Final SWM Design and Erosion and Sediment Control Report

February 25, 2025 Project: 01-24-0390

Sheetz Rebuild #62 - Frostburg

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PROJECT NARRATIVE

Scope of Work

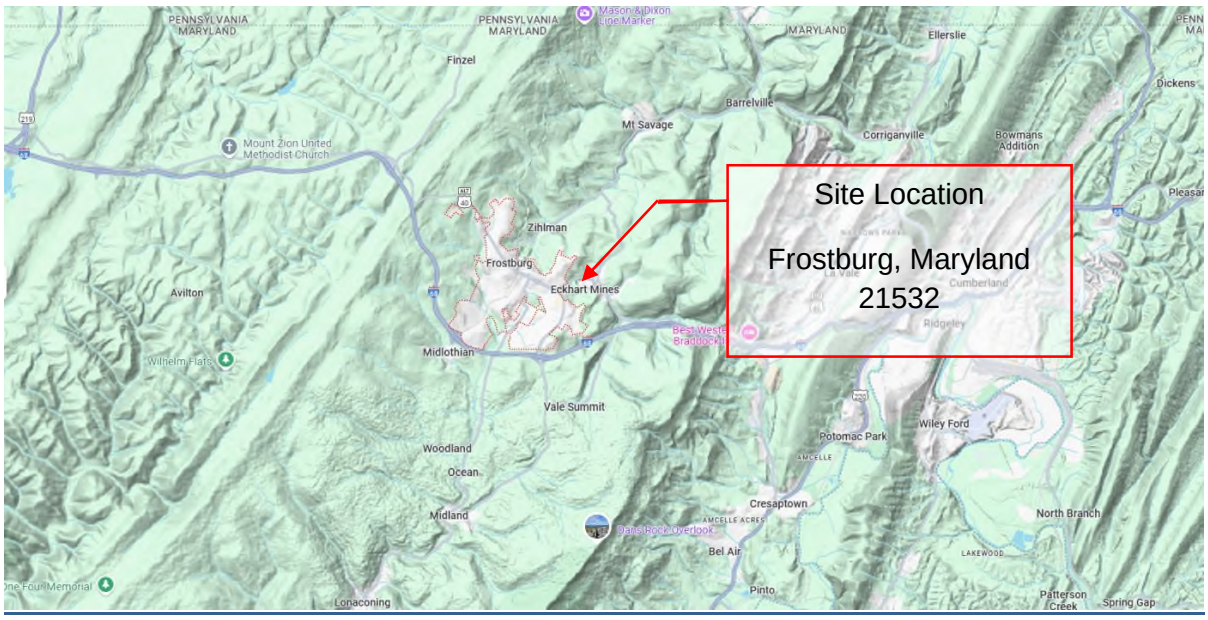
This report is for Stormwater Management and Erosion and Sediment Control Design for a new 6,132 SF, 1-story, Sheetz store and related site improvements within the City of Frostburg, Maryland. More specifically the site is located at the intersection of New Georges Creek Rd. SW and Dr. Gasmick Ln. where an existing Sheetz Store is located. The scope is for the demolition and replacement of the existing Sheetz Store and Fueling Canopy with new facilities.

Project Description

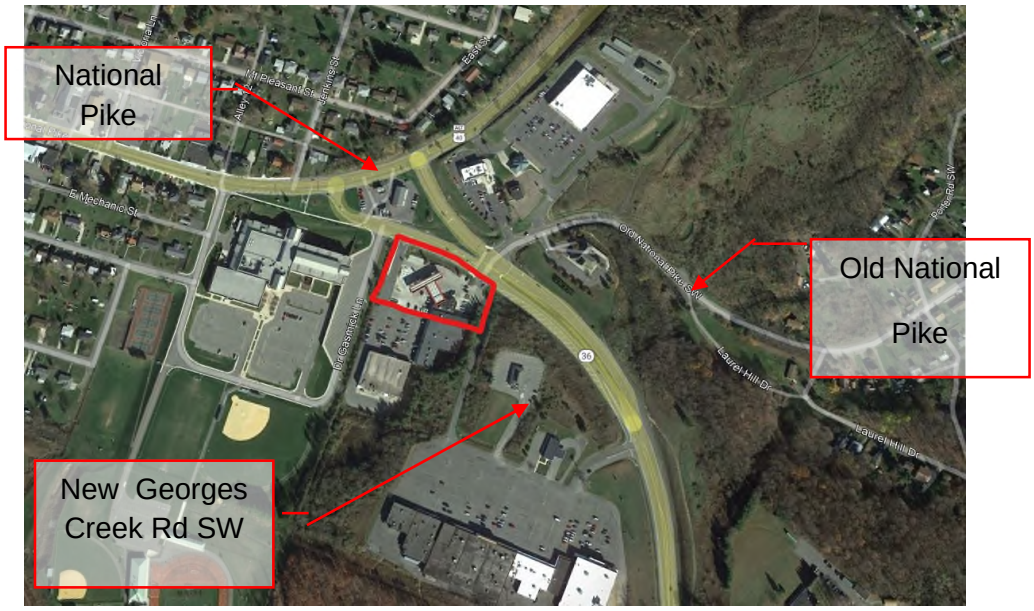
A new Sheetz convenience store / gas station is to be constructed in place of an existing Sheetz Store on-site. The site is located on ±1.38-acre tract more particularly described at Tax Map 0203, Grid 0024 P/O Tax Parcel with the last instrument in the chain of title being located at Libre 02217 per the land records of Allegany County, Maryland. The site is within the Highway Commercial "HC" zoning district within the City of Frostburg.

The total area of the ESD/LOD will be 1.49 acres.

Location Map



Vicinity Map



Topography and Soils

The topography of the site is gently sloping from south – north averagely ranging from 2% – 5%. The general site topography is shown on the Existing Conditions Plan of the Site Plan package, of which this report is a part thereof.

According to the USGS Maryland Geologic Map Data, the site is underlain by Dunkard Formation. Dunkard formation is generally described as medium gray to dark gray, carbonaceous, silty shale and siltstone; light to medium gray, micaceous, medium to coarse grained sandstone; and thin discontinuous nodular limestone, and thin coal beds. The Dunkard Foundation caps several hill in the Georges Creek Syncline, and may be as much as 250 feet thick.

According to the United States Department of Agriculture Natural Resources Conservation Service soils survey the site contains UxB – Urban land. See below partial copy of the Soil Survey Map and Custom Soil Resource Report within the indexes.

Symbol	Description	K Factor	HSG
UxB	Urban land, 0 to 8 percent slopes		

Soils Map

Streams, Waterways and Floodplain

There are no streams, waterways, wetlands or floodplain within the project limits.

See section 2.8 Floodplain Mapping below for Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRMette) Panel # 24001C0018E, with an effective date of April 3, 2020.

Floodplain Mapping

SWM Development Design

Scope of Work

This portion of this report is for the Final Site Development Design Phase of Environmental Site Design for a new Sheetz store and associated site features. These features include parking, fuel islands/canopy and a dumpster enclosure. Stormwater will be managed through a combination of reduction in impervious surface, disconnection and bioretention.

Basis of Design

The new Sheetz store will be developed in accordance with the Environmental Site Design requirements for redevelopment as defined in revised Chapter 5 of the 2000 Maryland Stormwater Design Manual per the 2007 Stormwater Management Act. This report and the included drawings and exhibits are submitted for approval of the Stormwater Management Design.

The hydrology analyses for both the Pre-development and Post-development drainage areas are based on the Rational Method. The runoff coefficients are taken from engineering design tables. The time of concentration values were computed using basic engineering judgment concerning the site conditions and utilization of minimum times as necessary. The attached

calculations satisfy the requirements for Redevelopment, as defined by the 2000 Maryland Stormwater Design Manual.

Site Fingerprinting and Development Layout

Sheetz rebuild - Frostburg proposes the following strategies for site layout:

- Plan the building footprint and layout to protect conservation areas.
  - There are no conservation areas on site.
- Evaluate opportunities to enhance/expand forested, wetland, and stream buffers.
  - There are no opportunities to enhance/expand forested, wetlands or stream buffers as part of this development.
- Grade the site so that runoff will flow from impervious areas directly to pervious areas or other natural conveyance systems.
  - Proposed design incorporates impervious area flows directly to pervious areas.
- Maintain natural flow paths between the site and upstream and downstream systems.
  - Site design incorporates proposed grading to maintain current upstream and downstream flow paths.
- Maintain sheet flow and natural overland flow processes where feasible.
  - Existing site sheet flow patterns and natural overland flow processes are maintained to the maximum extent practical.
- Provide stable conveyance of runoff off-site.
  - Design demonstrates stable conveyance of runoff off-site.

Additional Strategies

- In accordance with the design process micro-scale practices are proposed to treat impervious areas.
- Implementation of the Stormwater Management Plan will be integrated into the Soil Erosion and Sediment Control Design.
- Reduce impervious area from the existing conditions.

Location of ESD Practices

Sheetz Rebuild - Frostburg proposes to incorporate the following Site Development Strategies in accordance with Chapter 5, Table 5.2.

