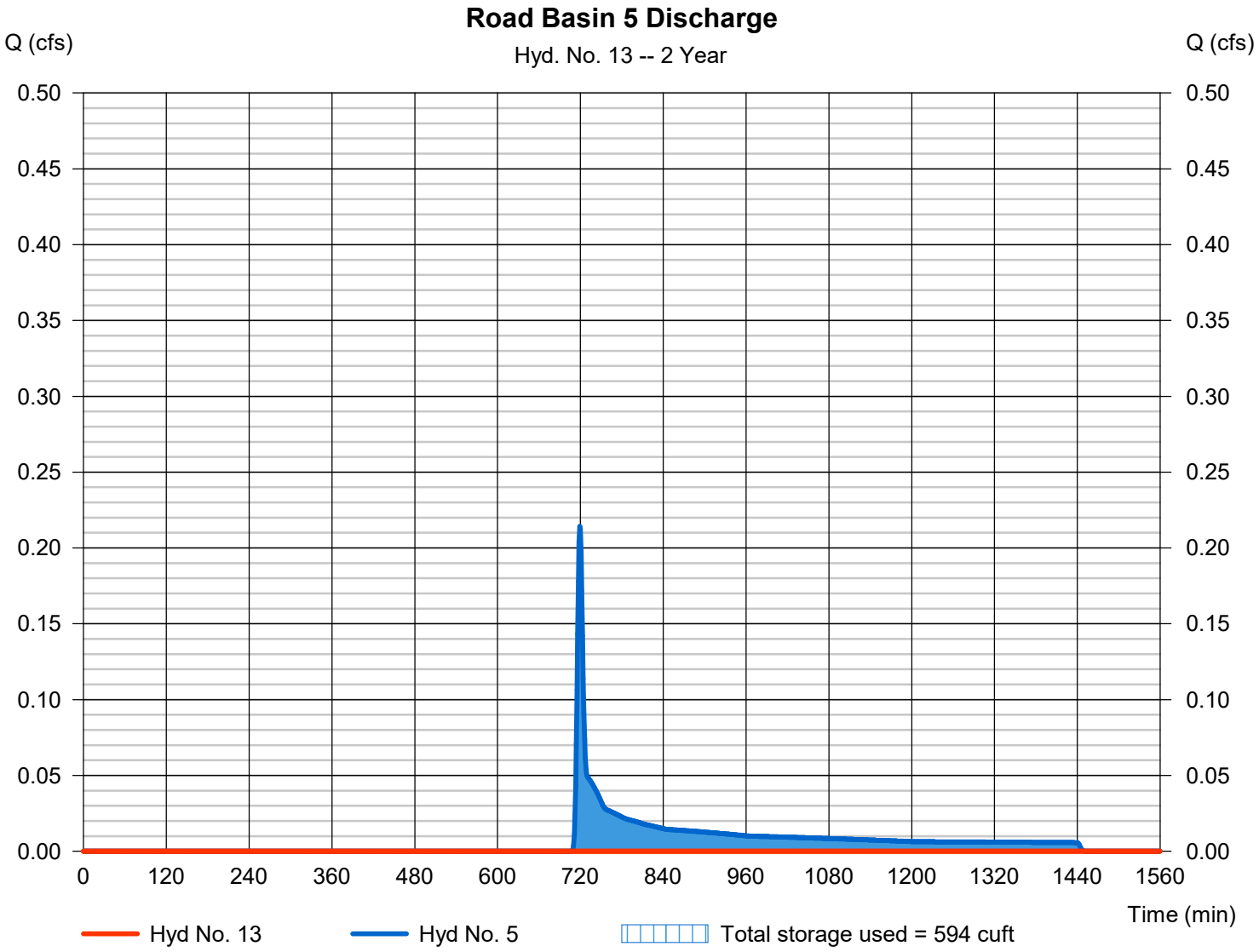
Hydrograph Report

Hyd. No. 13

Road Basin 5 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	5 - Post-Development Road Basin 5	Max. Elevation	=	1.56 ft
Reservoir name	=	Road Basin 5 Storage	Max. Storage	=	594 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - Road Basin 5 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,051	1,051
2.00	3.00	n/a	1,054	2,105
2.05	3.05	n/a	5	2,110

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

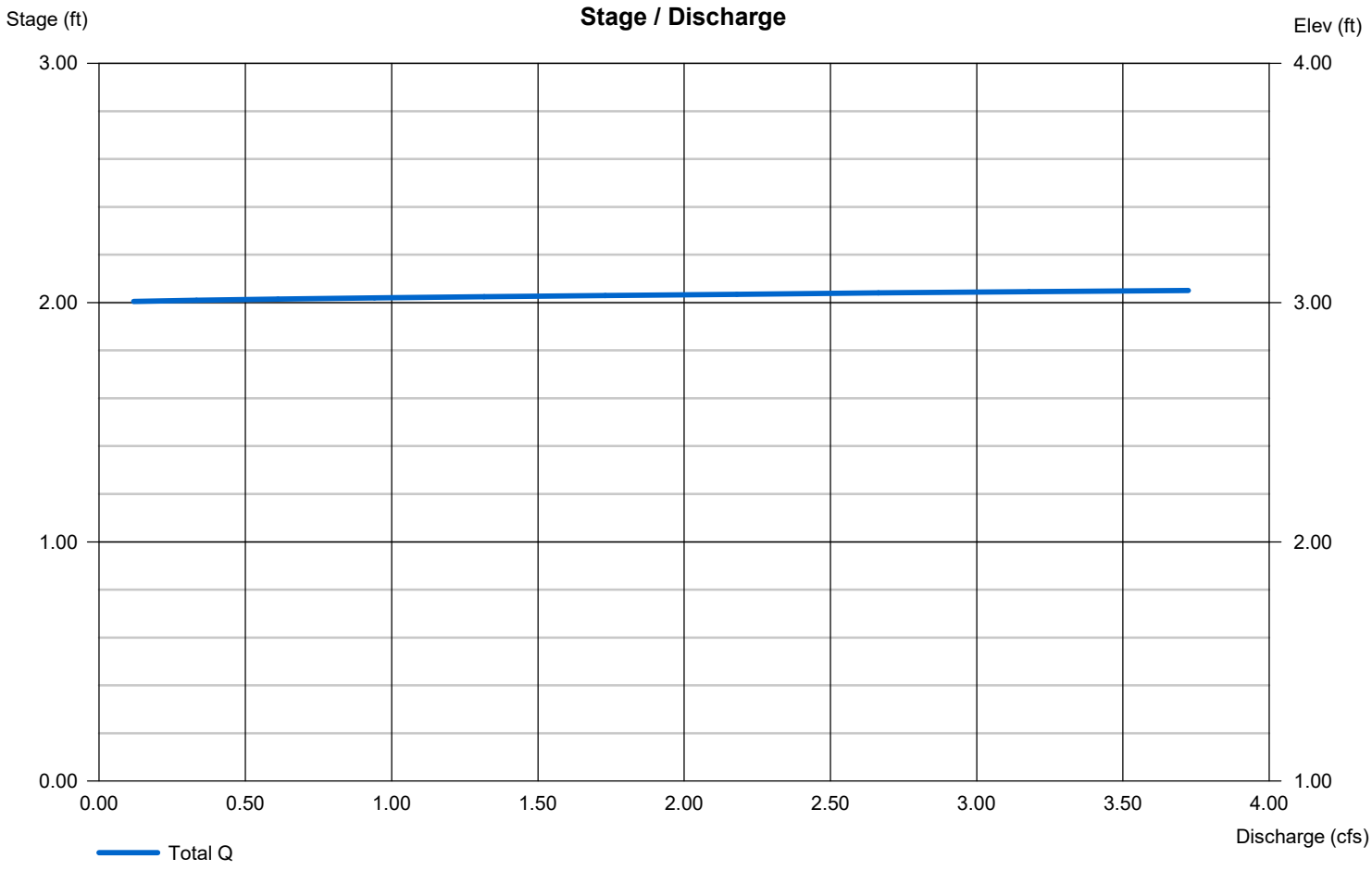
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 3.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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



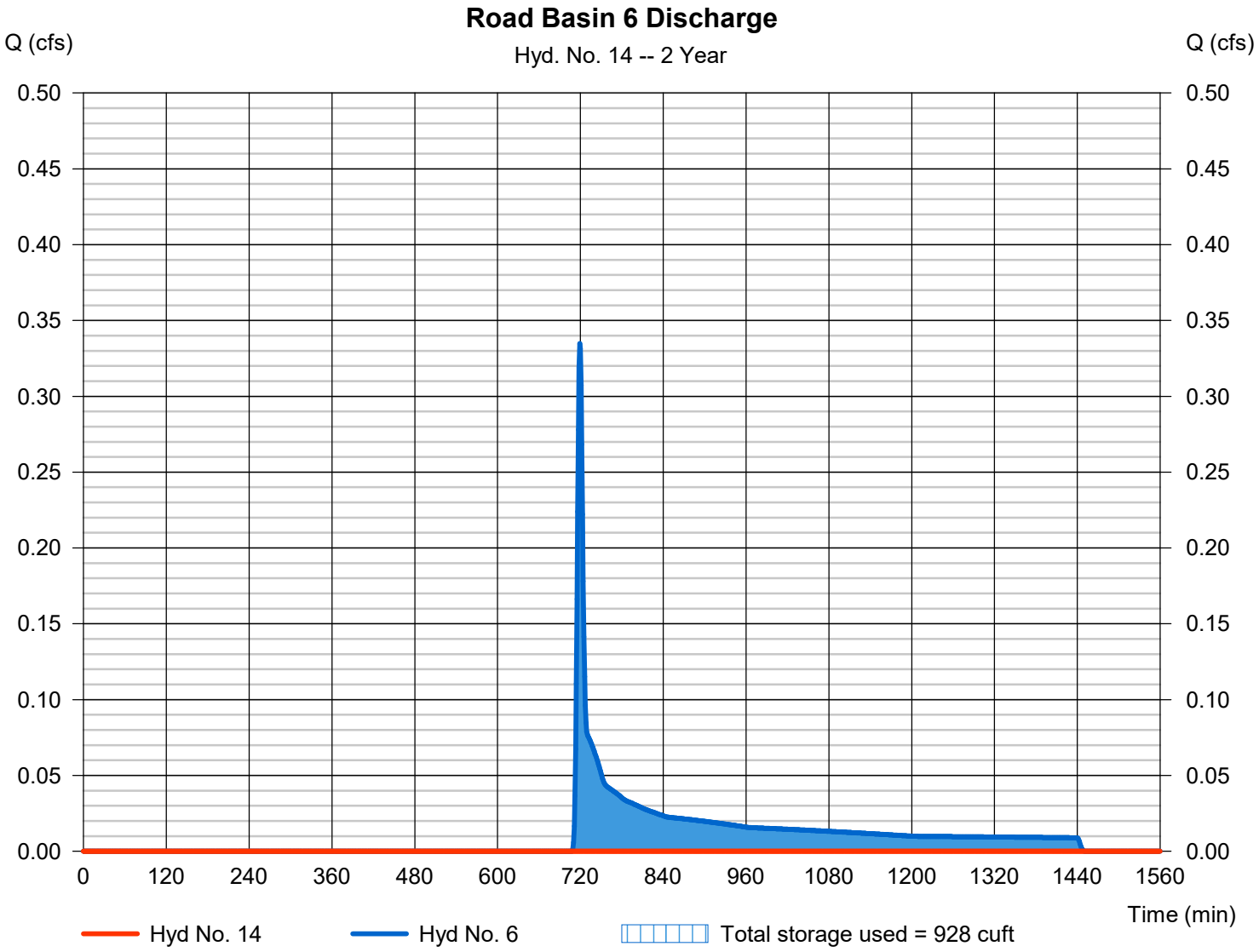
Hydrograph Report

Hyd. No. 14

Road Basin 6 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	6 - Post-Development Road Basin 6	Max. Elevation	=	1.42 ft
Reservoir name	=	Road Basin 6 Storage	Max. Storage	=	928 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - Road Basin 6 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,571	1,571
1.05	2.05	n/a	5	1,576

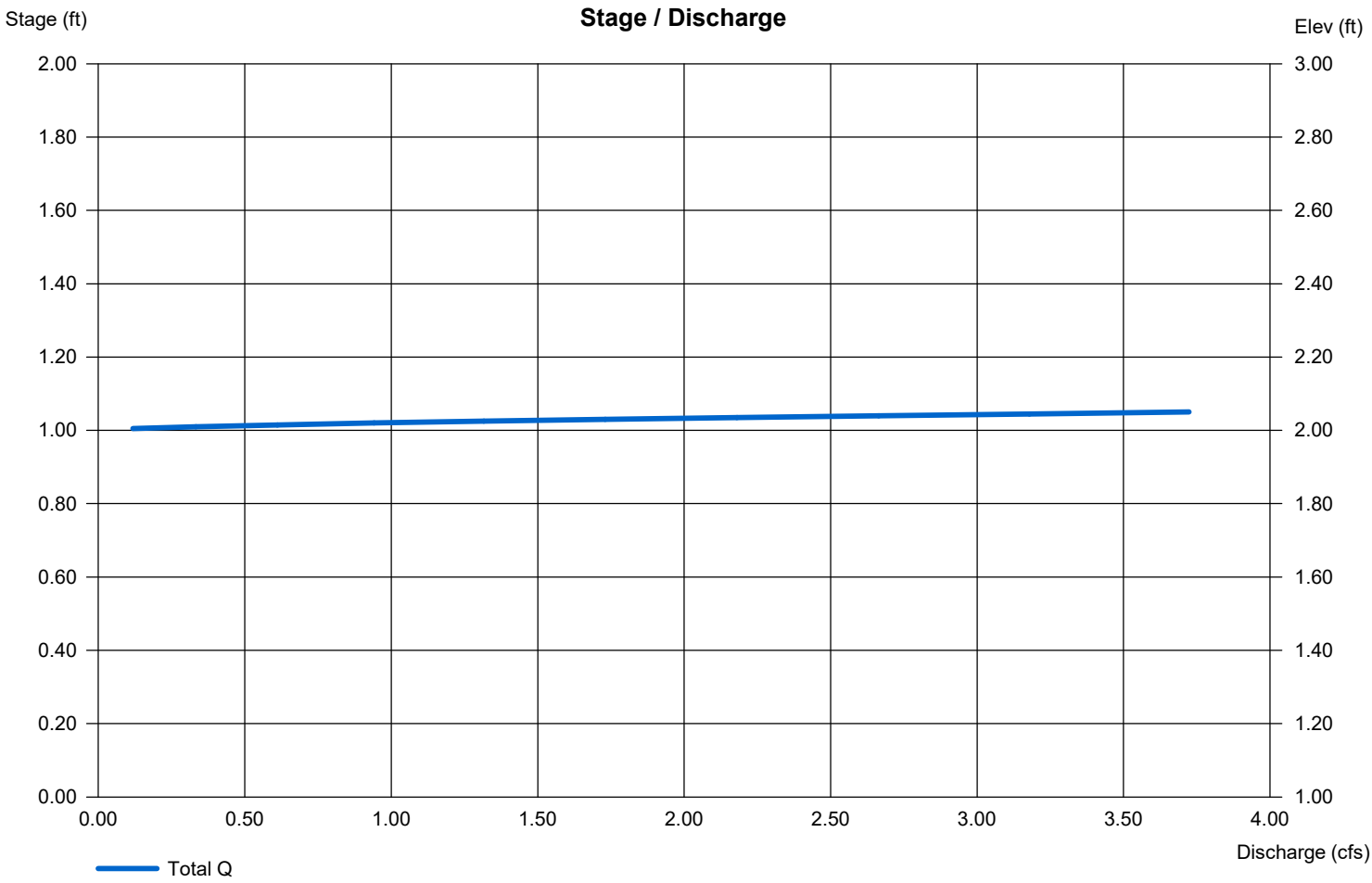
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



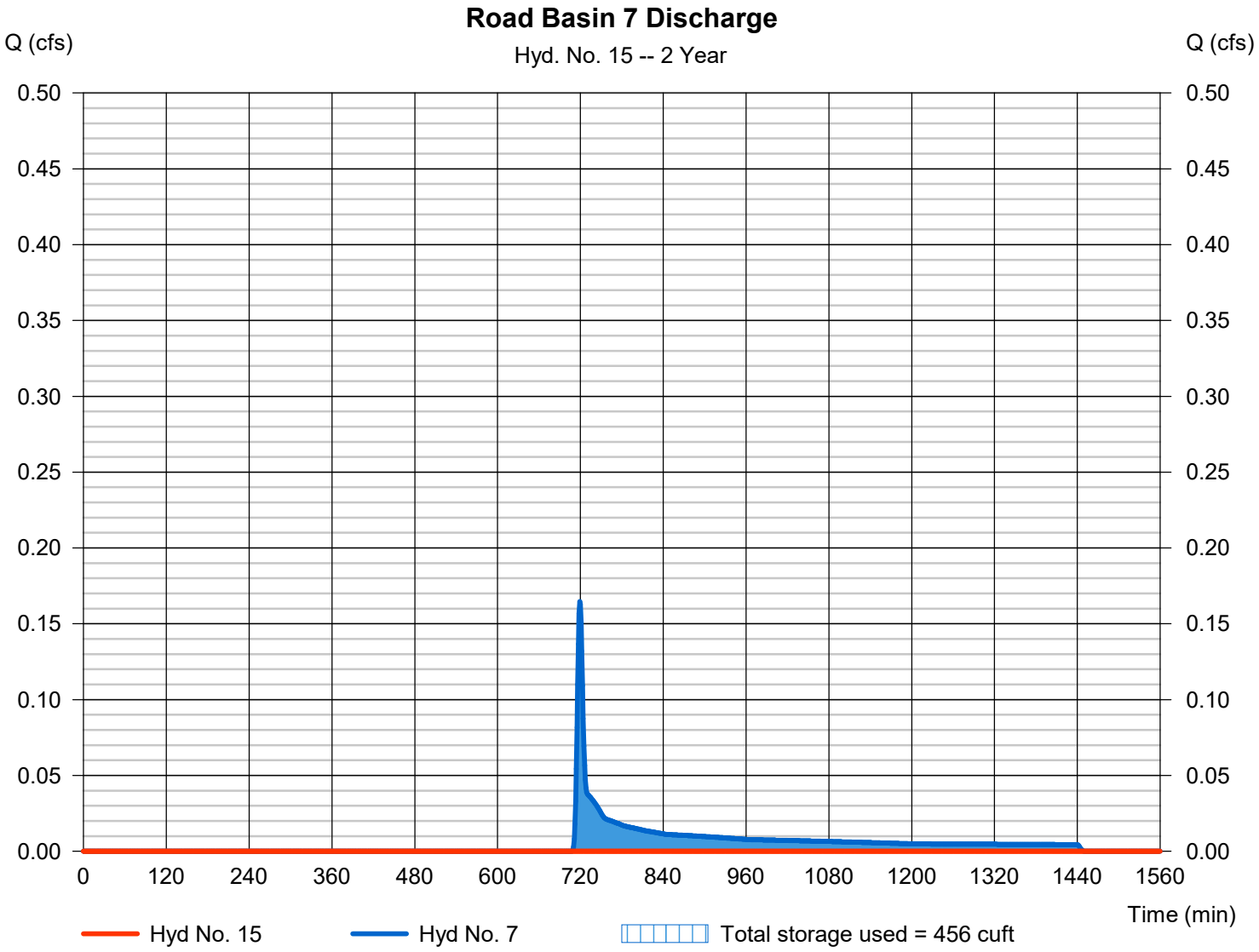
Hydrograph Report

Hyd. No. 15

Road Basin 7 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	7 - Post-Development Road Basin 7	Max. Elevation	=	1.42 ft
Reservoir name	=	Road Basin 7 Storage	Max. Storage	=	456 cuft

Storage Indication method used.



Pond Report

Pond No. 7 - Road Basin 7 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	1,075	1,075
1.05	2.05	n/a	5	1,080

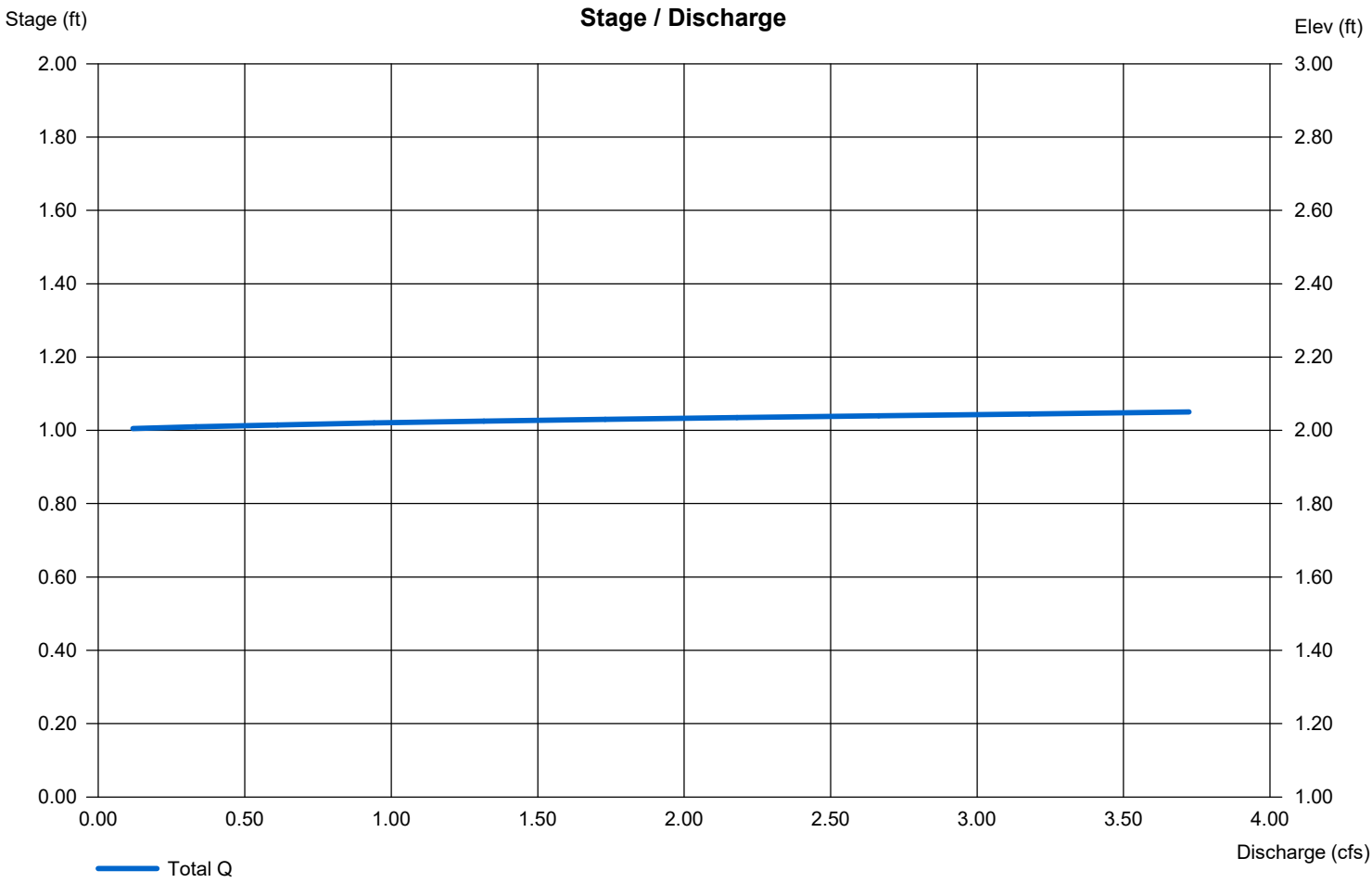
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



