

Stormwater Management

Crescent

Gahanna, Ohio

Prepared By:



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March 2023

I hereby certify that the calculations contained herein are accurate to the best of my knowledge and belief.

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Date

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EXECUTIVE SUMMARY (Ortho One Pond 1):

Table 1 – Critical Storm Summary Table

1Yr. Pre-Developed Storm Runoff Volume	0.304 AF
1Yr. Post-Developed Storm Runoff Volume	0.801 AF
Volume Increase	163%
Critical Storm	25 Year

Table 2 – Storm Water Runoff Summary Table

Storm Event	Pre-Dev. (CFS)	Dev. (CFS)	Allowable Release Rate (CFS)	Actual Release Rate (CFS)	Ponding Elev.
1 Yr.	5.09	16.56	5.09	0.64	786.48
2 Yr.	8.09	21.14	5.09	1.03	786.82
5 Yr.	12.86	27.67	5.09	1.45	787.39
10 Yr.	17.07	33.02	5.09	1.71	787.85
25 Yr.	23.32	40.48	5.09	2.01	788.48
50 Yr.	28.71	46.64	17.07	4.56	788.83
100 Yr.	34.52	53.09	17.07	7.68	789.11

*** Allowable release rate equals 1 Yr. Predeveloped less R/W, to the Critical Storm, limited to the 10 Yr. Predeveloped.**

Table 3 – Detention Summary Table

Water Quality Volume Required	14,318 CF
Water Quality Volume Provided	14,827 CF
Water Quantity Volume Required	71,513 CF
Water Quantity Volume Provided	79,866 CF

EXECUTIVE SUMMARY (SE Pond 2):

Table 1 – Critical Storm Summary Table

1Yr. Pre-Developed Storm Runoff Volume	0.465 AF
1Yr. Post-Developed Storm Runoff Volume	1.311 AF
Volume Increase	182%
Critical Storm	25 Year

Table 2 – Storm Water Runoff Summary Table

Storm Event	Pre-Dev. (CFS)	Dev. (CFS)	Roadway (CFS)	From Ortho One (CFS)	Allowable Release Rate (CFS)	Actual Release Rate (CFS)	Ponding Elev.
1 Yr.	4.72	18.68	3.71	1.01	4.72	0.50	782.34
2 Yr.	10.01	25.54	4.84	1.37	4.72	1.12	782.91
5 Yr.	19.55	35.74	6.47	1.76	4.72	1.67	783.87
10 Yr.	28.54	44.33	7.81	2.01	4.72	2.31	784.64
25 Yr.	42.43	56.55	9.70	2.31	4.72	4.46	785.01
50 Yr.	54.82	66.77	11.26	5.47	28.54	6.96	785.52
100 Yr.	68.49	77.56	12.90	8.40	28.54	20.83	785.80

*** Allowable release rate equals 1 Yr. Predeveloped less un-detained, to the Critical Storm, limited to the 10 Yr. Predeveloped.**

Table 3 – Detention Summary Table

Water Quality Volume Required	37,644 CF
Water Quality Volume Provided	37,950 CF
Water Quantity Volume Required	167,276 CF
Water Quantity Volume Provided	173,843 CF

EXECUTIVE SUMMARY (SW Pond 3):

Table 1 – Critical Storm Summary Table

1Yr. Pre-Developed Storm Runoff Volume	0.531 AF
1Yr. Post-Developed Storm Runoff Volume	1.559 AF
Volume Increase	194%
Critical Storm	25 Year

Table 2 – Storm Water Runoff Summary Table

Storm Event	Pre-Dev. (CFS)	Dev. (CFS)	Allowable Release Rate (CFS)	Actual Release Rate (CFS)	Ponding Elev.
1 Yr.	5.96	24.02	5.96	0.71	784.37
2 Yr.	9.68	30.48	5.96	1.15	784.75
5 Yr.	15.65	39.66	5.96	1.90	785.25
10 Yr.	20.98	47.18	5.96	2.32	785.69
25 Yr.	28.91	57.65	5.96	5.93	786.13
50 Yr.	35.77	66.29	20.98	10.73	786.42
100 Yr.	43.20	75.34	20.98	18.59	786.69

*** Allowable release rate equals 1 Yr. Predeveloped less un-detained, to the Critical Storm, limited to the 10 Yr. Predeveloped.**

Table 3 – Detention Summary Table

Water Quality Volume Required	35,393 CF
Water Quality Volume Provided	37,237 CF
Water Quantity Volume Required	122,529 CF
Water Quantity Volume Provided	133,635 CF

INTRODUCTION:

The following report presents the storm water management plan for a development located at the northeast intersection of Hamilton Road and Tech Center Drive in Gahanna, Ohio. The analysis will include new commercial layout, an orthopedic building, roadway, and residential apartments. The storage shall be governed by the release rates set forth in the Franklin County Storm Water Manual guidelines.

The area to the north adds a new orthopedic development (7.55 Ac.), to the east a new road and residential apartment complex (1.57 Ac. and 16.66 Ac.) respectively. A commercial development to the southwest is approximately (13.20 Ac.). The total area considered disturbed in this report is approximately (38.98 Ac.). Tributary areas offsite were considered negligible.

Three ponds will provide water quality and quantity as required. A separate dry pond (Pond 1) for the orthopedic area will be analyzed and drain to the road and a (dry pond) to the southeast (Pond 2). The commercial site will have its own wet pond (Pond 3) which will drain to an existing storm sewer.

HYDROLOGIC ANALYSIS:

All hydrologic parameters were determined using the methodology described in the Franklin County Storm Water Manual guidelines. Both Pre-Development and Post-Development runoff and peak discharge amounts were calculated through HydroCAD version 10.2 software.

All proposed drainage (after storage) will be directed to the existing storm sewer system along Hamilton Road for the commercial site (southwest) and to a ditch on the residential, road and orthopedic portion. The storage shall be governed by the release of the 1 year predeveloped release rate to the critical storm and limited to the 10 year predeveloped rate.

PRE-DEVELOPED CONDITIONS (Ortho One Pond 1):

The pre-developed condition of the site consists of a row crops in good condition. A pre-developed curve number (CN) of 75 Hydrologic Soil Group (HSG B) was used for the site. The time of concentration used was 10 minutes.

POST-DEVELOPED CONDITIONS (Ortho One Pond 1):

The post developed condition for the site will consist of new buildings and paved parking. The developed curve number, with a (CN) of 91 (HSG D) was used for the site, including 4.62 Ac. paved at CN 98 and 2.93 Ac. at CN 80. The time of concentration used was 8 minutes.

PRE-DEVELOPED CONDITIONS (SE Pond 2):

The pre-developed condition of the site consists of the road area 1.57 Ac, the residential area 16.66 Ac. and the orthopedic area 7.55 Ac. with approximately 7.40 Ac. of row crops and 18.38 Ac. of woods/grass (HSG B).

A pre-developed curve number (CN) of 68 Hydrologic Soil Group (HSG B) was used for the site. The time of concentration used was 18.8 minutes.

POST-DEVELOPED CONDITIONS (SE Pond 2):

The post developed condition for the site will consist of a new road, new parking and apartment buildings with some grass. The developed curve number, with a (CN) of 85 (HSG B) was used for the site with 10.74 Ac. paved at CN 98 and 5.92 Ac. of grass CN 61. The time of concentration used was 17.5 minutes.

PRE-DEVELOPED CONDITIONS (SW Pond 3):

The pre-developed condition of the site consists of a row crops in good condition.

A pre-developed curve number (CN) of 75 Hydrologic Soil Group (HSG B) was used for the 13.20 Ac. site. The time of concentration used was 20.3 minutes.

POST-DEVELOPED CONDITIONS (SW Pond 3):

The post developed condition for the site will consist of new buildings and paved parking. The developed curve number, with a (CN) of 91 (HSG D) was used for the site, including 4.62 Ac. paved at CN 98 and 2.93 Ac. at CN 80. The time of concentration used was 8 minutes.

Critical Storm Calculation (Ortho One Pond 1):

The critical storm is determined by comparing the increase in runoff volume of the 1-year 24-hour rainfall event from the pre-developed condition to that of the post-developed.

Pre-Development 1-Year Storm Event: 0.304 af
Post-Development 1-Year Storm Event: 0.801 af
 $((0.801 \text{ af} - 0.304 \text{ af}) / 0.304 \text{ af}) \times 100\% = 163\%$ **(25-year critical storm)**

Critical Storm Calculation (SE Pond 2):

The critical storm is determined by comparing the increase in runoff volume of the 1-year 24-hour rainfall event from the pre-developed condition to that of the post-developed.

Pre-Development 1-Year Storm Event: 0.465 af
Post-Development 1-Year Storm Event: 1.311 af
 $((1.311 \text{ af} - 0.465 \text{ af}) / 0.465 \text{ af}) \times 100\% = 182\%$ **(25-year critical storm)**

Critical Storm Calculation (SW Pond 3):

The critical storm is determined by comparing the increase in runoff volume of the 1-year 24-hour rainfall event from the pre-developed condition to that of the post-developed.

Pre-Development 1-Year Storm Event: 0.531 af
Post-Development 1-Year Storm Event: 1.559 af
 $((1.559 \text{ af} - 0.531 \text{ af}) / 0.531 \text{ af}) \times 100\% = 194\%$ (**25-year critical storm**)

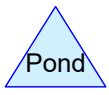
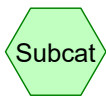
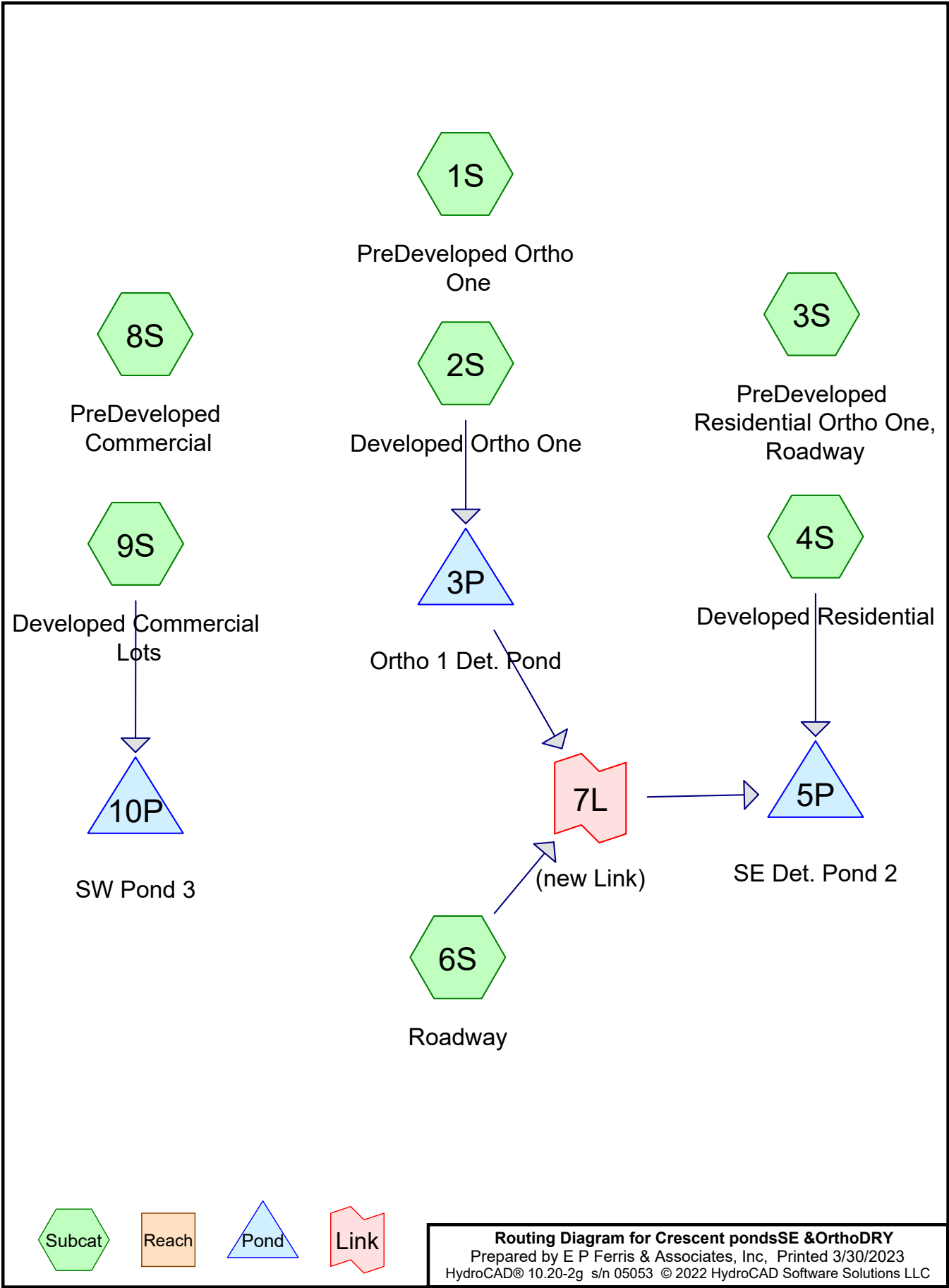
WATER QUALITY:

Water quality for the entire tributary area will be provided in the three proposed ponds. Water Quality calculations with drawdown can be found in Appendix C.

SUMMARY:

The 1 yr. pre-developed rate will not be exceeded to the critical storm. The site will use retention ponds to provide the necessary storage volume to achieve the required release rates from the site. Tributary Maps can be found in Appendix B Water Quality in Appendix C, a Soil Report found in Appendix D and Storm Pipe Calcs. in Appendix E.

APPENDIX A
HydroCAD REPORT



Routing Diagram for Crescent pondsSE & OrthoDRY
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Crescent pondsSE &OrthoDRY

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1Yr.	Type II 24-hr		Default	24.00	1	2.20	2
2	2Yr.	Type II 24-hr		Default	24.00	1	2.63	2
3	5Yr.	Type II 24-hr		Default	24.00	1	3.24	2
4	10Yr.	Type II 24-hr		Default	24.00	1	3.74	2
5	25Yr.	Type II 24-hr		Default	24.00	1	4.44	2
6	50Yr.	Type II 24-hr		Default	24.00	1	5.02	2
7	100Yr.	Type II 24-hr		Default	24.00	1	5.63	2

Crescent pondsSE &OrthoDRY

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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 5.09 cfs @ 12.03 hrs, Volume= 0.304 af, Depth= 0.48"

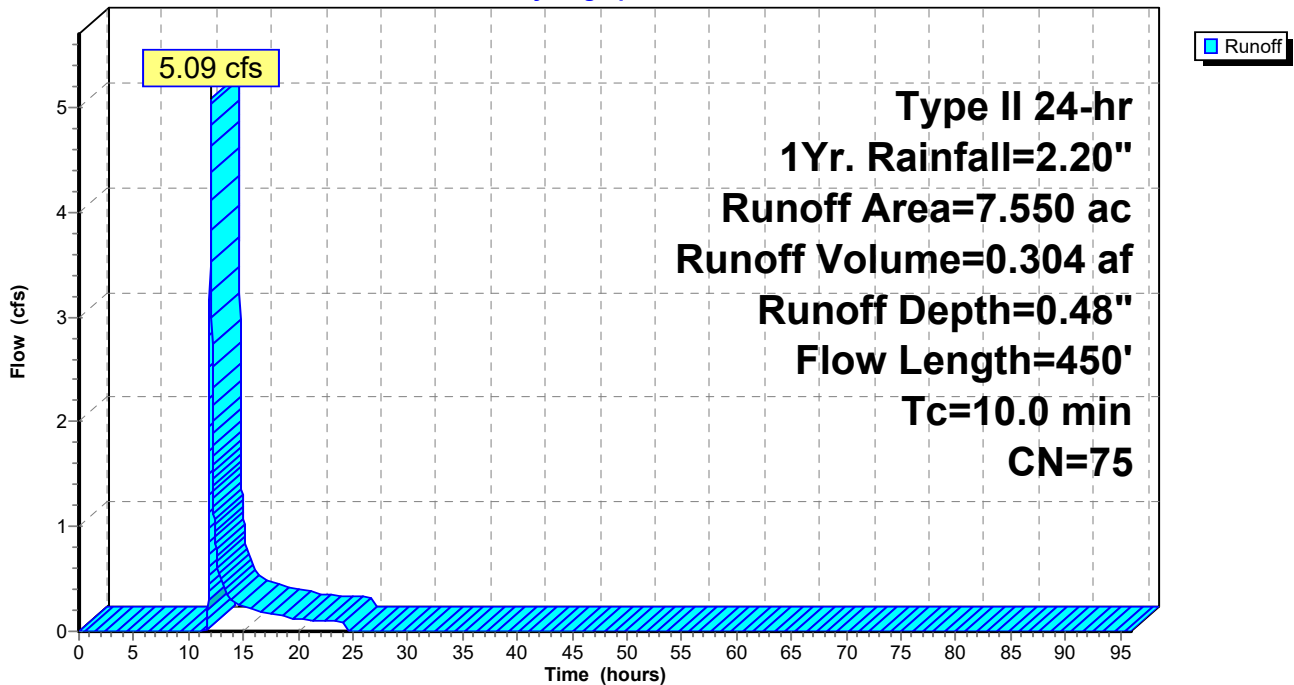
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 16.56 cfs @ 11.99 hrs, Volume= 0.843 af, Depth= 1.34"
 Routed to Pond 3P : Ortho 1 Det. Pond

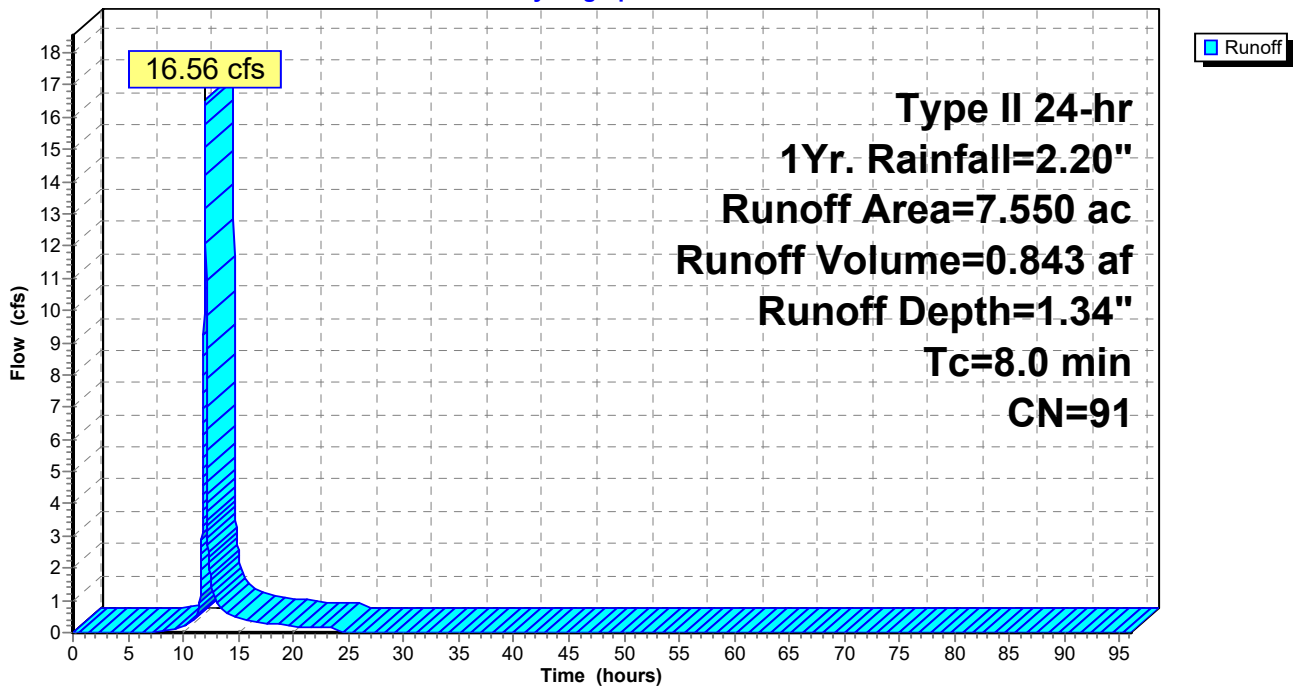
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 4.72 cfs @ 12.17 hrs, Volume= 0.571 af, Depth= 0.27"

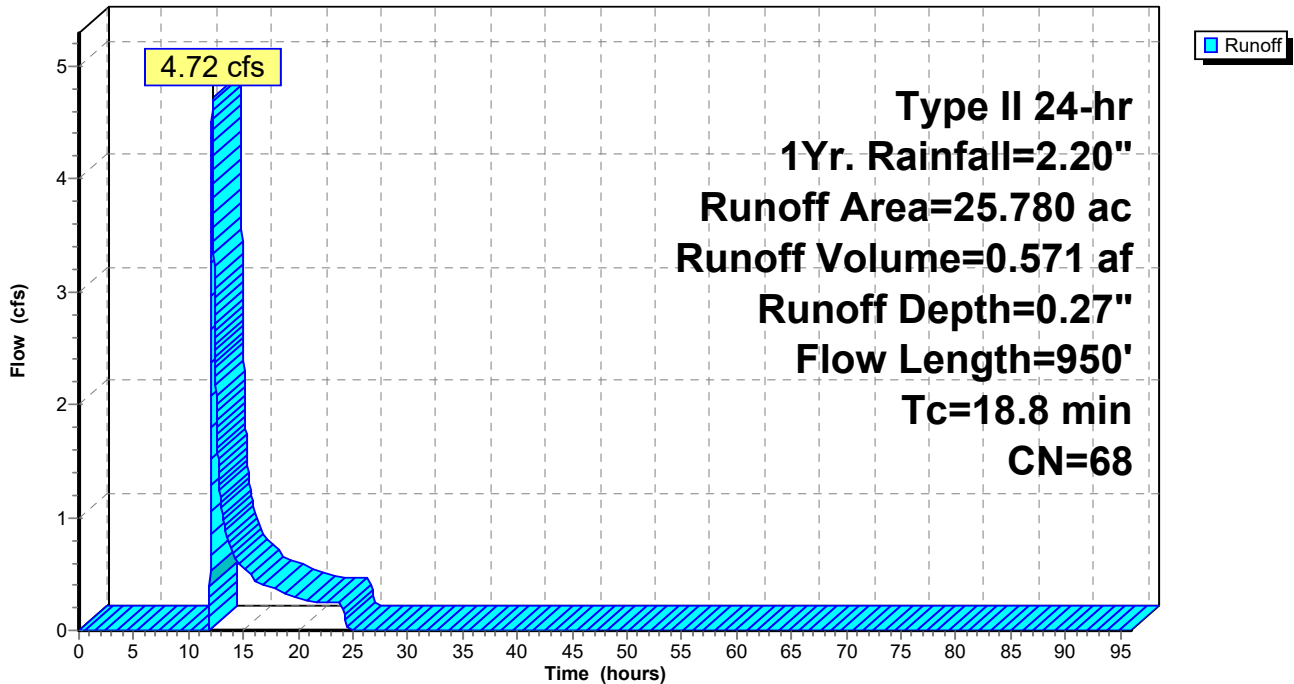
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 18.68 cfs @ 12.11 hrs, Volume= 1.311 af, Depth= 0.94"
 Routed to Pond 5P : SE Det. Pond 2

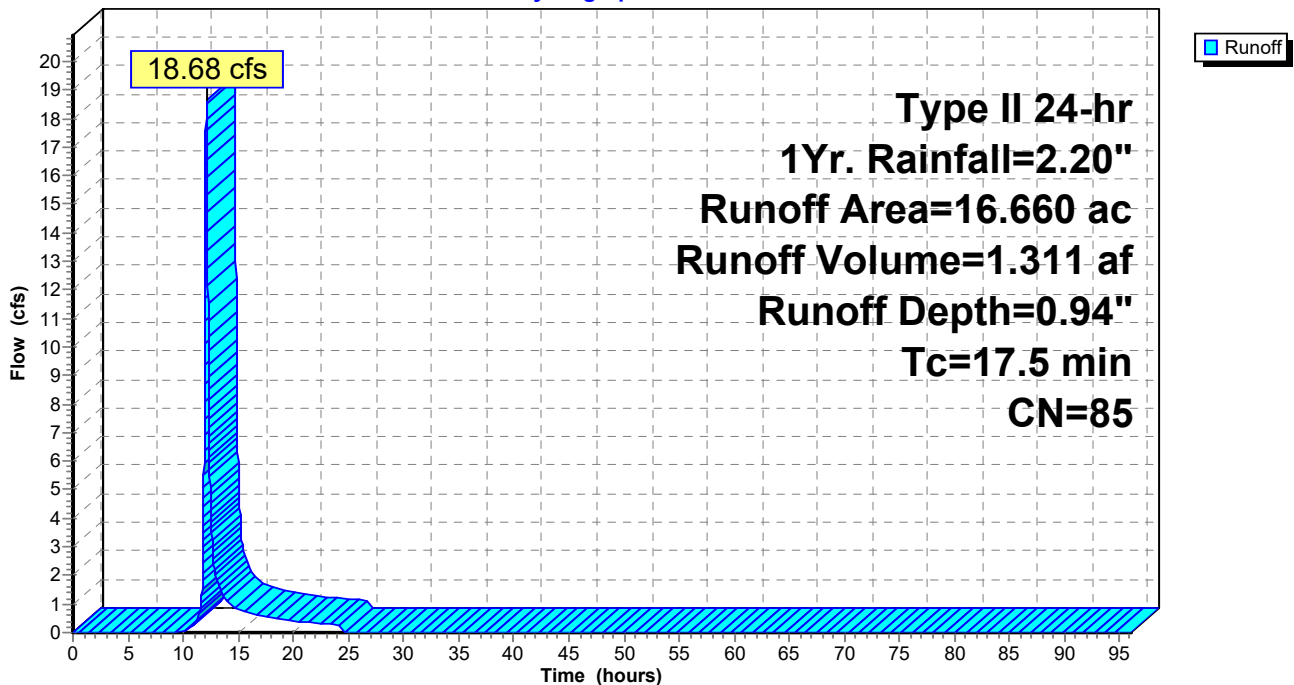
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 6S: Roadway

Runoff = 3.71 cfs @ 12.03 hrs, Volume= 0.208 af, Depth= 1.20"
 Routed to Link 7L : (new Link)

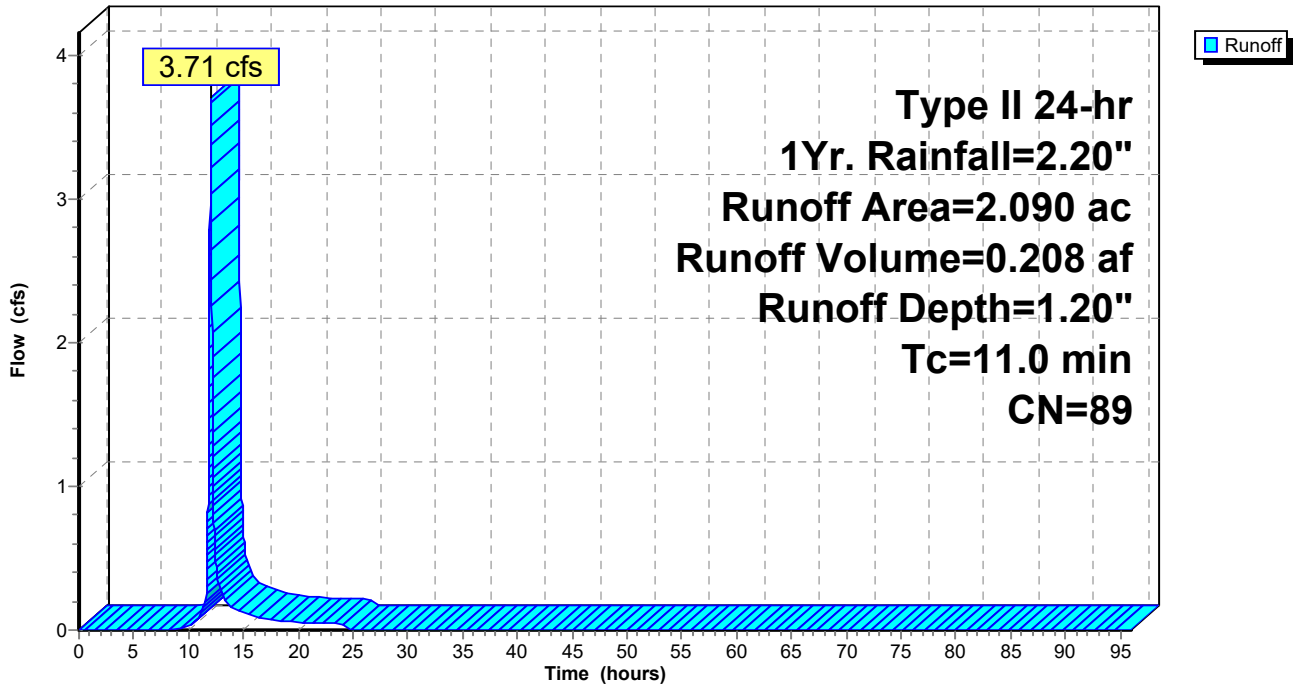
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 5.96 cfs @ 12.16 hrs, Volume= 0.531 af, Depth= 0.48"

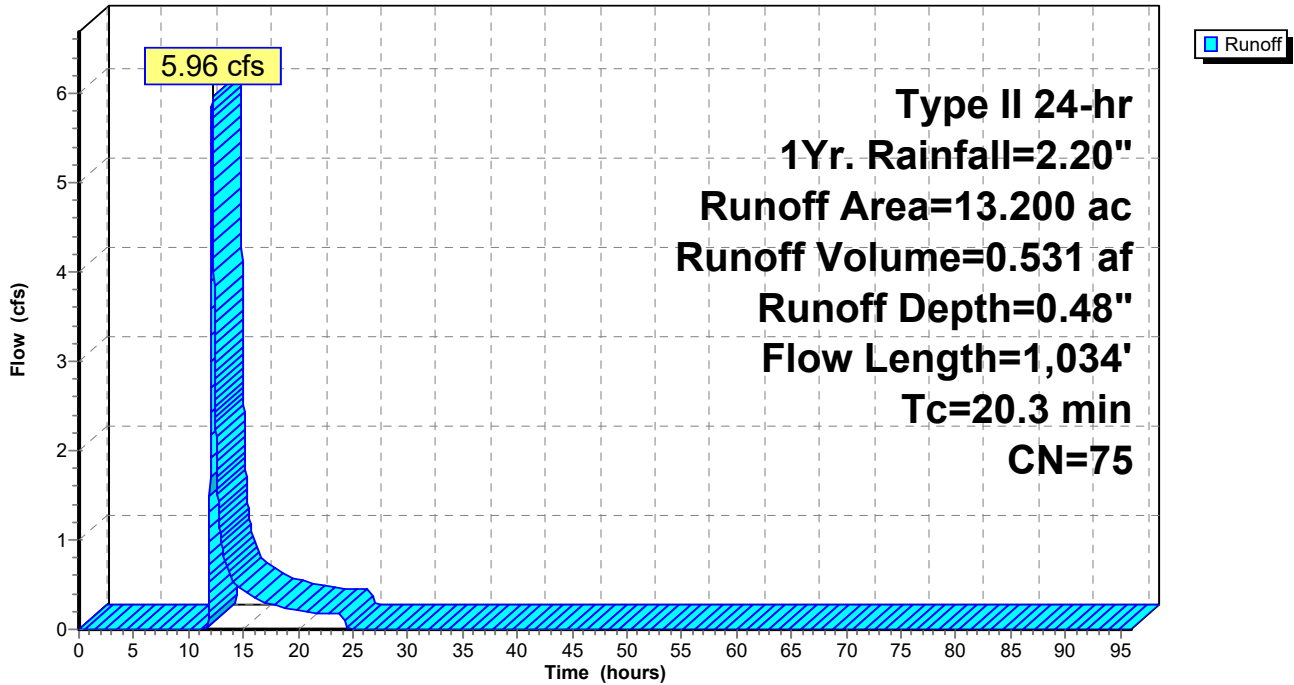
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



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Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 24.02 cfs @ 12.07 hrs, Volume= 1.559 af, Depth= 1.42"
 Routed to Pond 10P : SW Pond 3

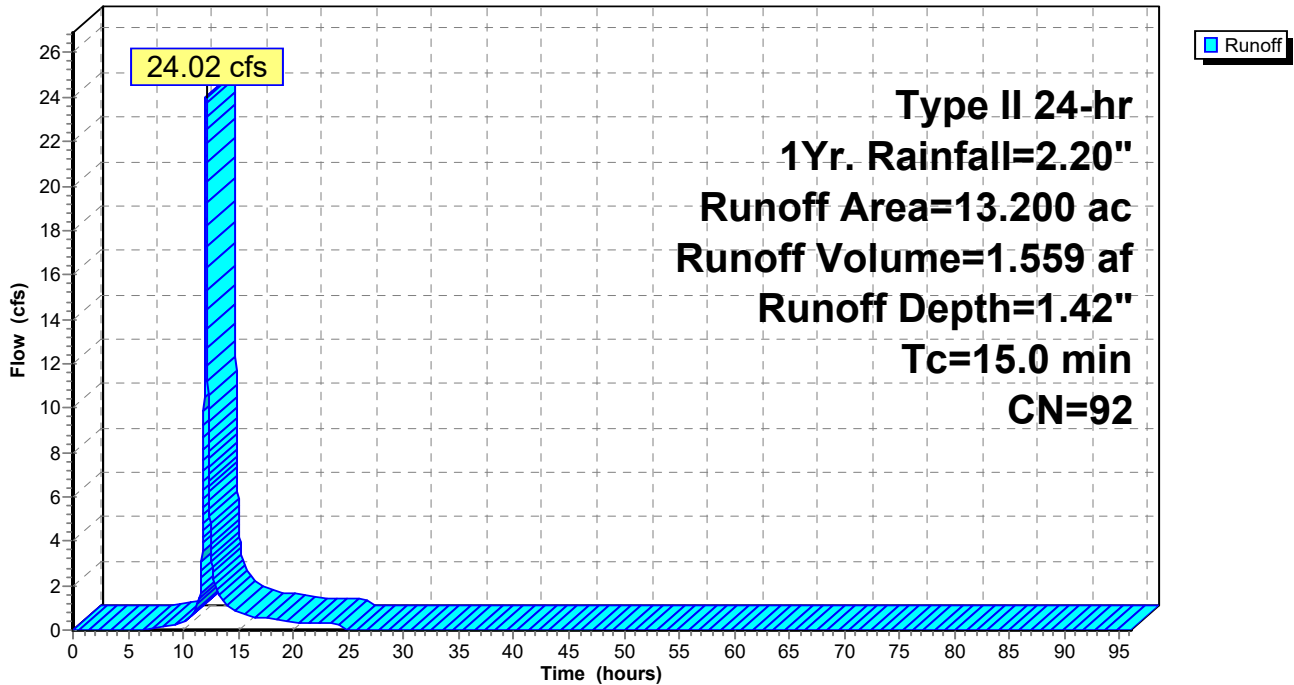
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1Yr. Rainfall=2.20"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 1.34" for 1Yr. event
 Inflow = 16.56 cfs @ 11.99 hrs, Volume= 0.843 af
 Outflow = 0.64 cfs @ 13.72 hrs, Volume= 0.714 af, Atten= 96%, Lag= 103.8 min
 Primary = 0.64 cfs @ 13.72 hrs, Volume= 0.714 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 786.48' @ 13.72 hrs Surf.Area= 14,932 sf Storage= 23,724 cf

Plug-Flow detention time= 1,122.6 min calculated for 0.714 af (85% of inflow)
 Center-of-Mass det. time= 1,053.0 min (1,869.0 - 816.1)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 '/'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.66 cfs @ 13.72 hrs HW=786.48' (Free Discharge)

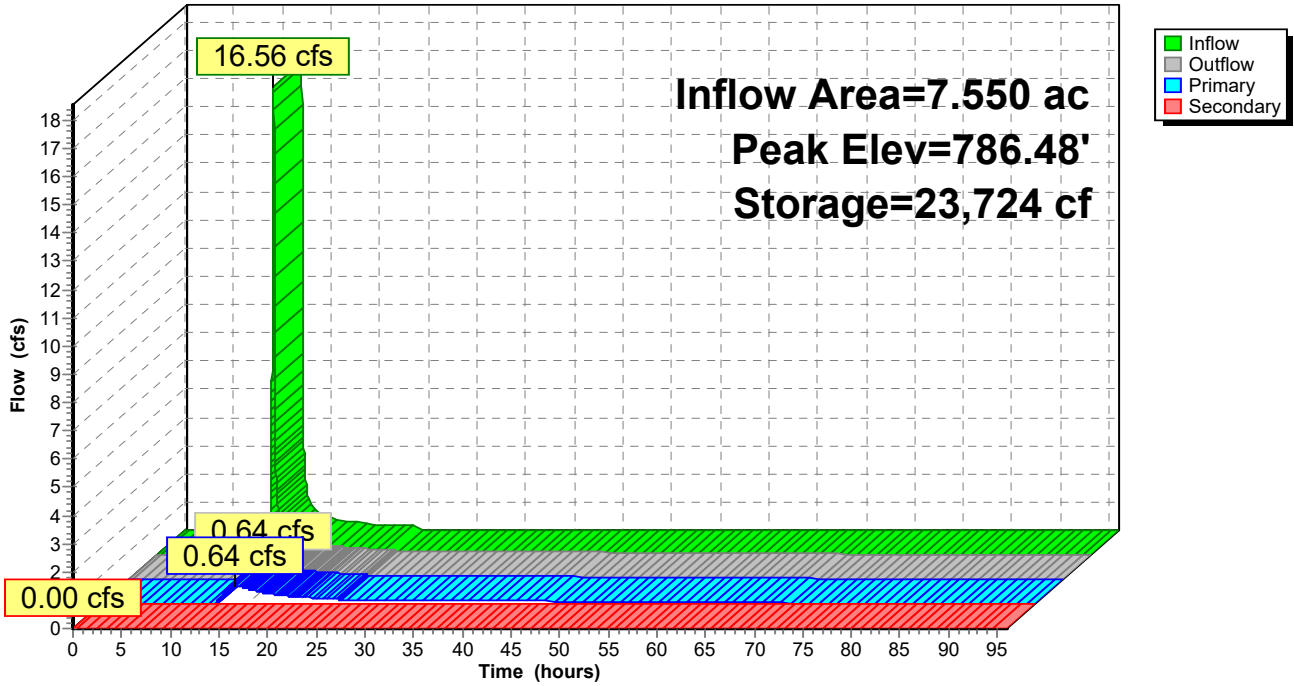
- 1=Culvert (Passes 0.66 cfs of 5.47 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.15 cfs @ 5.68 fps)
- 3=Orifice/Grate (Weir Controls 0.51 cfs @ 1.40 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

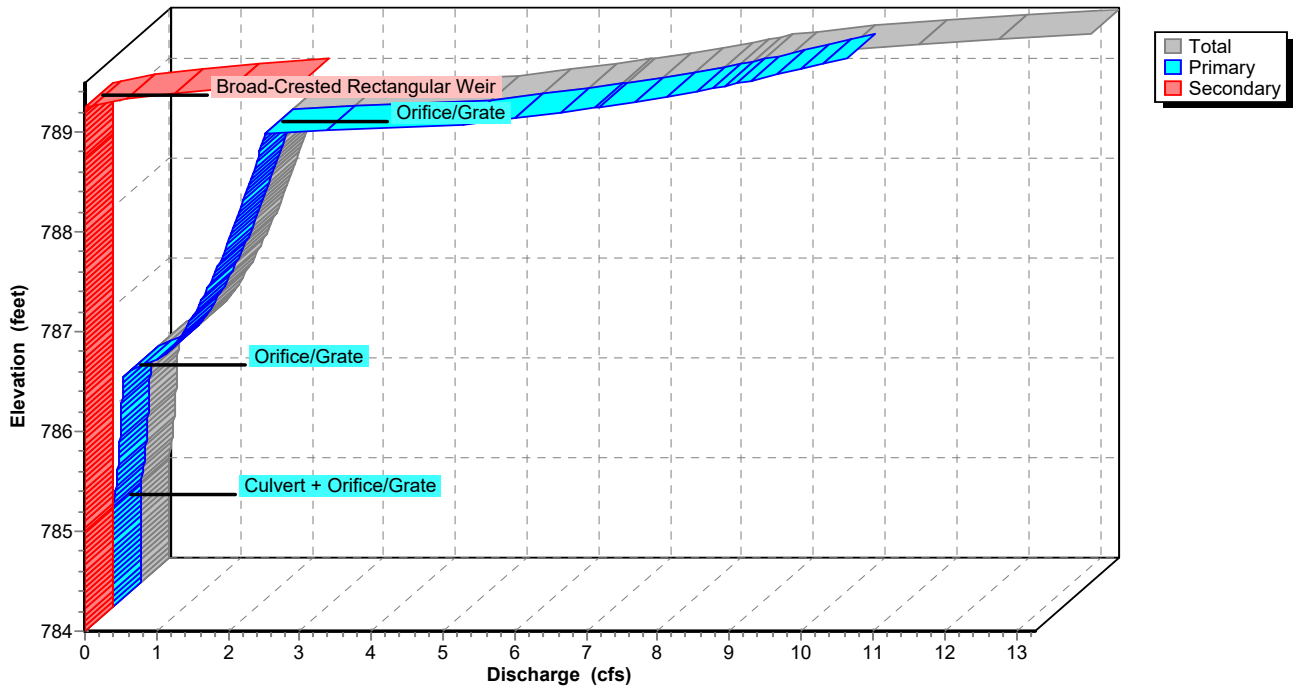
Pond 3P: Ortho 1 Det. Pond

Hydrograph

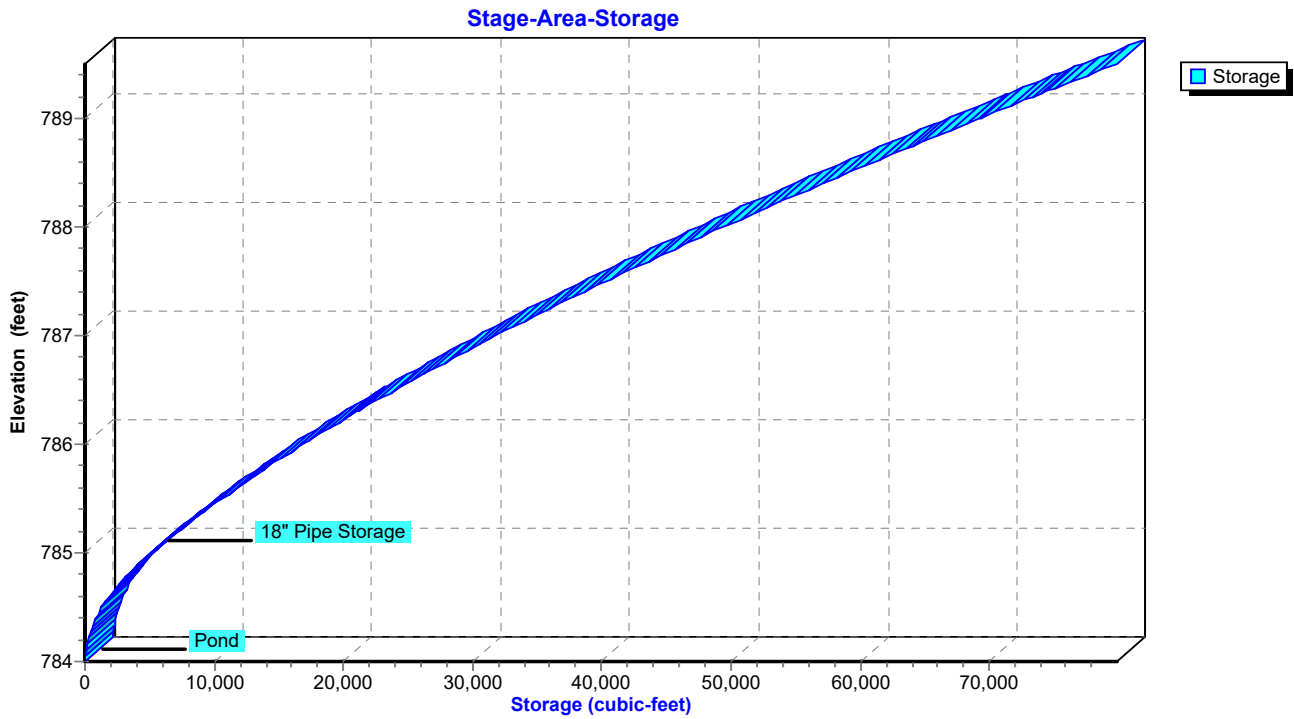


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



Crescent pondsSE &OrthoDRY

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Type II 24-hr 1Yr. Rainfall=2.20"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth > 1.02" for 1Yr. event
 Inflow = 21.70 cfs @ 12.09 hrs, Volume= 2.234 af
 Outflow = 0.50 cfs @ 24.12 hrs, Volume= 1.823 af, Atten= 98%, Lag= 722.1 min
 Primary = 0.50 cfs @ 24.12 hrs, Volume= 1.823 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 782.34' @ 24.12 hrs Surf.Area= 25,902 sf Storage= 64,128 cf

Plug-Flow detention time= 1,748.7 min calculated for 1.823 af (82% of inflow)
 Center-of-Mass det. time= 1,439.7 min (2,614.4 - 1,174.7)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=0.50 cfs @ 24.12 hrs HW=782.34' (Free Discharge)

- 1=Culvert (Passes 0.50 cfs of 7.66 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.40 cfs @ 7.15 fps)
- 3=Orifice/Grate (Orifice Controls 0.10 cfs @ 1.48 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=778.00' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Crescent pondsSE &OrthoDRY

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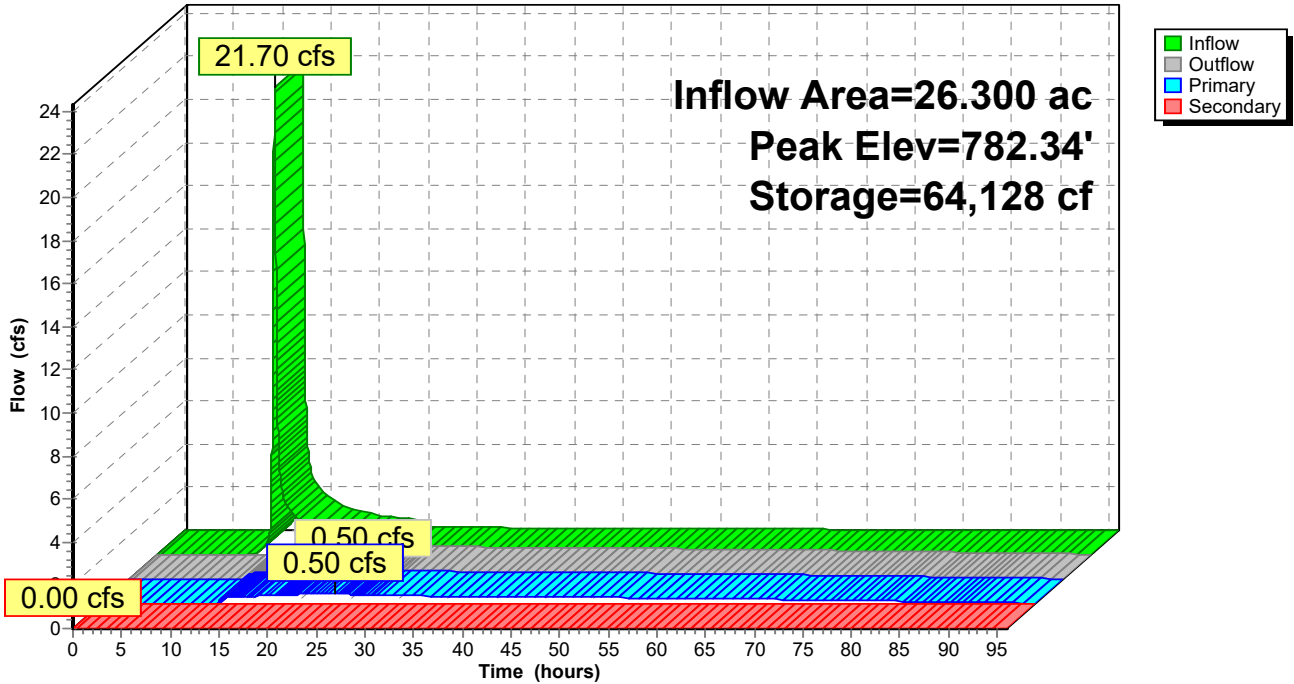
Type II 24-hr 1Yr. Rainfall=2.20"

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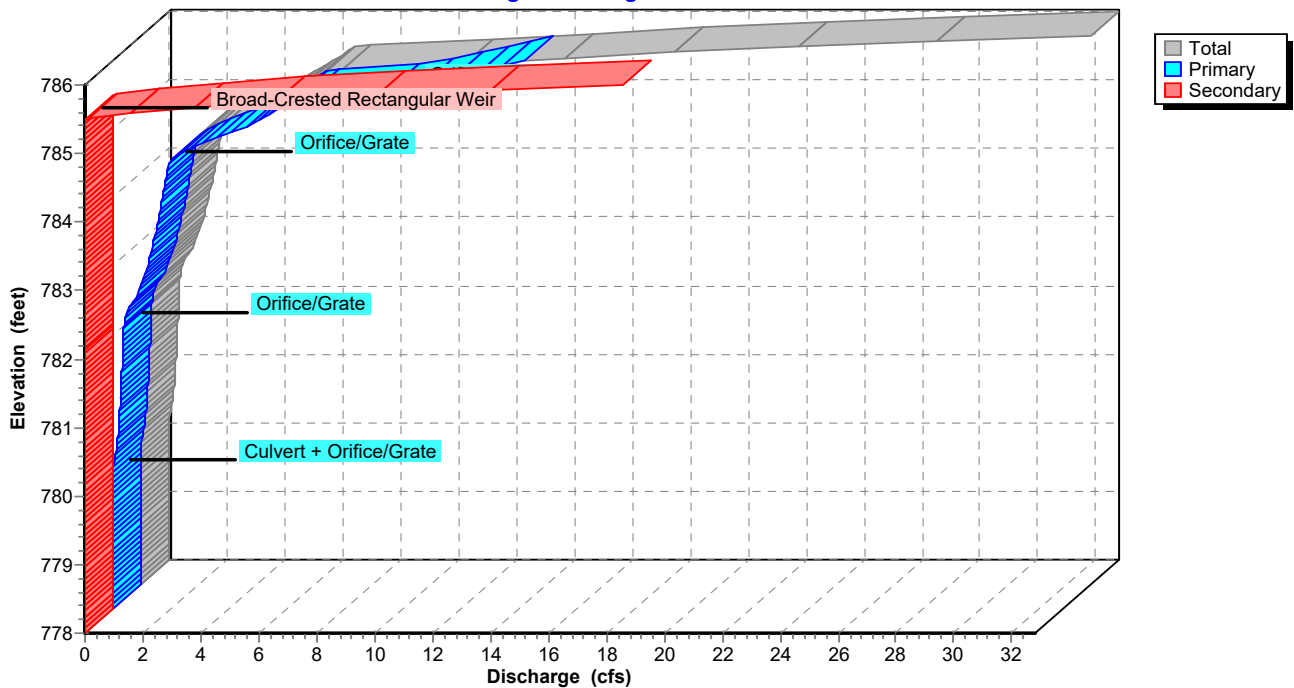
Pond 5P: SE Det. Pond 2

Hydrograph



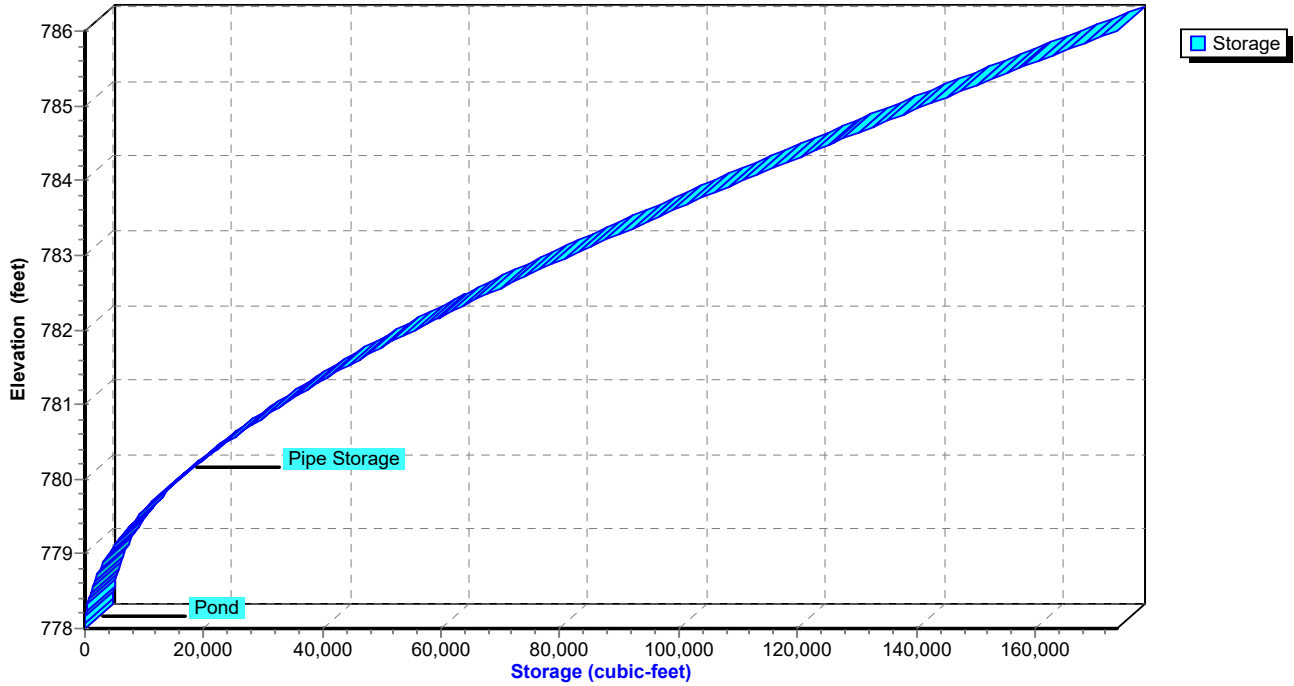
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 1Yr. Rainfall=2.20"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Crescent pondsSE &OrthoDRY