A. Narrower, shorter street, right of way, and sidewalk reductions are not applicable to this project.
B. Cul-de-sac design with reduced paving is not applicable to the project.
C. Storm drainage is conveyed by the existing drainage systems for this project.
D. Parking has been minimized from the existing conditions and the impervious area has been reduced.

E. The lot runoff is treated through non-structural and micro-scale practices.
F. Existing open space will be maintained for the project.
G. Relaxed setbacks and frontages are not applicable to the project.
H. The site currently has a shared driveway/entrance with the adjoining property, which will be maintained.
I. Sheet flow discharge of runoff to pervious areas is proposed for the project.
J. 100 Year Flood Plain and Stream Buffers are not applicable to the project.
K. Proposed grading and earth disturbance will be limited to that required to develop the project.
L. There are no tree conservation areas on-site nor opportunities for creation of said areas.
M. Conservation incentives (Natural Areas) are not applicable to this project.

Redevelopment

The site contains 87% of existing impervious surface area, 1.30 acres with a total area of 1.50 ac. Per Section 5.5 "Redevelopment" of the revised Chapter 5 of the Maryland Storm Water Design Manual, the existing impervious surface area threshold is 40%; therefore, this site is subject to Redevelopment. See calculations enclosed herein.

Computed ESD Targets

Stormwater management shall be addressed according to Redevelopment requirements for 50% of existing impervious area and net reduction in impervious area, which would be a total of 0.65 Ac. The site is located on majority 'D' soils. The proposed development reduces the impervious area by 0.17 Ac., leaving 0.48 Ac. of impervious area for ESDv treatment. The worksheet calculates a total ESDv volume of 1,655 cu. ft. of runoff to be treated at a target Pe=1" in which the proposed design sufficiently does.

Table 1– Target ESD_v, RCN and P_e

Project Site Area (LOD)	1.50
Existing Imperviousness (Ac.)	1.30
Percent Existing Impervious (%)	87%
Redevelopment?	Yes
Impervious Area to be Treated (Ac.)	0.65
Proposed Imperviousness (Ac.)	1.13
Percent Proposed Imperviousness (%)	75%
Imperviousness Reduction (Ac.)	0.17
Resulting Impervious to be Treated (Ac.)	0.48
Hydrologic Soil	D
Target P_e	1.0"
Target RCN	55
Target ESD_v	1,655

ESD BMP's

One (1) Micro-scale Practices Micro-bioretention (BMP M-6), has been implemented in this design to treat stormwater runoff and provide water quality for the site.

The ESD BMP's implemented will treat a combination of parking lot, rooftop and sidewalk runoff. Refer to the table below for BMP sizing and ESDv tabulations.

Table 2– Provided ESD_v, RCN and P_e

Project Site Area (LOD)	1.50
Percent Proposed Imperviousness (%)	75%
Treated Imperviousness (Ac.)	0.52
Hydrologic Soil	D
Provided P_e	1.0"
Provided RCN	55
Provided ESD_v	1,861

Table 3 - Summary Chart of ESD BMP Sizing

BMP	Contributing Drainage Area (AC.)	IMP. AREA (AC.)	TARGET Pe	TARGET ESDv	PROVIDED ESDv	RCN
MB #1	0.68	0.52	1.0	1655	1861	55

Pre-Development vs Post-Development Quantity Runoff

The entirety of the site discharges to a point at the northeast corner of the site and this point is used as the point of study for computations. See chart below for pre and post discharge quantities and reduction. See Appendix E for drainage area maps.

STORM EVENT	PRE-FLOW (CFS)	POST-FLOW (CFS)	POST – PRE FLOW DIFF (CFS)
10-YR	7.14	4.32	-2.82
100-YR	11.83	10.73	-1.10

Summary and Conclusion

Implementation of proposed Environmental Site Design for the proposed Sheetz Store in Frostburg, Maryland will bring this project into conformance of stormwater management and water quality standards by providing the required ESD treatment and reducing the rate of runoff for the 2-yr, 10-yr and 100-yr design storm.

Unified Sizing Criteria Chart

No.	CATEGORY	VOLUME REQUIRED	NOTES
1	ENVIRONMENTAL SITE DESIGN - ESDv	1,655 CUBIC FEET	PROVIDED THROUGH ESD
2	CHANNEL PROTECTION VOLUME – CPv (1 YEAR)	-	ESD PROVIDES VOLUME CONTROL TO ADDRESS CPv AND ALSO PROVIDES ADDITIONAL CONTROL FOR THE CPv ACCOUNTED FOR IN THE SWM STRUCTURE
3	OVER BANK FLOOD PROTECTION – Qp (10 YEAR)	-	Qp PROVIDED IN SWM STRUCTURE
4	EXTREME FLOOD VOLUME – Qf (100 YEAR)	-	ESD PROVIDED 1,961 CU.FT. AND A REDUCTION IN EXISTING IMPERVIOUS AREA WHICH REDUCED Qf IN THE SWM OF THE SITE AND ASSISTED IN PROVIDING SAFE CONVEYANCE.

Environmental Site Design Computations

Project # 01-24-0390

Sheetz – Frostburg Rebuild

Land Use Calculation

February 25, 2025

By : Eric H Iser

Limits of Disturbance – LOD = 65,286 SF = 1.50 Ac

Existing Impervious = 56,527 SF = 1.30 Ac

Existing Grass = 8,759 SF = 0.20

Proposed Impervious = 49,151 SF = 1.13 Ac

Proposed Grass = 16,376 SF = 0.37

Redevelopment : 1.30 Ac / 1.50 Ac = 87 % so Redevelopment Criteria is met

Need to treat 50% of the existing impervious minus any reduction in impervious area from existing to proposed.

1.30 Ac * 0.5 = 0.65 Ac

1.3 Ac – 1.13 Ac = 0.17 Ac

0.65 Ac – 0.17 Ac = 0.48 Ac of impervious needs treated at a Pe = 1”

Need 1655 cf of ESD Vol. Max allowed Credit 4147 (Pe=2.5) (See attached worksheet for ESD Volume calculations.)

Provided in Bio-retention (2.5’ Media & 0.5’ free water)

Media Area of 1125 SF * 2.5 * 0.40 = 1125 CF

Free Water - ((1125+1817)/2) * 0.5’ = 736 CF

Total treatment = 1861 CF

BMP ESDv COMPUTATIONS

TITLE: Sheetz Rebuild - Frosrburg
BMP: Site - Redevelopment **JOB No.:** 01-24-0390
COMPUTED BY: BDB **DATE:** 2/25/2025

SITE DRAINAGE AREA:	0.480	Ac.
IMPERVIOUSNESS:	0.480	Ac.
PERVIOUSNESS:	0.000	Ac.
I=(IMP./SITE)x100	100.0	%
Rv = 0.05+0.009(I)	0.95	

(Target) P_E=	1.0	FROM TABLE 5.3 OR PROVIDED	2.5	1yr. 24 hour event
$Q_E = P_E$ x Rv	0.95	RUNOFF DEPTH INCHES	2.38	RUNOFF DEPTH INCHES
ESDv =((Q_E* A)/12)*43560 SF/Ac.	1655	$FT.^3$	4147	$FT.^3$ (Max. ESDv Credit)
CN = 1000/{10+(5*P)+(10*Rv)-(10*(SQRT((Rv2)+(1.25*Rv*P))	100			

Tc =	0.10	hr.	FROM Tc WORK SHEET	Tc = 0.00	hr. FROM Tc WORK SHEET
Ia =	0.01			Ia = 0.01	
Ia/P =	0.01			Ia/P = 0.00	
qu =	0	csm/in.	FROM EXHIBIT 4-II	qu = 0	csm/in FROM EXHIBIT 4-II
A =	0.0008	$mi.^2$		A = 0.0008	$mi.^2$
Qp = qu x A x Qe	Qp=	0.00	cfs	Qp = qu x A x Qe1	Qp= NA cfs

DRAINAGE AREA SUMATION			IMPERVIOUS		PERVIOUS	
SUB AREA 1	0.480	Ac.	100%	0.48 Ac.	0.00	Ac.
SUB AREA 2	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 3	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 4	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 5	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 6	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 7	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 8	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 9	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 10	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 11	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 12	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
SUB AREA 13	0.000	Ac.	0%	0.00 Ac.	0.00	Ac.
TOTAL DRAINAGE AREA	0.48	Ac.		0.48 Ac.	0.00	Ac.

