

STORMWATER MANAGEMENT REPORT

North Woods Village
Planned Residential Development
25 Colonial Drive
Killingly, Connecticut 06241

Prepared For:
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1.0 Narrative

The proposed project is the construction of a planned residential development named North Woods Village located at 25 Colonial Drive, Killingly, CT. The location of the site in reference to the USGS Quad Map is attached as Figure 1, and in relation to the 2019 Connecticut orthoimagery as Figure 2. A location map is included on the Site Development Plans. The parcel was depicted as Lot 4 of a subdivision prepared for Upper Maple LLC in 2004.

Existing Conditions

The existing property is approximately 6.57-acres of undeveloped land located at the east end of Colonial Drive. The land is comprised of lawn, light brush, and woodlands. An aerial view of the existing property and surrounding area as they currently exist is attached as Figure 2. Existing ground is undulating with elevations ranging from approximately 288 to 262. Stormwater from the western side of the site and abutting properties flows to an existing infiltration basin that was constructed as part of the original 2004 subdivision. Stormwater from the southern and eastern portions of the site runs via sheet flow off site to undeveloped land. An existing conditions watershed map and stormwater flow paths are included as Figure 3. A summary of the existing condition peak stormwater flow rates from the site is included in Table 2.

Proposed Development

The proposed development includes the construction of a 14 residential duplexes and 2 triplexes with a private access drive over approximately 5.6-acres of the property. The proposed site improvements are depicted on the Site Improvement Plans. The buildings will be served with municipal sewer and water. The project includes a central common open space area that will include two pavilions, a stone dust sidewalk, open lawn area, and landscaping. The proposed site grading has been designed to match the existing drainage patterns as closely as possible. Stormwater onsite will be collected in a standard catch basin and culvert drainage system. ~~Two stormwater basins and subsurface infiltration chambers have been incorporated into the design to mitigate peak stormwater flow rates from the additional impervious areas.~~ The existing infiltration basin at the end of Colonial Drive will be modified as shown on the Site Improvement Plans to accommodate the new buildings and provide additional storage volume. *This basin provides enough storage volume to mitigate peak stormwater flow rates and stormwater volume without discharge through the 100-year storm. Due to the available volume and permeable soils the basin provides the required water quality volume and groundwater recharge volume as well.* ~~A new infiltration basin will be constructed at the southern end of the site to mitigate peak flow rates, runoff volume and provide the required water quality volume. Roof runoff from several of the building in the southern portion of the site will discharge to subsurface infiltration chambers as depicted on the Site Improvement Plans.~~

Analysis:

The overall site stormwater analysis was performed for the 2-year, 10-year, 25-year, 50-year, and 100-year frequency storms using the USDA/NRCS TR-55 method to determine the peak flow rates from the existing and post development site. Precipitation data, rainfall intensities, and distribution were acquired from NOAA Atlas 14, Volume 10, Version 3 for the site, and are included in Appendix A. The soils onsite fall into the hydrologic soil group A. A copy of the soil mapping is included in Appendix B. The runoff curve numbers for the site are based on the ground cover and hydrologic soil group and are included in Table 1.

Table 1 – Curve Numbers

Runoff curve numbers for the existing and post development conditions were compiled from Table 2-2 of the USDA/NRCS TR-55 manual a portion is included in Appendix A. The following curve numbers were used for the calculations:

| <u>Existing Conditions</u> | <u>CN</u> |
|--|-----------|
| Impervious (roofs, pavement, etc.) | 98 |
| Open Space (lawns, etc.), Good Conditions, HSG A | 39 |
| Woods, Good Conditions, HSG A | 30 |
| <u>Post Development</u> | <u>CN</u> |
| Impervious (roofs, pavement, etc.) | 98 |
| Open Space (lawns, etc.), Good Conditions, HSG A | 39 |
| Woods, Good Conditions, HSG A | 30 |

Weighted curve number calculations are included in the hydrograph reports.

To mitigate the peak stormwater runoff rates from the post development site, stormwater will be routed through the existing infiltration basin (PR Infiltration Basin #1) ~~and a proposed infiltration basin onsite (PR Infiltration Basin #2).~~ ~~Additionally, stormwater runoff from the roofs within Watershed #3 will be directed to subsurface infiltration chambers (PR Roof Infiltration).~~ Test pits were excavated onsite as shown on the Site Development Plans. Permeability samples were taken from test pits; copies of the permeability test data and sieve analysis are included in Appendix A. The 2004 Connecticut Stormwater Quality Manual recommends that the permeability rates be cut in half for the stormwater analysis as a factor of safety. The following permeability rates were used in the calculations:

| | <u>Permeability</u> | <u>50% Reduction</u> |
|------------------------|---------------------|---------------------------|
| Infiltration Basin #1 | | |
| (Sample #1, Basin #1): | 17.5 FT/Day | 8.75 FT/Day (4.38 IN/Hr) |
| Infiltration Basin #2 | | |
| (Sample #2, Basin #4): | 0.85 FT/Day | 0.425 FT/Day (0.21 IN/Hr) |

Roof Infiltration Chambers

(Sample #1, Basin #6): 8.3 FT/Day 4.15 FT/Day (2.0 IN/Hr.)

A summary of the existing condition and post development peak flow rates from the site are included in Table 2. Hydrographs detailing the calculations are included in the Calculations section.

Table 2 – Peak Flow Rates

| <u>WATERSHED 1</u> | Peak Flow Rate (CFS) | | | | |
|--------------------------------|----------------------|---------|---------|---------|----------|
| | 2-Year | 10-Year | 25-Year | 50-Year | 100-Year |
| Existing Condition (Hyd. #2) : | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Post Development (Hyd. #7) : | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Change : | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| <u>WATERSHED 2</u> | Peak Flow Rate (CFS) | | | | |
|--------------------------------|----------------------|---------|---------|---------|----------|
| | 2-Year | 10-Year | 25-Year | 50-Year | 100-Year |
| Existing Condition (Hyd. #3) : | 0.000 | 0.006 | 0.026 | 0.058 | 0.199 |
| Post Development (Hyd. #8) : | 0.000 | 0.014 | 0.089 | 0.182 | 0.370 |
| Change : | 0.000 | 0.008 | 0.063 | 0.124 | 0.171 |

| <u>WATERSHED 3</u> | Peak Flow Rate (CFS) | | | | |
|--------------------------------|----------------------|---------|---------|---------|----------|
| | 2-Year | 10-Year | 25-Year | 50-Year | 100-Year |
| Existing Condition (Hyd. #4) : | 0.000 | 0.009 | 0.047 | 0.104 | 0.341 |
| Post Development (Hyd. #9) : | 0.001 | 0.020 | 0.089 | 0.173 | 0.302 |
| Change : | 0.001 | 0.011 | 0.042 | 0.069 | -0.039 |

Watershed 1: PR Infiltration Basin #1 will have no discharge across all storm events, matching the existing conditions. The stormwater will be stored in the basin and will infiltrate into the ground.

Watershed 2: Stormwater will sheet flow toward the east from the rear yards of units #15 #17 through #26 #22. The post development peak flow rates will increase across all storms with a maximum increase of ~~0.365 CFS~~ 0.171 CFS. This flow will be spread across the entire eastern side of the property toward undeveloped land. In our opinion the increase is negligible and will have no negative impact downstream.

~~Watershed 3: PR Infiltration Basin #2 has been sized to mitigate the peak discharge from this watershed. Sizing information is included in the calculations and details for the level spreader outlet are included on the drainage plans. Roof infiltration chambers have been incorporated into this watershed and have been sized to completely store and infiltrate the stormwater across all~~

~~storm events. Peak stormwater flow rates leaving the site have been reduced across all storm events.~~

~~In our opinion, the proposed development will have no negative impact to the adjacent properties or to downstream infrastructure.~~

Stormwater will sheet flow toward the south from the rear yards of units #11 through #16, and the undeveloped land along the southern boundary. There is no proposed impervious area within this watershed. The post development peak flow rates vary depending on the storm event in comparison to the existing condition. This flow will be spread across the entire southern boundary toward undeveloped land. In our opinion the increase is negligible and will have no negative impact downstream.

2.0 Stormwater Quality

To meet the Connecticut DEEP stormwater quality requirements and Town MS4 requirements infiltration basins have been designed for the site in accordance with the 2004 Connecticut Stormwater Quality Manual to treat the proposed stormwater runoff.

Post Development Watershed 1

Stormwater runoff from post development watershed 1 will be directed to the existing modified infiltration basin (PR Infiltration Basin #1). This infiltration basin will completely store the stormwater runoff from all storm event. This available volume exceeds the required water quality volume for the watershed.

Post Development Watershed 2

Stormwater runoff Post Development Watershed 2 will sheet flow off the eastern side of the site. There is no proposed impervious surfaces that are included in this watershed. Therefore there is no sediment loading from impervious areas that contribute to the runoff and water quality measures are not required or necessary.

Post Development Watershed 3

~~Stormwater runoff from Post Development Watershed 3 will be directed to PR Infiltration Basin 2. This watershed includes the southern portion of the private driveway. The basin volume available below the high level overflow exceeds the required water quality volume. The required water quality volume for this watershed is calculated as follows:~~

Stormwater runoff Post Development Watershed 3 will sheet flow off the southern side of the site. There is no proposed impervious surfaces that are included in this watershed. Therefore there is no sediment loading from impervious areas that contribute to the runoff and water quality measures are not required or necessary.

3.0 Groundwater Recharge

The required groundwater recharge volume for the site and the adjacent properties will be provided within the Infiltration Basins as follows:

Per DEP 2004 Storm Water Quality Manual:
Hydrologic Soil Group Approach

$$\text{Required Ground Water Recharge Volume (GRV)} = (D)(A)(I) / 12$$

GRV = groundwater recharge volume (ac-ft)

D = depth of runoff to be recharged (in.) (table 7.4 of the manual)

A = site area (acres)

I = post-development site imperviousness (decimal)

A (total): 8.5 ac. (entire site)

A (impervious): 1.95 ac.

$$I = 1.95 \text{ ac.} / 8.5 \text{ ac.} = 0.23$$

NRCS Soil Group "A": D = 0.4 in. (from table 7-4)

$$\text{GRV} = (0.4 \text{ in.})(8.5 \text{ ac.})(0.23) / 12 = 0.0652 \text{ ac-ft} = \underline{2,838 \text{ cf (required)}}$$

| | | |
|-----------|--|--------------------------------|
| Provided: | Infiltration Basin #1 storage below the emergency outlet: | 63,309 cf |
| | Infiltration Basin #2 storage below the outlet: | 13,704 cf |
| | | Total= <u>63,309 cf</u> |

The storage in the Infiltration Basin below the high level overflow, exceeds the required groundwater recharge volume

4.0 Stormwater Management

Stormwater Management & Pollution Prevention:

Provisions for stormwater management and pollution prevention are outlined on the plans and are as follows:

1. Pollution Prevention Team:
The Owner shall be responsible for carrying out the provisions of the plan.
2. Sweeping:
Parking lots, sidewalks, and other impervious surfaces shall be swept clean of sand and litter and any other pollutants at least twice per year
 - a. Between November 15th and December 15th (after leaf fall)
 - b. During April (after snow melt)
3. Outside Storage:
Accessories or equipment stored outside shall be covered or maintained to minimize the possibility of these materials or their residue passing to stormwater.
4. Washing:
No washing of vehicles, accessories, equipment, or appliances onsite.
5. Maintenance and Inspection of Stormwater Infrastructure:
 - a. Monthly inspection of stormwater structures and outfalls.
 - b. Clean sediment and debris from structures at least once per year during April.
 - c. Comply with the infiltration basin maintenance schedule.
6. Spills or Accidental Discharges:
 - a. Comply with State and Federal regulations to contain and clean up any spill or discharge and dispose of materials at an approved facility.
 - b. Contact Connecticut DEEP oil and chemical spill response division 860-424-3338.
 - c. The following steps should be performed as soon as possible
 - Stop the source of the spill
 - Contain the spill
 - Cover the spill with absorbent material such as kitty litter, saw dust, or oil absorbent pads. Do not use straw.
 - Dispose of absorber in accordance with Local and State regulations.

5.0 Operations and Maintenance Schedule

The following is a general operations and maintenance schedule for the stormwater infrastructure and project site.

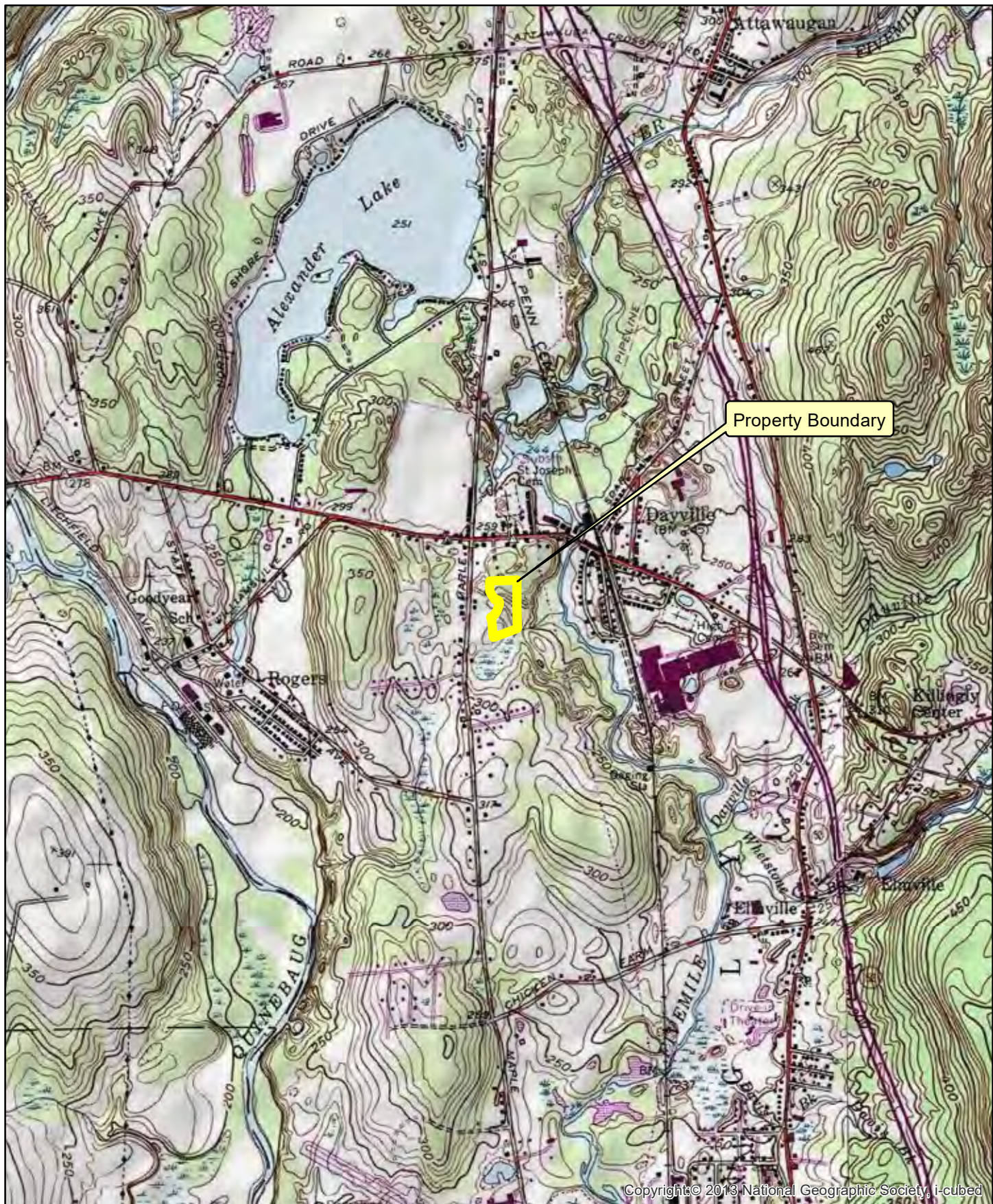
| Maintenance Schedule for Infiltration Basins | |
|---|------------------------|
| Activity | Schedule |
| <ul style="list-style-type: none"> Prior to new spring growth reaching a height of 2” (e.g., shortly after forsythia or redbud blooms), trim any material standing from the previous year close to the ground (approximately 2”). This will allow the soil to warm more quickly, which will stimulate the emergence and growth of native seedlings and reduce the likelihood of the meadow being invaded by shrubs. Problem weeds should be hand pulled or spot sprayed with an approved herbicide, such as Rodeo® or Garlon® 3A. If you did not plant vines or spiny plants as part of your mix, be vigilant about controlling them. These are more easily pulled when they are young rather than after they have had two to three months of growth. Examples include bindweed, blackberry, multiflora rose, mile-a-minute and Japanese hops. Be equally vigilant about controlling other invasive species, such as autumn olive and Japanese knotweed. Special Circumstances If you notice a heavy infestation of ragweed or foxtail in the second growing season, trim the meadow to a height of 8”. Trimming should cease by mid-September. | Second growing season |
| <ul style="list-style-type: none"> For the basin and side slopes, inspect for invasive vegetation. Grassy weeds or persistent perennials can re-establish in these soils. Monitor and control weeds by hand pulling or spot spraying. | Monthly |
| <ul style="list-style-type: none"> Inspect for damage, undercut, or eroded area Monitor for sediment accumulation | Semi-Annual inspection |
| <ul style="list-style-type: none"> Repair undercut or eroded areas. | As needed maintenance |
| <ul style="list-style-type: none"> Clean and remove debris & sediment from inlet and outlet structures Inspect and clean debris & sediment in the basin Clean and remove debris from the plunge pools Mow side slopes. Close mowing throughout the regular growing season or extensive chemical use is not conducive to water quality improvement and wildlife habitat. Spring mowed vegetation can typically remain within basins providing cover for new emerging vegetation. | Semi-annual |

| Maintenance Schedule for Infiltration Chambers | |
|---|---|
| Activity | Schedule |
| <ul style="list-style-type: none"> Inspect infiltrators through the inspection ports for accumulated sediment | <ul style="list-style-type: none"> Between November 15th and December 15th (after leaf fall) During April (after snow melt) |
| <ul style="list-style-type: none"> Remove sediment when depth exceeds 3". Jet the system clean with pressurized water through a culvert cleaning nozzle. Use a vac truck to remove sediment from the system. | <ul style="list-style-type: none"> As needed |

| Maintenance Schedule for Catch Basins | |
|--|---|
| Activity | Schedule |
| <ul style="list-style-type: none"> Clean out sediment from catch basin and hydrodynamic separator | <ul style="list-style-type: none"> Between November 15th and December 15th (after leaf fall) During April (after snow melt) |

| Maintenance Schedule for Parking / Driveway Areas | |
|---|---|
| Activity | Schedule |
| <ul style="list-style-type: none"> Sweep impervious areas | <ul style="list-style-type: none"> Between November 15th and December 15th (after leaf fall) During April (after snow melt) |
| <ul style="list-style-type: none"> Remove and dispose of trash and debris onsite | Daily - As needed maintenance |

FIGURES



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LOCATION MAP

Stormwater Management Report
 North Woods Village
 25 Colonial Drive, Killingly, CT
 Danielson Quad (#43)

DATE: 7/7/2023
 SCALE: 1 in = 2,000 ft
 SOURCE: USGS Quad



FIGURE

1



Property Boundary

COLONIAL DRIVE

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2019 AERIAL MAP

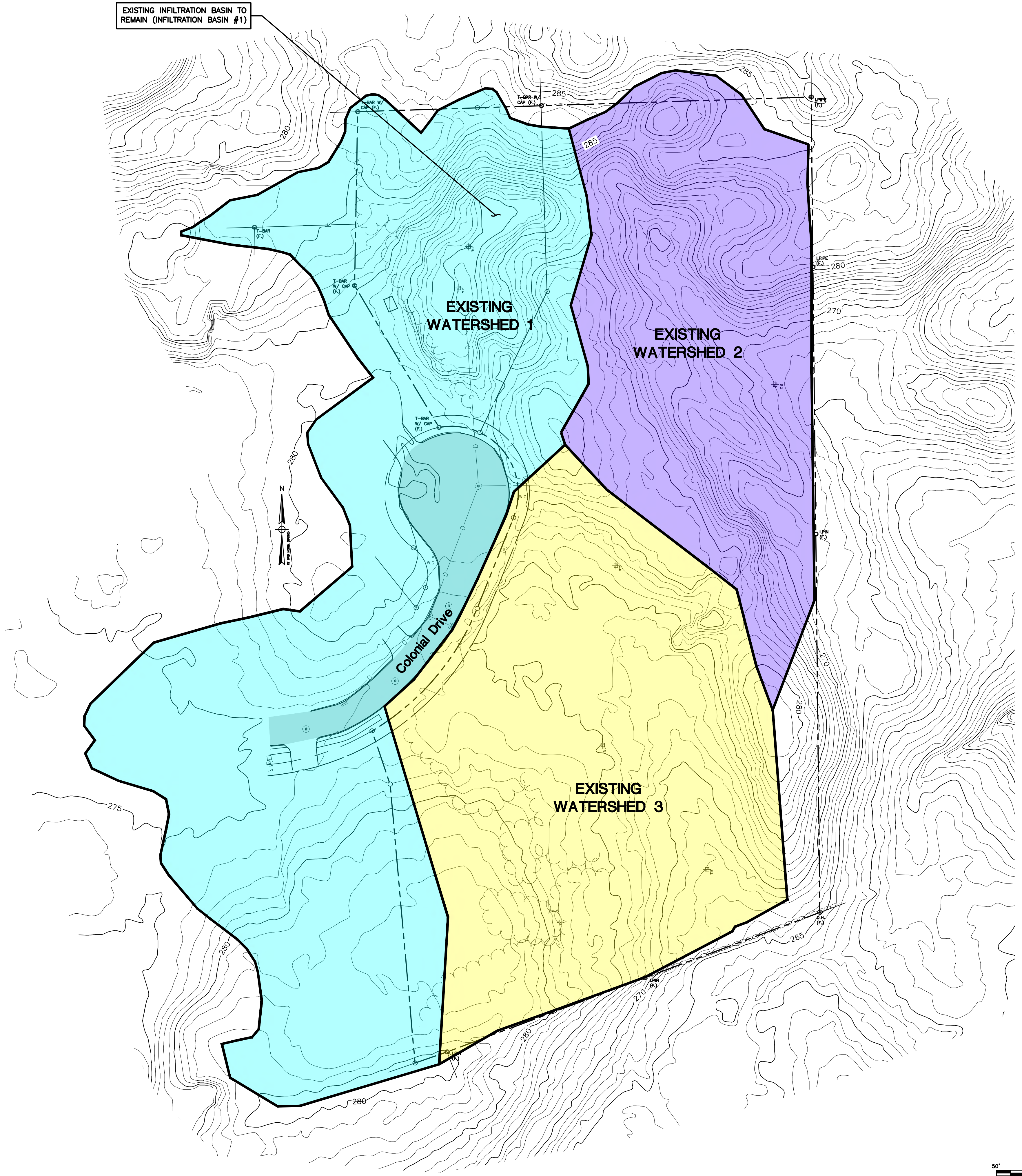
*Stormwater Management Report
North Woods Village
25 Colonial Drive, Killingly, CT*

DATE: 7/7/2023
SCALE: 1 in = 100 ft
SOURCE: USGS Quad



FIGURE

2



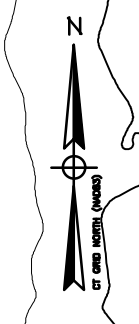
| | | CLA Engineers, Inc. CIVIL • STRUCTURAL • SURVEYING | |
|-----|----------|--|--------------------------|
| | | 317 Main Street Norwich, CT 06360 (860) 886-1966 Fax (860) 886-9165 | |
| 1 | 9/7/2023 | No Changes to This Figure | |
| No. | DATE | REVISION | |
| | | 25 Colonial Drive Killingly, Connecticut 06241 | |
| | | Site Improvement Plan North Woods Village Planned Residential Development | |
| | | Watershed Map - Existing Conditions | |
| | | Project No. CLA-7283 | Proj. Engineer K.J.H. |
| | | Date: 7/7/2023 | Figure No. 3 |

PR INFILTRATION BASIN 1
(MODIFIED EXISTING)

POST DEV.
WATERSHED 1

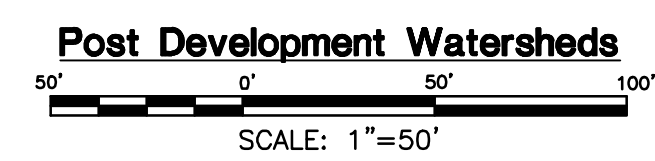
POST DEV.
WATERSHED 2

POST DEV.
WATERSHED 3



Colonial Drive

Private Driveway



| | | | |
|--|----------|--|--------------------------|
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| 1 | 9/7/2023 | Development Configuration | |
| No. | DATE | REVISION | |
| 25 Colonial Drive Killingly, Connecticut 06241 | | | Project No. CLA-7283 |
| Site Improvement Plan North Woods Village Planned Residential Development | | | Proj. Engineer K.J.H. |
| Watershed Map - Post Development | | | Date: 7/7/2023 |
| | | | Figure No. 4 |

CALCULATIONS:

Hydrograph Reports 2, 10, 25, 50, and 100-Year Frequencies

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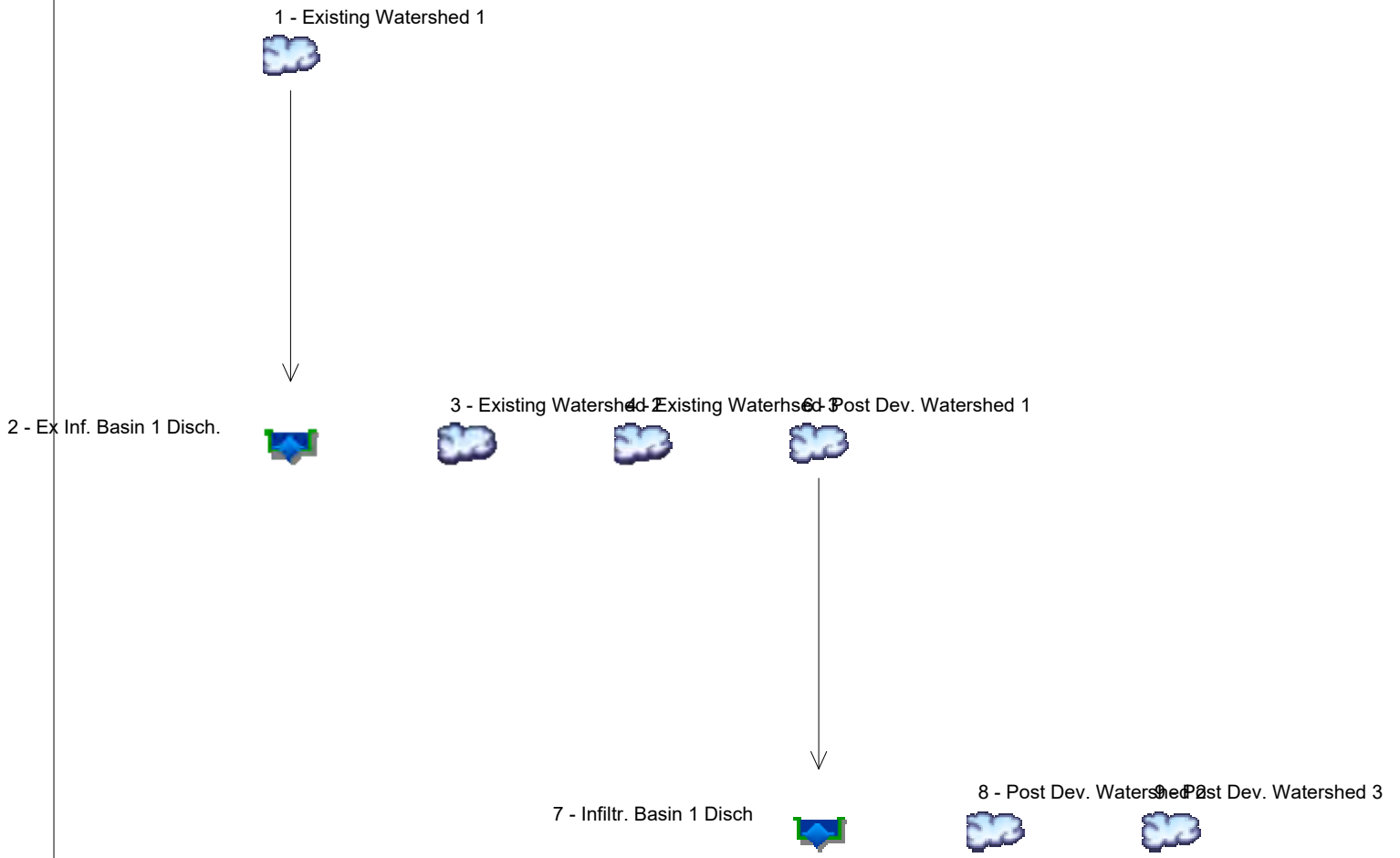
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Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3



Legend

| Hyd. | Origin | Description |
|------|------------|-------------------------|
| 1 | SCS Runoff | Existing Watershed 1 |
| 2 | Reservoir | Ex Inf. Basin 1 Disch. |
| 3 | SCS Runoff | Existing Watershed 2 |
| 4 | SCS Runoff | Existing Watershed 3 |
| 6 | SCS Runoff | Post Dev. Watershed 1 |
| 7 | Reservoir | Infiltr. Basin 1 Disch. |
| 8 | SCS Runoff | Post Dev. Watershed 2 |
| 9 | SCS Runoff | Post Dev. Watershed 3 |

Hydrograph Return Period Recap

Hydratlow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| Hyd. No. | Hydrograph type (origin) | Inflow hyd(s) | Peak Outflow (cfs) | | | | | | | | Hydrograph Description |
|----------|--------------------------|---------------|--------------------|-------|-------|-------|-------|-------|-------|--------|------------------------|
| | | | 1-yr | 2-yr | 3-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr | |
| 1 | SCS Runoff | ----- | ----- | 0.051 | ----- | ----- | 1.114 | 2.591 | 4.009 | 5.761 | Existing Watershed 1 |
| 2 | Reservoir | 1 | ----- | 0.000 | ----- | ----- | 0.000 | 0.000 | 0.000 | 0.000 | Ex Inf. Basin 1 Disch. |
| 3 | SCS Runoff | ----- | ----- | 0.000 | ----- | ----- | 0.006 | 0.026 | 0.058 | 0.199 | Existing Watershed 2 |
| 4 | SCS Runoff | ----- | ----- | 0.000 | ----- | ----- | 0.009 | 0.047 | 0.104 | 0.341 | Existing Waterhsed 3 |
| 6 | SCS Runoff | ----- | ----- | 0.628 | ----- | ----- | 4.752 | 8.872 | 12.36 | 16.45 | Post Dev. Watershed 1 |
| 7 | Reservoir | 6 | ----- | 0.000 | ----- | ----- | 0.000 | 0.000 | 0.000 | 0.000 | Infiltr. Basin 1 Disch |
| 8 | SCS Runoff | ----- | ----- | 0.000 | ----- | ----- | 0.014 | 0.089 | 0.182 | 0.370 | Post Dev. Watershed 2 |
| 9 | SCS Runoff | ----- | ----- | 0.001 | ----- | ----- | 0.020 | 0.089 | 0.173 | 0.302 | Post Dev. Watershed 3 |