Type II 24-hr 1Yr. Rainfall=2.20"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 1.42" for 1Yr. event
 Inflow = 24.02 cfs @ 12.07 hrs, Volume= 1.559 af
 Outflow = 0.71 cfs @ 15.62 hrs, Volume= 1.413 af, Atten= 97%, Lag= 213.2 min
 Primary = 0.71 cfs @ 15.62 hrs, Volume= 1.413 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 784.37' @ 15.62 hrs Surf.Area= 30,959 sf Storage= 46,205 cf

Plug-Flow detention time= 882.1 min calculated for 1.413 af (91% of inflow)
 Center-of-Mass det. time= 833.9 min (1,651.2 - 817.3)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.71 cfs @ 15.62 hrs HW=784.37' (Free Discharge)

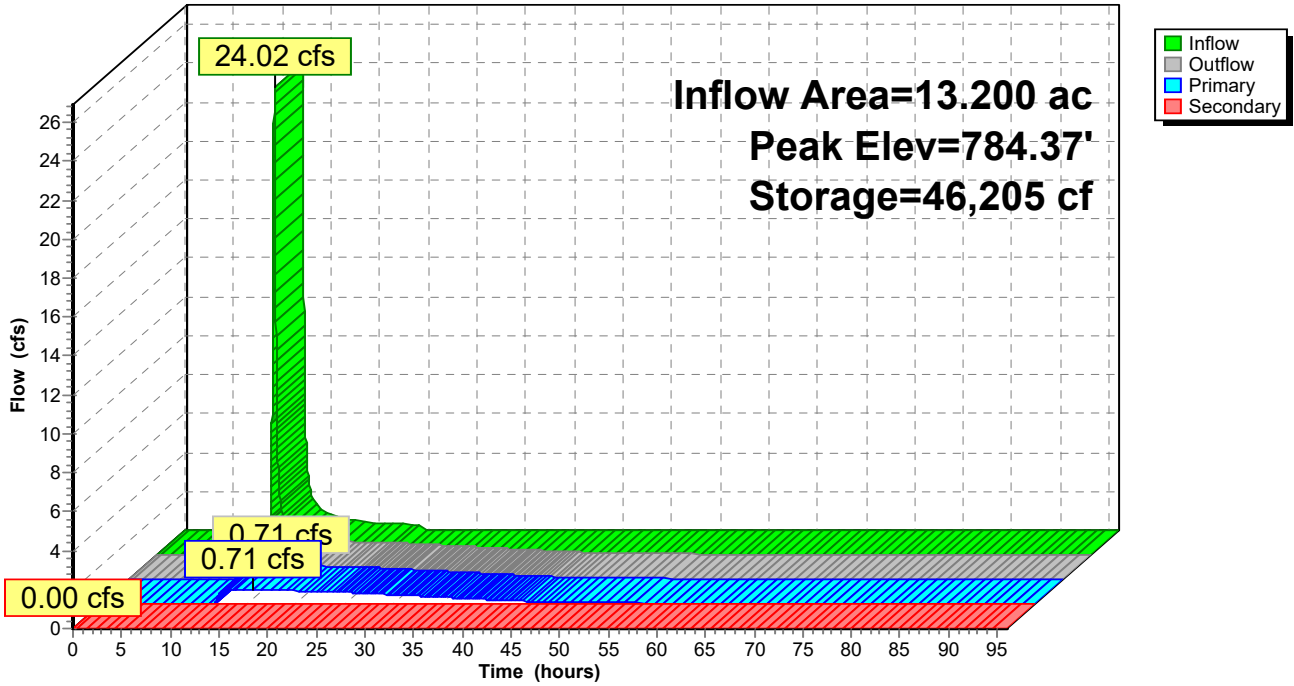
- 1=Culvert (Passes 0.71 cfs of 5.35 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.71 cfs @ 5.20 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=780.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

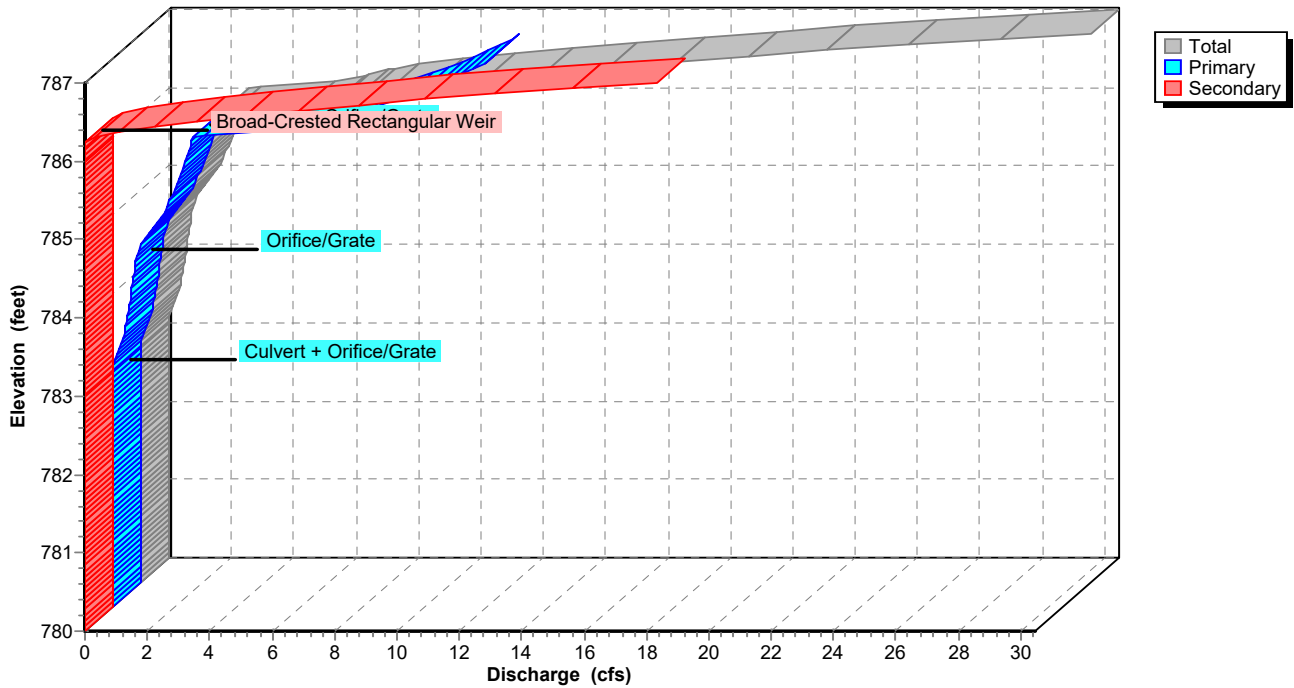
Pond 10P: SW Pond 3

Hydrograph



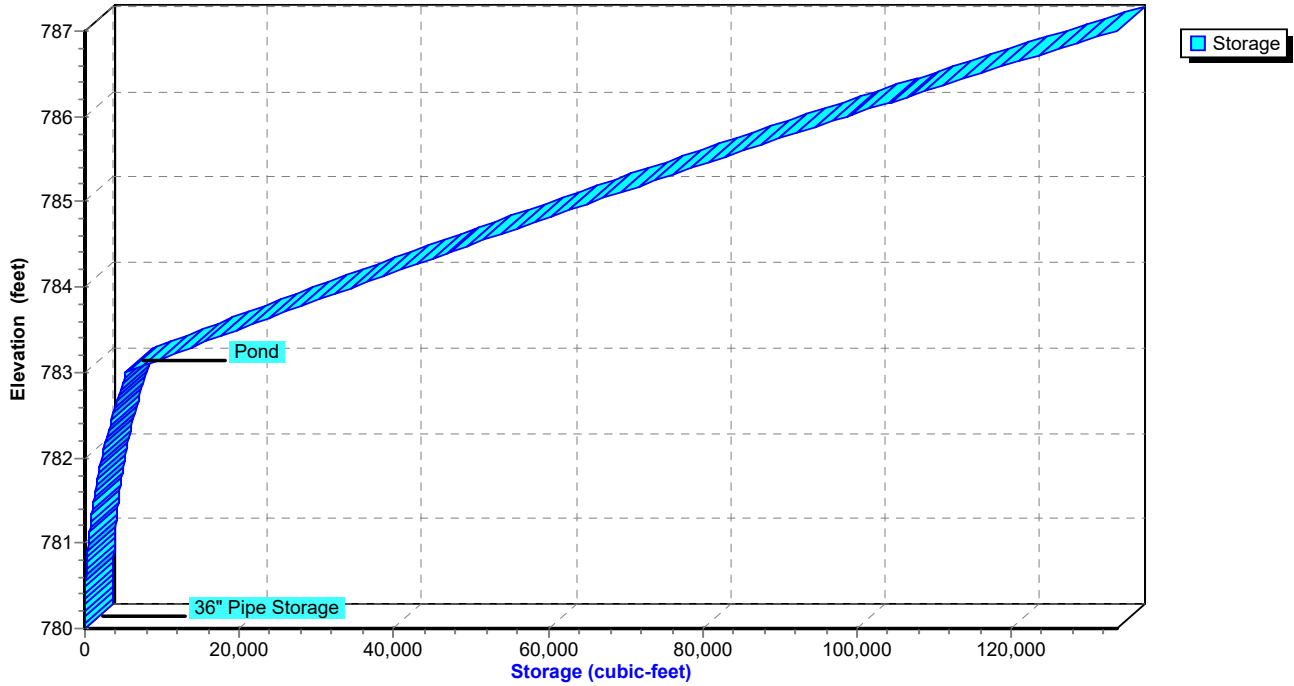
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



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Type II 24-hr 1Yr. Rainfall=2.20"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

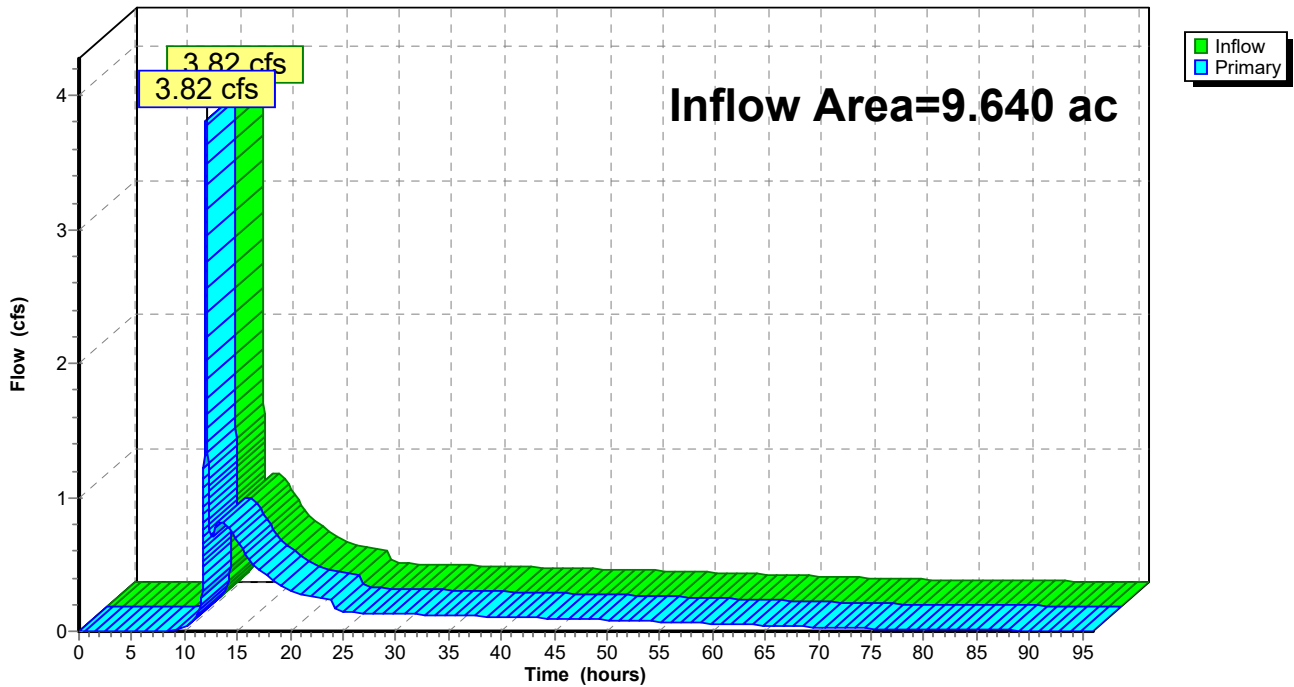
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 1.15" for 1Yr. event
Inflow = 3.82 cfs @ 12.03 hrs, Volume= 0.923 af
Primary = 3.82 cfs @ 12.03 hrs, Volume= 0.923 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 8.09 cfs @ 12.03 hrs, Volume= 0.458 af, Depth= 0.73"

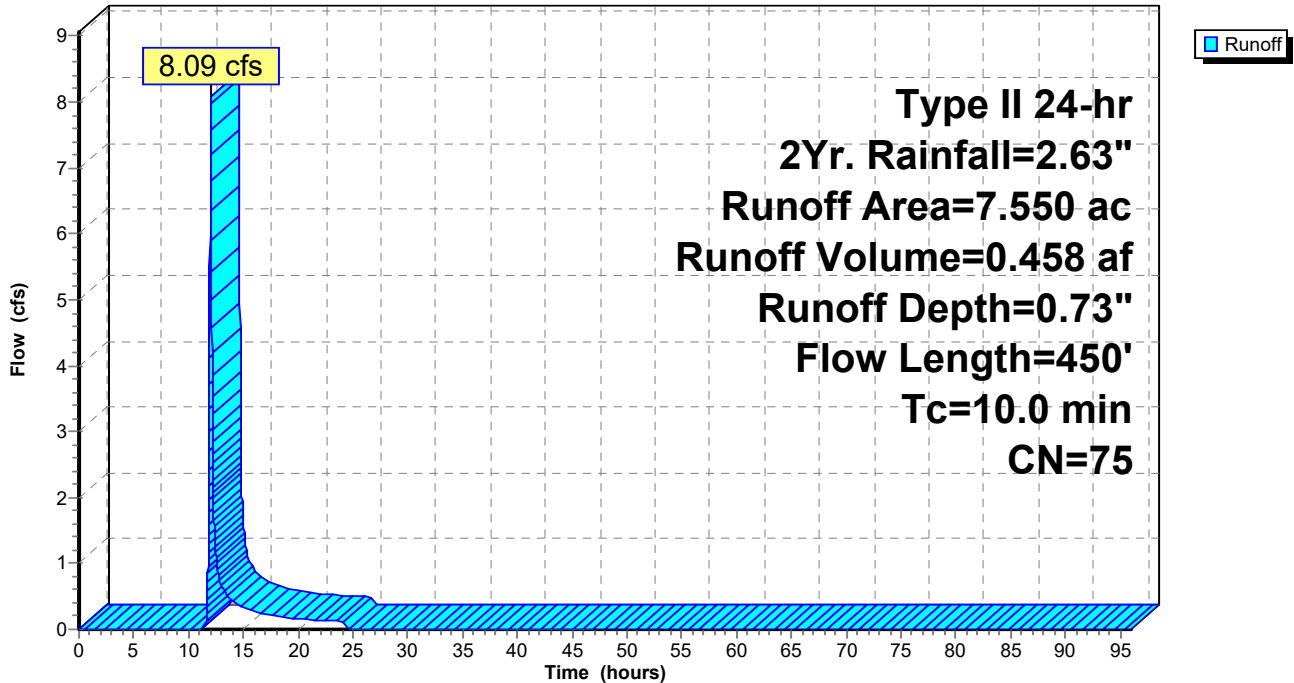
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 21.14 cfs @ 11.99 hrs, Volume= 1.088 af, Depth= 1.73"
 Routed to Pond 3P : Ortho 1 Det. Pond

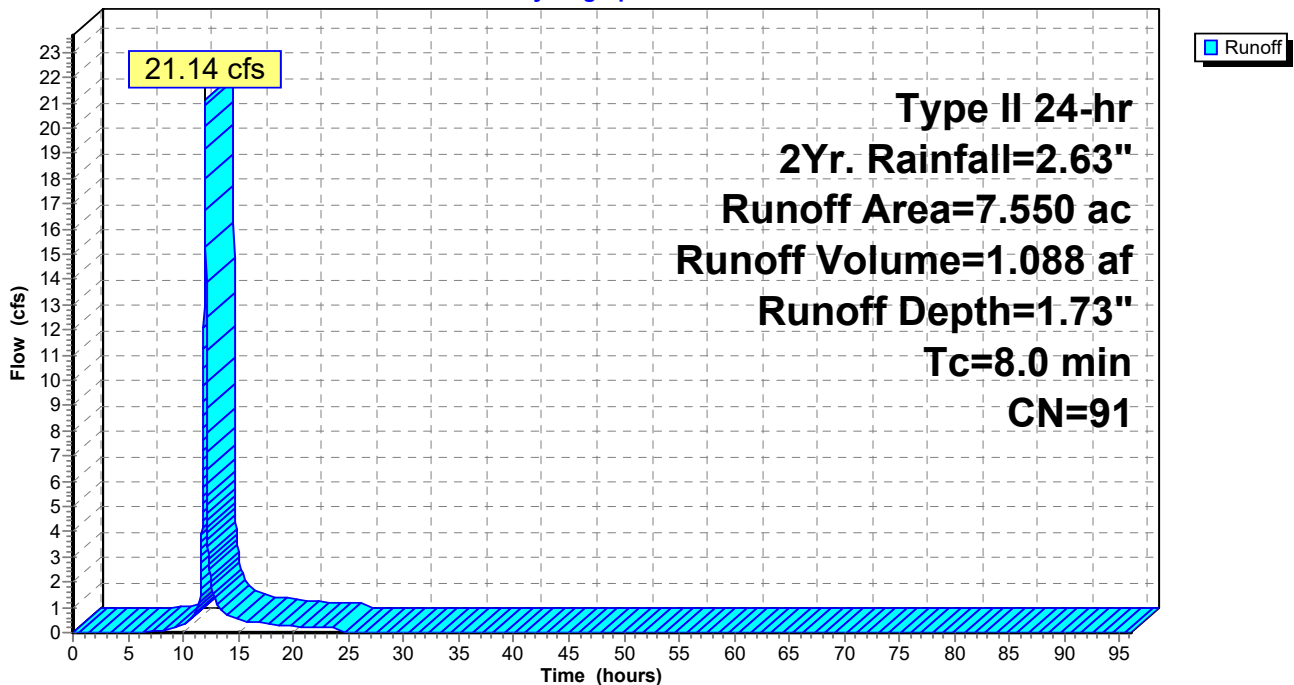
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 10.01 cfs @ 12.14 hrs, Volume= 0.958 af, Depth= 0.45"

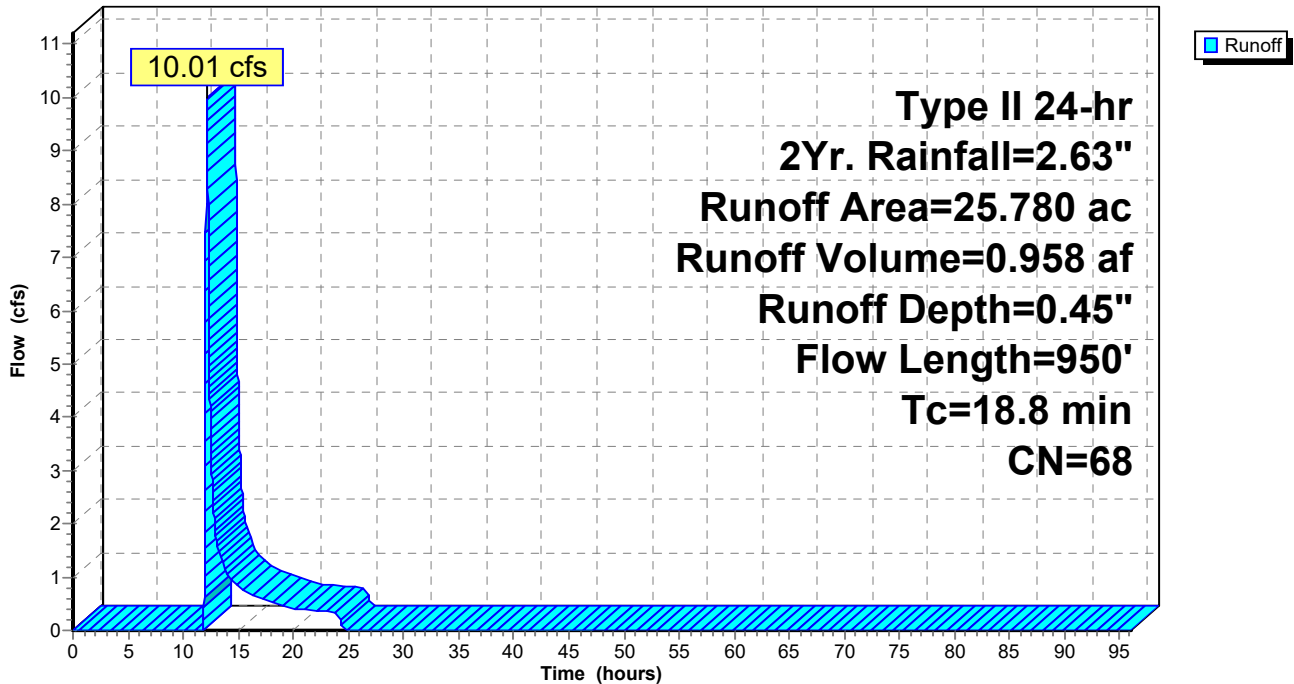
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



Summary for Subcatchment 4S: Developed Residential

Runoff = 25.54 cfs @ 12.10 hrs, Volume= 1.781 af, Depth= 1.28"
 Routed to Pond 5P : SE Det. Pond 2

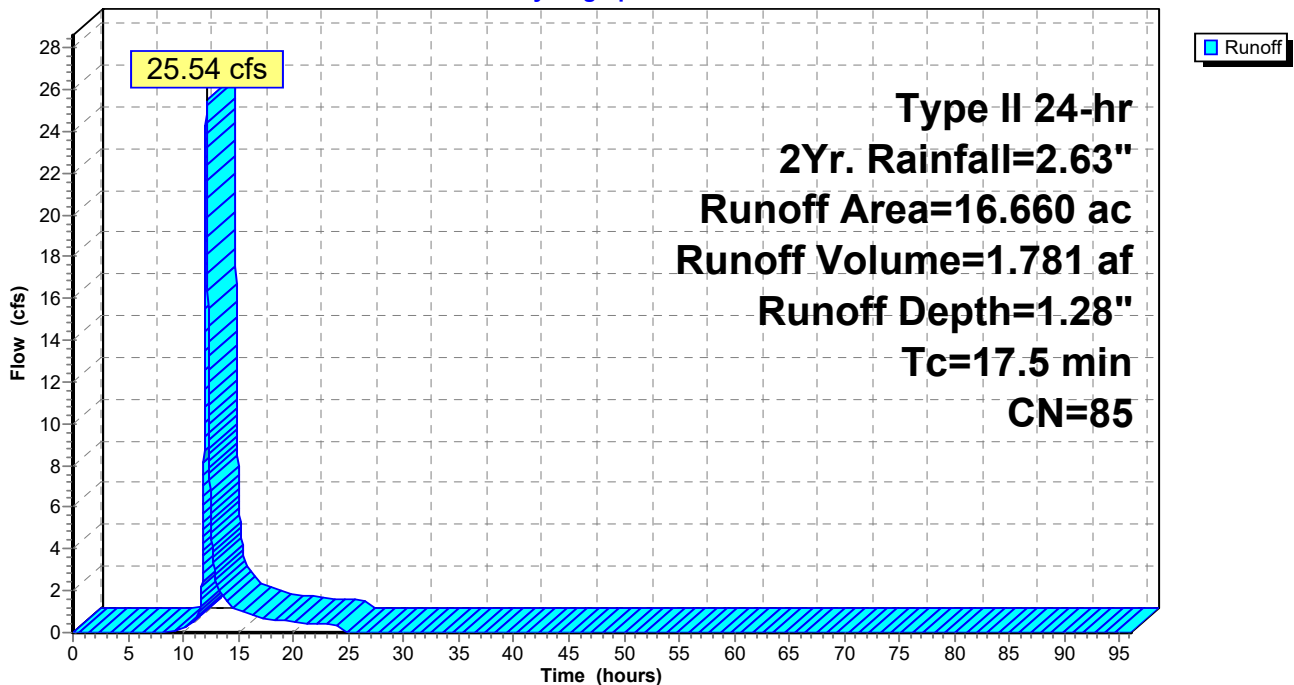
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 6S: Roadway

Runoff = 4.84 cfs @ 12.03 hrs, Volume= 0.273 af, Depth= 1.57"

Routed to Link 7L : (new Link)

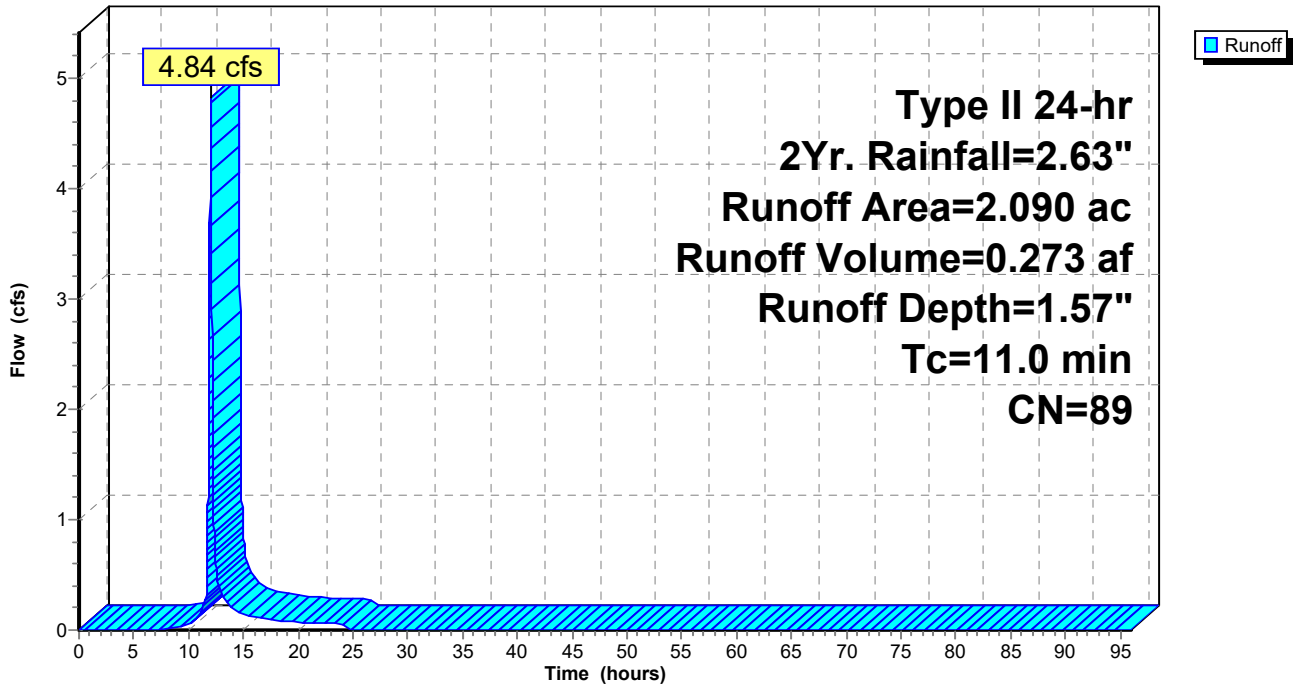
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 9.68 cfs @ 12.15 hrs, Volume= 0.801 af, Depth= 0.73"

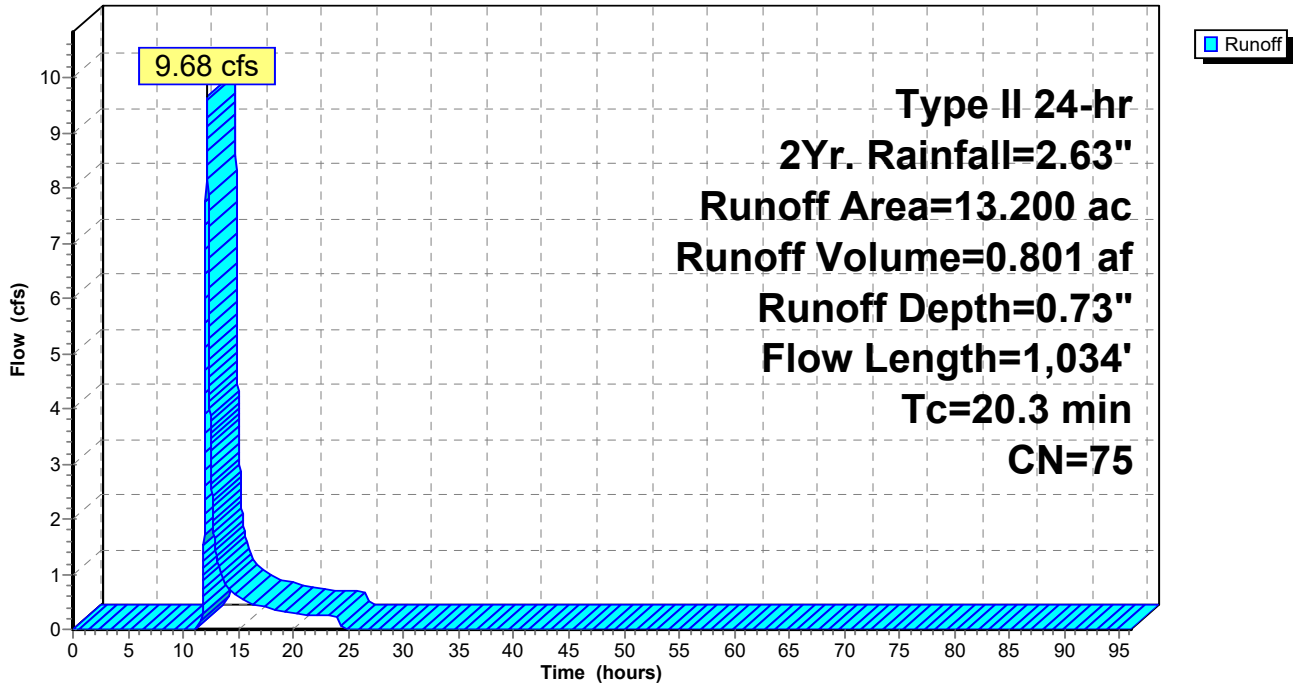
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



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Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 30.48 cfs @ 12.07 hrs, Volume= 1.995 af, Depth= 1.81"
 Routed to Pond 10P : SW Pond 3

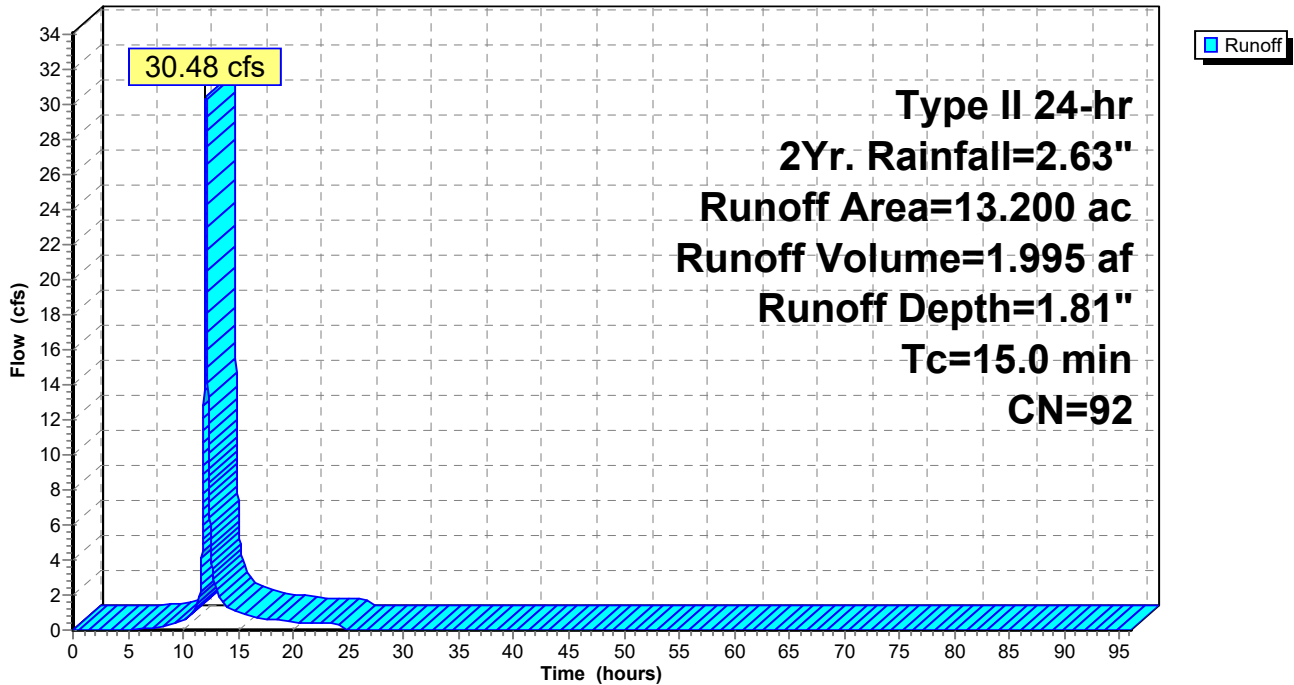
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2Yr. Rainfall=2.63"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 1.73" for 2Yr. event
 Inflow = 21.14 cfs @ 11.99 hrs, Volume= 1.088 af
 Outflow = 1.03 cfs @ 13.21 hrs, Volume= 0.959 af, Atten= 95%, Lag= 73.1 min
 Primary = 1.03 cfs @ 13.21 hrs, Volume= 0.959 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 786.82' @ 13.21 hrs Surf.Area= 15,818 sf Storage= 28,858 cf

Plug-Flow detention time= 891.3 min calculated for 0.959 af (88% of inflow)
 Center-of-Mass det. time= 833.3 min (1,642.1 - 808.8)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 '/'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 '/ Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.03 cfs @ 13.21 hrs HW=786.82' (Free Discharge)

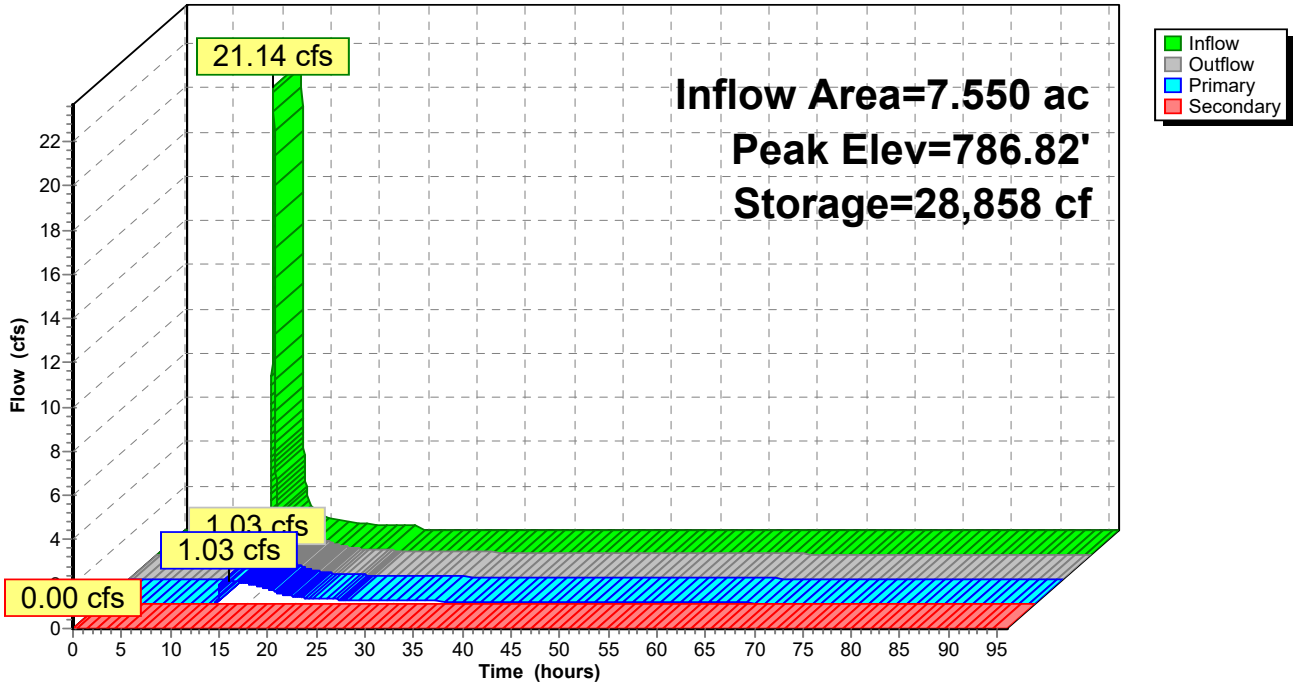
- ↑ 1=Culvert (Passes 1.03 cfs of 6.45 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.17 cfs @ 6.32 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 0.86 cfs @ 3.46 fps)
- ↑ 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

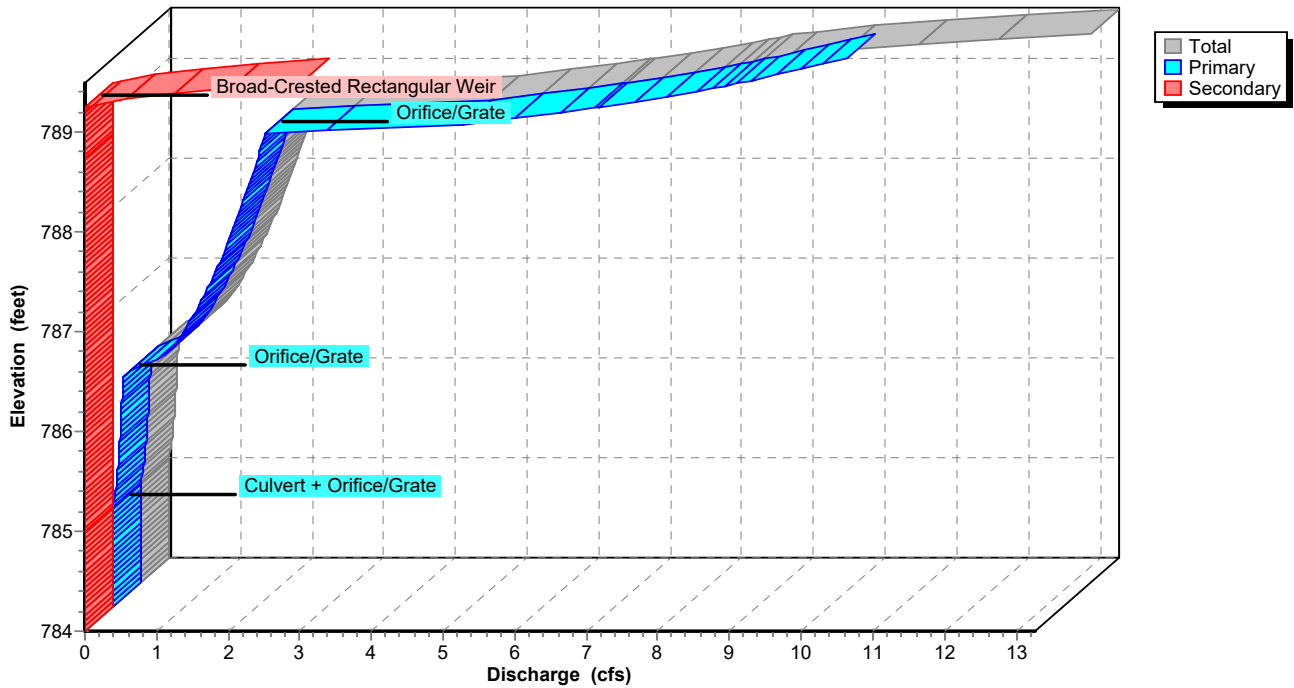
Pond 3P: Ortho 1 Det. Pond

Hydrograph

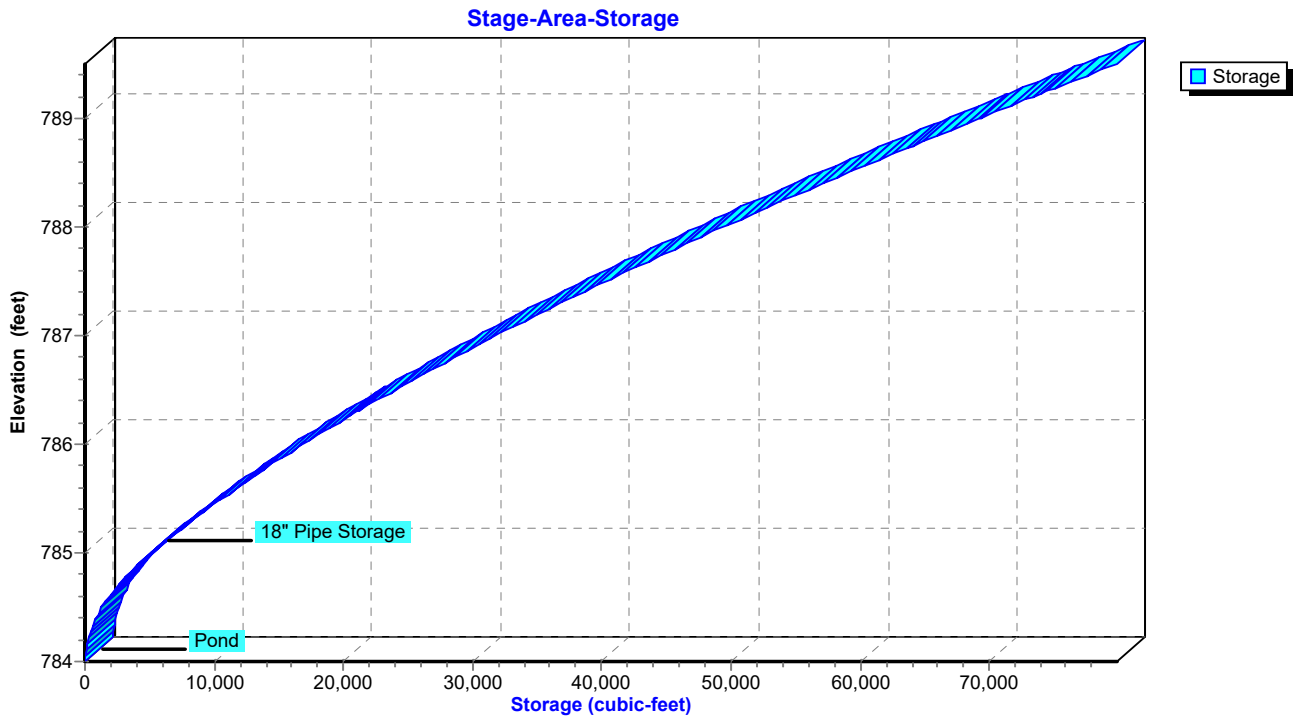


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



Crescent pondsSE &OrthoDRY

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Type II 24-hr 2Yr. Rainfall=2.63"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth > 1.37" for 2Yr. event
 Inflow = 30.00 cfs @ 12.09 hrs, Volume= 3.013 af
 Outflow = 1.12 cfs @ 18.64 hrs, Volume= 2.594 af, Atten= 96%, Lag= 392.8 min
 Primary = 1.12 cfs @ 18.64 hrs, Volume= 2.594 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 782.91' @ 18.64 hrs Surf.Area= 27,741 sf Storage= 79,468 cf

Plug-Flow detention time= 1,438.1 min calculated for 2.594 af (86% of inflow)
 Center-of-Mass det. time= 1,203.8 min (2,298.9 - 1,095.0)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=1.12 cfs @ 18.64 hrs HW=782.91' (Free Discharge)

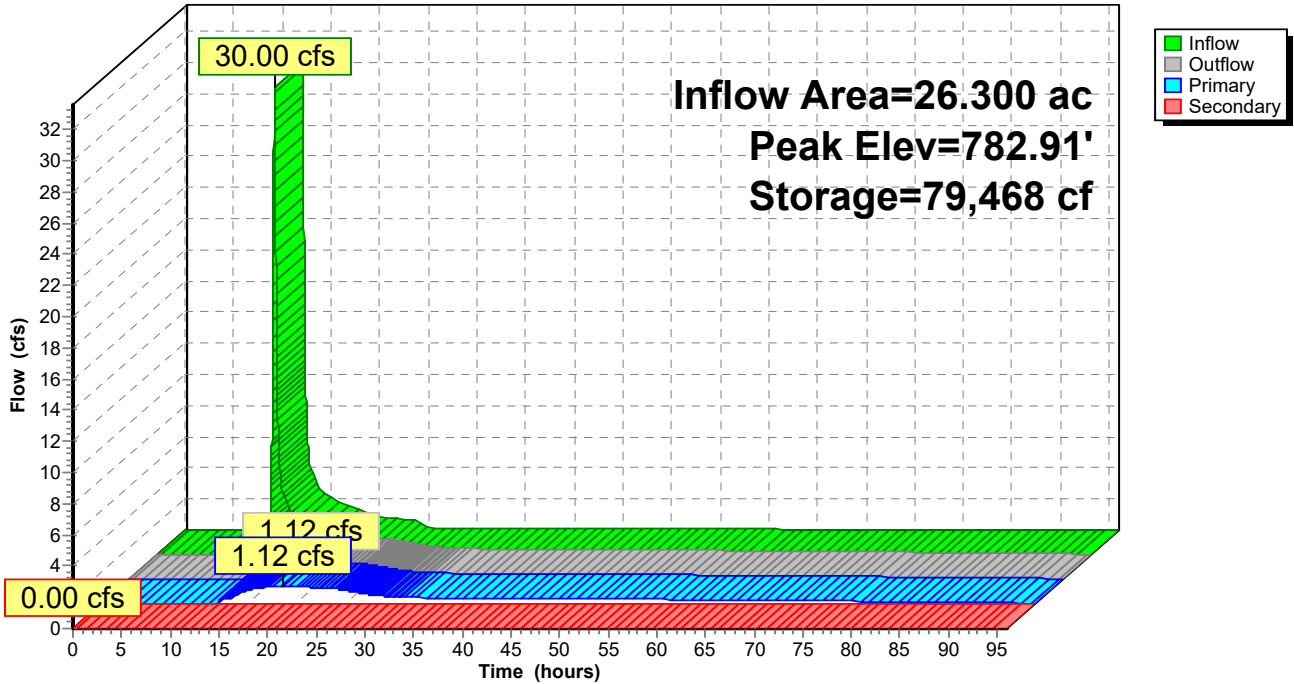
- 1=Culvert (Passes 1.12 cfs of 9.46 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.45 cfs @ 8.02 fps)
- 3=Orifice/Grate (Orifice Controls 0.68 cfs @ 3.44 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=778.00' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

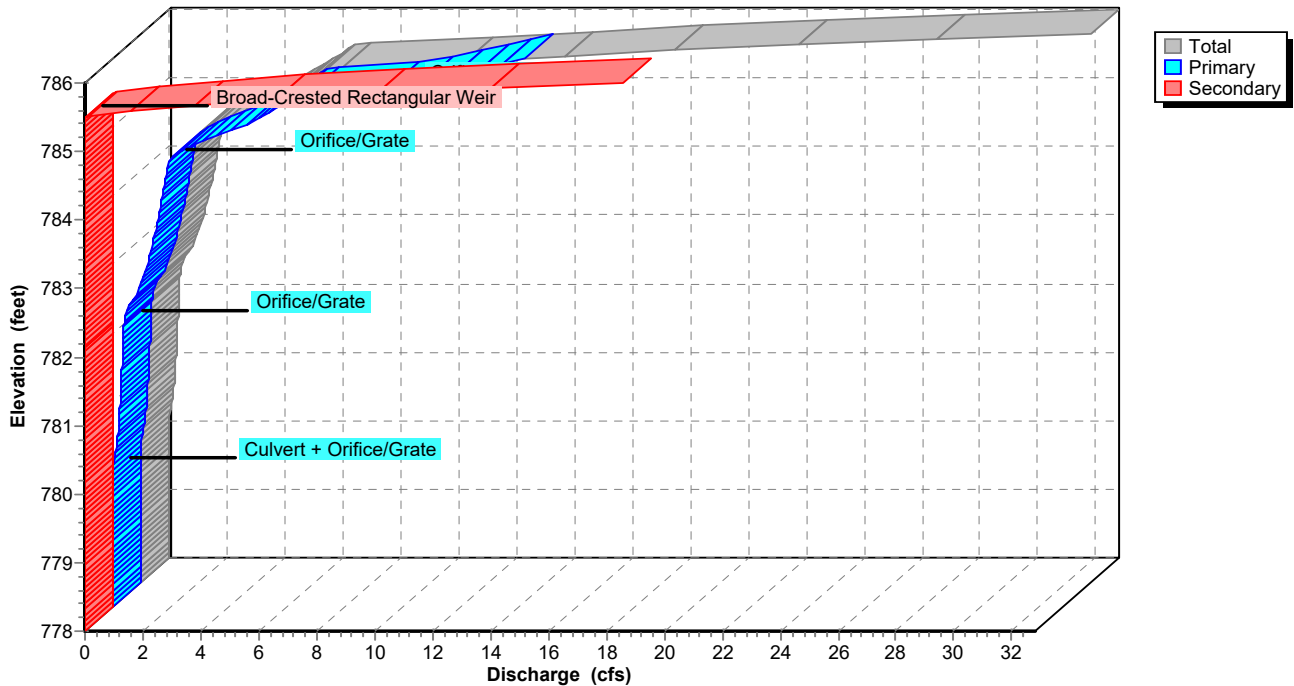
Pond 5P: SE Det. Pond 2

Hydrograph



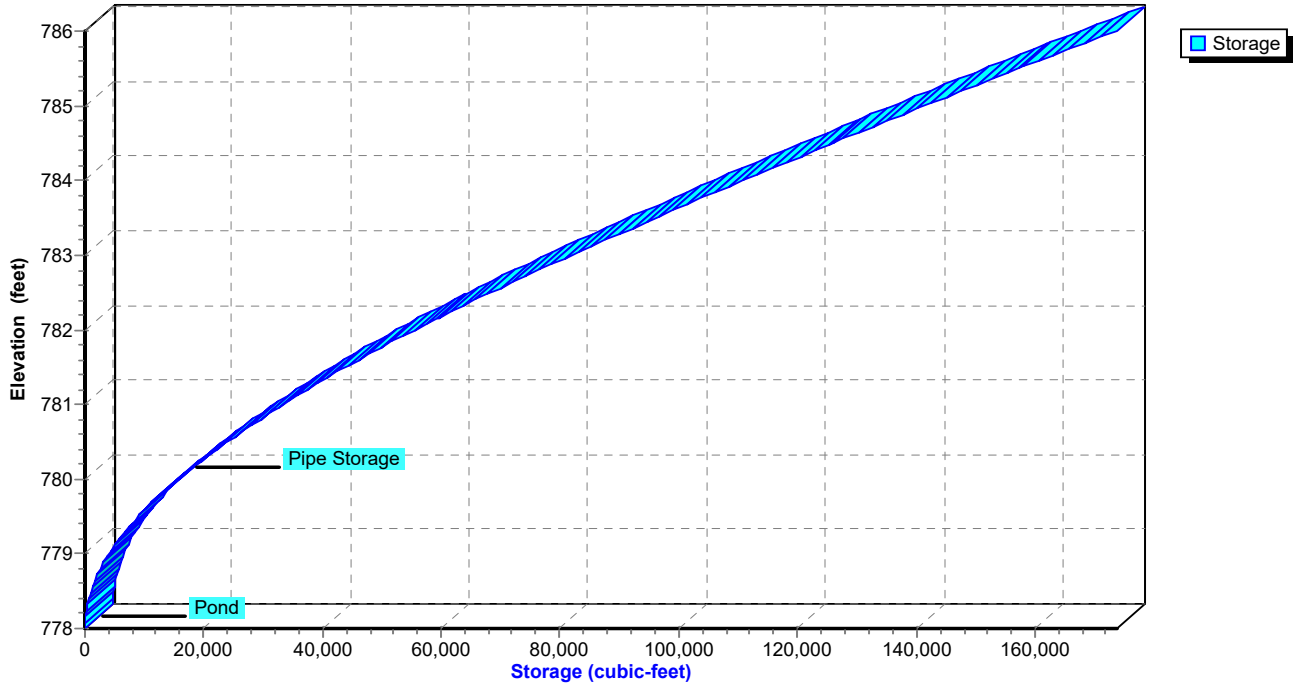
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 2Yr. Rainfall=2.63"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Crescent pondsSE &OrthoDRY

