Proposed Distribution Facility Project 7211 and 7219 Morgan Road Town of Clay, Onondaga County, New York

## Appendix G

Pre-Development Stormwater Analysis



# Hydrograph Return Period Recap

raph	Hydrograph					flow (cfs)	Peak Out				Inflow	Hydrograph	
ition	Description		100-yr	50-yr	25-yr	10-yr	5-yr	3-yr	2-yr	1-yr	hyd(s)	type (origin)	No.
		Ex WS A	178.51		106.33	72.28				21.28		SCS Runoff	1
		Ex WS B	26.39		14.01	8.484				1.329		SCS Runoff	2
		Ex WS C	13.26		7.385	4.705				0.994		SCS Runoff	3
		Ex WS D	11.64		7.963	6.100				2.901		SCS Runoff	4

Proj. file: Existing Hydrographs.gpw

Tuesday, 10 / 1 / 2019

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	21.28	2	746	147,872				ExWSA
2	SCS Runoff	1.329	2	736	9,986				Ex WS B
3	SCS Runoff	0.994	2	738	6,819				Ex WS C
Ev	isting Hydrogr	anhs anw			Return F	Period: 1 Ye	ear	Tuesday, 10	0/1/2019

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

= 24 hrs

Tuesday, 10 / 1 / 2019

= 484

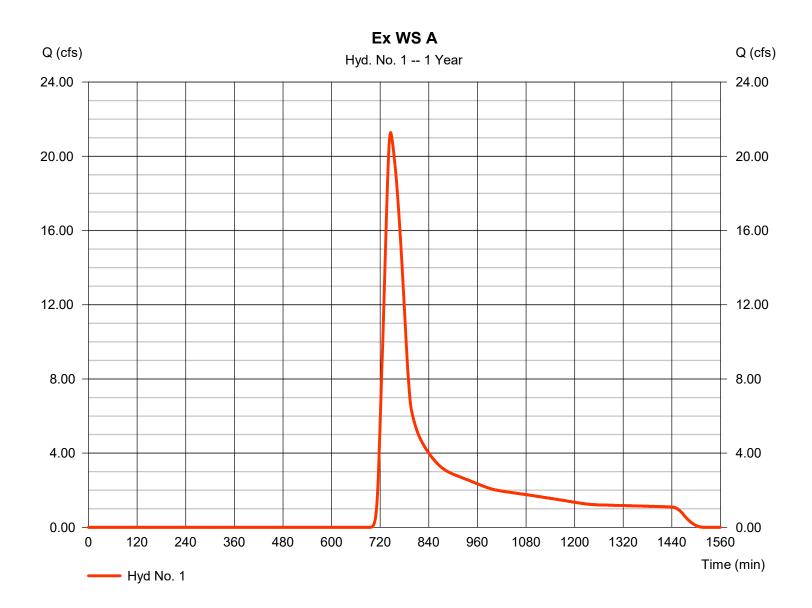
#### Hyd. No. 1

Storm duration

Ex WS A

= 21.28 cfsHydrograph type = SCS Runoff Peak discharge Storm frequency = 1 yrsTime to peak = 746 min Time interval = 2 min Hyd. volume = 147,872 cuft Drainage area Curve number = 88.760 ac = 77 Hydraulic length = 0 ftBasin Slope = 0.0 %Tc method Time of conc. (Tc)  $= 50.00 \, \text{min}$ = User Total precip. = 2.02 inDistribution = Type II

Shape factor



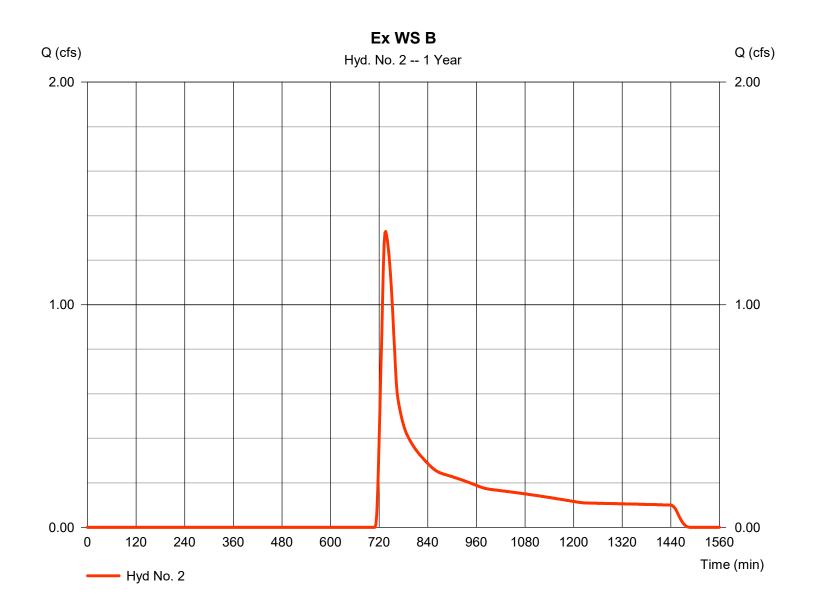
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 2

Ex WS B

Hydrograph type = SCS Runoff Peak discharge = 1.329 cfsStorm frequency = 1 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 9,986 cuft Drainage area = 12.290 ac Curve number = 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



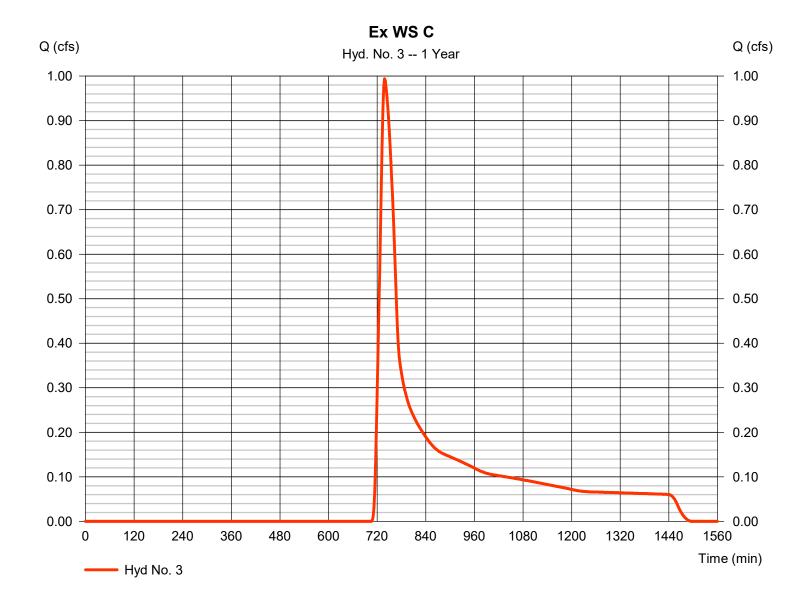
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 3

Ex WS C

Hydrograph type = SCS Runoff Peak discharge = 0.994 cfsStorm frequency = 1 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 6.819 cuft= 72 Drainage area = 6.320 acCurve number Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) = 34.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



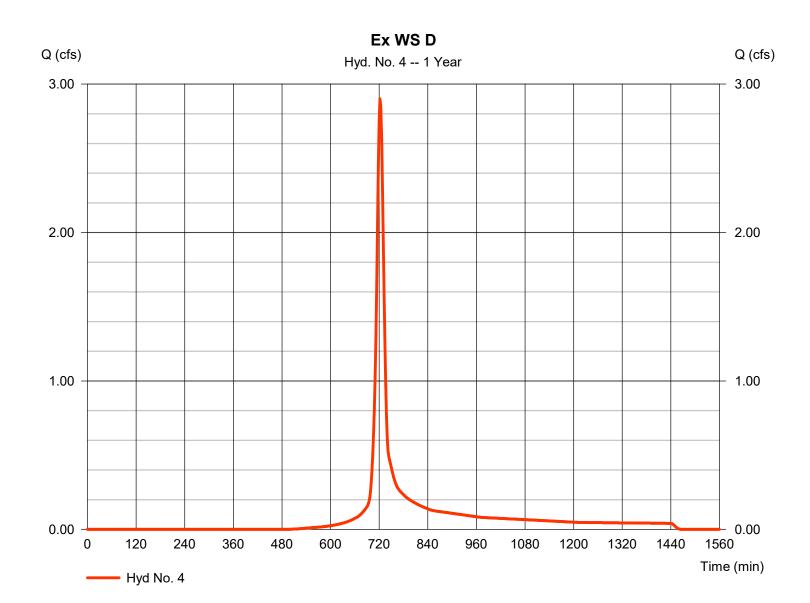
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 4

Ex WS D

Hydrograph type = SCS Runoff Peak discharge = 2.901 cfsStorm frequency = 1 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 8,133 cuft Drainage area = 2.200 acCurve number = 89 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	72.28	2	744	425,331				Ex WS A
2	SCS Runoff	8.484	2	732	38,608				Ex WS B
3	SCS Runoff	4.705	2	736	23,226				Ex WS C
Exi	⊥ sting Hydrogr	aphs.gpw	/		Return F	Period: 10 Y	⊥ ′ear	Tuesday, 10	0 / 1 / 2019

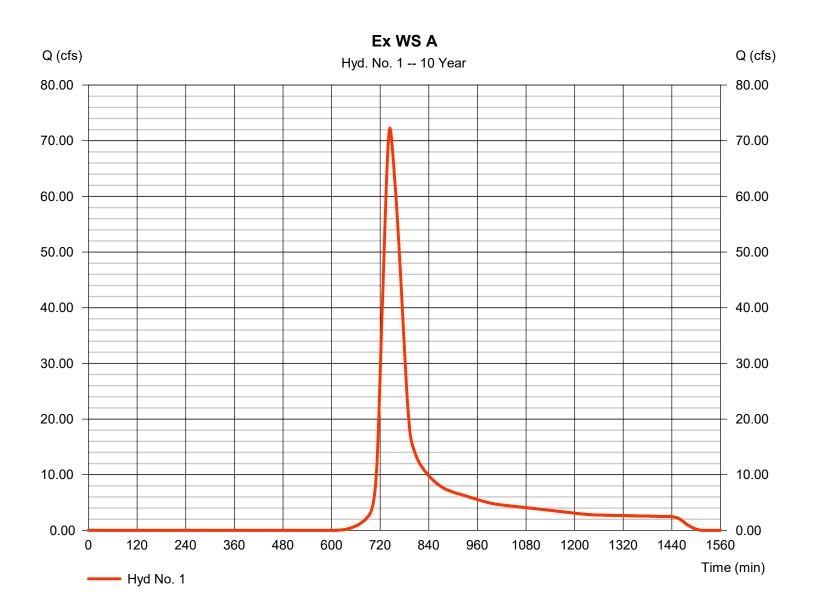
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 1

Ex WS A

= 72.28 cfsHydrograph type = SCS Runoff Peak discharge Storm frequency = 10 yrsTime to peak = 744 min Time interval = 2 min Hyd. volume = 425,331 cuft Drainage area Curve number = 88.760 ac = 77 Hydraulic length = 0 ftBasin Slope = 0.0 %Tc method Time of conc. (Tc)  $= 50.00 \, \text{min}$ = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



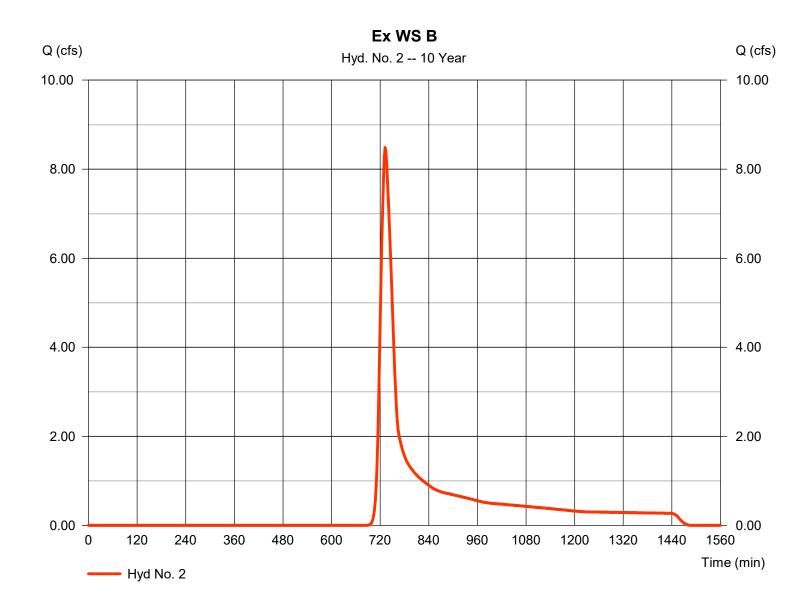
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 2

Ex WS B

Hydrograph type = SCS Runoff Peak discharge = 8.484 cfsStorm frequency = 10 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 38.608 cuft Drainage area Curve number = 12.290 ac = 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



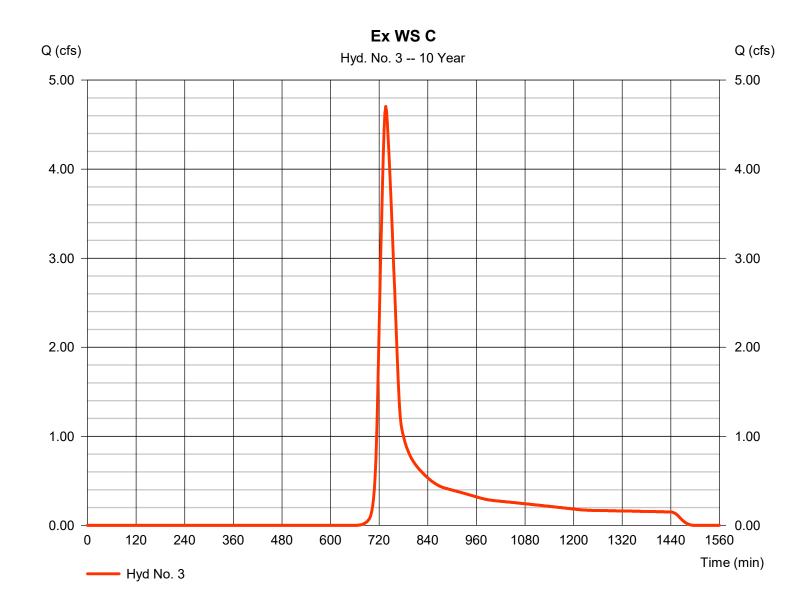
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 3

Ex WS C

Hydrograph type = SCS Runoff Peak discharge = 4.705 cfsStorm frequency = 10 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 23,226 cuft Drainage area Curve number = 6.320 ac= 72 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



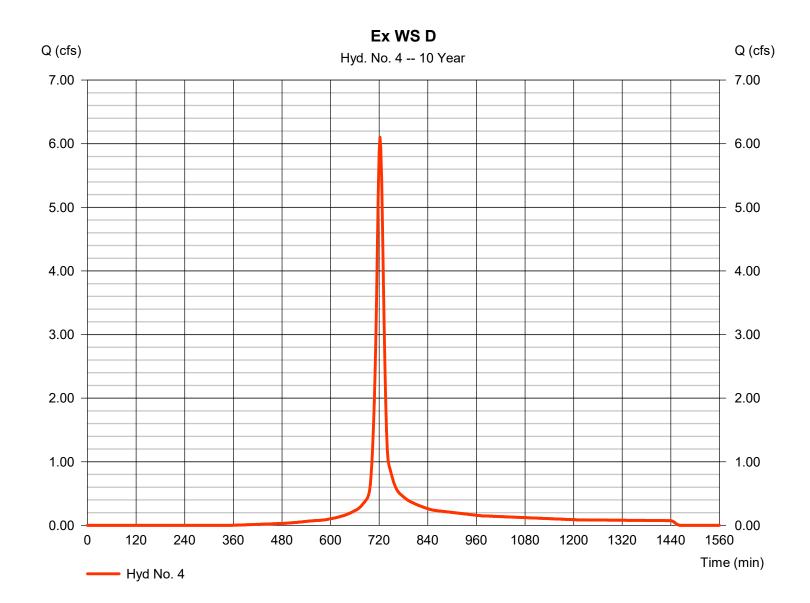
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 4

Ex WS D

Hydrograph type = SCS Runoff Peak discharge = 6.100 cfsStorm frequency = 10 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 17,277 cuft Drainage area = 2.200 acCurve number = 89 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	106.33	2	744	611,636				Ex WS A
2	SCS Runoff	14.01	2	732	59,722				Ex WS B
3	SCS Runoff	7.385	2	736	34,876				Ex WS C
3 4	SCS Runoff SCS Runoff	7.385 7.963	2 2	736	34,876 22,786				Ex WS D
Exi	sting Hydrogr	aphs.gpw	l l		Return F	Period: 25 Y	/ear	Tuesday, 1	0 / 1 / 2019

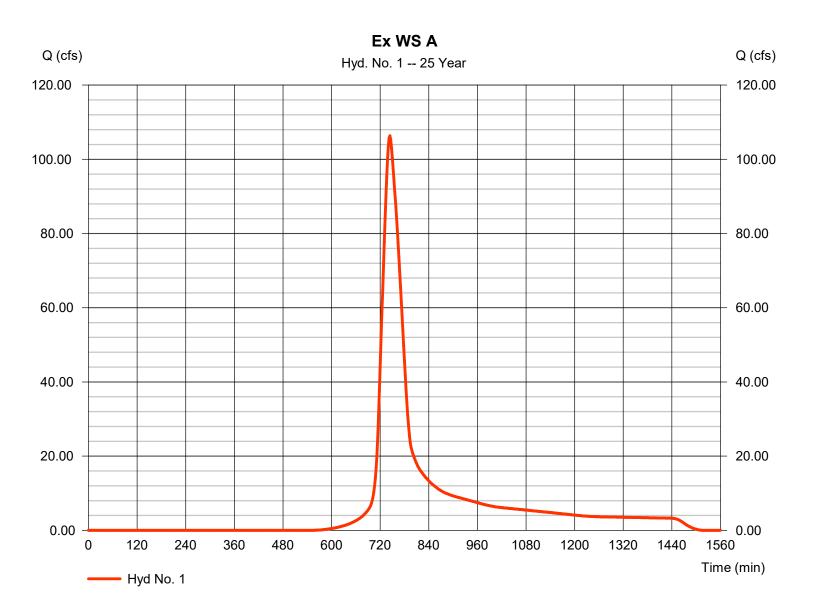
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 1

Ex WS A

Hydrograph type = SCS Runoff Peak discharge = 106.33 cfsStorm frequency = 25 yrs Time to peak = 744 min Time interval = 2 min Hyd. volume = 611,636 cuft Drainage area Curve number = 88.760 ac = 77 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 50.00 \, \text{min}$ = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



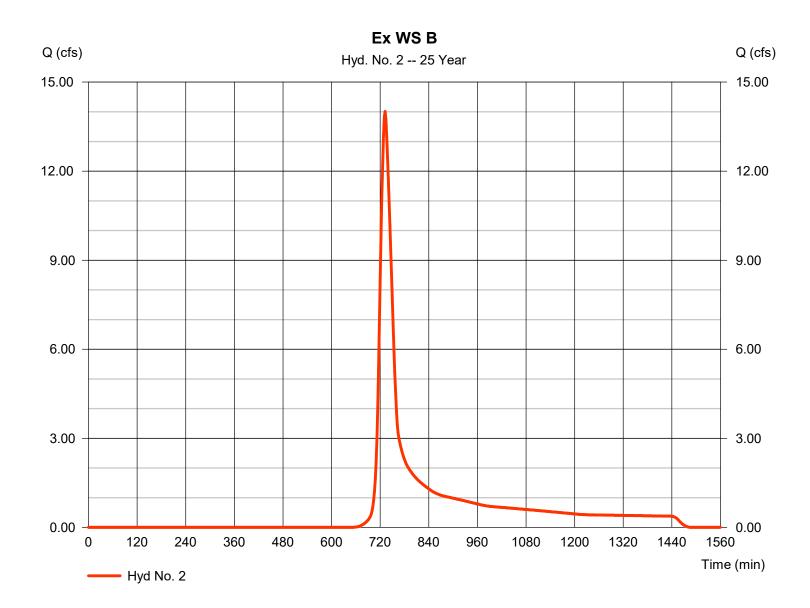
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 2

Ex WS B

Hydrograph type = SCS Runoff Peak discharge = 14.01 cfsStorm frequency = 25 yrs Time to peak = 732 min Time interval = 2 min Hyd. volume = 59,722 cuft Drainage area = 12.290 ac Curve number = 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



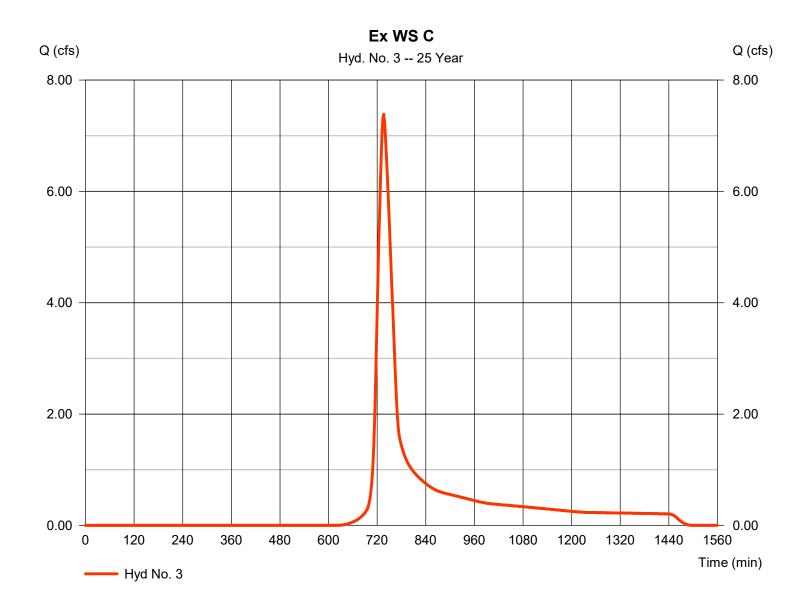
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 3

Ex WS C

Hydrograph type = SCS Runoff Peak discharge = 7.385 cfsStorm frequency = 25 yrs Time to peak = 736 min Time interval = 2 min Hyd. volume = 34,876 cuft Drainage area = 6.320 acCurve number = 72 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



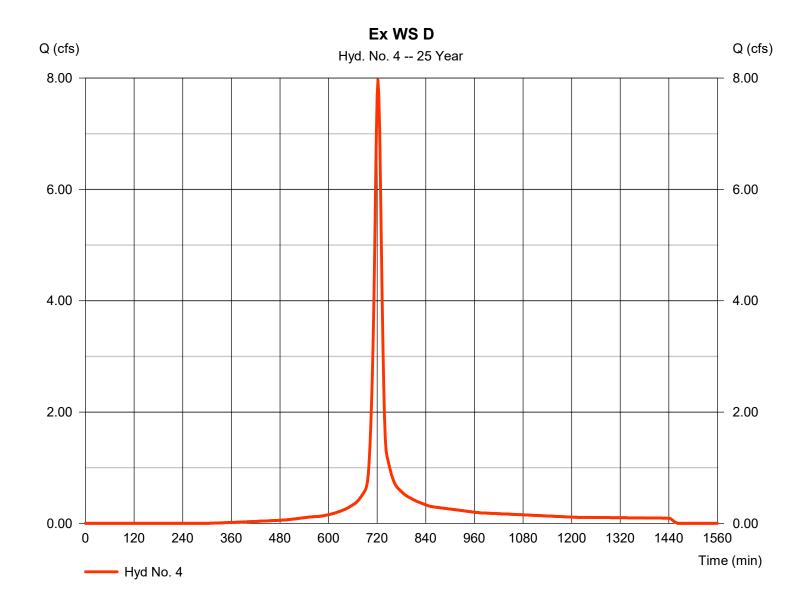
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 4

Ex WS D

Hydrograph type = SCS Runoff Peak discharge = 7.963 cfsStorm frequency = 25 yrs Time to peak = 722 min Time interval = 2 min Hyd. volume = 22,786 cuft Drainage area = 2.200 acCurve number = 89 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	178.51	2	744	1,012,001				Ex WS A
2	SCS Runoff	26.39	2	732	107,592				Ex WS B
3	SCS Runoff	13.26	2	736	60,727				Ex WS C
Exi	sting Hydrogr	aphs.gpw	l		Return P	eriod: 100	 Year	Tuesday, 10	0 / 1 / 2019

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

= 24 hrs

Tuesday, 10 / 1 / 2019

= 484

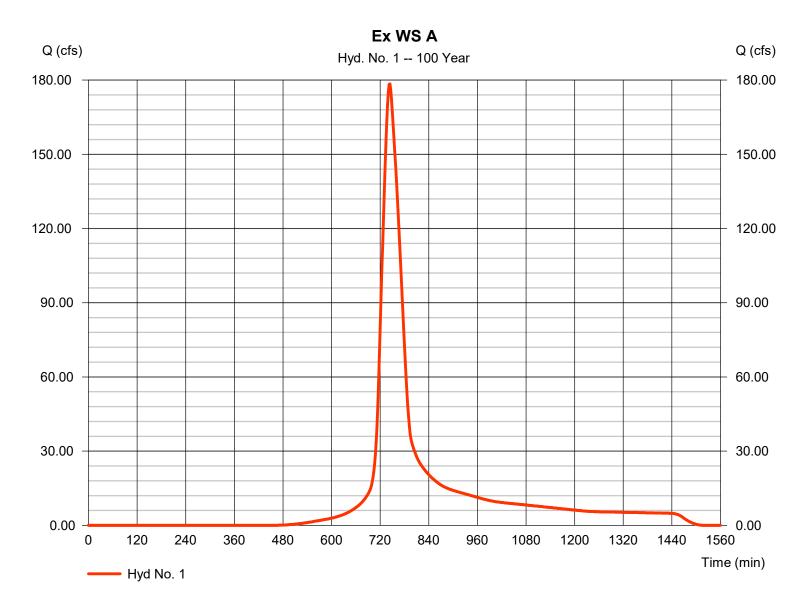
#### Hyd. No. 1

Storm duration

Ex WS A

Hydrograph type = SCS Runoff Peak discharge = 178.51 cfsStorm frequency = 100 yrsTime to peak = 744 min Time interval = 2 min Hyd. volume = 1,012,001 cuftDrainage area Curve number = 88.760 ac = 77 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 50.00 \, \text{min}$ = User Total precip. = 5.61 inDistribution = Type II

Shape factor



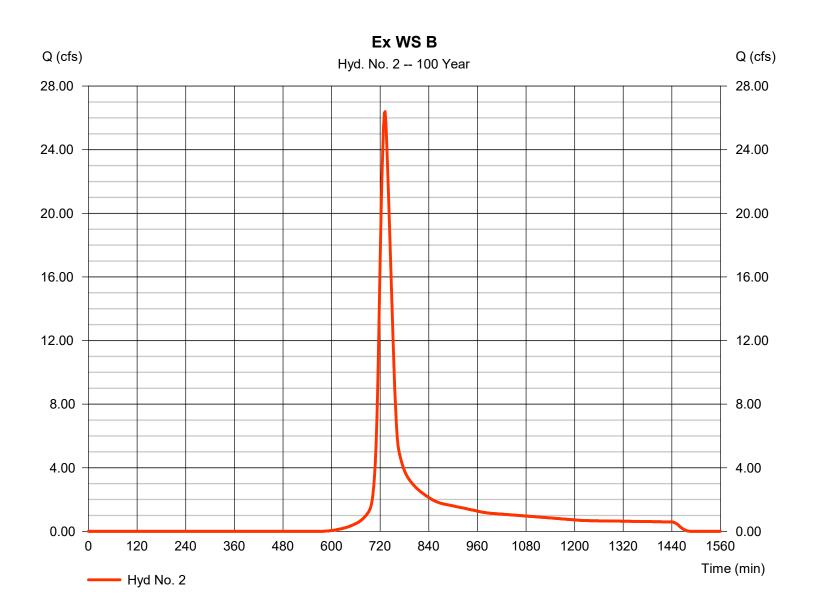
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 2

Ex WS B

Hydrograph type = SCS Runoff Peak discharge = 26.39 cfsStorm frequency = 100 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 107,592 cuft Drainage area Curve number = 12.290 ac = 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



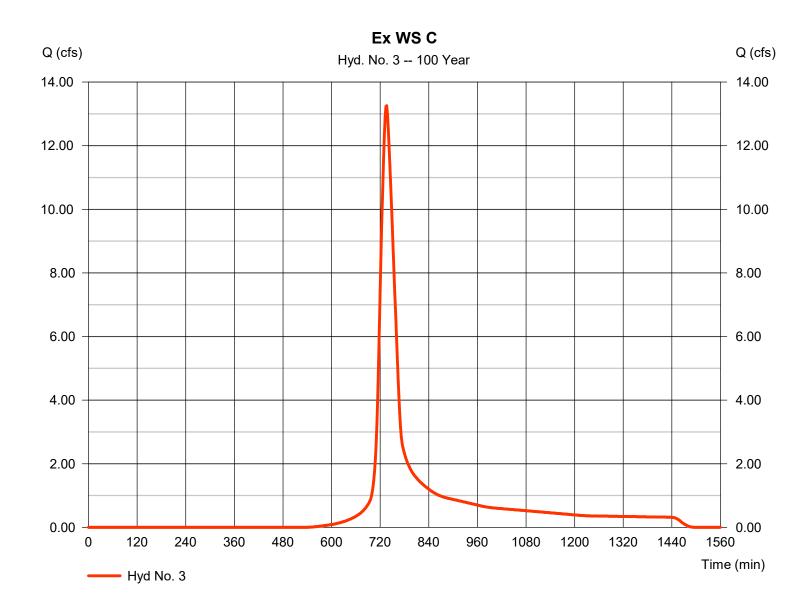
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 3

Ex WS C

Hydrograph type = SCS Runoff Peak discharge = 13.26 cfsStorm frequency = 100 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 60,727 cuft= 72 Drainage area Curve number = 6.320 ac= 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



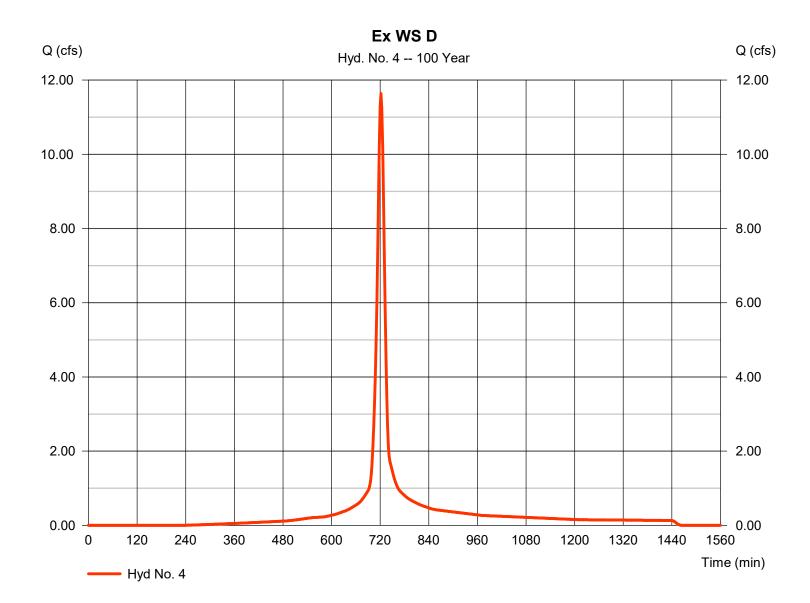
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 4

Ex WS D

Hydrograph type = SCS Runoff Peak discharge = 11.64 cfsStorm frequency = 100 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 33.936 cuft Drainage area = 2.200 acCurve number = 89 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



Proposed Distribution Facility Project 7211 and 7219 Morgan Road Town of Clay, Onondaga County, New York

## **Appendix H**

Post-Development Stormwater Analysis



# Hydrograph Return Period Recap

lyd. No.	Hydrograph	Inflow				Peak Out	tflow (cfs)				Hydrograph Description
10.	type (origin)	hyd(s)	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	Description
1	SCS Runoff		26.28				53.15	68.61		98.93	Pr WS A1
2	Diversion1	1	17.25				17.25	17.25		17.25	A1 to Bio #1
3	Diversion2	1	9.034				35.90	51.36		81.68	A1 to Detention
5	SCS Runoff		55.61				102.44	128.93		180.71	Pr WS A2
6	Diversion1	5	38.56				38.56	38.56		38.56	A2 to Bio #2
7	Diversion2	5	17.05				63.88	90.37		142.15	A2 to Detention
9	SCS Runoff		18.24				37.08	47.94		69.26	Pr WS A3
10	Diversion1	9	18.24				21.66	21.66		21.66	A3 to Bio #3
11	Diversion2	9	0.000				15.42	26.28		47.60	A3 to Detention
13	SCS Runoff		9.026				23.15	32.00		50.01	Pr WS A4
14	Diversion1	13	9.026				17.25	17.25		17.25	A4 to Bio #4
15	Diversion2	13	0.000				5.904	14.75		32.76	A4 to Detention
17	SCS Runoff		2.122				7.094	10.38		17.39	Pr WS A5
18	Reach	17	2.129				7.104	10.44		17.48	PR Reach A5
19	SCS Runoff		2.217				6.950	10.07		16.64	Pr WS A6
20	Combine	18, 19	4.259				13.84	20.22		33.67	Combine
21	Reach	20	4.240				13.85	20.25		33.73	PR Reach A6
22	SCS Runoff		0.971				6.203	10.20		19.13	Pr WS A7
24	Reservoir	2	3.078				11.87	14.45		15.94	Bio A1
25	Reservoir	6	13.33				25.88	27.14		27.90	Bio A2
26	Reservoir	10	0.936				8.284	12.43		17.25	Bio A3
27	Reservoir	14	1.279				13.01	15.62		16.86	Bio A4
29	Combine	3, 7, 11,	19.00				102.56	152.20		249.39	A1+A2+A3 Bypass
30	Combine	24, 25, 26,	16.68				43.65	52.02		60.05	A1+A2+A3 thru Bioretention
31	Combine	29, 30	22.91				129.84	192.35		303.21	A1 + A2 + A3
32	Reservoir	31	4.034				35.25	74.67		115.23	Wet Pond #1
34	Combine	15, 27,	1.279				13.01	24.24		47.03	A4
35	Reservoir	34	0.101				2.367	7.742		24.15	North Detention
37	Combine	21, 22, 32, 35,	5.208				49.64	104.84		167.43	Total WS A

Proj. file: Proposed Hydrographs.gpw

Tuesday, 10 / 1 / 2019

# Hydrograph Return Period Recap Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd.	Hydrograph	Inflow				Peak Ou	tflow (cfs)	)			Hydrograph
No.	type (origin)	hyd(s)	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	Description
39	SCS Runoff		0.695				5.777	9.983		19.57	Pr WS B
40	SCS Runoff		0.994				4.705	7.385		13.26	Pr WS C
41	SCS Runoff		0.310				0.913	1.307		2.127	Pr WS D

Proj. file: Proposed Hydrographs.gpw

Tuesday, 10 / 1 / 2019

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	26.28	2	716	53,276				Pr WS A1
2	Diversion1	17.25	2	712	50,023	1			A1 to Bio #1
3	Diversion2	9.034	2	716	3,253	1			A1 to Detention
5	SCS Runoff	55.61	2	722	158,709				Pr WS A2
6	Diversion1	38.56	2	716	149,610	5			A2 to Bio #2
7	Diversion2	17.05	2	722	9,099	5			A2 to Detention
9	SCS Runoff	18.24	2	718	41,784				Pr WS A3
10	Diversion1	18.24	2	718	41,784	9			A3 to Bio #3
11	Diversion2	0.000	2	n/a	0	9			A3 to Detention
13	SCS Runoff	9.026	2	736	43,143				Pr WS A4
14	Diversion1	9.026	2	736	43,143	13			A4 to Bio #4
15	Diversion2	0.000	2	n/a	0	13			A4 to Detention
17	SCS Runoff	2.122	2	732	10,162				Pr WS A5
18	Reach	2.129	2	734	10,160	17			PR Reach A5
19	SCS Runoff	2.217	2	730	9,352				Pr WS A6
20	Combine	4.259	2	732	19,511	18, 19			Combine
21	Reach	4.240	2	734	19,511	20			PR Reach A6
22	SCS Runoff	0.971	2	732	6,646				Pr WS A7
24	Reservoir	3.078	2	738	47,727	2	405.89	23,516	Bio A1
25	Reservoir	13.33	2	738	140,421	6	401.89	73,290	Bio A2
26	Reservoir	0.936	2	798	40,720	10	409.04	25,021	Bio A3
27	Reservoir	1.279	2	804	43,088	14	403.32	21,817	Bio A4
29	Combine	19.00	2	718	12,352	3, 7, 11,			A1+A2+A3 Bypass
30	Combine	16.68	2	738	228,867	24, 25, 26,			A1+A2+A3 thru Bioretention
31	Combine	22.91	2	724	241,220	29, 30			A1 + A2 + A3
32	Reservoir	4.034	2	892	162,497	31	402.28	163,825	Wet Pond #1
34	Combine	1.279	2	804	43,088	15, 27,			A4
35	Reservoir	0.101	2	2638	7,320	34	402.83	37,545	North Detention
37	Combine	5.208	2	734	195,975	21, 22, 32, 35,			Total WS A
Pro	posed Hydro	graphs.g	pw		Return F	Period: 1 Ye	 ear	Tuesday, 1	10 / 1 / 2019

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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
39	SCS Runoff	0.695	2	738	6,448				Pr WS B
40	SCS Runoff	0.994	2	738	6,819				Pr WS C
Pro	posed Hydro	graphs.gr	ow	1	Return F	Period: 1 Ye	ear	Tuesday, 1	0 / 1 / 2019

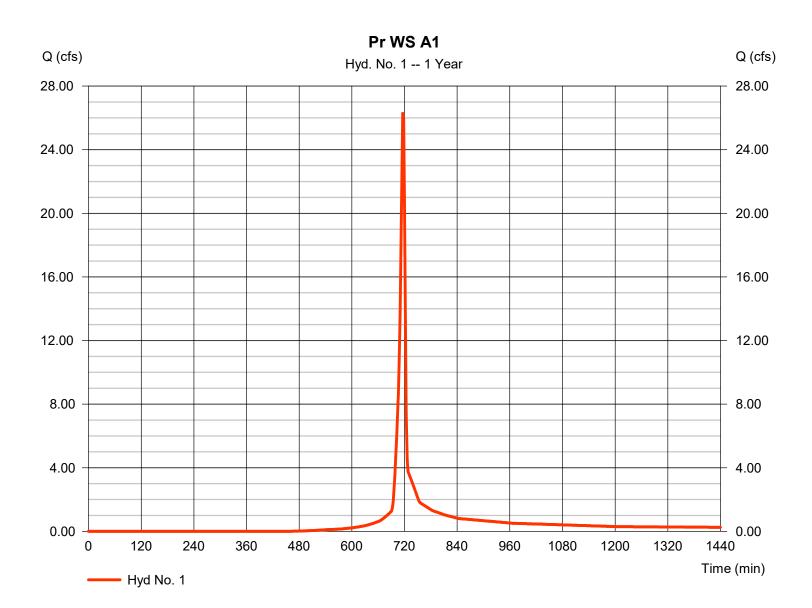
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 1

Pr WS A1

= 26.28 cfsHydrograph type = SCS Runoff Peak discharge Storm frequency Time to peak = 1 yrs= 716 min Time interval = 2 min Hyd. volume = 53,276 cuftDrainage area Curve number = 14.090 ac= 90 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc)  $= 6.00 \, \text{min}$ = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

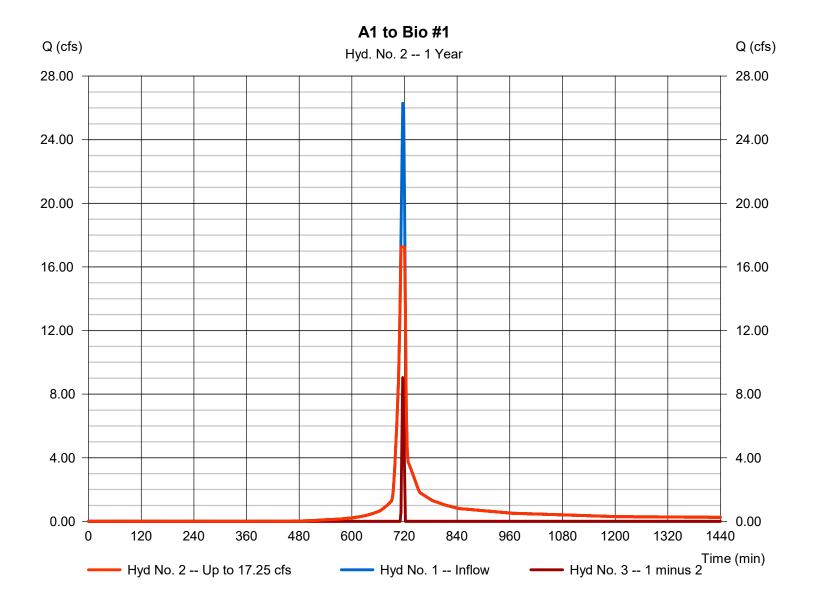
#### Hyd. No. 2

A1 to Bio #1

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 1 yrsTime to peak= 712 minTime interval= 2 minHyd. volume= 50,023 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 3

Diversion method = Constant Q Constant Q = 17.25 cfs



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

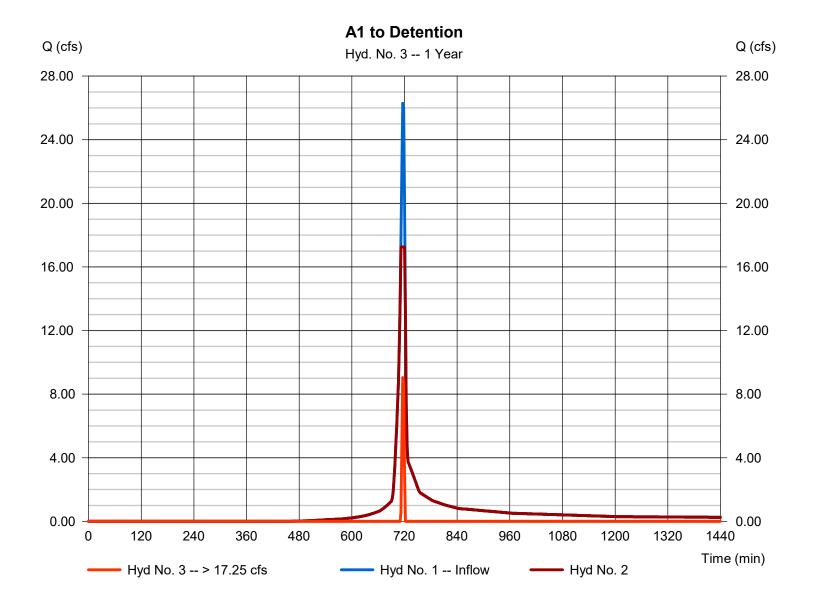
#### Hyd. No. 3

A1 to Detention

Hydrograph type= Diversion2Peak discharge= 9.034 cfsStorm frequency= 1 yrsTime to peak= 716 minTime interval= 2 minHyd. volume= 3,253 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 2

Diversion method = Constant Q Constant Q = 17.25 cfs



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= 24 hrs

Tuesday, 10 / 1 / 2019

= 484

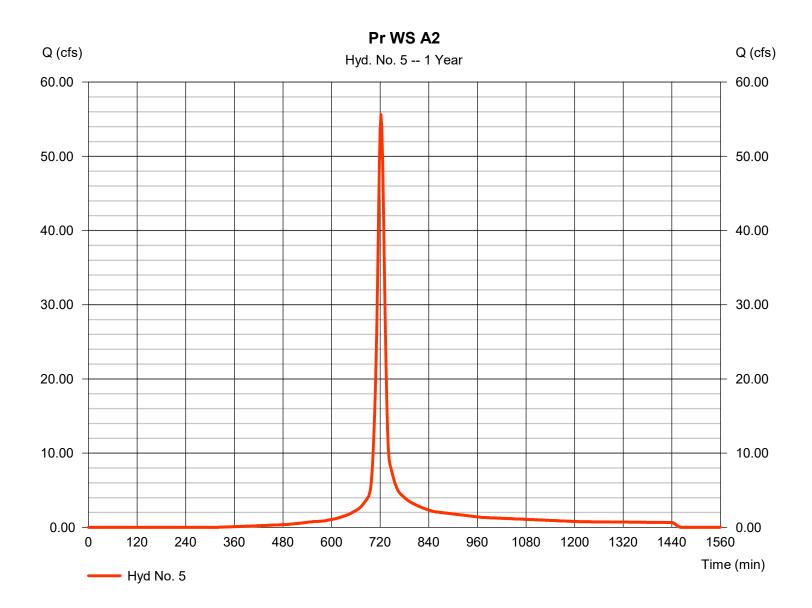
#### Hyd. No. 5

Storm duration

Pr WS A2

Hydrograph type = SCS Runoff Peak discharge = 55.61 cfsStorm frequency = 1 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 158,709 cuftDrainage area Curve number = 31.690 ac= 94 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User Total precip. = 2.02 inDistribution = Type II