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| 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 | 0.051 | 1 | 887 | 1,374 | ----- | ----- | ----- | Existing Watershed 1 |
| 2 | Reservoir | 0.000 | 1 | 847 | 0 | 1 | 268.19 | 163 | Ex Inf. Basin 1 Disch. |
| 3 | SCS Runoff | 0.000 | 1 | n/a | 0 | ----- | ----- | ----- | Existing Watershed 2 |
| 4 | SCS Runoff | 0.000 | 1 | n/a | 0 | ----- | ----- | ----- | Existing Waterhsed 3 |
| 6 | SCS Runoff | 0.628 | 1 | 749 | 6,909 | ----- | ----- | ----- | Post Dev. Watershed 1 |
| 7 | Reservoir | 0.000 | 1 | 797 | 0 | 6 | 269.00 | 1,521 | Infiltr. Basin 1 Disch |
| 8 | SCS Runoff | 0.000 | 1 | n/a | 0 | ----- | ----- | ----- | Post Dev. Watershed 2 |
| 9 | SCS Runoff | 0.001 | 1 | 1327 | 7 | ----- | ----- | ----- | Post Dev. Watershed 3 |
| 7283 TR55 R1.gpw | | | | | Return Period: 2 Year | | | Thursday, 09 / 7 / 2023 | |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 1

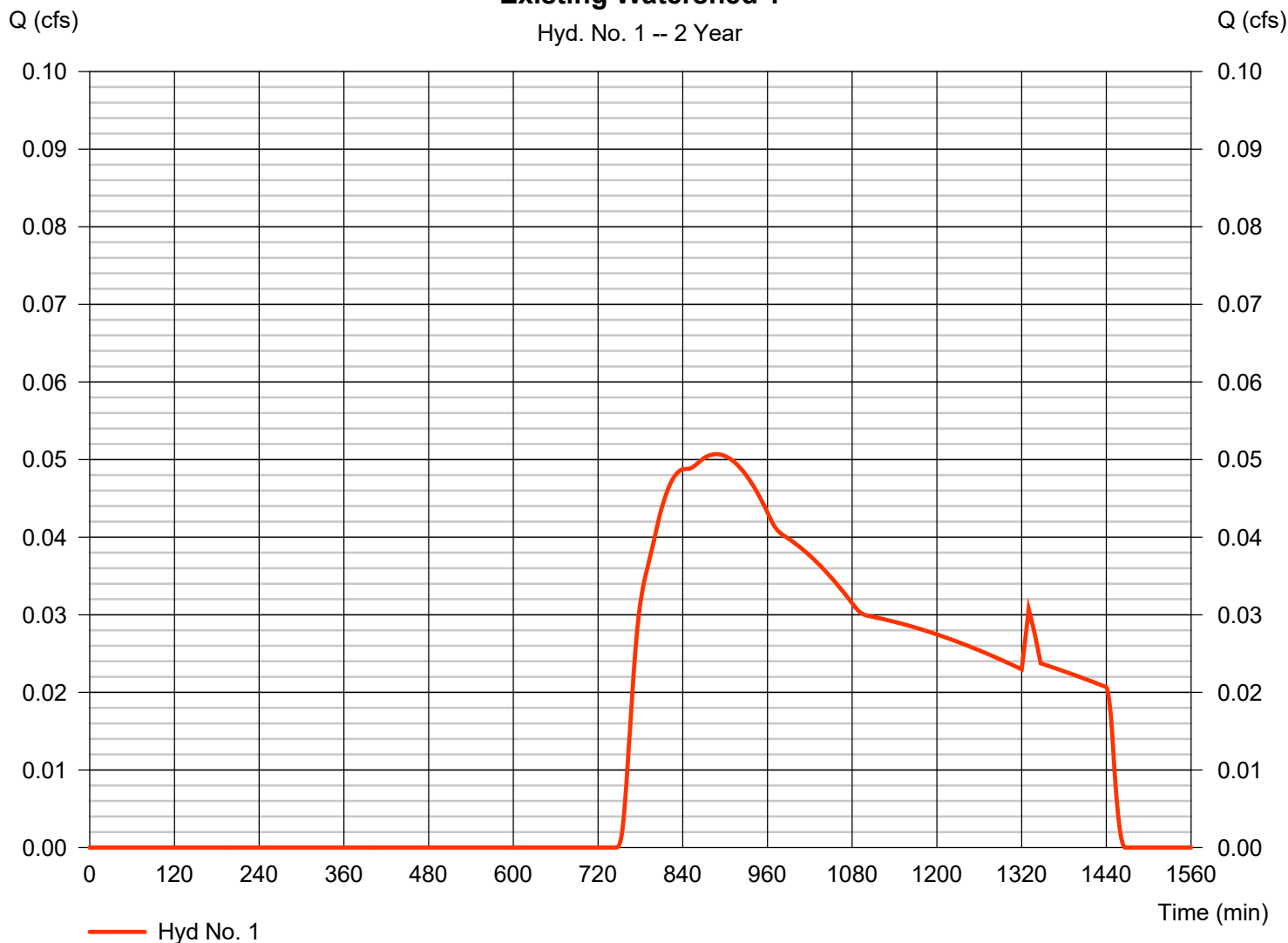
Existing Watershed 1

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.051 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 887 min |
| Time interval | = 1 min | Hyd. volume | = 1,374 cuft |
| Drainage area | = 4.400 ac | Curve number | = 46* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.690 x 98) + (2.470 x 39) + (1.240 x 30)] / 4.400

Existing Watershed 1

Hyd. No. 1 -- 2 Year



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No. 1

Existing Watershed 1

| <u>Description</u> | <u>A</u> | <u>B</u> | <u>C</u> | <u>Totals</u> |
|------------------------------------|----------------|---------------|---------------|------------------|
| Sheet Flow | | | | |
| Manning's n-value | = 0.240 | 0.011 | 0.011 | |
| Flow length (ft) | = 160.0 | 0.0 | 0.0 | |
| Two-year 24-hr precip. (in) | = 3.39 | 0.00 | 0.00 | |
| Land slope (%) | = 3.70 | 0.00 | 0.00 | |
| Travel Time (min) | = 15.79 | + 0.00 | + 0.00 | = 15.79 |
| Shallow Concentrated Flow | | | | |
| Flow length (ft) | = 70.00 | 105.00 | 0.00 | |
| Watercourse slope (%) | = 14.30 | 2.80 | 0.00 | |
| Surface description | = Unpaved | Unpaved | Paved | |
| Average velocity (ft/s) | =6.10 | 2.70 | 0.00 | |
| Travel Time (min) | = 0.19 | + 0.65 | + 0.00 | = 0.84 |
| Channel Flow | | | | |
| X sectional flow area (sqft) | = 0.00 | 0.00 | 0.00 | |
| Wetted perimeter (ft) | = 0.00 | 0.00 | 0.00 | |
| Channel slope (%) | = 0.00 | 0.00 | 0.00 | |
| Manning's n-value | = 0.015 | 0.015 | 0.015 | |
| Velocity (ft/s) | =0.00 | 0.00 | 0.00 | |
| Flow length (ft) | 0.0 | 0.0 | 0.0 | |
| Travel Time (min) | = 0.00 | + 0.00 | + 0.00 | = 0.00 |
| Total Travel Time, Tc | | | | 16.60 min |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

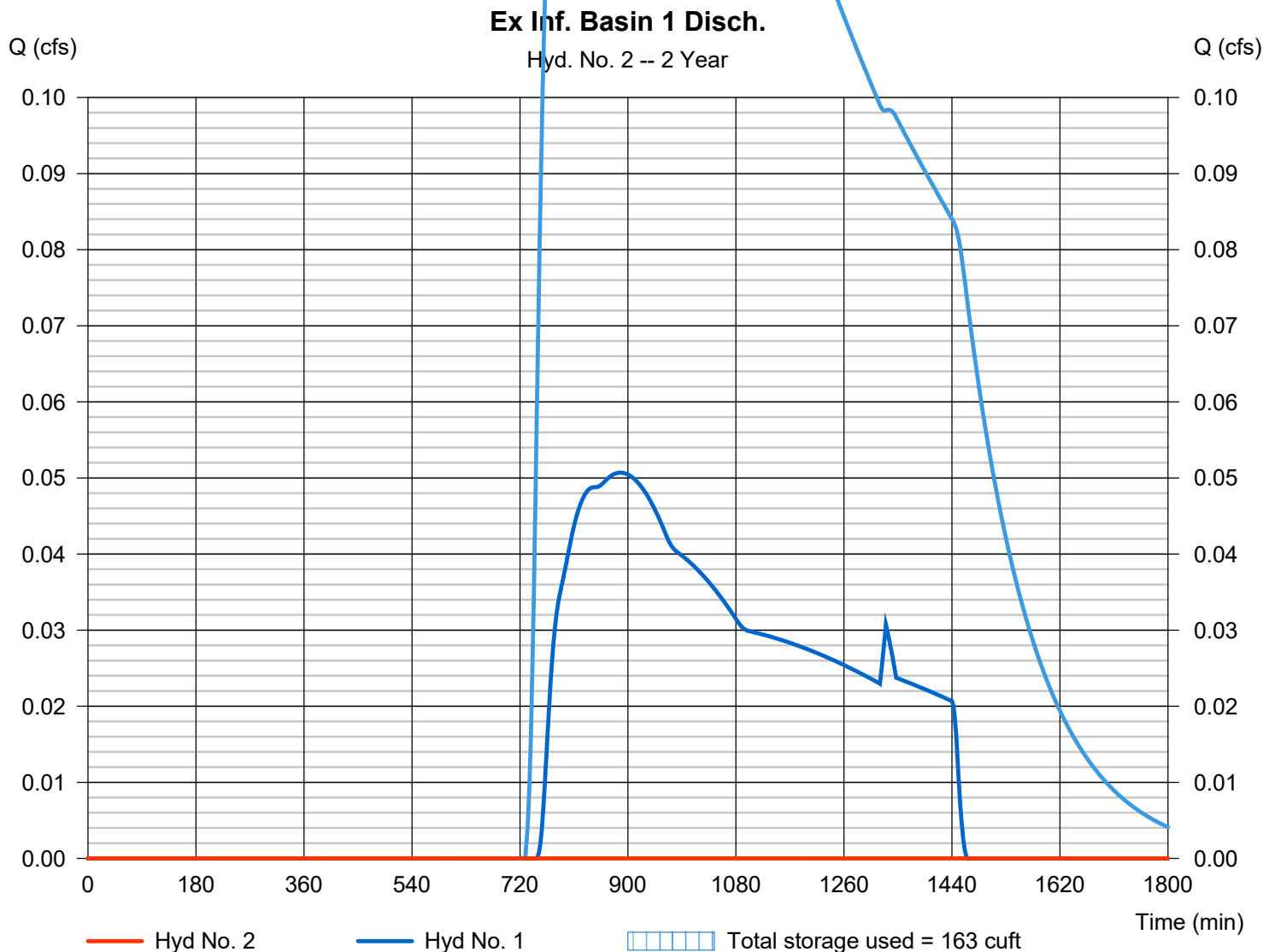
Thursday, 09 / 7 / 2023

Hyd. No. 2

Ex Inf. Basin 1 Disch.

| | | | |
|-----------------|----------------------------|----------------|-------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 847 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 1 - Existing Watershed 1 | Max. Elevation | = 268.19 ft |
| Reservoir name | = EX Infiltration Basin | Max. Storage | = 163 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - EX Infiltration Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 268.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 268.00 | 14 | 0 | 0 |
| 2.00 | 270.00 | 2,401 | 1,732 | 1,732 |
| 4.00 | 272.00 | 7,155 | 9,133 | 10,865 |
| 6.00 | 274.00 | 10,988 | 18,005 | 28,870 |
| 8.00 | 276.00 | 15,028 | 25,908 | 54,778 |
| 10.00 | 278.00 | 21,389 | 36,227 | 91,005 |

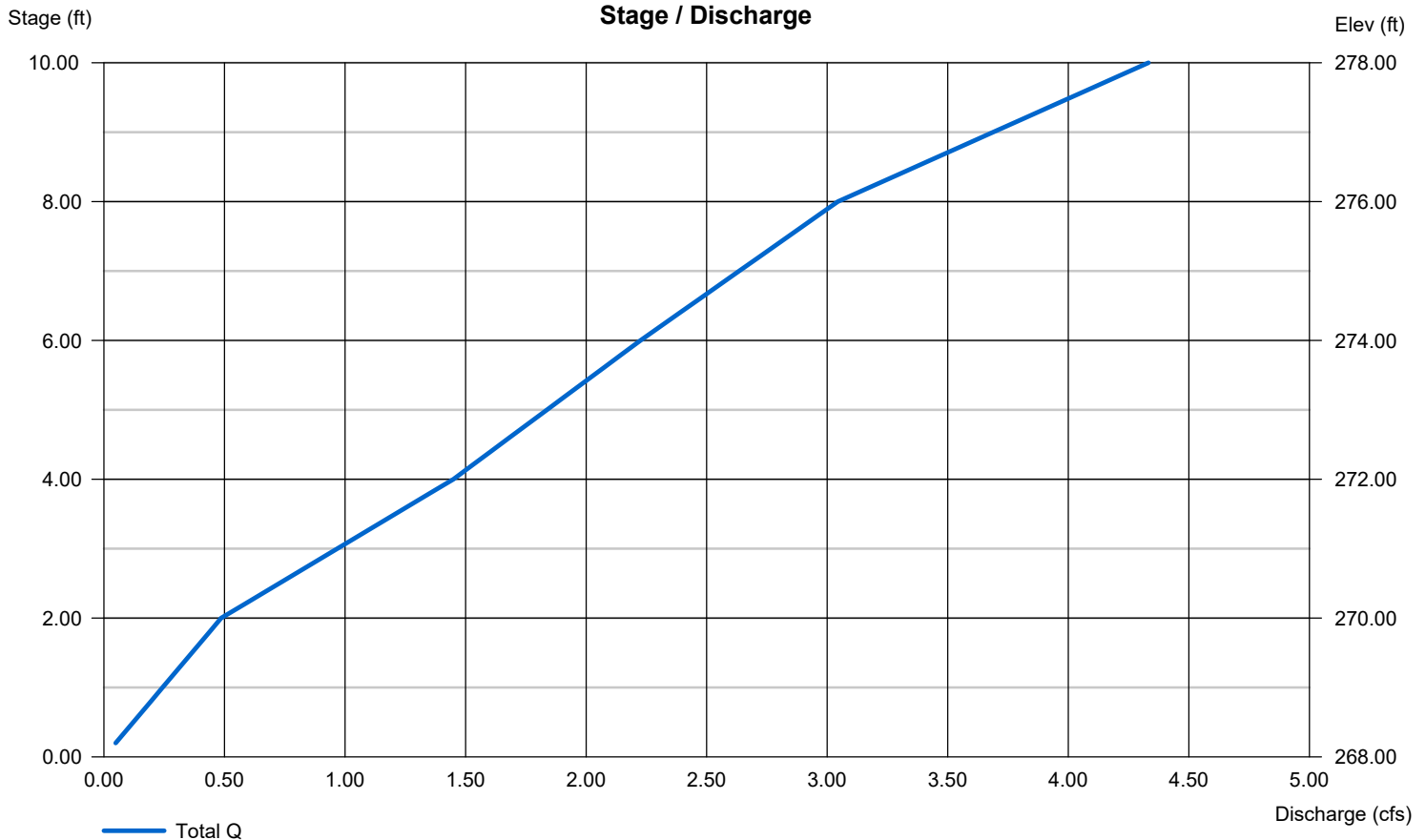
Culvert / Orifice Structures

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

Weir Structures

| | [A] | [B] | [C] | [D] |
|----------------|----------------------|------|------|------|
| Crest Len (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Crest El. (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = --- | --- | --- | --- |
| Multi-Stage | = No | No | No | No |
| Exfil.(in/hr) | = 8.750 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

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



Hydrograph Report

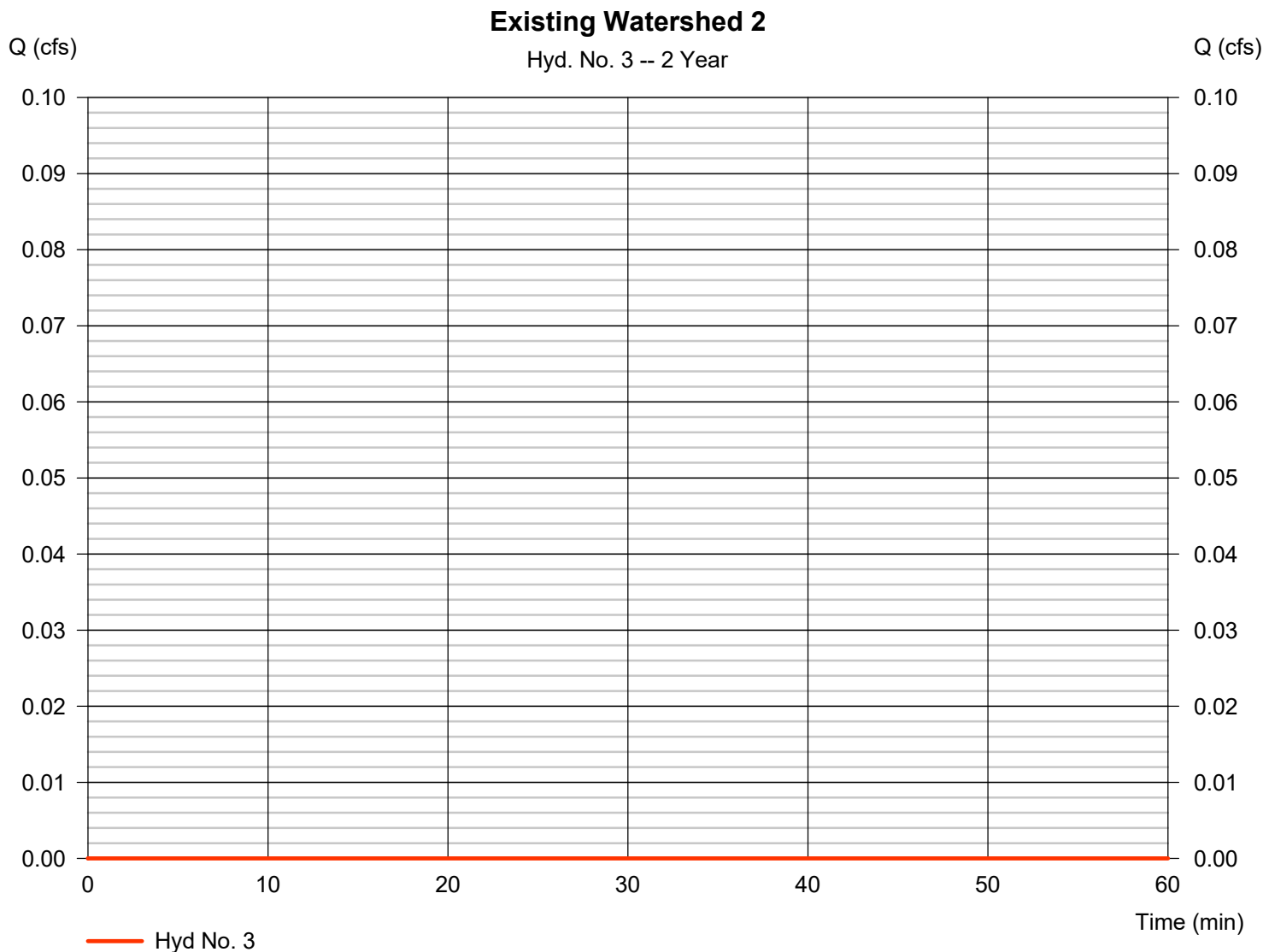
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 3

Existing Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.000 cfs |
| Storm frequency | = 2 yrs | Time to peak | = n/a |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Drainage area | = 2.020 ac | Curve number | = 30 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 4

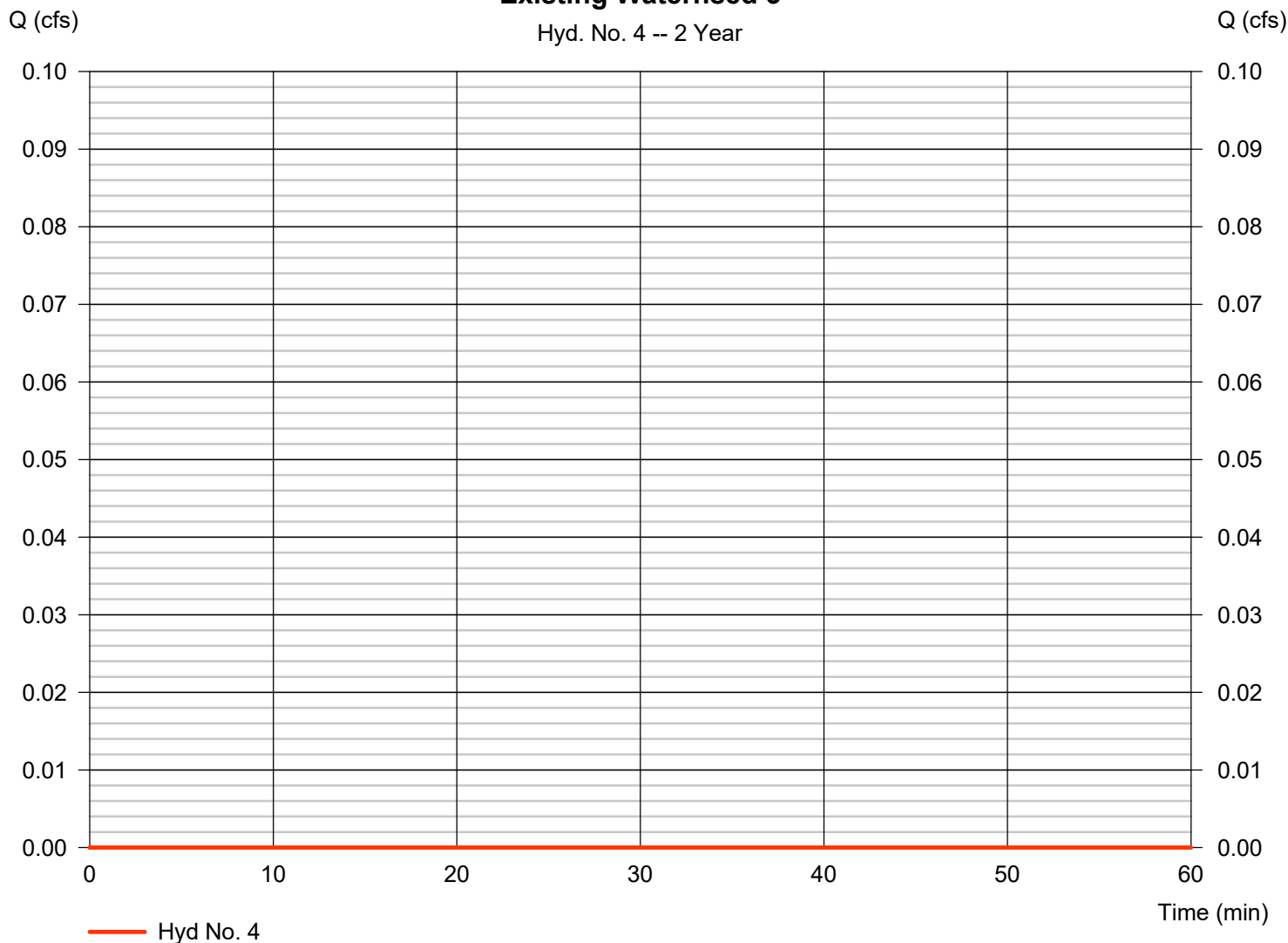
Existing Waterhsed 3

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.000 cfs |
| Storm frequency | = 2 yrs | Time to peak | = n/a |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Drainage area | = 2.900 ac | Curve number | = 31* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 19.10 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.210 x 39) + (2.690 x 30)] / 2.900

Existing Waterhsed 3

Hyd. No. 4 -- 2 Year



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No. 4

Existing Watershed 3

| <u>Description</u> | <u>A</u> | <u>B</u> | <u>C</u> | <u>Totals</u> |
|------------------------------------|----------------|---------------|---------------|------------------|
| Sheet Flow | | | | |
| Manning's n-value | = 0.240 | 0.011 | 0.011 | |
| Flow length (ft) | = 150.0 | 0.0 | 0.0 | |
| Two-year 24-hr precip. (in) | = 3.39 | 0.00 | 0.00 | |
| Land slope (%) | = 2.50 | 0.00 | 0.00 | |
| Travel Time (min) | = 17.54 | + 0.00 | + 0.00 | = 17.54 |
| Shallow Concentrated Flow | | | | |
| Flow length (ft) | = 360.00 | 0.00 | 0.00 | |
| Watercourse slope (%) | = 5.80 | 0.00 | 0.00 | |
| Surface description | = Unpaved | Paved | Paved | |
| Average velocity (ft/s) | =3.89 | 0.00 | 0.00 | |
| Travel Time (min) | = 1.54 | + 0.00 | + 0.00 | = 1.54 |
| Channel Flow | | | | |
| X sectional flow area (sqft) | = 0.00 | 0.00 | 0.00 | |
| Wetted perimeter (ft) | = 0.00 | 0.00 | 0.00 | |
| Channel slope (%) | = 0.00 | 0.00 | 0.00 | |
| Manning's n-value | = 0.015 | 0.015 | 0.015 | |
| Velocity (ft/s) | =0.00 | 0.00 | 0.00 | |
| Flow length (ft) | 0.0 | 0.0 | 0.0 | |
| Travel Time (min) | = 0.00 | + 0.00 | + 0.00 | = 0.00 |
| Total Travel Time, Tc | | | | 19.10 min |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

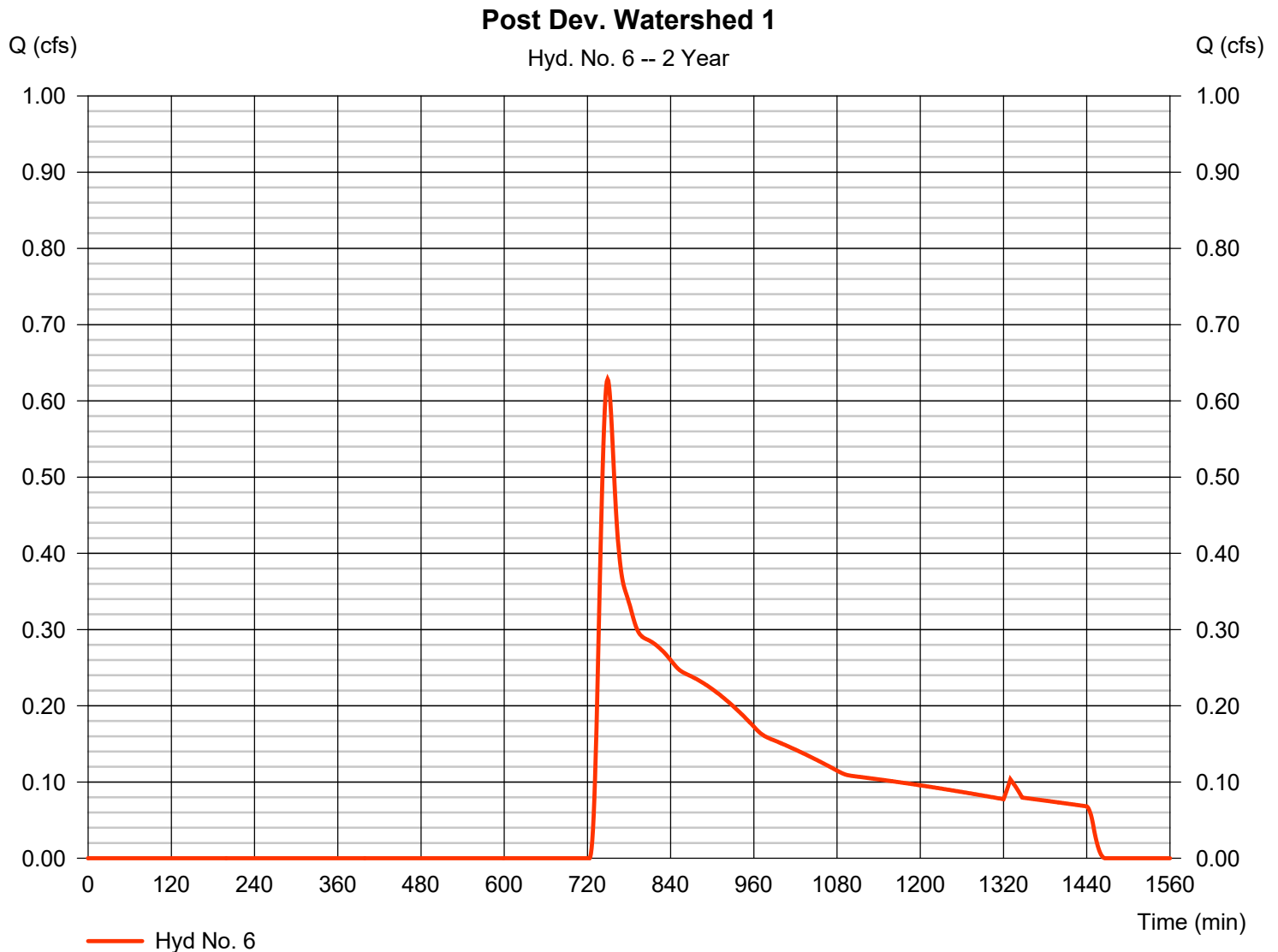
Thursday, 09 / 7 / 2023

Hyd. No. 6

Post Dev. Watershed 1

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.628 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 749 min |
| Time interval | = 1 min | Hyd. volume | = 6,909 cuft |
| Drainage area | = 8.500 ac | Curve number | = 52* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(1.950 x 98) + (6.150 x 39) + (0.400 x 30)] / 8.500



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No. 6

Post Dev. Watershed 1

| <u>Description</u> | <u>A</u> | <u>B</u> | <u>C</u> | <u>Totals</u> |
|------------------------------------|----------------|---------------|---------------|------------------|
| Sheet Flow | | | | |
| Manning's n-value | = 0.240 | 0.011 | 0.011 | |
| Flow length (ft) | = 160.0 | 0.0 | 0.0 | |
| Two-year 24-hr precip. (in) | = 3.39 | 0.00 | 0.00 | |
| Land slope (%) | = 3.70 | 0.00 | 0.00 | |
| Travel Time (min) | = 15.79 | + 0.00 | + 0.00 | = 15.79 |
| Shallow Concentrated Flow | | | | |
| Flow length (ft) | = 70.00 | 105.00 | 0.00 | |
| Watercourse slope (%) | = 14.30 | 2.80 | 0.00 | |
| Surface description | = Unpaved | Unpaved | Paved | |
| Average velocity (ft/s) | =6.10 | 2.70 | 0.00 | |
| Travel Time (min) | = 0.19 | + 0.65 | + 0.00 | = 0.84 |
| Channel Flow | | | | |
| X sectional flow area (sqft) | = 0.00 | 0.00 | 0.00 | |
| Wetted perimeter (ft) | = 0.00 | 0.00 | 0.00 | |
| Channel slope (%) | = 0.00 | 0.00 | 0.00 | |
| Manning's n-value | = 0.015 | 0.015 | 0.015 | |
| Velocity (ft/s) | =0.00 | 0.00 | 0.00 | |
| Flow length (ft) | 0.0 | 0.0 | 0.0 | |
| Travel Time (min) | = 0.00 | + 0.00 | + 0.00 | = 0.00 |
| Total Travel Time, Tc | | | | 16.60 min |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