Type II 24-hr 2Yr. Rainfall=2.63"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 1.81" for 2Yr. event
 Inflow = 30.48 cfs @ 12.07 hrs, Volume= 1.995 af
 Outflow = 1.15 cfs @ 14.36 hrs, Volume= 1.847 af, Atten= 96%, Lag= 137.8 min
 Primary = 1.15 cfs @ 14.36 hrs, Volume= 1.847 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 784.75' @ 14.36 hrs Surf.Area= 31,511 sf Storage= 57,898 cf

Plug-Flow detention time= 856.3 min calculated for 1.847 af (93% of inflow)
 Center-of-Mass det. time= 816.3 min (1,626.6 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/'
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.15 cfs @ 14.36 hrs HW=784.75' (Free Discharge)

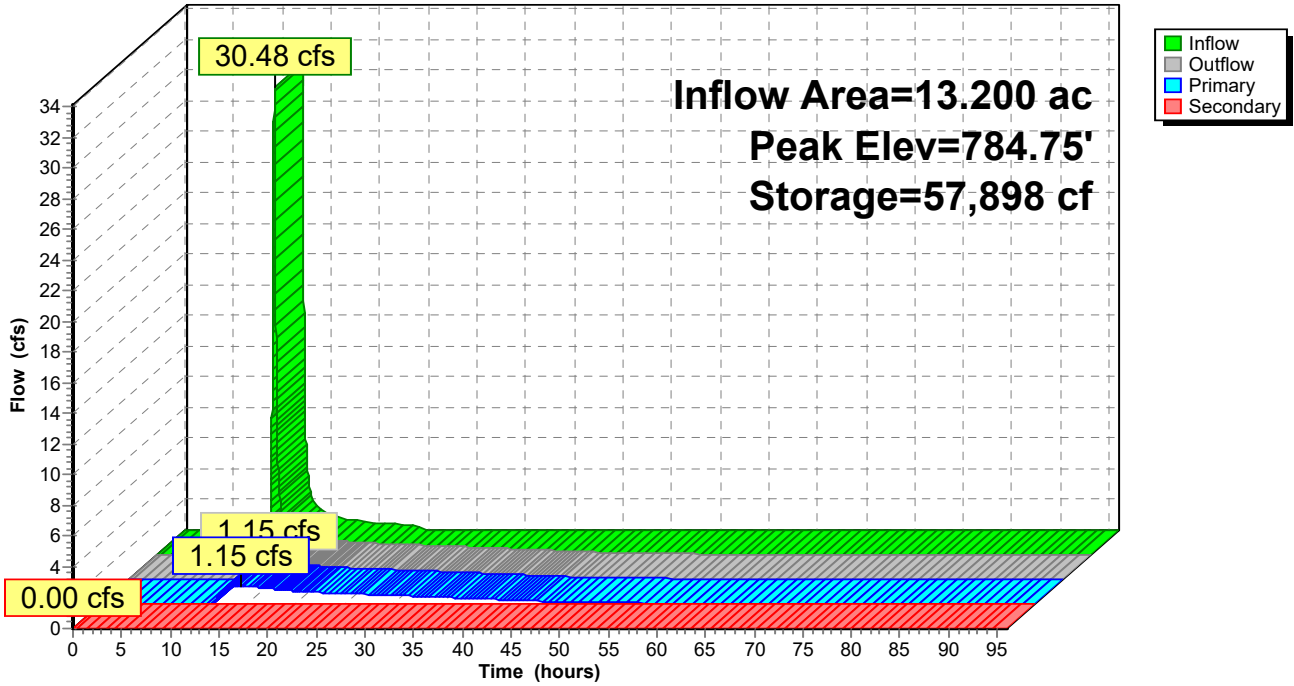
- 1=Culvert (Passes 1.15 cfs of 6.71 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.81 cfs @ 5.98 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 2.01 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=780.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

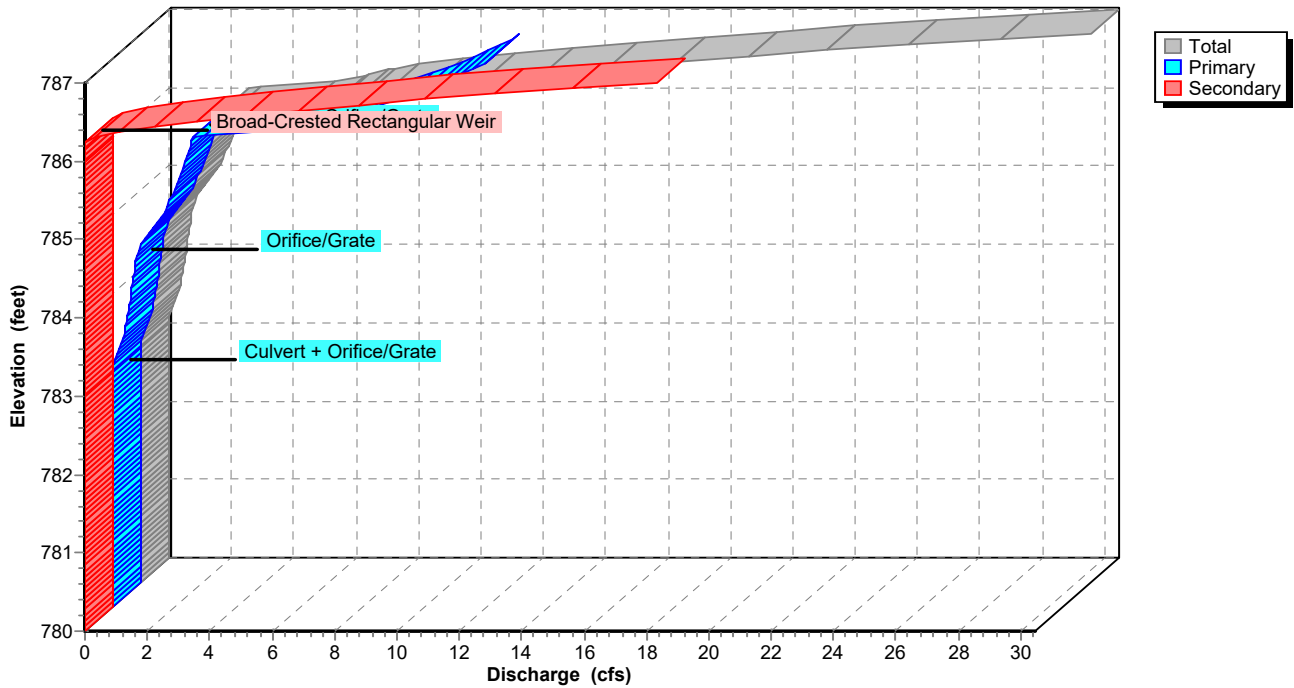
Pond 10P: SW Pond 3

Hydrograph



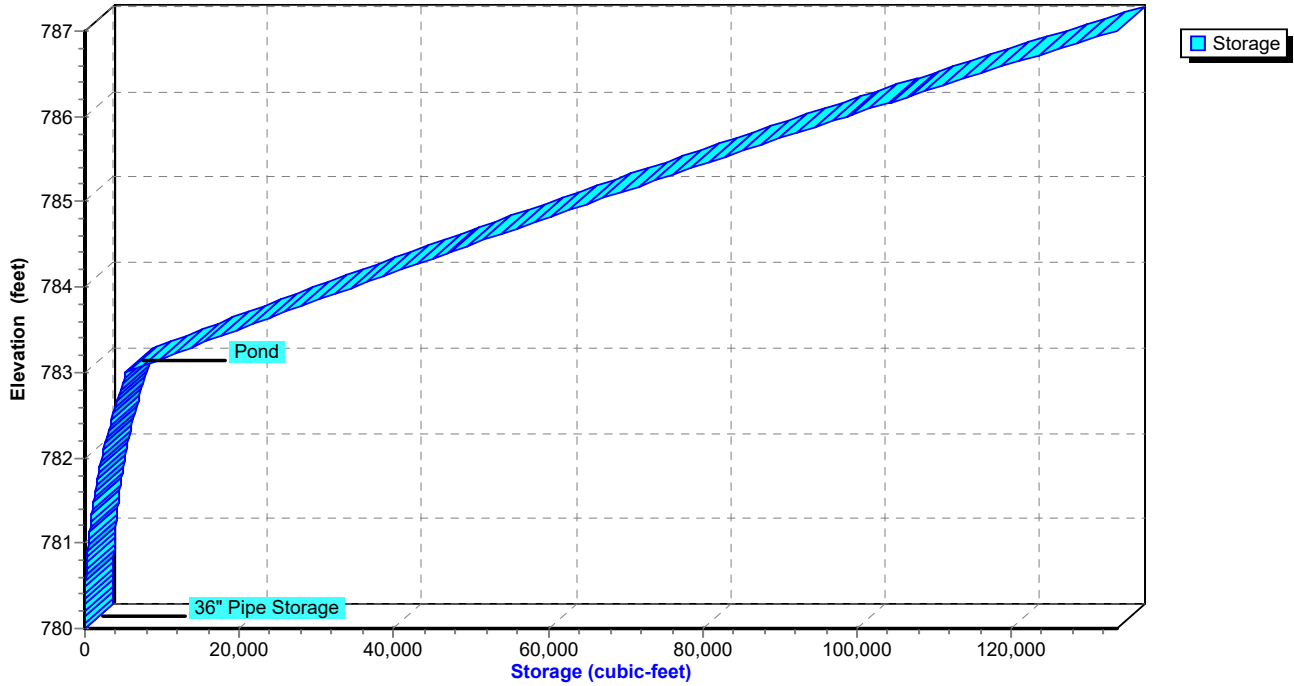
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 2Yr. Rainfall=2.63"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

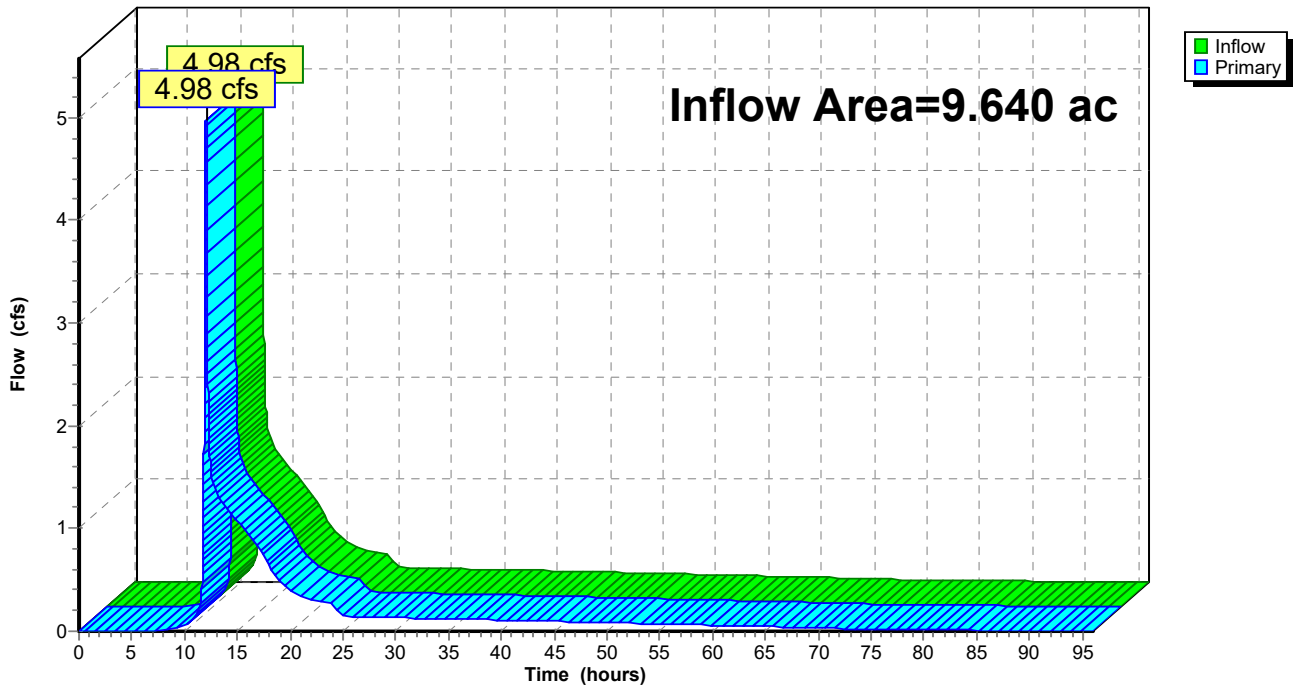
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 1.53" for 2Yr. event
Inflow = 4.98 cfs @ 12.03 hrs, Volume= 1.232 af
Primary = 4.98 cfs @ 12.03 hrs, Volume= 1.232 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 12.86 cfs @ 12.03 hrs, Volume= 0.705 af, Depth= 1.12"

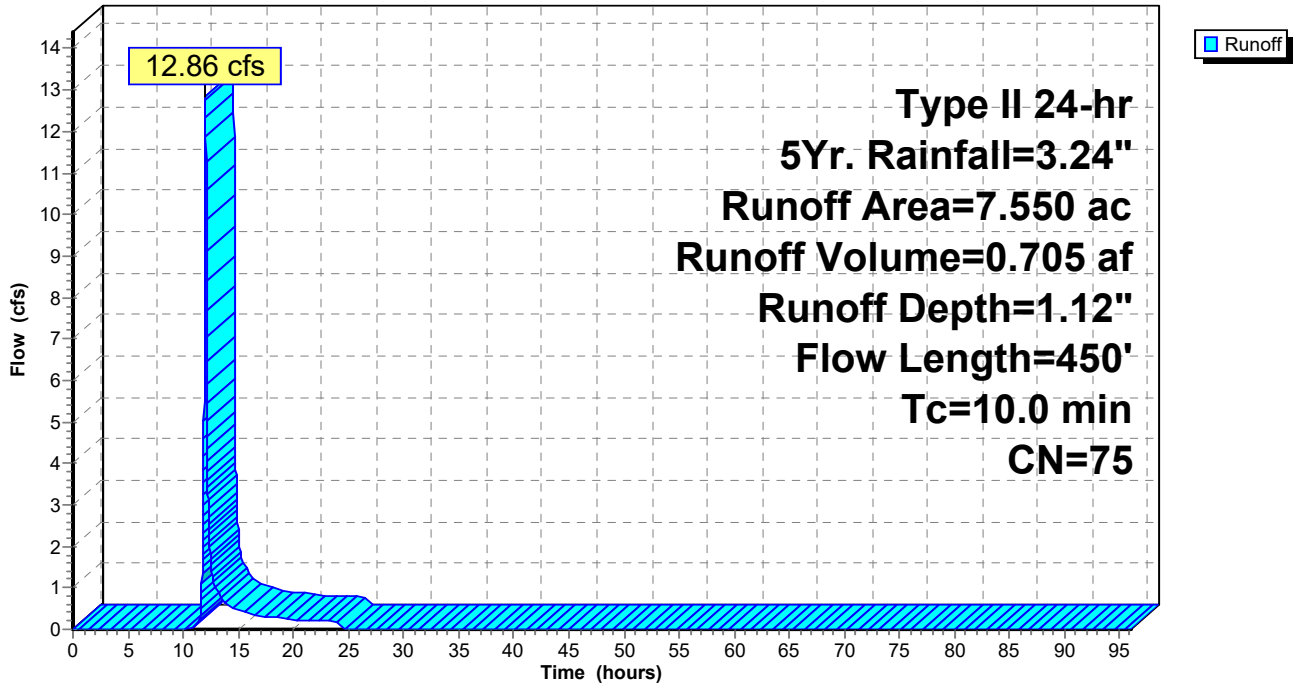
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 27.67 cfs @ 11.99 hrs, Volume= 1.444 af, Depth= 2.30"
Routed to Pond 3P : Ortho 1 Det. Pond

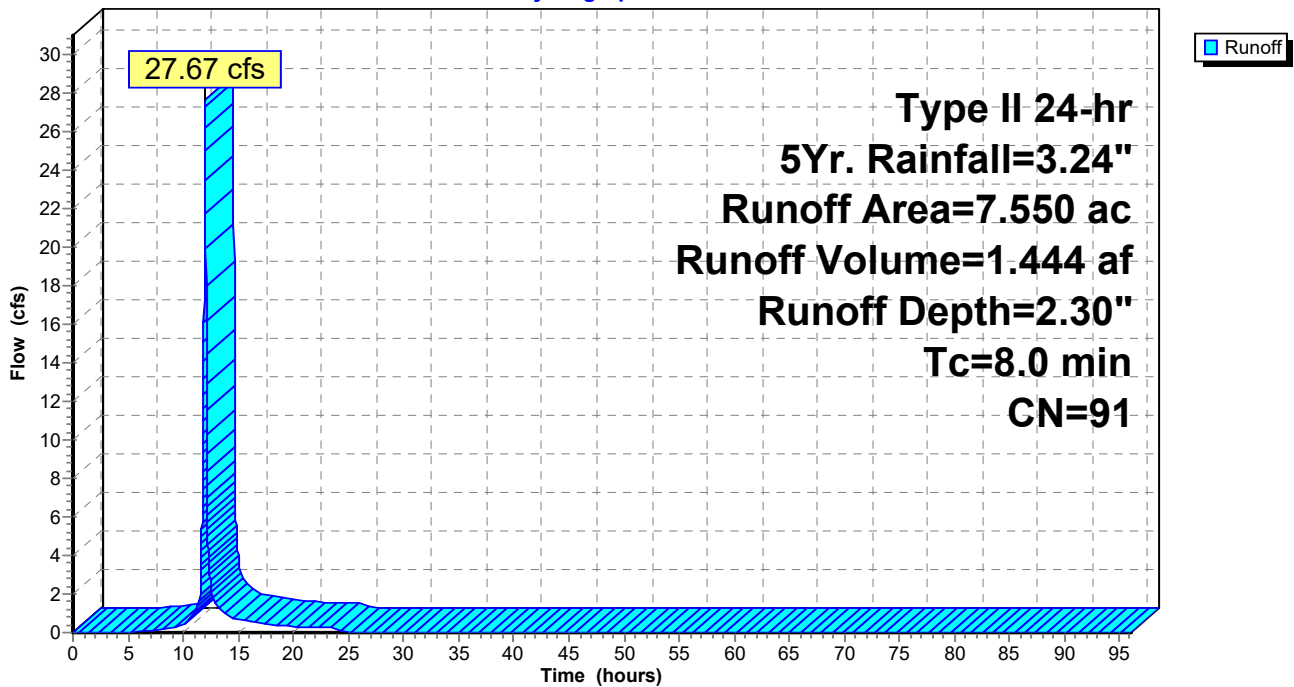
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 19.55 cfs @ 12.14 hrs, Volume= 1.621 af, Depth= 0.75"

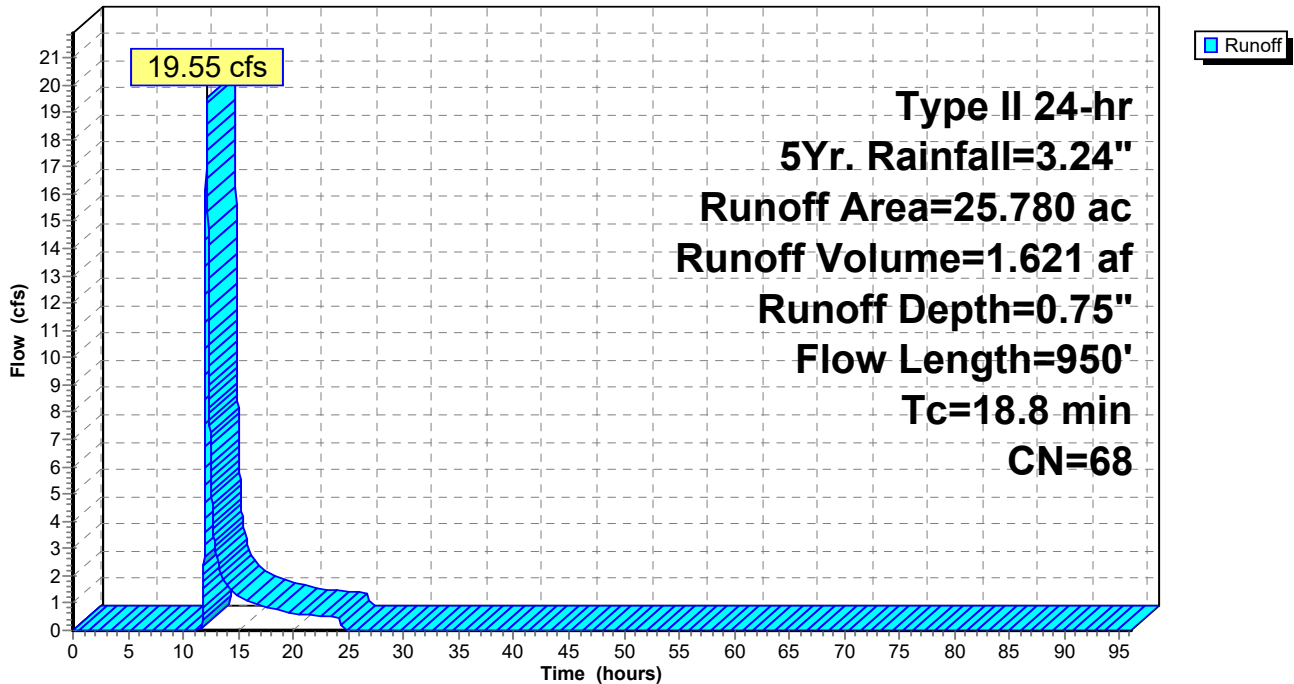
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 35.74 cfs @ 12.10 hrs, Volume= 2.488 af, Depth= 1.79"
 Routed to Pond 5P : SE Det. Pond 2

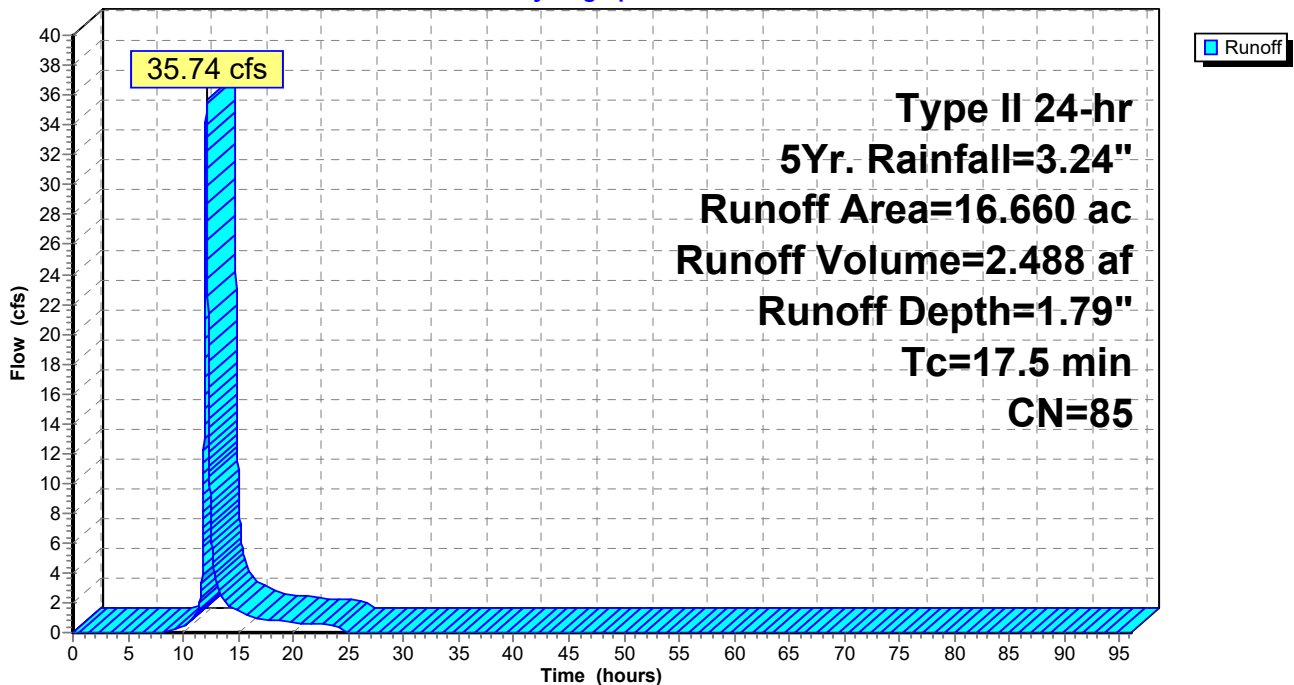
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 6S: Roadway

Runoff = 6.47 cfs @ 12.02 hrs, Volume= 0.369 af, Depth= 2.12"

Routed to Link 7L : (new Link)

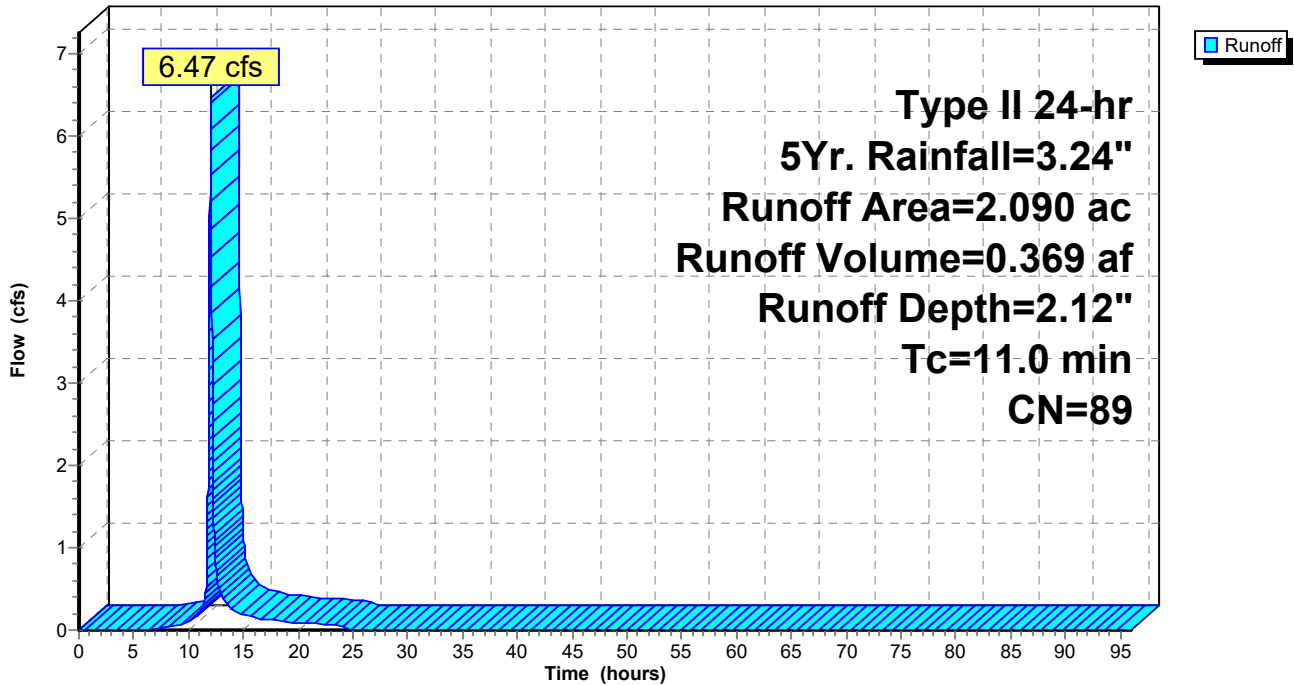
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 15.65 cfs @ 12.14 hrs, Volume= 1.233 af, Depth= 1.12"

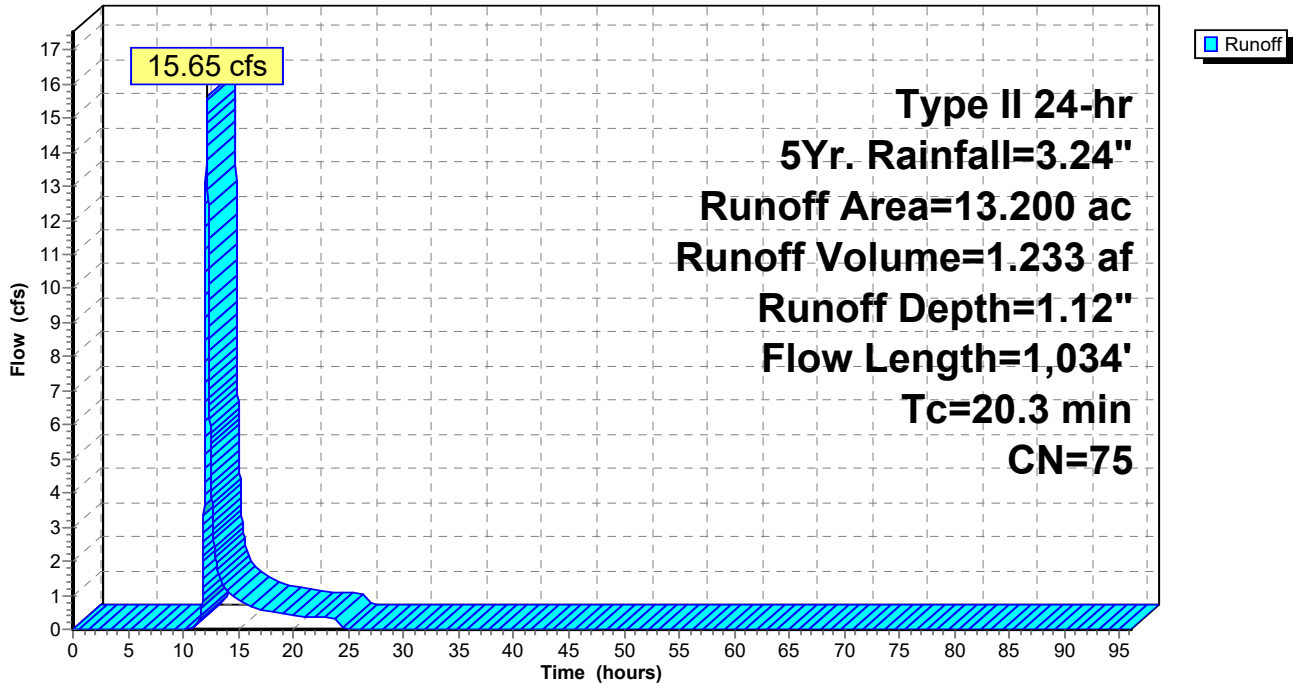
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 39.66 cfs @ 12.07 hrs, Volume= 2.628 af, Depth= 2.39"
 Routed to Pond 10P : SW Pond 3

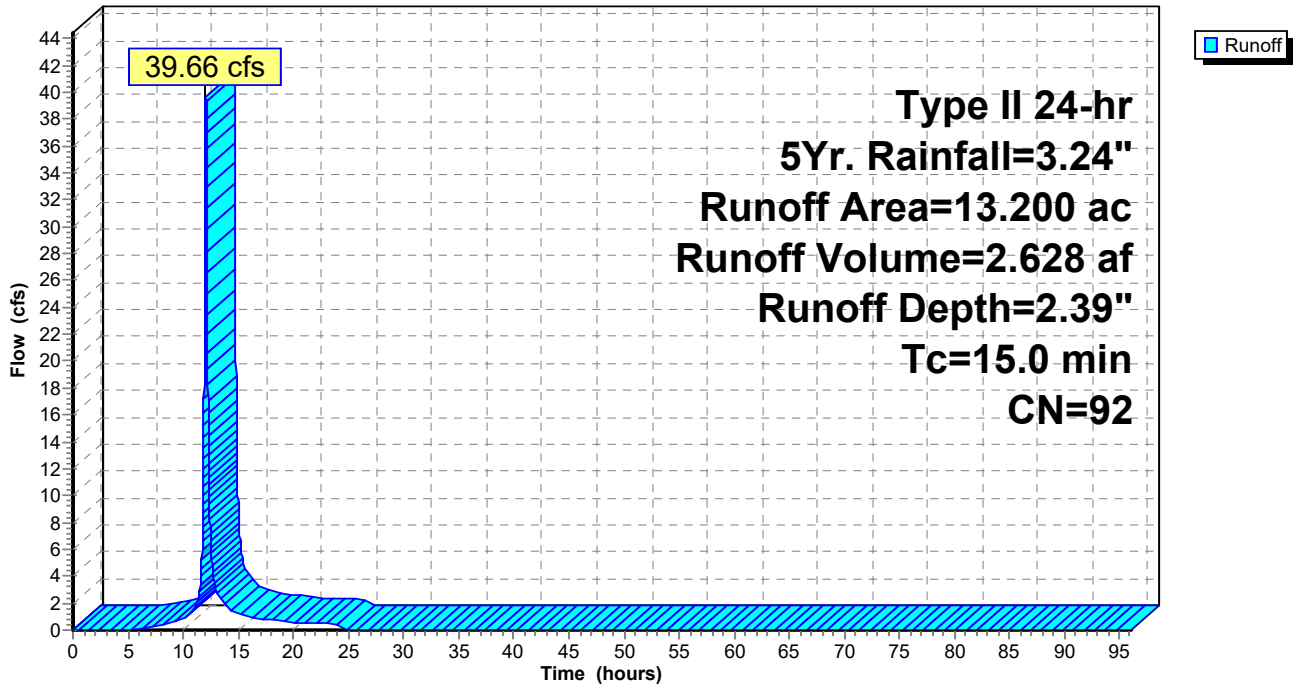
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 5Yr. Rainfall=3.24"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 2.30" for 5Yr. event
 Inflow = 27.67 cfs @ 11.99 hrs, Volume= 1.444 af
 Outflow = 1.45 cfs @ 13.06 hrs, Volume= 1.315 af, Atten= 95%, Lag= 63.8 min
 Primary = 1.45 cfs @ 13.06 hrs, Volume= 1.315 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 787.39' @ 13.06 hrs Surf.Area= 17,333 sf Storage= 38,339 cf

Plug-Flow detention time= 728.1 min calculated for 1.315 af (91% of inflow)
 Center-of-Mass det. time= 681.2 min (1,481.9 - 800.8)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 '/'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.45 cfs @ 13.06 hrs HW=787.39' (Free Discharge)

- 1=Culvert (Passes 1.45 cfs of 7.85 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.19 cfs @ 7.30 fps)
- 3=Orifice/Grate (Orifice Controls 1.26 cfs @ 5.02 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Crescent pondsSE &OrthoDRY

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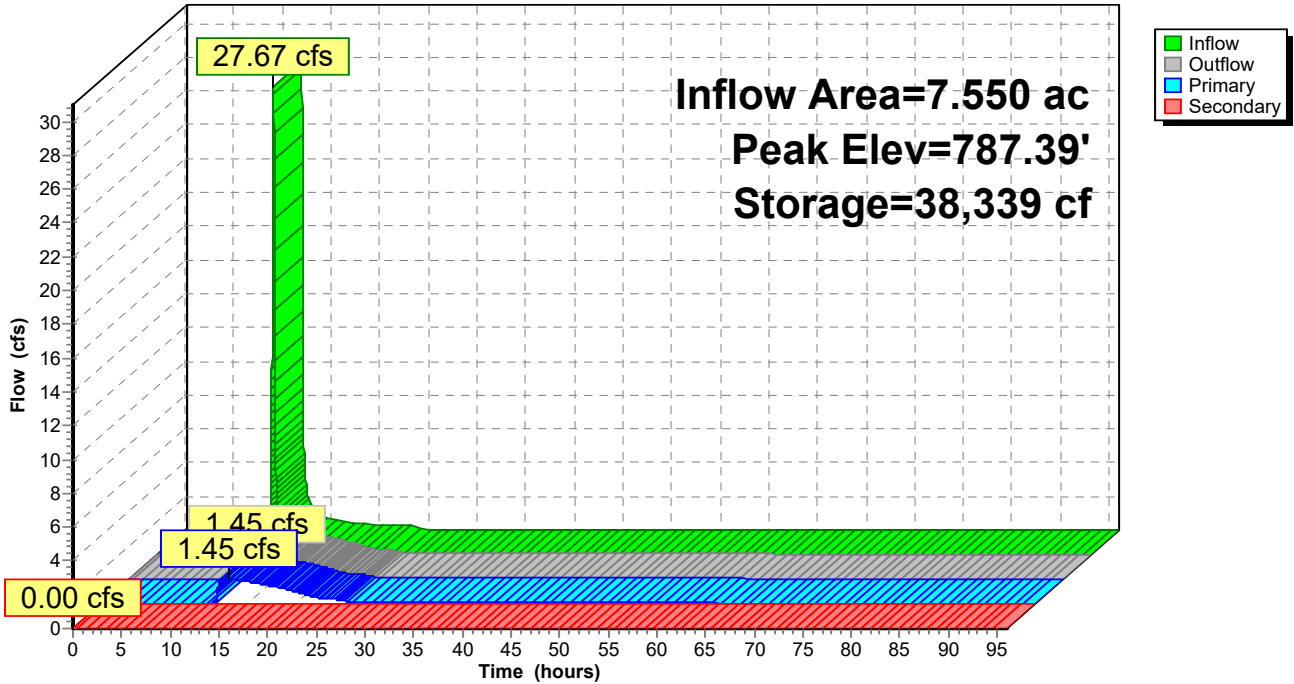
Type II 24-hr 5Yr. Rainfall=3.24"

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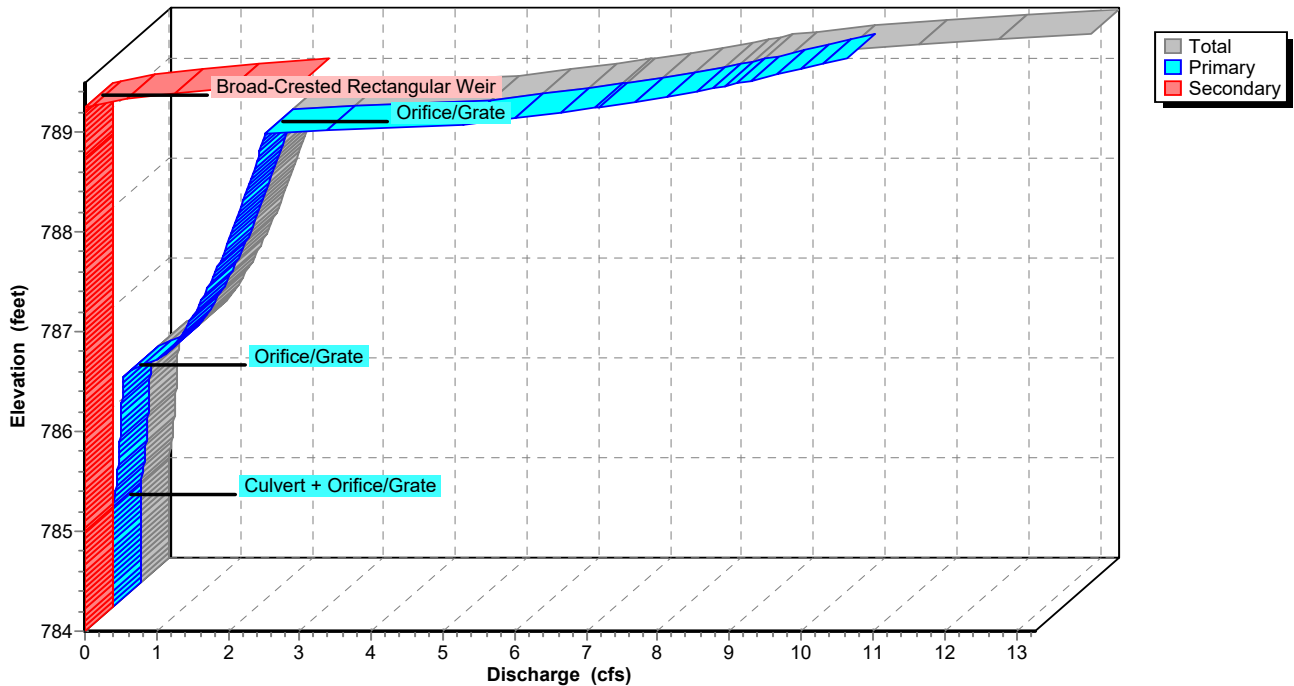
Pond 3P: Ortho 1 Det. Pond

Hydrograph

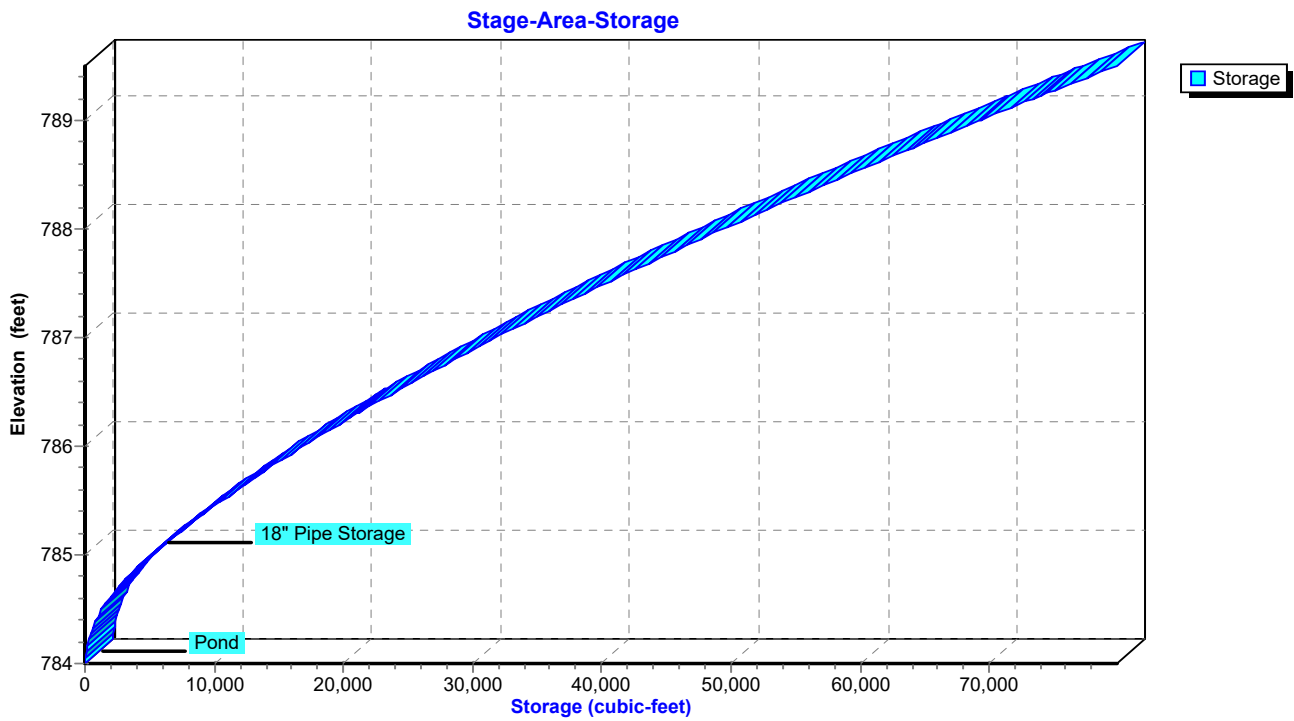


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



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Type II 24-hr 5Yr. Rainfall=3.24"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 5Yr. Rainfall=3.24"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth = 1.90" for 5Yr. event
 Inflow = 42.14 cfs @ 12.08 hrs, Volume= 4.172 af
 Outflow = 1.67 cfs @ 19.18 hrs, Volume= 3.738 af, Atten= 96%, Lag= 425.6 min
 Primary = 1.67 cfs @ 19.18 hrs, Volume= 3.738 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 783.87' @ 19.18 hrs Surf.Area= 29,575 sf Storage= 107,152 cf

Plug-Flow detention time= 1,232.5 min calculated for 3.738 af (90% of inflow)
 Center-of-Mass det. time= 1,059.3 min (2,095.1 - 1,035.8)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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

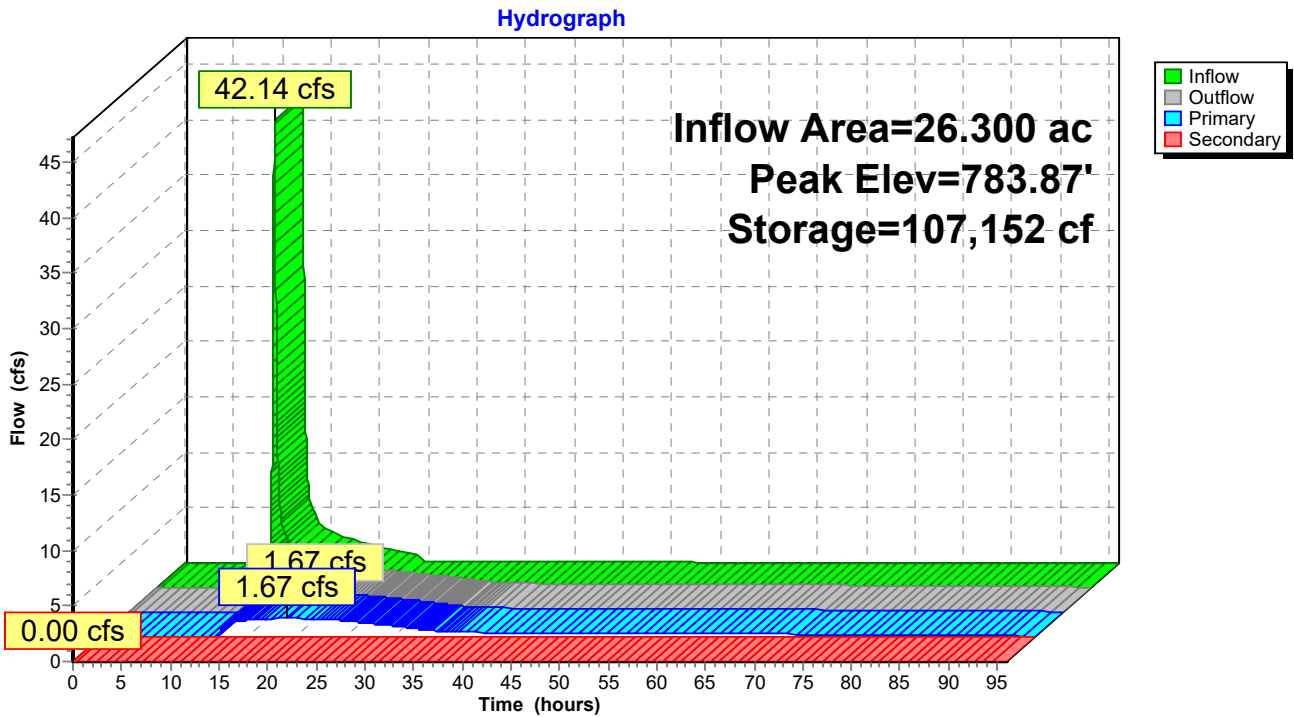
Primary OutFlow Max=1.67 cfs @ 19.18 hrs HW=783.87' (Free Discharge)

- 1=Culvert (Passes 1.67 cfs of 11.87 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.52 cfs @ 9.31 fps)
- 3=Orifice/Grate (Orifice Controls 1.15 cfs @ 5.84 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

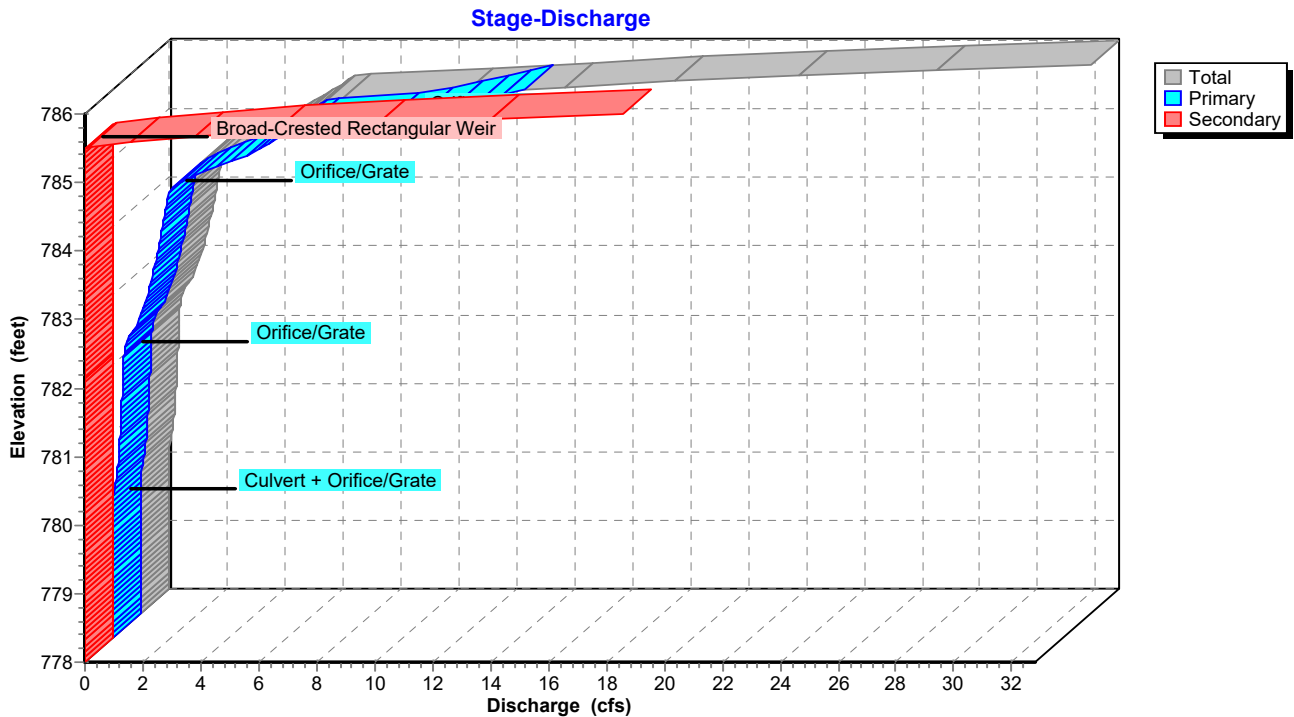
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=778.00' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: SE Det. Pond 2

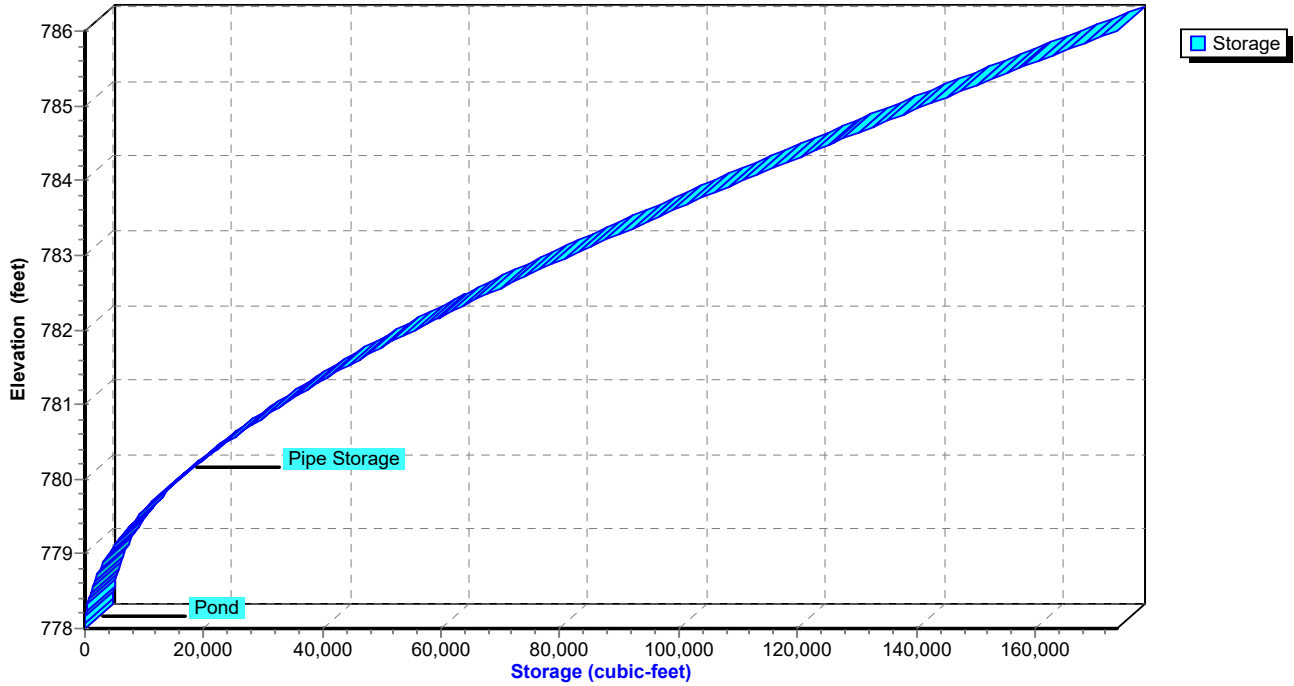


Pond 5P: SE Det. Pond 2



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 5Yr. Rainfall=3.24"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 2.39" for 5Yr. event
 Inflow = 39.66 cfs @ 12.07 hrs, Volume= 2.628 af
 Outflow = 1.90 cfs @ 13.73 hrs, Volume= 2.478 af, Atten= 95%, Lag= 100.0 min
 Primary = 1.90 cfs @ 13.73 hrs, Volume= 2.478 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 785.25' @ 13.73 hrs Surf.Area= 32,264 sf Storage= 73,793 cf