Shape factor



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Tuesday, 10 / 1 / 2019

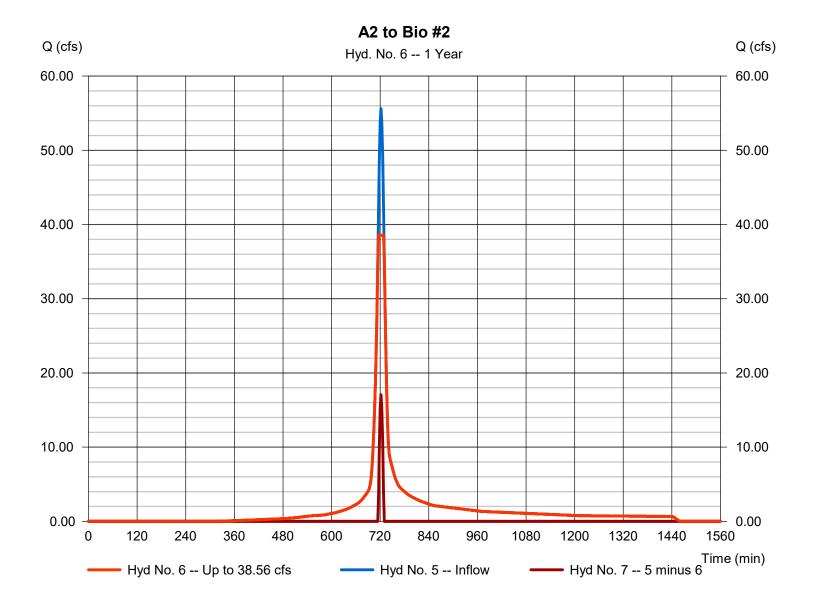
#### Hyd. No. 6

A2 to Bio #2

Hydrograph type= Diversion1Peak discharge= 38.56 cfsStorm frequency= 1 yrsTime to peak= 716 minTime interval= 2 minHyd. volume= 149,610 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 7

Diversion method = Constant Q Constant Q = 38.56 cfs



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Tuesday, 10 / 1 / 2019

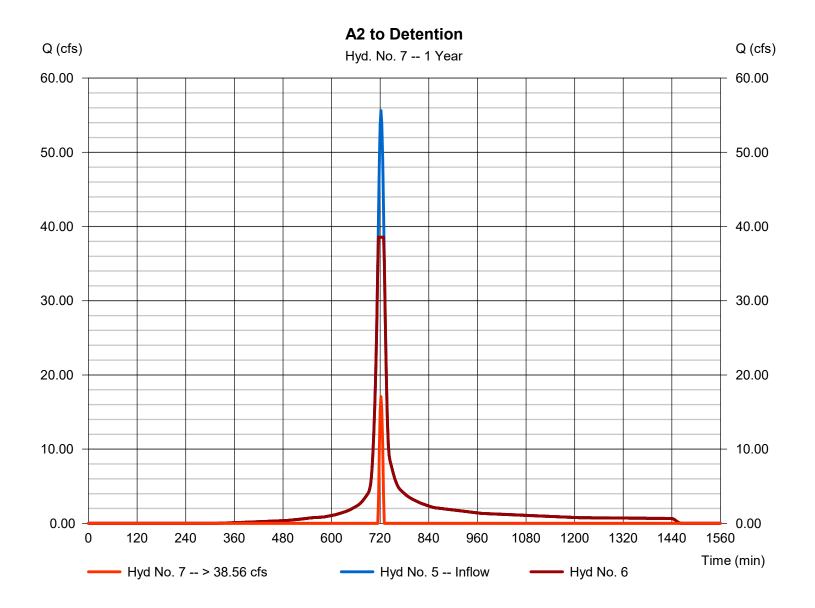
#### Hyd. No. 7

A2 to Detention

Hydrograph type= Diversion2Peak discharge= 17.05 cfsStorm frequency= 1 yrsTime to peak= 722 minTime interval= 2 minHyd. volume= 9,099 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 6

Diversion method = Constant Q Constant Q = 38.56 cfs



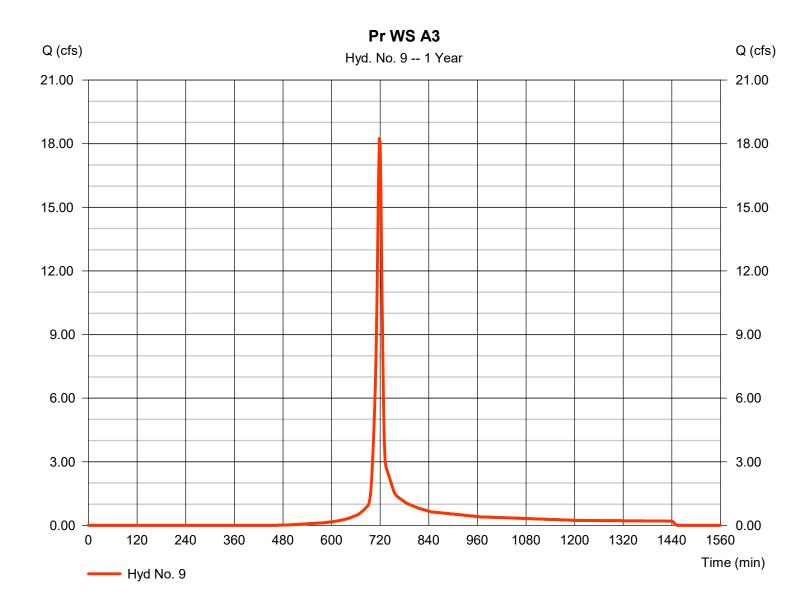
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 9

Pr WS A3

Hydrograph type = SCS Runoff Peak discharge = 18.24 cfsStorm frequency Time to peak = 1 yrs= 718 min Time interval = 2 min Hyd. volume = 41,784 cuft Drainage area Curve number = 10.360 ac= 90 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc)  $= 7.00 \, \text{min}$ = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

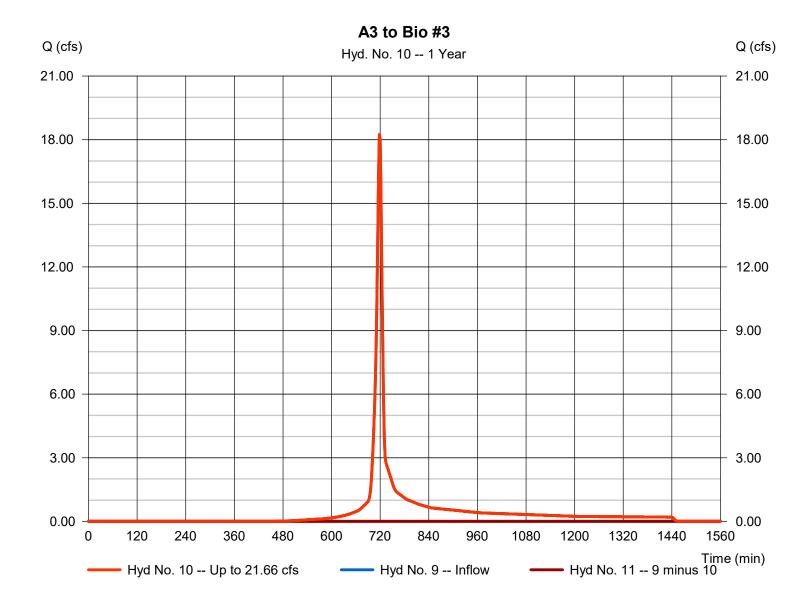
#### Hyd. No. 10

A3 to Bio #3

Hydrograph type= Diversion1Peak discharge= 18.24 cfsStorm frequency= 1 yrsTime to peak= 718 minTime interval= 2 minHyd. volume= 41,784 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 11

Diversion method = Constant Q Constant Q = 21.66 cfs



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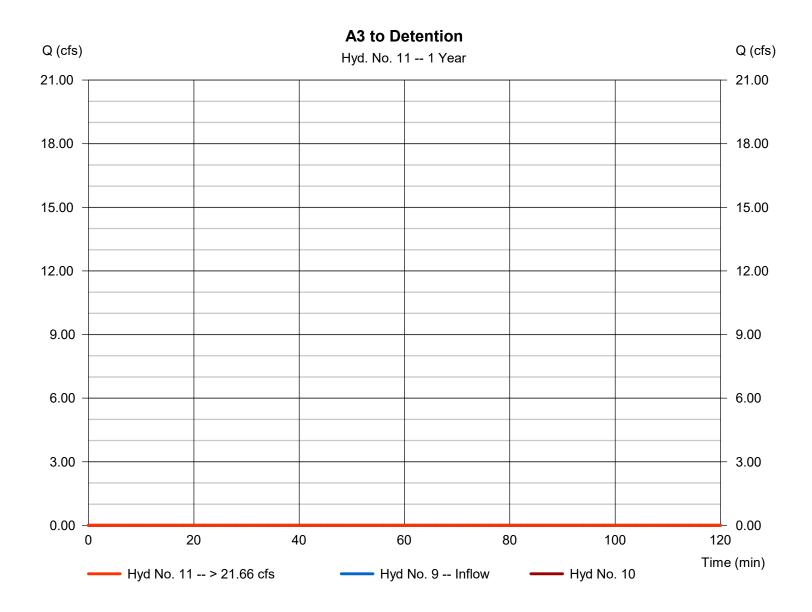
Tuesday, 10 / 1 / 2019

#### Hyd. No. 11

A3 to Detention

Hydrograph type Peak discharge = 0.000 cfs= Diversion2 Storm frequency = 1 yrsTime to peak = n/aTime interval = 2 min Hyd. volume = 0 cuft Inflow hydrograph 2nd diverted hyd. = 9 - Pr WS A3 = 10

Diversion method = Constant Q Constant Q = 21.66 cfs



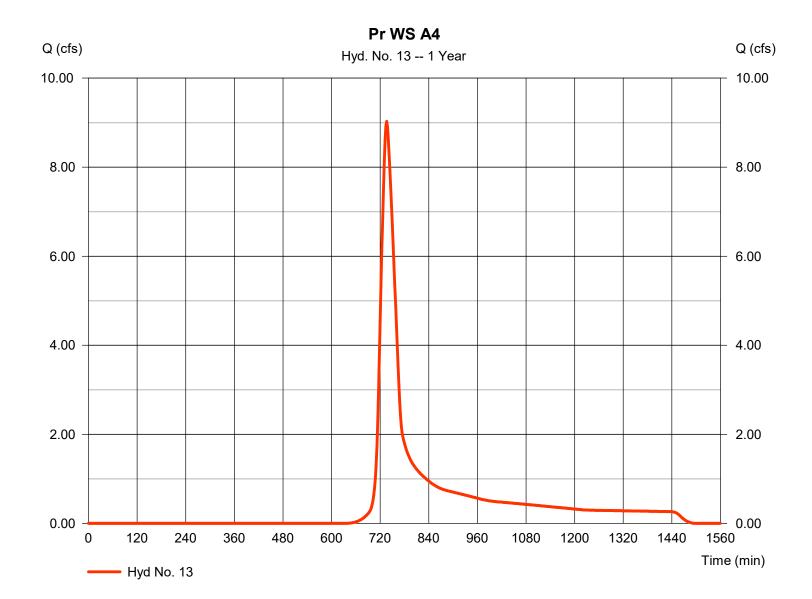
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Tuesday, 10 / 1 / 2019

#### **Hyd. No. 13**

Pr WS A4

Hydrograph type = SCS Runoff Peak discharge = 9.026 cfsStorm frequency = 1 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 43,143 cuft Drainage area = 16.960 ac Curve number = 83 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 36.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

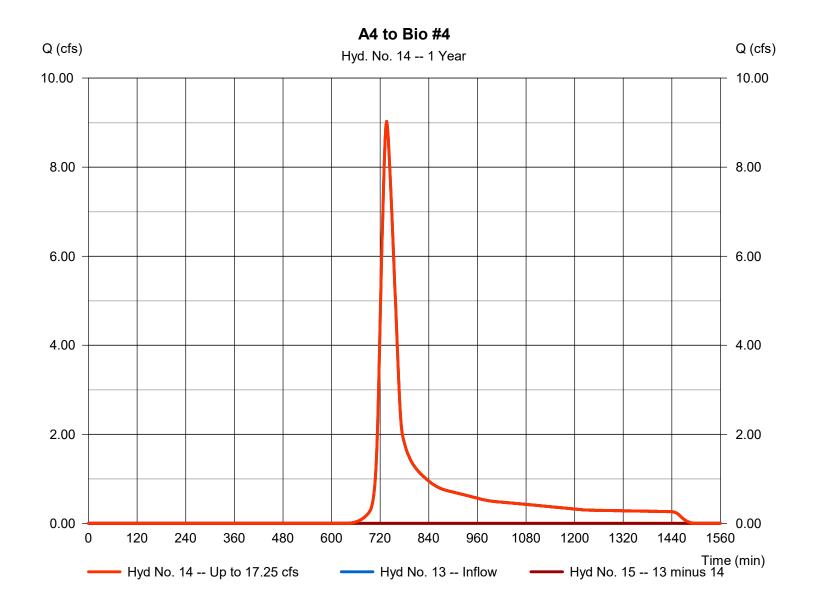
#### Hyd. No. 14

A4 to Bio #4

Hydrograph type= Diversion1Peak discharge= 9.026 cfsStorm frequency= 1 yrsTime to peak= 736 minTime interval= 2 minHyd. volume= 43,143 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 15

Diversion method = Constant Q Constant Q = 17.25 cfs



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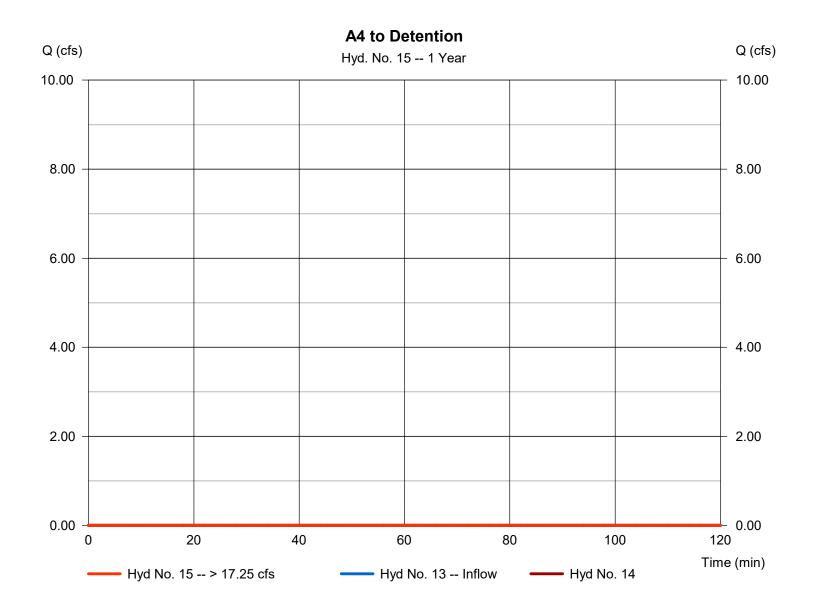
Tuesday, 10 / 1 / 2019

## Hyd. No. 15

A4 to Detention

Hydrograph type = Diversion2 Peak discharge = 0.000 cfsStorm frequency = 1 yrsTime to peak = n/aTime interval = 2 min Hyd. volume = 0 cuft Inflow hydrograph 2nd diverted hyd. = 13 - Pr WS A4 = 14

Diversion method = Constant Q Constant Q = 17.25 cfs



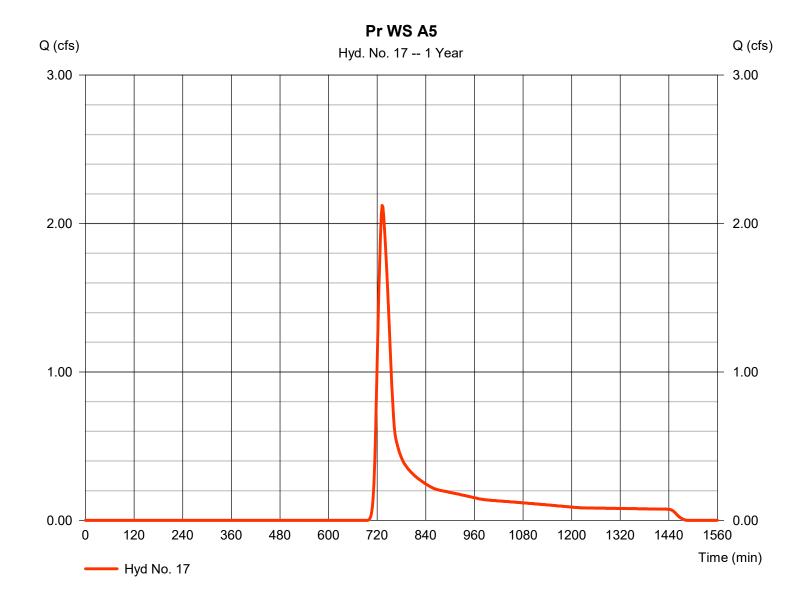
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 17

Pr WS A5

Hydrograph type = SCS Runoff Peak discharge = 2.122 cfsStorm frequency = 1 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 10,162 cuft Drainage area = 6.100 acCurve number = 77 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 30.00 \, \text{min}$ = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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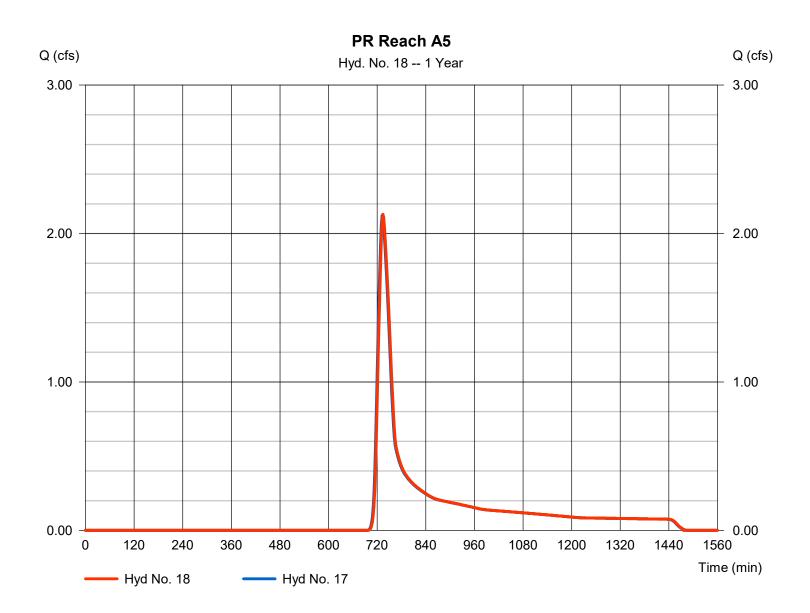
Tuesday, 10 / 1 / 2019

#### Hyd. No. 18

PR Reach A5

Hydrograph type Peak discharge = 2.129 cfs= Reach Storm frequency = 1 yrsTime to peak = 734 min Time interval = 2 min Hyd. volume = 10,160 cuftInflow hyd. No. = 17 - Pr WS A5 Section type = Trapezoidal Reach length = 101.0 ftChannel slope = 1.6 % Manning's n = 0.025Bottom width  $= 12.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 1.0 ftRating curve x = 1.437Rating curve m = 1.425Ave. velocity = 1.61 ft/sRouting coeff. = 1.1547

Modified Att-Kin routing method used.



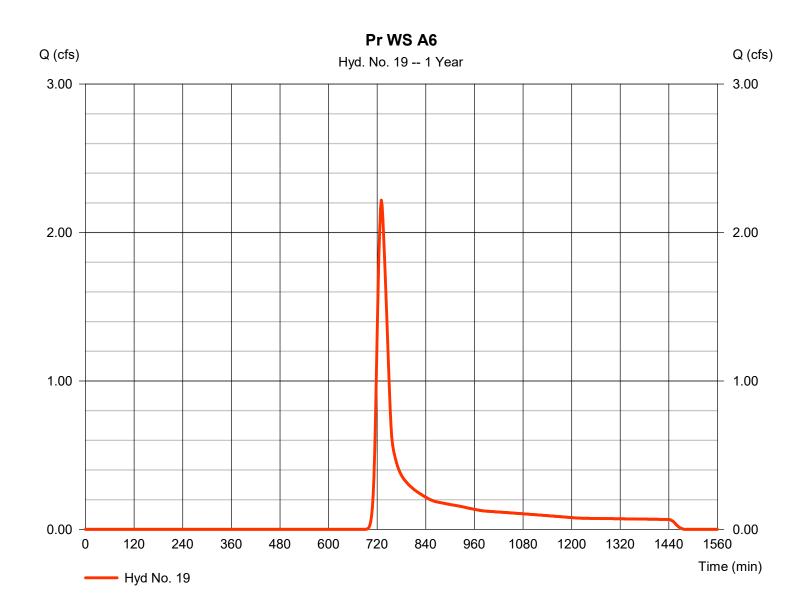
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Tuesday, 10 / 1 / 2019

## Hyd. No. 19

Pr WS A6

Hydrograph type = SCS Runoff Peak discharge = 2.217 cfsStorm frequency = 1 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 9.352 cuft= 78 Drainage area = 5.280 acCurve number = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 24.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



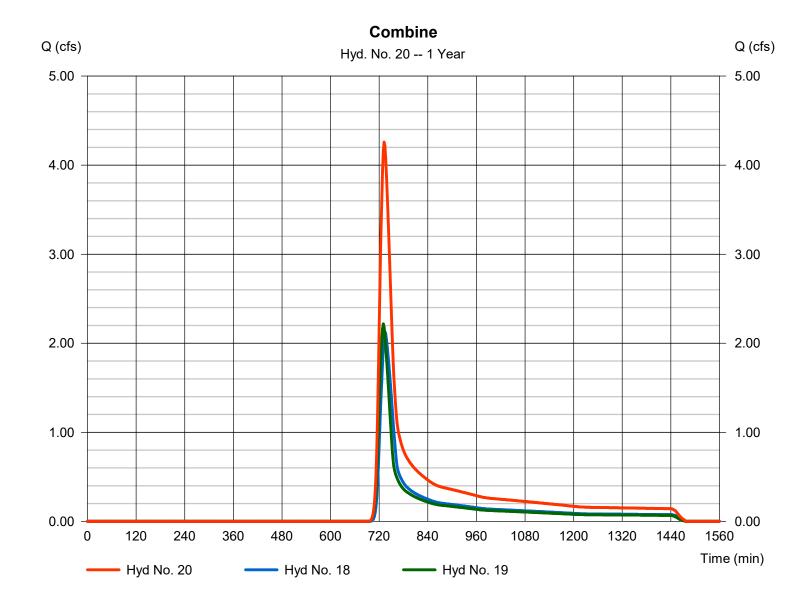
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Tuesday, 10 / 1 / 2019

## Hyd. No. 20

Combine

= 4.259 cfsHydrograph type = Combine Peak discharge Storm frequency = 1 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 19,511 cuft Inflow hyds. = 18, 19 Contrib. drain. area = 5.280 ac



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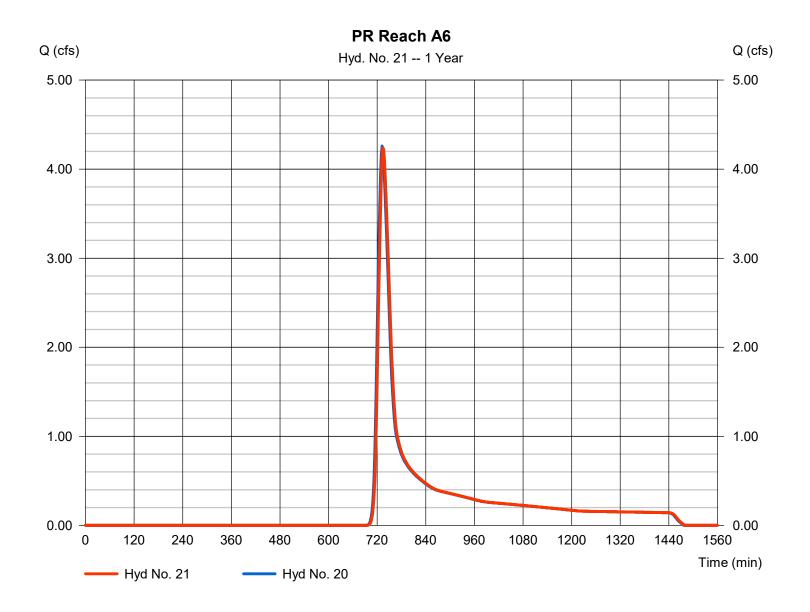
Tuesday, 10 / 1 / 2019

#### Hyd. No. 21

PR Reach A6

Hydrograph type Peak discharge = 4.240 cfs= Reach Storm frequency = 1 yrsTime to peak = 734 min Time interval = 2 min Hyd. volume = 19,511 cuft Inflow hyd. No. = 20 - Combine Section type = Trapezoidal Reach length = 413.0 ftChannel slope = 3.8 % Manning's n = 0.025Bottom width  $= 6.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 5.0 ftRating curve x Rating curve m = 3.540= 1.395Ave. velocity = 3.73 ft/sRouting coeff. = 0.8611

Modified Att-Kin routing method used.



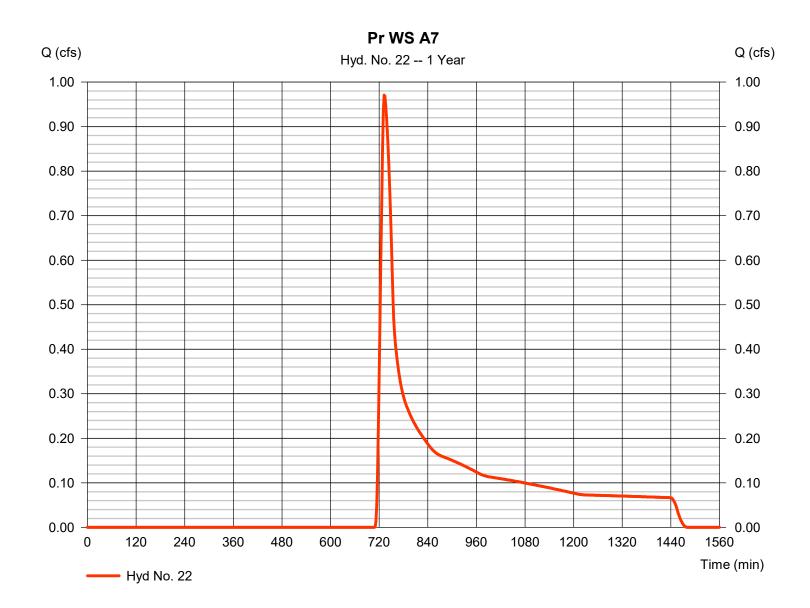
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 22

Pr WS A7

Hydrograph type = SCS Runoff Peak discharge = 0.971 cfsStorm frequency = 1 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 6,646 cuftDrainage area Curve number = 8.310 ac= 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 26.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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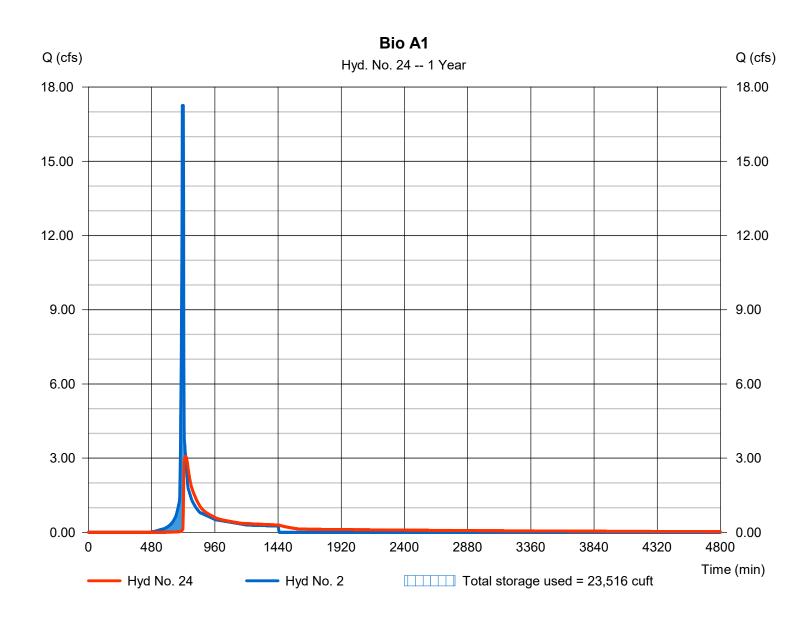
Tuesday, 10 / 1 / 2019

#### Hyd. No. 24

Bio A1

Hydrograph type = Reservoir Peak discharge = 3.078 cfsStorm frequency = 1 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 47,727 cuftInflow hyd. No. Max. Elevation = 2 - A1 to Bio #1 = 405.89 ftReservoir name = Bio A1 (south) Max. Storage = 23,516 cuft

Storage Indication method used. Outflow includes exfiltration.



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Tuesday, 10 / 1 / 2019

#### Pond No. 1 - Bio A1 (south)

#### **Pond Data**

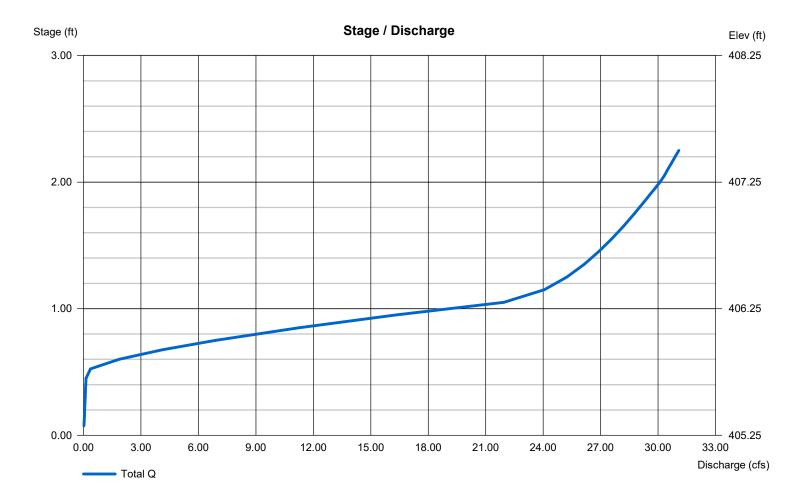
Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 405.25 ft

#### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	405.25	35,798	0	0
0.75	406.00	37,619	27,526	27,526
1.75	407.00	40,097	38,848	66,373
2.25	407.50	41,358	20,361	86,734

#### **Culvert / Orifice Structures Weir Structures** [A] [B] [C] [D] [A] [B] [C] [PrfRsr] Rise (in) = 24.00 0.00 0.00 0.00 Crest Len (ft) = 16.00 0.00 0.00 0.00 Span (in) = 24.000.00 0.00 0.00 Crest El. (ft) = 405.75 0.00 0.00 0.00 No. Barrels = 1 0 0 Weir Coeff. = 3.333.33 3.33 3.33 = 402.30 0.00 0.00 0.00 Weir Type Invert El. (ft) = 1 = 60.000.00 0.00 0.00 Multi-Stage Length (ft) = Yes No No No Slope (%) = 0.400.00 0.00 n/a N-Value = .013 .013 .013 n/a = 0.250 (by Contour) 0.60 0.60 = 0.600.60 Exfil.(in/hr) Orifice Coeff. Multi-Stage = n/aNo No No 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).



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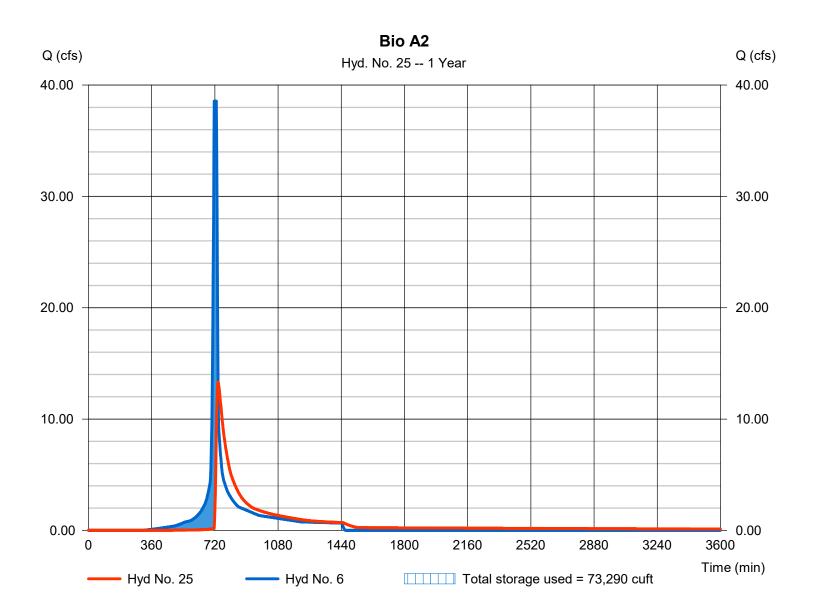
Tuesday, 10 / 1 / 2019

#### Hyd. No. 25

Bio A2

Hydrograph type = Reservoir Peak discharge = 13.33 cfsStorm frequency = 1 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 140,421 cuft Inflow hyd. No. = 6 - A2 to Bio #2 Max. Elevation = 401.89 ft= 73,290 cuft Reservoir name = Bio A2 (west) Max. Storage

Storage Indication method used. Outflow includes exfiltration.



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Tuesday, 10 / 1 / 2019

#### Pond No. 2 - Bio A2 (west)

#### **Pond Data**

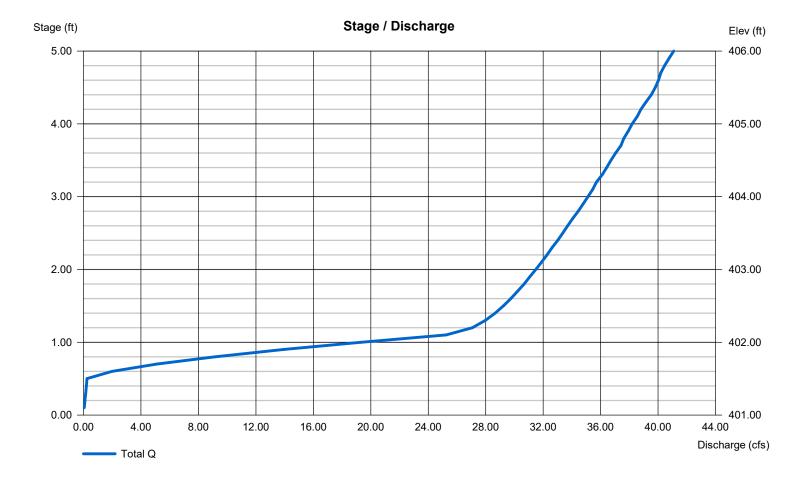
Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 401.00 ft

#### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	401.00	80,646	0	0
1.00	402.00	84,524	82,569	82,569
2.00	403.00	88,459	86,475	169,045
3.00	404.00	92,451	90,439	259,483
4.00	405.00	96,499	94,458	353,942
5.00	406.00	100,603	98,534	452,476

#### **Culvert / Orifice Structures Weir Structures** [A] [B] [C] [PrfRsr] [A] [B] [C] [D] = 24.00 0.00 0.00 = 16.00 0.00 0.00 0.00 Rise (in) 0.00 Crest Len (ft) Span (in) = 24.000.00 0.00 0.00 Crest El. (ft) = 401.50 0.00 0.00 0.00 No. Barrels 0 Weir Coeff. = 3.333.33 3.33 3.33 Invert El. (ft) = 397.750.00 0.00 0.00 Weir Type = 1 = 54.000.00 0.00 0.00 Multi-Stage No Length (ft) = Yes No No Slope (%) = 2.000.00 0.00 n/a N-Value = .013 .013 .013 n/a = 0.600.60 0.60 0.60 Exfil.(in/hr) = 0.250 (by Contour) Orifice Coeff. TW Elev. (ft) Multi-Stage = n/a No No No = 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).



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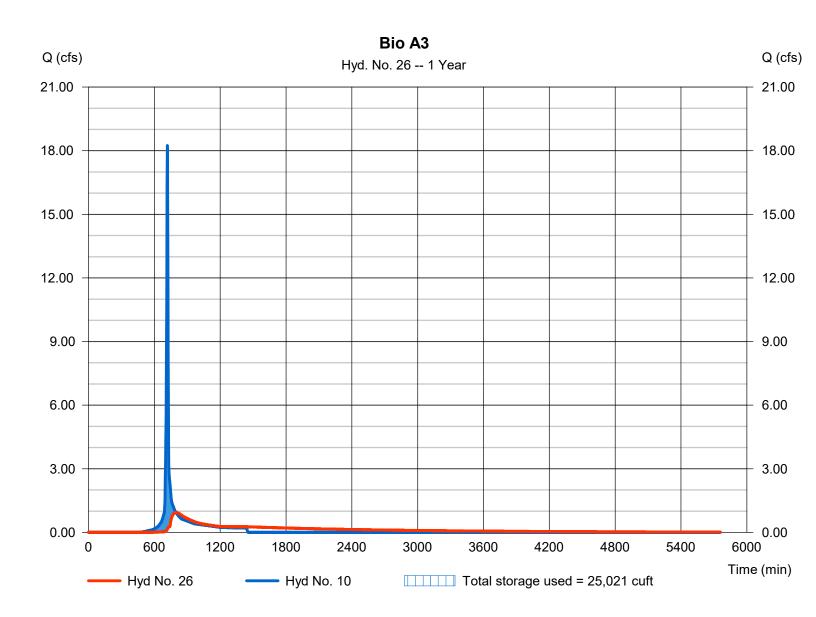
Tuesday, 10 / 1 / 2019

#### Hyd. No. 26

Bio A3

Hydrograph type = Reservoir Peak discharge = 0.936 cfsStorm frequency = 1 yrsTime to peak = 798 min Time interval = 2 min Hyd. volume = 40,720 cuftInflow hyd. No. = 10 - A3 to Bio #3 Max. Elevation = 409.04 ftReservoir name = Bio A3 (east) Max. Storage = 25,021 cuft

Storage Indication method used. Outflow includes exfiltration.



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Tuesday, 10 / 1 / 2019

#### Pond No. 3 - Bio A3 (east)

#### **Pond Data**

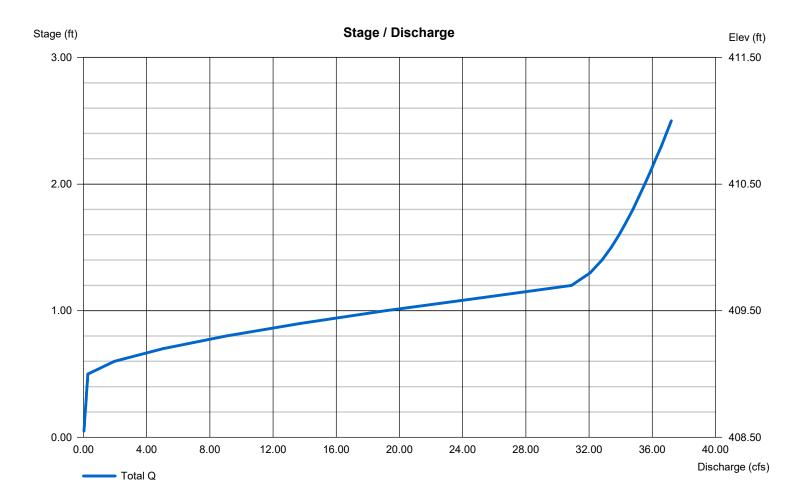
Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 408.50 ft

#### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	408.50	45,503	0	0
0.50	409.00	46,963	23,113	23,113
1.50	410.00	49,927	48,433	71,546
2.50	411.00	52,947	51,424	122,970

#### **Culvert / Orifice Structures Weir Structures** [A] [B] [C] [D] [A] [B] [C] [PrfRsr] Rise (in) = 24.00 0.00 0.00 0.00 Crest Len (ft) = 16.00 0.00 0.00 0.00 Span (in) = 24.000.00 0.00 0.00 Crest El. (ft) = 409.00 0.00 0.00 0.00 No. Barrels = 1 0 0 Weir Coeff. = 3.333.33 3.33 3.33 = 404.00 0.00 0.00 0.00 Weir Type Invert El. (ft) = 1 = 83.00 0.00 0.00 0.00 Multi-Stage Length (ft) = Yes No No No Slope (%) = 1.00 0.00 0.00 n/a N-Value = .013 .013 .013 n/a = 0.250 (by Contour) 0.60 0.60 = 0.600.60 Exfil.(in/hr) Orifice Coeff. Multi-Stage = n/aNo No No 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).



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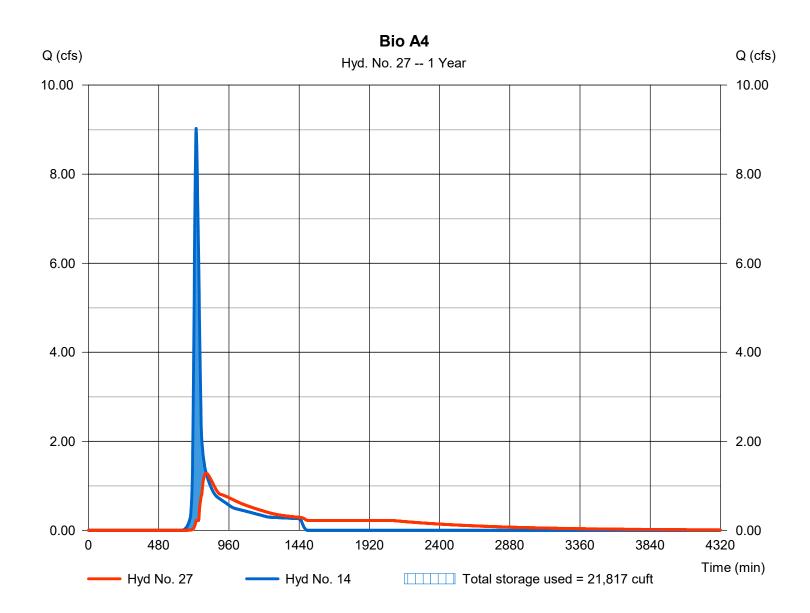
Tuesday, 10 / 1 / 2019

#### Hyd. No. 27

Bio A4

Hydrograph type Peak discharge = 1.279 cfs= Reservoir Storm frequency = 1 yrsTime to peak = 804 min Time interval = 2 min Hyd. volume = 43,088 cuft Max. Elevation Inflow hyd. No. = 14 - A4 to Bio #4 = 403.32 ftReservoir name = Bio A4 (north) Max. Storage = 21,817 cuft

Storage Indication method used. Outflow includes exfiltration.



