1) Drainage Area #3

Summary for Subcatchment PA #3: PA #3

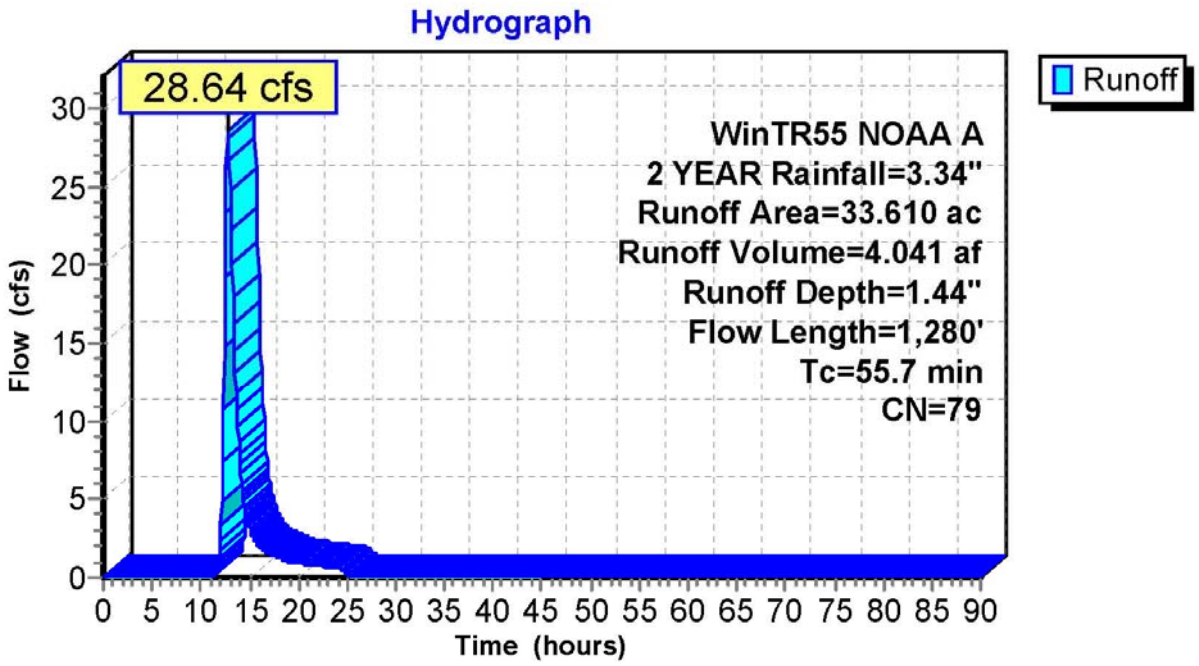
Runoff = 28.64 cfs @ 12.80 hrs, Volume= 4.041 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area (ac)	CN	Description
*	13.350	86	Urban industrial, 65% imp, HSG C
	5.100	98	Paved parking, HSG C
*	5.280	64	>75% Grass cover, Good, HSG C
	2.030	98	Paved roads w/curbs & sewers, HSG C
*	0.670	61	>75% Grass cover, Good, HSG C
*	4.240	61	>75% Grass cover, Good, HSG C
*	2.940	61	>75% Grass cover, Good, HSG C
	33.610	79	Weighted Average
	17.802		52.97% Pervious Area
	15.808		47.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.9	240	0.0063	0.09		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
10.8	1,040	0.0100	1.61		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
55.7	1,280	Total			

Subcatchment PA #3: PA #3



Summary for Subcatchment PA #3: PA #3

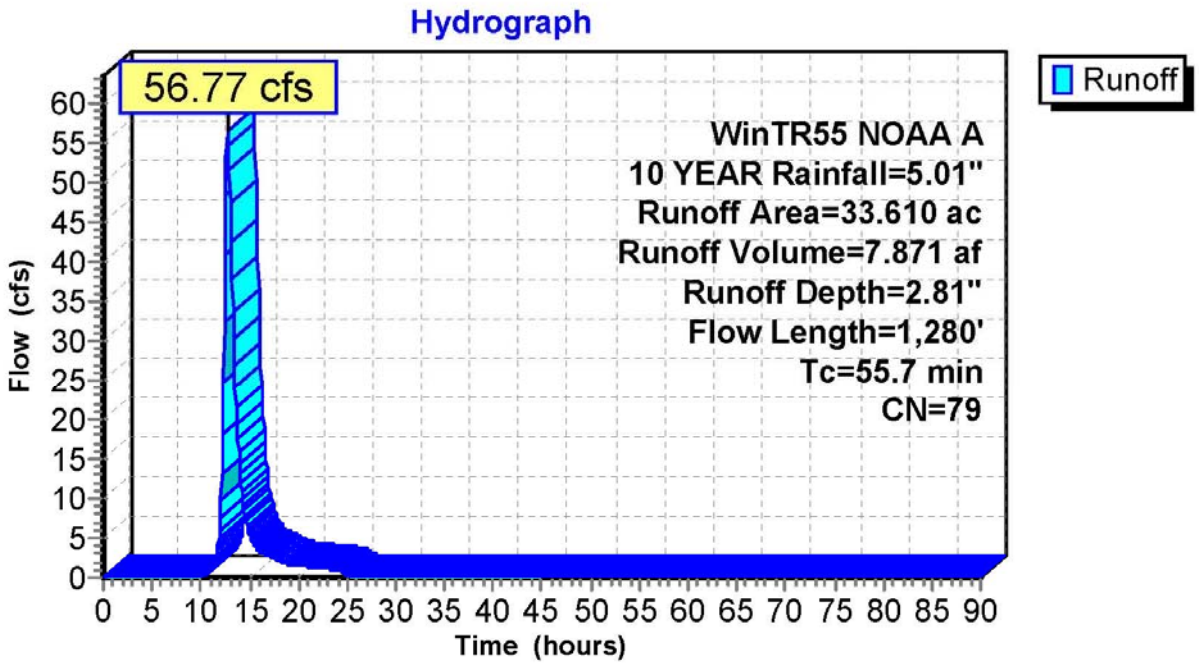
Runoff = 56.77 cfs @ 12.77 hrs, Volume= 7.871 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area (ac)	CN	Description
*	13.350	86	Urban industrial, 65% imp, HSG C
	5.100	98	Paved parking, HSG C
*	5.280	64	>75% Grass cover, Good, HSG C
	2.030	98	Paved roads w/curbs & sewers, HSG C
*	0.670	61	>75% Grass cover, Good, HSG C
*	4.240	61	>75% Grass cover, Good, HSG C
*	2.940	61	>75% Grass cover, Good, HSG C
	33.610	79	Weighted Average
	17.802		52.97% Pervious Area
	15.808		47.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.9	240	0.0063	0.09		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
10.8	1,040	0.0100	1.61		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
55.7	1,280	Total			

Subcatchment PA #3: PA #3



Summary for Subcatchment PA #3: PA #3

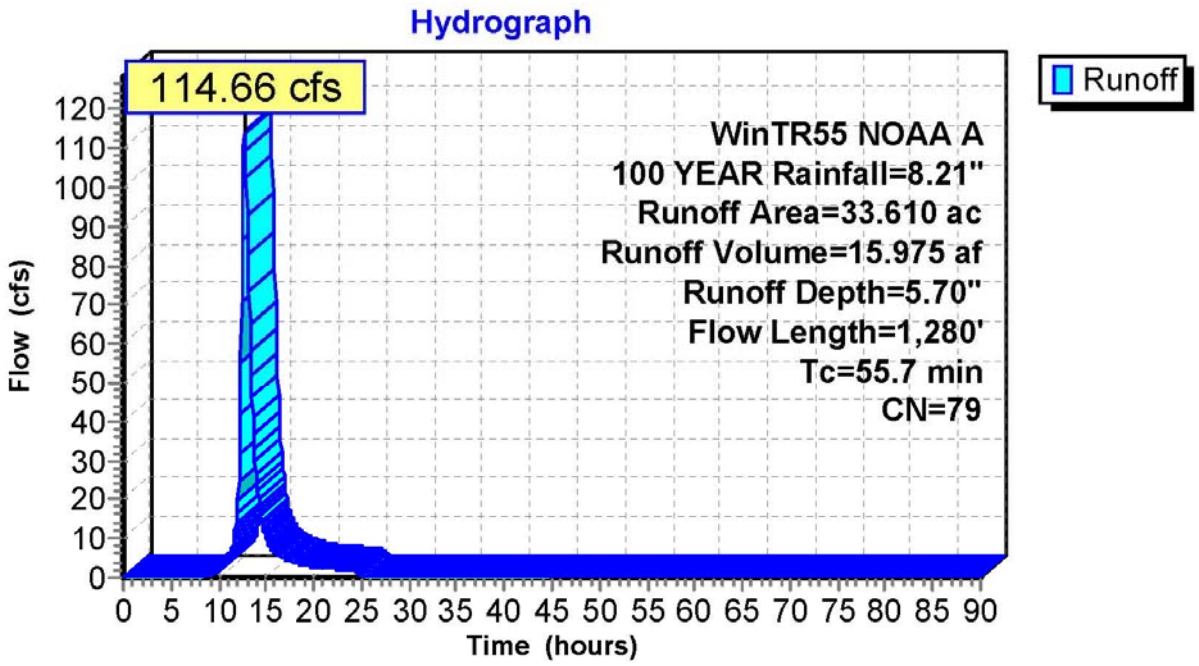
Runoff = 114.66 cfs @ 12.75 hrs, Volume= 15.975 af, Depth= 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	Area (ac)	CN	Description
*	13.350	86	Urban industrial, 65% imp, HSG C
	5.100	98	Paved parking, HSG C
*	5.280	64	>75% Grass cover, Good, HSG C
	2.030	98	Paved roads w/curbs & sewers, HSG C
*	0.670	61	>75% Grass cover, Good, HSG C
*	4.240	61	>75% Grass cover, Good, HSG C
*	2.940	61	>75% Grass cover, Good, HSG C
	33.610	79	Weighted Average
	17.802		52.97% Pervious Area
	15.808		47.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.9	240	0.0063	0.09		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
10.8	1,040	0.0100	1.61		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
55.7	1,280	Total			

Subcatchment PA #3: PA #3



2) Routing for Basin #3

Summary for Pond Basin #3: Pond #3

Inflow Area = 33.610 ac, 47.03% Impervious, Inflow Depth = 1.44" for 2 YEAR event
Inflow = 28.64 cfs @ 12.80 hrs, Volume= 4.041 af
Outflow = 1.45 cfs @ 17.39 hrs, Volume= 3.321 af, Atten= 95%, Lag= 275.4 min
Primary = 1.45 cfs @ 17.39 hrs, Volume= 3.321 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 72.83' @ 17.39 hrs Surf.Area= 2.207 ac Storage= 3.095 af

Plug-Flow detention time= 1,700.7 min calculated for 3.318 af (82% of inflow)
Center-of-Mass det. time= 1,636.0 min (2,500.6 - 864.6)

Volume	Invert	Avail.Storage	Storage Description
#1	69.50'	13.505 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