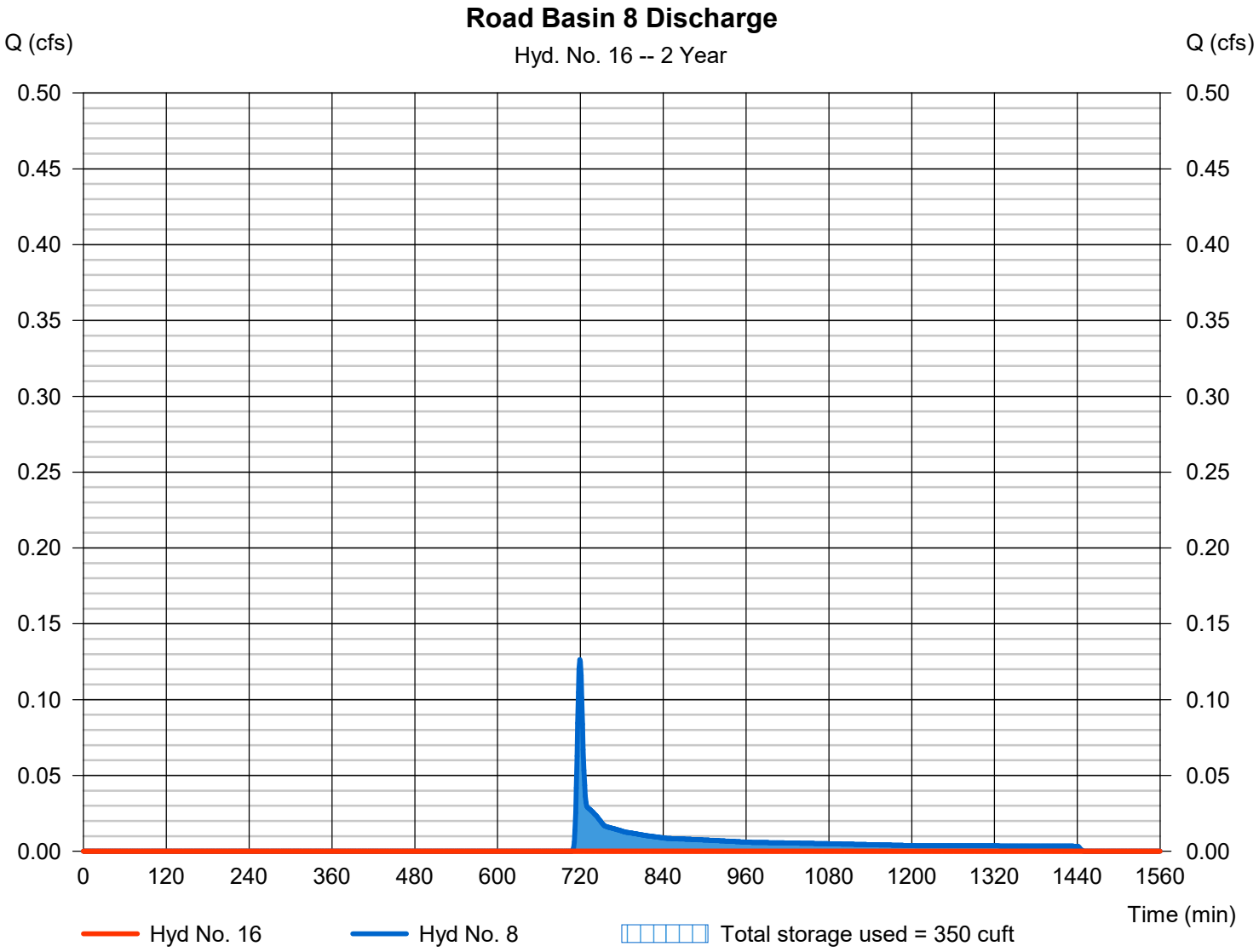
Hydrograph Report

Hyd. No. 16

Road Basin 8 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	8 - Post-Development Road Basin 8	Max. Elevation	=	1.54 ft
Reservoir name	=	Road Basin 8 Storage	Max. Storage	=	350 cuft

Storage Indication method used.



Pond Report

Pond No. 8 - Road Basin 8 Storage

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
1.00	2.00	n/a	645	645
1.05	2.05	n/a	5	650

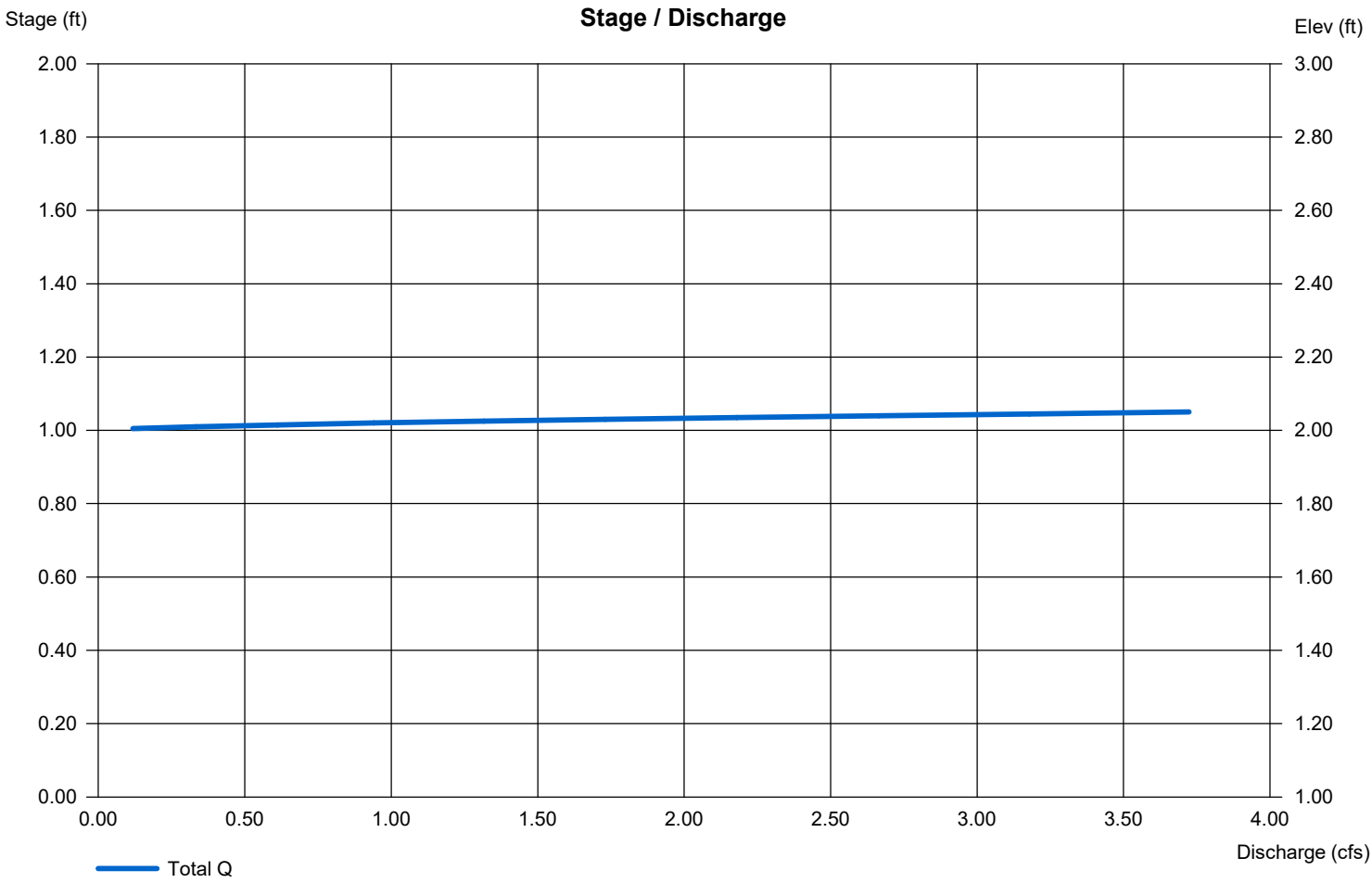
Culvert / Orifice Structures

	[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)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 2.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Summary Report

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

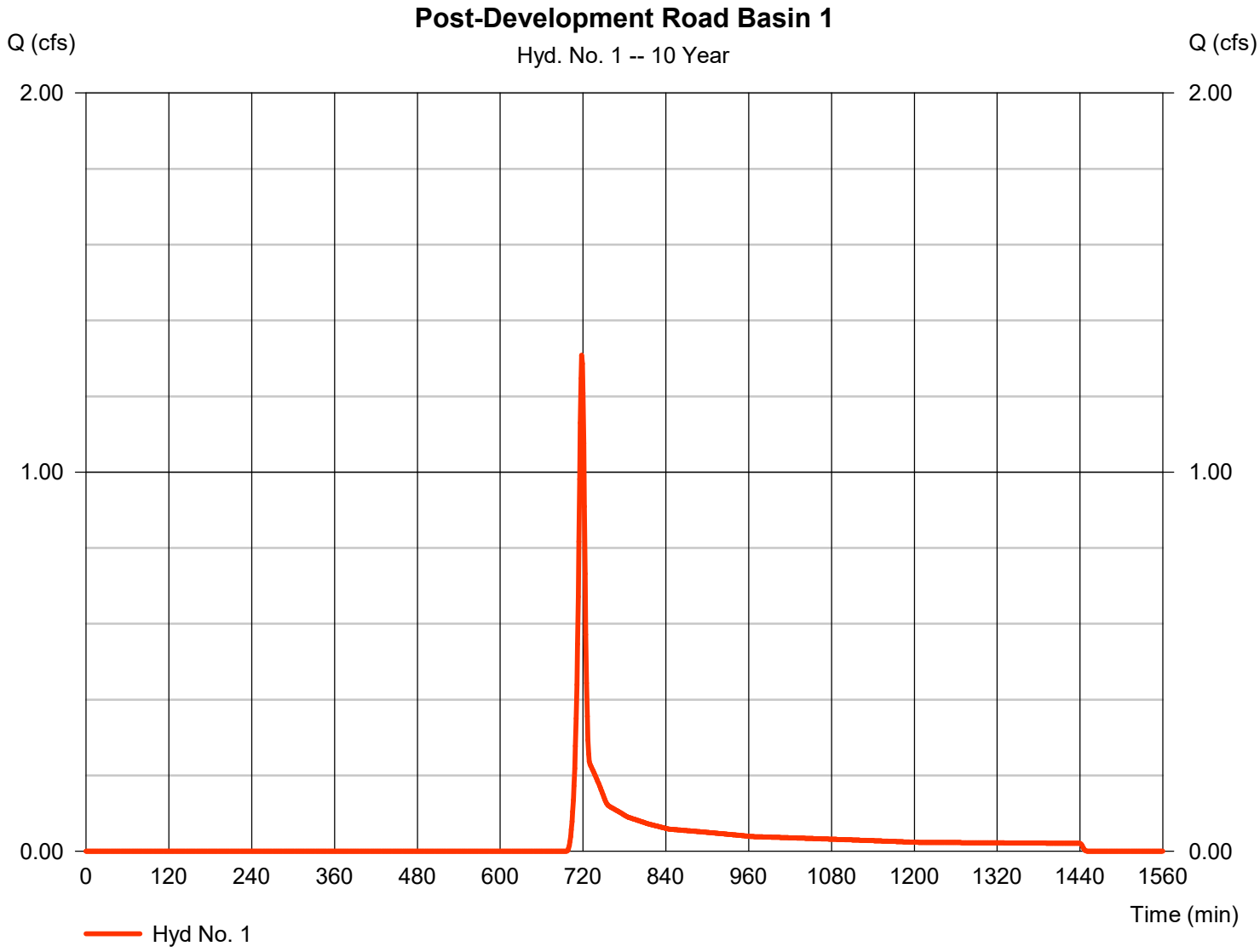
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.308	1	718	2,808	------	------	------	Post-Development Road Basin 1
2	SCS Runoff	0.462	1	718	991	------	------	------	Post-Development Road Basin 2
3	SCS Runoff	0.693	1	718	1,486	------	------	------	Post-Development Road Basin 3
4	SCS Runoff	1.815	1	718	3,895	------	------	------	Post-Development Road Basin 4
5	SCS Runoff	0.718	1	718	1,541	------	------	------	Post-Development Road Basin 5
6	SCS Runoff	1.122	1	718	2,408	------	------	------	Post-Development Road Basin 6
7	SCS Runoff	0.551	1	718	1,184	------	------	------	Post-Development Road Basin 7
8	SCS Runoff	0.423	1	718	908	------	------	------	Post-Development Road Basin 8
9	Reservoir	0.000	1	n/a	0	1	2.93	2,808	Road Basin 1 Discharge
10	Reservoir	0.000	1	n/a	0	2	1.95	991	Road Basin 2 Discharge
11	Reservoir	0.000	1	n/a	0	3	1.96	1,486	Road Basin 3 Discharge
12	Reservoir	0.000	1	n/a	0	4	2.95	3,895	Road Basin 4 Discharge
13	Reservoir	0.000	1	n/a	0	5	2.47	1,541	Road Basin 5 Discharge
14	Reservoir	0.019	1	1296	177	6	2.00	2,233	Road Basin 6 Discharge
15	Reservoir	0.016	1	1249	109	7	2.00	1,075	Road Basin 7 Discharge
16	Reservoir	0.016	1	948	263	8	2.00	645	Road Basin 8 Discharge

Hydrograph Report

Hyd. No. 1

Post-Development Road Basin 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.308 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,808 cuft
Drainage area	= 2.040 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

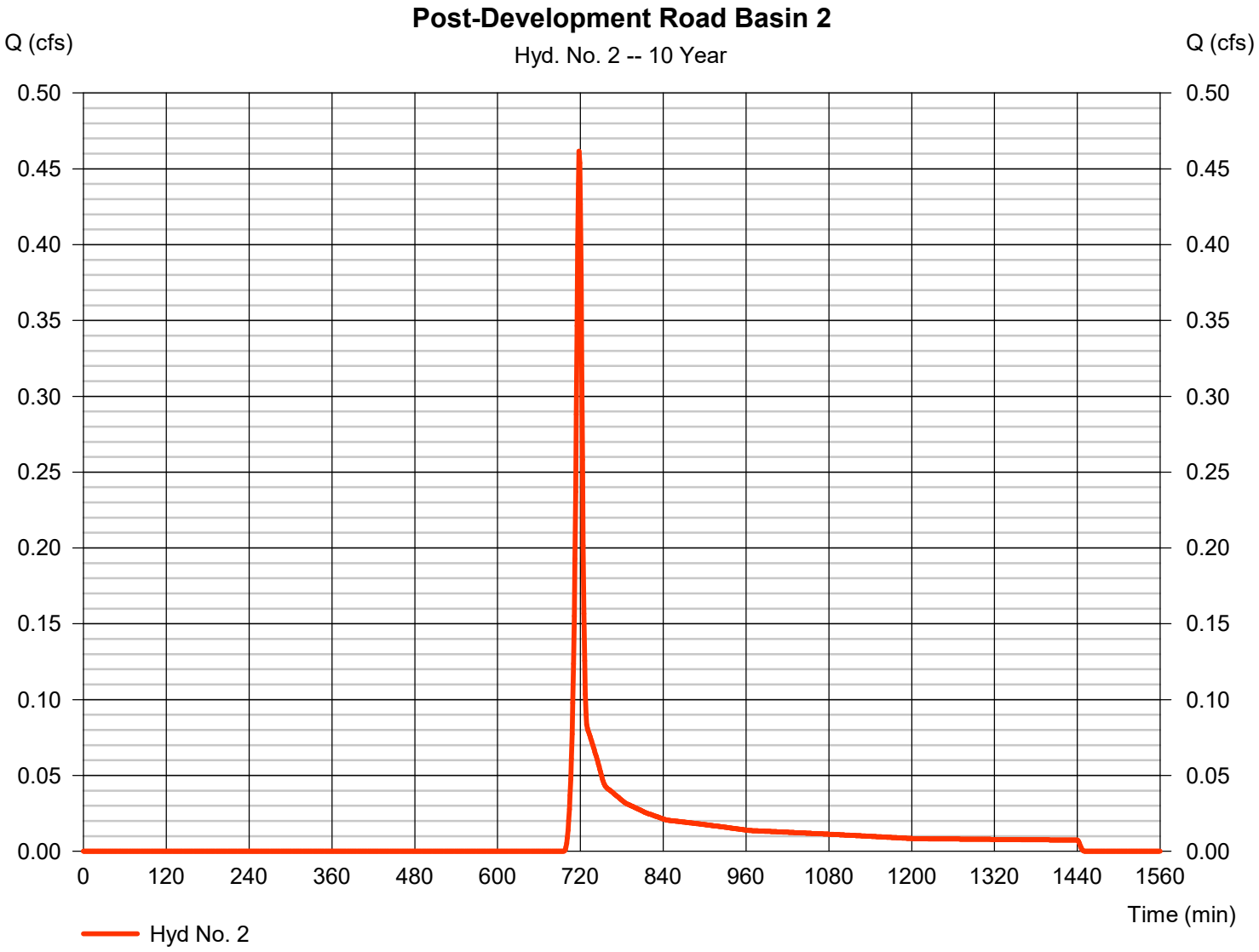


Hydrograph Report

Hyd. No. 2

Post-Development Road Basin 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.462 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 991 cuft
Drainage area	= 0.720 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

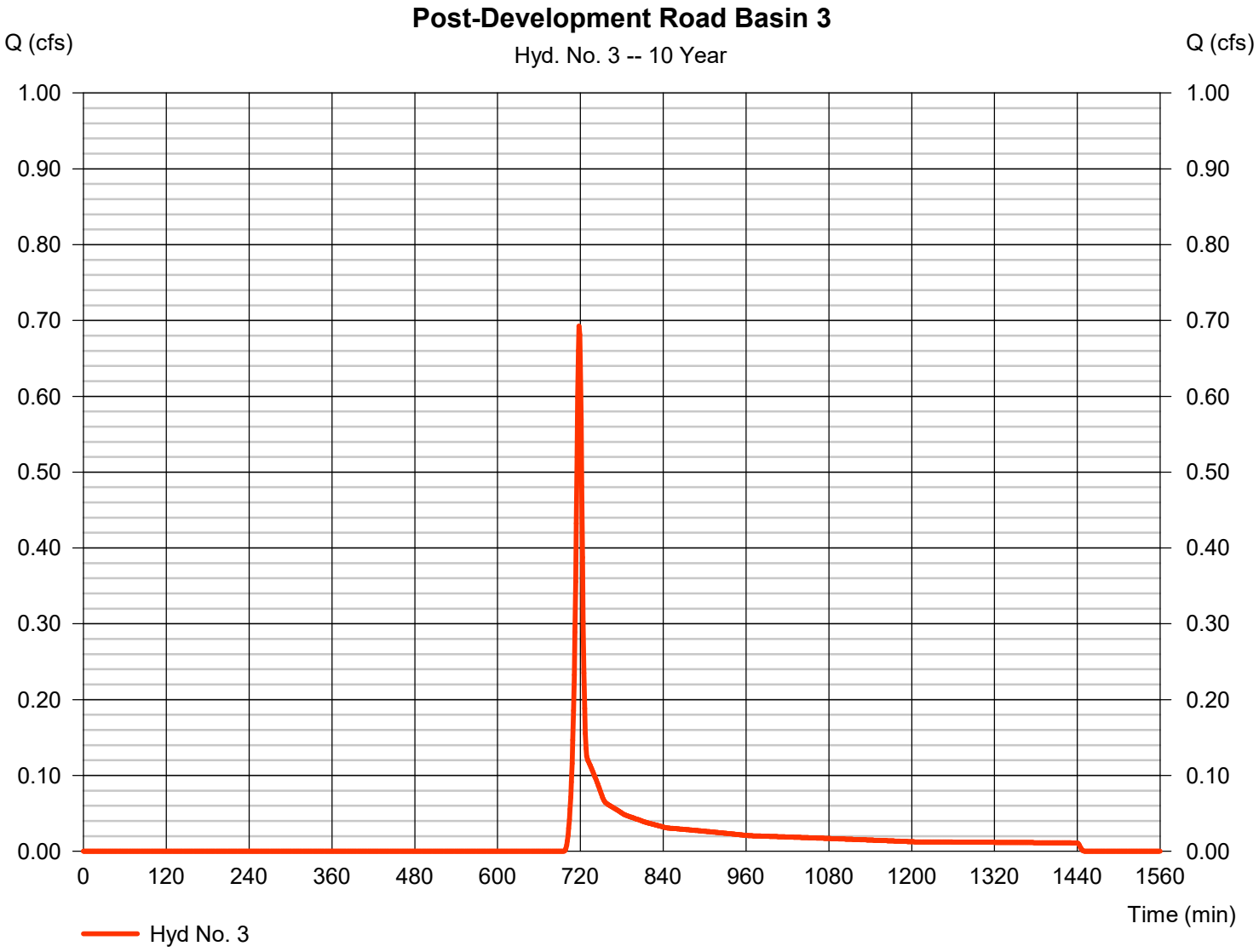


Hydrograph Report

Hyd. No. 3

Post-Development Road Basin 3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.693 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,486 cuft
Drainage area	= 1.080 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

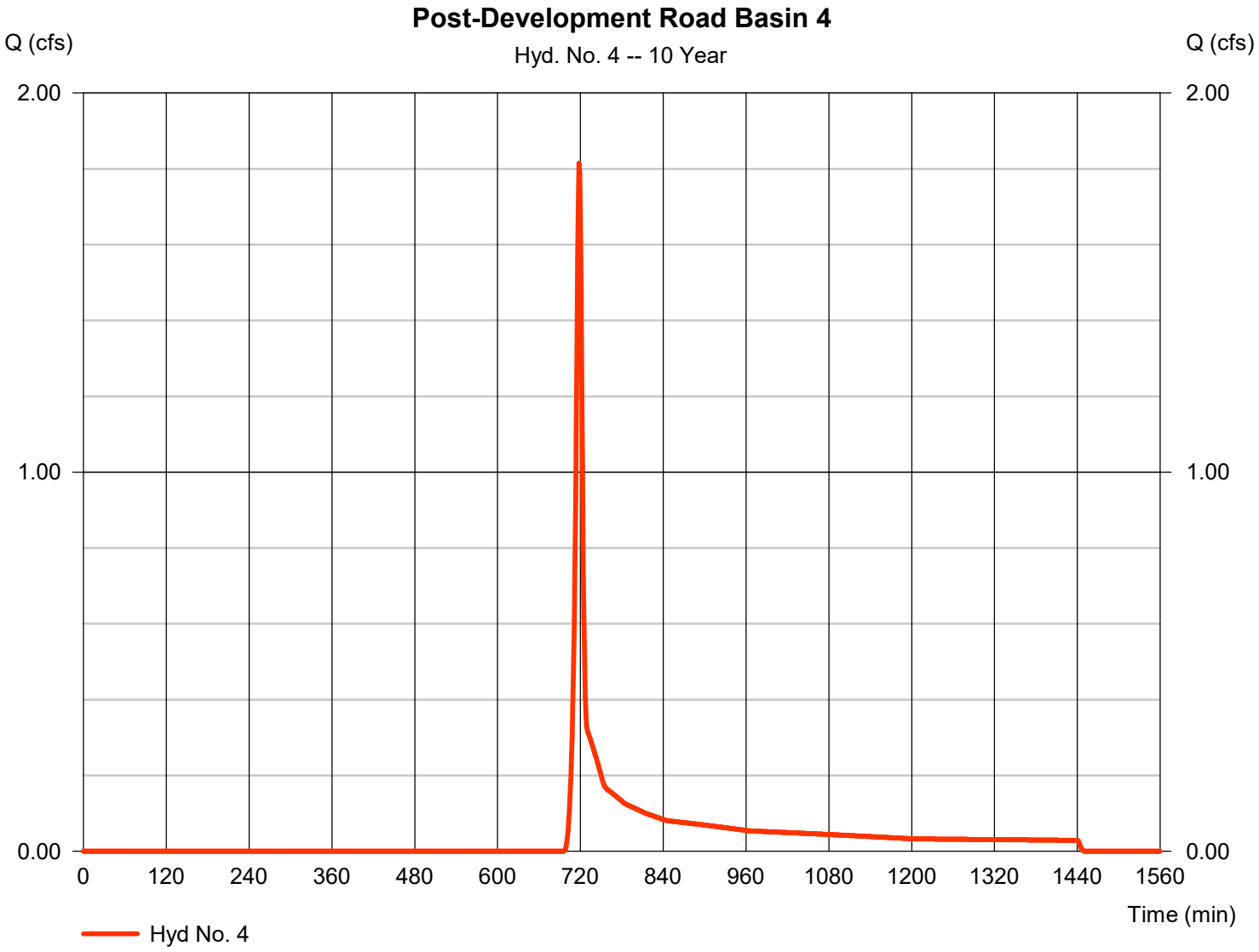


Hydrograph Report

Hyd. No. 4

Post-Development Road Basin 4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.815 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 3,895 cuft
Drainage area	= 2.830 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