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Tuesday, 10 / 1 / 2019

#### Pond No. 4 - Bio A4 (north)

#### **Pond Data**

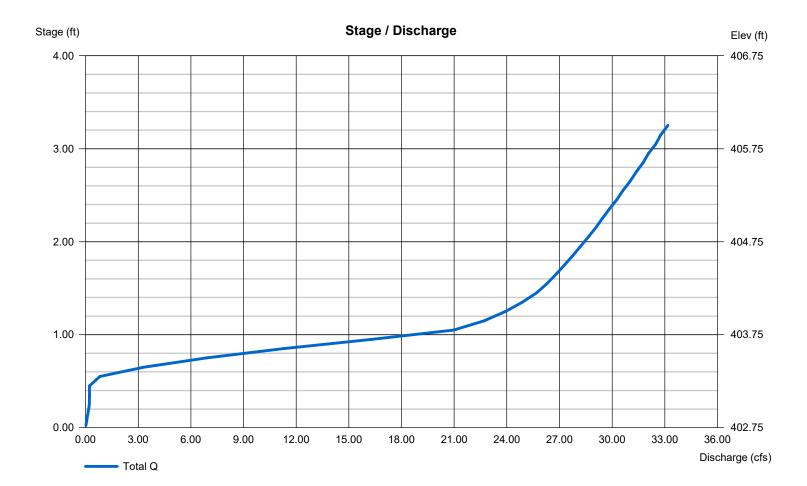
Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 402.75 ft

#### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	402.75	37,012	0	0
0.25	403.00	37,734	9,342	9,342
1.25	404.00	40,654	39,181	48,523
2.25	405.00	43,631	42,130	90,653
3.25	406.00	46,664	45,135	135,787

#### **Culvert / Orifice Structures Weir Structures** [A] [B] [C] [PrfRsr] [A] [B] [C] [D] = 24.000.00 0.00 = 16.00 0.00 0.00 0.00 Rise (in) 0.00 Crest Len (ft) = 24.00 0.00 0.00 0.00 Crest El. (ft) = 403.25 0.00 0.00 0.00 Span (in) No. Barrels = 1 0 0 Weir Coeff. = 3.333.33 3.33 3.33 Invert El. (ft) = 400.24 0.00 0.00 0.00 Weir Type = 1 = 44.00 0.00 0.00 0.00 Multi-Stage Length (ft) = Yes No No No = 0.550.00 0.00 Slope (%) n/a N-Value = .013 .013 .013 n/a 0.60 0.60 0.60 Orifice Coeff. = 0.60Exfil.(in/hr) = 0.250 (by Contour) TW Elev. (ft) Multi-Stage = n/aNo No No = 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).



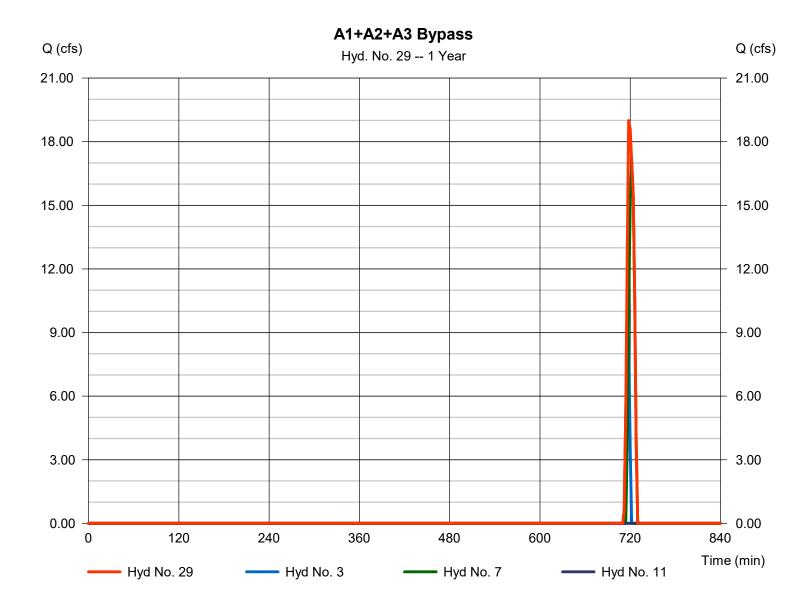
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Tuesday, 10 / 1 / 2019

## Hyd. No. 29

A1+A2+A3 Bypass

Hydrograph type = Combine Peak discharge = 19.00 cfsStorm frequency Time to peak = 1 yrs= 718 min Time interval = 2 min Hyd. volume = 12,352 cuft Inflow hyds. = 3, 7, 11Contrib. drain. area = 0.000 ac



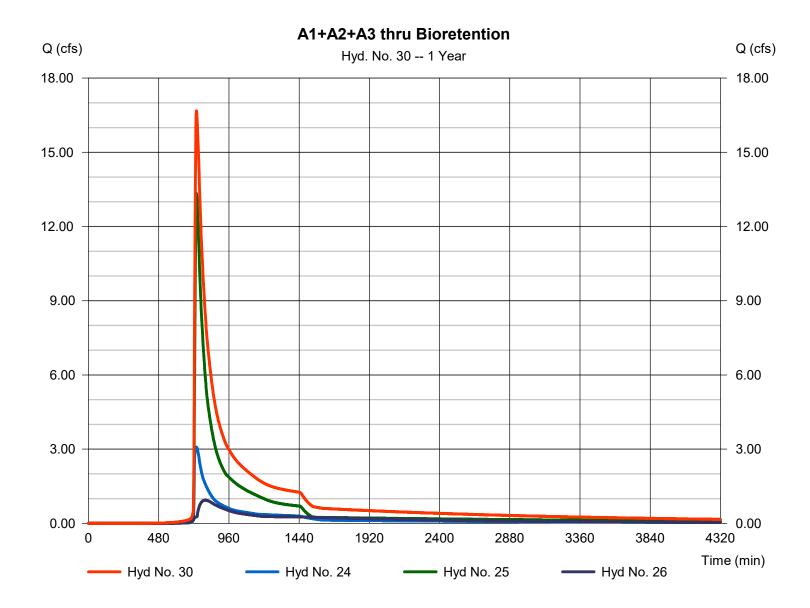
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 30

A1+A2+A3 thru Bioretention

Hydrograph type = Combine Peak discharge = 16.68 cfsStorm frequency Time to peak = 1 yrs= 738 min Time interval = 2 min Hyd. volume = 228,867 cuft Inflow hyds. = 24, 25, 26 Contrib. drain. area = 0.000 ac



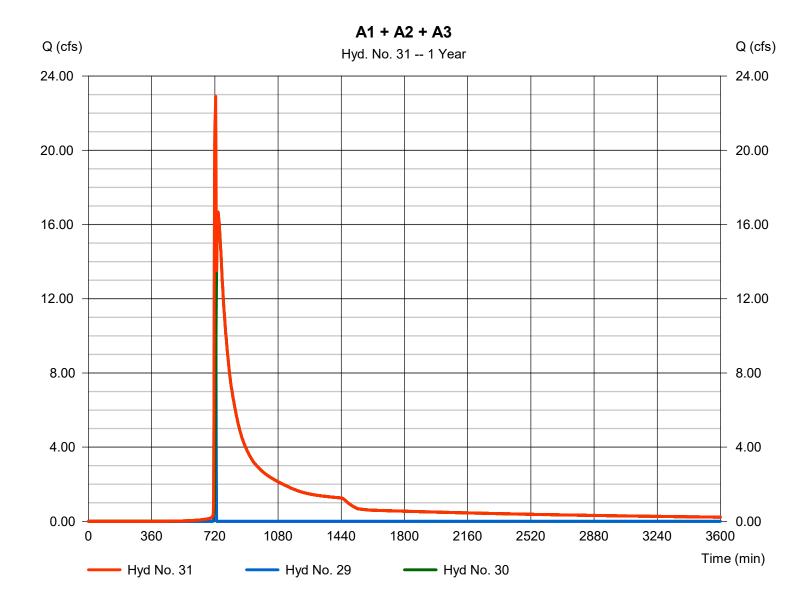
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Tuesday, 10 / 1 / 2019

## Hyd. No. 31

A1 + A2 + A3

Hydrograph type = Combine Peak discharge = 22.91 cfsStorm frequency Time to peak = 1 yrs= 724 min Time interval = 2 min Hyd. volume = 241,220 cuft Inflow hyds. = 29,30Contrib. drain. area = 0.000 ac



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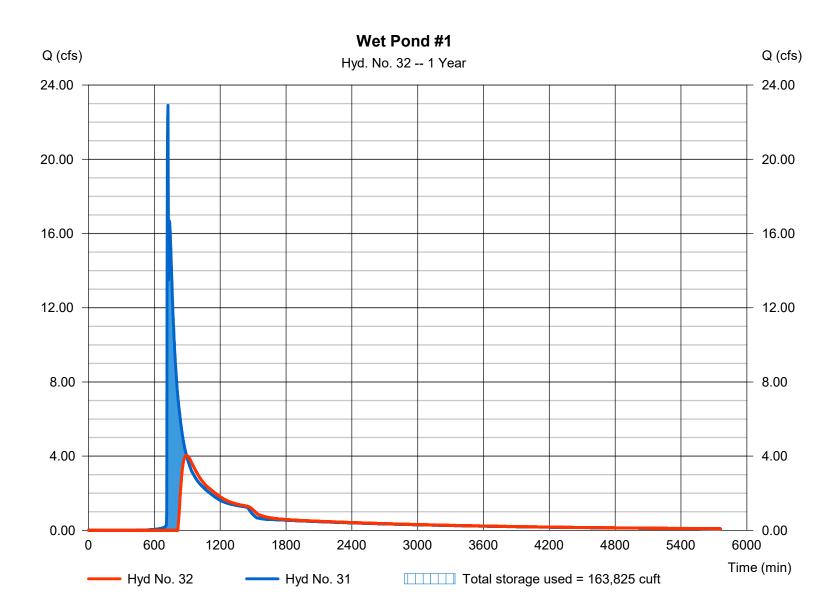
Tuesday, 10 / 1 / 2019

## Hyd. No. 32

Wet Pond #1

Hydrograph type Peak discharge = 4.034 cfs= Reservoir Storm frequency = 1 yrsTime to peak = 892 min Time interval = 2 min Hyd. volume = 162,497 cuft = 31 - A1 + A2 + A3Max. Elevation Inflow hyd. No. = 402.28 ft= Wet Pond #1 Reservoir name Max. Storage = 163,825 cuft

Storage Indication method used. Wet pond routing start elevation = 400.00 ft.



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Tuesday, 10 / 1 / 2019

#### Pond No. 9 - Wet Pond #1

#### **Pond Data**

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 397.50 ft

#### Stage / Storage Table

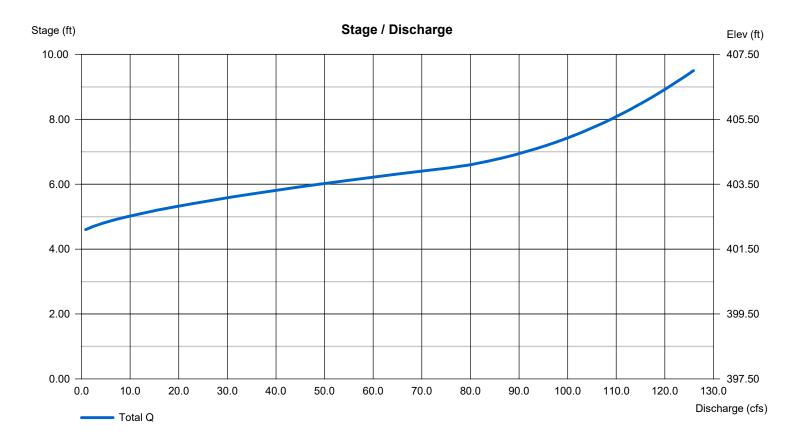
Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	397.50	23,939	0	0
2.50	400.00	34,930	73,148	73,148
3.00	400.50	37,790	18,174	91,321
3.50	401.00	39,299	19,269	110,590
4.00	401.50	40,822	20,027	130,617
4.50	402.00	42,360	20,792	151,410
5.50	403.00	45,477	43,905	195,314
6.50	404.00	48,650	47,050	242,364
7.50	405.00	51,880	50,251	292,616
8.50	406.00	55,206	53,529	346,145
9.50	407.00	57,712	56,449	402,593

#### Culvert / Orifice Structures

#### **Weir Structures**

	[A]	[B]	[C]	[PrfRsr]		[A]	[B]	[C]	[D]
Rise (in)	= 42.00	5.00	30.00	0.00	Crest Len (ft)	= 8.00	0.00	0.00	0.00
Span (in)	= 42.00	5.00	30.00	0.00	Crest El. (ft)	= 402.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0	Weir Coeff.	= 3.33	3.33	3.33	3.33
Invert El. (ft)	= 397.50	400.00	401.00	0.00	Weir Type	= Rect			
Length (ft)	= 0.00	0.00	0.00	0.00	Multi-Stage	= Yes	No	No	No
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	Exfil.(in/hr)	= 0.000 (by	Contour)		
Multi-Stage	= n/a	Yes	Yes	No	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).



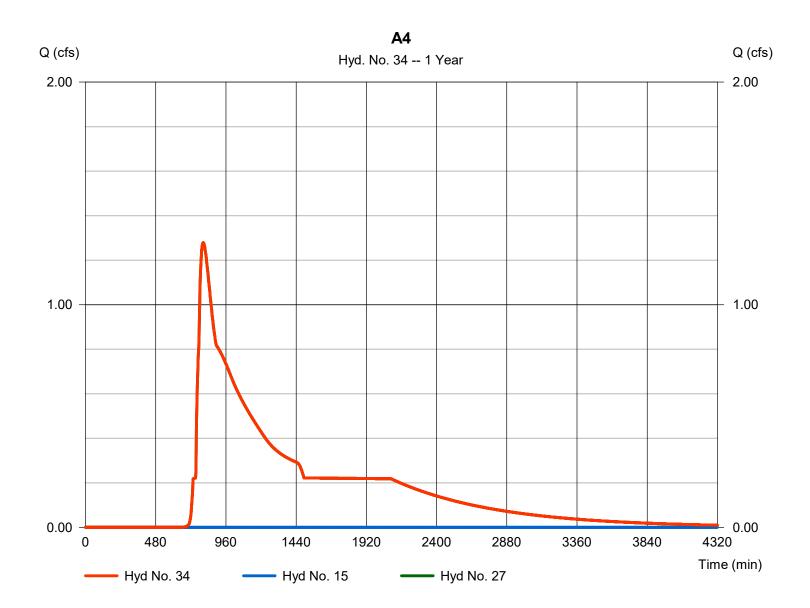
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 34

Α4

= 1.279 cfsHydrograph type = Combine Peak discharge Storm frequency = 1 yrsTime to peak = 804 min Time interval = 2 min Hyd. volume = 43,088 cuft Inflow hyds. = 15, 27 Contrib. drain. area = 0.000 ac



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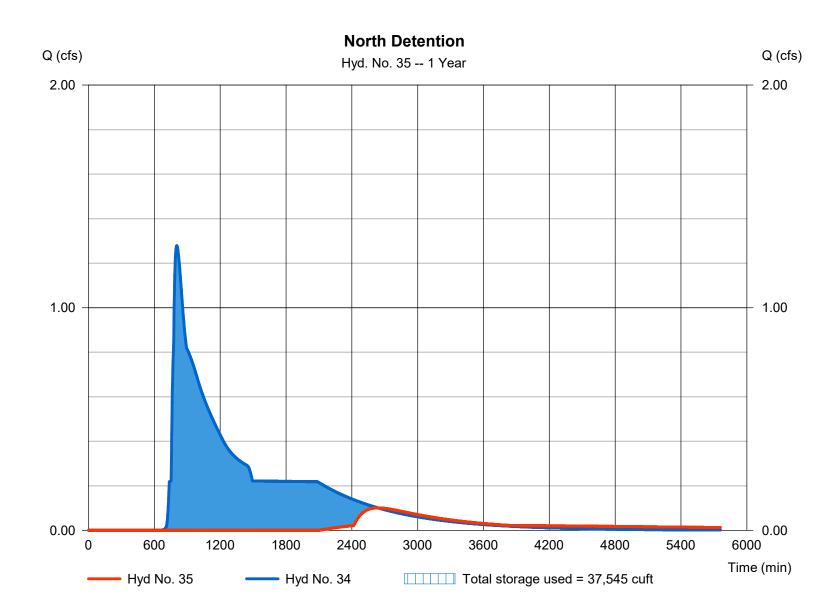
Tuesday, 10 / 1 / 2019

## Hyd. No. 35

**North Detention** 

Hydrograph type = Reservoir Peak discharge = 0.101 cfsStorm frequency = 1 yrsTime to peak = 2638 min Time interval = 2 min Hyd. volume = 7,320 cuftInflow hyd. No. = 34 - A4Max. Elevation = 402.83 ftReservoir name = Dry Detention #1 Max. Storage = 37,545 cuft

Storage Indication method used.



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Tuesday, 10 / 1 / 2019

#### Pond No. 7 - Dry Detention #1

#### **Pond Data**

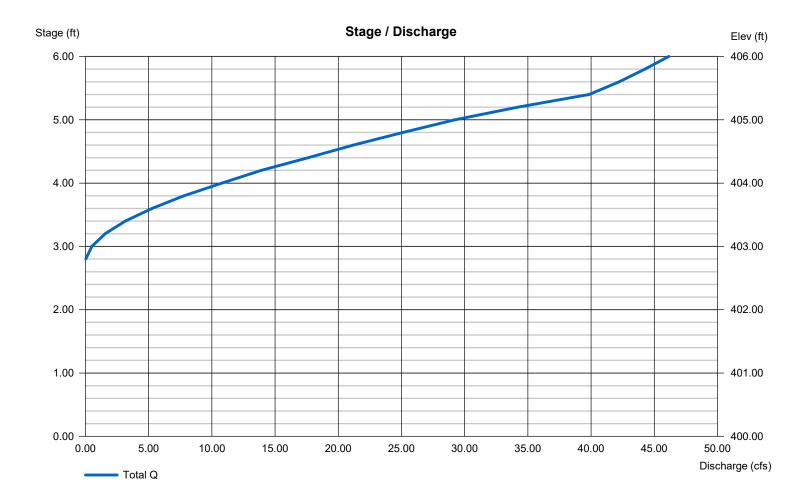
Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 400.00 ft

#### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	400.00	10,783	0	0
2.00	402.00	13,895	24,610	24,610
4.00	404.00	17,231	31,063	55,673
6.00	406.00	20,793	37,964	93,637

#### **Culvert / Orifice Structures Weir Structures** [A] [B] [C] [D] [A] [B] [C] [PrfRsr] Rise (in) = 30.004.50 36.00 0.00 Crest Len (ft) = 4.00 0.00 0.00 0.00 = 30.004.50 36.00 0.00 Crest El. (ft) = 405.00 0.00 0.00 0.00 Span (in) No. Barrels = 1 0 Weir Coeff. = 3.333.33 3.33 3.33 1 = 400.00 400.00 402.75 0.00 = Rect Invert El. (ft) Weir Type = 0.000.00 0.00 0.00 Multi-Stage Length (ft) = Yes No No No Slope (%) = 0.000.00 0.00 n/a N-Value = .013 .013 .013 n/a = 0.000 (by Wet area) = 0.600.60 0.60 0.60 Exfil.(in/hr) Orifice Coeff. Multi-Stage = n/aNo TW Elev. (ft) = 0.00Yes Yes

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



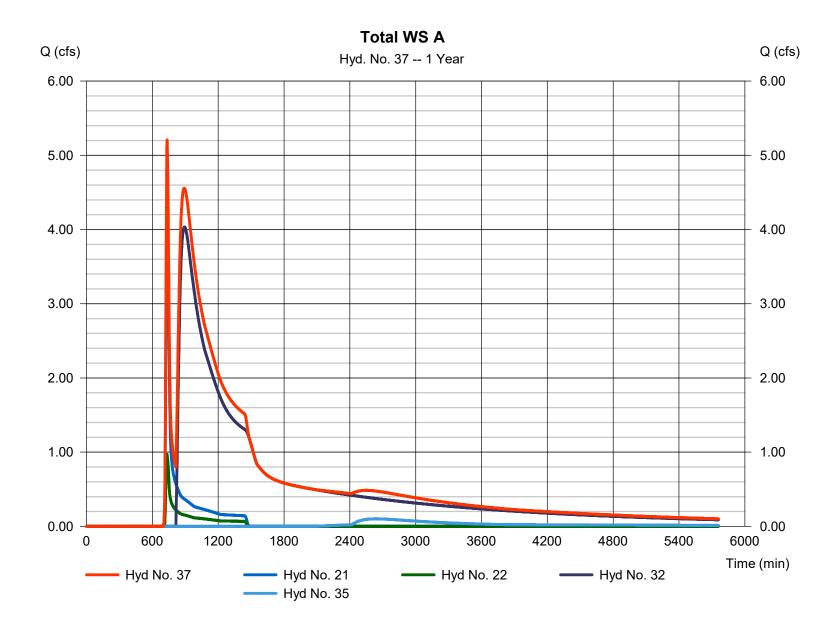
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Tuesday, 10 / 1 / 2019

## Hyd. No. 37

Total WS A

Hydrograph type = Combine Peak discharge = 5.208 cfsStorm frequency = 1 yrsTime to peak = 734 min Time interval = 2 min Hyd. volume = 195,975 cuft Inflow hyds. = 21, 22, 32, 35 Contrib. drain. area = 8.310 ac



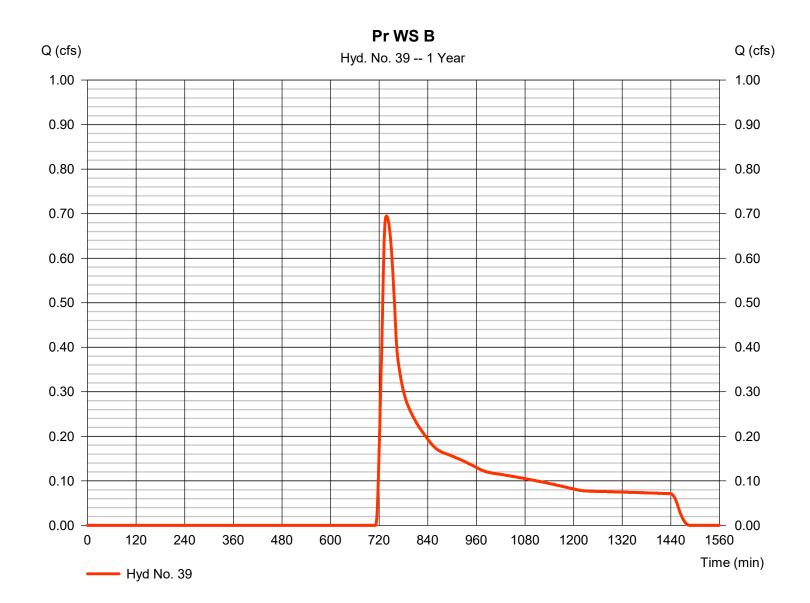
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 39

Pr WS B

Hydrograph type = SCS Runoff Peak discharge = 0.695 cfsStorm frequency = 1 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 6,448 cuft Drainage area Curve number = 9.900 ac= 67 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



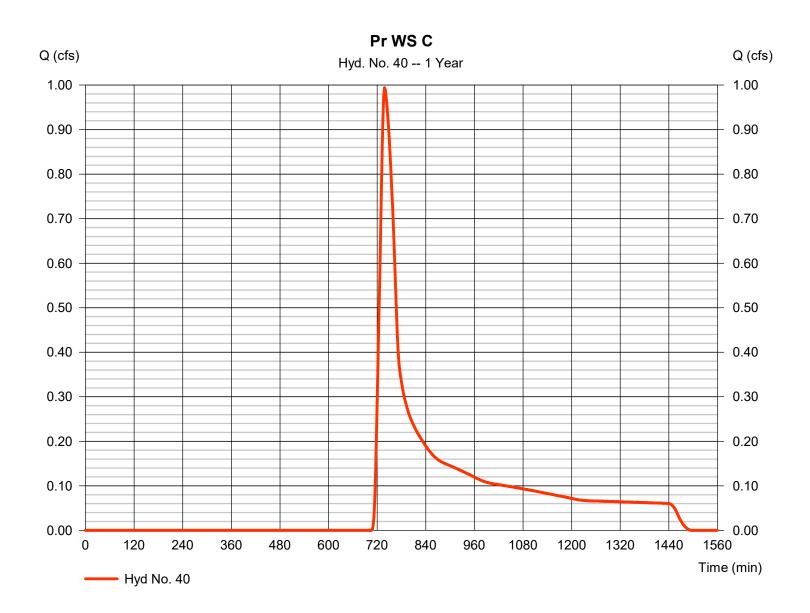
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 40

Pr WS C

Hydrograph type = SCS Runoff Peak discharge = 0.994 cfsStorm frequency = 1 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 6.819 cuft= 72 Drainage area = 6.320 acCurve number Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 34.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



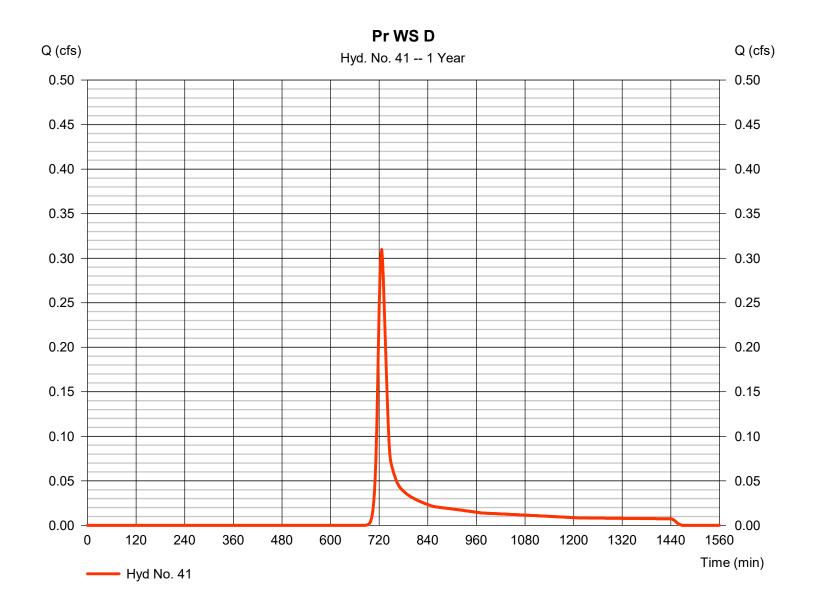
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

## Hyd. No. 41

Pr WS D

Hydrograph type = SCS Runoff Peak discharge = 0.310 cfsStorm frequency = 1 yrsTime to peak = 726 min Time interval = 2 min Hyd. volume = 1.067 cuftDrainage area Curve number = 0.550 ac= 79 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 20.00 min = User Total precip. = 2.02 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

lyd. 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	53.15	2	716	110,665				Pr WS A1
2	Diversion1	17.25	2	706	89,869	1			A1 to Bio #1
3	Diversion2	35.90	2	716	20,795	1			A1 to Detention
5	SCS Runoff	102.44	2	722	301,660				Pr WS A2
6	Diversion1	38.56	2	710	246,623	5			A2 to Bio #2
7	Diversion2	63.88	2	722	55,037	5			A2 to Detention
9	SCS Runoff	37.08	2	718	86,793				Pr WS A3
10	Diversion1	21.66	2	712	79,445	9			A3 to Bio #3
11	Diversion2	15.42	2	718	7,348	9			A3 to Detention
13	SCS Runoff	23.15	2	736	105,486				Pr WS A4
14	Diversion1	17.25	2	726	100,248	13			A4 to Bio #4
15	Diversion2	5.904	2	736	5,239	13			A4 to Detention
17	SCS Runoff	7.094	2	732	29,231				Pr WS A5
18	Reach	7.104	2	732	29,229	17			PR Reach A5
19	SCS Runoff	6.950	2	730	26,118				Pr WS A6
20	Combine	13.84	2	730	55,347	18, 19			Combine
21	Reach	13.85	2	732	55,347	20			PR Reach A6
22	SCS Runoff	6.203	2	730	25,698				Pr WS A7
24	Reservoir	11.87	2	724	87,518	2	406.12	31,882	Bio A1
25	Reservoir	25.88	2	738	237,292	6	402.14	94,192	Bio A2
26	Reservoir	8.284	2	730	78,332	10	409.28	36,736	Bio A3
27	Reservoir	13.01	2	756	100,187	14	403.64	34,206	Bio A4
29	Combine	102.56	2	718	83,181	3, 7, 11,			A1+A2+A3 Bypass
30	Combine	43.65	2	732	403,142	24, 25, 26,			A1+A2+A3 thru Bioretention
31	Combine	129.84	2	720	486,323	29, 30			A1 + A2 + A3
32	Reservoir	35.25	2	750	407,589	31	403.21	204,971	Wet Pond #1
34	Combine	13.01	2	756	105,426	15, 27,			A4
35	Reservoir	2.367	2	854	69,606	34	403.30	44,842	North Detention
37	Combine	49.64	2	738	558,240	21, 22, 32, 35,			Total WS A
	posed Hydro	graphe gr	)M/		Raturn 5	eriod: 10 Y	/ear	Tuesday	     10 / 1 / 2019

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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
39	SCS Runoff	5.777	2	732	27,569				Pr WS B
40	SCS Runoff	4.705	2	736	23,226				Pr WS C
Pro	posed Hydro	graphs.g	ow	1	Return F	Period: 10 Y	′ear	Tuesday, 1	0 / 1 / 2019

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

= 3.35 in

= 24 hrs

Tuesday, 10 / 1 / 2019

= Type II

= 484

#### Hyd. No. 1

Total precip.

Storm duration

Pr WS A1

Hydrograph type = SCS Runoff Peak discharge = 53.15 cfsStorm frequency = 10 yrsTime to peak = 716 min Time interval = 2 min Hyd. volume = 110,665 cuft Drainage area Curve number = 14.090 ac= 90 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc)  $= 6.00 \, \text{min}$ = User

Distribution

Shape factor

Pr WS A1 Q (cfs) Q (cfs) Hyd. No. 1 -- 10 Year 60.00 60.00 50.00 -50.00 40.00 40.00 30.00 30.00 20.00 20.00 10.00 10.00 0.00 0.00 120 240 360 480 600 720 840 960 1080 1200 1320 Time (min) Hyd No. 1

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

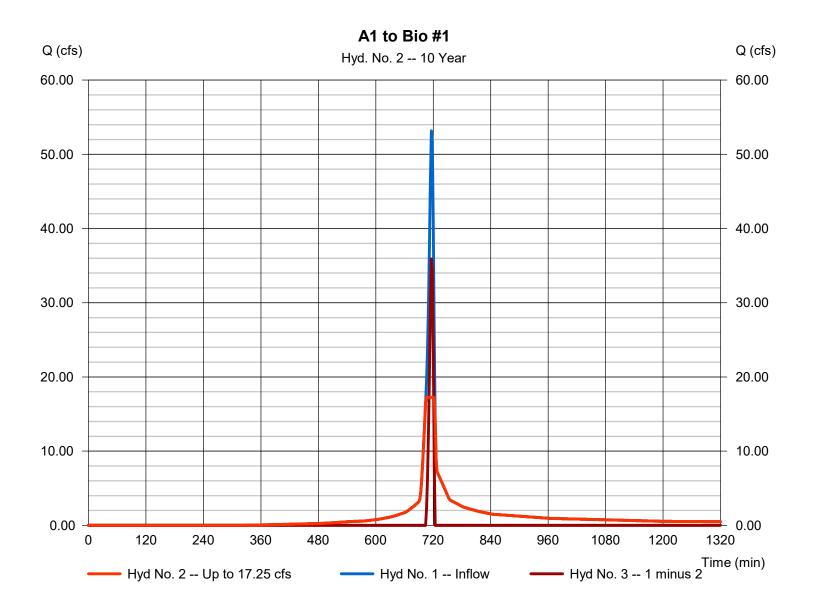
#### Hyd. No. 2

A1 to Bio #1

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 10 yrsTime to peak= 706 minTime interval= 2 minHyd. volume= 89,869 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 3

Diversion method = Constant Q Constant Q = 17.25 cfs



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Tuesday, 10 / 1 / 2019

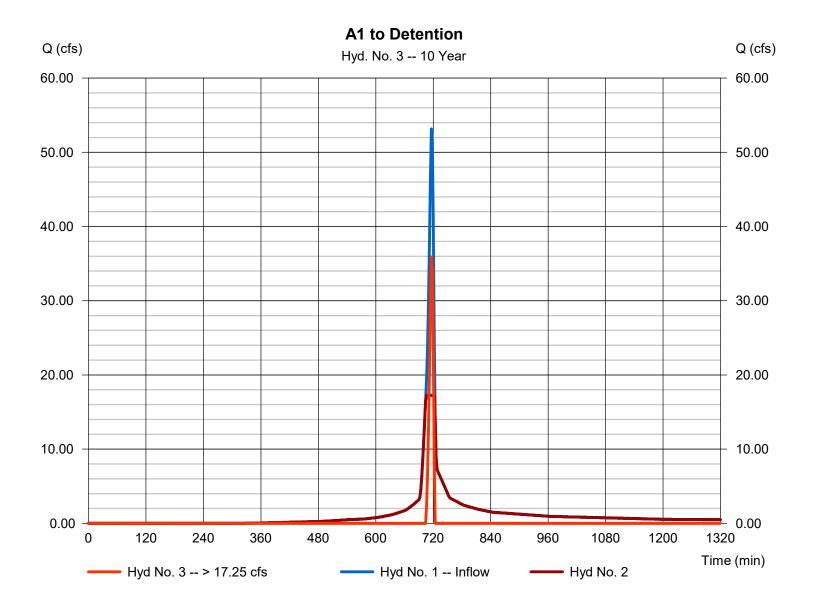
## Hyd. No. 3

A1 to Detention

Hydrograph type= Diversion2Peak discharge= 35.90 cfsStorm frequency= 10 yrsTime to peak= 716 minTime interval= 2 minHyd. volume= 20,795 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 2

Diversion method = Constant Q Constant Q = 17.25 cfs



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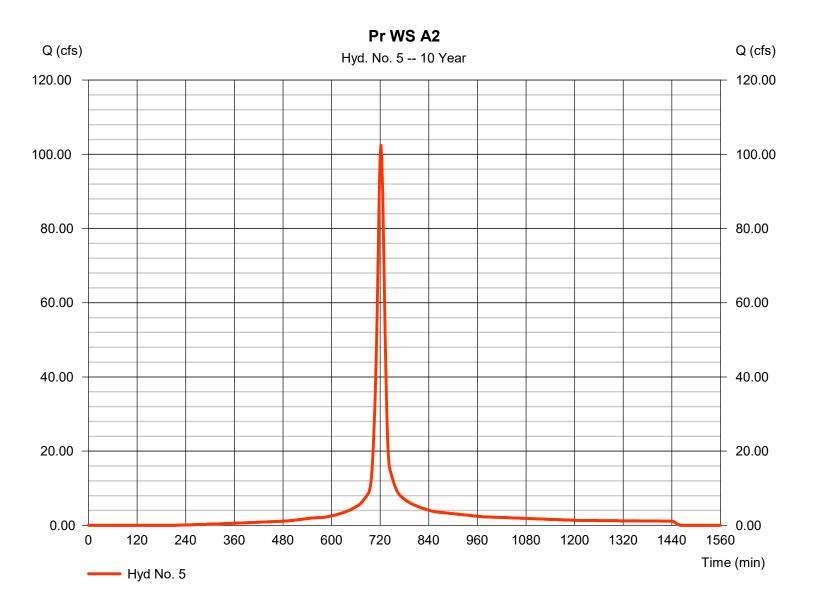
Tuesday, 10 / 1 / 2019

#### Hyd. No. 5

Pr WS A2

Hydrograph type = SCS Runoff Peak discharge = 102.44 cfsStorm frequency = 10 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 301,660 cuft Drainage area Curve number = 31.690 ac= 94 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 15.00 min = User

Total precip. = 3.35 in Distribution = Type II
Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

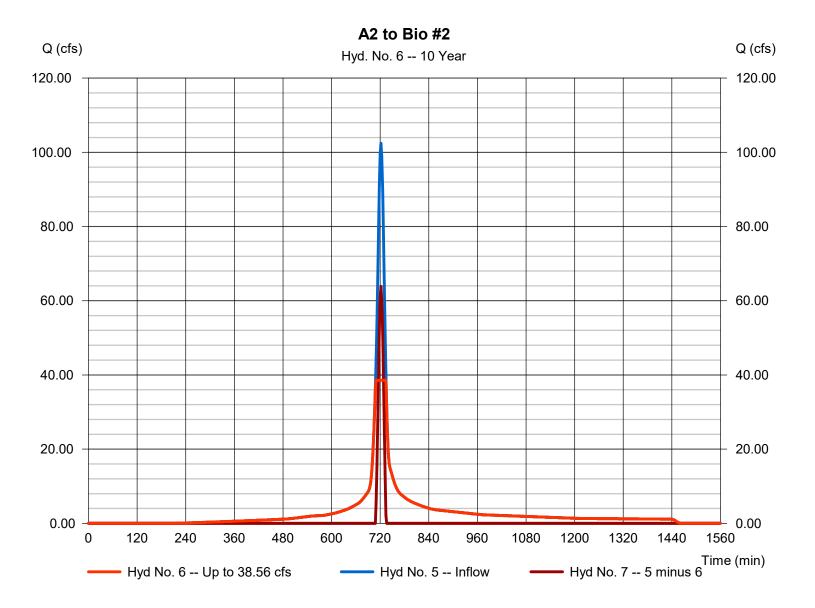
#### Hyd. No. 6

A2 to Bio #2

Hydrograph type= Diversion1Peak discharge= 38.56 cfsStorm frequency= 10 yrsTime to peak= 710 minTime interval= 2 minHyd. volume= 246,623 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 7

Diversion method = Constant Q Constant Q = 38.56 cfs



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Tuesday, 10 / 1 / 2019

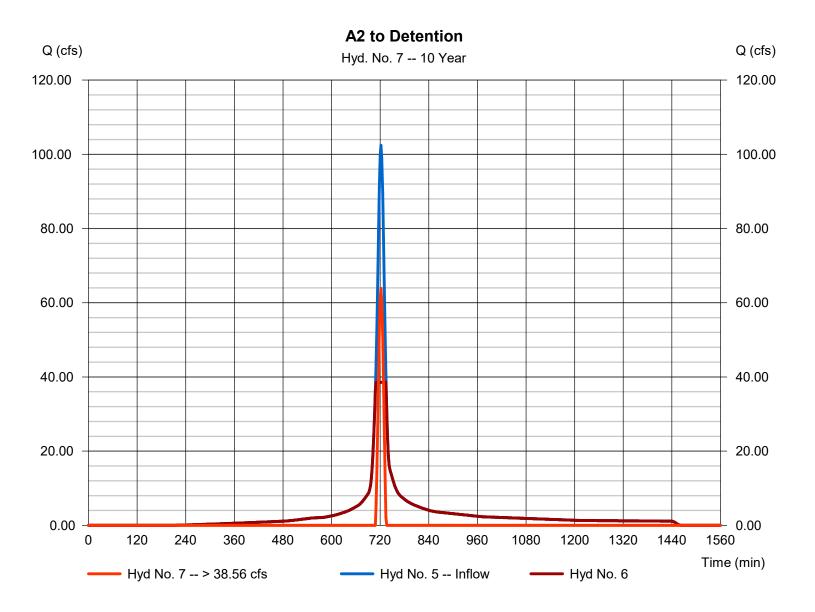
## Hyd. No. 7

A2 to Detention

Hydrograph type= Diversion2Peak discharge= 63.88 cfsStorm frequency= 10 yrsTime to peak= 722 minTime interval= 2 minHyd. volume= 55,037 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 6

Diversion method = Constant Q Constant Q = 38.56 cfs



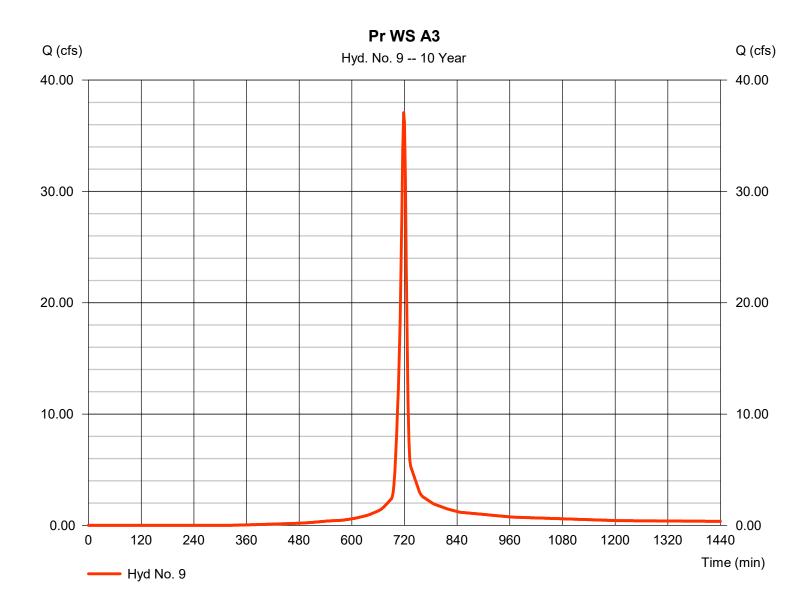
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

### Hyd. No. 9

Pr WS A3

Hydrograph type = SCS Runoff Peak discharge = 37.08 cfsStorm frequency = 10 yrsTime to peak = 718 min Time interval = 2 min Hyd. volume = 86,793 cuft Drainage area = 10.360 acCurve number = 90 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc)  $= 7.00 \, \text{min}$ = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

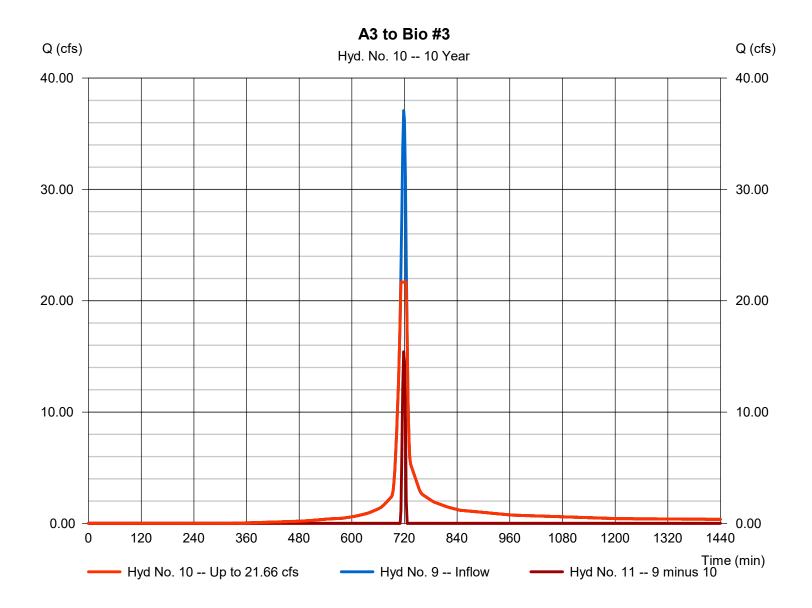
### Hyd. No. 10

A3 to Bio #3

Hydrograph type= Diversion1Peak discharge= 21.66 cfsStorm frequency= 10 yrsTime to peak= 712 minTime interval= 2 minHyd. volume= 79,445 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 11

Diversion method = Constant Q Constant Q = 21.66 cfs



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Tuesday, 10 / 1 / 2019

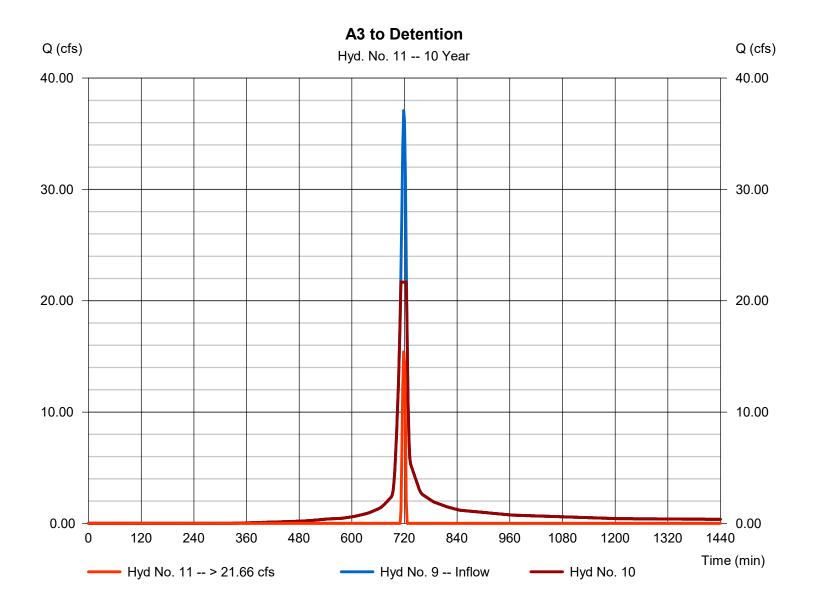
## Hyd. No. 11

A3 to Detention

Hydrograph type= Diversion2Peak discharge= 15.42 cfsStorm frequency= 10 yrsTime to peak= 718 minTime interval= 2 minHyd. volume= 7,348 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 10