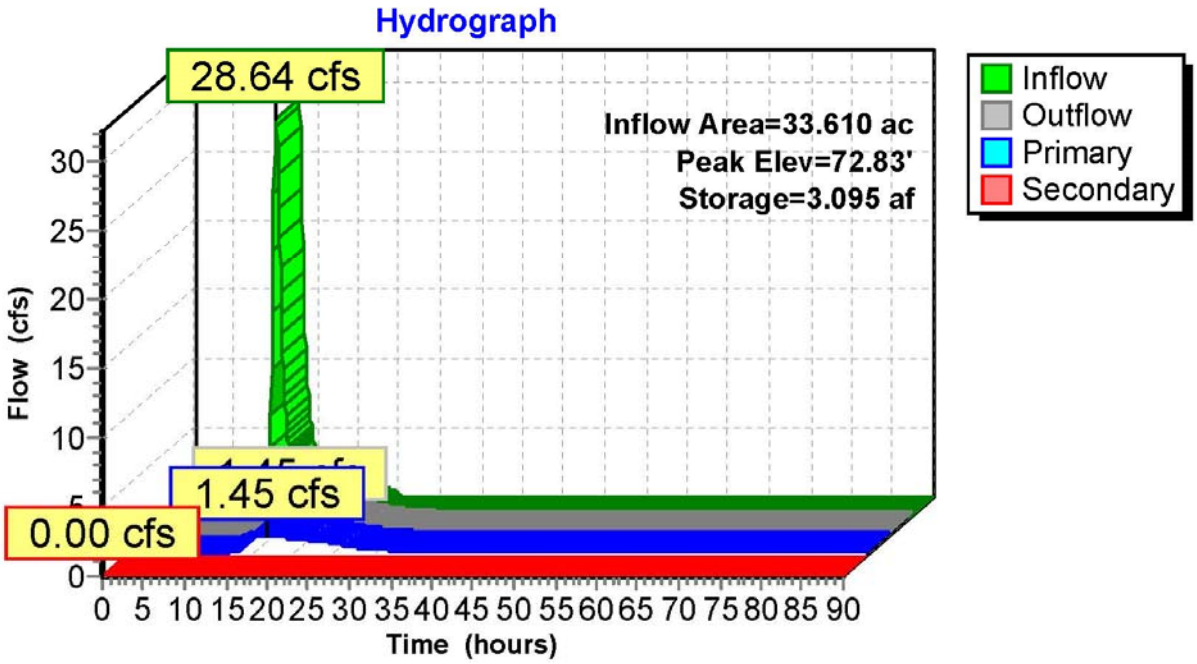
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
69.50	0.000	0.000	0.000
70.00	0.160	0.040	0.040
71.00	0.500	0.330	0.370
72.00	1.700	1.100	1.470
73.00	2.310	2.005	3.475
74.00	2.400	2.355	5.830
75.00	2.500	2.450	8.280
76.00	2.620	2.560	10.840
77.00	2.710	2.665	13.505

Device	Routing	Invert	Outlet Devices
#1	Device 3	69.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	72.50'	**20.0" W x 17.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	69.40'	**36.0" Round Culvert** L= 86.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.45 cfs @ 17.39 hrs HW=72.83' (Free Discharge)
└**3=Culvert** (Passes 1.45 cfs of 47.31 cfs potential flow)
  └**1=Orifice/Grate** (Orifice Controls 0.42 cfs @ 8.62 fps)
  └**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 1.85 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Basin #3: Pond #3



Summary for Pond Basin #3: Pond #3

Inflow Area = 33.610 ac, 47.03% Impervious, Inflow Depth = 2.81" for 10 YEAR event
Inflow = 56.77 cfs @ 12.77 hrs, Volume= 7.871 af
Outflow = 7.79 cfs @ 14.51 hrs, Volume= 7.038 af, Atten= 86%, Lag= 104.2 min
Primary = 7.79 cfs @ 14.51 hrs, Volume= 7.038 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 73.73' @ 14.51 hrs Surf.Area= 2.376 ac Storage= 5.188 af

Plug-Flow detention time= 965.7 min calculated for 7.038 af (89% of inflow)
Center-of-Mass det. time= 918.3 min (1,768.8 - 850.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.50'	13.505 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

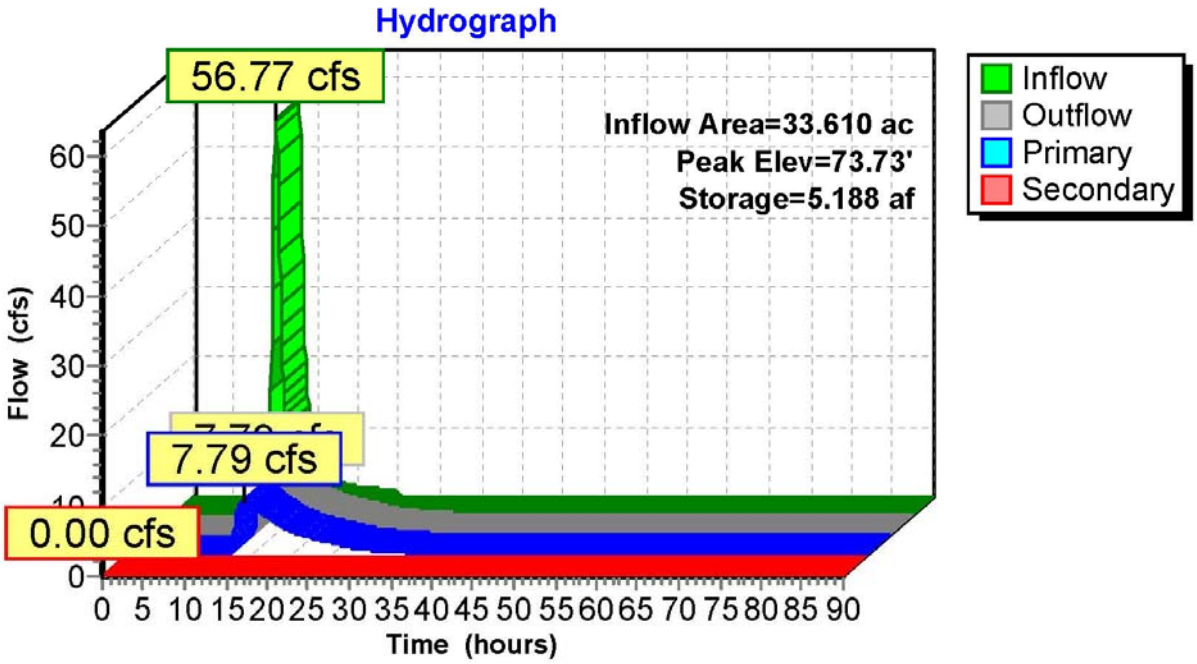
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
69.50	0.000	0.000	0.000
70.00	0.160	0.040	0.040
71.00	0.500	0.330	0.370
72.00	1.700	1.100	1.470
73.00	2.310	2.005	3.475
74.00	2.400	2.355	5.830
75.00	2.500	2.450	8.280
76.00	2.620	2.560	10.840
77.00	2.710	2.665	13.505

Device	Routing	Invert	Outlet Devices
#1	Device 3	69.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	72.50'	**20.0" W x 17.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	69.40'	**36.0" Round Culvert** L= 86.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.79 cfs @ 14.51 hrs HW=73.73' (Free Discharge)
└**3=Culvert** (Passes 7.79 cfs of 57.27 cfs potential flow)
  └**1=Orifice/Grate** (Orifice Controls 0.48 cfs @ 9.76 fps)
  └**2=Orifice/Grate** (Orifice Controls 7.31 cfs @ 3.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Basin #3: Pond #3



Summary for Pond Basin #3: Pond #3

Inflow Area = 33.610 ac, 47.03% Impervious, Inflow Depth = 5.70" for 100 YEAR event
Inflow = 114.66 cfs @ 12.75 hrs, Volume= 15.975 af
Outflow = 18.54 cfs @ 14.24 hrs, Volume= 15.057 af, Atten= 84%, Lag= 88.9 min
Primary = 18.54 cfs @ 14.24 hrs, Volume= 15.057 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 75.72' @ 14.24 hrs Surf.Area= 2.586 ac Storage= 10.111 af

Plug-Flow detention time= 599.8 min calculated for 15.044 af (94% of inflow)
Center-of-Mass det. time= 572.9 min (1,408.9 - 835.9)

Volume	Invert	Avail.Storage	Storage Description
#1	69.50'	13.505 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

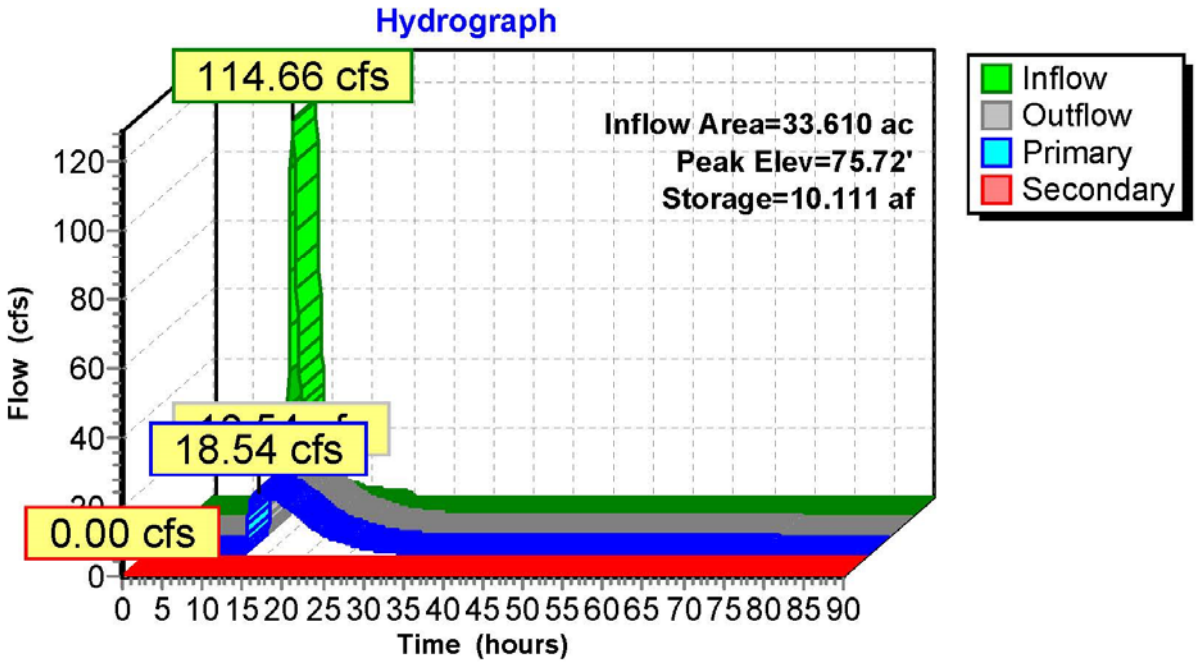
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
69.50	0.000	0.000	0.000
70.00	0.160	0.040	0.040
71.00	0.500	0.330	0.370
72.00	1.700	1.100	1.470
73.00	2.310	2.005	3.475
74.00	2.400	2.355	5.830
75.00	2.500	2.450	8.280
76.00	2.620	2.560	10.840
77.00	2.710	2.665	13.505

Device	Routing	Invert	Outlet Devices
#1	Device 3	69.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	72.50'	**20.0" W x 17.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	69.40'	**36.0" Round Culvert** L= 86.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.40' / 67.50' S= 0.0221 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#4	Secondary	76.00'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=18.54 cfs @ 14.24 hrs HW=75.72' (Free Discharge)
└**3=Culvert** (Passes 18.54 cfs of 74.72 cfs potential flow)
  └**1=Orifice/Grate** (Orifice Controls 0.58 cfs @ 11.89 fps)
  └**2=Orifice/Grate** (Orifice Controls 17.96 cfs @ 7.61 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Basin #3: Pond #3