Q_p & Q_f Peak Storm Computations

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2025

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.140	2	716	16,100	------	------	------	DA - Pt. A Pre-Dev
3	SCS Runoff	3.118	2	716	6,810	------	------	------	DA Pt A1 - Post-dev
4	Reservoir	1.368	2	722	6,809	3	1966.08	2,048	Pt A1 to Bio
5	SCS Runoff	3.677	2	716	7,929	------	------	------	DA Pt A2 - Post dev
6	Combine	4.323	2	716	14,738	4, 5	------	------	Postdev Total Site

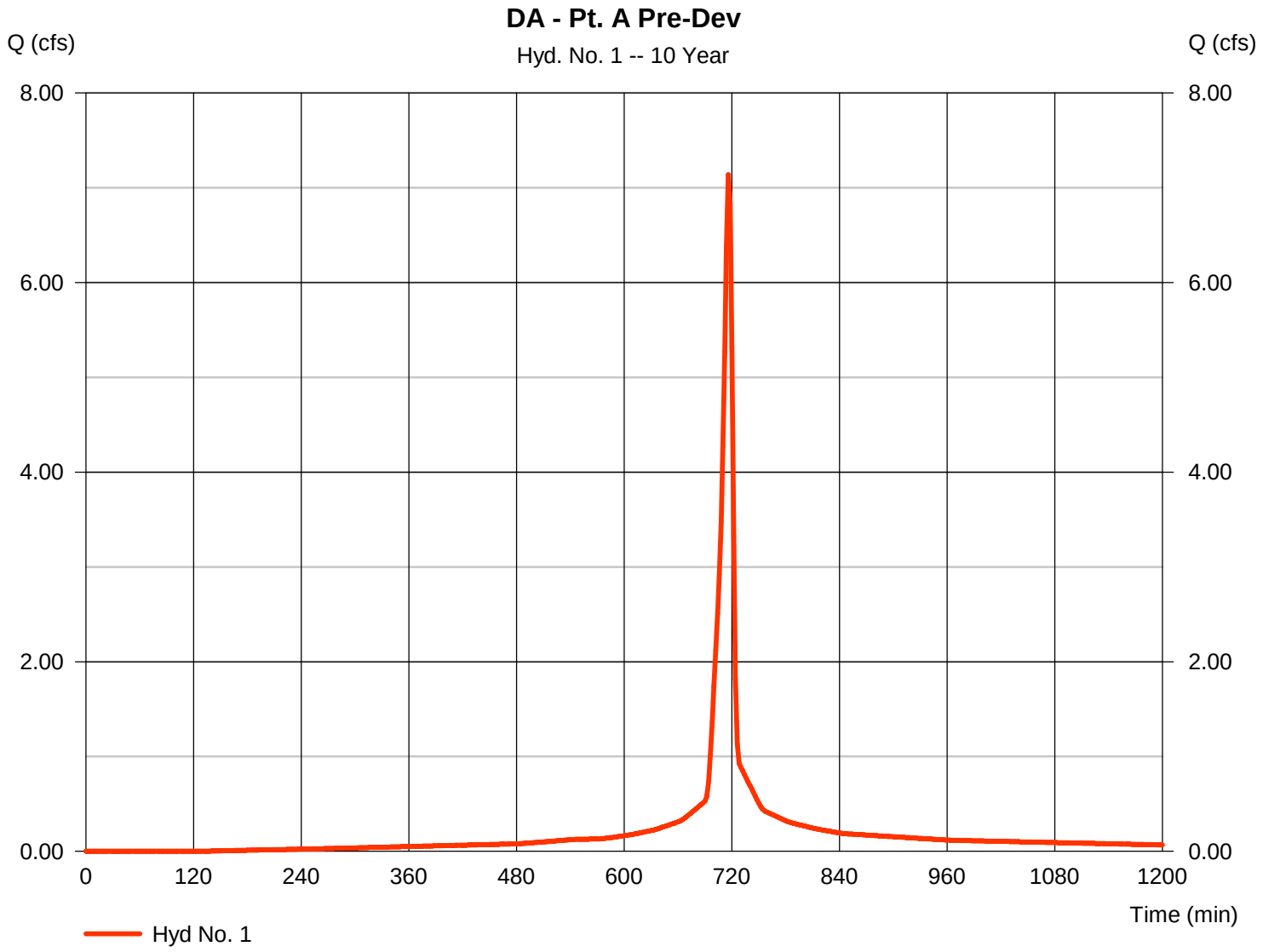
Hydrograph Report

Hyd. No. 1

DA - Pt. A Pre-Dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.140 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	16,100 cuft
Drainage area	=	1.500 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.300 x 98) + (0.200 x 80)] / 1.500



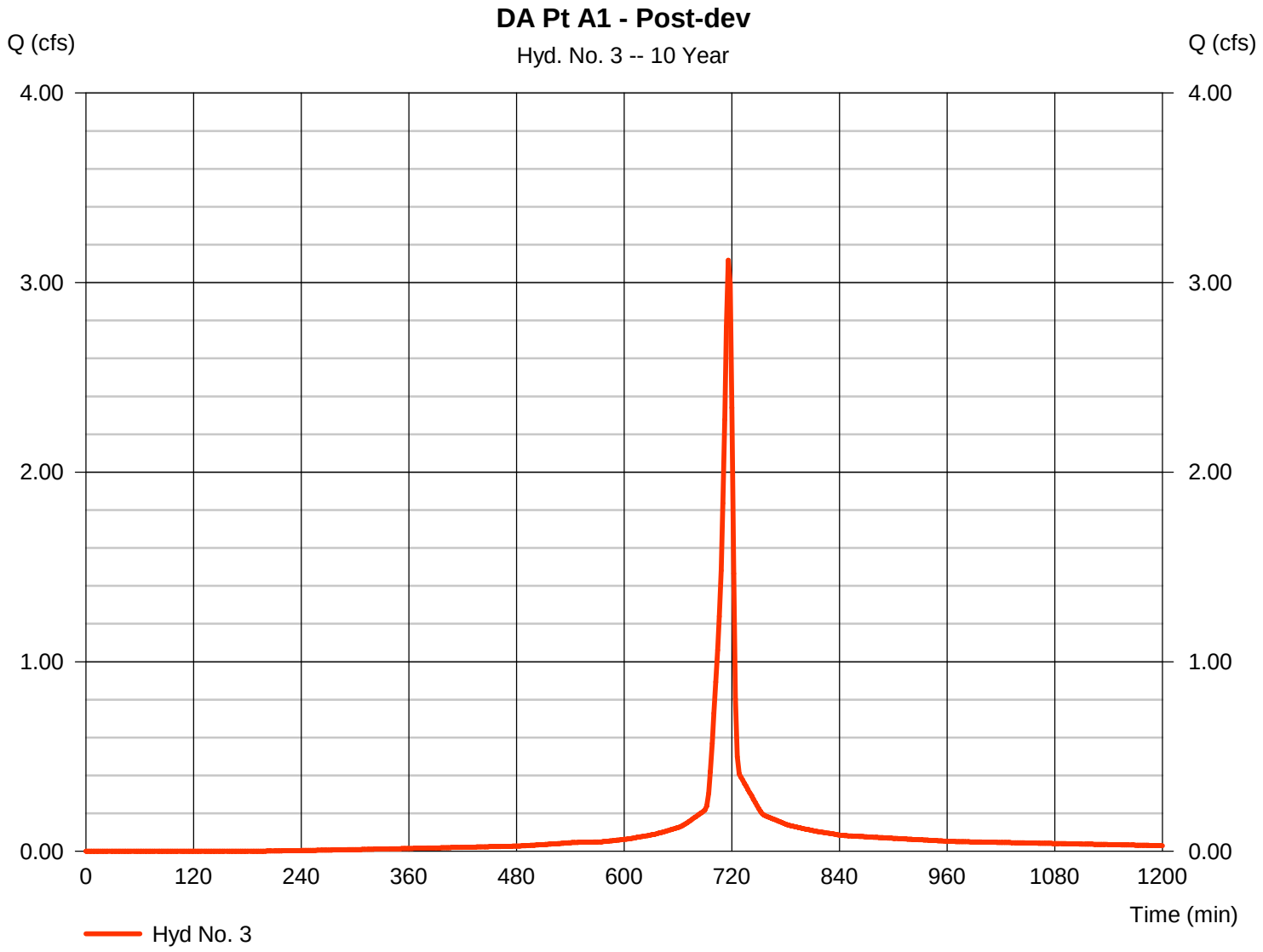
Hydrograph Report

Hyd. No. 3

DA Pt A1 - Post-dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.118 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	6,810 cuft
Drainage area	=	0.680 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.520 x 98) + (0.160 x 80)] / 0.680