Plug-Flow detention time= 760.0 min calculated for 2.477 af (94% of inflow)
 Center-of-Mass det. time= 727.9 min (1,530.4 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.90 cfs @ 13.73 hrs HW=785.25' (Free Discharge)

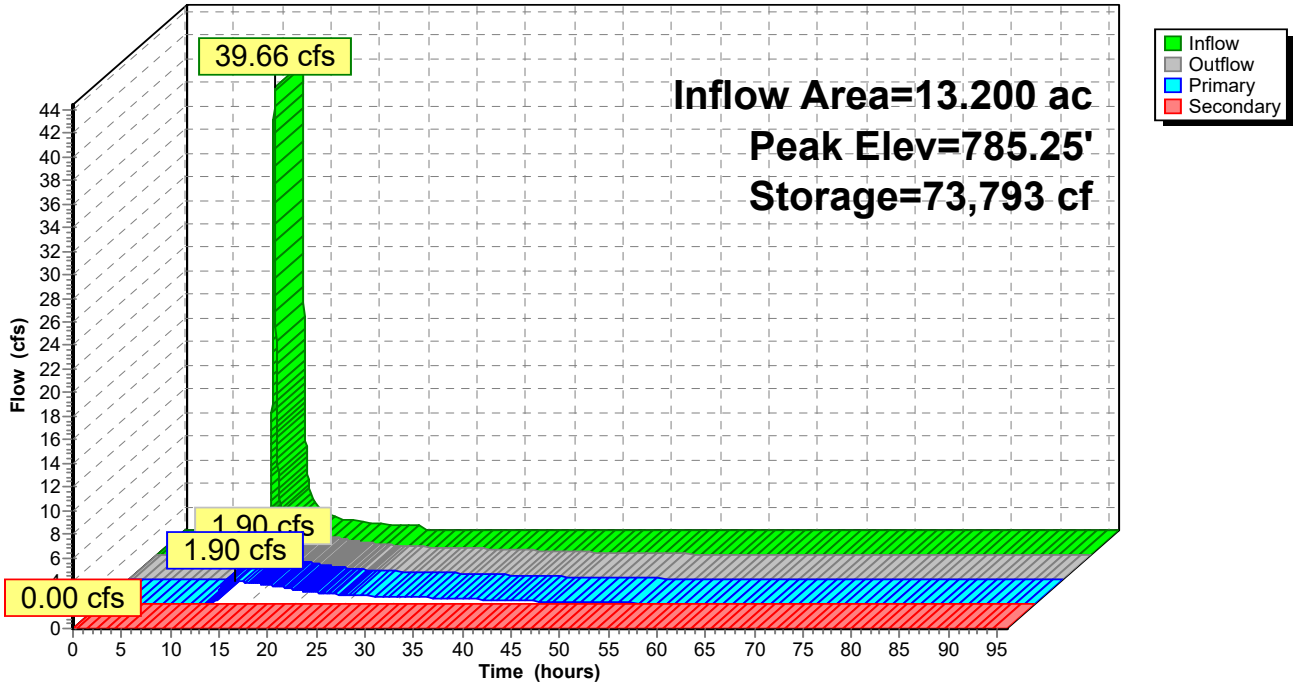
- ↑ 1=Culvert (Passes 1.90 cfs of 8.22 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.94 cfs @ 6.88 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 0.96 cfs @ 3.59 fps)
- ↑ 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=780.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

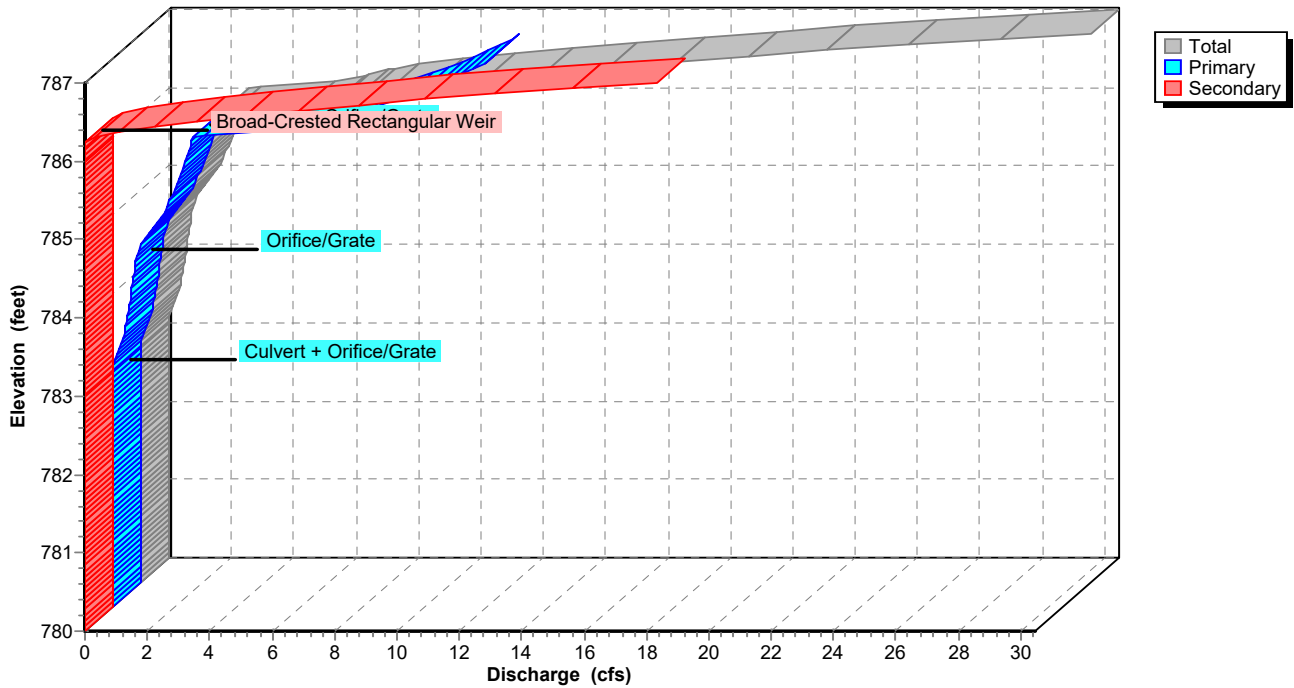
Pond 10P: SW Pond 3

Hydrograph



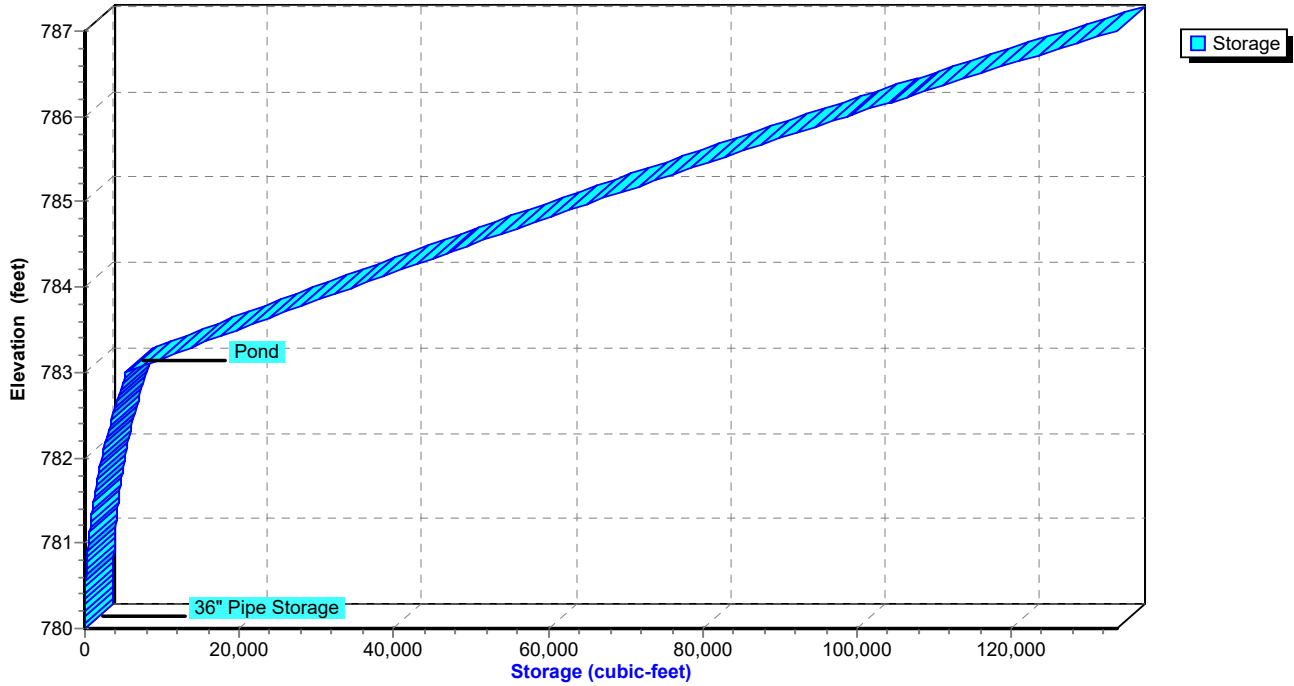
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



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Type II 24-hr 5Yr. Rainfall=3.24"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

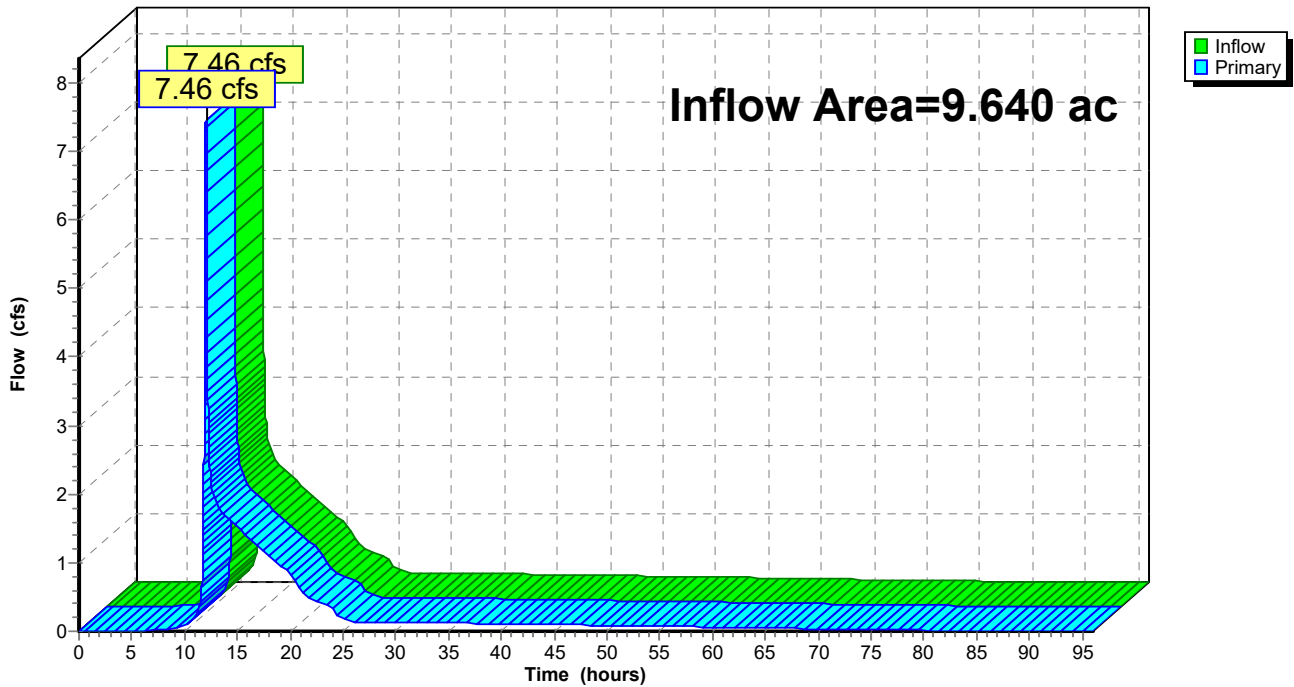
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 2.10" for 5Yr. event
Inflow = 7.46 cfs @ 12.03 hrs, Volume= 1.684 af
Primary = 7.46 cfs @ 12.03 hrs, Volume= 1.684 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 17.07 cfs @ 12.02 hrs, Volume= 0.928 af, Depth= 1.47"

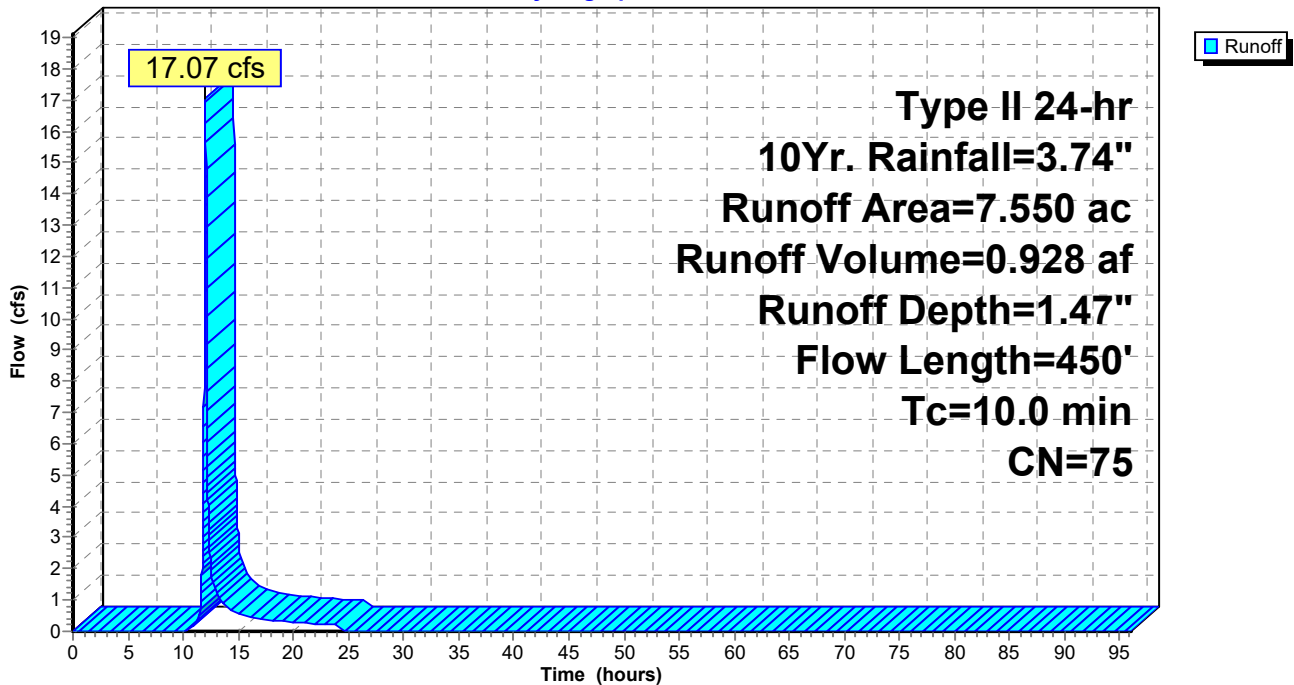
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 33.02 cfs @ 11.99 hrs, Volume= 1.742 af, Depth= 2.77"
 Routed to Pond 3P : Ortho 1 Det. Pond

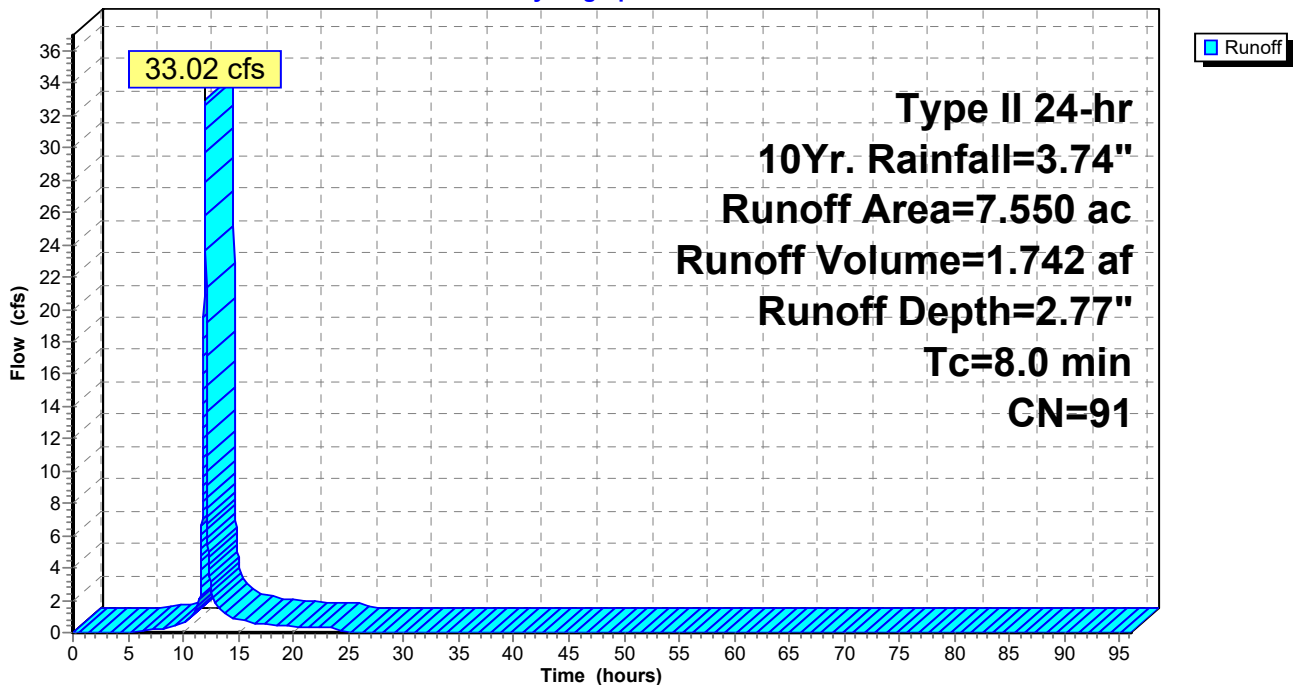
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 28.54 cfs @ 12.13 hrs, Volume= 2.242 af, Depth= 1.04"

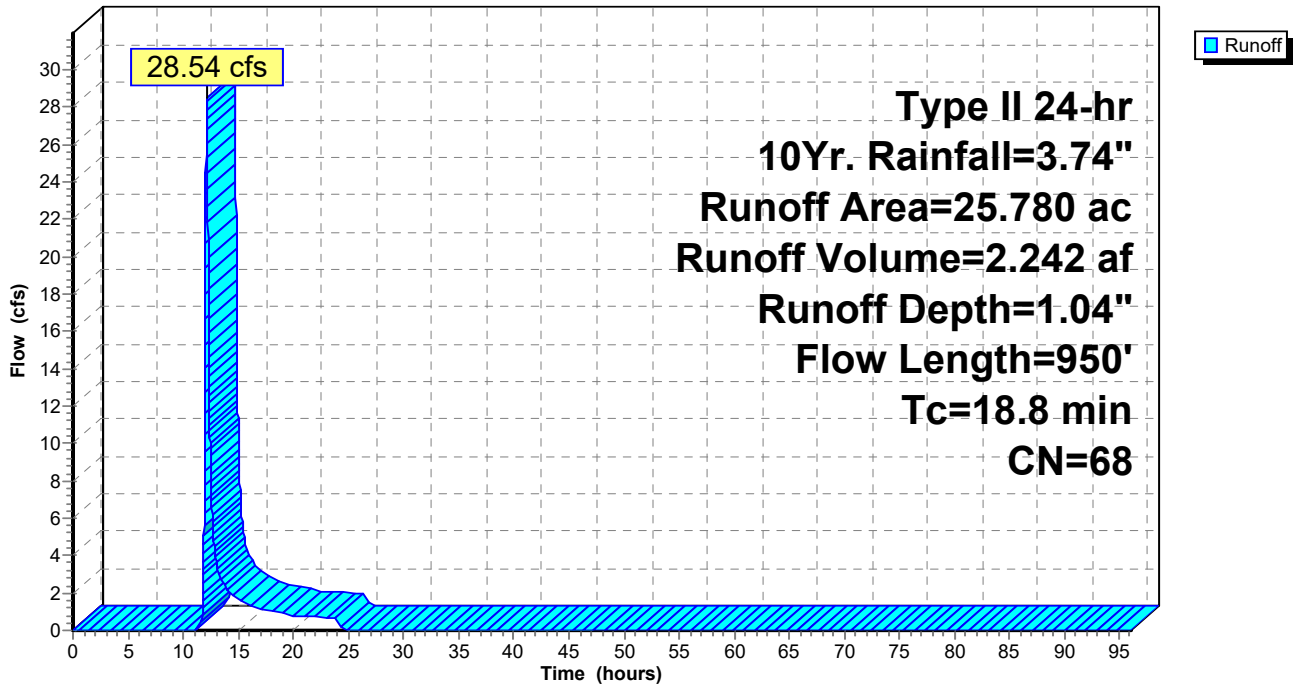
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 44.33 cfs @ 12.10 hrs, Volume= 3.092 af, Depth= 2.23"
 Routed to Pond 5P : SE Det. Pond 2

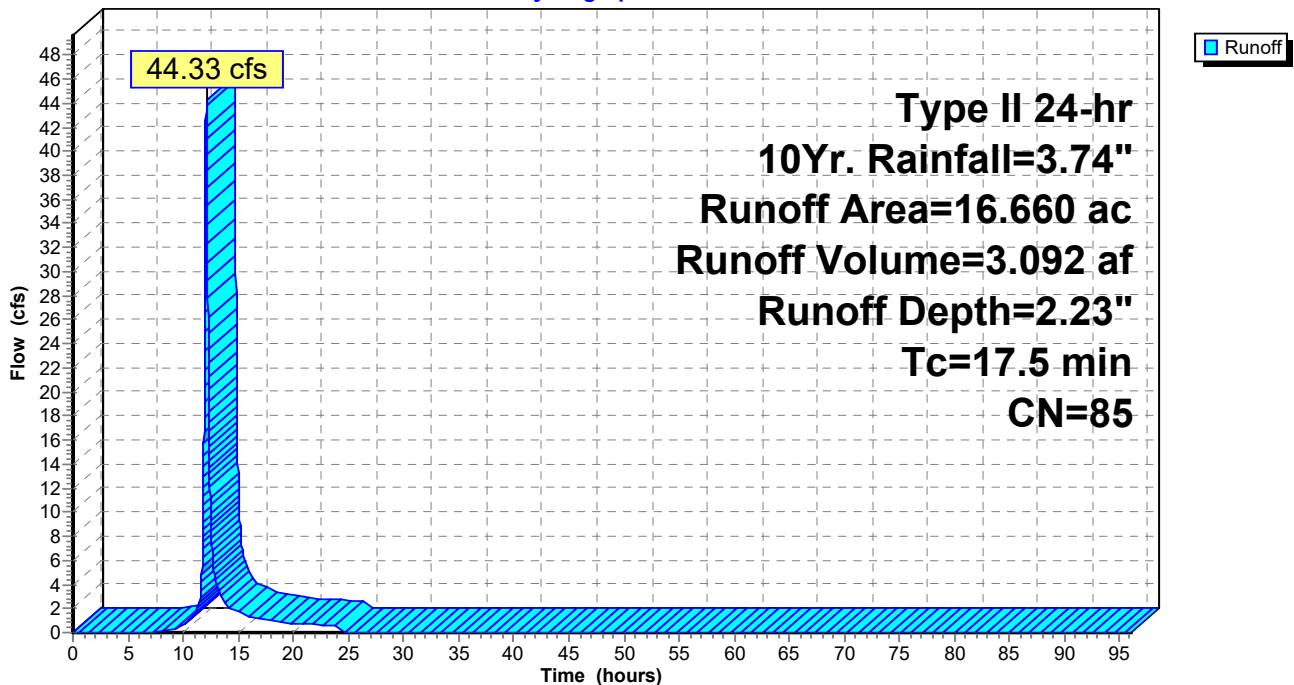
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 6S: Roadway

Runoff = 7.81 cfs @ 12.02 hrs, Volume= 0.449 af, Depth= 2.58"

Routed to Link 7L : (new Link)

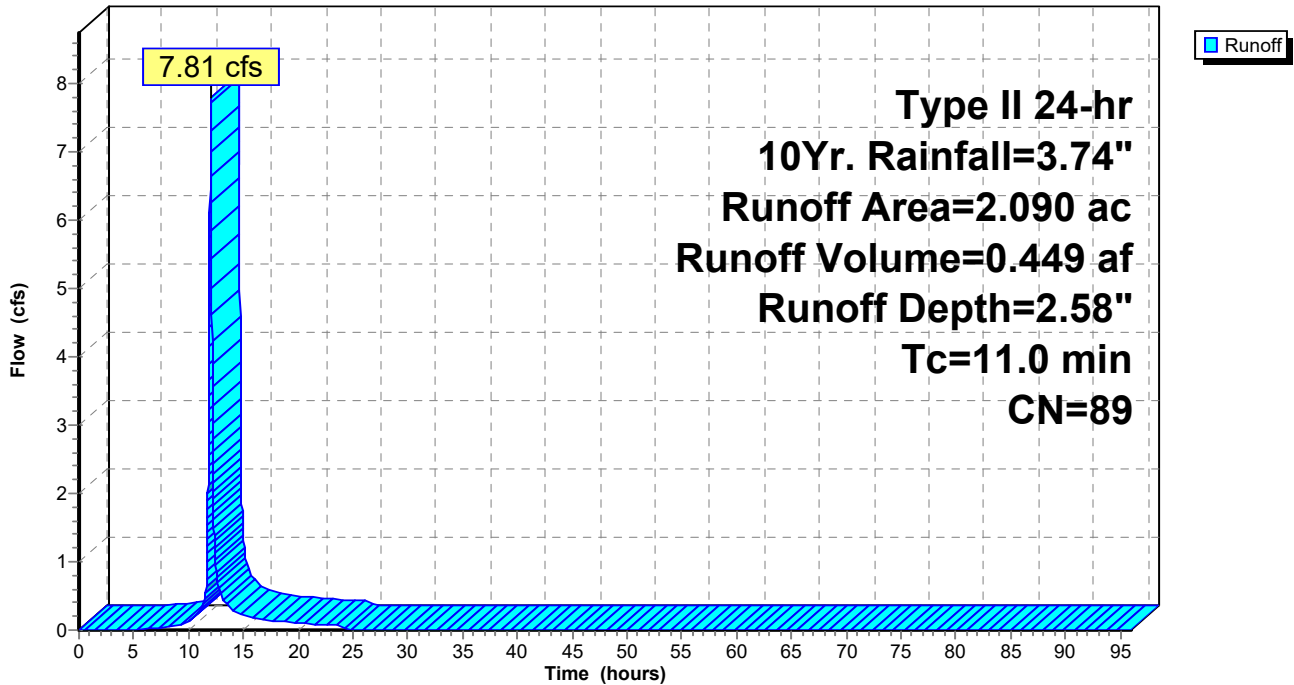
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 20.98 cfs @ 12.14 hrs, Volume= 1.622 af, Depth= 1.47"

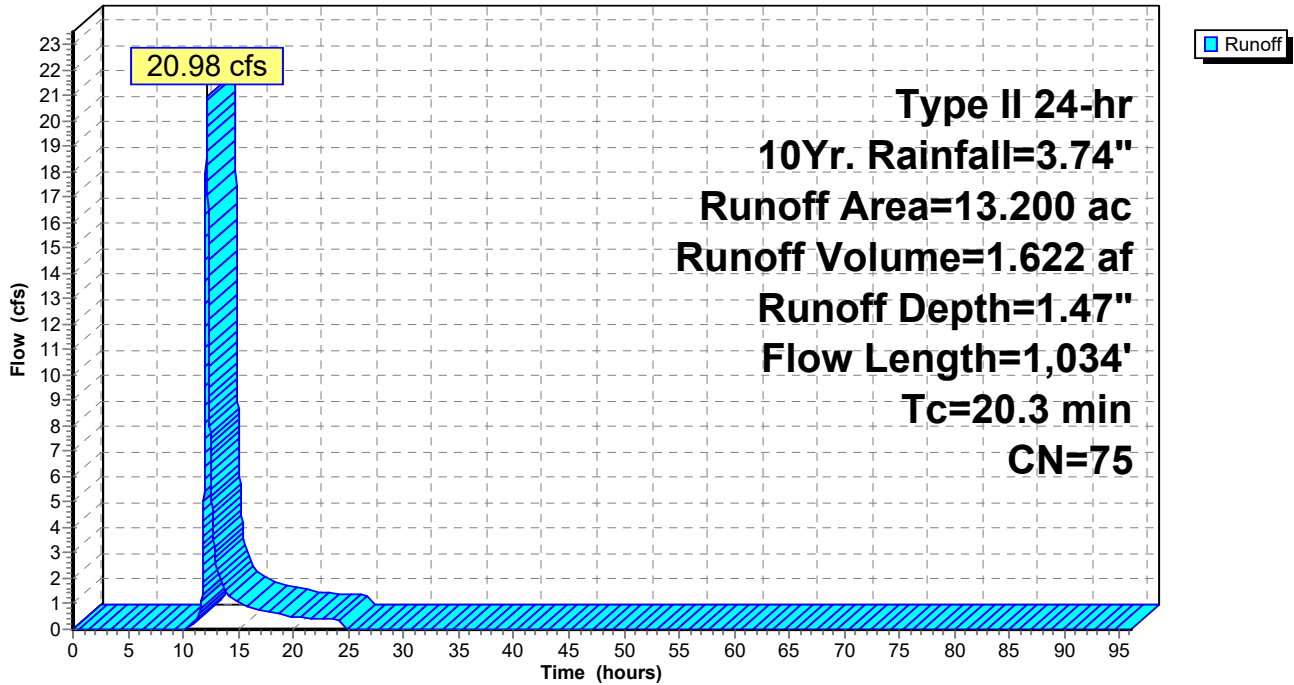
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 47.18 cfs @ 12.07 hrs, Volume= 3.154 af, Depth= 2.87"
 Routed to Pond 10P : SW Pond 3

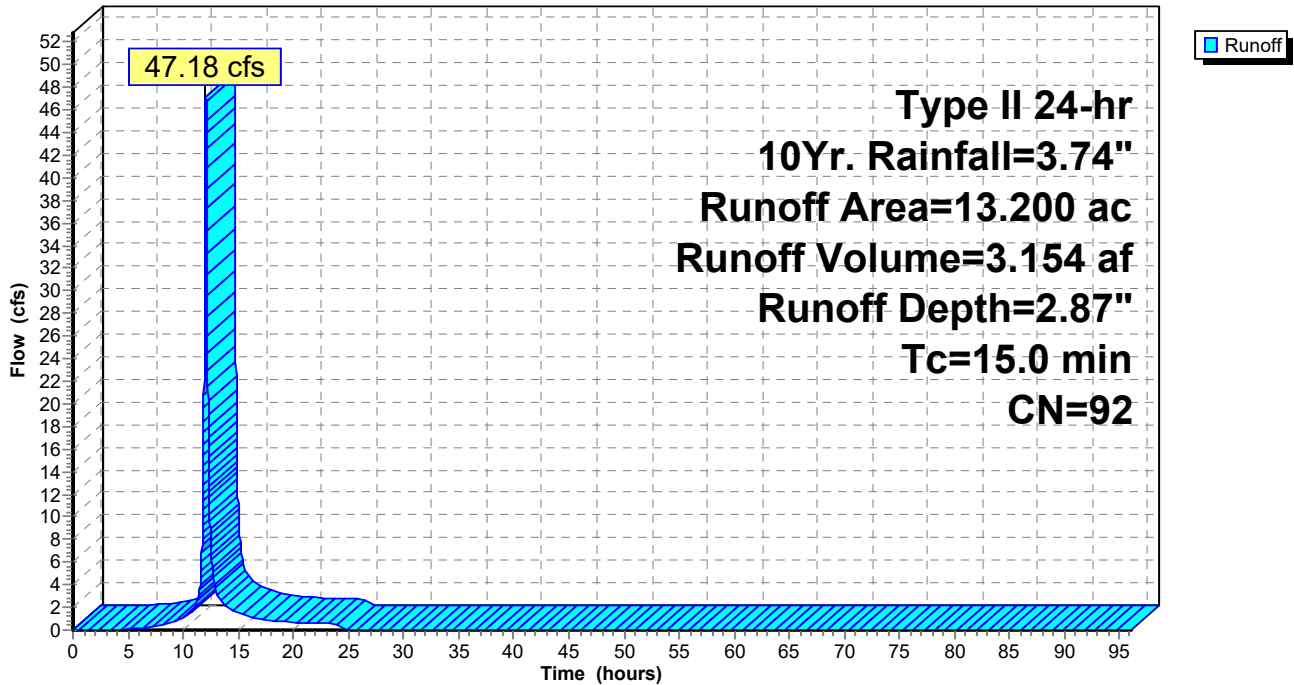
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 10Yr. Rainfall=3.74"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 2.77" for 10Yr. event
 Inflow = 33.02 cfs @ 11.99 hrs, Volume= 1.742 af
 Outflow = 1.71 cfs @ 13.05 hrs, Volume= 1.613 af, Atten= 95%, Lag= 63.6 min
 Primary = 1.71 cfs @ 13.05 hrs, Volume= 1.613 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 787.85' @ 13.05 hrs Surf.Area= 18,515 sf Storage= 46,672 cf

Plug-Flow detention time= 660.9 min calculated for 1.613 af (93% of inflow)
 Center-of-Mass det. time= 620.4 min (1,415.9 - 795.5)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 ' /'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 ' /' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.71 cfs @ 13.05 hrs HW=787.85' (Free Discharge)

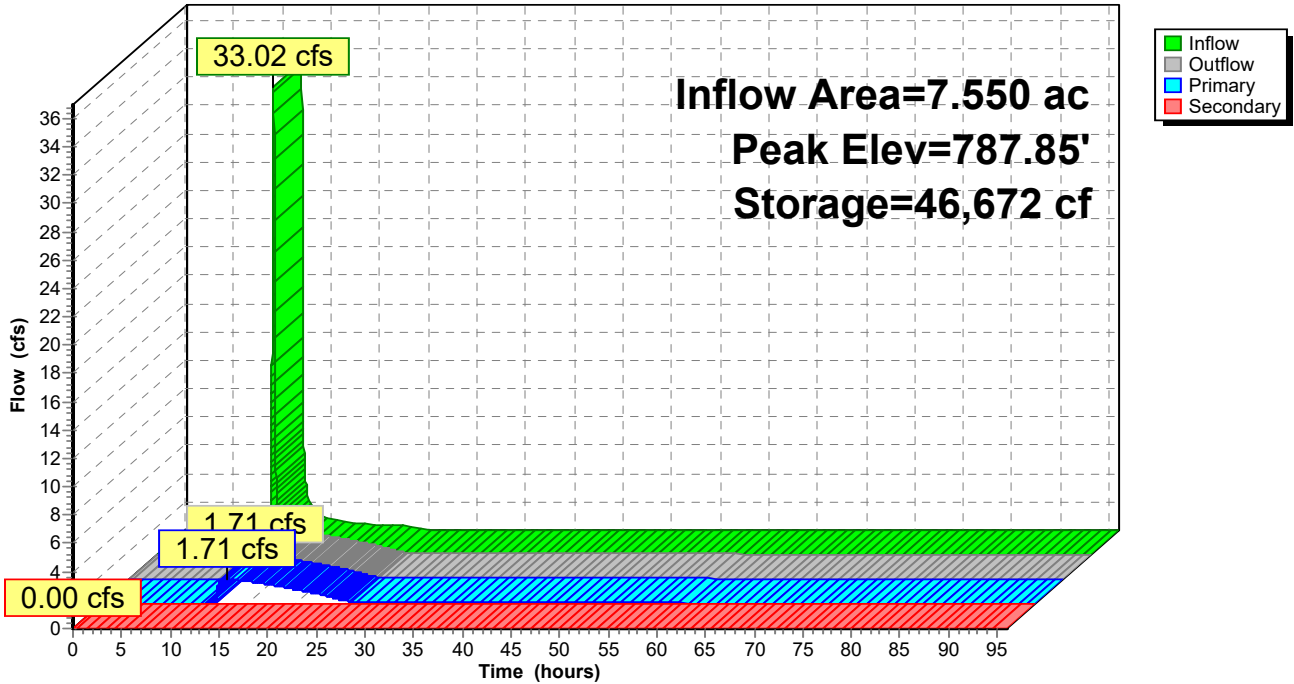
- ↑ 1=Culvert (Passes 1.71 cfs of 8.82 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.21 cfs @ 8.00 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 1.50 cfs @ 6.00 fps)
- ↑ 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

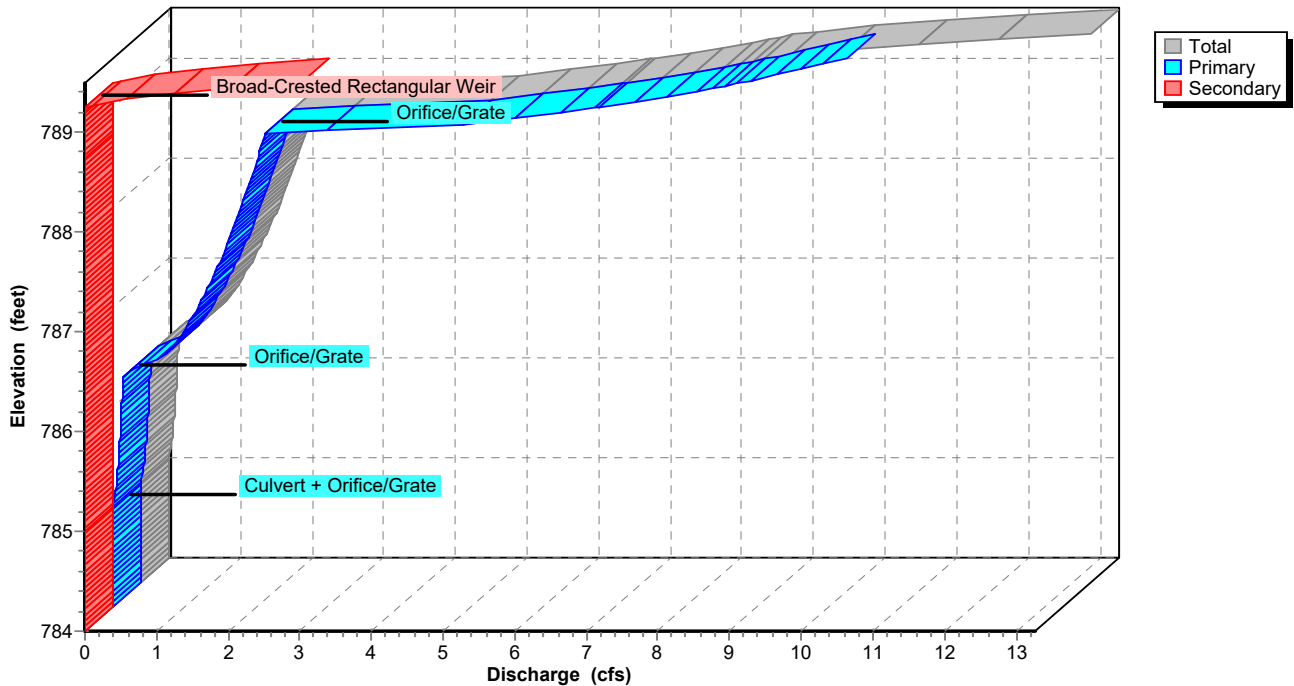
Pond 3P: Ortho 1 Det. Pond

Hydrograph

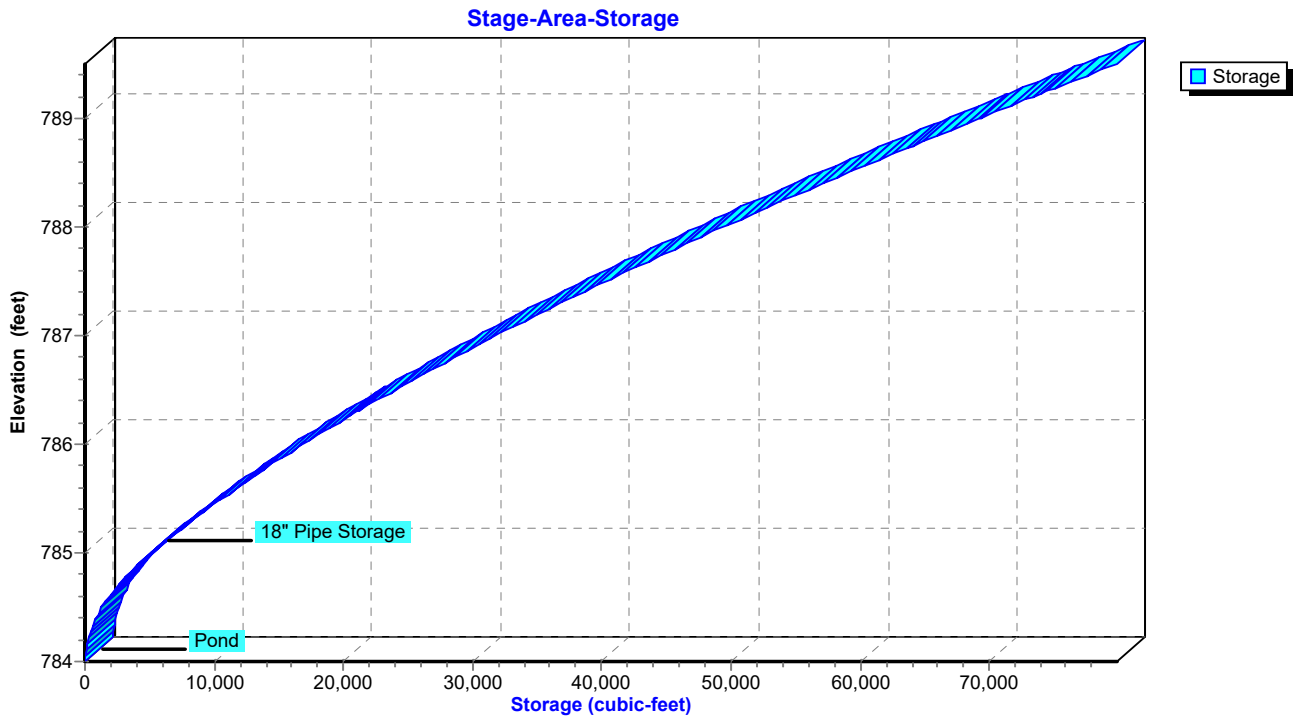


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



Crescent pondsSE &OrthoDRY

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Type II 24-hr 10Yr. Rainfall=3.74"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

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Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth = 2.35" for 10Yr. event
 Inflow = 52.13 cfs @ 12.08 hrs, Volume= 5.154 af
 Outflow = 2.31 cfs @ 18.42 hrs, Volume= 4.705 af, Atten= 96%, Lag= 380.2 min
 Primary = 2.31 cfs @ 18.42 hrs, Volume= 4.705 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 784.64' @ 18.42 hrs Surf.Area= 30,632 sf Storage= 130,218 cf

Plug-Flow detention time= 1,148.1 min calculated for 4.705 af (91% of inflow)
 Center-of-Mass det. time= 1,004.6 min (2,014.0 - 1,009.4)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=2.31 cfs @ 18.42 hrs HW=784.64' (Free Discharge)

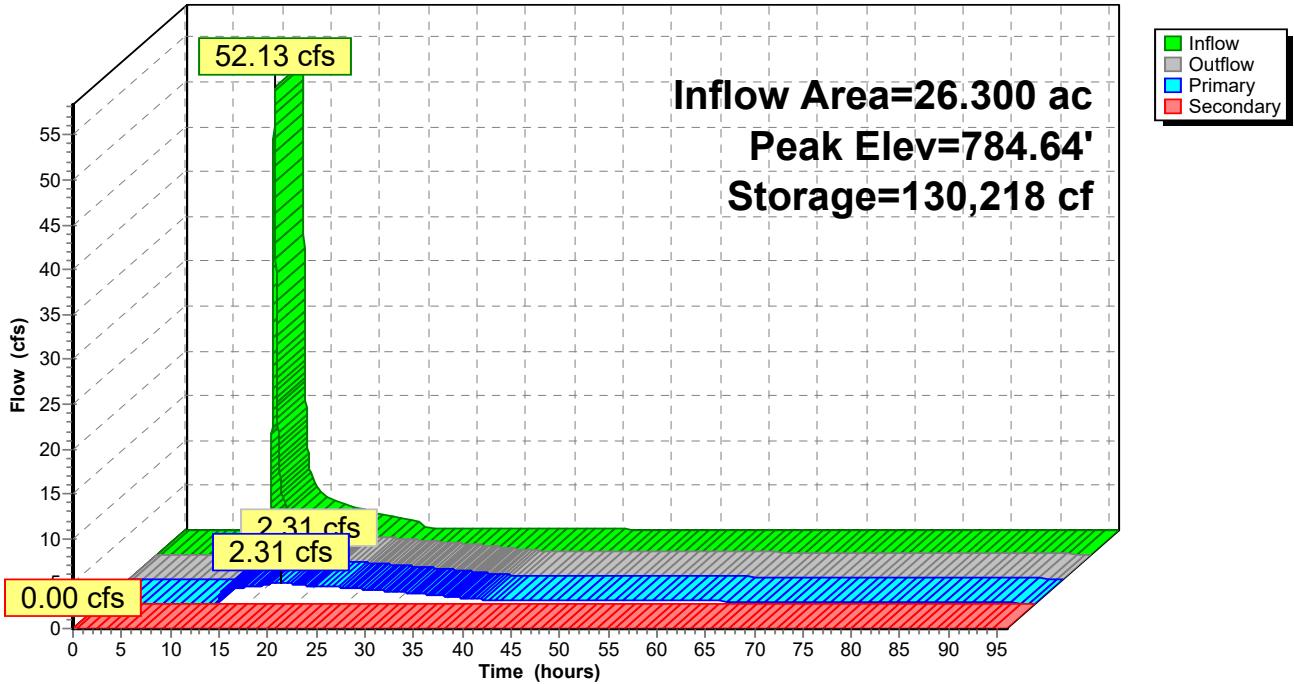
- 1=Culvert (Passes 2.31 cfs of 13.24 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.57 cfs @ 10.22 fps)
- 3=Orifice/Grate (Orifice Controls 1.41 cfs @ 7.20 fps)
- 4=Orifice/Grate (Orifice Controls 0.33 cfs @ 1.19 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=778.00' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

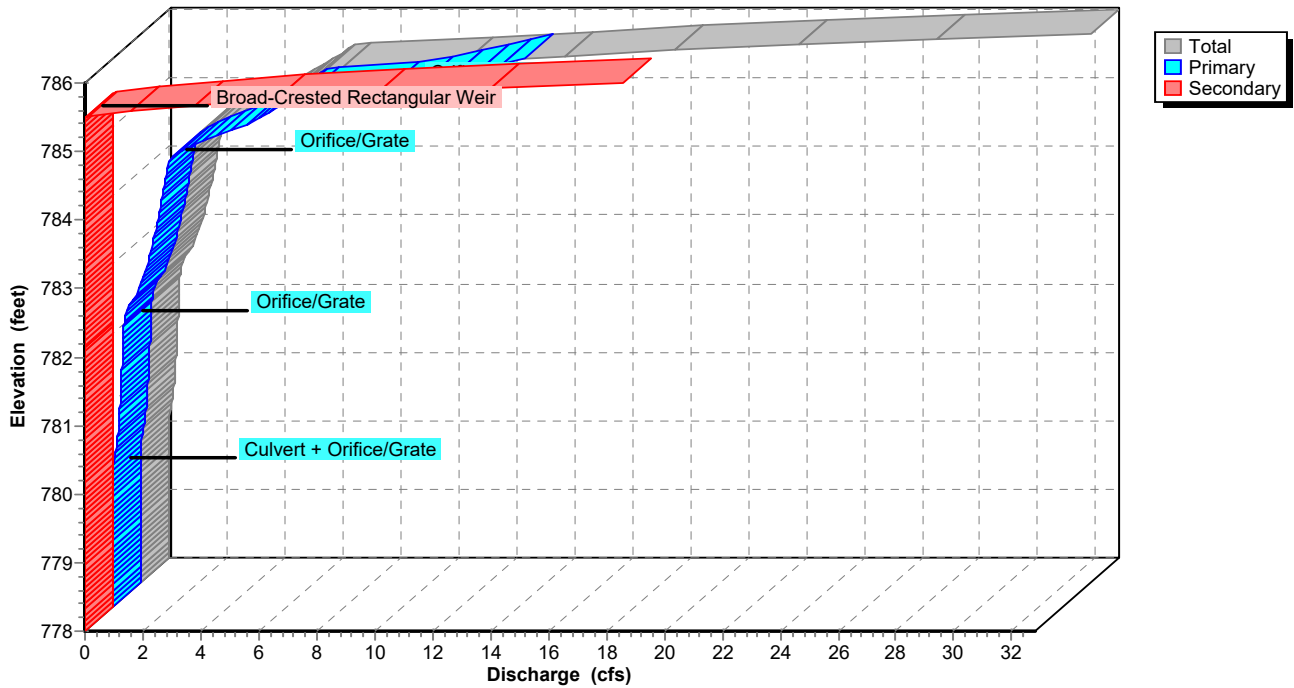
Pond 5P: SE Det. Pond 2

Hydrograph



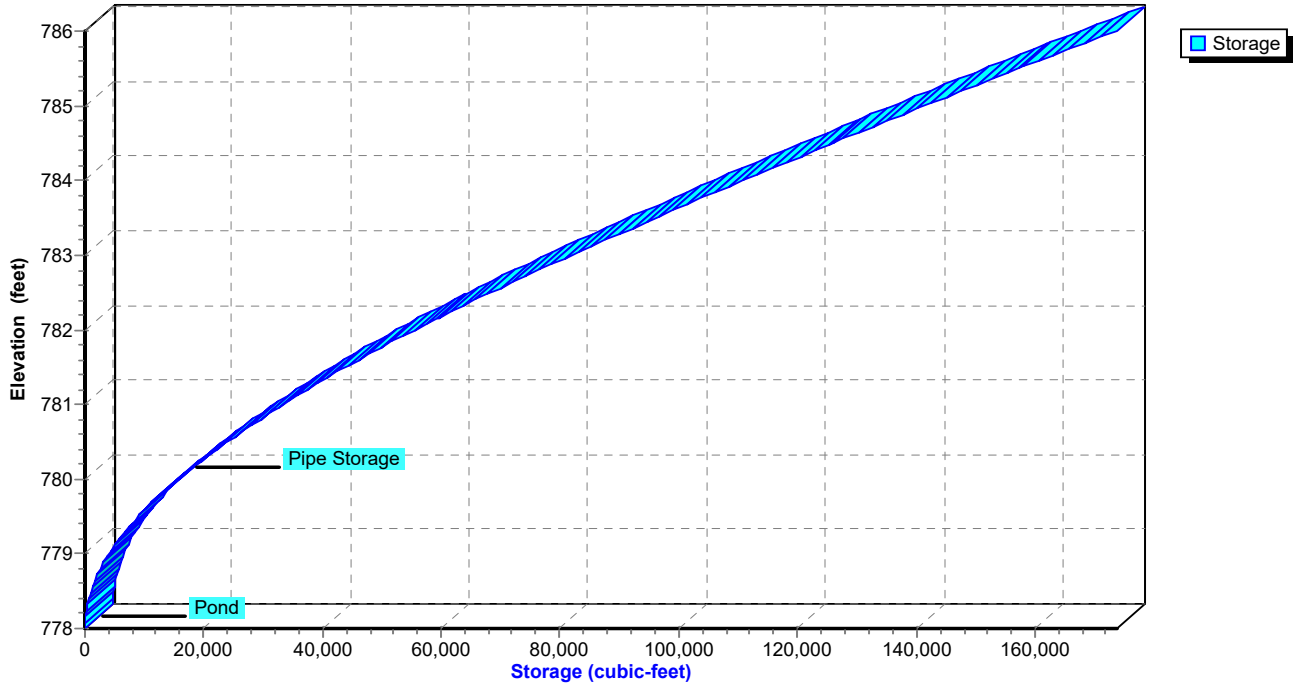
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 10Yr. Rainfall=3.74"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Crescent pondsSE &OrthoDRY

Type II 24-hr 10Yr. Rainfall=3.74"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 2.87" for 10Yr. event
 Inflow = 47.18 cfs @ 12.07 hrs, Volume= 3.154 af
 Outflow = 2.32 cfs @ 13.65 hrs, Volume= 3.003 af, Atten= 95%, Lag= 94.9 min
 Primary = 2.32 cfs @ 13.65 hrs, Volume= 3.003 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 785.69' @ 13.65 hrs Surf.Area= 33,026 sf Storage= 88,359 cf

Plug-Flow detention time= 718.9 min calculated for 3.002 af (95% of inflow)
 Center-of-Mass det. time= 691.3 min (1,488.7 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=2.32 cfs @ 13.65 hrs HW=785.69' (Free Discharge)