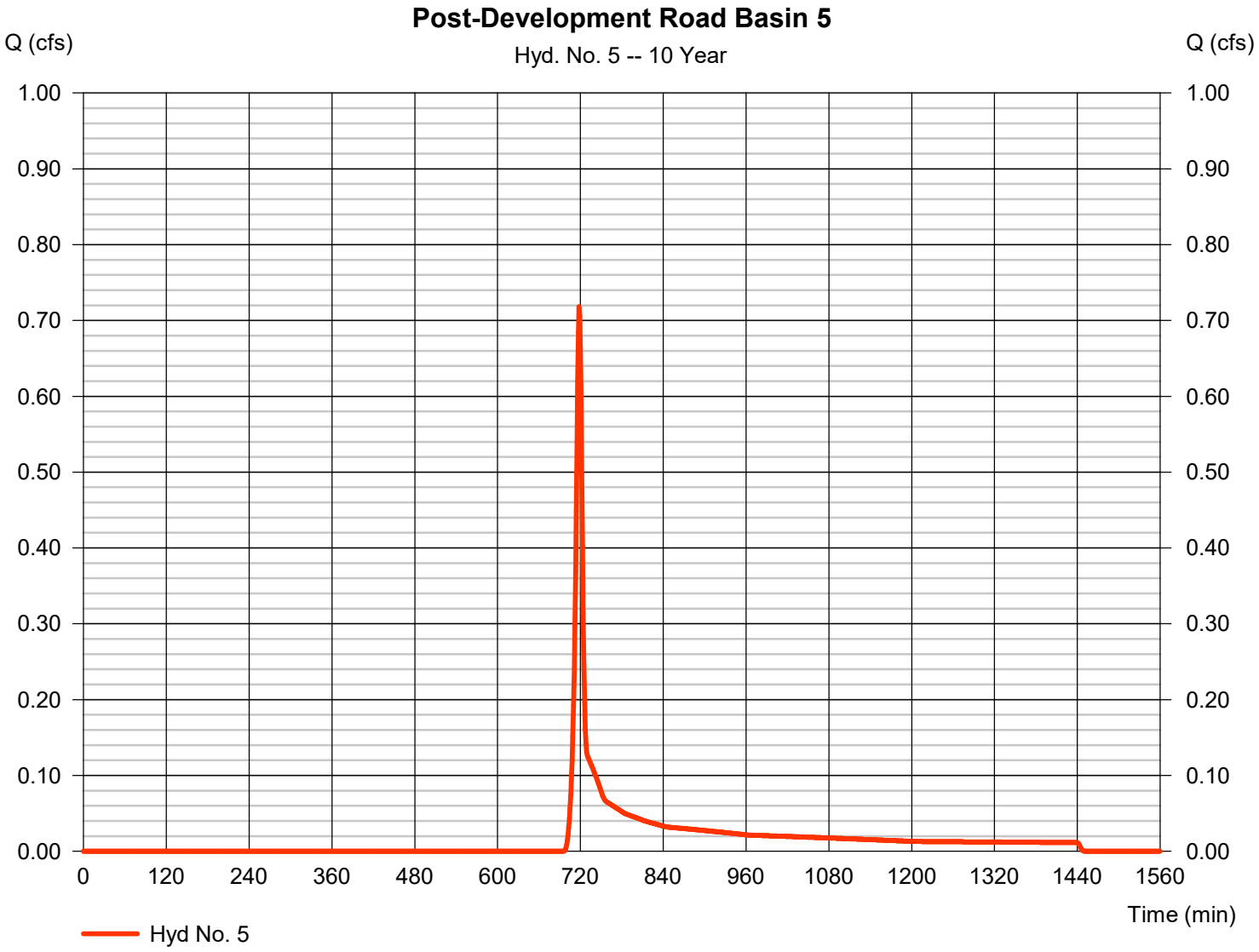


Hydrograph Report

Hyd. No. 5

Post-Development Road Basin 5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.718 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,541 cuft
Drainage area	= 1.120 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

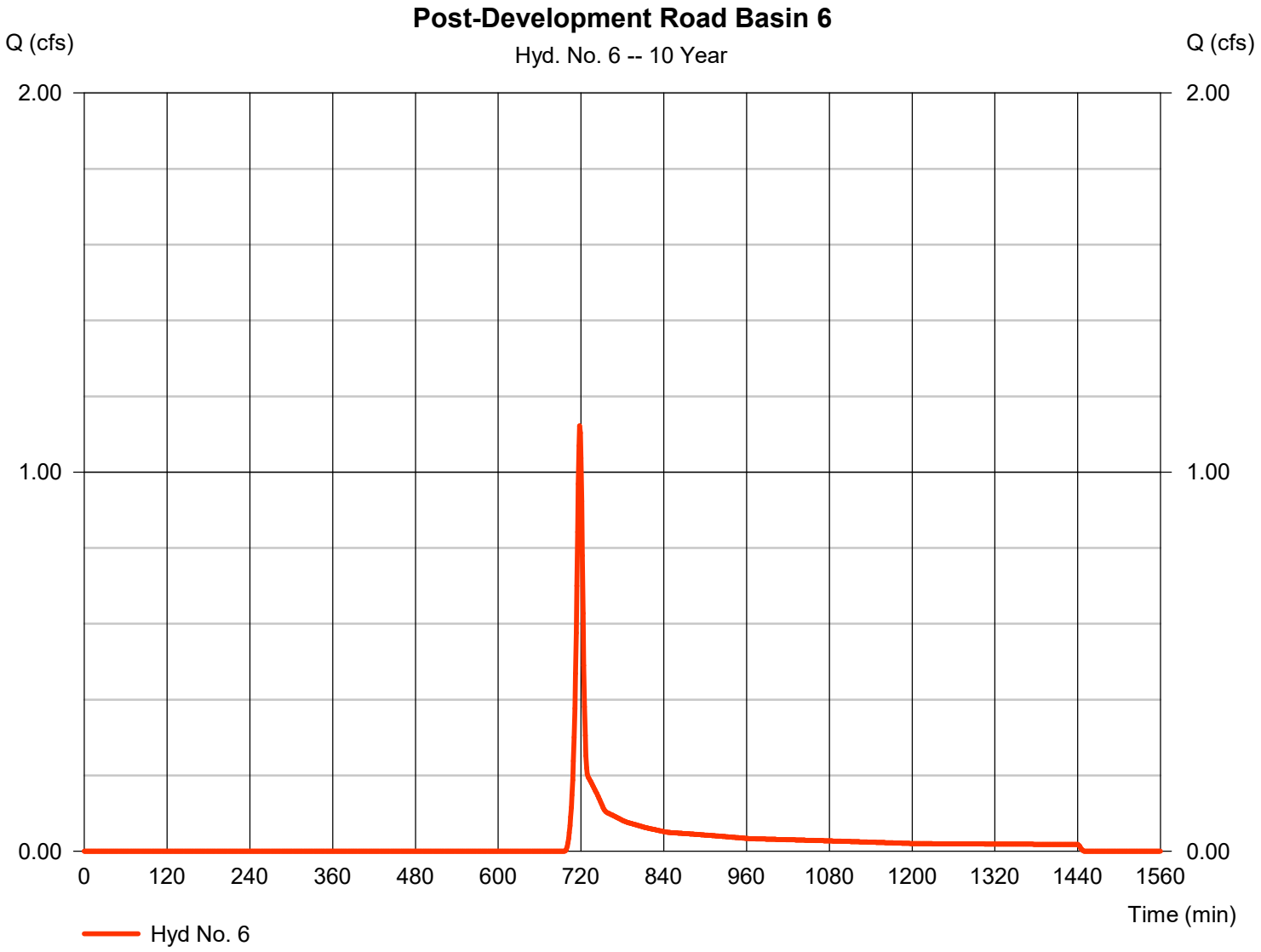


Hydrograph Report

Hyd. No. 6

Post-Development Road Basin 6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.122 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,408 cuft
Drainage area	= 1.750 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

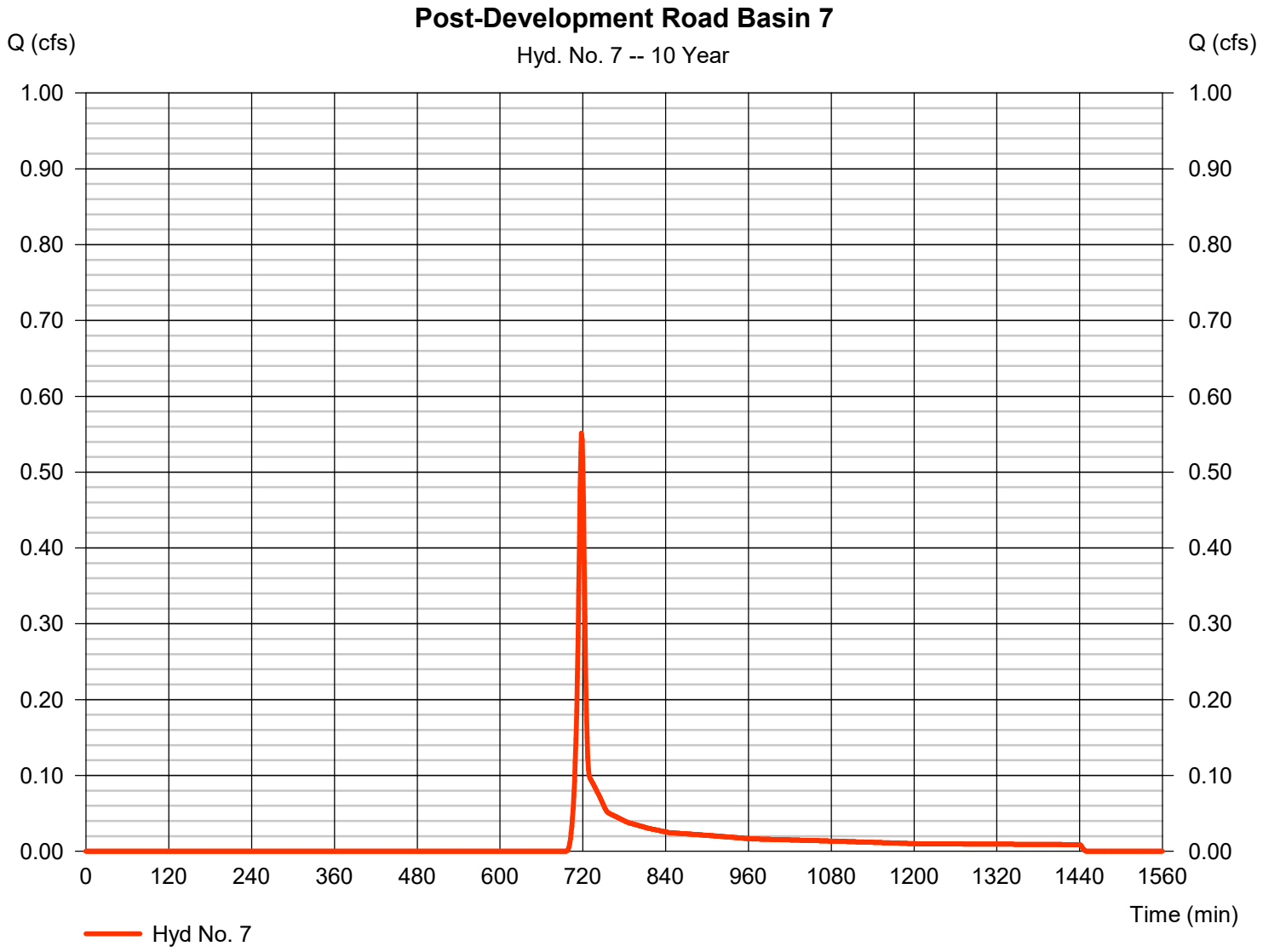


Hydrograph Report

Hyd. No. 7

Post-Development Road Basin 7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.551 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,184 cuft
Drainage area	= 0.860 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

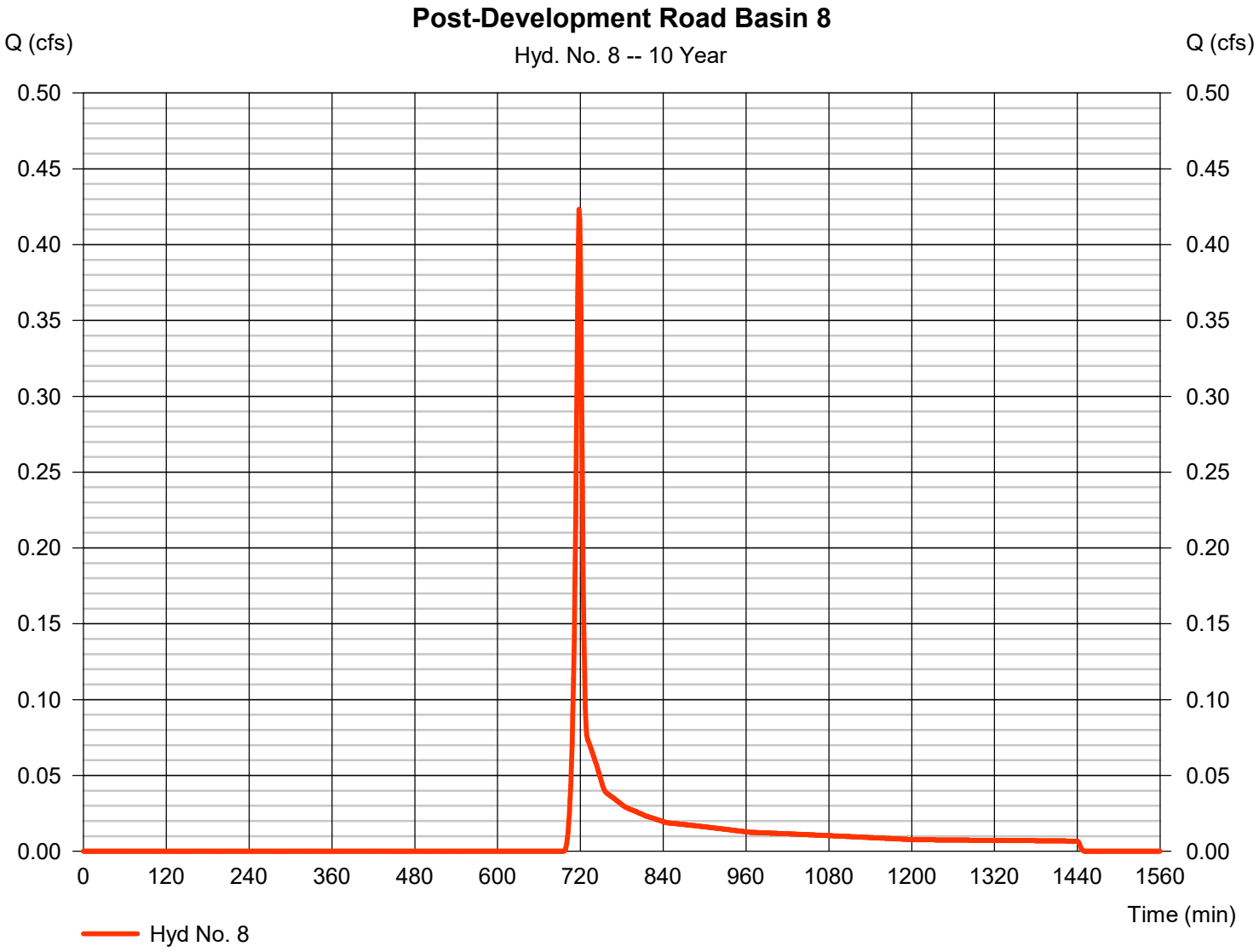


Hydrograph Report

Hyd. No. 8

Post-Development Road Basin 8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.423 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 908 cuft
Drainage area	= 0.660 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.66 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



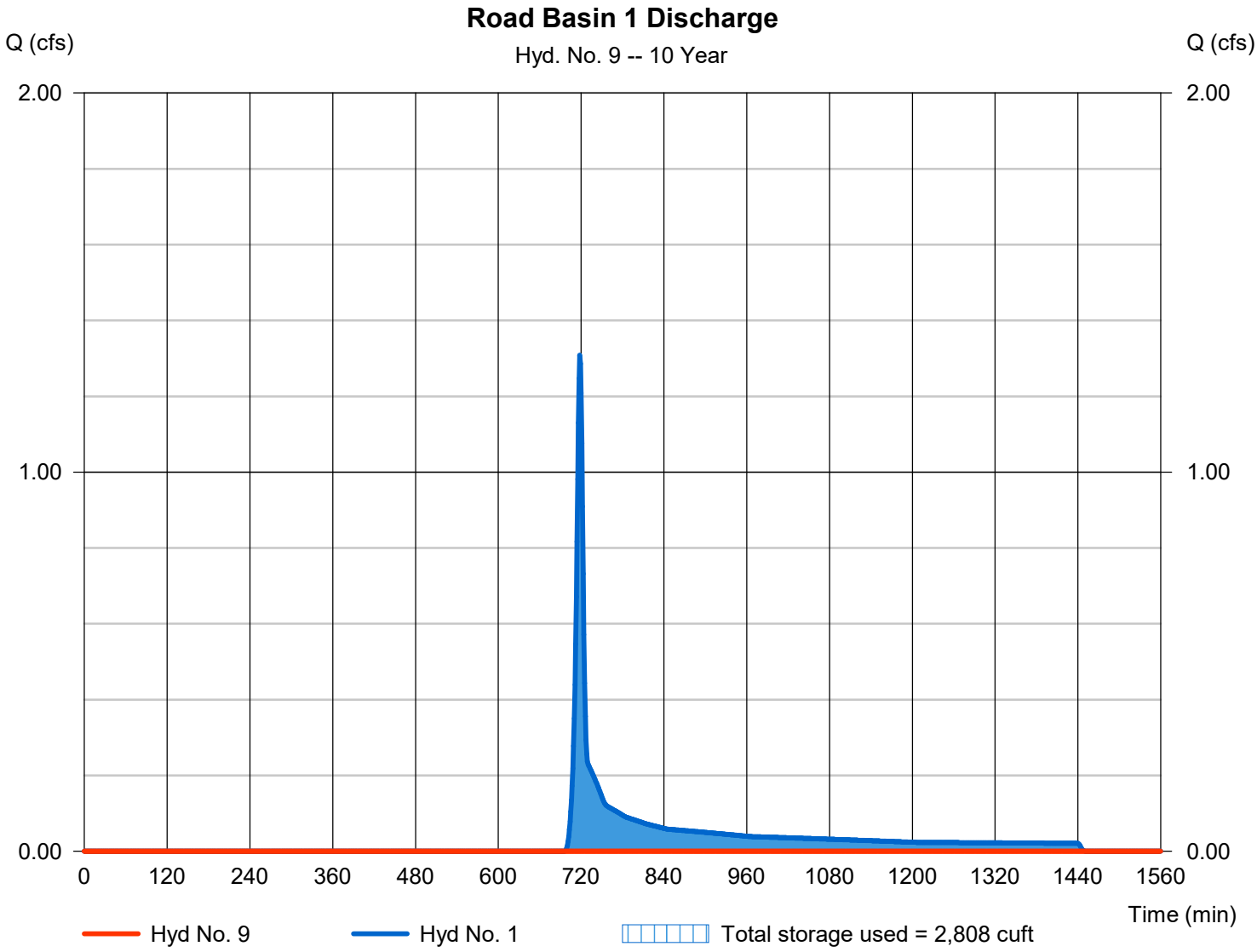
Hydrograph Report

Hyd. No. 9

Road Basin 1 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - Post-Development Road Basin 1	Max. Elevation	=	2.93 ft
Reservoir name	=	Road Basin 1 Storage	Max. Storage	=	2,808 cuft

Storage Indication method used.



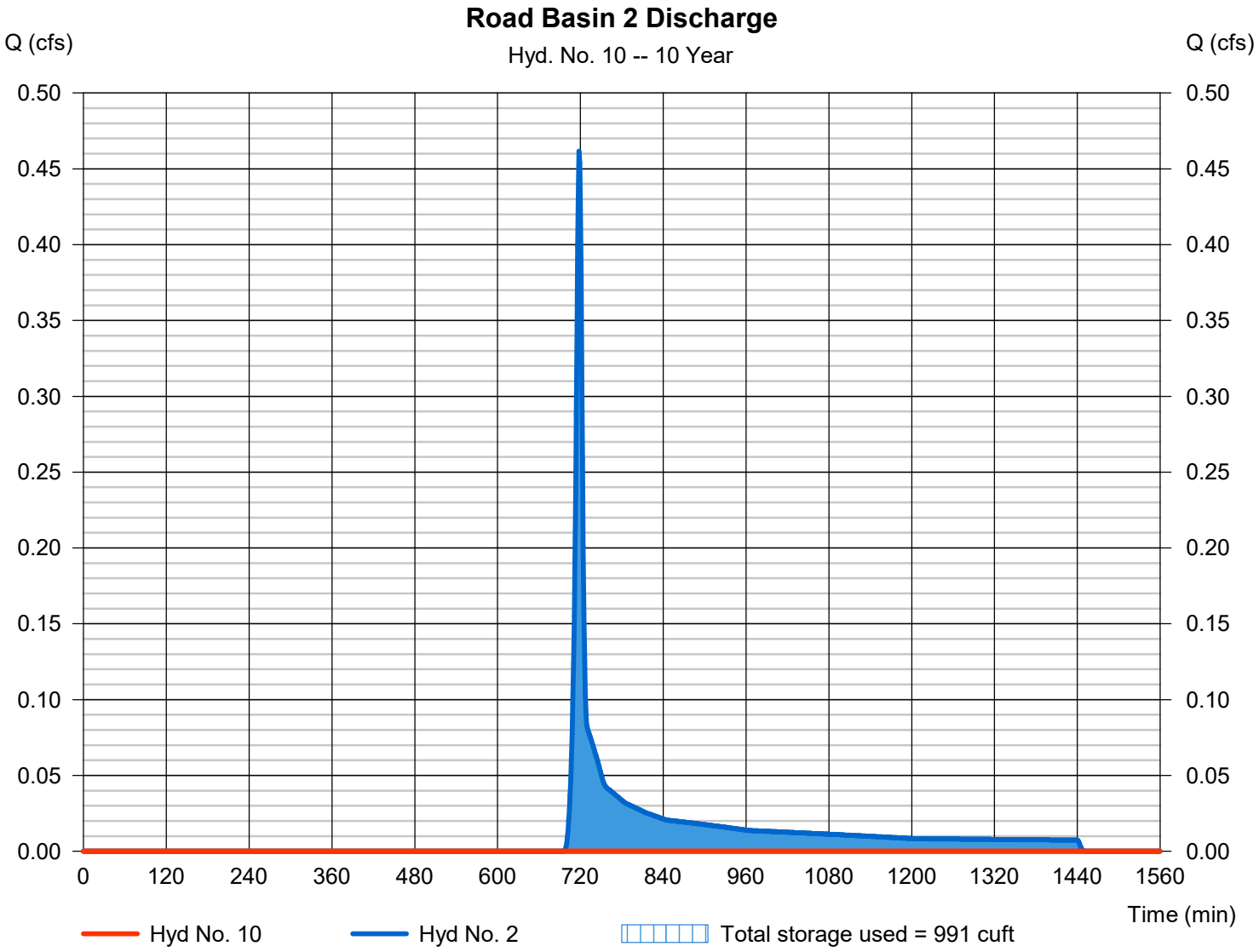
Hydrograph Report

Hyd. No. 10

Road Basin 2 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	2 - Post-Development Road Basin 2	Max. Elevation	=	1.95 ft
Reservoir name	=	Road Basin 2 Storage	Max. Storage	=	991 cuft

Storage Indication method used.