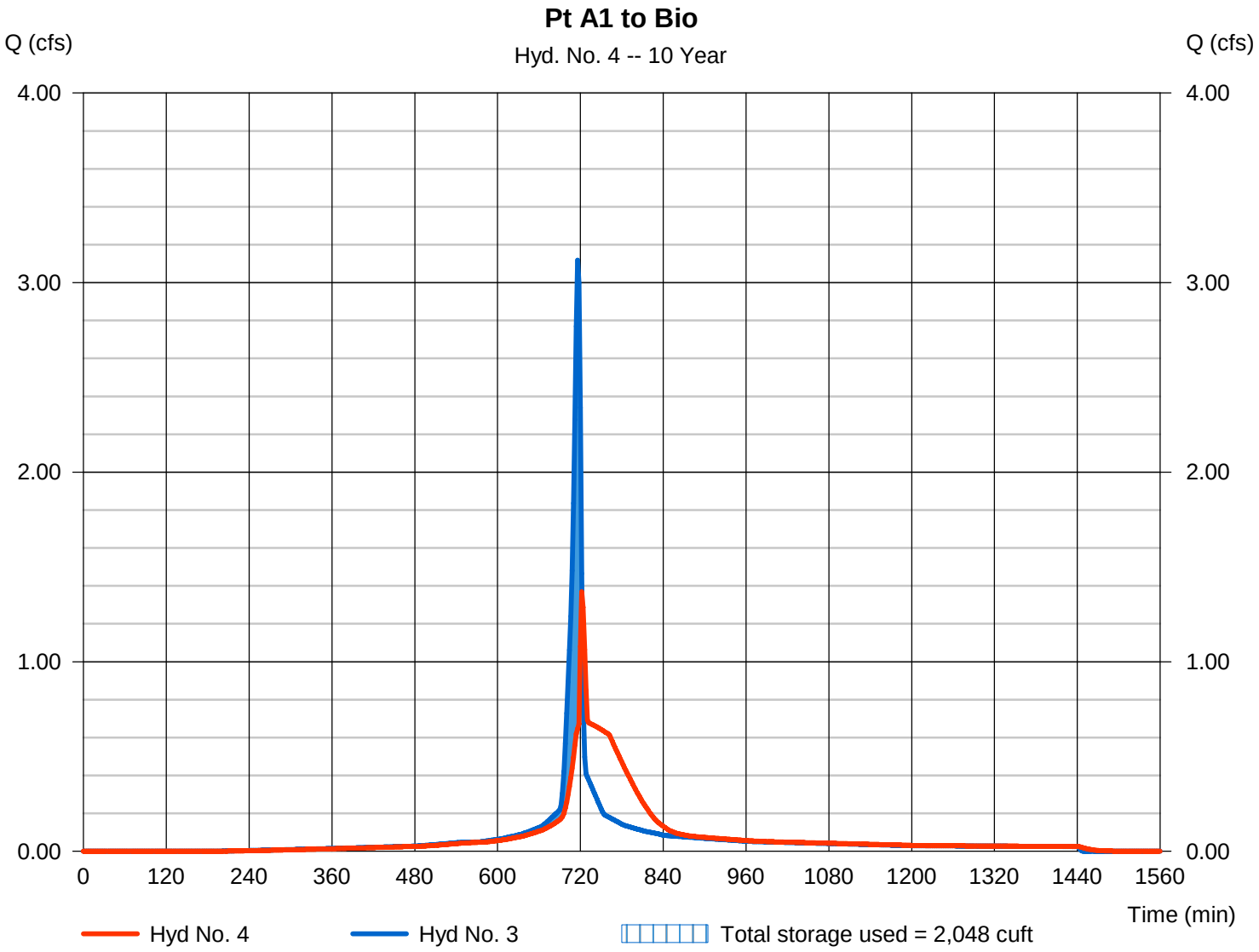
Hydrograph Report

Hyd. No. 4

Pt A1 to Bio

Hydrograph type	=	Reservoir	Peak discharge	=	1.368 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	6,809 cuft
Inflow hyd. No.	=	3 - DA Pt A1 - Post-dev	Max. Elevation	=	1966.08 ft
Reservoir name	=	Bio-Retention Area	Max. Storage	=	2,048 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Bio-Retention Area

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1963.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1963.00	450	0	0
2.50	1965.50	450	1,125	1,125
2.51	1965.51	1,126	8	1,133
3.00	1966.00	1,817	721	1,854
4.00	1967.00	2,857	2,337	4,191

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.00	0.00	0.00
Span (in)	= 15.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1963.00	1632.80	0.00	0.00
Length (ft)	= 60.00	0.50	0.00	0.00
Slope (%)	= 0.80	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

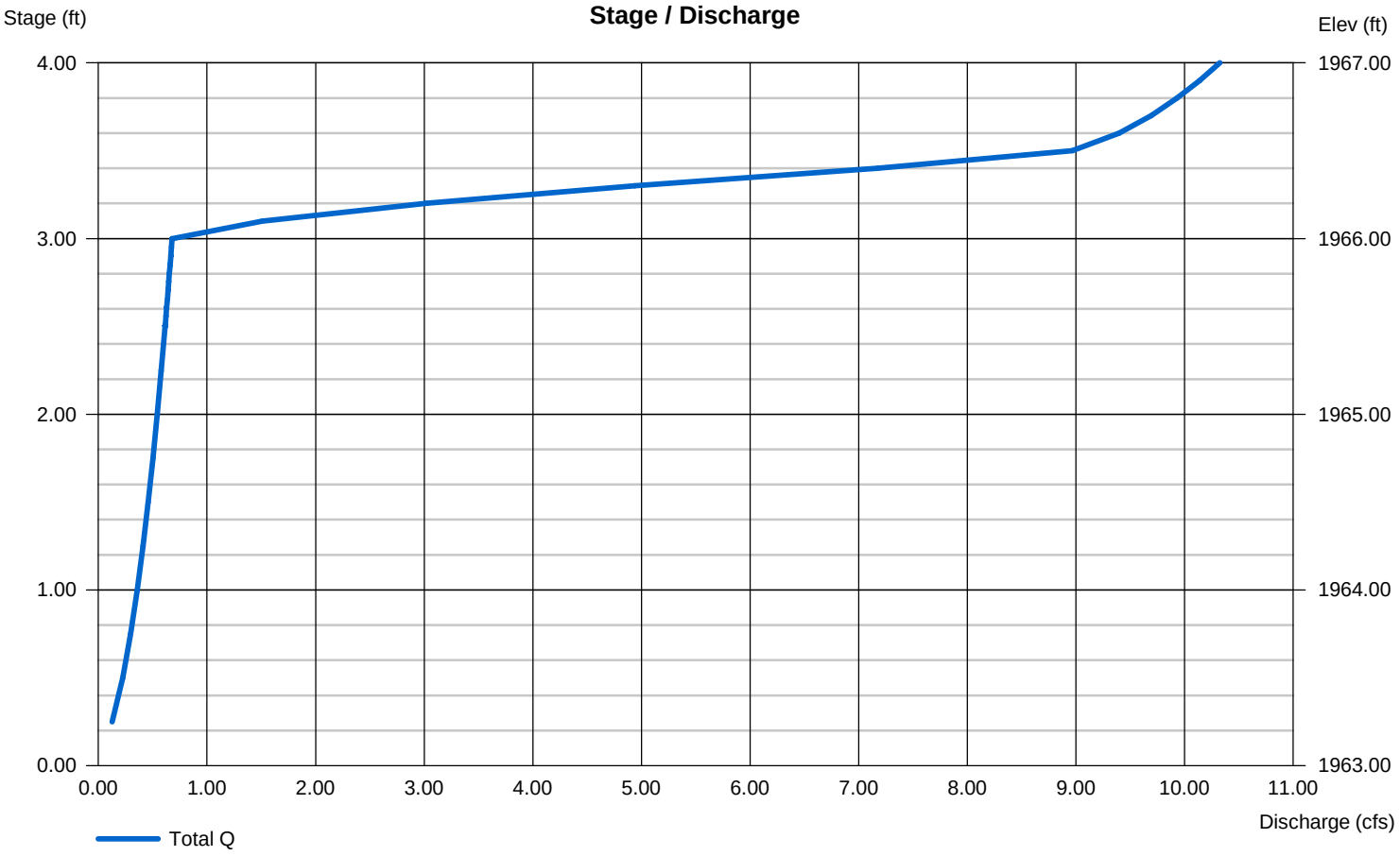
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	0.00	0.00	0.00
Crest El. (ft)	= 1966.00	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) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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