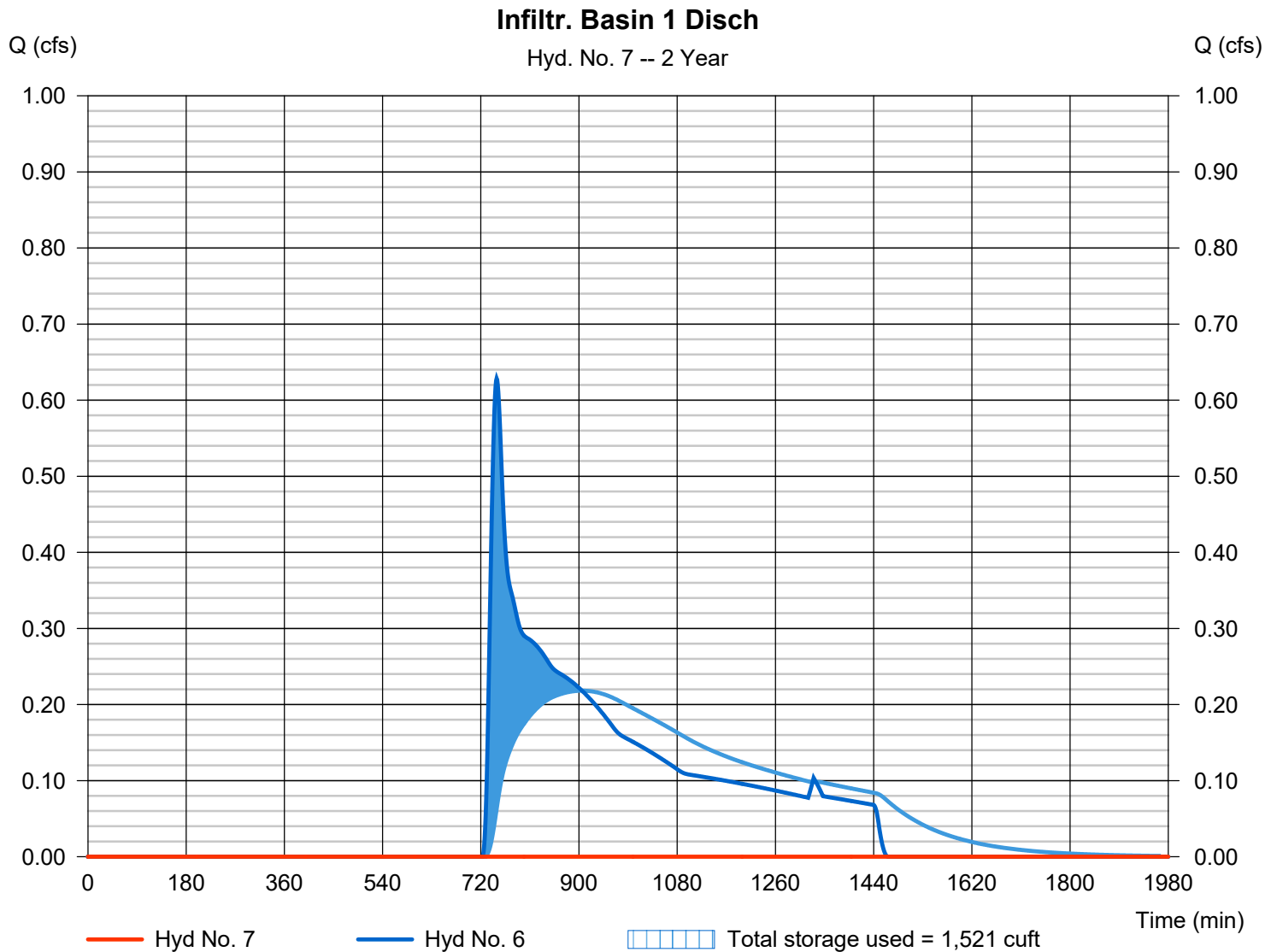
Thursday, 09 / 7 / 2023

Hyd. No. 7

Infiltr. Basin 1 Disch

| | | | |
|-----------------|-----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 797 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 6 - Post Dev. Watershed 1 | Max. Elevation | = 269.00 ft |
| Reservoir name | = PR Infiltration Basin 1 | Max. Storage | = 1,521 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 2 - PR Infiltration Basin 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 268.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 268.00 | 14 | 0 | 0 |
| 2.00 | 270.00 | 4,320 | 3,053 | 3,053 |
| 4.00 | 272.00 | 8,683 | 12,750 | 15,803 |
| 6.00 | 274.00 | 11,945 | 20,539 | 36,343 |
| 8.00 | 276.00 | 15,085 | 26,966 | 63,309 |
| 10.00 | 278.00 | 19,850 | 34,823 | 98,132 |

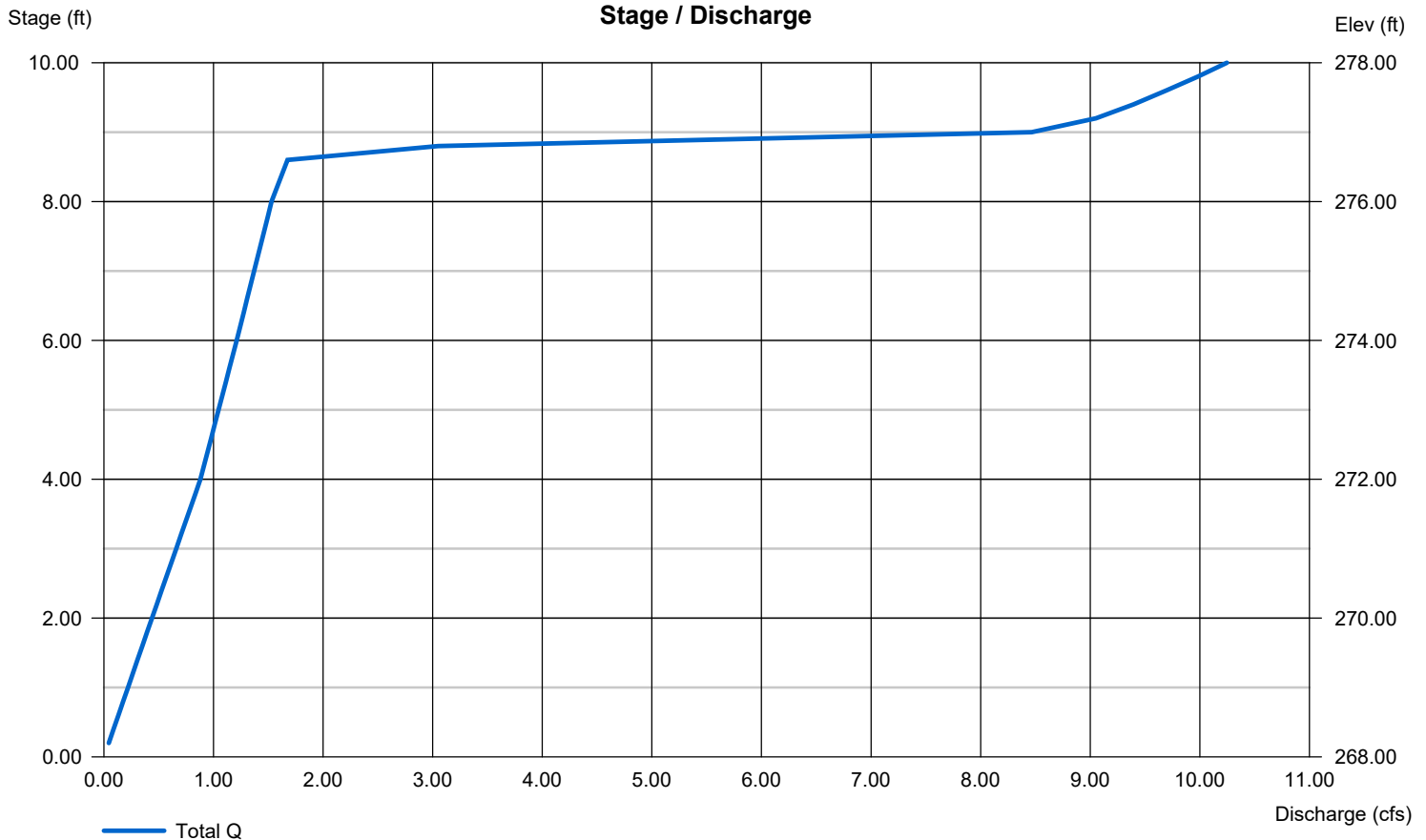
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|----------|------|------|----------|
| Rise (in) | = 15.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 15.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 274.40 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 155.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.80 | 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) | = 12.60 | 0.00 | 0.00 | 0.00 |
| Crest El. (ft) | = 276.70 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 3.33 | 3.33 | 3.33 |
| Weir Type | = 1 | --- | --- | --- |
| Multi-Stage | = Yes | No | No | No |
| Exfil.(in/hr) | = 4.380 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

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



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

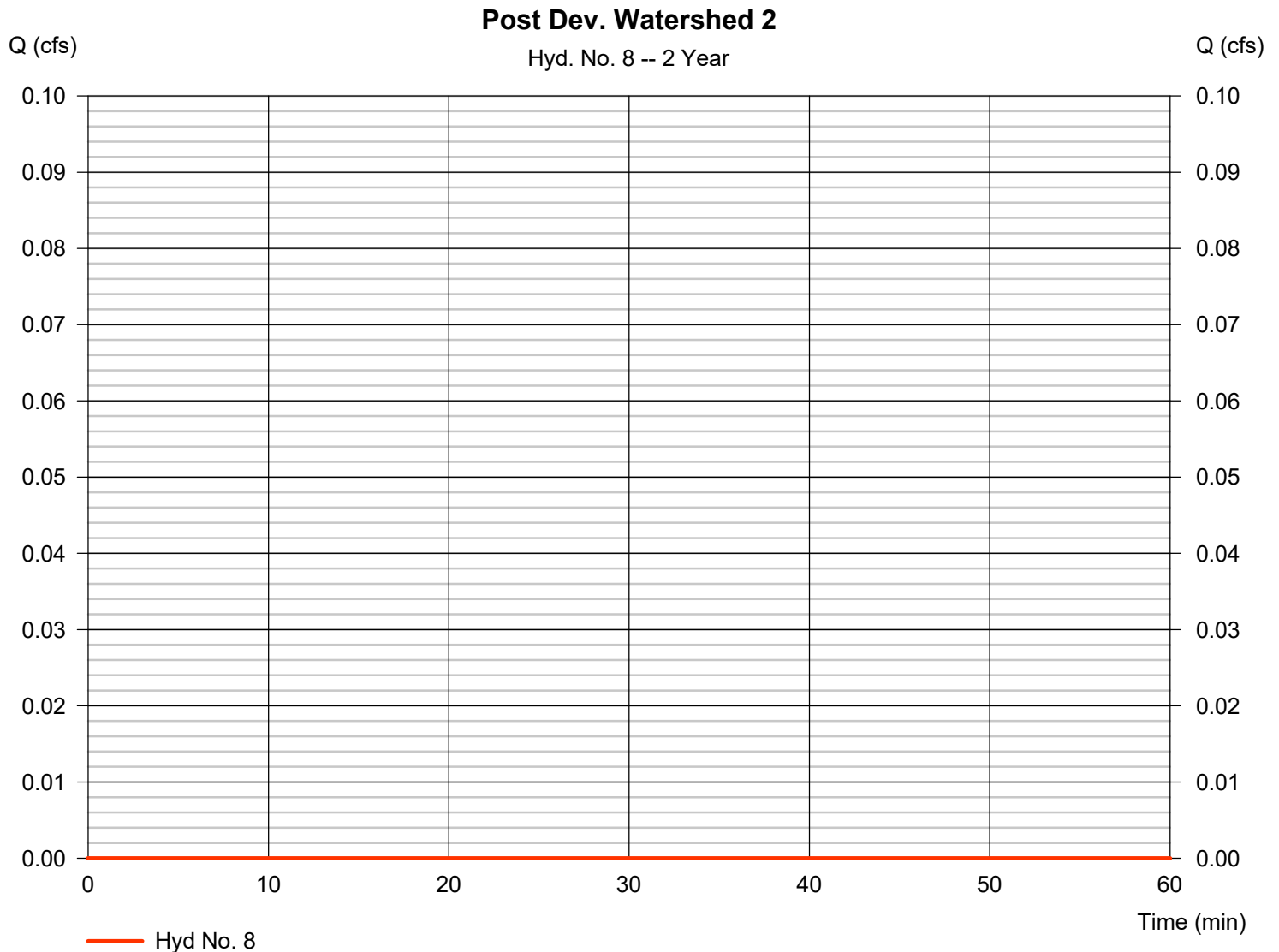
Thursday, 09 / 7 / 2023

Hyd. No. 8

Post Dev. Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.000 cfs |
| Storm frequency | = 2 yrs | Time to peak | = n/a |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Drainage area | = 0.640 ac | Curve number | = 37* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.130 x 30) + (0.510 x 39)] / 0.640



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 9

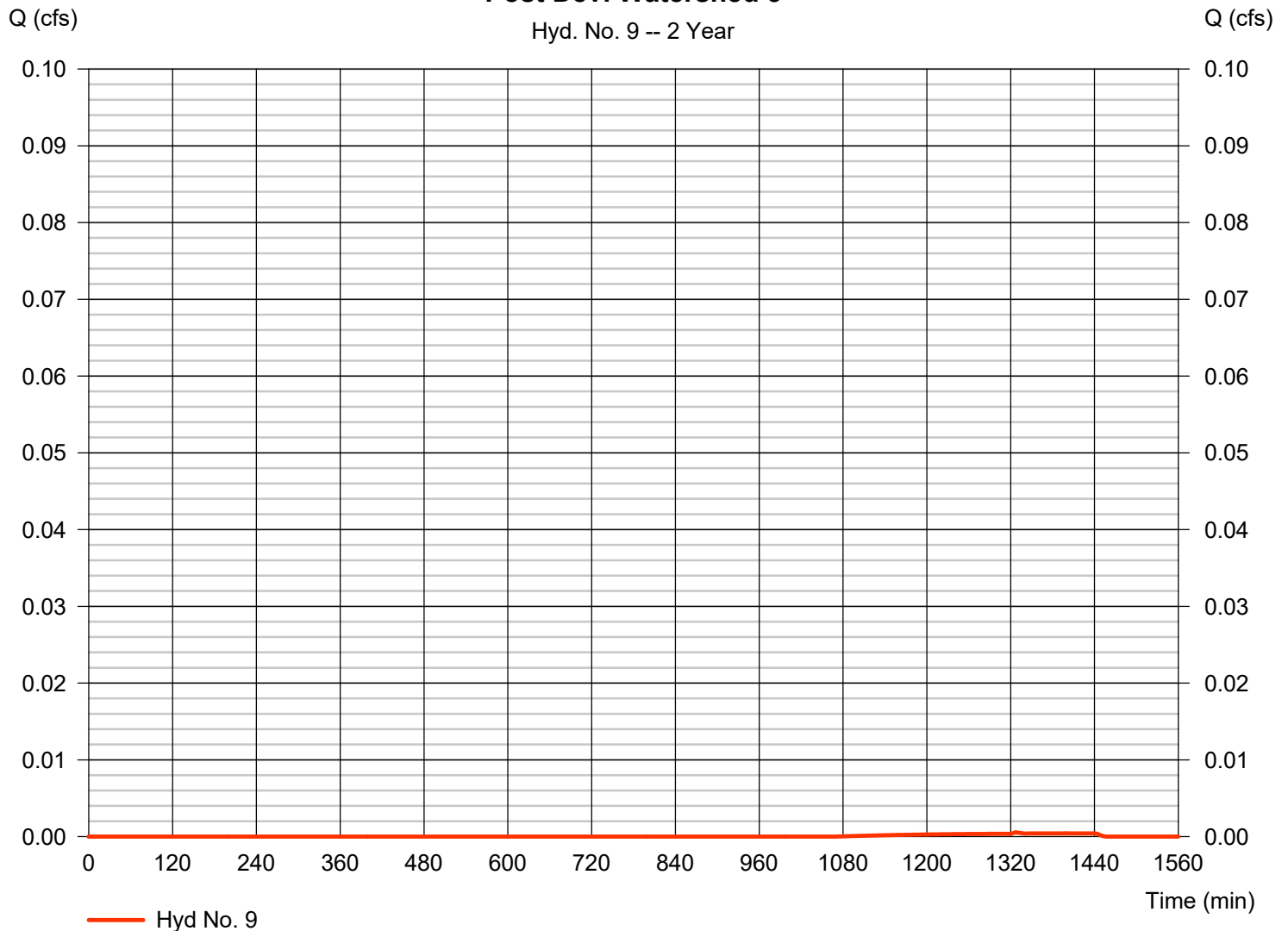
Post Dev. Watershed 3

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.001 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 1327 min |
| Time interval | = 1 min | Hyd. volume | = 7 cuft |
| Drainage area | = 0.430 ac | Curve number | = 39* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 10.50 min |
| Total precip. | = 3.39 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.430 x 39)] / 0.430

Post Dev. Watershed 3

Hyd. No. 9 -- 2 Year



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Hyd. No. 9

Post Dev. Watershed 3

| <u>Description</u> | <u>A</u> | <u>B</u> | <u>C</u> | <u>Totals</u> |
|------------------------------------|---------------|----------------------|----------------------|------------------|
| Sheet Flow | | | | |
| Manning's n-value | = 0.240 | 0.011 | 0.011 | |
| Flow length (ft) | = 60.0 | 0.0 | 0.0 | |
| Two-year 24-hr precip. (in) | = 3.39 | 0.00 | 0.00 | |
| Land slope (%) | = 1.70 | 0.00 | 0.00 | |
| Travel Time (min) | = 9.83 | + 0.00 | + 0.00 | = 9.83 |
| Shallow Concentrated Flow | | | | |
| Flow length (ft) | = 160.00 | 0.00 | 0.00 | |
| Watercourse slope (%) | = 6.30 | 0.00 | 0.00 | |
| Surface description | = Unpaved | Paved | Paved | |
| Average velocity (ft/s) | =4.05 | 0.00 | 0.00 | |
| Travel Time (min) | = 0.66 | + 0.00 | + 0.00 | = 0.66 |
| Channel Flow | | | | |
| X sectional flow area (sqft) | = 0.00 | 0.00 | 0.00 | |
| Wetted perimeter (ft) | = 0.00 | 0.00 | 0.00 | |
| Channel slope (%) | = 0.00 | 0.00 | 0.00 | |
| Manning's n-value | = 0.015 | 0.015 | 0.015 | |
| Velocity (ft/s) | =0.00 | 0.00 | 0.00 | |
| Flow length (ft) | 0.0 | 0.0 | 0.0 | |
| Travel Time (min) | = 0.00 | + 0.00 | + 0.00 | = 0.00 |
| Total Travel Time, Tc | | | | 10.50 min |

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| 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 | 1.114 | 1 | 743 | 8,452 | ----- | ----- | ----- | Existing Watershed 1 | |
| 2 | Reservoir | 0.000 | 1 | 775 | 0 | 1 | 269.71 | 1,480 | Ex Inf. Basin 1 Disch. | |
| 3 | SCS Runoff | 0.006 | 1 | 1324 | 60 | ----- | ----- | ----- | Existing Watershed 2 | |
| 4 | SCS Runoff | 0.009 | 1 | 1332 | 193 | ----- | ----- | ----- | Existing Waterhsed 3 | |
| 6 | SCS Runoff | 4.752 | 1 | 737 | 26,493 | ----- | ----- | ----- | Post Dev. Watershed 1 | |
| 7 | Reservoir | 0.000 | 1 | 738 | 0 | 6 | 271.07 | 9,895 | Infiltr. Basin 1 Disch | |
| 8 | SCS Runoff | 0.014 | 1 | 825 | 367 | ----- | ----- | ----- | Post Dev. Watershed 2 | |
| 9 | SCS Runoff | 0.020 | 1 | 750 | 351 | ----- | ----- | ----- | Post Dev. Watershed 3 | |
| 7283 TR55 R1.gpw | | | | | Return Period: 10 Year | | | Thursday, 09 / 7 / 2023 | | |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

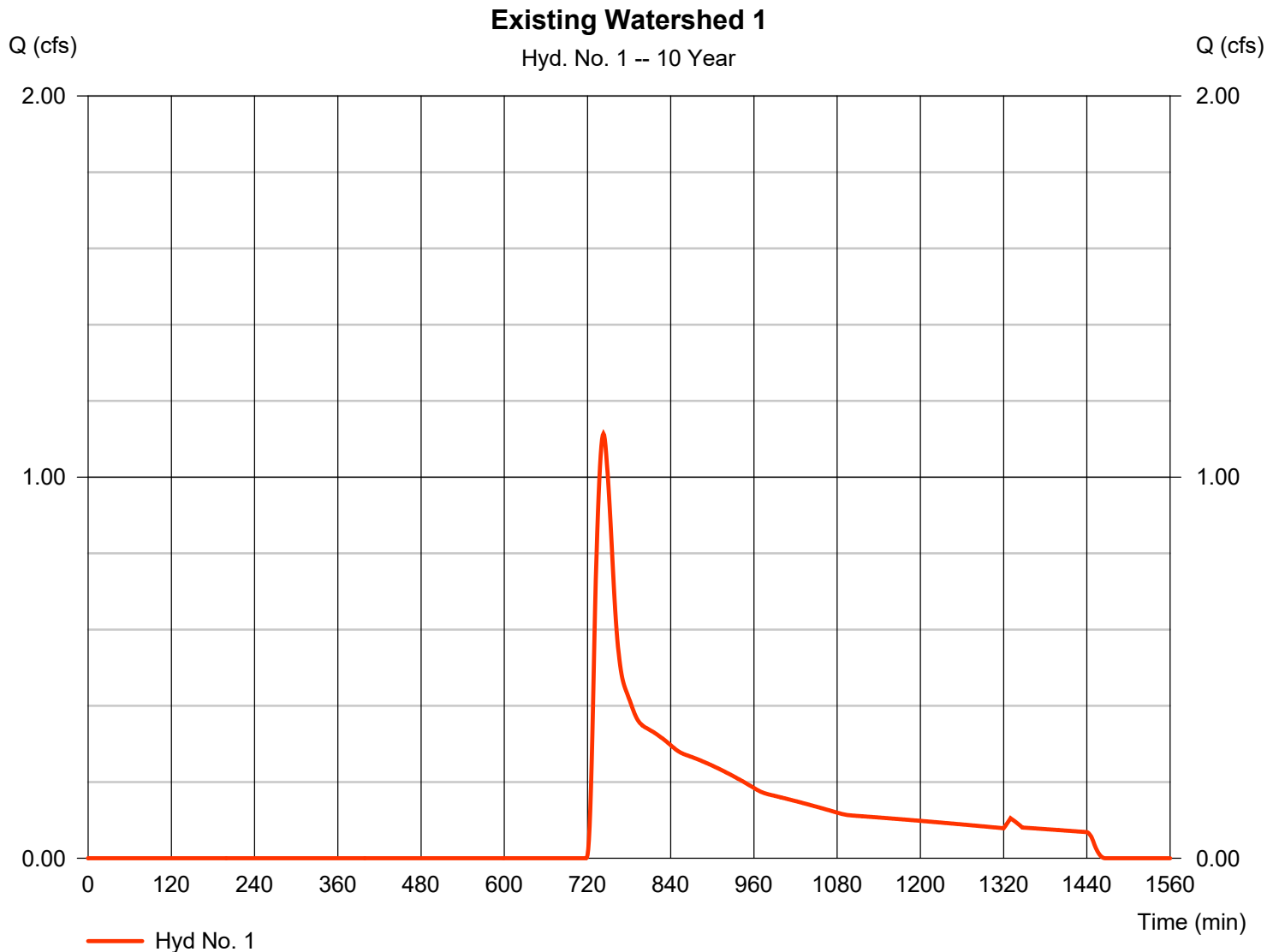
Thursday, 09 / 7 / 2023

Hyd. No. 1

Existing Watershed 1

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.114 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 743 min |
| Time interval | = 1 min | Hyd. volume | = 8,452 cuft |
| Drainage area | = 4.400 ac | Curve number | = 46* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.690 x 98) + (2.470 x 39) + (1.240 x 30)] / 4.400



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

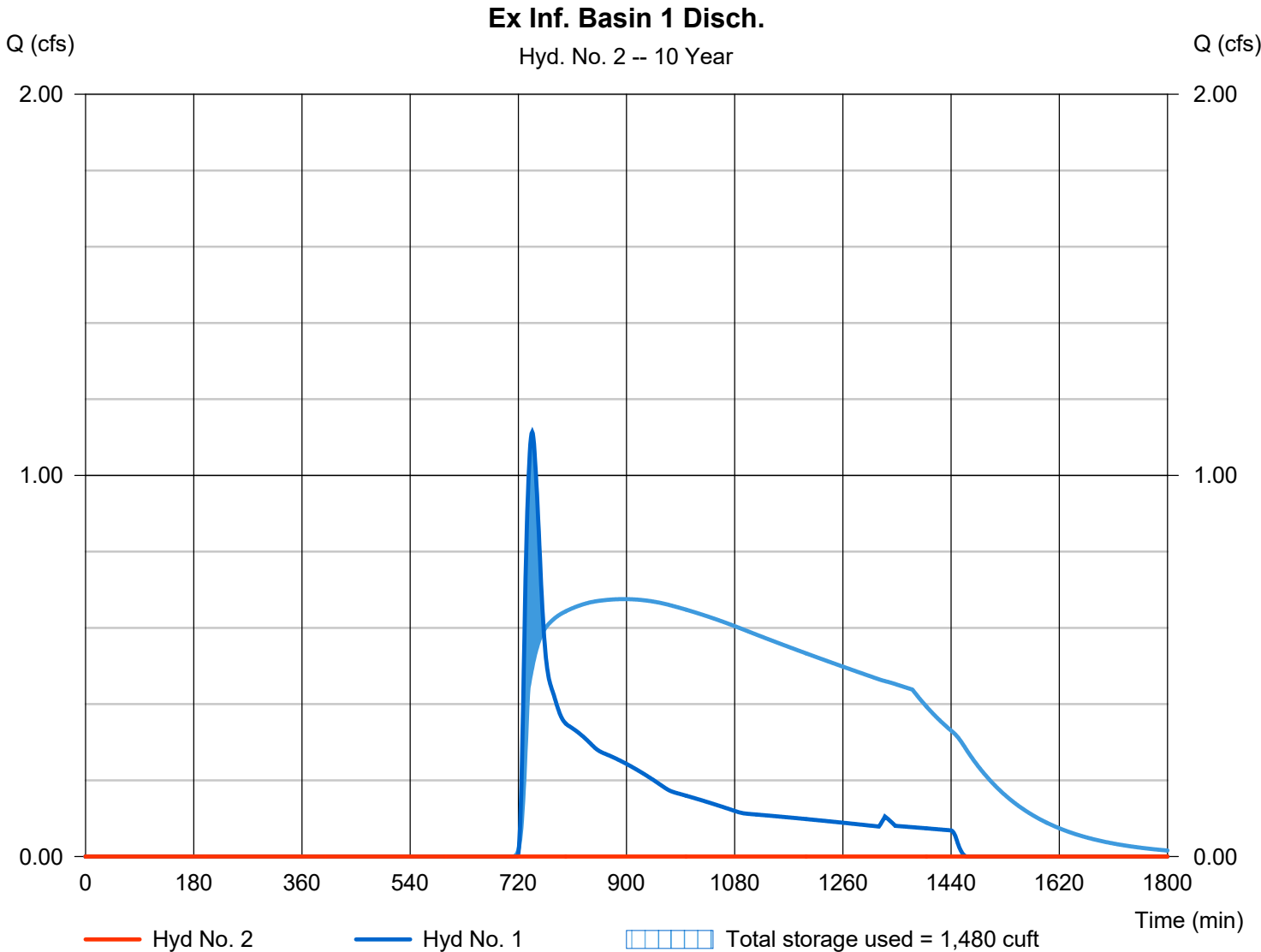
Thursday, 09 / 7 / 2023

Hyd. No. 2

Ex Inf. Basin 1 Disch.

| | | | |
|-----------------|----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 775 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 1 - Existing Watershed 1 | Max. Elevation | = 269.71 ft |
| Reservoir name | = EX Infiltration Basin | Max. Storage | = 1,480 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.