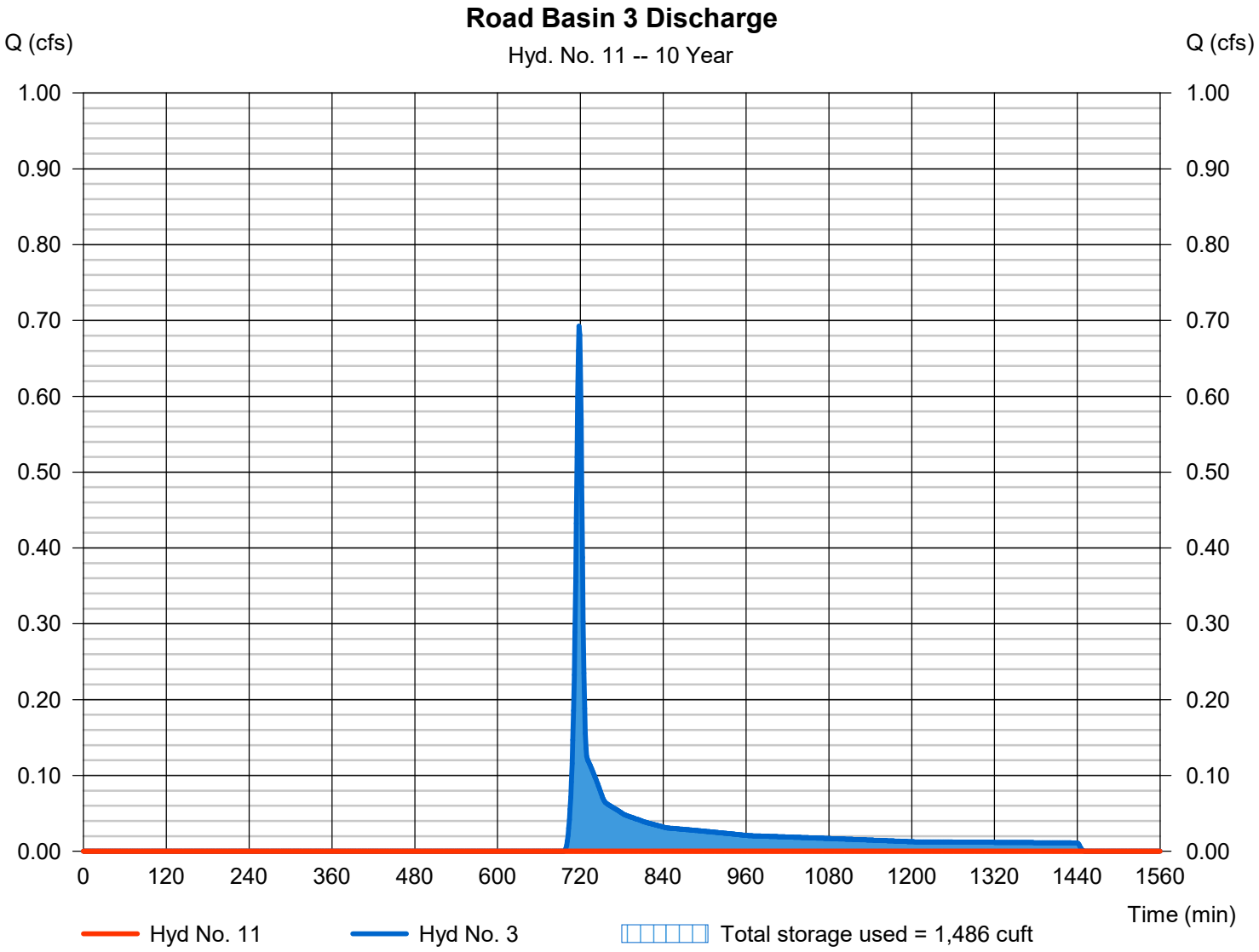
Hydrograph Report

Hyd. No. 11

Road Basin 3 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - Post-Development Road Basin 3	Max. Elevation	=	1.96 ft
Reservoir name	=	Road Basin 3 Storage	Max. Storage	=	1,486 cuft

Storage Indication method used.



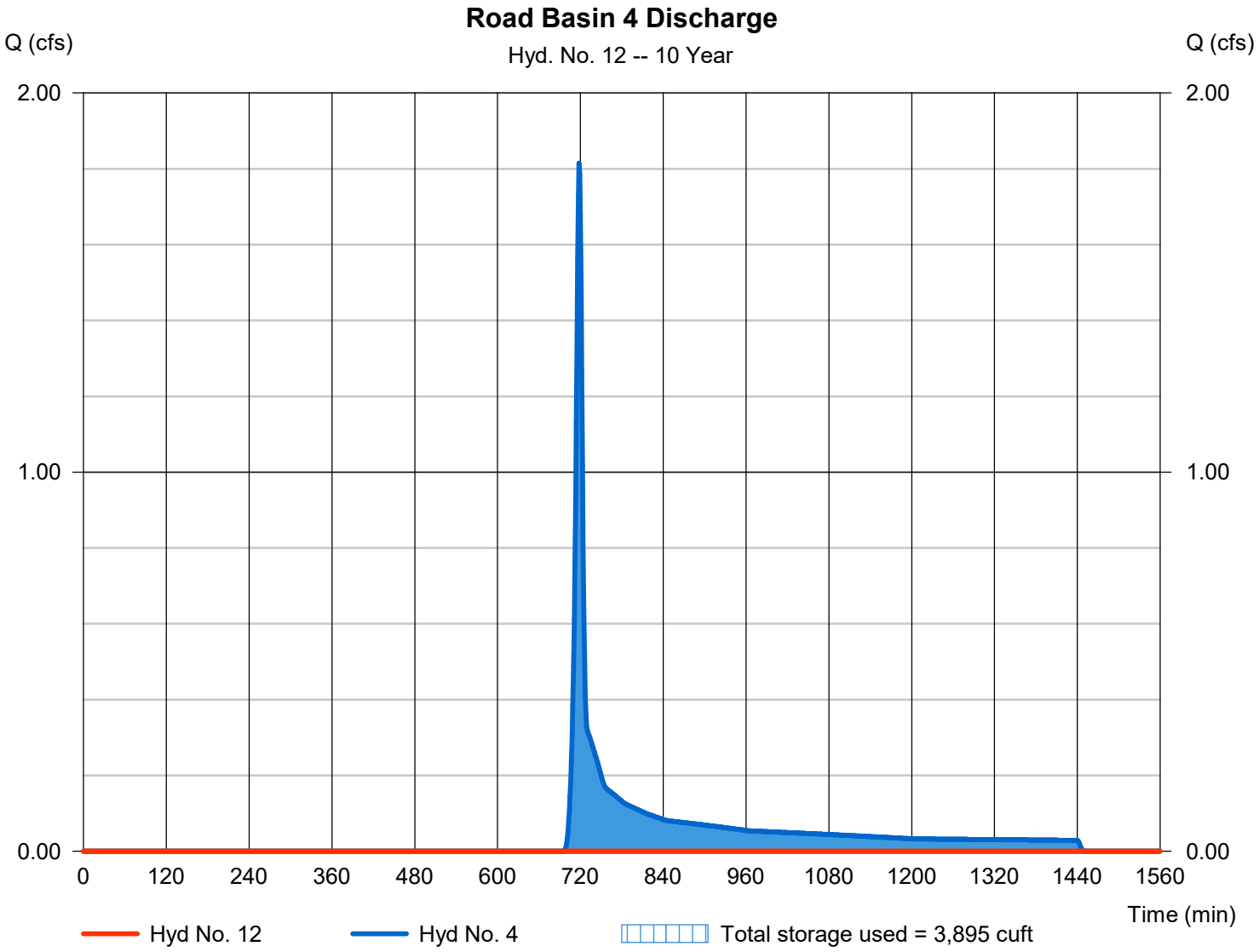
Hydrograph Report

Hyd. No. 12

Road Basin 4 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	4 - Post-Development Road Basin 4	Max. Elevation	=	2.95 ft
Reservoir name	=	Road BAsin 4 Storage	Max. Storage	=	3,895 cuft

Storage Indication method used.



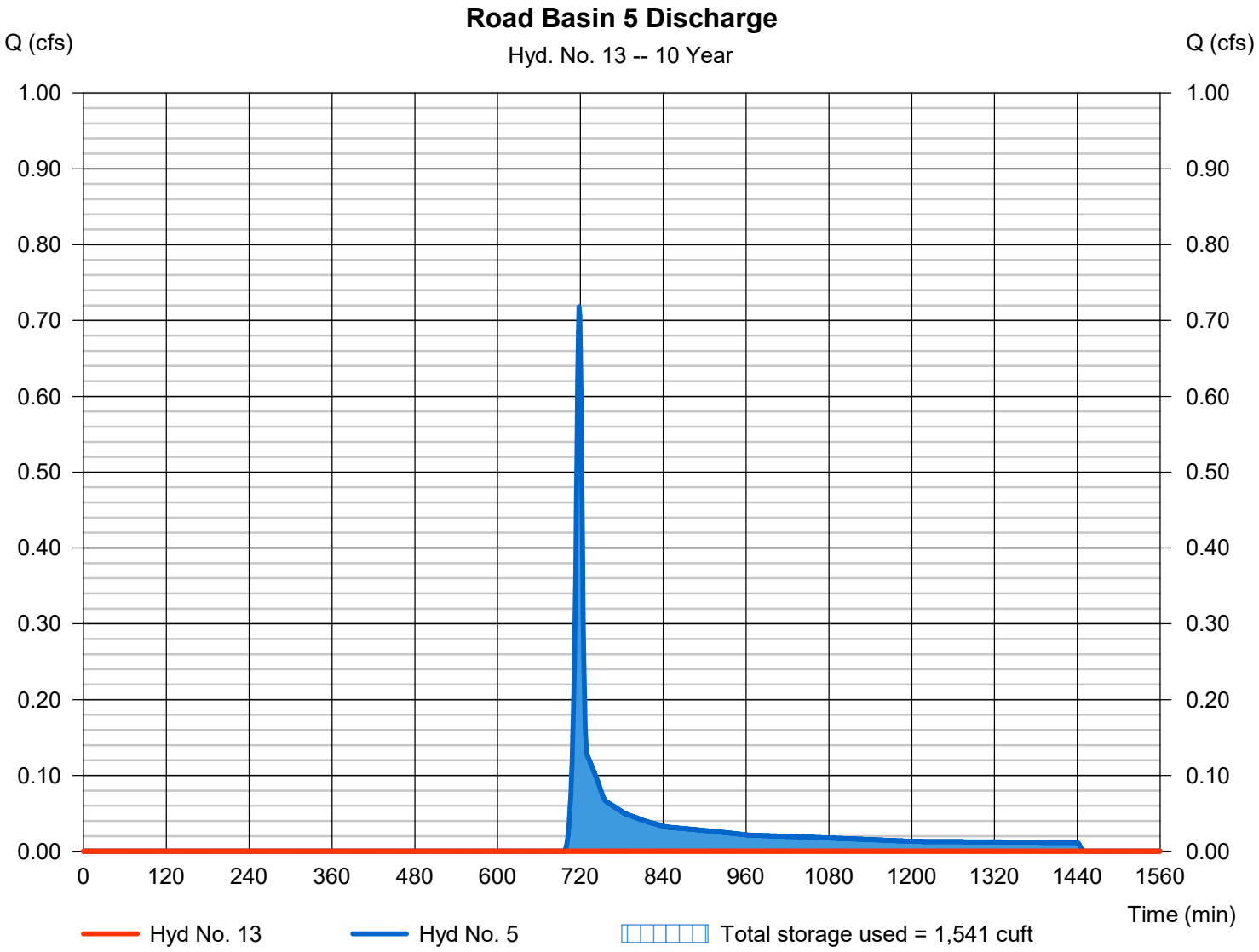
Hydrograph Report

Hyd. No. 13

Road Basin 5 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	5 - Post-Development Road Basin 5	Max. Elevation	=	2.47 ft
Reservoir name	=	Road Basin 5 Storage	Max. Storage	=	1,541 cuft

Storage Indication method used.



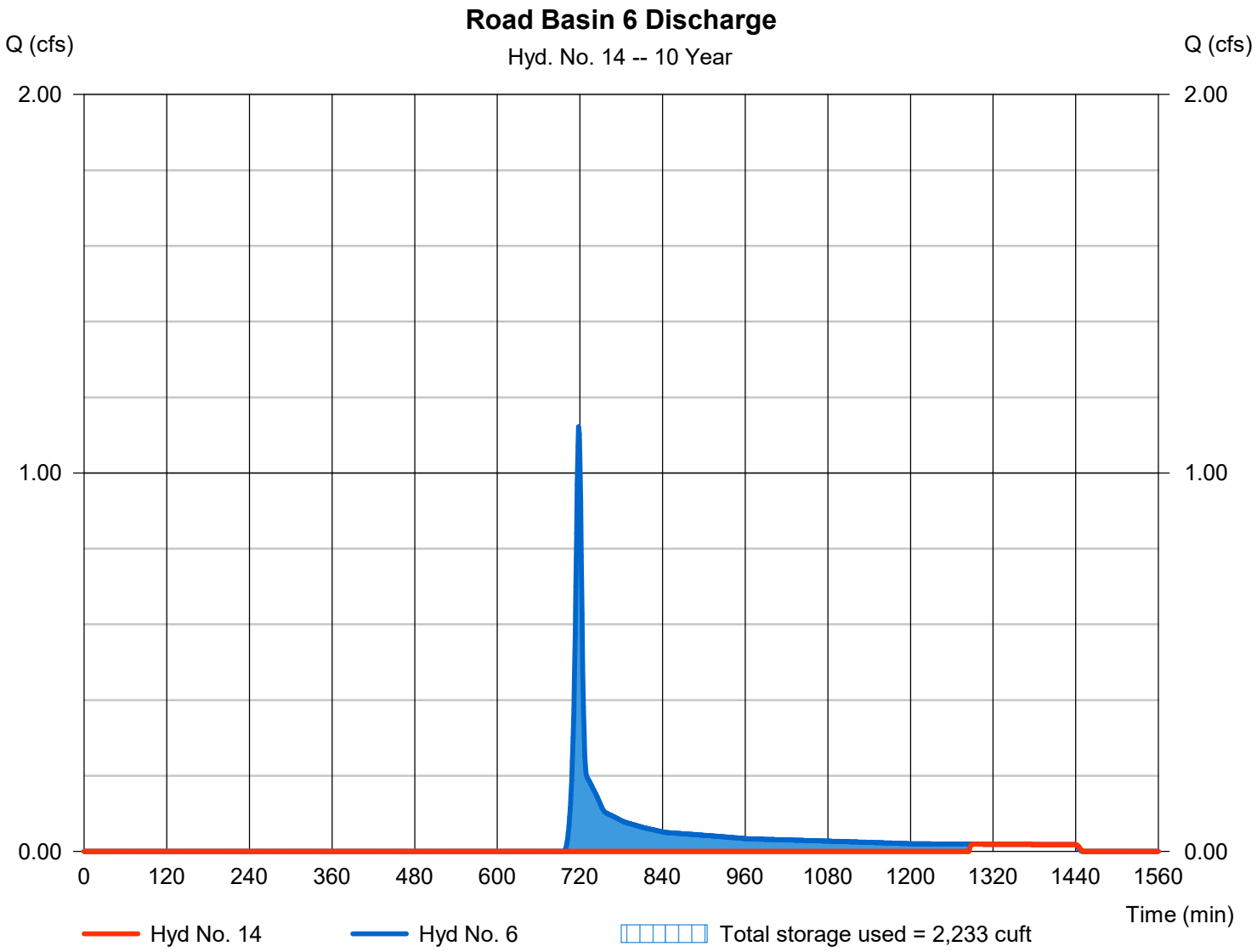
Hydrograph Report

Hyd. No. 14

Road Basin 6 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.019 cfs
Storm frequency	=	10 yrs	Time to peak	=	1296 min
Time interval	=	1 min	Hyd. volume	=	177 cuft
Inflow hyd. No.	=	6 - Post-Development Road Basin 6	Max. Elevation	=	2.00 ft
Reservoir name	=	Road Basin 6 Storage	Max. Storage	=	2,233 cuft

Storage Indication method used.



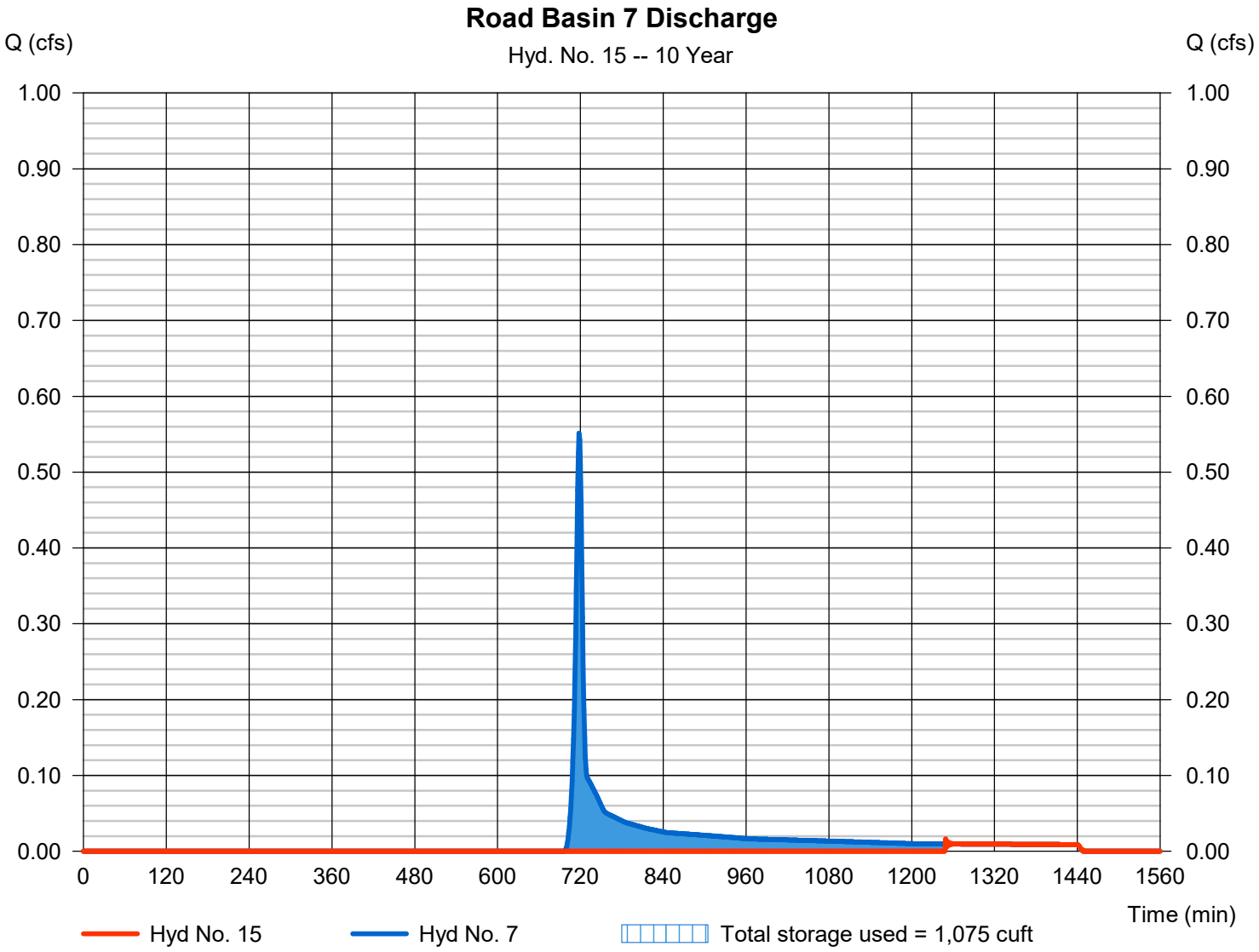
Hydrograph Report

Hyd. No. 15

Road Basin 7 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	1249 min
Time interval	=	1 min	Hyd. volume	=	109 cuft
Inflow hyd. No.	=	7 - Post-Development Road Basin 7	Max. Elevation	=	2.00 ft
Reservoir name	=	Road Basin 7 Storage	Max. Storage	=	1,075 cuft

Storage Indication method used.



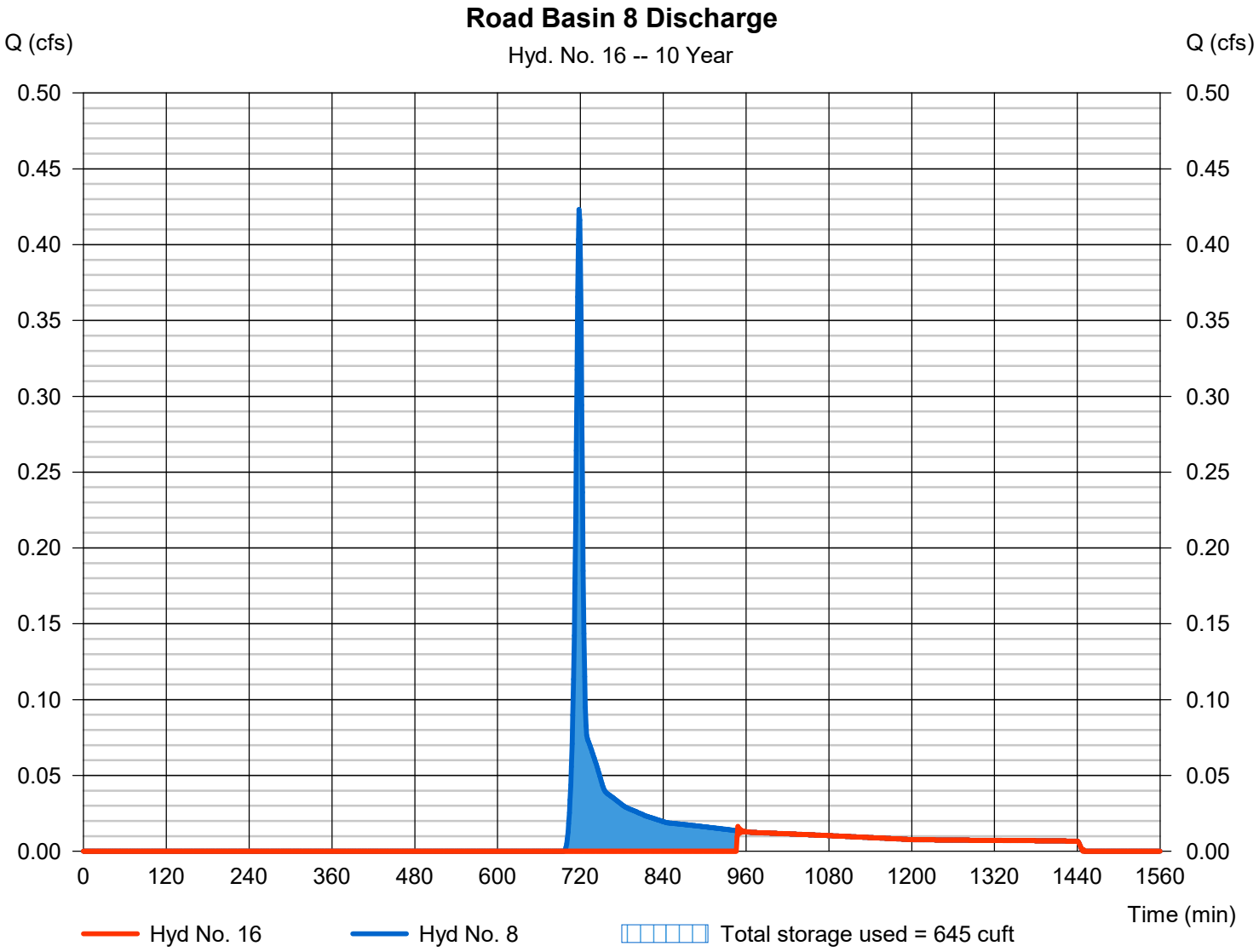
Hydrograph Report

Hyd. No. 16

Road Basin 8 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	948 min
Time interval	=	1 min	Hyd. volume	=	263 cuft
Inflow hyd. No.	=	8 - Post-Development Road Basin 8	Max. Elevation	=	2.00 ft
Reservoir name	=	Road Basin 8 Storage	Max. Storage	=	645 cuft

Storage Indication method used.