6. 150 Pierce Street, LLC – June 2020

i. Post Development Peak Flow Conditions (Basin #1)

1) Drainage Area #1

Summary for Subcatchment PA #1: PA #1

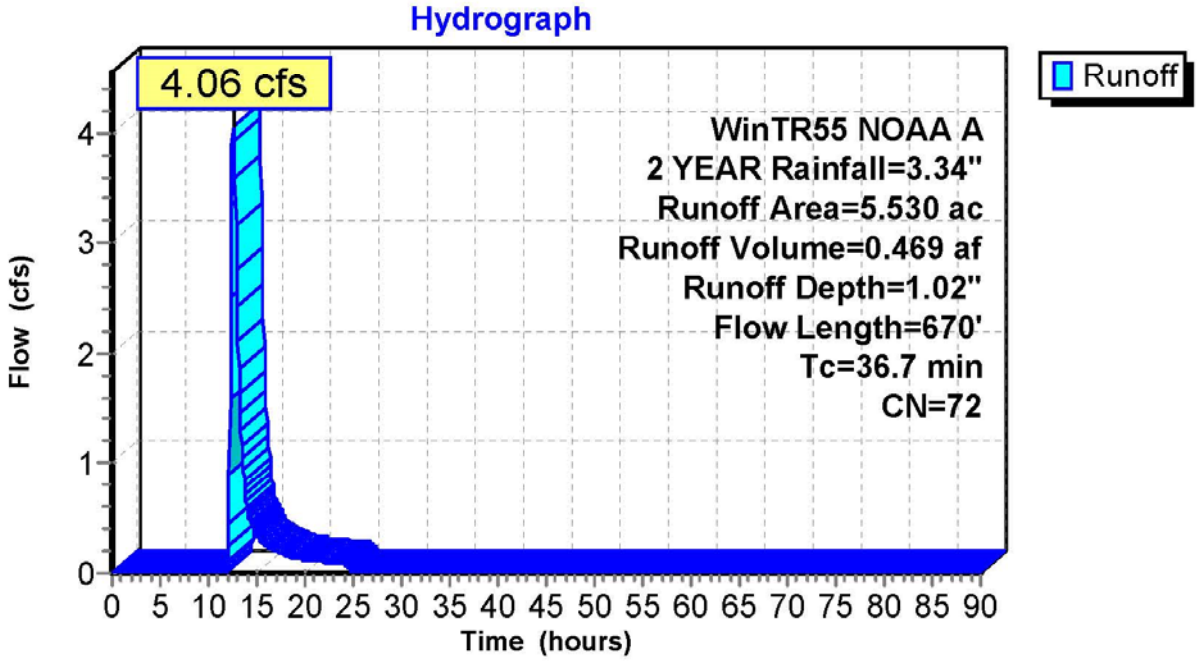
Runoff = 4.06 cfs @ 12.57 hrs, Volume= 0.469 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area (ac)	CN	Description
	3.600	72	1/3 acre lots, 30% imp, HSG B
*	0.710	90	Paved roads w/open ditches, 50% imp, HSG C
*	1.220	60	Brush, Good, HSG C
	5.530	72	Weighted Average
	4.095		74.05% Pervious Area
	1.435		25.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.9	370	0.0170	2.10		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
36.7	670	Total			

Subcatchment PA #1: PA #1



Summary for Subcatchment PA #1: PA #1

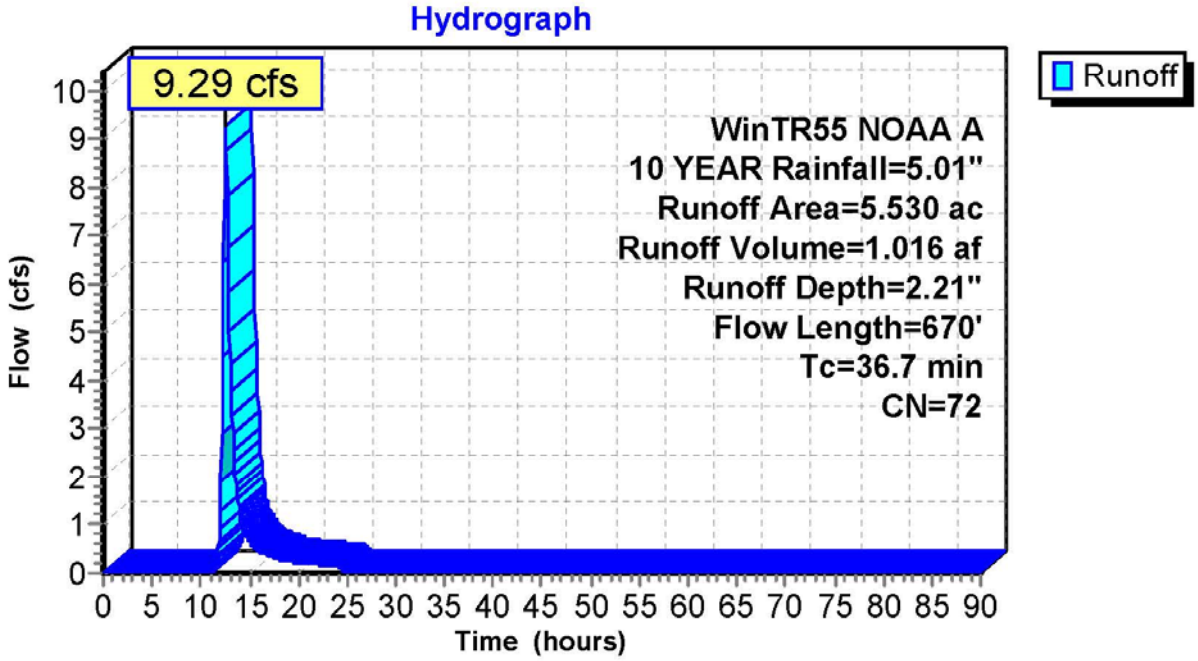
Runoff = 9.29 cfs @ 12.54 hrs, Volume= 1.016 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area (ac)	CN	Description
	3.600	72	1/3 acre lots, 30% imp, HSG B
*	0.710	90	Paved roads w/open ditches, 50% imp, HSG C
*	1.220	60	Brush, Good, HSG C
	5.530	72	Weighted Average
	4.095		74.05% Pervious Area
	1.435		25.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.9	370	0.0170	2.10		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
36.7	670	Total			

Subcatchment PA #1: PA #1



Summary for Subcatchment PA #1: PA #1

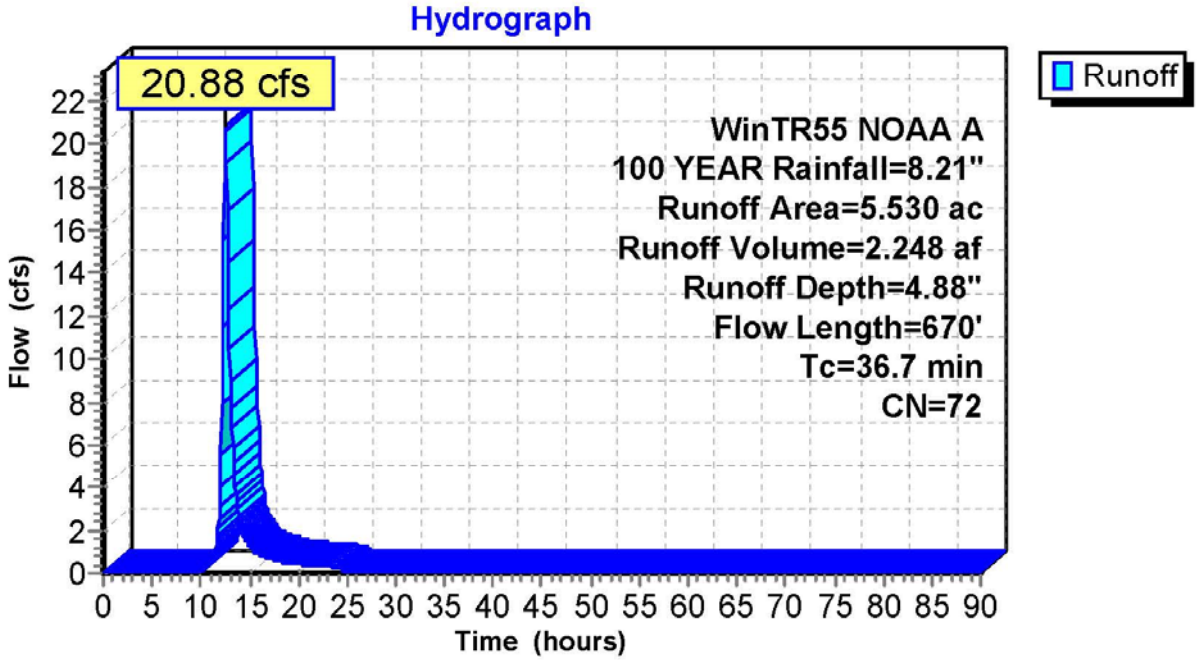
Runoff = 20.88 cfs @ 12.52 hrs, Volume= 2.248 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	Area (ac)	CN	Description
	3.600	72	1/3 acre lots, 30% imp, HSG B
*	0.710	90	Paved roads w/open ditches, 50% imp, HSG C
*	1.220	60	Brush, Good, HSG C
	5.530	72	Weighted Average
	4.095		74.05% Pervious Area
	1.435		25.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.9	370	0.0170	2.10		**Shallow Concentrated Flow, Segment #2** Unpaved Kv= 16.1 fps
36.7	670	Total			

Subcatchment PA #1: PA #1



2) Drainage Area #2

Summary for Subcatchment PA #2: PA #2

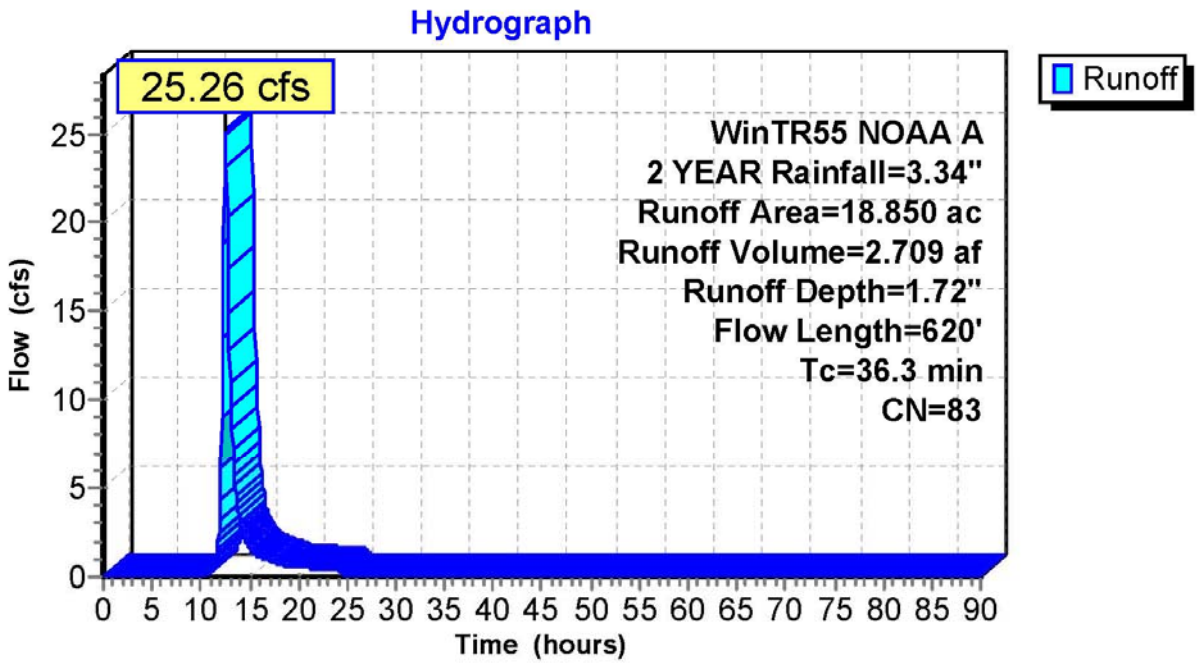
Runoff = 25.26 cfs @ 12.51 hrs, Volume= 2.709 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 2 YEAR Rainfall=3.34"

	Area (ac)	CN	Description
*	13.380	86	Urban industrial, 65% imp, HSG C
	2.000	98	Paved parking, HSG C
*	3.060	64	>75% Grass cover, Good, HSG C
*	0.410	61	Brush, Good, HSG C
	18.850	83	Weighted Average
	8.153		43.25% Pervious Area
	10.697		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.5	320	0.0112	2.15		**Shallow Concentrated Flow, Segment #2** Paved Kv= 20.3 fps
36.3	620	Total			

Subcatchment PA #2: PA #2



Summary for Subcatchment PA #2: PA #2

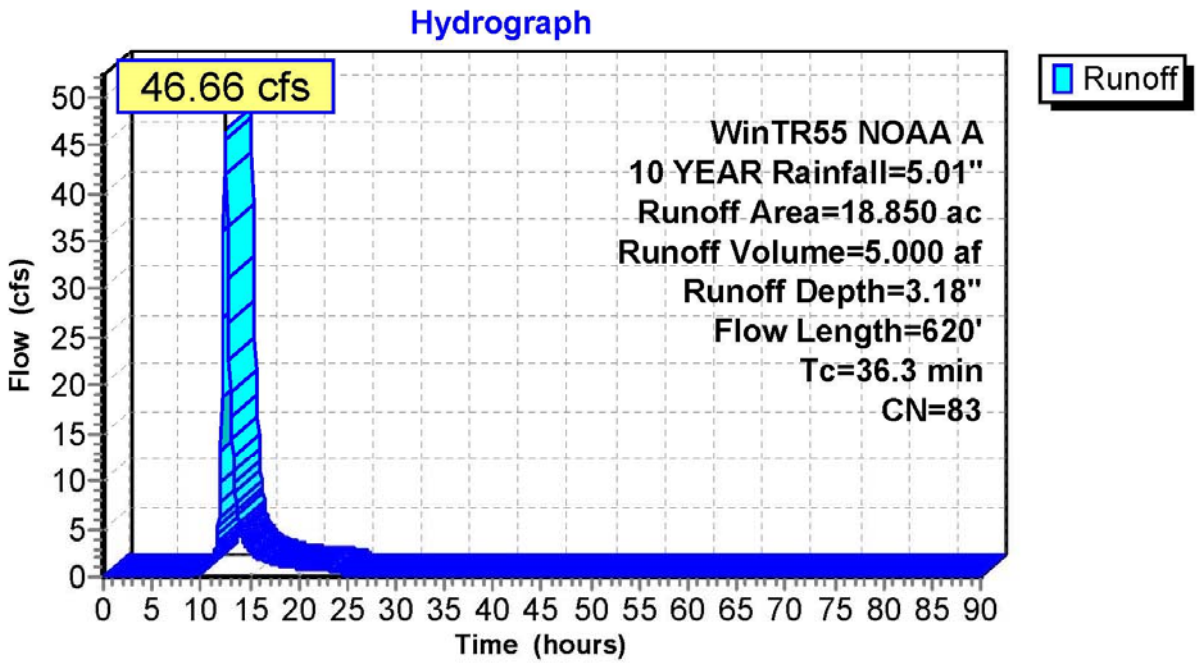
Runoff = 46.66 cfs @ 12.50 hrs, Volume= 5.000 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 10 YEAR Rainfall=5.01"

	Area (ac)	CN	Description
*	13.380	86	Urban industrial, 65% imp, HSG C
	2.000	98	Paved parking, HSG C
*	3.060	64	>75% Grass cover, Good, HSG C
*	0.410	61	Brush, Good, HSG C
	18.850	83	Weighted Average
	8.153		43.25% Pervious Area
	10.697		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.5	320	0.0112	2.15		**Shallow Concentrated Flow, Segment #2** Paved Kv= 20.3 fps
36.3	620	Total			

Subcatchment PA #2: PA #2



Summary for Subcatchment PA #2: PA #2

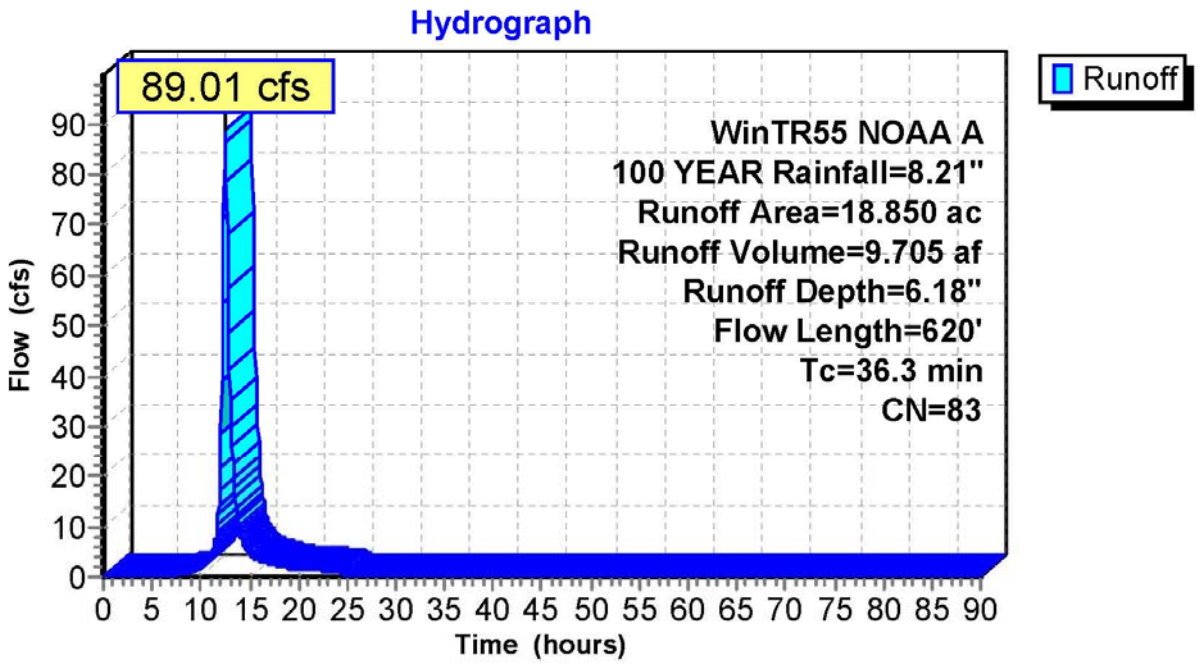
Runoff = 89.01 cfs @ 12.49 hrs, Volume= 9.705 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 100 YEAR Rainfall=8.21"

	Area (ac)	CN	Description
*	13.380	86	Urban industrial, 65% imp, HSG C
	2.000	98	Paved parking, HSG C
*	3.060	64	>75% Grass cover, Good, HSG C
*	0.410	61	Brush, Good, HSG C
	18.850	83	Weighted Average
	8.153		43.25% Pervious Area
	10.697		56.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	300	0.0200	0.15		**Sheet Flow, Segment #1** Grass: Dense n= 0.240 P2= 3.30"
2.5	320	0.0112	2.15		**Shallow Concentrated Flow, Segment #2** Paved Kv= 20.3 fps
36.3	620	Total			

Subcatchment PA #2: PA #2



3) Drainage Area for Biobasin #2 (Pharmscript East)

Summary for Subcatchment Pharma E: Pharma East

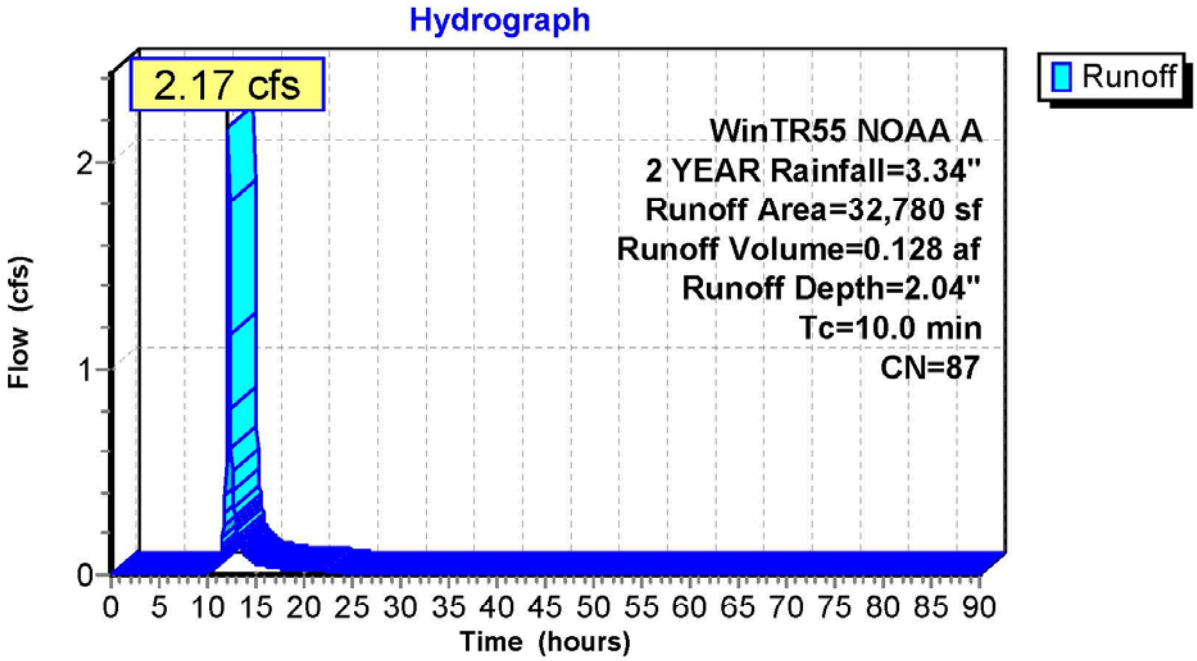
Runoff = 2.17 cfs @ 12.17 hrs, Volume= 0.128 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Area (sf)	CN	Description
15,090	74	>75% Grass cover, Good, HSG C
17,690	98	Paved parking, HSG C
32,780	87	Weighted Average
15,090		46.03% Pervious Area
17,690		53.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma E: Pharma East



Summary for Subcatchment Pharma E: Pharma East

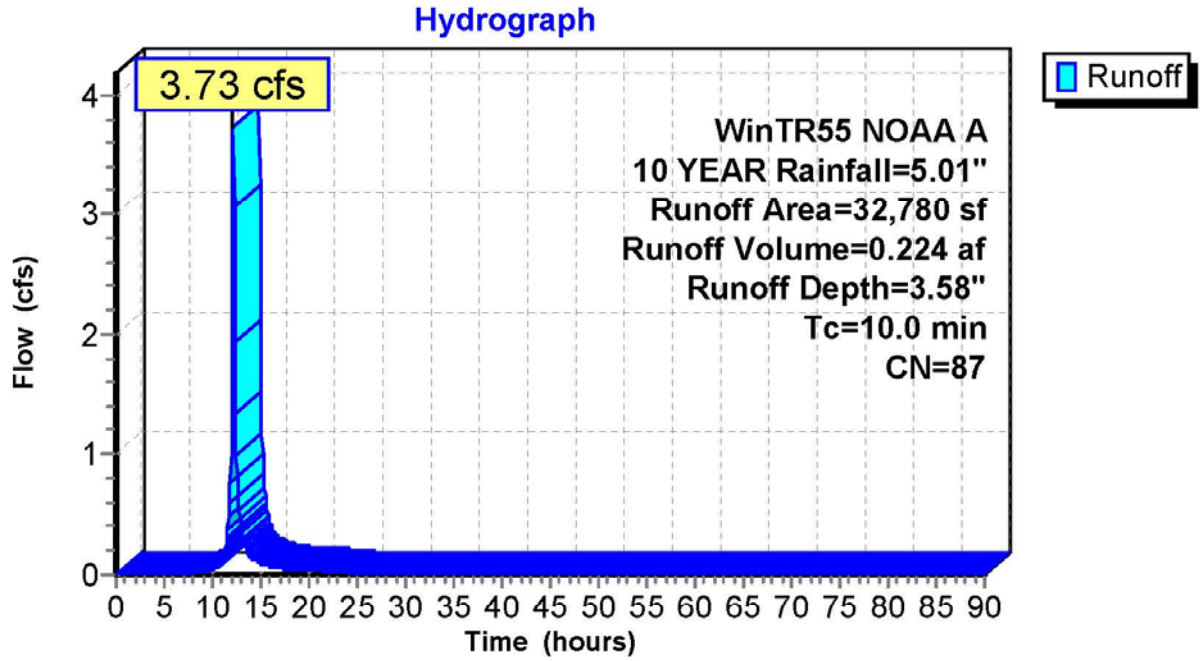
Runoff = 3.73 cfs @ 12.17 hrs, Volume= 0.224 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Area (sf)	CN	Description
15,090	74	>75% Grass cover, Good, HSG C
17,690	98	Paved parking, HSG C
32,780	87	Weighted Average
15,090		46.03% Pervious Area
17,690		53.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma E: Pharma East



Summary for Subcatchment Pharma E: Pharma East

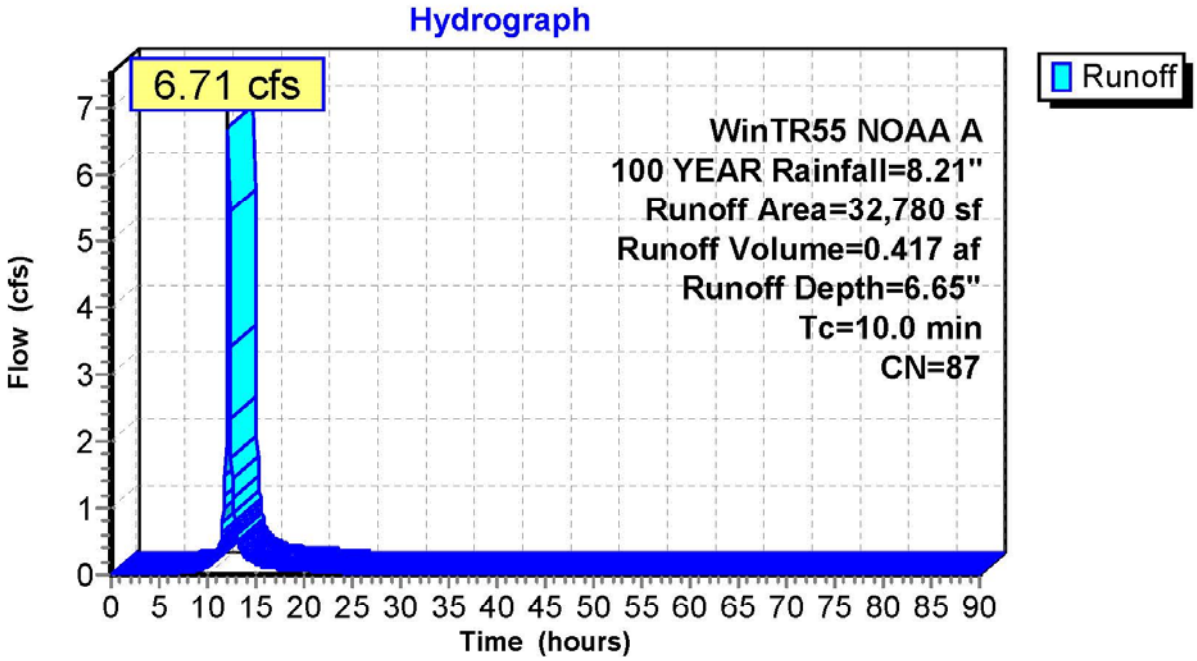
Runoff = 6.71 cfs @ 12.17 hrs, Volume= 0.417 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Area (sf)	CN	Description
15,090	74	>75% Grass cover, Good, HSG C
17,690	98	Paved parking, HSG C
32,780	87	Weighted Average
15,090		46.03% Pervious Area
17,690		53.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma E: Pharma East



4) Routing for Bio Basin East

Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 0.37" for 1-YR WATER QUALITY event
Inflow = 0.69 cfs @ 1.19 hrs, Volume= 0.023 af
Outflow = 0.08 cfs @ 1.93 hrs, Volume= 0.023 af, Atten= 88%, Lag= 44.1 min
Discarded = 0.08 cfs @ 1.93 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.63' @ 1.93 hrs Surf.Area= 2,194 sf Storage= 710 cf

Plug-Flow detention time= 89.8 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 90.1 min (172.3 - 82.2)

Volume	Invert	Avail.Storage	Storage Description
#1	82.25'	1,633 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

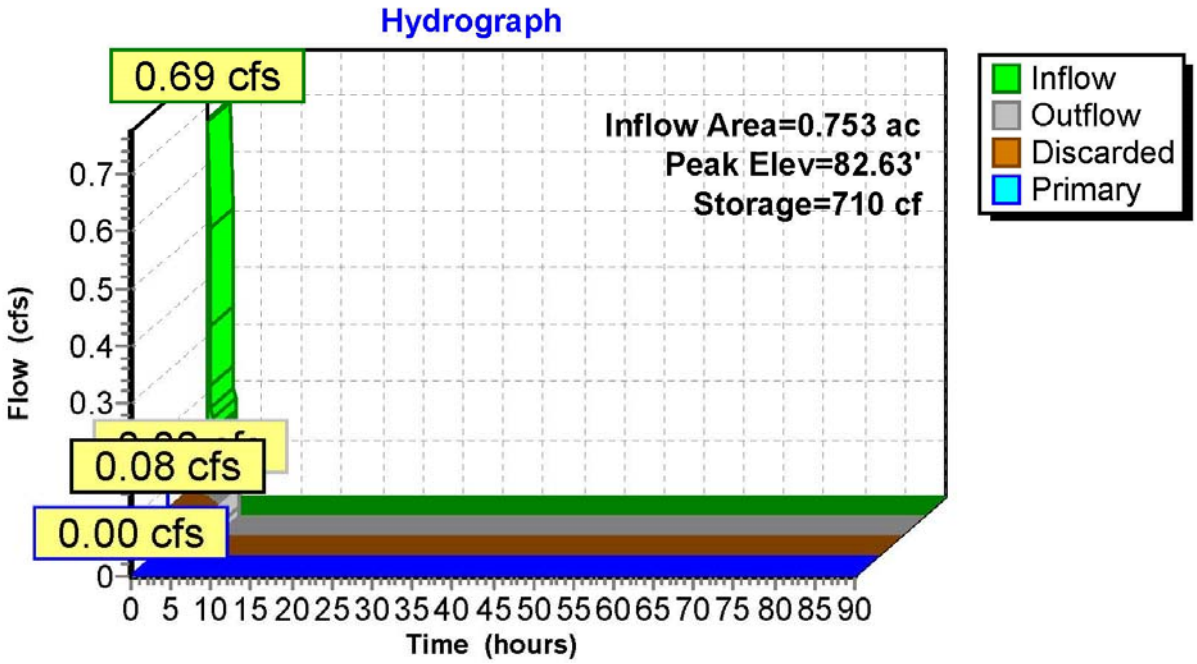
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.25	1,500	0	0
83.00	2,855	1,633	1,633

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.25'	**1.620 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**50.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.08 cfs @ 1.93 hrs HW=82.63' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=82.25' TW=68.90' (Dynamic Tailwater)
↳**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BIO-2: Biobasin -East



Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 2.04" for 2 YEAR event
Inflow = 2.17 cfs @ 12.17 hrs, Volume= 0.128 af
Outflow = 2.09 cfs @ 12.22 hrs, Volume= 0.128 af, Atten= 4%, Lag= 2.5 min
Discarded = 0.09 cfs @ 12.21 hrs, Volume= 0.072 af
Primary = 1.99 cfs @ 12.22 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.81' @ 12.21 hrs Surf.Area= 2,519 sf Storage= 1,134 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 63.6 min (866.3 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1	82.25'	1,633 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

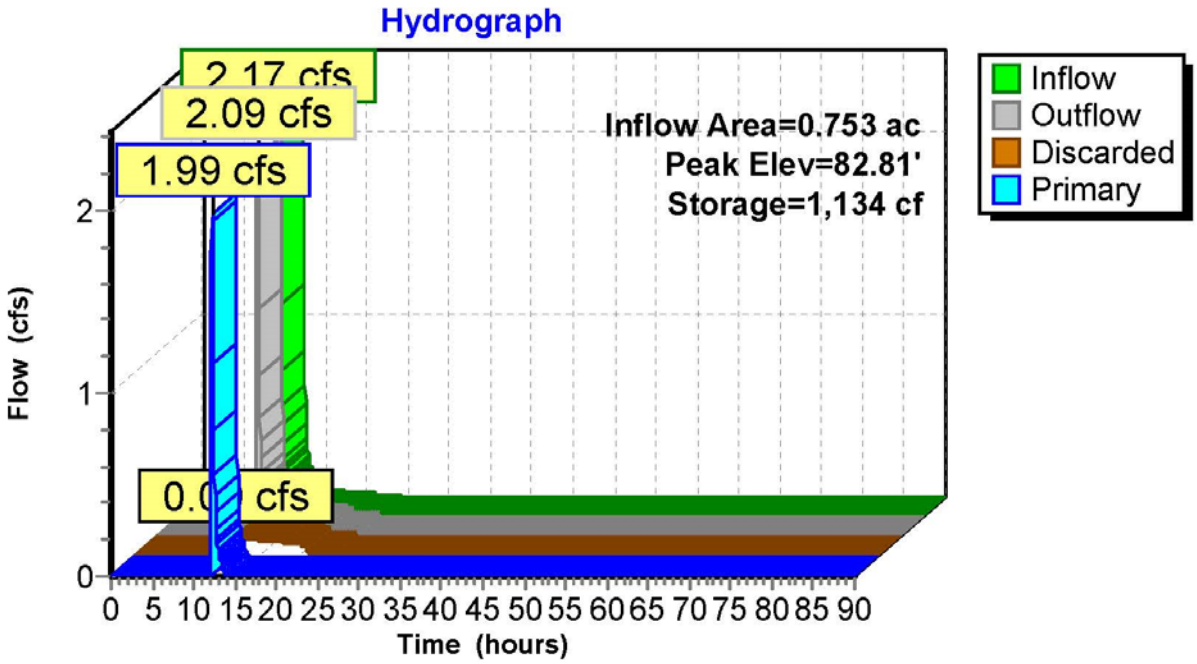
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.25	1,500	0	0
83.00	2,855	1,633	1,633

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.25'	**1.620 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**50.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.09 cfs @ 12.21 hrs HW=82.81' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.89 cfs @ 12.22 hrs HW=82.81' TW=70.56' (Dynamic Tailwater)
↳**2=Broad-Crested Rectangular Weir** (Weir Controls 1.89 cfs @ 0.61 fps)

Pond BIO-2: Biobasin -East



Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 3.58" for 10 YEAR event
Inflow = 3.73 cfs @ 12.17 hrs, Volume= 0.224 af
Outflow = 3.65 cfs @ 12.19 hrs, Volume= 0.224 af, Atten= 2%, Lag= 0.9 min
Discarded = 0.10 cfs @ 12.19 hrs, Volume= 0.092 af
Primary = 3.56 cfs @ 12.19 hrs, Volume= 0.132 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.84' @ 12.19 hrs Surf.Area= 2,574 sf Storage= 1,211 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 49.8 min (841.0 - 791.2)

Volume	Invert	Avail.Storage	Storage Description
#1	82.25'	1,633 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

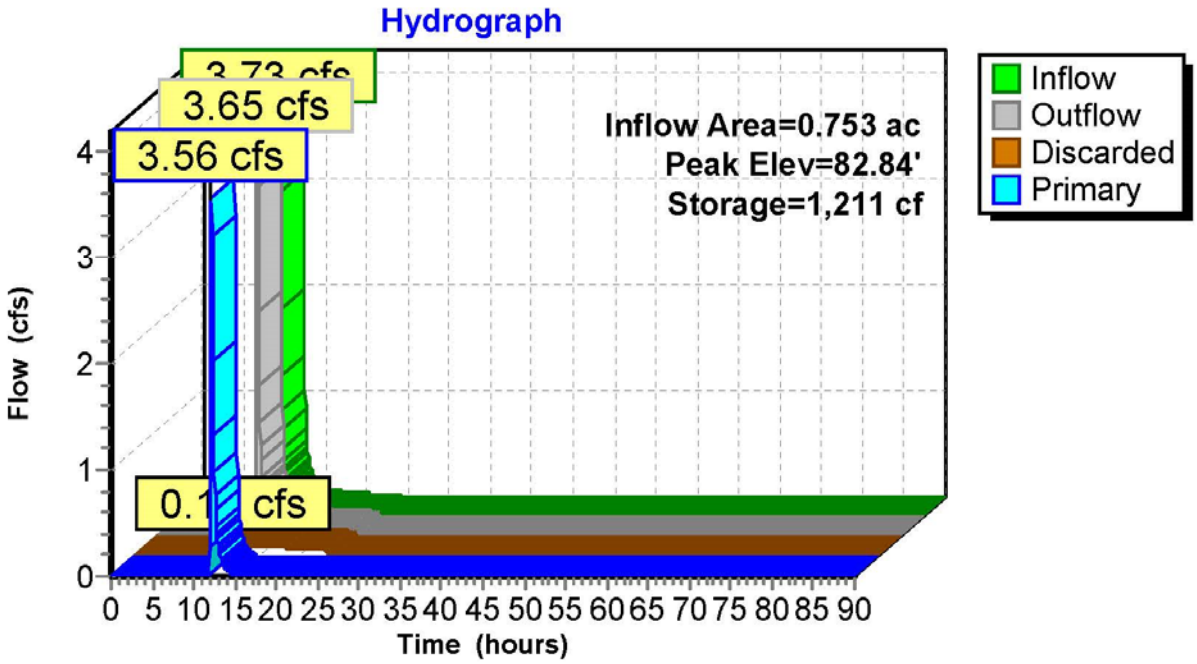
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.25	1,500	0	0
83.00	2,855	1,633	1,633

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.25'	**1.620 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**50.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.10 cfs @ 12.19 hrs HW=82.84' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=3.38 cfs @ 12.19 hrs HW=82.84' TW=71.50' (Dynamic Tailwater)
↳**2=Broad-Crested Rectangular Weir** (Weir Controls 3.38 cfs @ 0.74 fps)

Pond BIO-2: Biobasin -East



Summary for Pond BIO-2: Biobasin -East

Inflow Area = 0.753 ac, 53.97% Impervious, Inflow Depth = 6.65" for 100 YEAR event
Inflow = 6.71 cfs @ 12.17 hrs, Volume= 0.417 af
Outflow = 6.54 cfs @ 12.18 hrs, Volume= 0.417 af, Atten= 3%, Lag= 0.8 min
Discarded = 0.10 cfs @ 12.18 hrs, Volume= 0.122 af
Primary = 6.44 cfs @ 12.18 hrs, Volume= 0.295 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.89' @ 12.18 hrs Surf.Area= 2,656 sf Storage= 1,330 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 39.7 min (818.4 - 778.7)

Volume	Invert	Avail.Storage	Storage Description
#1	82.25'	1,633 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

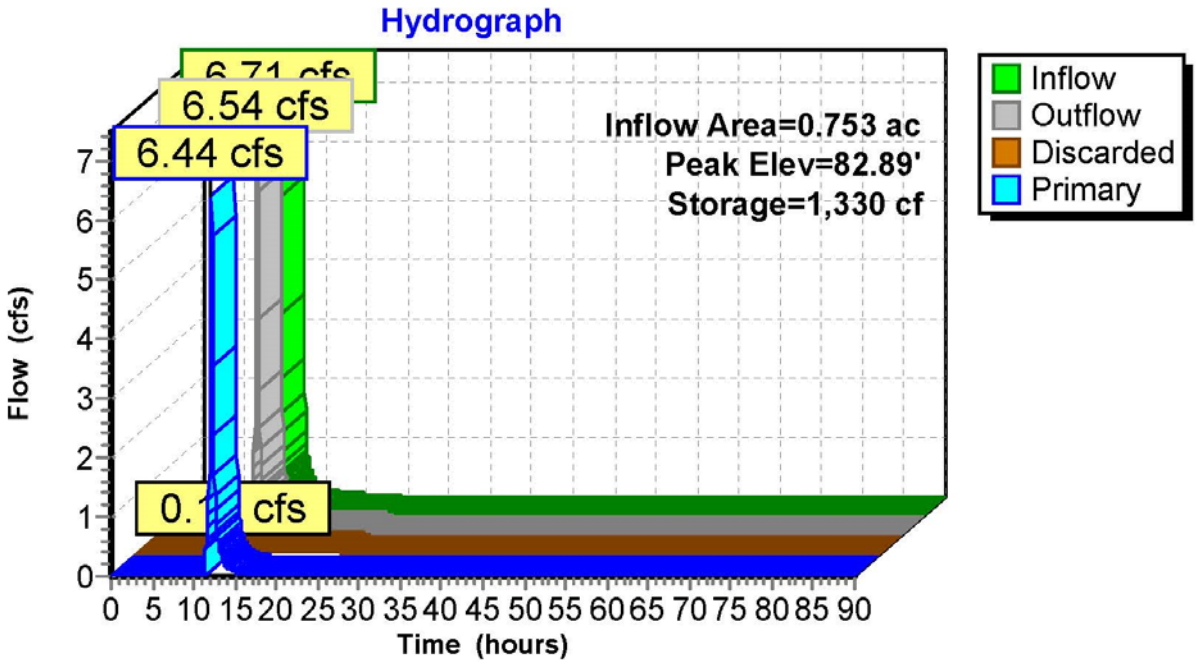
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.25	1,500	0	0
83.00	2,855	1,633	1,633

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.25'	**1.620 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**50.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.10 cfs @ 12.18 hrs HW=82.89' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=6.18 cfs @ 12.18 hrs HW=82.89' TW=73.47' (Dynamic Tailwater)
↳**2=Broad-Crested Rectangular Weir** (Weir Controls 6.18 cfs @ 0.91 fps)

Pond BIO-2: Biobasin -East



5) Drainage Area for Bio Basin #3 (Pharmscript North)

Summary for Subcatchment Pharma N: Pharma North

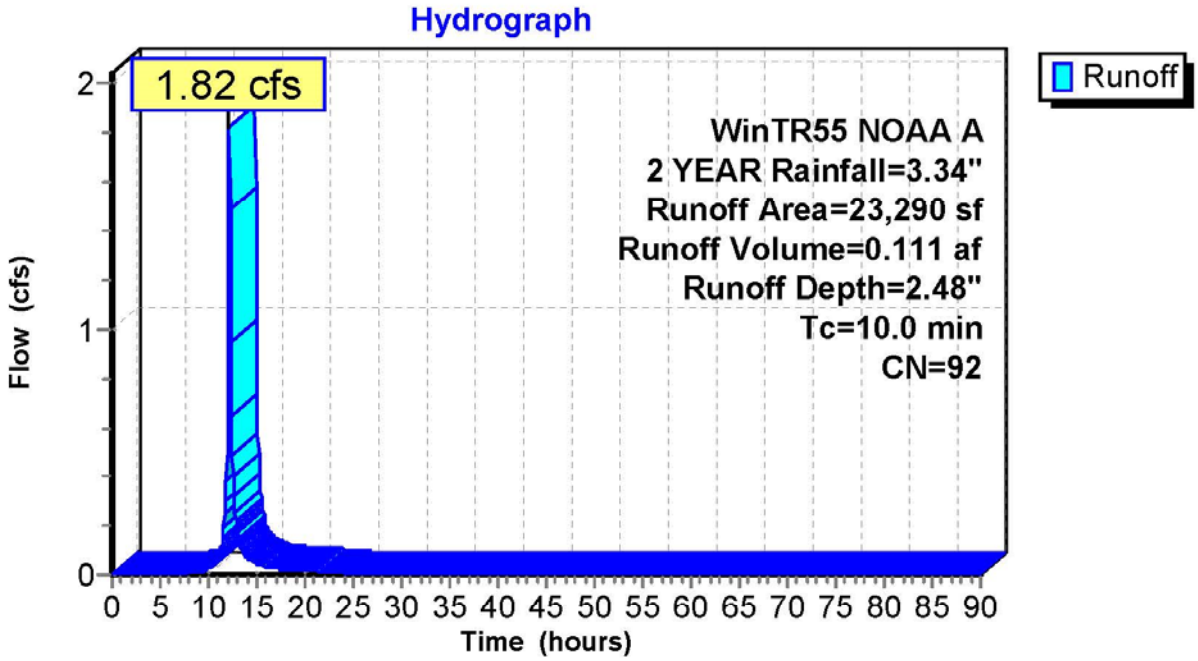
Runoff = 1.82 cfs @ 12.17 hrs, Volume= 0.111 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 2 YEAR Rainfall=3.34"

Area (sf)	CN	Description
5,755	74	>75% Grass cover, Good, HSG C
17,535	98	Paved parking, HSG C
23,290	92	Weighted Average
5,755		24.71% Pervious Area
17,535		75.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma N: Pharma North



Summary for Subcatchment Pharma N: Pharma North

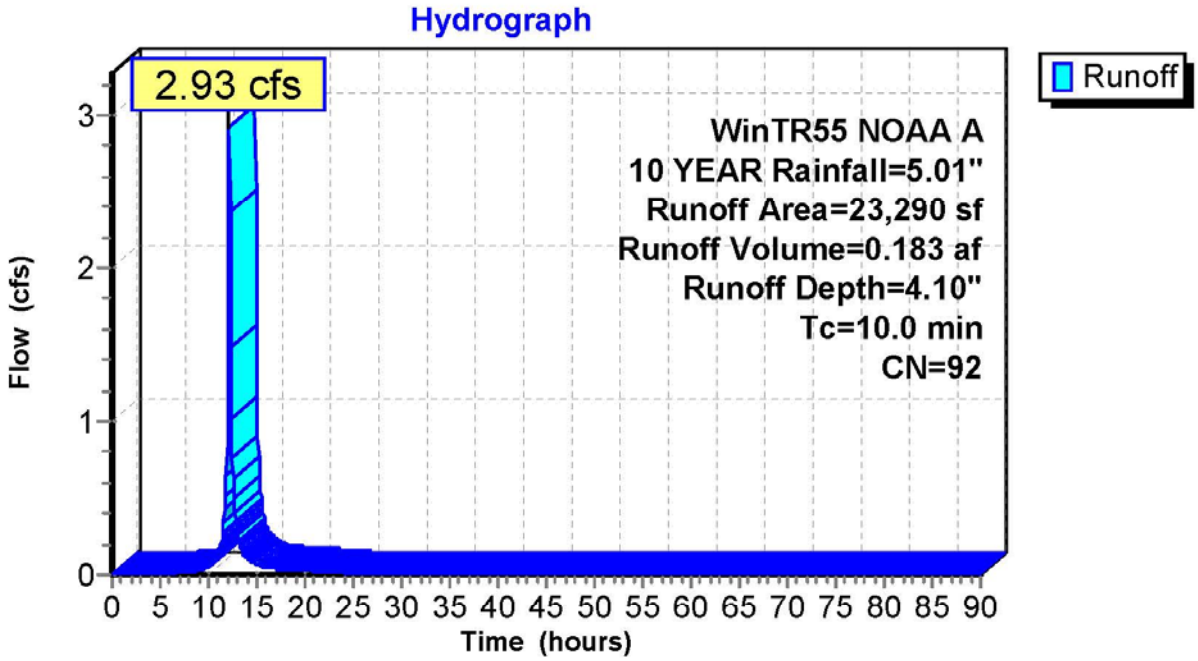
Runoff = 2.93 cfs @ 12.17 hrs, Volume= 0.183 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 10 YEAR Rainfall=5.01"

Area (sf)	CN	Description
5,755	74	>75% Grass cover, Good, HSG C
17,535	98	Paved parking, HSG C
23,290	92	Weighted Average
5,755		24.71% Pervious Area
17,535		75.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma N: Pharma North



Summary for Subcatchment Pharma N: Pharma North

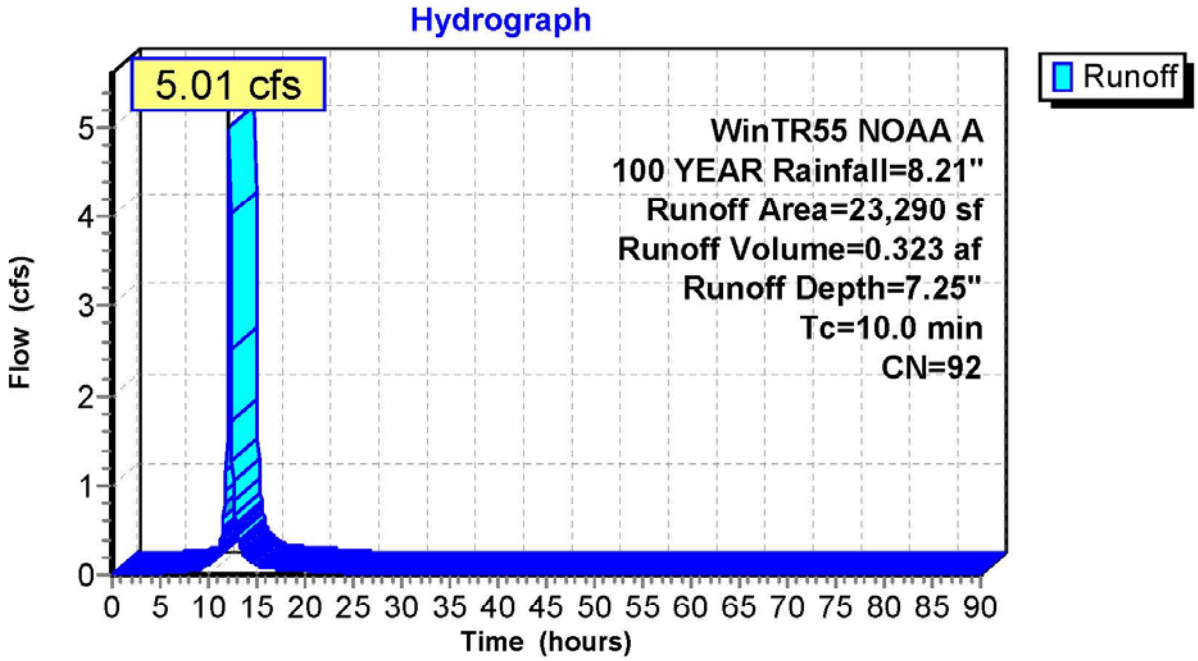
Runoff = 5.01 cfs @ 12.17 hrs, Volume= 0.323 af, Depth= 7.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
WinTR55 NOAA A 100 YEAR Rainfall=8.21"

Area (sf)	CN	Description
5,755	74	>75% Grass cover, Good, HSG C
17,535	98	Paved parking, HSG C
23,290	92	Weighted Average
5,755		24.71% Pervious Area
17,535		75.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Pharma N: Pharma North



6) Routing for Bio Basin North

Summary for Pond BIO-3: Biobasin -North

Inflow Area = 0.535 ac, 75.29% Impervious, Inflow Depth = 0.60" for 1-YR WATER QUALITY event
Inflow = 0.80 cfs @ 1.17 hrs, Volume= 0.027 af
Outflow = 0.26 cfs @ 1.41 hrs, Volume= 0.027 af, Atten= 67%, Lag= 14.7 min
Discarded = 0.26 cfs @ 1.41 hrs, Volume= 0.027 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.62' @ 1.41 hrs Surf.Area= 3,674 sf Storage= 417 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.8 min (95.1 - 79.3)

Volume	Invert	Avail.Storage	Storage Description
#1	82.50'	1,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

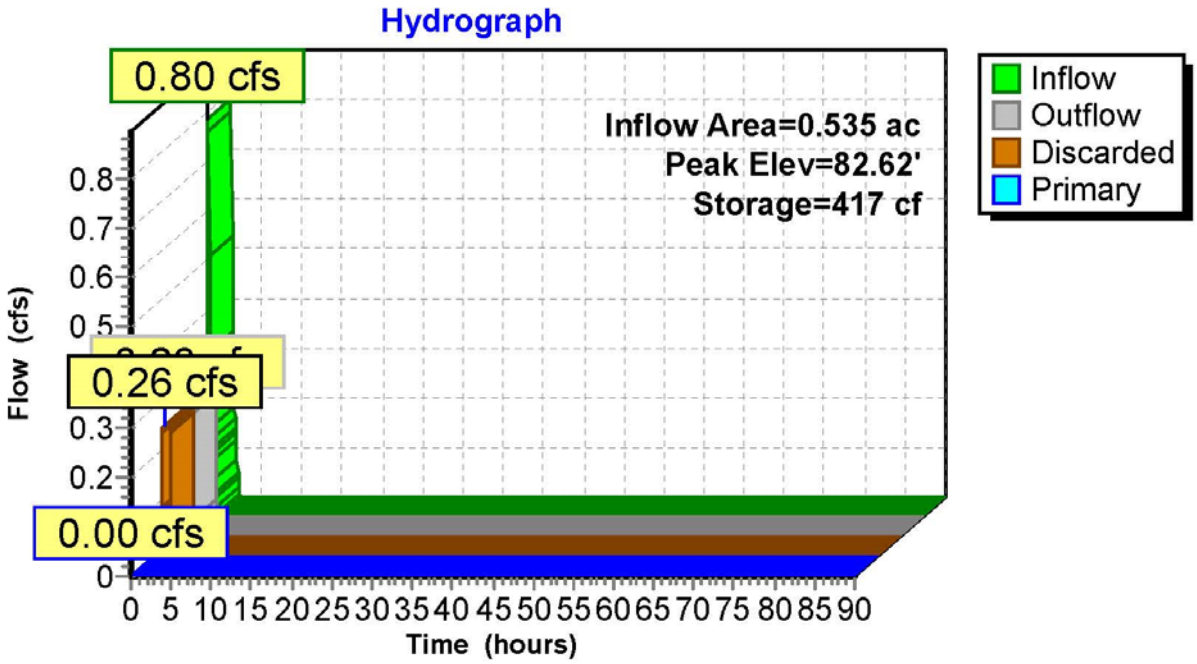
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.50	3,465	0	0
83.00	4,358	1,956	1,956

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.50'	**3.100 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.26 cfs @ 1.41 hrs HW=82.62' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=82.50' TW=68.90' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BIO-3: Biobasin -North



Summary for Pond BIO-3: Biobasin -North

Inflow Area = 0.535 ac, 75.29% Impervious, Inflow Depth = 2.48" for 2 YEAR event
Inflow = 1.82 cfs @ 12.17 hrs, Volume= 0.111 af
Outflow = 1.47 cfs @ 12.27 hrs, Volume= 0.111 af, Atten= 20%, Lag= 5.7 min
Discarded = 0.28 cfs @ 12.27 hrs, Volume= 0.092 af
Primary = 1.18 cfs @ 12.27 hrs, Volume= 0.019 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.78' @ 12.27 hrs Surf.Area= 3,970 sf Storage= 1,052 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 19.6 min (807.2 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	82.50'	1,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

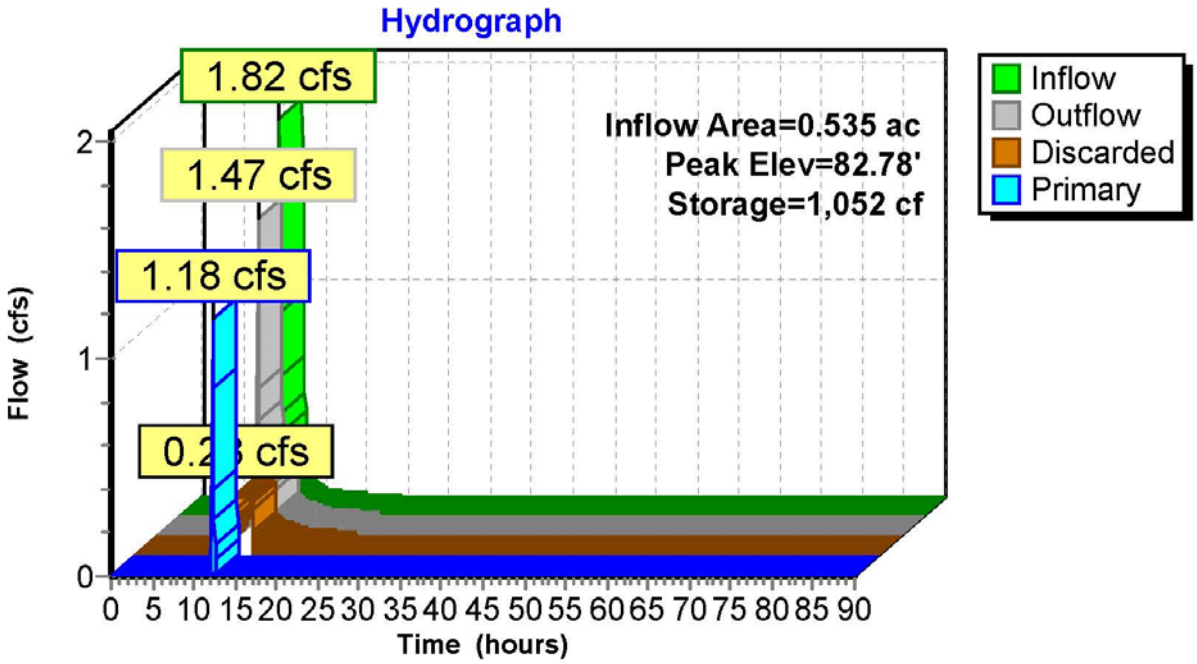
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.50	3,465	0	0
83.00	4,358	1,956	1,956

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.50'	**3.100 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.28 cfs @ 12.27 hrs HW=82.77' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=1.03 cfs @ 12.27 hrs HW=82.78' TW=70.74' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 1.03 cfs @ 0.41 fps)

Pond BIO-3: Biobasin -North



Summary for Pond BIO-3: Biobasin -North

Inflow Area = 0.535 ac, 75.29% Impervious, Inflow Depth = 4.10" for 10 YEAR event
Inflow = 2.93 cfs @ 12.17 hrs, Volume= 0.183 af
Outflow = 3.38 cfs @ 12.18 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.6 min
Discarded = 0.29 cfs @ 12.18 hrs, Volume= 0.123 af
Primary = 3.09 cfs @ 12.18 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.80' @ 12.18 hrs Surf.Area= 4,007 sf Storage= 1,135 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.1 min (793.7 - 777.6)

Volume	Invert	Avail.Storage	Storage Description
#1	82.50'	1,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

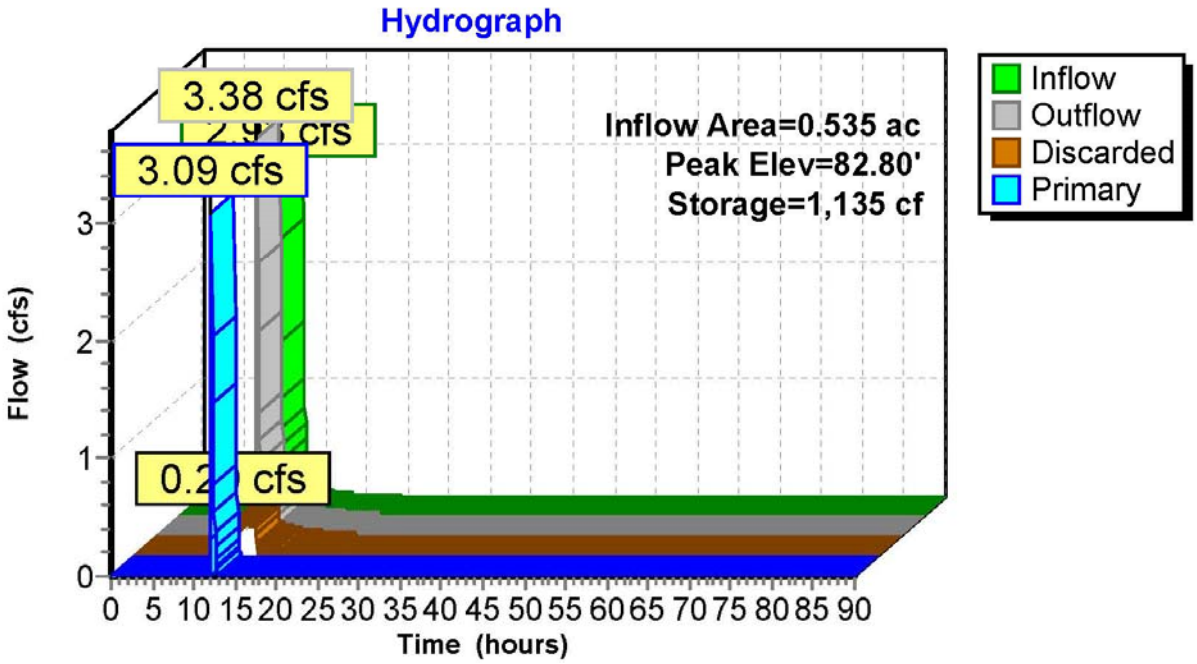
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.50	3,465	0	0
83.00	4,358	1,956	1,956

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.50'	**3.100 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.29 cfs @ 12.18 hrs HW=82.80' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=2.75 cfs @ 12.18 hrs HW=82.80' TW=71.46' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 2.75 cfs @ 0.56 fps)

Pond BIO-3: Biobasin -North



Summary for Pond BIO-3: Biobasin -North

Inflow Area = 0.535 ac, 75.29% Impervious, Inflow Depth = 7.25" for 100 YEAR event
Inflow = 5.01 cfs @ 12.17 hrs, Volume= 0.323 af
Outflow = 4.88 cfs @ 12.18 hrs, Volume= 0.323 af, Atten= 2%, Lag= 0.8 min
Discarded = 0.29 cfs @ 12.18 hrs, Volume= 0.173 af
Primary = 4.60 cfs @ 12.18 hrs, Volume= 0.150 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 82.82' @ 12.18 hrs Surf.Area= 4,035 sf Storage= 1,196 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.2 min (779.8 - 766.6)

Volume	Invert	Avail.Storage	Storage Description
#1	82.50'	1,956 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

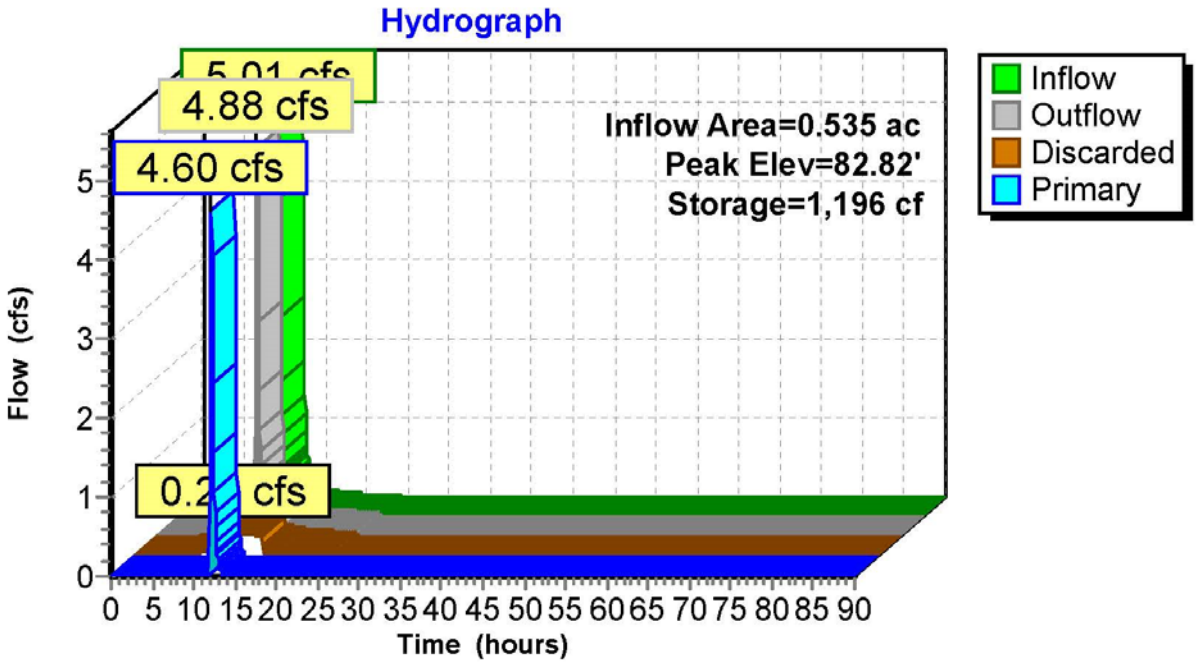
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.50	3,465	0	0
83.00	4,358	1,956	1,956

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.50'	**3.100 in/hr Exfiltration over Surface area**
#2	Primary	82.75'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.29 cfs @ 12.18 hrs HW=82.82' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=4.40 cfs @ 12.18 hrs HW=82.82' TW=73.46' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 4.40 cfs @ 0.66 fps)

Pond BIO-3: Biobasin -North



7) Routing for Basin #1

Summary for Pond Basin #1: Pond #1

Inflow Area = 25.667 ac, 50.42% Impervious, Inflow Depth = 1.52" for 2 YEAR event
Inflow = 29.96 cfs @ 12.51 hrs, Volume= 3.253 af
Outflow = 0.68 cfs @ 19.66 hrs, Volume= 2.397 af, Atten= 98%, Lag= 428.8 min
Primary = 0.68 cfs @ 19.66 hrs, Volume= 2.397 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.08 hrs
Peak Elev= 74.25' @ 19.66 hrs Surf.Area= 45,344 sf Storage= 117,941 cf

Plug-Flow detention time= 2,002.1 min calculated for 2.395 af (74% of inflow)
Center-of-Mass det. time= 1,927.4 min (2,766.2 - 838.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.90'	382,696 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.90	0	0	0
70.00	9,148	5,031	5,031
71.00	21,344	15,246	20,277
72.00	25,700	23,522	43,799
73.00	30,492	28,096	71,895
74.00	40,075	35,284	107,179
75.00	60,984	50,530	157,708
76.00	70,132	65,558	223,266
77.00	79,715	74,924	298,190
78.00	89,298	84,507	382,696

Device	Routing	Invert	Outlet Devices
#1	Device 6	68.90'	**2.5" Vert. Orifice/Grate** C= 0.600
#2	Device 6	74.00'	**9.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 6	76.00'	**60.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 6	76.00'	**54.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 6	76.00'	**54.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Primary	68.80'	**36.0" Round Culvert** L= 86.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 68.80' / 66.53' S= 0.0264 '/' Cc= 0.900 n= 0.011, Flow Area= 7.07 sf
#7	Secondary	77.50'	**75.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.68 cfs @ 19.66 hrs HW=74.25' (Free Discharge)
- **6=Culvert** (Passes 0.68 cfs of 67.66 cfs potential flow)
  - **1=Orifice/Grate** (Orifice Controls 0.38 cfs @ 11.03 fps)
  - **2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 1.61 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.90' (Free Discharge)
- **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Basin #1: Pond #1