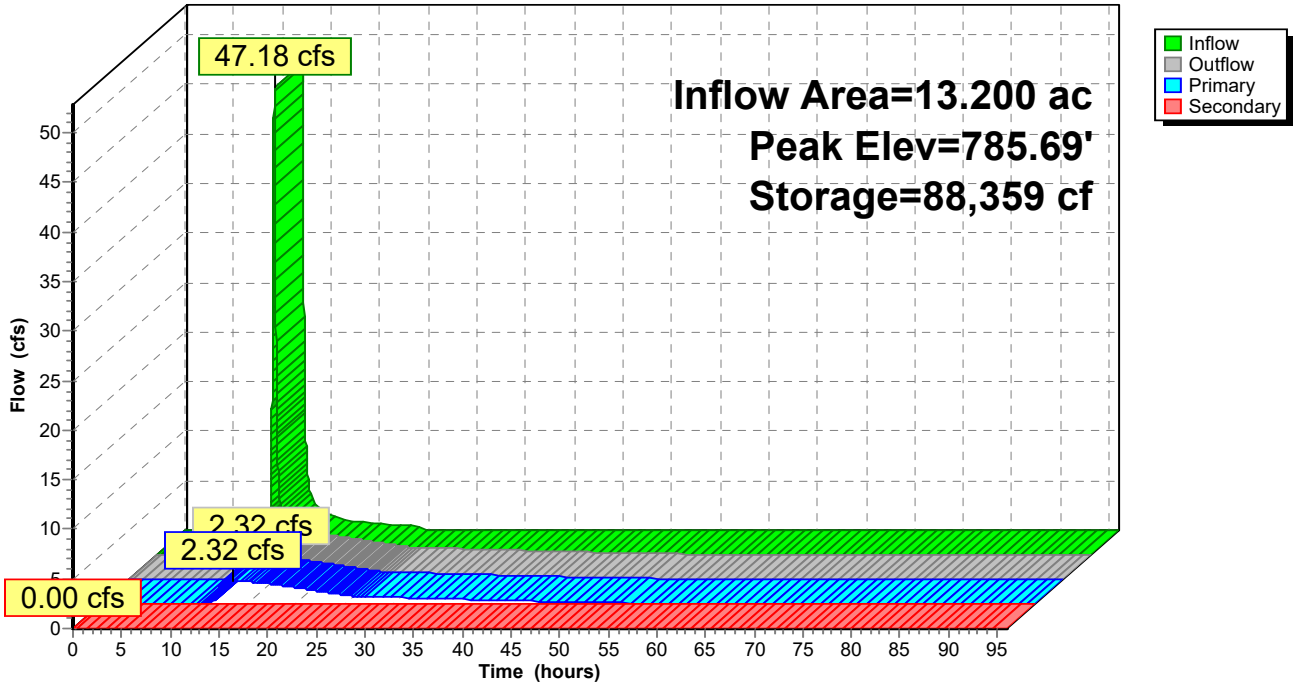
- 1=Culvert (Passes 2.32 cfs of 9.37 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.04 cfs @ 7.59 fps)
- 3=Orifice/Grate (Orifice Controls 1.29 cfs @ 4.82 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=780.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

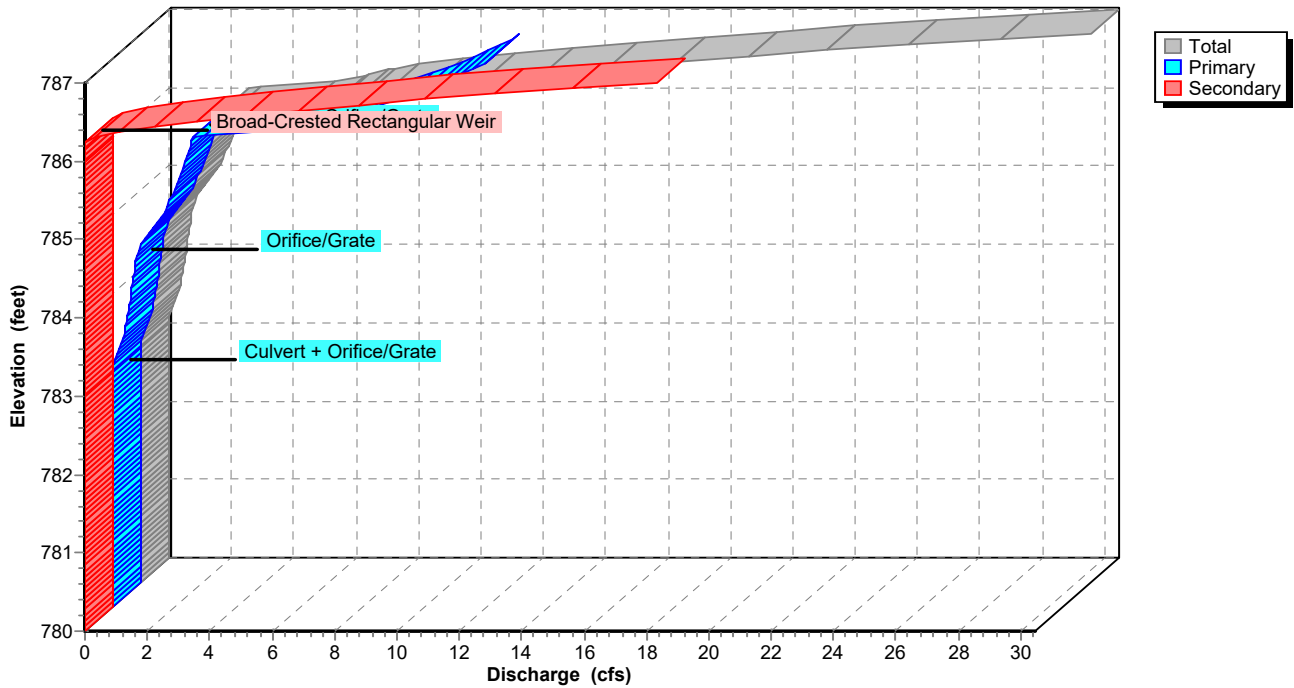
Pond 10P: SW Pond 3

Hydrograph



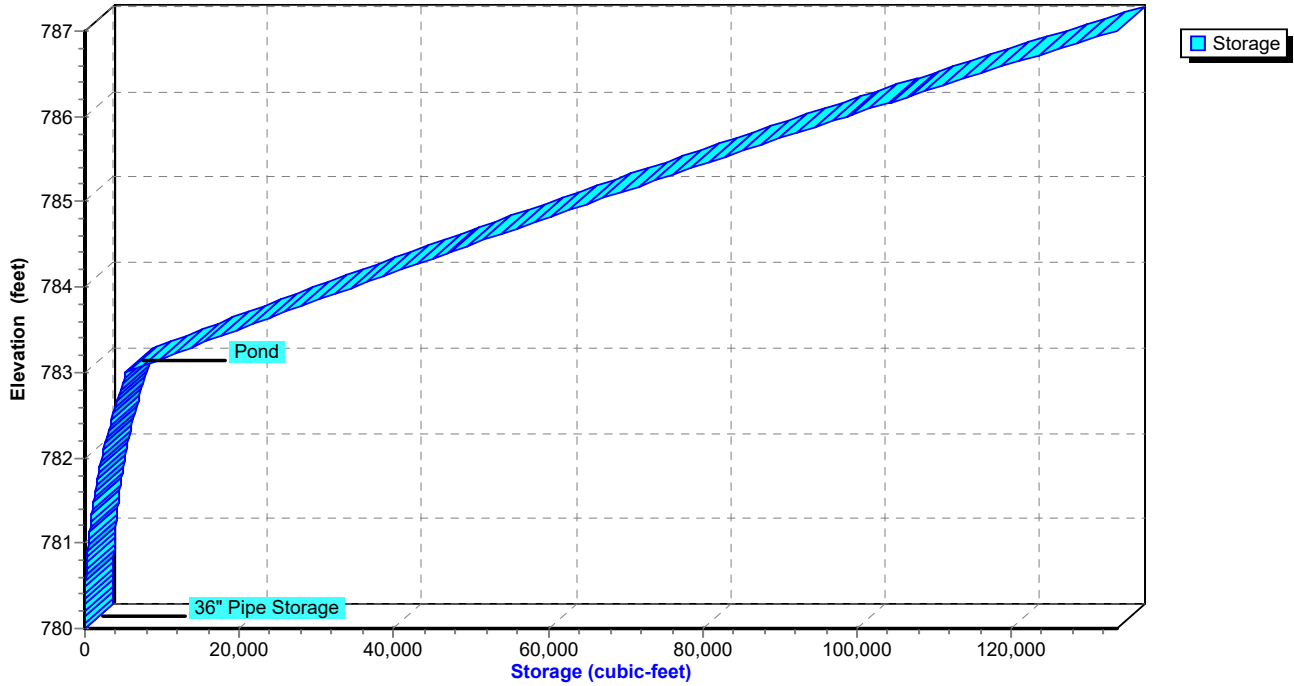
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



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Type II 24-hr 10Yr. Rainfall=3.74"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

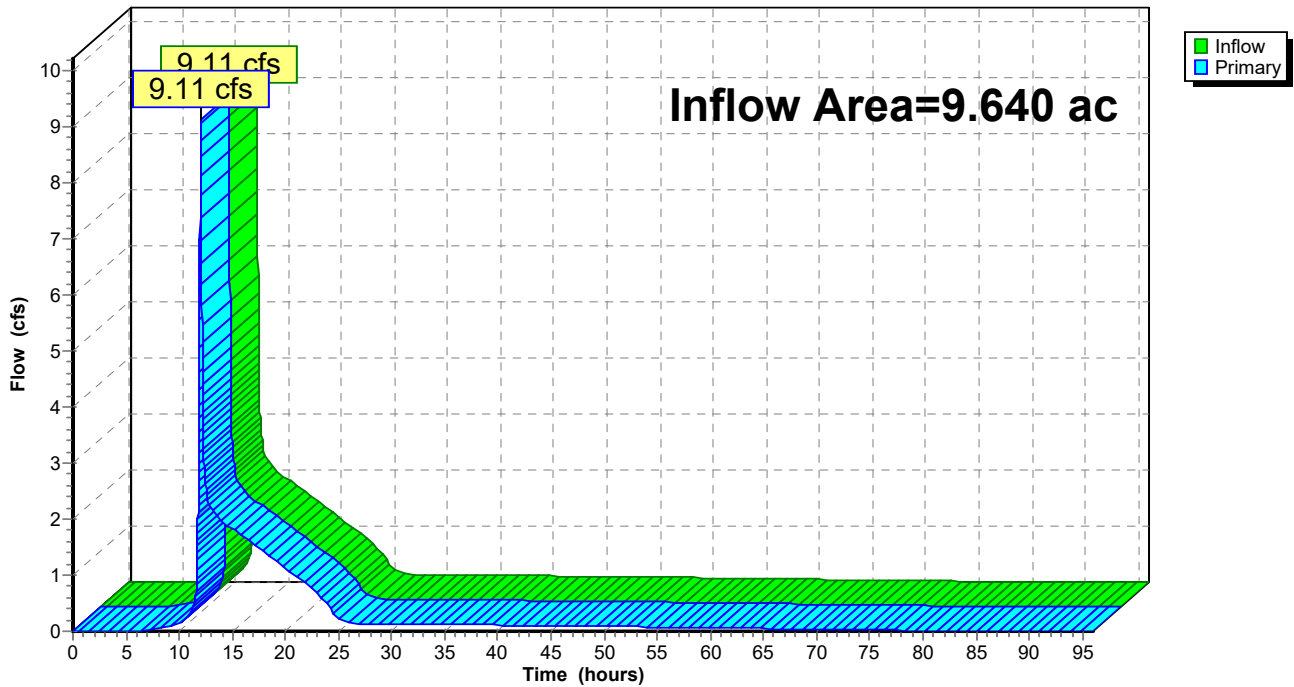
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 2.57" for 10Yr. event
Inflow = 9.11 cfs @ 12.03 hrs, Volume= 2.062 af
Primary = 9.11 cfs @ 12.03 hrs, Volume= 2.062 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 23.32 cfs @ 12.02 hrs, Volume= 1.261 af, Depth= 2.00"

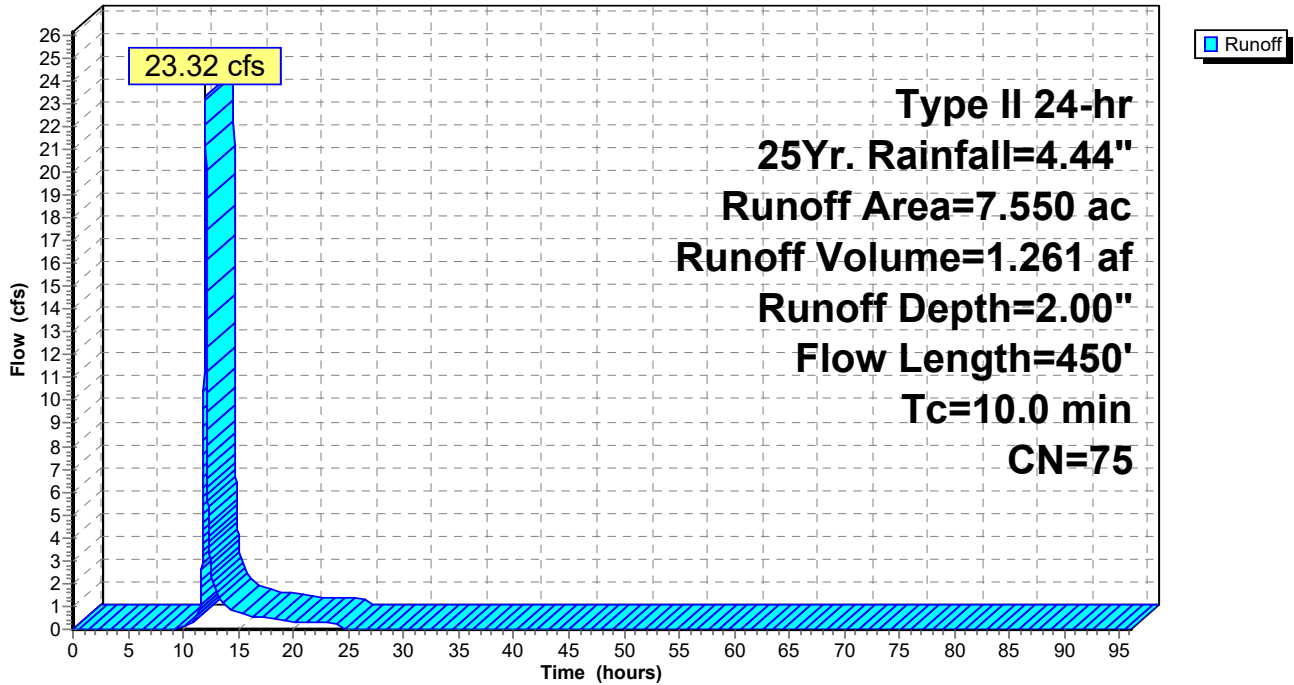
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 40.48 cfs @ 11.99 hrs, Volume= 2.164 af, Depth= 3.44"
Routed to Pond 3P : Ortho 1 Det. Pond

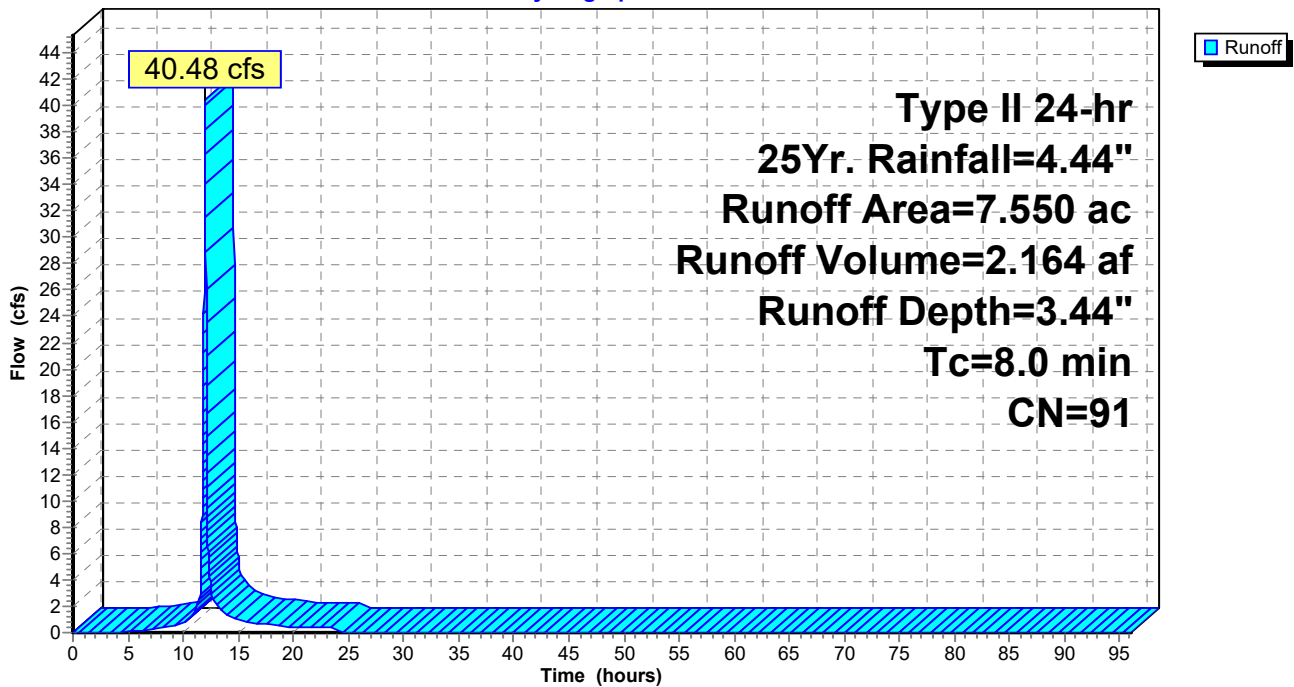
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 42.43 cfs @ 12.13 hrs, Volume= 3.205 af, Depth= 1.49"

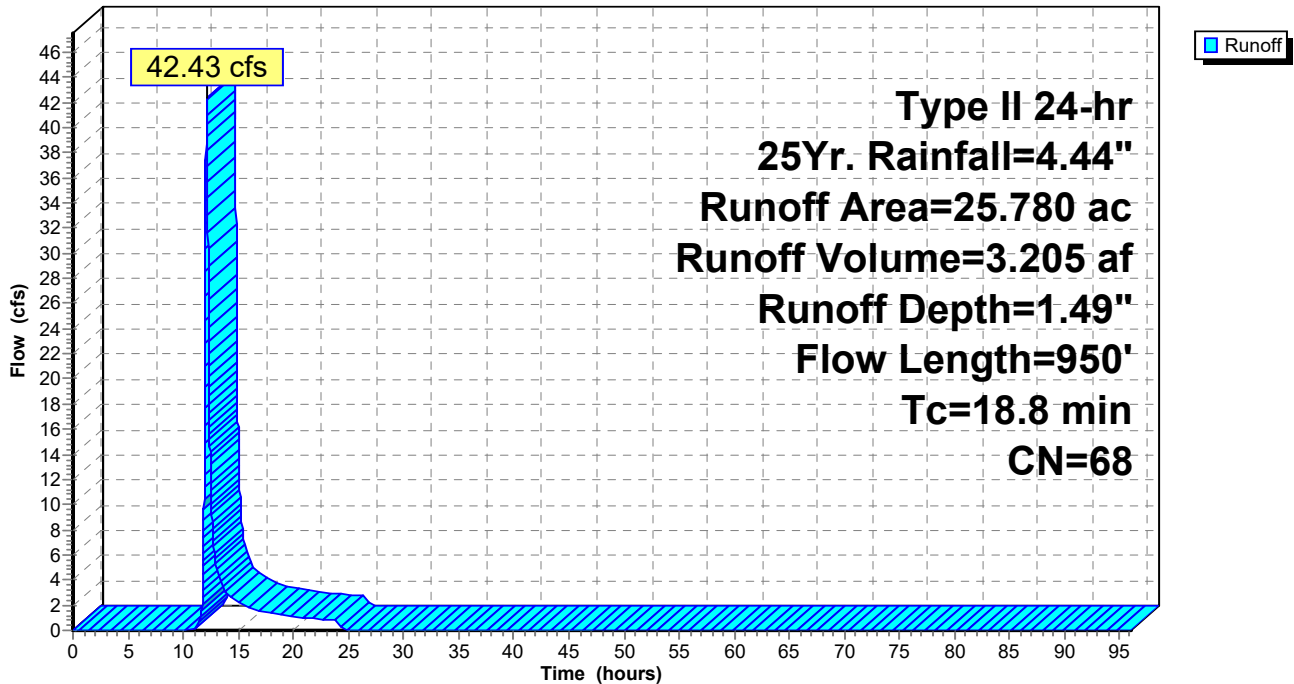
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 56.55 cfs @ 12.10 hrs, Volume= 3.963 af, Depth= 2.85"
 Routed to Pond 5P : SE Det. Pond 2

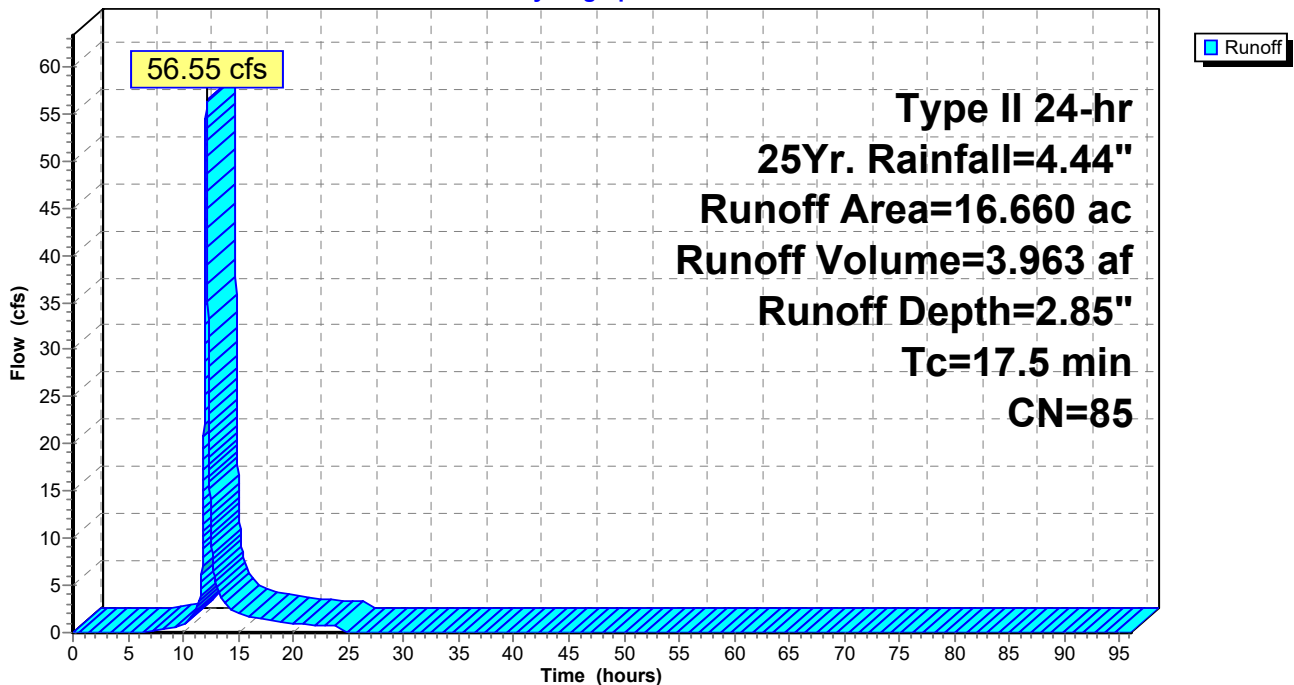
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 6S: Roadway

Runoff = 9.70 cfs @ 12.02 hrs, Volume= 0.564 af, Depth= 3.24"
 Routed to Link 7L : (new Link)

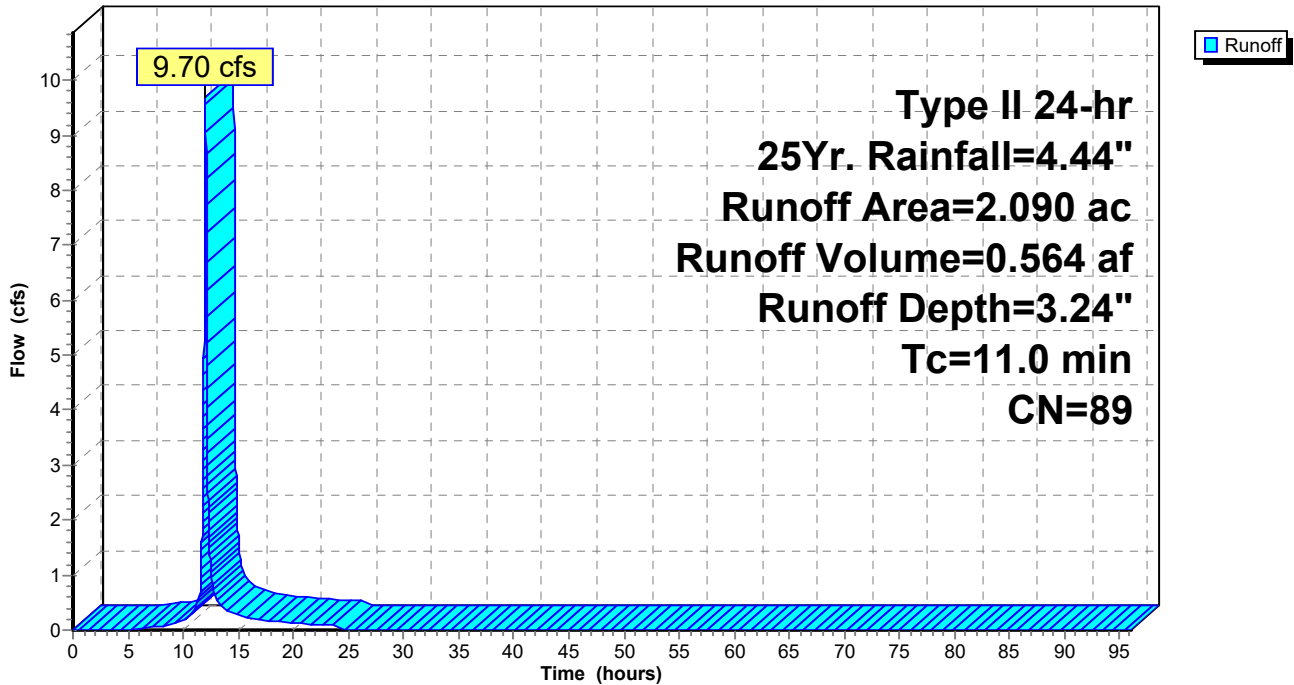
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 28.91 cfs @ 12.14 hrs, Volume= 2.204 af, Depth= 2.00"

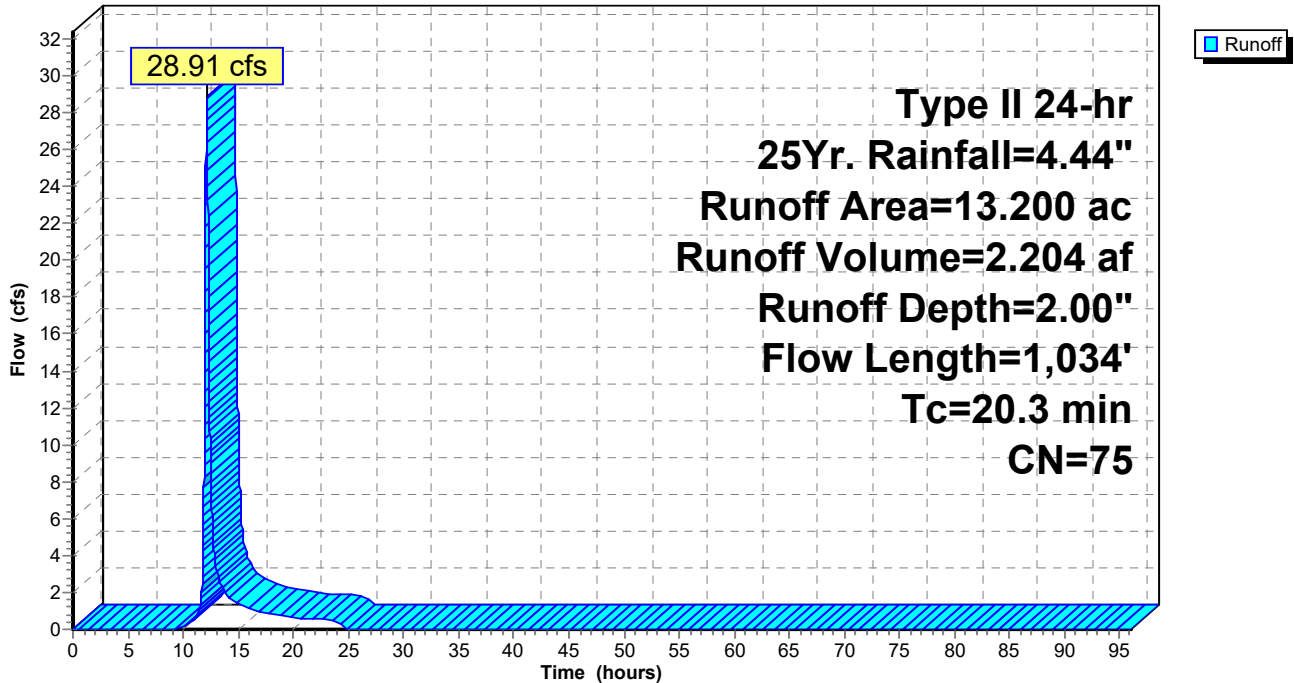
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 57.65 cfs @ 12.06 hrs, Volume= 3.898 af, Depth= 3.54"
 Routed to Pond 10P : SW Pond 3

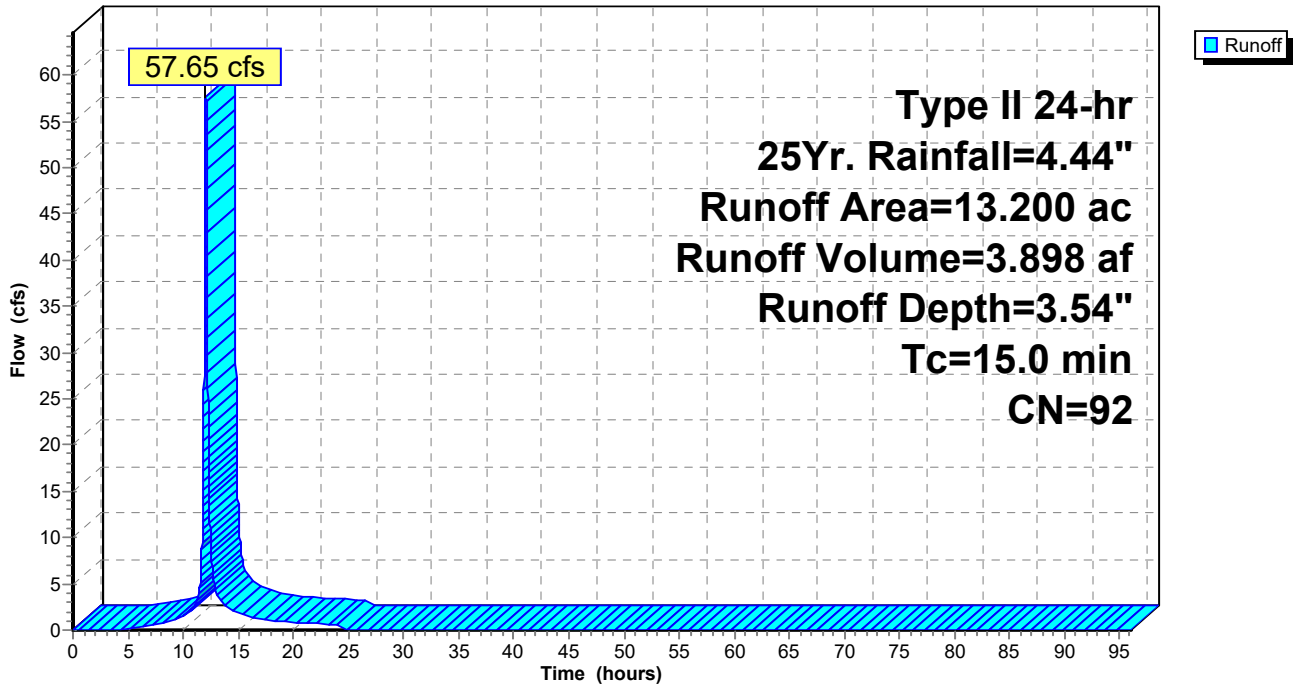
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 25Yr. Rainfall=4.44"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 3.44" for 25Yr. event
 Inflow = 40.48 cfs @ 11.99 hrs, Volume= 2.164 af
 Outflow = 2.01 cfs @ 13.09 hrs, Volume= 2.035 af, Atten= 95%, Lag= 65.8 min
 Primary = 2.01 cfs @ 13.09 hrs, Volume= 2.035 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 788.48' @ 13.09 hrs Surf.Area= 19,767 sf Storage= 58,769 cf

Plug-Flow detention time= 619.5 min calculated for 2.035 af (94% of inflow)
 Center-of-Mass det. time= 585.5 min (1,374.9 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 ' /'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 ' /' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.01 cfs @ 13.09 hrs HW=788.48' (Free Discharge)

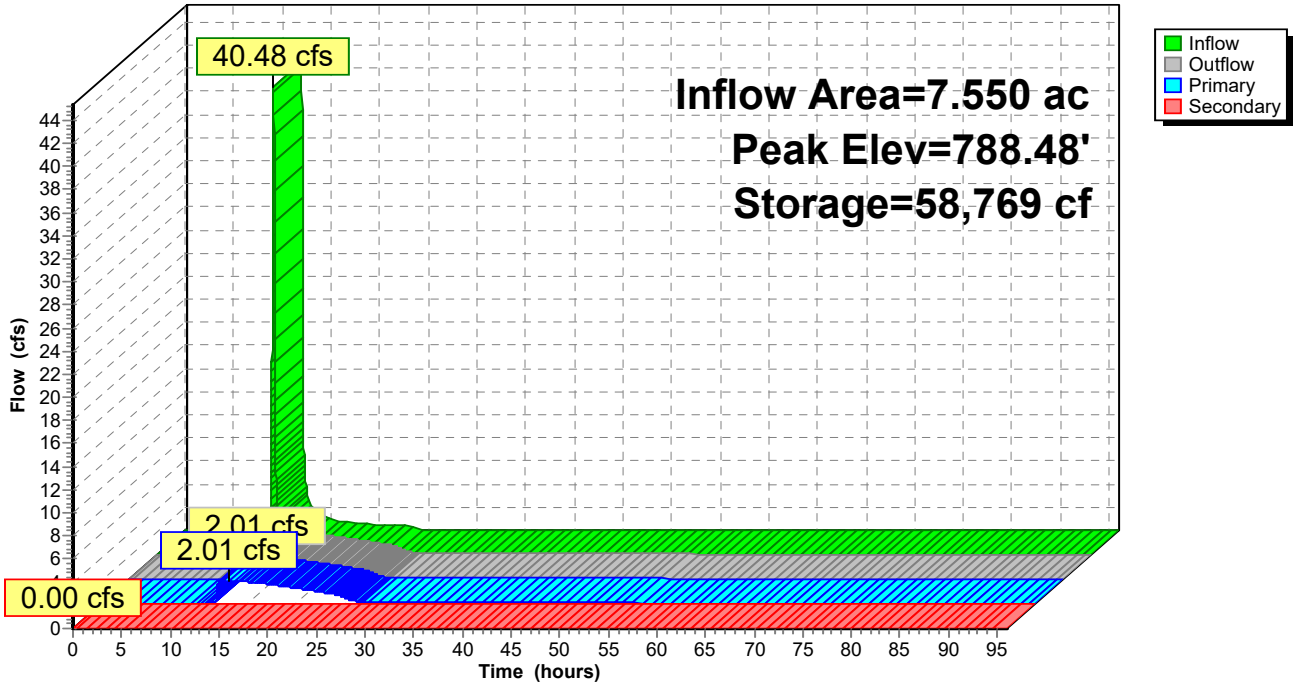
- 1=Culvert (Passes 2.01 cfs of 9.99 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 8.87 fps)
- 3=Orifice/Grate (Orifice Controls 1.78 cfs @ 7.12 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

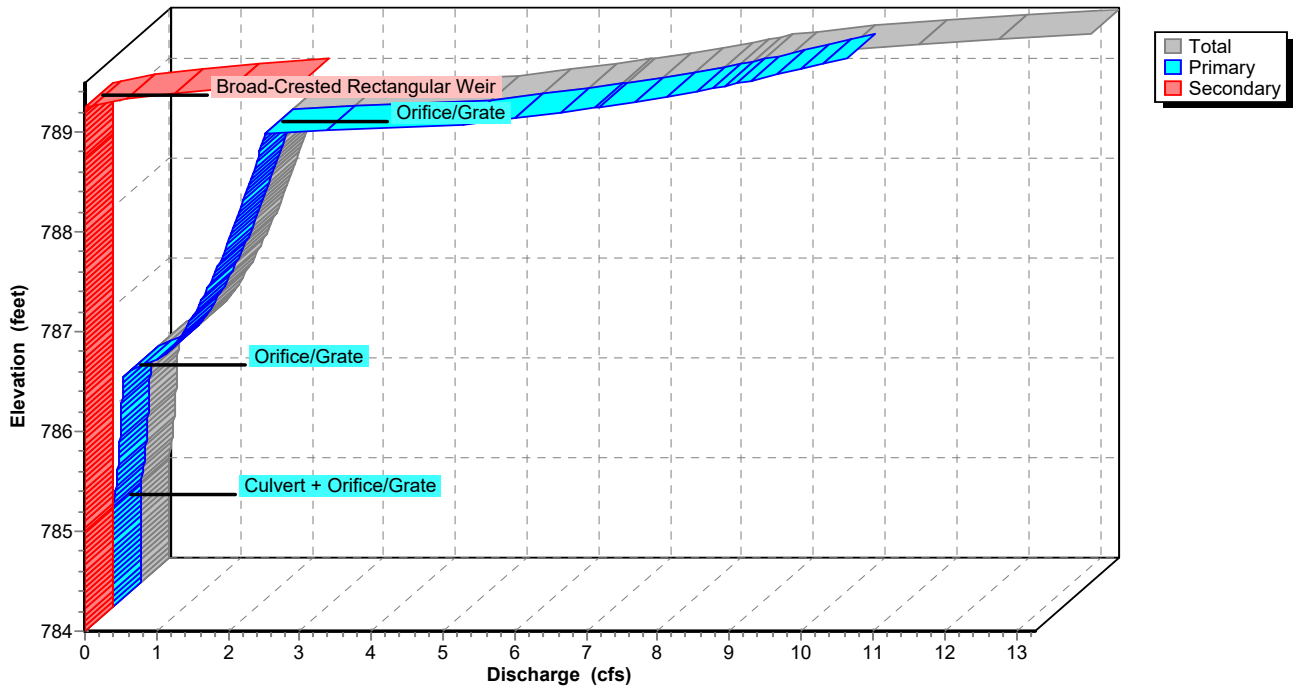
Pond 3P: Ortho 1 Det. Pond

Hydrograph

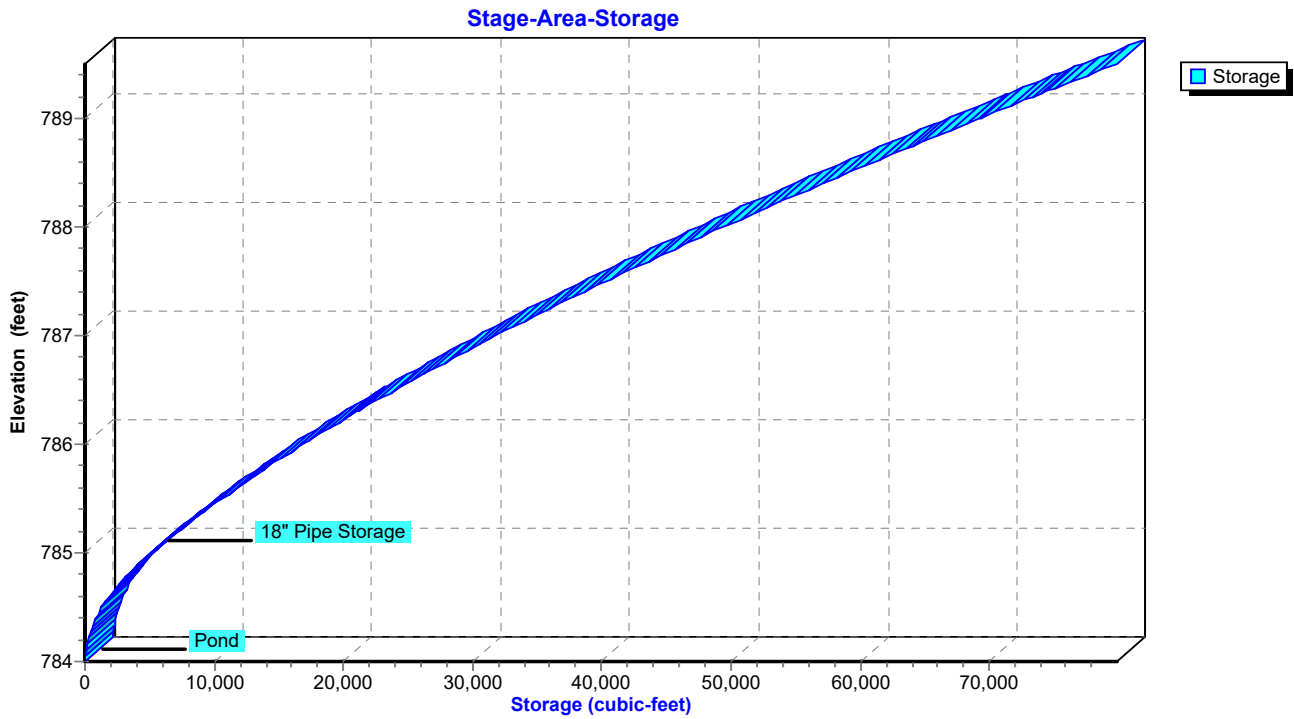


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



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Type II 24-hr 25Yr. Rainfall=4.44"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth = 2.99" for 25Yr. event
 Inflow = 66.24 cfs @ 12.08 hrs, Volume= 6.562 af
 Outflow = 4.46 cfs @ 14.69 hrs, Volume= 6.104 af, Atten= 93%, Lag= 156.7 min
 Primary = 4.46 cfs @ 14.69 hrs, Volume= 6.104 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 785.01' @ 14.69 hrs Surf.Area= 31,260 sf Storage= 141,895 cf

Plug-Flow detention time= 951.5 min calculated for 6.103 af (93% of inflow)
 Center-of-Mass det. time= 834.0 min (1,824.2 - 990.3)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=4.48 cfs @ 14.69 hrs HW=785.01' (Free Discharge)

- 1=Culvert (Passes 4.48 cfs of 13.87 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.59 cfs @ 10.64 fps)
- 3=Orifice/Grate (Orifice Controls 1.53 cfs @ 7.79 fps)
- 4=Orifice/Grate (Orifice Controls 2.36 cfs @ 2.36 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=778.00' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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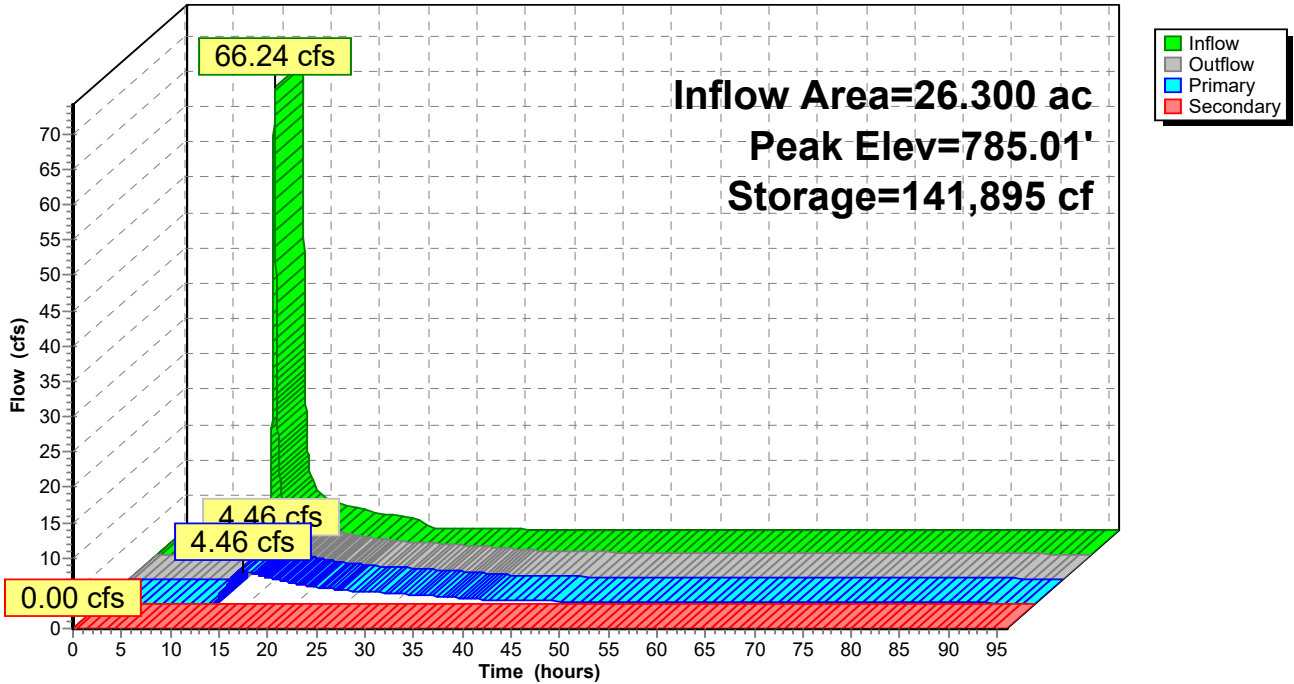
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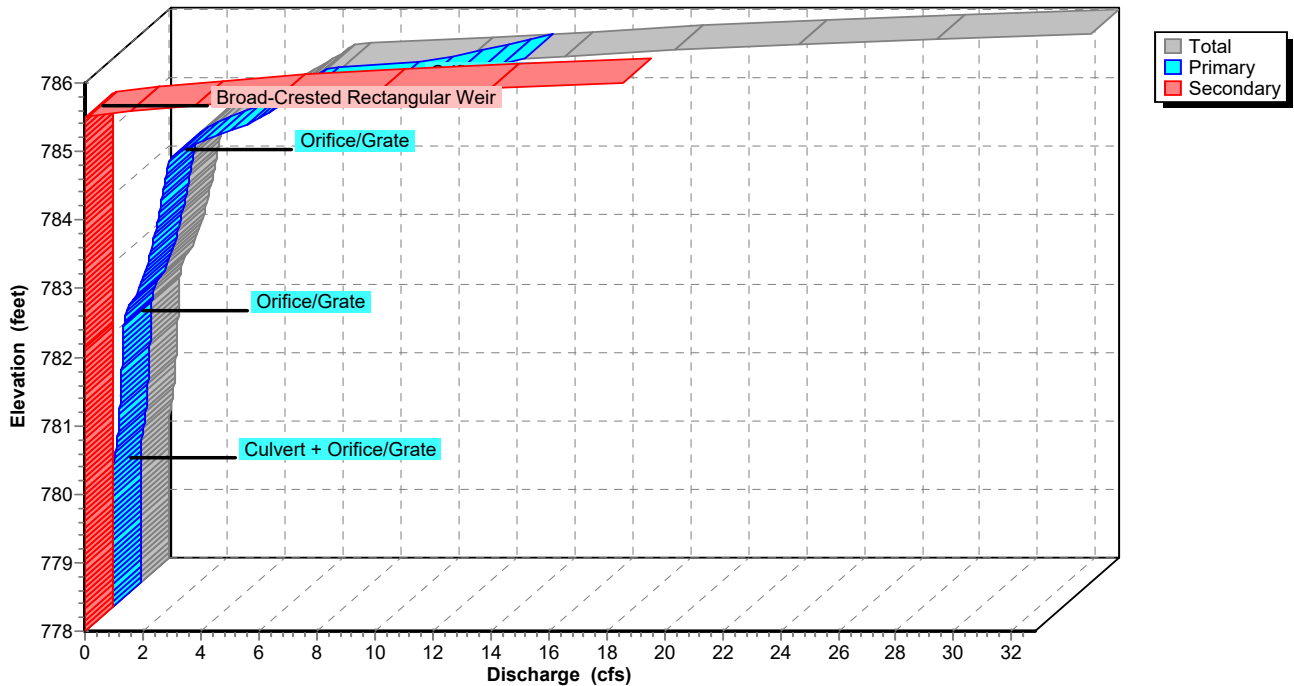
Pond 5P: SE Det. Pond 2

Hydrograph



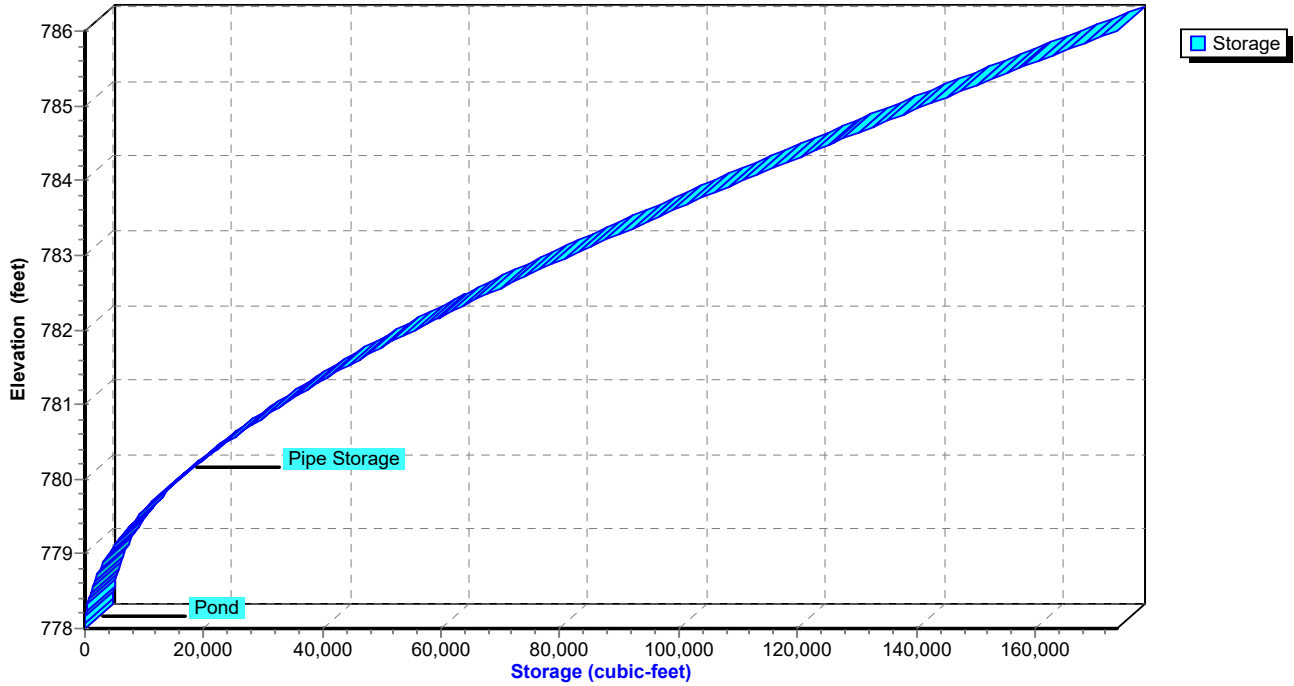
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Crescent pondsSE &OrthoDRY

Type II 24-hr 25Yr. Rainfall=4.44"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 3.54" for 25Yr. event
 Inflow = 57.65 cfs @ 12.06 hrs, Volume= 3.898 af
 Outflow = 5.93 cfs @ 12.68 hrs, Volume= 3.746 af, Atten= 90%, Lag= 36.8 min
 Primary = 5.93 cfs @ 12.68 hrs, Volume= 3.746 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 786.13' @ 12.68 hrs Surf.Area= 33,977 sf Storage= 103,054 cf

Plug-Flow detention time= 652.8 min calculated for 3.746 af (96% of inflow)
 Center-of-Mass det. time= 629.4 min (1,420.9 - 791.6)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.95 cfs @ 12.68 hrs HW=786.13' (Free Discharge)