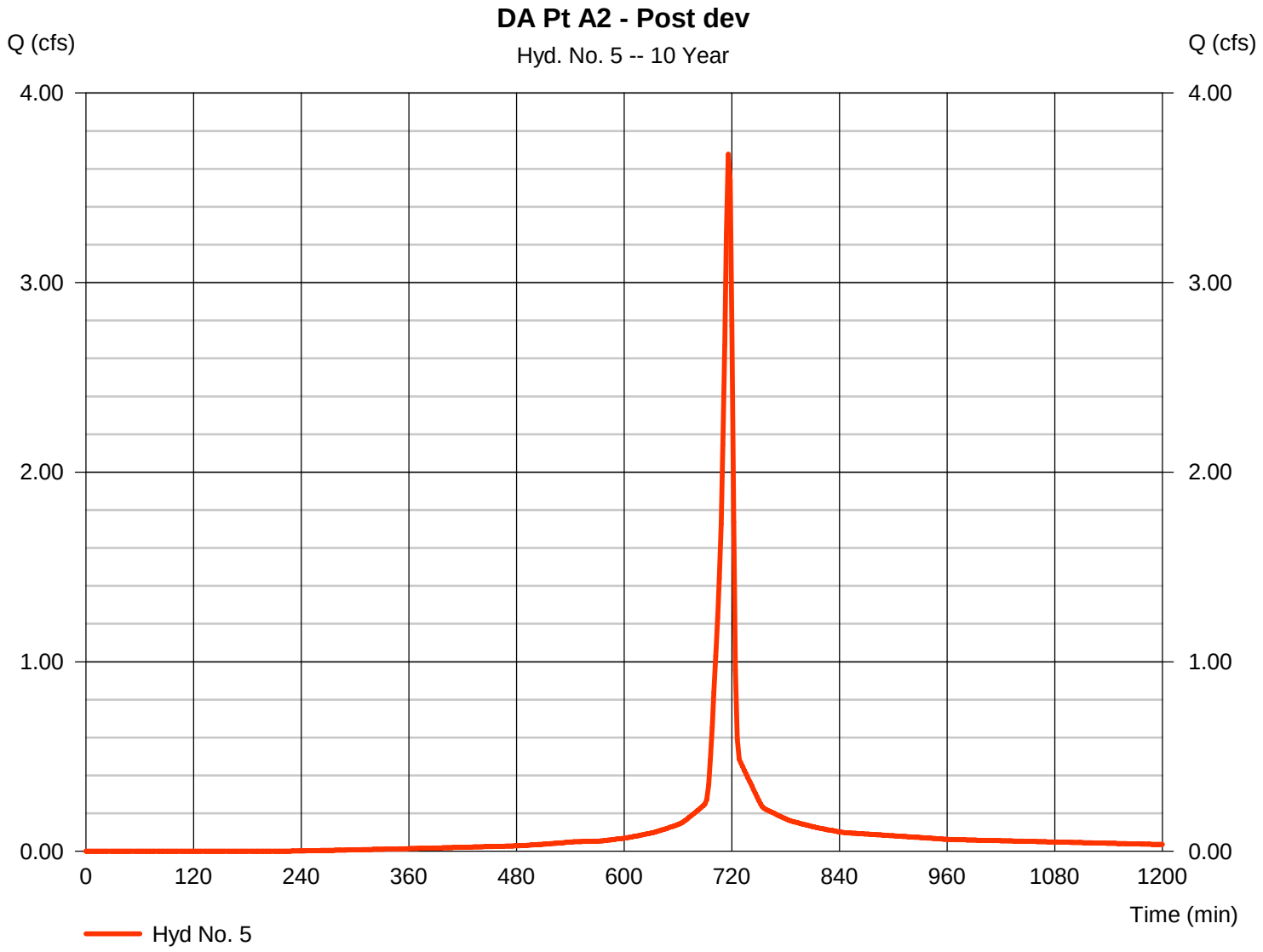
Hydrograph Report

Hyd. No. 5

DA Pt A2 - Post dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.677 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	7,929 cuft
Drainage area	=	0.820 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.610 x 98) + (0.210 x 80)] / 0.820

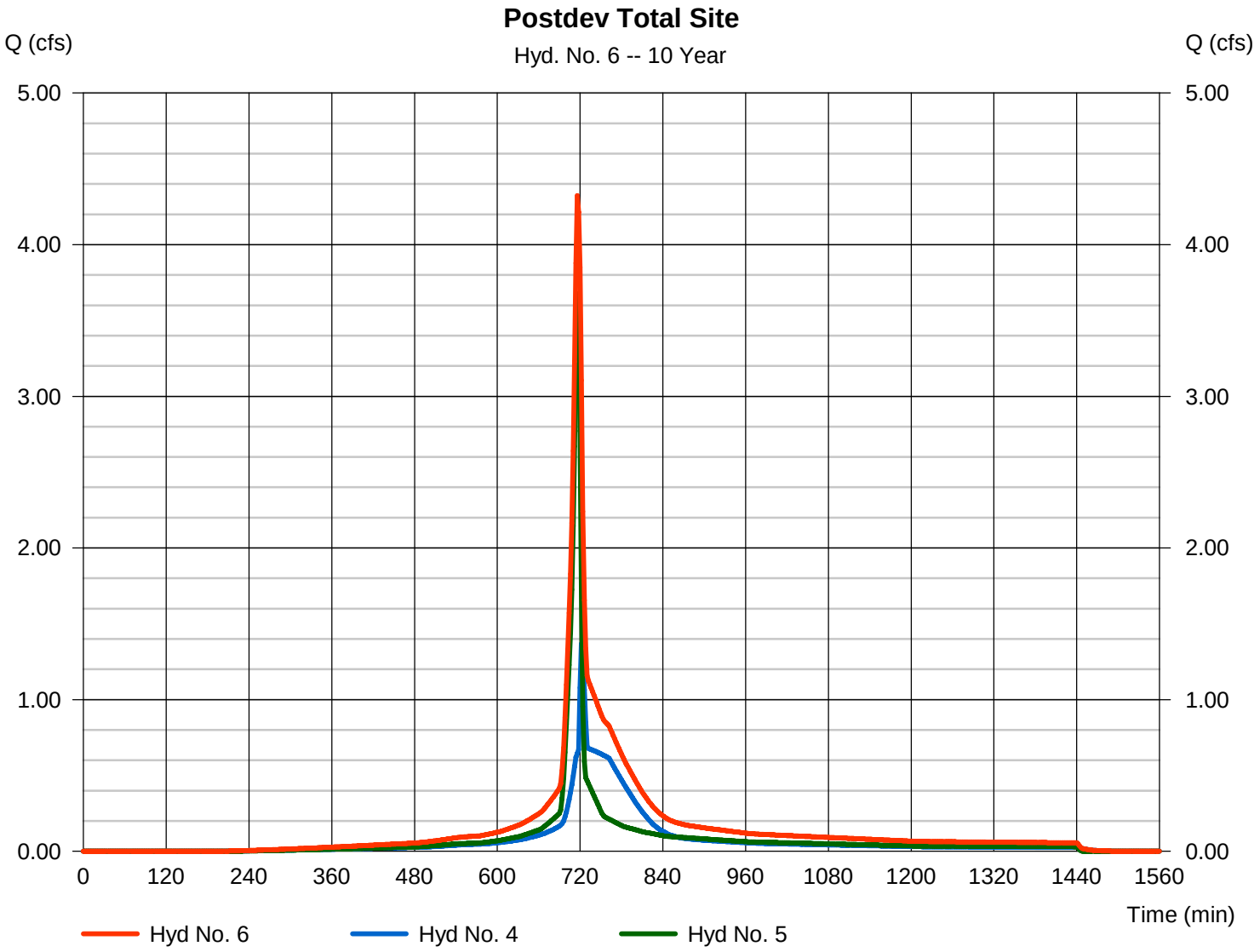


Hydrograph Report

Hyd. No. 6

Postdev Total Site

Hydrograph type	= Combine	Peak discharge	= 4.323 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 14,738 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.820 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2025

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	11.83	2	716	27,504	------	------	------	DA - Pt. A Pre-Dev
3	SCS Runoff	5.272	2	716	11,936	------	------	------	DA Pt A1 - Post-dev
4	Reservoir	4.701	2	718	11,935	3	1966.29	2,526	Pt A1 to Bio
5	SCS Runoff	6.290	2	716	14,077	------	------	------	DA Pt A2 - Post dev
6	Combine	10.73	2	718	26,012	4, 5	------	------	Postdev Total Site