Hydrograph Summary Report

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

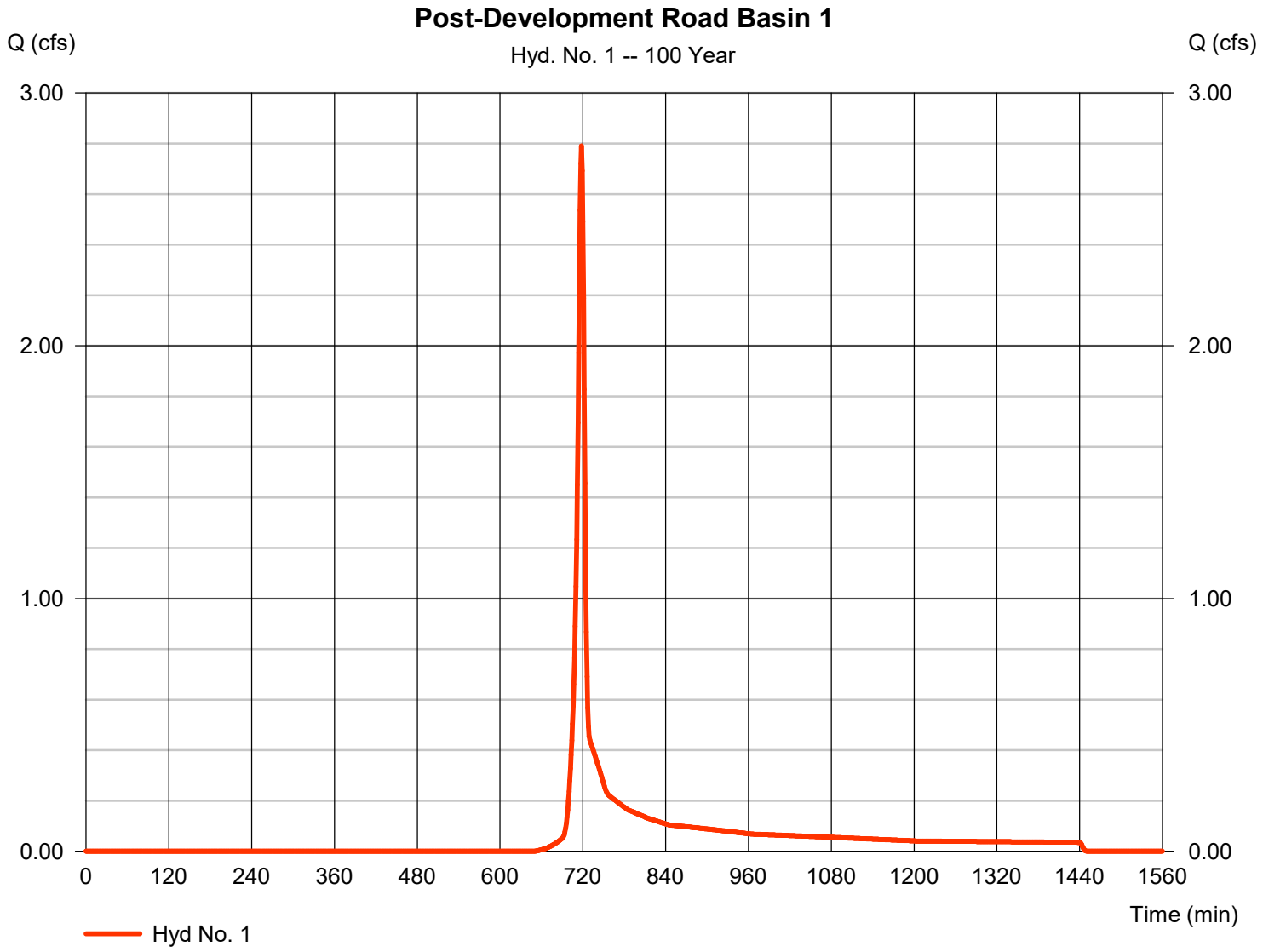
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.790	1	718	5,653	------	------	------	Post-Development Road Basin 1
2	SCS Runoff	0.985	1	718	1,995	------	------	------	Post-Development Road Basin 2
3	SCS Runoff	1.477	1	718	2,993	------	------	------	Post-Development Road Basin 3
4	SCS Runoff	3.871	1	718	7,842	------	------	------	Post-Development Road Basin 4
5	SCS Runoff	1.532	1	718	3,104	------	------	------	Post-Development Road Basin 5
6	SCS Runoff	2.394	1	718	4,850	------	------	------	Post-Development Road Basin 6
7	SCS Runoff	1.176	1	718	2,383	------	------	------	Post-Development Road Basin 7
8	SCS Runoff	0.903	1	718	1,829	------	------	------	Post-Development Road Basin 8
9	Reservoir	0.367	1	758	2,749	1	3.01	2,905	Road Basin 1 Discharge
10	Reservoir	0.114	1	762	952	2	2.00	1,043	Road Basin 2 Discharge
11	Reservoir	0.000	1	n/a	0	3	2.92	2,993	Road Basin 3 Discharge
12	Reservoir	0.463	1	758	3,817	4	3.00	4,026	Road Basin 4 Discharge
13	Reservoir	0.068	1	867	999	5	3.00	2,105	Road Basin 5 Discharge
14	Reservoir	0.287	1	743	2,619	6	2.01	2,251	Road Basin 6 Discharge
15	Reservoir	0.276	1	738	1,308	7	2.01	1,076	Road Basin 7 Discharge
16	Reservoir	0.737	1	723	1,184	8	2.02	647	Road Basin 8 Discharge

Hydrograph Report

Hyd. No. 1

Post-Development Road Basin 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.790 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 5,653 cuft
Drainage area	= 2.040 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

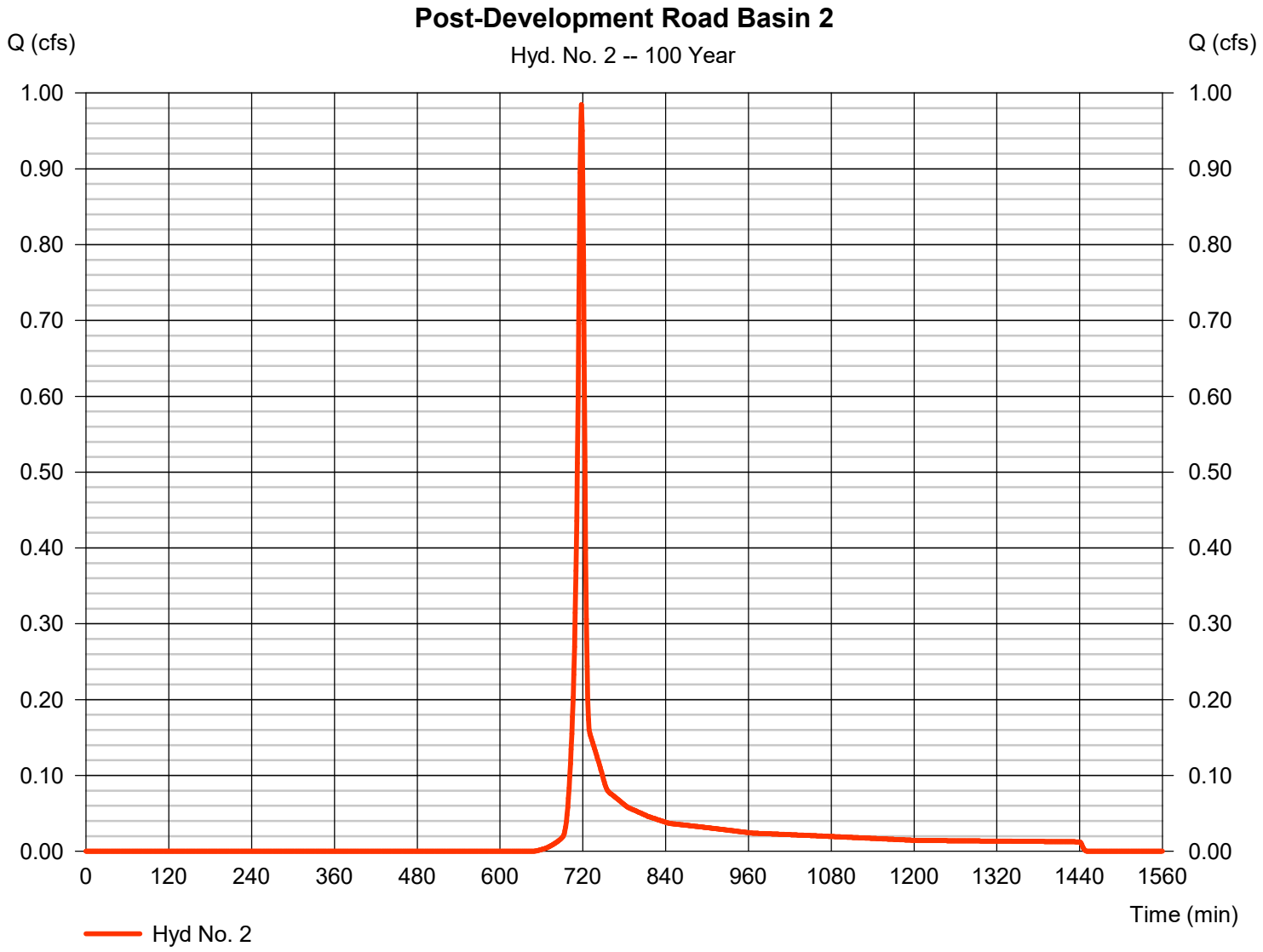


Hydrograph Report

Hyd. No. 2

Post-Development Road Basin 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.985 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,995 cuft
Drainage area	= 0.720 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

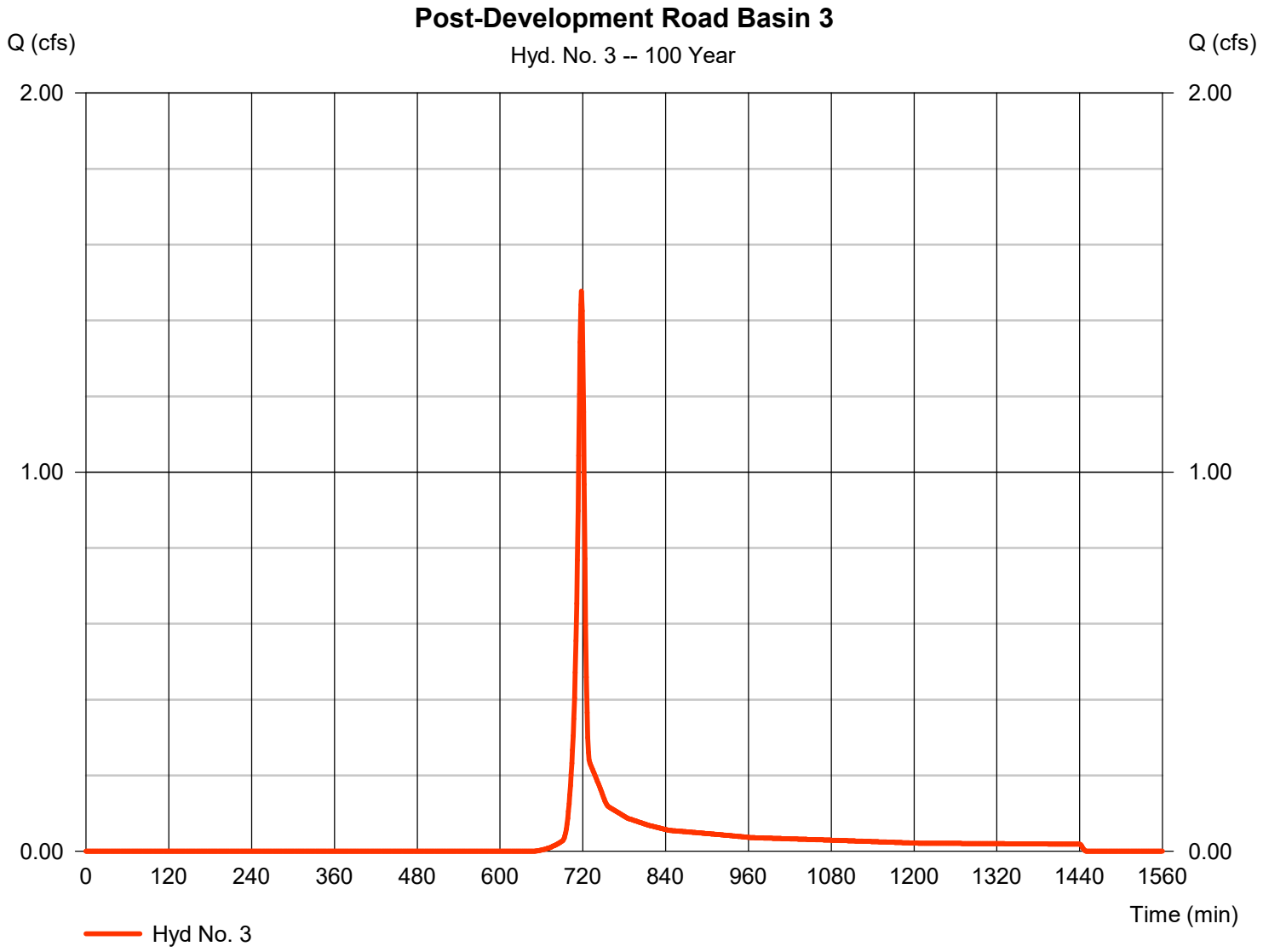


Hydrograph Report

Hyd. No. 3

Post-Development Road Basin 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.477 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	2,993 cuft
Drainage area	=	1.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

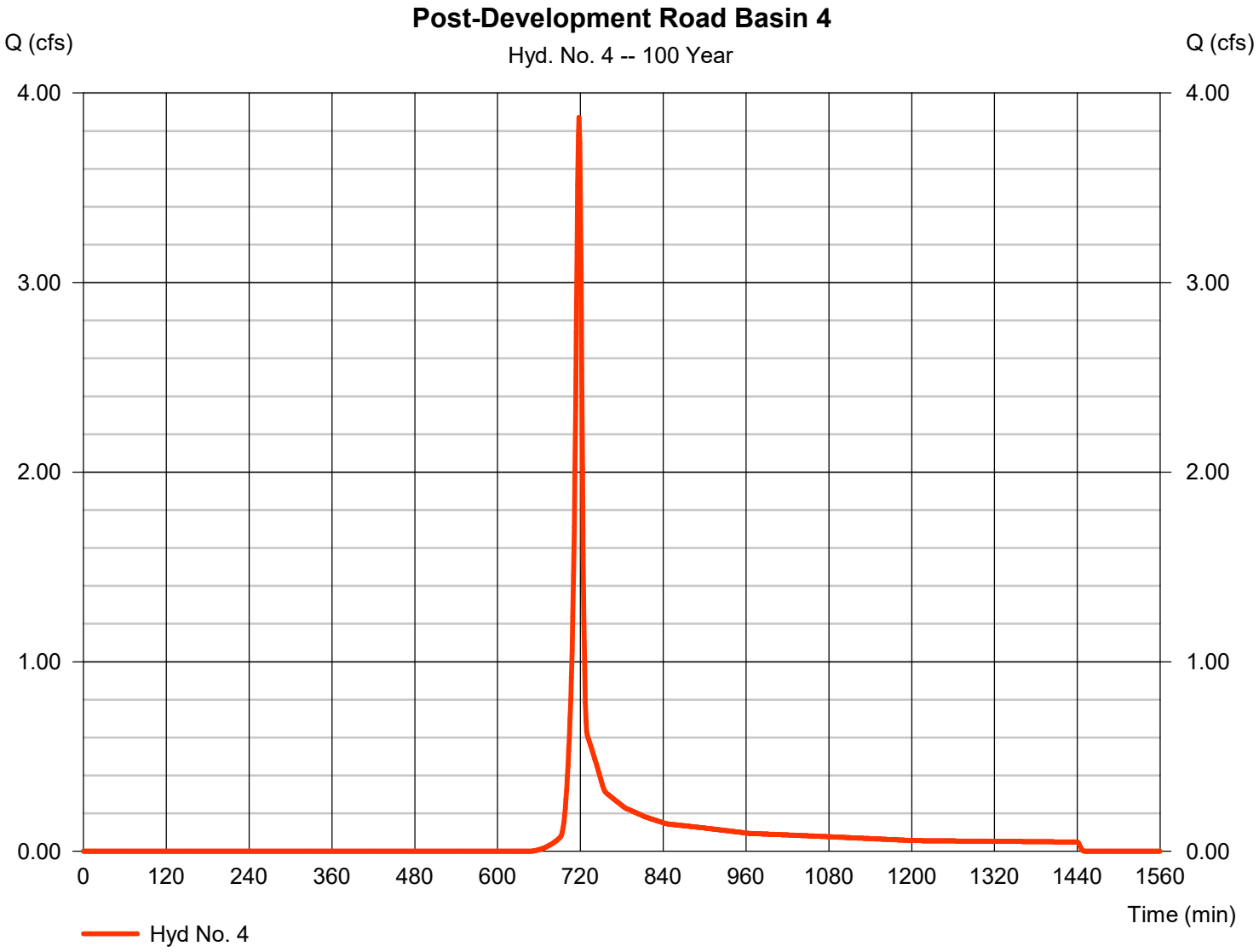


Hydrograph Report

Hyd. No. 4

Post-Development Road Basin 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.871 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	7,842 cuft
Drainage area	=	2.830 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

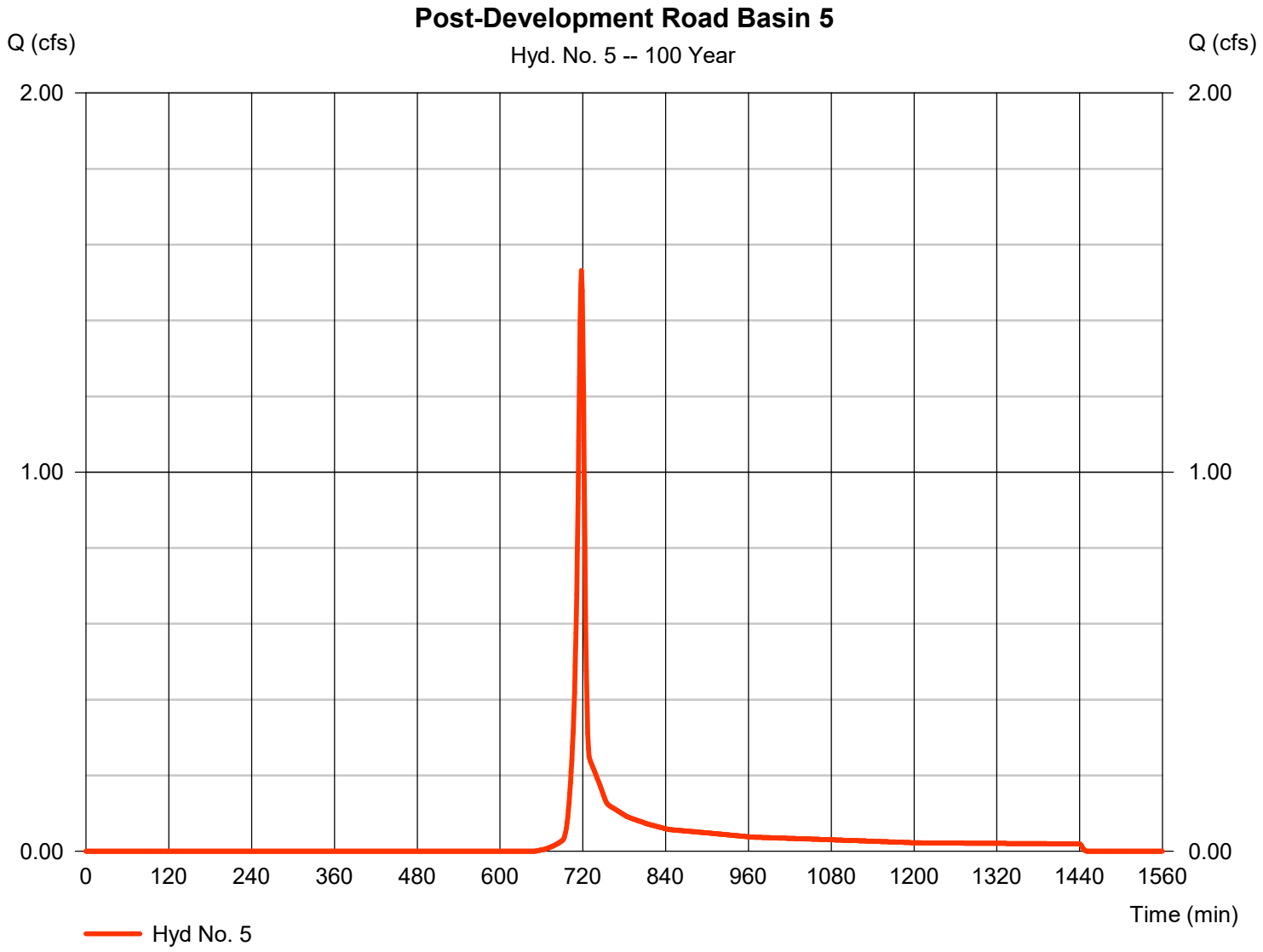


Hydrograph Report

Hyd. No. 5

Post-Development Road Basin 5

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.532 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	3,104 cuft
Drainage area	=	1.120 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

