



STATE OF
COLORADO

Cazier - DNR, Tim <tim.cazier@state.co.us>

Hayden surface water

1 message

Ben Langenfeld <benl@lewicki.biz>

Thu, Jul 20, 2023 at 5:12 PM

To: "tim.cazier@state.co.us" <tim.cazier@state.co.us>

Cc: "Ridley - DNR, Hunter" <hunter.ridley@state.co.us>, Sydney Connor <Sydney@lewicki.biz>

Tim

Here is the Appendix G-1 with TC calculations included. I re-ran the software to try and find the weird 6% gap, so some of the volumes have changed a tiny bit. Let me know if you have any questions.

Ben Langenfeld, P.E.

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App G-1 Stormwater Calcs.pdf
312K

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	27.38	2	750	4.503	-----	-----	-----	Basin 1 - Premine
2	SCS Runoff	43.81	2	754	7.203	-----	-----	-----	Basin 1 - Mine
3	SCS Runoff	27.38	2	750	4.503	-----	-----	-----	Basin 1 - Reclaimed
4	SCS Runoff	40.61	2	722	2.584	-----	-----	-----	Basin 2 - Premine
5	SCS Runoff	61.16	2	722	3.699	-----	-----	-----	Basin 2 - Mine
6	SCS Runoff	40.61	2	722	2.584	-----	-----	-----	Basin 2 - Reclaimed
7	SCS Runoff	26.45	2	736	3.146	-----	-----	-----	Basin 3 - Premine
8	SCS Runoff	21.73	2	756	3.808	-----	-----	-----	Basin 3 - Mine
9	SCS Runoff	26.45	2	736	3.146	-----	-----	-----	Basin 3 - Reclaimed
10	SCS Runoff	20.78	2	774	5.057	-----	-----	-----	Basin 4 - All Conditions
2023 Expansion Drainage Basins.gpw					Return Period: 100 Year			Thursday, 07 / 20 / 2023	

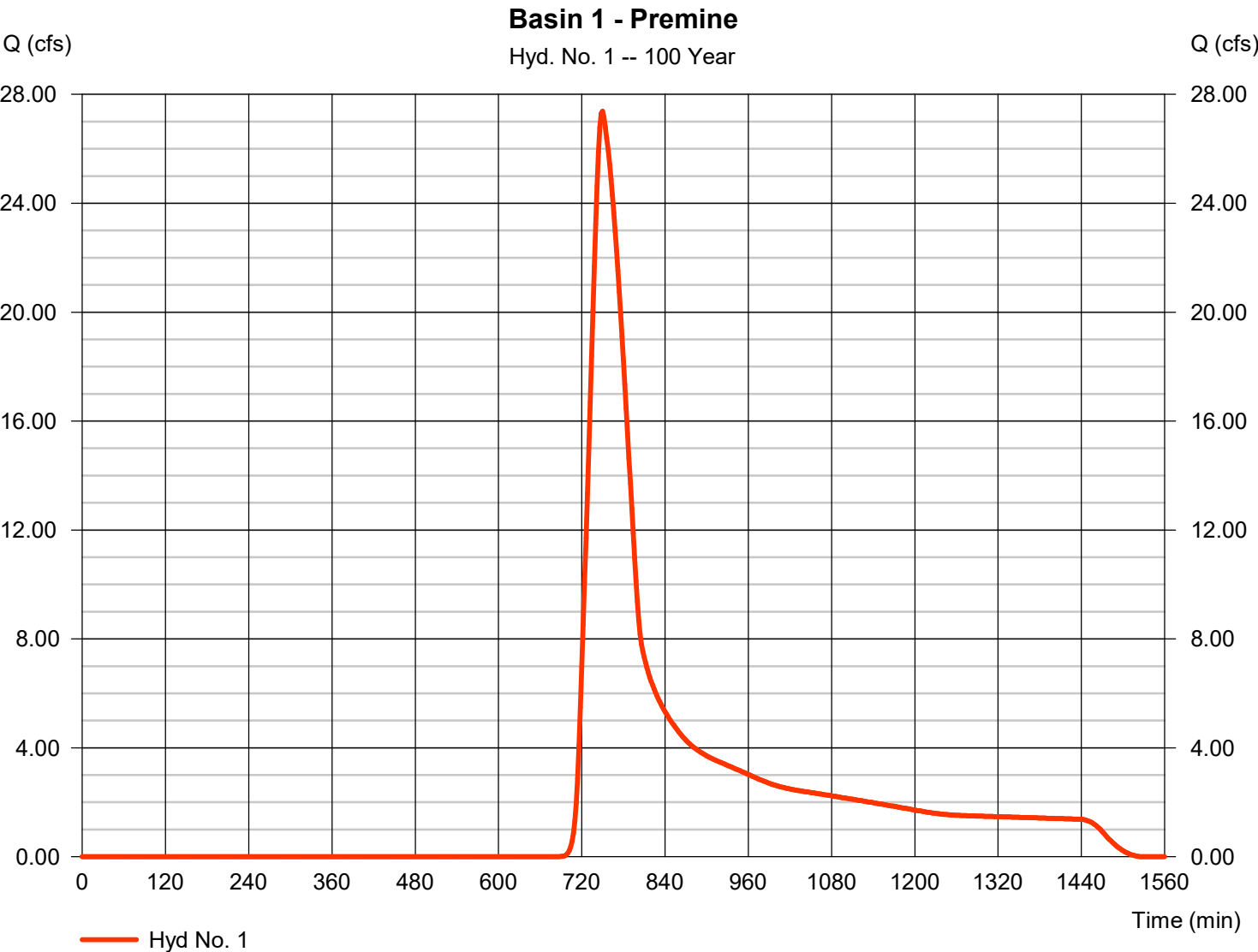
Hydrograph Report

Hyd. No. 1

Basin 1 - Premine

Hydrograph type	=	SCS Runoff	Peak discharge	=	27.38 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	2 min	Hyd. volume	=	4.503 acft
Drainage area	=	78.400 ac	Curve number	=	74*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	57.30 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(78.400 x 74)] / 78.400