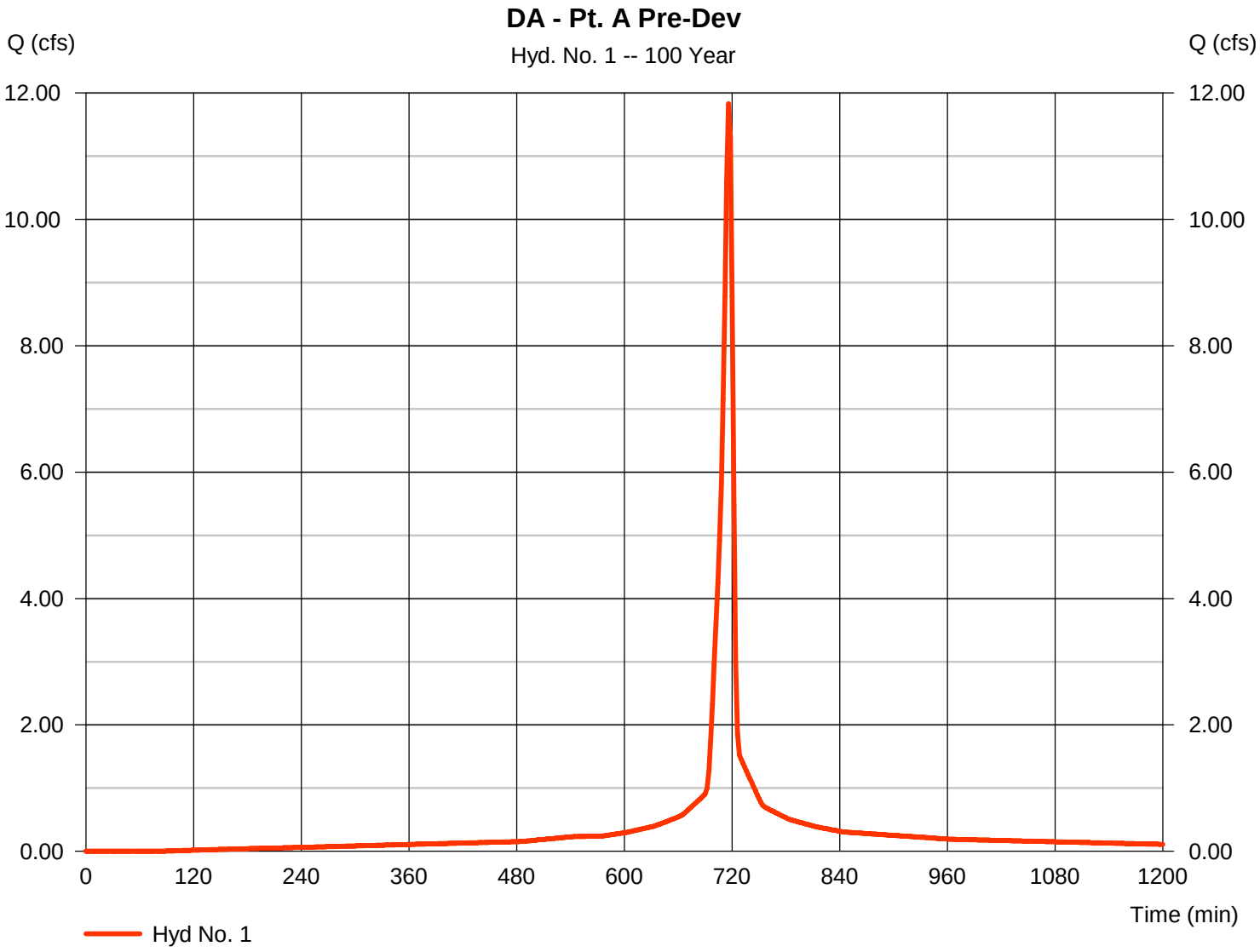
Hydrograph Report

Hyd. No. 1

DA - Pt. A Pre-Dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.83 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	27,504 cuft
Drainage area	=	1.500 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.86 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.300 x 98) + (0.200 x 80)] / 1.500



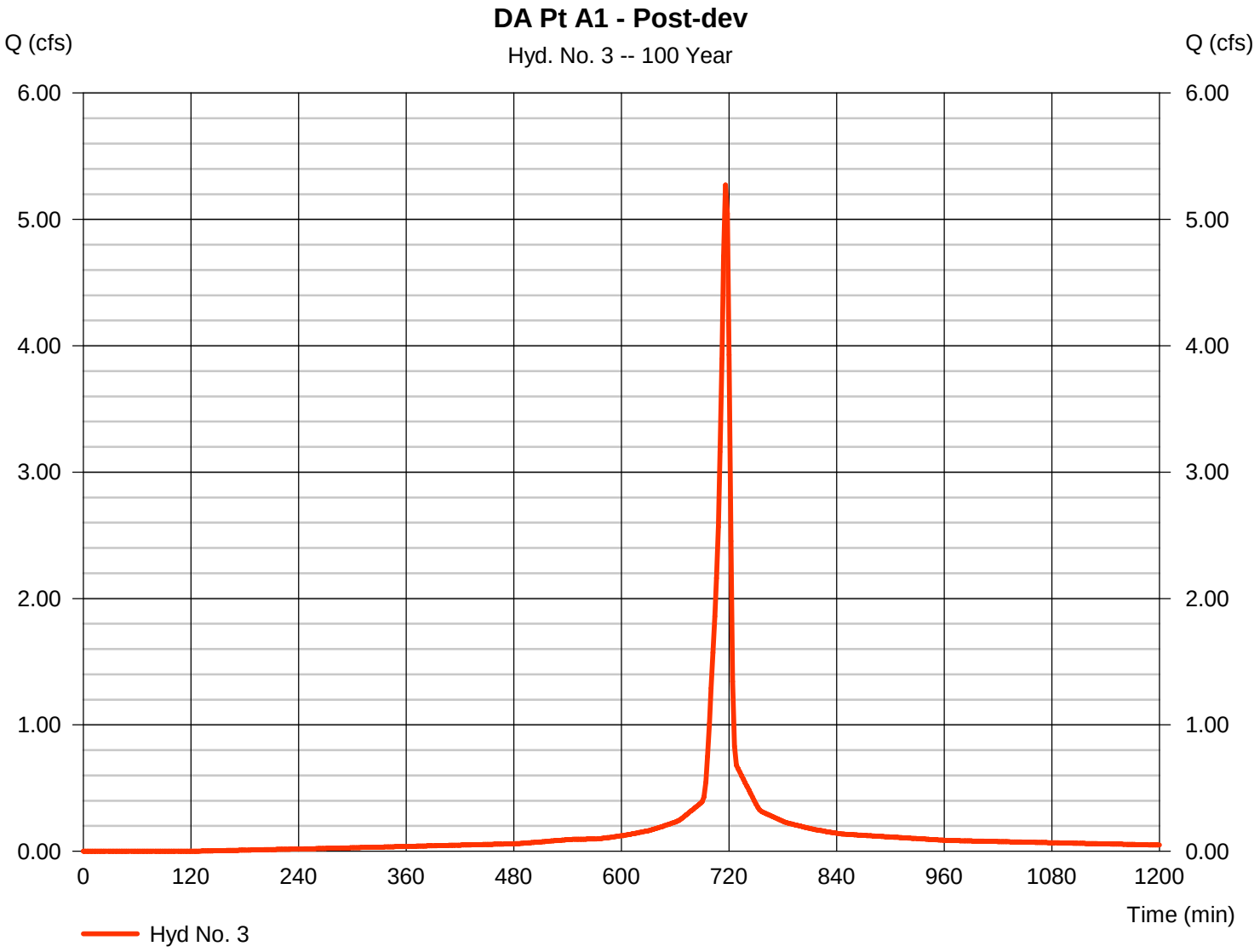
Hydrograph Report

Hyd. No. 3

DA Pt A1 - Post-dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.272 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	11,936 cuft
Drainage area	=	0.680 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.86 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.520 x 98) + (0.160 x 80)] / 0.680



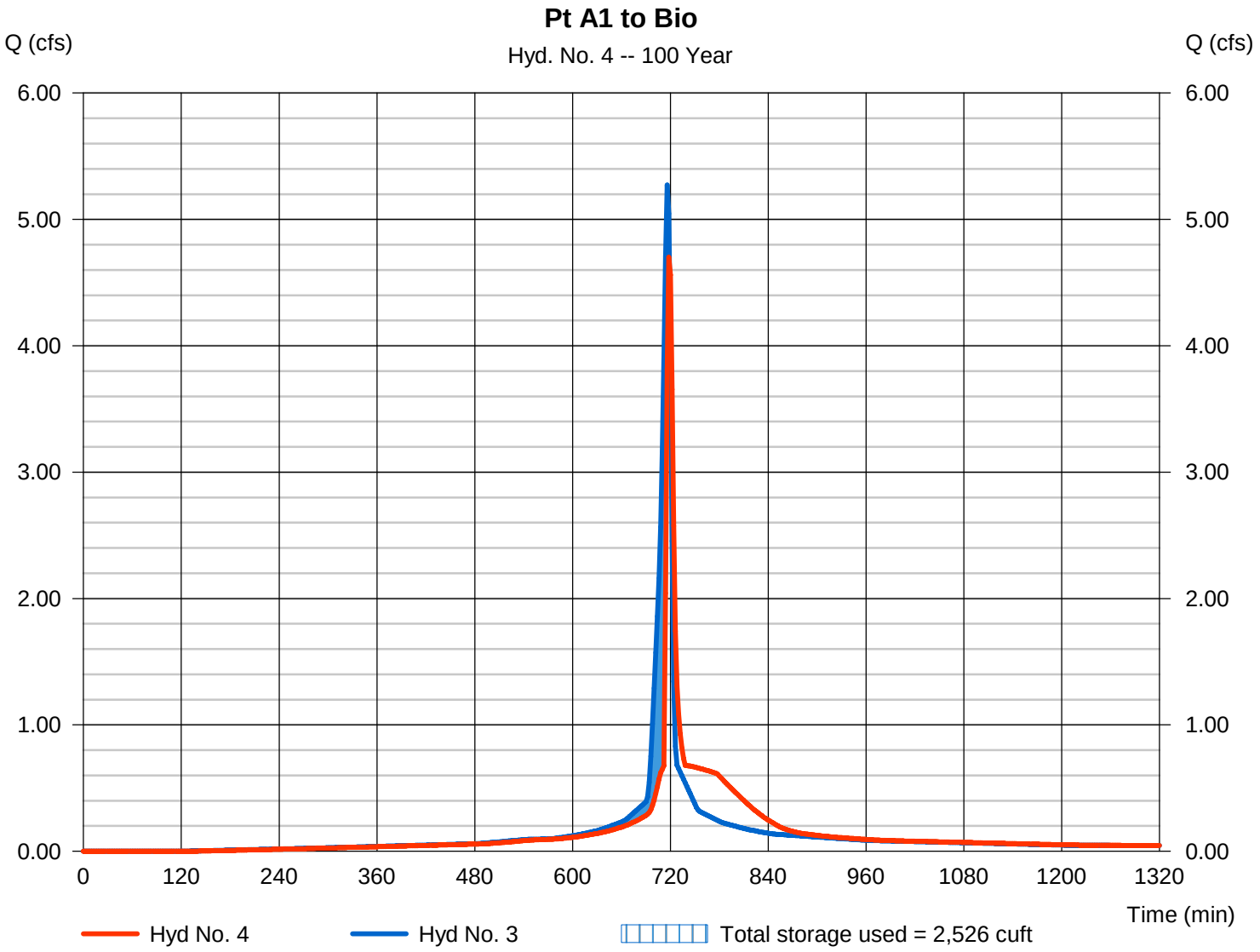
Hydrograph Report

Hyd. No. 4

Pt A1 to Bio

Hydrograph type	=	Reservoir	Peak discharge	=	4.701 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	11,935 cuft
Inflow hyd. No.	=	3 - DA Pt A1 - Post-dev	Max. Elevation	=	1966.29 ft
Reservoir name	=	Bio-Retention Area	Max. Storage	=	2,526 cuft

Storage Indication method used.



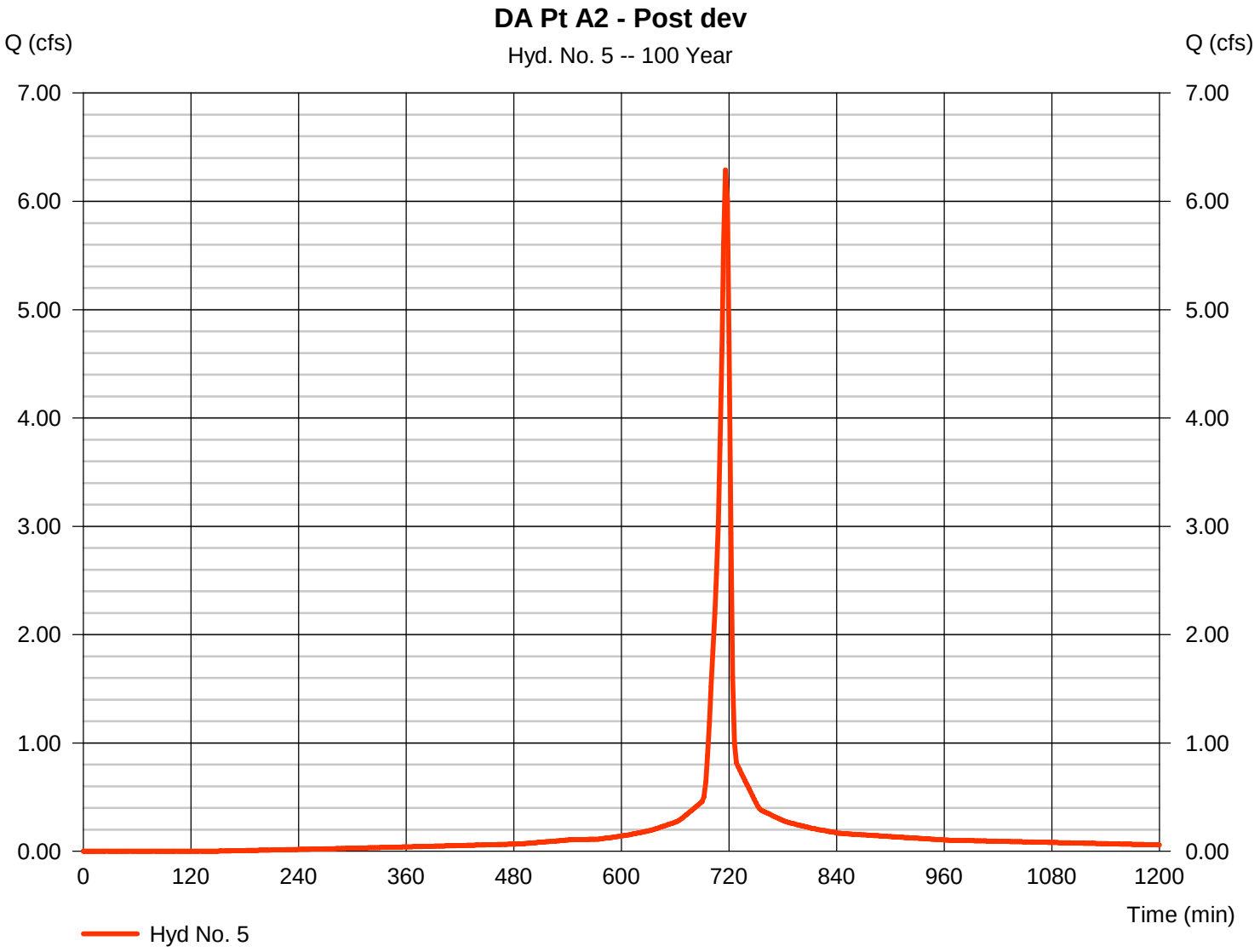
Hydrograph Report

Hyd. No. 5

DA Pt A2 - Post dev

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.290 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	14,077 cuft
Drainage area	=	0.820 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.86 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.610 x 98) + (0.210 x 80)] / 0.820

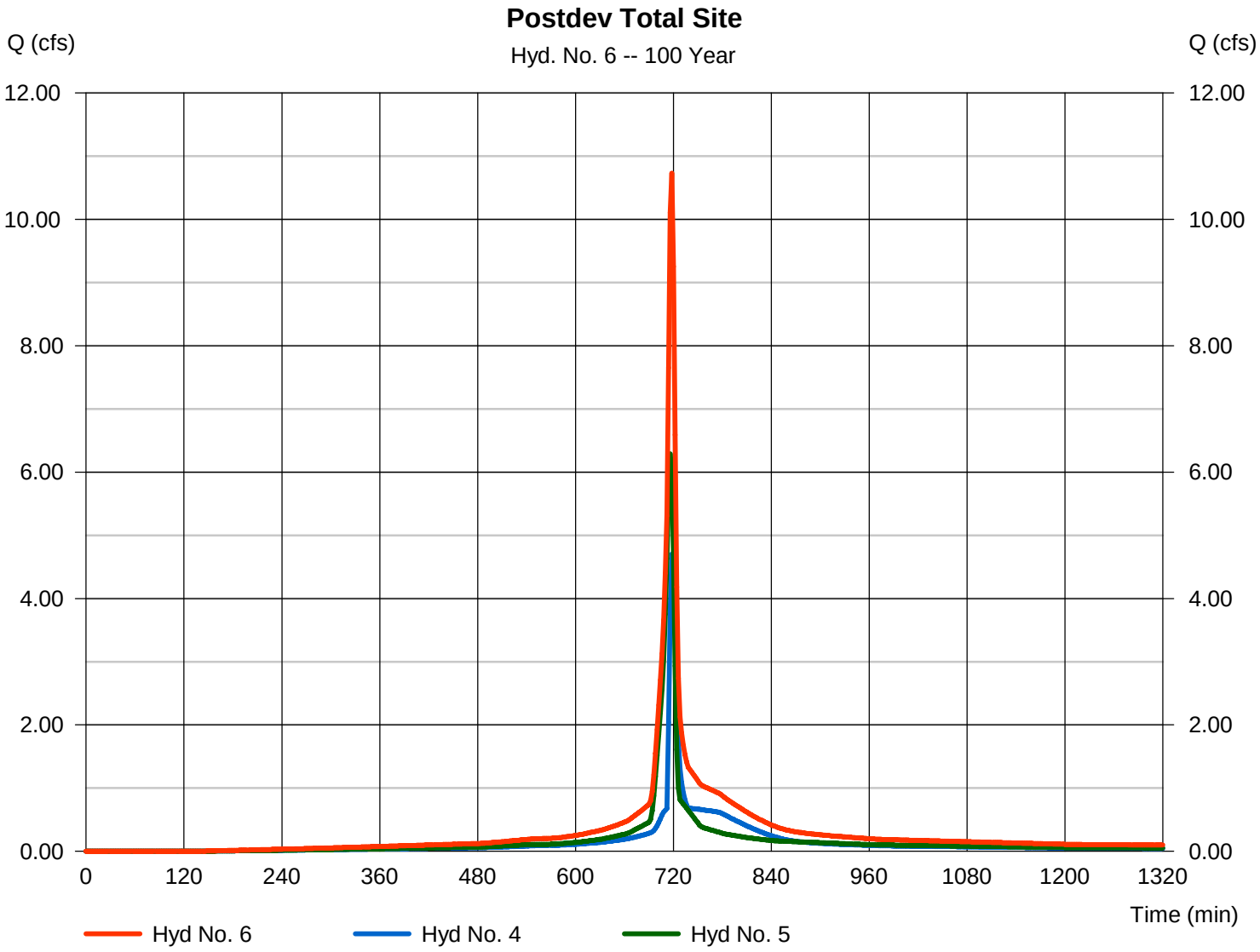


Hydrograph Report

Hyd. No. 6

Postdev Total Site

Hydrograph type	= Combine	Peak discharge	= 10.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 26,012 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.820 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	32.8620	7.9000	0.8075	--------
3	0.0000	0.0000	0.0000	--------
5	33.0936	7.2000	0.7467	--------
10	34.6805	6.9000	0.7227	--------
25	38.0922	6.7000	0.7026	--------
50	41.0153	6.6000	0.6918	--------
100	43.9299	6.5000	0.6829	--------

File name: cumberland-mdsha.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.17	3.20	2.62	2.24	1.96	1.75	1.58	1.44	1.33	1.24	1.16	1.09
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.11	3.96	3.27	2.81	2.48	2.22	2.02	1.86	1.73	1.61	1.51	1.43
10	5.79	4.50	3.73	3.21	2.84	2.56	2.33	2.15	2.00	1.87	1.76	1.66
25	6.77	5.27	4.38	3.79	3.36	3.03	2.77	2.56	2.38	2.23	2.10	1.99
50	7.53	5.87	4.90	4.24	3.76	3.40	3.11	2.88	2.68	2.51	2.37	2.25
100	8.29	6.48	5.41	4.69	4.16	3.77	3.45	3.19	2.98	2.79	2.64	2.50

Tc = time in minutes. Values may exceed 60.