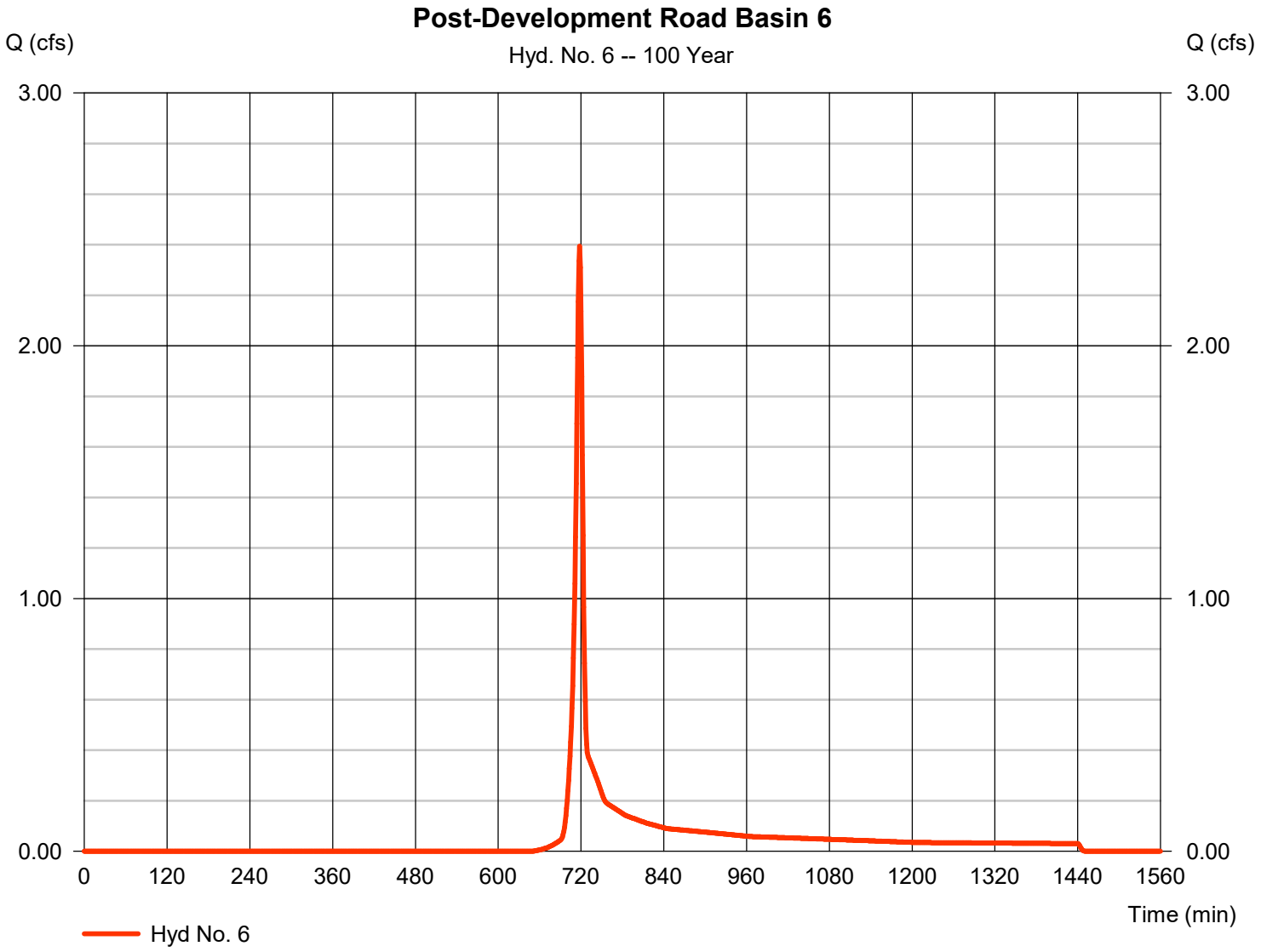


Hydrograph Report

Hyd. No. 6

Post-Development Road Basin 6

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.394 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	4,850 cuft
Drainage area	=	1.750 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

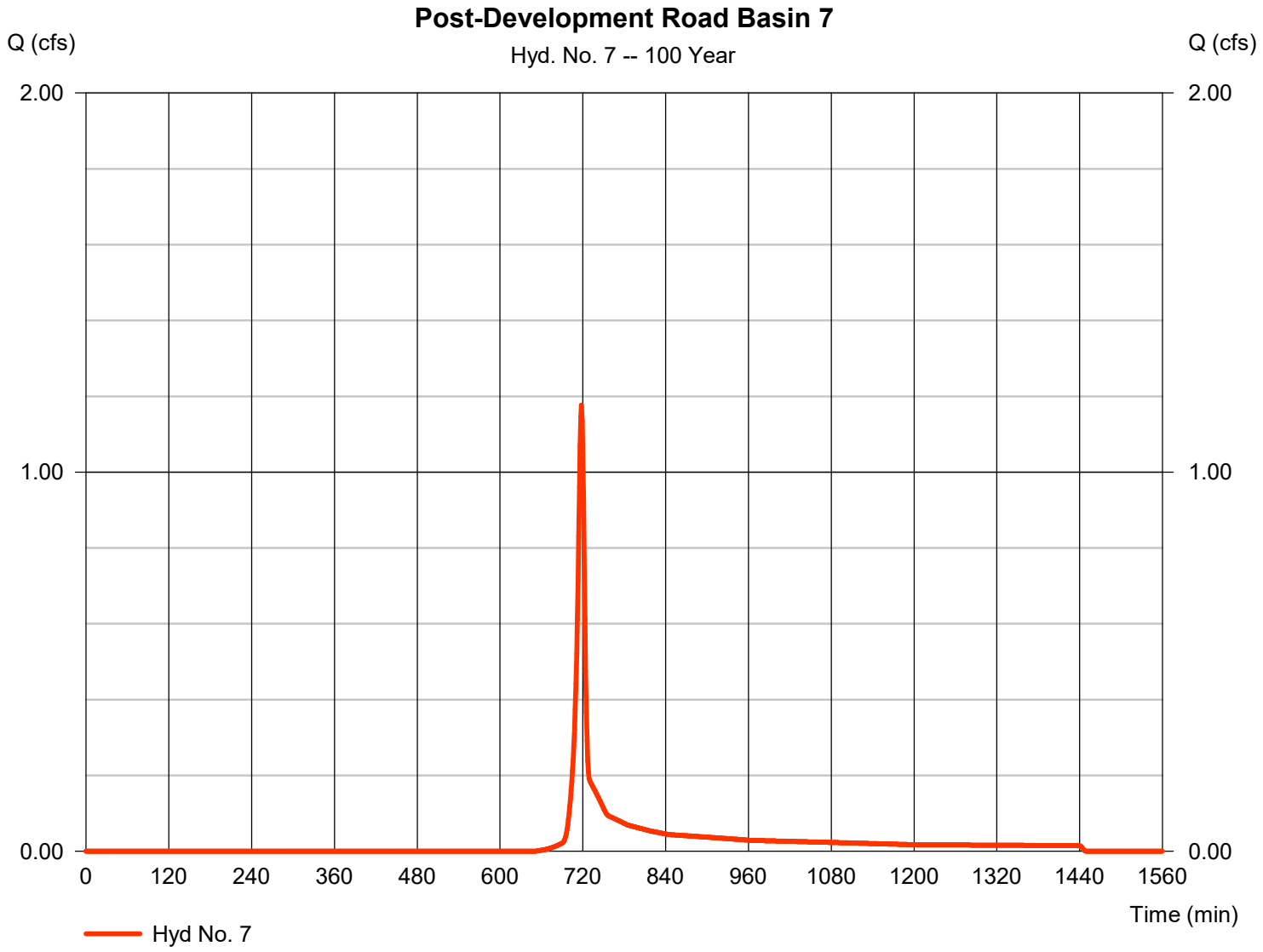


Hydrograph Report

Hyd. No. 7

Post-Development Road Basin 7

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.176 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	2,383 cuft
Drainage area	=	0.860 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.28 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

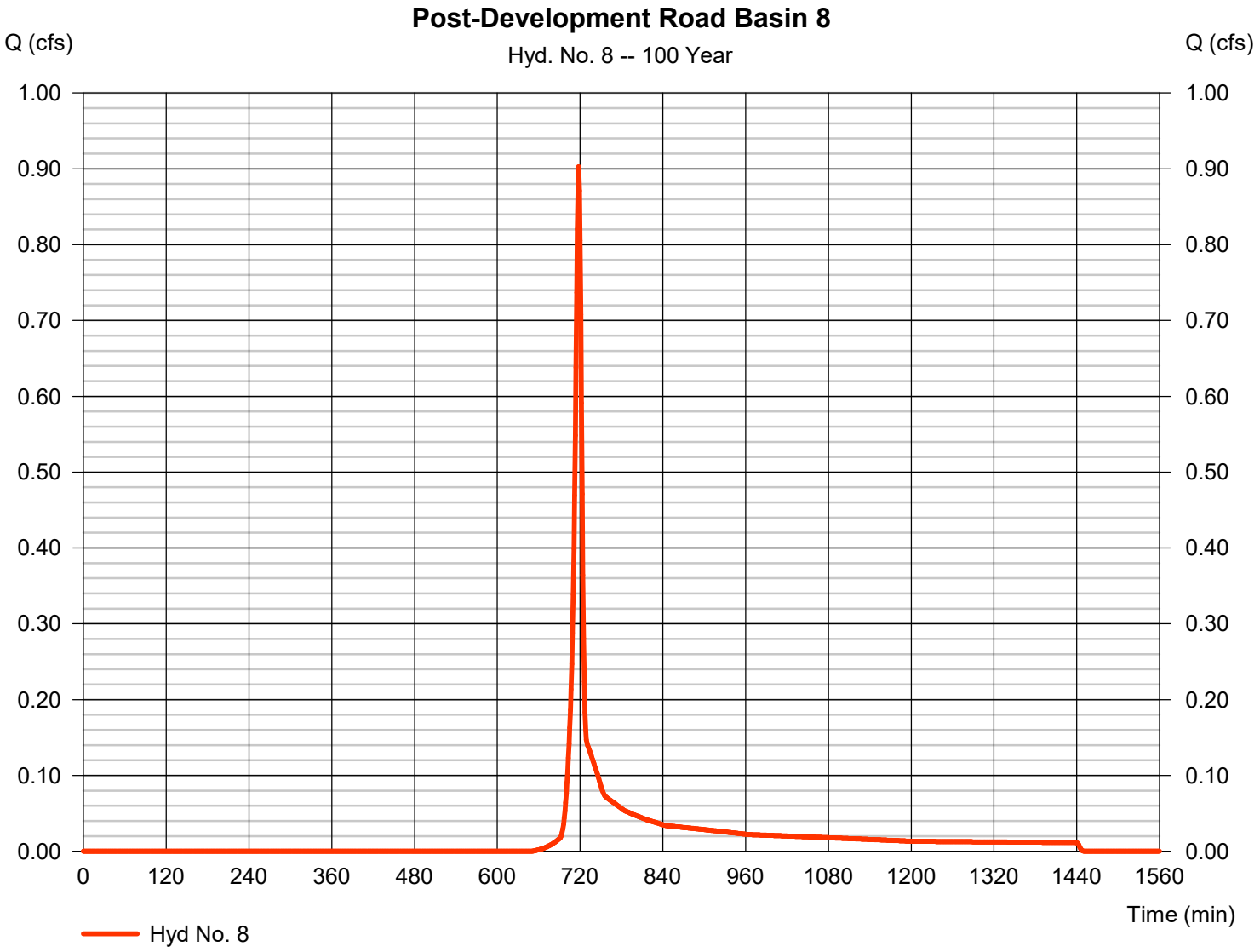


Hydrograph Report

Hyd. No. 8

Post-Development Road Basin 8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.903 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,829 cuft
Drainage area	= 0.660 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



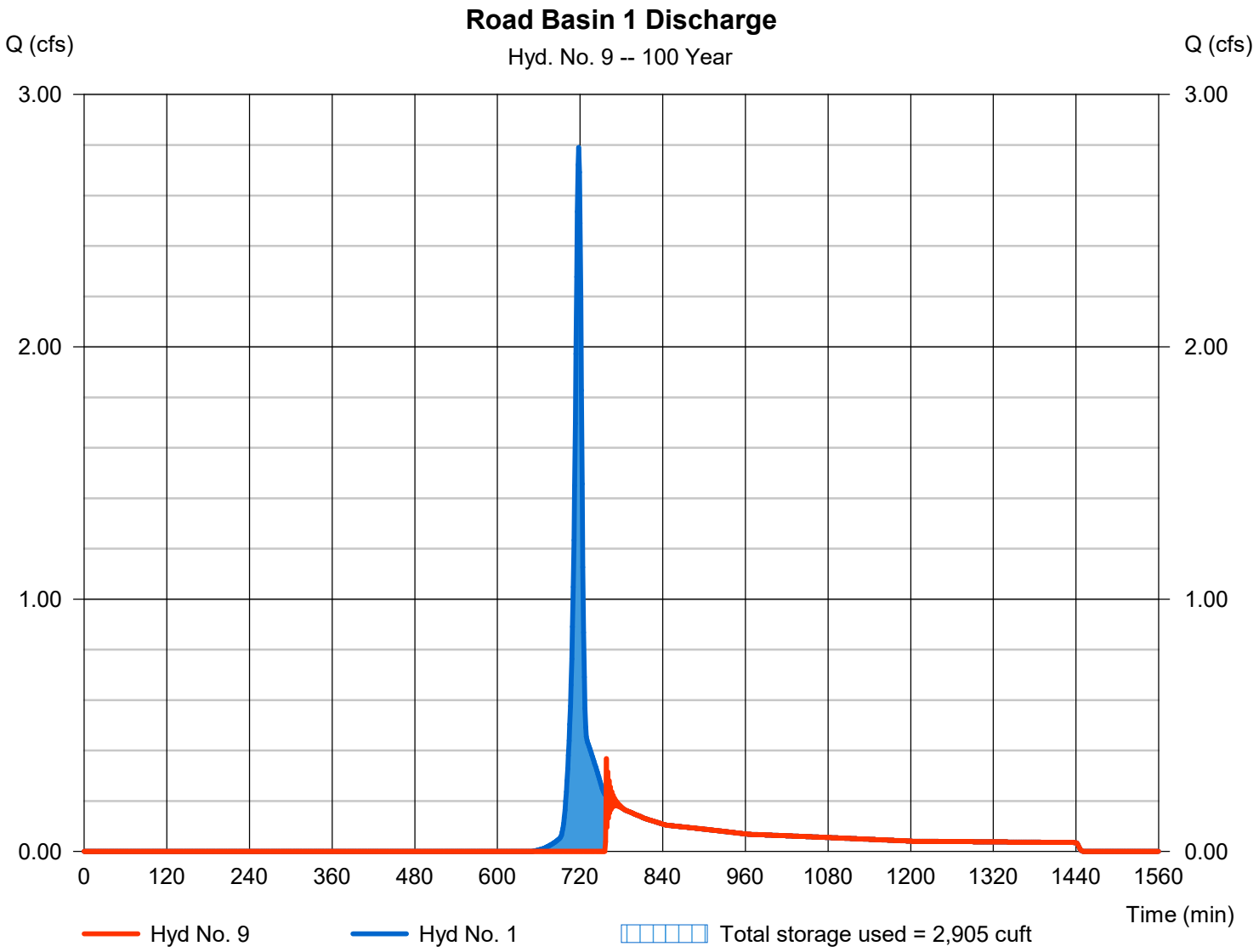
Hydrograph Report

Hyd. No. 9

Road Basin 1 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.367 cfs
Storm frequency	=	100 yrs	Time to peak	=	758 min
Time interval	=	1 min	Hyd. volume	=	2,749 cuft
Inflow hyd. No.	=	1 - Post-Development Road Basin 1	Max. Elevation	=	3.01 ft
Reservoir name	=	Road Basin 1 Storage	Max. Storage	=	2,905 cuft

Storage Indication method used.



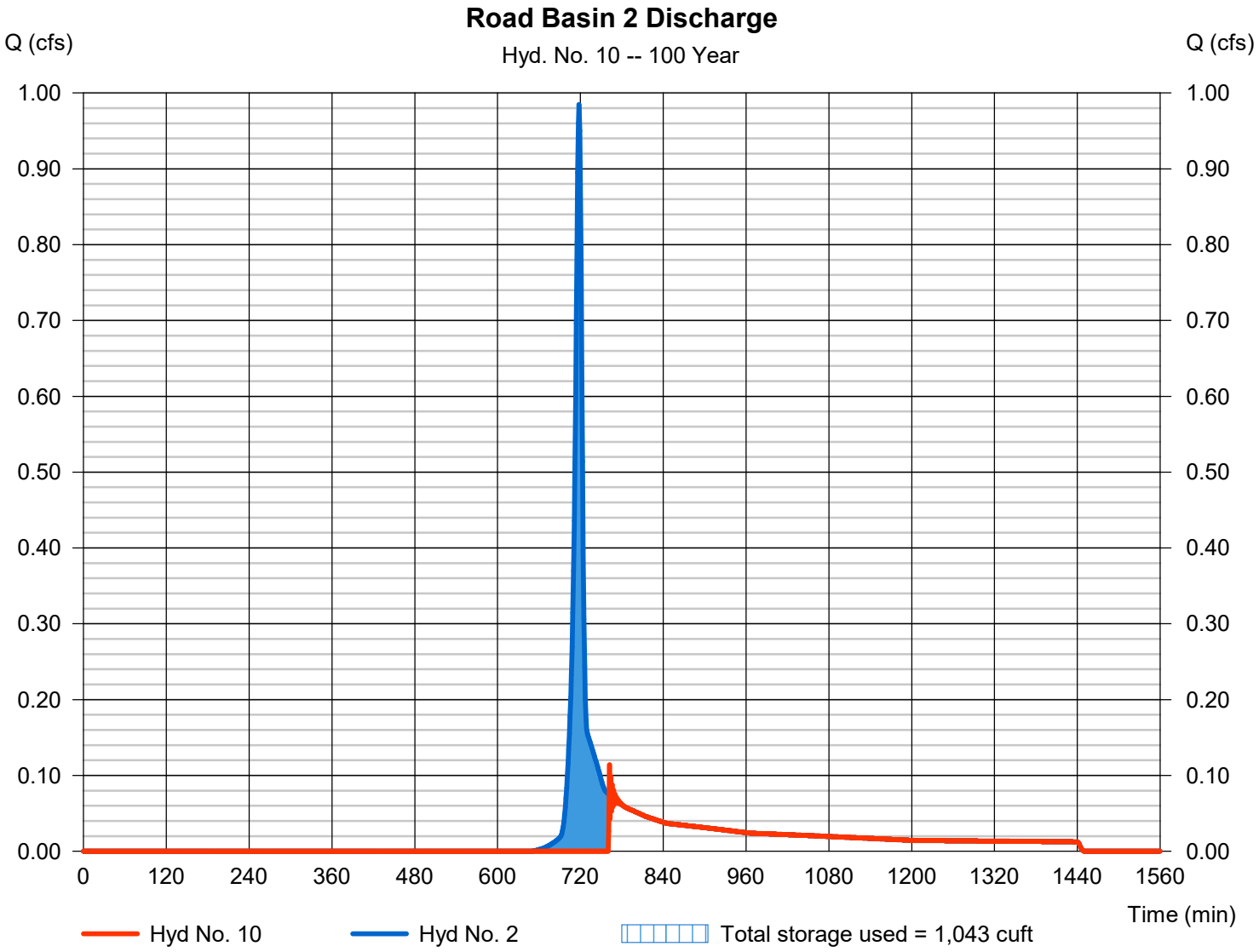
Hydrograph Report

Hyd. No. 10

Road Basin 2 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.114 cfs
Storm frequency	=	100 yrs	Time to peak	=	762 min
Time interval	=	1 min	Hyd. volume	=	952 cuft
Inflow hyd. No.	=	2 - Post-Development Road Basin 2	Max. Elevation	=	2.00 ft
Reservoir name	=	Road Basin 2 Storage	Max. Storage	=	1,043 cuft

Storage Indication method used.



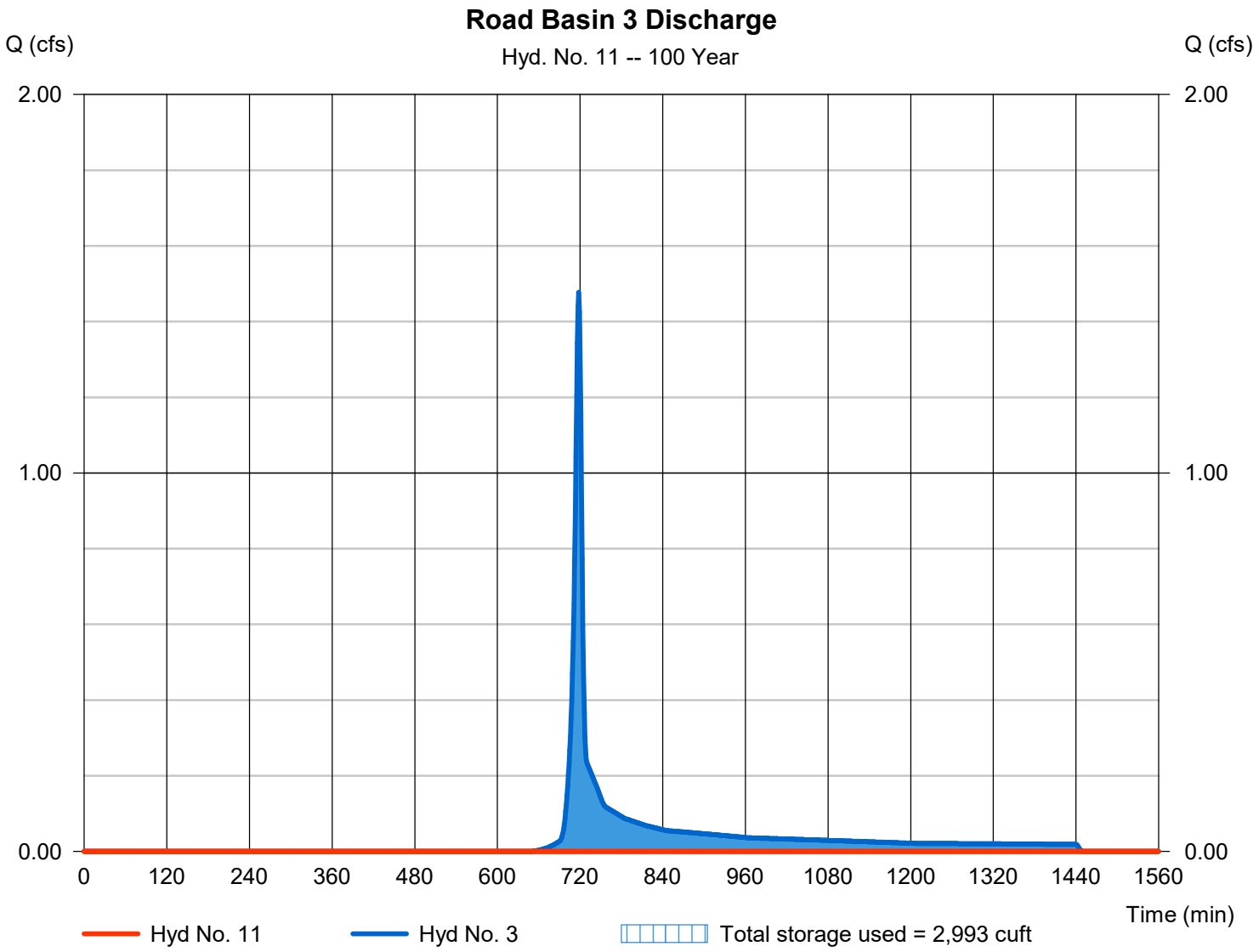
Hydrograph Report

Hyd. No. 11

Road Basin 3 Discharge

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.	=	3 - Post-Development Road Basin	Max. Elevation	=	2.92 ft
Reservoir name	=	Road Basin 3 Storage	Max. Storage	=	2,993 cuft

Storage Indication method used.