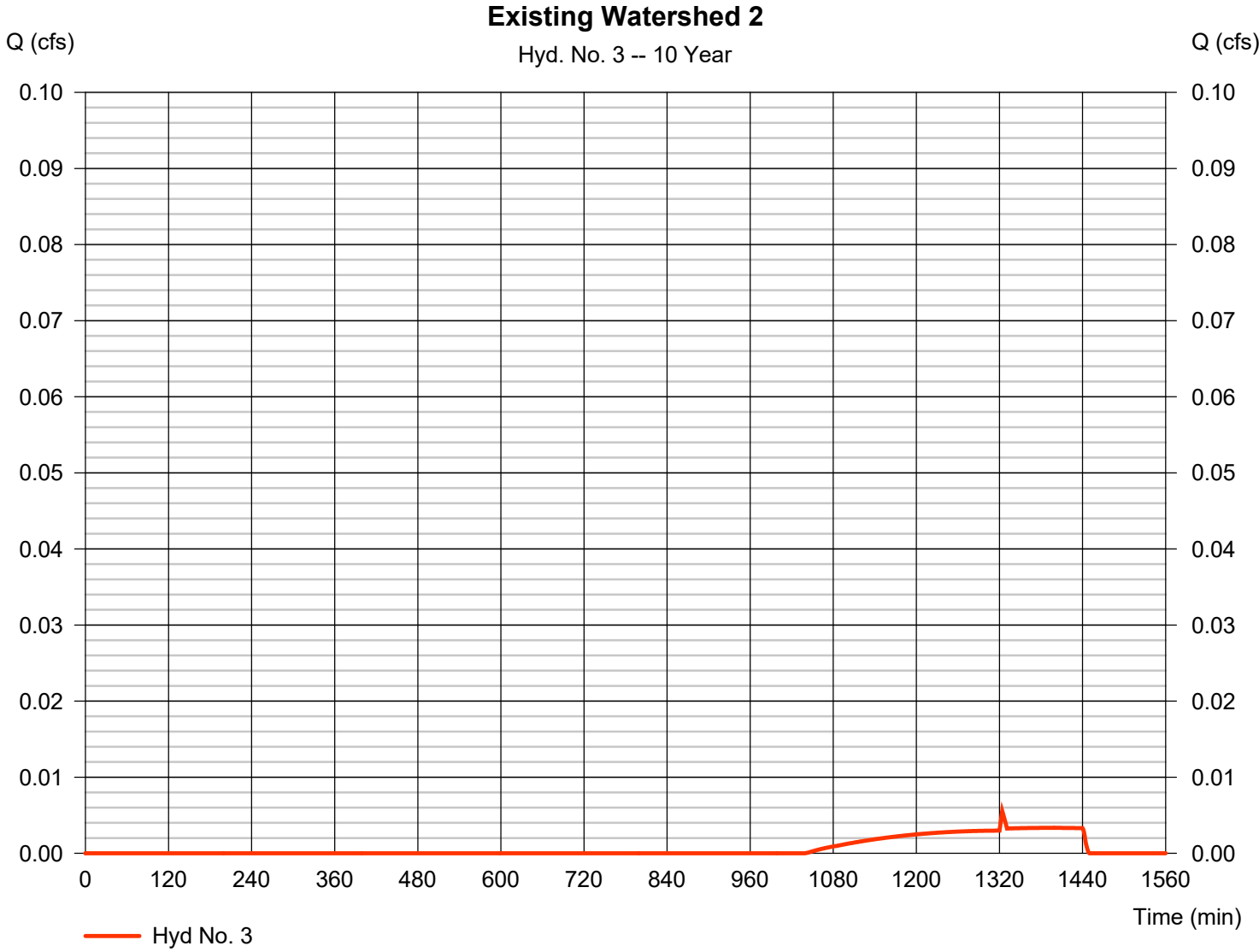


Hydrograph Report

Hyd. No. 3

Existing Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.006 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 1324 min |
| Time interval | = 1 min | Hyd. volume | = 60 cuft |
| Drainage area | = 2.020 ac | Curve number | = 30 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

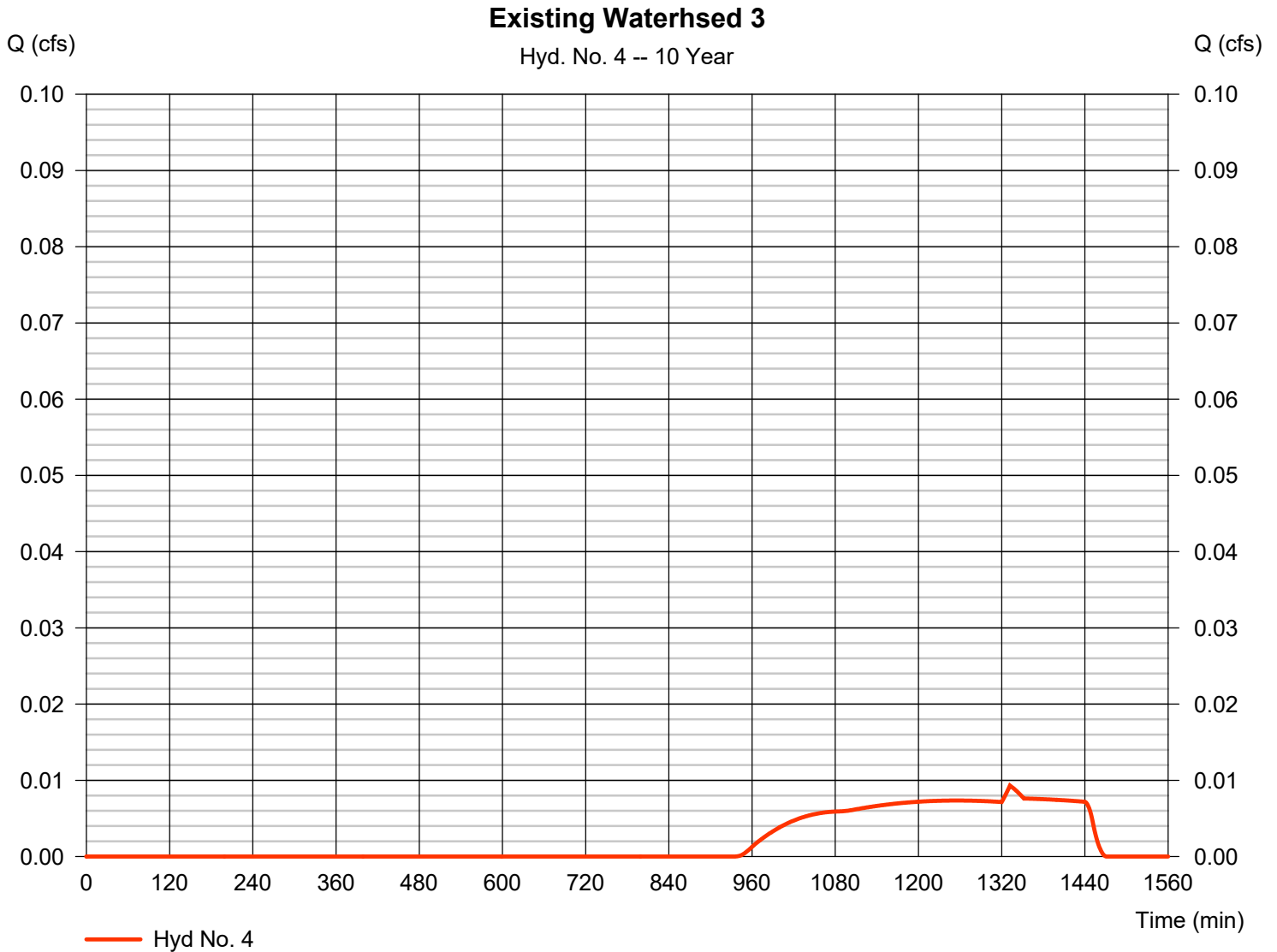
Thursday, 09 / 7 / 2023

Hyd. No. 4

Existing Waterhsed 3

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.009 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 1332 min |
| Time interval | = 1 min | Hyd. volume | = 193 cuft |
| Drainage area | = 2.900 ac | Curve number | = 31* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 19.10 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.210 x 39) + (2.690 x 30)] / 2.900



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

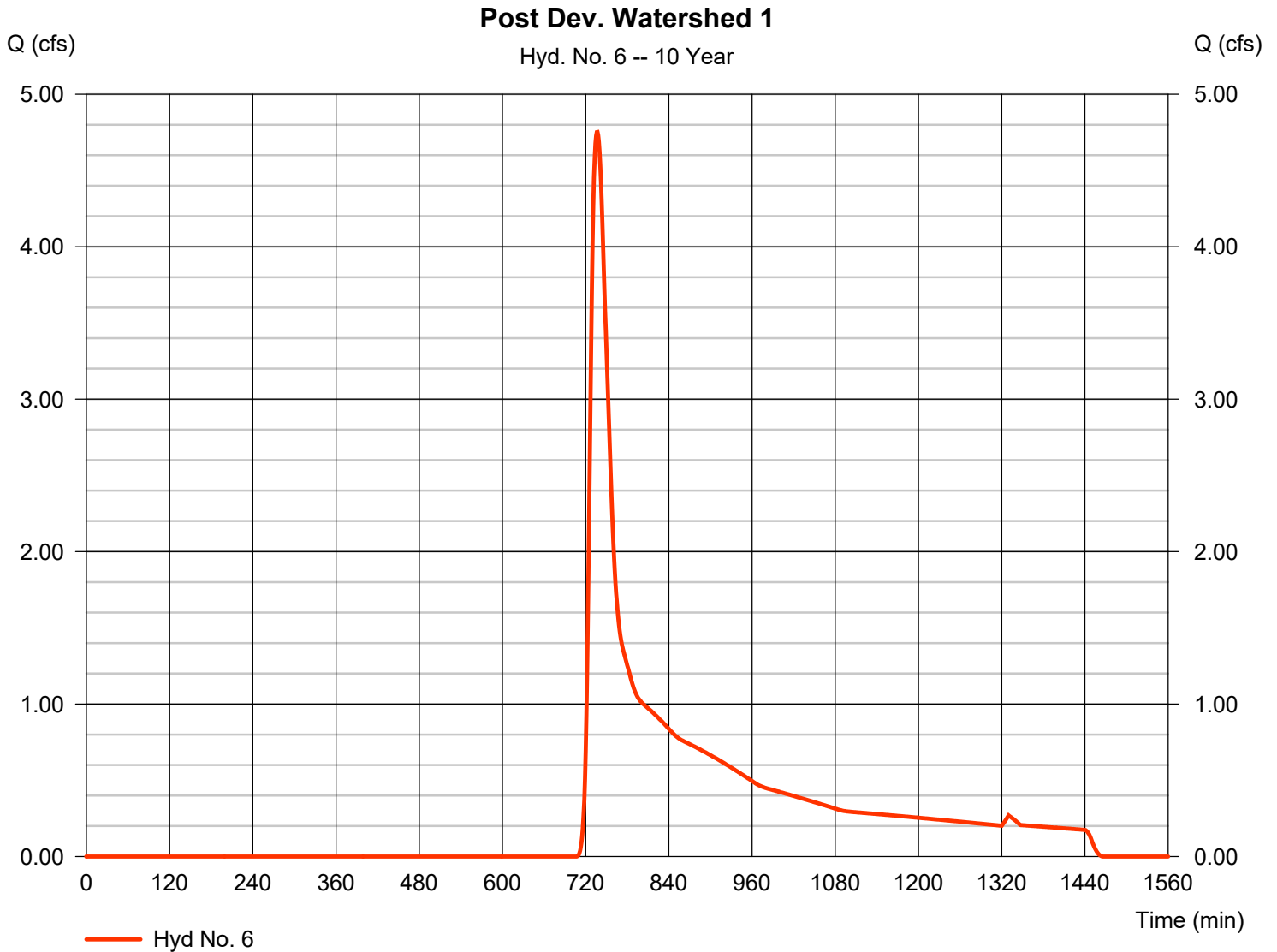
Thursday, 09 / 7 / 2023

Hyd. No. 6

Post Dev. Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 4.752 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 737 min |
| Time interval | = 1 min | Hyd. volume | = 26,493 cuft |
| Drainage area | = 8.500 ac | Curve number | = 52* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(1.950 x 98) + (6.150 x 39) + (0.400 x 30)] / 8.500



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

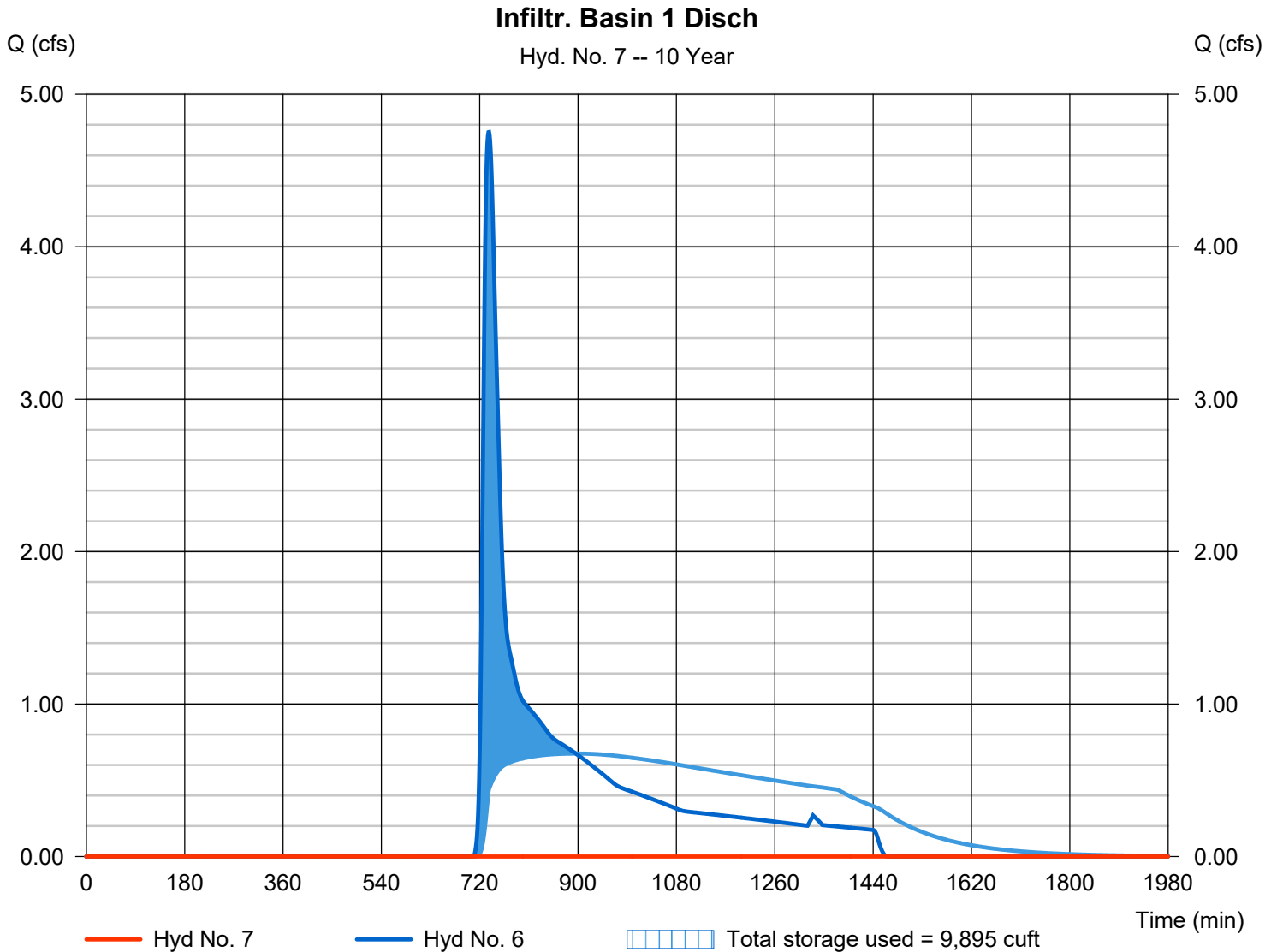
Thursday, 09 / 7 / 2023

Hyd. No. 7

Infiltr. Basin 1 Disch

| | | | |
|-----------------|-----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 738 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 6 - Post Dev. Watershed 1 | Max. Elevation | = 271.07 ft |
| Reservoir name | = PR Infiltration Basin 1 | Max. Storage | = 9,895 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 8

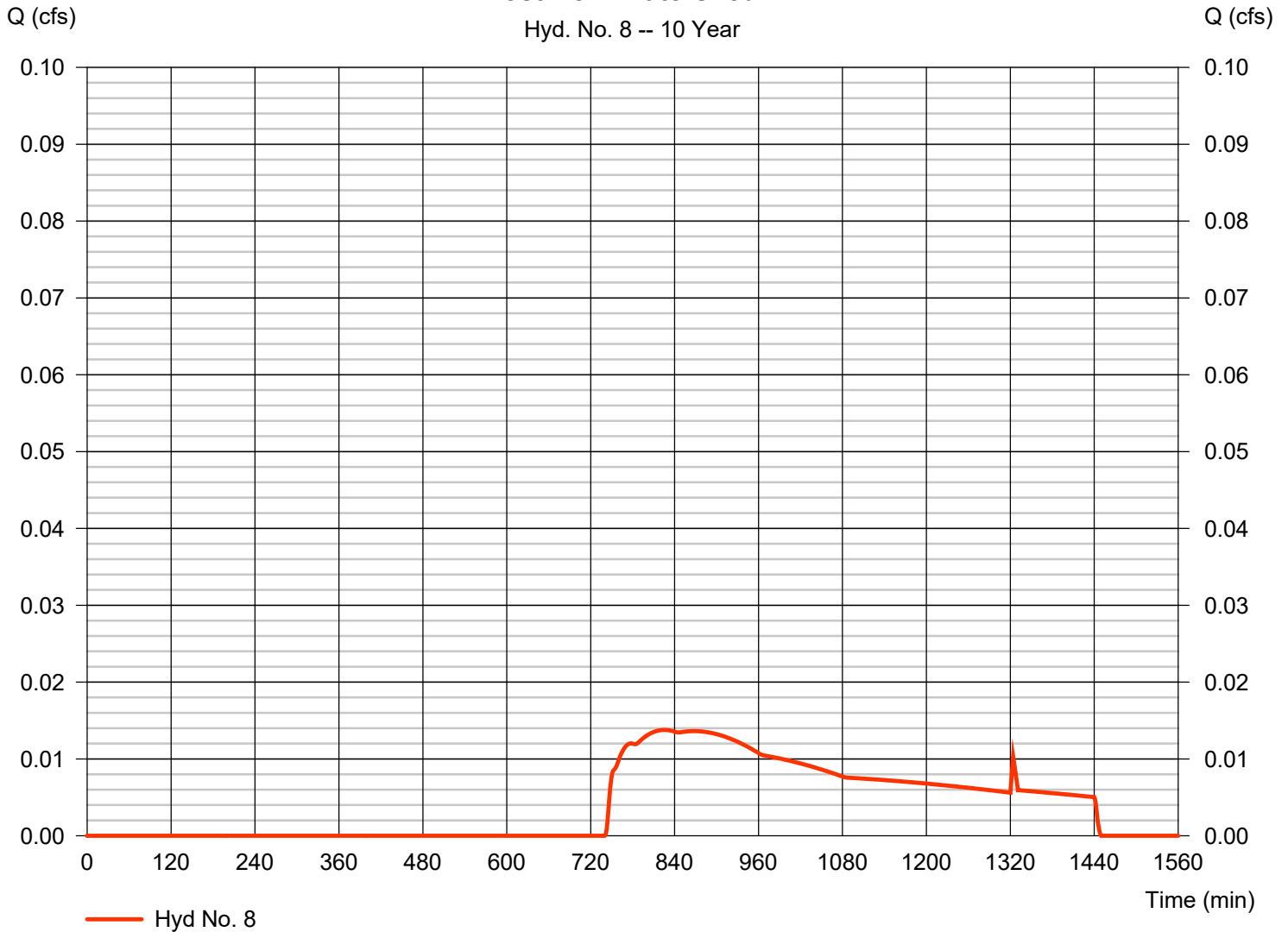
Post Dev. Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.014 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 825 min |
| Time interval | = 1 min | Hyd. volume | = 367 cuft |
| Drainage area | = 0.640 ac | Curve number | = 37* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.130 x 30) + (0.510 x 39)] / 0.640

Post Dev. Watershed 2

Hyd. No. 8 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

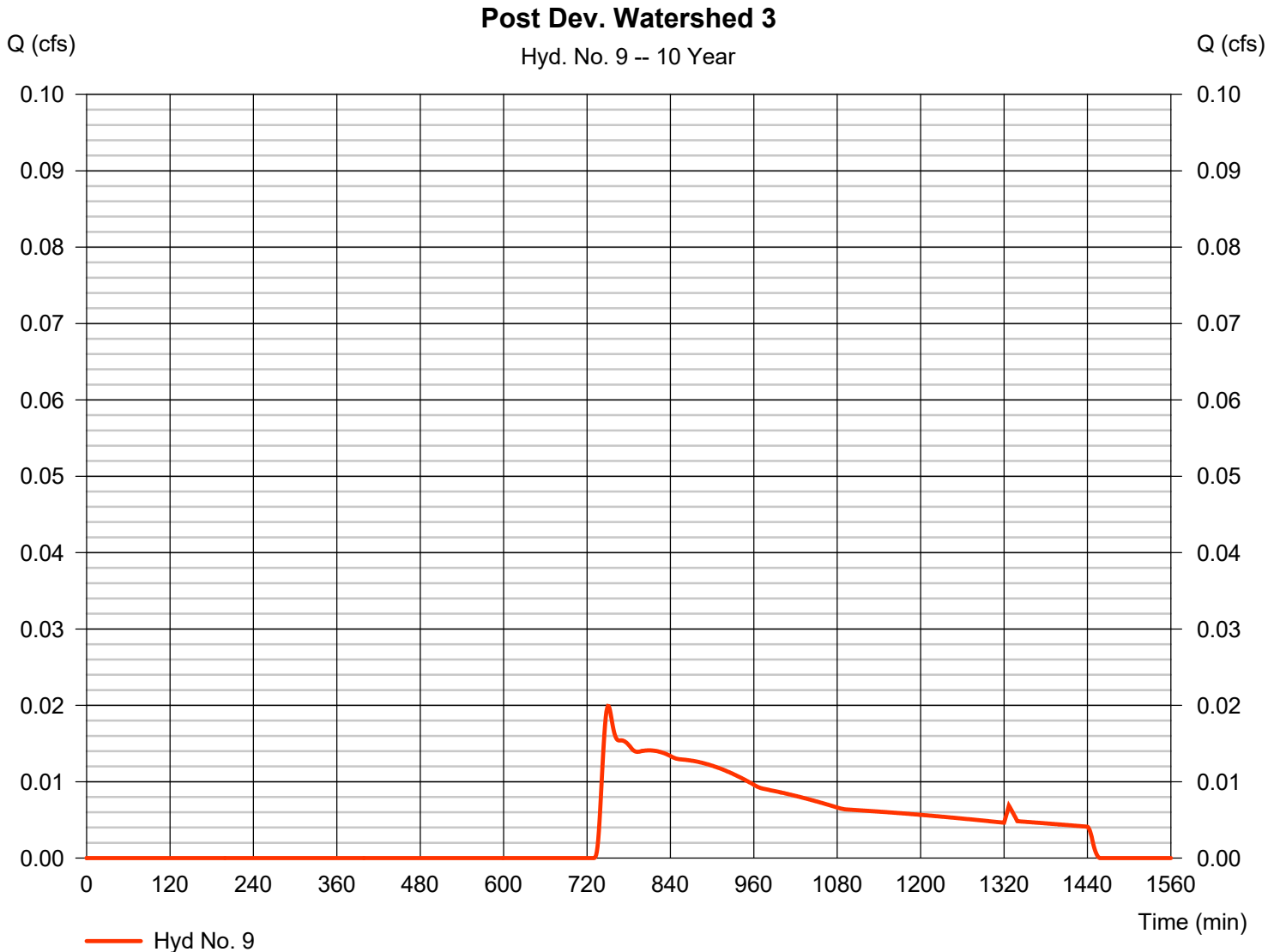
Thursday, 09 / 7 / 2023

Hyd. No. 9

Post Dev. Watershed 3

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.020 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 750 min |
| Time interval | = 1 min | Hyd. volume | = 351 cuft |
| Drainage area | = 0.430 ac | Curve number | = 39* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 10.50 min |
| Total precip. | = 5.10 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.430 x 39)] / 0.430



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| 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 | 2.591 | 1 | 738 | 15,182 | ----- | ----- | ----- | Existing Watershed 1 | |
| 2 | Reservoir | 0.000 | 1 | 740 | 0 | 1 | 270.43 | 3,704 | Ex Inf. Basin 1 Disch. | |
| 3 | SCS Runoff | 0.026 | 1 | 1324 | 688 | ----- | ----- | ----- | Existing Watershed 2 | |
| 4 | SCS Runoff | 0.047 | 1 | 905 | 1,296 | ----- | ----- | ----- | Existing Waterhsed 3 | |
| 6 | SCS Runoff | 8.872 | 1 | 734 | 43,090 | ----- | ----- | ----- | Post Dev. Watershed 1 | |
| 7 | Reservoir | 0.000 | 1 | 790 | 0 | 6 | 272.33 | 19,160 | Infiltr. Basin 1 Disch | |
| 8 | SCS Runoff | 0.089 | 1 | 742 | 925 | ----- | ----- | ----- | Post Dev. Watershed 2 | |
| 9 | SCS Runoff | 0.089 | 1 | 742 | 787 | ----- | ----- | ----- | Post Dev. Watershed 3 | |
| 7283 TR55 R1.gpw | | | | | Return Period: 25 Year | | | Thursday, 09 / 7 / 2023 | | |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

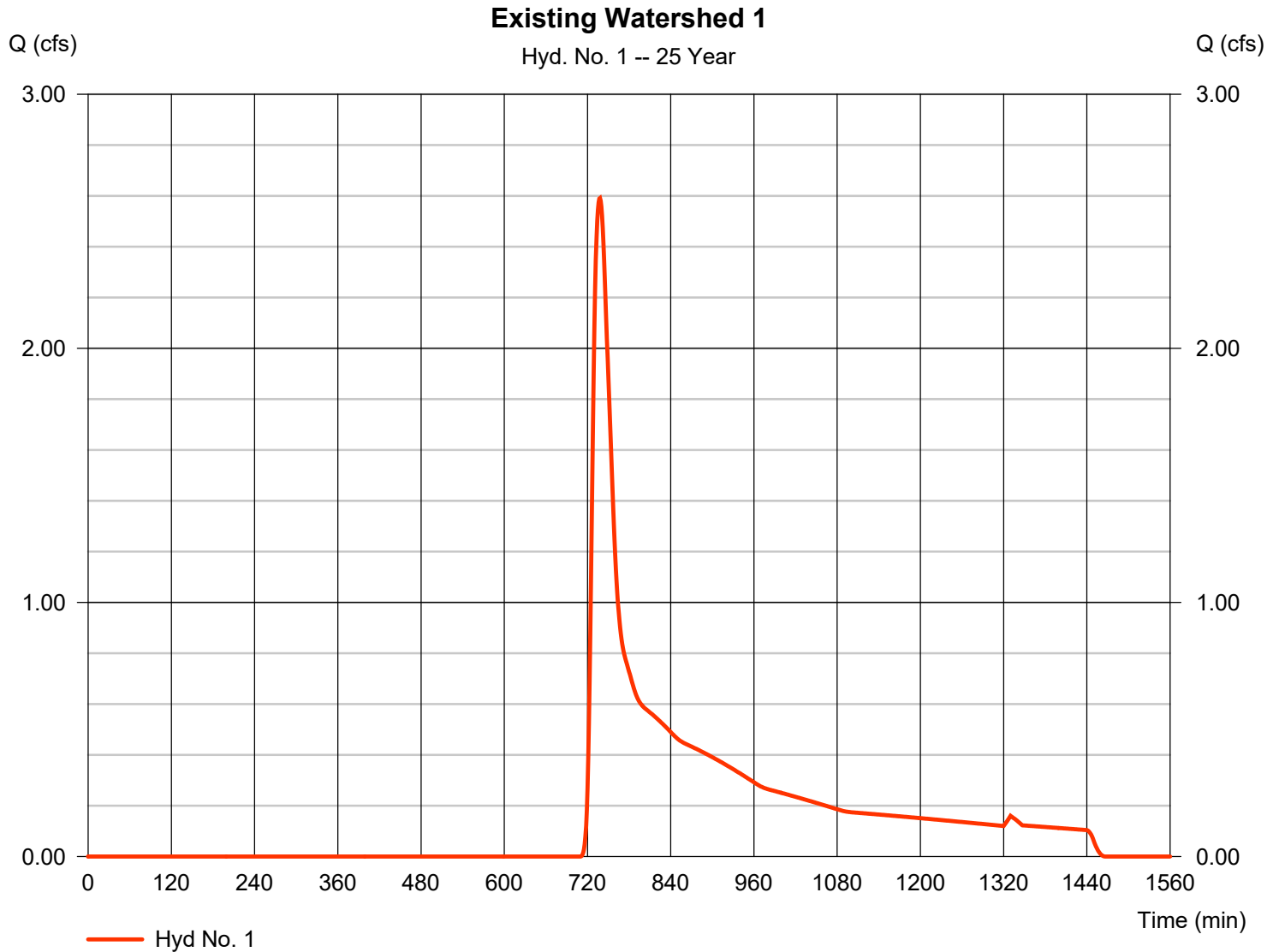
Thursday, 09 / 7 / 2023

Hyd. No. 1

Existing Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.591 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 738 min |
| Time interval | = 1 min | Hyd. volume | = 15,182 cuft |
| Drainage area | = 4.400 ac | Curve number | = 46* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.690 x 98) + (2.470 x 39) + (1.240 x 30)] / 4.400



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

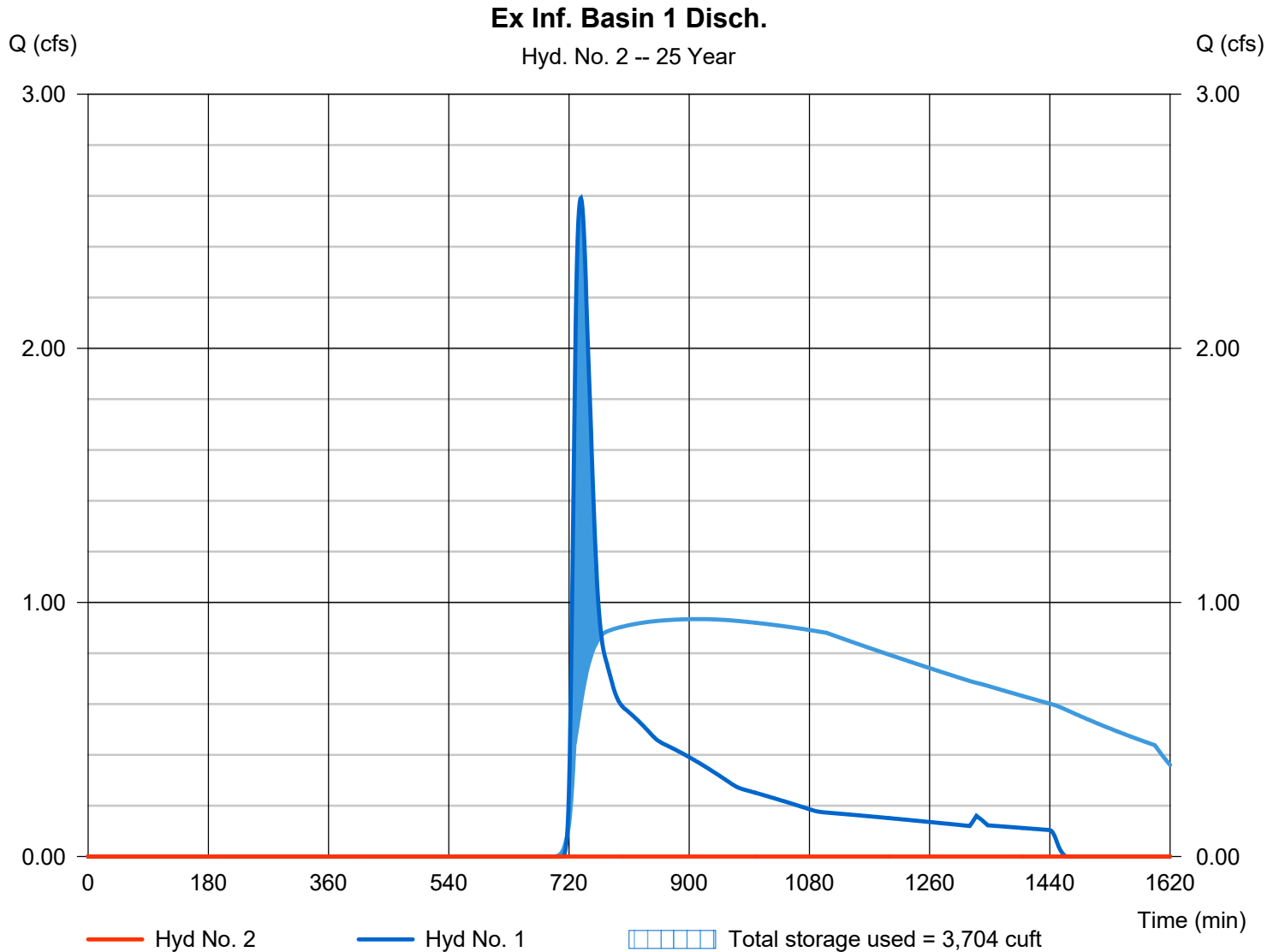
Thursday, 09 / 7 / 2023

Hyd. No. 2

Ex Inf. Basin 1 Disch.

| | | | |
|-----------------|----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 740 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 1 - Existing Watershed 1 | Max. Elevation | = 270.43 ft |
| Reservoir name | = EX Infiltration Basin | Max. Storage | = 3,704 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 3

Existing Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.026 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 1324 min |
| Time interval | = 1 min | Hyd. volume | = 688 cuft |
| Drainage area | = 2.020 ac | Curve number | = 30 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 4

Existing Waterhsed 3

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.047 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 905 min |
| Time interval | = 1 min | Hyd. volume | = 1,296 cuft |
| Drainage area | = 2.900 ac | Curve number | = 31* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 19.10 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.210 x 39) + (2.690 x 30)] / 2.900