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 1

Basin 1 - Premine

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 1.18	0.00	0.00	
Land slope (%)	= 10.00	0.00	0.00	
Travel Time (min)	= 29.73	+ 0.00	+ 0.00	= 29.73
Shallow Concentrated Flow				
Flow length (ft)	= 2900.00	0.00	0.00	
Watercourse slope (%)	= 1.18	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.75	0.00	0.00	
Travel Time (min)	= 27.58	+ 0.00	+ 0.00	= 27.58
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				57.30 min

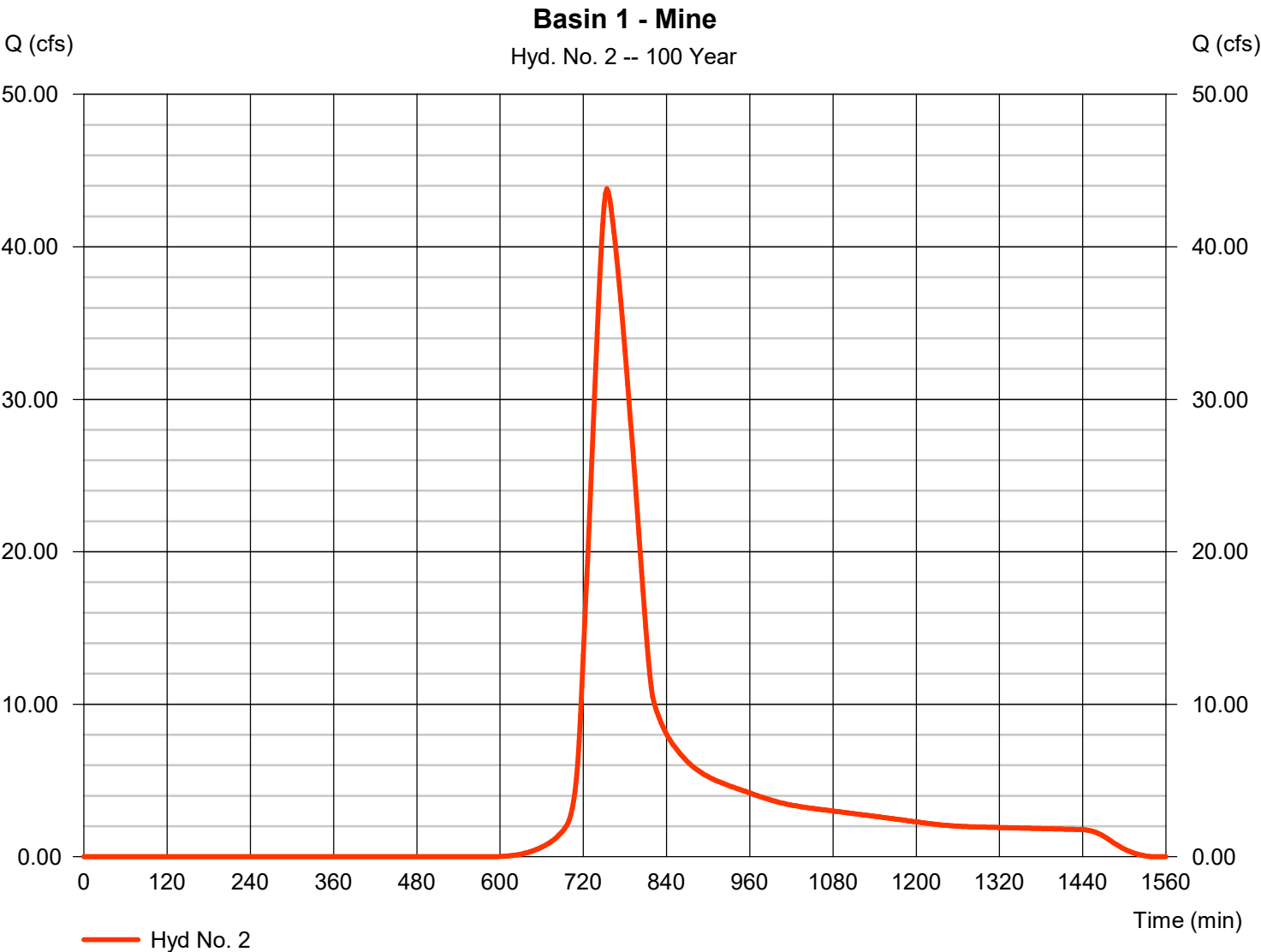
Hydrograph Report

Hyd. No. 2

Basin 1 - Mine

Hydrograph type	=	SCS Runoff	Peak discharge	=	43.81 cfs
Storm frequency	=	100 yrs	Time to peak	=	754 min
Time interval	=	2 min	Hyd. volume	=	7.203 acft
Drainage area	=	78.400 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	65.40 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(39.200 x 74) + (39.200 x 89)] / 78.400



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 2

Basin 1 - Mine

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 1.18	0.00	0.00	
Land slope (%)	= 3.00	0.00	0.00	
Travel Time (min)	= 48.12	+ 0.00	+ 0.00	= 48.12
Shallow Concentrated Flow				
Flow length (ft)	= 2900.00	0.00	0.00	
Watercourse slope (%)	= 3.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.79	0.00	0.00	
Travel Time (min)	= 17.30	+ 0.00	+ 0.00	= 17.30
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				65.40 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