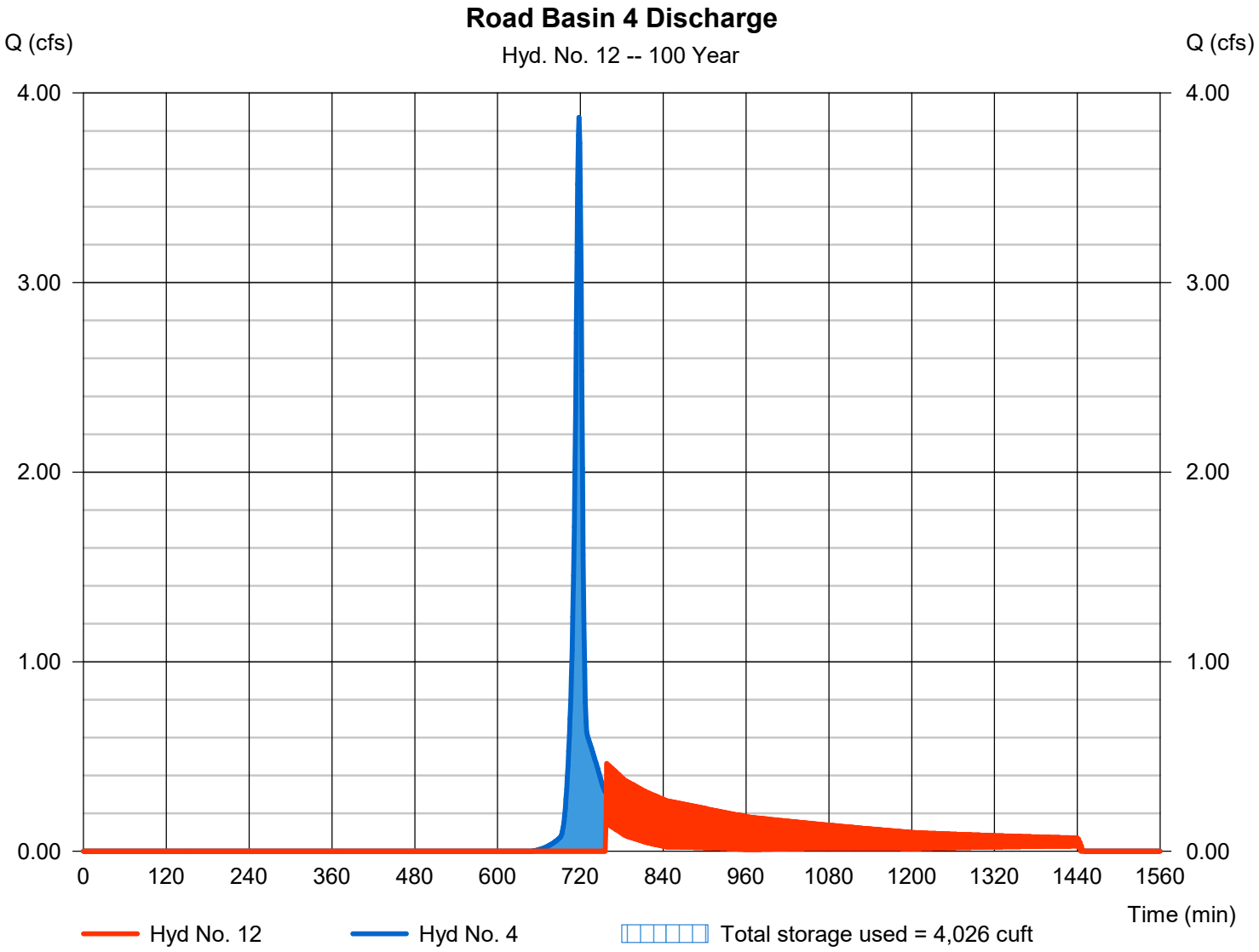
Hydrograph Report

Hyd. No. 12

Road Basin 4 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.463 cfs
Storm frequency	=	100 yrs	Time to peak	=	758 min
Time interval	=	1 min	Hyd. volume	=	3,817 cuft
Inflow hyd. No.	=	4 - Post-Development Road Basin 4	Max. Elevation	=	3.00 ft
Reservoir name	=	Road BAsin 4 Storage	Max. Storage	=	4,026 cuft

Storage Indication method used.



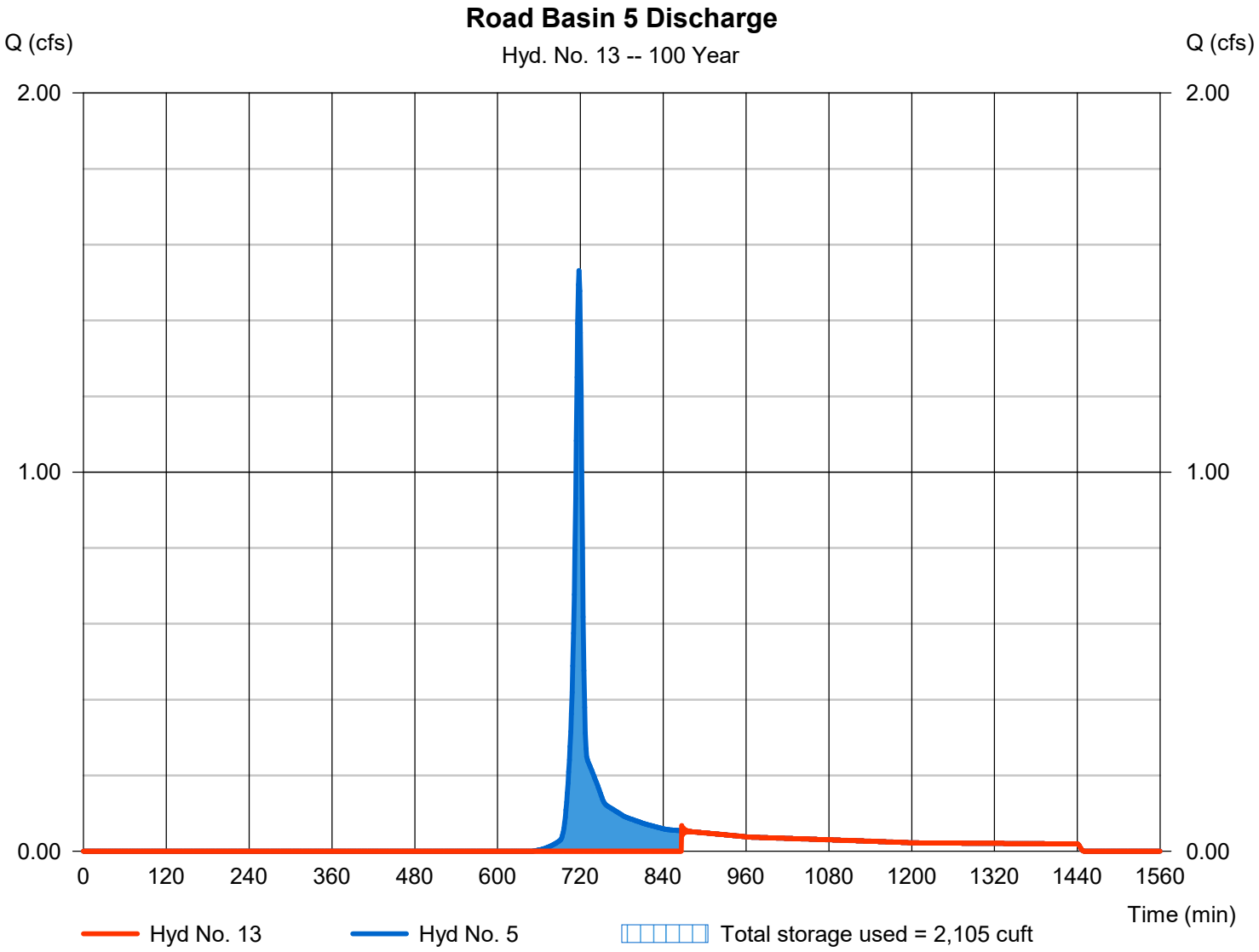
Hydrograph Report

Hyd. No. 13

Road Basin 5 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.068 cfs
Storm frequency	=	100 yrs	Time to peak	=	867 min
Time interval	=	1 min	Hyd. volume	=	999 cuft
Inflow hyd. No.	=	5 - Post-Development Road Basin 5	Max. Elevation	=	3.00 ft
Reservoir name	=	Road Basin 5 Storage	Max. Storage	=	2,105 cuft

Storage Indication method used.



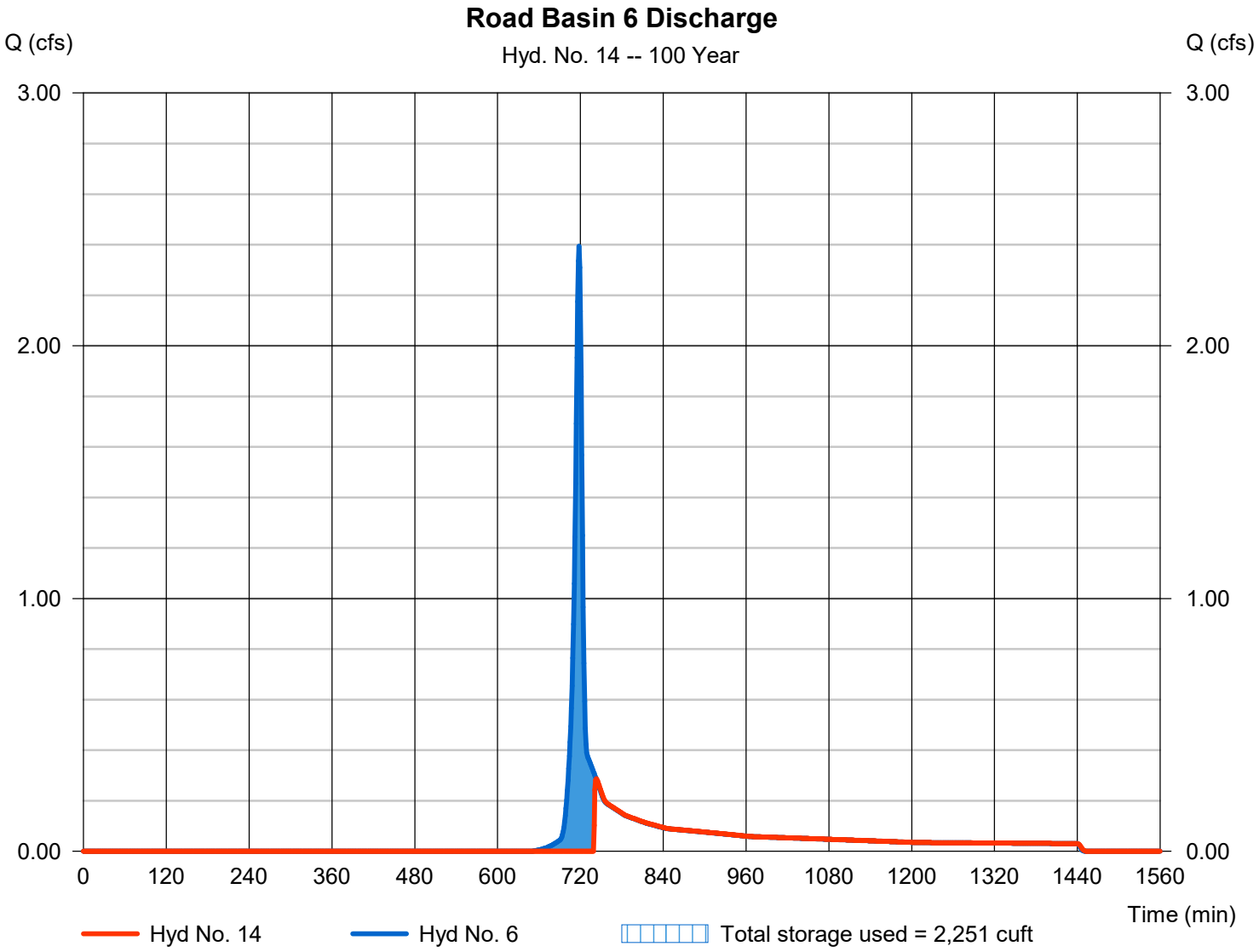
Hydrograph Report

Hyd. No. 14

Road Basin 6 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.287 cfs
Storm frequency	=	100 yrs	Time to peak	=	743 min
Time interval	=	1 min	Hyd. volume	=	2,619 cuft
Inflow hyd. No.	=	6 - Post-Development Road Basin 6	Max. Elevation	=	2.01 ft
Reservoir name	=	Road Basin 6 Storage	Max. Storage	=	2,251 cuft

Storage Indication method used.



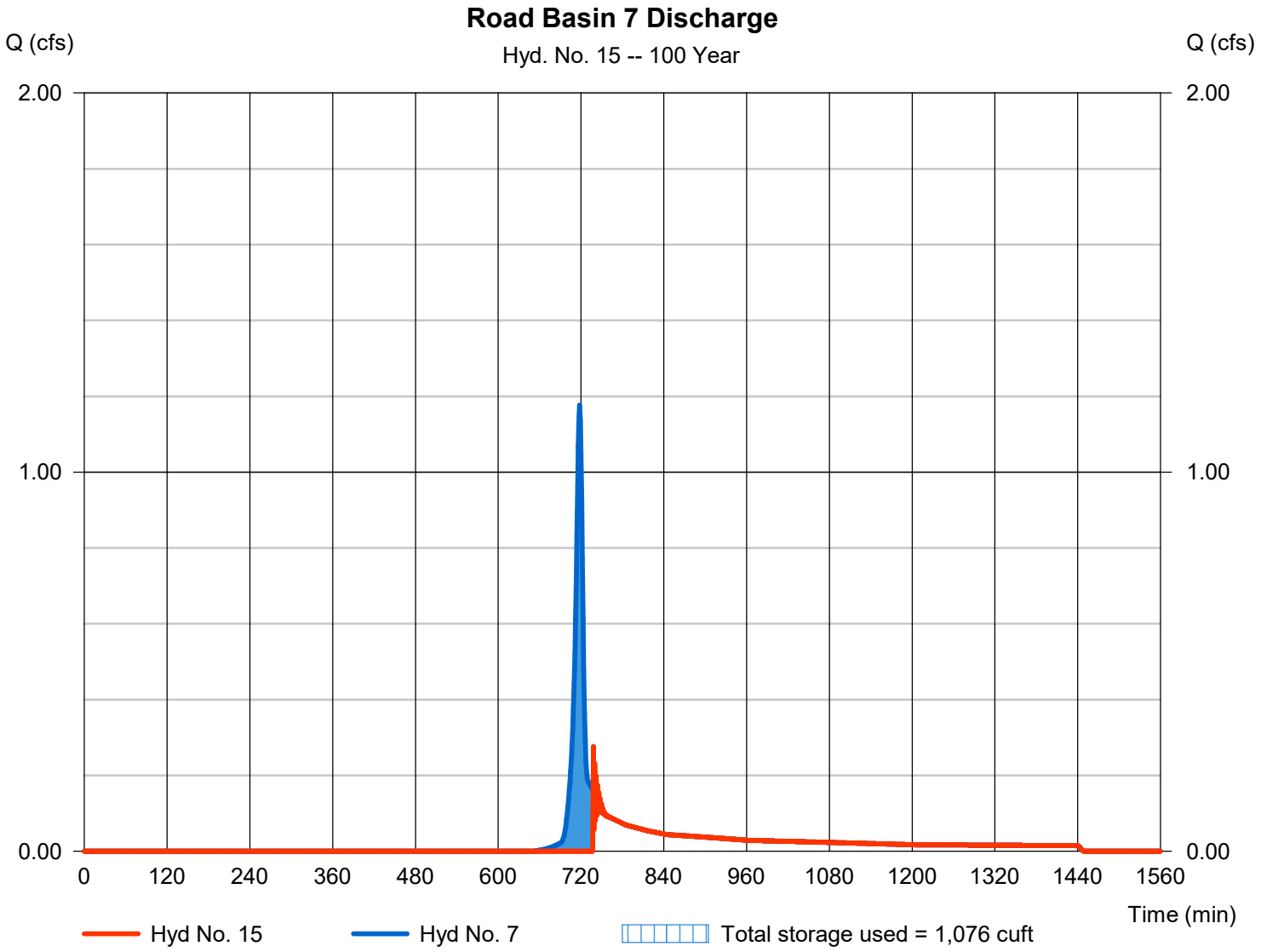
Hydrograph Report

Hyd. No. 15

Road Basin 7 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.276 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	1 min	Hyd. volume	=	1,308 cuft
Inflow hyd. No.	=	7 - Post-Development Road Basin 7	Max. Elevation	=	2.01 ft
Reservoir name	=	Road Basin 7 Storage	Max. Storage	=	1,076 cuft

Storage Indication method used.



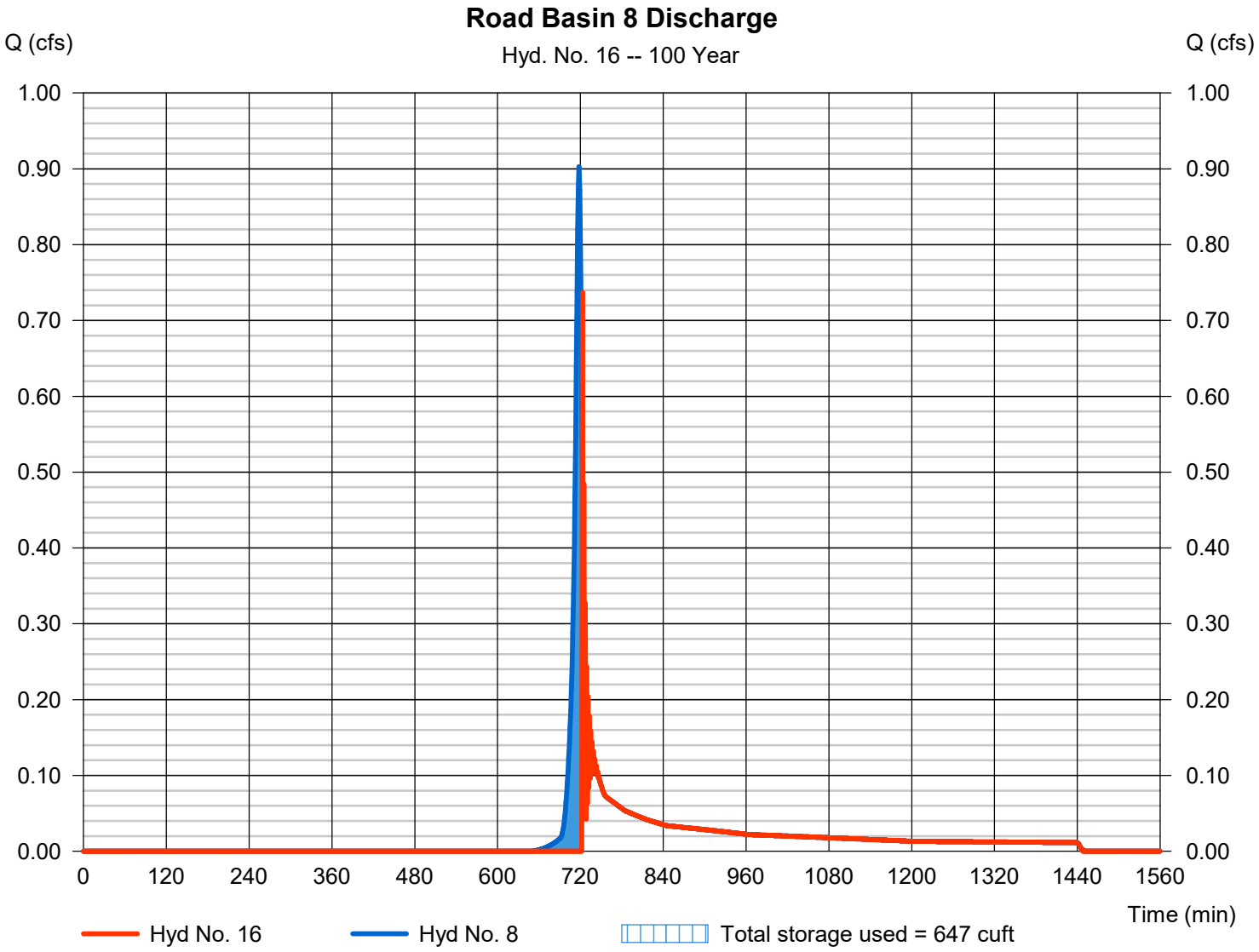
Hydrograph Report

Hyd. No. 16

Road Basin 8 Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	0.737 cfs
Storm frequency	=	100 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	1,184 cuft
Inflow hyd. No.	=	8 - Post-Development Road Basin 8	Max. Elevation	=	2.02 ft
Reservoir name	=	Road Basin 8 Storage	Max. Storage	=	647 cuft

Storage Indication method used.