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

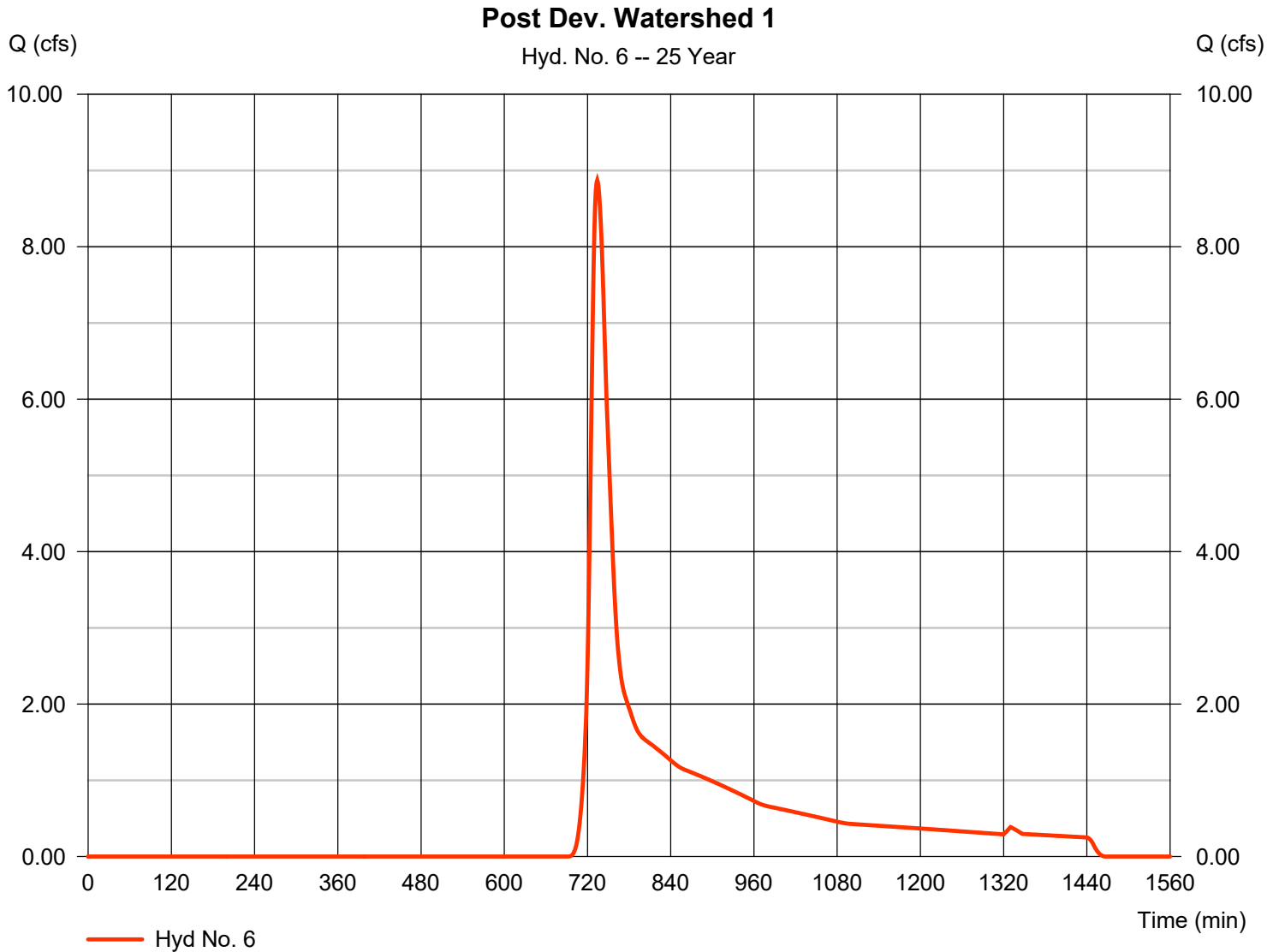
Thursday, 09 / 7 / 2023

Hyd. No. 6

Post Dev. Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 8.872 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 734 min |
| Time interval | = 1 min | Hyd. volume | = 43,090 cuft |
| Drainage area | = 8.500 ac | Curve number | = 52* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(1.950 x 98) + (6.150 x 39) + (0.400 x 30)] / 8.500



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

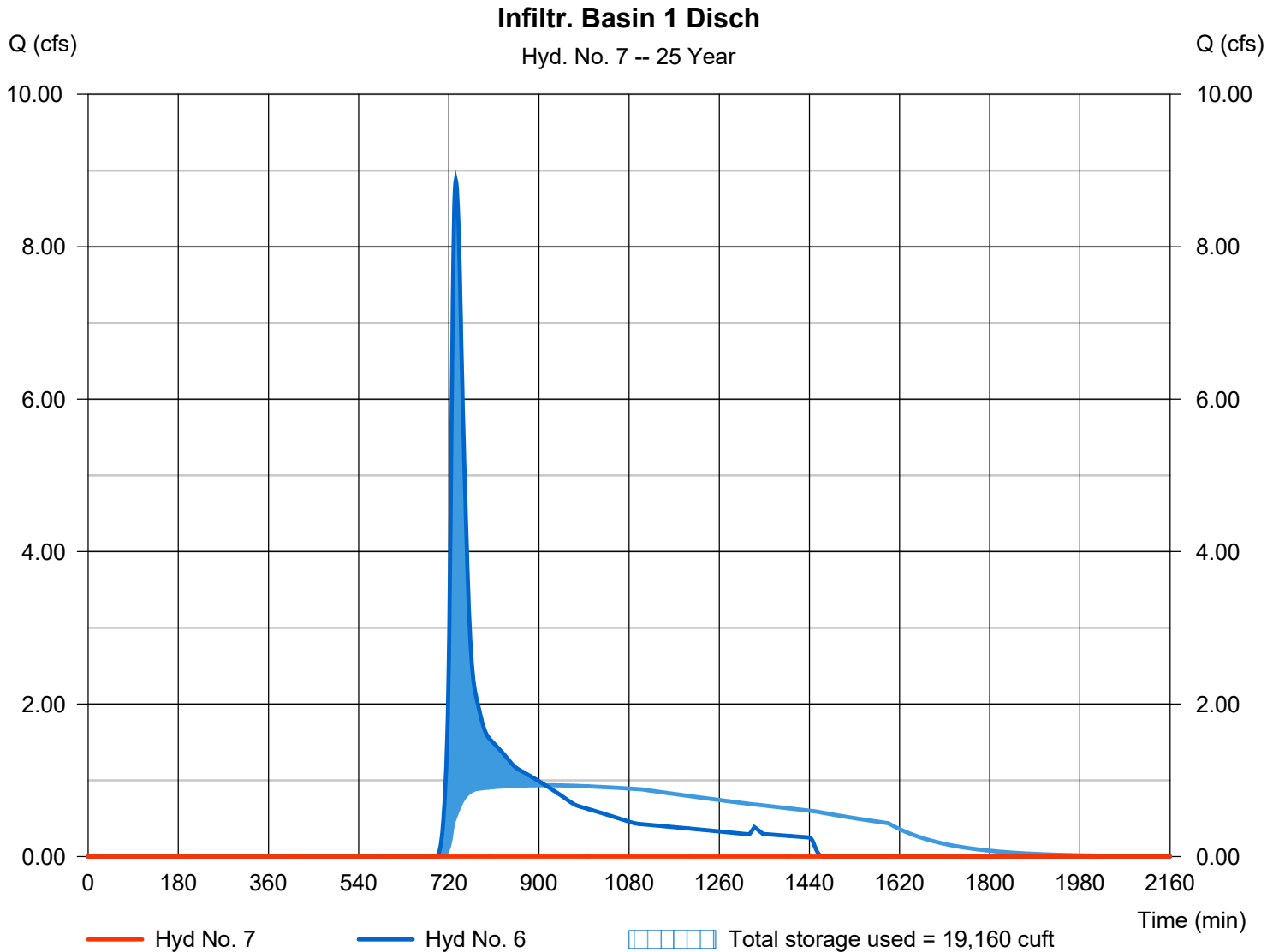
Thursday, 09 / 7 / 2023

Hyd. No. 7

Infiltr. Basin 1 Disch

| | | | |
|-----------------|-----------------------------|----------------|---------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 790 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 6 - Post Dev. Watershed 1 | Max. Elevation | = 272.33 ft |
| Reservoir name | = PR Infiltration Basin 1 | Max. Storage | = 19,160 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 8

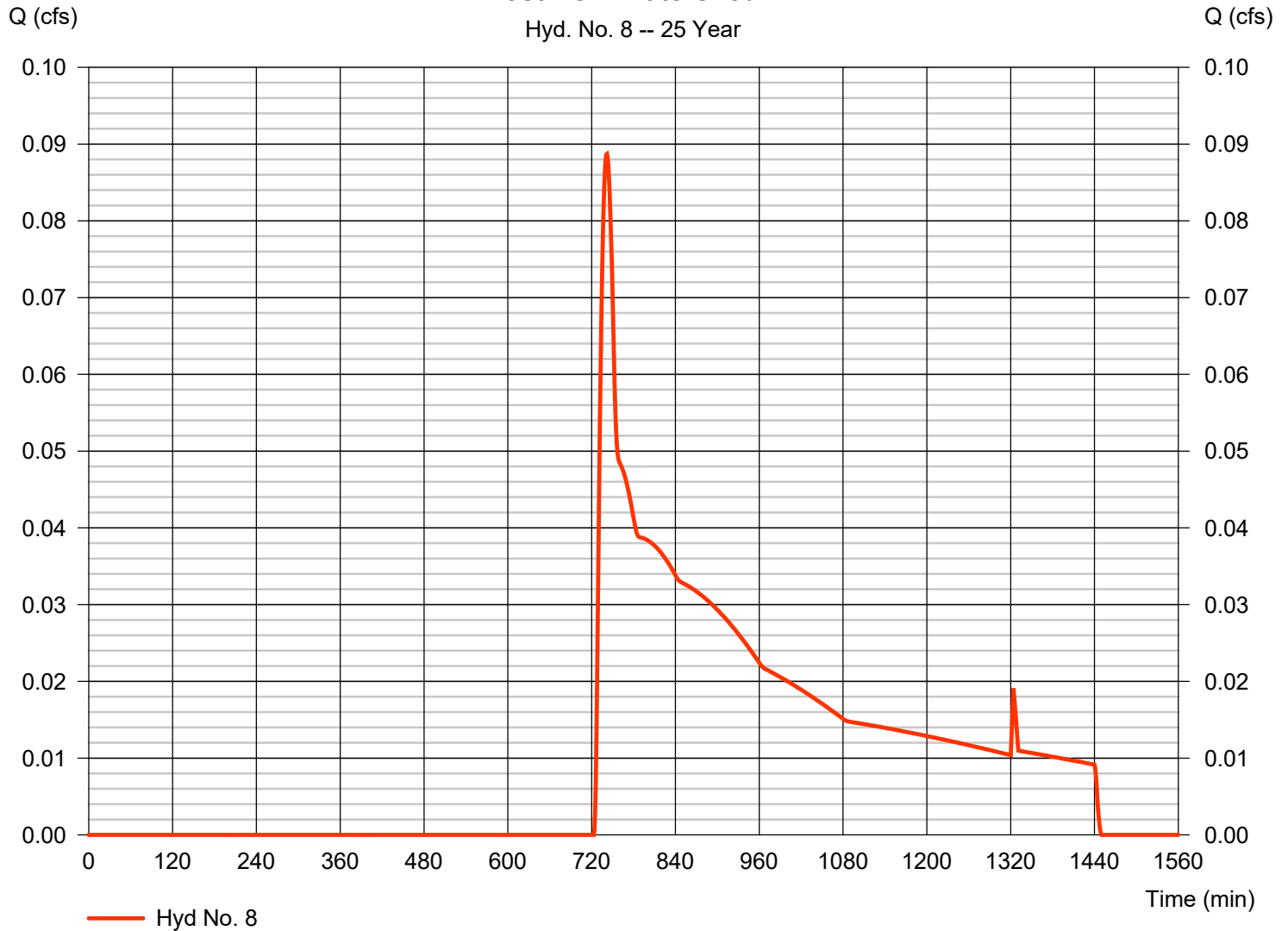
Post Dev. Watershed 2

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.089 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 742 min |
| Time interval | = 1 min | Hyd. volume | = 925 cuft |
| Drainage area | = 0.640 ac | Curve number | = 37* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.130 x 30) + (0.510 x 39)] / 0.640

Post Dev. Watershed 2

Hyd. No. 8 -- 25 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

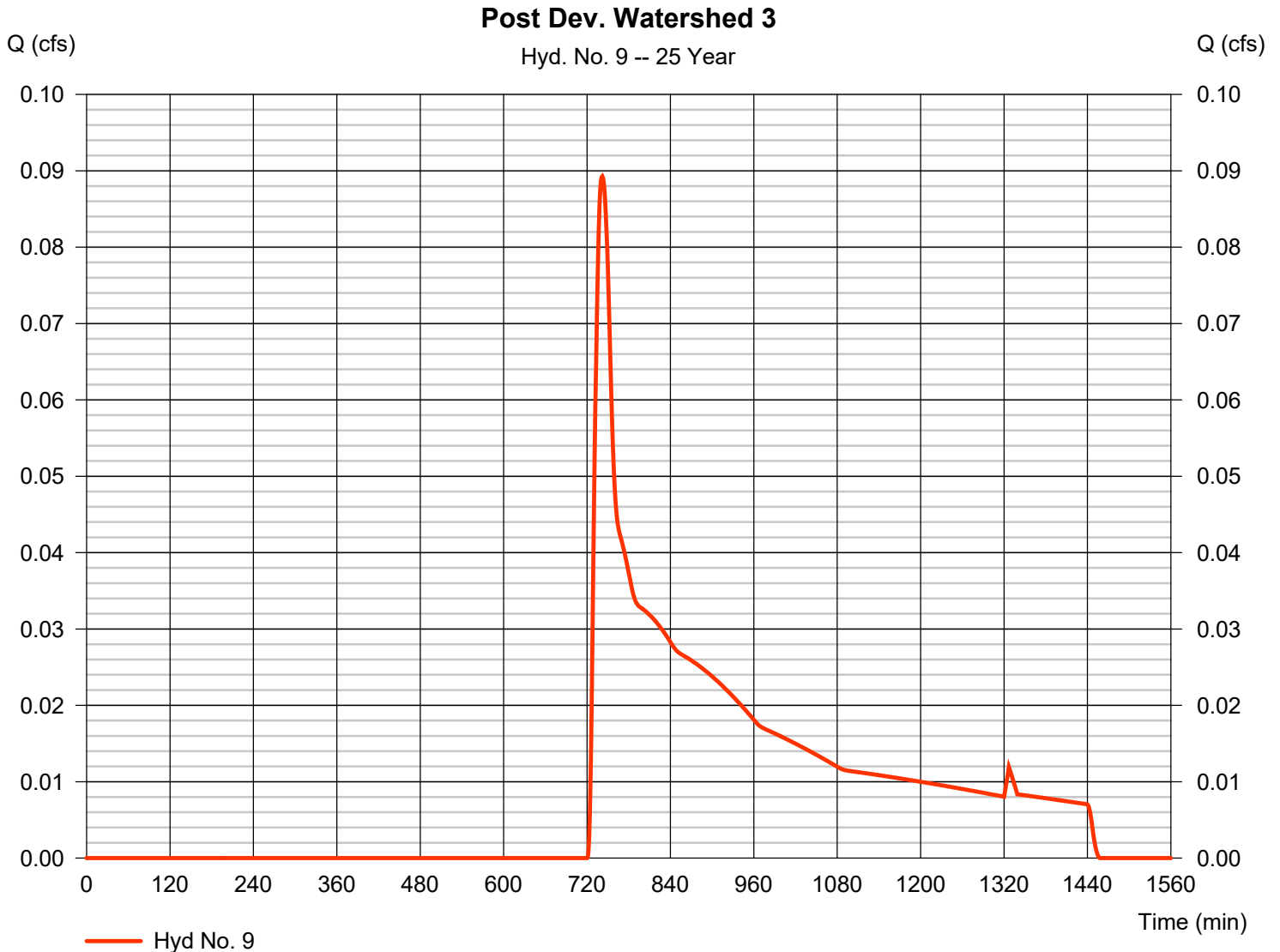
Thursday, 09 / 7 / 2023

Hyd. No. 9

Post Dev. Watershed 3

| | | | |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.089 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 742 min |
| Time interval | = 1 min | Hyd. volume | = 787 cuft |
| Drainage area | = 0.430 ac | Curve number | = 39* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 10.50 min |
| Total precip. | = 6.17 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.430 x 39)] / 0.430



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description | |
|------------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 4.009 | 1 | 735 | 21,038 | ----- | ----- | ----- | Existing Watershed 1 | |
| 2 | Reservoir | 0.000 | 1 | 732 | 0 | 1 | 270.93 | 5,962 | Ex Inf. Basin 1 Disch. | |
| 3 | SCS Runoff | 0.058 | 1 | 827 | 1,552 | ----- | ----- | ----- | Existing Watershed 2 | |
| 4 | SCS Runoff | 0.104 | 1 | 825 | 2,674 | ----- | ----- | ----- | Existing Waterhsed 3 | |
| 6 | SCS Runoff | 12.36 | 1 | 733 | 56,954 | ----- | ----- | ----- | Post Dev. Watershed 1 | |
| 7 | Reservoir | 0.000 | 1 | 749 | 0 | 6 | 273.19 | 28,025 | Infiltr. Basin 1 Disch | |
| 8 | SCS Runoff | 0.182 | 1 | 737 | 1,470 | ----- | ----- | ----- | Post Dev. Watershed 2 | |
| 9 | SCS Runoff | 0.173 | 1 | 736 | 1,198 | ----- | ----- | ----- | Post Dev. Watershed 3 | |
| 7283 TR55 R1.gpw | | | | | Return Period: 50 Year | | | Thursday, 09 / 7 / 2023 | | |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

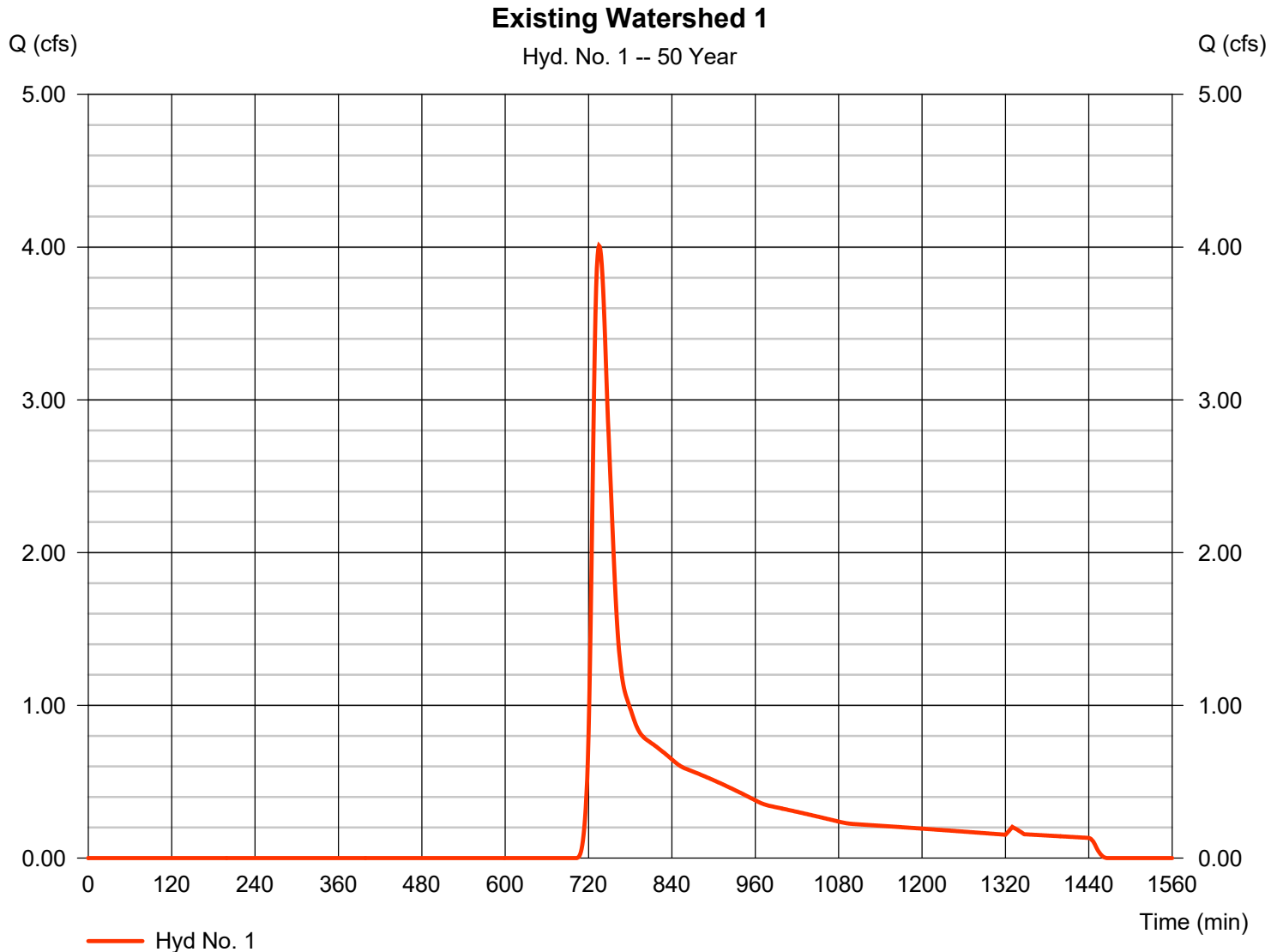
Thursday, 09 / 7 / 2023

Hyd. No. 1

Existing Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 4.009 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 735 min |
| Time interval | = 1 min | Hyd. volume | = 21,038 cuft |
| Drainage area | = 4.400 ac | Curve number | = 46* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.690 x 98) + (2.470 x 39) + (1.240 x 30)] / 4.400



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

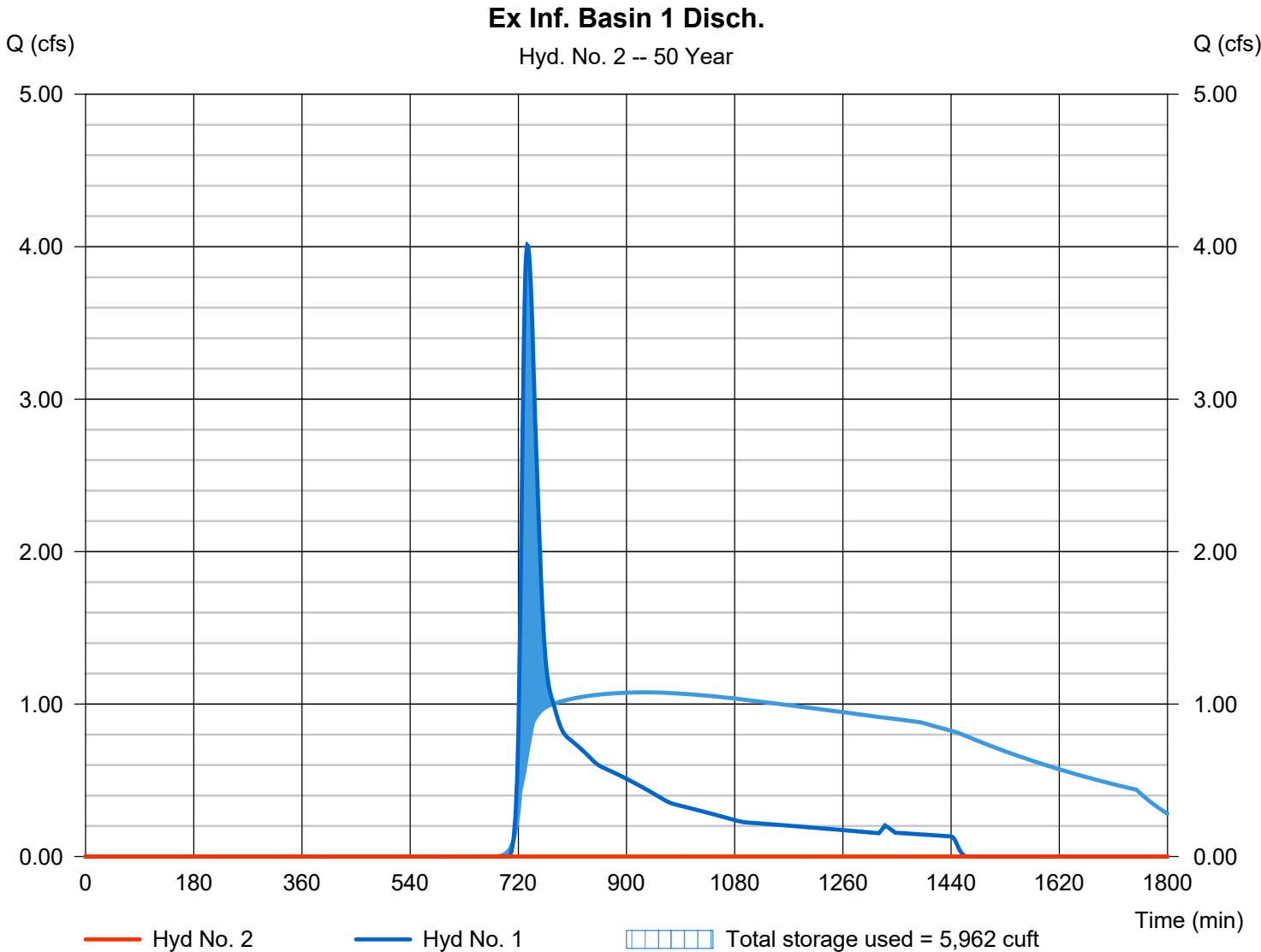
Thursday, 09 / 7 / 2023

Hyd. No. 2

Ex Inf. Basin 1 Disch.

| | | | |
|-----------------|----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 732 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 1 - Existing Watershed 1 | Max. Elevation | = 270.93 ft |
| Reservoir name | = EX Infiltration Basin | Max. Storage | = 5,962 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.

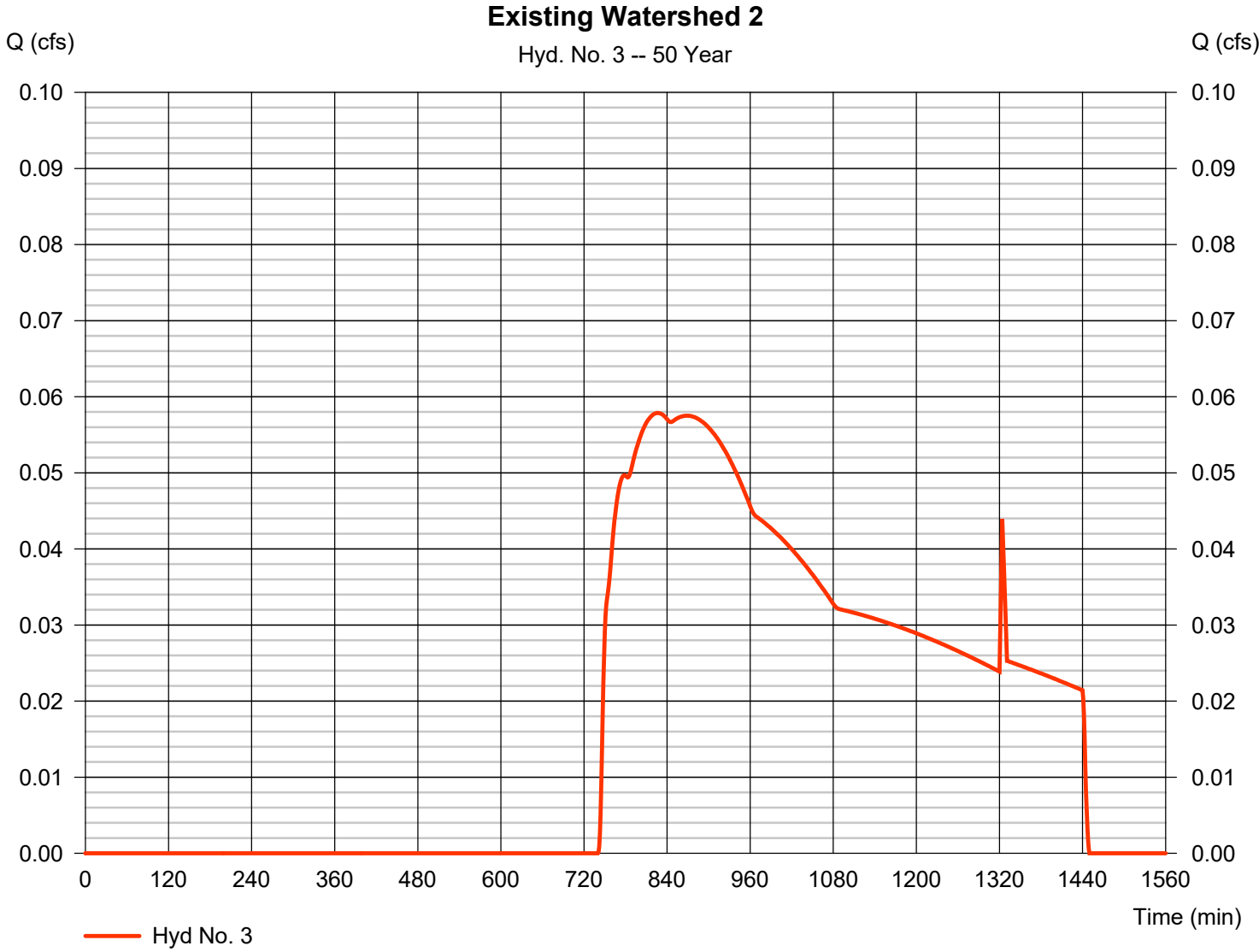


Hydrograph Report

Hyd. No. 3

Existing Watershed 2

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.058 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 827 min |
| Time interval | = 1 min | Hyd. volume | = 1,552 cuft |
| Drainage area | = 2.020 ac | Curve number | = 30 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

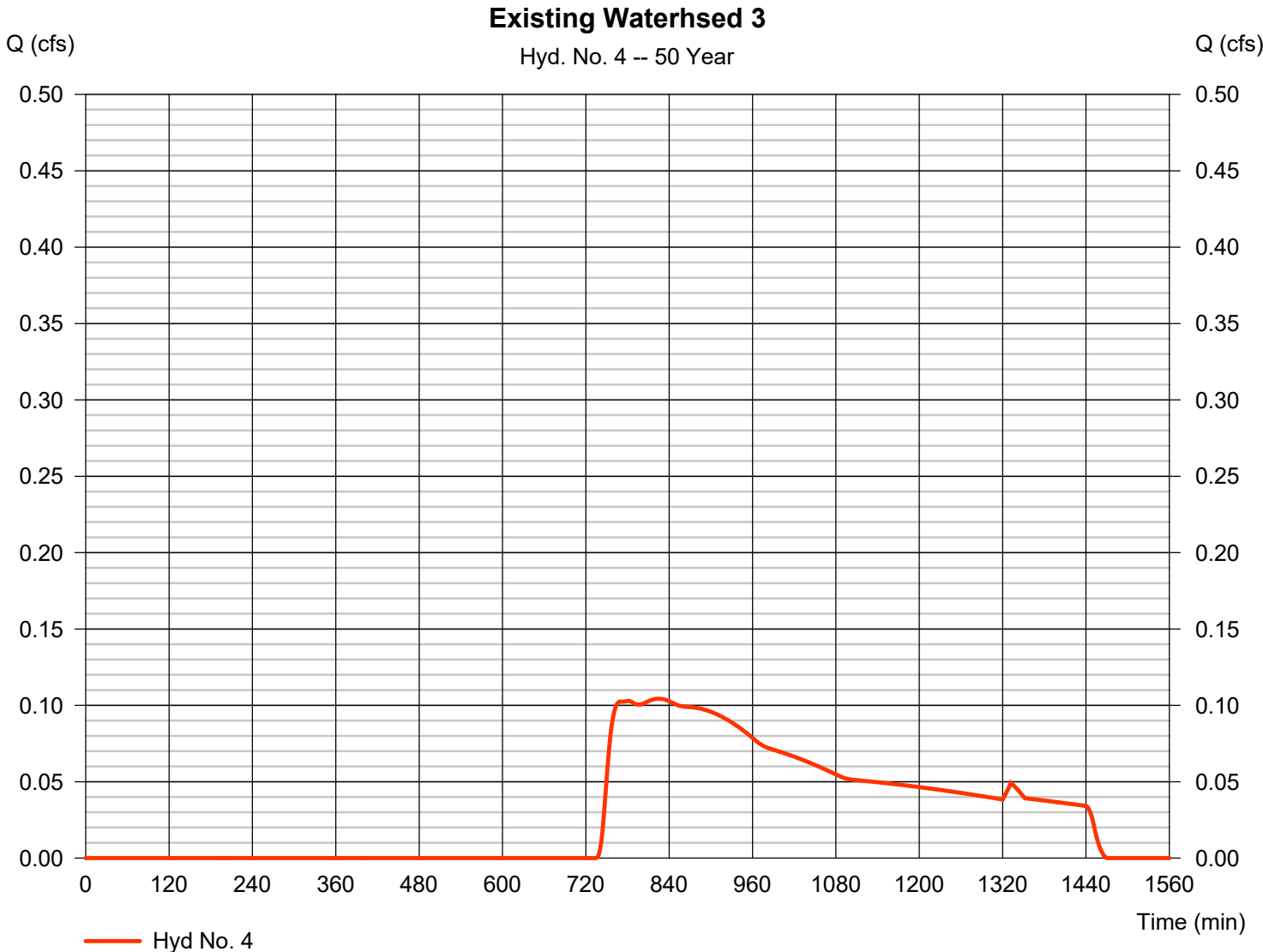
Thursday, 09 / 7 / 2023

Hyd. No. 4

Existing Waterhsed 3

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.104 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 825 min |
| Time interval | = 1 min | Hyd. volume | = 2,674 cuft |
| Drainage area | = 2.900 ac | Curve number | = 31* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 19.10 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.210 x 39) + (2.690 x 30)] / 2.900