Precip. file name: E:\AUTOCAD-DEFAULTS\HYDRAFLOW\MD-Alleganyco.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.06	2.47	0.00	3.08	3.61	4.41	5.10	5.86
SCS 6-Hr	1.41	1.69	0.00	2.11	2.47	3.00	3.46	3.95
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Erosion and Sediment Control Design Report

Project Narrative

Scope of Work

This report is for Stormwater Management and Erosion and Sediment Control Design for a new 6,132 SF, 1-story, Sheetz store and related site improvements within the City of Frostburg, Maryland. More specifically the site is located at the intersection of New Georges Creek Rd. SW and Dr. Gasmick Ln. where an existing Sheetz Store is located. The scope is for the demolition and replacement of the existing Sheetz Store and Fueling Canopy with new facilities.

Project Description

A new Sheetz convenience store / gas station is to be constructed in place of an existing Sheetz Store on-site. The site is located on ±1.38-acre tract more particularly described at Tax Map 0203, Grid 0024 P/O Tax Parcel with the last instrument in the chain of title being located at Libre 02217 per the land records of Allegany County, Maryland. The site is within the Highway Commercial "HC" zoning district within the City of Frostburg.

The total area of the ESD/LOD will be 1.49 acres.

Site Resources and Mapping

Land Use and Cover

The site area is currently a developed Sheetz store site. The disturbed area for this project consists of demolition and rebuilding of a new Sheetz store in its place.

Topography and Soils

The topography of the site is gently sloping from south – north averagely ranging from 2% – 5%. The general site topography is shown on the Existing Conditions Plan of the Site Plan package, of which this report is a part thereof.

According to the USGS Maryland Geologic Map Data, the site is underlain by Dunkard Formation. Dunkard formation is generally described as medium gray to dark gray, carbonaceous, silty shale and siltstone; light to medium gray, micaceous, medium to coarse grained sandstone; and thin discontinuous nodular limestone, and thin coal beds. The Dunkard Foundation caps several hill in the Georges Creek Syncline, and may be as much as 250 feet thick.

According to the United States Department of Agriculture Natural Resources Conservation Service soils survey the site contains UxB – Urban land. See below partial copy of the Soil Survey Map and Custom Soil Resource Report within the indexes.

Symbol	Description	K Factor	HSG
Uxb	Urban land, 0 to 8 percent slopes		

Streams, Waterways and Floodplains

There are no streams, waterways, wetlands or floodplain within the project limits.

See section 2.8 Floodplain Mapping below for Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRMette) Panel # 24001C0018E, with an effective date of April 3, 2020.

Eight-Point Response

Eight-point response of site compliance to erosion sediment control and storm water management regarding the General Permit.

1. Utilization of Environmental Site Design:
   A. This project meets the criteria to be a redevelopment project per Section 5.5 "Redevelopment" of the revised Chapter 5 of the Maryland Storm Water Design Manual. ESD BMPs and reduction in impervious surface is proposed to address Environmental Site Design requirements for this project.
2. Maintenance of Limits of Disturbance to Protect Natural Area's:
   B. The Limits of Disturbances have been designed and limited to only what is necessary to construct the site and surrounding improvements. Standard erosion and sediment controls are proposed as part of the Erosion Sediment Control Plan to limit disturbance and sediment laden water from leaving the project site.
3. Control of Construction Equipment and Vehicles:
   C. The limits of disturbance have been designed in a manner to keep all construction traffic limited to an access route to and from the construction area.
4. Evaluation and Appropriate Limitation of Site Clearing:
   D. The limits of site clearing have been limited to only the area of new disturbance. All clearing is of an existing development including a building and site parking.

5. Evaluation and Designation of Site Area for Phasing or Sequencing:
   E. The project plans include a construction phasing that fits the intended work in an orderly sequence. The first phase includes demolition of exiting site features as well as rough grading and initial stabilization. The second phase will include ultimate site improvement construction, BMP installation and final stabilization.
6. Identification of Soils at High Risk for Erosion and Advanced Stabilization
   F. Techniques to be Used:
   G. Normal erosion sediment control techniques should eliminate any need for special treatment by advanced erosion sediment control design.
7. Identification of Steep Slopes and Designation Limitations on Clearing:
   H. No steep slopes present on site.
8. Evaluation and Designation of Stabilization Requirements and Time Limits and Protection Measures for Discharges to the Chesapeake Bay, Impaired Waters or Waters with an Established Total maximum Daily Load (TMDL):
   I. The proposed water quality facilities provide treatment for site improvements associated with this project. The time frame of construction is approximately 3-4 months with a phased erosion and sediment control plan in close coordination with the construction activity. The plan provides for stabilization within 3 to 7 days and incorporates BMP's such as inlet protection and filter log to meet the requirements of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control to the MEP (maximum extent practical). The Total Maximum Daily Load (TMDL) for sediment during construction will be met by the implementation of the ESC plan. Additionally, the use of the Micro-Scale Practice BMP's to meet ESD requirements to the MEP, per the Maryland 2000 Storm Water Design Manual, will continue to treat the TMDL for pollutants upon completion of the project.

Soil Erosion and Sediment Control Measures

A Soil Erosion and Sediment Control Plan is required due to the area of land disturbance. The Erosion Sediment Control Sequence shown on the plan is for the establishment of perimeter controls for construction and the Stabilized Construction Entrance. Filter sock and Inlet protection are chosen for the downhill perimeter control. After perimeter control and the construction entrance is in place, the contractor will proceed with the demolition and preliminary grading for the new Sheetz store. Any soil stripped from the site in the grading process is to be placed in the specified soils stockpile area with silt fence place downstream of the stockpile area. The soil stockpile area is to be temporarily stabilized as detailed.

The Erosion Sediment Control Plan is designed to assist with management of the site runoff during the phases needed for the construction of this project and bringing the site into conformance with the overall Storm Water Drainage requirements.

The Erosion/Sediment Control Plan was prepared by Raymond Burns under the direction of Eric Eiser, P.E., TRIAD ENGINEERING, INC.

SUMMARY OF SOIL EROSION/SEDIMENT CONTROL MEASURES

Evaluation	Designation of stabilization	Protection Measures	Time Limit	Design/Construction Information
Construction Entrance	Erosion/Sediment Control	Stabilized Construction Entrance	Length of Project	See ESC Site Plans Sheets C.6.0 & C.6.1 for construction details.
----	----	----	---	---
Soil Stockpiles	Erosion/Sediment Control	Silt Fence	Length of Project	See ESC Site Plans construction details.
Perimeter Control	Erosion/Sediment Control	Filter Sock	Length of Project	See ESC Site Plans construction details.
Perimeter Control	Erosion/Sediment Control	Standard Inlet Protection	Length of Project	See ESC Site Plans for construction details.

Soil Erosion and Sediment Control Worksheet

PROJECT NAME: Sheetz Rebuild - Frostburg
LOCATION: New Georges Creek Road SW, Allegany County, MD.
PREPARED BY: RDB DATE: 2/25/25
CHECKED BY: EI DATE: 2/25/25

FILTERING DEVICE

TYPE OF DEVICE	LOCATION	APPROX. SLOPE RANGE	SLOPE LENGTH ABOVE BARRIER	MAX. SLOPE LENGTH ALLOWED ABOVE BARRIER	MAX. DEVICE LENGTH USED	MAX. ALLOWABLE DEVICE LENGTH
SILT FENCE	DOWNGRADE SIDE OF SOILS STOCKPILE	2 - 5%	25 ft.	125 ft.	125 ft.	1,000 ft.
FILTER SOCK	DOWNGRADE OF CONSTRUCTION AND GRADING PRACTICES	2 %	220 ft.	250	-	-

Appendix A: Custom Soil 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 Allegany County, Maryland

February 25, 2025

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:854 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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: Allegany County, Maryland
Survey Area Data: Version 18, Sep 6, 2024

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

Date(s) aerial images were photographed: May 18, 2023—Jun 3, 2023

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
UxB	Urban land, 0 to 8 percent slopes	1.4	100.0%
Totals for Area of Interest		**1.4**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Allegany County, Maryland

UxB—Urban land, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2llhb
Elevation: 560 to 2,850 feet
Mean annual precipitation: 32 to 68 inches
Mean annual air temperature: 41 to 65 degrees F
Frost-free period: 147 to 199 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: D
Other vegetative classification: Not Suited (NS)
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 10 percent
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Not Suited (NS)
Hydric soil rating: No

Buchanan

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Acid Loams (AL2)
Hydric soil rating: No

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Appendix B: Mapping