Drainage Basins	Total Area (acres)	2-Year Runoff Peak Flow (CFS)	2-Year Runoff Volume (CF)	10-Year Runoff Peak Flow (CFS)	10-Year Runoff Volume (CF)	100-Year Runoff Peak Flow Rate (CFS)	100-Year Runoff Volume (CF)
Veterans Way Discharge Location							
Basin C	7.94	6.5	13022	3.77	25925	16.1	41959
Basin D	0.95	0.46	932	0.012	2138	1.46	3792
Road Basin 1	2.04	0.083	1055	0.29	2738	0.67	5513
Road Basin 2	0.72	0.13	347	0.43	901	0.91	1814
Road Basin 3	1.08	0.2	520	0.65	1351	1.36	2721
Road Basin 8	0.66	0.12	318	0.4	826	0.83	1663
Existing Basin 1	**21.5**	**0.035**	**1215**	**0.5**	**8635**	**2.42**	**25519**
Abner Grier Road Discharge Location							
Basin A	4.53	3.71	7430	1.907	14791	9.19	23939
Basin B	4.96	0.9	2390	0	5694	4.42	12051
Basin E	3.84	1.22	2690	0.01	6813	4.89	12833
Basin F	2.27	0.12	604	0.84	1952	2.13	4367
Basin G	2.73	2.95	5984	2.52	11014	6.35	16903
Basin H	2.99	0	0	0.01	415	0.29	1960
Basin I	6.46	3.48	7053	0.45	15691	10.52	27311
Road Basin 4	2.83	0.31	1418	1.152	3682	2.53	7415
Road Basin 5	1.12	0.2	540	0.67	1401	1.41	2822
Road Basin 7	0.86	0.156	414	0.52	1076	1.08	2167
Existing Basin 2	**10.1**	**0.016**	**571**	**0.25**	**4062**	**1.285**	**12003**
Existing Basin 3	**12.11**	**0.02**	**684**	**0.28**	**4864**	**1.37**	**14374**
Pine Butte Boulevard Discharge Location							
Road Basin 6	1.75	0.14	885	0.52	2299	1.19	4629
Existing Basin 4	**13.9**	**0.023**	**788**	**0.38**	**5600**	**2.05**	**16548**

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Basin A Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Landscape Island

Central Landscape Island Pond	14,625	CF

3' deep storage area in landscape islands, 2.5' of storage before overflow, 3:1 side slopes

Total Storage Provided	**14,625**	**CF**

Landscape Island Pond Storage

Area of Top of Pond:	8,876	SF
Area of Bottom of Pond	2,824	SF
Average Area:	5,850	SF
Depth of Pond	2.50	FT
Storage Provided:	**14,625**	**CF**

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Basin B Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Landscape Island

Central Landscape Island Pond	14,625	CF

3' deep storage area in landscape islands, 2.5' of storage before overflow, 3:1 side slopes

Total Storage Provided	**14,625**	**CF**

Landscape Island Pond Storage

Area of Top of Pond:	8,876	SF
Area of Bottom of Pond	2,824	SF
Average Area:	5,850	SF
Depth of Pond	2.50	FT
Storage Provided:	**14,625**	**CF**

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Basin C Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Landscape Island

Western Landscape Island Ponds (2 Ponds)	14,010	CF
(3' deep storage area in landscape islands, 2.5' of storage before overflow, 3:1 side slopes)		
Eastern Landscape Island Ponds (2 Ponds)	7,688	CF
(3' deep storage area in landscape islands 2.5' of storage before overflow, 3:1 side slopes)		
Central Landscape Island Pond	11,759	CF
(3' deep storage area in landscape island 2.5' of storage before overflow, 3:1 side slopes)		
Total Storage Provided	**32,605**	**CF**

Western Landscape Island Pond Storage (2 Ponds)

Area of Top of Pond:	5,600	SF
Area of Bottom of Pond	4	SF
Average Area:	2,802	SF
Depth of Pond	2.50	FT
Storage Provided:	7,005	CF
Total Storage Provided:	**14,010**	**CF**

Eastern Landscape Islands Pond Storage (2 Ponds)

Area of Top of Pond:	1,584	SF
Area of Bottom of Pond	239	SF
Average Area:	912	SF
Depth of Pond	2.50	FT
Storage Provided:	2,279	CF
Total Storage Provided:	**6,836**	**CF**

Central Landscape Island Pond Storage (1 Pond)

Area of Top of Pond:	7,985	SF
Area of Bottom of Pond	1,422	SF
Average Area:	4,704	SF
Depth of Pond	2.50	FT
Storage Provided:	**11,759**	**CF**

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Basin D Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided:Retention Swale

Western Retention Swale	3,032	CF
(0.7' deep storage area in swale adjacent to parking area, 3:1 side slopes)		
Total Storage Provided	**3,032**	**CF**

Eastern Retention Swale

Area of Top of Swale:	5,232	SF
Area of Bottom of Swale:	3,431	SF
Average Area:	4,332	SF
Depth of Swale	0.70	FT
Storage Provided:	**3,032**	**CF**

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Basin E Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Stormwater Retention Pond (Located in Basin I)

Shared Detention Pond	9,815	CF
(3' deep retention pond in open space, 3:1 side slopes)		
Total Storage Provided	**9,815**	**CF**

Stormwater Retention Pond (Located in Basin I)

Area of Top of Pond:	4,412	SF
Area of Bottom of Pond	2,131	SF
Average Area:	3,272	SF
Depth of Pond	3.00	FT
Storage Provided:	9,815	CF

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Basin F Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided:Landscape Island Ponds

Corner Parking Lot Ponds	233	CF
1' deep area in landscape islands, 0.5' of storage before overflow, 3:1 side slopes		
Western Retention Pond	1,887	CF
1' deep area in landscape islands, 0.5' of storage before overflow, 3:1 side slopes		
Total Storage Provided	**2,119**	**CF**

Landscape Island Ponds (3 Ponds)

Area of Top of Pond:	260	SF
Area of Bottom of Pond:	50	SF
Average Area:	155	SF
Depth of Pond	0.50	FT
Storage Provided:	**78**	**CF**
Total Storage Provided (3 Ponds):	**233**	**CF**

Eastern Landscape Pond

Area of Top of Pond:	1,523	SF
Area of Bottom of Pond:	154	SF
Average Area:	839	SF
Depth of Pond	2.25	FT
Storage Provided:	**1,887**	**CF**

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Missoula, MT 59806

Basin G Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided:Landscape Island Ponds

Landscape Island Pond Storage (3 Ponds)	10,488	CF
(2.5' deep storage area in landscape islands 2' of storage before overflow, 3:1 side slopes)		
Total Storage Provided	**10,488**	**CF**

Central Landscape Island Pond Storage (3 Ponds)

Area of Top of Pond:	1,260	SF
Area of Bottom of Pond:	2,236	SF
Average Area:	1,748	SF
Depth of Pond	2.00	FT
Storage Provided:	**3,496**	**CF**
Total Storage Provided:	**10,488**	**CF**

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Basin I Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided:Retention Swale

Western Landscape Island Ponds (2 Ponds)	7,754	CF
(2.5' deep storage area in landscape islands, 2' of storage before overflow, 3:1 side slopes)		
Eastern Landscape Island Ponds (2 Ponds)	7,240	CF
(2.5' deep storage area in landscape islands, 2' of storage before overflow, 3:1 side slopes)		
Total Storage Provided	**14,994**	**CF**

Western Landscape Island Pond Storage (2 Ponds)

Area of Top of Pond:	3,847	SF
Area of Bottom of Pond:	30	SF
Average Area:	1,939	SF
Depth of Pond:	2.00	FT
Storage Provided:	**3,877**	**CF**
Total Storage Provided (2 Ponds):	**7,754**	**CF**

Eastern Landscape Island Pond Storage (2 Ponds)

Area of Top of Pond:	3,590	SF
Area of Bottom of Pond:	30	SF
Average Area:	1,810	SF
Depth of Pond:	2.00	FT
Storage Provided Per Pond:	3,620	CF
Total Storage Provided (4 Ponds):	**7,240**	**CF**

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Road Basin 1 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, Depth to vary between 2' and 1')*	2,904	CF
Total Storage Provided	**2,904**	**CF**

Bio-Retention Pond A Storage (6 Ponds)

Area of Top of Pond:	370	SF
Area of Bottom of Pond:	-	SF
Average Area:	185	SF
Depth of Pond	2.00	FT
Storage Provided:	370	CF
Total Storage Provided:	**2,220**	**CF**

Bio-Retention Pond B Storage (3 ponds)

Area of Top of Pond:	370	SF
Area of Bottom of Pond:	10	SF
Average Area:	190	SF
Depth of Pond	1.20	FT
Storage Provided:	**228**	**CF**
Total Storage Provided:	**684**	**CF**

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Road Basin 2 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 11/2/2022

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, 1' depth within tree planters)*	1,043	CF
Total Storage Provided	**1,043**	**CF**

Bio-Retention Pond C Storage (in Landscape Planters) (15 Ponds)

Area of Top of Pond:	119	SF
Area of Bottom of Pond:	20	SF
Average Area:	70	SF
Depth of Pond	1.00	FT
Storage Provided:	70	CF
Total Storage Provided:	**1,043**	**CF**

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Road Basin 3 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, 1' depth within tree planters)*	3,110	CF
Total Storage Provided	**3,110**	**CF**

Bio-Retention Pond D Storage (in Boulevard) (2 Ponds)

Area of Top of Pond:	1,839	SF
Area of Bottom of Pond:	234	SF
Average Area:	1,037	SF
Depth of Pond	1.50	FT
Storage Provided:	1,555	CF
Total Storage Provided:	**3,110**	**CF**

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Road Basin 4 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, Depth to vary between 2' and 1')*	4,026	CF
Total Storage Provided	**4,026**	**CF**

Bio-Retention Pond E Storage (2 Ponds)

Area of Top of Pond:	214	SF
Area of Bottom of Pond:	10	SF
Average Area:	112	SF
Depth of Pond	1.00	FT
Storage Provided:	**112**	**CF**
Total Storage Provided:	**224**	**CF**

Bio-Retention Pond F Storage (2 Ponds)

Area of Top of Pond:	800	SF
Area of Bottom of Pond:	218	SF
Average Area:	509	SF
Depth of Pond	1.00	FT
Storage Provided:	**509**	**CF**
Total Storage Provided:	**2,545**	**CF**

Bio-Retention Pond G Storage (3 Ponds)

Area of Top of Pond:	380	SF
Area of Bottom of Pond:	39	SF
Average Area:	210	SF
Depth of Pond	2.00	FT
Storage Provided:	**419**	**CF**
Total Storage Provided:	**1,257**	**CF**

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Road Basin 5 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, 1' depth within tree planters)*	2,105	CF
Total Storage Provided	**2,105**	**CF**

Bio-Retention Pond H Storage (in Landscape Planters) (2 Ponds)

Area of Top of Pond:	1,177	SF
Area of Bottom of Pond:	226	SF
Average Area:	702	SF
Depth of Pond	1.50	FT
Storage Provided:	1,052	CF
Total Storage Provided:	**2,105**	**CF**

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Road Basin 6 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, depth varies within tree planters)*	1,571	CF
Total Storage Provided	**1,571**	**CF**

Bio-Retention Pond I Storage (in Landscape Planters) (7 Ponds)

Area of Top of Pond:	119	SF
Area of Bottom of Pond:	20	SF
Average Area:	70	SF
Depth of Pond	1.00	FT
Storage Provided:	70	CF
Total Storage Provided:	**626**	**CF**

Bio-Retention Pond J Storage (3 Ponds)

Area of Top of Pond:	410	SF
Area of Bottom of Pond:	10	SF
Average Area:	210	SF
Depth of Pond	1.50	FT
Storage Provided:	**315**	**CF**
Total Storage Provided:	**945**	**CF**

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Road Basin 7 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

Bio-Retention Area Storage Provided *(3:1 Side Slopes, 1' depth within tree planters)*	1,075	CF
Total Storage Provided	**1,075**	**CF**

Bio-Retention Pond K Storage (in Landscape Planters) (5 Ponds)

Area of Top of Pond:	382	SF
Area of Bottom of Pond:	48	SF
Average Area:	215	SF
Depth of Pond	1.00	FT
Storage Provided:	**215**	**CF**
Total Storage Provided:	**1,075**	**CF**

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Road Basin 8 Storage Calculations

Project Name: Icon Apartments
Project # : 21002675
Date: 3/6/2023

Storage Provided: Bio Retention Ponds

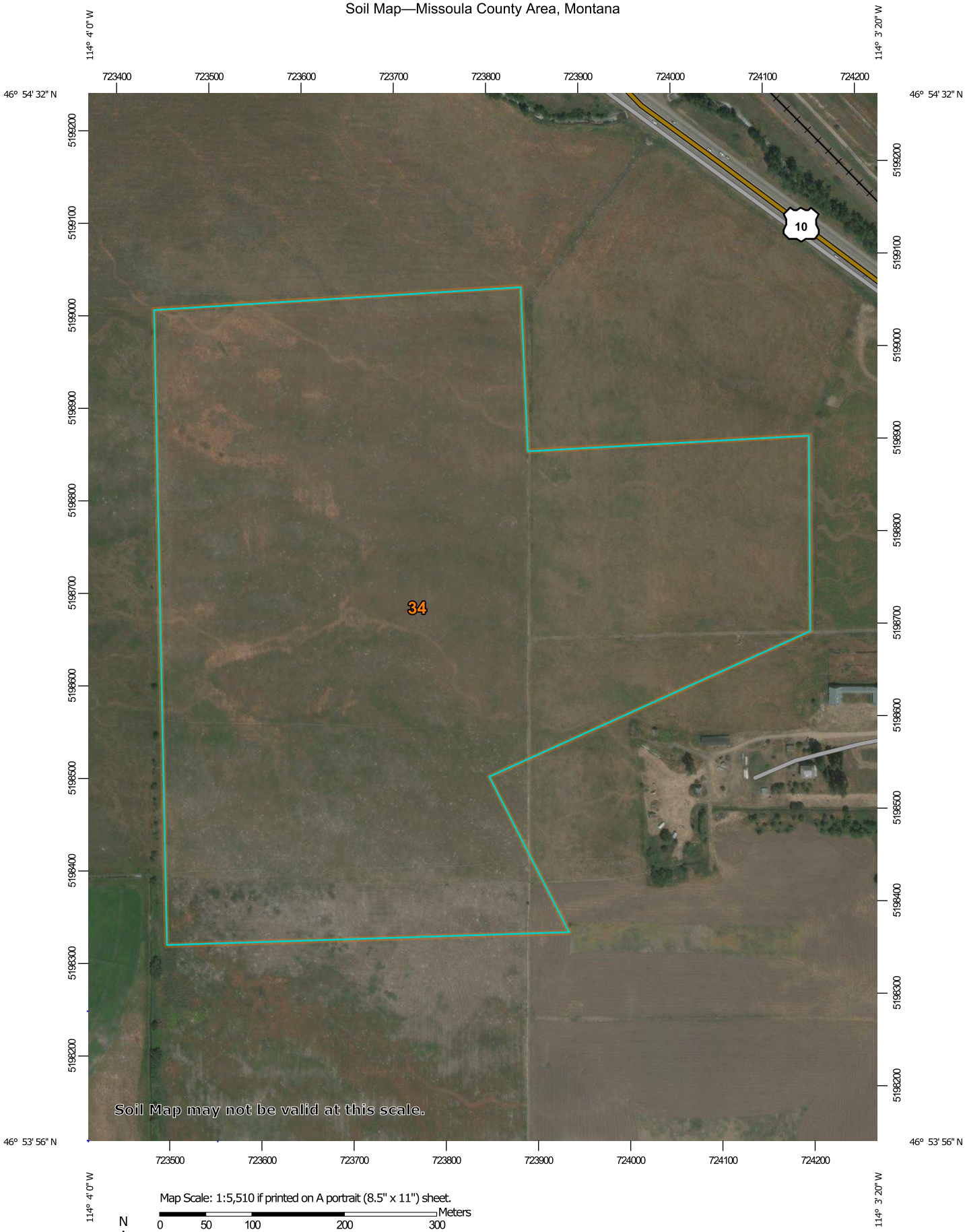
Bio-Retention Area Storage Provided *(3:1 Side Slopes, 1' depth within tree planters)*	645	CF
Total Storage Provided	**645**	**CF**

Bio-Retention Pond L Storage (in Landscape Planters) (3 Ponds)

Area of Top of Pond:	382	SF
Area of Bottom of Pond:	48	SF
Average Area:	215	SF
Depth of Pond	1.00	FT
Storage Provided:	**215**	**CF**
Total Storage Provided:	**645**	**CF**

Appendix C:

USDA NRCS Soil Data Map & Information
Firmette Map
Neighboring Well Log
Stormwater Evaluation Form



Map Scale: 1:5,510 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N 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 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Missoula County Area, Montana
Survey Area Data: Version 19, Sep 2, 2021

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

Date(s) aerial images were photographed: Aug 6, 2014—Nov 2, 2016

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
34	Desmet loam, 0 to 2 percent slopes	88.9	100.0%
Totals for Area of Interest		**88.9**	**100.0%**

National Flood Hazard Layer FIRMette

FEMA

114°3'42"W 46°54'22"N

114°3'5"W 46°53'58"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/29/2022 at 6:01 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

MISSOULA
PUBLIC WORKS & MOBILITY DEPARTMENT—Storm Water Division
1345 W. Broadway • Missoula, Montana 59802 • (406) 552-6744

rev. May 7, 2021

Storm Water Site Evaluation Form

This form is used for the Construction Site Inspection Frequency Determination and is completed by the applicant/owner.

Date: _____

Project Name: _____ **Permit No.:** _____

Address: _____ **Zip Code:** _____

Project Area (acres): _____ **Disturbance Area (acres):** _____

Applicant/Owner Representative: _____ **Phone number:** _____

Owner Name: _____ **Phone Number:** _____

Owner Address: _____

In compliance with the Clean Water Act and the National Pollutant Discharge and Elimination System permit program—administered by the Montana Department of Environmental Quality as authorized by the U.S. Environmental Protection Agency—the City of Missoula must inspect construction sites based upon their priority ranking.

Site Priority Determination

Check the appropriate Project Priority box based on the worksheet total on page 2.

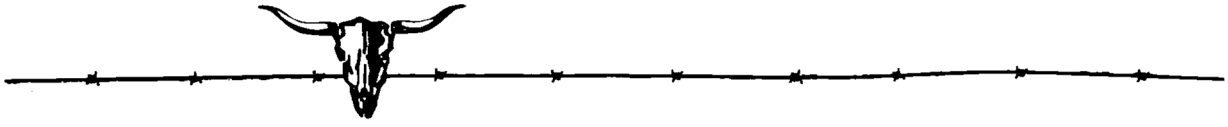
Score	Priority	Inspection Frequency	Project Priority
6 to 11	Low	1. Once at commencement of construction after BMPs have been implemented	
12 to 30	Medium	1. Once at commencement of construction after BMPs have been implemented	
		2. Once at the conclusion of the project prior to finalization	
31 to 67	High	1. Once at commencement of construction after BMPs have been implemented	
		2. Once within 48 hours, after one rain event of 0.25 inches or greater	
		3. Once within 48 hours, after runoff from snowmelt due to thawing conditions that cause visible surface erosion at the project site	
		4. Once at the conclusion of the project prior to finalization	

rev. May 7, 2021

Site Priority Ranking Worksheet

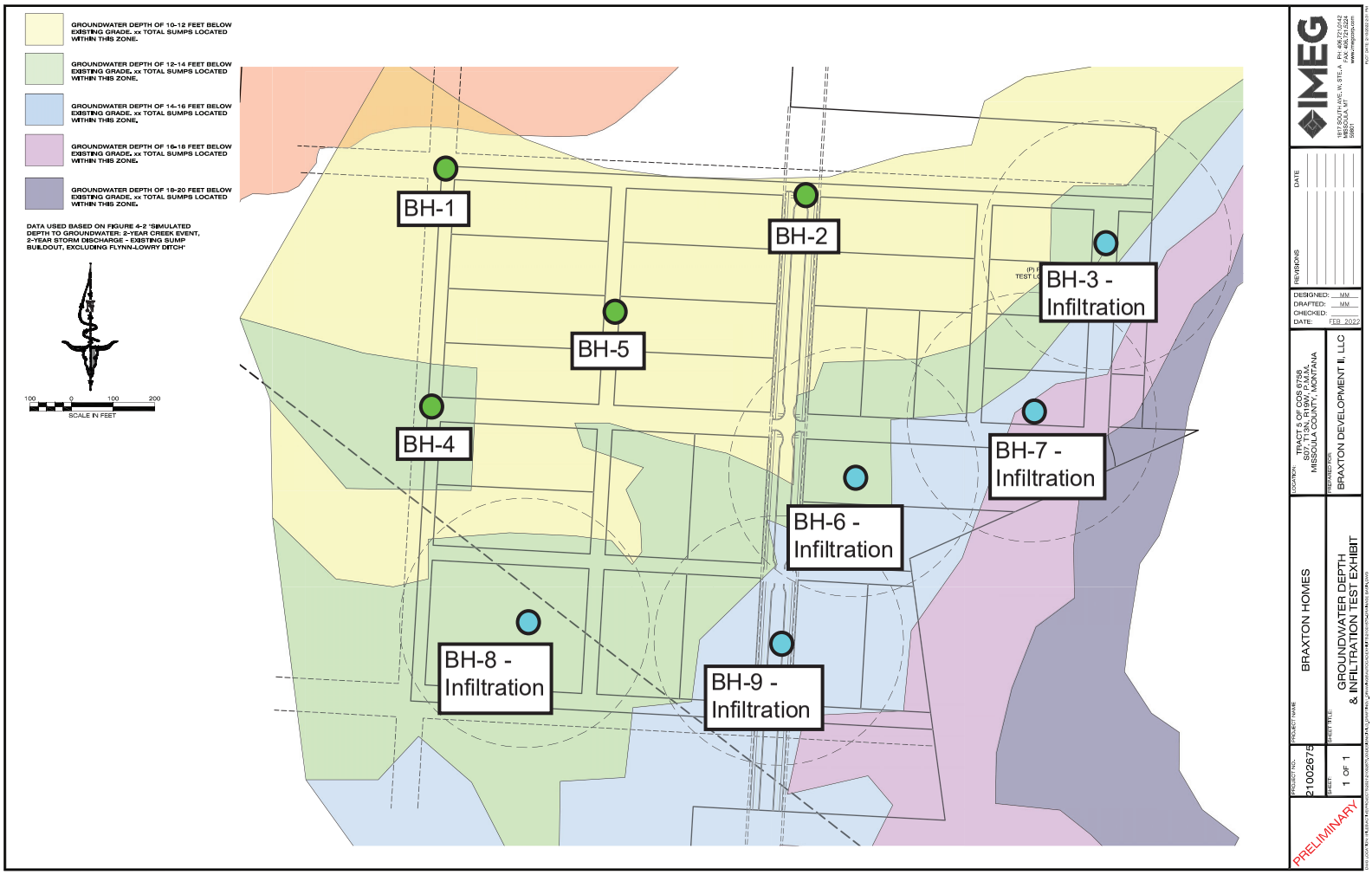
Criteria	Rating System	Rating Value	Site Rating
Project type	Subdivision with 5 or more units	7	
	TED with 5 or more units	7	
	Commercial site ≥ 0.5 acres	7	
	None of the above	0	
Proximity to waterbody (surface or dry well/groundwater)	≥ 1,500 feet	1	
	200 to 1,499 feet	5	
	< 200 feet	7	
	Discharge to waterbody	10	
Depth to groundwater	> 20 feet	1	
	≤ 20 feet	10	
Discharge to an impaired waterbody	No (dry well/groundwater, Butler Creek, LaValle Creek, Pattee Creek, or Rattlesnake Creek)	1	
	Yes (Bitterroot River, Clark Fork River, Grant Creek, or Miller Creek)	10	
Maximum proposed slope	Slopes < 20:1 (H:V) Slopes < 5%	1	
	20:1 ≤ Slopes < 10:1 (H:V) 5% ≤ Slopes < 10%	5	
	Slopes ≥10:1 (H:V) Slopes ≥ 10%	10	
History of non-compliance (applicant and/or owner)	No history of non-compliance	1	
	1 time non-compliant	5	
	2+ times non-compliant	10	
Risk of hazardous material spills/leaks	No hazardous materials stored on site	1	
	Non-liquid hazardous materials stored on site	5	
	Liquid hazardous materials stored on site	10	
		Total Score	
6 to 11 = Low	12 to 30 = Medium	31 to 67 = High	

Permittees found to be habitually non-compliant may be subject to one or more disciplinary actions: compliance through the Missoula Valley Water Quality District Enforcement Response Plan; increased inspection frequency; formal Notice of Violation (NOV), including stop work order; fine(s); and/or suspension/revocation of City Business License.



Appendix D:

Tetra Tech Percolation Test Results



IMEG
1817 SOUTH AVE. W. STE. A PH: 406.721.0242
MISSOULA, MT FAX: 406.721.0243
59801 www.imegcorp.com

REVISIONS | DATE

DESIGNED: MM
DRAFTED: MM
CHECKED:
DATE: FEB 2022

LOCATION: TRACT 5 OF COS 6758, S07, T13N, R19W, P.M.M., MISSOULA COUNTY, MONTANA

PREPARED FOR: BRAXTON DEVELOPMENT II, LLC

PROJECT NAME: BRAXTON HOMES

SHEET TITLE: GROUNDWATER DEPTH & INFILTRATION TEST EXHIBIT

PROJECT NO.: 21002675

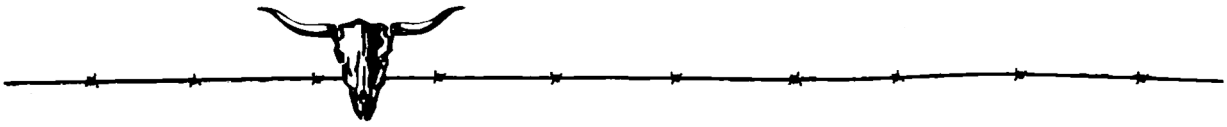
SHEET: 1 OF 1

PRELIMINARY

Tetra Tech performed three (3) infiltration tests following procedures outlined in Appendix A Circular DEQ 4. At each test location, Tetra Tech installed a 4-inch solid PVC pipe (with the bottom 1 foot being perforated) through hollow stem augers to depths of approximately 3.0 feet over 4 to 5 inches of pea gravel. Pea gravel was also placed around the PVC pipe extending upward above the slotted section of pipe. Following installation of the PVC pipe and pea gravel, the auger was removed from the borehole and the remaining annulus was backfilled with auger cuttings.

Table 1. Braxton Infiltration Test Results

Test Location	Soil Type (USCS)	Infiltration Rate (in/hr)
BH-3	CL	7.7
BH-6	SM	4.4
BH-7	SM	3.3
BH-8	CL	20.5
BH-9	SC	10.6



Grading and Drainage Plans (attached separately)

INCLUDED BY REFERENCE

Montana Public Works and Specifications *(latest edition)*
Montana Department of Environmental Quality Circular 8 *(2018 Edition)*
Chapter 6 of the City of Missoula Public Works Manual (*2021 Edition*)