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 6

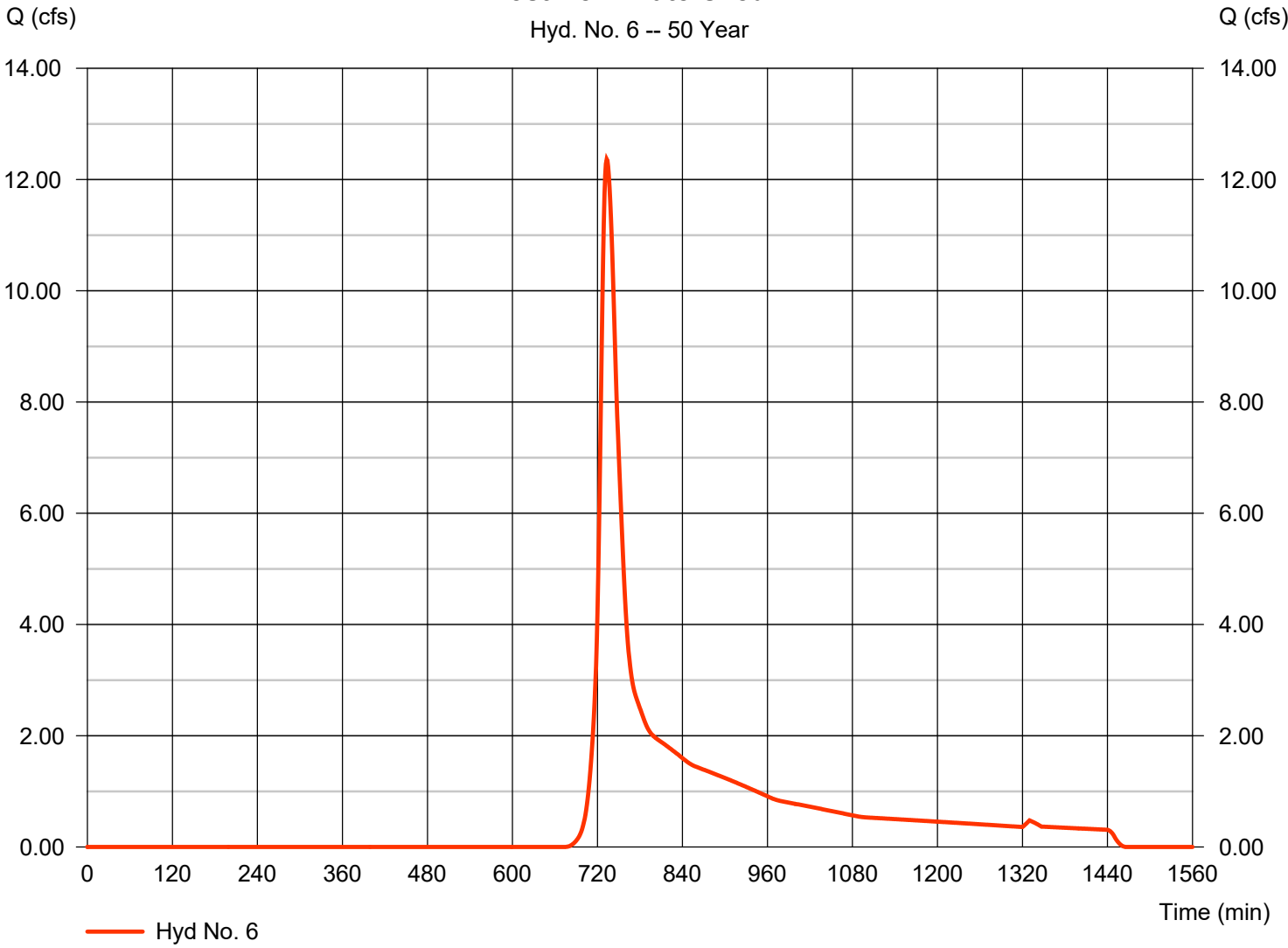
Post Dev. Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 12.36 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 733 min |
| Time interval | = 1 min | Hyd. volume | = 56,954 cuft |
| Drainage area | = 8.500 ac | Curve number | = 52* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(1.950 x 98) + (6.150 x 39) + (0.400 x 30)] / 8.500

Post Dev. Watershed 1

Hyd. No. 6 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

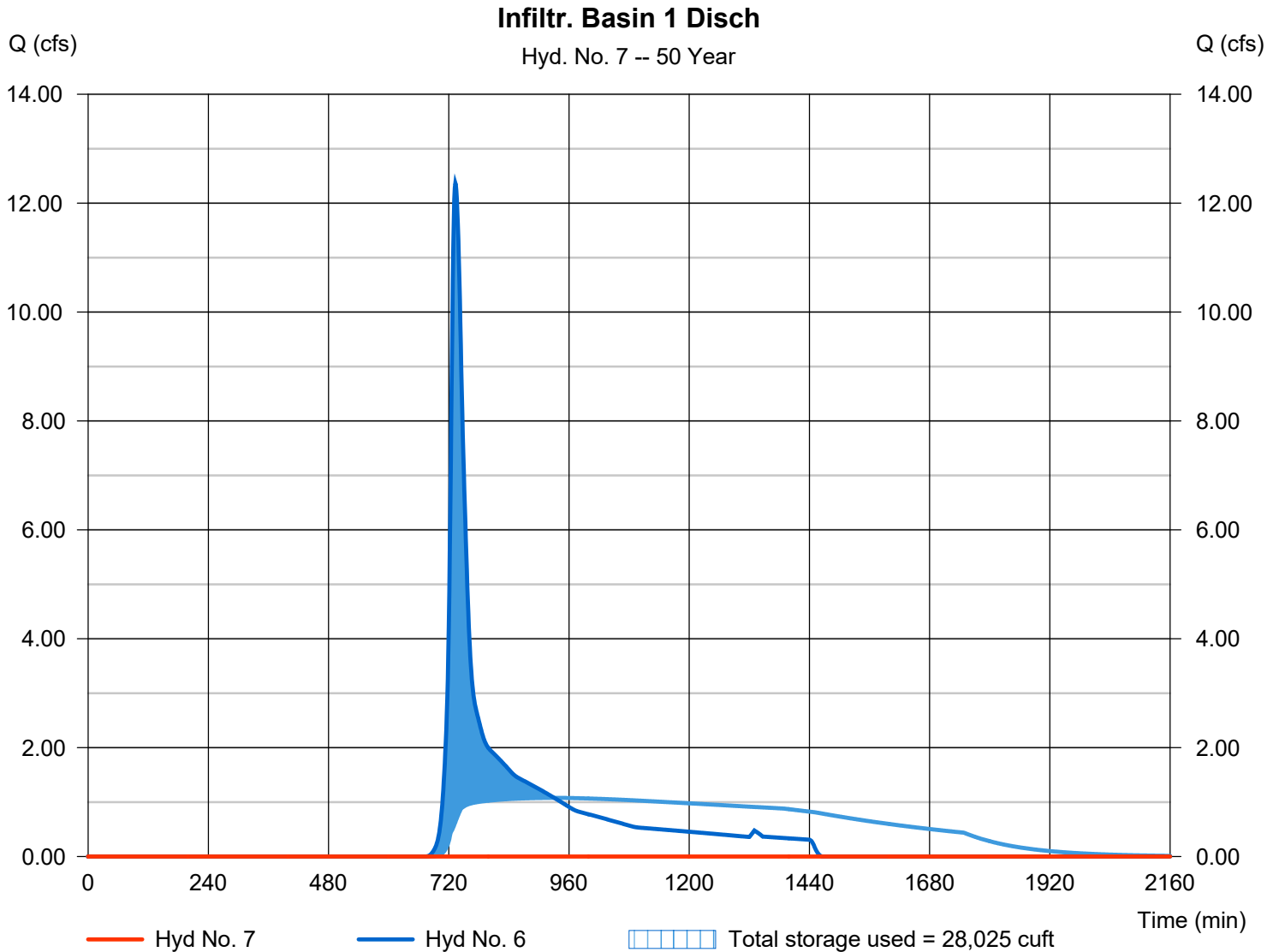
Thursday, 09 / 7 / 2023

Hyd. No. 7

Infiltr. Basin 1 Disch

| | | | |
|-----------------|-----------------------------|----------------|---------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 749 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 6 - Post Dev. Watershed 1 | Max. Elevation | = 273.19 ft |
| Reservoir name | = PR Infiltration Basin 1 | Max. Storage | = 28,025 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

Hyd. No. 8

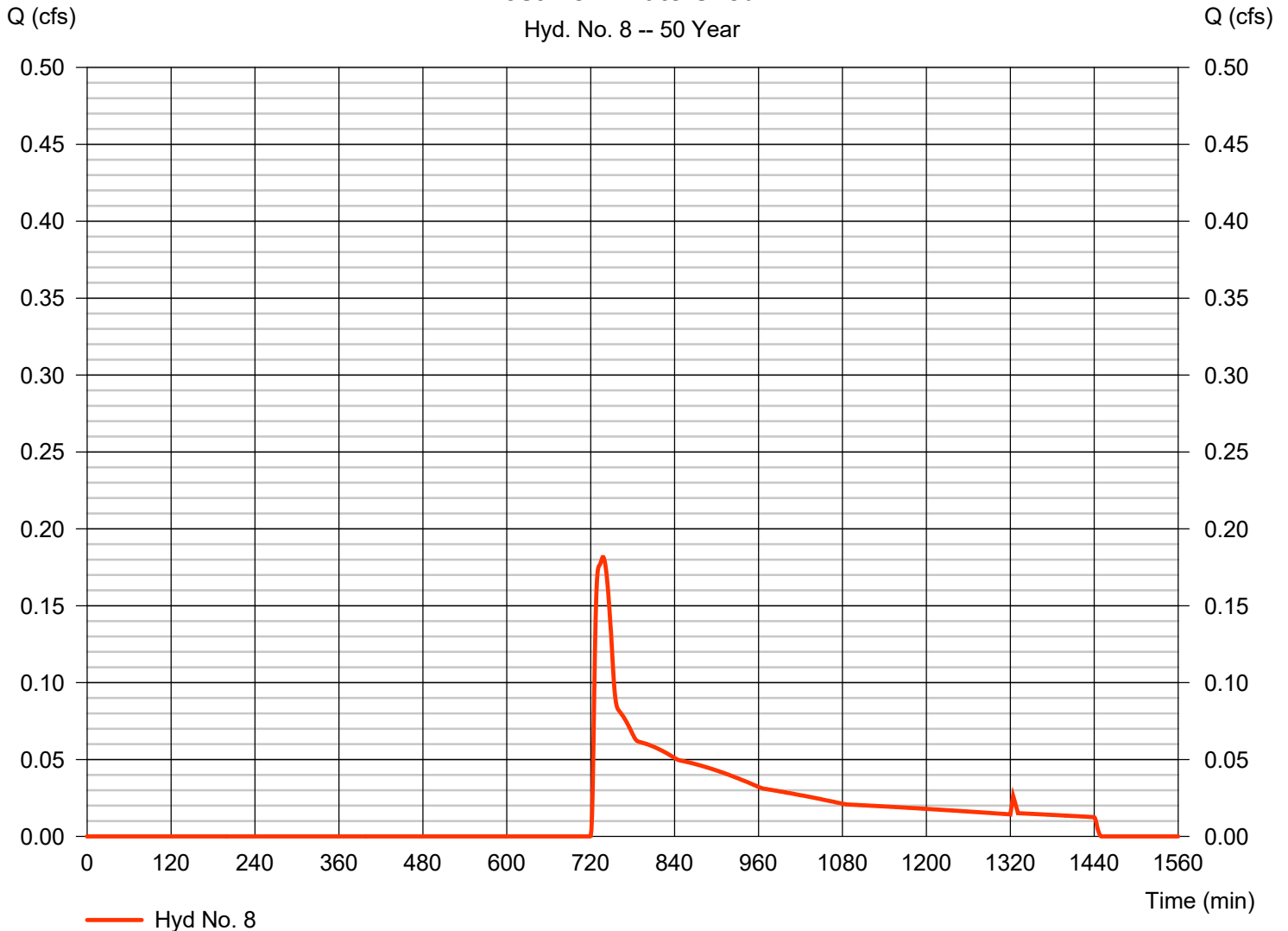
Post Dev. Watershed 2

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.182 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 737 min |
| Time interval | = 1 min | Hyd. volume | = 1,470 cuft |
| Drainage area | = 0.640 ac | Curve number | = 37* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.130 x 30) + (0.510 x 39)] / 0.640

Post Dev. Watershed 2

Hyd. No. 8 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

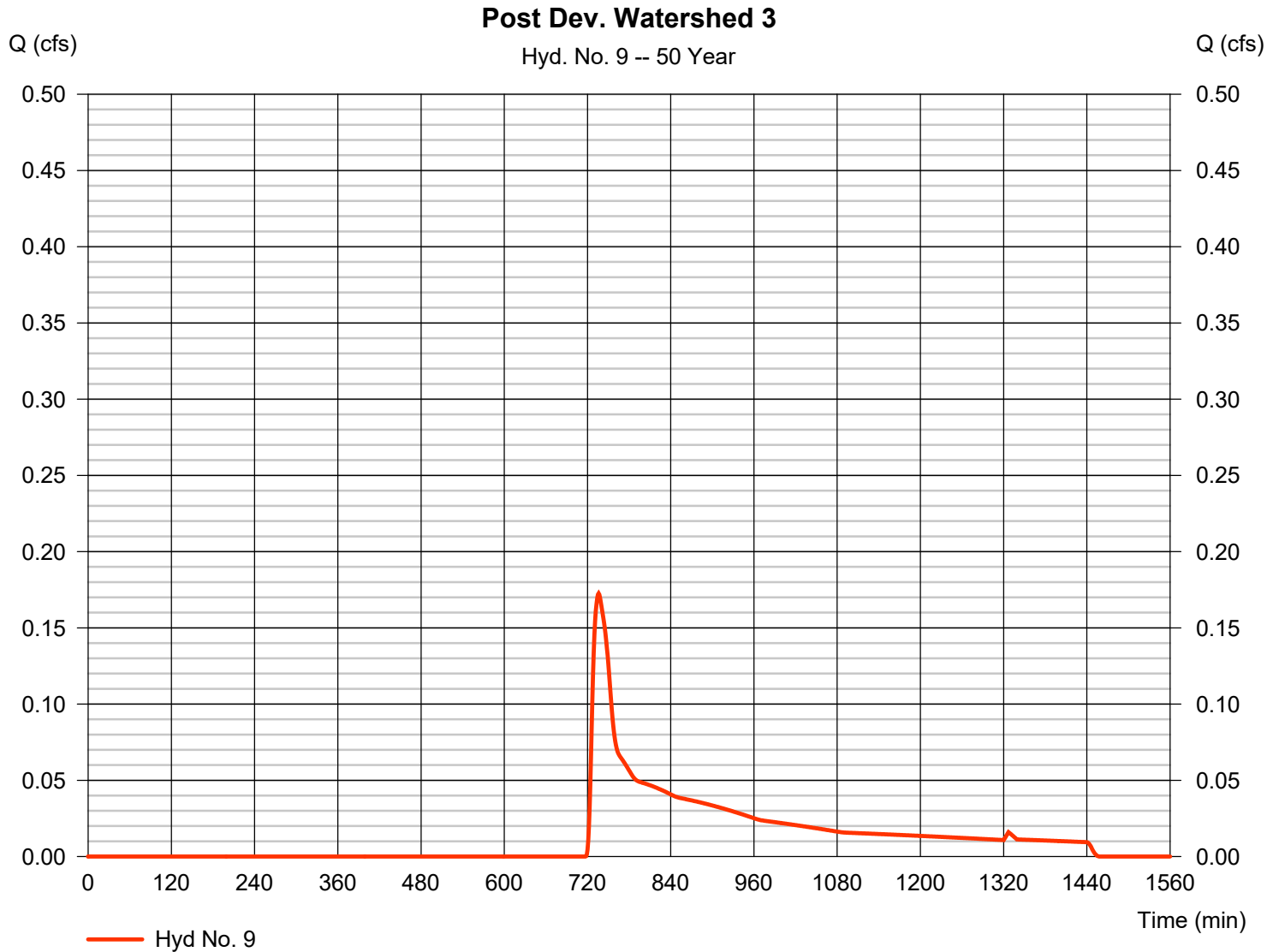
Thursday, 09 / 7 / 2023

Hyd. No. 9

Post Dev. Watershed 3

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.173 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 736 min |
| Time interval | = 1 min | Hyd. volume | = 1,198 cuft |
| Drainage area | = 0.430 ac | Curve number | = 39* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 10.50 min |
| Total precip. | = 6.96 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.430 x 39)] / 0.430



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description | |
|------------------|--------------------------|-----------------|---------------------|--------------------|-------------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 5.761 | 1 | 734 | 28,049 | ----- | ----- | ----- | Existing Watershed 1 | |
| 2 | Reservoir | 0.000 | 1 | 728 | 0 | 1 | 271.55 | 8,794 | Ex Inf. Basin 1 Disch. | |
| 3 | SCS Runoff | 0.199 | 1 | 745 | 2,822 | ----- | ----- | ----- | Existing Watershed 2 | |
| 4 | SCS Runoff | 0.341 | 1 | 754 | 4,634 | ----- | ----- | ----- | Existing Waterhsed 3 | |
| 6 | SCS Runoff | 16.45 | 1 | 733 | 73,128 | ----- | ----- | ----- | Post Dev. Watershed 1 | |
| 7 | Reservoir | 0.000 | 1 | 737 | 0 | 6 | 274.17 | 38,638 | Infiltr. Basin 1 Disch | |
| 8 | SCS Runoff | 0.370 | 1 | 728 | 2,169 | ----- | ----- | ----- | Post Dev. Watershed 2 | |
| 9 | SCS Runoff | 0.302 | 1 | 732 | 1,714 | ----- | ----- | ----- | Post Dev. Watershed 3 | |
| 7283 TR55 R1.gpw | | | | | Return Period: 100 Year | | | Thursday, 09 / 7 / 2023 | | |

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

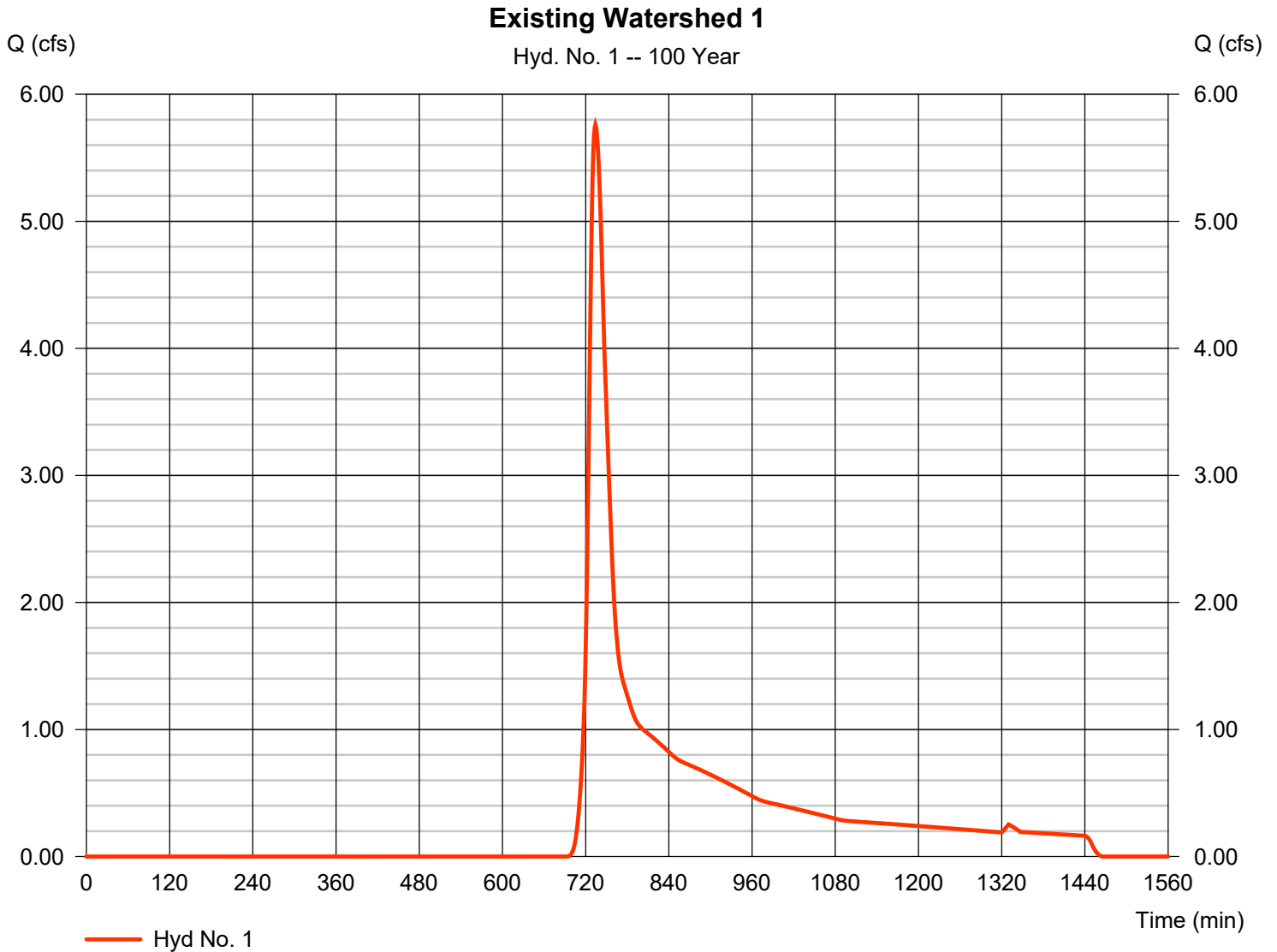
Thursday, 09 / 7 / 2023

Hyd. No. 1

Existing Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 5.761 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 734 min |
| Time interval | = 1 min | Hyd. volume | = 28,049 cuft |
| Drainage area | = 4.400 ac | Curve number | = 46* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.690 x 98) + (2.470 x 39) + (1.240 x 30)] / 4.400



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

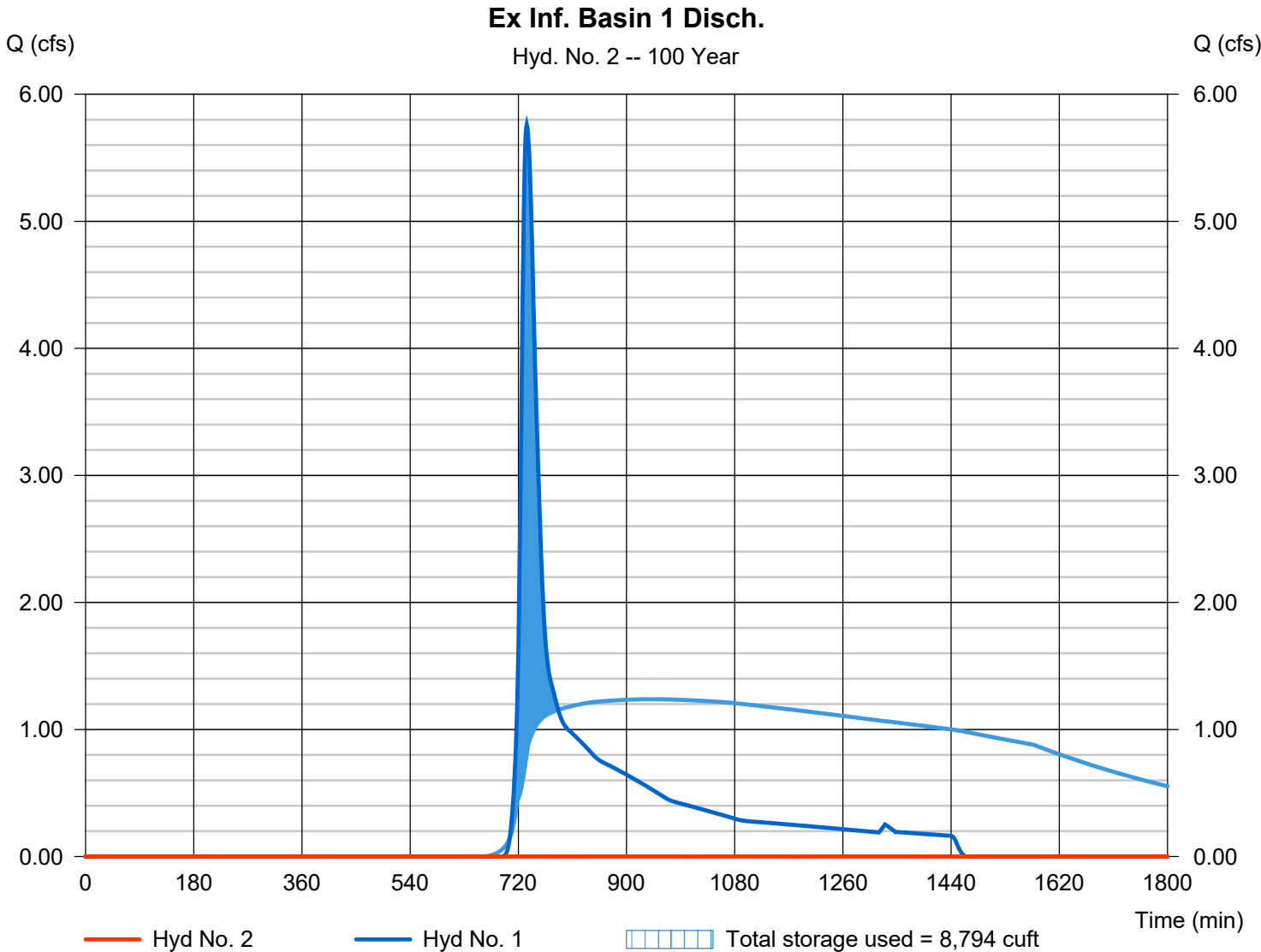
Thursday, 09 / 7 / 2023

Hyd. No. 2

Ex Inf. Basin 1 Disch.

| | | | |
|-----------------|----------------------------|----------------|--------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 728 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 1 - Existing Watershed 1 | Max. Elevation | = 271.55 ft |
| Reservoir name | = EX Infiltration Basin | Max. Storage | = 8,794 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

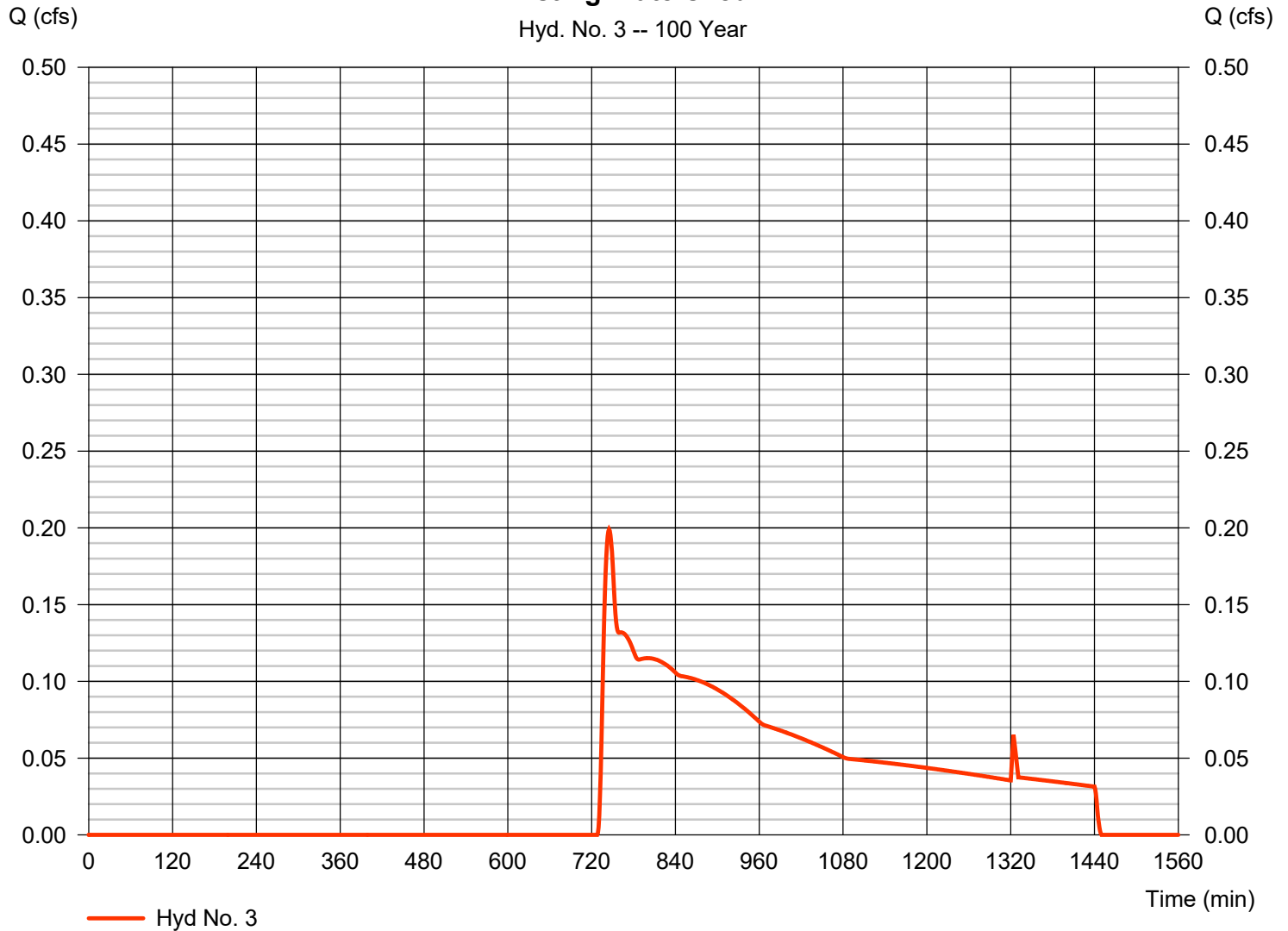
Hyd. No. 3

Existing Watershed 2

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.199 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 745 min |
| Time interval | = 1 min | Hyd. volume | = 2,822 cuft |
| Drainage area | = 2.020 ac | Curve number | = 30 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