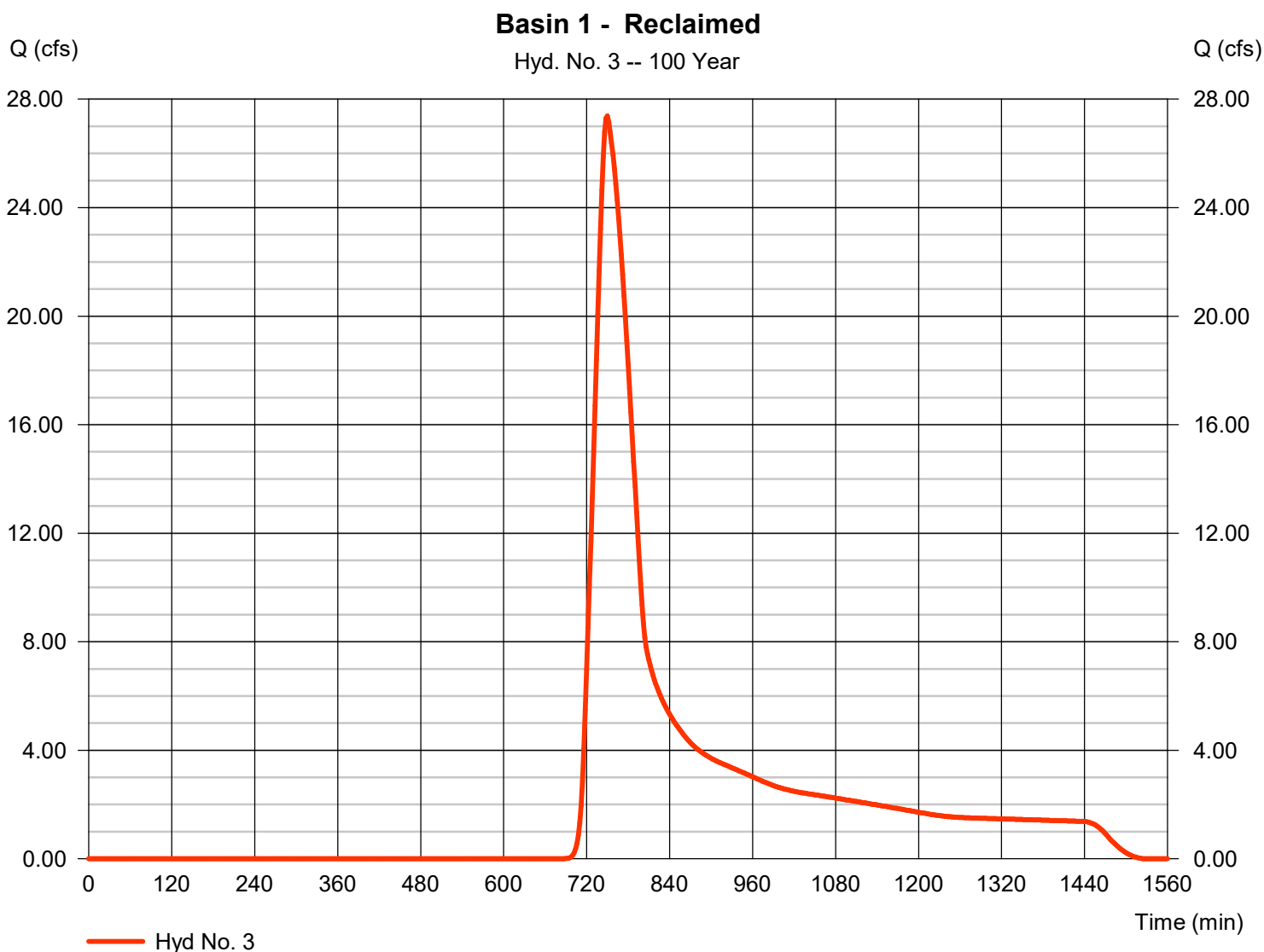
Thursday, 07 / 20 / 2023

Hyd. No. 3

Basin 1 - Reclaimed

Hydrograph type	= SCS Runoff	Peak discharge	= 27.38 cfs
Storm frequency	= 100 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 4.503 acft
Drainage area	= 78.400 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.30 min
Total precip.	= 2.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(39.200 \times 74) + (39.200 \times 74)] / 78.400$



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 3

Basin 1 - Reclaimed

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 1.18	0.00	0.00	
Land slope (%)	= 10.00	0.00	0.00	
Travel Time (min)	= 29.73	+ 0.00	+ 0.00	= 29.73
Shallow Concentrated Flow				
Flow length (ft)	= 2900.00	0.00	0.00	
Watercourse slope (%)	= 1.18	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.75	0.00	0.00	
Travel Time (min)	= 27.58	+ 0.00	+ 0.00	= 27.58
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				57.30 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

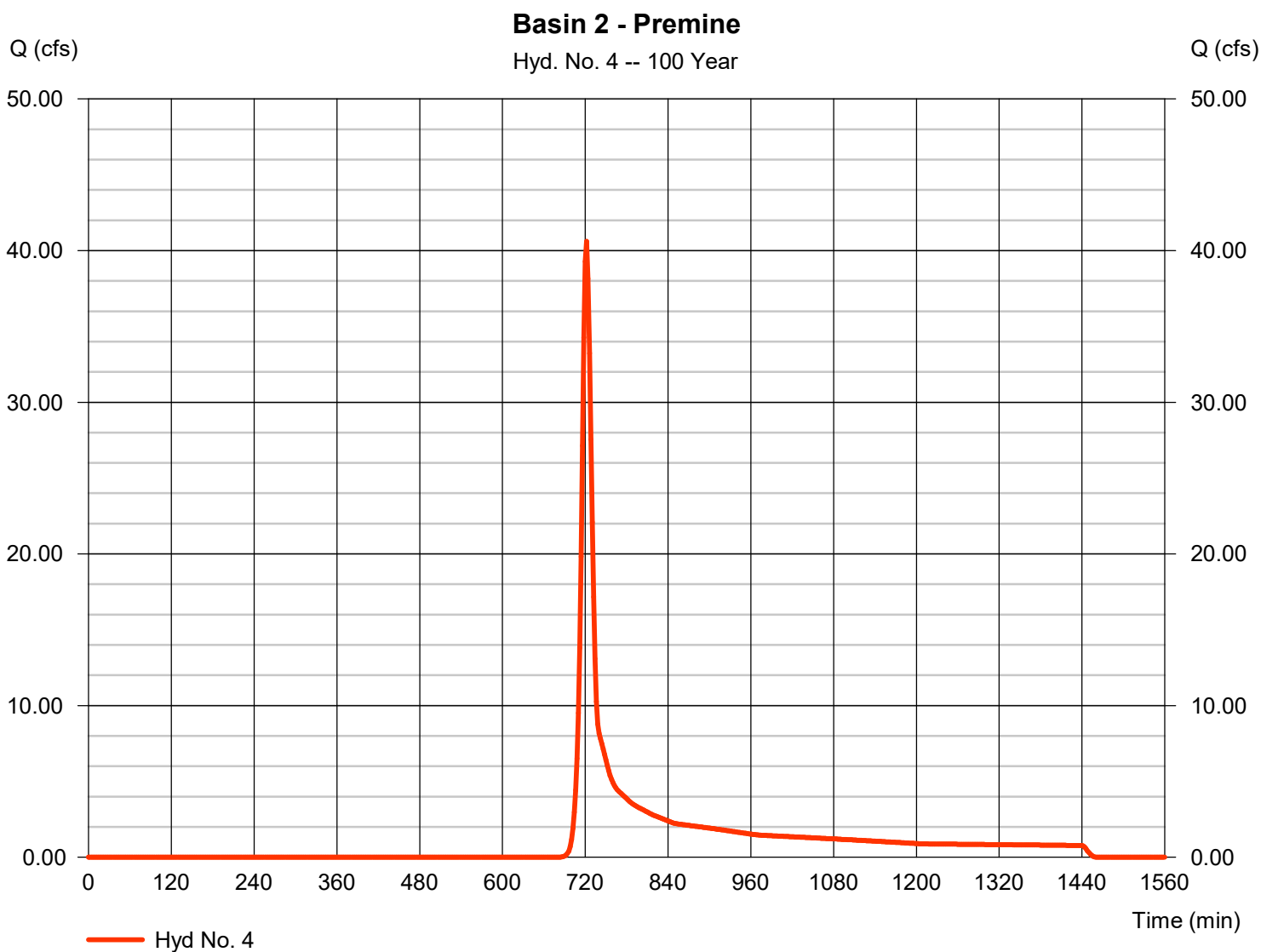
Thursday, 07 / 20 / 2023

Hyd. No. 4

Basin 2 - Premine

Hydrograph type	= SCS Runoff	Peak discharge	= 40.61 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2.584 acft
Drainage area	= 43.300 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.00 min
Total precip.	= 2.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(141.000 \times 74)] / 43.300$



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 4

Basin 2 - Premine

<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)	= 0.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.00	1.18	0.00				
Land slope (%)	= 0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Shallow Concentrated Flow							
Flow length (ft)	= 1500.00	0.00	0.00				
Watercourse slope (%)	= 2.00	0.00	0.00				
Surface description	= Unpaved	Paved	Paved				
Average velocity (ft/s)	=2.28	0.00	0.00				
Travel Time (min)	= 10.96	+	0.00	+	0.00	=	10.96
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	((0})0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				11.00 min			

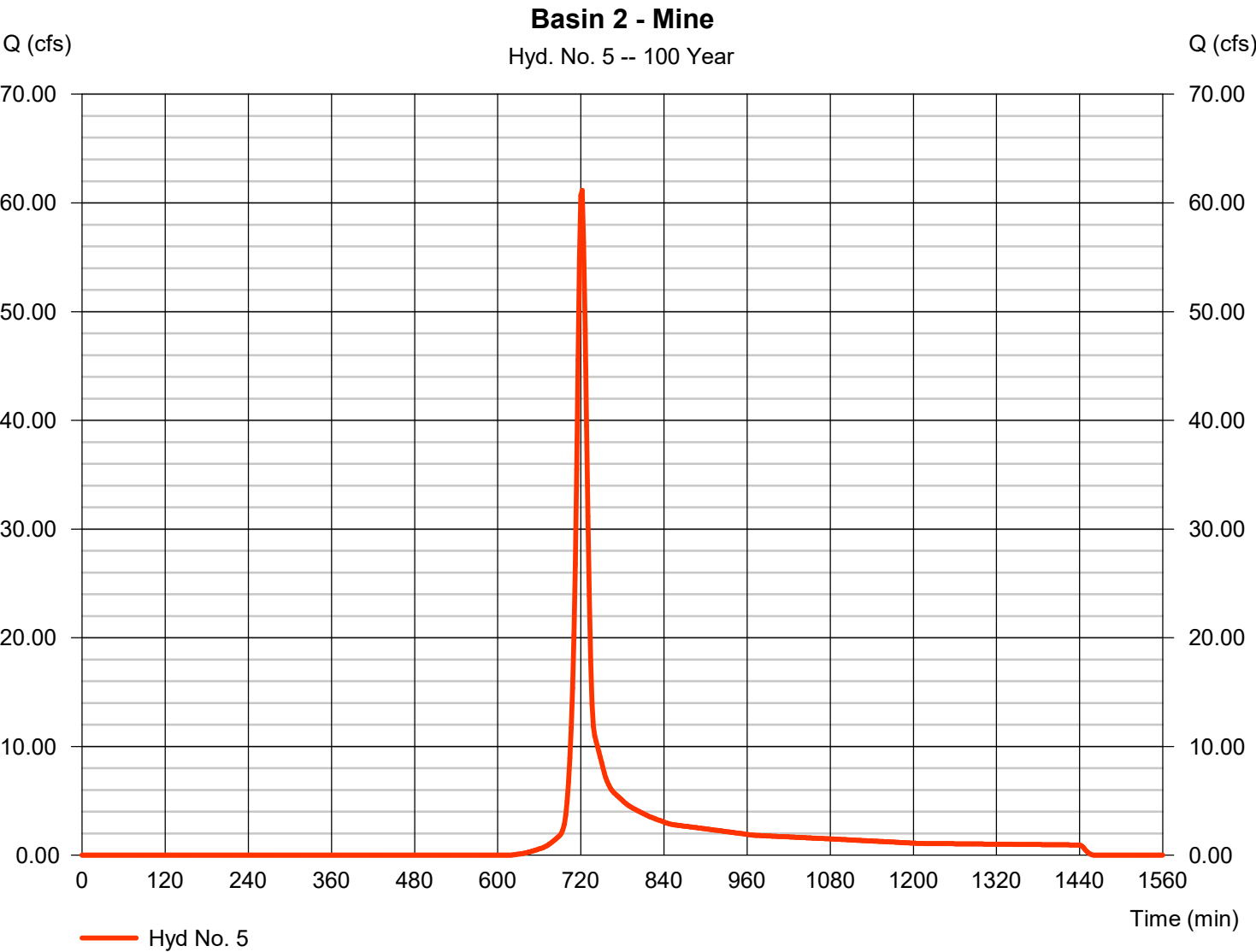
Hydrograph Report

Hyd. No. 5

Basin 2 - Mine

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.16 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	3.699 acft
Drainage area	=	43.300 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.96 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.300 x 74) + (40.000 x 81)] / 43.300



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 5

Basin 2 - Mine

<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)	= 0.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.00	1.18	0.00				
Land slope (%)	= 0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Shallow Concentrated Flow							
Flow length (ft)	= 1500.00	0.00	0.00				
Watercourse slope (%)	= 2.00	0.00	0.00				
Surface description	= Unpaved	Paved	Paved				
Average velocity (ft/s)	=2.28	0.00	0.00				
Travel Time (min)	= 10.96	+	0.00	+	0.00	=	10.96
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				10.96 min			

Hydrograph Report

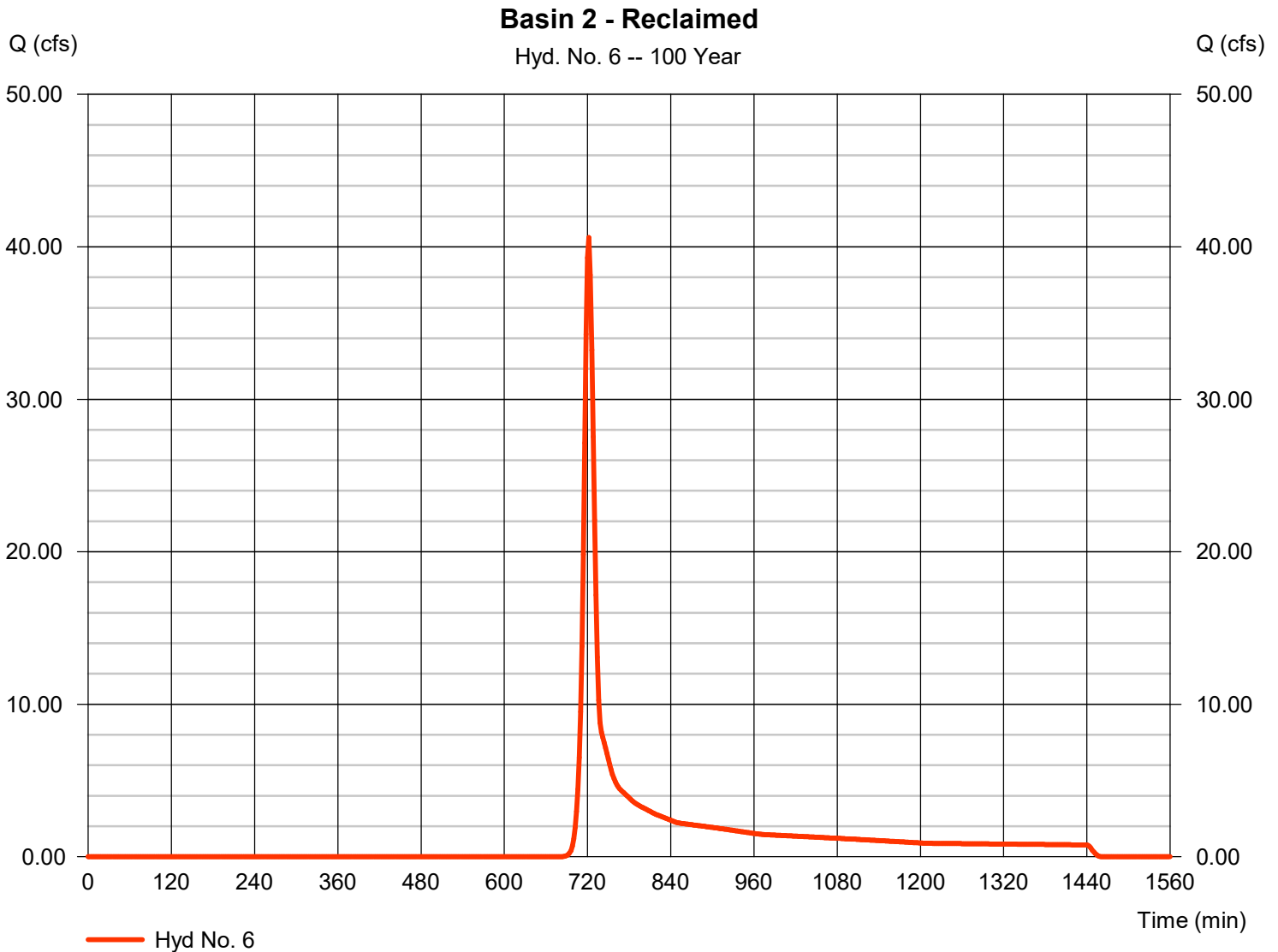
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Thursday, 07 / 20 / 2023

Hyd. No. 6

Basin 2 - Reclaimed

Hydrograph type	= SCS Runoff	Peak discharge	= 40.61 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2.584 acft
Drainage area	= 43.300 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.00 min
Total precip.	= 2.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(141.000 \times 74)] / 43.300$ 

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 6

Basin 2 - Reclaimed

<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)	= 0.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.00	1.18	0.00				
Land slope (%)	= 0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Shallow Concentrated Flow							
Flow length (ft)	= 1500.00	0.00	0.00				
Watercourse slope (%)	= 2.00	0.00	0.00				
Surface description	= Unpaved	Paved	Paved				
Average velocity (ft/s)	=2.28	0.00	0.00				
Travel Time (min)	= 10.96	+	0.00	+	0.00	=	10.96
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				11.00 min			

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

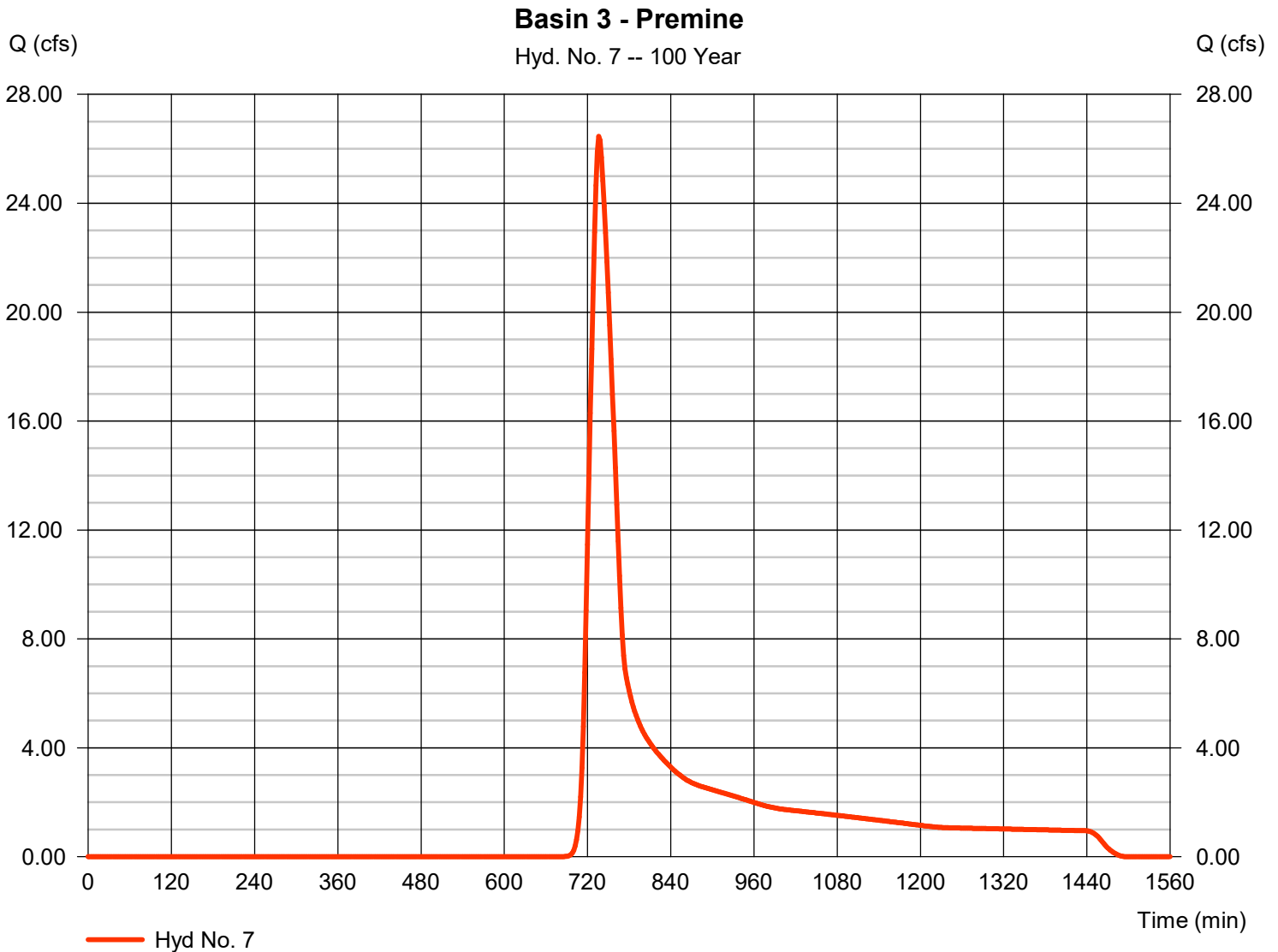
Thursday, 07 / 20 / 2023

Hyd. No. 7

Basin 3 - Premine

Hydrograph type	= SCS Runoff	Peak discharge	= 26.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 3.146 acft
Drainage area	= 55.000 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 33.80 min
Total precip.	= 2.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(141.000 \times 74)] / 55.000$



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 7

Basin 3 - Premine

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.00	0.00	0.00	
Land slope (%)	= 10.00	0.00	0.00	
Travel Time (min)	= 22.83	+ 0.00	+ 0.00	= 22.83
Shallow Concentrated Flow				
Flow length (ft)	= 1500.00	0.00	0.00	
Watercourse slope (%)	= 2.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.28	0.00	0.00	
Travel Time (min)	= 10.96	+ 0.00	+ 0.00	= 10.96
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				33.80 min

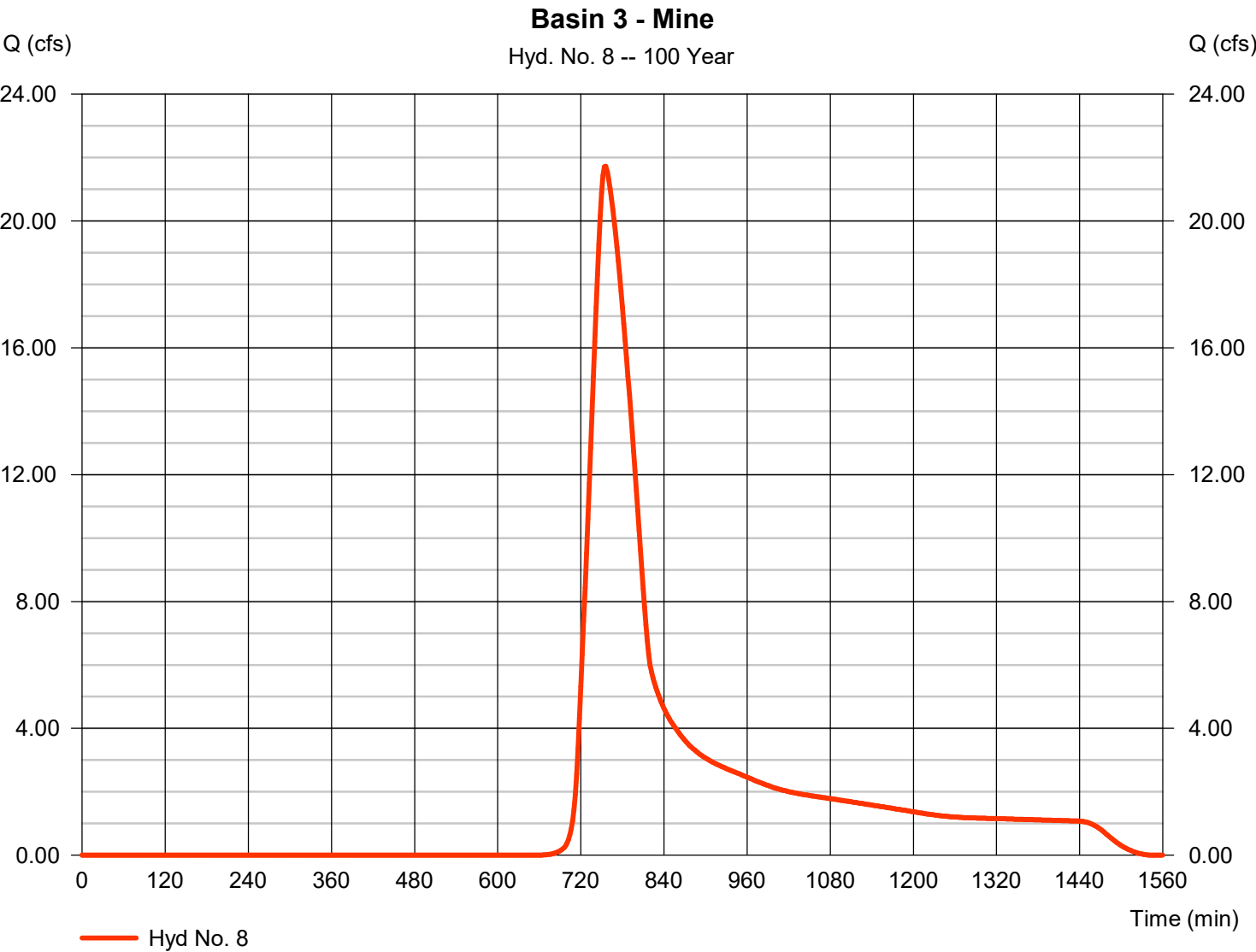
Hydrograph Report

Hyd. No. 8

Basin 3 - Mine

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.73 cfs
Storm frequency	=	100 yrs	Time to peak	=	756 min
Time interval	=	2 min	Hyd. volume	=	3.808 acft
Drainage area	=	55.000 ac	Curve number	=	77*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	67.50 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(88.100 x 74) + (52.900 x 81)] / 55.000



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 8

Basin 3 - Mine

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 1.18	0.00	0.00	
Land slope (%)	= 2.00	0.00	0.00	
Travel Time (min)	= 56.59	+	0.00	+
			0.00	= 56.59
Shallow Concentrated Flow				
Flow length (ft)	= 1500.00	0.00	0.00	
Watercourse slope (%)	= 2.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.28	0.00	0.00	
Travel Time (min)	= 10.96	+	0.00	+
			0.00	= 10.96
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				67.50 min

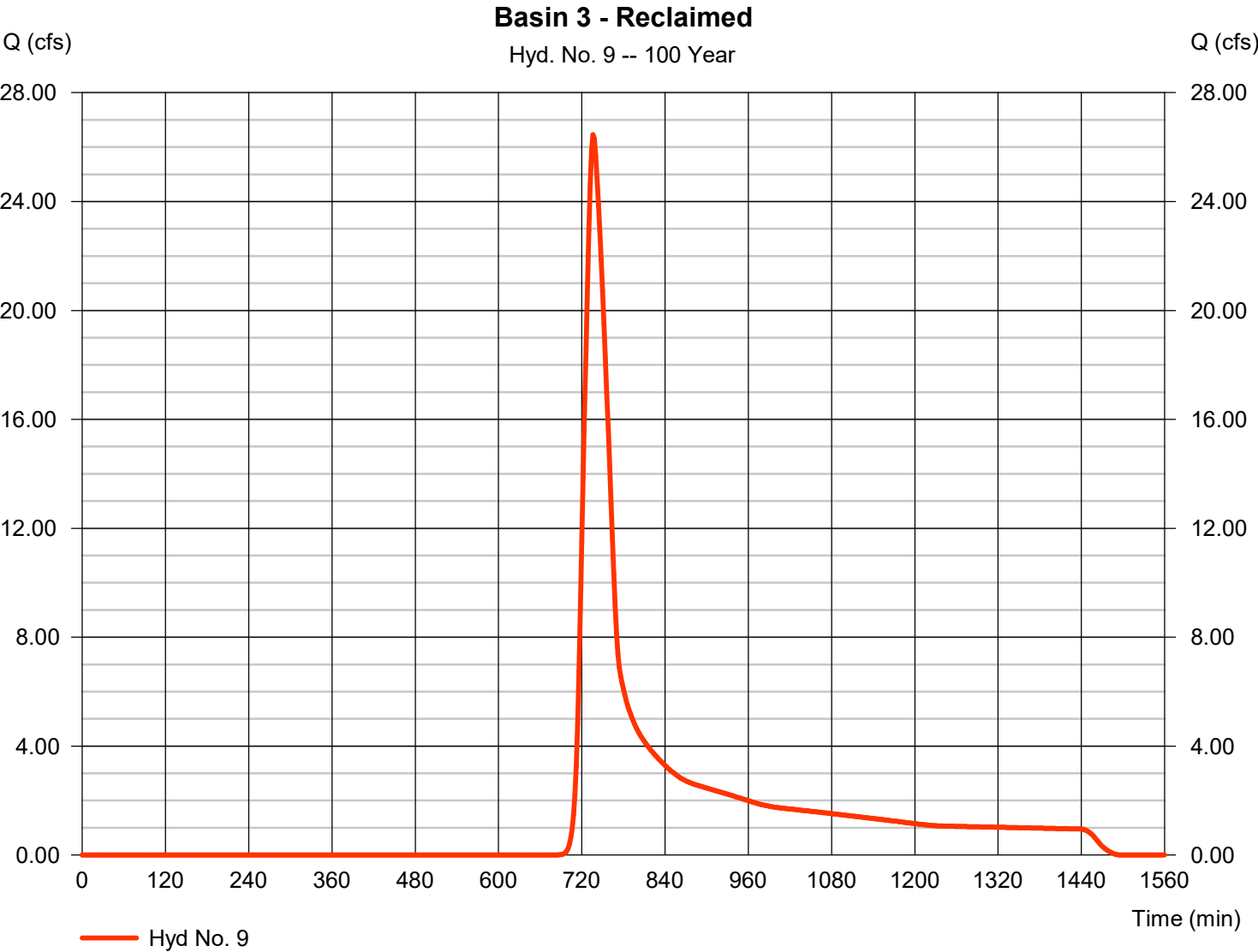
Hydrograph Report

Hyd. No. 9

Basin 3 - Reclaimed

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.45 cfs
Storm frequency	=	100 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	3.146 acft
Drainage area	=	55.000 ac	Curve number	=	74*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	33.80 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(141.000 x 74)] / 55.000



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 9

Basin 3 - Reclaimed

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.00	0.00	0.00	
Land slope (%)	= 10.00	0.00	0.00	
Travel Time (min)	= 22.83	+	0.00	+
			0.00	= 22.83
Shallow Concentrated Flow				
Flow length (ft)	= 1500.00	0.00	0.00	
Watercourse slope (%)	= 2.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.28	0.00	0.00	
Travel Time (min)	= 10.96	+	0.00	+
			0.00	= 10.96
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				33.80 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

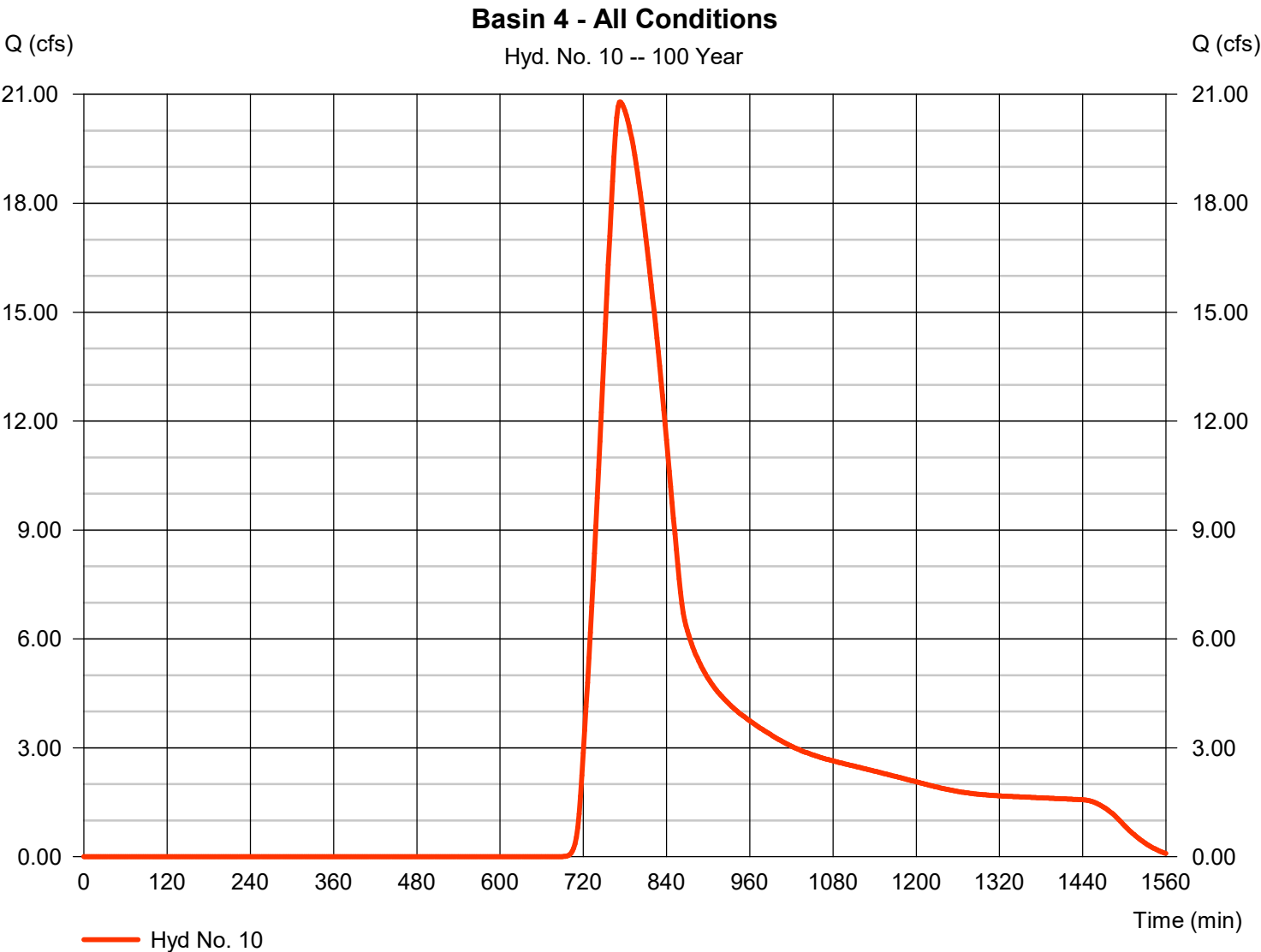
Thursday, 07 / 20 / 2023

Hyd. No. 10

Basin 4 - All Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.78 cfs
Storm frequency	=	100 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	5.057 acft
Drainage area	=	87.000 ac	Curve number	=	74*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	93.90 min
Total precip.	=	2.65 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(141.000 x 74)] / 87.000



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 10

Basin 4 - All Conditions

<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)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 1.18	0.00	0.00	
Land slope (%)	= 1.50	0.00	0.00	
Travel Time (min)	= 63.49	+ 0.00	+ 0.00	= 63.49
Shallow Concentrated Flow				
Flow length (ft)	= 3600.00	0.00	0.00	
Watercourse slope (%)	= 1.50	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.98	0.00	0.00	
Travel Time (min)	= 30.36	+ 0.00	+ 0.00	= 30.36
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				93.90 min

100 - Year

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 Hydrograph No. 2, SCS Runoff, Basin 1 - Mine..... 4

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 Hydrograph No. 3, SCS Runoff, Basin 1 - Reclaimed..... 6

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 Hydrograph No. 4, SCS Runoff, Basin 2 - Premine..... 8

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 Hydrograph No. 5, SCS Runoff, Basin 2 - Mine..... 10

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 Hydrograph No. 6, SCS Runoff, Basin 2 - Reclaimed..... 12

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 Hydrograph No. 7, SCS Runoff, Basin 3 - Premine..... 14

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 Hydrograph No. 8, SCS Runoff, Basin 3 - Mine..... 16

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 Hydrograph No. 9, SCS Runoff, Basin 3 - Reclaimed..... 18

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 Hydrograph No. 10, SCS Runoff, Basin 4 - All Conditions..... 20

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