Diversion method = Constant Q Constant Q = 21.66 cfs



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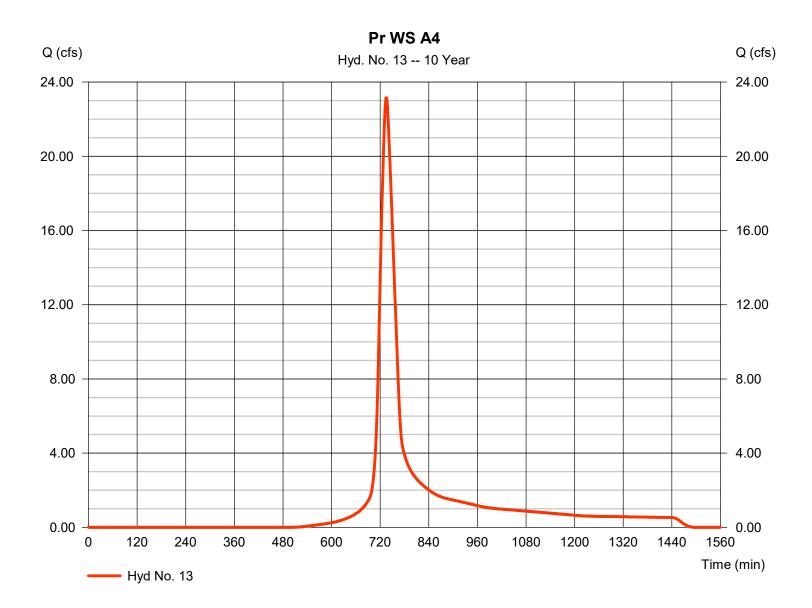
Tuesday, 10 / 1 / 2019

## Hyd. No. 13

Pr WS A4

Hydrograph type = SCS Runoff Peak discharge = 23.15 cfsStorm frequency = 10 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 105,486 cuft Drainage area Curve number = 16.960 ac= 83

Tc method = User Time of conc. (Tc) = 36.00 min
Total precip. = 3.35 in Distribution = Type II
Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

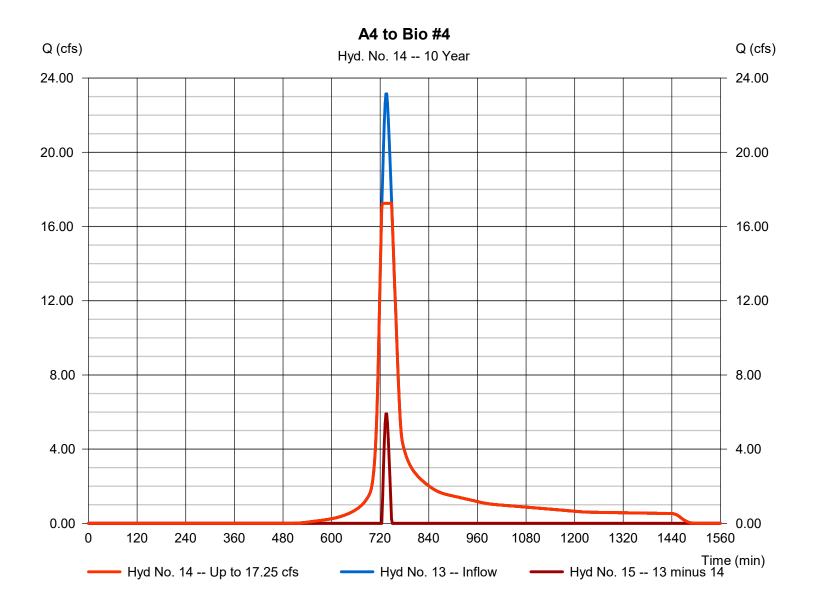
### Hyd. No. 14

A4 to Bio #4

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 10 yrsTime to peak= 726 minTime interval= 2 minHyd. volume= 100,248 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 15

Diversion method = Constant Q Constant Q = 17.25 cfs



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Tuesday, 10 / 1 / 2019

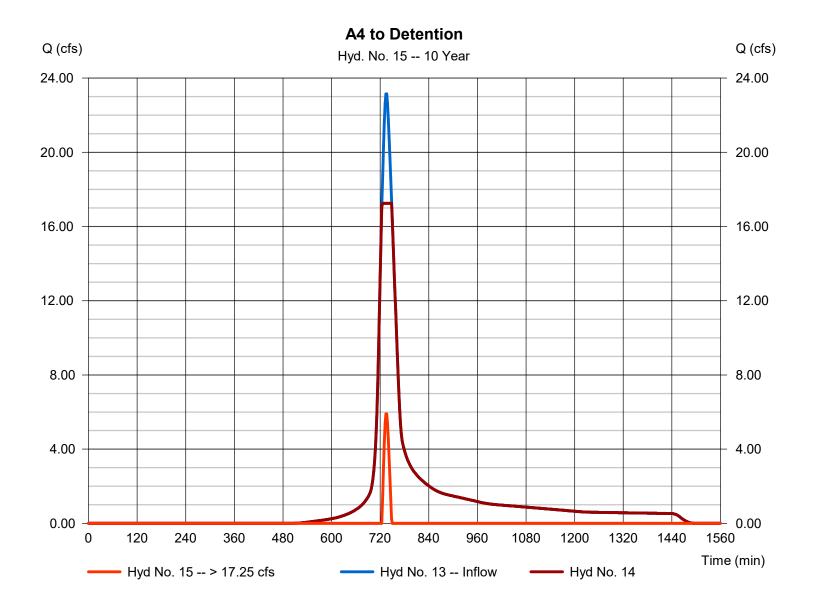
## Hyd. No. 15

A4 to Detention

Hydrograph type= Diversion2Peak discharge= 5.904 cfsStorm frequency= 10 yrsTime to peak= 736 minTime interval= 2 minHyd. volume= 5,239 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 14

Diversion method = Constant Q Constant Q = 17.25 cfs



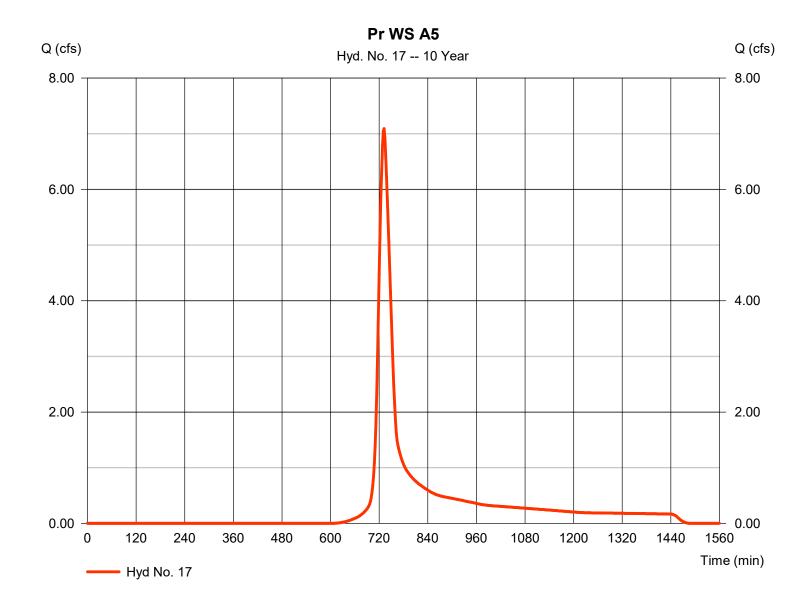
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Tuesday, 10 / 1 / 2019

### Hyd. No. 17

Pr WS A5

Hydrograph type = SCS Runoff Peak discharge = 7.094 cfsStorm frequency = 10 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 29,231 cuft Drainage area Curve number = 6.100 ac= 77 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 30.00 \, \text{min}$ = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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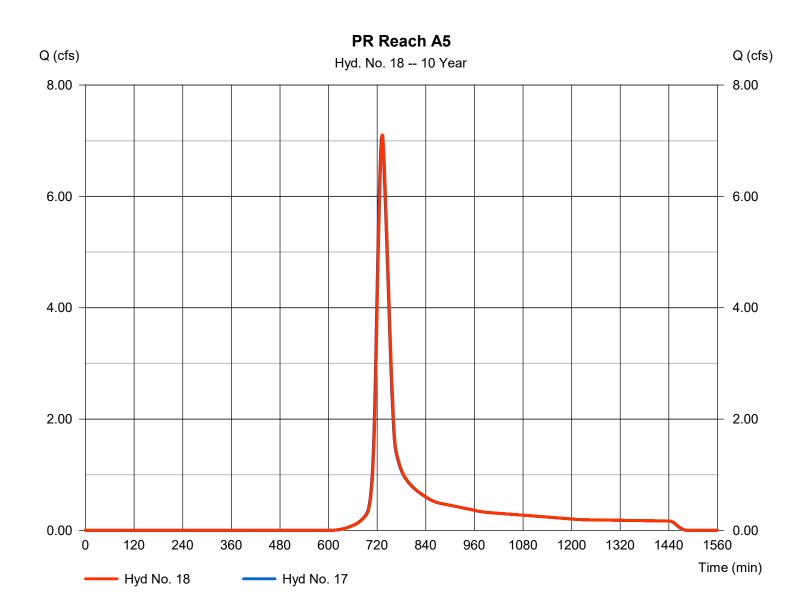
Tuesday, 10 / 1 / 2019

### Hyd. No. 18

PR Reach A5

Peak discharge Hydrograph type = Reach = 7.104 cfsStorm frequency = 10 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 29.229 cuft Inflow hyd. No. = 17 - Pr WS A5 Section type = Trapezoidal Reach length = 101.0 ftChannel slope = 1.6 % Manning's n = 0.025Bottom width  $= 12.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 1.0 ftRating curve x = 1.437Rating curve m = 1.425Ave. velocity = 2.31 ft/sRouting coeff. = 1.3238

Modified Att-Kin routing method used.



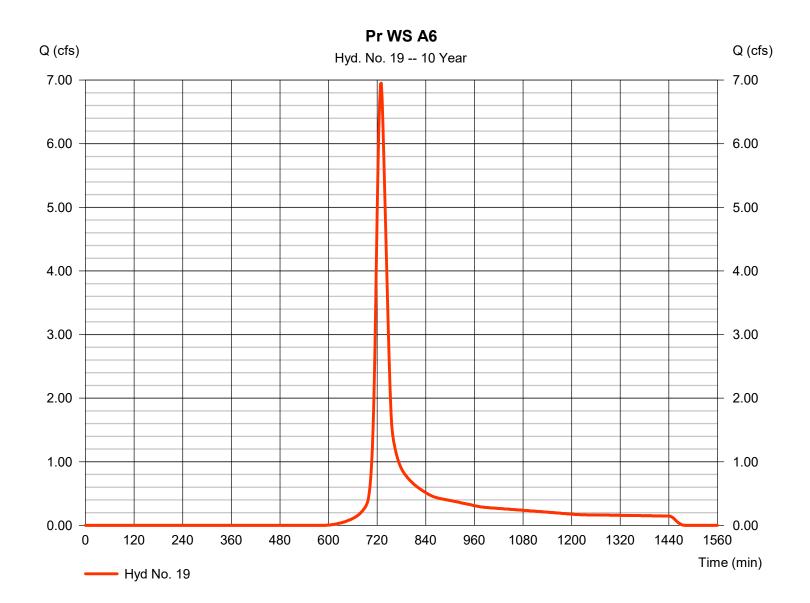
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Tuesday, 10 / 1 / 2019

## Hyd. No. 19

Pr WS A6

Hydrograph type = SCS Runoff Peak discharge = 6.950 cfsStorm frequency = 10 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 26,118 cuft Drainage area = 5.280 acCurve number = 78 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 24.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



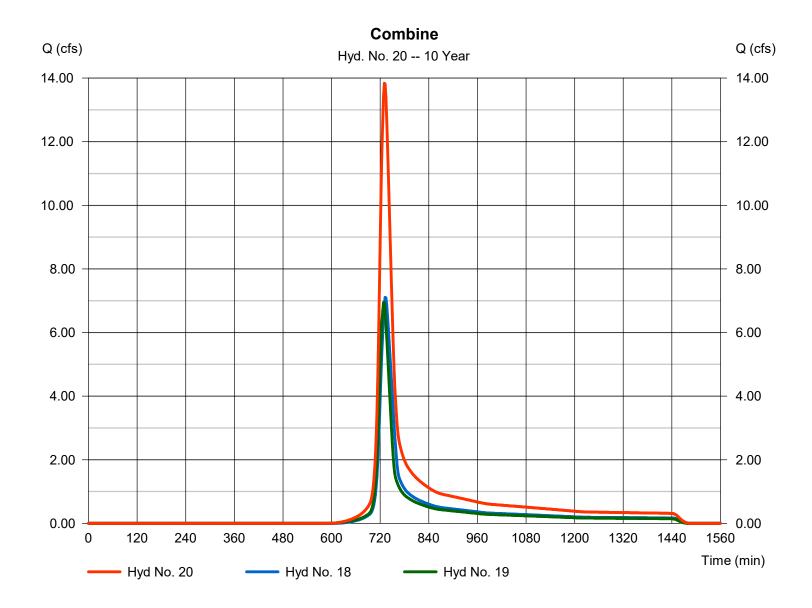
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Tuesday, 10 / 1 / 2019

## Hyd. No. 20

Combine

Hydrograph type = Combine Peak discharge = 13.84 cfsStorm frequency Time to peak = 10 yrs= 730 min Time interval = 2 min Hyd. volume = 55,347 cuft Inflow hyds. = 18, 19 Contrib. drain. area = 5.280 ac



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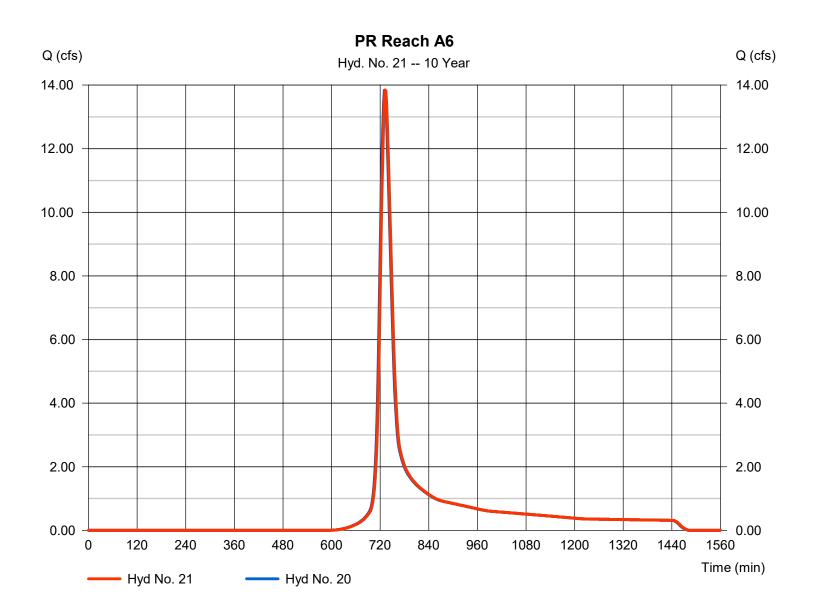
Tuesday, 10 / 1 / 2019

### Hyd. No. 21

PR Reach A6

Hydrograph type Peak discharge = 13.85 cfs= Reach Storm frequency = 10 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 55.347 cuft Section type Inflow hyd. No. = 20 - Combine = Trapezoidal Channel slope Reach length = 413.0 ft= 3.8 % Bottom width = 6.0 ftManning's n = 0.025Side slope Max. depth = 5.0 ft= 2.0:1Rating curve x = 3.540Rating curve m = 1.395Ave. velocity = 5.21 ft/sRouting coeff. = 1.0270

Modified Att-Kin routing method used.



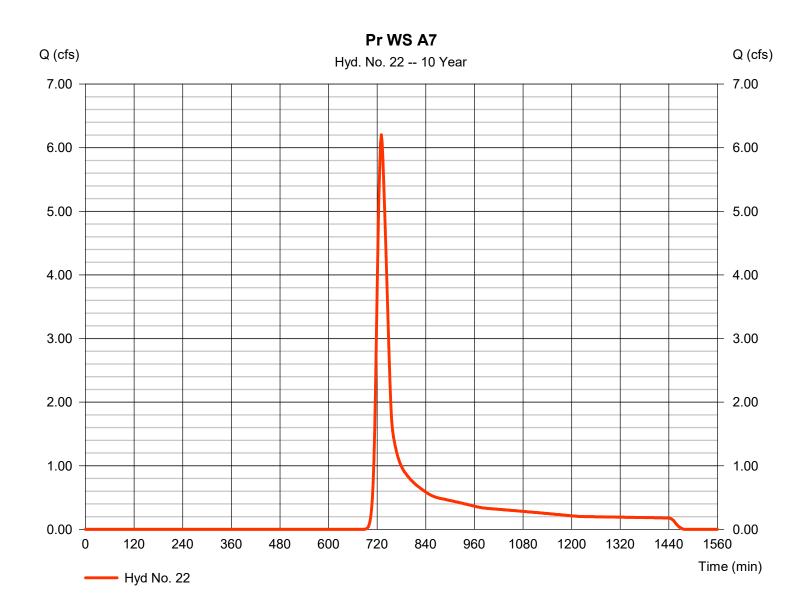
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Tuesday, 10 / 1 / 2019

### Hyd. No. 22

Pr WS A7

Hydrograph type = SCS Runoff Peak discharge = 6.203 cfsStorm frequency = 10 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 25.698 cuft Drainage area Curve number = 8.310 ac= 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 26.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



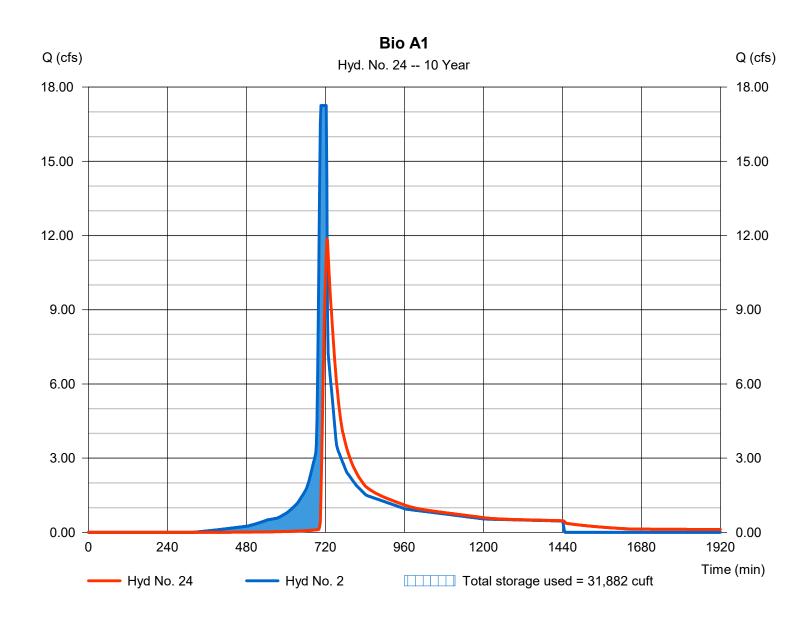
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Tuesday, 10 / 1 / 2019

### Hyd. No. 24

Bio A1

Hydrograph type = Reservoir Peak discharge = 11.87 cfsStorm frequency = 10 yrsTime to peak = 724 min Time interval = 2 min Hyd. volume = 87,518 cuft Inflow hyd. No. Max. Elevation = 406.12 ft= 2 - A1 to Bio #1 Reservoir name = Bio A1 (south) Max. Storage = 31,882 cuft



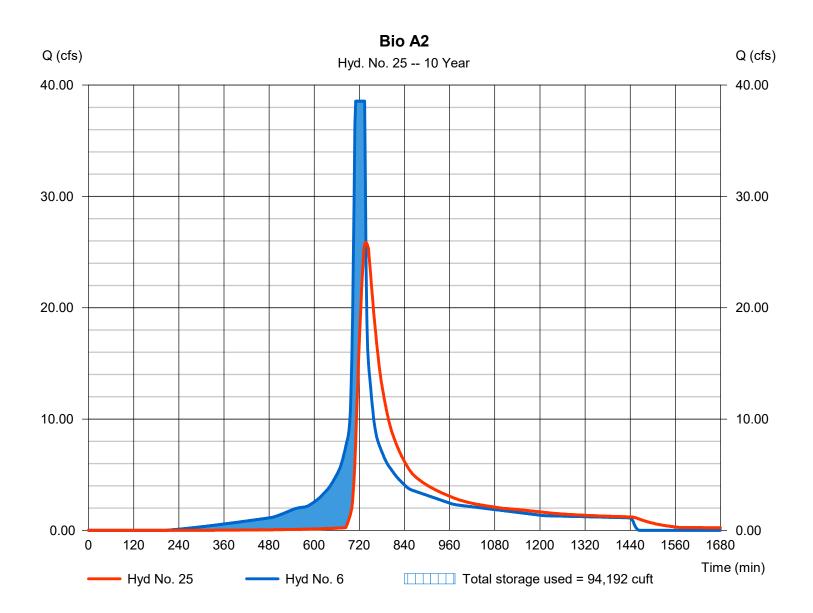
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Tuesday, 10 / 1 / 2019

### Hyd. No. 25

Bio A2

Hydrograph type Peak discharge = 25.88 cfs= Reservoir Storm frequency = 10 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 237,292 cuft Max. Elevation = 402.14 ftInflow hyd. No. = 6 - A2 to Bio #2 Reservoir name = Bio A2 (west) Max. Storage = 94,192 cuft



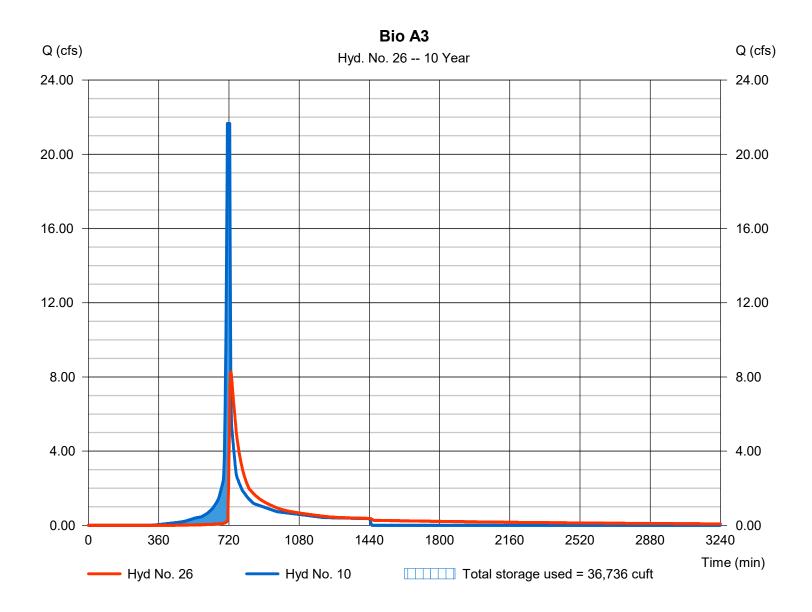
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Tuesday, 10 / 1 / 2019

### Hyd. No. 26

Bio A3

Hydrograph type = Reservoir Peak discharge = 8.284 cfsStorm frequency = 10 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 78,332 cuft = 10 - A3 to Bio #3 Max. Elevation = 409.28 ftInflow hyd. No. Reservoir name = Bio A3 (east) Max. Storage = 36,736 cuft



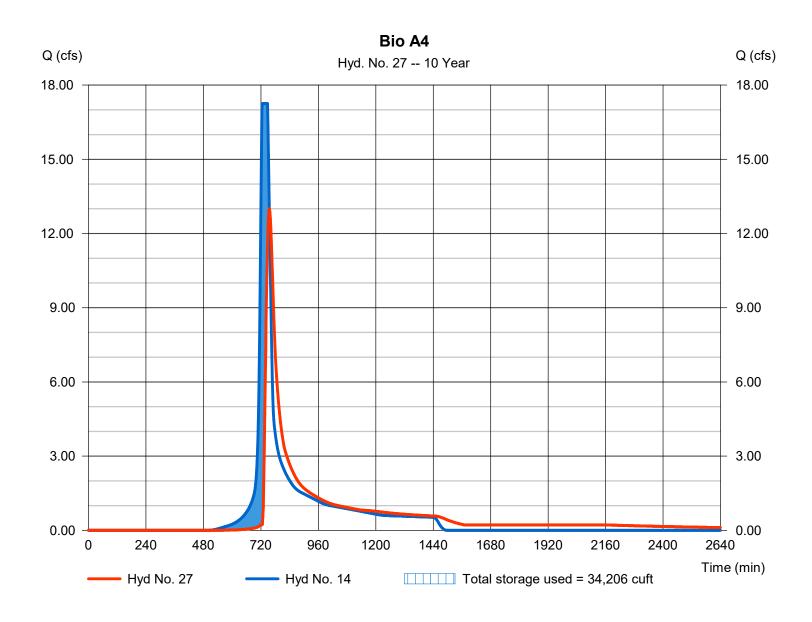
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Tuesday, 10 / 1 / 2019

## Hyd. No. 27

Bio A4

Hydrograph type Peak discharge = 13.01 cfs= Reservoir Storm frequency = 10 yrsTime to peak = 756 min Time interval = 2 min Hyd. volume = 100,187 cuft Max. Elevation = 403.64 ftInflow hyd. No. = 14 - A4 to Bio #4 Reservoir name = Bio A4 (north) Max. Storage = 34,206 cuft



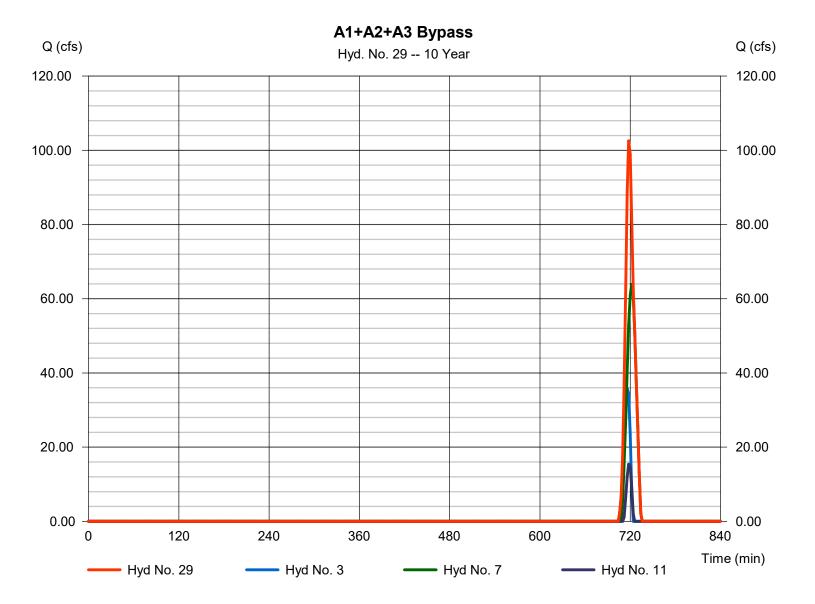
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Tuesday, 10 / 1 / 2019

### Hyd. No. 29

A1+A2+A3 Bypass

Hydrograph type = Combine Peak discharge = 102.56 cfsStorm frequency Time to peak = 10 yrs= 718 min Time interval = 2 min Hyd. volume = 83,181 cuft Inflow hyds. = 3, 7, 11Contrib. drain. area = 0.000 ac



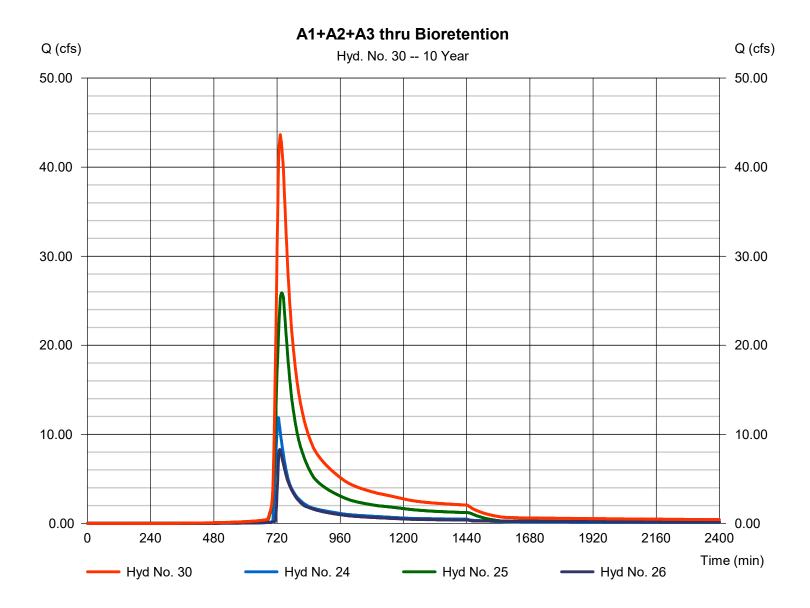
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Tuesday, 10 / 1 / 2019

### Hyd. No. 30

A1+A2+A3 thru Bioretention

Hydrograph type = Combine Peak discharge = 43.65 cfsStorm frequency Time to peak = 10 yrs= 732 min Time interval = 2 min Hyd. volume = 403,142 cuft Inflow hyds. = 24, 25, 26 Contrib. drain. area = 0.000 ac



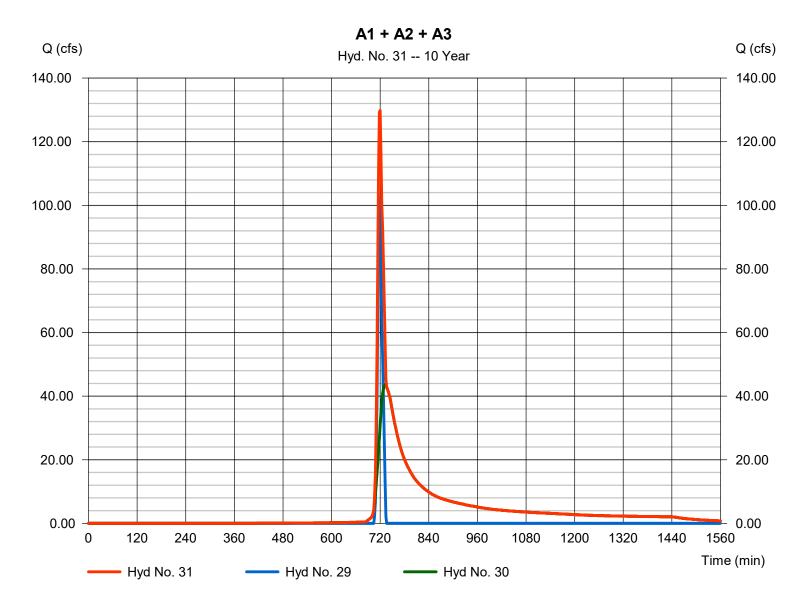
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Tuesday, 10 / 1 / 2019

### Hyd. No. 31

A1 + A2 + A3

Hydrograph type = Combine Peak discharge = 129.84 cfsStorm frequency Time to peak = 10 yrs= 720 min Time interval = 2 min Hyd. volume = 486,323 cuft Inflow hyds. = 29,30Contrib. drain. area = 0.000 ac



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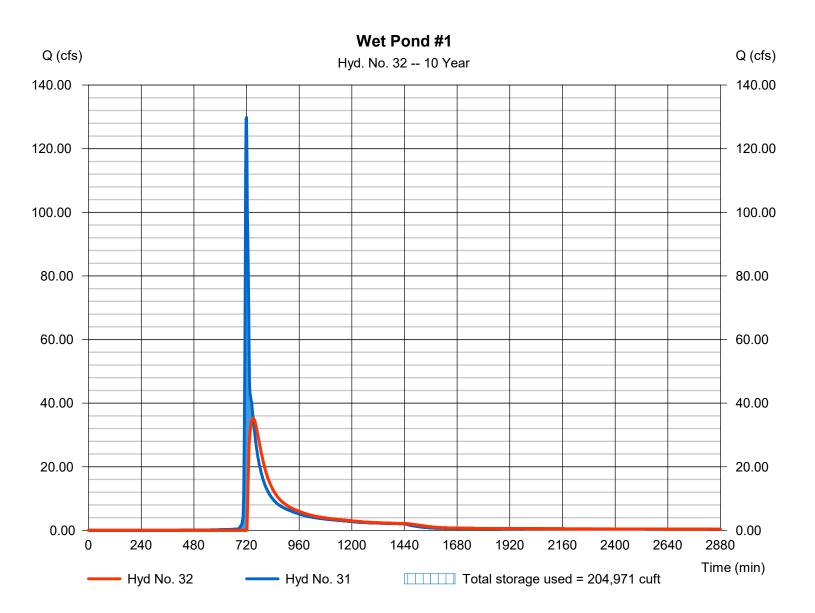
Tuesday, 10 / 1 / 2019

## Hyd. No. 32

Wet Pond #1

Hydrograph type Peak discharge = 35.25 cfs= Reservoir Storm frequency = 10 yrsTime to peak = 750 min Time interval = 2 min Hyd. volume = 407,589 cuft= 31 - A1 + A2 + A3Max. Elevation  $= 403.21 \, ft$ Inflow hyd. No. = Wet Pond #1 = 204,971 cuft Reservoir name Max. Storage

Storage Indication method used. Wet pond routing start elevation = 400.00 ft.



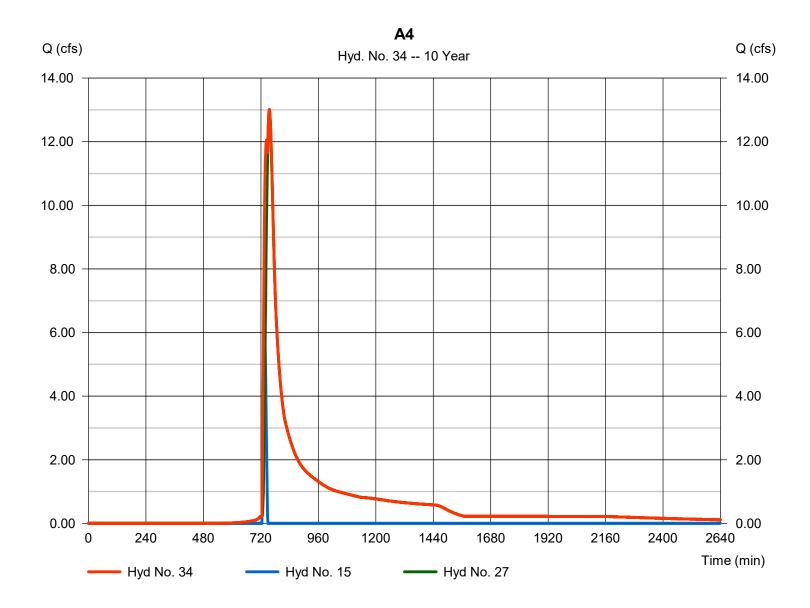
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Tuesday, 10 / 1 / 2019

### Hyd. No. 34

Α4

Hydrograph type = Combine Peak discharge = 13.01 cfsStorm frequency Time to peak = 10 yrs= 756 min Time interval = 2 min Hyd. volume = 105,426 cuft Inflow hyds. = 15, 27 Contrib. drain. area = 0.000 ac



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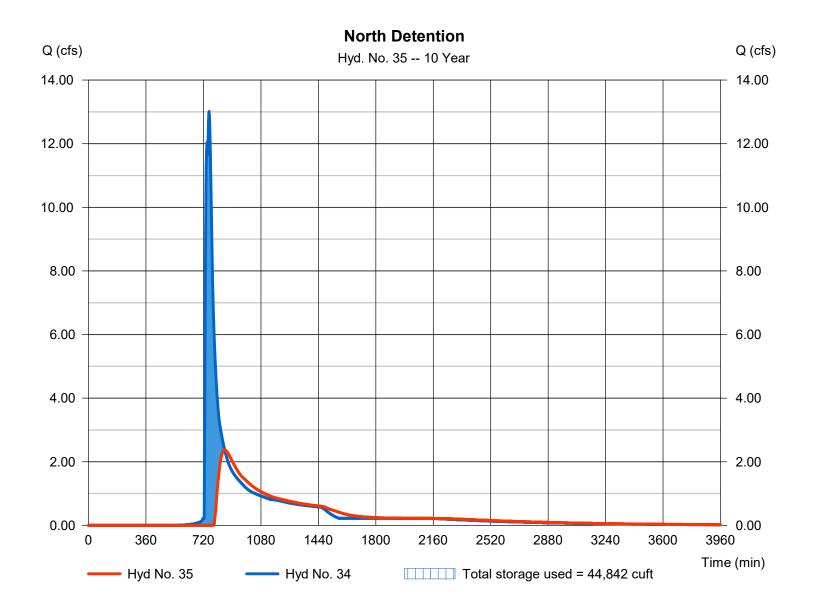
Tuesday, 10 / 1 / 2019

## Hyd. No. 35

North Detention

Hydrograph type Peak discharge = 2.367 cfs= Reservoir Storm frequency = 10 yrsTime to peak = 854 min Time interval = 2 min Hyd. volume = 69,606 cuft Inflow hyd. No. Max. Elevation = 403.30 ft= 34 - A4Reservoir name = Dry Detention #1 Max. Storage = 44,842 cuft

Storage Indication method used.



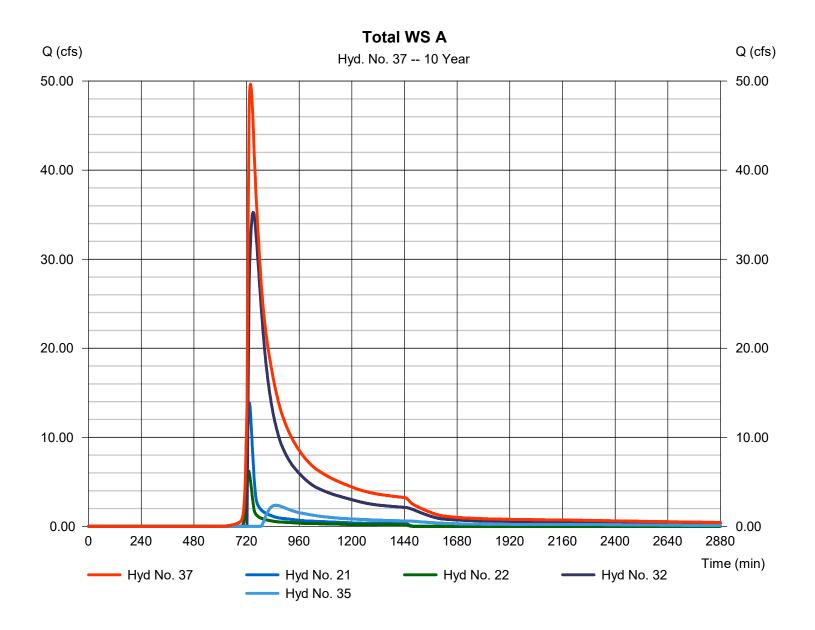
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Tuesday, 10 / 1 / 2019

## Hyd. No. 37

Total WS A

Hydrograph type = Combine Peak discharge = 49.64 cfsStorm frequency = 10 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 558,240 cuft Inflow hyds. = 21, 22, 32, 35 Contrib. drain. area = 8.310 ac



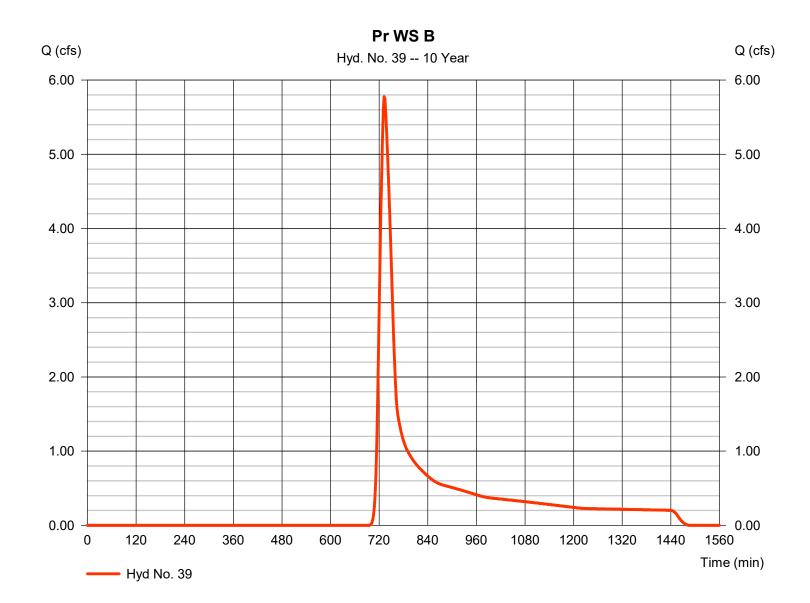
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Tuesday, 10 / 1 / 2019

## Hyd. No. 39

Pr WS B

Hydrograph type = SCS Runoff Peak discharge = 5.777 cfsStorm frequency = 10 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 27,569 cuftDrainage area Curve number = 9.900 ac= 67 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



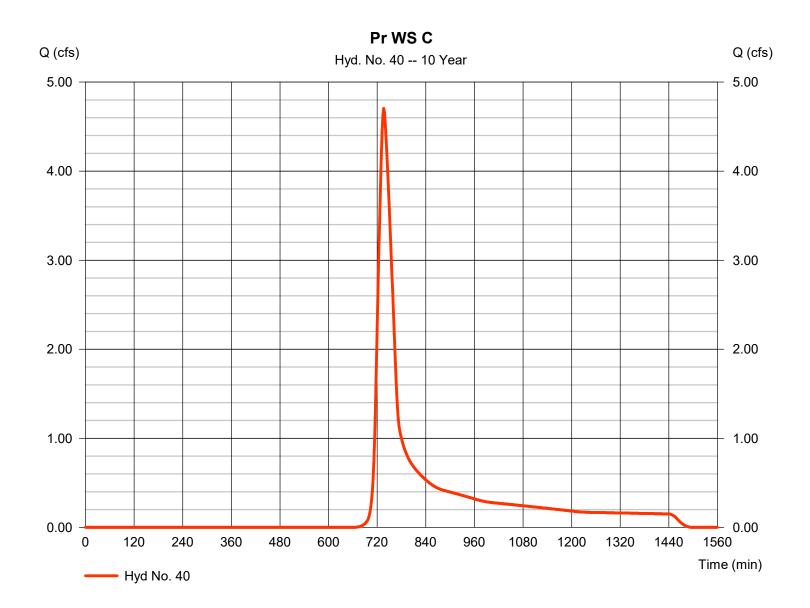
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Tuesday, 10 / 1 / 2019

### Hyd. No. 40

Pr WS C

Hydrograph type = SCS Runoff Peak discharge = 4.705 cfsStorm frequency = 10 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 23,226 cuft Drainage area Curve number = 6.320 ac= 72 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



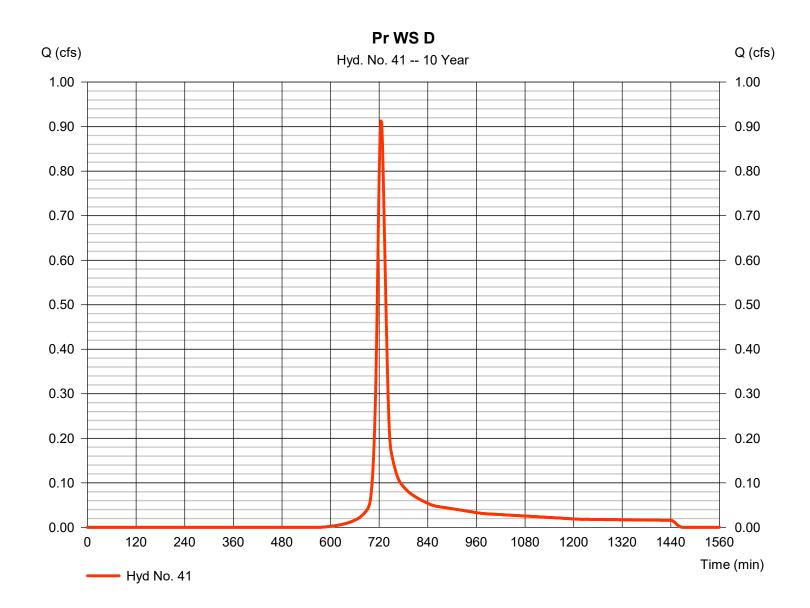
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Tuesday, 10 / 1 / 2019

### Hyd. No. 41

Pr WS D

Hydrograph type = SCS Runoff Peak discharge = 0.913 cfsStorm frequency = 10 yrsTime to peak = 724 min Time interval = 2 min Hyd. volume = 2.896 cuft Drainage area Curve number = 0.550 ac= 79 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 20.00 min = User Total precip. = 3.35 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

lyd. Io.	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	68.61	2	716	144,983				Pr WS A1
2	Diversion1	17.25	2	702	111,643	1			A1 to Bio #1
3	Diversion2	51.36	2	716	33,341	1			A1 to Detention
5	SCS Runoff	128.93	2	722	384,954				Pr WS A2
6	Diversion1	38.56	2	718	298,873	5			A2 to Bio #2
7	Diversion2	90.37	2	722	86,081	5			A2 to Detention
9	SCS Runoff	47.94	2	718	113,709				Pr WS A3
10	Diversion1	21.66	2	710	98,518	9			A3 to Bio #3
11	Diversion2	26.28	2	718	15,191	9			A3 to Detention
13	SCS Runoff	32.00	2	734	144,977				Pr WS A4
14	Diversion1	17.25	2	720	125,626	13			A4 to Bio #4
15	Diversion2	14.75	2	734	19,351	13			A4 to Detention
17	SCS Runoff	10.38	2	732	42,034				Pr WS A5
18	Reach	10.44	2	732	42,033	17			PR Reach A5
19	SCS Runoff	10.07	2	728	37,261				Pr WS A6
20	Combine	20.22	2	730	79,295	18, 19			Combine
21	Reach	20.25	2	732	79,295	20			PR Reach A6
22	SCS Runoff	10.20	2	730	39,750				Pr WS A7
24	Reservoir	14.45	2	724	109,284	2	406.17	33,870	Bio A1
25	Reservoir	27.14	2	738	289,487	6	402.21	100,396	Bio A2
26	Reservoir	12.43	2	728	97,397	10	409.37	41,129	Bio A3
27	Reservoir	15.62	2	758	125,564	14	403.69	36,229	Bio A4
29	Combine	152.20	2	718	134,613	3, 7, 11,			A1+A2+A3 Bypass
30	Combine	52.02	2	728	496,168	24, 25, 26,			A1+A2+A3 thru Bioretention
31	Combine	192.35	2	718	630,779	29, 30			A1 + A2 + A3
32	Reservoir	74.67	2	732	552,044	31	403.99	241,790	Wet Pond #1
34	Combine	24.24	2	738	144,915	15, 27,			A4
35	Reservoir	7.742	2	786	109,076	34	403.80	52,517	North Detention
37	Combine	104.84	2	732	780,165	21, 22, 32, 35,			Total WS A
Proposed Hydrographs.gpw				Return F	Return Period: 25 Year			Tuesday, 10 / 1 / 2019	

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

yd. o.	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	
		(6.6)	()	<b>(</b> )	(54.1)		(14)	(cuit)		
39	SCS Runoff	9.983	2	732	43,592				Pr WS B	
40	SCS Runoff	7.385	2	736	34,876				Pr WS C	
41	SCS Runoff	1.307	2 2	736	4,099				Pr WS D	
ro	posed Hydro	graphs.di	pw	•	Return F	Return Period: 25 Year			Tuesday, 10 / 1 / 2019	

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

= 24 hrs

Tuesday, 10 / 1 / 2019

= 484

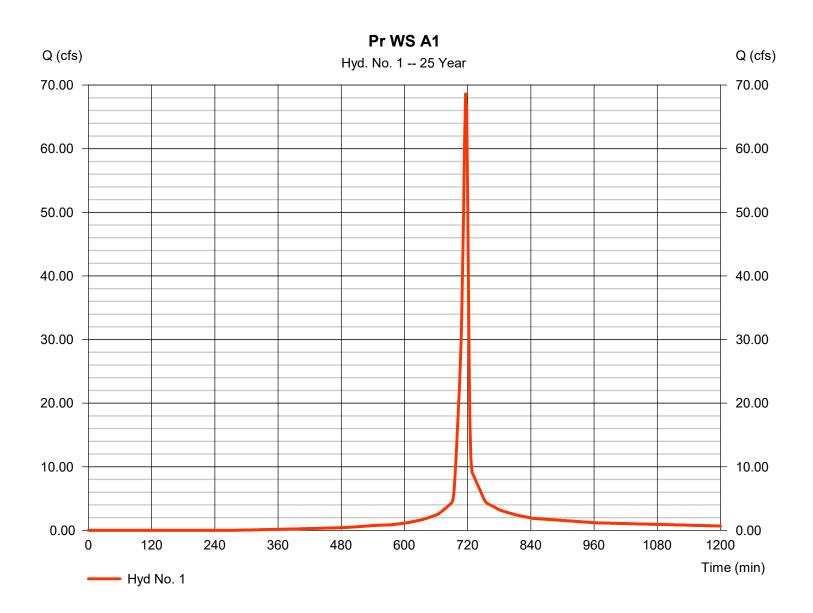
### Hyd. No. 1

Storm duration

Pr WS A1

Hydrograph type = SCS Runoff Peak discharge = 68.61 cfsStorm frequency Time to peak = 25 yrs = 716 min Time interval = 2 min Hyd. volume = 144,983 cuft Drainage area = 14.090 acCurve number = 90 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc)  $= 6.00 \, \text{min}$ = User Total precip. = 4.11 inDistribution = Type II

Shape factor



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Tuesday, 10 / 1 / 2019

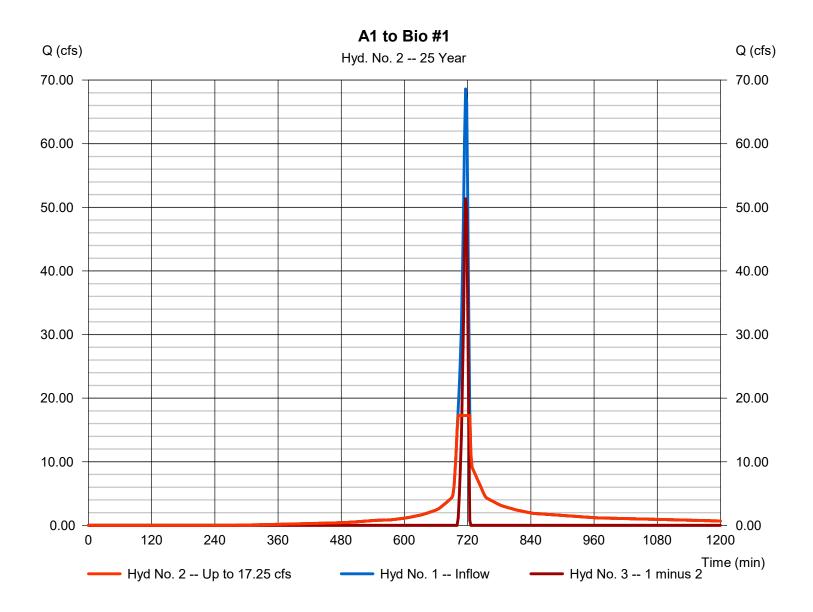
### Hyd. No. 2

A1 to Bio #1

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 25 yrsTime to peak= 702 minTime interval= 2 minHyd. volume= 111,643 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 3

Diversion method = Constant Q Constant Q = 17.25 cfs



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Tuesday, 10 / 1 / 2019

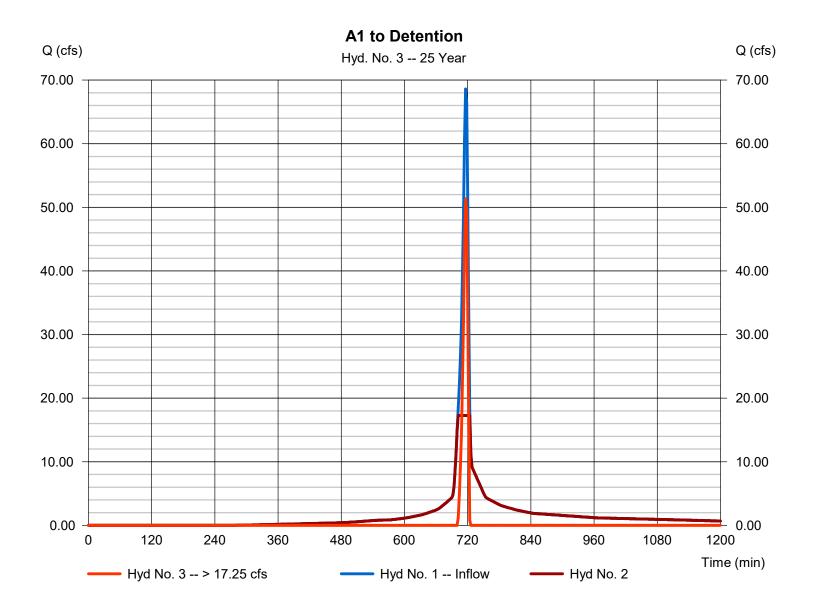
## Hyd. No. 3

A1 to Detention

Hydrograph type= Diversion2Peak discharge= 51.36 cfsStorm frequency= 25 yrsTime to peak= 716 minTime interval= 2 minHyd. volume= 33,341 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 2

Diversion method = Constant Q Constant Q = 17.25 cfs



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Tuesday, 10 / 1 / 2019

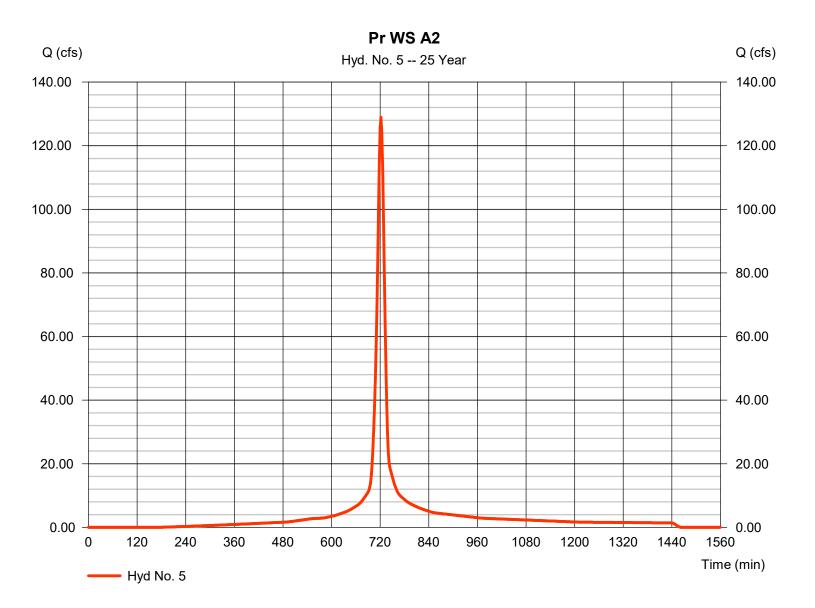
### Hyd. No. 5

Pr WS A2

Hydrograph type= SCS RunoffPeak discharge= 128.93 cfsStorm frequency= 25 yrsTime to peak= 722 minTime interval= 2 minHyd. volume= 384,954 cuft

Drainage area = 31.690 ac Curve number = 94 Basin Slope = 0.0 % Hydraulic length = 0 ft

Tc method = User Time of conc. (Tc) = 15.00 min
Total precip. = 4.11 in Distribution = Type II
Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

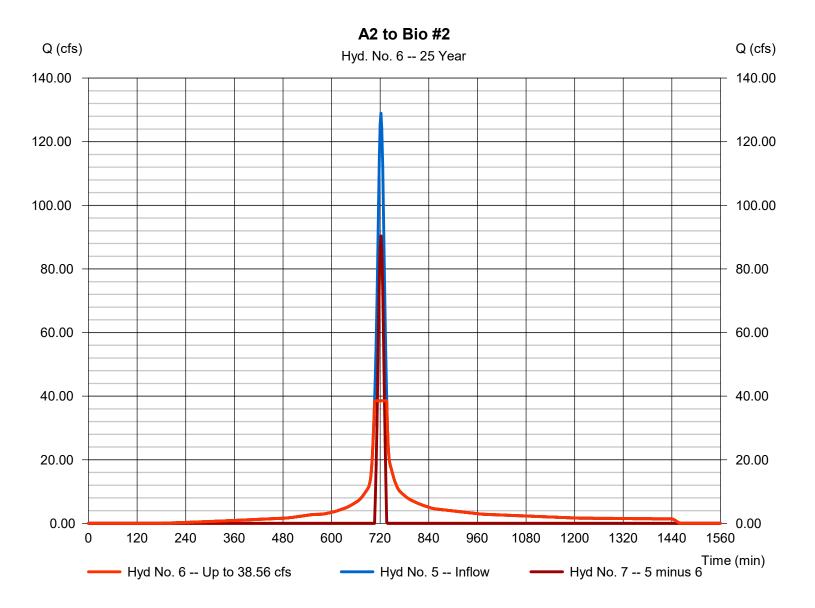
### Hyd. No. 6

A2 to Bio #2

Hydrograph type= Diversion1Peak discharge= 38.56 cfsStorm frequency= 25 yrsTime to peak= 718 minTime interval= 2 minHyd. volume= 298,873 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 7

Diversion method = Constant Q Constant Q = 38.56 cfs



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Tuesday, 10 / 1 / 2019

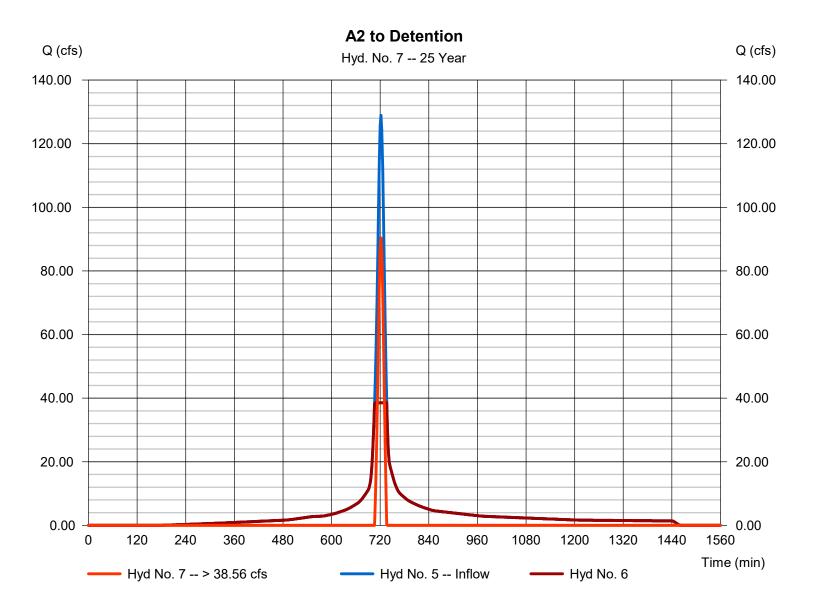
### Hyd. No. 7

A2 to Detention

Hydrograph type= Diversion2Peak discharge= 90.37 cfsStorm frequency= 25 yrsTime to peak= 722 minTime interval= 2 minHyd. volume= 86,081 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 6

Diversion method = Constant Q Constant Q = 38.56 cfs



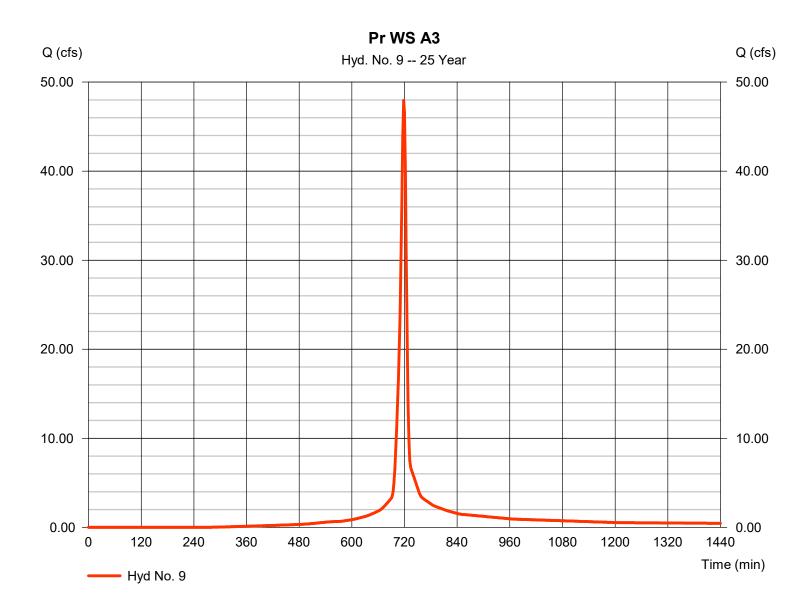
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Tuesday, 10 / 1 / 2019

### Hyd. No. 9

Pr WS A3

Hydrograph type = SCS Runoff Peak discharge = 47.94 cfsStorm frequency = 25 yrsTime to peak = 718 min Time interval = 2 min Hyd. volume = 113,709 cuftDrainage area Curve number = 10.360 ac= 90 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 7.00 \, \text{min}$ = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

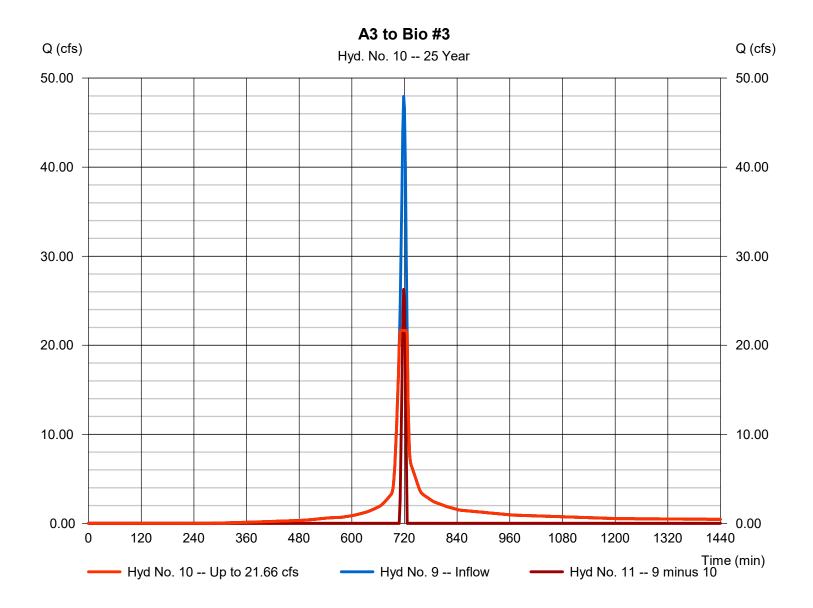
#### Hyd. No. 10

A3 to Bio #3

Hydrograph type= Diversion1Peak discharge= 21.66 cfsStorm frequency= 25 yrsTime to peak= 710 minTime interval= 2 minHyd. volume= 98,518 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 11

Diversion method = Constant Q Constant Q = 21.66 cfs



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Tuesday, 10 / 1 / 2019

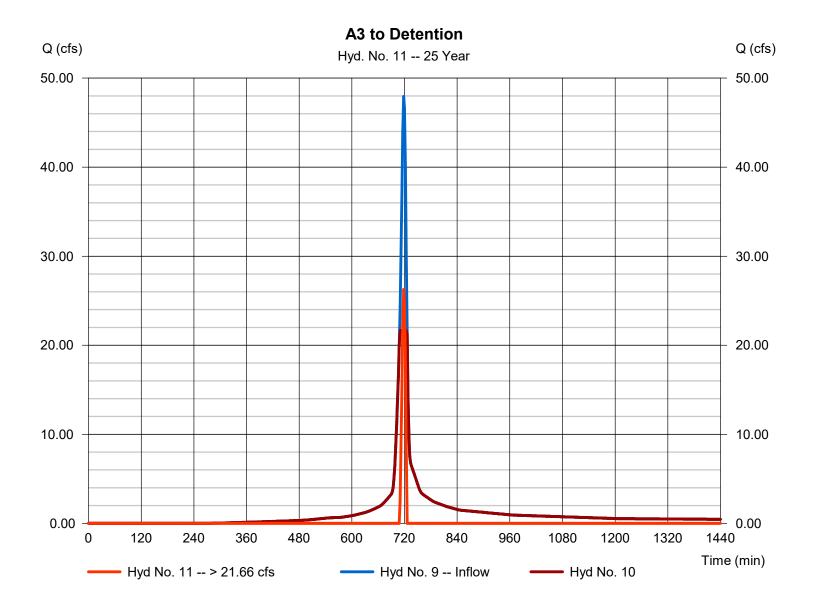
#### Hyd. No. 11

A3 to Detention

Hydrograph type= Diversion2Peak discharge= 26.28 cfsStorm frequency= 25 yrsTime to peak= 718 minTime interval= 2 minHyd. volume= 15,191 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 10

Diversion method = Constant Q Constant Q = 21.66 cfs



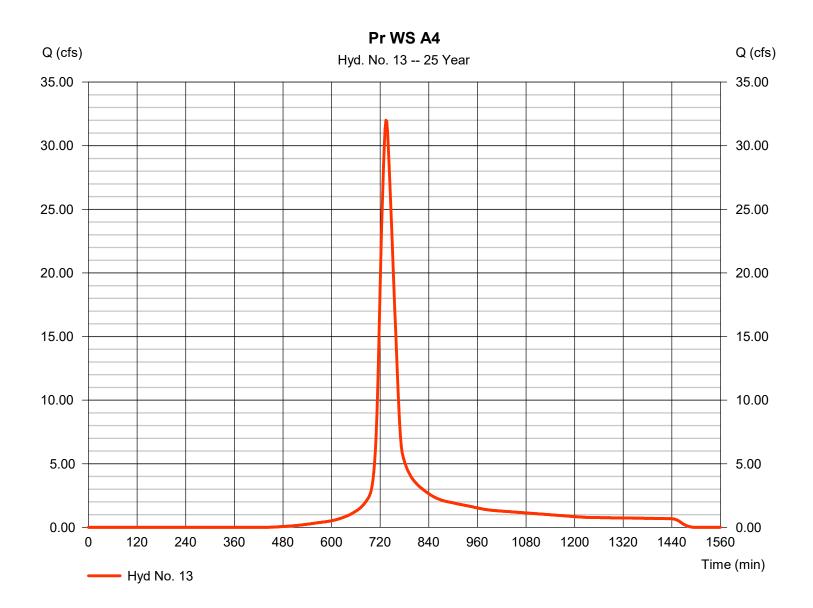
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Tuesday, 10 / 1 / 2019

#### **Hyd. No. 13**

Pr WS A4

Hydrograph type = SCS Runoff Peak discharge = 32.00 cfsStorm frequency = 25 yrs Time to peak = 734 min Time interval = 2 min Hyd. volume = 144,977 cuft Drainage area Curve number = 16.960 ac= 83 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 36.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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Tuesday, 10 / 1 / 2019

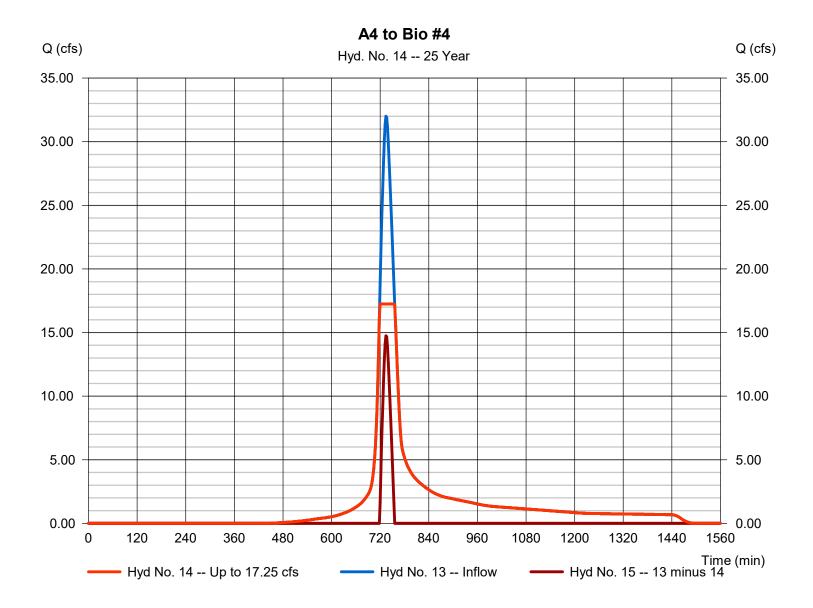
#### Hyd. No. 14

A4 to Bio #4

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 25 yrsTime to peak= 720 minTime interval= 2 minHyd. volume= 125,626 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 15

Diversion method = Constant Q Constant Q = 17.25 cfs



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Tuesday, 10 / 1 / 2019

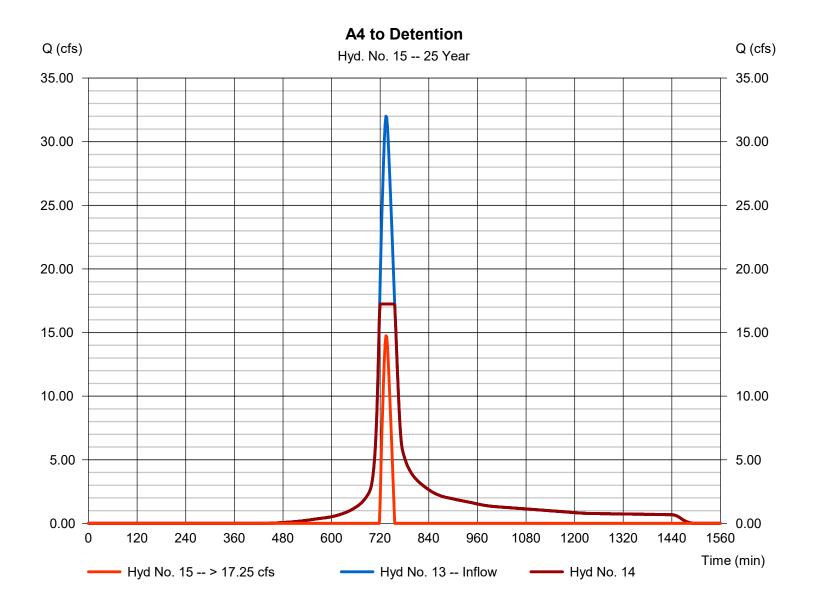
#### Hyd. No. 15

A4 to Detention

Hydrograph type= Diversion2Peak discharge= 14.75 cfsStorm frequency= 25 yrsTime to peak= 734 minTime interval= 2 minHyd. volume= 19,351 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 14

Diversion method = Constant Q Constant Q = 17.25 cfs



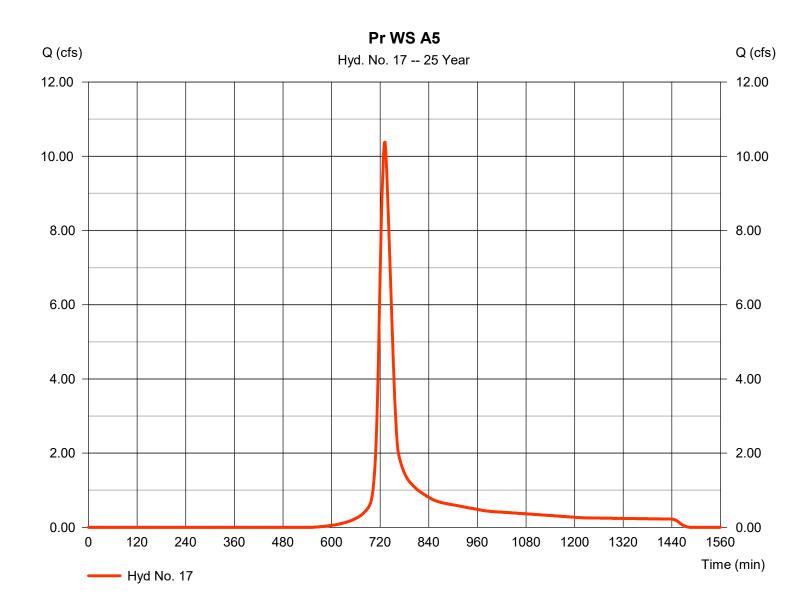
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 17

Pr WS A5

Hydrograph type = SCS Runoff Peak discharge = 10.38 cfsStorm frequency = 25 yrs Time to peak = 732 min Time interval = 2 min Hyd. volume = 42,034 cuftDrainage area = 6.100 acCurve number = 77 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc)  $= 30.00 \, \text{min}$ = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



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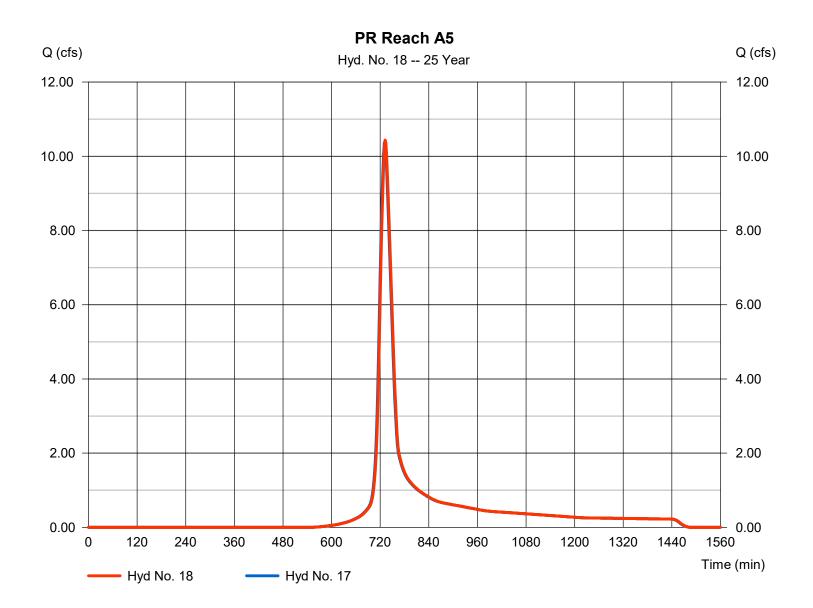
Tuesday, 10 / 1 / 2019

#### Hyd. No. 18

PR Reach A5

Hydrograph type = Reach Peak discharge = 10.44 cfsStorm frequency = 25 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 42.033 cuft Section type Inflow hyd. No. = 17 - Pr WS A5 = Trapezoidal Reach length = 101.0 ftChannel slope = 1.6 % Bottom width Manning's n = 0.025 $= 12.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 1.0 ftRating curve x Rating curve m = 1.425= 1.437Ave. velocity = 2.59 ft/sRouting coeff. = 1.3736

Modified Att-Kin routing method used.



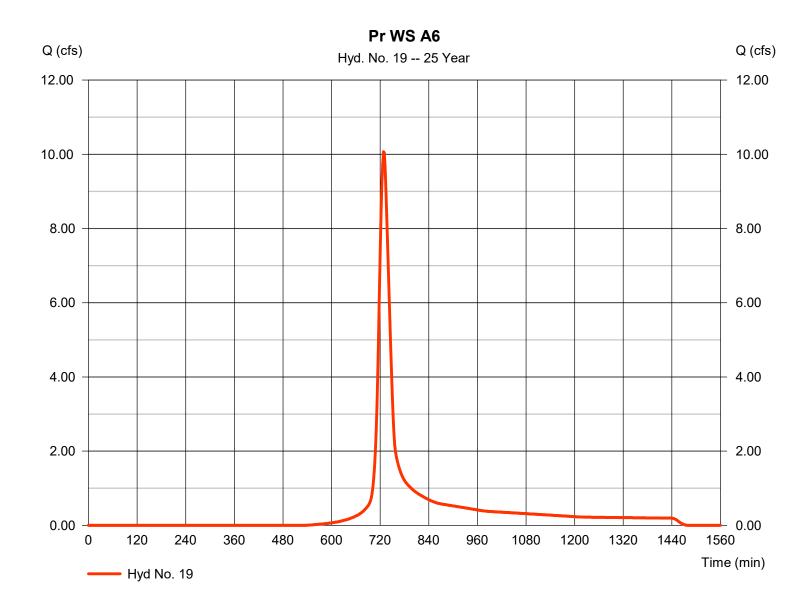
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 19

Pr WS A6

Hydrograph type = SCS Runoff Peak discharge = 10.07 cfsStorm frequency = 25 yrs Time to peak = 728 min Time interval = 2 min Hyd. volume = 37,261 cuftDrainage area = 5.280 acCurve number = 78 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 24.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



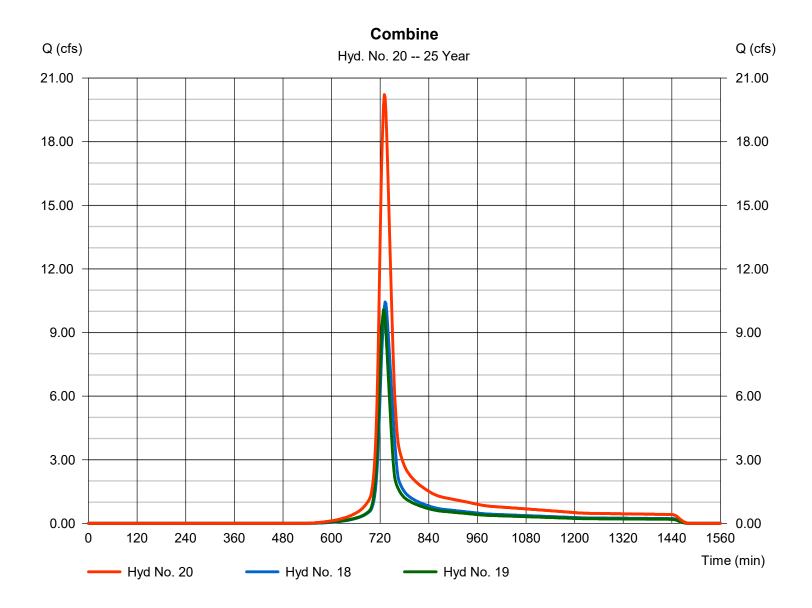
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 20

Combine

= 20.22 cfsHydrograph type = Combine Peak discharge Storm frequency = 25 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 79,295 cuft Inflow hyds. = 18, 19 Contrib. drain. area = 5.280 ac



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= 5.80 ft/s

Tuesday, 10 / 1 / 2019

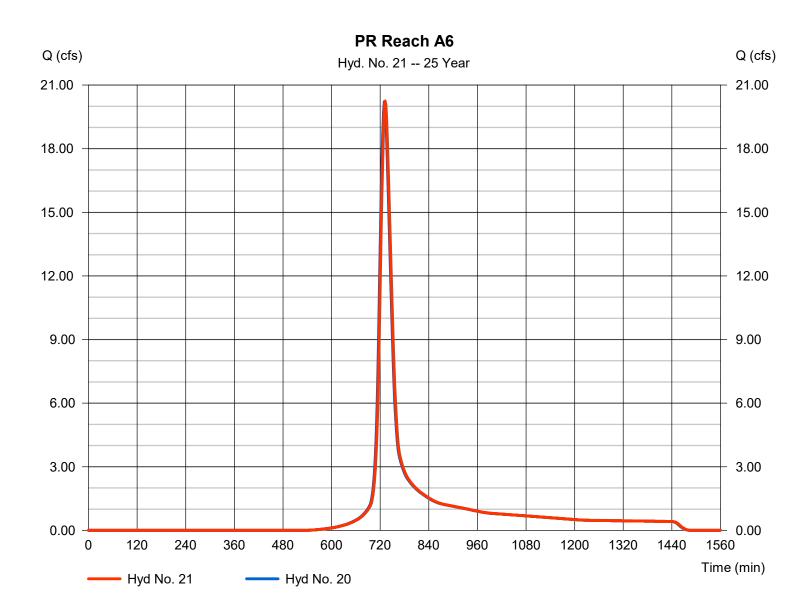
= 1.0806

#### Hyd. No. 21

PR Reach A6

Hydrograph type = Reach Peak discharge = 20.25 cfsStorm frequency = 25 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 79.295 cuft Section type Inflow hyd. No. = 20 - Combine = Trapezoidal Channel slope Reach length = 413.0 ft= 3.8 % Bottom width Manning's n = 0.025 $= 6.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 5.0 ftRating curve x Rating curve m = 3.540= 1.395Ave. velocity Routing coeff.

Modified Att-Kin routing method used.



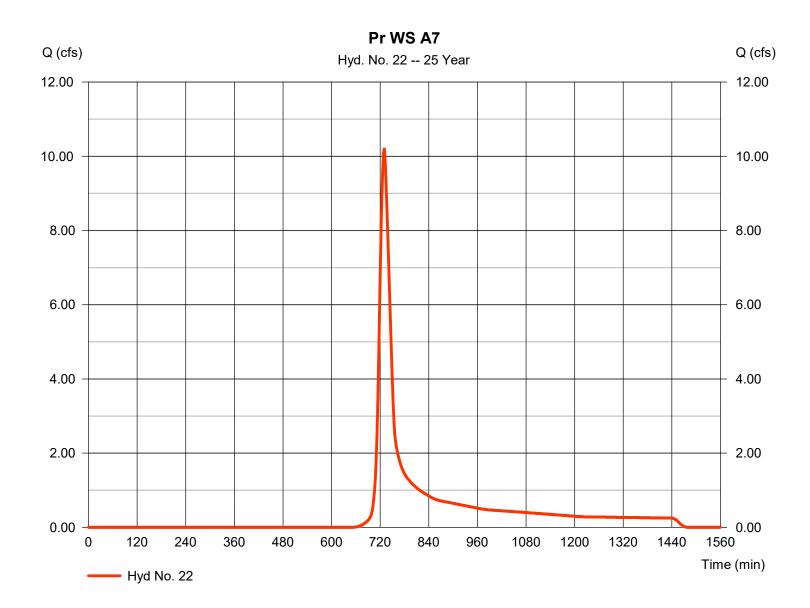
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 22

Pr WS A7

Hydrograph type = SCS Runoff Peak discharge = 10.20 cfsStorm frequency = 25 yrs Time to peak = 730 min Time interval = 2 min Hyd. volume = 39,750 cuftDrainage area Curve number = 8.310 ac= 69 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 26.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



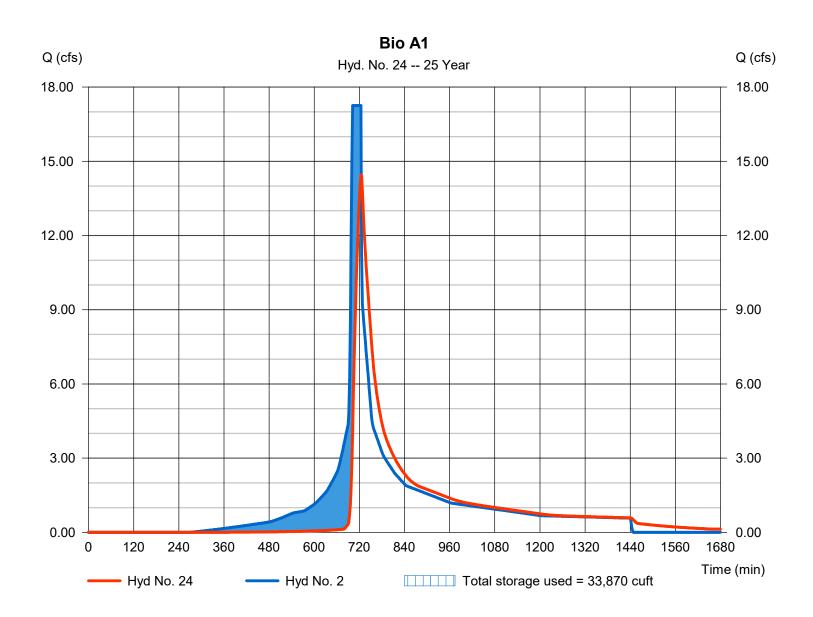
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 24

Bio A1

Hydrograph type = Reservoir Peak discharge = 14.45 cfsStorm frequency = 25 yrsTime to peak = 724 min Time interval = 2 min Hyd. volume = 109,284 cuft Inflow hyd. No. Max. Elevation = 406.17 ft= 2 - A1 to Bio #1 Reservoir name = Bio A1 (south) Max. Storage = 33,870 cuft



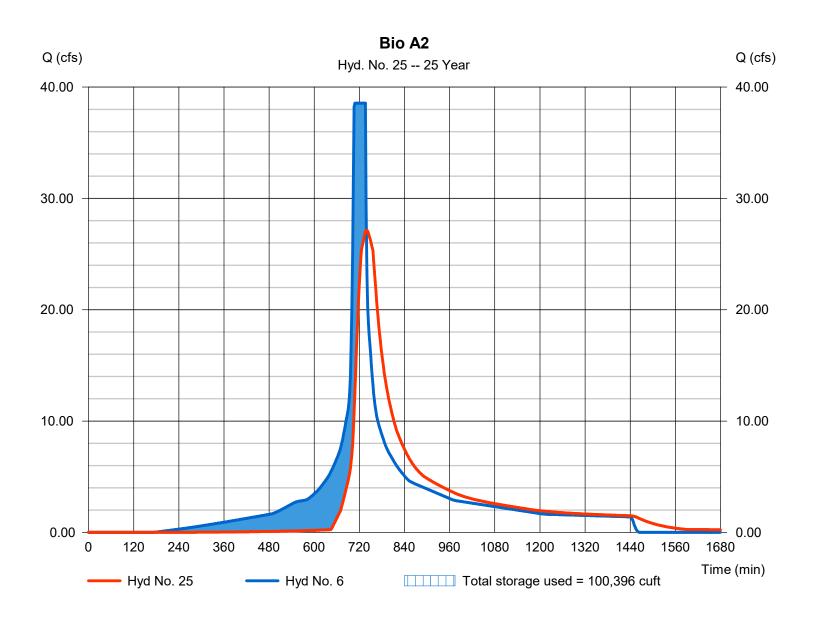
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 25

Bio A2

Hydrograph type = Reservoir Peak discharge = 27.14 cfsStorm frequency = 25 yrsTime to peak = 738 min Time interval = 2 min Hyd. volume = 289,487 cuft Max. Elevation = 402.21 ftInflow hyd. No. = 6 - A2 to Bio #2 Reservoir name = Bio A2 (west) Max. Storage = 100,396 cuft



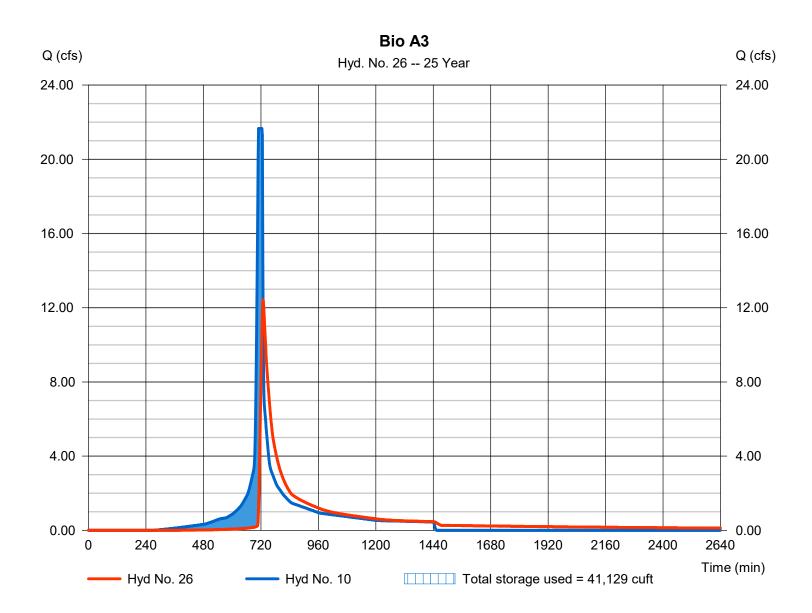
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 26

Bio A3

Hydrograph type = Reservoir Peak discharge = 12.43 cfsStorm frequency = 25 yrsTime to peak = 728 min Time interval = 2 min Hyd. volume = 97,397 cuft = 10 - A3 to Bio #3 Max. Elevation Inflow hyd. No. = 409.37 ftReservoir name = Bio A3 (east) Max. Storage = 41,129 cuft



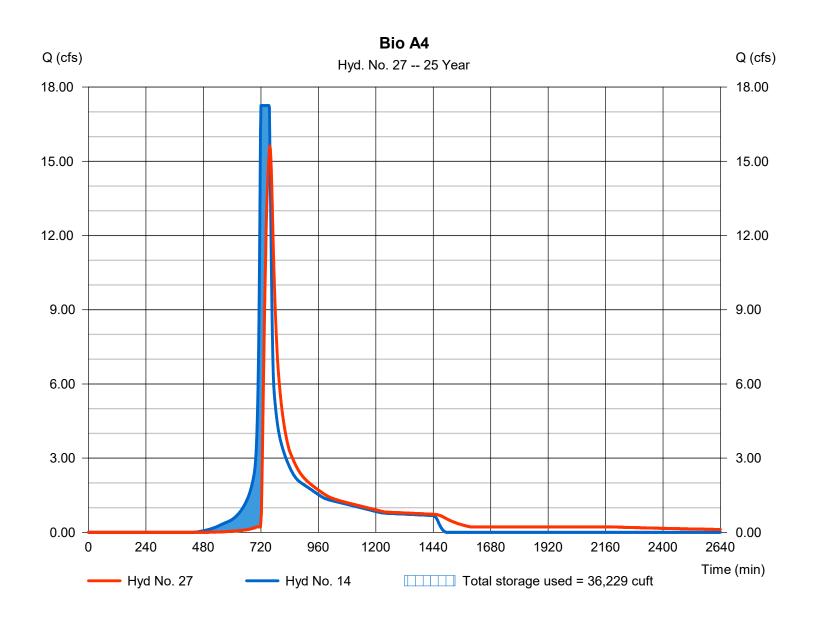
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 27

Bio A4

Hydrograph type = Reservoir Peak discharge = 15.62 cfsStorm frequency = 25 yrsTime to peak = 758 min Time interval = 2 min Hyd. volume = 125,564 cuft Inflow hyd. No. = 14 - A4 to Bio #4 Max. Elevation = 403.69 ft= 36,229 cuft Reservoir name = Bio A4 (north) Max. Storage



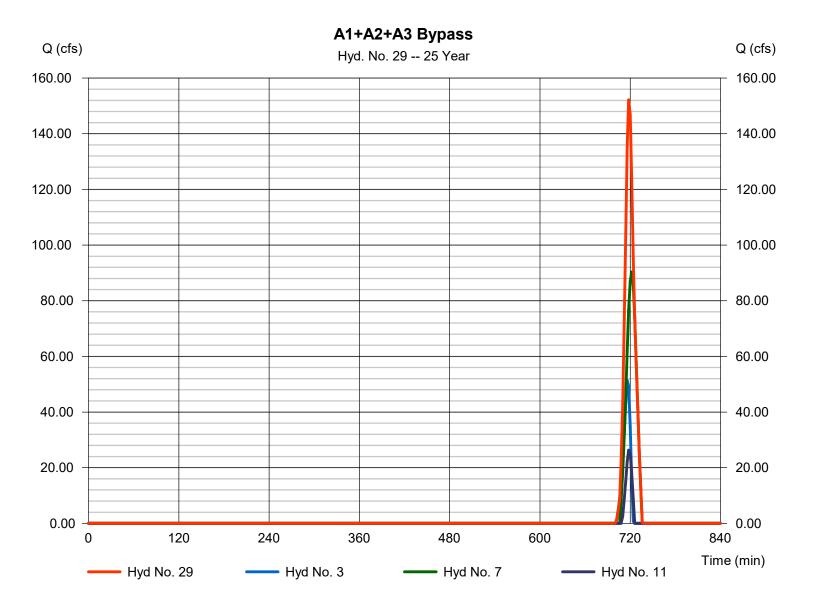
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 29

A1+A2+A3 Bypass

Hydrograph type = Combine Peak discharge = 152.20 cfsStorm frequency Time to peak = 25 yrs= 718 min Time interval = 2 min Hyd. volume = 134,613 cuft Inflow hyds. = 3, 7, 11Contrib. drain. area = 0.000 ac

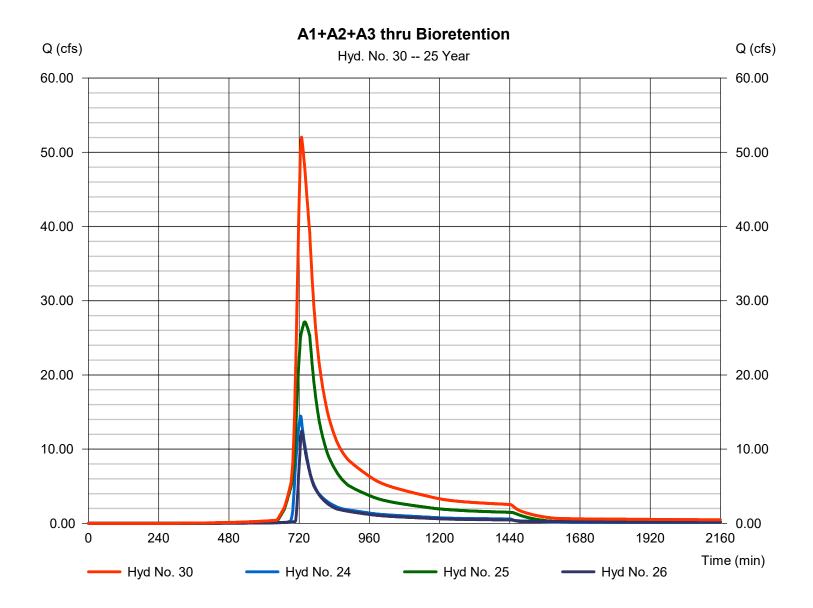


Tuesday, 10 / 1 / 2019

#### Hyd. No. 30

A1+A2+A3 thru Bioretention

Hydrograph type = Combine Peak discharge = 52.02 cfsStorm frequency Time to peak = 25 yrs= 728 min Time interval = 2 min Hyd. volume = 496,168 cuft Inflow hyds. = 24, 25, 26 Contrib. drain. area = 0.000 ac



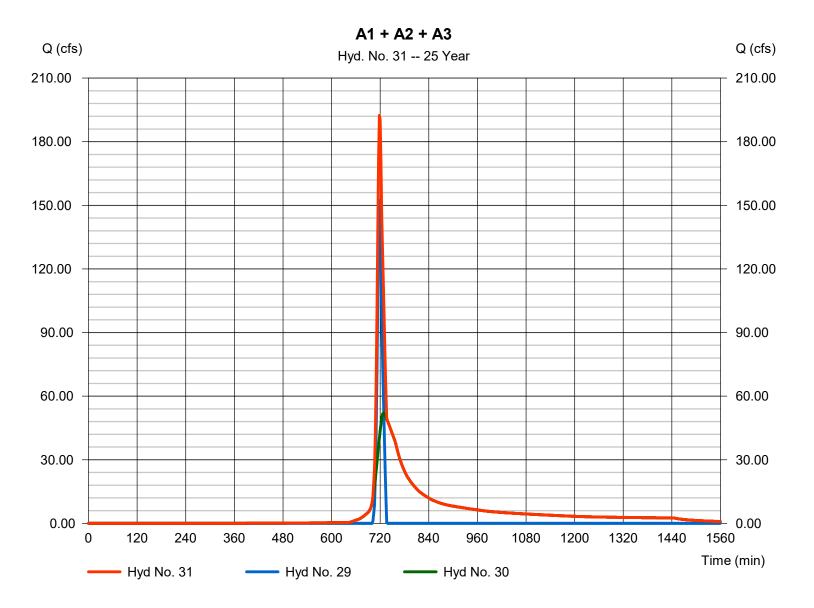
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 31

A1 + A2 + A3

Hydrograph type = Combine Peak discharge = 192.35 cfsStorm frequency Time to peak = 25 yrs= 718 min Time interval = 2 min Hyd. volume = 630,779 cuftInflow hyds. = 29,30Contrib. drain. area = 0.000 ac



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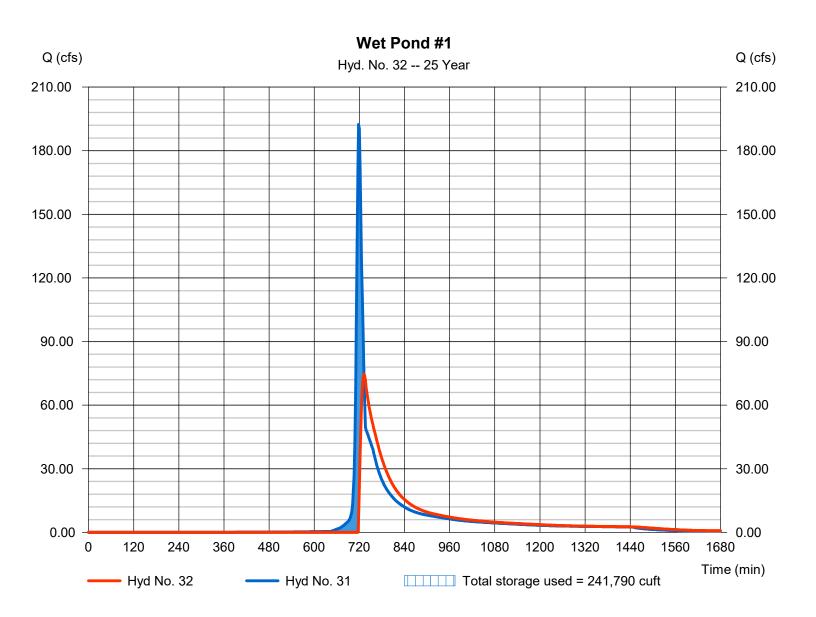
Tuesday, 10 / 1 / 2019

#### Hyd. No. 32

Wet Pond #1

Hydrograph type Peak discharge = 74.67 cfs= Reservoir Storm frequency = 25 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 552,044 cuft = 31 - A1 + A2 + A3Max. Elevation Inflow hyd. No. = 403.99 ft= Wet Pond #1 Reservoir name Max. Storage = 241,790 cuft

Storage Indication method used. Wet pond routing start elevation = 400.00 ft.



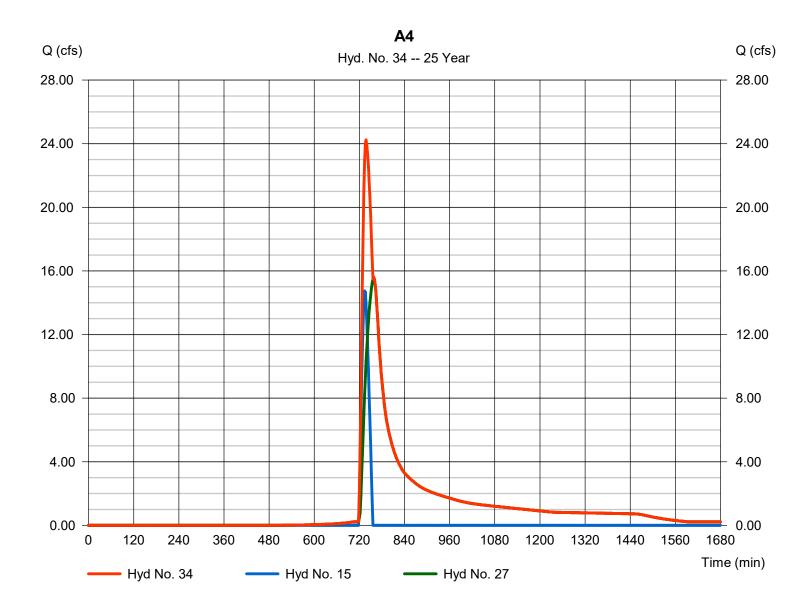
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 34

Α4

Hydrograph type = Combine Peak discharge = 24.24 cfsStorm frequency Time to peak = 25 yrs= 738 min Time interval = 2 min Hyd. volume = 144,915 cuft Inflow hyds. = 15, 27Contrib. drain. area = 0.000 ac



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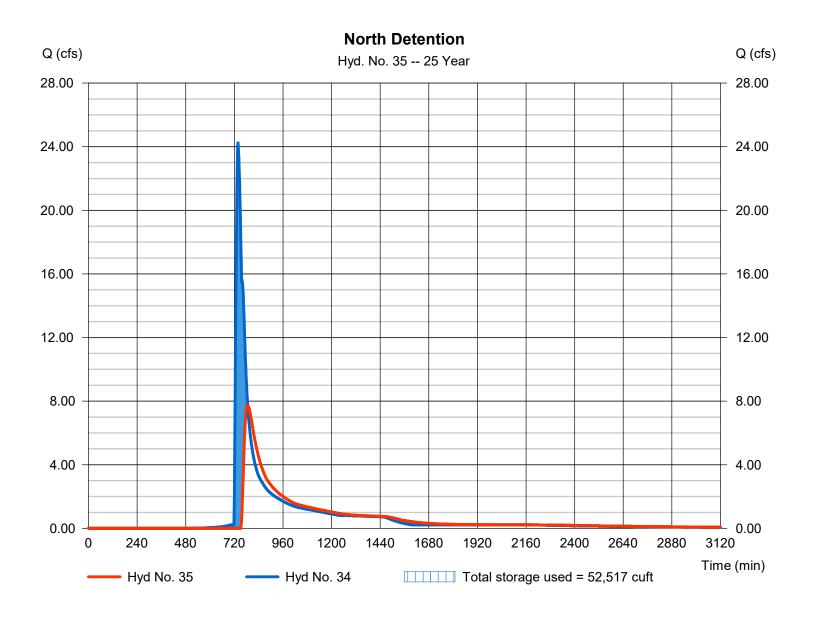
Tuesday, 10 / 1 / 2019

#### Hyd. No. 35

North Detention

Hydrograph type Peak discharge = 7.742 cfs= Reservoir Storm frequency = 25 yrsTime to peak = 786 min Time interval = 2 min Hyd. volume = 109,076 cuftInflow hyd. No. = 34 - A4Max. Elevation = 403.80 ftReservoir name = Dry Detention #1 Max. Storage = 52,517 cuft

Storage Indication method used.

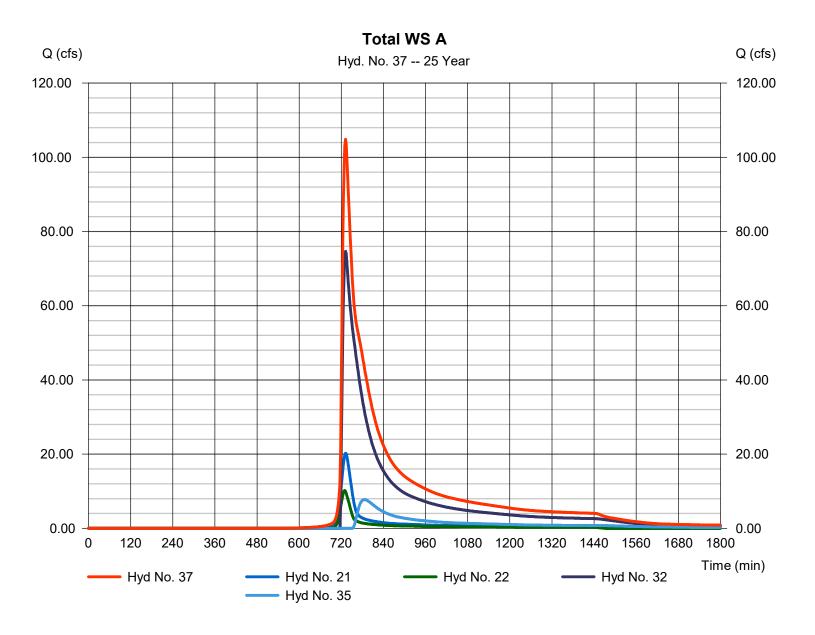


Tuesday, 10 / 1 / 2019

#### Hyd. No. 37

Total WS A

Hydrograph type = Combine Peak discharge = 104.84 cfsStorm frequency Time to peak = 25 yrs= 732 min Time interval = 2 min Hyd. volume = 780,165 cuft Inflow hyds. = 21, 22, 32, 35 Contrib. drain. area = 8.310 ac

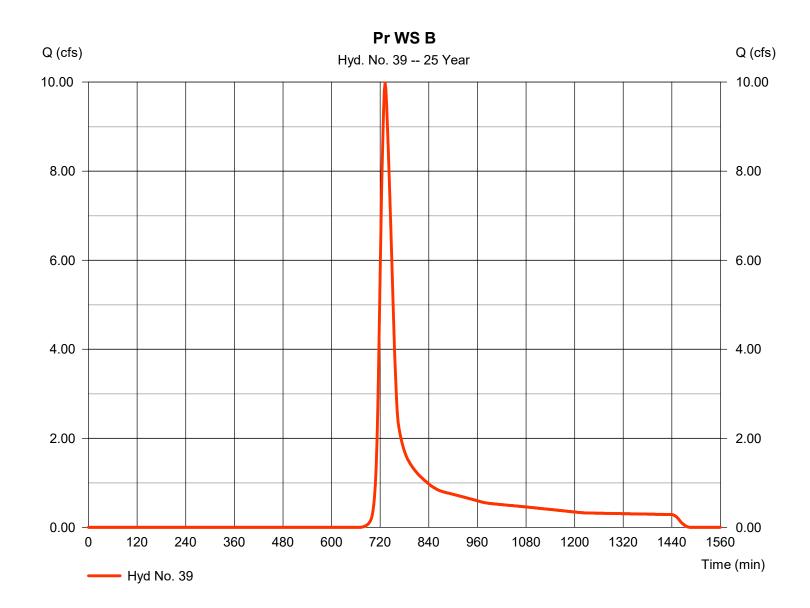


Tuesday, 10 / 1 / 2019

#### Hyd. No. 39

Pr WS B

Hydrograph type = SCS Runoff Peak discharge = 9.983 cfsStorm frequency = 25 yrs Time to peak = 732 min Time interval = 2 min Hyd. volume = 43,592 cuft Drainage area = 9.900 acCurve number = 67 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484

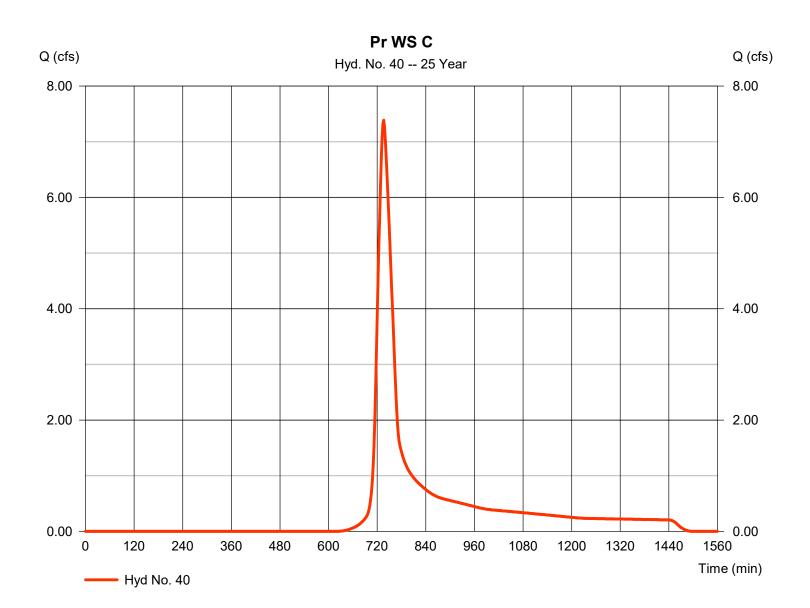


Tuesday, 10 / 1 / 2019

#### Hyd. No. 40

Pr WS C

Hydrograph type = SCS Runoff Peak discharge = 7.385 cfsStorm frequency = 25 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 34,876 cuftDrainage area = 6.320 acCurve number = 72 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



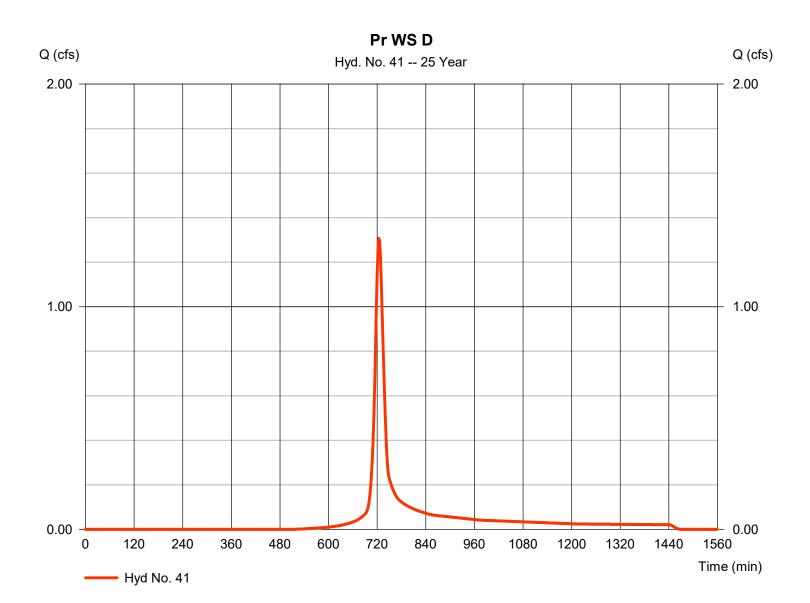
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 41

Pr WS D

Hydrograph type = SCS Runoff Peak discharge = 1.307 cfsStorm frequency = 25 yrs Time to peak = 724 min Time interval = 2 min Hyd. volume = 4,099 cuftDrainage area = 0.550 acCurve number = 79 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 20.00 min = User Total precip. = 4.11 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	98.93	2	716	214,175				Pr WS A1
2	Diversion1	17.25	2	698	153,681	1			A1 to Bio #1
3	Diversion2	81.68	2	716	60,495	1			A1 to Detention
5	SCS Runoff	180.71	2	722	550,769				Pr WS A2
6	Diversion1	38.56	2	704	398,739	5			A2 to Bio #2
7	Diversion2	142.15	2	722	152,029	5			A2 to Detention
9	SCS Runoff	69.26	2	718	167,976				Pr WS A3
10	Diversion1	21.66	2	706	134,190	9			A3 to Bio #3
11	Diversion2	47.60	2	718	33,786	9			A3 to Detention
13	SCS Runoff	50.01	2	734	227,083				Pr WS A4
14	Diversion1	17.25	2	714	171,726	13			A4 to Bio #4
15	Diversion2	32.76	2	734	55,357	13			A4 to Detention
17	SCS Runoff	17.39	2	730	69,549				Pr WS A5
18	Reach	17.48	2	732	69,548	17			PR Reach A5
19	SCS Runoff	16.64	2	728	61,066				Pr WS A6
20	Combine	33.67	2	730	130,614	18, 19			Combine
21	Reach	33.73	2	732	130,614	20			PR Reach A6
22	SCS Runoff	19.13	2	730	71,613				Pr WS A7
24	Reservoir	15.94	2	726	151,311	2	406.19	35,011	Bio A1
25	Reservoir	27.90	2	742	389,275	6	402.29	107,731	Bio A2
26	Reservoir	17.25	2	728	133,056	10	409.47	45,640	Bio A3
27	Reservoir	16.86	2	762	171,662	14	403.71	37,230	Bio A4
29	Combine	249.39	2	718	246,309	3, 7, 11,			A1+A2+A3 Bypass
30	Combine	60.05	2	728	673,641	24, 25, 26,			A1+A2+A3 thru Bioretention
31	Combine	303.21	2	718	919,952	29, 30			A1 + A2 + A3
32	Reservoir	115.23	2	732	841,211	31	406.00	346,087	Wet Pond #1
34	Combine	47.03	2	736	227,019	15, 27,			A4
35	Reservoir	24.15	2	758	191,167	34	404.75	69,921	North Detention
37	Combine	167.43	2	730	1,234,606	21, 22, 32, 35,			Total WS A
Proposed Hydrographs.gpw					Return Period: 100 Year			Tuesday, 10 / 1 / 2019	

# Hydrograph Summary Report Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

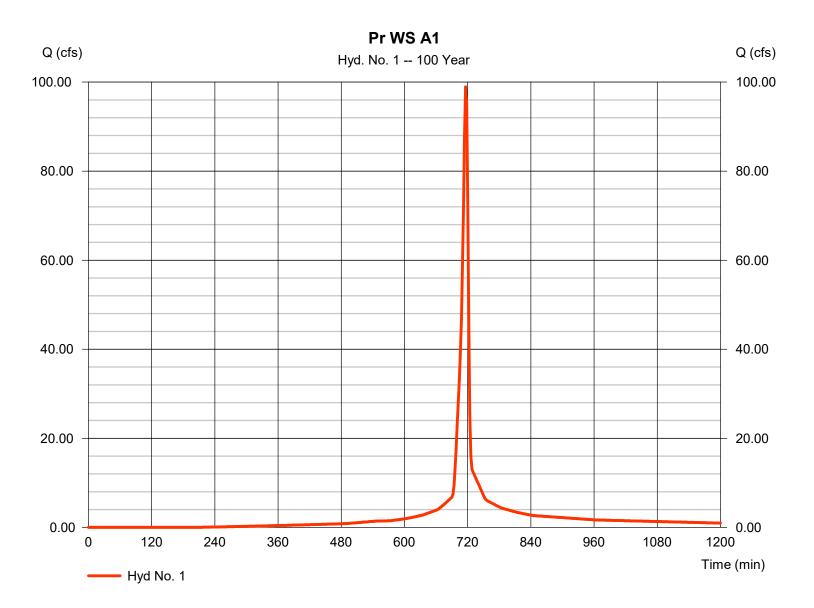
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
39	SCS Runoff	19.57	2	732	80,489				Pr WS B
40	SCS Runoff	13.26	2	736	60,727				Pr WS C
Proposed Hydrographs.gpw					Return Period: 100 Year			Tuesday, 10 / 1 / 2019	

Tuesday, 10 / 1 / 2019

#### Hyd. No. 1

Pr WS A1

Hydrograph type = SCS Runoff Peak discharge = 98.93 cfsStorm frequency = 100 yrsTime to peak = 716 min Time interval = 2 min Hyd. volume = 214,175 cuft Drainage area Curve number = 14.090 ac= 90 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc)  $= 6.00 \, \text{min}$ = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

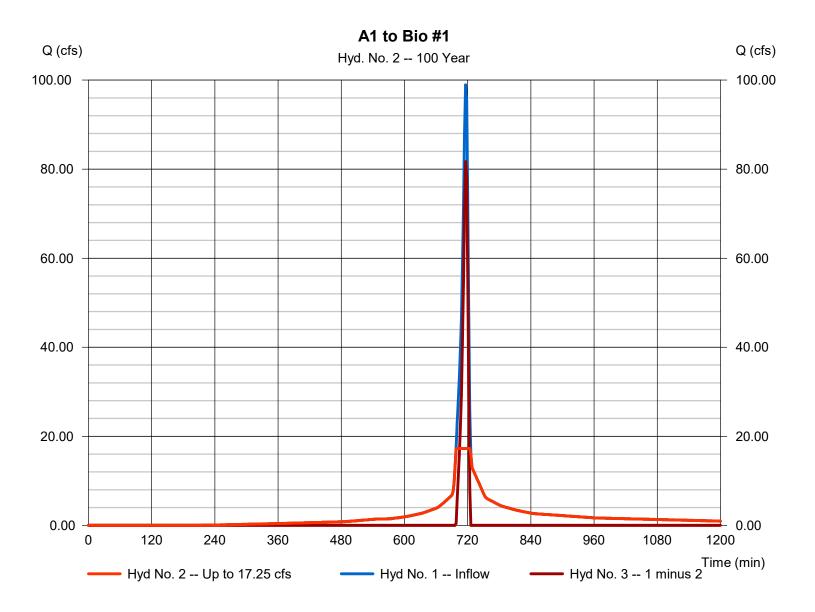
#### Hyd. No. 2

A1 to Bio #1

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 100 yrsTime to peak= 698 minTime interval= 2 minHyd. volume= 153,681 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 3

Diversion method = Constant Q Constant Q = 17.25 cfs



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

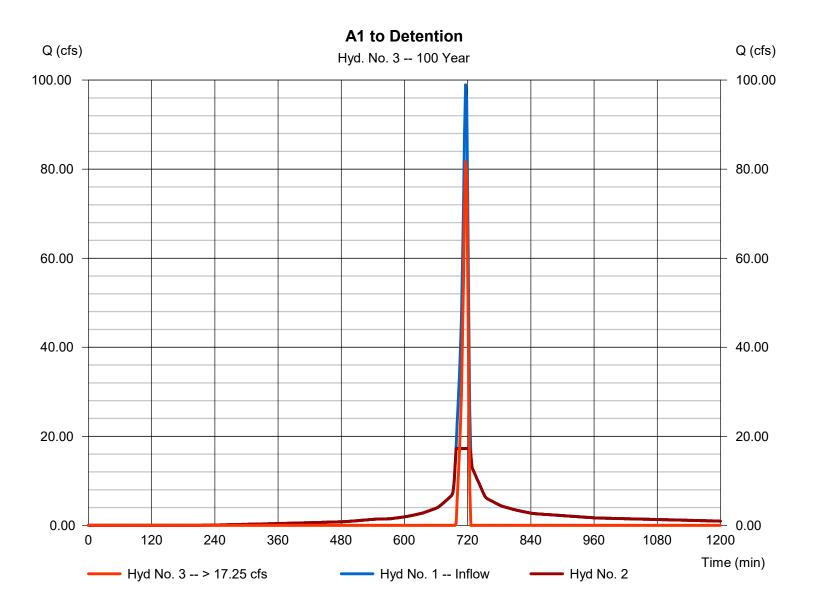
#### Hyd. No. 3

A1 to Detention

Hydrograph type= Diversion2Peak discharge= 81.68 cfsStorm frequency= 100 yrsTime to peak= 716 minTime interval= 2 minHyd. volume= 60,495 cuft

Inflow hydrograph = 1 - Pr WS A1 2nd diverted hyd. = 2

Diversion method = Constant Q Constant Q = 17.25 cfs



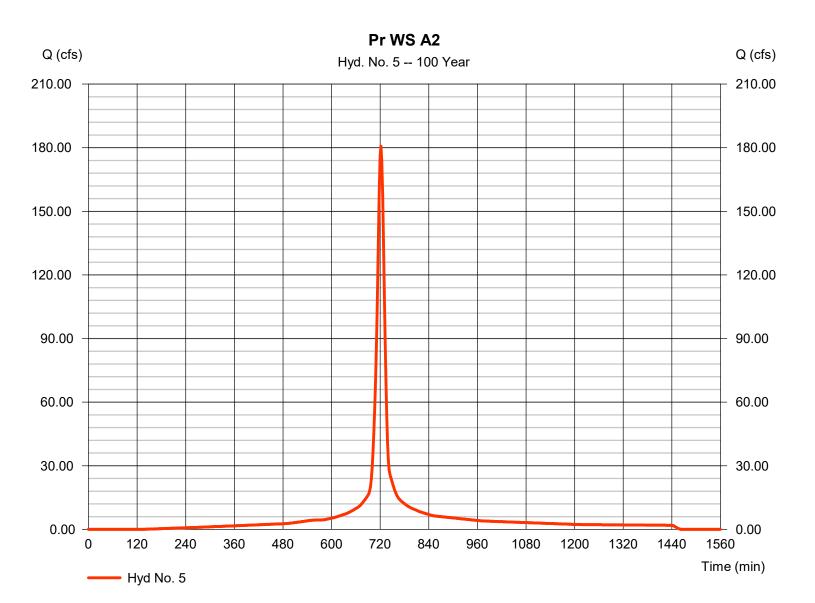
Tuesday, 10 / 1 / 2019

#### Hyd. No. 5

Pr WS A2

Hydrograph type = SCS Runoff Peak discharge = 180.71 cfsStorm frequency = 100 yrsTime to peak = 722 min Time interval = 2 min Hyd. volume = 550,769 cuftDrainage area Curve number = 31.690 ac= 94 Basin Slope = 0.0 %Hydraulic length = 0 ft

Tc method = User Time of conc. (Tc) = 15.00 min
Total precip. = 5.61 in Distribution = Type II
Storm duration = 24 hrs Shape factor = 484



Tuesday, 10 / 1 / 2019

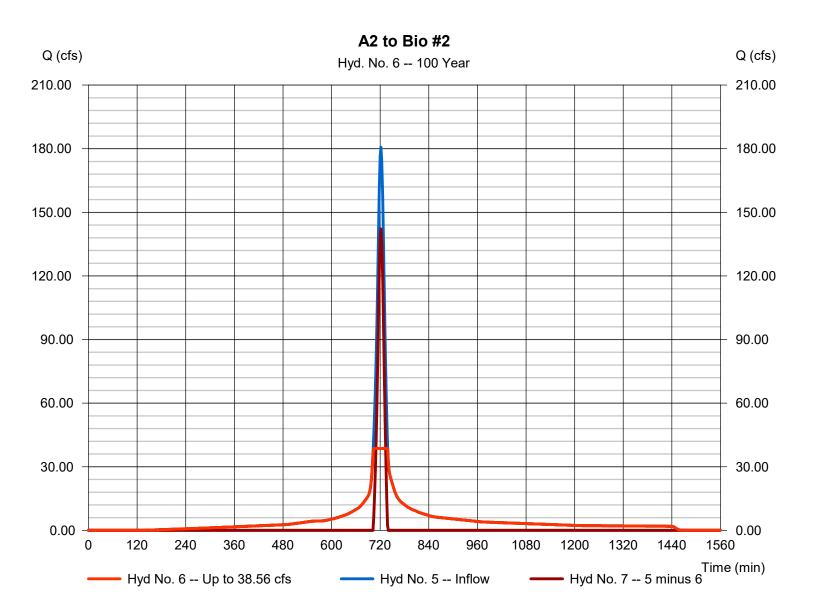
#### Hyd. No. 6

A2 to Bio #2

Hydrograph type= Diversion1Peak discharge= 38.56 cfsStorm frequency= 100 yrsTime to peak= 704 minTime interval= 2 minHyd. volume= 398,739 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 7

Diversion method = Constant Q Constant Q = 38.56 cfs



Tuesday, 10 / 1 / 2019

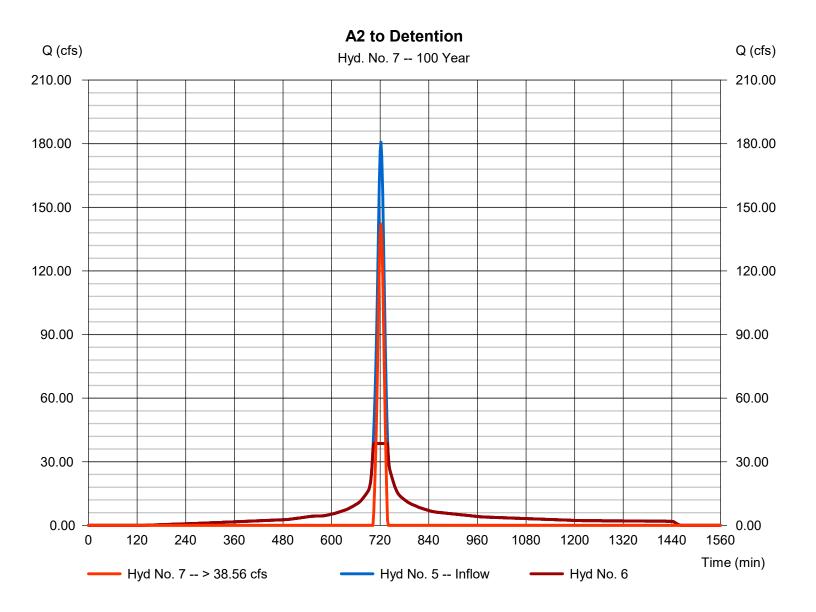
#### Hyd. No. 7

A2 to Detention

Hydrograph type= Diversion2Peak discharge= 142.15 cfsStorm frequency= 100 yrsTime to peak= 722 minTime interval= 2 minHyd. volume= 152,029 cuft

Inflow hydrograph = 5 - Pr WS A2 2nd diverted hyd. = 6

Diversion method = Constant Q Constant Q = 38.56 cfs



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

= 24 hrs

Tuesday, 10 / 1 / 2019

= 484

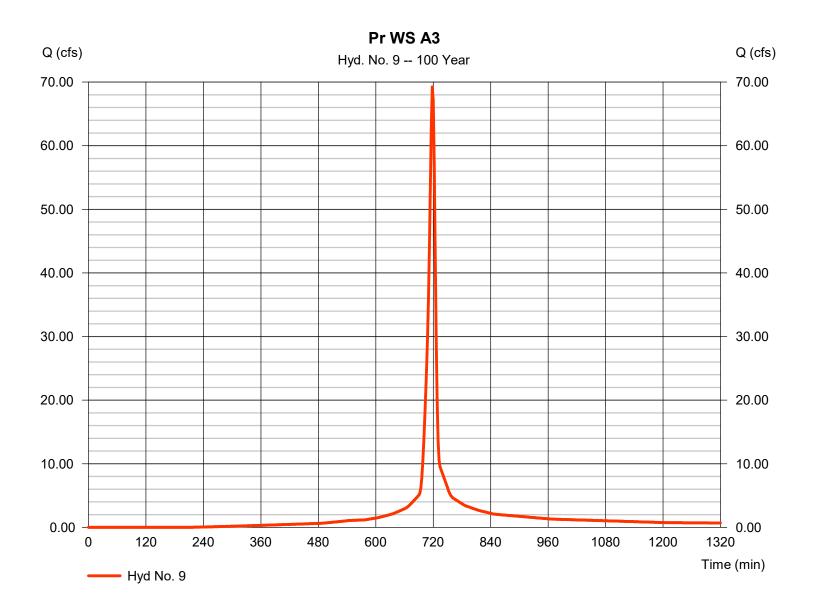
#### Hyd. No. 9

Storm duration

Pr WS A3

Hydrograph type = SCS Runoff Peak discharge = 69.26 cfsStorm frequency Time to peak = 100 yrs= 718 min Time interval = 2 min Hyd. volume = 167,976 cuft Drainage area Curve number = 90 = 10.360 acHydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc)  $= 7.00 \, \text{min}$ = User Total precip. = 5.61 inDistribution = Type II

Shape factor



Tuesday, 10 / 1 / 2019

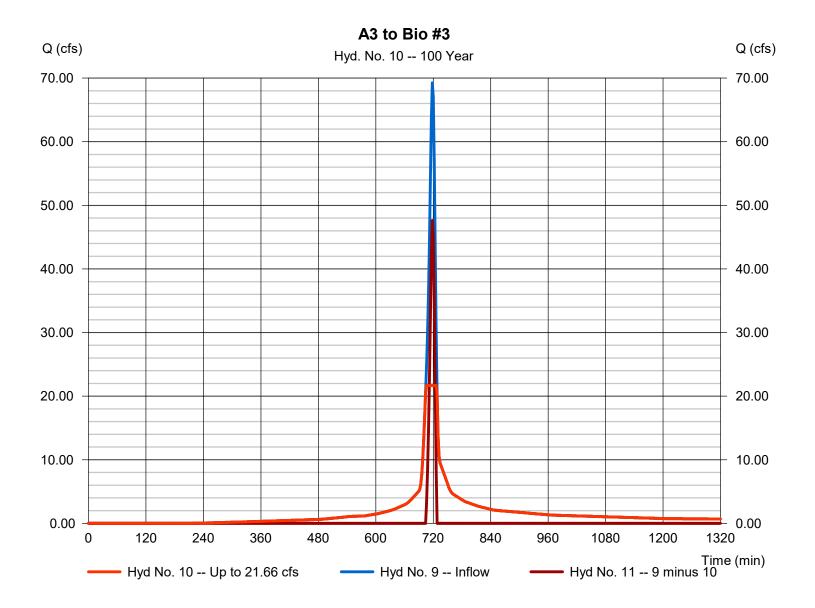
#### Hyd. No. 10

A3 to Bio #3

Hydrograph type= Diversion1Peak discharge= 21.66 cfsStorm frequency= 100 yrsTime to peak= 706 minTime interval= 2 minHyd. volume= 134,190 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 11

Diversion method = Constant Q Constant Q = 21.66 cfs



Tuesday, 10 / 1 / 2019

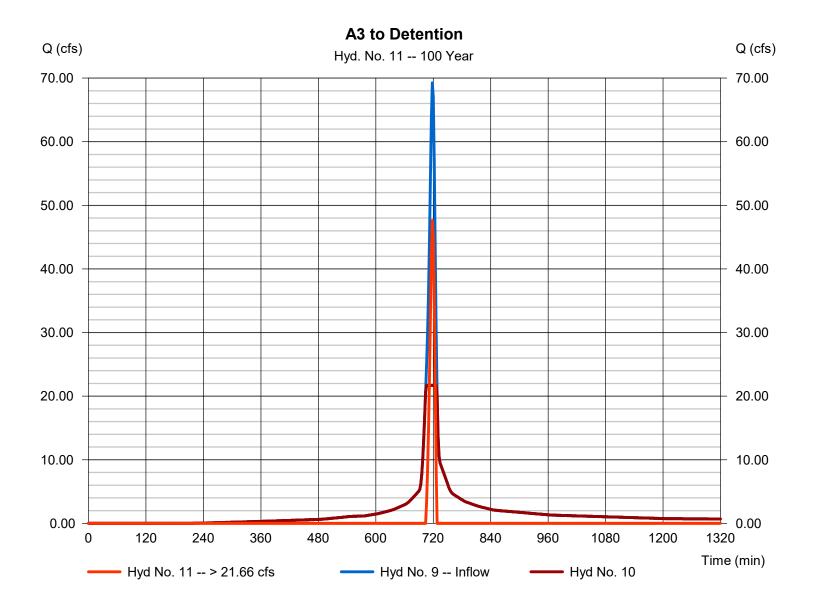
#### Hyd. No. 11

A3 to Detention

Hydrograph type= Diversion2Peak discharge= 47.60 cfsStorm frequency= 100 yrsTime to peak= 718 minTime interval= 2 minHyd. volume= 33,786 cuft

Inflow hydrograph = 9 - Pr WS A3 2nd diverted hyd. = 10

Diversion method = Constant Q Constant Q = 21.66 cfs



Tuesday, 10 / 1 / 2019

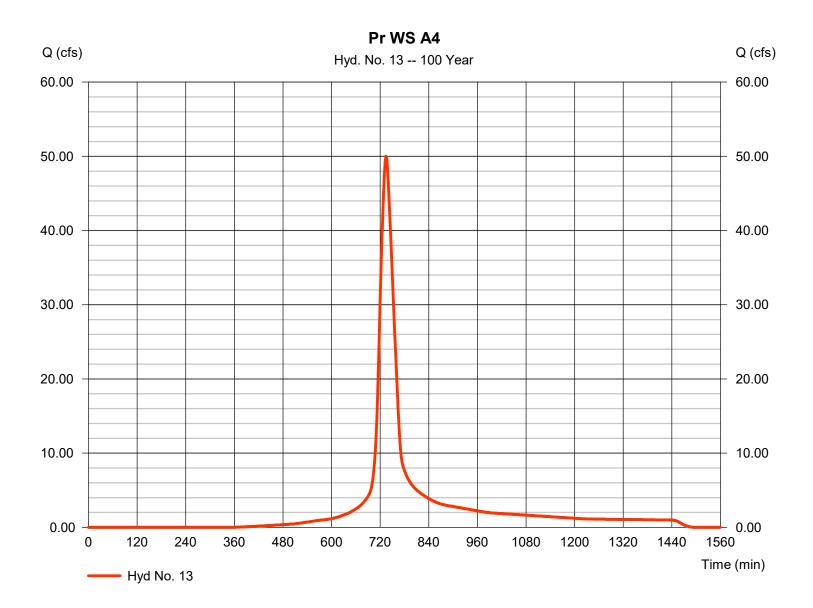
#### **Hyd. No. 13**

Pr WS A4

Hydrograph type= SCS RunoffPeak discharge= 50.01 cfsStorm frequency= 100 yrsTime to peak= 734 minTime interval= 2 minHyd. volume= 227,083 cuftDrainage area= 16.960 acCurve number= 83

Drainage area = 16.960 ac Curve number = 83 Basin Slope = 0.0 % Hydraulic length = 0.0 ft

Tc method = User Time of conc. (Tc) = 36.00 min
Total precip. = 5.61 in Distribution = Type II
Storm duration = 24 hrs Shape factor = 484



Tuesday, 10 / 1 / 2019

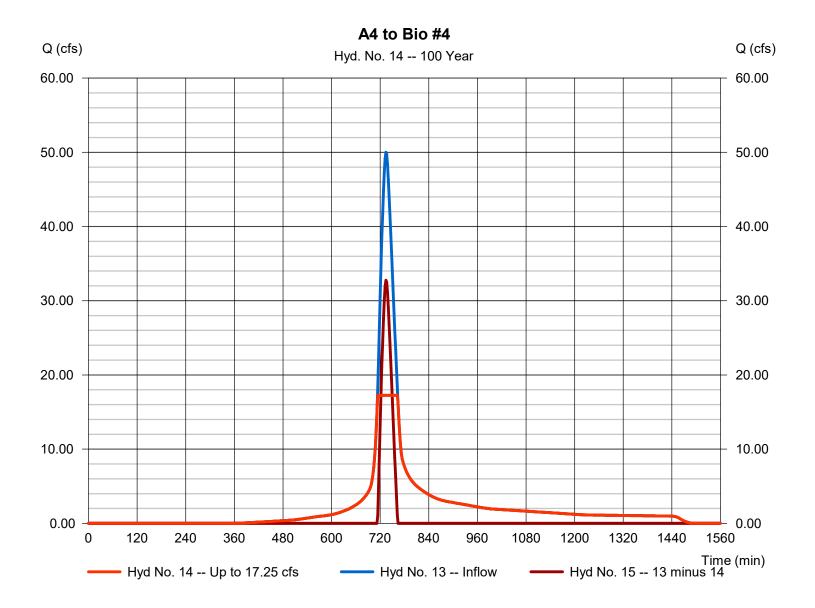
#### Hyd. No. 14

A4 to Bio #4

Hydrograph type= Diversion1Peak discharge= 17.25 cfsStorm frequency= 100 yrsTime to peak= 714 minTime interval= 2 minHyd. volume= 171,726 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 15

Diversion method = Constant Q Constant Q = 17.25 cfs



Tuesday, 10 / 1 / 2019

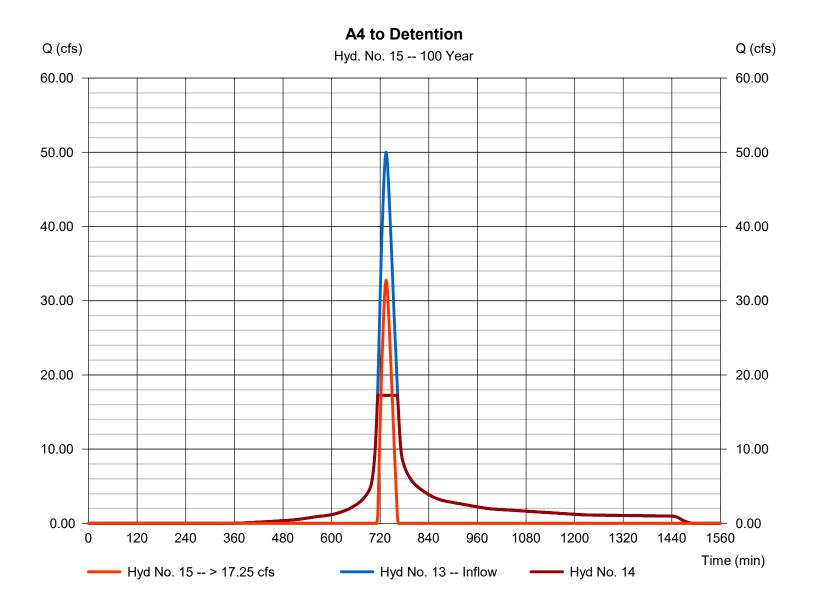
#### Hyd. No. 15

A4 to Detention

Hydrograph type= Diversion2Peak discharge= 32.76 cfsStorm frequency= 100 yrsTime to peak= 734 minTime interval= 2 minHyd. volume= 55,357 cuft

Inflow hydrograph = 13 - Pr WS A4 2nd diverted hyd. = 14

Diversion method = Constant Q Constant Q = 17.25 cfs

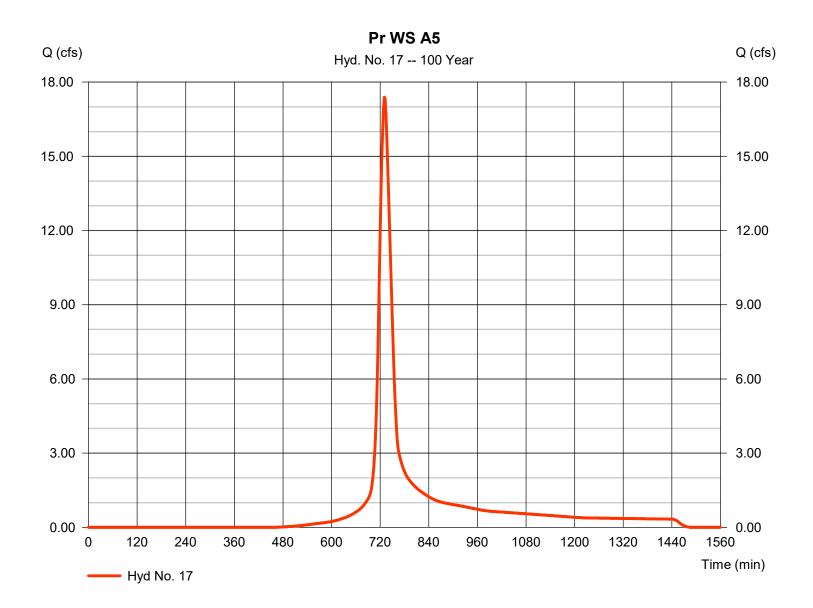


Tuesday, 10 / 1 / 2019

#### Hyd. No. 17

Pr WS A5

Hydrograph type = SCS Runoff Peak discharge = 17.39 cfsStorm frequency = 100 yrsTime to peak = 730 min Time interval = 2 min Hyd. volume = 69,549 cuftDrainage area = 6.100 acCurve number = 77 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc)  $= 30.00 \, \text{min}$ = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

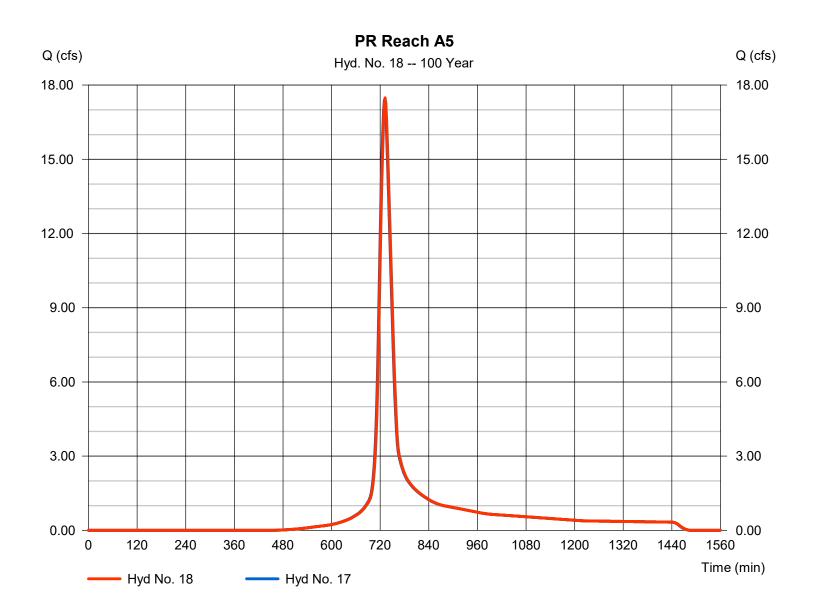
Tuesday, 10 / 1 / 2019

#### Hyd. No. 18

PR Reach A5

= Reach Hydrograph type Peak discharge = 17.48 cfsStorm frequency = 100 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 69.548 cuft Section type Inflow hyd. No. = 17 - Pr WS A5 = Trapezoidal Channel slope Reach length = 101.0 ft= 1.6 % Bottom width Manning's n = 0.025 $= 12.0 \, \text{ft}$ Side slope Max. depth = 2.0:1= 1.0 ftRating curve x Rating curve m = 1.425= 1.437Ave. velocity = 3.02 ft/sRouting coeff. = 1.4378

Modified Att-Kin routing method used.

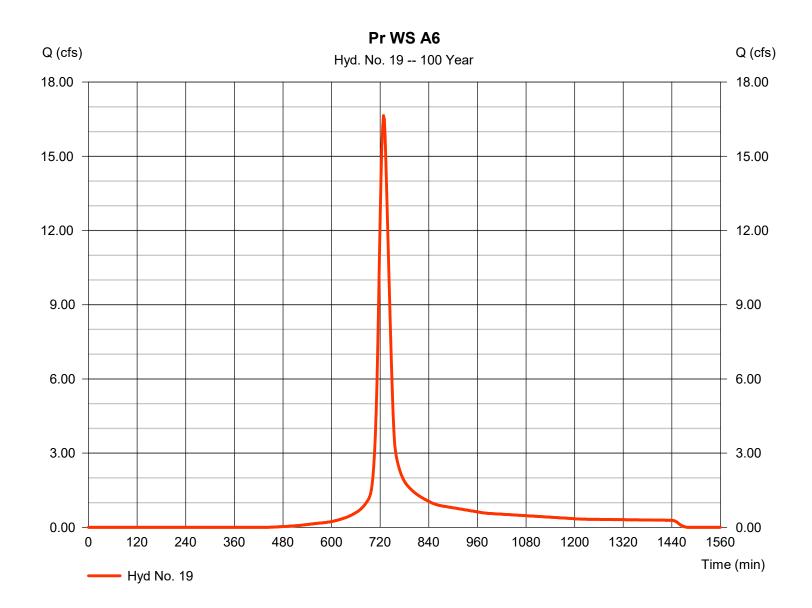


Tuesday, 10 / 1 / 2019

#### Hyd. No. 19

Pr WS A6

Hydrograph type = SCS Runoff Peak discharge = 16.64 cfsStorm frequency = 100 yrsTime to peak = 728 min Time interval = 2 min Hyd. volume = 61,066 cuft Drainage area = 5.280 acCurve number = 78 Hydraulic length = 0 ftBasin Slope = 0.0 %Tc method Time of conc. (Tc) = 24.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



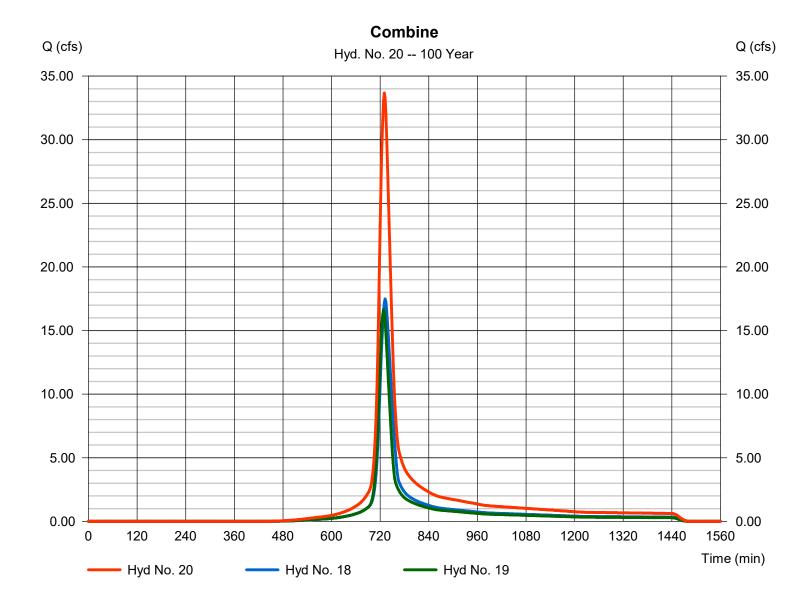
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 20

Combine

Hydrograph type = Combine Peak discharge = 33.67 cfsStorm frequency Time to peak = 100 yrs= 730 min Time interval = 2 min Hyd. volume = 130,614 cuft Inflow hyds. = 18, 19 Contrib. drain. area = 5.280 ac



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

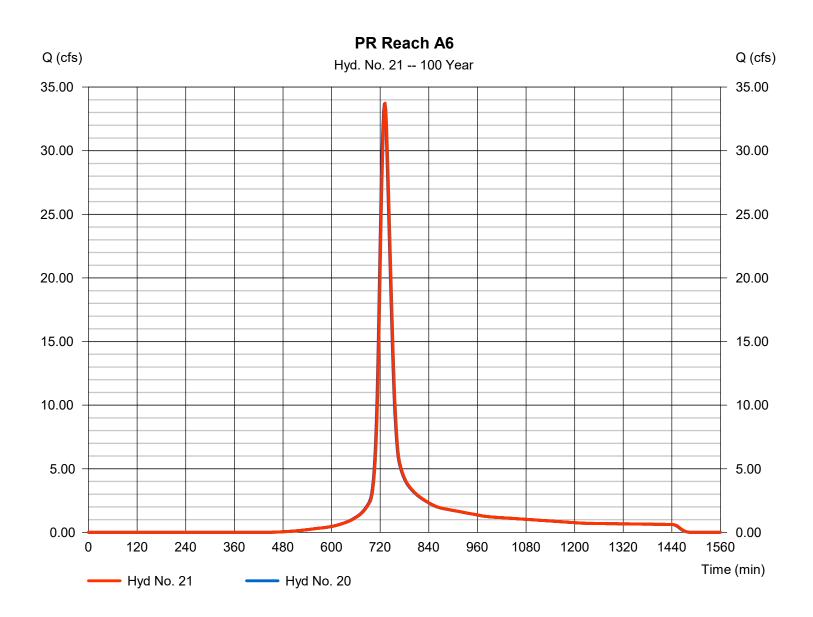
Tuesday, 10 / 1 / 2019

#### Hyd. No. 21

PR Reach A6

= Reach Hydrograph type Peak discharge = 33.73 cfsStorm frequency = 100 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 130.614 cuft Section type Inflow hyd. No. = Trapezoidal = 20 - Combine Channel slope Reach length = 413.0 ft= 3.8 % Bottom width = 6.0 ftManning's n = 0.025Side slope Max. depth = 5.0 ft= 2.0:1Rating curve x = 3.540Rating curve m = 1.395Ave. velocity = 6.70 ft/sRouting coeff. = 1.1518

Modified Att-Kin routing method used.

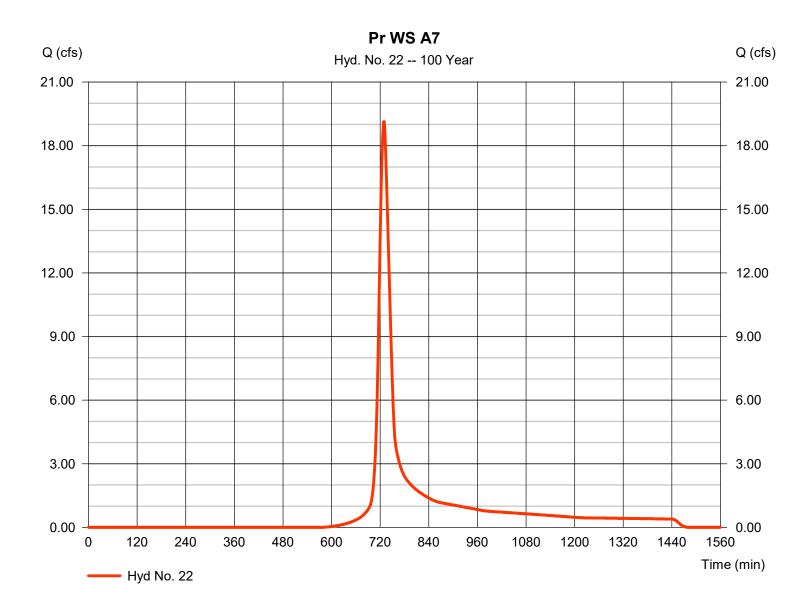


Tuesday, 10 / 1 / 2019

#### Hyd. No. 22

Pr WS A7

Hydrograph type = SCS Runoff Peak discharge = 19.13 cfsStorm frequency = 100 yrsTime to peak = 730 min = 71,613 cuft Time interval = 2 min Hyd. volume Drainage area = 8.310 ac Curve number = 69 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) = 26.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



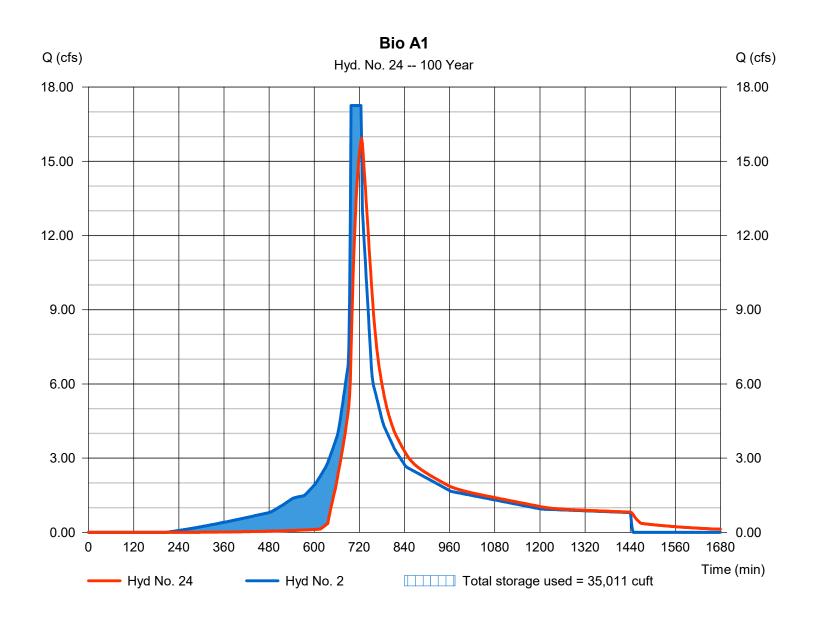
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 24

Bio A1

Hydrograph type Peak discharge = 15.94 cfs= Reservoir Storm frequency = 100 yrsTime to peak = 726 min Time interval = 2 min Hyd. volume = 151,311 cuft Max. Elevation = 406.19 ftInflow hyd. No. = 2 - A1 to Bio #1 = 35,011 cuft Reservoir name = Bio A1 (south) Max. Storage



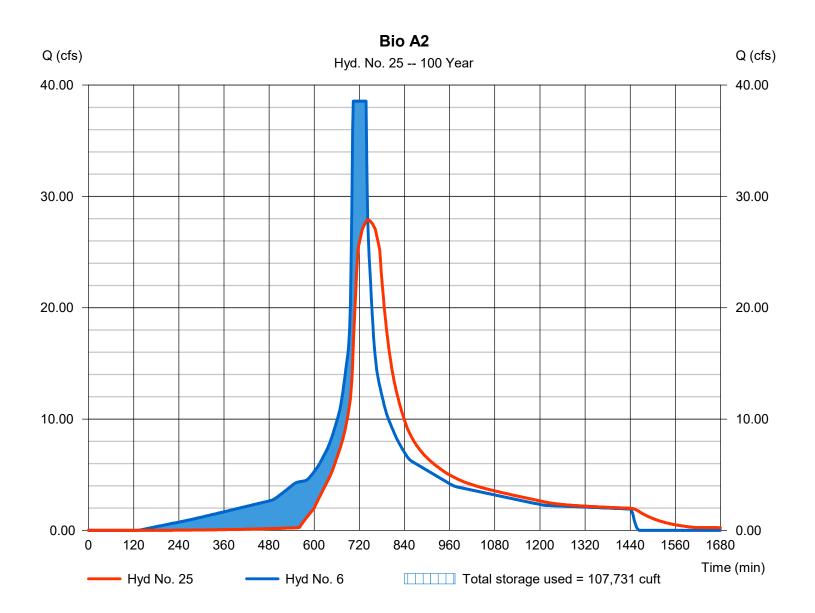
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Tuesday, 10 / 1 / 2019

#### Hyd. No. 25

Bio A2

Hydrograph type Peak discharge = 27.90 cfs= Reservoir Storm frequency = 100 yrsTime to peak = 742 min Time interval = 2 min Hyd. volume = 389,275 cuft Max. Elevation = 402.29 ftInflow hyd. No. = 6 - A2 to Bio #2 Reservoir name = Bio A2 (west) Max. Storage = 107,731 cuft



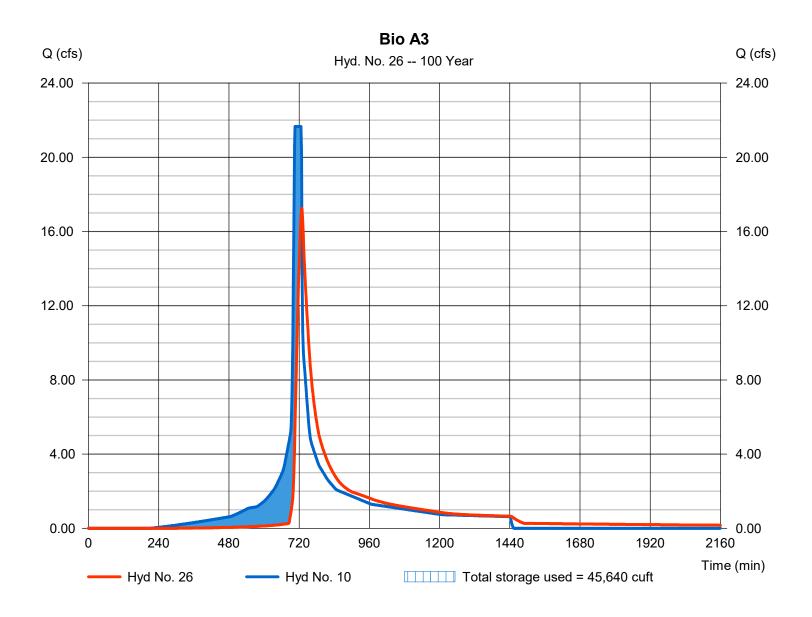
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 26

Bio A3

= Reservoir Hydrograph type Peak discharge = 17.25 cfsStorm frequency = 100 yrsTime to peak = 728 min Time interval = 2 min Hyd. volume = 133,056 cuft = 10 - A3 to Bio #3 Max. Elevation Inflow hyd. No. = 409.47 ftReservoir name = Bio A3 (east) Max. Storage = 45,640 cuft



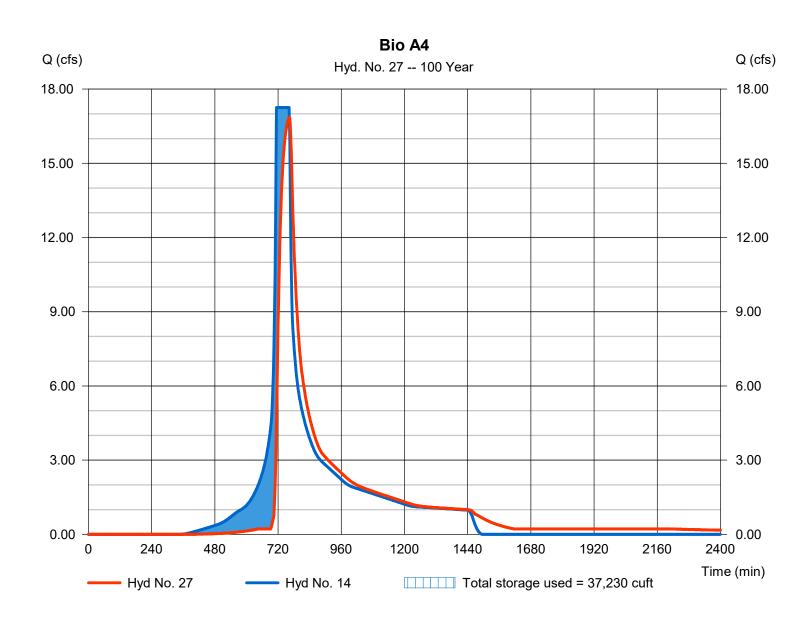
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 27

Bio A4

= Reservoir Hydrograph type Peak discharge = 16.86 cfsStorm frequency = 100 yrsTime to peak = 762 min Time interval = 2 min Hyd. volume = 171,662 cuft Inflow hyd. No. = 403.71 ft Max. Elevation = 14 - A4 to Bio #4 = 37,230 cuftReservoir name = Bio A4 (north) Max. Storage



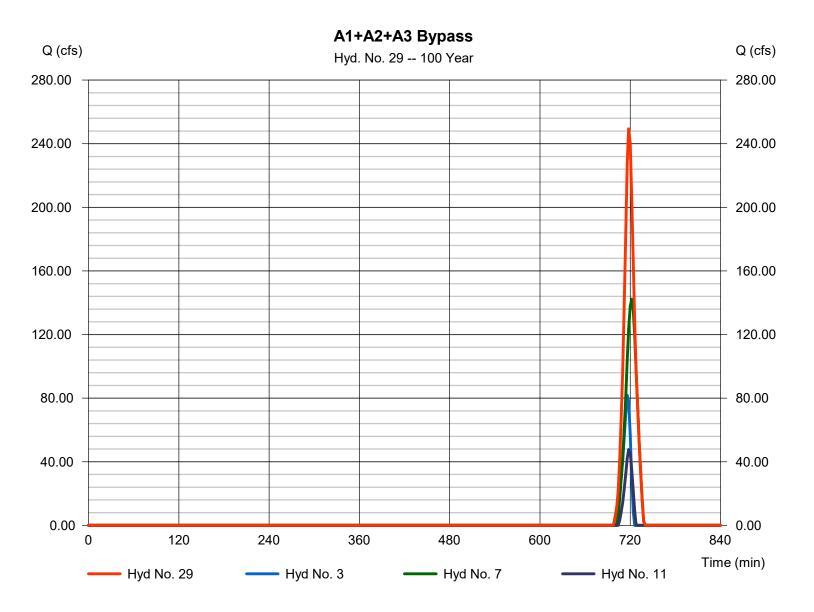
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 29

A1+A2+A3 Bypass

Hydrograph type = Combine Peak discharge = 249.39 cfsStorm frequency Time to peak = 100 yrs= 718 min Time interval = 2 min Hyd. volume = 246,309 cuft Inflow hyds. = 3, 7, 11Contrib. drain. area = 0.000 ac

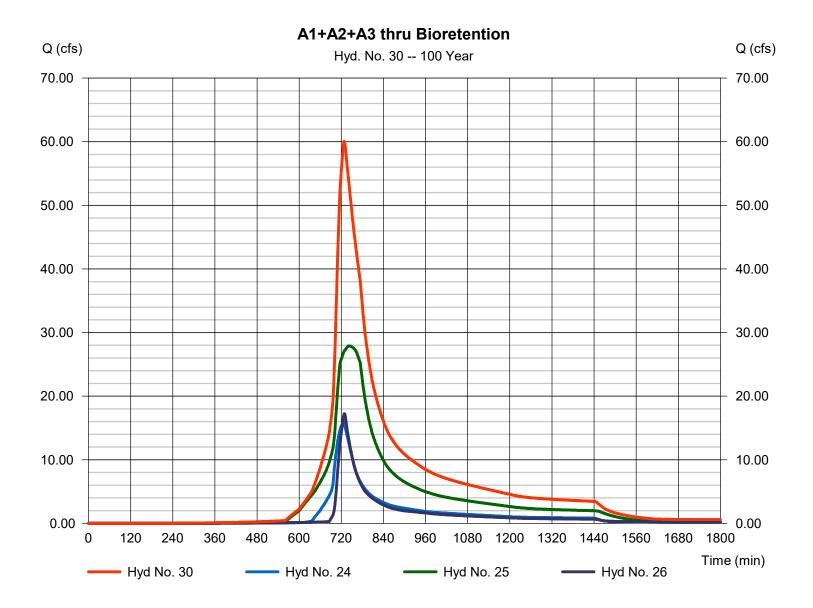


Tuesday, 10 / 1 / 2019

#### Hyd. No. 30

A1+A2+A3 thru Bioretention

Hydrograph type = Combine Peak discharge = 60.05 cfsStorm frequency Time to peak = 100 yrs= 728 min Time interval = 2 min Hyd. volume = 673,641 cuft Inflow hyds. = 24, 25, 26 Contrib. drain. area = 0.000 ac



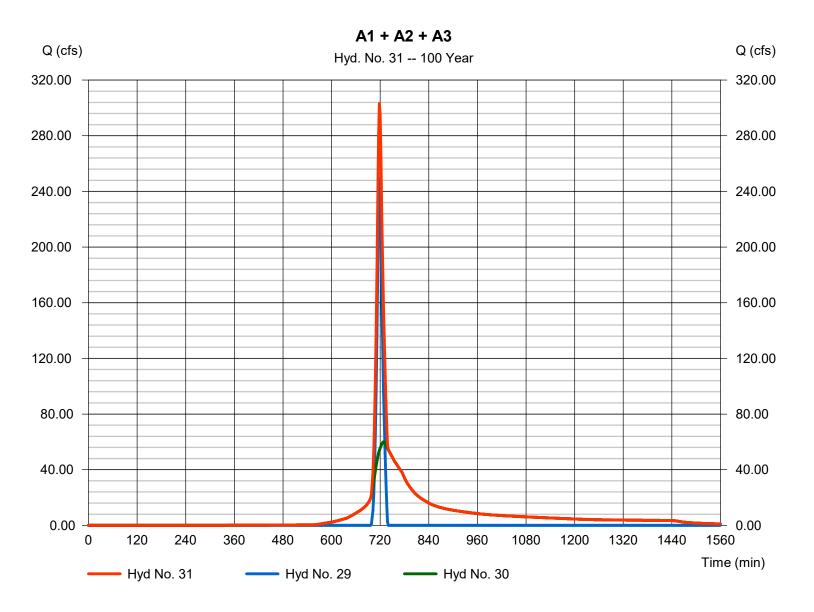
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 10 / 1 / 2019

#### Hyd. No. 31

A1 + A2 + A3

Hydrograph type = Combine Peak discharge = 303.21 cfsStorm frequency Time to peak = 100 yrs= 718 min Time interval = 2 min Hyd. volume = 919,952 cuft Inflow hyds. = 29,30Contrib. drain. area = 0.000 ac



Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

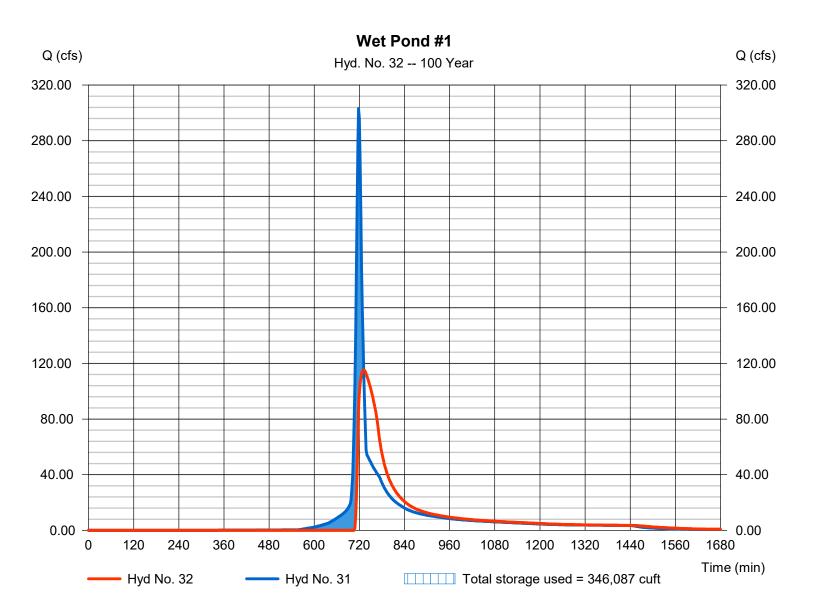
Tuesday, 10 / 1 / 2019

### Hyd. No. 32

Wet Pond #1

Hydrograph type Peak discharge = 115.23 cfs= Reservoir Storm frequency = 100 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 841,211 cuft = 31 - A1 + A2 + A3Max. Elevation Inflow hyd. No.  $= 406.00 \, \text{ft}$ = Wet Pond #1 Reservoir name Max. Storage = 346,087 cuft

Storage Indication method used. Wet pond routing start elevation = 400.00 ft.

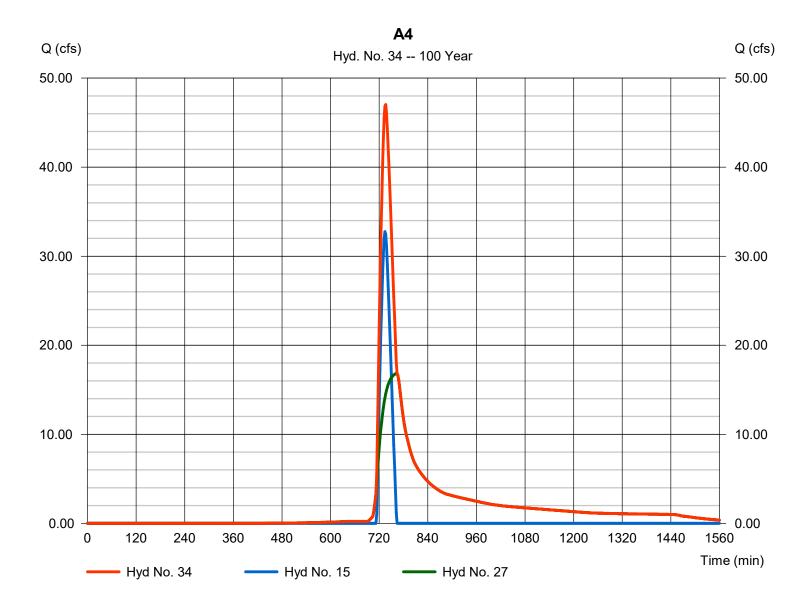


Tuesday, 10 / 1 / 2019

#### Hyd. No. 34

Α4

Hydrograph type = Combine Peak discharge = 47.03 cfsStorm frequency = 100 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 227,019 cuft Inflow hyds. = 15, 27 Contrib. drain. area = 0.000 ac



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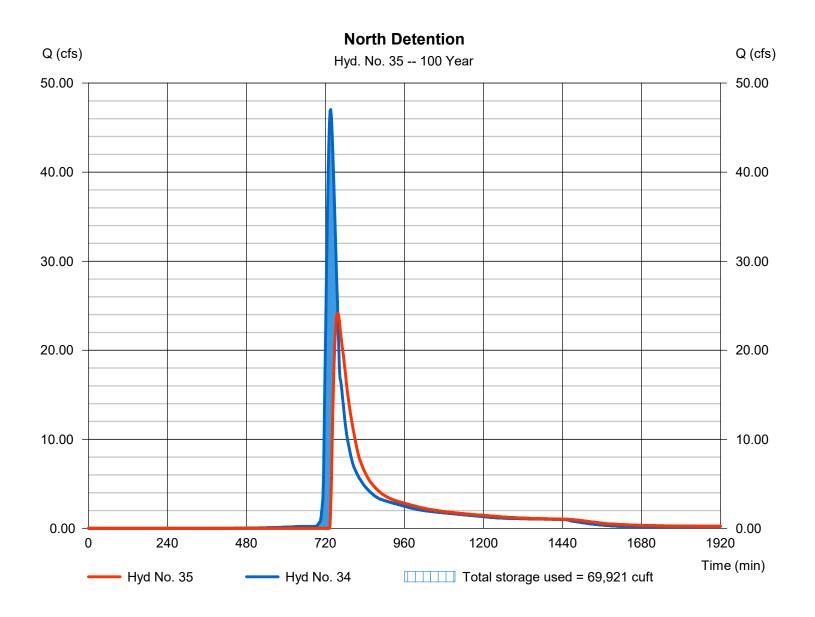
Tuesday, 10 / 1 / 2019

### Hyd. No. 35

North Detention

= Reservoir Hydrograph type Peak discharge = 24.15 cfsStorm frequency = 100 yrsTime to peak = 758 min Time interval = 2 min Hyd. volume = 191,167 cuft Max. Elevation = 404.75 ftInflow hyd. No. = 34 - A4= 69,921 cuft Reservoir name = Dry Detention #1 Max. Storage

Storage Indication method used.



Tuesday, 10 / 1 / 2019

#### Hyd. No. 37

Total WS A

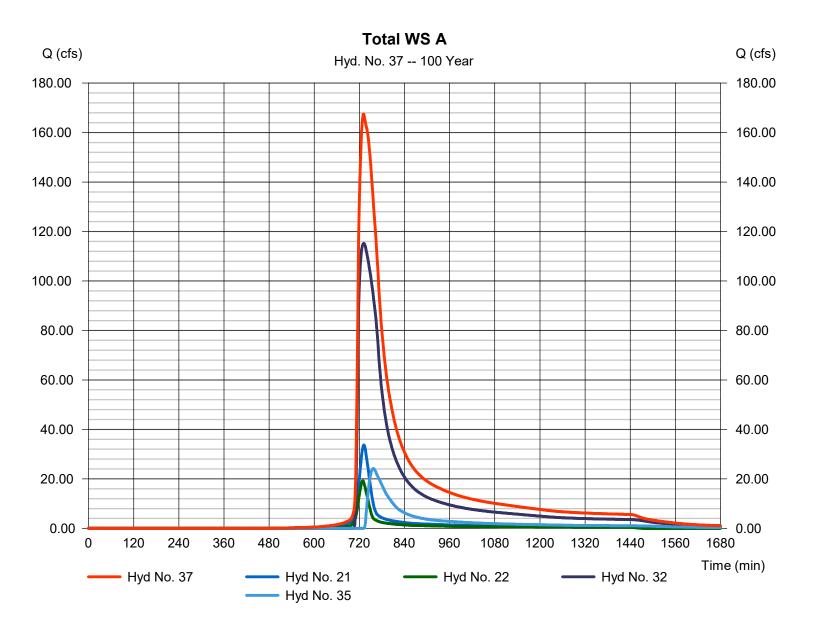
Hydrograph type = Combine Storm frequency = 100 yrsTime interval = 2 min

Inflow hyds.

= 21, 22, 32, 35

Peak discharge = 167.43 cfsTime to peak = 730 min Hyd. volume = 1,234,606 cuft

Contrib. drain. area = 8.310 ac

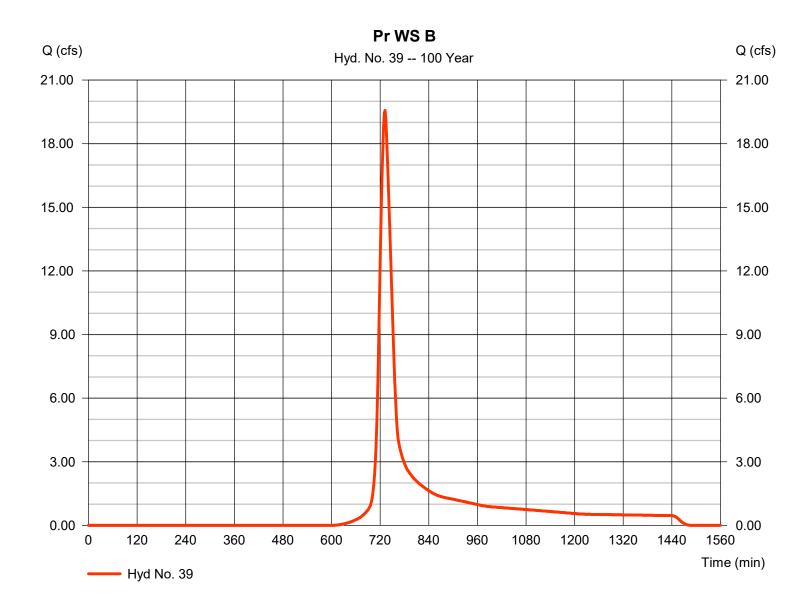


Tuesday, 10 / 1 / 2019

#### Hyd. No. 39

Pr WS B

Hydrograph type = SCS Runoff Peak discharge = 19.57 cfsStorm frequency = 100 yrsTime to peak = 732 min Time interval = 2 min Hyd. volume = 80.489 cuft Drainage area = 9.900 acCurve number = 67 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) = 27.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484

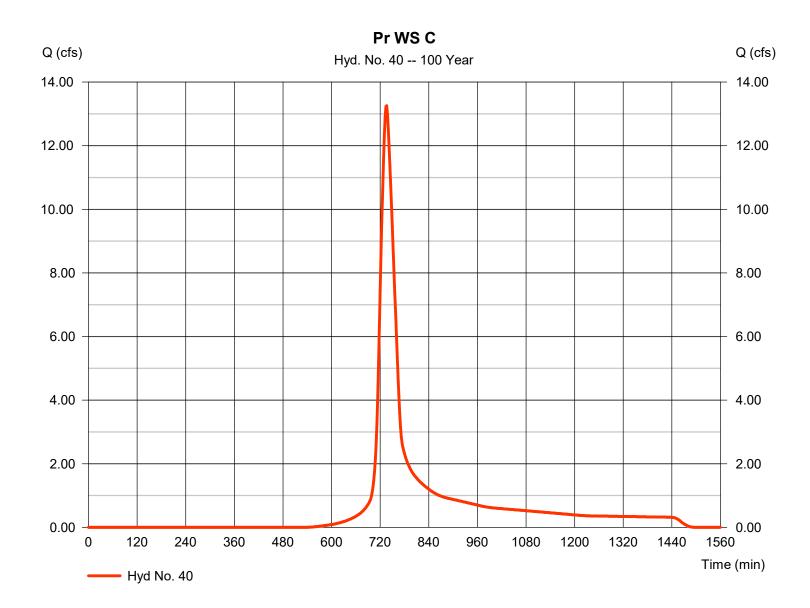


Tuesday, 10 / 1 / 2019

#### Hyd. No. 40

Pr WS C

Hydrograph type = SCS Runoff Peak discharge = 13.26 cfsStorm frequency = 100 yrsTime to peak = 736 min Time interval = 2 min Hyd. volume = 60,727 cuftDrainage area = 6.320 acCurve number = 72 Hydraulic length = 0 ftBasin Slope = 0.0 %Tc method Time of conc. (Tc) = 34.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484

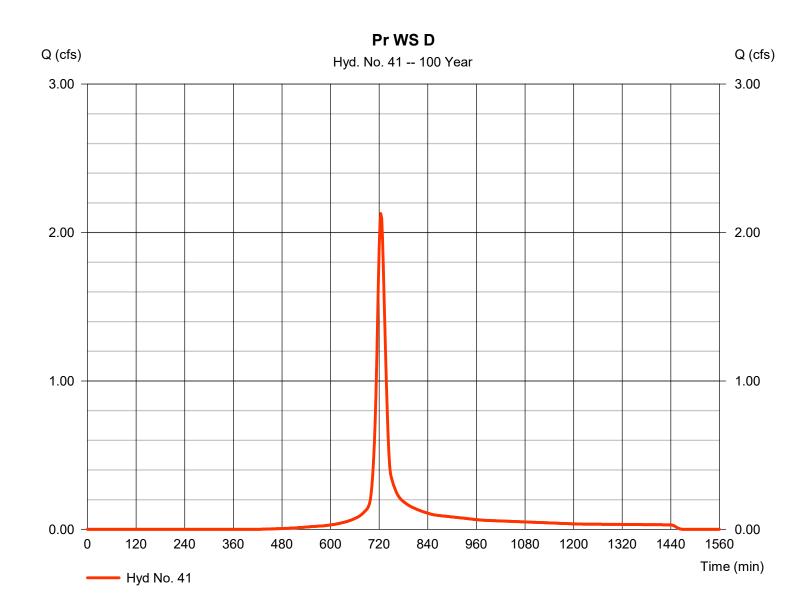


Tuesday, 10 / 1 / 2019

#### Hyd. No. 41

Pr WS D

Hydrograph type = SCS Runoff Peak discharge = 2.127 cfsStorm frequency = 100 yrsTime to peak = 724 min Time interval = 2 min Hyd. volume = 6,655 cuftDrainage area Curve number = 79 = 0.550 ac= 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 20.00 min = User Total precip. = 5.61 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



Proposed Distribution Facility Project 7211 and 7219 Morgan Road Town of Clay, Onondaga County, New York

## Appendix I

Post-Construction Inspection and Maintenance



1.

## **Post Construction Inspection and Maintenance Site Checklist**

	_	opes (any slope 3:1 or steeper)			
(Fre	_	ncy: Annual)	Yes	No	NA
a.		etation and ground cover adequate.			$\sqcup$
	i.	Minimum 80% ground cover.			Ш
		Maintenance: Topsoil, rake and seed bare areas. Remove			
		any dead or dying plants and decaying plant material.			
		Replace dead and dying plants.			
	ii.	Excessively tall grass (greater than 6" in height)	Ш		Ш
		Maintenance: Mow slopes 3:1 or flatter to have a grass			
		height of 4" to 6". Increase mowing frequency as			
		necessary. Steep slopes planted with meadow mix as			
		shown on the approved plans do not have to be mowed.			
	iii.	Unauthorized plants.		Ш	Ш
		Maintenance: Remove any unauthorized plants, including			
		roots. Do not use herbicides. Topsoil, rake and seed the			
la.	Clara	area disturbed by their removal.			
b.		e erosion.	H	H	H
	I.	Small bare areas (min. 50 square feet).	Ш	Ш	Ш
	ii.	<u>Maintenance</u> : Topsoil, rake and seed bare areas.  Ruts less than 12" wide.			
	11.				Ш
		<u>Maintenance</u> : Prior to making any repairs, identify the source of erosion and correct. Protect the slopes prior to any work			
		occurring. Backfill ruts and compact soil. Topsoil, rake and			
		seed bare areas. Alternatively, hydroseeding can be used to			
		seed the slope.			
	iii.	Ruts greater than 12" wide.			
	1111.	Maintenance: Prior to making any repairs, identify the source	Ш	ш	ш
		of erosion and correct. Protect the slopes prior to any work			
		occurring. Re-grade, backfill ruts and compact soil. Install			
		erosion control mats on slopes 3:1 or steeper to protect the			
		re-graded slope. Topsoil, rake and seed bare areas. Inspect			
		on a weekly basis until 80% ground cover is achieved.			
		Alternatively, hydroseeding can be used to seed the slope.			
C.	Une	ven settling			
		ntenance: Visually inspect for uneven settling. Classify the			
		ling based upon the categories below.			
	i.	Greater than 0" but less than 2" of settling.			
		Maintenance: No immediate action required. Re-inspect in 6	_		
		months.			
	ii.	Greater than 2" but less than 4" of settling.			
		Maintenance: Immediately repair. Re-grade and compact the	_	_	
		soil. Topsoil, rake and seed the area. Re-inspect in 6			
		months.			

			ribution Facility Project New York		Appe	ndix I
		a Cou				Site
		iii.	Greater than 4" of settling. <u>Maintenance</u> : Immediately stabilize the area and consult a  NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.	Yes	No 🗌	NA
2.	Swa	ales		Yes	No	NA
	(Fre	quen	ncy: Annual)			
	a.	Inflo	w Points			
		i.	Vegetation and ground cover adequate. <u>Maintenance</u> : Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the			
		ii.	disturbed area by their removal.  Free from erosion/undercutting.  Maintenance: Immediately stabilize and repair any areas where erosion around has occurred. Rake and seed the area. Seed mixture shall meet the seed mixture requirements			
		iii.	specified on the approved plans. Rip rap in good condition.			
			Maintenance: Replace stone, as necessary.		ш	Ш
		iv.	No evidence of sediment buildup. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when the depth is 20% of swale design depth.			
	b.	Che	ck Dams			
		i.	No evidence of sediment buildup. <u>Maintenance</u> : Remove accumulated sediment behind dams			
		ii.	when sediment depth is one-third the dam height. Stone in good condition.			
			Maintenance: Replace stone, as necessary.			
		iii.	No evidence of erosion <u>Maintenance</u> : Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.			
	C.	Ene	rgy Dissipaters			
		i.	No evidence of sediment buildup. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when half of the void space is filled.			
		ii.	Rip rap in good condition.			
			Maintenance: Replace stone, as necessary.			
		iii.	No evidence of erosion. <u>Maintenance</u> : Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.			

#### Notes:

- 1. The site must be returned to the approved conditions when any repairs are made.
- 2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
- 3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
- 4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.

Comments:			
Actions to be taken:			

# Post Construction Inspection and Maintenance Checklist Bioretention Basin

1.	Em	bank	ment			
	(Fre	quer	ncy: Annual)	Yes	No	NA
	a.	Veg	etation and ground cover adequate.			
		i.	Minimum 80% ground cover.			
			Maintenance: Topsoil, rake and seed bare areas. Replace	_		
			dead and dying plants.			
		ii.	Excessively tall grass (greater than 6" in height)			
			Maintenance: Mow grass to have a height of 4" to 6".			
			Increase mowing frequency as necessary.			
		iii.	Unauthorized plants.			
			Maintenance: Remove any unauthorized plants, including			
			roots. Do not use herbicides. Topsoil, rake and seed the			
			area disturbed by their removal.			
	b.	Slop	pe erosion.			
		i.	Small bare areas (min. 50 square feet).			
			Maintenance: Topsoil, rake and seed bare areas.			
		ii.	Ruts less than 12" wide.			
			Maintenance: Prior to making any repairs, identify the source			
			of erosion and correct. Protect the slopes prior to any work			
			occurring. Backfill ruts and compact soil. Topsoil, rake and			
			seed bare areas. Alternatively, hydroseeding can be used to			
			seed the slope.		_	
		iii.	Ruts greater than 12" wide.			
			Maintenance: Prior to making any repairs, identify the source			
			of erosion and correct. Protect the slopes prior to any work			
			occurring. Re-grade, backfill ruts and compact soil. Install			
			erosion control mats on slopes 3:1 or steeper to protect the			
			re-graded slope. Topsoil, rake and seed bare areas. Inspect			
			on a weekly basis until 80% ground cover is achieved.			
			Alternatively, hydroseeding can be used to seed the slope.			_
	C.		ven settling			
			ntenance: Install permanent benchmarks or other permanent			
			rence point in each practice to be used with as-built elevations			
		_	neasure uneven settling.			
		i.	Greater than 0" but less than 2" of settling.	Ш		
			Maintenance: No immediate action required. Re-inspect in 6			
			months.			
		II.	Greater than 2" but less than 4" of settling.			

<u>Maintenance</u>: Immediately repair. Re-grade and compact the soil. Topsoil, rake and seed the area. Re-inspect in 6 months.

		iii. Greater than 4" of settling. <u>Maintenance</u> : Immediately stabilize the area and consult a  NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.	Yes	No	
	d.	Animal burrows.  Maintenance: Fill animal burrows with similar material to the existing material and compact. Rake and seed the area.			
	e.	Cracking, bulging, or sliding of slope.  i. Upstream face.  ii. Downstream face.  iii. At or beyond downstream toe.  iv. At or beyond upstream toe.  v. Emergency spillway.  Maintenance: Immediately stabilize the slope and consult an NYS  Licensed Professional Engineer within 2 weeks before making any additional repairs.			
	f.	Seeps/leaks at downstream face. <u>Maintenance</u> : Look for changes in the color of the vegetation, plant species and their density to help locate the leak source.			
	g.	Rip rap slope protection failure. <u>Maintenance</u> : Stabilize slope, re-grade and compact the soil.  Replace stone as necessary.			
	i.	Emergency spillway clear of any obstructions or debris.  Maintenance: Remove and properly dispose of any trash and debris. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.			
2.		ow Points			
	(Fre	Vegetation and ground cover adequate. <u>Maintenance</u> : Reseed bare areas. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots.  Do not use any herbicides. Topsoil, rake and seed the disturbed area by their removal.	Yes	No	NA
	b.	Free from erosion/undercutting.			

	c.	eros mix the Rip	intenance: Immediately stabilize and repair any areas where sion around has occurred. Rake and seed the area. Seed ture shall meet the seed mixture requirements specified on approved plans.  rap in good condition.  intenance: Replace stone, as necessary.			
	d.	<u>Mai</u> sev	es free from damage, corrosion, and sediment.  intenance: Immediately repair any damaged pipes. If pipes are erely damaged and cannot be repaired, replace the pipes.  move and properly dispose of any sediment.	Yes	No	NA
3.	Out	let S	Structure/Overflow Spillway			
			ncy: Annual)	Yes	No	NA
	a.	i	let structure in good condition. In good condition, no need for repairs.	H	H	H
		١.	a. Cracks or displacement	H	H	H
			Maintenance: Repair any minor cracks or displacement.			
			Replace structure if major cracks or displacement is			
			observed.			
			b. Minor spalling (<1").	Ш	Ш	Ш
			<u>Maintenance</u> : Repair any minor spalling observed.  c. Major spalling (rebars exposed).			
			c. Major spalling (rebars exposed). <u>Maintenance</u> : Replace structure.	Ш	Ш	Ш
			d. Joint failures.			
			Maintenance: Replace structure.			
			e. Water tightness.			
			Maintenance: Reseal structure for water tightness if			
			minor leaks are observed. Replace structure if significant			
		::	leaks are observed.			
		ii.	Clear of sediment. <u>Maintenance</u> : Remove and properly dispose of any	Ш	Ш	Ш
			accumulated sediment when at 50% of sump height.			
		iii.	Clear of debris and trash.			
			Maintenance: Remove and properly dispose of any debris and	_		
			trash.	_	_	_
		iv.	Pipes free from damage, corrosion, and sediment.			Ш
			Maintenance: Immediately repair any damaged pipes. If			
			pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.			
	b.	Ove	erflow spillway			
	∼.	J V C		ш		-

4.

Maintenance: Replace stone, as necessary.			
ii. Clear of sediment.			
Maintenance: Remove and properly dispose of any	_		_
accumulated sediment when half of the void space is filled.			_
iii. Clear of debris and trash.	. $\square$		Ш
Maintenance: Remove and properly dispose of any debris and	d		
trash.			
· No in the contract of the con	Yes	No	NA
iv. No evidence of erosion.	Ш	Ш	Ш
Maintenance: Immediately stabilize and repair any areas where erosion occurred around or below the overflow			
spillway. Replace stone, as necessary. Topsoil, rake and			
seed the area.			
v. No evidence of erosion at downstream toe of drop structure			
or weir spillway.			ш
Maintenance: Immediately stabilize and repair any areas			
where erosion has occurred. Replace stone, as necessary.			
Topsoil, rake and reseed.			
Check Dams/Energy Dissipaters/Swales			
(Frequency: Annual)	Yes	No	NA
a. Check Dams			
d. Chook Barrie	$\vdash$	ш	ш
i. No evidence of sediment buildup.			
i. No evidence of sediment buildup.  Maintenance: Remove accumulated sediment behind dams			
Maintenance: Remove accumulated sediment behind dams			
Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.			
<ul><li><u>Maintenance</u>: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li><li>ii. Stone in good condition.</li></ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary.</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> <li>b. Energy Dissipaters</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> <li>b. Energy Dissipaters  i. No evidence of sediment buildup.</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> <li>b. Energy Dissipaters  i. No evidence of sediment buildup.  Maintenance: Remove and properly dispose of any</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> <li>b. Energy Dissipaters  i. No evidence of sediment buildup.  Maintenance: Remove and properly dispose of any accumulated sediment when half of the void space is filled.</li> </ul>			
<ul> <li>Maintenance: Remove accumulated sediment behind dams when sediment depth is one-third the dam height.</li> <li>ii. Stone in good condition.  Maintenance: Replace stone, as necessary.</li> <li>iii. No evidence of erosion  Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed area.</li> <li>b. Energy Dissipaters  i. No evidence of sediment buildup.  Maintenance: Remove and properly dispose of any</li> </ul>			

			Maintenance: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and reseed.			
	C.	Swa i.	ales No evidence of sediment buildup.			
			<u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when the depth is 20% of swale design depth.			
		ii.	No evidence of erosion.			
			<u>Maintenance</u> : Immediately stabilize. Backfill any ruts and compact the soil. Topsoil, rake and seed the area.			
5.			nt Forebay			
	-	•	ncy: Monthly)	Yes	No	NA
	a.		e of sediment.		Ш	Ш
			intenance: Remove and properly dispose of any accumulated liment when at 50% of the design capacity.			
	b.		evidence of erosion.			
	ο.	_	intenance: Immediately stabilize and repair any areas where	ш		ш
			sion has occurred. Topsoil, rake and seed the area.			
	C.	Ove	erflow Spillway.			
		i.	In good working condition, no need for repairs.			
			Maintenance: Replace stone, as necessary.			
		II.	Clear of sediment.			Ш
			<u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when half of the void space is filled.			
		iii.	Clear of trash and debris.			
			Maintenance: Remove and properly dispose of any debris and	Ш	Ш	ш
			trash.			
		iv.	No evidence of erosion.			
			Maintenance: Immediately stabilize and repair any areas			
			where erosion occurred around or below the overflow			
			spillway. Replace stone, as necessary. Topsoil, rake and			
		٧.	seed the area.  No evidence of erosion at downstream toe of drop structure			
		٧.	or weir spillway.			Ш
			Maintenance: Immediately stabilize and repair any areas			
			where erosion has occurred. Replace stone, as necessary.			
			Topsoil, rake and seed the area.			

6.		oris Cleanout equency: Monthly)	Yes	No	NA
	a.	Contributing areas clean of debris. <u>Maintenance</u> : Remove and properly dispose of any trash and debris.			
	b.	No dumping of yard wastes into practice. <u>Maintenance</u> : Remove any yard wastes. Remind any maintenance personnel, landscapers, etc. to properly dispose of any yard			
	C.	wastes. Clear of debris and litter. <u>Maintenance</u> : Remove and properly dispose of any trash and debris.			
7.	(Fre	retention Basin Vegetation equency: Monthly)	Yes	No	ŅΑ
	a.	Plant height not less than design water depth of 3". <u>Maintenance</u> : Remove any plants that have heights less than 3".  Replace with plants specified on the approved plans that have a minimum height of 3".			
	b.	Plant composition according to approved plans. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.			
	C.	No placement of unapproved plants. <u>Maintenance</u> : Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides.			
	d.	Grass height not greater than 6". <u>Maintenance</u> : Mow grass. Increase frequency of mowing as			
	e.	necessary to keep grass heights less than 6".  Sparse or bare vegetation in more than 10% of bioretention area. <u>Maintenance</u> : Install replacement plants, as necessary. Topsoil, rake and seed the area.			
	f.	Nuisance weeds or vegetation taking over more than 25% of the basin.  Maintenance: Remove any nuisance weeds and vegetation, including their roots. Do not use any herbicides. Topsoil, rake and seed the disturbed area			
	g.	Mulch is in good condition and the appropriate thickness.			

<u>Maintenance</u>: Replace decomposed mulch to the thickness shown on the approved plans.

<b>(Fr</b> a.	eretention Basin Dewatering equency: Monthly)  Dewaters between storms.	Yes	No	NA
	Maintenance: If filter bed is clogged or draining poorly, remove top few inches of discolored filter media. Rake the remaining material			
b.	and replace the removed filter bed media.  No evidence of standing water 48 or more hours after a rainfall.  Maintenance: If standing water covers more than 15% of the planting bed 48 hours after a rainfall, remove top few inches of planting bed media. Rake the filter bed media to loosen the soil. Recheck after next rainfall event. If still not dewatering fully after 48 hours, remove and replace the entire filter bed media. If problem persists, contact a NYS licensed Professional Engineer.			
C.	Underdrain present and no evidence of standing water 48 or more hours after a rainfall.	Yes	No	NA
	Maintenance: Flush underdrain system to remove any trapped sediment. If no sediment is present, remove top few inches of planting bed media. Rake the filter bed media to loosen the soil. Recheck after next rainfall event. If still not dewatering fully after 48 hours, remove entire filter bed material and check the gravel drainage layer for clogging. Replace filter bed media and gravel drainage layer with new material. If problem persists, contact a NYS licensed Professional Engineer.			
	oretention Basin Filter Bed Integrity	Vaa	No	NIA
a.	equency: Annual)  Filter bed has not been blocked or filled inappropriately.  Maintenance: Remove all blockages and inappropriate fill. Restore filter bed to elevation shown on the approved plans.	Yes	No	NA
b.	Filter bed flat and level.  Maintenance: Remove all blockages, inappropriate fill, or accumulated sediment if present. Check embankment for differential settlement. If differential settlement is noted, refer to			

		is noted, valve and level the planting bad modify so that it is flat and
		is noted, rake and level the planting bed media so that it is flat and level.
	_	
	C.	Uneven ponding.  Maintenance: Remove all blockages, inappropriate fill, or accumulated sediment if present. Check embankment for differential settlement. If differential settlement is noted, refer to Item 1.c for maintenance procedures. If no differential settlement is noted, rake and level the planting bed media so that it is flat and level.
Note	·6.	
	_	ne site must be returned to the approved conditions when any repairs are made.
2	. U	nauthorized plants are any plants that are growing or have been installed that are not of the plants shown on the approved plans.
3	. А	Il seed mixtures shall meet the seed mixture requirements specified on the approved ans.
4		eplace any dead or dying plants with plants specified in the planting schedule shown in the approved plans.
5	. R	eplaced stone shall meet the stone requirements specified on the approved plans.
6		eplaced filter bed media shall meet the filter bed media requirements specified on the oproved plans.
7		eplaced gravel drainage layer shall meet the gravel drainage layer requirements becified on the approved plans.
Com	mer	nts:
-		
-		
Actic	ons t	to be taken:

## Post Construction Inspection and Maintenance Checklist Stormwater Pond

1.		bankment equency: Annual)	Yes	No	NA
	<b>.</b> а.				
		i. Minimum 80% ground cover.			
		Maintenance: Topsoil, rake and seed bare areas. Replace			
		dead and dying plants.			
		ii. Excessively tall grass (greater than 6" in height)			
		Maintenance: Mow grass to have a height of 4" to 6".			
		Increase mowing frequency as necessary.			
		iii. Unauthorized plants.			Ш
		<u>Maintenance</u> : Remove any unauthorized plants, including			
		roots. Do not use herbicides. Topsoil, rake and seed the			
		area disturbed by their removal.			
	b.	Slope erosion.	$\square$	$\Box$	
		i. Small bare areas (min. 50 square feet).			
		Maintenance: Topsoil, rake and seed bare areas.			
		ii. Ruts less than 12" wide.			
		Maintenance: Prior to making any repairs, identify the source			
		of erosion and correct. Protect the slopes prior to any work			
		occurring. Backfill ruts and compact soil. Topsoil, rake and			
		seed bare areas. Alternatively, hydroseeding can be used to			
		seed the slope.			
		iii. Ruts greater than 12" wide.		Ш	Ш
		Maintenance: Prior to making any repairs, identify the source			
		of erosion and correct. Protect the slopes prior to any work occurring. Re-grade, backfill ruts and compact soil. Install			
		erosion control mats on slopes 3:1 or steeper to protect the			
		re-graded slope. Topsoil, rake and seed bare areas. Inspect			
		on a weekly basis until 80% ground cover is achieved.			
		Alternatively, hydroseeding can be used to seed the slope.			
	C.	Uneven settling			
	٥.	Maintenance: Install permanent benchmarks or other permanent			
		reference point in each practice to be used with as-built elevations			
		to measure uneven settling.			
		i. Greater than 0" but less than 2" of settling.			
		Maintenance: No immediate action required. Re-inspect in 6		_	
		months.			
		ii. Greater than 2" but less than 4" of settling.			
		Maintenance: Immediately repair. Re-grade and compact the			
		soil. Topsoil, rake and seed the area. Re-inspect in 6			
		months.			

2.

	iii. Greater than 4" of settling. <u>Maintenance</u> : Immediately stabilize the area and consult a  NYS Licensed Professional Engineer within 2 weeks before	Tes		
d.	making any additional repairs.  Animal burrows.  Maintenance: Fill animal burrows with similar material to the			
e.	existing material and compact. Topsoil, rake and seed the area.  Cracking, bulging, or sliding of slope.  i. Upstream face.  ii. Downstream face.  iii. At or beyond downstream toe.  iv. At or beyond upstream toe.  v. Emergency spillway.			
f.	<u>Maintenance</u> : Immediately stabilize the slope and consult an NYS Licensed Professional Engineer within 2 weeks before making any additional repairs.  Seeps/leaks at downstream face.			
g.	Maintenance: Look for changes in the color of the vegetation, plant species and their density to help locate the leak source.  Rip rap slope protection failure.  Maintenance: Stabilize slope, re-grade and compact the soil.			
i.	Replace stone, as necessary. Emergency spillway clear of any obstructions or debris.  Maintenance: Remove and properly dispose of any trash and debris. Remove any unauthorized plants, or any nuisance weeds and vegetation, including their roots. Do not use any herbicides.			
	Topsoil, rake and seed the area disturbed by their removal.  ow Points quency: Annual)  Vegetation and ground cover adequate.  Maintenance: Reseed bare areas. Remove any unauthorized	Yes	No	NA
b.	plants or any nuisance weeds and vegetation, including their roots.  Do not use any herbicides. Topsoil, rake and seed the area disturbed by their removal.  Free from erosion/undercutting.  Maintenance: Immediately stabilize and repair any areas where			
c. d.	erosion around has occurred. Topsoil, rake and seed the area. Rip rap in good condition.  Maintenance: Replace stone, as necessary. Pipes free from damage, corrosion, and sediment.			
	<u>Maintenance</u> : Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace the pipes. Remove and properly dispose of any sediment.			

3.

		tructure.	/Overflow Spillway	Yes	No	NA
a.	_	r pipe	iuai)			
a.	i.	In good	condition, no need for repairs. nance: Repair any minor damages. Replace structure			
			cant damages are observed.			
	ii.		sediment.			
			nance: Remove and properly dispose of any			
	iii.		lated sediment when at 50% of sump height. debris and trash.			
			nance: Remove and properly dispose of any debris and		Ш	
		trash.				
b.	Con	crete out	tlet structure			
	i.	In good	condition, no need for repairs.	同	Ħ	同
		_	cks or displacement.	П	一	同
			intenance: Repair any minor cracks. If minor		_	
			placement is observed, re-inspect in 6 months.			
			place structure if major cracks or significant			
			placement is observed.			
			nor spalling (<1").			
		<u>Ma</u>	<u>intenance</u> : Repair any minor spalling.			
		c. Ma	jor spalling (rebars exposed).			
			<u>intenance</u> : Replace structure.	_	_	
		d. Joir	nt failures.			
			<u>intenance</u> : Replace structure.			
			ter tightness.			
			intenance: Reseal structure for water tightness if			
			nor leaks are observed. Replace structure if significant			
			ks are observed.			_
	ii.		sediment.			
			nance: Remove and properly dispose of any			
			lated sediment when at 50% of sump height.			
	iii.		debris and trash.			Ш
		-	nance: Remove and properly dispose of any debris and			
		trash.				
	iv.		ee from damage, corrosion, and sediment.		Ш	Ш
			nance: Immediately repair any damaged pipes. If			
			re severely damaged and cannot be repaired, replace			
			es. Remove and properly dispose of any sediment.			
C.			fice is unobstructed.			
			e: Remove and properly dispose of any debris and			
	tras	٦.				

d.	Low flow trash rack.  i. Clear of debris and trash.  Maintenance: Remove and properly dispose of any debris and			
	trash.  ii. Clear of any corrosion.  Maintenance: If significant corrosion is observed, replace			
e.	trash rack. Weir trash rack. i. Clear of debris and trash.  Maintenance: Remove and properly dispose of any debris and trash.			
	ii. Clear of any corrosion. <u>Maintenance</u> : If significant corrosion is observed, replace trash rack.			
f.	Control valve operational.  Maintenance: Replace if not functioning or operational.			
g.	Pond valve operational, chained and locked. <u>Maintenance</u> : Replace valve if not functioning or operational.			
h.	Overflow spillway i. In good condition, no need for repairs. <u>Maintenance</u> : Replace any dislodged stone with the same			
	stone type. ii. Clear of sediment. <u>Maintenance</u> : Remove and properly dispose of any			
	<ul> <li>accumulated sediment when half of the void space is filled.</li> <li>iii. Clear of debris and trash.</li> <li>Maintenance: Remove and properly dispose of any debris and trash.</li> </ul>			
	iv. No evidence of erosion. <u>Maintenance</u> : Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and seed the area.			
	v. No evidence of erosion at downstream toe of drop structure or weir spillway. <u>Maintenance</u> : Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.			
	liment Forebay equency: Monthly) Free of sediment.  Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.	Yes	No	NA

	b.	No evidence of erosion.	Yes	No	NA
		<u>Maintenance</u> : Immediately stabilize and repair any areas where erosion has occurred. Topsoil, rake and seed the area.		_	
	C.	Overflow Spillway.			
		i. In good working condition, no need for repairs.			
		Maintenance: Replace stone, as necessary.			
		<ul><li>ii. Clear of sediment.</li><li><u>Maintenance</u>: Remove and properly dispose of any</li></ul>		Ш	Ш
		accumulated sediment when half of the void space is filled.			
		iii. Clear of trash and debris.			
		<u>Maintenance</u> : Remove and properly dispose of any debris and			
		<i>trash.</i> iv. No evidence of erosion.			
		<u>Maintenance</u> : Immediately stabilize and repair any areas		Ш	
		where erosion occurred around or below the overflow			
		spillway. Replace stone, as necessary. Topsoil, rake and			
		seed the area.			
		v. No evidence of erosion at downstream toe of drop structure or weir spillway.		Ш	
		<u>Maintenance</u> : Immediately stabilize and repair any areas			
		where erosion has occurred. Replace stone, as necessary.			
		Topsoil, rake and seed the area.			
5.	Per	manent Pool (Wet Ponds)			
		equency: Monthly)	Yes	No	NA
	(Fre	equency: Monthly) Undesirable vegetative growth.	Yes	No	NA
		equency: Monthly) Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove	Yes	No	NA
		equency: Monthly) Undesirable vegetative growth.	Yes	No	NA
	a.	Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.	Yes	No	NA
		Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required.	Yes	No	NA
	a.	Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required.  Maintenance: Remove and properly dispose of any debris and	Yes	No	NA
	a.	Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required.  Maintenance: Remove and properly dispose of any debris and trash.	Yes	No	NA
	a. b.	Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.  Visible pollution. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or	Yes	No	<b>NA</b>
	a. b.	Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required.  Maintenance: Remove and properly dispose of any debris and trash.  Visible pollution.  Maintenance: Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.	Yes	No	NA
	a. b.	Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.  Visible pollution. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.  Erosion occurring along shoreline.	Yes	No	<b>NA</b>
	a. b.	Undesirable vegetative growth.  Maintenance: Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required.  Maintenance: Remove and properly dispose of any debris and trash.  Visible pollution.  Maintenance: Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.	Yes	No	<b>NA</b>
6	a. b. c.	Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.  Visible pollution. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.  Erosion occurring along shoreline. <u>Maintenance</u> : Leave a 10' unmowed vegetated buffer around the perimeter of the permanent pool to help prevent shoreline erosion.	Yes	No	<b>NA</b>
6.	a. b. c.	Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.  Visible pollution. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.  Erosion occurring along shoreline. <u>Maintenance</u> : Leave a 10' unmowed vegetated buffer around the perimeter of the permanent pool to help prevent shoreline erosion.	Yes	No	NA
6.	a. b. c.	Undesirable vegetative growth. <u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.  Floating or floatable debris removal required. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.  Visible pollution. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.  Erosion occurring along shoreline. <u>Maintenance</u> : Leave a 10' unmowed vegetated buffer around the perimeter of the permanent pool to help prevent shoreline erosion.	Yes	No	NA

	b.	Undesirable vegetative growth.	Yes	No	NA
		<u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and			
	C.	seed the area disturbed by their removal. Undesirable woody vegetation. <u>Maintenance</u> : Remove any undesirable woody vegetation, including their roots. Do not use herbicides. Topsoil, rake and			
	d.	seed the area disturbed by their removal. Low flow channels clear of obstructions. <u>Maintenance</u> : Remove and properly dispose of any debris and			
	e.	trash. Standing water or wet spots. <u>Maintenance</u> : Re-grade areas to ensure positive drainage. Topsoil,			
	f.	rake and seed the area. Sediment and trash accumulation.  Maintenance: Remove and properly dispose of any accumulated sediment and trash.			
7.	We	tland Vegetation			
		equency: Annual)	Yes	No	NA
	a.	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant			
		material Replace dead and dving plants			
		<ul><li>material. Replace dead and dying plants.</li><li>i. Wetland maintaining 50% surface area coverage of wetland</li></ul>	Yes	No	NA
	h	<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.</li> <li><u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> </ul>	Yes	No	NA
	b.	<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.  <u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> <li>Dominant wetland plants: <ol> <li>i. Survival of desired wetland plant species.  <u>Maintenance</u>: Remove any dead or dying plants and decaying plant material. Remove any unauthorized plants or any</li> </ol> </li> </ul>	Yes	No	NA
	b.	<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.  <u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> <li>Dominant wetland plants: <ol> <li>i. Survival of desired wetland plant species.</li> <li><u>Maintenance</u>: Remove any dead or dying plants and decaying plant material. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Replace any dead and dying plants.</li> </ol> </li> </ul>	Yes	No	NA
	b.	<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.  <u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> <li>Dominant wetland plants: <ol> <li>i. Survival of desired wetland plant species.  <u>Maintenance</u>: Remove any dead or dying plants and decaying plant material. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Replace any dead and dying plants.</li> <li>ii. Distribution according to landscaping plan.  <u>Maintenance</u>: Install additional wetland plants as necessary.</li> </ol> </li></ul>	Yes	<b>No</b>	NA
	b.	<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.  <u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> <li>Dominant wetland plants: <ol> <li>i. Survival of desired wetland plant species.  <u>Maintenance</u>: Remove any dead or dying plants and decaying plant material. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Replace any dead and dying plants.</li> <li>ii. Distribution according to landscaping plan.  <u>Maintenance</u>: Install additional wetland plants as necessary.</li> </ol> </li> <li>Evidence of invasive species.  <u>Maintenance</u>: Remove invasive species, including roots. Do not</li> </ul>	Yes	<b>No</b>	<b>NA</b>
		<ul> <li>i. Wetland maintaining 50% surface area coverage of wetland plants after second growing season.  <u>Maintenance</u>: If unsatisfactory, install reinforcement plants.</li> <li>Dominant wetland plants: <ol> <li>i. Survival of desired wetland plant species.  <u>Maintenance</u>: Remove any dead or dying plants and decaying plant material. Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Replace any dead and dying plants.</li> <li>ii. Distribution according to landscaping plan.  <u>Maintenance</u>: Install additional wetland plants as necessary.</li> </ol> </li> <li>Evidence of invasive species.</li> </ul>	Yes	<b>No</b>	<b>NA</b>

			Yes	No	NA
	e.	Harvesting of emergent plantings needed. <u>Maintenance</u> : A qualified professional shall identify the plants to			
		be removed.			
	f.	Accumulated sediment reducing pool volume significantly or			
		plants are "choked" with sediment.			
		Maintenance: Remove and properly dispose of any accumulated			
		sediment when at 50% of the design capacity. A bathymetric			
		study may be necessary to determine the amount of water and			
	~	accumulated sediment in the pond.			
	g.	Eutrophication level of wetland. <u>Maintenance</u> : Reduce the amount of phosphorus being applied		Ш	Ш
		upstream starting in early April and through September. Chemical			
		treatments can be applied; however, consult a NYS licensed			
		Professional Engineer prior to starting any treatments as chemical			
		treatments may require a permit.			
		, , ,			
8.	Mis	cellaneous			
	(Fre	equency: Monthly)	Yes	No	NΑ
	(Fre	equency: Monthly) Encroachment on pond or easement area.	Yes	No	NA
		equency: Monthly) Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or	Yes	No	NA
		equency: Monthly) Encroachment on pond or easement area.			
	a.	Equency: Monthly) Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or easement area.	Yes  Yes	No	NA 
		Equency: Monthly)  Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.			
	a.	Equency: Monthly)  Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the			
	a.	Equency: Monthly)  Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is			
	a.	Equency: Monthly)  Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access			
	a. b.	Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.			
	a.	Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition. <u>Maintenance</u> : Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.  Signs of hydrocarbon build-up.			
	a. b.	Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.  Signs of hydrocarbon build-up.  Maintenance: Coordinate removal/cleanup of any oil, gas, or			
	a. b.	Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition. <u>Maintenance</u> : Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.  Signs of hydrocarbon build-up. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.			
	a. b.	Encroachment on pond or easement area.  Maintenance: Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition.  Maintenance: Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.  Signs of hydrocarbon build-up.  Maintenance: Coordinate removal/cleanup of any oil, gas, or			
	a. b.	Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or easement area.  Maintenance access routes in good condition. <u>Maintenance</u> : Repair any minor damage or erosion to the maintenance access routes. If significant damage or erosion is noted, stabilize, re-grade and re-establish the maintenance access routes in accordance with the plans.  Signs of hydrocarbon build-up. <u>Maintenance</u> : Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.  Fence in good condition.			

## Notes:

- 1. The site must be returned to the approved conditions when any repairs are made.
- 2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
- 3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
- 4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.
- 5. Replaced stone shall meet the stone requirements specified on the approved plans.

Comments:			
Actions to be taken:			

1.

## Post Construction Inspection and Maintenance Checklist Dry Detention Basin

		ment	Vaa	NI.	NI A
	_	ncy: Annual)	Yes	No	NA
a.		etation and ground cover adequate.	$\mathbb{H}$	H	H
	i.	Maintagana, Tanail, sake and soud have group.	Ш	Ш	
		Maintenance: Topsoil, rake and seed bare areas. Replace			
		dead and dying plants.			
	ii.	Excessively tall grass (greater than 6" in height)	Ш	Ш	
		Maintenance: Mow grass to have a height of 4" to 6".			
		Increase mowing frequency as necessary.			
	iii.	Unauthorized plants.	Ш	Ш	
		Maintenance: Remove any unauthorized plants, including			
		roots. Do not use herbicides. Topsoil, rake and seed the			
	0.1	area disturbed by their removal.			
b.		e erosion.	$\square$	$\Box$	닏
	1.	Small bare areas (min. 50 square feet).	Ш	Ш	
		Maintenance: Topsoil, rake and seed bare areas.			
	ii.	Ruts less than 12" wide.	Ш		
		Maintenance: Prior to making any repairs, identify the source			
		of erosion and correct. Protect the slopes prior to any work			
		occurring. Backfill ruts and compact soil. Topsoil, rake and			
		seed bare areas. Alternatively, hydroseeding can be used to			
		seed the slope.			
	iii.	Ruts greater than 12" wide.		Ш	
		Maintenance: Prior to making any repairs, identify the source			
		of erosion and correct. Protect the slopes prior to any work			
		occurring. Re-grade, backfill ruts and compact soil. Install			
		erosion control mats on slopes 3:1 or steeper to protect the			
		re-graded slope. Topsoil, rake and seed bare areas. Inspect			
		on a weekly basis until 80% ground cover is achieved.			
		Alternatively, hydroseeding can be used to seed the slope.			
C.		ven settling	Ш		
		ntenance: Install permanent benchmarks or other permanent			
		rence point in each practice to be used with as-built elevations			
	to n	neasure uneven settling.	_	_	_
	i.	Greater than 0" but less than 2" of settling.			
		Maintenance: No immediate action required. Re-inspect in 6			
		months.	_		
	ii.	Greater than 2" but less than 4" of settling.			

<u>Maintenance</u>: Immediately repair. Re-grade and compact the soil. Topsoil, rake and seed the area. Re-inspect in 6 months.

			Yes	No	NA
		iii. Greater than 4" of settling.			
		Maintenance: Immediately stabilize the area and consult a			
		NYS Licensed Professional Engineer within 2 weeks before			
		making any additional repairs.			
	d.	Animal burrows.			
		Maintenance: Fill animal burrows with similar material to the			
		existing material and compact. Topsoil, rake and seed the area.			
	e.	Cracking, bulging, or sliding of slope.			
		i. Upstream face.			
		ii. Downstream face.			
		iii. At or beyond downstream toe.			
		iv. At or beyond upstream toe.			
		v. Emergency spillway.			
		Maintenance: Immediately stabilize the slope and consult an NYS			
		Licensed Professional Engineer within 2 weeks before making any			
		additional repairs.			
	f.	Seeps/leaks at downstream face.			
		Maintenance: Look for changes in the color of the vegetation,			
		plant species and their density to help locate the leak source.			
	g.	Rip rap slope protection failure.			
		Maintenance: Stabilize slope, re-grade and compact the soil.			
		Replace stone, as necessary.			
	i.	Emergency spillway clear of any obstructions or debris.			
		Maintenance: Remove and properly dispose of any trash and			
		debris. Remove any unauthorized plants, or any nuisance weeds			
		and vegetation, including their roots. Do not use any herbicides.			
		Topsoil, rake and seed the area disturbed by their removal.			
2	lfl.	ow Points			
2.		equency: Annual)	Voc	Na	NA
	-		Yes	No	
	a.	Vegetation and ground cover adequate. <u>Maintenance</u> : Reseed bare areas. Remove any unauthorized	Ш	Ш	Ш
		plants or any nuisance weeds and vegetation, including their roots.			
		Do not use any herbicides. Topsoil, rake and seed the area			
		disturbed by their removal.			
	b.	Free from erosion/undercutting.			
	υ.	Maintenance: Immediately stabilize and repair any areas where	Ш	Ш	Ш
		· · · · · · · · · · · · · · · · · · ·			
		erosion around has occurred. Topsoil, rake and seed the area.			

	C.		ap in good		20000000				
	d.	Pipe <u>Mai</u> sev	s free from <u>ntenance</u> : I erely damag	Replace stone, as a damage, corrosion damage, corrosion mediately repail ged and cannot be coperly dispose of	on, and sedime r any damaged <sub>i</sub> e repaired, repla	pipes. If pipes are			
3.	Out	let S	ructure/O	verflow Spillwa	у				
	(Fre	_	cy: Annua	al)			Yes	No	NA
	a.	Rise	r pipe					Ц	닏
		i.	_	ondition, no need t	•		Ш	Ш	Ш
					_	Replace structure			
		ii.	Clear of se	nt damages are o	uservea.		П	П	
				nce: Remove and	properly dispos	e of anv	Ш	Ш	ш
				ted sediment whe					
		iii.	Clear of de	ebris and trash.					
				<u>nce</u> : Remove and	properly dispos	e of any debris and			
	1.	0	trash.				$\Box$		
	b.		crete outlet		for ropoiro		H	H	$\vdash$
		İ.	-	ondition, no need t	•		H	H	H
				s or displacemen <sup>:</sup> <u>tenance</u> : Repair ai		e If minor	Ш	Ш	Ш
				ncement is observ					
				ce structure if ma	·				
				ncement is observ					
			b. Minor	spalling (<1").					
			<u>Maint</u>	<u>tenance</u> : Repair ai	ny minor spallin	g.			
			-	spalling (rebars e	•				
				<u>tenance</u> : Replace	structure.				
				failures.					Ш
				<u>tenance</u> : Replace r tightness.	structure.				
				tenance: Reseal s	tructure for wat	ter tightness if		Ш	ш
						ructure if significant			
				are observed.	,	, and the second			
		ii.	Clear of se	ediment.					
			<u>Maintenar</u>	<u>nce</u> : Remove and	properly dispos	e of any			
				ted sediment whe	en at 50% of sui	mp height.			_
		iii.		ebris and trash.	,				Ш
				<u>ıce</u> : Kemove and	properly dispos	e of any debris and			
			trash.						

	iv.	Pipes free from damage, corrosion, and sediment. <u>Maintenance</u> : Immediately repair any damaged pipes. If pipes are severely damaged and cannot be repaired, replace			
C.	Mai	the pipes. Remove and properly dispose of any sediment. Intenance: Remove and properly dispose of any debris and			
	tras	h.			
			Yes	No	NA
d.		/ flow trash rack.	$\vdash$	님	님
	I.	Clear of debris and trash. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.			Ш
	ii.	Clear of any corrosion. <u>Maintenance</u> : If significant corrosion is observed, replace			
		trash rack.			
e.	Wei	r trash rack.			
	i.	Clear of debris and trash.			
		<u>Maintenance</u> : Remove and properly dispose of any debris and trash.			
	ii.	Clear of any corrosion.			
	".	Maintenance: If significant corrosion is observed, replace	Ш	Ш	Ш
		trash rack.			
f.	Con	trol valve operational.			
		ntenance: Replace if not functioning or operational.			
g.		d valve operational, chained and locked.			Ш
h		ntenance: Replace valve if not functioning or operational.			
h.	i.	erflow spillway In good condition, no need for repairs.	H	H	H
	١.	Maintenance: Replace any dislodged stone with the same	Ш	Ш	Ш
		stone type.			
	ii.	Clear of sediment.			
		Maintenance: Remove and properly dispose of any			
		accumulated sediment when half of the void space is filled.			
	iii.	Clear of debris and trash.			
		Maintenance: Remove and properly dispose of any debris and			
	iv.	trash.  No evidence of erosion.			
	IV.	Maintenance: Immediately stabilize and repair any areas	Ш	Ш	Ш
		where erosion occurred around or below the overflow			

		<ul> <li>spillway. Replace stone, as necessary. Topsoil, rake and seed the area.</li> <li>v. No evidence of erosion at downstream toe of drop structure or weir spillway. <ul> <li><u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.</li> </ul> </li> </ul>			
4.		iment Forebay quency: Monthly) Free of sediment.  Maintenance: Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.	Yes	No	NA
	b.	No evidence of erosion. <u>Maintenance</u> : Immediately stabilize and repair any areas where	Yes	No	NA
	C.	erosion has occurred. Topsoil, rake and seed the area.  Overflow Spillway.  i. In good working condition, no need for repairs.			
		<ul> <li>Maintenance: Replace stone, as necessary.</li> <li>ii. Clear of sediment.</li> <li>Maintenance: Remove and properly dispose of any</li> </ul>			
		iii. Clear of trash and debris.  Maintenance: Remove and properly dispose of any debris and			
		trash.  iv. No evidence of erosion. <u>Maintenance</u> : Immediately stabilize and repair any areas where erosion occurred around or below the overflow spillway. Replace stone, as necessary. Topsoil, rake and			
		<ul> <li>seed the area.</li> <li>v. No evidence of erosion at downstream toe of drop structure or weir spillway. <u>Maintenance</u>: Immediately stabilize and repair any areas where erosion has occurred. Replace stone, as necessary. Topsoil, rake and seed the area.</li> </ul>			
5.	•	Pond Areas quency: Monthly)	Yes	No	NA
	a.	Vegetation adequate.			
	b.	Maintenance: Topsoil, rake and seed the area. Undesirable vegetative growth.			

		<u>Maintenance</u> : Mow grass to have a height of 4" to 6". Remove any unauthorized plants or any nuisance weeds and vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.			
	c.	Undesirable woody vegetation. <u>Maintenance</u> : Remove any undesirable woody vegetation, including their roots. Do not use herbicides. Topsoil, rake and seed the area disturbed by their removal.			
	d.	Low flow channels clear of obstructions. <u>Maintenance</u> : Remove and properly dispose of any debris and trash.			
	e.	Standing water or wet spots.  Maintenance: Re-grade areas to ensure positive drainage. Topsoil, rake and seed the area.			
	f.	Sediment and trash accumulation. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment and trash.			
6.	_	getation equency: Annual)	Yes	No	NA
		aucilev. Alliluai <i>i</i>			
	a.	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant			
		Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.  Evidence of invasive species. <u>Maintenance</u> : Remove invasive species, including roots. Do not			
	a.	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.  Evidence of invasive species.			
7.	a. b. c.	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.  Evidence of invasive species. <u>Maintenance</u> : Remove invasive species, including roots. Do not use herbicides. Install additional wetland plants as necessary.  Accumulated sediment reducing volume significantly. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.			
7.	a. b. c.	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.  Evidence of invasive species. <u>Maintenance</u> : Remove invasive species, including roots. Do not use herbicides. Install additional wetland plants as necessary.  Accumulated sediment reducing volume significantly. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.  cellaneous equency: Monthly)  Encroachment on pond or easement area. <u>Maintenance</u> : Remove any encroachments into the pond or	Yes	No	NA
7.	a. b. c. Mis	Vegetation health and growing. <u>Maintenance</u> : Remove any dead or dying plants and decaying plant material. Replace dead and dying plants.  Evidence of invasive species. <u>Maintenance</u> : Remove invasive species, including roots. Do not use herbicides. Install additional wetland plants as necessary.  Accumulated sediment reducing volume significantly. <u>Maintenance</u> : Remove and properly dispose of any accumulated sediment when at 50% of the design capacity.  cellaneous equency: Monthly)  Encroachment on pond or easement area.			

Proposed Distribution Facility Project
Town of Clay, New York
Onondaga County

Appendix I Dry Detention

	Maintenance: Coordinate removal/cleanup of any oil, gas, or contaminants with the appropriate clean-up personnel.		
d.	Fence in good condition.		
	Maintenance: Replace any damaged sections of fence.		
e.	Safety signs are installed.		
	Maintenance: Replace any missing signs.		

## Notes:

- 1. The site must be returned to the approved conditions when any repairs are made.
- 2. Unauthorized plants are any plants that are growing or have been installed that are not any of the plants shown on the approved plans.
- 3. All seed mixtures shall meet the seed mixture requirements specified on the approved plans.
- 4. Replace any dead or dying plants with plants specified in the planting schedule shown on the approved plans.
- 5. Replaced stone shall meet the stone requirements specified on the approved plans.

Comments:			
Actions to be taken:			