Existing Watershed 2

Hyd. No. 3 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

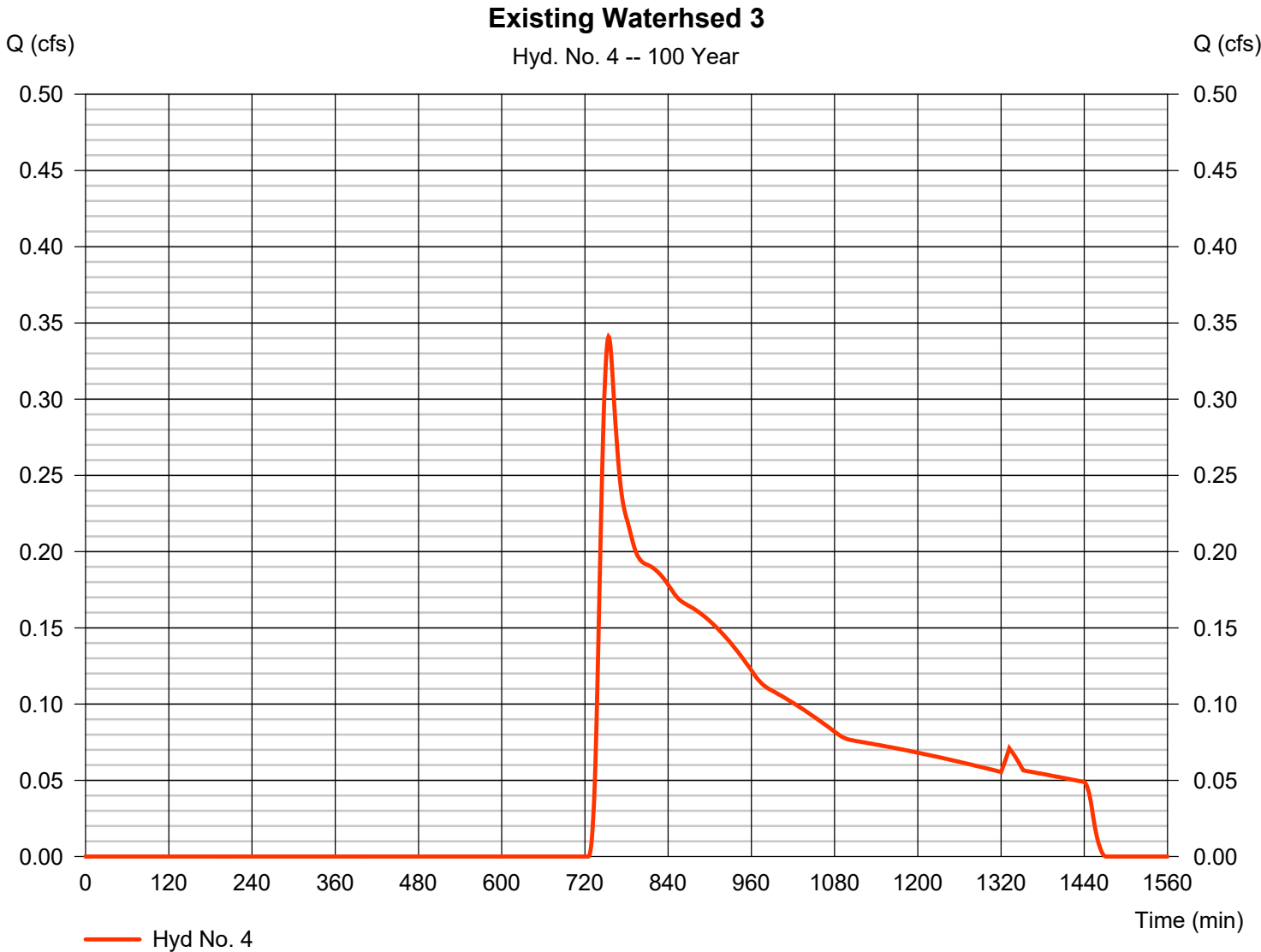
Thursday, 09 / 7 / 2023

Hyd. No. 4

Existing Waterhsed 3

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.341 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 754 min |
| Time interval | = 1 min | Hyd. volume | = 4,634 cuft |
| Drainage area | = 2.900 ac | Curve number | = 31* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 19.10 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.210 x 39) + (2.690 x 30)] / 2.900



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

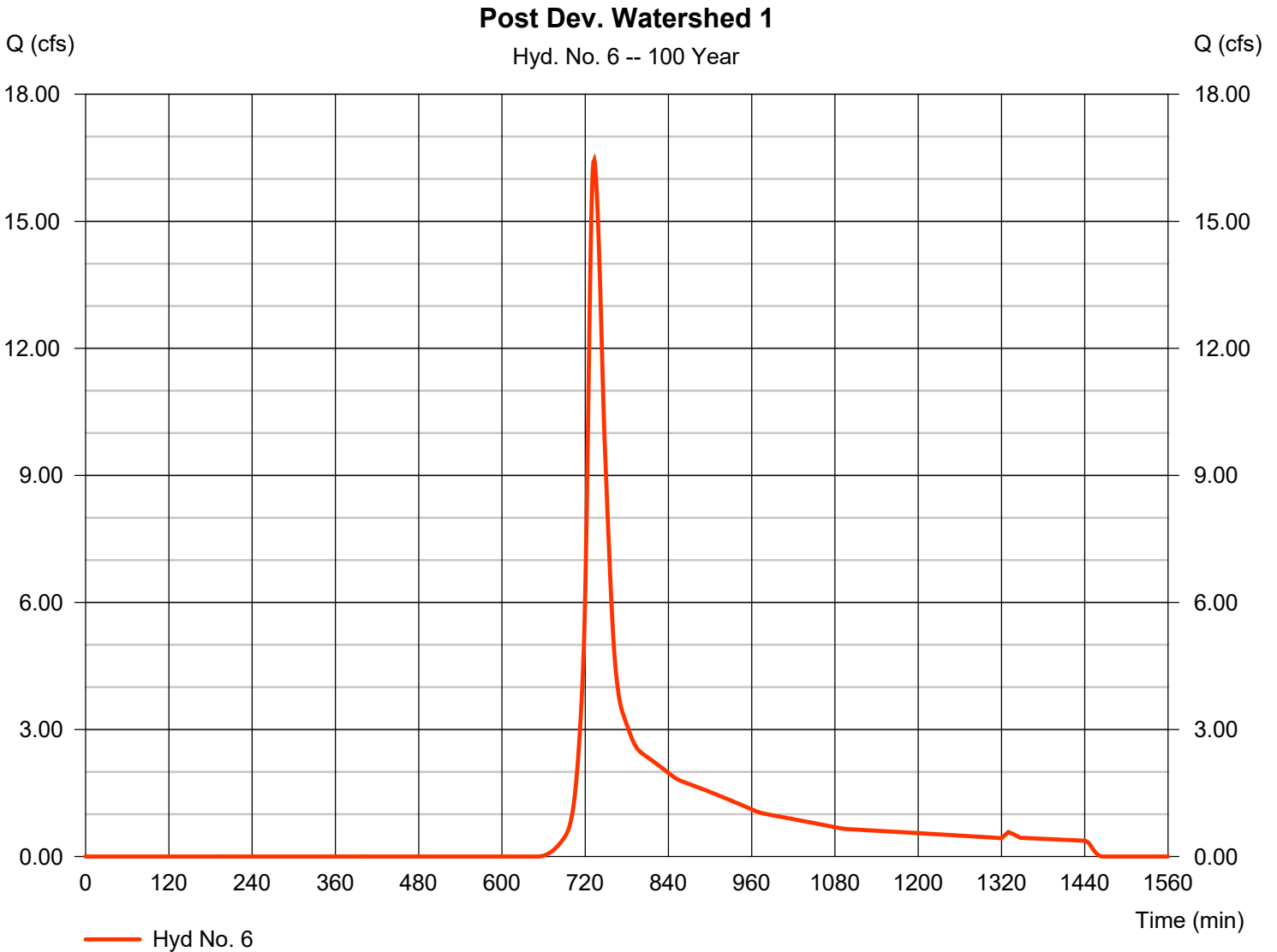
Thursday, 09 / 7 / 2023

Hyd. No. 6

Post Dev. Watershed 1

| | | | |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 16.45 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 733 min |
| Time interval | = 1 min | Hyd. volume | = 73,128 cuft |
| Drainage area | = 8.500 ac | Curve number | = 52* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 16.60 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(1.950 x 98) + (6.150 x 39) + (0.400 x 30)] / 8.500



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

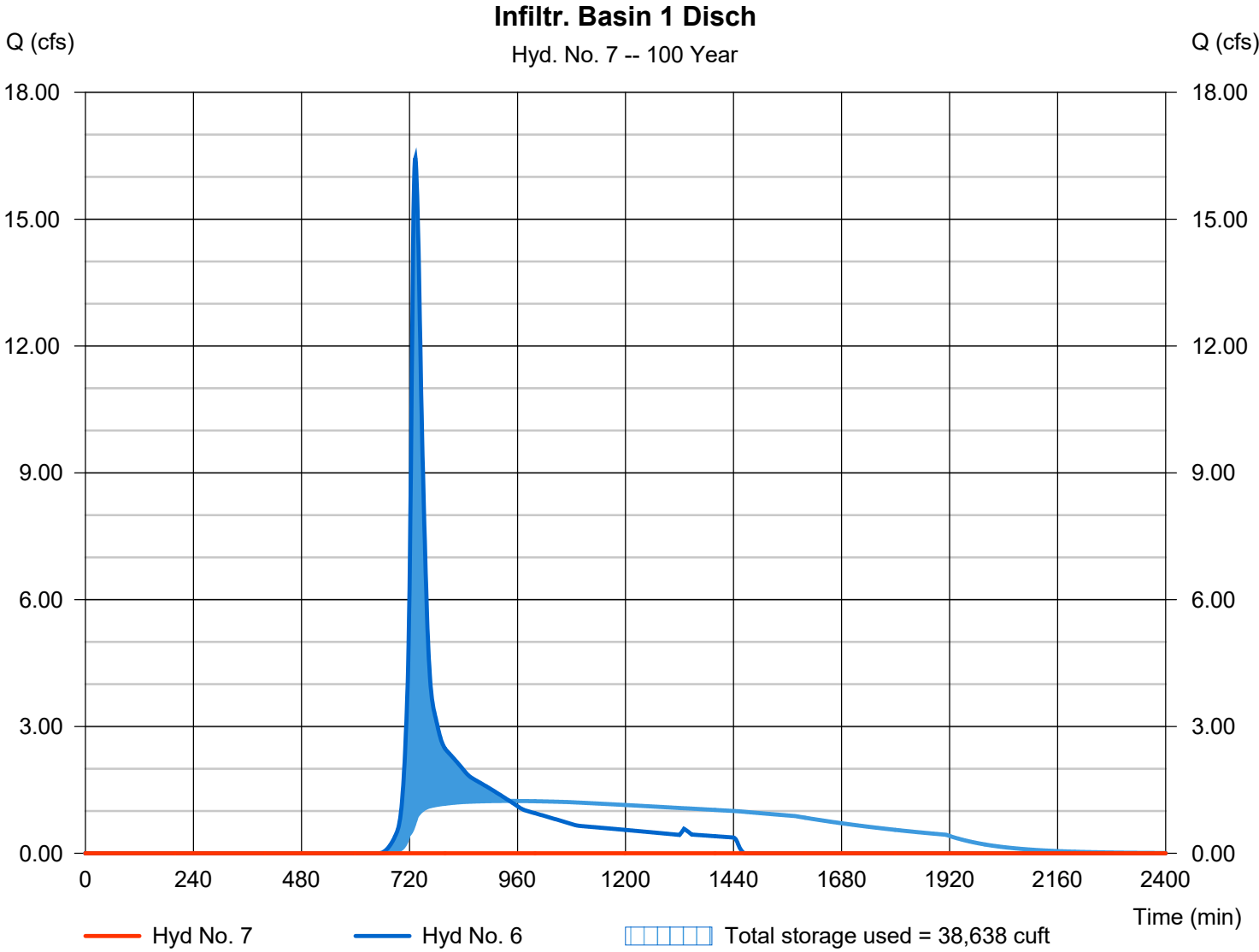
Thursday, 09 / 7 / 2023

Hyd. No. 7

Infiltr. Basin 1 Disch

| | | | |
|-----------------|-----------------------------|----------------|---------------|
| Hydrograph type | = Reservoir | Peak discharge | = 0.000 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 737 min |
| Time interval | = 1 min | Hyd. volume | = 0 cuft |
| Inflow hyd. No. | = 6 - Post Dev. Watershed 1 | Max. Elevation | = 274.17 ft |
| Reservoir name | = PR Infiltration Basin 1 | Max. Storage | = 38,638 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

Thursday, 09 / 7 / 2023

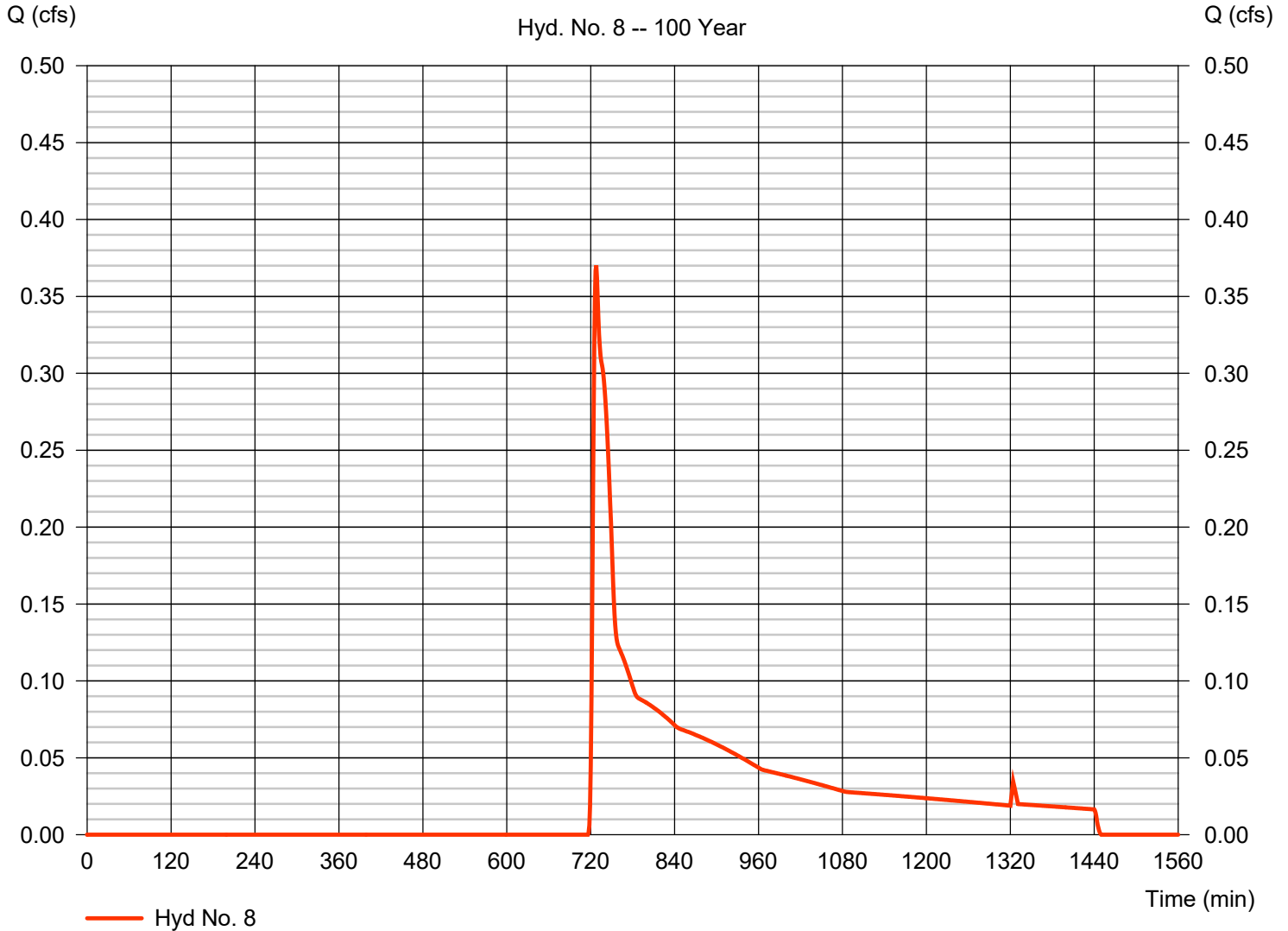
Hyd. No. 8

Post Dev. Watershed 2

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.370 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 728 min |
| Time interval | = 1 min | Hyd. volume | = 2,169 cuft |
| Drainage area | = 0.640 ac | Curve number | = 37* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 6.00 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.130 x 30) + (0.510 x 39)] / 0.640

Post Dev. Watershed 2



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v2018.3

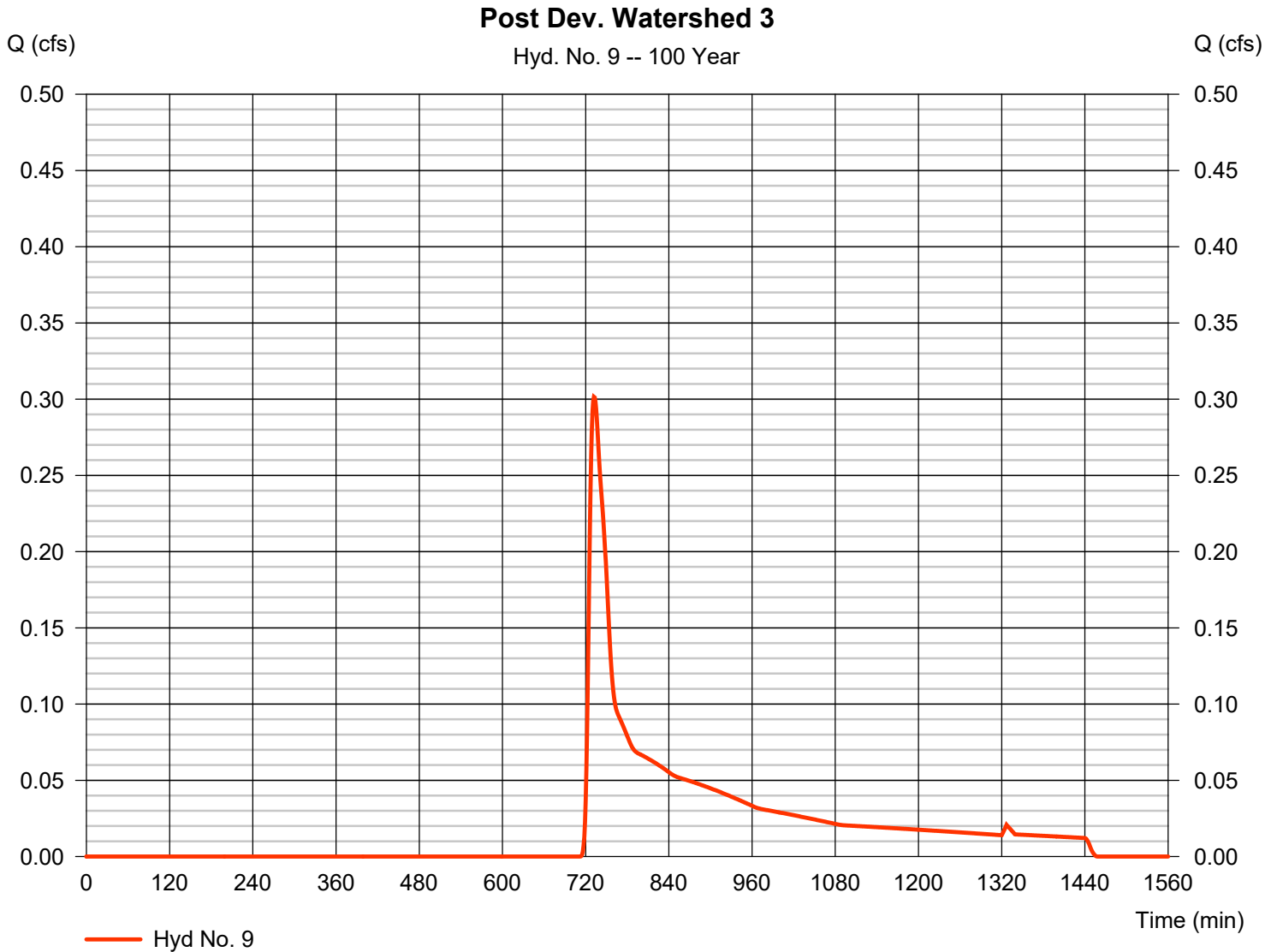
Thursday, 09 / 7 / 2023

Hyd. No. 9

Post Dev. Watershed 3

| | | | |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.302 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 732 min |
| Time interval | = 1 min | Hyd. volume | = 1,714 cuft |
| Drainage area | = 0.430 ac | Curve number | = 39* |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = TR55 | Time of conc. (Tc) | = 10.50 min |
| Total precip. | = 7.81 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |

* Composite (Area/CN) = [(0.430 x 39)] / 0.430



APPENDIX A

Calculation Support Information



POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

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

PF tabular

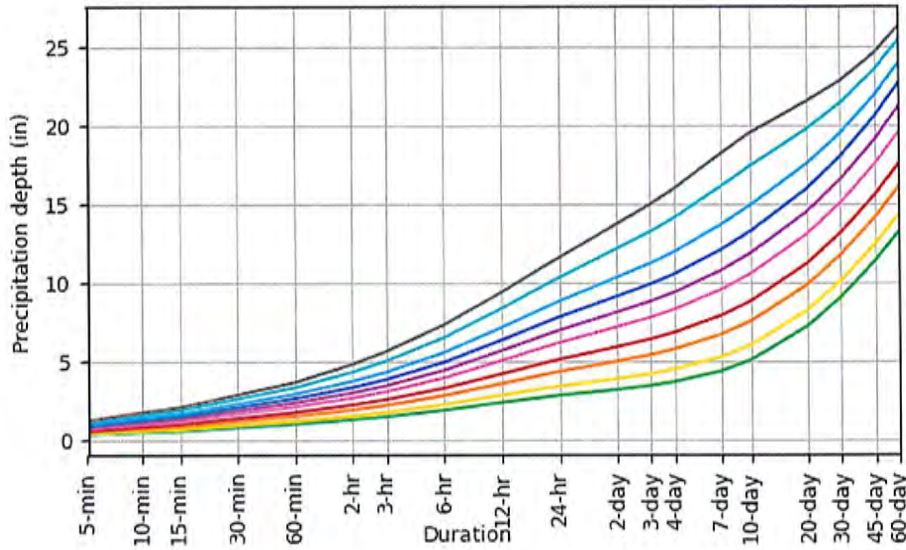
| PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹ | | | | | | | | | | |
|--|-------------------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|
| Duration | Average recurrence interval (years) | | | | | | | | | |
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.334 (0.258-0.428) | 0.397 (0.306-0.510) | 0.500 (0.385-0.644) | 0.585 (0.447-0.758) | 0.703 (0.521-0.947) | 0.793 (0.576-1.09) | 0.885 (0.624-1.25) | 0.985 (0.663-1.43) | 1.12 (0.727-1.68) | 1.23 (0.781-1.89) |
| 10-min | 0.473 (0.365-0.607) | 0.562 (0.434-0.722) | 0.708 (0.545-0.913) | 0.829 (0.635-1.08) | 0.996 (0.739-1.34) | 1.12 (0.816-1.54) | 1.25 (0.884-1.78) | 1.40 (0.938-2.02) | 1.59 (1.03-2.39) | 1.75 (1.11-2.67) |
| 15-min | 0.556 (0.430-0.714) | 0.661 (0.511-0.849) | 0.833 (0.641-1.07) | 0.976 (0.747-1.26) | 1.17 (0.869-1.58) | 1.32 (0.959-1.81) | 1.48 (1.04-2.09) | 1.64 (1.10-2.38) | 1.87 (1.21-2.81) | 2.06 (1.30-3.14) |
| 30-min | 0.775 (0.599-0.994) | 0.921 (0.711-1.18) | 1.16 (0.892-1.49) | 1.36 (1.04-1.76) | 1.63 (1.21-2.20) | 1.84 (1.33-2.52) | 2.05 (1.45-2.90) | 2.28 (1.53-3.31) | 2.60 (1.69-3.90) | 2.86 (1.81-4.36) |
| 60-min | 0.993 (0.768-1.28) | 1.18 (0.911-1.52) | 1.49 (1.14-1.92) | 1.74 (1.33-2.25) | 2.09 (1.55-2.81) | 2.35 (1.71-3.23) | 2.63 (1.85-3.72) | 2.92 (1.96-4.24) | 3.33 (2.16-4.99) | 3.66 (2.31-5.59) |
| 2-hr | 1.27 (0.987-1.62) | 1.51 (1.17-1.92) | 1.89 (1.46-2.42) | 2.21 (1.70-2.85) | 2.65 (1.98-3.56) | 2.98 (2.18-4.08) | 3.33 (2.37-4.72) | 3.73 (2.52-5.38) | 4.32 (2.80-6.43) | 4.80 (3.05-7.30) |
| 3-hr | 1.46 (1.14-1.86) | 1.74 (1.35-2.21) | 2.18 (1.69-2.79) | 2.55 (1.97-3.27) | 3.06 (2.29-4.09) | 3.43 (2.52-4.70) | 3.84 (2.75-5.44) | 4.31 (2.91-6.20) | 5.02 (3.27-7.46) | 5.62 (3.58-8.50) |
| 6-hr | 1.87 (1.47-2.37) | 2.22 (1.74-2.82) | 2.80 (2.18-3.55) | 3.27 (2.54-4.18) | 3.92 (2.96-5.23) | 4.41 (3.26-6.01) | 4.93 (3.56-6.98) | 5.56 (3.77-7.95) | 6.51 (4.25-9.60) | 7.32 (4.67-11.0) |
| 12-hr | 2.36 (1.86-2.98) | 2.82 (2.22-3.55) | 3.56 (2.79-4.50) | 4.18 (3.26-5.31) | 5.03 (3.81-6.67) | 5.66 (4.20-7.66) | 6.34 (4.59-8.91) | 7.15 (4.86-10.2) | 8.36 (5.47-12.3) | 9.38 (6.00-14.0) |
| 24-hr | 2.82 (2.23-3.53) | 3.39 (2.68-4.25) | 4.32 (3.41-5.43) | 5.10 (4.00-6.44) | 6.17 (4.69-8.13) | 6.96 (5.19-9.36) | 7.81 (5.67-10.9) | 8.82 (6.02-12.4) | 10.3 (6.78-15.0) | 11.6 (7.44-17.2) |
| 2-day | 3.18 (2.53-3.95) | 3.86 (3.07-4.81) | 4.97 (3.94-6.21) | 5.89 (4.64-7.40) | 7.17 (5.48-9.40) | 8.11 (6.08-10.9) | 9.13 (6.67-12.7) | 10.3 (7.09-14.5) | 12.2 (8.02-17.6) | 13.7 (8.84-20.2) |
| 3-day | 3.44 (2.75-4.27) | 4.18 (3.34-5.19) | 5.39 (4.29-6.72) | 6.40 (5.06-8.01) | 7.78 (5.97-10.2) | 8.80 (6.62-11.8) | 9.91 (7.27-13.7) | 11.2 (7.72-15.7) | 13.3 (8.76-19.1) | 15.0 (9.67-22.0) |
| 4-day | 3.68 (2.95-4.56) | 4.47 (3.57-5.54) | 5.75 (4.58-7.15) | 6.82 (5.40-8.52) | 8.29 (6.37-10.8) | 9.37 (7.07-12.5) | 10.5 (7.75-14.6) | 12.0 (8.23-16.7) | 14.1 (9.34-20.3) | 16.0 (10.3-23.4) |
| 7-day | 4.36 (3.51-5.38) | 5.24 (4.21-6.47) | 6.69 (5.35-8.28) | 7.89 (6.28-9.81) | 9.54 (7.36-12.4) | 10.8 (8.14-14.3) | 12.1 (8.90-16.6) | 13.7 (9.44-19.0) | 16.1 (10.7-23.0) | 18.2 (11.8-26.5) |
| 10-day | 5.05 (4.07-6.21) | 5.99 (4.82-7.37) | 7.52 (6.04-9.28) | 8.80 (7.02-10.9) | 10.5 (8.16-13.6) | 11.9 (8.98-15.6) | 13.3 (9.76-18.1) | 14.9 (10.3-20.6) | 17.4 (11.6-24.8) | 19.5 (12.7-28.3) |
| 20-day | 7.23 (5.86-8.84) | 8.23 (6.67-10.1) | 9.88 (7.97-12.1) | 11.2 (9.01-13.9) | 13.1 (10.2-16.7) | 14.5 (11.0-18.9) | 16.0 (11.7-21.4) | 17.6 (12.2-24.1) | 19.8 (13.2-28.0) | 21.6 (14.0-31.0) |
| 30-day | 9.06 (7.37-11.0) | 10.1 (8.20-12.3) | 11.8 (9.53-14.4) | 13.2 (10.6-16.2) | 15.1 (11.7-19.1) | 16.6 (12.5-21.3) | 18.1 (13.2-23.8) | 19.5 (13.6-26.6) | 21.4 (14.4-30.1) | 22.9 (14.9-32.7) |
| 45-day | 11.3 (9.25-13.8) | 12.4 (10.1-15.1) | 14.1 (11.5-17.2) | 15.6 (12.6-19.0) | 17.5 (13.6-22.0) | 19.1 (14.4-24.4) | 20.6 (15.0-26.9) | 21.9 (15.3-29.7) | 23.5 (15.8-32.9) | 24.6 (16.1-35.1) |
| 60-day | 13.2 (10.8-16.0) | 14.3 (11.7-17.3) | 16.1 (13.1-19.5) | 17.5 (14.2-21.4) | 19.6 (15.2-24.5) | 21.2 (16.1-26.9) | 22.7 (16.5-29.4) | 23.9 (16.8-32.4) | 25.4 (17.1-35.4) | 26.3 (17.2-37.4) |

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

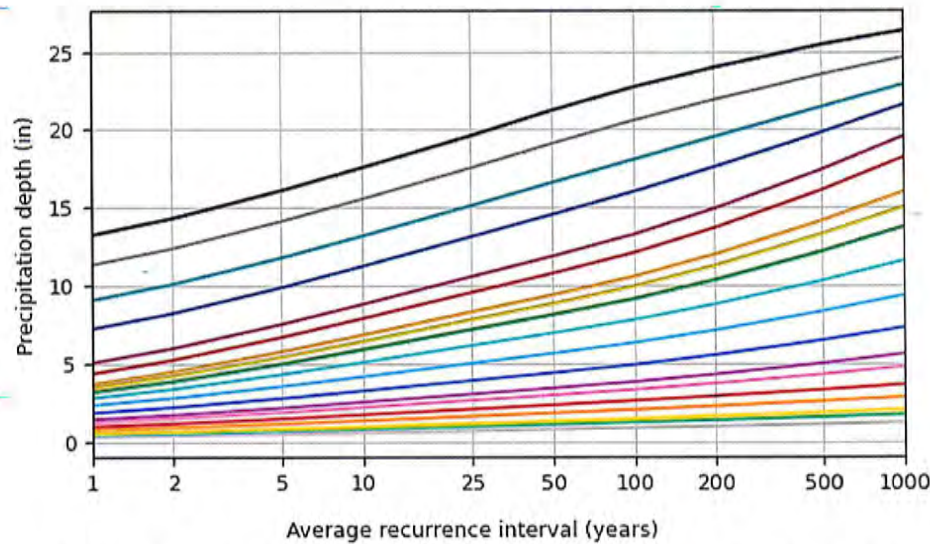
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PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 41.8440°, Longitude: -71.8937°



| Average recurrence interval (years) |
|-------------------------------------|
| 1 |
| 2 |
| 5 |
| 10 |
| 25 |
| 50 |
| 100 |
| 200 |
| 500 |
| 1000 |