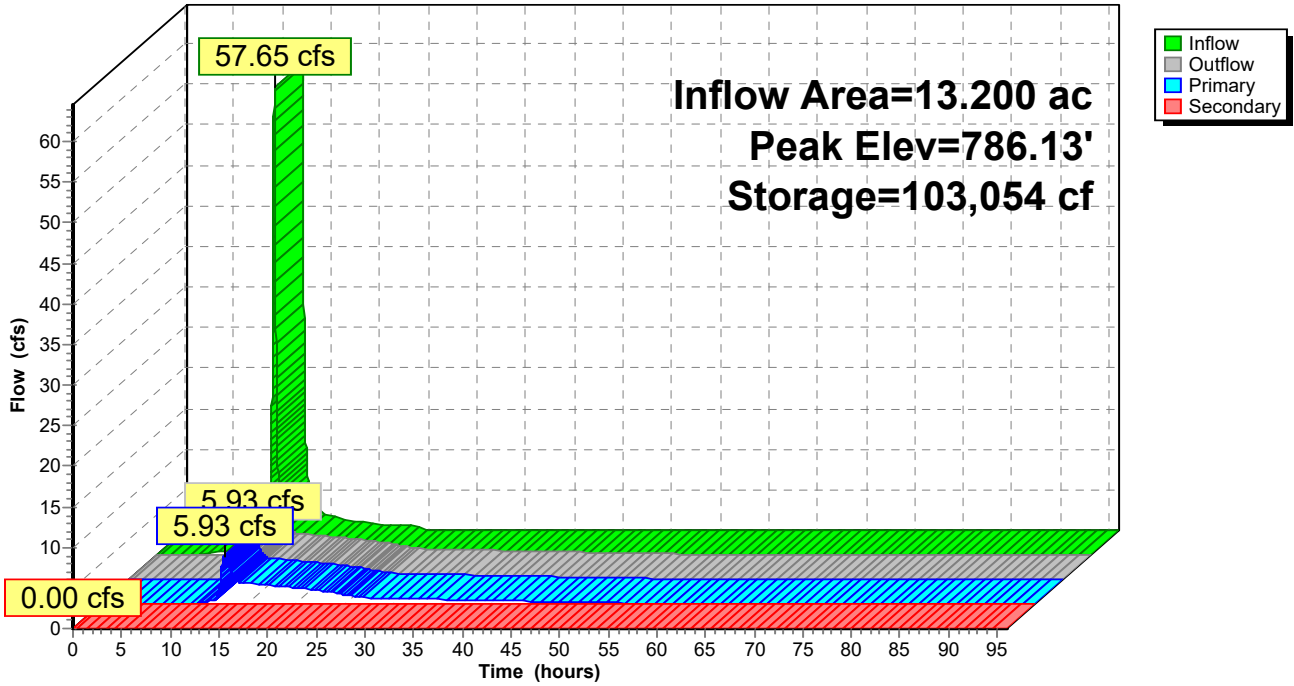
- 1=Culvert (Passes 5.95 cfs of 10.37 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.12 cfs @ 8.23 fps)
- 3=Orifice/Grate (Orifice Controls 1.54 cfs @ 5.78 fps)
- 4=Orifice/Grate (Orifice Controls 3.29 cfs @ 1.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=780.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

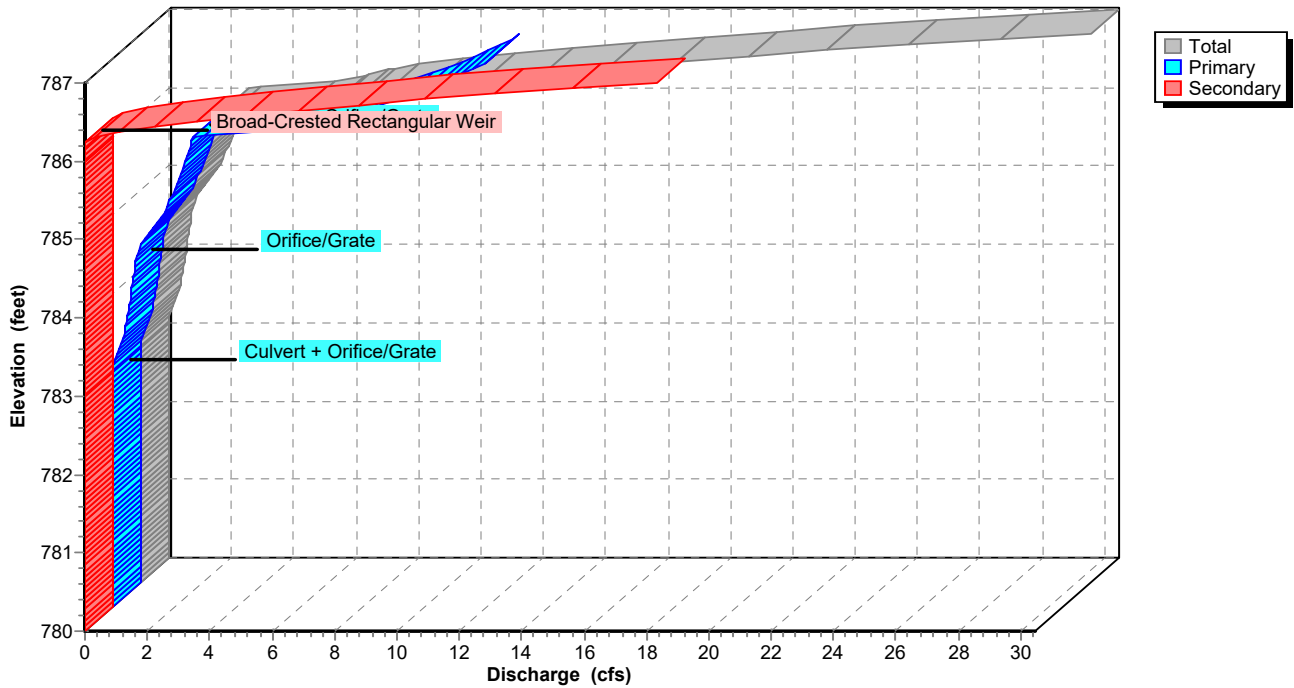
Pond 10P: SW Pond 3

Hydrograph



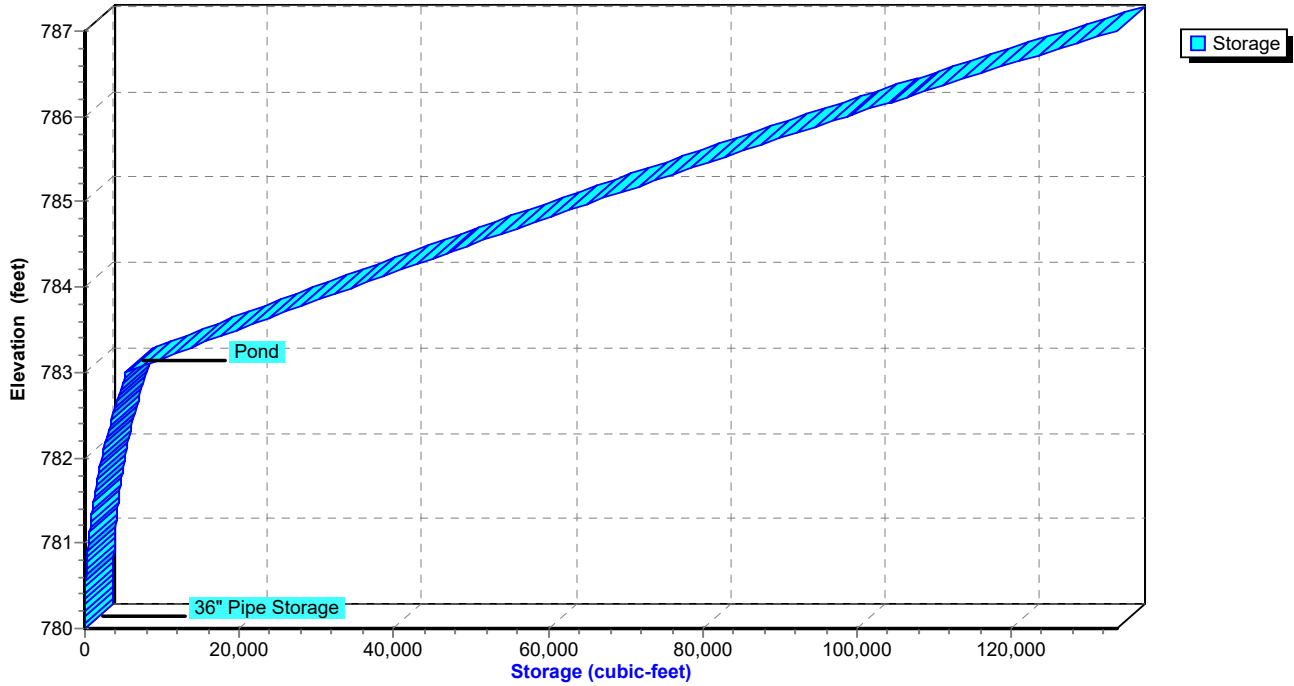
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

Crescent pondsSE &OrthoDRY

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Type II 24-hr 25Yr. Rainfall=4.44"

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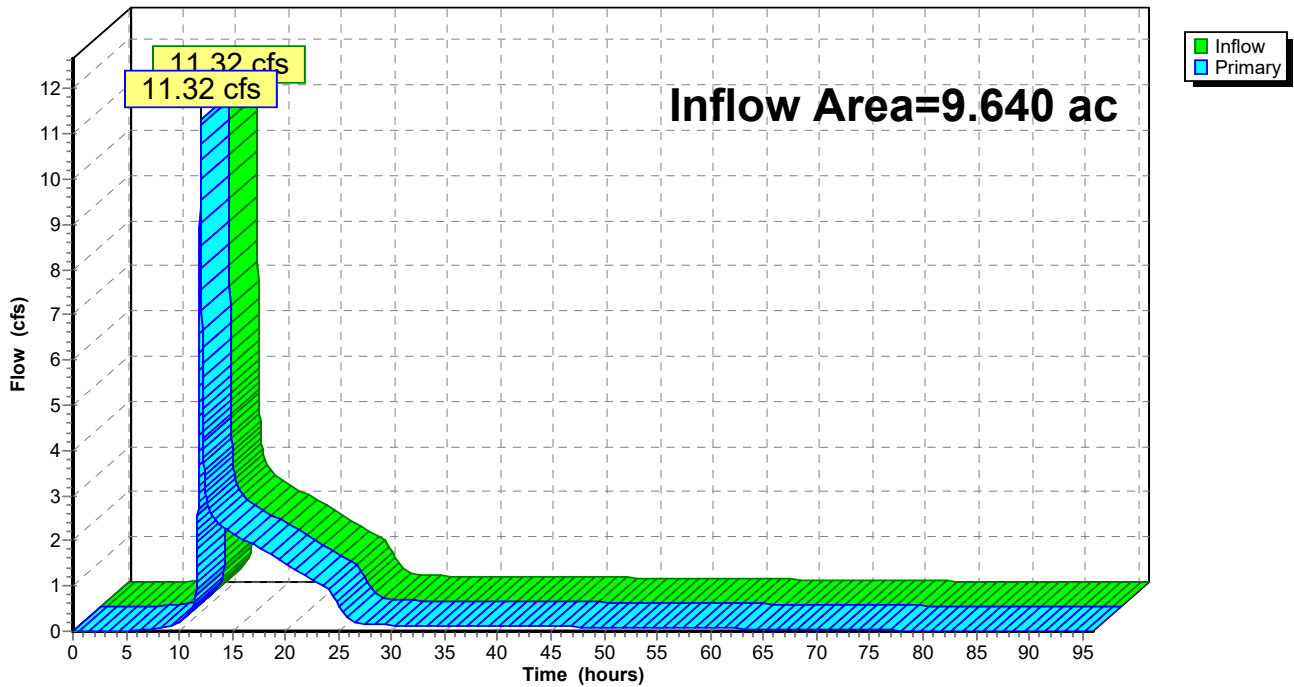
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 3.23" for 25Yr. event
Inflow = 11.32 cfs @ 12.03 hrs, Volume= 2.599 af
Primary = 11.32 cfs @ 12.03 hrs, Volume= 2.599 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 28.71 cfs @ 12.02 hrs, Volume= 1.551 af, Depth= 2.47"

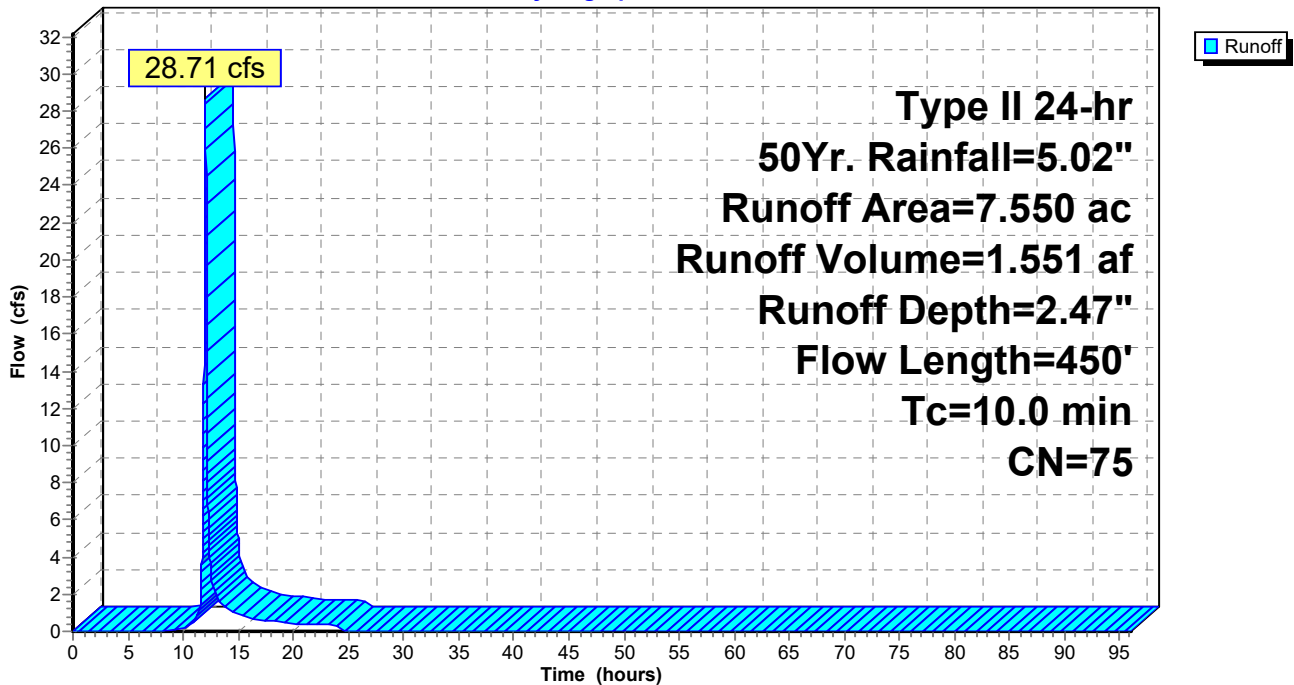
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 46.64 cfs @ 11.99 hrs, Volume= 2.518 af, Depth= 4.00"
 Routed to Pond 3P : Ortho 1 Det. Pond

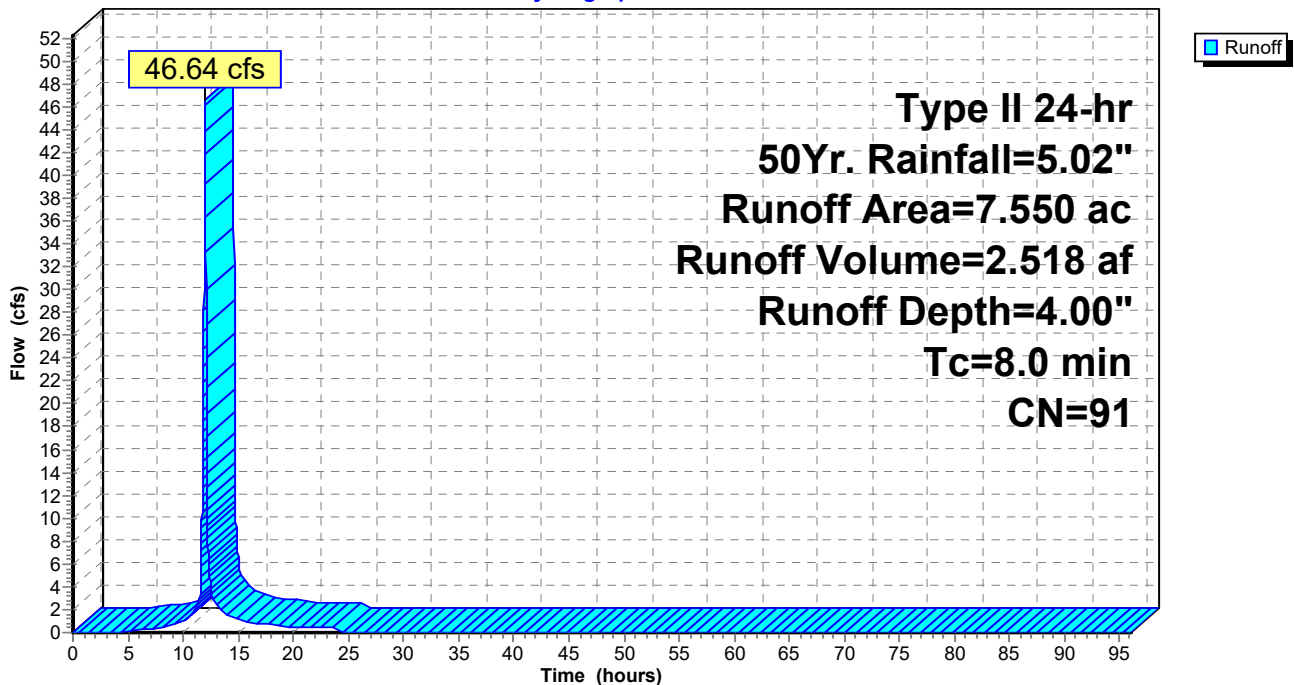
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 54.82 cfs @ 12.12 hrs, Volume= 4.069 af, Depth= 1.89"

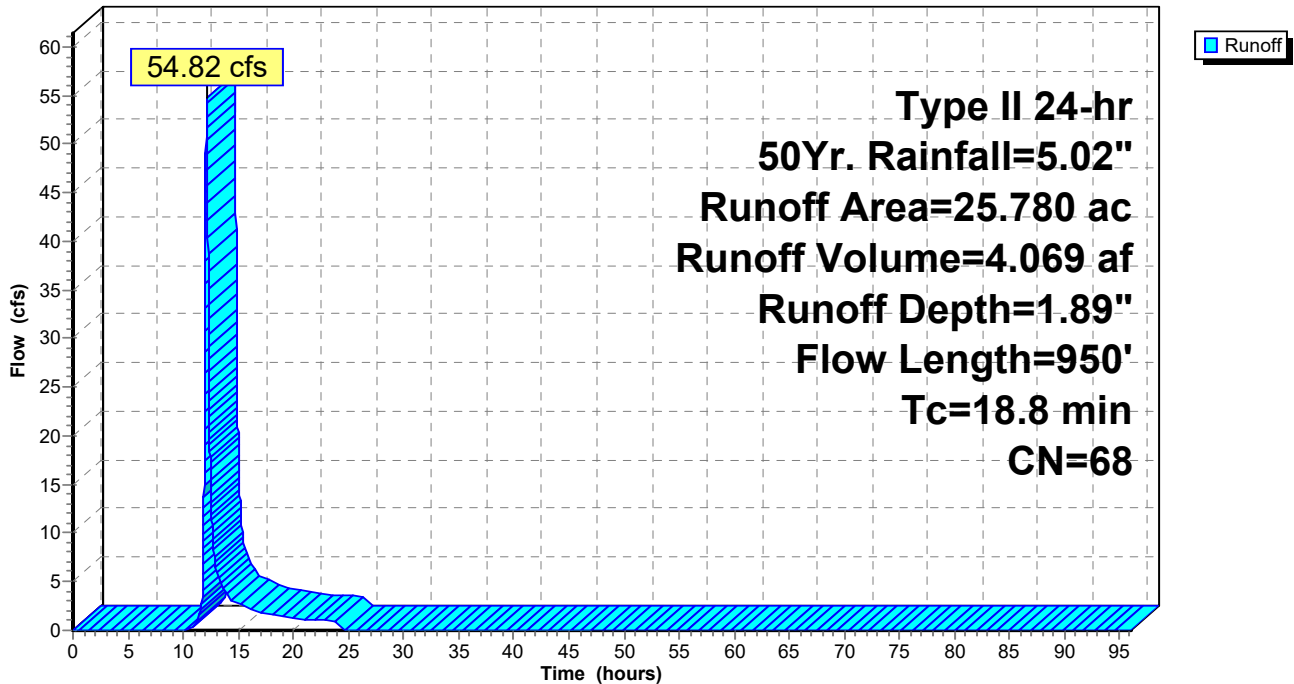
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 66.77 cfs @ 12.09 hrs, Volume= 4.702 af, Depth= 3.39"

Routed to Pond 5P : SE Det. Pond 2

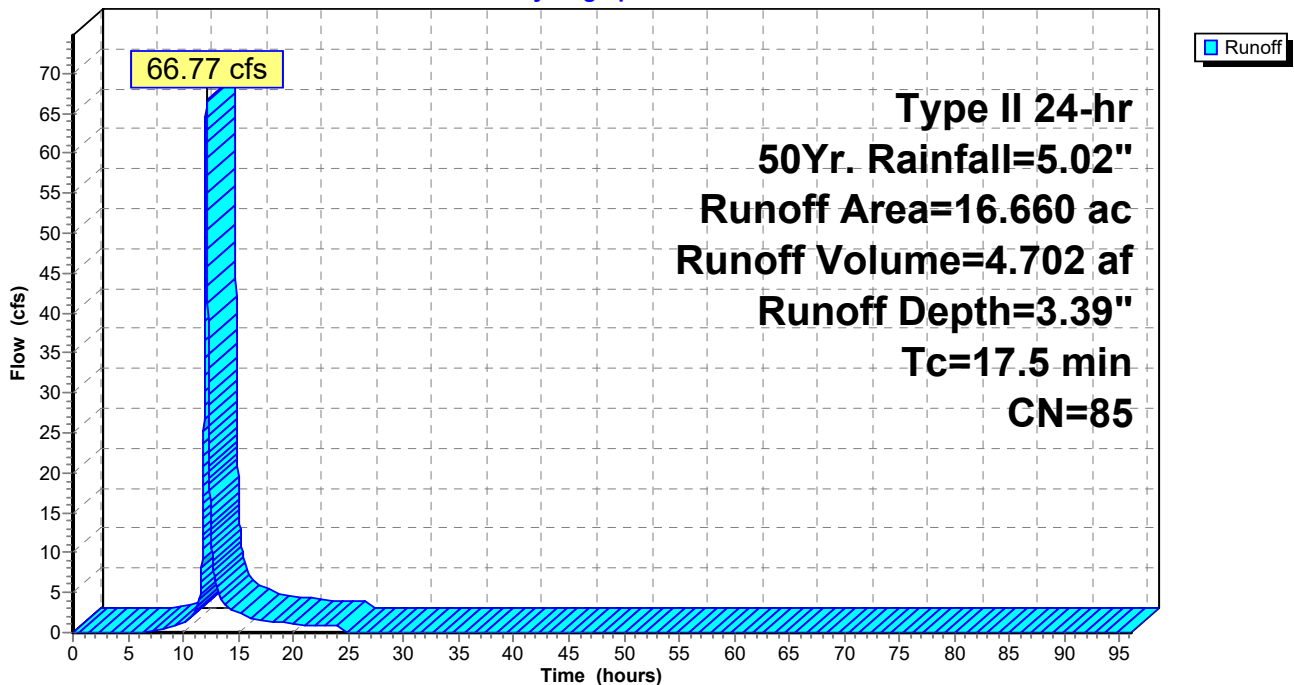
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 6S: Roadway

Runoff = 11.26 cfs @ 12.02 hrs, Volume= 0.660 af, Depth= 3.79"

Routed to Link 7L : (new Link)

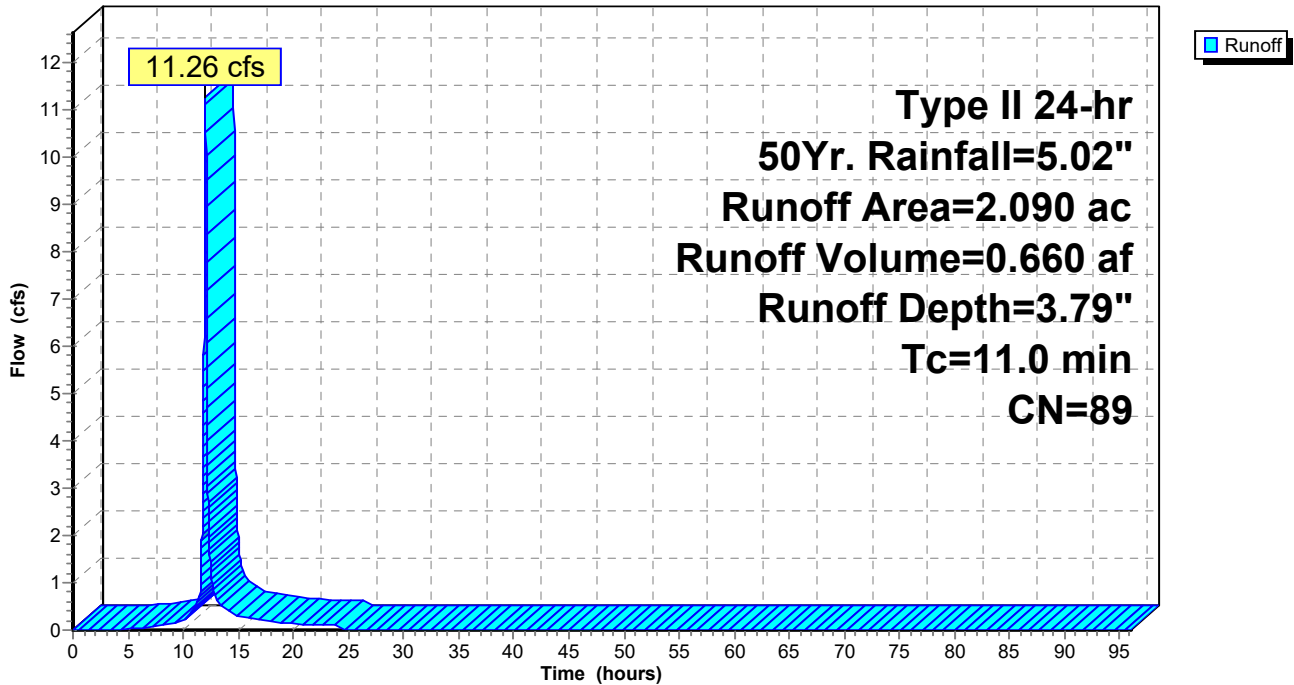
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 35.77 cfs @ 12.13 hrs, Volume= 2.712 af, Depth= 2.47"

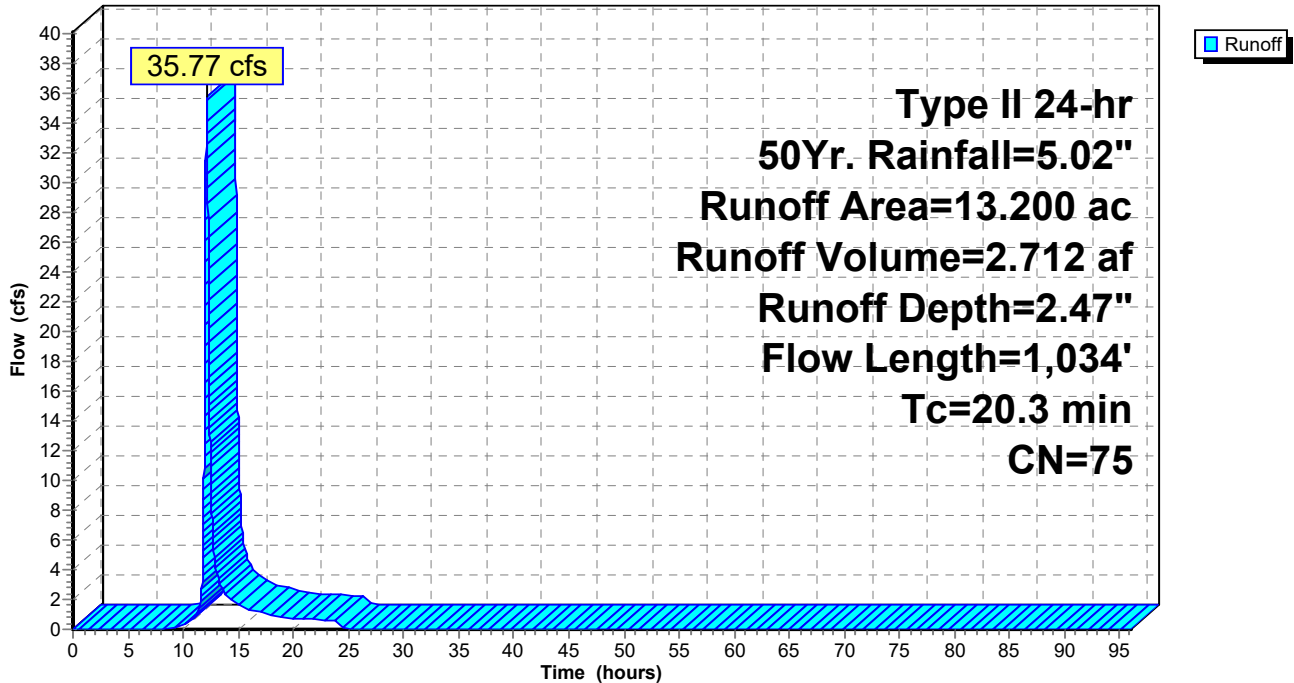
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



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Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 66.29 cfs @ 12.06 hrs, Volume= 4.520 af, Depth= 4.11"
 Routed to Pond 10P : SW Pond 3

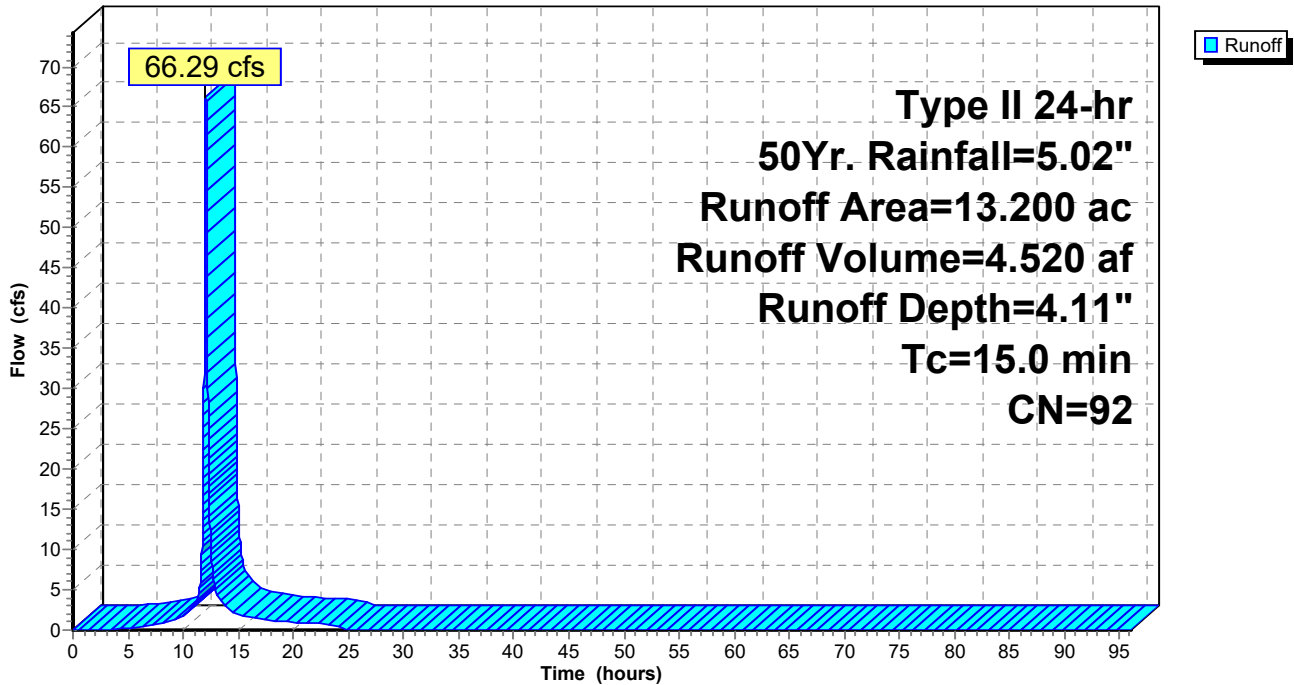
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 50Yr. Rainfall=5.02"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 4.00" for 50Yr. event
 Inflow = 46.64 cfs @ 11.99 hrs, Volume= 2.518 af
 Outflow = 4.56 cfs @ 12.45 hrs, Volume= 2.388 af, Atten= 90%, Lag= 27.9 min
 Primary = 4.56 cfs @ 12.45 hrs, Volume= 2.388 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 788.83' @ 12.45 hrs Surf.Area= 20,438 sf Storage= 65,739 cf

Plug-Flow detention time= 580.6 min calculated for 2.388 af (95% of inflow)
 Center-of-Mass det. time= 550.6 min (1,335.8 - 785.3)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 '/'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.73 cfs @ 12.45 hrs HW=788.83' (Free Discharge)

- ↑ 1=Culvert (Passes 4.73 cfs of 10.58 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.25 cfs @ 9.31 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 1.91 cfs @ 7.66 fps)
- ↑ 4=Orifice/Grate (Orifice Controls 2.57 cfs @ 1.37 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Crescent pondsSE &OrthoDRY

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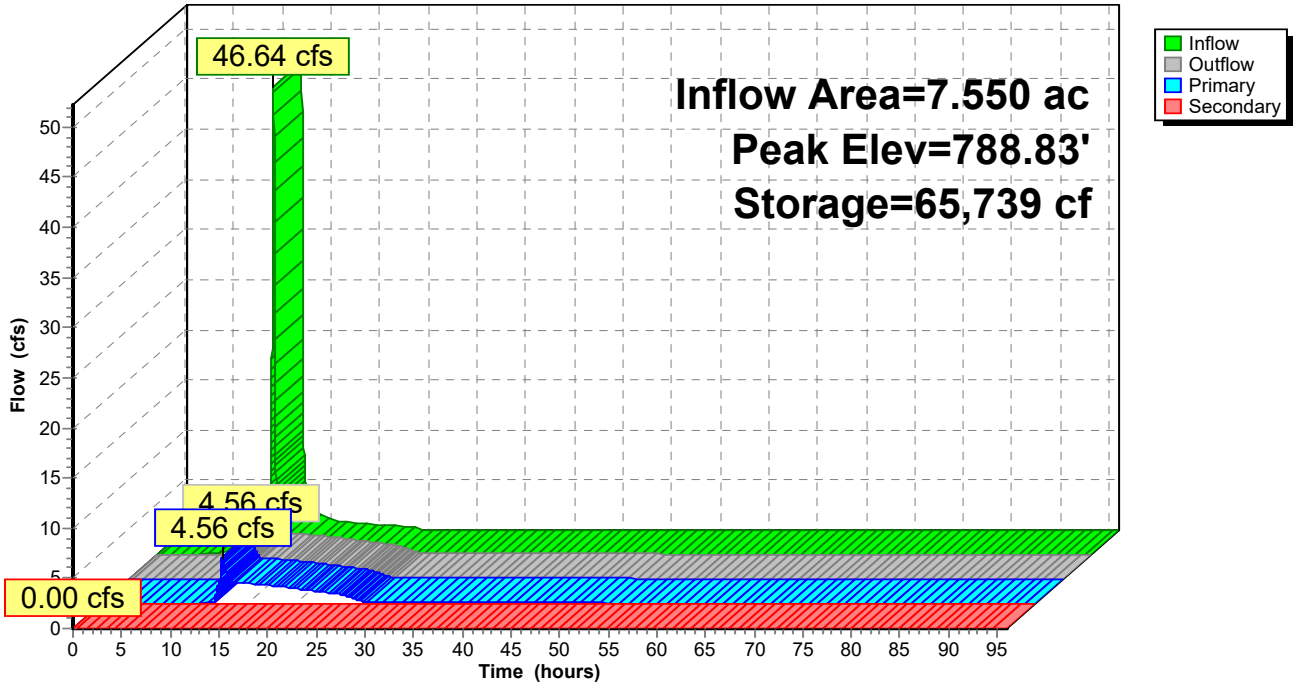
Type II 24-hr 50Yr. Rainfall=5.02"

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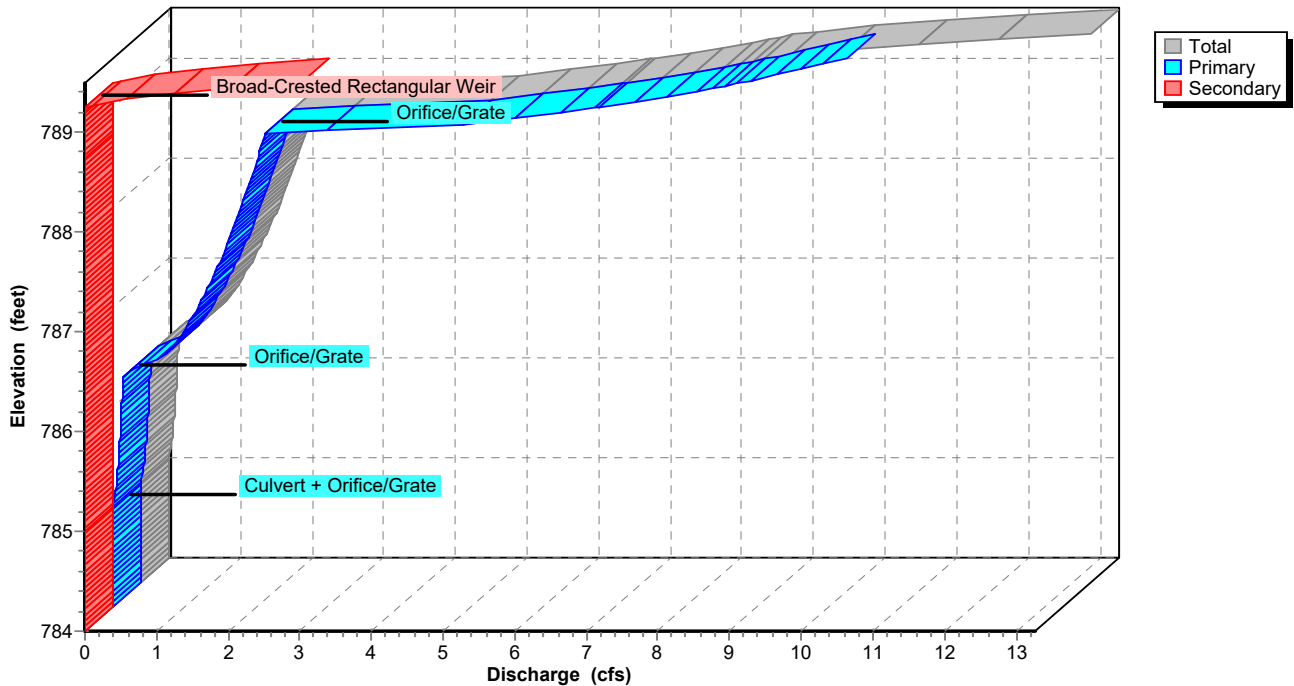
Pond 3P: Ortho 1 Det. Pond

Hydrograph

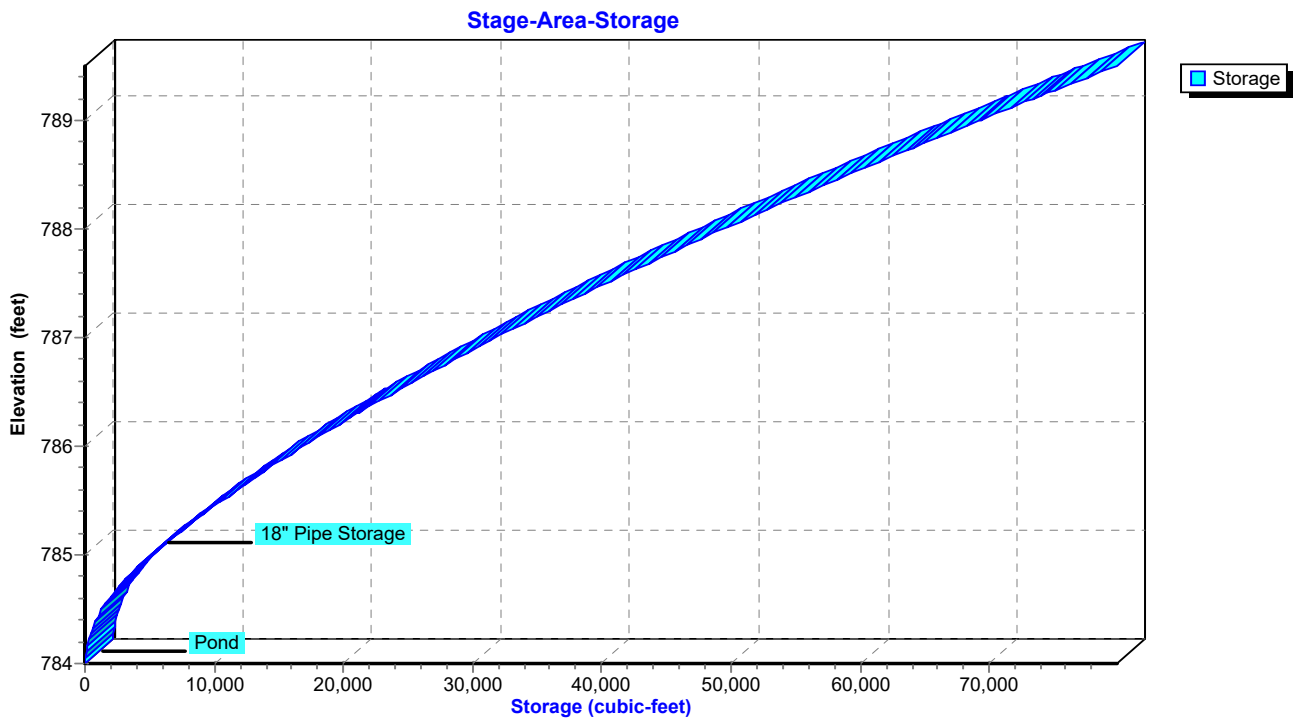


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



Crescent pondsSE &OrthoDRY

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Type II 24-hr 50Yr. Rainfall=5.02"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth = 3.54" for 50Yr. event
 Inflow = 77.97 cfs @ 12.08 hrs, Volume= 7.749 af
 Outflow = 6.96 cfs @ 13.44 hrs, Volume= 7.286 af, Atten= 91%, Lag= 81.7 min
 Primary = 6.83 cfs @ 13.44 hrs, Volume= 7.281 af
 Secondary = 0.13 cfs @ 13.44 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 785.52' @ 13.44 hrs Surf.Area= 32,387 sf Storage= 157,901 cf

Plug-Flow detention time= 830.4 min calculated for 7.285 af (94% of inflow)
 Center-of-Mass det. time= 727.4 min (1,701.2 - 973.8)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=6.82 cfs @ 13.44 hrs HW=785.52' (Free Discharge)

- 1=Culvert (Passes 6.82 cfs of 14.67 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.62 cfs @ 11.17 fps)
- 3=Orifice/Grate (Orifice Controls 1.67 cfs @ 8.50 fps)
- 4=Orifice/Grate (Orifice Controls 4.20 cfs @ 4.20 fps)
- 5=Orifice/Grate (Weir Controls 0.32 cfs @ 0.45 fps)

Secondary OutFlow Max=0.13 cfs @ 13.44 hrs HW=785.52' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Weir Controls 0.13 cfs @ 0.34 fps)

Crescent pondsSE &OrthoDRY

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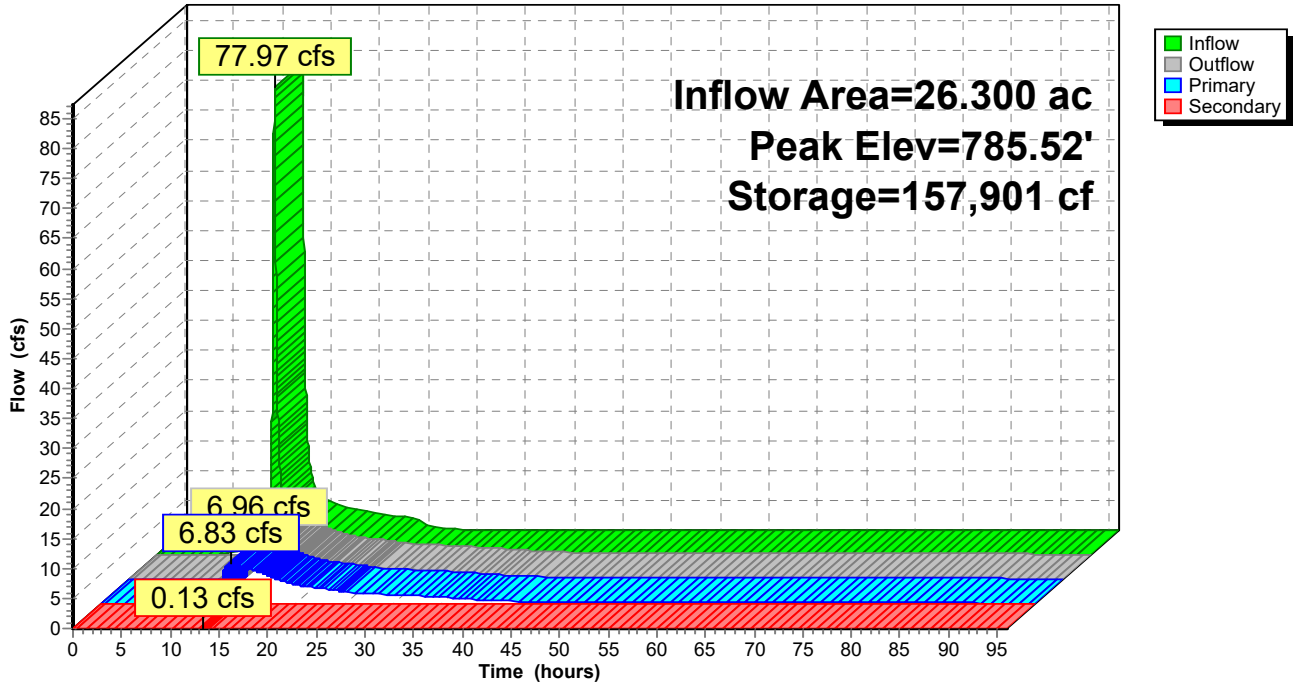
Type II 24-hr 50Yr. Rainfall=5.02"

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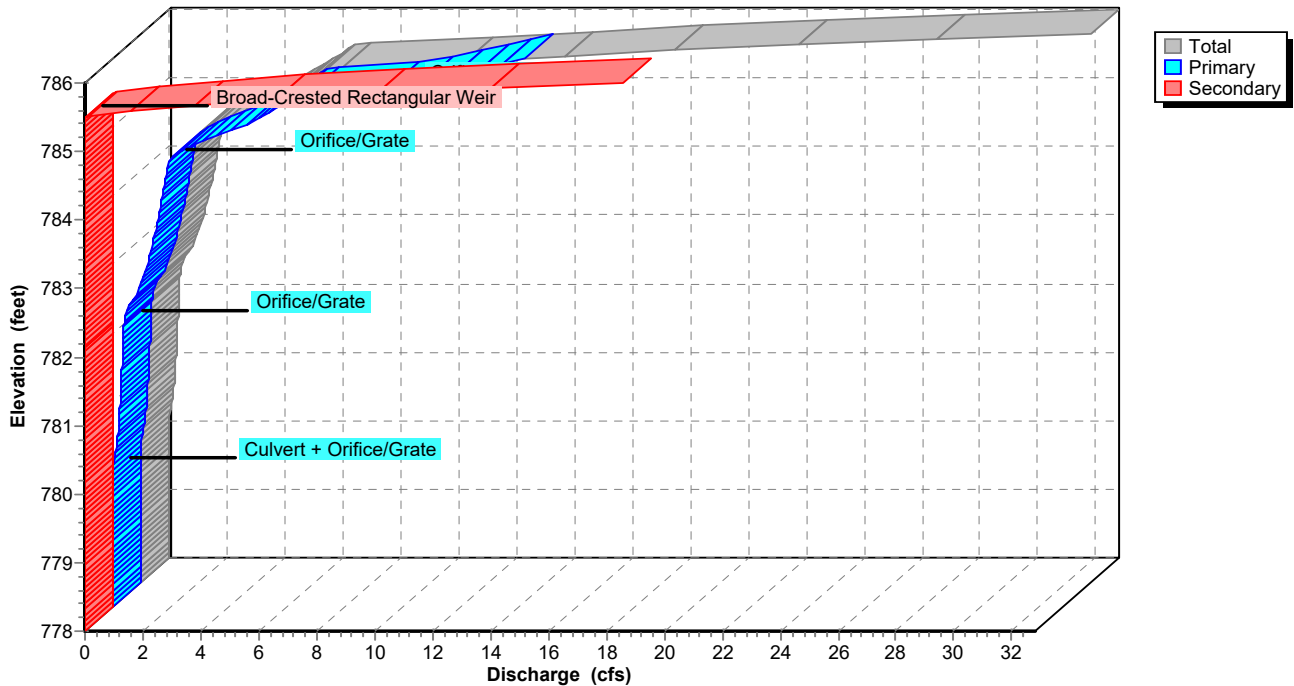
Pond 5P: SE Det. Pond 2

Hydrograph



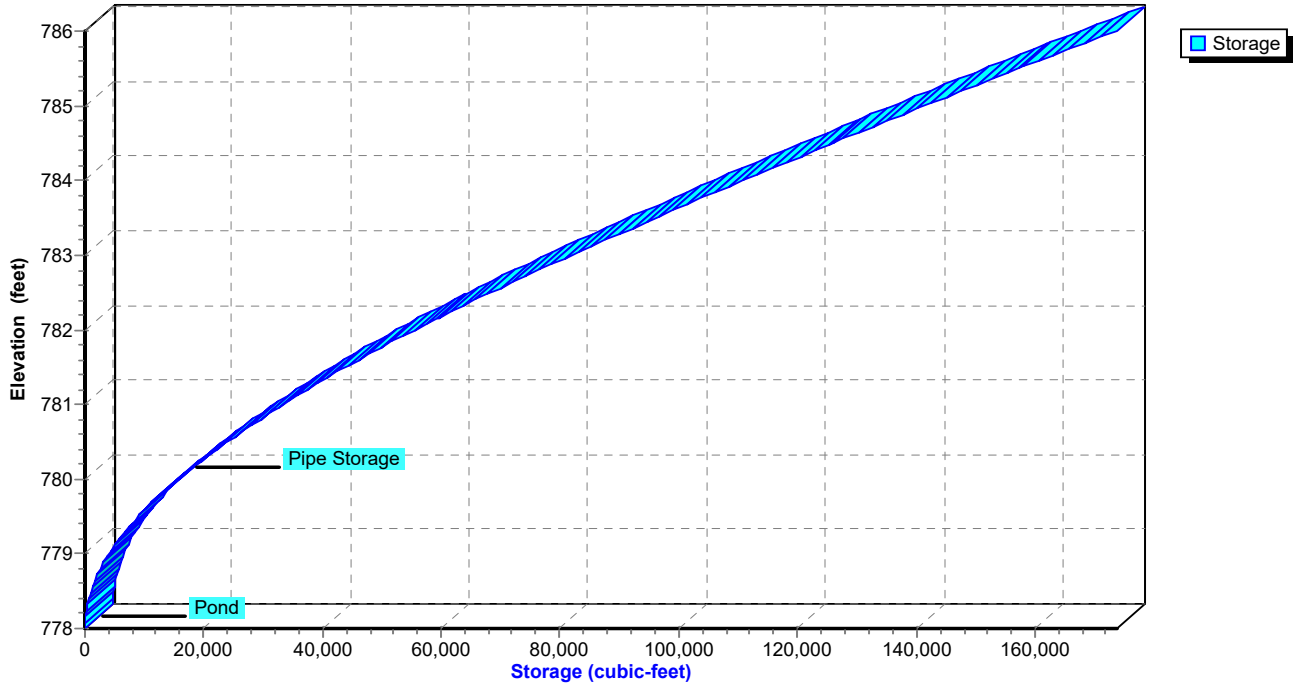
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



Crescent pondsSE &OrthoDRY

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Type II 24-hr 50Yr. Rainfall=5.02"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

Crescent pondsSE &OrthoDRY

Type II 24-hr 50Yr. Rainfall=5.02"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 4.11" for 50Yr. event
 Inflow = 66.29 cfs @ 12.06 hrs, Volume= 4.520 af
 Outflow = 10.73 cfs @ 12.49 hrs, Volume= 4.367 af, Atten= 84%, Lag= 25.3 min
 Primary = 8.75 cfs @ 12.49 hrs, Volume= 4.295 af
 Secondary = 1.98 cfs @ 12.49 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 786.42' @ 12.49 hrs Surf.Area= 34,834 sf Storage= 113,090 cf

Plug-Flow detention time= 585.9 min calculated for 4.367 af (97% of inflow)
 Center-of-Mass det. time= 565.3 min (1,352.9 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/'
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=8.75 cfs @ 12.49 hrs HW=786.42' (Free Discharge)

- 1=Culvert (Passes 8.75 cfs of 10.99 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.18 cfs @ 8.63 fps)
- 3=Orifice/Grate (Orifice Controls 1.69 cfs @ 6.34 fps)
- 4=Orifice/Grate (Orifice Controls 5.88 cfs @ 3.14 fps)

Secondary OutFlow Max=1.96 cfs @ 12.49 hrs HW=786.42' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Weir Controls 1.96 cfs @ 1.12 fps)

Crescent pondsSE &OrthoDRY

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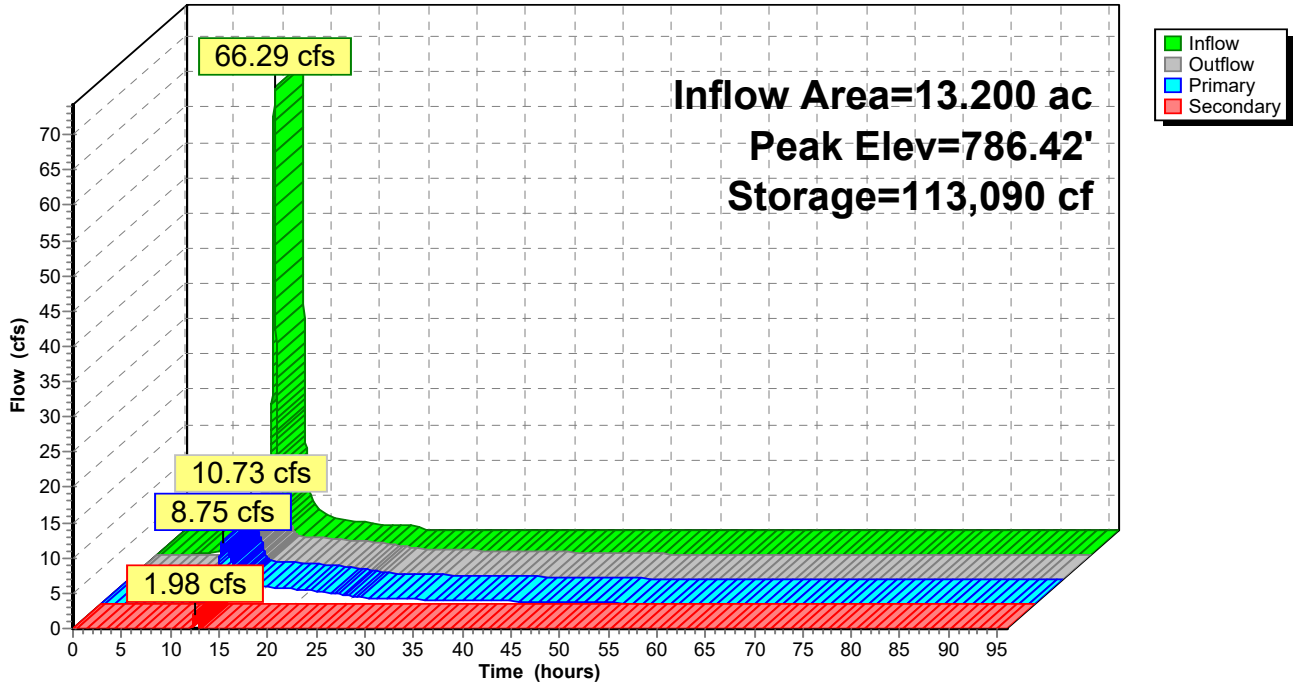
Type II 24-hr 50Yr. Rainfall=5.02"

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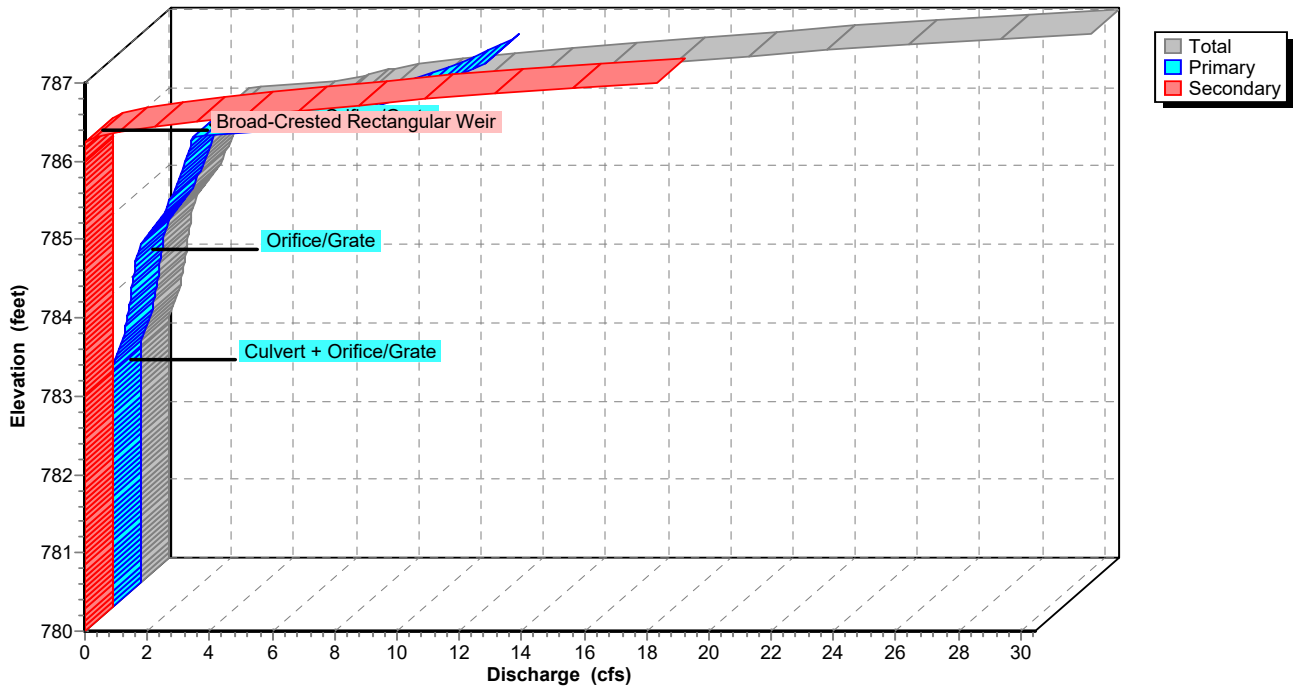
Pond 10P: SW Pond 3

Hydrograph



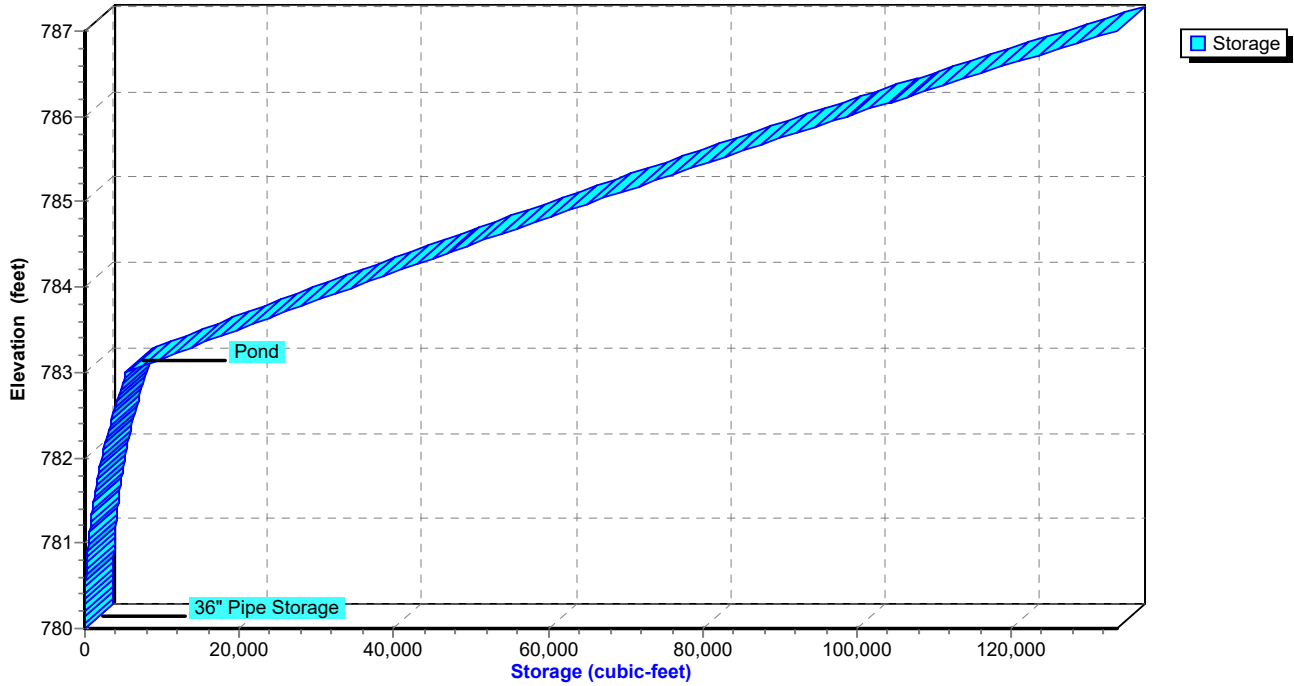
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



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Type II 24-hr 50Yr. Rainfall=5.02"

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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

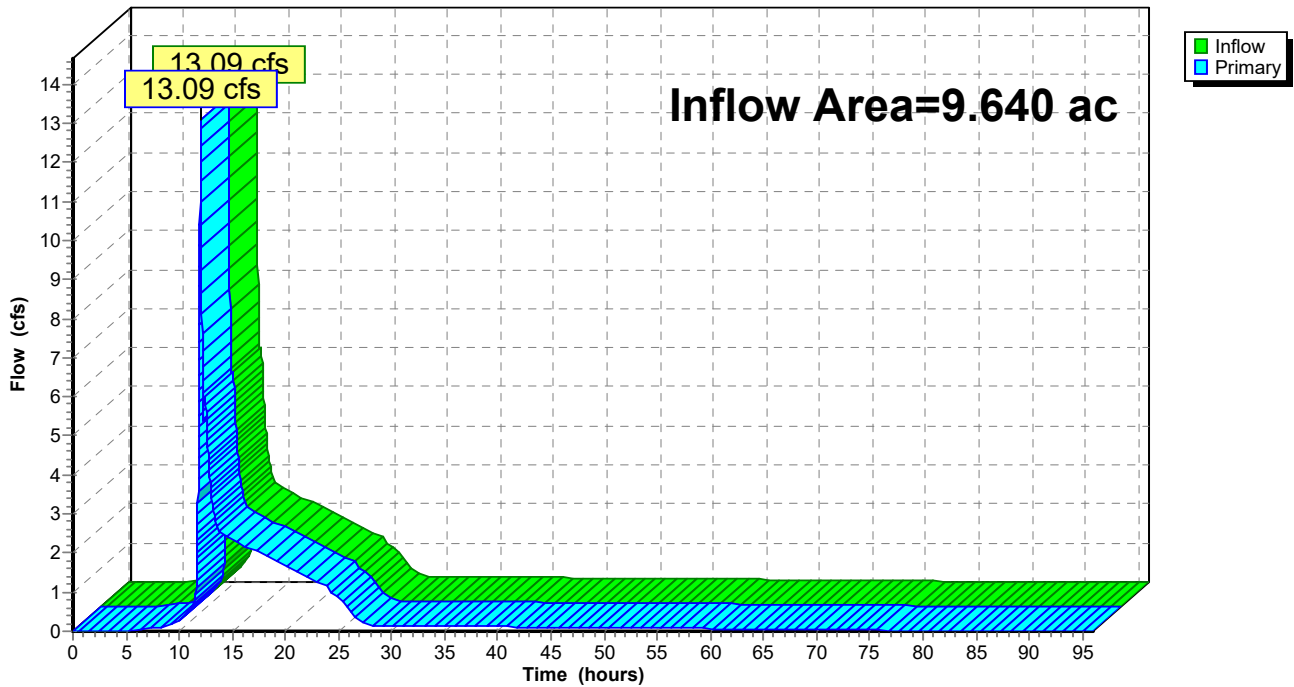
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 3.79" for 50Yr. event
Inflow = 13.09 cfs @ 12.03 hrs, Volume= 3.048 af
Primary = 13.09 cfs @ 12.03 hrs, Volume= 3.048 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 1S: PreDeveloped Ortho One

Runoff = 34.52 cfs @ 12.02 hrs, Volume= 1.868 af, Depth= 2.97"

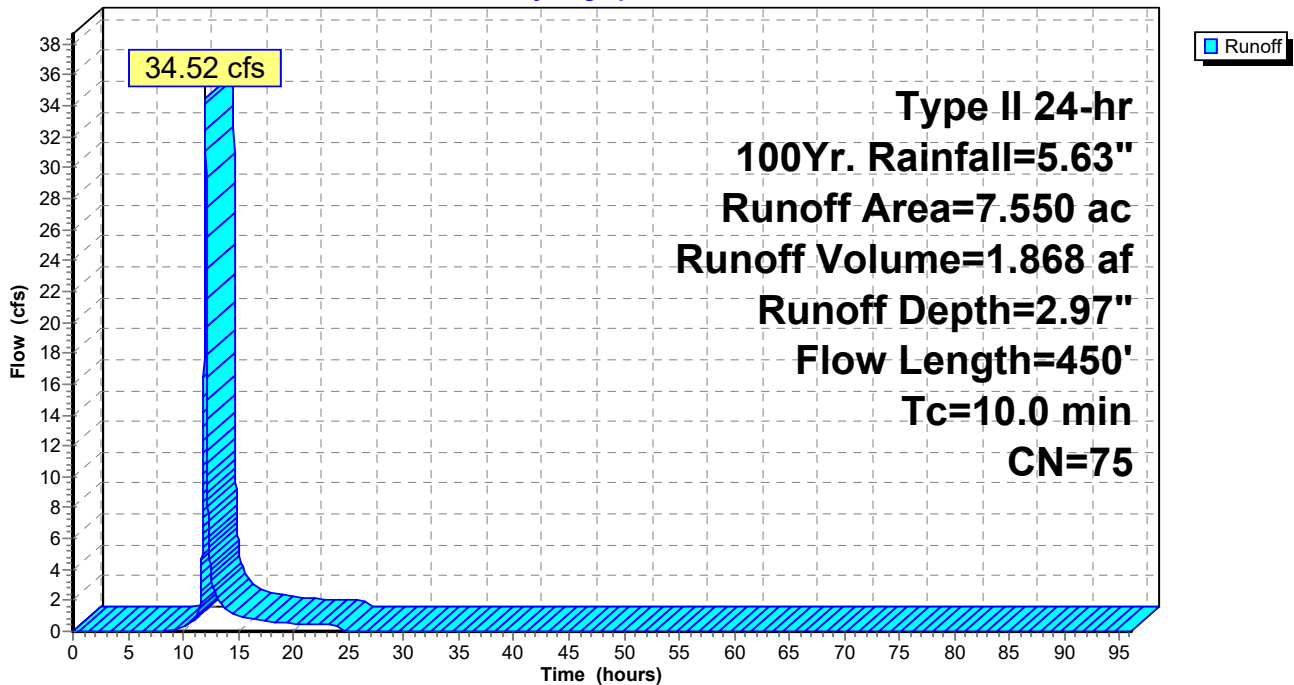
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
7.550	75	Row crops, SR + CR, Good, HSG B
7.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
6.2	350	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
10.0	450	Total			

Subcatchment 1S: PreDeveloped Ortho One

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 2S: Developed Ortho One

Runoff = 53.09 cfs @ 11.99 hrs, Volume= 2.891 af, Depth= 4.60"
 Routed to Pond 3P : Ortho 1 Det. Pond

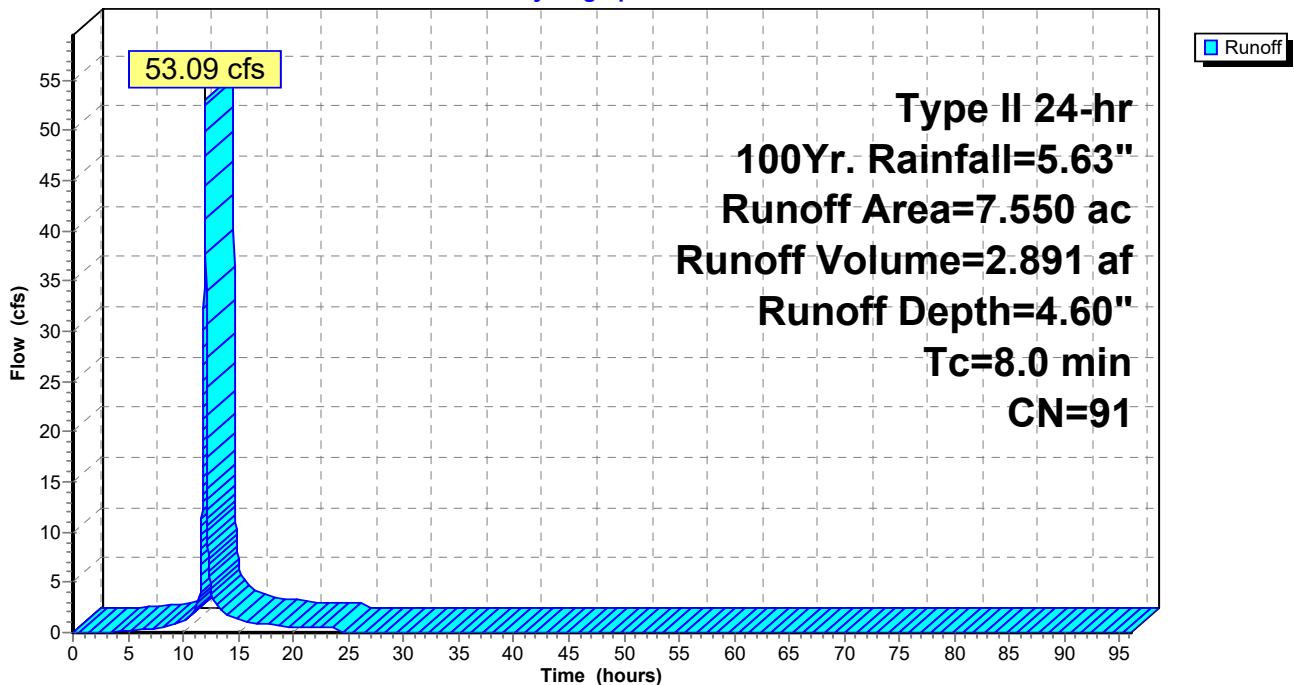
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
4.620	98	Unconnected pavement, HSG D
2.930	80	>75% Grass cover, Good, HSG D
7.550	91	Weighted Average
2.930		38.81% Pervious Area
4.620		61.19% Impervious Area
4.620		100.00% Unconnected

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

Subcatchment 2S: Developed Ortho One

Hydrograph



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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Runoff = 68.49 cfs @ 12.12 hrs, Volume= 5.027 af, Depth= 2.34"

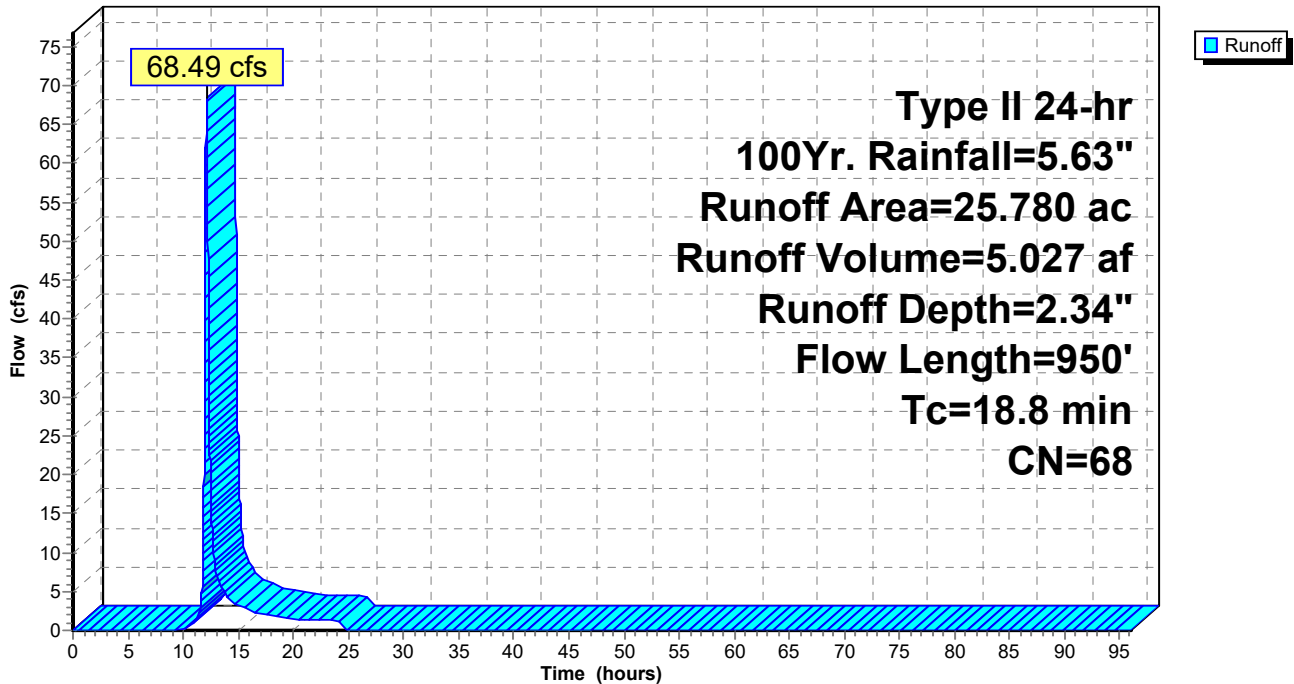
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
7.400	75	Row crops, SR + CR, Good, HSG B
18.380	65	Woods/grass comb., Fair, HSG B
25.780	68	Weighted Average
25.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.0300	0.16		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.63"
8.6	850	0.0120	1.64		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
18.8	950	Total			

Subcatchment 3S: PreDeveloped Residential Ortho One, Roadway

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 4S: Developed Residential

Runoff = 77.56 cfs @ 12.09 hrs, Volume= 5.490 af, Depth= 3.95"
 Routed to Pond 5P : SE Det. Pond 2

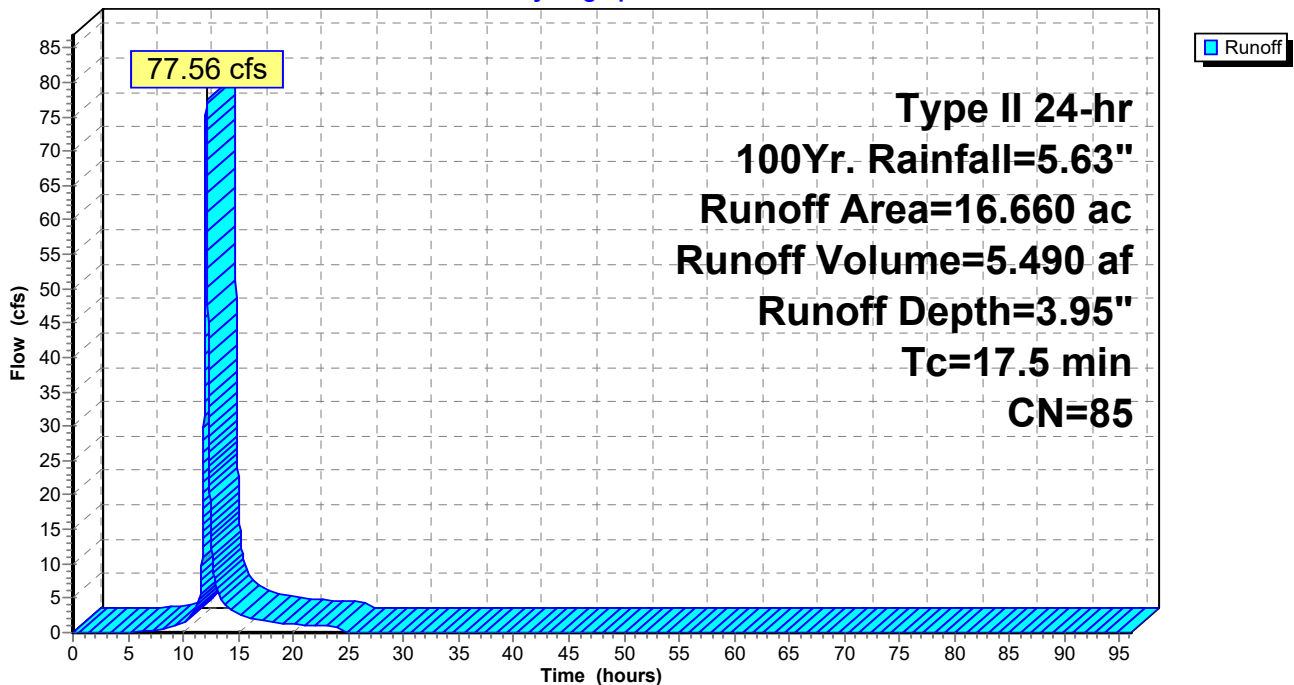
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
10.740	98	Unconnected pavement, HSG B
5.920	61	>75% Grass cover, Good, HSG B
16.660	85	Weighted Average
5.920		35.53% Pervious Area
10.740		64.47% Impervious Area
10.740		100.00% Unconnected

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

Subcatchment 4S: Developed Residential

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 6S: Roadway

Runoff = 12.90 cfs @ 12.02 hrs, Volume= 0.762 af, Depth= 4.38"

Routed to Link 7L : (new Link)

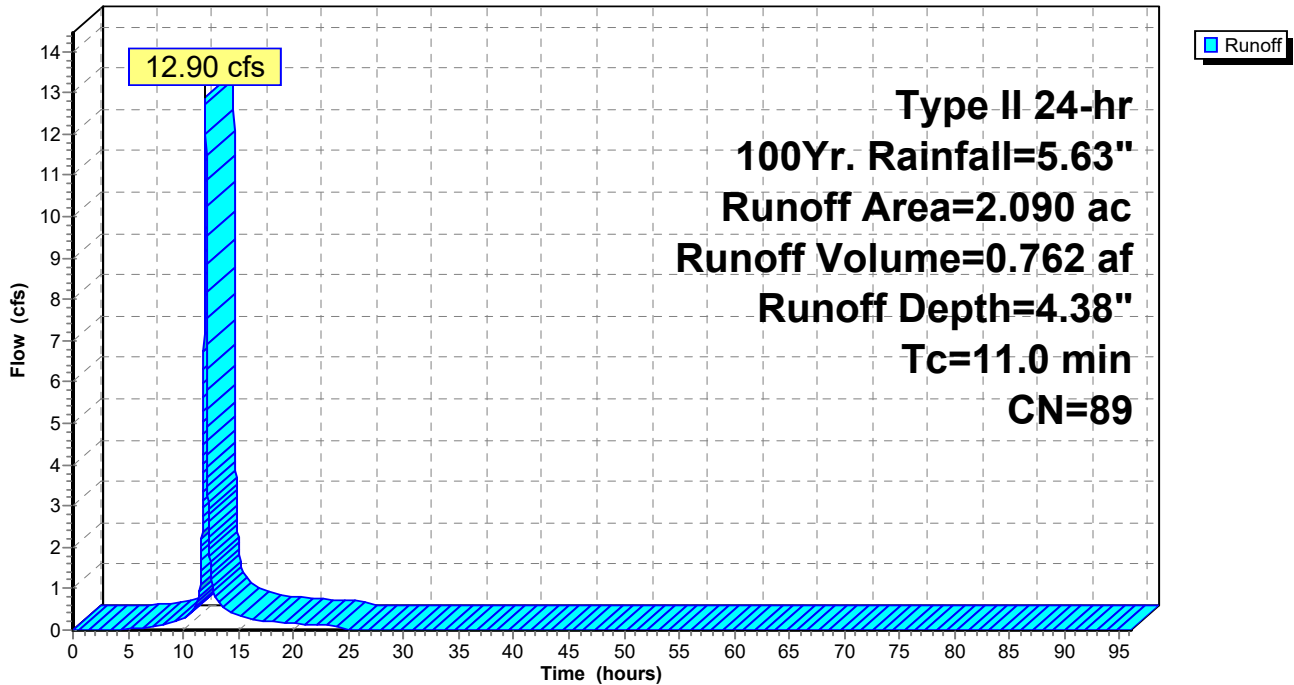
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
1.570	98	Paved roads w/curbs & sewers, HSG B
0.520	61	>75% Grass cover, Good, HSG B
2.090	89	Weighted Average
0.520		24.88% Pervious Area
1.570		75.12% Impervious Area

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

Subcatchment 6S: Roadway

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 8S: PreDeveloped Commercial

Runoff = 43.20 cfs @ 12.13 hrs, Volume= 3.266 af, Depth= 2.97"

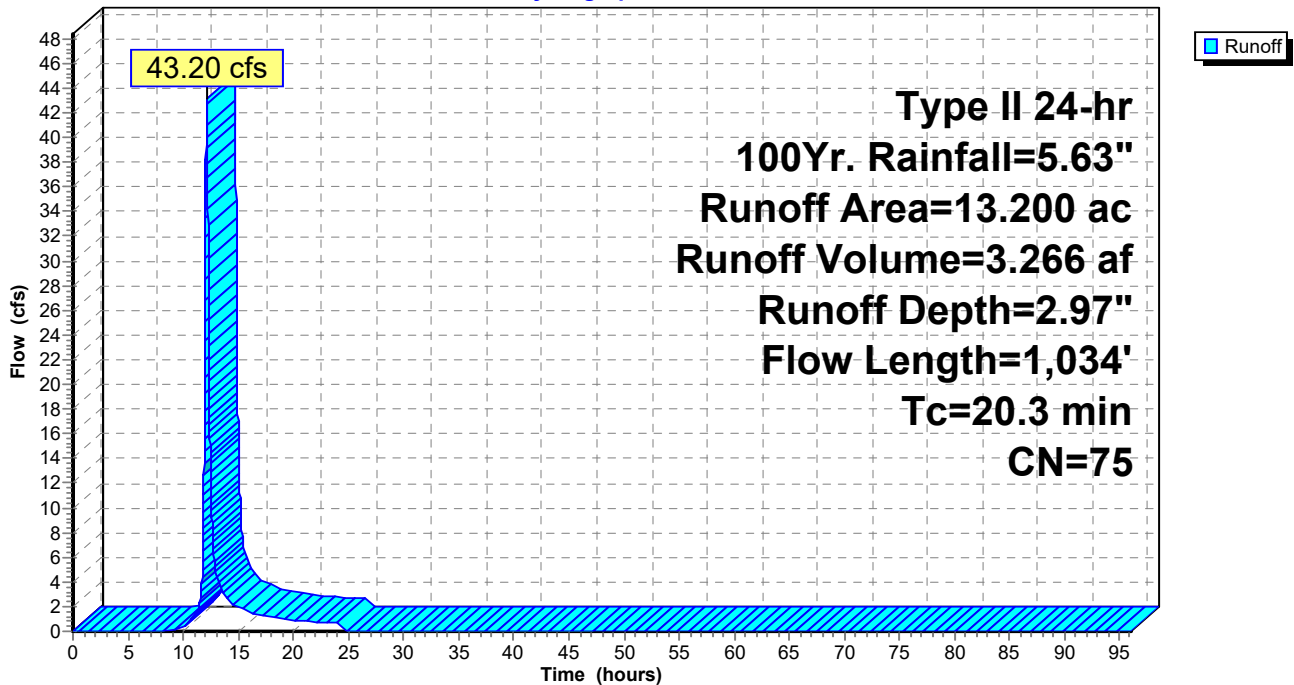
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
13.200	75	Row crops, SR + CR, Good, HSG B
13.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0300	0.44		Sheet Flow, Fallow n= 0.050 P2= 2.63"
16.5	934	0.0110	0.94		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
20.3	1,034	Total			

Subcatchment 8S: PreDeveloped Commercial

Hydrograph



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Subcatchment 9S: Developed Commercial Lots

Runoff = 75.34 cfs @ 12.06 hrs, Volume= 5.177 af, Depth= 4.71"
 Routed to Pond 10P : SW Pond 3

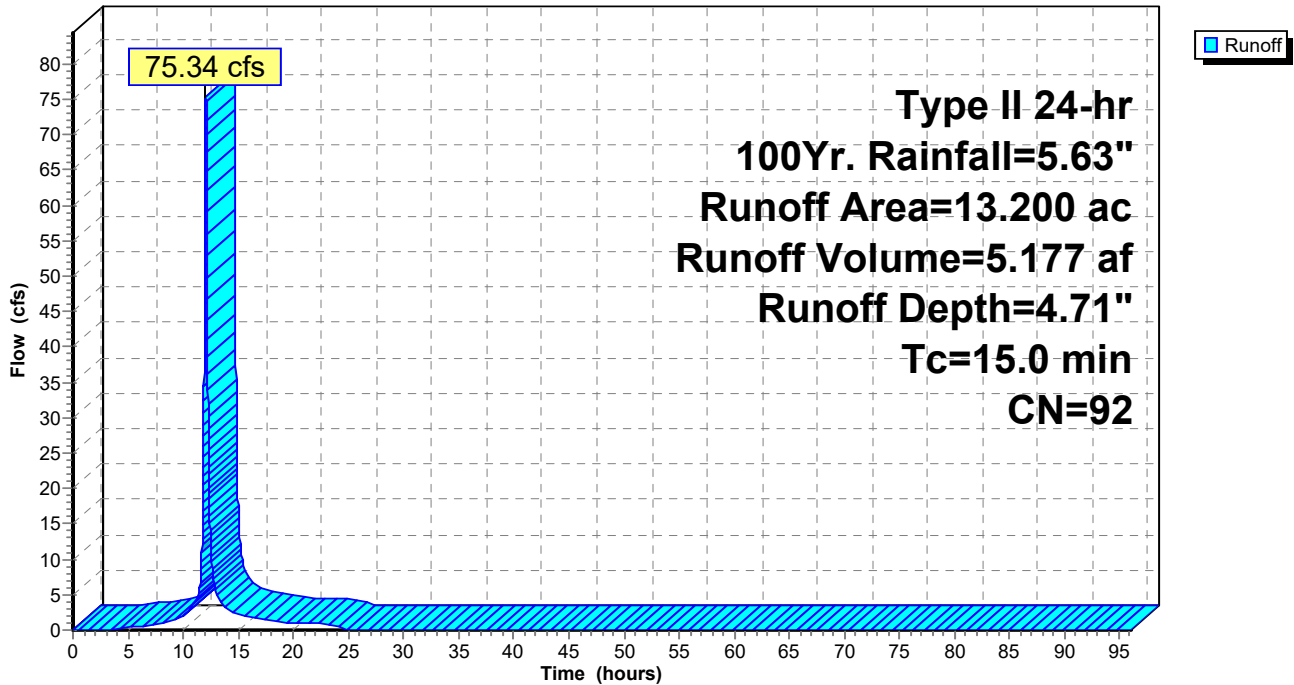
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Type II 24-hr 100Yr. Rainfall=5.63"

Area (ac)	CN	Description
12.640	92	Urban commercial, 85% imp, HSG B
0.560	98	Water Surface, HSG B
13.200	92	Weighted Average
1.896		14.36% Pervious Area
11.304		85.64% Impervious Area

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

Subcatchment 9S: Developed Commercial Lots

Hydrograph



Crescent pondsSE &OrthoDRY

Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Pond 3P: Ortho 1 Det. Pond

Inflow Area = 7.550 ac, 61.19% Impervious, Inflow Depth = 4.60" for 100Yr. event
 Inflow = 53.09 cfs @ 11.99 hrs, Volume= 2.891 af
 Outflow = 7.68 cfs @ 12.26 hrs, Volume= 2.761 af, Atten= 86%, Lag= 16.5 min
 Primary = 7.68 cfs @ 12.26 hrs, Volume= 2.761 af
 Routed to Link 7L : (new Link)
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 789.11' @ 12.26 hrs Surf.Area= 20,980 sf Storage= 71,513 cf

Plug-Flow detention time= 523.9 min calculated for 2.761 af (95% of inflow)
 Center-of-Mass det. time= 497.2 min (1,278.7 - 781.5)

Volume	Invert	Avail.Storage	Storage Description
#1	784.00'	77,481 cf	Pond (Prismatic) Listed below (Recalc)
#2	785.00'	2,386 cf	18.0" Round 18" Pipe Storage L= 1,350.0' S= 0.0020 1'
		79,866 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
784.00	200	0	0
785.00	10,125	5,163	5,163
789.00	20,717	61,684	66,847
789.50	21,819	10,634	77,481

Device	Routing	Invert	Outlet Devices
#1	Primary	785.00'	15.0" Round Culvert L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 785.00' / 784.00' S= 0.0222 1' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	785.00'	2.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	786.30'	6.0" x 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	788.75'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	789.25'	10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.69 cfs @ 12.26 hrs HW=789.11' (Free Discharge)

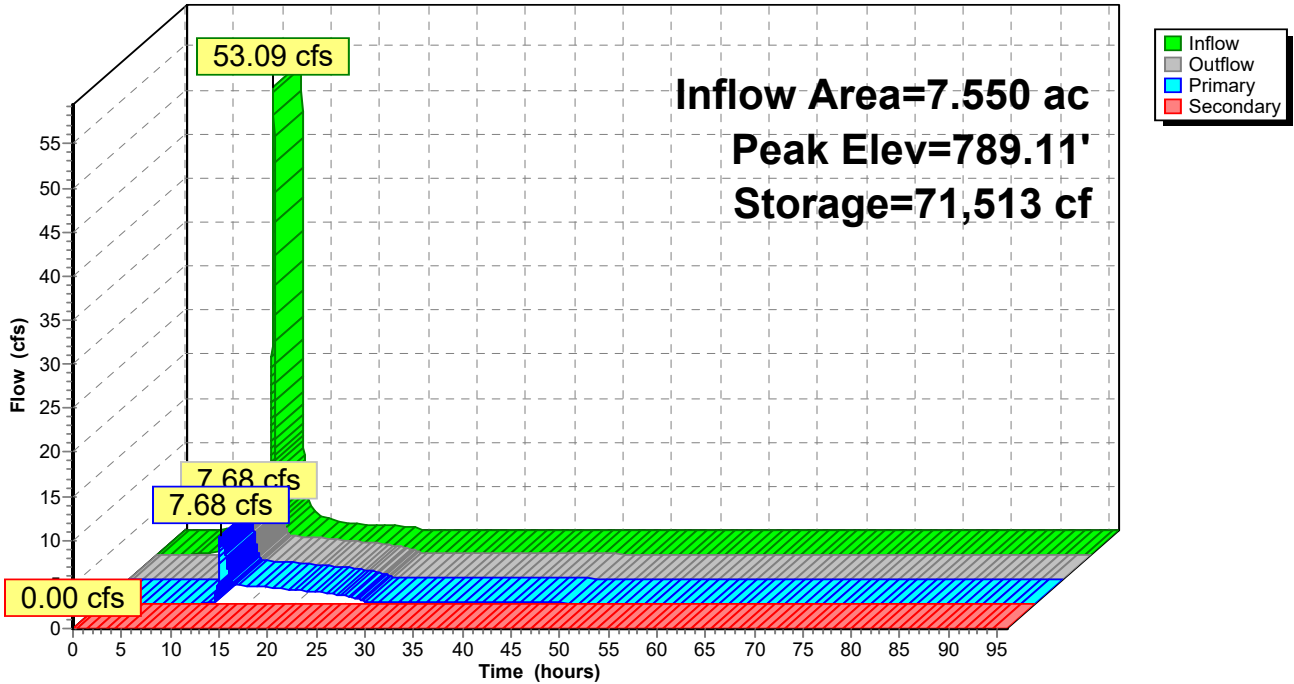
- 1=Culvert (Passes 7.69 cfs of 11.03 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.25 cfs @ 9.65 fps)
- 3=Orifice/Grate (Orifice Controls 2.02 cfs @ 8.07 fps)
- 4=Orifice/Grate (Orifice Controls 5.41 cfs @ 2.89 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=784.00' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

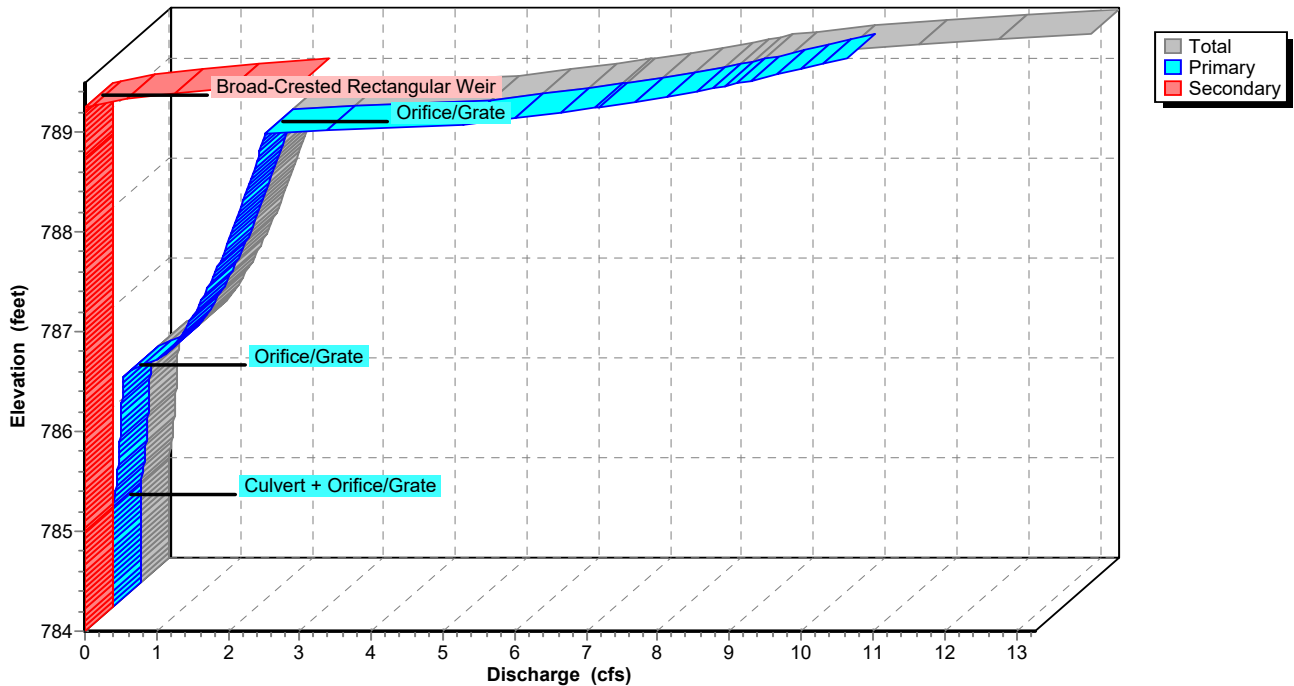
Pond 3P: Ortho 1 Det. Pond

Hydrograph

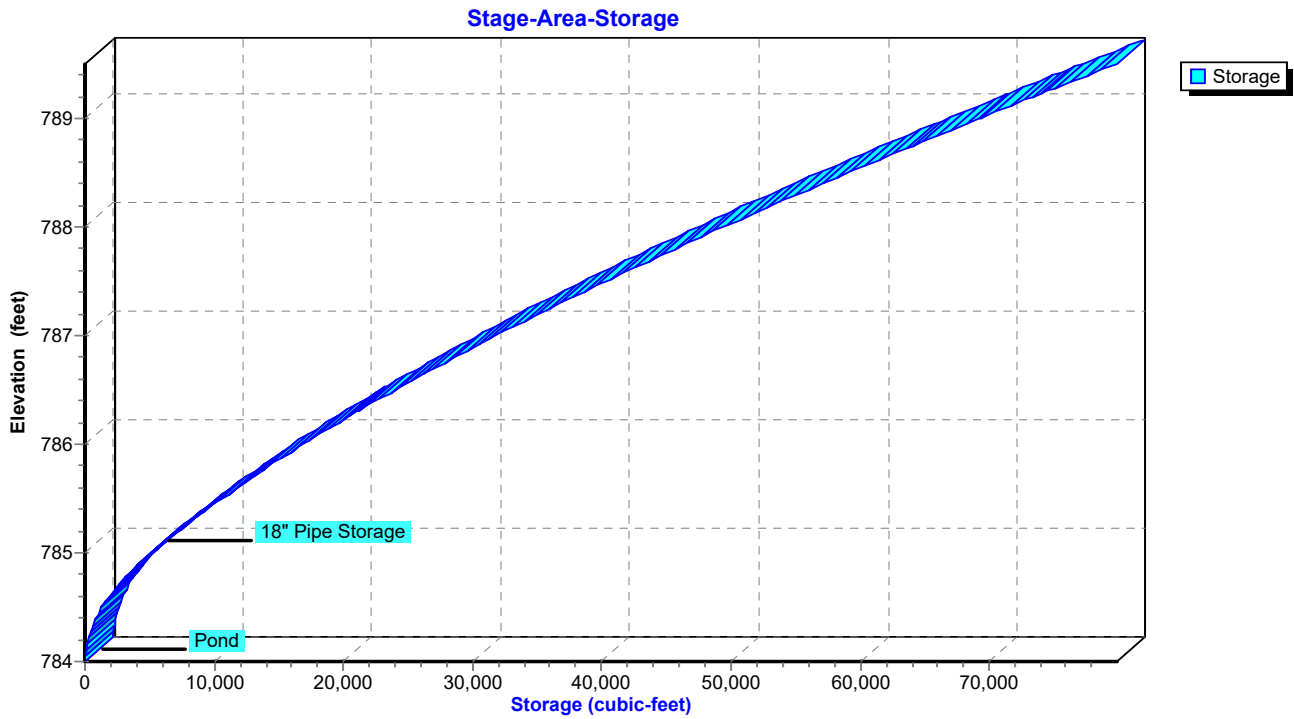


Pond 3P: Ortho 1 Det. Pond

Stage-Discharge



Pond 3P: Ortho 1 Det. Pond



Crescent pondsSE &OrthoDRY

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Type II 24-hr 100Yr. Rainfall=5.63"

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Stage-Area-Storage for Pond 3P: Ortho 1 Det. Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
784.00	0	786.65	26,269	789.30	75,546
784.05	22	786.70	27,041	789.35	76,618
784.10	70	786.75	27,820	789.40	77,695
784.15	142	786.80	28,605	789.45	78,778
784.20	239	786.85	29,397	789.50	79,866
784.25	360	786.90	30,196		
784.30	507	786.95	31,001		
784.35	678	787.00	31,813		
784.40	874	787.05	32,632		
784.45	1,095	787.10	33,457		
784.50	1,341	787.15	34,288		
784.55	1,611	787.20	35,127		
784.60	1,907	787.25	35,972		
784.65	2,227	787.30	36,823		
784.70	2,572	787.35	37,682		
784.75	2,941	787.40	38,547		
784.80	3,336	787.45	39,418		
784.85	3,755	787.50	40,296		
784.90	4,200	787.55	41,181		
784.95	4,669	787.60	42,072		
785.00	5,163	787.65	42,970		
785.05	5,672	787.70	43,875		
785.10	6,189	787.75	44,786		
785.15	6,714	787.80	45,703		
785.20	7,246	787.85	46,626		
785.25	7,786	787.90	47,554		
785.30	8,335	787.95	48,487		
785.35	8,891	788.00	49,426		
785.40	9,455	788.05	50,370		
785.45	10,028	788.10	51,319		
785.50	10,609	788.15	52,273		
785.55	11,199	788.20	53,232		
785.60	11,797	788.25	54,195		
785.65	12,403	788.30	55,164		
785.70	13,018	788.35	56,137		
785.75	13,642	788.40	57,115		
785.80	14,273	788.45	58,098		
785.85	14,914	788.50	59,085		
785.90	15,563	788.55	60,077		
785.95	16,220	788.60	61,074		
786.00	16,886	788.65	62,076		
786.05	17,560	788.70	63,083		
786.10	18,242	788.75	64,094		
786.15	18,933	788.80	65,111		
786.20	19,632	788.85	66,132		
786.25	20,339	788.90	67,158		
786.30	21,054	788.95	68,190		
786.35	21,777	789.00	69,226		
786.40	22,508	789.05	70,268		
786.45	23,246	789.10	71,314		
786.50	23,992	789.15	72,364		
786.55	24,744	789.20	73,420		
786.60	25,503	789.25	74,480		

Crescent pondsSE &OrthoDRY

Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Pond 5P: SE Det. Pond 2

Inflow Area = 26.300 ac, 64.37% Impervious, Inflow Depth = 4.11" for 100Yr. event
 Inflow = 93.73 cfs @ 12.09 hrs, Volume= 9.014 af
 Outflow = 20.83 cfs @ 12.58 hrs, Volume= 8.547 af, Atten= 78%, Lag= 29.6 min
 Primary = 12.29 cfs @ 12.58 hrs, Volume= 8.113 af
 Secondary = 8.55 cfs @ 12.58 hrs, Volume= 0.434 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 785.80' @ 12.58 hrs Surf.Area= 33,255 sf Storage= 167,276 cf

Plug-Flow detention time= 722.8 min calculated for 8.546 af (95% of inflow)
 Center-of-Mass det. time= 632.4 min (1,584.8 - 952.4)

Volume	Invert	Avail.Storage	Storage Description
#1	778.00'	164,222 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	9,621 cf	42.0" Round Pipe Storage L= 1,000.0' S= 0.0020 '/'
		173,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
778.00	200	0	0
780.00	15,618	15,818	15,818
786.00	33,850	148,404	164,222

Device	Routing	Invert	Outlet Devices
#1	Primary	780.00'	18.0" Round Culvert L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 780.00' / 779.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	780.00'	3.2" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	782.15'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	784.50'	24.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	785.50'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#6	Secondary	785.50'	20.0' 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=12.30 cfs @ 12.58 hrs HW=785.80' (Free Discharge)

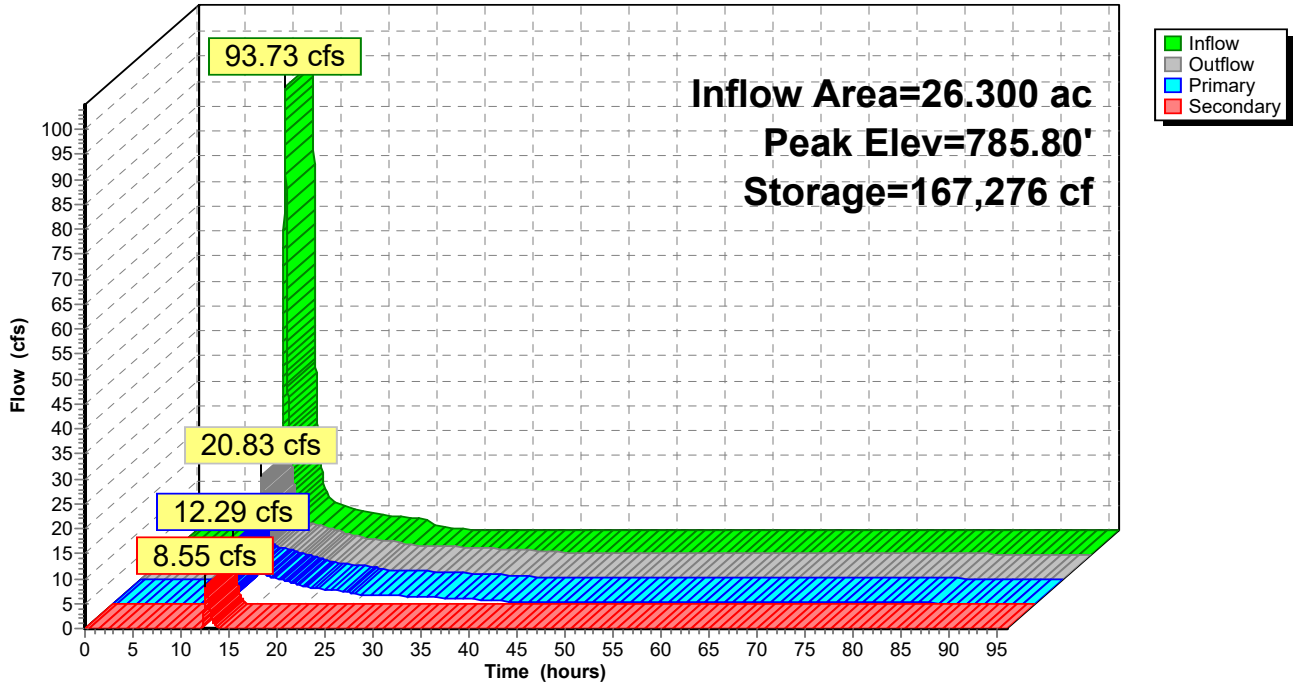
- 1=Culvert (Passes 12.30 cfs of 15.10 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.64 cfs @ 11.47 fps)
- 3=Orifice/Grate (Orifice Controls 1.74 cfs @ 8.88 fps)
- 4=Orifice/Grate (Orifice Controls 4.93 cfs @ 4.93 fps)
- 5=Orifice/Grate (Orifice Controls 4.98 cfs @ 2.66 fps)

Secondary OutFlow Max=8.48 cfs @ 12.58 hrs HW=785.80' (Free Discharge)

- 6=Broad-Crested Rectangular Weir (Weir Controls 8.48 cfs @ 1.39 fps)

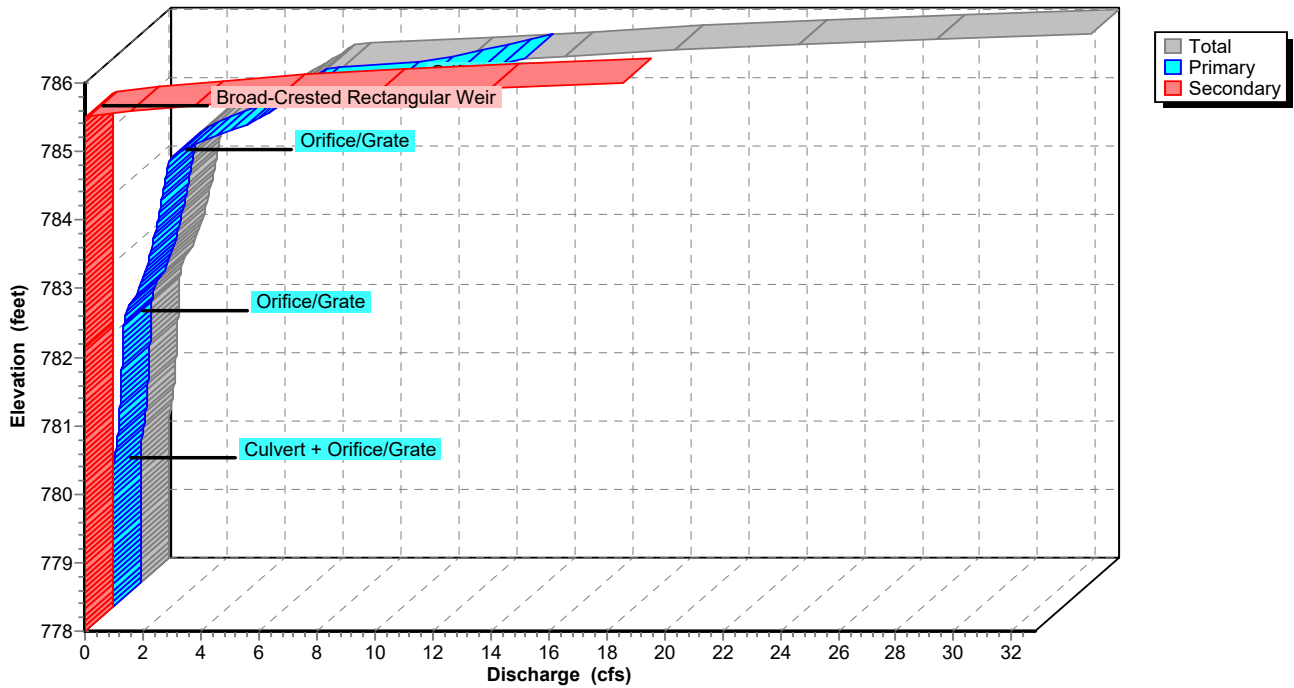
Pond 5P: SE Det. Pond 2

Hydrograph



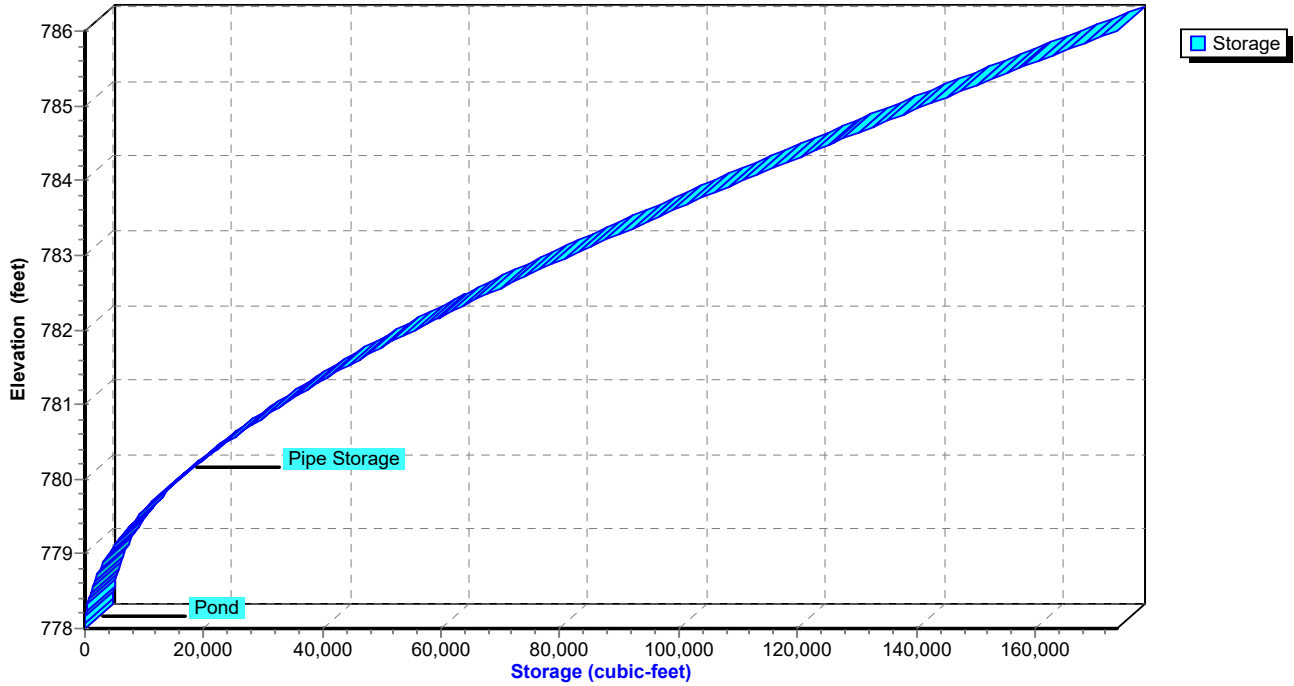
Pond 5P: SE Det. Pond 2

Stage-Discharge



Pond 5P: SE Det. Pond 2

Stage-Area-Storage



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Type II 24-hr 100Yr. Rainfall=5.63"

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Stage-Area-Storage for Pond 5P: SE Det. Pond 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
778.00	0	783.30	90,488
778.10	59	783.40	93,370
778.20	194	783.50	96,272
778.30	407	783.60	99,188
778.40	697	783.70	102,117
778.50	1,064	783.80	105,058
778.60	1,508	783.90	108,013
778.70	2,029	784.00	110,981
778.80	2,627	784.10	113,962
778.90	3,302	784.20	116,956
779.00	4,055	784.30	119,963
779.10	4,884	784.40	122,984
779.20	5,790	784.50	126,020
779.30	6,774	784.60	129,070
779.40	7,835	784.70	132,135
779.50	8,973	784.80	135,215
779.60	10,188	784.90	138,313
779.70	11,480	785.00	141,427
779.80	12,849	785.10	144,560
779.90	14,295	785.20	147,711
780.00	15,818	785.30	150,884
780.10	17,397	785.40	154,079
780.20	19,011	785.50	157,298
780.30	20,664	785.60	160,546
780.40	22,358	785.70	163,825
780.50	24,092	785.80	167,134
780.60	25,870	785.90	170,473
780.70	27,691	786.00	173,843
780.80	29,556		
780.90	31,466		
781.00	33,422		
781.10	35,425		
781.20	37,473		
781.30	39,569		
781.40	41,713		
781.50	43,903		
781.60	46,142		
781.70	48,428		
781.80	50,762		
781.90	53,144		
782.00	55,574		
782.10	58,050		
782.20	60,567		
782.30	63,124		
782.40	65,719		
782.50	68,348		
782.60	71,012		
782.70	73,708		
782.80	76,435		
782.90	79,192		
783.00	81,978		
783.10	84,790		
783.20	87,627		

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Type II 24-hr 100Yr. Rainfall=5.63"

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Summary for Pond 10P: SW Pond 3

Inflow Area = 13.200 ac, 85.64% Impervious, Inflow Depth = 4.71" for 100Yr. event
 Inflow = 75.34 cfs @ 12.06 hrs, Volume= 5.177 af
 Outflow = 18.59 cfs @ 12.36 hrs, Volume= 5.024 af, Atten= 75%, Lag= 17.8 min
 Primary = 10.55 cfs @ 12.36 hrs, Volume= 4.685 af
 Secondary = 8.04 cfs @ 12.36 hrs, Volume= 0.339 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 786.69' @ 12.36 hrs Surf.Area= 35,629 sf Storage= 122,529 cf

Plug-Flow detention time= 530.5 min calculated for 5.024 af (97% of inflow)
 Center-of-Mass det. time= 512.6 min (1,296.6 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	783.00'	122,438 cf	Pond (Prismatic) Listed below (Recalc)
#2	780.00'	11,197 cf	36.0" Round 36" Pipe Storage L= 1,584.0' S= 0.0020 '/'
		133,635 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
783.00	24,677	0	0
787.00	36,542	122,438	122,438

Device	Routing	Invert	Outlet Devices
#1	Primary	783.00'	18.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 783.00' / 782.00' S= 0.0133 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	783.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	784.40'	7.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	786.00'	1.5" x 5.0" Horiz. Orifice/Grate X 9.00 columns X 4 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	786.25'	10.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=10.56 cfs @ 12.36 hrs HW=786.69' (Free Discharge)

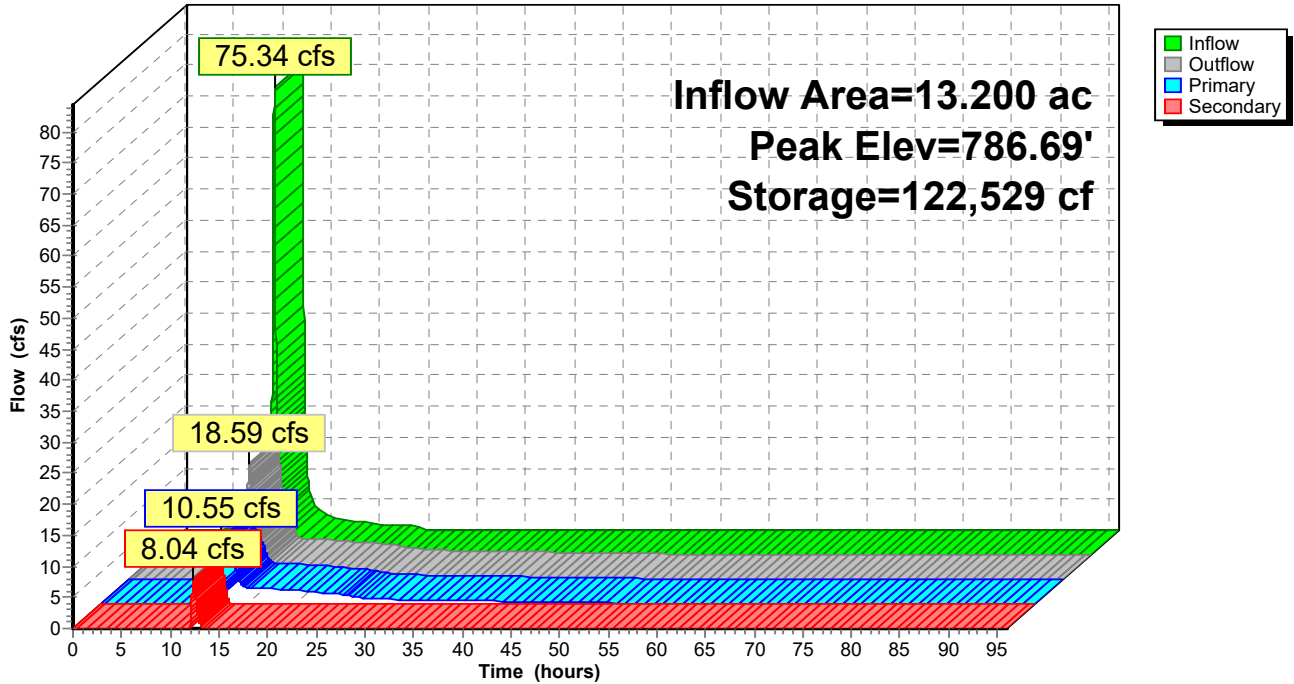
- 1=Culvert (Passes 10.56 cfs of 11.52 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.23 cfs @ 8.99 fps)
- 3=Orifice/Grate (Orifice Controls 1.82 cfs @ 6.81 fps)
- 4=Orifice/Grate (Orifice Controls 7.51 cfs @ 4.01 fps)

Secondary OutFlow Max=8.02 cfs @ 12.36 hrs HW=786.69' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Weir Controls 8.02 cfs @ 1.81 fps)

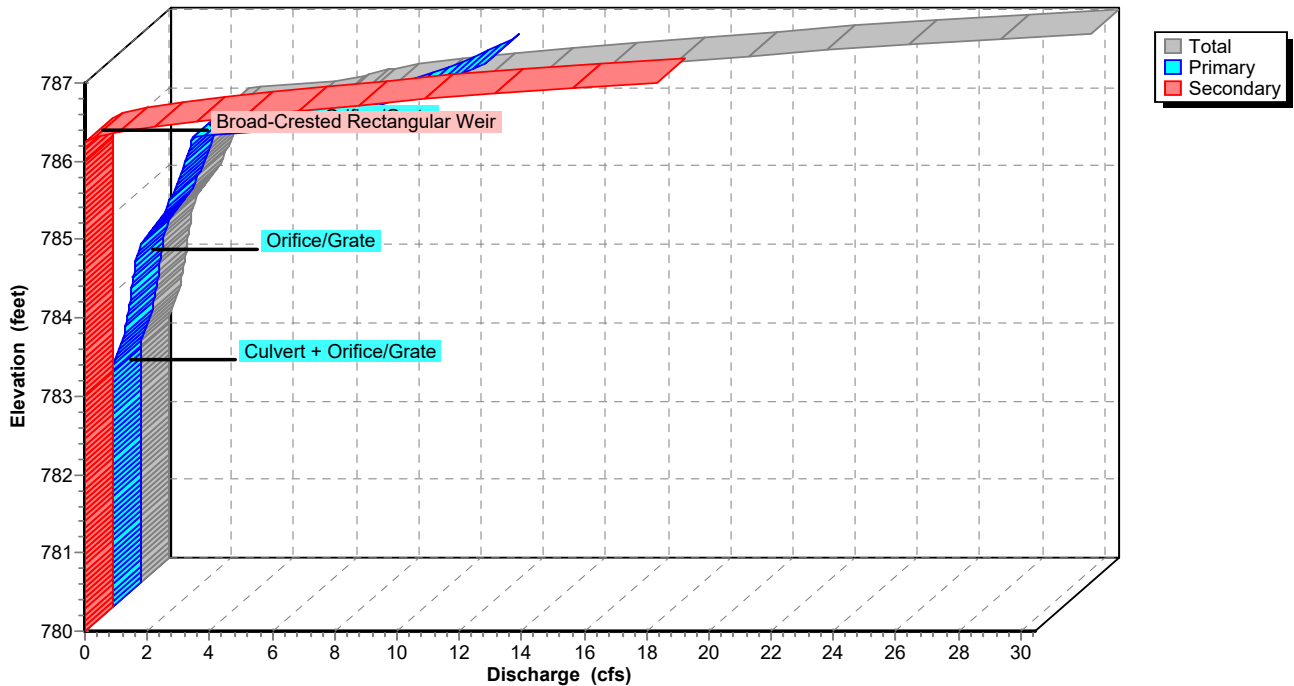
Pond 10P: SW Pond 3

Hydrograph



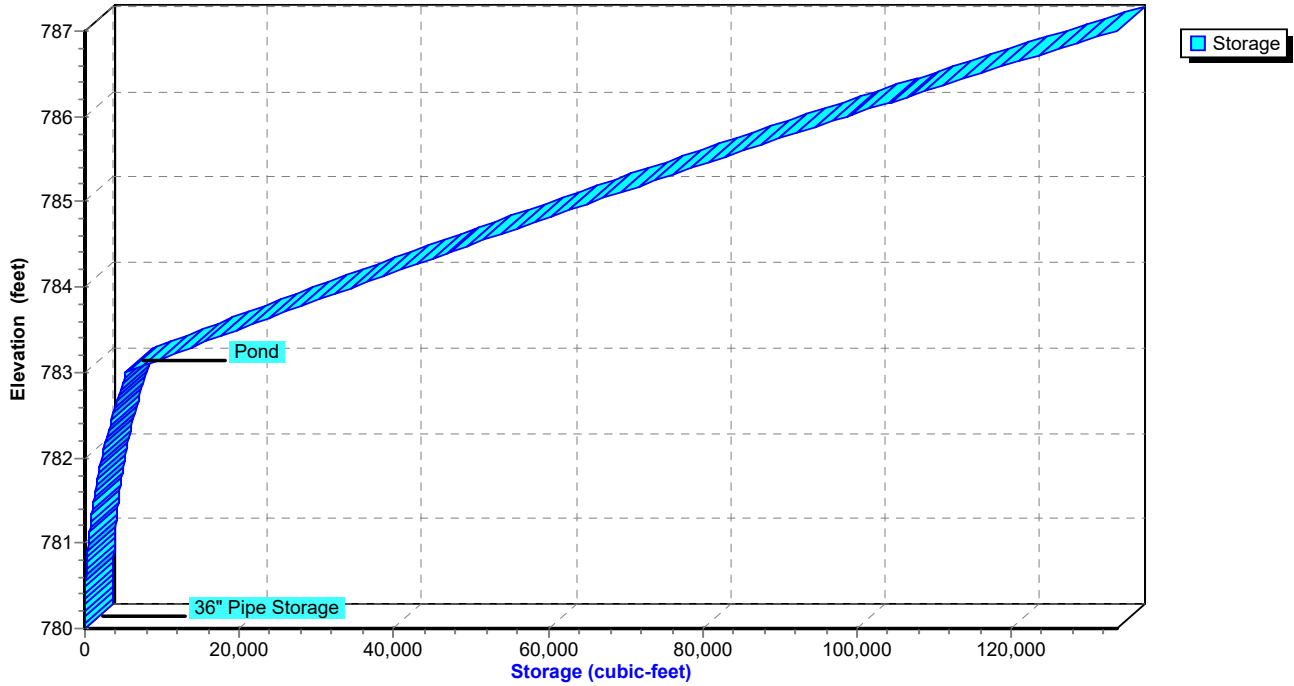
Pond 10P: SW Pond 3

Stage-Discharge



Pond 10P: SW Pond 3

Stage-Area-Storage



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Stage-Area-Storage for Pond 10P: SW Pond 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
780.00	0	782.65	4,097	785.30	75,496
780.05	0	782.70	4,263	785.35	77,116
780.10	1	782.75	4,432	785.40	78,739
780.15	4	782.80	4,603	785.45	80,367
780.20	8	782.85	4,775	785.50	81,999
780.25	14	782.90	4,949	785.55	83,635
780.30	22	782.95	5,125	785.60	85,275
780.35	33	783.00	5,301	785.65	86,920
780.40	45	783.05	6,716	785.70	88,570
780.45	61	783.10	8,137	785.75	90,224
780.50	79	783.15	9,567	785.80	91,883
780.55	99	783.20	11,003	785.85	93,547
780.60	123	783.25	12,446	785.90	95,216
780.65	150	783.30	13,895	785.95	96,891
780.70	180	783.35	15,351	786.00	98,570
780.75	212	783.40	16,812	786.05	100,256
780.80	249	783.45	18,278	786.10	101,948
780.85	288	783.50	19,749	786.15	103,645
780.90	331	783.55	21,226	786.20	105,350
780.95	377	783.60	22,707	786.25	107,062
781.00	427	783.65	24,194	786.30	108,782
781.05	480	783.70	25,684	786.35	110,509
781.10	537	783.75	27,180	786.40	112,243
781.15	598	783.80	28,680	786.45	113,985
781.20	662	783.85	30,184	786.50	115,734
781.25	730	783.90	31,693	786.55	117,491
781.30	801	783.95	33,205	786.60	119,255
781.35	877	784.00	34,722	786.65	121,027
781.40	956	784.05	36,243	786.70	122,806
781.45	1,038	784.10	37,768	786.75	124,592
781.50	1,125	784.15	39,297	786.80	126,386
781.55	1,215	784.20	40,830	786.85	128,187
781.60	1,309	784.25	42,366	786.90	129,995
781.65	1,407	784.30	43,907	786.95	131,811
781.70	1,508	784.35	45,451	787.00	133,635
781.75	1,613	784.40	46,999		
781.80	1,722	784.45	48,551		
781.85	1,835	784.50	50,106		
781.90	1,951	784.55	51,665		
781.95	2,071	784.60	53,228		
782.00	2,194	784.65	54,795		
782.05	2,321	784.70	56,365		
782.10	2,452	784.75	57,938		
782.15	2,585	784.80	59,516		
782.20	2,723	784.85	61,097		
782.25	2,863	784.90	62,682		
782.30	3,007	784.95	64,270		
782.35	3,154	785.00	65,863		
782.40	3,304	785.05	67,459		
782.45	3,457	785.10	69,058		
782.50	3,613	785.15	70,662		
782.55	3,772	785.20	72,270		
782.60	3,933	785.25	73,881		

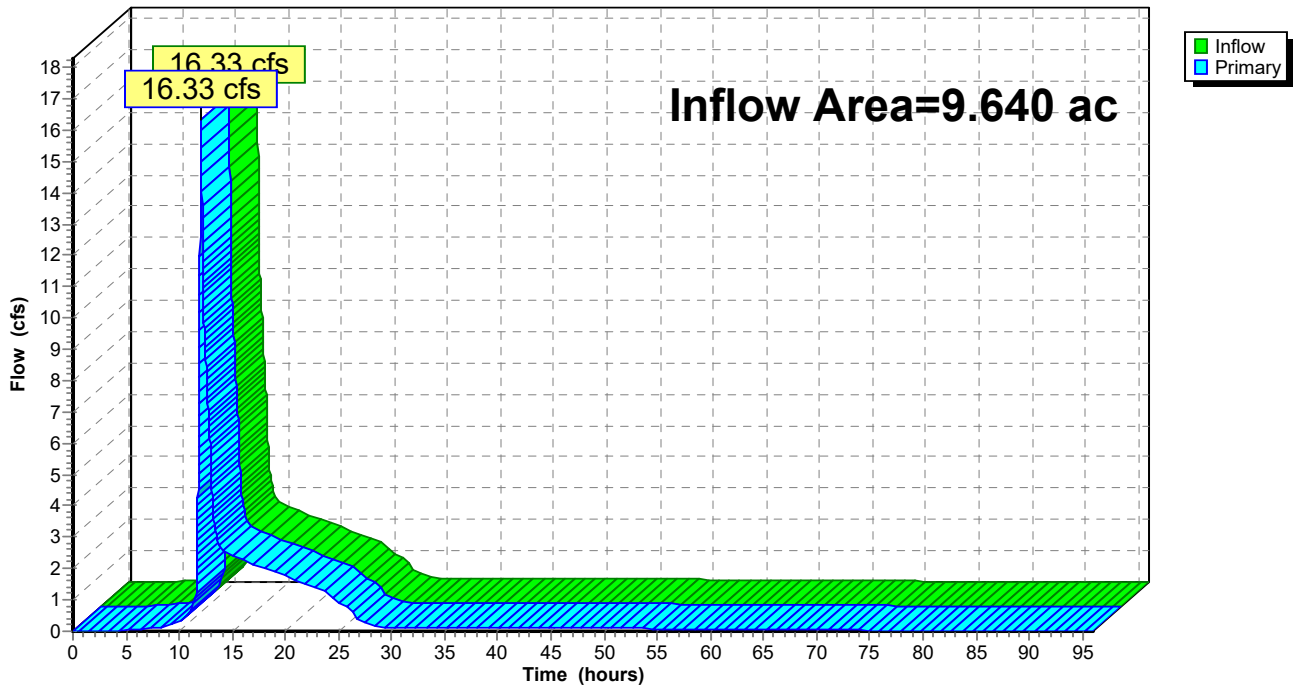
Summary for Link 7L: (new Link)

Inflow Area = 9.640 ac, 64.21% Impervious, Inflow Depth > 4.39" for 100Yr. event
Inflow = 16.33 cfs @ 12.08 hrs, Volume= 3.524 af
Primary = 16.33 cfs @ 12.08 hrs, Volume= 3.524 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : SE Det. Pond 2

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7L: (new Link)

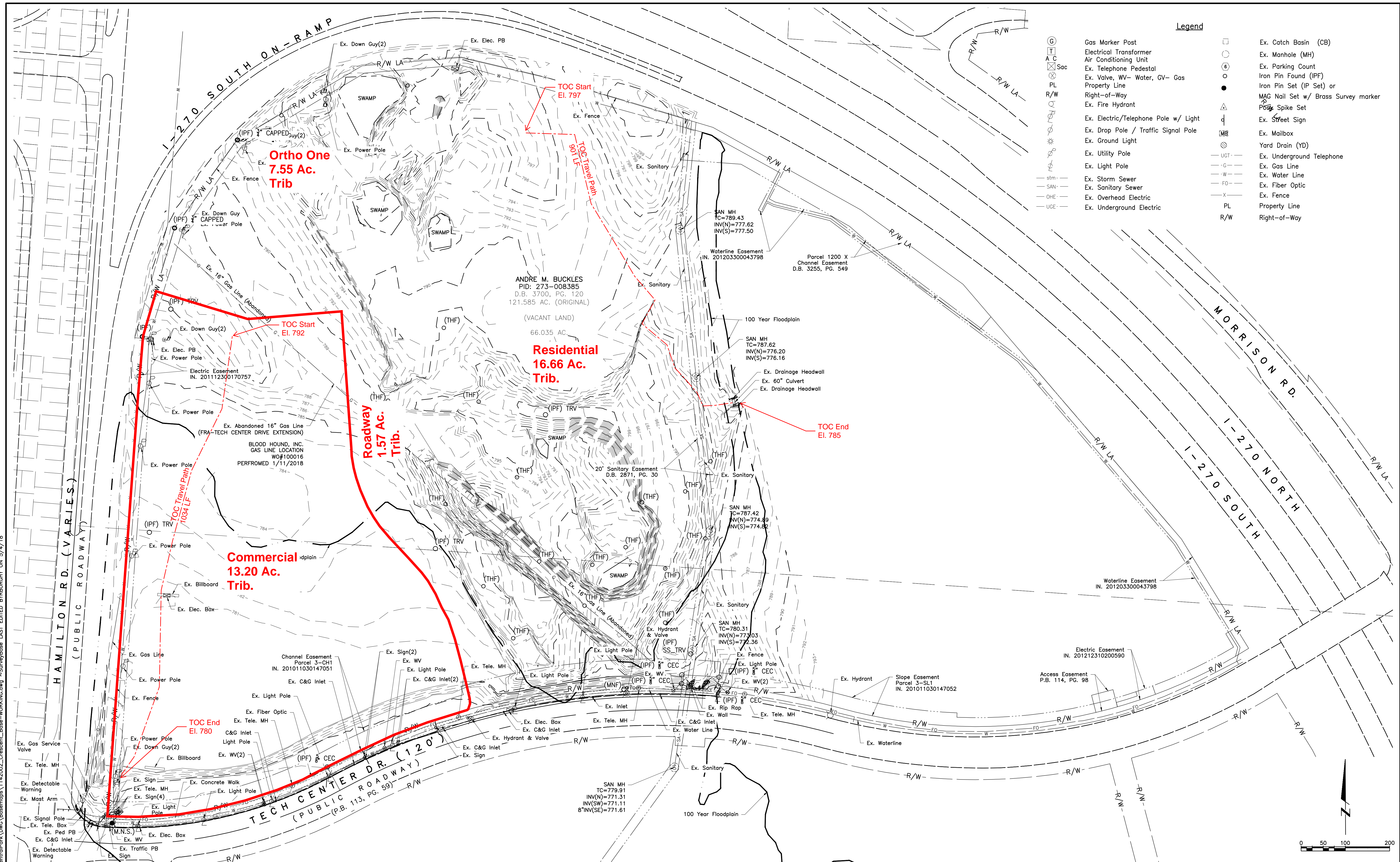
Hydrograph



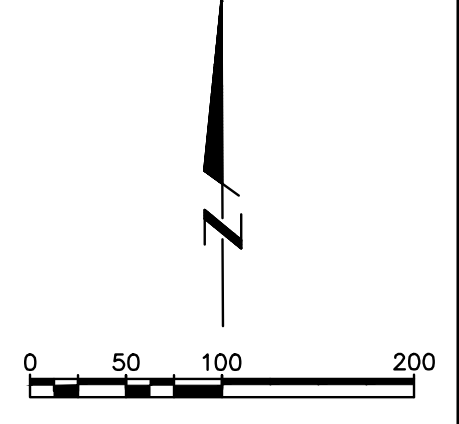
APPENDIX B

(Tributary Maps)

M:\1142002_CrescentCentralPark\DWG\Bases\1142002_Crescent_Base-WORKING.dwg --SurveyBase LAST EDITED BYRUBURGHY ON 5/4/18



Legend	
	Gas Marker Post
	Electrical Transformer
	Air Conditioning Unit
	Ex. Telephone Pedestal
	Ex. Valve, W-Water, G-V-Gas
	Property Line
	Right-of-Way
	Ex. Fire Hydrant
	Ex. Electric/Telephone Pole w/ Light
	Ex. Drop Pole / Traffic Signal Pole
	Ex. Ground Light
	Ex. Utility Pole
	Ex. Light Pole
	Ex. Storm Sewer
	Ex. Sanitary Sewer
	Ex. Overhead Electric
	Ex. Underground Electric
	Ex. Catch Basin (CB)
	Ex. Manhole (MH)
	Ex. Parking Count
	Iron Pin Found (IPF)
	Iron Pin Set (IP Set) or MAG Nail Set w/ Brass Survey marker
	Spike Set
	Ex. Street Sign
	Ex. Mailbox
	Yard Drain (YD)
	Ex. Underground Telephone
	Ex. Gas Line
	Ex. Water Line
	Ex. Fiber Optic
	Ex. Fence
	Property Line
	Right-of-Way



REVISIONS	DATE	BY	CHK.

E. P. FERRIS
 AND ASSOCIATES
 INC.
Consulting Civil Engineers and Surveyors

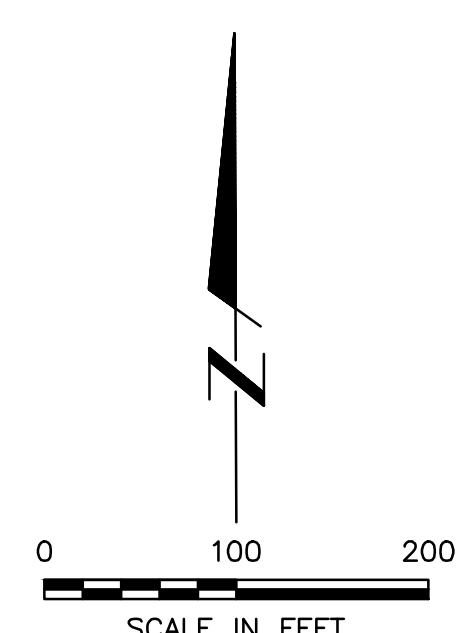
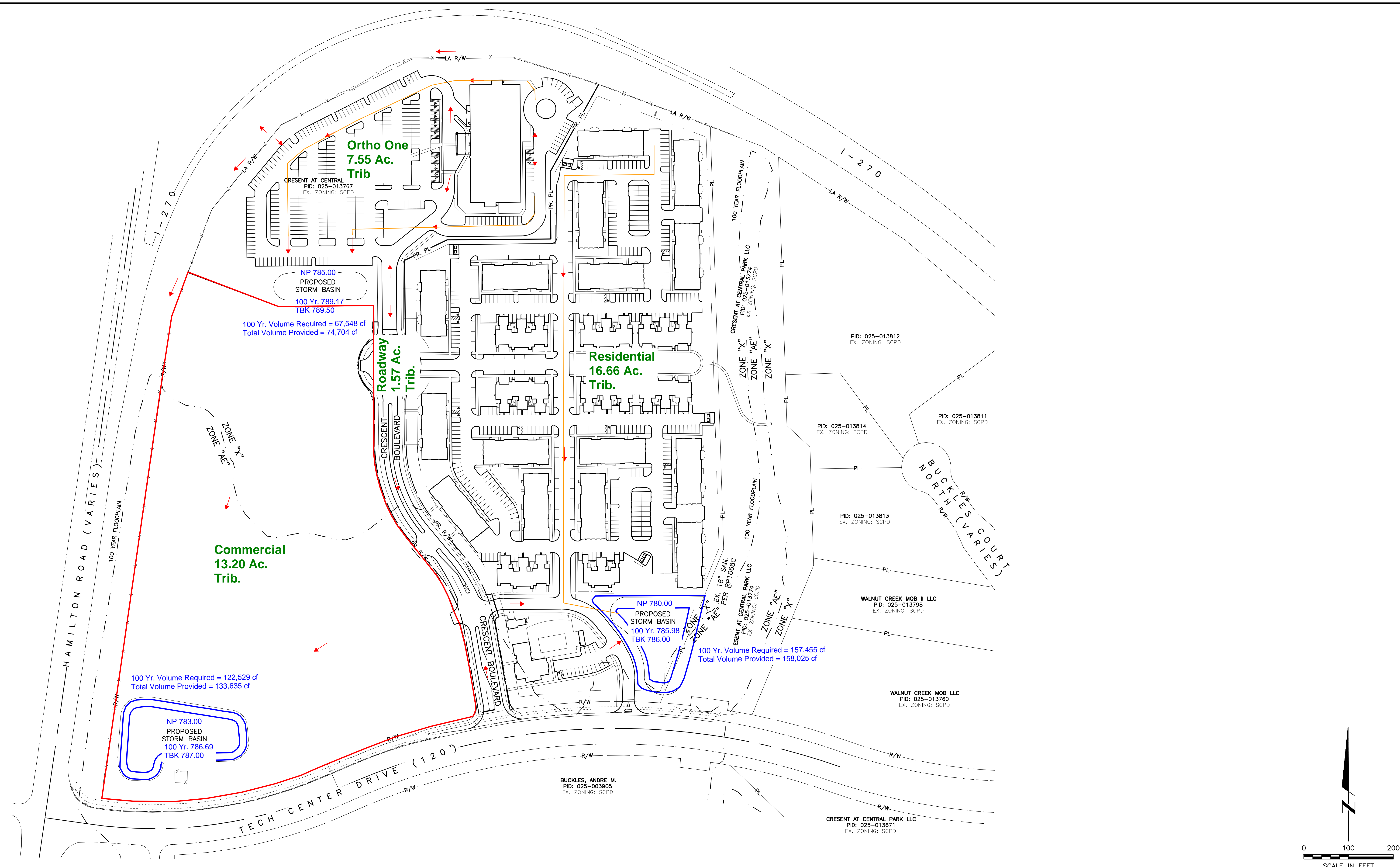
880 KING AVENUE
 COLUMBUS, OHIO 43212
 (614) 299-2999
 (614) 299-2992 (Fax)
 www.EPFERRIS.com

CITY OF GAHANNA, OHIO
CRESCENT AT CENTRAL PARK
 CRESCENT AT CENTRAL PARK, LLC

JOB NO.	
DESIGNED BY:	CRK
DRAWN BY:	RJB
CHECKED BY:	
APPROVED BY:	
DATE:	05/5/18

TOPOGRAPHIC SURVEY	
SCALE:	1" = 100'
SHEET NO.	OF
1	1

M:\958011_CrescentPark\DWG\Exhibits\Site Utility Plan_JAR_MJO.dwg -VOID - Gas Site Utility Plan (2) LAST EDITED BY JAR ON 3/17/23



REVISIONS	DATE	BY	CHK

E. P. FERRIS
AND ASSOCIATES
INC

Consulting Civil Engineers and Surveyors

2130 QUARRY TRAILS DR,
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CITY OF GAHANNA, OHIO
ORTHOPEDIC ONE
CRESCENT AT CENTRAL PARK LLC

JOB NO.	1267.001
DESIGNED BY:	JAR
DRAWN BY:	JAR
CHECKED BY:	CLP
APPROVED BY:	CLP
DATE:	03/17/23

PRELIMINARY SITE PLAN

SCALE: 1" = 100'

SHEET NO.	OF
1	1

APPENDIX C

(Water Quality)

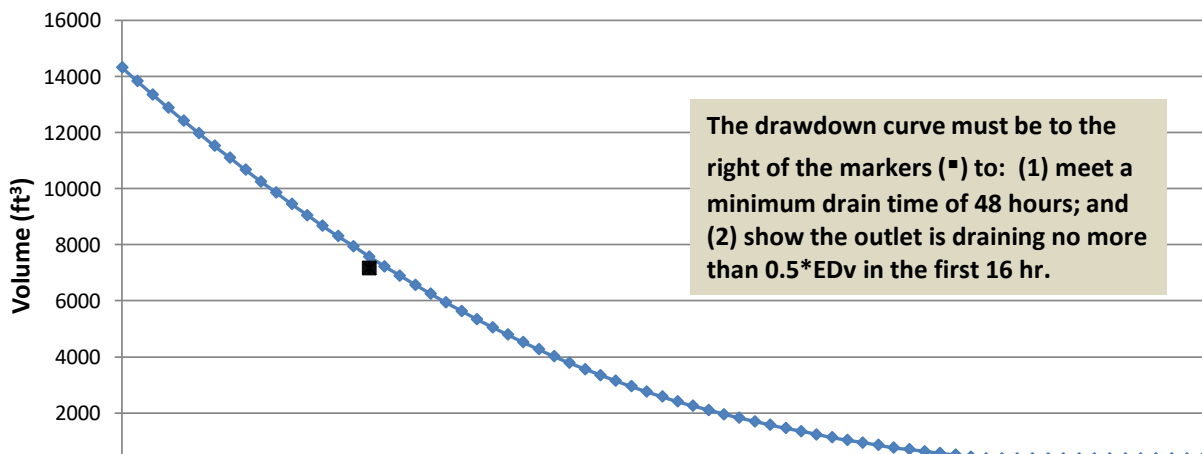
Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	785.00	
Elevation of Top of EDv =	786.25	
Secondary Outlet Invert Elevation =	786.30	OKAY
WQ Treatment Volume Provided, $V_{\text{treatment}}$ =	14,827 ft^3	
Treatment Vol Provided Relative to EDv, $V_{\text{treatment}}/\text{EDv}$ =	1.04	= 104% OKAY
Permanent Pool Volume Provided, PPv =	7,832 ft^3	
Forebay Volume Provided, V_{forebay} =	2,500 ft^3	= 1.75
Is forebay volume below WQ outlet? (Yes or No)	Yes	= 175% OKAY
Permanent Micropool Volume Provided, $V_{\text{micropool}}$ =	5,332 ft^3	
Ratio $V_{\text{micropool}}$ Provided to $V_{\text{micropool}}$ Required =	3.72	= 372% OKAY
Sediment Storage Volume Provided, V_{sediment} =	7,832 ft^3	
Ratio V_{sediment} Provided to V_{sediment} Required =	2.74	= 274% OKAY

Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, H_{max} =	1.25 ft	
Orifice Coefficient, C =	0.6	
Target (Minimum) Draw-down Time, T_d =	48 hr	
Target Average Discharge, Q_{avg} =	0.08 cfs	
Average Hydraulic Head, H_{avg} =	0.63 ft	
Estimated Orifice Area, A_{orifice} =	3.13 in^2	= 0.022 ft^2
Estimated Orifice Diameter, D_{orifice} =	2.00 in	= 0.17 ft
Design Orifice Diameter, D_{orifice} =	2.20 in	= 0.18 ft
Design Orifice Area, A_{orifice} =	3.78 in^2	= 0.026 ft^2
Time to Completely Drain EDv, T_d =	>72 hr	must be \geq 48 hr OKAY
Volume Drained in First 16 hr =	6,738 ft^3	
% of EDv =	47.1 %	must be \leq 50% OKAY

Dry Basin - EDv Drawdown vs Time



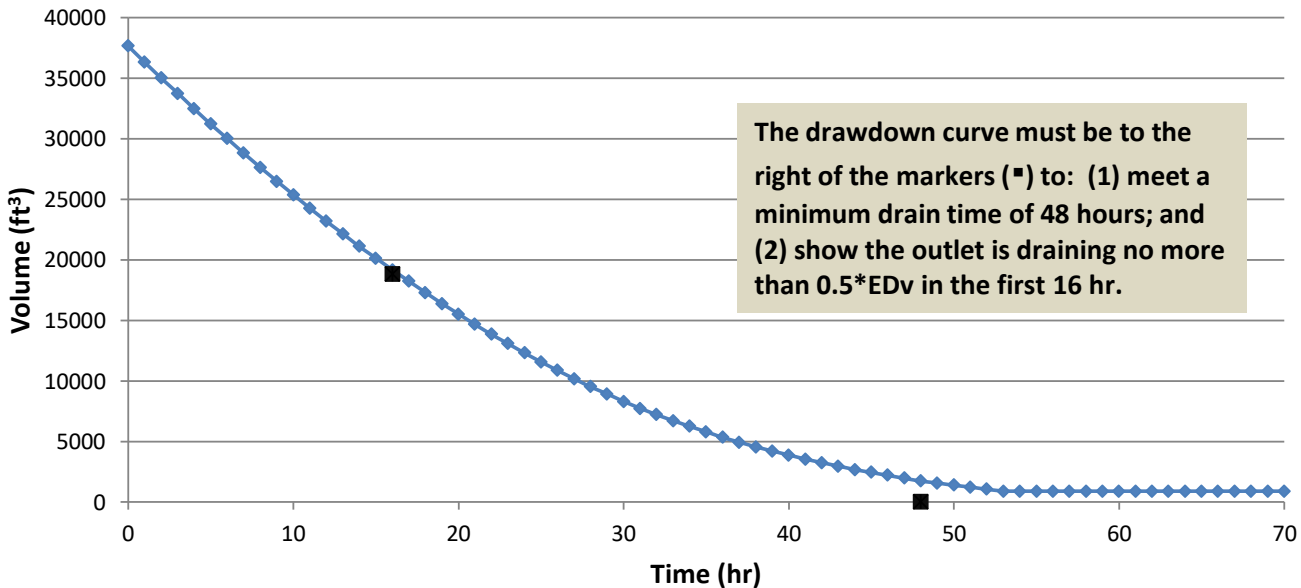
Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	780.00		
Elevation of Top of EDv =	782.05		
Secondary Outlet Invert Elevation =	782.15		OKAY
WQ Treatment Volume Provided, $V_{\text{treatment}}$ =	37,950	ft ³	
Treatment Vol Provided Relative to EDv, $V_{\text{treatment}}/EDv$ =	1.01		= 101% OKAY
Permanent Pool Volume Provided, PPv =	20,866	ft ³	
Forebay Volume Provided, V_{forebay} =	15,818	ft ³	= 4.20
Is forebay volume below WQ outlet? (Yes or No)	Yes		= 420% OKAY
Permanent Micropool Volume Provided, $V_{\text{micropool}}$ =	5,048	ft ³	
Ratio $V_{\text{micropool}}$ Provided to $V_{\text{micropool}}$ Required =	1.34		= 134% OKAY
Sediment Storage Volume Provided, V_{sediment} =	20,866	ft ³	
Ratio V_{sediment} Provided to V_{sediment} Required =	2.77		= 277% OKAY

Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, H _{max} =	2.05	ft	
Orifice Coefficient, C =	0.6		
Target (Minimum) Draw-down Time, T _d =	48	hr	
Target Average Discharge, Q _{avg} =	0.22	cfs	
Average Hydraulic Head, H _{avg} =	1.02	ft	
Estimated Orifice Area, A _{orifice} =	6.44	in ²	= 0.045 ft ²
Estimated Orifice Diameter, D _{orifice} =	2.86	in	= 0.24 ft
Design Orifice Diameter, D _{orifice} =	3.20	in	= 0.27 ft
Design Orifice Area, A _{orifice} =	7.99	in ²	= 0.055 ft ²
Time to Completely Drain EDv, T _d =	>72	hr	must be ≥ 48 hr OKAY
Volume Drained in First 16 hr =	18,490	ft ³	
% of EDv =	49.1	%	must be ≤ 50% OKAY

Dry Basin - EDv Drawdown vs Time



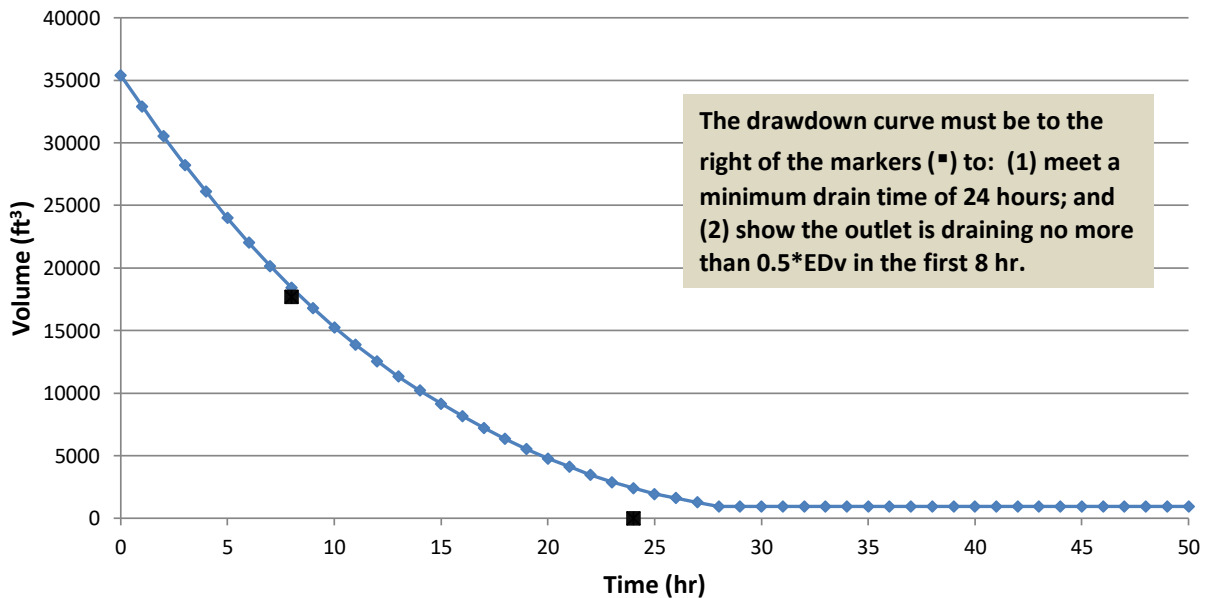
Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	783.00		
Elevation of Top of EDv =	784.33		
Secondary Outlet Invert Elevation =	784.40		OKAY
WQ Treatment Volume Provided, $V_{\text{treatment}}$ =	37,237	ft ³	
Treatment Vol Provided Relative to EDv, $V_{\text{treatment}}/\text{EDv}$ =	1.05		= 105% OKAY
Permanent Pool Volume Provided, PPv =	108,760	ft ³	
Ratio PPv Provided to PPv Required =	2.56		= 256% OKAY

Step 5 - Outlet (Orifice) Sizing

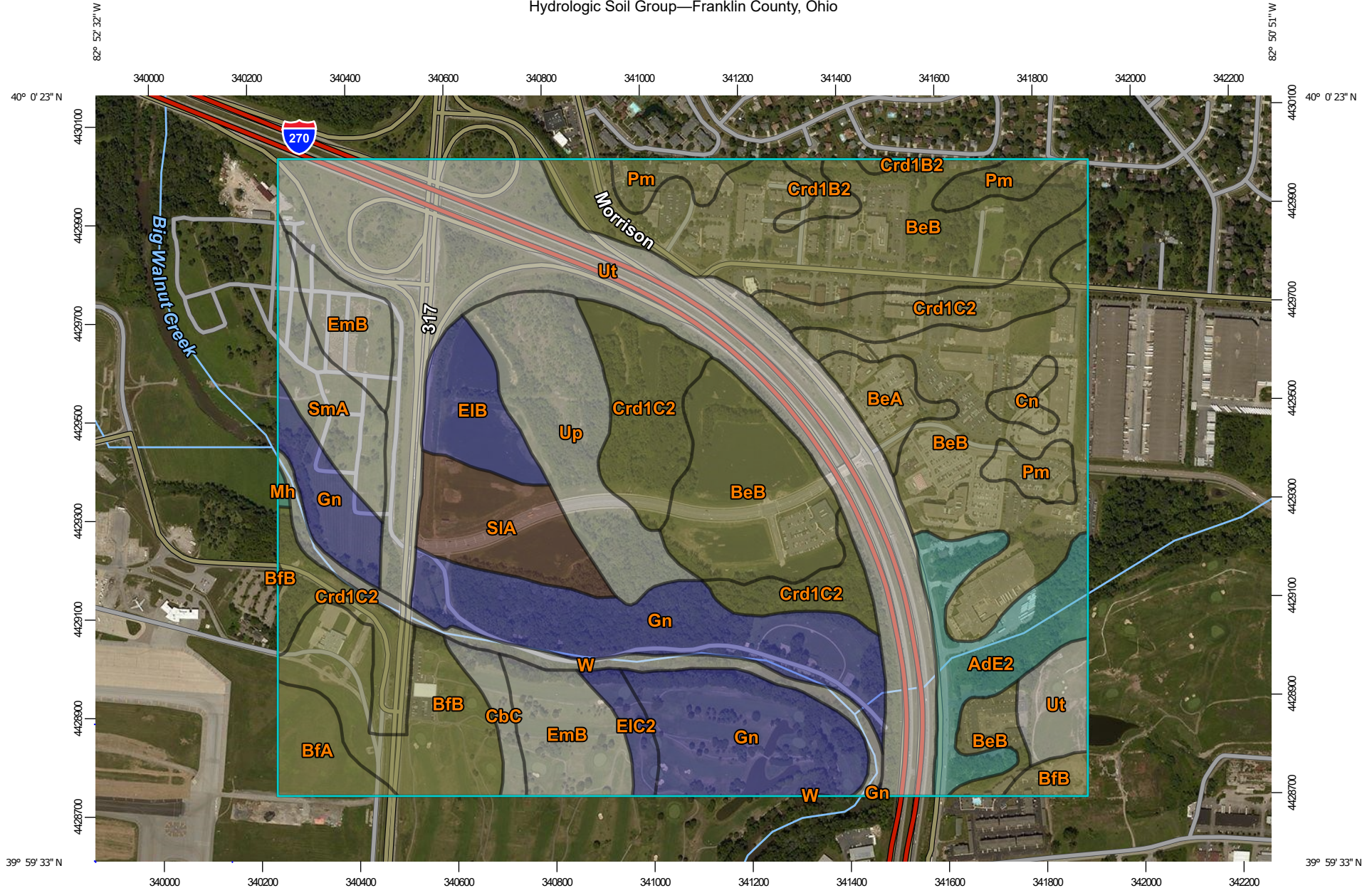
Maximum Hydraulic Head, H_{max} =	1.33	ft	
Orifice Coefficient, C =	0.6		
Target (Minimum) Draw-down Time, T_d =	24	hr	
Target Average Discharge, Q_{avg} =	0.41	cfs	
Average Hydraulic Head, H_{avg} =	0.67	ft	
Estimated Orifice Area, A_{orifice} =	15.02	in ²	= 0.104 ft ²
Estimated Orifice Diameter, D_{orifice} =	4.37	in	= 0.36 ft
Design Orifice Diameter, D_{orifice} =	5.00	in	= 0.42 ft
Design Orifice Area, A_{orifice} =	19.51	in ²	= 0.135 ft ²
Time to Completely Drain EDv, T_d =	>72	hr	must be ≥ 24 hr OKAY
Volume Drained in First 8 hr =	16,975	ft ³	
% of EDv =	48.0	%	must be $\leq 50\%$ OKAY

Wet Basin - EDv Drawdown vs Time

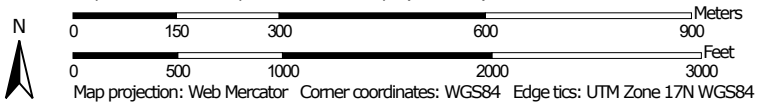


APPENDIX D
(Soil Report)

Hydrologic Soil Group—Franklin County, Ohio



Map Scale: 1:11,000 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines

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

Soil Rating Points






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

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


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Ohio
 Survey Area Data: Version 19, Jun 11, 2020

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

Date(s) aerial images were photographed: Aug 4, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdE2	Alexandria silt loam, 18 to 25 percent slopes, eroded	C	20.1	3.8%
BeA	Bennington silt loam, 0 to 2 percent slopes	C/D	7.1	1.3%
BeB	Bennington silt loam, 2 to 6 percent slopes	C/D	124.6	23.5%
BfA	Bennington-Urban land complex, 0 to 2 percent slopes	C/D	8.2	1.6%
BfB	Bennington-Urban land complex, 0 to 6 percent slopes	C/D	26.6	5.0%
CbC	Cardington-Urban land complex, 6 to 12 percent slopes		4.2	0.8%
Cn	Condit silt loam, 0 to 1 percent slopes	C/D	2.8	0.5%
Crd1B2	Cardington silt loam, 2 to 6 percent slopes, eroded	C/D	3.7	0.7%
Crd1C2	Cardington silt loam, 6 to 12 percent slopes, eroded	C/D	48.5	9.2%
EIB	Eldean silt loam, 2 to 6 percent slopes	B	11.7	2.2%
EIC2	Eldean silt loam, 6 to 12 percent slopes, eroded	B	4.0	0.7%
EmB	Eldean-Urban land complex, 2 to 6 percent slopes		22.0	4.2%
Gn	Genesee silt loam, 0 to 2 percent slopes, occasionally flooded	B	65.9	12.5%
Mh	Medway silt loam, occasionally flooded	C	0.4	0.1%
Pm	Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes	C/D	12.5	2.4%
SIA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	B/D	16.5	3.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
SmA	Sleeth-Urban land complex, 0 to 2 percent slopes		12.9	2.4%
Up	Udorthents, loamy, rolling		27.1	5.1%
Ut	Udorthents-Urban land complex, gently rolling		100.0	18.9%
W	Water		10.5	2.0%
Totals for Area of Interest			529.3	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX E
(Storm Pipe Calculations)