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

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Maps & aerials

Small scale terrain



POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

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

PF tabular

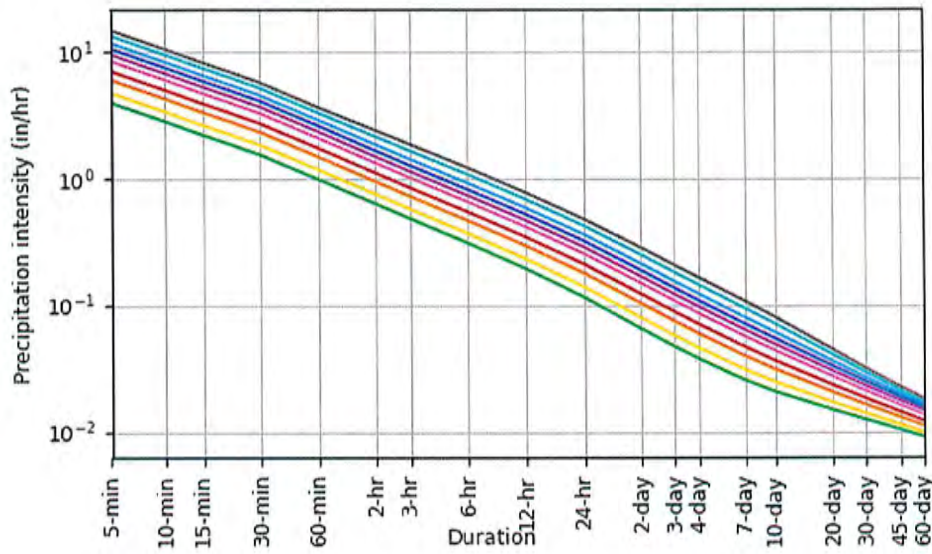
| PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹ | | | | | | | | | | |
|---|-------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Duration | Average recurrence interval (years) | | | | | | | | | |
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 4.01 (3.10-5.14) | 4.76 (3.67-6.12) | 6.00 (4.82-7.73) | 7.02 (5.36-9.10) | 8.44 (6.25-11.4) | 9.52 (6.91-13.0) | 10.6 (7.49-15.0) | 11.8 (7.96-17.1) | 13.5 (8.72-20.2) | 14.8 (9.37-22.6) |
| 10-min | 2.84 (2.19-3.64) | 3.37 (2.60-4.33) | 4.25 (3.27-5.48) | 4.97 (3.81-6.45) | 5.98 (4.43-8.05) | 6.74 (4.90-9.24) | 7.52 (5.30-10.7) | 8.37 (5.63-12.2) | 9.55 (6.19-14.3) | 10.5 (6.64-16.0) |
| 15-min | 2.22 (1.72-2.86) | 2.64 (2.04-3.40) | 3.33 (2.56-4.30) | 3.90 (2.99-5.05) | 4.69 (3.48-6.31) | 5.28 (3.84-7.24) | 5.90 (4.16-8.36) | 6.56 (4.42-9.53) | 7.49 (4.85-11.2) | 8.23 (5.21-12.6) |
| 30-min | 1.55 (1.20-1.99) | 1.84 (1.42-2.37) | 2.32 (1.78-2.99) | 2.71 (2.08-3.52) | 3.26 (2.42-4.39) | 3.67 (2.67-5.04) | 4.10 (2.89-5.81) | 4.56 (3.07-6.62) | 5.20 (3.37-7.80) | 5.71 (3.62-8.73) |
| 60-min | 0.993 (0.768-1.28) | 1.18 (0.911-1.52) | 1.49 (1.14-1.92) | 1.74 (1.33-2.25) | 2.09 (1.55-2.81) | 2.35 (1.71-3.23) | 2.63 (1.85-3.72) | 2.92 (1.96-4.24) | 3.33 (2.16-4.99) | 3.66 (2.31-5.59) |
| 2-hr | 0.635 (0.493-0.811) | 0.753 (0.584-0.962) | 0.945 (0.731-1.21) | 1.10 (0.850-1.42) | 1.32 (0.989-1.78) | 1.49 (1.09-2.04) | 1.66 (1.19-2.36) | 1.86 (1.26-2.69) | 2.16 (1.40-3.22) | 2.40 (1.52-3.65) |
| 3-hr | 0.487 (0.380-0.621) | 0.578 (0.450-0.736) | 0.726 (0.563-0.928) | 0.848 (0.655-1.09) | 1.02 (0.762-1.36) | 1.14 (0.840-1.56) | 1.28 (0.915-1.81) | 1.44 (0.970-2.06) | 1.67 (1.09-2.48) | 1.87 (1.19-2.83) |
| 6-hr | 0.312 (0.244-0.395) | 0.371 (0.290-0.470) | 0.466 (0.364-0.593) | 0.546 (0.423-0.697) | 0.655 (0.493-0.874) | 0.736 (0.544-1.00) | 0.823 (0.594-1.16) | 0.928 (0.629-1.33) | 1.09 (0.709-1.60) | 1.22 (0.779-1.84) |
| 12-hr | 0.196 (0.154-0.246) | 0.233 (0.184-0.294) | 0.295 (0.231-0.373) | 0.346 (0.270-0.440) | 0.417 (0.316-0.553) | 0.470 (0.349-0.636) | 0.526 (0.380-0.739) | 0.593 (0.403-0.843) | 0.693 (0.454-1.02) | 0.778 (0.498-1.16) |
| 24-hr | 0.117 (0.093-0.147) | 0.141 (0.111-0.177) | 0.180 (0.142-0.226) | 0.212 (0.166-0.268) | 0.256 (0.195-0.338) | 0.290 (0.216-0.390) | 0.325 (0.236-0.454) | 0.367 (0.250-0.518) | 0.430 (0.282-0.626) | 0.483 (0.310-0.716) |
| 2-day | 0.066 (0.052-0.082) | 0.080 (0.063-0.100) | 0.103 (0.082-0.129) | 0.122 (0.096-0.154) | 0.149 (0.114-0.195) | 0.168 (0.126-0.226) | 0.190 (0.138-0.264) | 0.215 (0.147-0.302) | 0.253 (0.167-0.366) | 0.286 (0.184-0.421) |
| 3-day | 0.047 (0.038-0.059) | 0.058 (0.046-0.072) | 0.074 (0.059-0.093) | 0.088 (0.070-0.111) | 0.108 (0.082-0.141) | 0.122 (0.092-0.163) | 0.137 (0.100-0.190) | 0.156 (0.107-0.218) | 0.184 (0.121-0.265) | 0.208 (0.134-0.305) |
| 4-day | 0.038 (0.030-0.047) | 0.046 (0.037-0.057) | 0.059 (0.047-0.074) | 0.071 (0.056-0.088) | 0.086 (0.066-0.112) | 0.097 (0.073-0.130) | 0.109 (0.080-0.152) | 0.124 (0.085-0.173) | 0.147 (0.097-0.211) | 0.166 (0.107-0.243) |
| 7-day | 0.025 (0.020-0.031) | 0.031 (0.025-0.038) | 0.039 (0.031-0.049) | 0.046 (0.037-0.058) | 0.056 (0.043-0.073) | 0.064 (0.048-0.084) | 0.071 (0.053-0.098) | 0.081 (0.056-0.112) | 0.095 (0.063-0.137) | 0.108 (0.070-0.157) |
| 10-day | 0.021 (0.016-0.025) | 0.024 (0.020-0.030) | 0.031 (0.025-0.038) | 0.036 (0.029-0.045) | 0.043 (0.033-0.056) | 0.049 (0.037-0.065) | 0.055 (0.040-0.075) | 0.062 (0.042-0.085) | 0.072 (0.048-0.103) | 0.081 (0.052-0.117) |
| 20-day | 0.015 (0.012-0.018) | 0.017 (0.013-0.020) | 0.020 (0.016-0.025) | 0.023 (0.018-0.028) | 0.027 (0.021-0.034) | 0.030 (0.022-0.039) | 0.033 (0.024-0.044) | 0.036 (0.025-0.050) | 0.041 (0.027-0.058) | 0.044 (0.029-0.064) |
| 30-day | 0.012 (0.010-0.015) | 0.014 (0.011-0.017) | 0.016 (0.013-0.019) | 0.018 (0.014-0.022) | 0.020 (0.016-0.026) | 0.023 (0.017-0.029) | 0.025 (0.018-0.033) | 0.027 (0.018-0.036) | 0.029 (0.019-0.041) | 0.031 (0.020-0.045) |
| 45-day | 0.010 (0.008-0.012) | 0.011 (0.009-0.013) | 0.013 (0.010-0.015) | 0.014 (0.011-0.017) | 0.016 (0.012-0.020) | 0.017 (0.013-0.022) | 0.019 (0.013-0.024) | 0.020 (0.014-0.027) | 0.021 (0.014-0.030) | 0.022 (0.014-0.032) |
| 60-day | 0.009 (0.007-0.011) | 0.009 (0.008-0.012) | 0.011 (0.009-0.013) | 0.012 (0.009-0.014) | 0.013 (0.010-0.017) | 0.014 (0.011-0.018) | 0.015 (0.011-0.020) | 0.016 (0.011-0.022) | 0.017 (0.011-0.024) | 0.018 (0.011-0.025) |

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

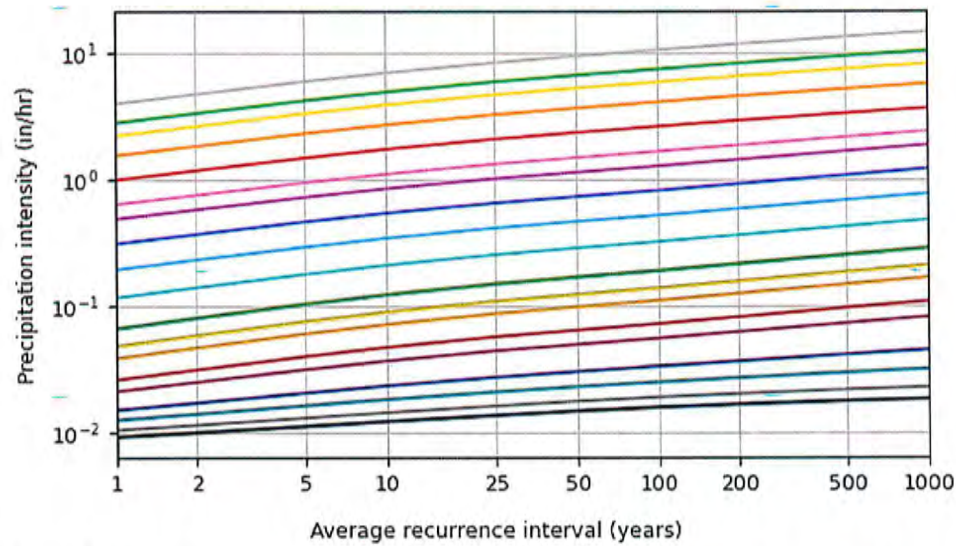
[Back to Top](#)

PF graphical

PDS-based intensity-duration-frequency (IDF) curves
 Latitude: 41.8440°, Longitude: -71.8937°



| Average recurrence interval (years) |
|-------------------------------------|
| 1 |
| 2 |
| 5 |
| 10 |
| 25 |
| 50 |
| 100 |
| 200 |
| 500 |
| 1000 |



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

[Back to Top](#)

Maps & aerials

Small scale terrain



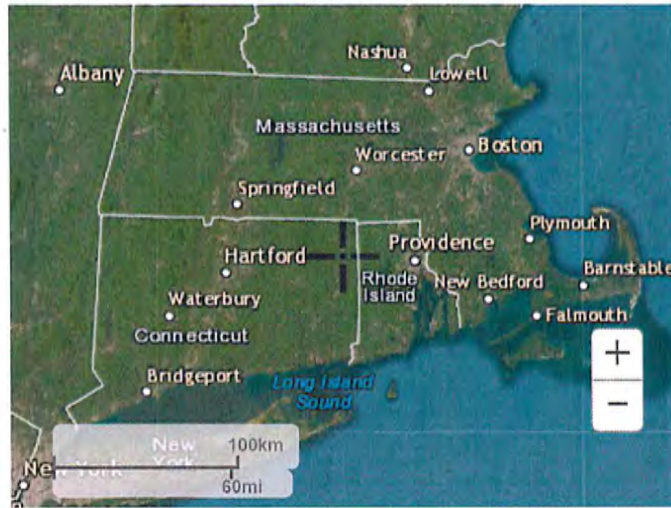
Large scale terrain



Large scale map



Large scale aerial



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[National Water Center](#)
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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Table 2-2a Runoff curve numbers for urban areas ^{1/}

| Cover description | Average percent impervious area ^{2/} | Curve numbers for hydrologic soil group | | | |
|--|--|--|----|----|----|
| | | A | B | C | D |
| Fully developed urban areas (vegetation established) | | | | | |
| Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} : | | | | | |
| Poor condition (grass cover < 50%) | | 68 | 79 | 86 | 89 |
| Fair condition (grass cover 50% to 75%) | | 49 | 69 | 79 | 84 |
| Good condition (grass cover > 75%) | | 39 | 61 | 74 | 80 |
| Impervious areas: | | | | | |
| Paved parking lots, roofs, driveways, etc. (excluding right-of-way) | | 98 | 98 | 98 | 98 |
| Streets and roads: | | | | | |
| Paved; curbs and storm sewers (excluding right-of-way) | | 98 | 98 | 98 | 98 |
| Paved; open ditches (including right-of-way) | | 83 | 89 | 92 | 93 |
| Gravel (including right-of-way) | | 76 | 85 | 89 | 91 |
| Dirt (including right-of-way) | | 72 | 82 | 87 | 89 |
| Western desert urban areas: | | | | | |
| Natural desert landscaping (pervious areas only) ^{4/} | | 63 | 77 | 85 | 88 |
| Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) | | 96 | 96 | 96 | 96 |
| Urban districts: | | | | | |
| Commercial and business | 85 | 89 | 92 | 94 | 95 |
| Industrial | 72 | 81 | 88 | 91 | 93 |
| Residential districts by average lot size: | | | | | |
| 1/8 acre or less (town houses) | 65 | 77 | 85 | 90 | 92 |
| 1/4 acre | 38 | 61 | 75 | 83 | 87 |
| 1/3 acre | 30 | 57 | 72 | 81 | 86 |
| 1/2 acre | 25 | 54 | 70 | 80 | 85 |
| 1 acre | 20 | 51 | 68 | 79 | 84 |
| 2 acres | 12 | 46 | 65 | 77 | 82 |

Developing urban areas

Newly graded areas
(pervious areas only, no vegetation) ^{5/}

| | | | | |
|--|----|----|----|----|
| | 77 | 86 | 91 | 94 |
|--|----|----|----|----|

Idle lands (CN's are determined using cover types
similar to those in table 2-2c).

¹ Average runoff condition, and $I_a = 0.2S$.

² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands ^{1/}

| Cover description | | | Curve numbers for hydrologic soil group | | | |
|--|----------------------------|------------------------------------|---|----|----|----|
| Cover type | Treatment ^{2/} | Hydrologic condition ^{3/} | A | B | C | D |
| Fallow | Bare soil | — | 77 | 86 | 91 | 94 |
| | Crop residue cover (CR) | Poor | 76 | 85 | 90 | 93 |
| | | Good | 74 | 83 | 88 | 90 |
| Row crops | Straight row (SR) | Poor | 72 | 81 | 88 | 91 |
| | | Good | 67 | 78 | 85 | 89 |
| | SR + CR | Poor | 71 | 80 | 87 | 90 |
| | | Good | 64 | 75 | 82 | 85 |
| | Contoured (C) | Poor | 70 | 79 | 84 | 88 |
| | | Good | 65 | 75 | 82 | 86 |
| | C + CR | Poor | 69 | 78 | 83 | 87 |
| | | Good | 64 | 74 | 81 | 85 |
| | Contoured & terraced (C&T) | Poor | 66 | 74 | 80 | 82 |
| | | Good | 62 | 71 | 78 | 81 |
| C&T+ CR | Poor | 65 | 73 | 79 | 81 | |
| | Good | 61 | 70 | 77 | 80 | |
| Small grain | SR | Poor | 65 | 76 | 84 | 88 |
| | | Good | 63 | 75 | 83 | 87 |
| | SR + CR | Poor | 64 | 75 | 83 | 86 |
| | | Good | 60 | 72 | 80 | 84 |
| | C | Poor | 63 | 74 | 82 | 85 |
| | | Good | 61 | 73 | 81 | 84 |
| | C + CR | Poor | 62 | 73 | 81 | 84 |
| | | Good | 60 | 72 | 80 | 83 |
| | C&T | Poor | 61 | 72 | 79 | 82 |
| | | Good | 59 | 70 | 78 | 81 |
| C&T+ CR | Poor | 60 | 71 | 78 | 81 | |
| | Good | 58 | 69 | 77 | 80 | |
| Close-seeded or broadcast legumes or rotation meadow | SR | Poor | 66 | 77 | 85 | 89 |
| | | Good | 58 | 72 | 81 | 85 |
| | C | Poor | 64 | 75 | 83 | 85 |
| | | Good | 55 | 69 | 78 | 83 |
| | C&T | Poor | 63 | 73 | 80 | 83 |
| | | Good | 51 | 67 | 76 | 80 |

¹ Average runoff condition, and $I_a=0.2S$

² Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

³ Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good $\geq 20\%$), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands ^{1/}

| Cover description | Hydrologic condition | Curve numbers for hydrologic soil group | | | |
|--|----------------------|---|----|----|----|
| | | A | B | C | D |
| Pasture, grassland, or range—continuous forage for grazing. ^{2/} | Poor | 68 | 79 | 86 | 89 |
| | Fair | 49 | 69 | 79 | 84 |
| | Good | 39 | 61 | 74 | 80 |
| Meadow—continuous grass, protected from grazing and generally mowed for hay. | — | 30 | 58 | 71 | 78 |
| Brush—brush-weed-grass mixture with brush the major element. ^{3/} | Poor | 48 | 67 | 77 | 83 |
| | Fair | 35 | 56 | 70 | 77 |
| | Good | 30 ^{4/} | 48 | 65 | 73 |
| Woods—grass combination (orchard or tree farm). ^{5/} | Poor | 57 | 73 | 82 | 86 |
| | Fair | 43 | 65 | 76 | 82 |
| | Good | 32 | 58 | 72 | 79 |
| Woods. ^{6/} | Poor | 45 | 66 | 77 | 83 |
| | Fair | 36 | 60 | 73 | 79 |
| | Good | 30 ^{4/} | 55 | 70 | 77 |
| Farmsteads—buildings, lanes, driveways, and surrounding lots. | — | 59 | 74 | 82 | 86 |

¹ Average runoff condition, and $I_a = 0.2S$.

² **Poor:** <50% ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

³ **Poor:** <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

⁴ Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

⁶ **Poor:** Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands ^{1/}

| Cover description | | Curve numbers for hydrologic soil group | | | |
|--|------------------------------------|---|----|----|----|
| Cover type | Hydrologic condition ^{2/} | A ^{3/} | B | C | D |
| Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element. | Poor | | 80 | 87 | 93 |
| | Fair | | 71 | 81 | 89 |
| | Good | | 62 | 74 | 85 |
| Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush. | Poor | | 66 | 74 | 79 |
| | Fair | | 48 | 57 | 63 |
| | Good | | 30 | 41 | 48 |
| Pinyon-juniper—pinyon, juniper, or both; grass understory. | Poor | | 75 | 85 | 89 |
| | Fair | | 58 | 73 | 80 |
| | Good | | 41 | 61 | 71 |
| Sagebrush with grass understory. | Poor | | 67 | 80 | 85 |
| | Fair | | 51 | 63 | 70 |
| | Good | | 35 | 47 | 55 |
| Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus. | Poor | 63 | 77 | 85 | 88 |
| | Fair | 55 | 72 | 81 | 86 |
| | Good | 49 | 68 | 79 | 84 |

¹ Average runoff condition, and I_a , = 0.2S. For range in humid regions, use table 2-2c.

² Poor: <30% ground cover (litter, grass, and brush overstory).

Fair: 30 to 70% ground cover.

Good: > 70% ground cover.

³ Curve numbers for group A have been developed only for desert shrub.

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Permeability of Soils using Compaction Permeameter

Date: 5/1, 5/2 & 5/3/2023

Project: Colonial Drive, Killingly, Ct.

CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: Compacted to 100.0 lbs/cu ft per Soil Profiles

Page #1

Sample #1: Basin #1

Permeability: 6.17×10^{-3} cm/sec or 17.5 ft/day

Sample #2: Basin #3

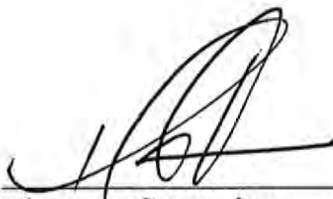
Permeability: 4.63×10^{-3} cm/sec or 13.1 ft/day

Sample #3: Basin #5

Permeability: 4.27×10^{-3} cm/sec or 12.1 ft/day

Sample #4: Basin #5

Permeability: 3.92×10^{-3} cm/sec or 11.2 ft/day



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Permeability of Soils using Compaction Permeameter

Date: 5/1, 5/2 & 5/3/2023

Project: Colonial Drive, Killingly, Ct.

CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: Compacted to 100.0 lbs/cu ft per Soil Profiles

Page #2

Sample #1: Basin #6

Permeability: 2.92×10^{-3} cm/sec or 8.3 ft/day

Sample #2: Basin #4

Permeability: 3.03×10^{-4} cm/sec or .85 ft/day



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SIEVE ANALYSIS

Date: 5/1/2023

Project: Colonial Drive, Killingly, Ct.

CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: N/A

Sample Designation: Basin #1

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 69.6 |
| 1/4 in | 51.0 |
| #4 | 47.8 |
| #10 | 37.2 |
| #20 | 22.7 |
| #40 | 11.1 |
| #60 | 6.7 |
| #100 | 4.4 |
| #200 | 2.5 |



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SIEVE ANALYSIS

Date: 5/1/2023

Project: Colonial Drive, Killingly, Ct.

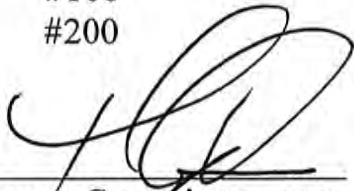
CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: N/A

Sample Designation: Basin #2

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 65.8 |
| 1/4 in | 47.2 |
| #4 | 44.3 |
| #10 | 34.5 |
| #20 | 23.5 |
| #40 | 13.9 |
| #60 | 9.4 |
| #100 | 6.6 |
| #200 | 4.0 |



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SIEVE ANALYSIS

Date: 5/1/2023

Project: Colonial Drive, Killingly, Ct.


CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: N/A

Sample Designation: Basin #3

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 85.7 |
| 1/4 in | 76.8 |
| #4 | 74.1 |
| #10 | 61.3 |
| #20 | 37.4 |
| #40 | 18.8 |
| #60 | 9.8 |
| #100 | 5.9 |
| #200 | 3.4 |


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SIEVE ANALYSIS

Date: 5/2/2023

Project: Colonial Drive, Killingly, Ct.

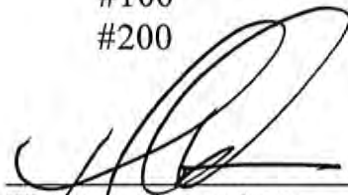
CLA Project #: 7283

Material: On-site material (Test Pits)

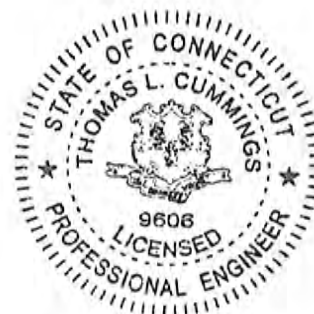
Specification: N/A

Sample Designation: Basin #4

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 100 |
| 1/4 in | 95.6 |
| #4 | 95.0 |
| #10 | 93.1 |
| #20 | 91.5 |
| #40 | 90.0 |
| #60 | 88.4 |
| #100 | 84.5 |
| #200 | 52.5 |



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SIEVE ANALYSIS

Date: 5/1/2023

Project: Colonial Drive, Killingly, Ct.

CLA Project #: 7283

Material: On-site material (Test Pits)

Specification: N/A

Sample Designation: Basin #5

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 76.3 |
| 1/4 in | 60.8 |
| #4 | 57.1 |
| #10 | 44.5 |
| #20 | 26.9 |
| #40 | 15.6 |
| #60 | 11.0 |
| #100 | 7.8 |
| #200 | 4.6 |



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SIEVE ANALYSIS

Date: 5/2/2023

Project: Colonial Drive, Killingly, Ct.

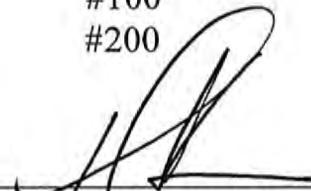
CLA Project #: 7283

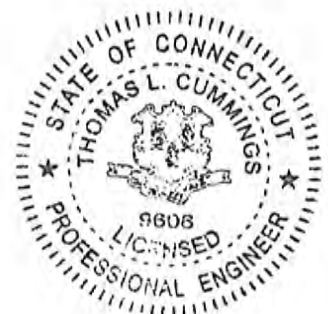
Material: On-site material (Test Pits)

Specification: N/A

Sample Designation: Basin #6

| Sieve Size | % Passing |
|------------|-----------|
| 3/4 in | 75.9 |
| 1/4 in | 49.3 |
| #4 | 46.5 |
| #10 | 34.5 |
| #20 | 26.4 |
| #40 | 21.8 |
| #60 | 17.8 |
| #100 | 13.3 |
| #200 | 7.8 |


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APPENDIX B

Soil Resource Report



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for State of Connecticut

25 Colonial Drive



Preface

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

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

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

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

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

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

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Soil Map

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

Custom Soil Resource Report Soil Map



Map Scale: 1:2,670 if printed on A landscape (11" x 8.5") sheet.

0 35 70 140 210 Meters

0 100 200 400 600 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N 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 1:12,000.

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: State of Connecticut
 Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Jul 1, 2022

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 |
|------------------------------------|---|--------------|----------------|
| 17 | Timakwa and Natchaug soils, 0 to 2 percent slopes | 0.3 | 1.6% |
| 23A | Sudbury sandy loam, 0 to 5 percent slopes | 3.3 | 17.5% |
| 36A | Windsor loamy sand, 0 to 3 percent slopes | 0.3 | 1.6% |
| 36B | Windsor loamy sand, 3 to 8 percent slopes | 3.0 | 16.0% |
| 38C | Hinckley loamy sand, 3 to 15 percent slopes | 11.7 | 62.0% |
| 38E | Hinckley loamy sand, 15 to 45 percent slopes | 0.3 | 1.4% |
| Totals for Area of Interest | | 18.9 | 100.0% |

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

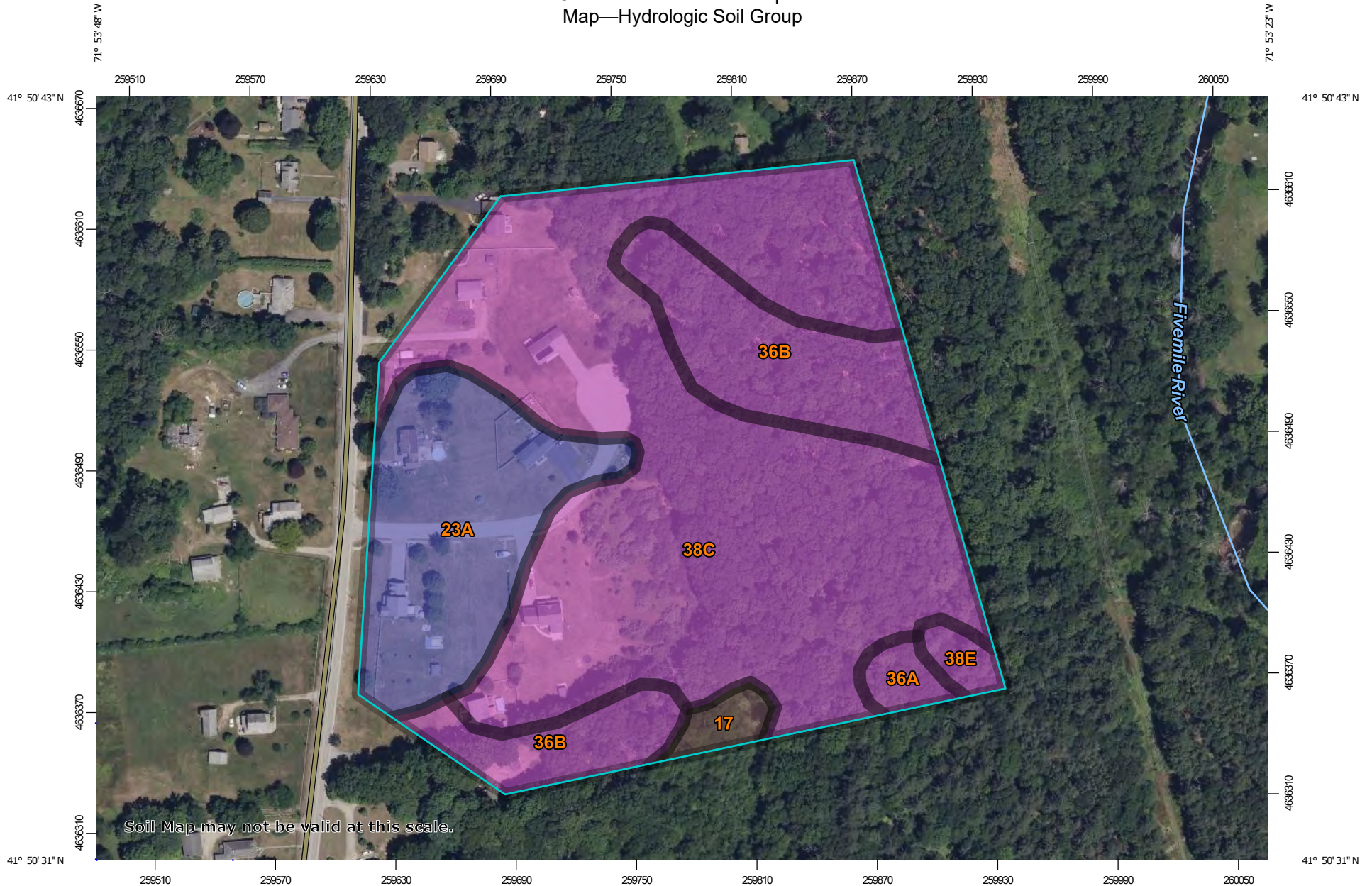
Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

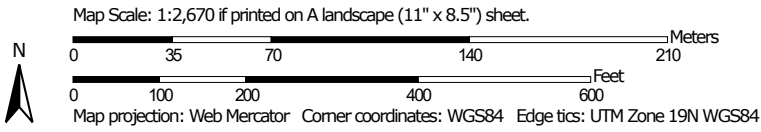
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Lines


-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Points






-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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 Web Soil Survey URL:
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Table—Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------|--------------|----------------|
| 17 | Timakwa and Natchaug soils, 0 to 2 percent slopes | B/D | 0.3 | 1.6% |
| 23A | Sudbury sandy loam, 0 to 5 percent slopes | B | 3.3 | 17.5% |
| 36A | Windsor loamy sand, 0 to 3 percent slopes | A | 0.3 | 1.6% |
| 36B | Windsor loamy sand, 3 to 8 percent slopes | A | 3.0 | 16.0% |
| 38C | Hinckley loamy sand, 3 to 15 percent slopes | A | 11.7 | 62.0% |
| 38E | Hinckley loamy sand, 15 to 45 percent slopes | A | 0.3 | 1.4% |
| Totals for Area of Interest | | | 18.9 | 100.0% |

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher