HUDSON VOLUME ANALYSIS

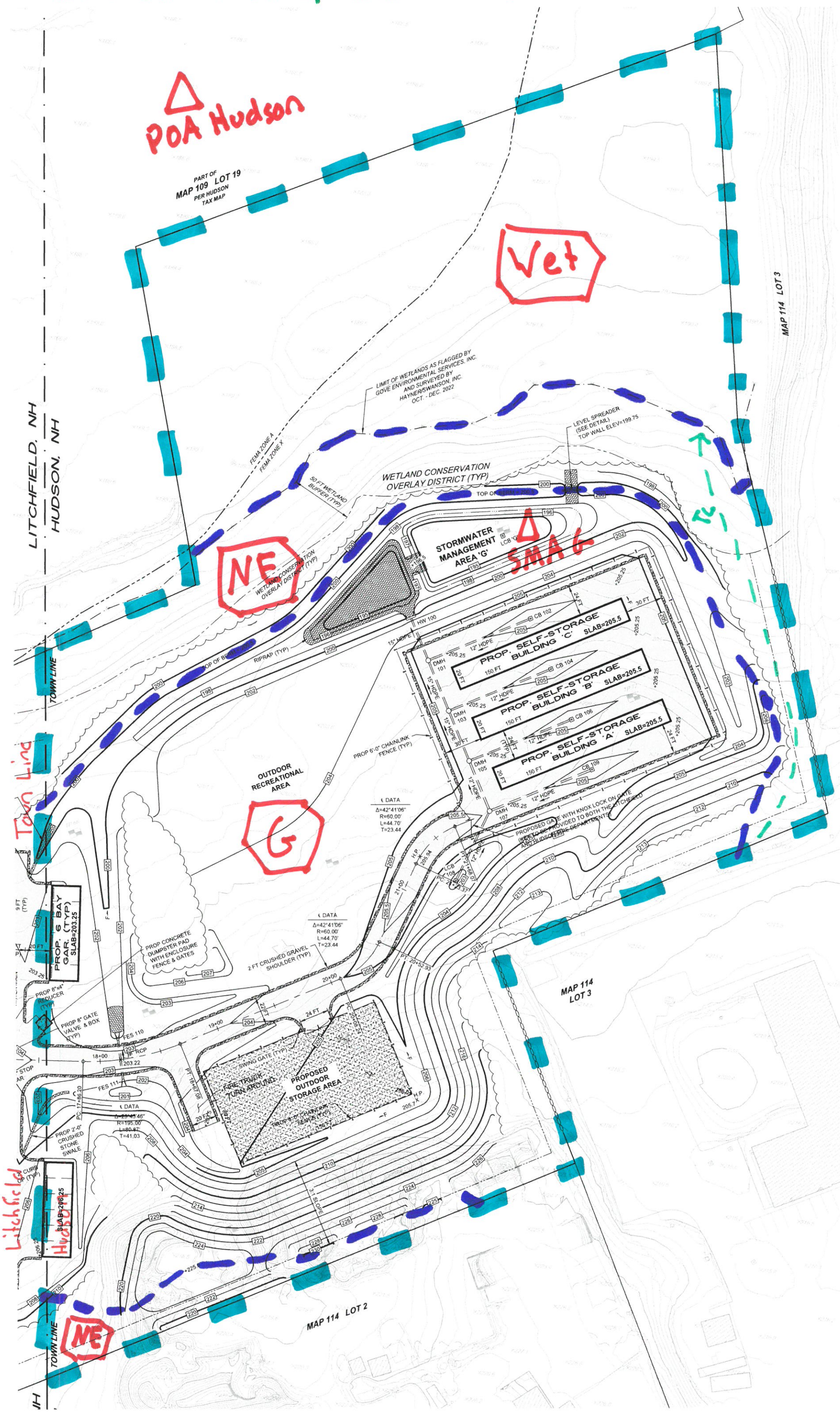
TABLE 1: COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT PEAK VOLUMES

Location	Storm Frequency	Pre-Development Volume (af)	Post-Development Volume (af)
Point of Analysis	2-year	0.244	0.227
	10-year	0.674	0.481
	25-year	1.137	0.718
	50-year	1.642	0.962

In response to comments provided to us, we were able to analyze the peak volumes leaving just the Hudson portion of the site. Included in this package are the HydroCAD calculations and Drainage Area Maps for this exercise.

- Based on the information above, there is a reduction in peak volumes leaving the Hudson portion of the site in the 2, 10, 25 and 50-year storm events
- Furthermore, the proposed SMA G contains sufficient volume to fully store and infiltrate up to and including the 50-year storm event of the entirety of the developed portion of the Hudson site

Driveway Area Map Sketch - Post - Hudson



Drainage Area Sketch - Plc - Hudson

POA Hudson

PART OF MAP 109 LOT 19 PER HUDSON TAX MAP

Wet

MAP 114 LOT 3

LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT. - DEC. 2022

FEMA ZONE A
FEMA ZONE X

50 FT WETLAND BUFFER (TYP)

WETLAND CONSERVATION OVERLAY DISTRICT (TYP)

WETLAND CONSERVATION OVERLAY DISTRICT (TYP)

LITCHFIELD, NH
HUDSON, NH

TOWN LINE

NE

Litch Fld
Hudson

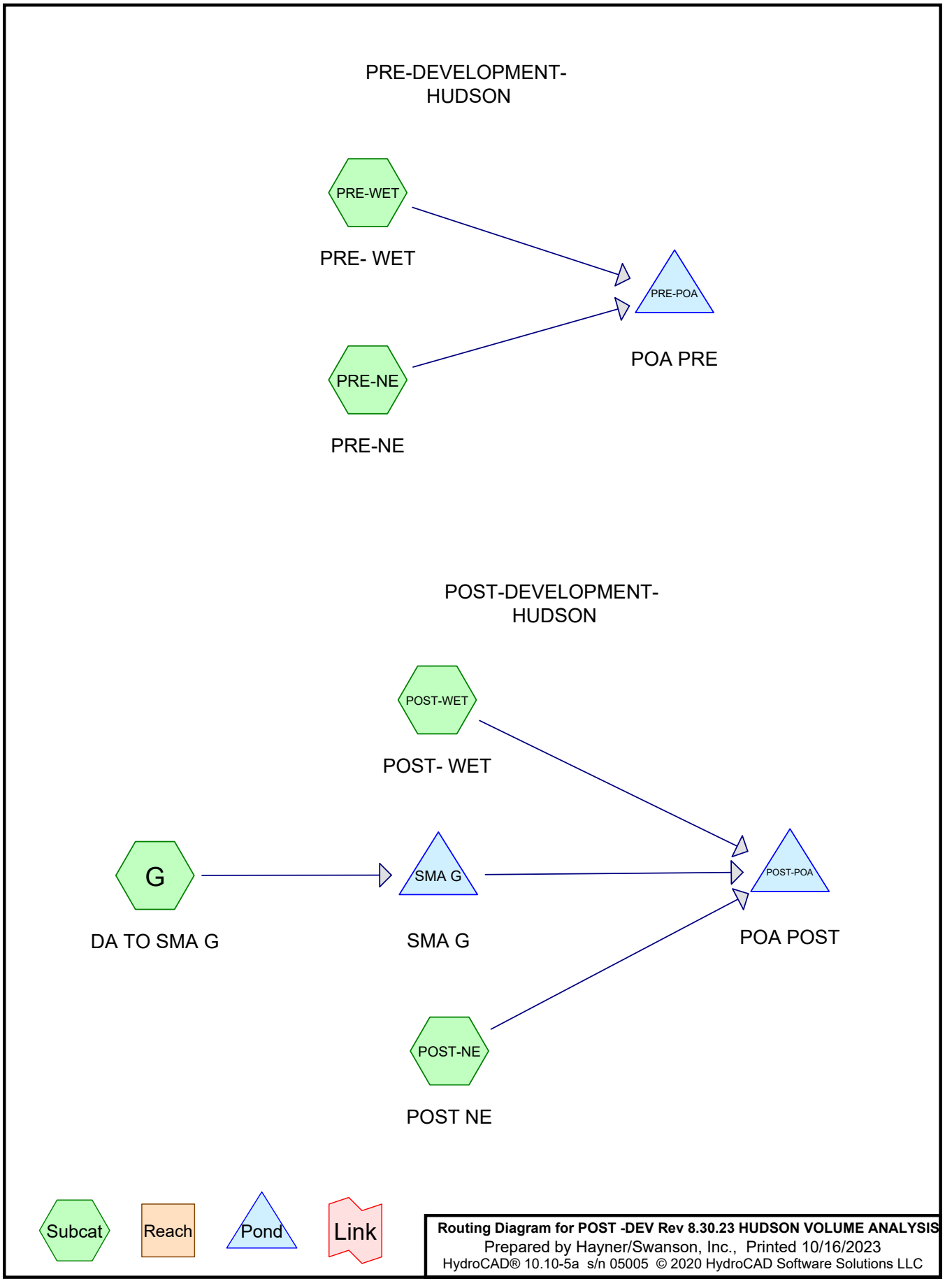
Town Line

MAP 114 LOT 3

MAP 114 LOT 2

TOWN LINE

NH
IH


PRE-DEVELOPMENT-
HUDSON
PRE-WET
PRE- WET
PRE-POA
POA PRE
PRE-NE
PRE-NE
POST-DEVELOPMENT-
HUDSON
POST-WET
POST- WET
G
DA TO SMA G
SMA G
SMA G
POST-POA
POA POST
POST-NE
POST NE
Subcat
Reach
Pond
Link
Routing Diagram for POST -DEV Rev 8.30.23 HUDSON VOLUME ANALYSIS
Prepared by Hayner/Swanson, Inc., Printed 10/16/2023
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Events for Pond PRE-POA: POA PRE

Event	Volume (acre-feet)	Elevation (feet)	Storage (acre-feet)
2-YR	0.244	**0.00**	**0.000**
10-YR	0.674	0.00	0.000
25-YR	1.137	0.00	0.000
50-YR	**1.642**	0.00	0.000

Events for Pond POST-POA: POA POST

Event	Volume (acre-feet)	Elevation (feet)	Storage (acre-feet)
2-YR	0.227	**0.00**	**0.000**
10-YR	0.481	0.00	0.000
25-YR	0.718	0.00	0.000
50-YR	**0.962**	0.00	0.000

POST -DEV Rev 8.30.23 HUDSON VOLUME ANALYSIS
Prepared by Hayner/Swanson, Inc. Printed 10/16/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.053	39	>75% Grass cover, Good, HSG A (G, POST-NE)
2.490	61	>75% Grass cover, Good, HSG B (G, POST-NE)
1.051	96	Gravel surface, HSG B (G, PRE-NE)
0.497	98	Paved parking, HSG A (G)
0.313	98	Paved parking, HSG B (G)
0.235	98	Roofs, HSG A (G)
0.053	98	Roofs, HSG B (G)
5.247	30	Woods, Good, HSG A (G, POST-NE, PRE-NE)
3.126	55	Woods, Good, HSG B (G, POST-NE, PRE-NE)
5.322	77	Woods, Good, HSG D (POST-WET, PRE-WET)
20.386	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.032	HSG A	G, POST-NE, PRE-NE
7.033	HSG B	G, POST-NE, PRE-NE
0.000	HSG C	
5.322	HSG D	POST-WET, PRE-WET
0.000	Other	
20.386		**TOTAL AREA**

POST -DEV Rev 8.30.23 HUDSON VOLUME ANALYSIS
Prepared by Hayner/Swanson, Inc. Printed 10/16/2023

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.053	2.490	0.000	0.000	0.000	4.542	>75% Grass cover, Good	G, POST-NE
0.000	1.051	0.000	0.000	0.000	1.051	Gravel surface	G, PRE-NE
0.497	0.313	0.000	0.000	0.000	0.811	Paved parking	G
0.235	0.053	0.000	0.000	0.000	0.288	Roofs	G
5.247	3.126	0.000	5.322	0.000	13.694	Woods, Good	G, POST-NE, POST-WET, PRE-NE, PRE-WET
8.032	**7.033**	**0.000**	**5.322**	**0.000**	**20.386**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment G: DA TO SMA G Runoff Area=257,699 sf 18.57% Impervious Runoff Depth=1.82"
Tc=0.0 min CN=62 Runoff=14.65 cfs 0.898 af

Subcatchment POST-NE: POST NE Runoff Area=70,420 sf 0.00% Impervious Runoff Depth=0.17"
Tc=10.0 min CN=35 Runoff=0.04 cfs 0.023 af

Subcatchment POST-WET: POST- WET Runoff Area=115,904 sf 0.00% Impervious Runoff Depth=3.13"
Tc=6.0 min CN=77 Runoff=9.78 cfs 0.695 af

Subcatchment PRE-NE: PRE-NE Runoff Area=328,104 sf 0.00% Impervious Runoff Depth=0.71"
Tc=16.0 min CN=46 Runoff=2.73 cfs 0.443 af

Subcatchment PRE-WET: PRE- WET Runoff Area=115,904 sf 0.00% Impervious Runoff Depth=3.13"
Tc=6.0 min CN=77 Runoff=9.78 cfs 0.695 af

Pond POST-POA: POA POST Inflow=9.78 cfs 0.718 af
Primary=9.78 cfs 0.718 af

Pond PRE-POA: POA PRE Inflow=10.26 cfs 1.137 af
Primary=10.26 cfs 1.137 af

Pond SMA G: SMA G Peak Elev=197.52' Storage=15,469 cf Inflow=14.65 cfs 0.898 af
Discarded=1.24 cfs 0.898 af Primary=0.00 cfs 0.000 af Outflow=1.24 cfs 0.898 af

Total Runoff Area = 20.386 ac Runoff Volume = 2.753 af Average Runoff Depth = 1.62"
94.61% Pervious = 19.288 ac 5.39% Impervious = 1.099 ac

Summary for Subcatchment G: DA TO SMA G

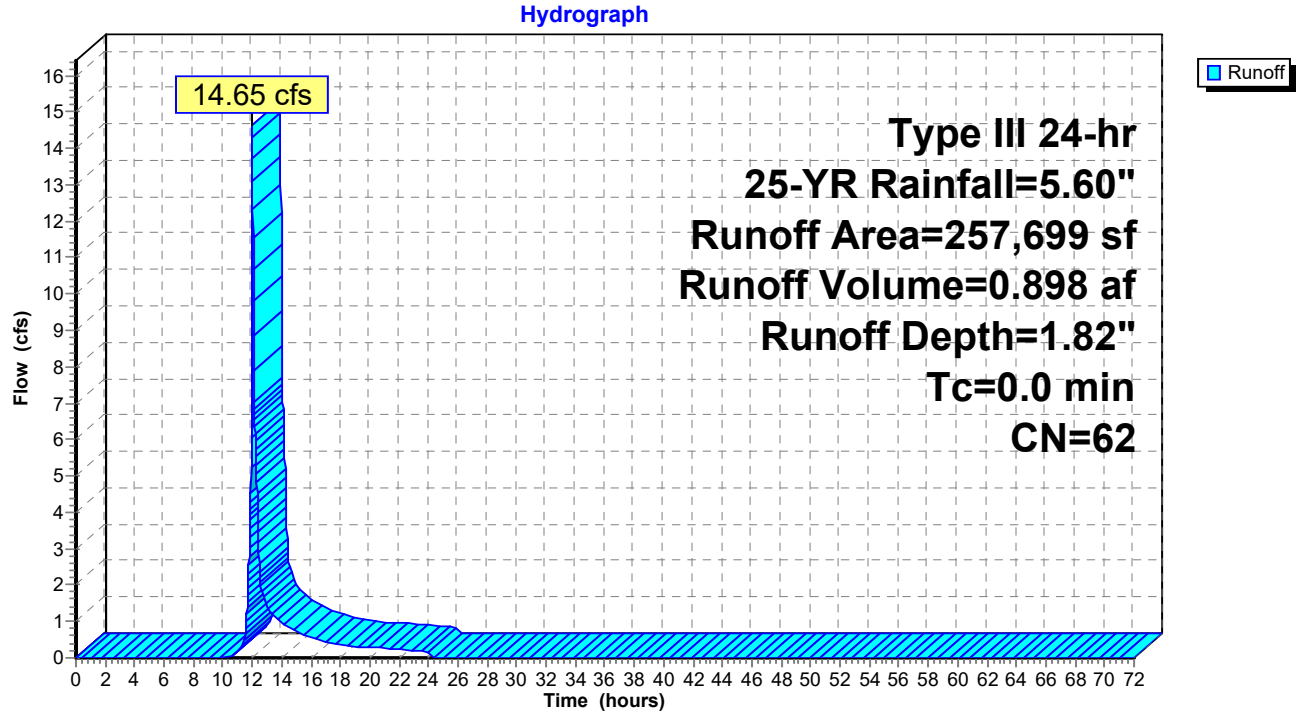
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 14.65 cfs @ 12.00 hrs, Volume= 0.898 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
10,228	98	Roofs, HSG A
2,317	98	Roofs, HSG B
21,665	98	Paved parking, HSG A
13,645	98	Paved parking, HSG B
78,014	39	>75% Grass cover, Good, HSG A
102,083	61	>75% Grass cover, Good, HSG B
3,018	30	Woods, Good, HSG A
14,799	55	Woods, Good, HSG B
11,930	96	Gravel surface, HSG B
257,699	62	Weighted Average
209,844		81.43% Pervious Area
47,855		18.57% Impervious Area

Subcatchment G: DA TO SMA G



Summary for Subcatchment POST-NE: POST NE

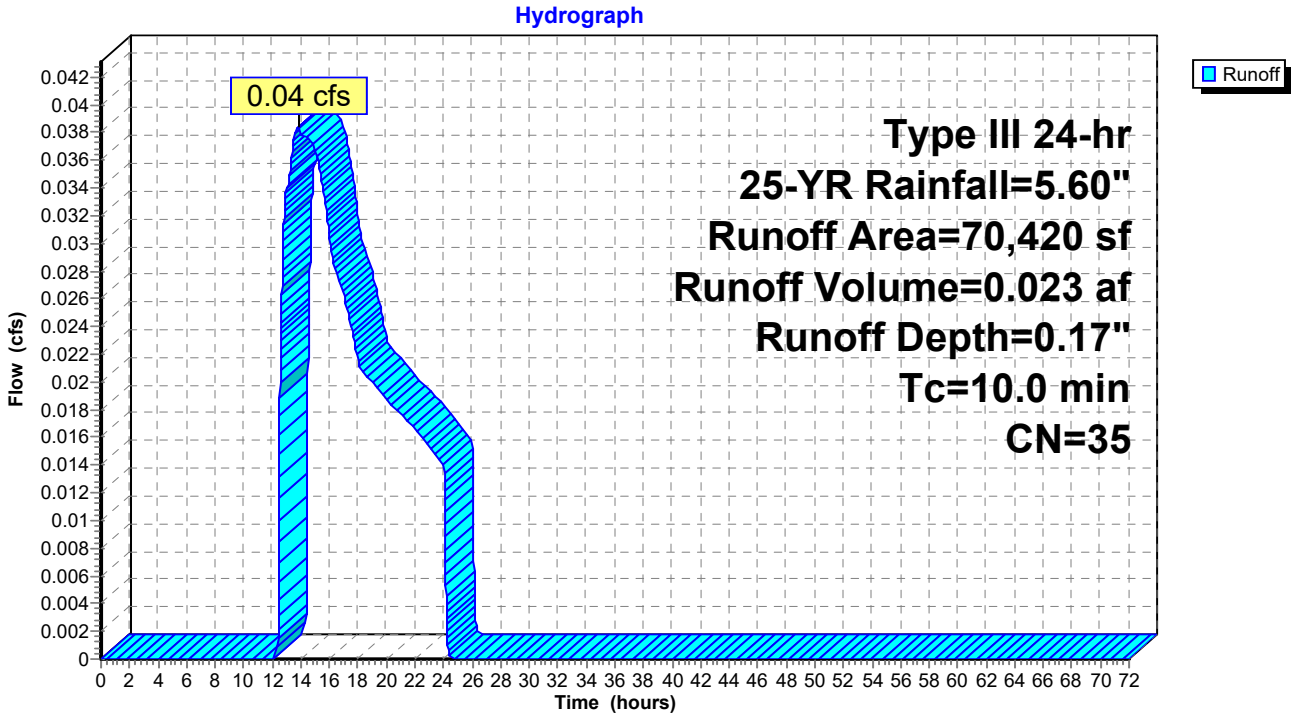
Runoff = 0.04 cfs @ 13.81 hrs, Volume= 0.023 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
11,413	39	>75% Grass cover, Good, HSG A
6,360	61	>75% Grass cover, Good, HSG B
50,600	30	Woods, Good, HSG A
2,047	55	Woods, Good, HSG B
70,420	35	Weighted Average
70,420		100.00% Pervious Area

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

Subcatchment POST-NE: POST NE



Summary for Subcatchment POST-WET: POST- WET

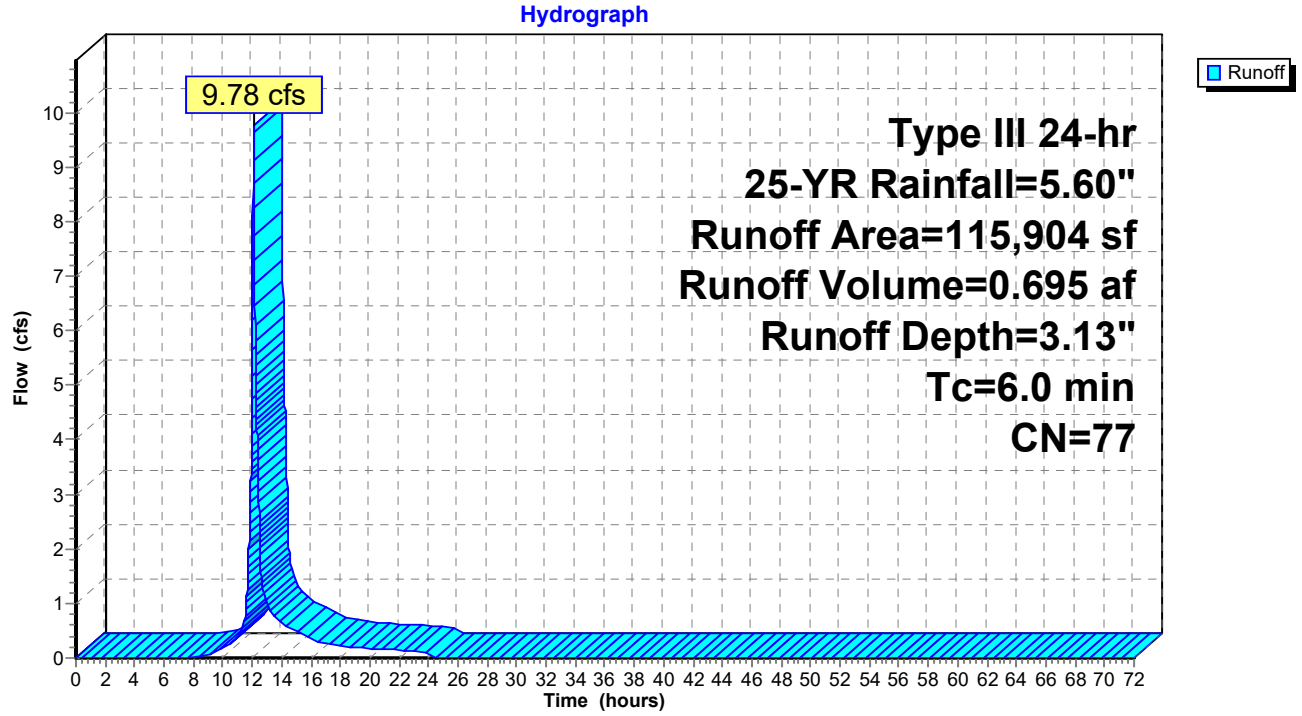
Runoff = 9.78 cfs @ 12.09 hrs, Volume= 0.695 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
115,904	77	Woods, Good, HSG D
115,904		100.00% Pervious Area

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

Subcatchment POST-WET: POST- WET



Summary for Subcatchment PRE-NE: PRE-NE

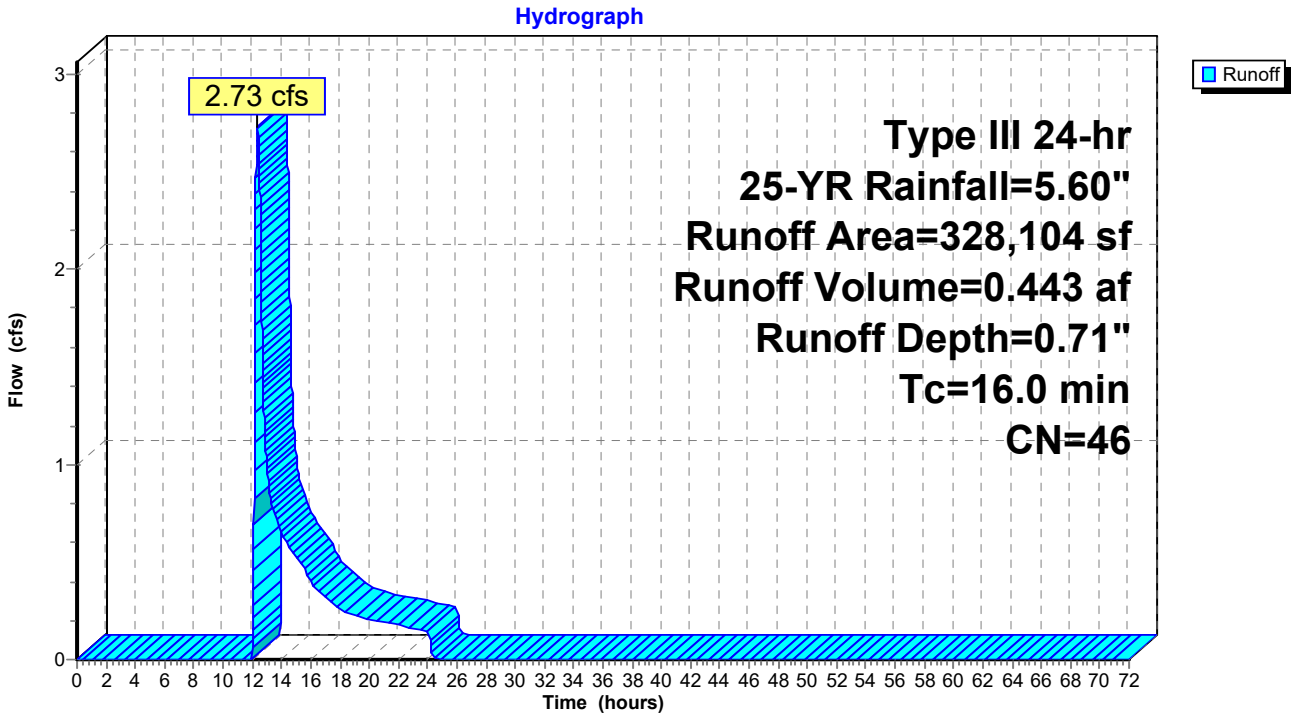
Runoff = 2.73 cfs @ 12.35 hrs, Volume= 0.443 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
174,922	30	Woods, Good, HSG A
119,325	55	Woods, Good, HSG B
33,857	96	Gravel surface, HSG B
328,104	46	Weighted Average
328,104		100.00% Pervious Area

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

Subcatchment PRE-NE: PRE-NE



Summary for Subcatchment PRE-WET: PRE- WET

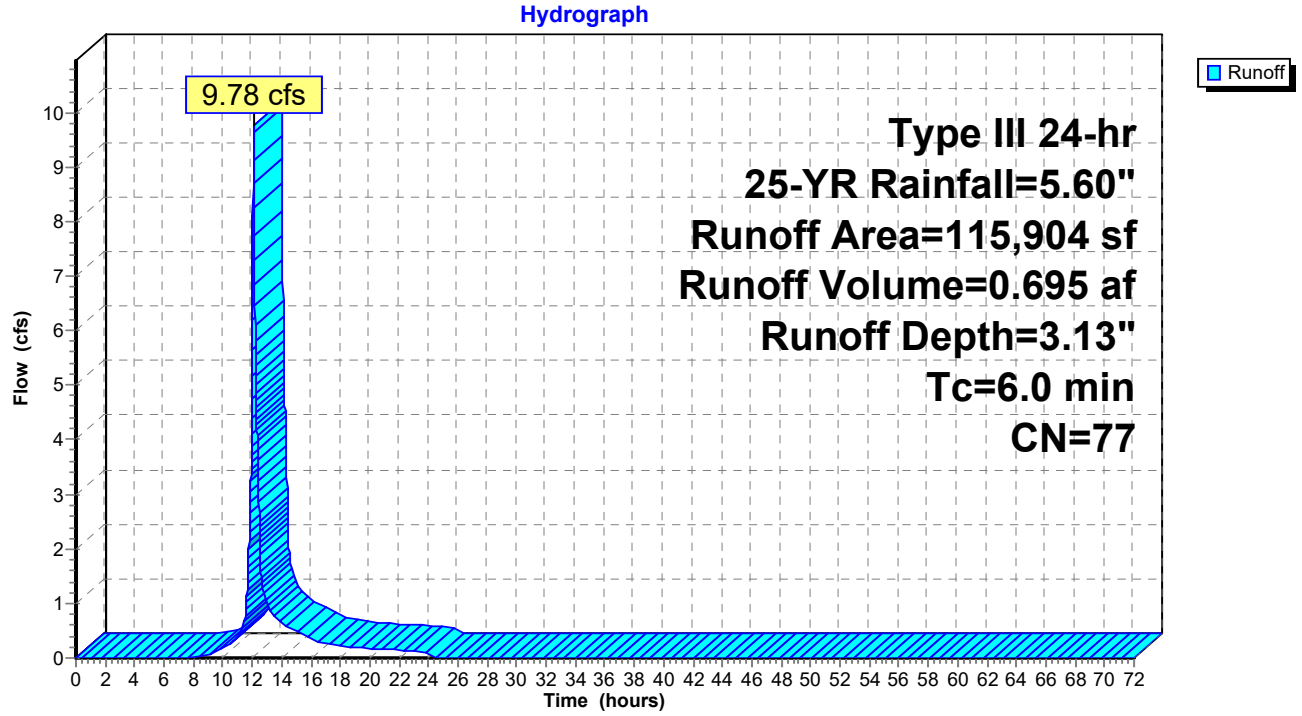
Runoff = 9.78 cfs @ 12.09 hrs, Volume= 0.695 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
115,904	77	Woods, Good, HSG D
115,904		100.00% Pervious Area

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

Subcatchment PRE-WET: PRE- WET



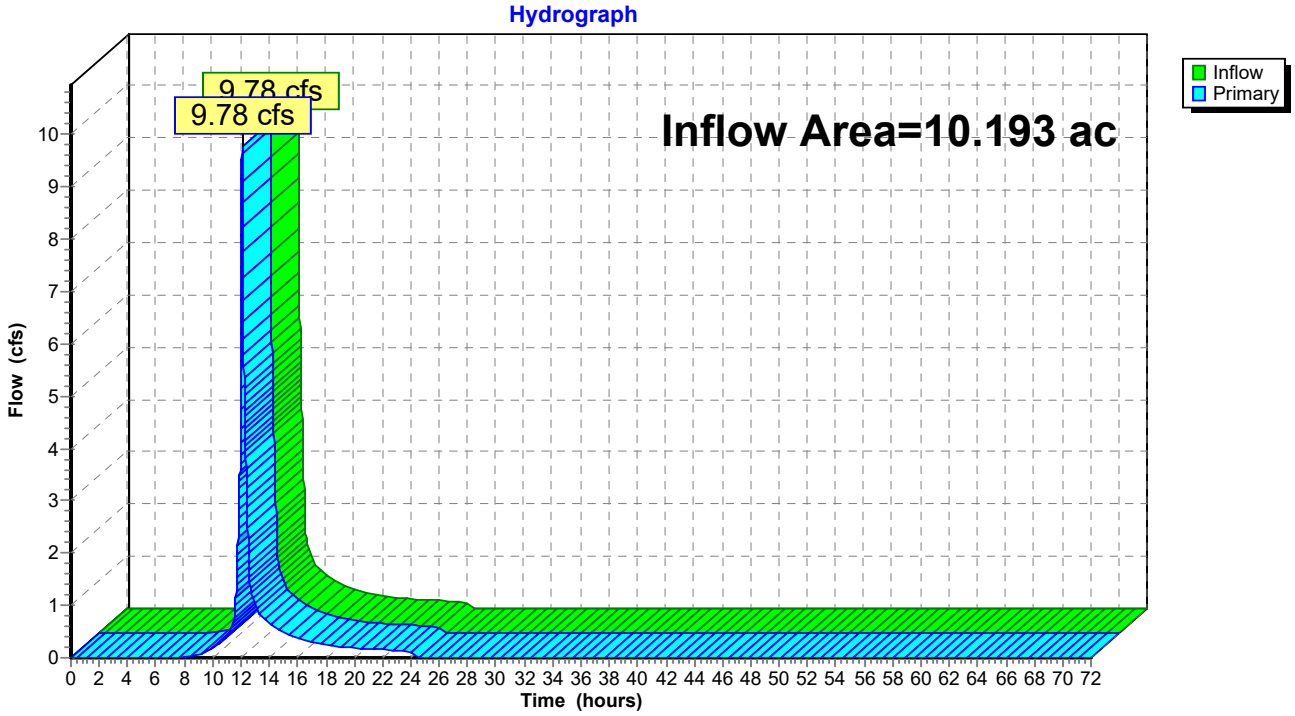
Summary for Pond POST-POA: POA POST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.193 ac, 10.78% Impervious, Inflow Depth = 0.85" for 25-YR event
Inflow = 9.78 cfs @ 12.09 hrs, Volume= 0.718 af
Primary = 9.78 cfs @ 12.09 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POST-POA: POA POST



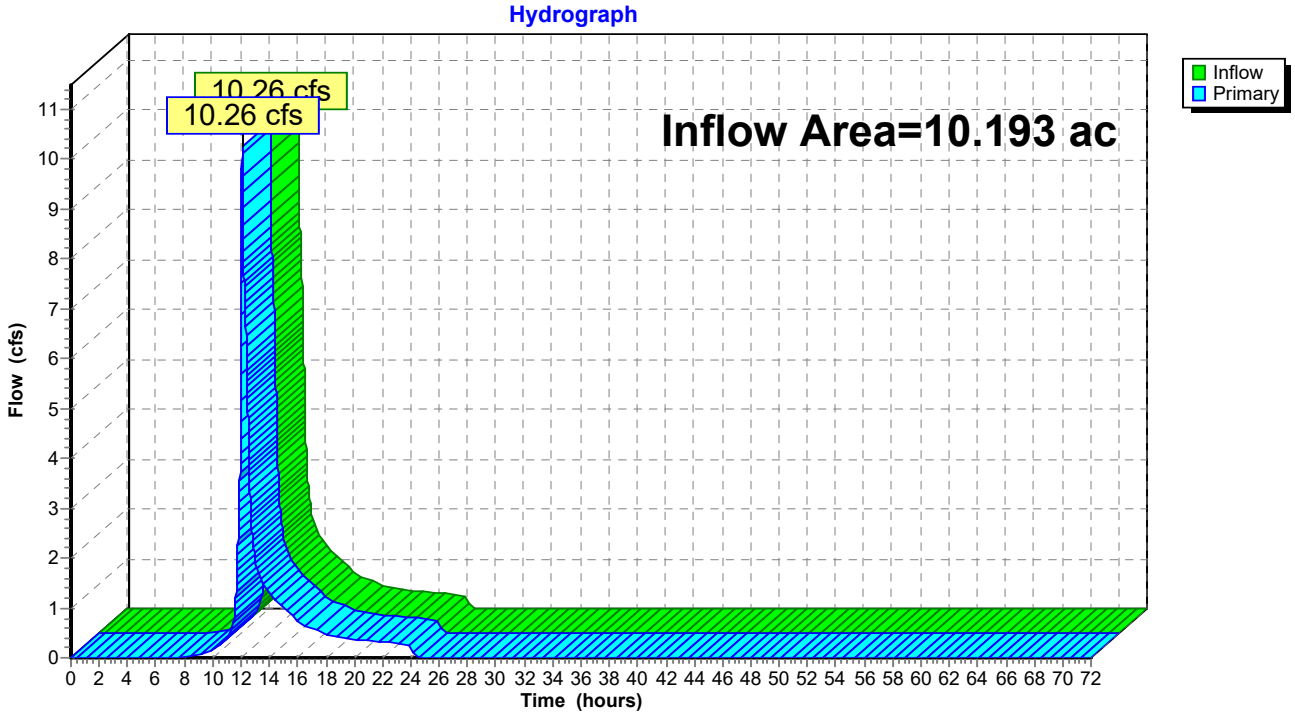
Summary for Pond PRE-POA: POA PRE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.193 ac, 0.00% Impervious, Inflow Depth = 1.34" for 25-YR event
Inflow = 10.26 cfs @ 12.10 hrs, Volume= 1.137 af
Primary = 10.26 cfs @ 12.10 hrs, Volume= 1.137 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond PRE-POA: POA PRE



Summary for Pond SMA G: SMA G

Inflow Area = 5.916 ac, 18.57% Impervious, Inflow Depth = 1.82" for 25-YR event
Inflow = 14.65 cfs @ 12.00 hrs, Volume= 0.898 af
Outflow = 1.24 cfs @ 13.28 hrs, Volume= 0.898 af, Atten= 92%, Lag= 76.4 min
Discarded = 1.24 cfs @ 13.28 hrs, Volume= 0.898 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 197.52' @ 13.28 hrs Surf.Area= 10,630 sf Storage= 15,469 cf

Plug-Flow detention time= 160.7 min calculated for 0.898 af (100% of inflow)
Center-of-Mass det. time= 160.7 min (1,017.0 - 856.3)

Volume	Invert	Avail.Storage	Storage Description
#1	195.00'	67,994 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

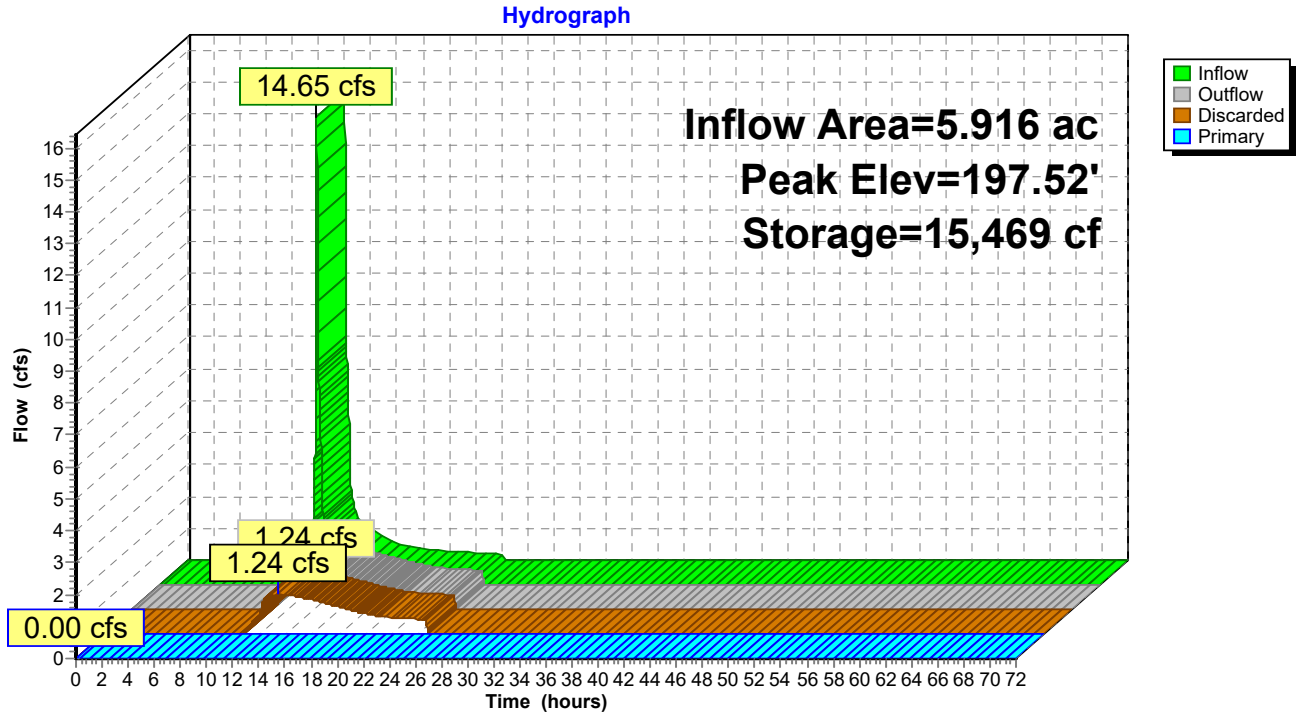
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
195.00	3,642	0	0	3,642
196.00	4,698	4,159	4,159	4,722
198.00	13,033	17,037	21,196	13,083
200.00	22,772	35,355	56,551	22,867
200.50	23,000	11,443	67,994	23,219

Device	Routing	Invert	Outlet Devices
#1	Discarded	195.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	200.25'	**150.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

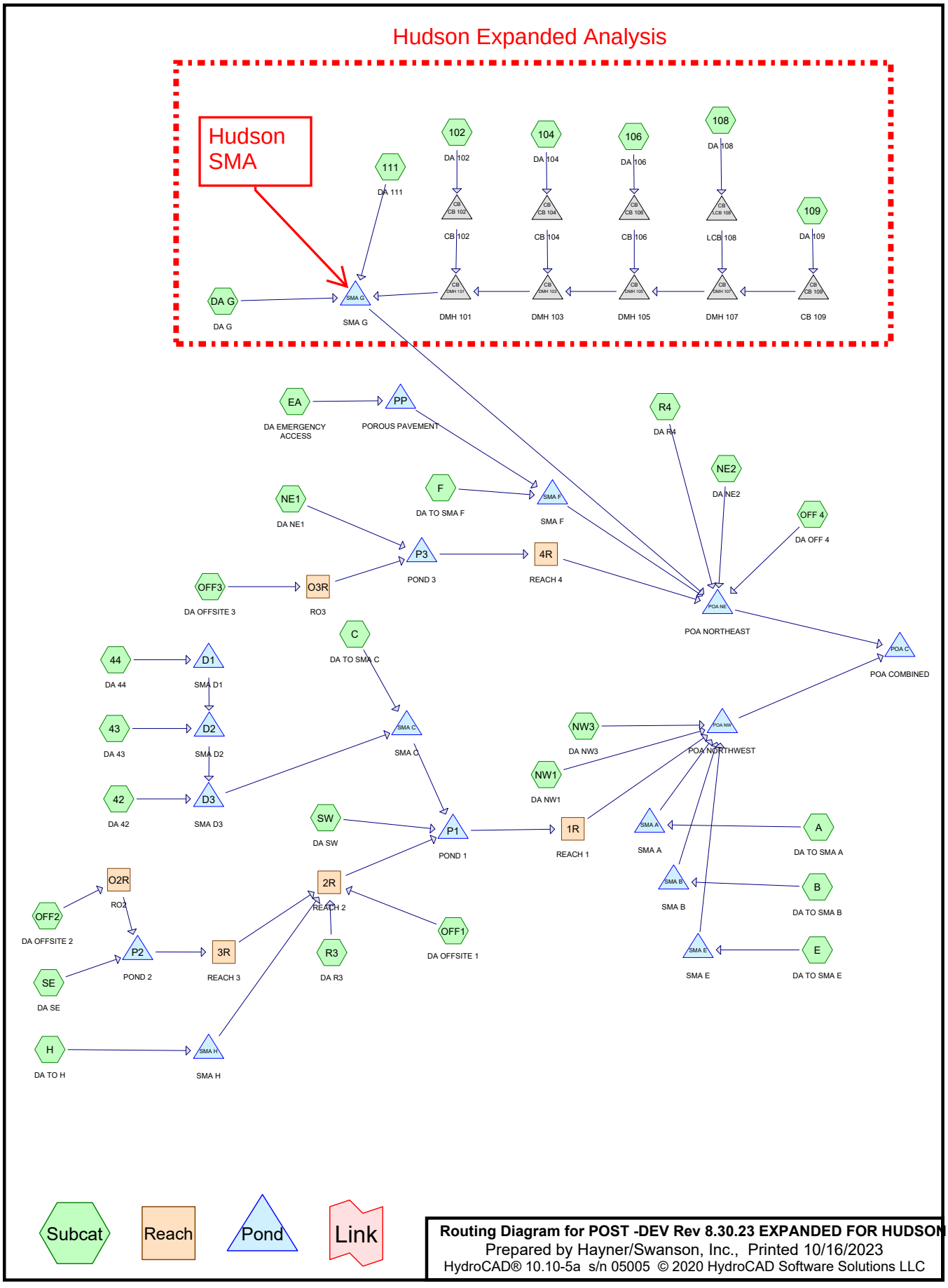
Discarded OutFlow Max=1.24 cfs @ 13.28 hrs HW=197.52' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=195.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA G: SMA G



POST-DEVELOPMENT DRAINAGE CALCULATIONS- EXPANDED



Routing Diagram for POST -DEV Rev 8.30.23 EXPANDED FOR HUDSON
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	5.60	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
26.091	46	2 acre lots, 12% imp, HSG A (OFF1, OFF3)
45.616	65	2 acre lots, 12% imp, HSG B (OFF1, OFF2, OFF3)
10.394	77	2 acre lots, 12% imp, HSG C (OFF1, OFF3)
2.575	82	2 acre lots, 12% imp, HSG D (OFF1)
23.444	39	>75% Grass cover, Good, HSG A (42, 43, 44, 108, A, B, C, DA G, E, EA, F, NE1, NE2, NW1, NW3, OFF1, R3, R4, SE, SW)
20.709	61	>75% Grass cover, Good, HSG B (44, 108, 111, A, B, C, DA G, E, F, H, NE1, NW1, NW3, OFF 4, OFF1, OFF3, R3, R4, SE, SW)
4.097	74	>75% Grass cover, Good, HSG C (C, E, NE1, NW1, NW3, R3, R4, SE, SW)
0.661	80	>75% Grass cover, Good, HSG D (E, NW1, SW)
21.116	96	Gravel surface, HSG A (OFF3)
13.436	96	Gravel surface, HSG B (111, DA G, OFF 4, OFF3)
4.248	96	Gravel surface, HSG C (OFF3)
7.423	98	Paved parking, HSG A (42, 43, 44, 102, 104, 106, 109, A, B, C, DA G, E, EA, F, NW3, OFF1)
7.348	98	Paved parking, HSG B (44, 108, 109, 111, A, B, C, DA G, E, H, NW3, OFF 4, OFF2, OFF3)
0.289	98	Paved parking, HSG C (C, E, NW3)
1.912	98	Roofs, HSG A (42, 43, 44, 102, 104, 106, 109, A, B, C, E, F)
0.783	98	Roofs, HSG B (44, 106, 109, 111, B, C, E, H, SE)
0.162	98	Unconnected pavement, HSG A (NW1, R4, SW)
0.050	98	Unconnected pavement, HSG B (B, R4, SE)
1.067	98	Unconnected roofs, HSG A (B, C, DA G, E, EA, F, NE1, NW1, R3, R4, SE, SW)
0.342	98	Unconnected roofs, HSG B (DA G, E, NE1, NW1, R4, SW)
6.046	98	Water Surface, HSG D (OFF3)
81.394	30	Woods, Good, HSG A (108, C, DA G, NE1, NE2, NW1, OFF1, OFF2, OFF3, R3, R4, SE, SW)
165.660	55	Woods, Good, HSG B (111, DA G, NE1, NW1, OFF 4, OFF1, OFF2, OFF3, R3, R4, SE, SW)
77.058	70	Woods, Good, HSG C (NE1, NW1, OFF3, R3, R4, SE, SW)
16.046	77	Woods, Good, HSG D (NE2, OFF1, OFF2, OFF3, SW)
537.966	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
162.608	HSG A	42, 43, 44, 102, 104, 106, 108, 109, A, B, C, DA G, E, EA, F, NE1, NE2, NW1, NW3, OFF1, OFF2, OFF3, R3, R4, SE, SW
253.944	HSG B	44, 106, 108, 109, 111, A, B, C, DA G, E, F, H, NE1, NW1, NW3, OFF 4, OFF1, OFF2, OFF3, R3, R4, SE, SW
96.086	HSG C	C, E, NE1, NW1, NW3, OFF1, OFF3, R3, R4, SE, SW
25.328	HSG D	E, NE2, NW1, OFF1, OFF2, OFF3, SW
0.000	Other	
537.966		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
26.091	45.616	10.394	2.575	0.000	84.676	2 acre lots, 12% imp	OFF1, OFF2, OFF3
23.444	20.709	4.097	0.661	0.000	48.910	>75% Grass cover, Good	42, 43, 44, 108, 111, A, B, C, DA G, E, EA, F, H, NE1, NE2, NW1, NW3, OFF 4, OFF1, OFF3, R3, R4, SE, SW
21.116	13.436	4.248	0.000	0.000	38.800	Gravel surface	111, DA G, OFF 4, OFF3
7.423	7.348	0.289	0.000	0.000	15.060	Paved parking	42, 43, 44, 102, 104, 106, 108, 109, 111, A, B, C, DA G, E, EA, F, H, NW3, OFF 4, OFF1, OFF2, OFF3
1.912	0.783	0.000	0.000	0.000	2.695	Roofs	42, 43, 44, 102, 104, 106, 109, 111, A, B, C, E, F, H, SE
0.162	0.050	0.000	0.000	0.000	0.212	Unconnected pavement	B, NW1, R4, SE, SW

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.067	0.342	0.000	0.000	0.000	1.408	Unconnected roofs	B, C, DA G, E, EA, F, NE1, NW1, R3, R4, SE, SW
0.000	0.000	0.000	6.046	0.000	6.046	Water Surface	OFF3
81.394	165.660	77.058	16.046	0.000	340.158	Woods, Good	108, 111, C, DA G, NE1, NE2, NW1, OFF 4, OFF1, OFF2, OFF3, R3, R4, SE, SW
162.608	**253.944**	**96.086**	**25.328**	**0.000**	**537.966**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=45,229 sf 57.20% Impervious Runoff Depth=2.76"
Tc=6.0 min CN=73 Runoff=3.35 cfs 0.239 af

Subcatchment 43: DA 43 Runoff Area=40,098 sf 61.82% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=75 Runoff=3.18 cfs 0.226 af

Subcatchment 44: DA 44 Runoff Area=55,496 sf 68.39% Impervious Runoff Depth=3.42"
Tc=6.0 min CN=80 Runoff=5.10 cfs 0.363 af

Subcatchment 102: DA 102 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.64 cfs 0.052 af

Subcatchment 104: DA 104 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.83 cfs 0.068 af

Subcatchment 106: DA 106 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.83 cfs 0.068 af

Subcatchment 108: DA 108 Runoff Area=24,993 sf 9.15% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=62 Runoff=1.16 cfs 0.087 af

Subcatchment 109: DA 109 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.64 cfs 0.052 af

Subcatchment 111: DA 111 Runoff Area=84,131 sf 23.01% Impervious Runoff Depth=2.85"
Tc=6.0 min CN=74 Runoff=6.45 cfs 0.459 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=2.06"
Tc=6.4 min CN=65 Runoff=2.38 cfs 0.177 af

Subcatchment B: DA TO SMA B Runoff Area=217,662 sf 33.09% Impervious Runoff Depth=2.06"
Tc=7.4 min CN=65 Runoff=11.16 cfs 0.860 af

Subcatchment C: DA TO SMA C Runoff Area=180,572 sf 31.94% Impervious Runoff Depth=1.59"
Tc=7.5 min CN=59 Runoff=6.71 cfs 0.549 af

Subcatchment DA G: DA G Runoff Area=5.481 ac 23.26% Impervious Runoff Depth=1.82"
Tc=0.0 min CN=62 Runoff=13.58 cfs 0.832 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=2.67"
Tc=7.7 min CN=72 Runoff=27.29 cfs 2.067 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=1.02"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.39 cfs 0.036 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=1.98"
Tc=6.1 min CN=64 Runoff=2.90 cfs 0.215 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=3.42"
Tc=6.5 min CN=80 Runoff=5.25 cfs 0.380 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=1.67"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=16.27 cfs 1.485 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=471' Tc=17.2 min CN=58 Runoff=5.19 cfs 0.574 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=1.74"
Flow Length=762' Tc=14.8 min CN=61 Runoff=14.86 cfs 1.491 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=2.85"
Flow Length=1,017' Tc=9.3 min CN=74 Runoff=3.26 cfs 0.260 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=3.42"
Tc=6.0 min CN=80 Runoff=12.84 cfs 0.915 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.15"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=40.65 cfs 7.752 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=1.59"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=29.33 cfs 2.994 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=1.67"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=151.04 cfs 46.913 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=1.74"
Flow Length=330' Tc=11.0 min CN=61 Runoff=5.97 cfs 0.537 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=1.22"
Flow Length=297' Tc=9.1 min UI Adjusted CN=54 Runoff=3.30 cfs 0.313 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=1.67"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=11.74 cfs 1.625 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=1.59"
Flow Length=1,267' Tc=18.5 min CN=59 Runoff=16.54 cfs 1.856 af

Reach 1R: REACH 1 Avg. Flow Depth=0.87' Max Vel=1.88 fps Inflow=36.70 cfs 15.297 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=36.65 cfs 15.297 af

Reach 2R: REACH 2 Avg. Flow Depth=0.87' Max Vel=3.55 fps Inflow=66.55 cfs 12.901 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=65.60 cfs 12.901 af

Reach 3R: REACH 3 Avg. Flow Depth=0.49' Max Vel=1.45 fps Inflow=24.82 cfs 4.612 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=24.68 cfs 4.612 af

Reach 4R: REACH 4 Avg. Flow Depth=1.32' Max Vel=3.37 fps Inflow=152.69 cfs 48.397 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=152.66 cfs 48.397 af

Reach O2R: RO2 Avg. Flow Depth=0.62' Max Vel=2.86 fps Inflow=29.33 cfs 2.994 af
n=0.025 L=680.0' S=0.0096 '/' Capacity=154.12 cfs Outflow=27.72 cfs 2.994 af

Reach O3R: RO3 Avg. Flow Depth=1.12' Max Vel=4.75 fps Inflow=151.04 cfs 46.913 af
n=0.025 L=960.0' S=0.0120 '/' Capacity=1,095.54 cfs Outflow=150.78 cfs 46.913 af

Pond CB 102: CB 102 Peak Elev=201.06' Inflow=0.64 cfs 0.052 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.64 cfs 0.052 af

Pond CB 104: CB 104 Peak Elev=201.13' Inflow=0.83 cfs 0.068 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.83 cfs 0.068 af

Pond CB 106: CB 106 Peak Elev=201.13' Inflow=0.83 cfs 0.068 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.83 cfs 0.068 af

Pond CB 109: CB 109 Peak Elev=201.06' Inflow=0.64 cfs 0.052 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.64 cfs 0.052 af

Pond D1: SMA D1 Peak Elev=212.44' Storage=6,786 cf Inflow=5.10 cfs 0.363 af
Discarded=0.16 cfs 0.158 af Primary=0.59 cfs 0.205 af Outflow=0.75 cfs 0.363 af

Pond D2: SMA D2 Peak Elev=209.79' Storage=11,111 cf Inflow=3.62 cfs 0.431 af
Discarded=0.28 cfs 0.431 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.431 af

Pond D3: SMA D3 Peak Elev=207.80' Storage=4,158 cf Inflow=3.35 cfs 0.239 af
Discarded=0.29 cfs 0.239 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.239 af

Pond DMH 101: DMH 101 Peak Elev=198.98' Inflow=4.10 cfs 0.327 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=4.10 cfs 0.327 af

Pond DMH 103: DMH 103 Peak Elev=199.34' Inflow=3.46 cfs 0.275 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=3.46 cfs 0.275 af

Pond DMH 105: DMH 105 Peak Elev=199.57' Inflow=2.63 cfs 0.207 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0048 '/' Outflow=2.63 cfs 0.207 af

Pond DMH 107: DMH 107 Peak Elev=199.84' Inflow=1.80 cfs 0.139 af
12.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=1.80 cfs 0.139 af

Pond LCB 108: LCB 108 Peak Elev=200.05' Inflow=1.16 cfs 0.087 af
12.0" Round Culvert n=0.012 L=63.0' S=0.0049 '/' Outflow=1.16 cfs 0.087 af

Pond P1: POND 1 Peak Elev=191.39' Storage=120,906 cf Inflow=71.83 cfs 15.298 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=36.70 cfs 15.297 af

Pond P2: POND 2 Peak Elev=206.13' Storage=27,642 cf Inflow=36.56 cfs 4.619 af
Outflow=24.82 cfs 4.612 af

Pond P3: POND 3 Peak Elev=195.70' Storage=1,080 cf Inflow=152.69 cfs 48.398 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=152.69 cfs 48.397 af

Pond POA C: POA COMBINED Inflow=195.50 cfs 70.106 af
Primary=195.50 cfs 70.106 af

Pond POA NE: POA NORTHEAST Inflow=154.88 cfs 50.269 af
Primary=154.88 cfs 50.269 af

Pond POA NW: POA NORTHWEST Inflow=40.80 cfs 19.837 af
Primary=40.80 cfs 19.837 af

Pond PP: POROUS PAVEMENT Peak Elev=191.01' Storage=0.005 af Inflow=0.39 cfs 0.036 af
Discarded=0.14 cfs 0.036 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.036 af

Pond SMA A: SMA A Peak Elev=191.89' Storage=2,283 cf Inflow=2.38 cfs 0.177 af
Discarded=0.45 cfs 0.177 af Primary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.177 af

Pond SMA B: SMA B Peak Elev=189.84' Storage=117,125 cf Inflow=11.16 cfs 0.860 af
Outflow=0.63 cfs 0.827 af

Pond SMA C: SMA C Peak Elev=195.78' Storage=74,995 cf Inflow=6.71 cfs 0.549 af
Outflow=0.56 cfs 0.541 af

Pond SMA E: SMA E Peak Elev=194.15' Storage=219,337 cf Inflow=27.29 cfs 2.067 af
Outflow=1.35 cfs 1.962 af

Pond SMA F: SMA F Peak Elev=194.59' Storage=2,413 cf Inflow=2.90 cfs 0.215 af
Discarded=0.13 cfs 0.145 af Primary=1.55 cfs 0.070 af Outflow=1.68 cfs 0.215 af

Pond SMA G: SMA G Peak Elev=198.65' Storage=30,662 cf Inflow=20.17 cfs 1.618 af
Discarded=1.85 cfs 1.618 af Primary=0.00 cfs 0.000 af Outflow=1.85 cfs 1.618 af

Pond SMA H: SMA H Peak Elev=209.55' Storage=10,987 cf Inflow=5.25 cfs 0.380 af
Discarded=0.14 cfs 0.380 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.380 af

Total Runoff Area = 537.966 ac Runoff Volume = 73.443 af Average Runoff Depth = 1.64"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Summary for Subcatchment 42: DA 42

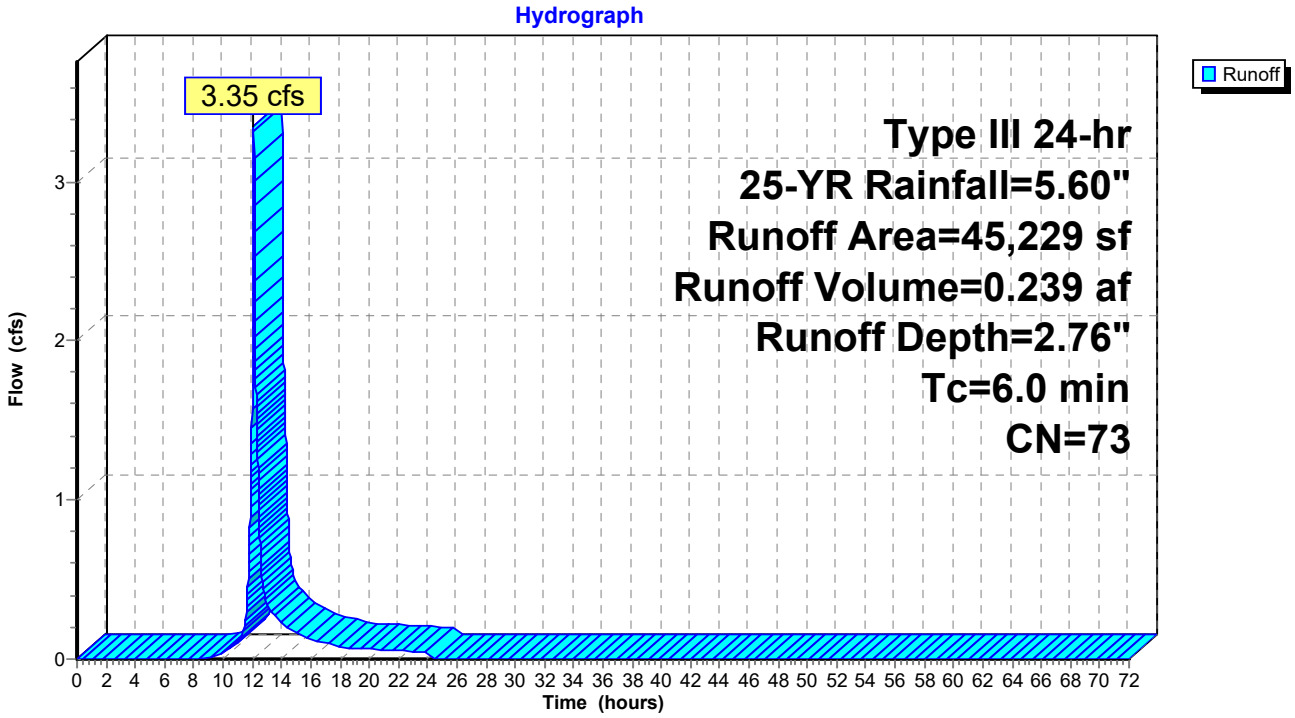
Runoff = 3.35 cfs @ 12.09 hrs, Volume= 0.239 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
17,448	98	Paved parking, HSG A
19,360	39	>75% Grass cover, Good, HSG A
8,421	98	Roofs, HSG A
45,229	73	Weighted Average
19,360		42.80% Pervious Area
25,869		57.20% Impervious Area

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

Subcatchment 42: DA 42



Summary for Subcatchment 43: DA 43

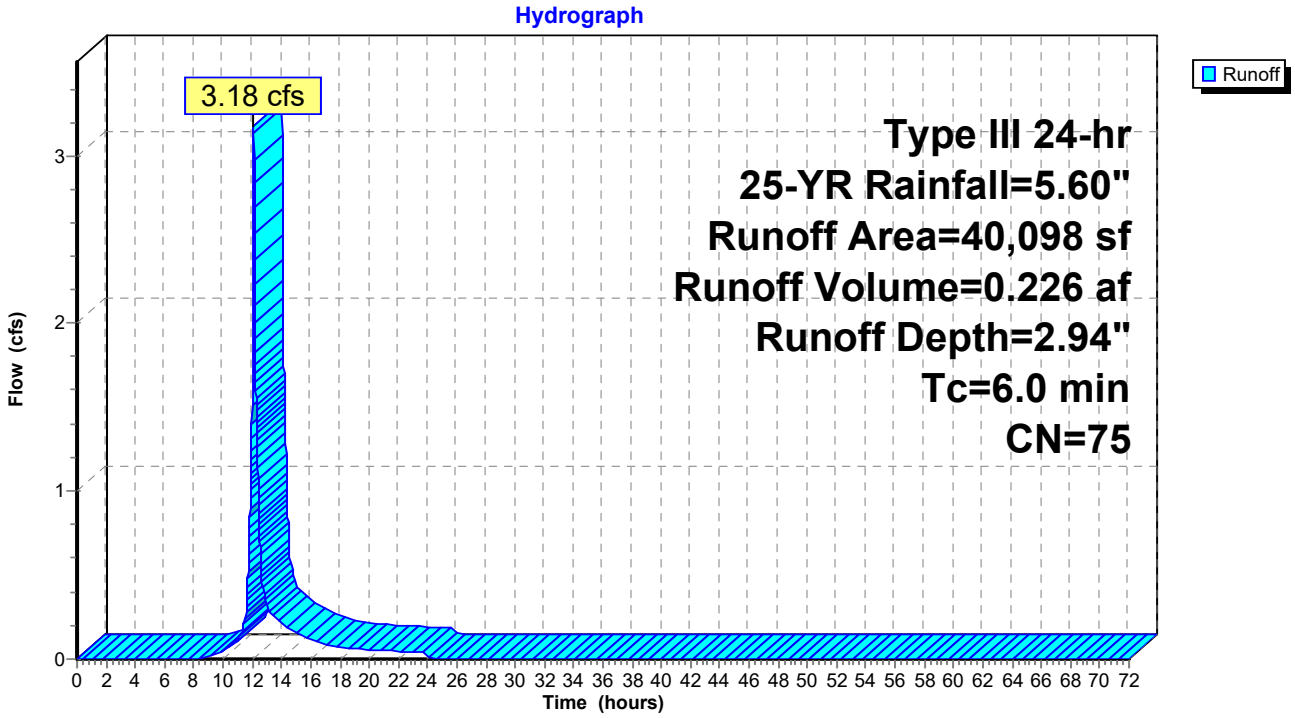
Runoff = 3.18 cfs @ 12.09 hrs, Volume= 0.226 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
16,495	98	Paved parking, HSG A
15,309	39	>75% Grass cover, Good, HSG A
8,294	98	Roofs, HSG A
40,098	75	Weighted Average
15,309		38.18% Pervious Area
24,789		61.82% Impervious Area

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

Subcatchment 43: DA 43



Summary for Subcatchment 44: DA 44

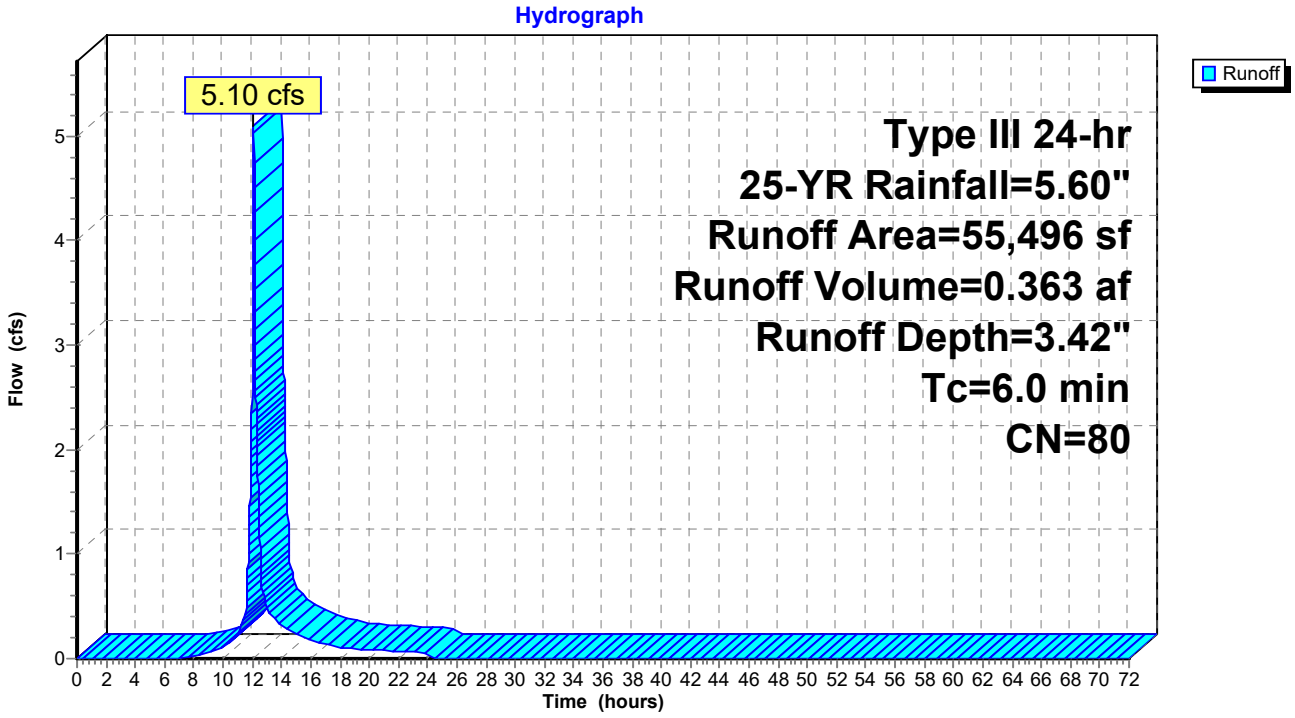
Runoff = 5.10 cfs @ 12.09 hrs, Volume= 0.363 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
22,116	98	Paved parking, HSG A
14,691	39	>75% Grass cover, Good, HSG A
9,672	98	Roofs, HSG A
3,725	98	Paved parking, HSG B
2,850	61	>75% Grass cover, Good, HSG B
2,442	98	Roofs, HSG B
55,496	80	Weighted Average
17,541		31.61% Pervious Area
37,955		68.39% Impervious Area

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

Subcatchment 44: DA 44



Summary for Subcatchment 102: DA 102

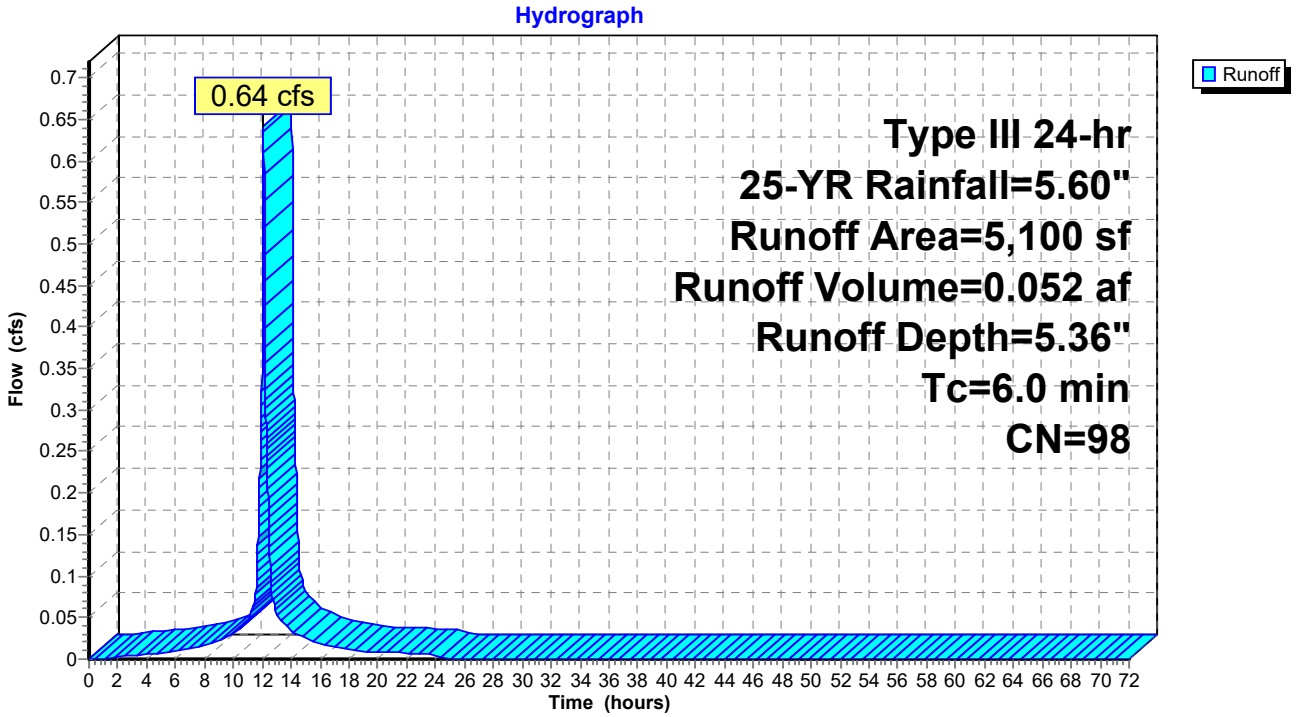
Runoff = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
3,600	98	Paved parking, HSG A
0	39	>75% Grass cover, Good, HSG A
1,500	98	Roofs, HSG A
0	98	Paved parking, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
5,100	98	Weighted Average
5,100		100.00% Impervious Area

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

Subcatchment 102: DA 102



Summary for Subcatchment 104: DA 104

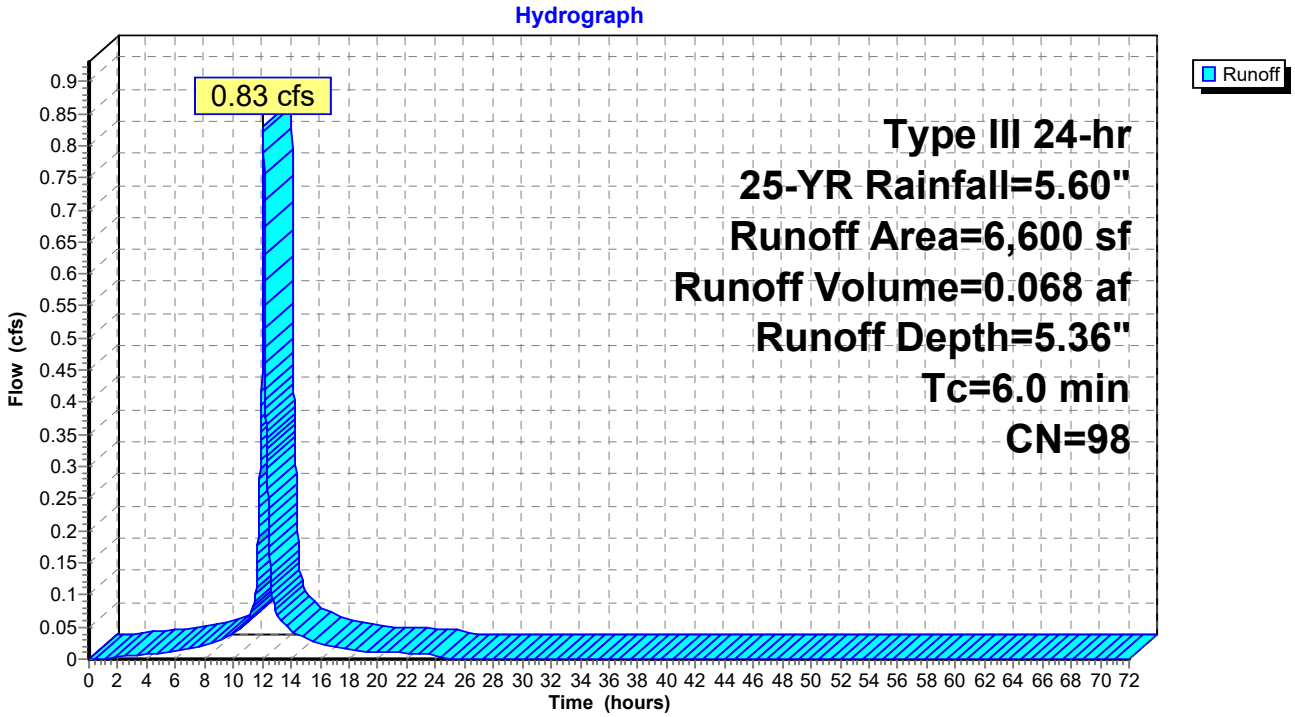
Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
3,600	98	Paved parking, HSG A
0	39	>75% Grass cover, Good, HSG A
3,000	98	Roofs, HSG A
0	98	Paved parking, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
6,600	98	Weighted Average
6,600		100.00% Impervious Area

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

Subcatchment 104: DA 104



Summary for Subcatchment 106: DA 106

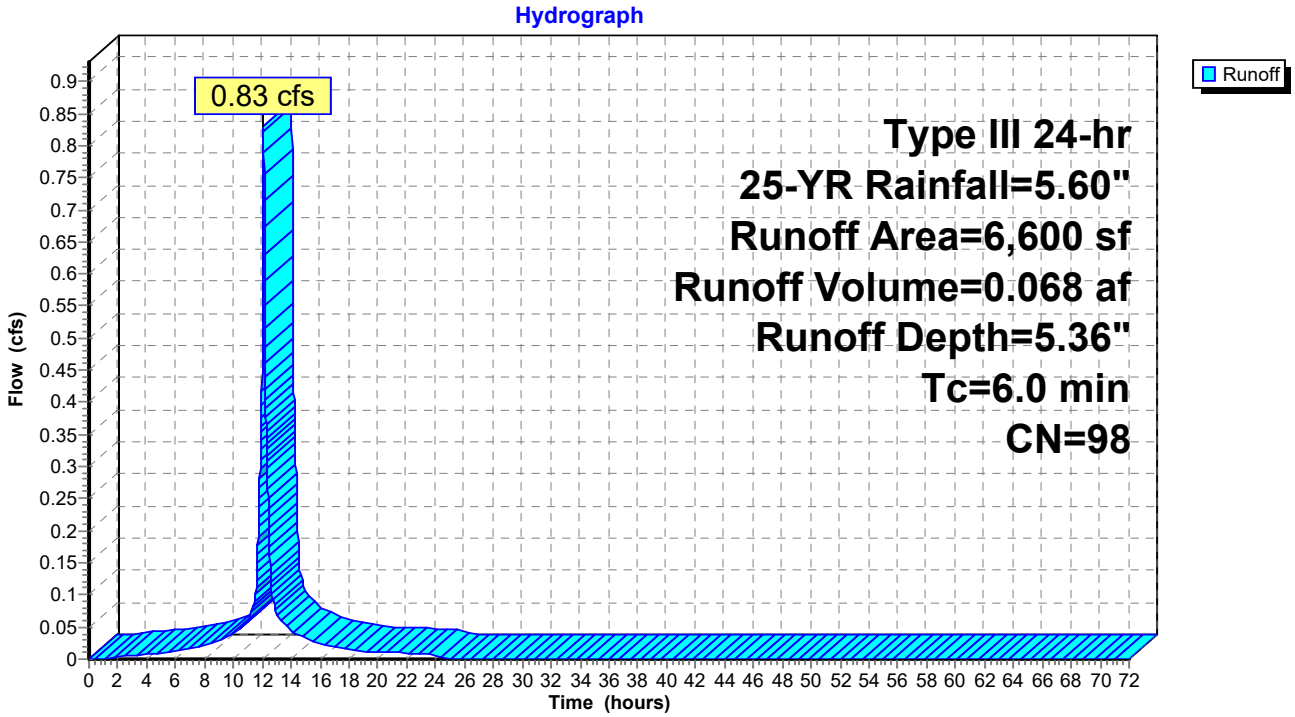
Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
3,600	98	Paved parking, HSG A
0	39	>75% Grass cover, Good, HSG A
2,957	98	Roofs, HSG A
0	98	Paved parking, HSG B
0	61	>75% Grass cover, Good, HSG B
43	98	Roofs, HSG B
6,600	98	Weighted Average
6,600		100.00% Impervious Area

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

Subcatchment 106: DA 106



Summary for Subcatchment 108: DA 108

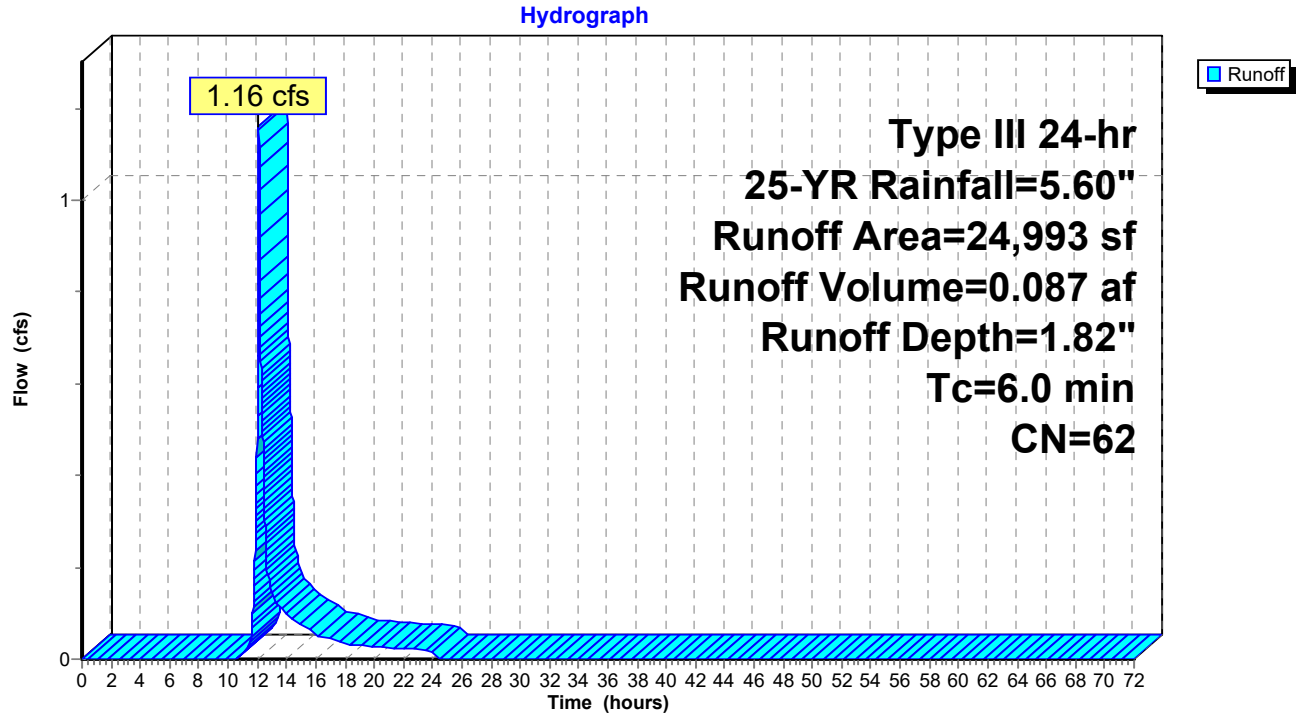
Runoff = 1.16 cfs @ 12.10 hrs, Volume= 0.087 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
0	98	Paved parking, HSG A
628	39	>75% Grass cover, Good, HSG A
0	98	Roofs, HSG A
2,287	98	Paved parking, HSG B
20,689	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
1,389	30	Woods, Good, HSG A
24,993	62	Weighted Average
22,706		90.85% Pervious Area
2,287		9.15% Impervious Area

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

Subcatchment 108: DA 108



Summary for Subcatchment 109: DA 109

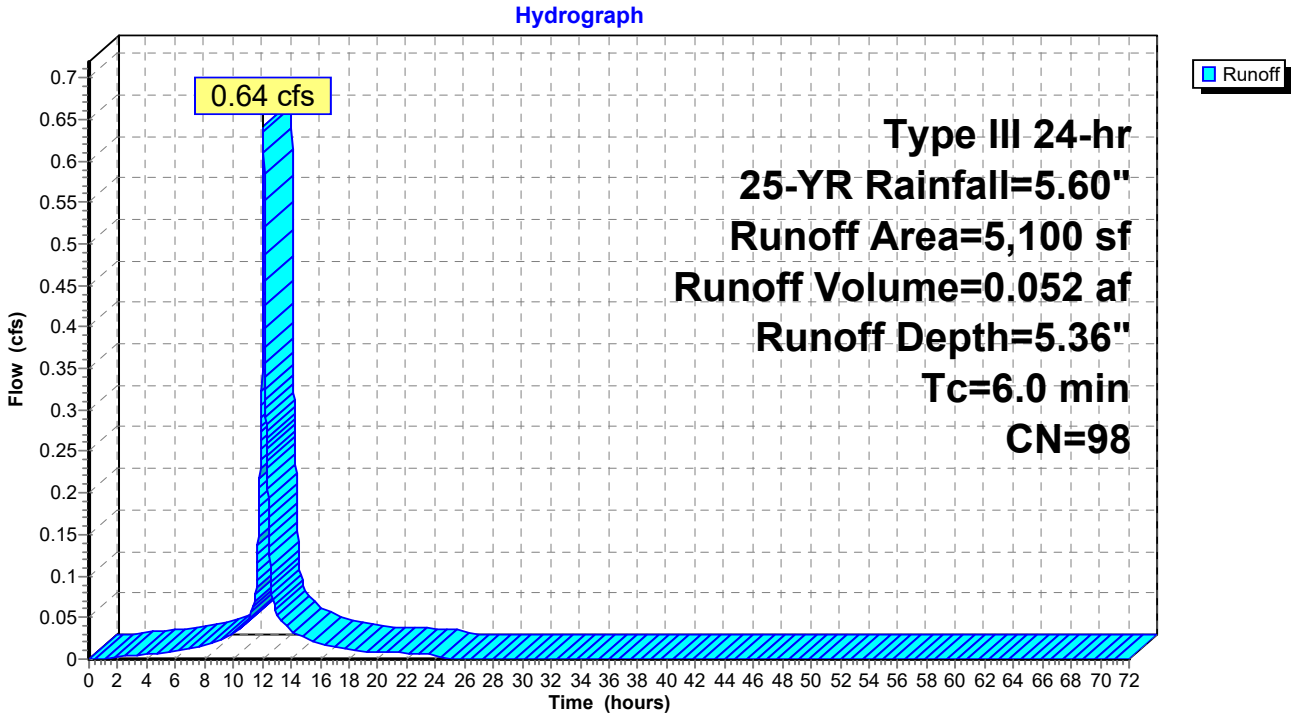
Runoff = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
2,804	98	Paved parking, HSG A
0	39	>75% Grass cover, Good, HSG A
1,351	98	Roofs, HSG A
796	98	Paved parking, HSG B
0	61	>75% Grass cover, Good, HSG B
149	98	Roofs, HSG B
5,100	98	Weighted Average
5,100		100.00% Impervious Area

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

Subcatchment 109: DA 109



Summary for Subcatchment 111: DA 111

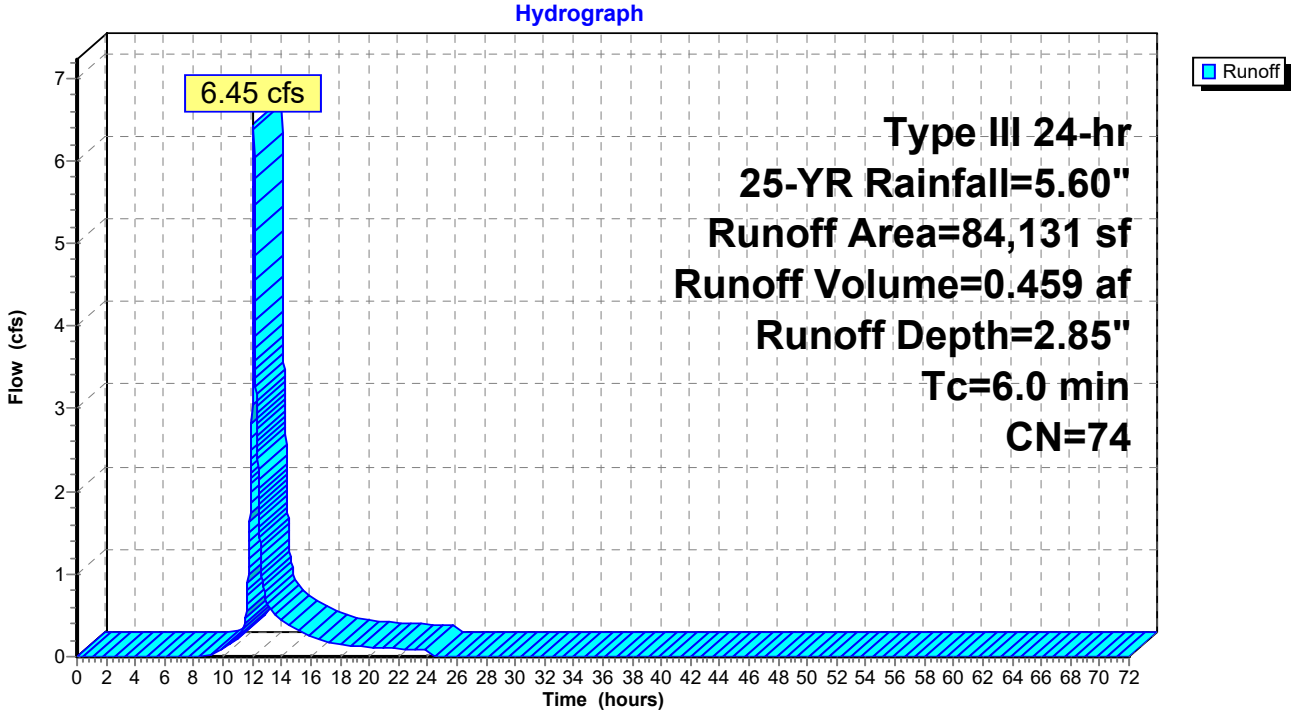
Runoff = 6.45 cfs @ 12.09 hrs, Volume= 0.459 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
0	98	Paved parking, HSG A
0	39	>75% Grass cover, Good, HSG A
0	98	Roofs, HSG A
15,147	98	Paved parking, HSG B
49,262	61	>75% Grass cover, Good, HSG B
4,211	98	Roofs, HSG B
3,581	55	Woods, Good, HSG B
11,930	96	Gravel surface, HSG B
84,131	74	Weighted Average
64,773		76.99% Pervious Area
19,358		23.01% Impervious Area

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

Subcatchment 111: DA 111



Summary for Subcatchment A: DA TO SMA A

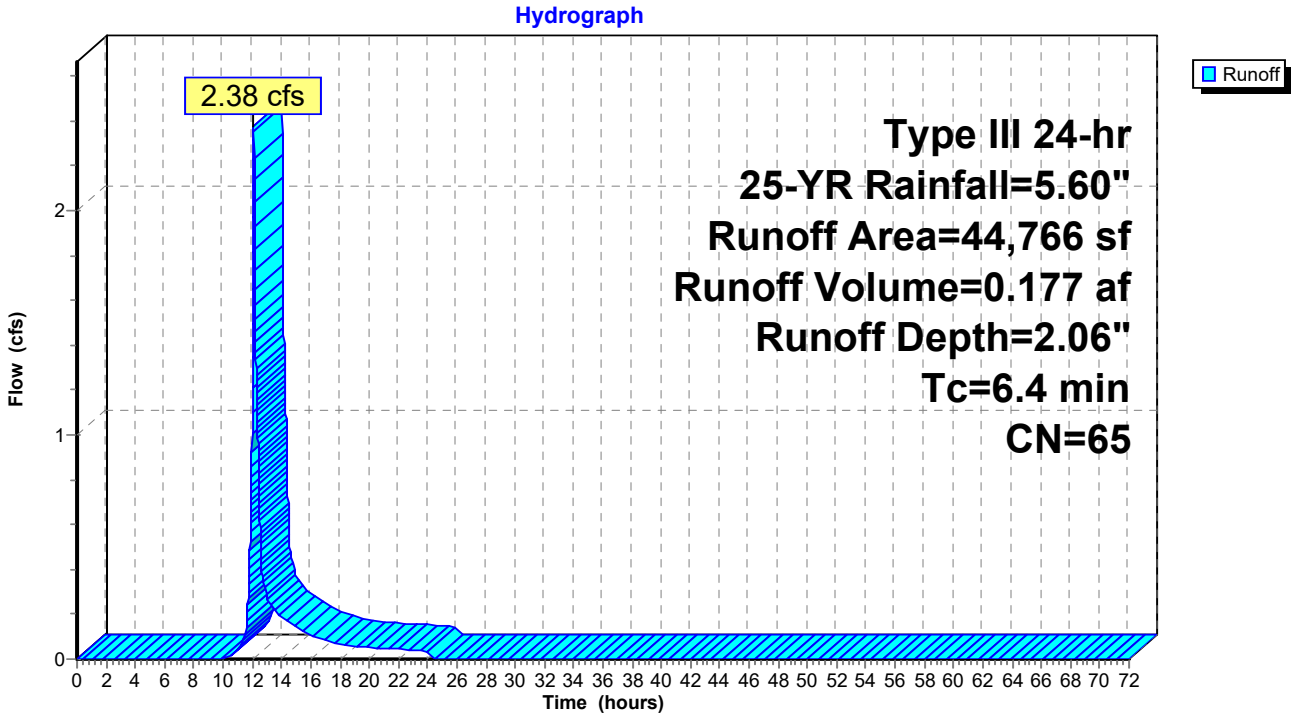
Runoff = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
13,423	98	Paved parking, HSG A
24,647	39	>75% Grass cover, Good, HSG A
4,211	98	Roofs, HSG A
1,929	98	Paved parking, HSG B
556	61	>75% Grass cover, Good, HSG B
44,766	65	Weighted Average
25,203		56.30% Pervious Area
19,563		43.70% Impervious Area

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

Subcatchment A: DA TO SMA A



Summary for Subcatchment B: DA TO SMA B

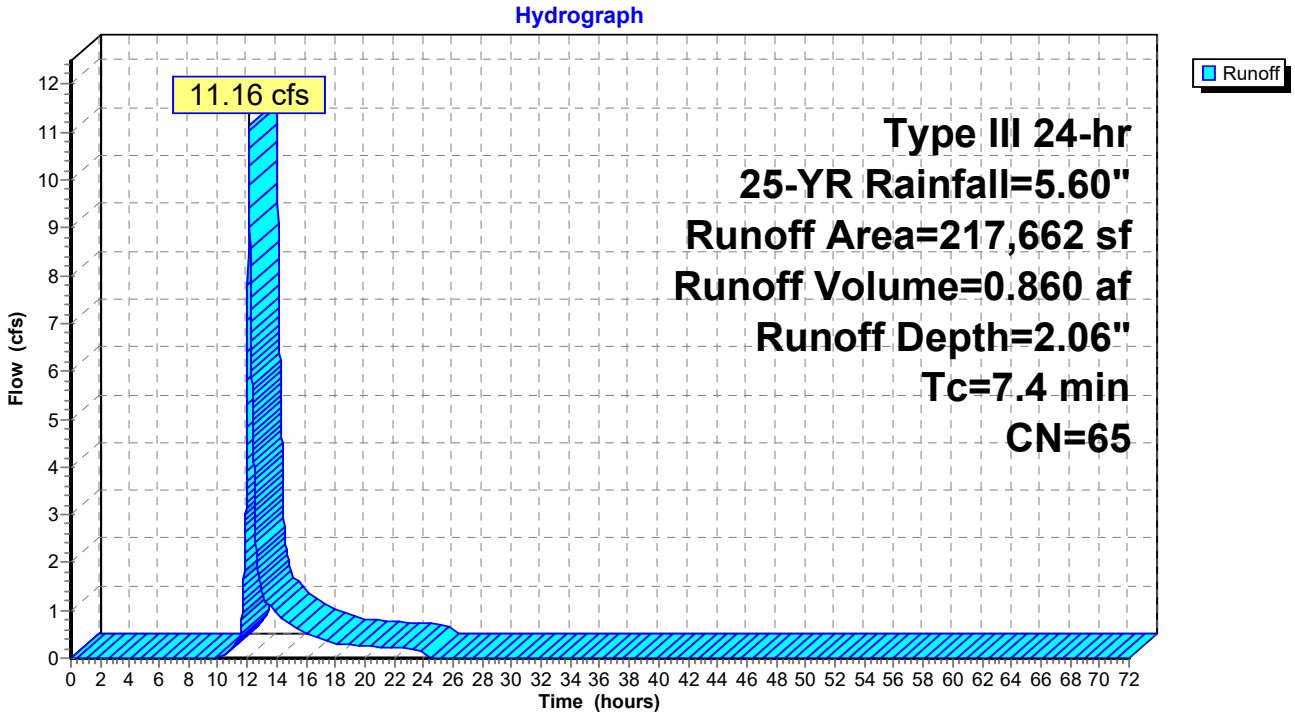
Runoff = 11.16 cfs @ 12.11 hrs, Volume= 0.860 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
39,403	98	Paved parking, HSG A
78,039	39	>75% Grass cover, Good, HSG A
4,782	98	Roofs, HSG A
3,020	98	Unconnected roofs, HSG A
19,543	98	Paved parking, HSG B
67,593	61	>75% Grass cover, Good, HSG B
4,217	98	Roofs, HSG B
1,065	98	Unconnected pavement, HSG B
217,662	65	Weighted Average
145,632		66.91% Pervious Area
72,030		33.09% Impervious Area
4,085		5.67% Unconnected

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

Subcatchment B: DA TO SMA B



Summary for Subcatchment C: DA TO SMA C

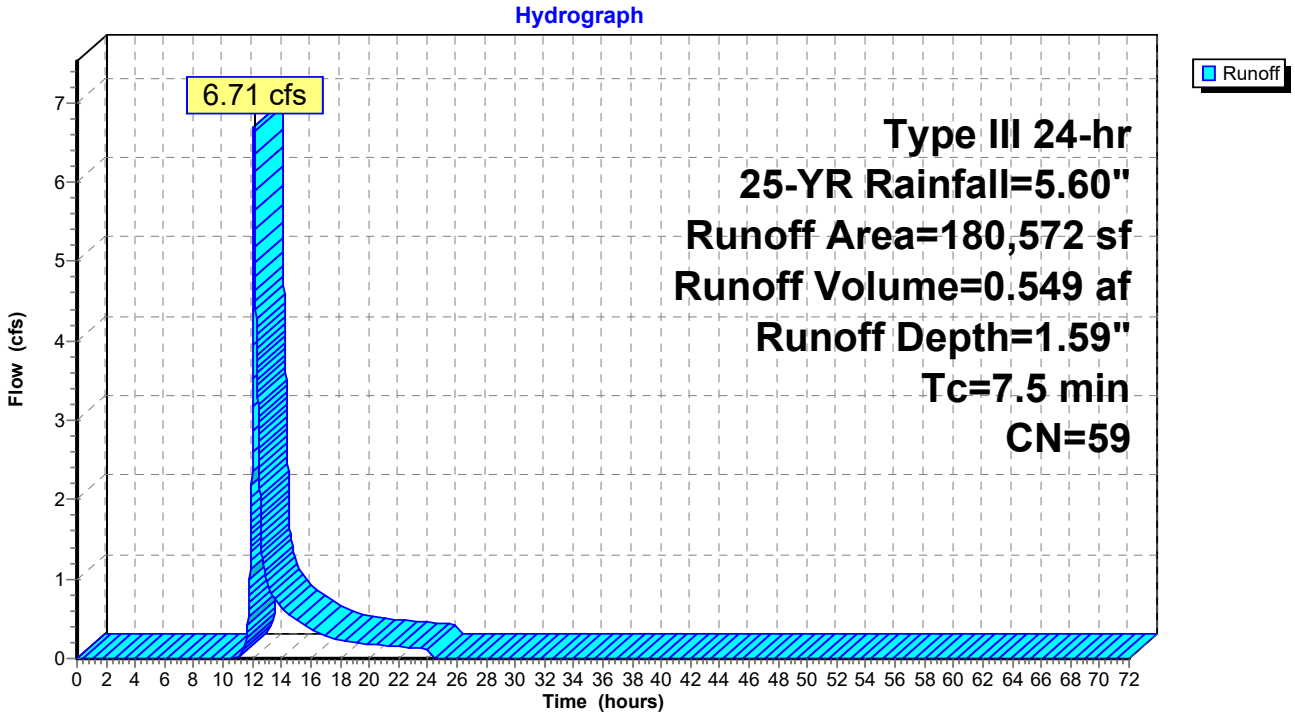
Runoff = 6.71 cfs @ 12.12 hrs, Volume= 0.549 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
35,767	98	Paved parking, HSG A
104,471	39	>75% Grass cover, Good, HSG A
9,496	98	Roofs, HSG A
5,358	98	Unconnected roofs, HSG A
1,350	98	Paved parking, HSG B
6,270	61	>75% Grass cover, Good, HSG B
218	98	Roofs, HSG B
0	98	Unconnected roofs, HSG B
5,489	98	Paved parking, HSG C
2,178	74	>75% Grass cover, Good, HSG C
9,975	30	Woods, Good, HSG A
180,572	59	Weighted Average
122,894		68.06% Pervious Area
57,678		31.94% Impervious Area
5,358		9.29% Unconnected

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

Subcatchment C: DA TO SMA C



Summary for Subcatchment DA G: DA G

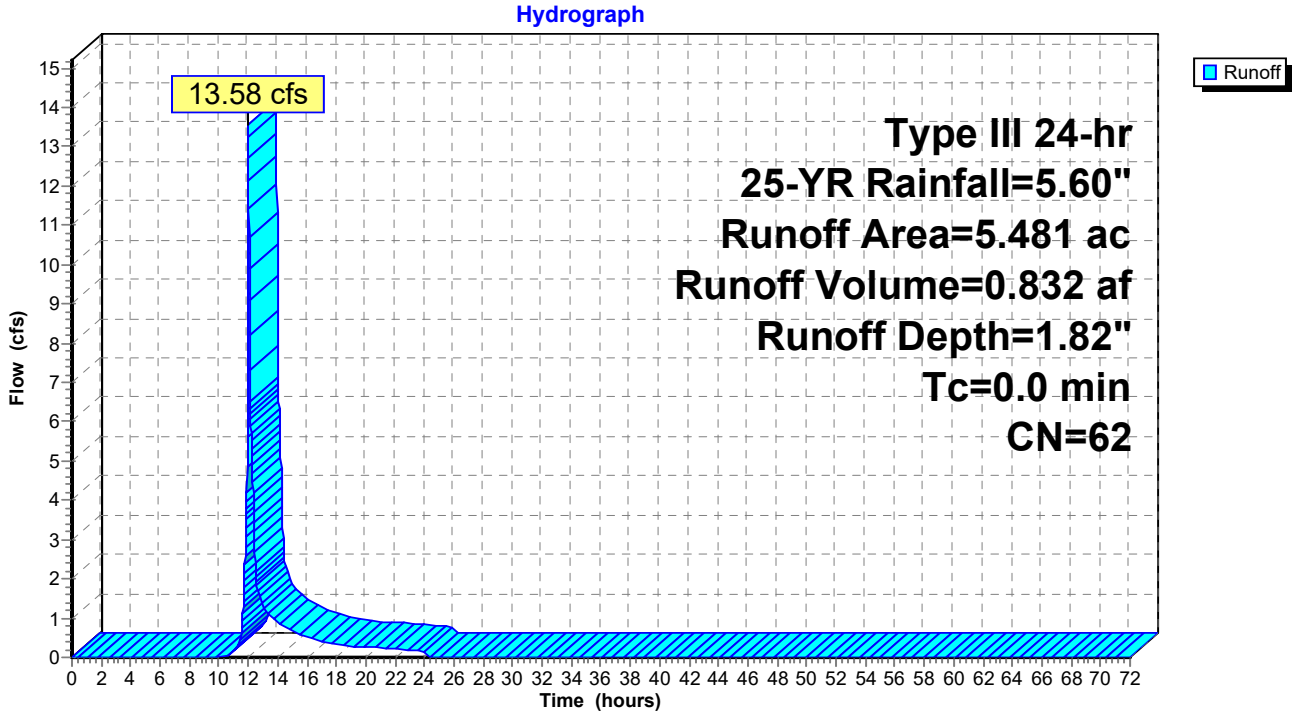
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 13.58 cfs @ 12.00 hrs, Volume= 0.832 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
1.847	39	>75% Grass cover, Good, HSG A
0.086	98	Unconnected roofs, HSG A
0.840	98	Paved parking, HSG B
1.542	61	>75% Grass cover, Good, HSG B
0.011	98	Unconnected roofs, HSG B
0.284	30	Woods, Good, HSG A
0.233	55	Woods, Good, HSG B
0.300	96	Gravel surface, HSG B
5.481	62	Weighted Average
4.206		76.74% Pervious Area
1.275		23.26% Impervious Area
0.097		7.61% Unconnected

Subcatchment DA G: DA G



Summary for Subcatchment E: DA TO SMA E

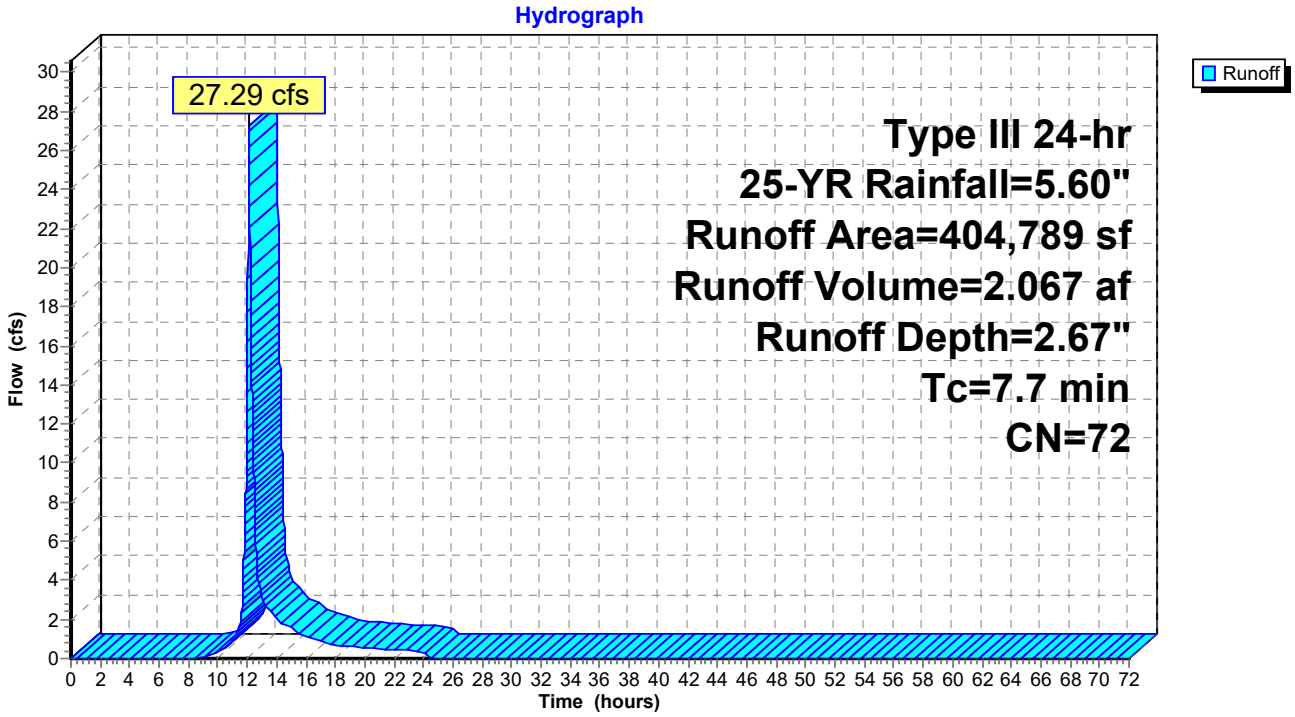
Runoff = 27.29 cfs @ 12.11 hrs, Volume= 2.067 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
73,877	98	Paved parking, HSG A
99,146	39	>75% Grass cover, Good, HSG A
23,409	98	Roofs, HSG A
2,985	98	Unconnected roofs, HSG A
50,502	98	Paved parking, HSG B
113,548	61	>75% Grass cover, Good, HSG B
12,150	98	Roofs, HSG B
3,194	98	Unconnected roofs, HSG B
469	98	Paved parking, HSG C
225	74	>75% Grass cover, Good, HSG C
25,284	80	>75% Grass cover, Good, HSG D
404,789	72	Weighted Average
238,203		58.85% Pervious Area
166,586		41.15% Impervious Area
6,179		3.71% Unconnected

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

Subcatchment E: DA TO SMA E



Summary for Subcatchment EA: DA EMERGENCY ACCESS

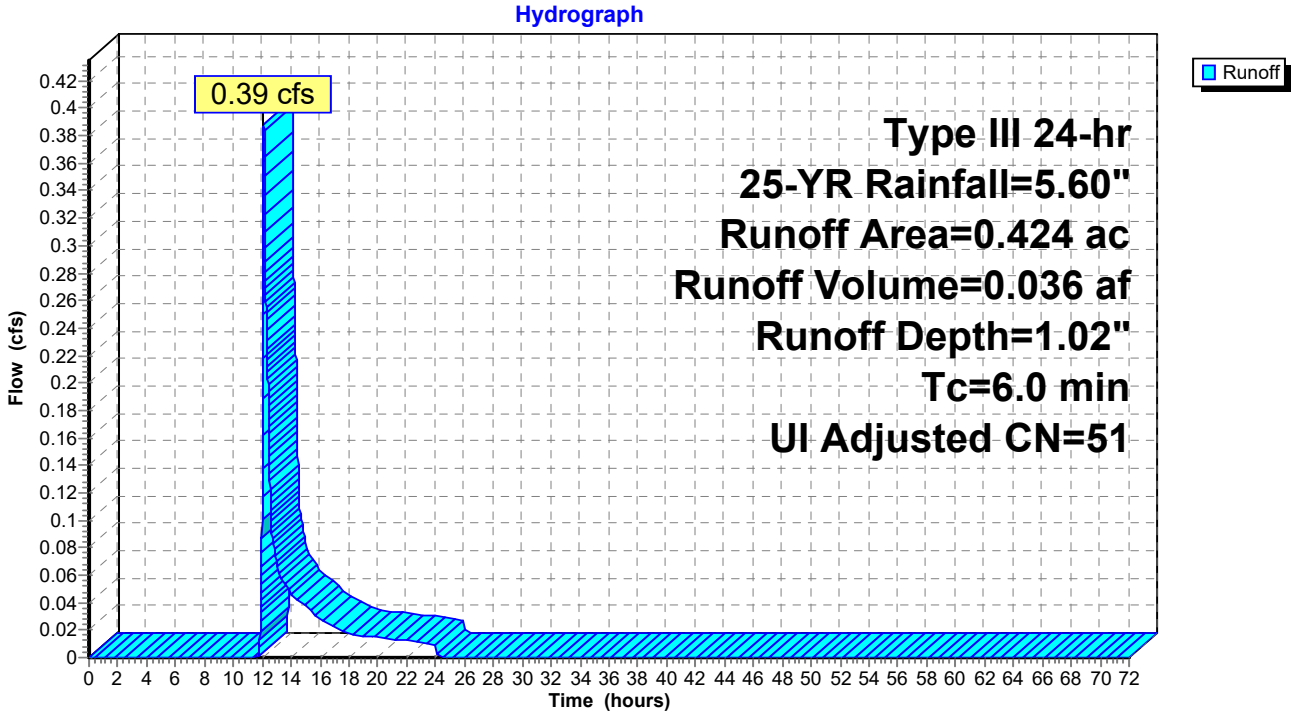
Runoff = 0.39 cfs @ 12.11 hrs, Volume= 0.036 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.010	98		Unconnected roofs, HSG A
0.082	98		Paved parking, HSG A
0.332	39		>75% Grass cover, Good, HSG A
0.424	52	51	Weighted Average, UI Adjusted
0.332			78.30% Pervious Area
0.092			21.70% Impervious Area
0.010			10.87% Unconnected

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

Subcatchment EA: DA EMERGENCY ACCESS



Summary for Subcatchment F: DA TO SMA F

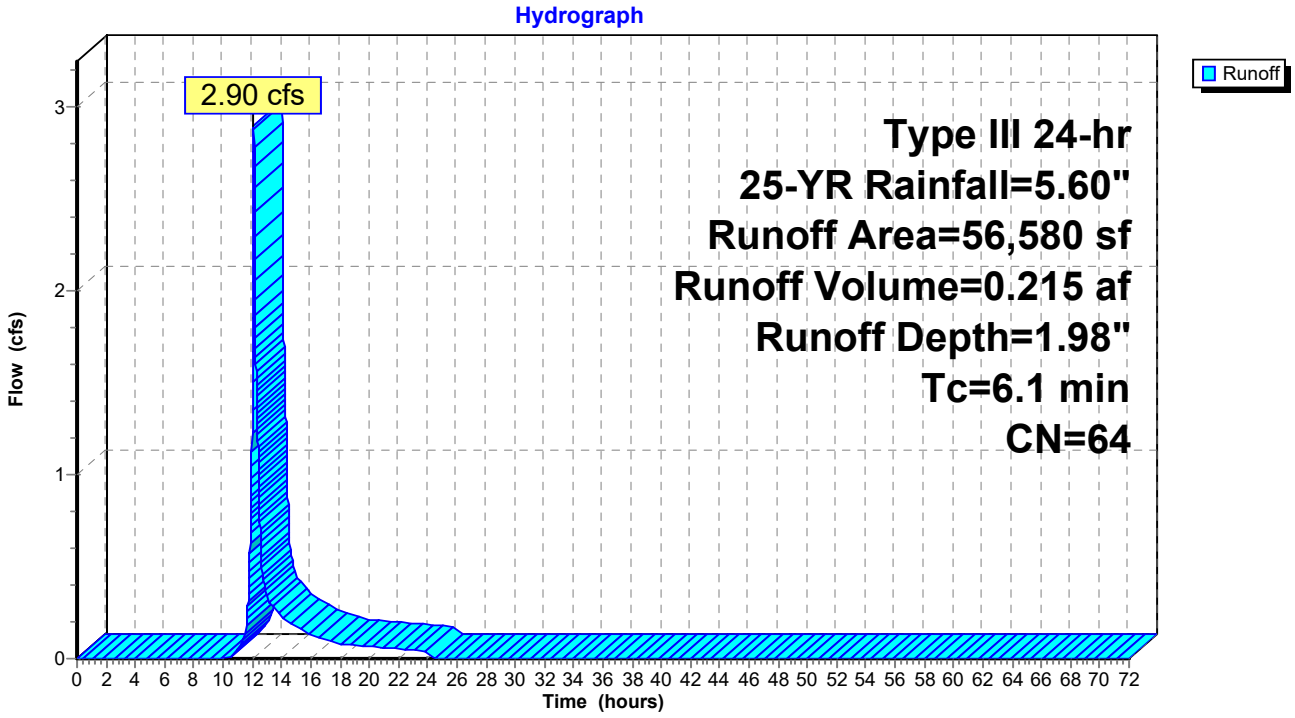
Runoff = 2.90 cfs @ 12.10 hrs, Volume= 0.215 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
15,117	98	Paved parking, HSG A
31,182	39	>75% Grass cover, Good, HSG A
6,199	98	Roofs, HSG A
2,261	98	Unconnected roofs, HSG A
1,821	61	>75% Grass cover, Good, HSG B
56,580	64	Weighted Average
33,003		58.33% Pervious Area
23,577		41.67% Impervious Area
2,261		9.59% Unconnected

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

Subcatchment F: DA TO SMA F



Summary for Subcatchment H: DA TO H

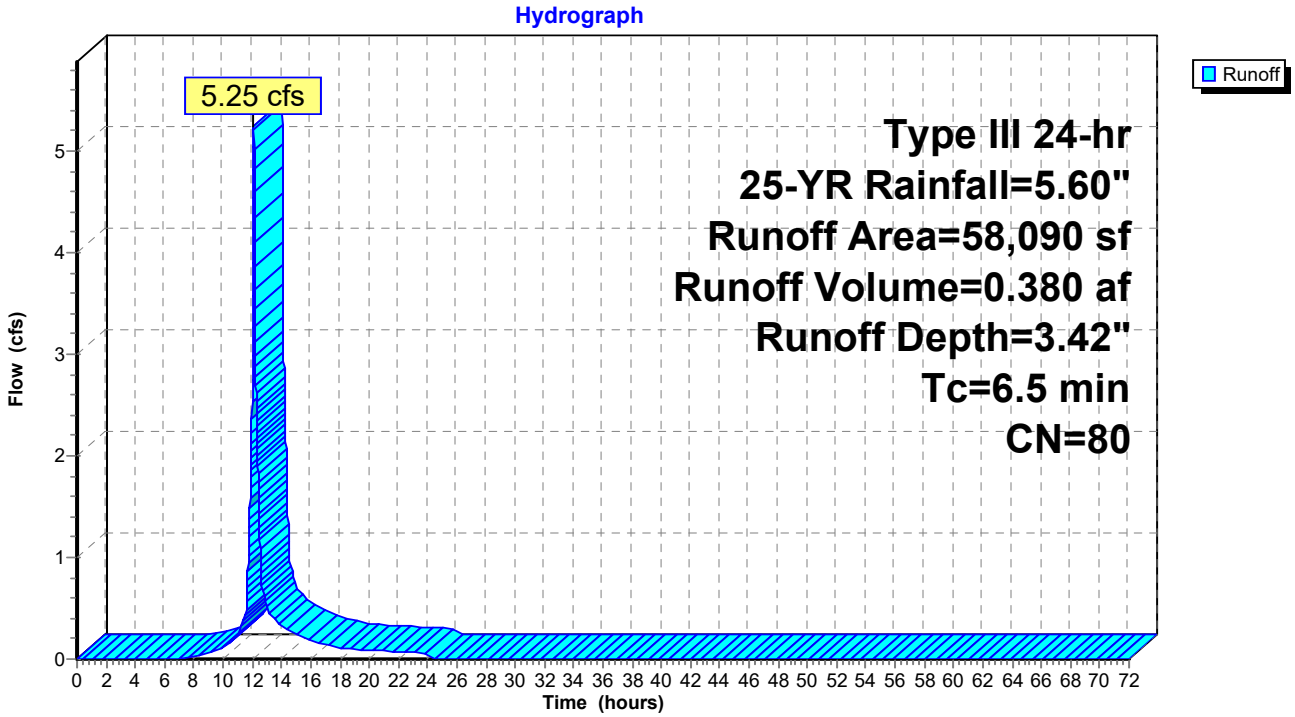
Runoff = 5.25 cfs @ 12.09 hrs, Volume= 0.380 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
21,652	98	Paved parking, HSG B
28,016	61	>75% Grass cover, Good, HSG B
8,422	98	Roofs, HSG B
58,090	80	Weighted Average
28,016		48.23% Pervious Area
30,074		51.77% Impervious Area

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

Subcatchment H: DA TO H



Summary for Subcatchment NE1: DA NE1

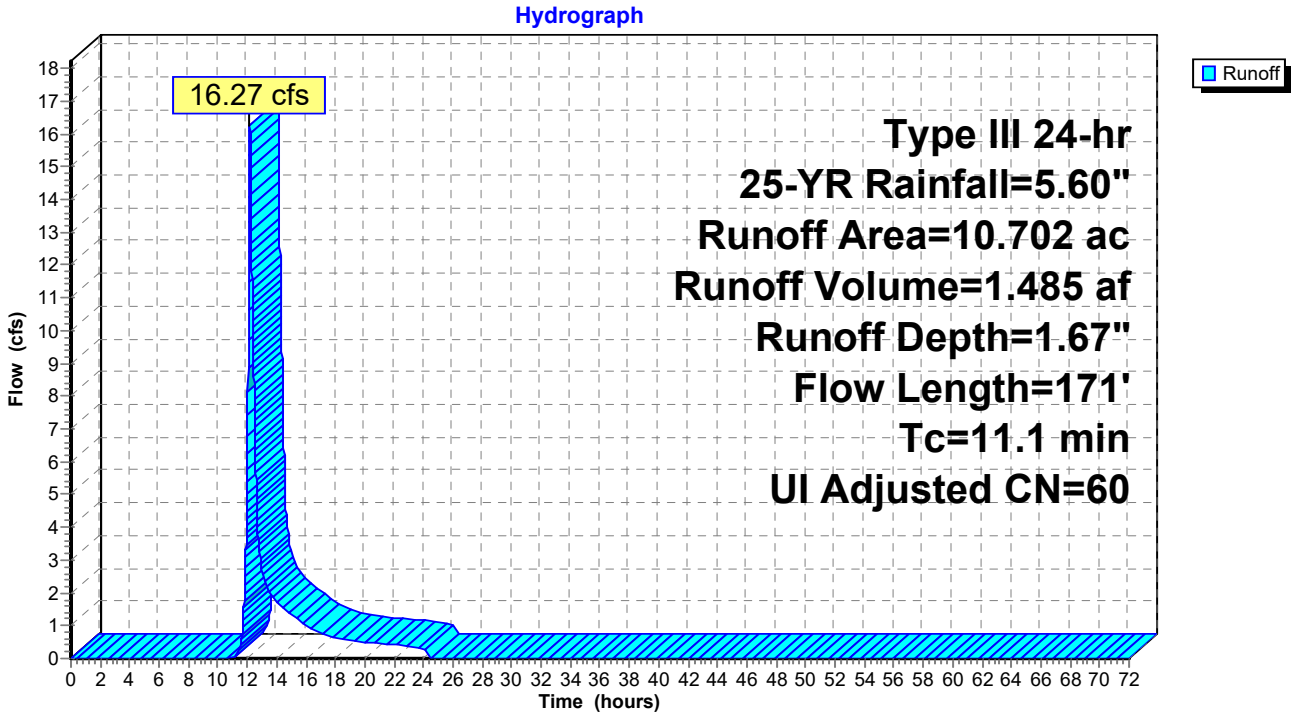
Runoff = 16.27 cfs @ 12.17 hrs, Volume= 1.485 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.145	30		Woods, Good, HSG A
3.645	55		Woods, Good, HSG B
3.253	70		Woods, Good, HSG C
0.805	39		>75% Grass cover, Good, HSG A
2.322	61		>75% Grass cover, Good, HSG B
0.263	74		>75% Grass cover, Good, HSG C
0.096	98		Unconnected roofs, HSG A
0.173	98		Unconnected roofs, HSG B
10.702	61	60	Weighted Average, UI Adjusted
10.433			97.49% Pervious Area
0.269			2.51% Impervious Area
0.269			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0450	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
1.8	121	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	171	Total			

Subcatchment NE1: DA NE1



Summary for Subcatchment NE2: DA NE2

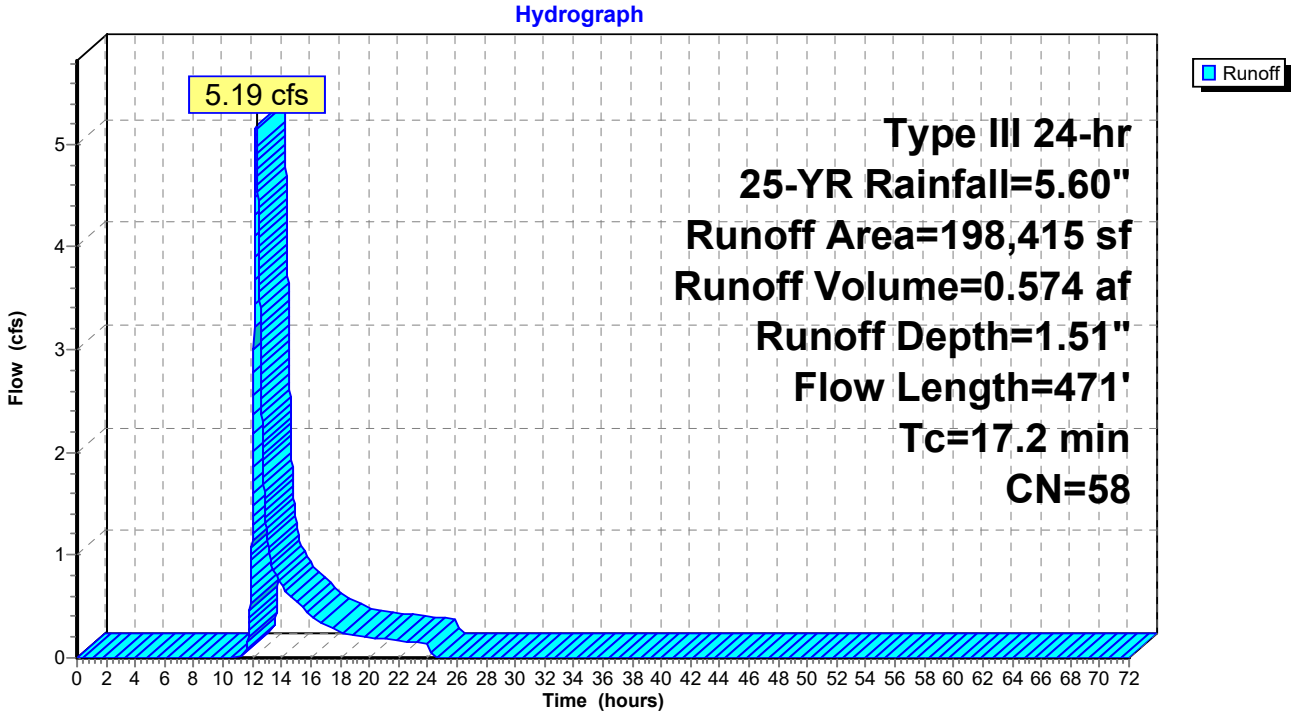
Runoff = 5.19 cfs @ 12.26 hrs, Volume= 0.574 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
115,990	77	Woods, Good, HSG D
68,591	30	Woods, Good, HSG A
13,834	39	>75% Grass cover, Good, HSG A
198,415	58	Weighted Average
198,415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0360	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
7.0	421	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	471	Total			

Subcatchment NE2: DA NE2



Summary for Subcatchment NW1: DA NW1

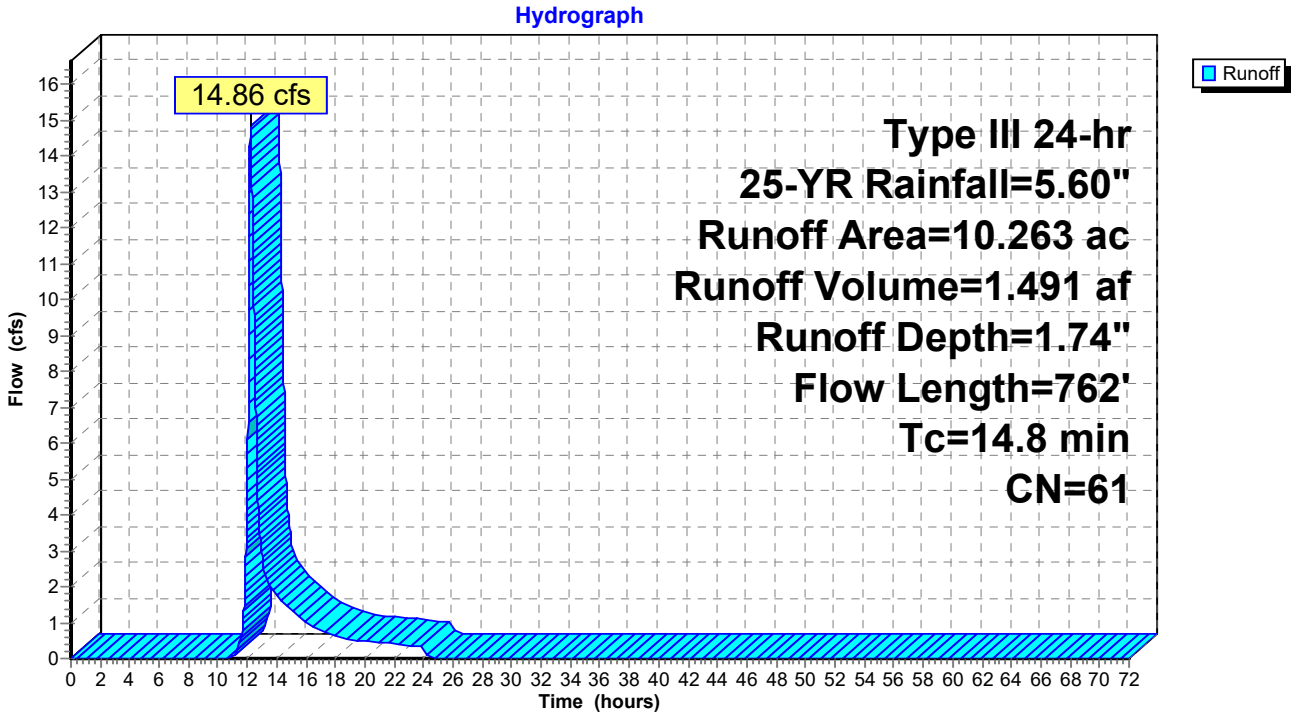
Runoff = 14.86 cfs @ 12.22 hrs, Volume= 1.491 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
2.521	39	>75% Grass cover, Good, HSG A
0.447	55	Woods, Good, HSG B
1.631	61	>75% Grass cover, Good, HSG B
3.945	70	Woods, Good, HSG C
1.419	74	>75% Grass cover, Good, HSG C
0.030	80	>75% Grass cover, Good, HSG D
0.174	98	Unconnected roofs, HSG A
0.006	98	Unconnected roofs, HSG B
0.040	98	Unconnected pavement, HSG A
10.263	61	Weighted Average
10.043		97.86% Pervious Area
0.220		2.14% Impervious Area
0.220		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	730	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	32	0.0260	9.58	517.56	**Channel Flow,** Area= 54.0 sf Perim= 54.0' r= 1.00' n= 0.025
14.8	762	Total			

Subcatchment NW1: DA NW1



Summary for Subcatchment NW3: DA NW3

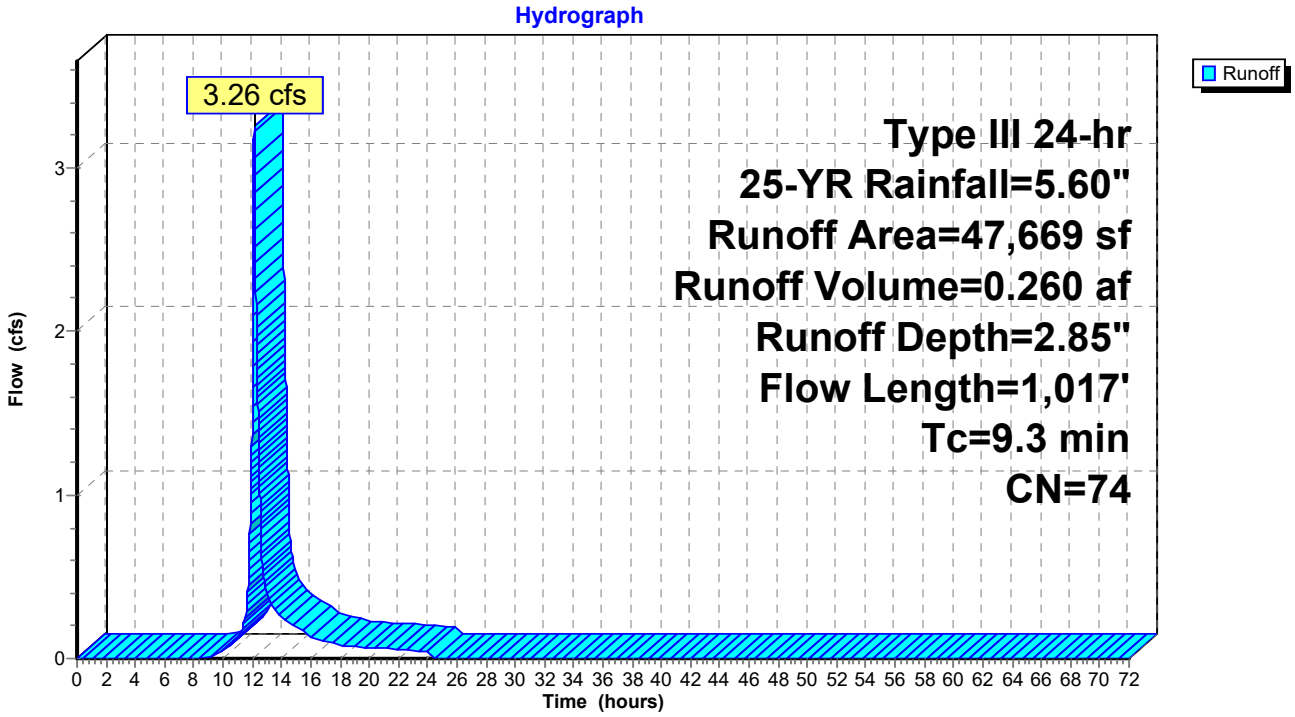
Runoff = 3.26 cfs @ 12.13 hrs, Volume= 0.260 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
11,228	39	>75% Grass cover, Good, HSG A
8,533	98	Paved parking, HSG A
3,448	98	Paved parking, HSG B
5,271	61	>75% Grass cover, Good, HSG B
6,625	98	Paved parking, HSG C
12,564	74	>75% Grass cover, Good, HSG C
47,669	74	Weighted Average
29,063		60.97% Pervious Area
18,606		39.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.93"
2.7	350	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	339	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	278	0.0250	9.40	507.51	**Channel Flow,** Area= 54.0 sf Perim= 54.0' r= 1.00' n= 0.025
9.3	1,017	Total			

Subcatchment NW3: DA NW3



Summary for Subcatchment OFF 4: DA OFF 4

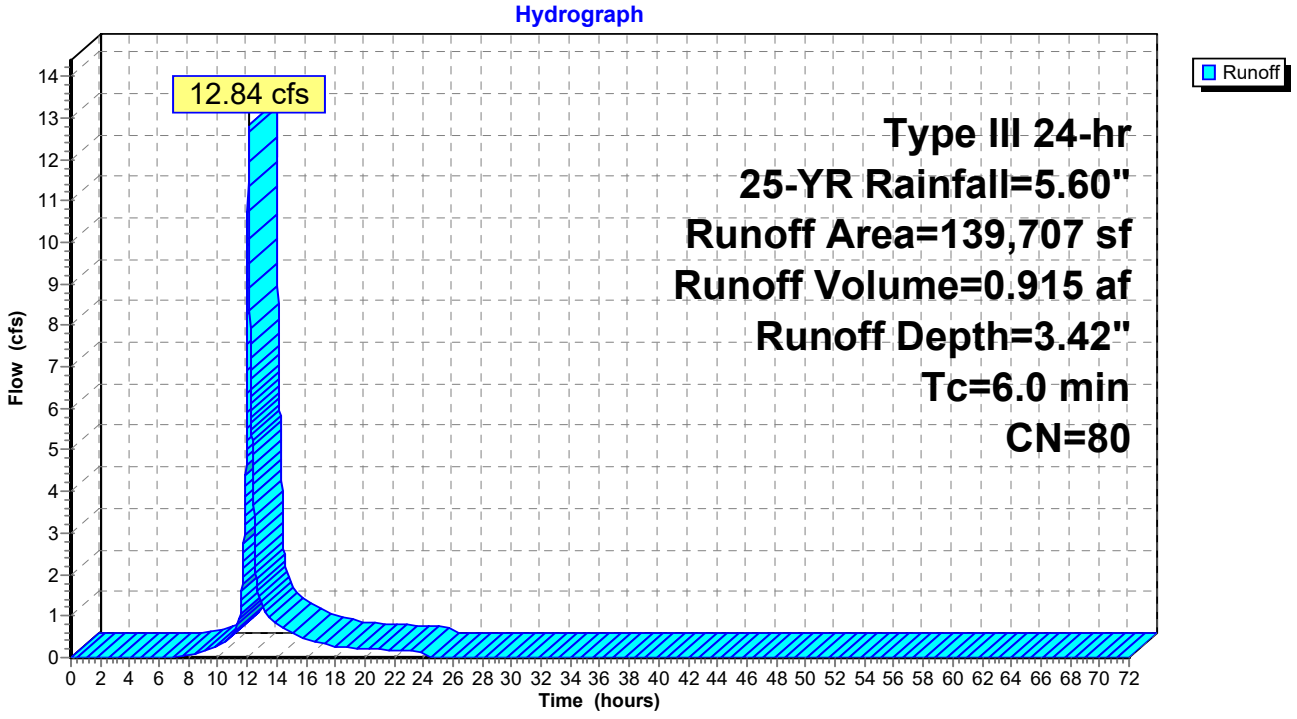
Runoff = 12.84 cfs @ 12.09 hrs, Volume= 0.915 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
32,879	61	>75% Grass cover, Good, HSG B
70,234	98	Paved parking, HSG B
7,602	96	Gravel surface, HSG B
28,992	55	Woods, Good, HSG B
139,707	80	Weighted Average
69,473		49.73% Pervious Area
70,234		50.27% Impervious Area

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

Subcatchment OFF 4: DA OFF 4



Summary for Subcatchment OFF1: DA OFFSITE 1

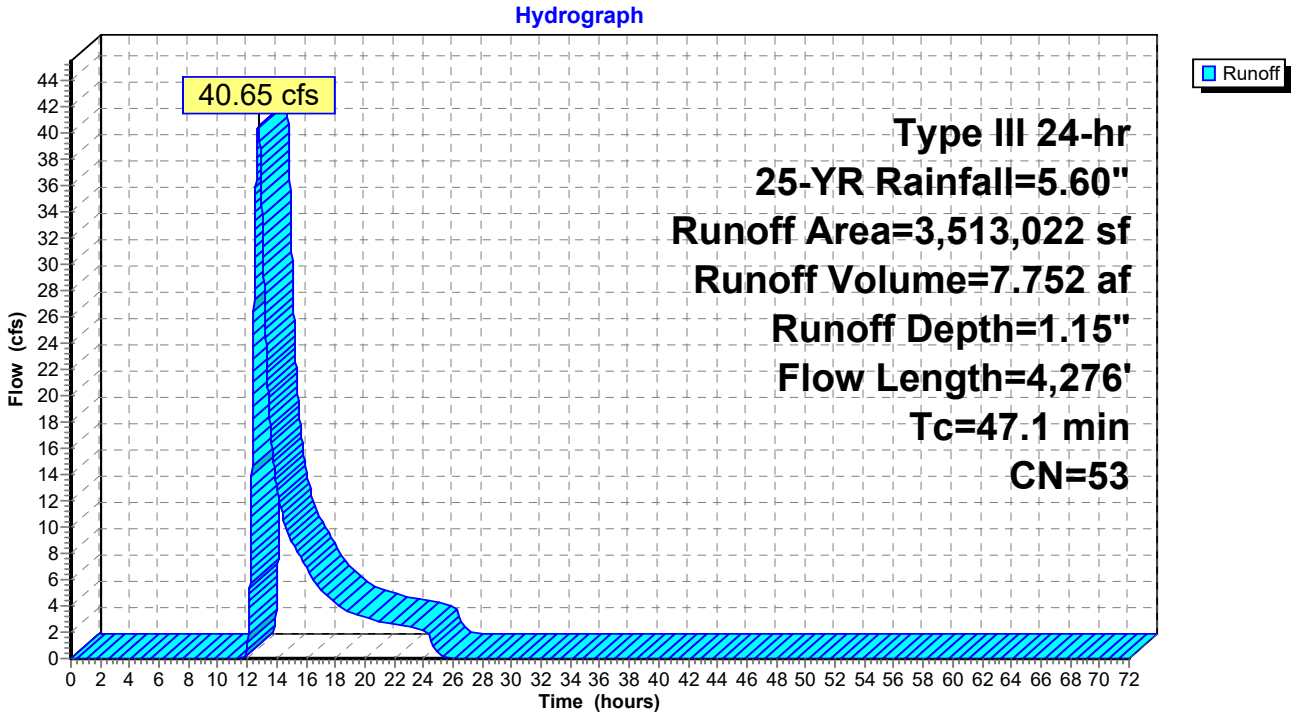
Runoff = 40.65 cfs @ 12.76 hrs, Volume= 7.752 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
605,170	46	2 acre lots, 12% imp, HSG A
995,464	65	2 acre lots, 12% imp, HSG B
173,809	77	2 acre lots, 12% imp, HSG C
112,172	82	2 acre lots, 12% imp, HSG D
897,227	30	Woods, Good, HSG A
305,263	55	Woods, Good, HSG B
208,972	77	Woods, Good, HSG D
117,815	39	>75% Grass cover, Good, HSG A
47,873	61	>75% Grass cover, Good, HSG B
49,257	98	Paved parking, HSG A
3,513,022	53	Weighted Average
3,237,371		92.15% Pervious Area
275,651		7.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0800	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
39.7	4,226	0.1260	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
47.1	4,276	Total			

Subcatchment OFF1: DA OFFSITE 1



Summary for Subcatchment OFF2: DA OFFSITE 2

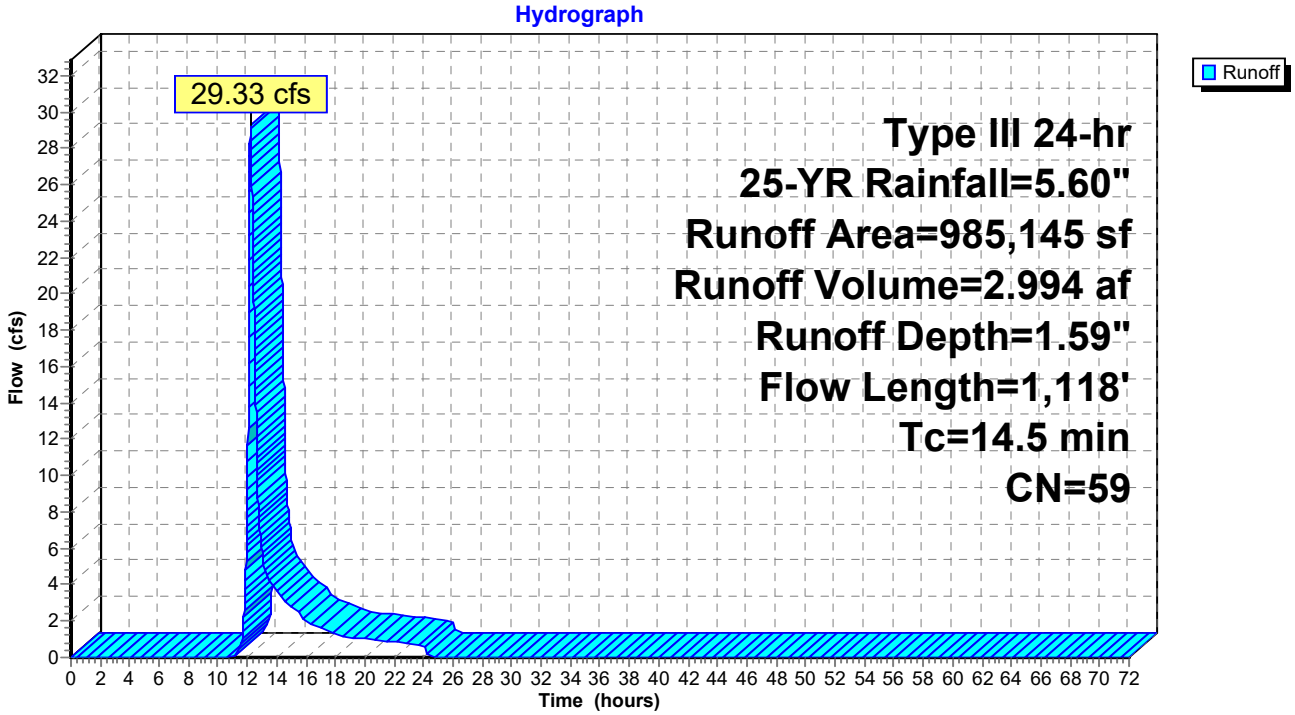
Runoff = 29.33 cfs @ 12.22 hrs, Volume= 2.994 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
8,899	30	Woods, Good, HSG A
674,826	55	Woods, Good, HSG B
43,382	77	Woods, Good, HSG D
233,757	65	2 acre lots, 12% imp, HSG B
24,281	98	Paved parking, HSG B
985,145	59	Weighted Average
932,813		94.69% Pervious Area
52,332		5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
8.2	1,068	0.1900	2.18		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.5	1,118	Total			

Subcatchment OFF2: DA OFFSITE 2



Summary for Subcatchment OFF3: DA OFFSITE 3

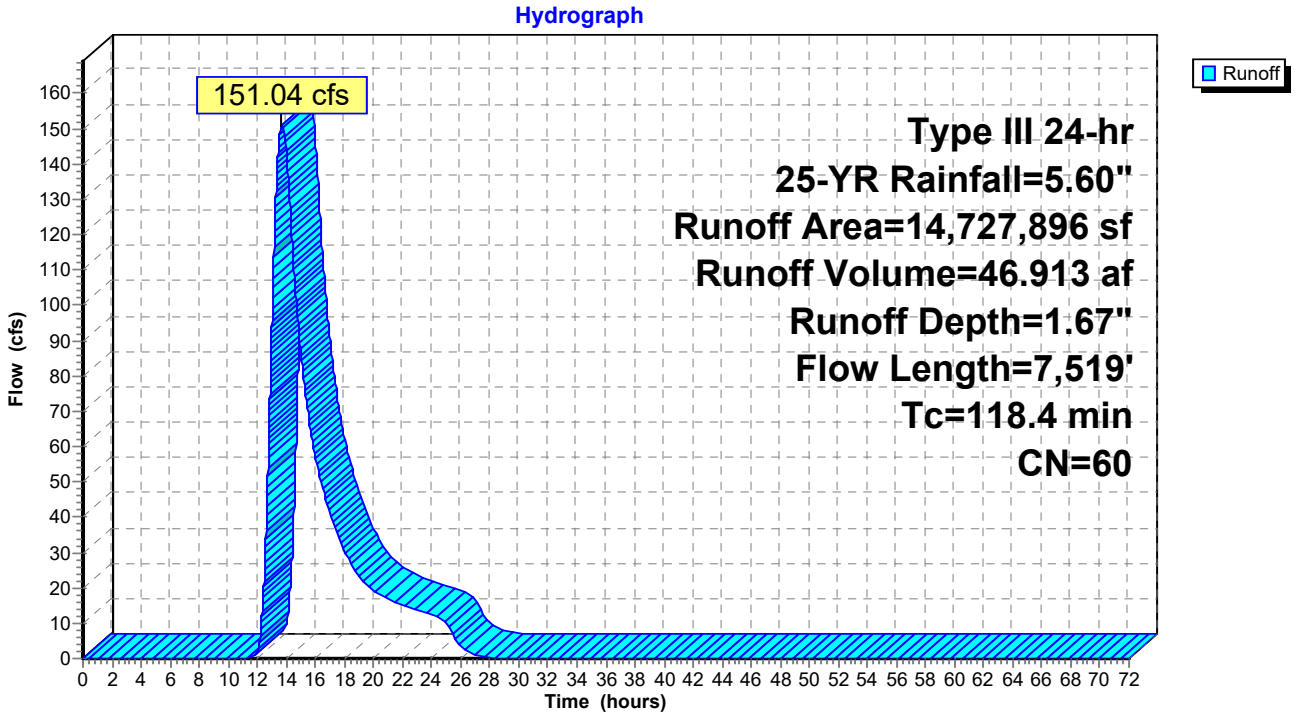
Runoff = 151.04 cfs @ 13.68 hrs, Volume= 46.913 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
531,355	46	2 acre lots, 12% imp, HSG A
757,822	65	2 acre lots, 12% imp, HSG B
278,947	77	2 acre lots, 12% imp, HSG C
919,821	96	Gravel surface, HSG A
552,685	96	Gravel surface, HSG B
185,042	96	Gravel surface, HSG C
2,473,692	30	Woods, Good, HSG A
5,672,758	55	Woods, Good, HSG B
2,621,592	70	Woods, Good, HSG C
238,740	77	Woods, Good, HSG D
68,600	98	Paved parking, HSG B
163,466	61	>75% Grass cover, Good, HSG B
263,376	98	Water Surface, HSG D
14,727,896	60	Weighted Average
14,207,745		96.47% Pervious Area
520,151		3.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
111.3	7,469	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
118.4	7,519	Total			

Subcatchment OFF3: DA OFFSITE 3



Summary for Subcatchment R3: DA R3

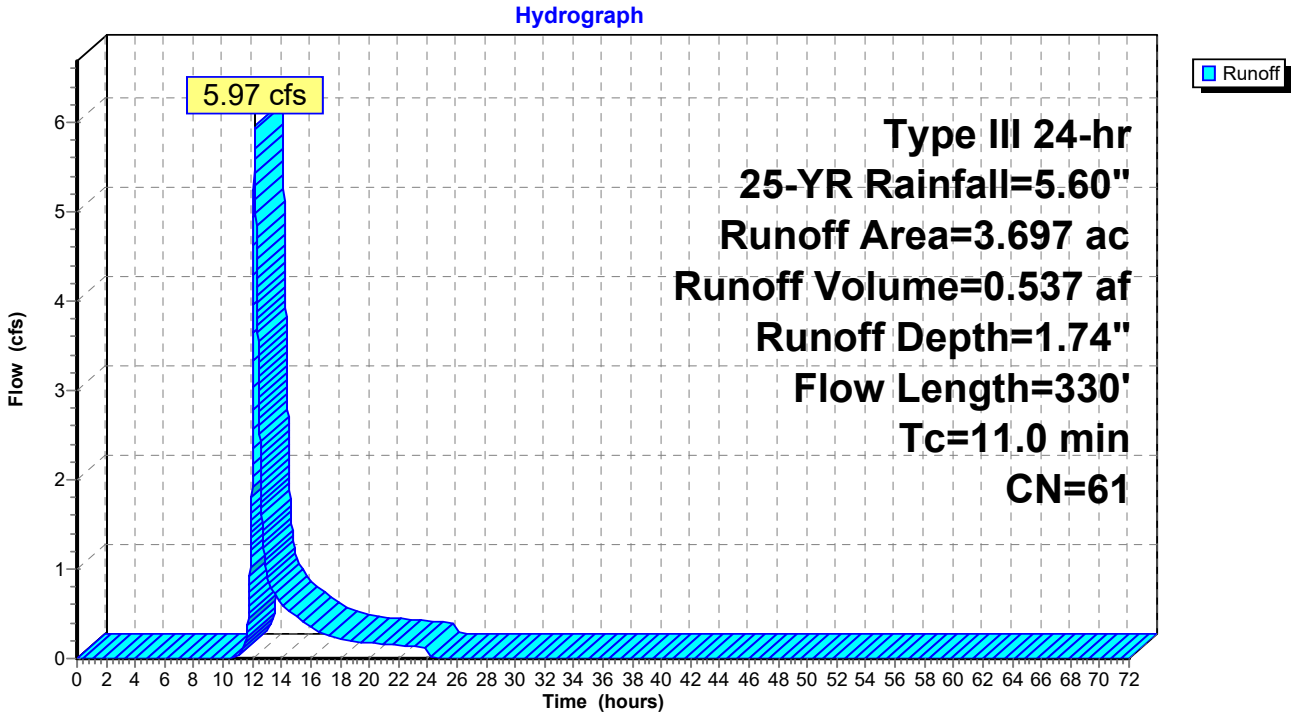
Runoff = 5.97 cfs @ 12.16 hrs, Volume= 0.537 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.007	30	Woods, Good, HSG A
0.965	39	>75% Grass cover, Good, HSG A
0.441	55	Woods, Good, HSG B
0.100	61	>75% Grass cover, Good, HSG B
1.244	70	Woods, Good, HSG C
0.878	74	>75% Grass cover, Good, HSG C
0.062	98	Unconnected roofs, HSG A
3.697	61	Weighted Average
3.635		98.32% Pervious Area
0.062		1.68% Impervious Area
0.062		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	29	0.1000	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.93"
3.4	21	0.1000	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
4.7	280	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.0	330	Total			

Subcatchment R3: DA R3



Summary for Subcatchment R4: DA R4

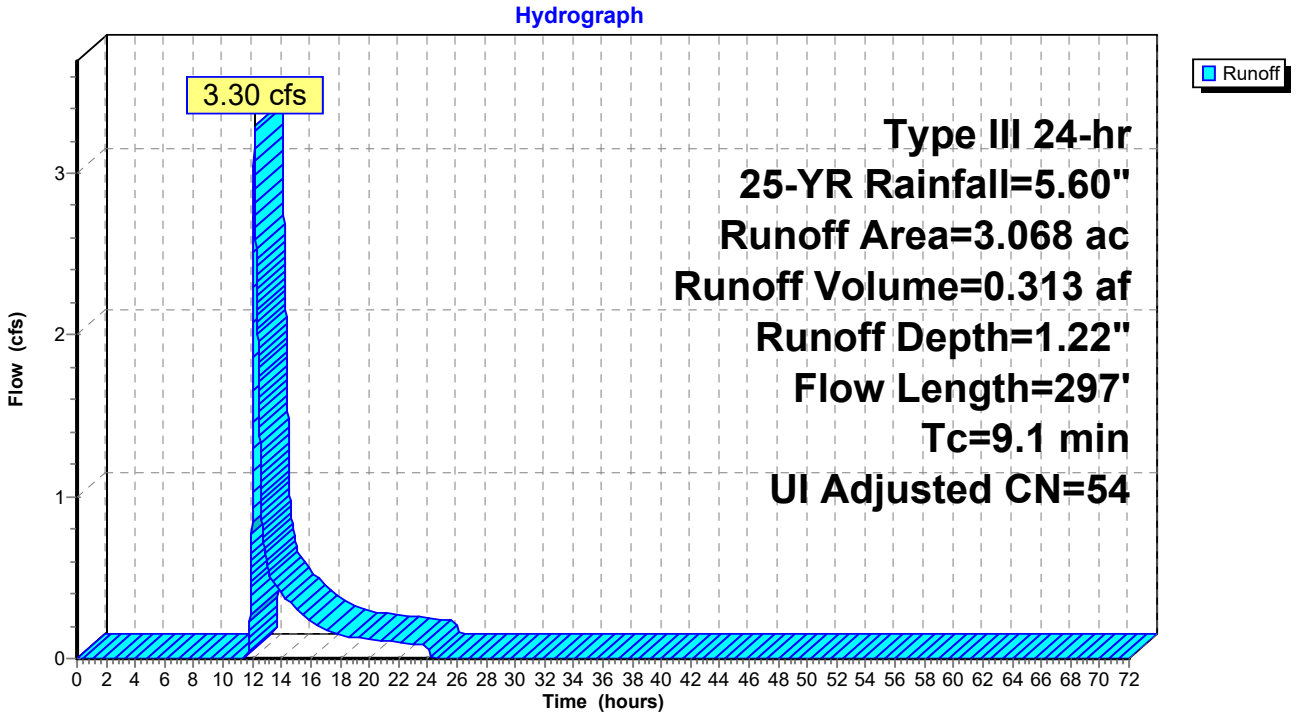
Runoff = 3.30 cfs @ 12.15 hrs, Volume= 0.313 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.276	30		Woods, Good, HSG A
0.149	55		Woods, Good, HSG B
0.064	70		Woods, Good, HSG C
0.847	39		>75% Grass cover, Good, HSG A
1.352	61		>75% Grass cover, Good, HSG B
0.183	74		>75% Grass cover, Good, HSG C
0.049	98		Unconnected roofs, HSG A
0.015	98		Unconnected roofs, HSG B
0.116	98		Unconnected pavement, HSG A
0.017	98		Unconnected pavement, HSG B
3.068	55	54	Weighted Average, UI Adjusted
2.871			93.58% Pervious Area
0.197			6.42% Impervious Area
0.197			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.93"
2.6	247	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	297	Total			

Subcatchment R4: DA R4



Summary for Subcatchment SE: DA SE

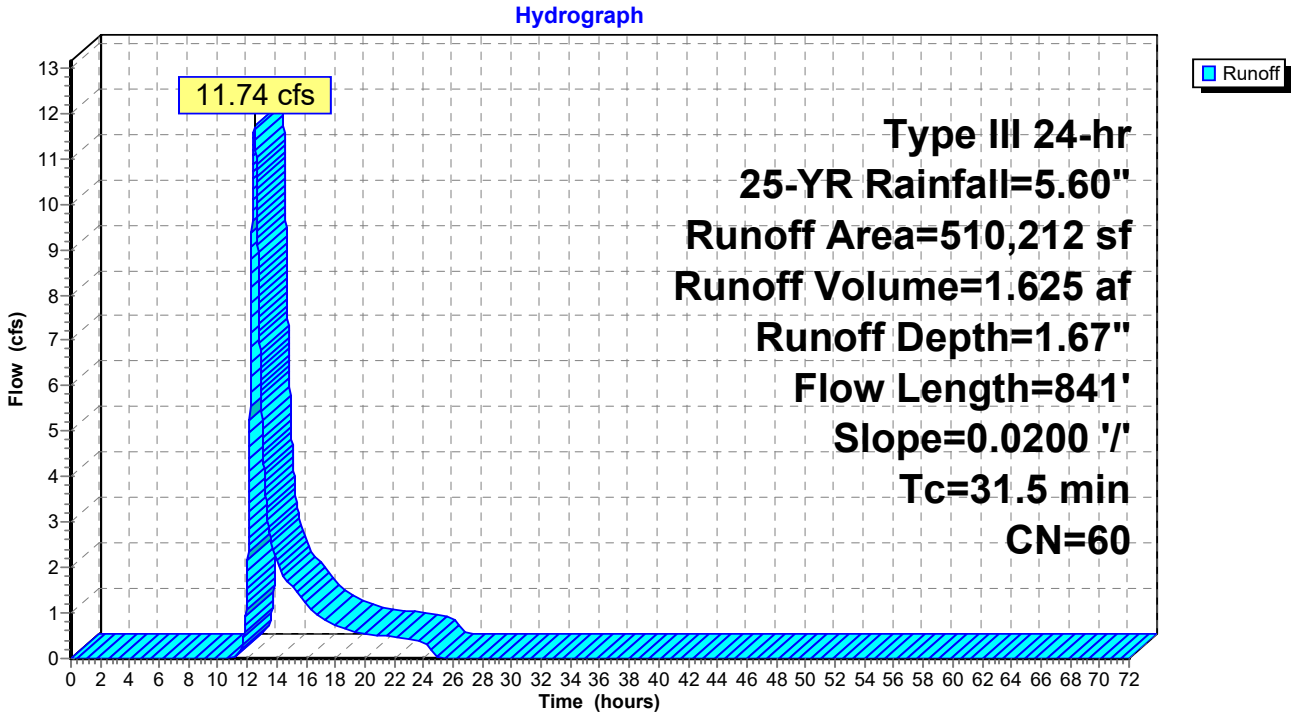
Runoff = 11.74 cfs @ 12.49 hrs, Volume= 1.625 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
5,034	30	Woods, Good, HSG A
74,117	39	>75% Grass cover, Good, HSG A
163,017	55	Woods, Good, HSG B
27,230	61	>75% Grass cover, Good, HSG B
210,136	70	Woods, Good, HSG C
22,121	74	>75% Grass cover, Good, HSG C
5,917	98	Unconnected roofs, HSG A
2,253	98	Roofs, HSG B
387	98	Unconnected pavement, HSG B
510,212	60	Weighted Average
501,655		98.32% Pervious Area
8,557		1.68% Impervious Area
6,304		73.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
18.6	791	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.5	841	Total			

Subcatchment SE: DA SE



Summary for Subcatchment SW: DA SW

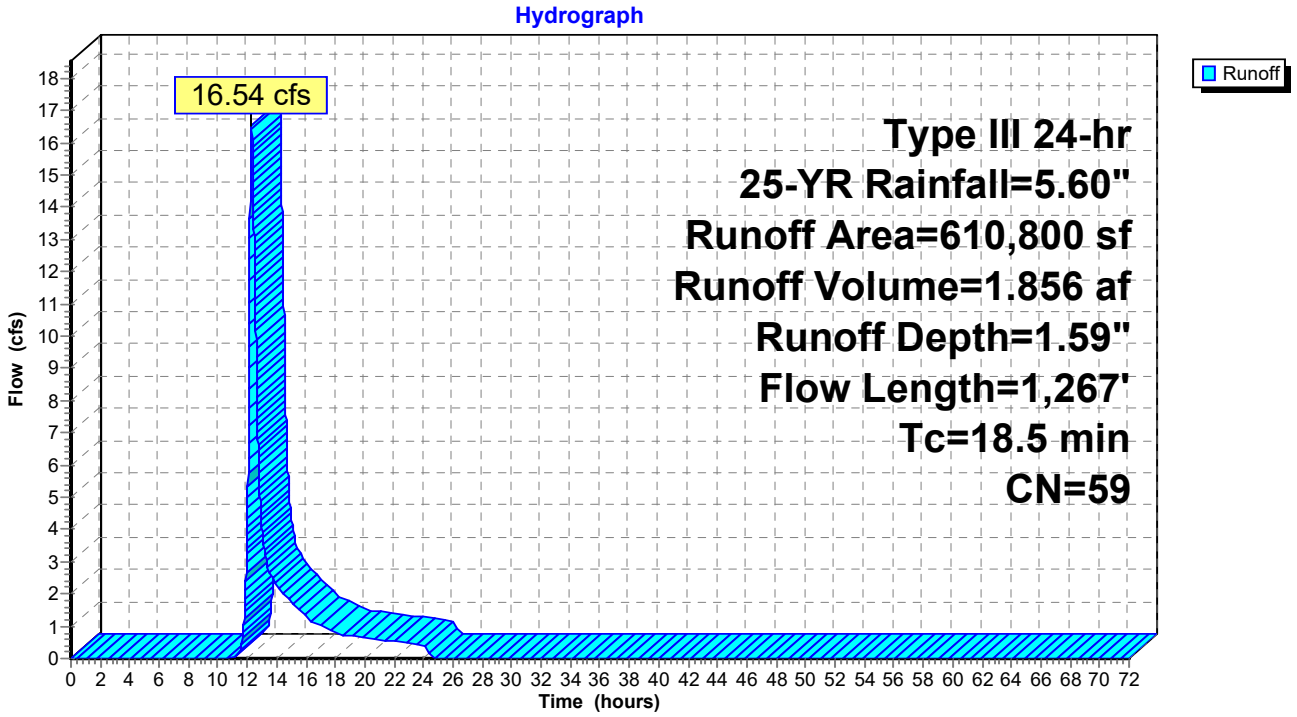
Runoff = 16.54 cfs @ 12.28 hrs, Volume= 1.856 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
47,522	30	Woods, Good, HSG A
98,012	39	>75% Grass cover, Good, HSG A
153,615	55	Woods, Good, HSG B
32,132	61	>75% Grass cover, Good, HSG B
154,380	70	Woods, Good, HSG C
91,896	77	Woods, Good, HSG D
21,909	74	>75% Grass cover, Good, HSG C
2,189	80	>75% Grass cover, Good, HSG D
6,142	98	Unconnected roofs, HSG A
2,761	98	Unconnected roofs, HSG B
242	98	Unconnected pavement, HSG A
610,800	59	Weighted Average
601,655		98.50% Pervious Area
9,145		1.50% Impervious Area
9,145		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
6.6	407	0.0420	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.0	810	0.0100	4.55	164.82	**Channel Flow,** Area= 36.2 sf Perim= 54.0' r= 0.67' n= 0.025
18.5	1,267	Total			

Subcatchment SW: DA SW



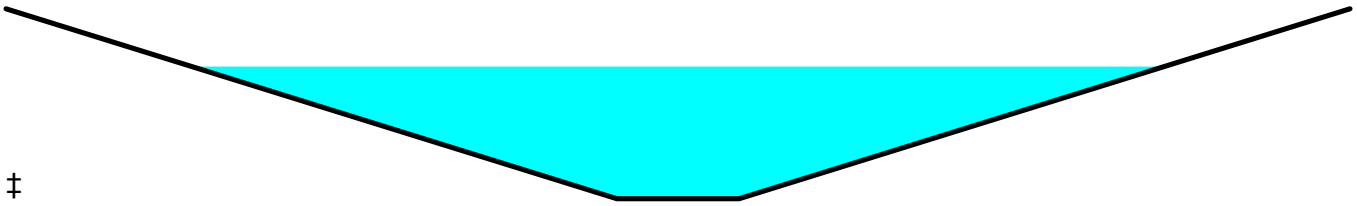
Summary for Reach 1R: REACH 1

Inflow Area = 141.407 ac, 8.52% Impervious, Inflow Depth = 1.30" for 25-YR event
Inflow = 36.70 cfs @ 13.52 hrs, Volume= 15.297 af
Outflow = 36.65 cfs @ 13.61 hrs, Volume= 15.297 af, Atten= 0%, Lag= 5.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.88 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 26.8 min

Peak Storage= 14,927 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.87' , Surface Width= 39.77'
Bank-Full Depth= 1.25' Flow Area= 37.5 sf, Capacity= 88.11 cfs

5.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 55.00'
Length= 767.0' Slope= 0.0026 '/'
Inlet Invert= 187.50', Outlet Invert= 185.50'



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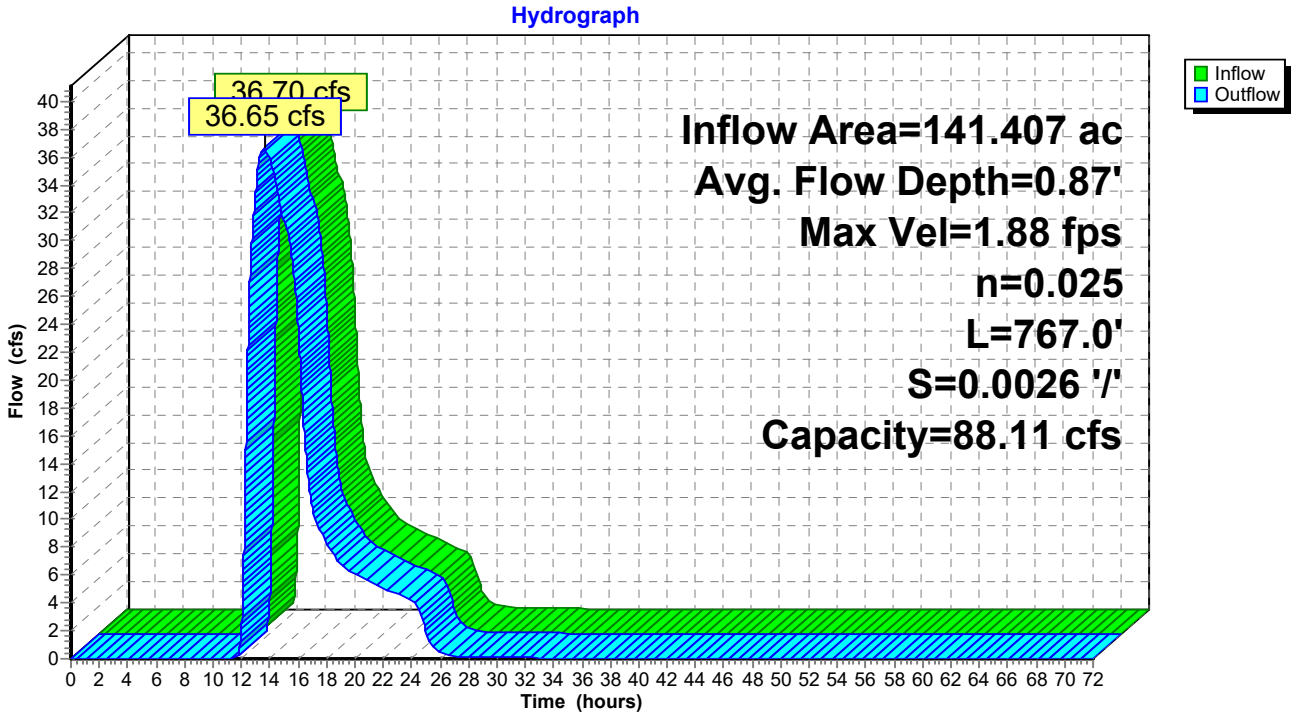
Reach 1R: REACH 1



Summary for Reach 2R: REACH 2

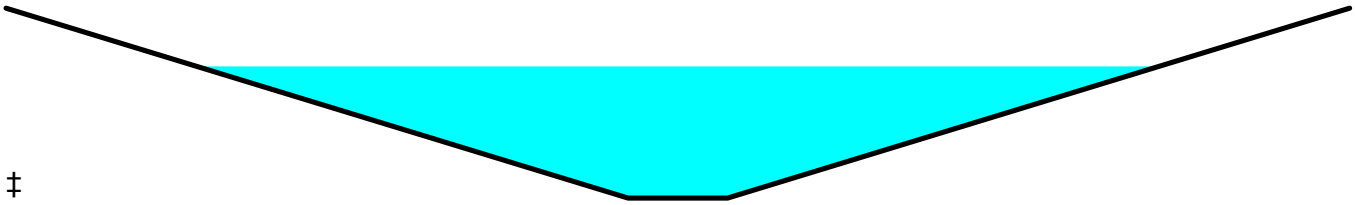
[62] Hint: Exceeded Reach 3R OUTLET depth by 0.38' @ 12.86 hrs

Inflow Area = 120.007 ac, 7.06% Impervious, Inflow Depth = 1.29" for 25-YR event
Inflow = 66.55 cfs @ 12.72 hrs, Volume= 12.901 af
Outflow = 65.60 cfs @ 12.80 hrs, Volume= 12.901 af, Atten= 1%, Lag= 4.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.55 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 23.5 min

Peak Storage= 21,345 cf @ 12.80 hrs
Average Depth at Peak Storage= 0.87' , Surface Width= 38.67'
Bank-Full Depth= 1.25' Flow Area= 36.3 sf, Capacity= 161.16 cfs

4.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 54.00'
Length= 1,154.0' Slope= 0.0095 '/'
Inlet Invert= 200.00', Outlet Invert= 189.00'



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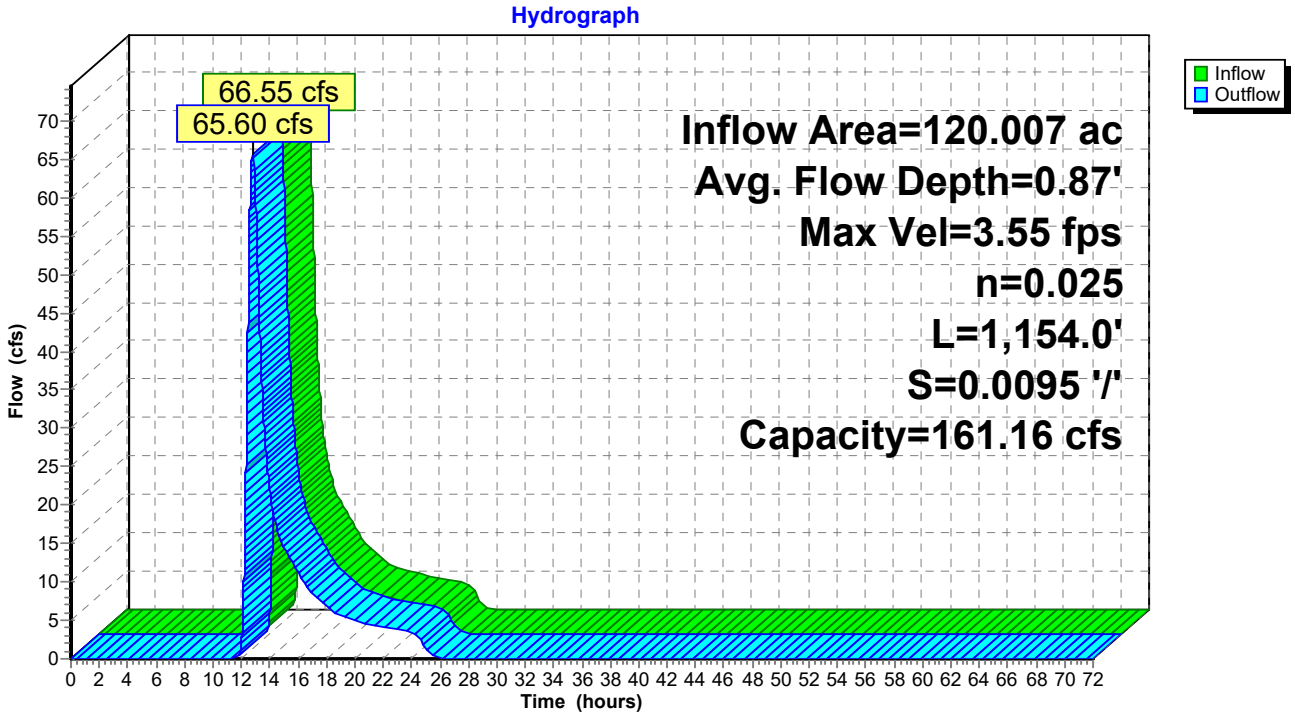
Reach 2R: REACH 2



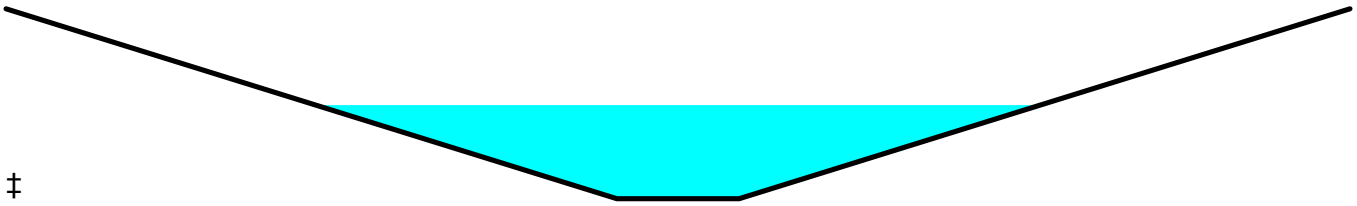
Summary for Reach 3R: REACH 3

Inflow Area = 34.329 ac, 4.07% Impervious, Inflow Depth = 1.61" for 25-YR event
Inflow = 24.82 cfs @ 12.63 hrs, Volume= 4.612 af
Outflow = 24.68 cfs @ 12.69 hrs, Volume= 4.612 af, Atten= 1%, Lag= 3.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.45 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 21.3 min

Peak Storage= 6,518 cf @ 12.69 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 59.27'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 132.87 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 50.0 '/' Top Width= 110.00'
Length= 382.0' Slope= 0.0031 '/'
Inlet Invert= 201.19', Outlet Invert= 200.00'



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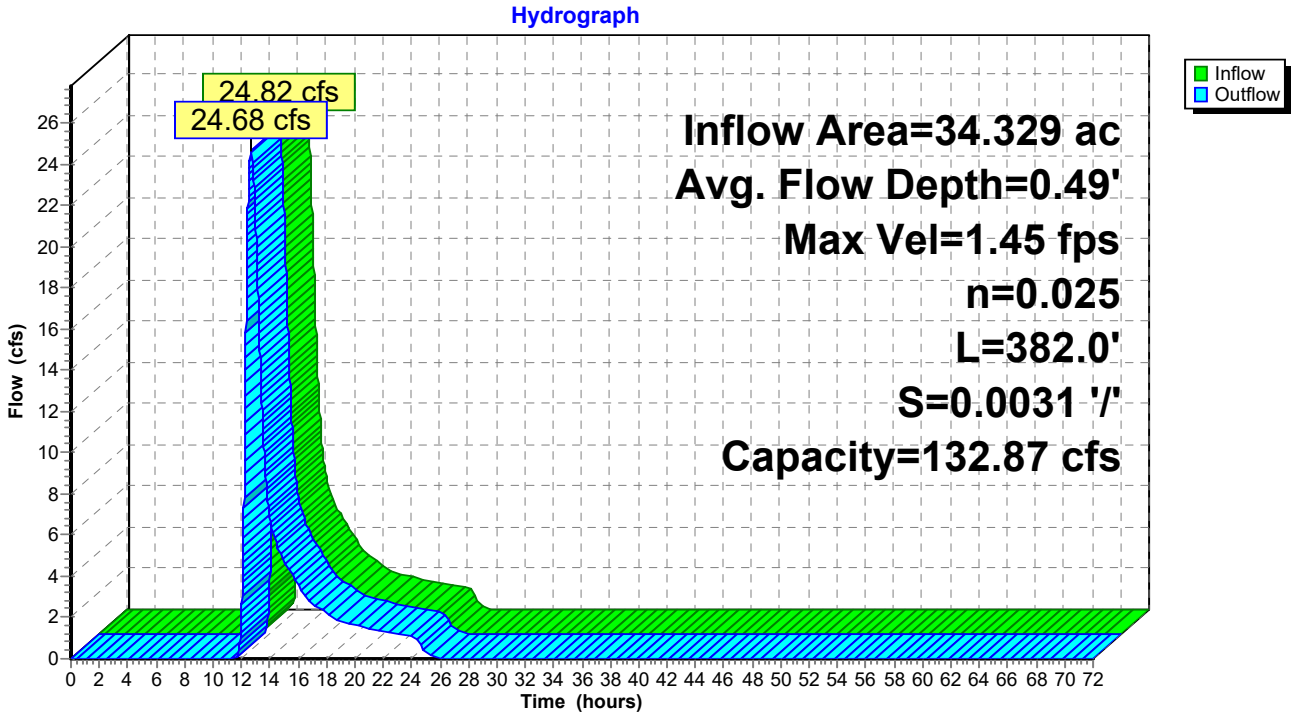
Reach 3R: REACH 3



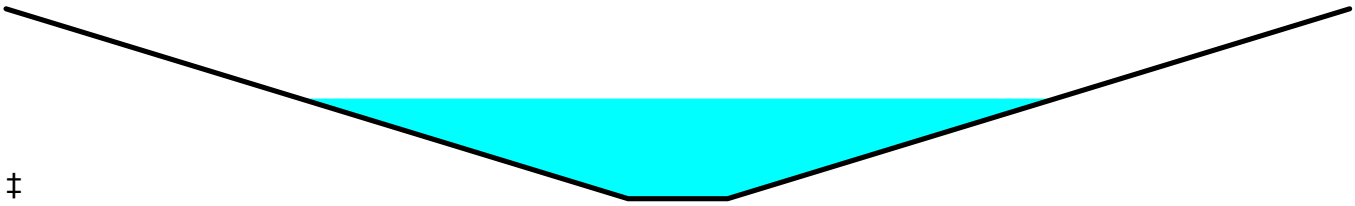
Summary for Reach 4R: REACH 4

Inflow Area = 348.808 ac, 3.50% Impervious, Inflow Depth = 1.66" for 25-YR event
Inflow = 152.69 cfs @ 13.73 hrs, Volume= 48.397 af
Outflow = 152.66 cfs @ 13.76 hrs, Volume= 48.397 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 3.1 min

Peak Storage= 13,229 cf @ 13.76 hrs
Average Depth at Peak Storage= 1.32' , Surface Width= 60.73'
Bank-Full Depth= 2.50' Flow Area= 145.0 sf, Capacity= 722.85 cfs

8.00' x 2.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 108.00'
Length= 292.0' Slope= 0.0068 '/'
Inlet Invert= 191.50', Outlet Invert= 189.50'



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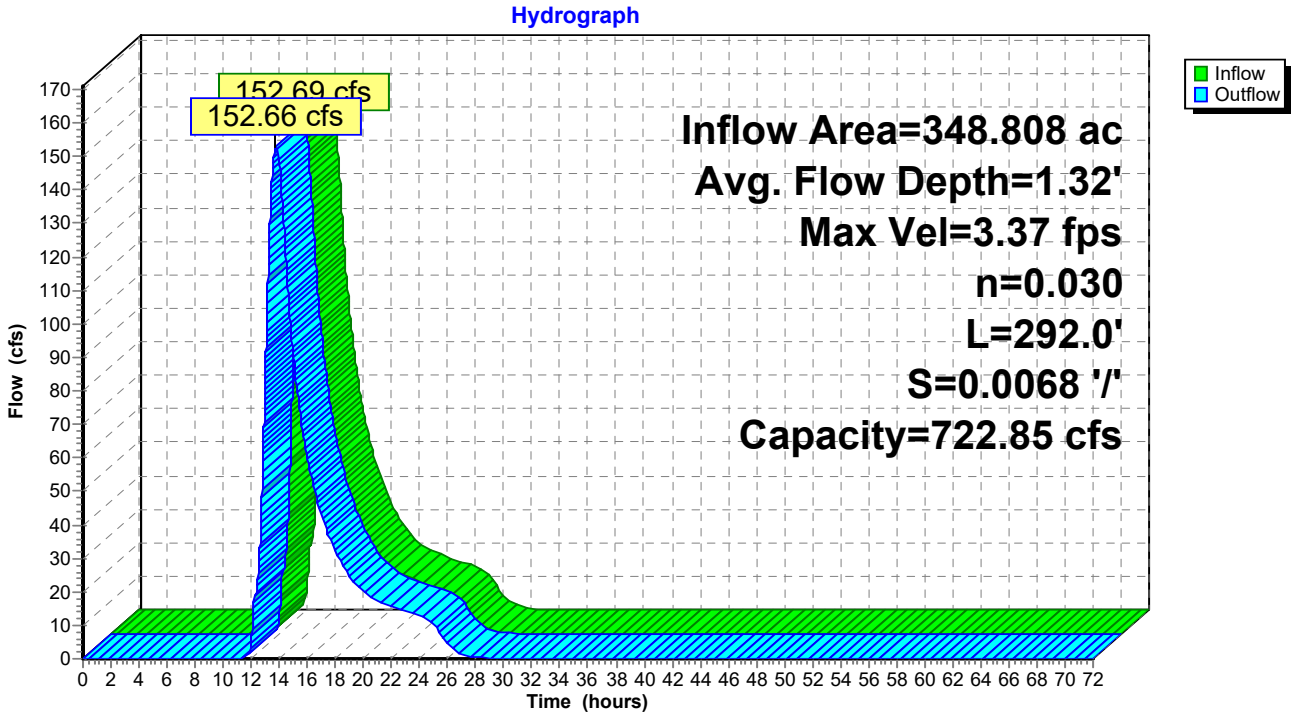
Reach 4R: REACH 4



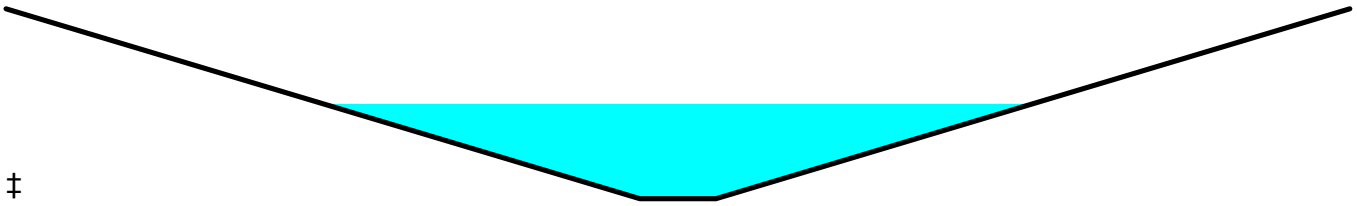
Summary for Reach O2R: RO2

Inflow Area = 22.616 ac, 5.31% Impervious, Inflow Depth = 1.59" for 25-YR event
Inflow = 29.33 cfs @ 12.22 hrs, Volume= 2.994 af
Outflow = 27.72 cfs @ 12.27 hrs, Volume= 2.994 af, Atten= 5%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.86 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 10.1 min

Peak Storage= 6,587 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 28.00'
Bank-Full Depth= 1.25' Flow Area= 35.0 sf, Capacity= 154.12 cfs

3.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 53.00'
Length= 680.0' Slope= 0.0096 '/'
Inlet Invert= 211.00', Outlet Invert= 204.50'



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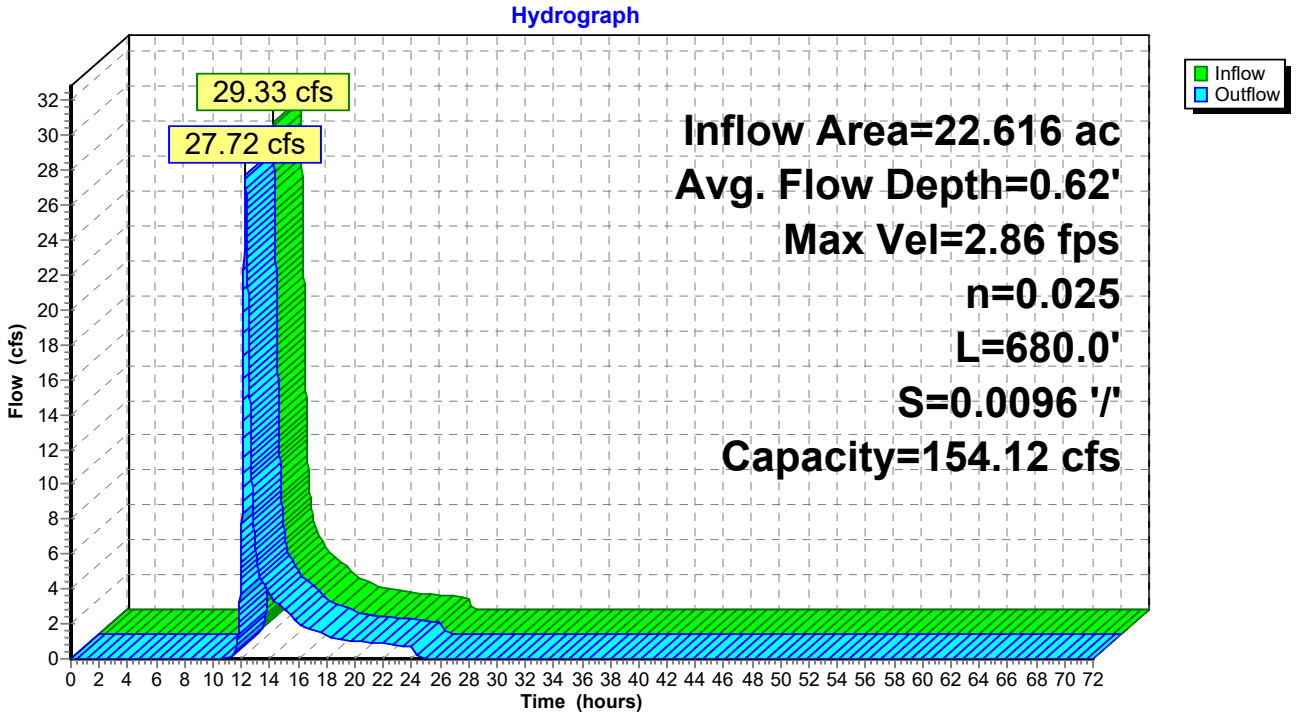
Reach O2R: RO2



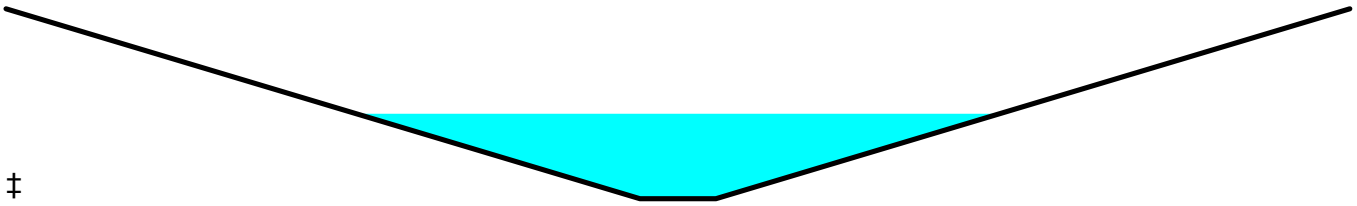
Summary for Reach O3R: RO3

Inflow Area = 338.106 ac, 3.53% Impervious, Inflow Depth = 1.67" for 25-YR event
Inflow = 151.04 cfs @ 13.68 hrs, Volume= 46.913 af
Outflow = 150.78 cfs @ 13.74 hrs, Volume= 46.913 af, Atten= 0%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 7.1 min

Peak Storage= 30,449 cf @ 13.74 hrs
Average Depth at Peak Storage= 1.12' , Surface Width= 50.73'
Bank-Full Depth= 2.50' Flow Area= 140.0 sf, Capacity= 1,095.54 cfs

6.00' x 2.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 106.00'
Length= 960.0' Slope= 0.0120 '/'
Inlet Invert= 208.00', Outlet Invert= 196.50'



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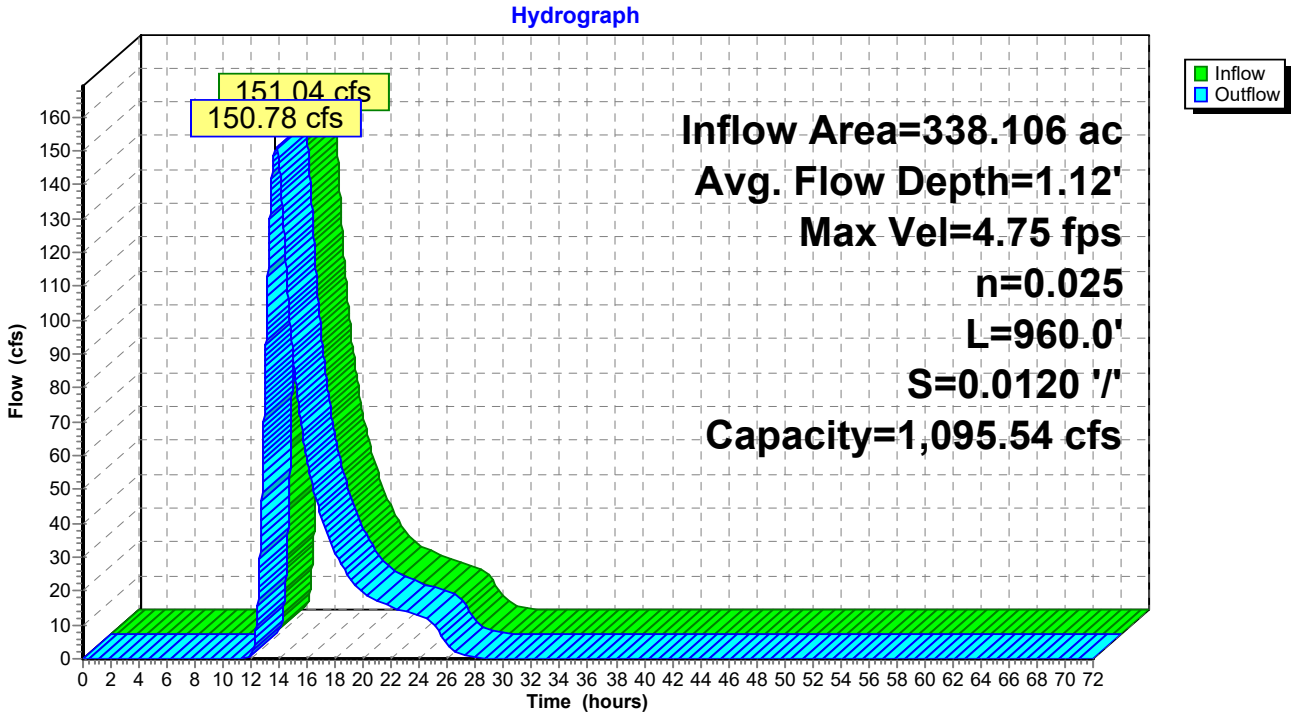


Summary for Pond CB 102: CB 102

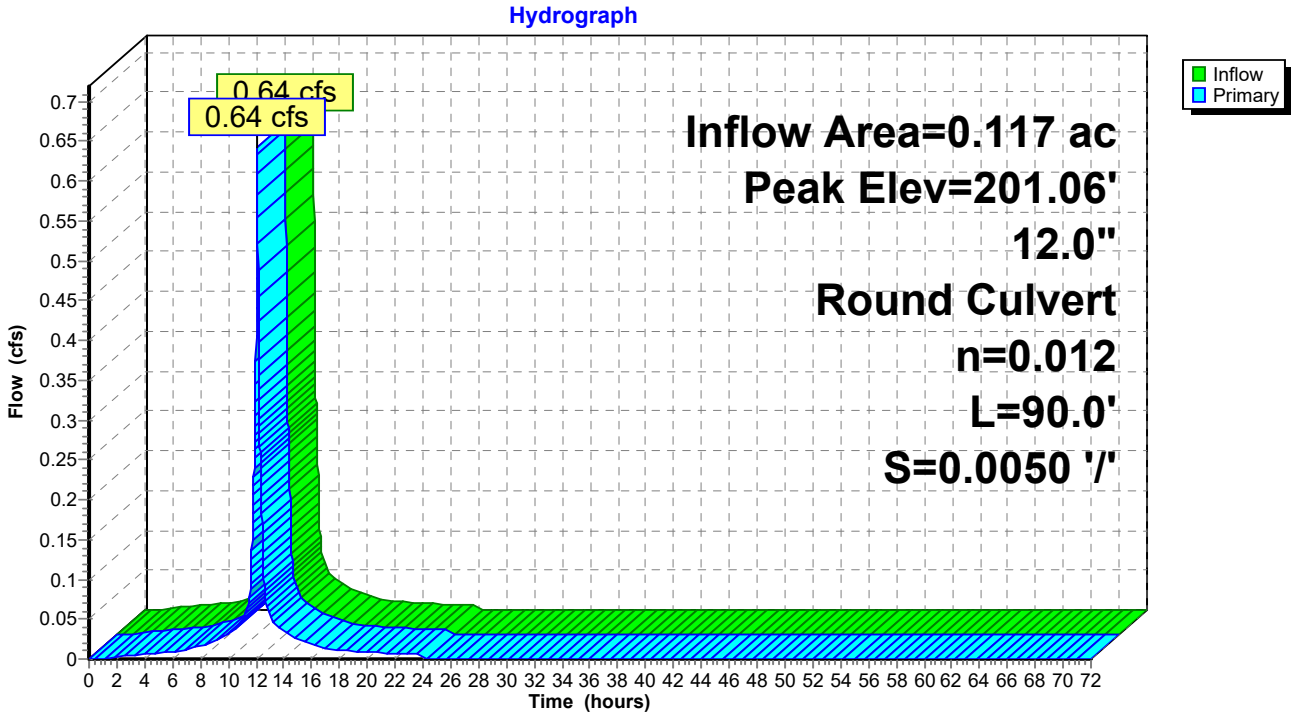
Inflow Area = 0.117 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-YR event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af
Outflow = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 201.06' @ 12.08 hrs
Flood Elev= 205.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	200.60'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 200.60' / 200.15' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.08 hrs HW=201.06' TW=198.98' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.64 cfs @ 2.70 fps)

Pond CB 102: CB 102



Summary for Pond CB 104: CB 104

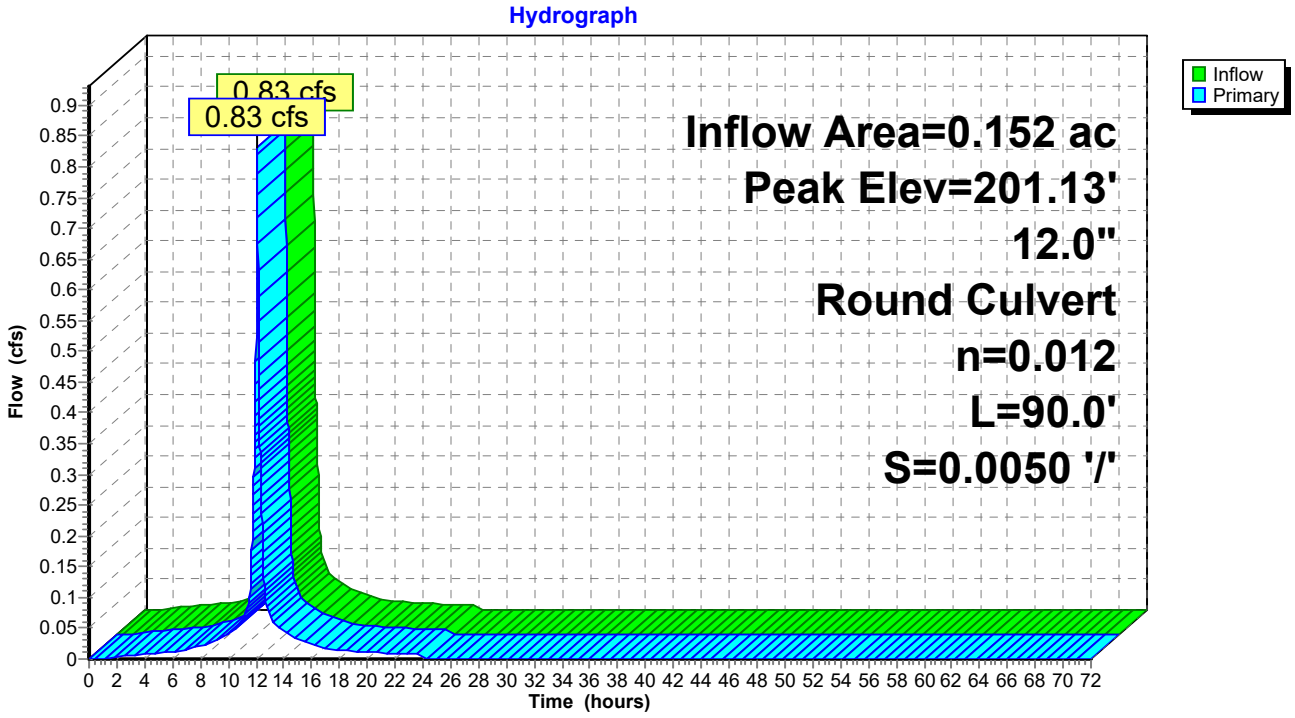
Inflow Area = 0.152 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-YR event
Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af
Outflow = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 201.13' @ 12.08 hrs
Flood Elev= 205.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	200.60'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 200.60' / 200.15' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.08 hrs HW=201.13' TW=199.33' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.83 cfs @ 2.88 fps)

Pond CB 104: CB 104



Summary for Pond CB 106: CB 106

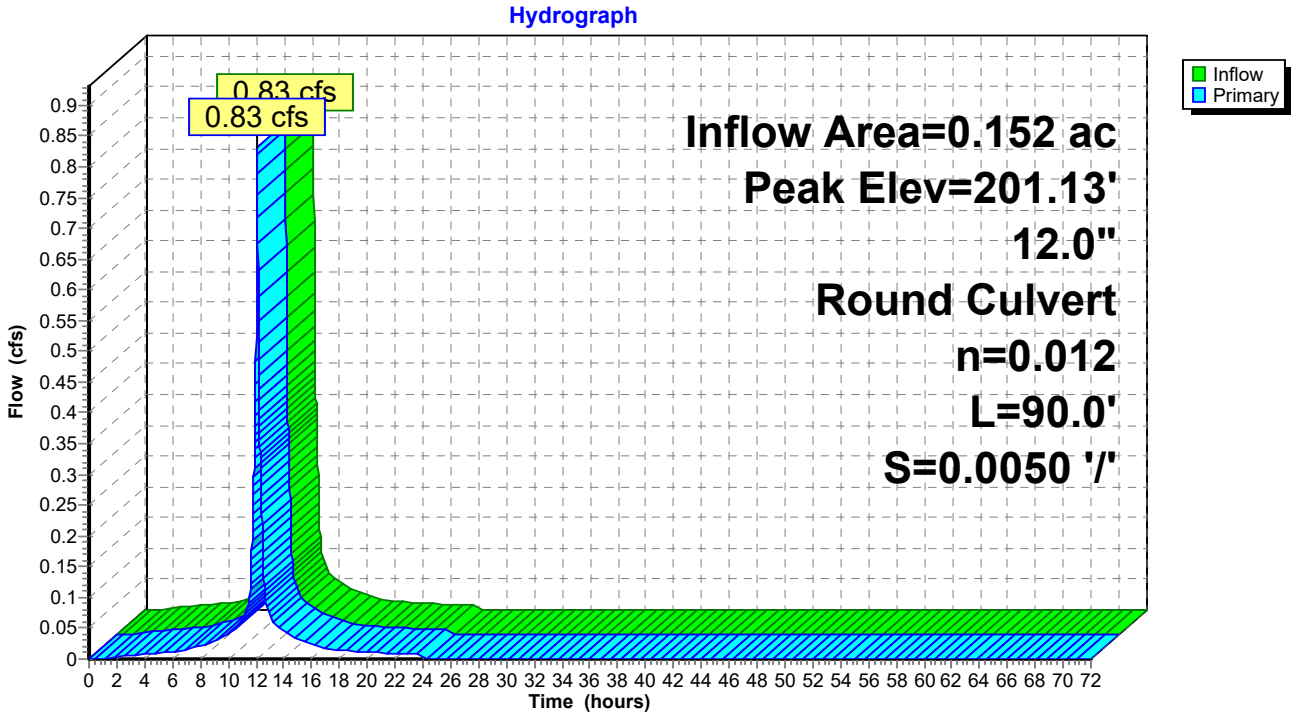
Inflow Area = 0.152 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-YR event
Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af
Outflow = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.08 hrs, Volume= 0.068 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 201.13' @ 12.08 hrs
Flood Elev= 205.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	200.60'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 200.60' / 200.15' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.08 hrs HW=201.13' TW=199.55' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.83 cfs @ 2.88 fps)

Pond CB 106: CB 106



Summary for Pond CB 109: CB 109

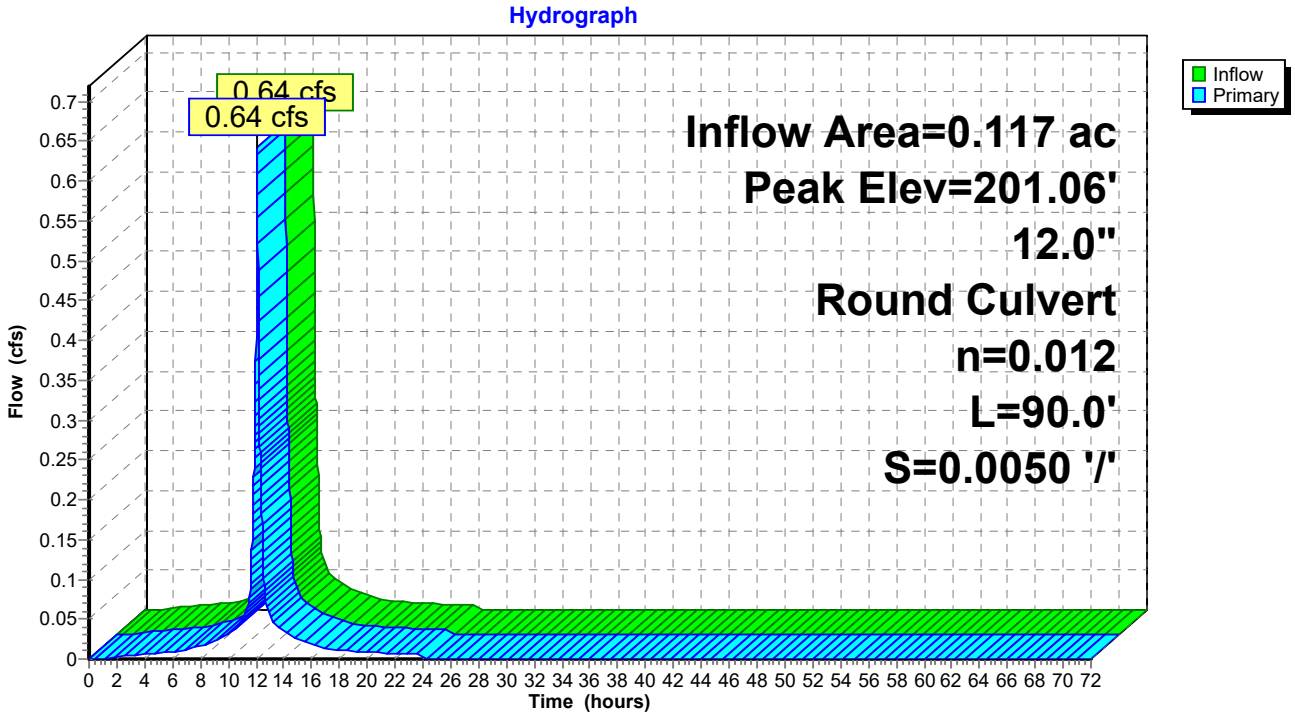
Inflow Area = 0.117 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-YR event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af
Outflow = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 201.06' @ 12.08 hrs
Flood Elev= 205.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	200.60'	**12.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 200.60' / 200.15' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.08 hrs HW=201.06' TW=199.81' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.64 cfs @ 2.70 fps)

Pond CB 109: CB 109



Summary for Pond D1: SMA D1

Inflow Area = 1.274 ac, 68.39% Impervious, Inflow Depth = 3.42" for 25-YR event
Inflow = 5.10 cfs @ 12.09 hrs, Volume= 0.363 af
Outflow = 0.75 cfs @ 12.61 hrs, Volume= 0.363 af, Atten= 85%, Lag= 31.2 min
Discarded = 0.16 cfs @ 12.61 hrs, Volume= 0.158 af
Primary = 0.59 cfs @ 12.61 hrs, Volume= 0.205 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 212.44' @ 12.61 hrs Surf.Area= 3,020 sf Storage= 6,786 cf

Plug-Flow detention time= 149.8 min calculated for 0.363 af (100% of inflow)
Center-of-Mass det. time= 149.8 min (966.8 - 817.0)

Volume	Invert	Avail.Storage	Storage Description
#1	209.00'	12,044 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

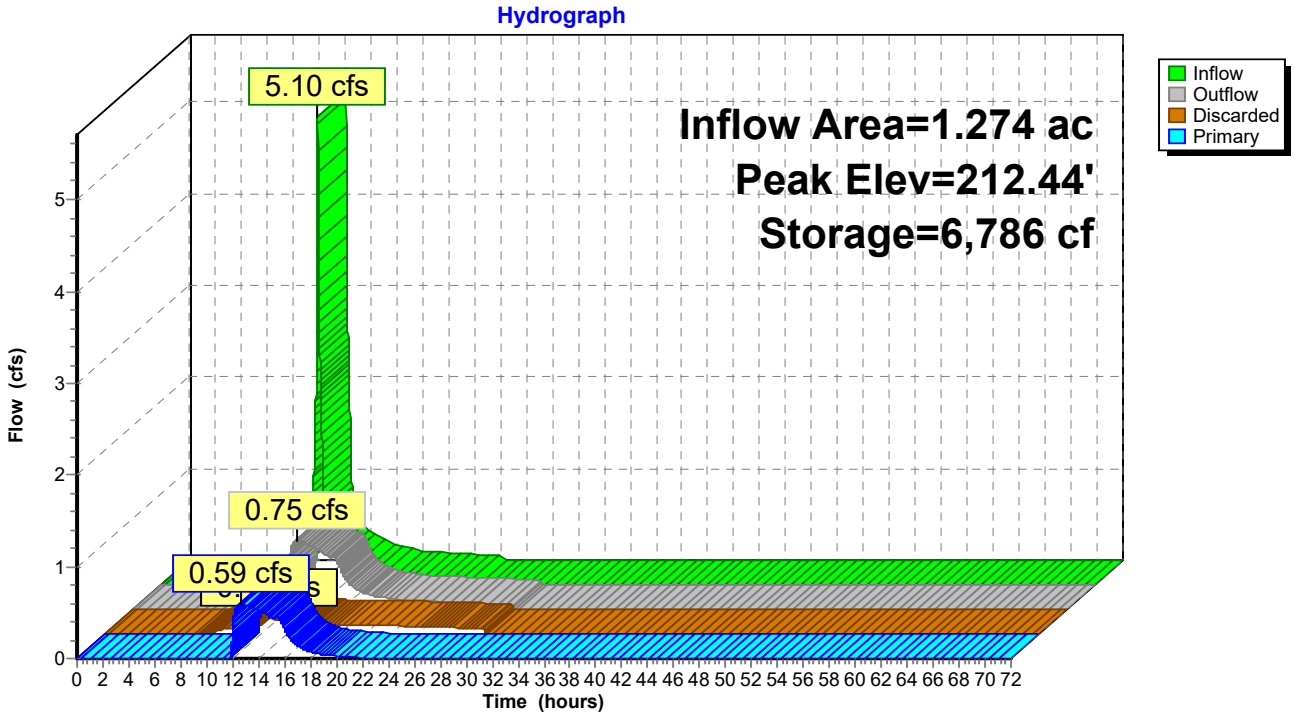
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
209.00	1,067	0	0	1,067
210.00	1,547	1,300	1,300	1,564
212.00	2,737	4,228	5,527	2,797
213.00	3,404	3,064	8,592	3,492
214.00	3,500	3,452	12,044	3,722

Device	Routing	Invert	Outlet Devices
#1	Discarded	209.00'	**2.300 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	210.00'	**12.0" Round Culvert** L= 105.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 210.00' / 209.00' S= 0.0095 '/' Cc= 0.900 n= 0.120, Flow Area= 0.79 sf

Discarded OutFlow Max=0.16 cfs @ 12.61 hrs HW=212.44' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.59 cfs @ 12.61 hrs HW=212.44' TW=208.51' (Dynamic Tailwater)
↑**2=Culvert** (Barrel Controls 0.59 cfs @ 0.75 fps)

Pond D1: SMA D1



Summary for Pond D2: SMA D2

Inflow Area = 2.195 ac, 65.64% Impervious, Inflow Depth = 2.36" for 25-YR event
Inflow = 3.62 cfs @ 12.09 hrs, Volume= 0.431 af
Outflow = 0.28 cfs @ 16.67 hrs, Volume= 0.431 af, Atten= 92%, Lag= 274.9 min
Discarded = 0.28 cfs @ 16.67 hrs, Volume= 0.431 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 209.79' @ 16.67 hrs Surf.Area= 5,102 sf Storage= 11,111 cf

Plug-Flow detention time= 441.8 min calculated for 0.431 af (100% of inflow)
Center-of-Mass det. time= 441.8 min (1,291.1 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1	207.00'	24,138 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

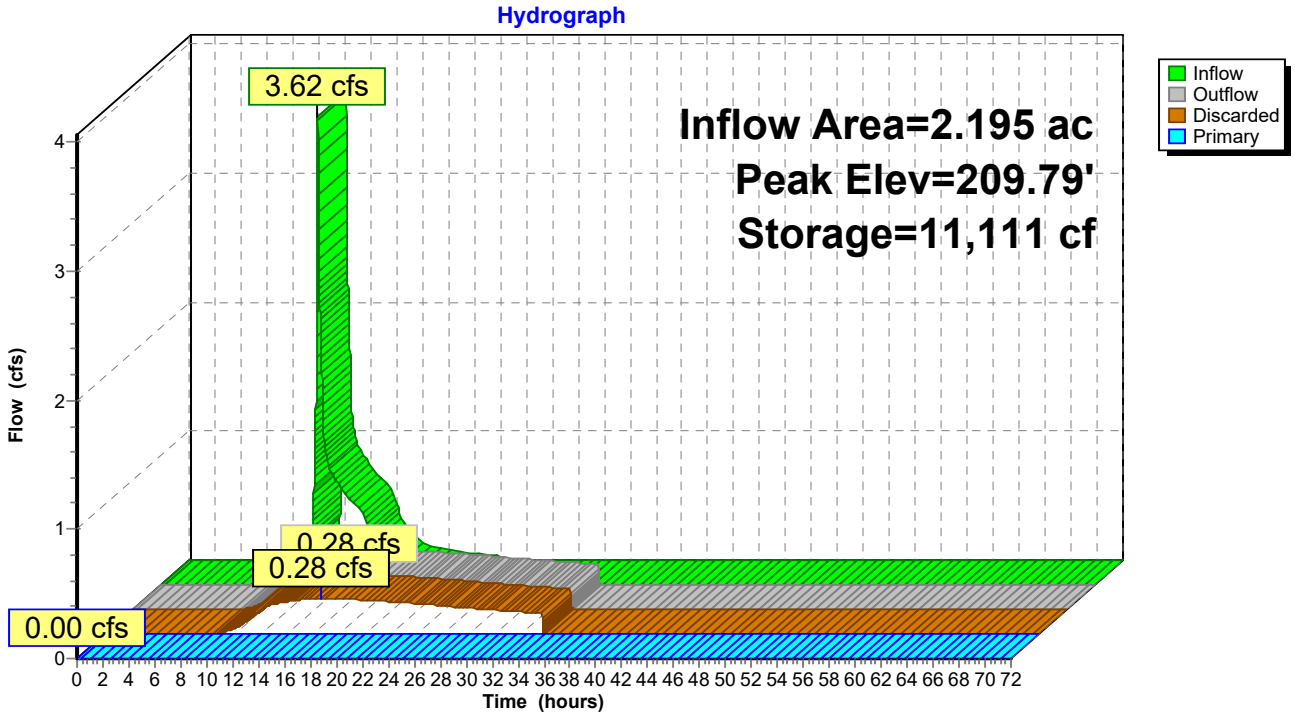
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.00	2,976	0	0	2,976
208.00	3,670	3,317	3,317	3,699
210.00	5,290	8,911	12,228	5,387
211.00	6,171	5,725	17,953	6,308
212.00	6,200	6,185	24,138	6,588

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.00'	**2.300 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	209.90'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.28 cfs @ 16.67 hrs HW=209.79' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.00' TW=207.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond D2: SMA D2



Summary for Pond D3: SMA D3

Inflow Area = 3.233 ac, 62.93% Impervious, Inflow Depth = 0.89" for 25-YR event
Inflow = 3.35 cfs @ 12.09 hrs, Volume= 0.239 af
Outflow = 0.29 cfs @ 13.35 hrs, Volume= 0.239 af, Atten= 91%, Lag= 75.3 min
Discarded = 0.29 cfs @ 13.35 hrs, Volume= 0.239 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 207.80' @ 13.35 hrs Surf.Area= 5,547 sf Storage= 4,158 cf

Plug-Flow detention time= 133.8 min calculated for 0.239 af (100% of inflow)
Center-of-Mass det. time= 133.8 min (968.2 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1	207.00'	29,248 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

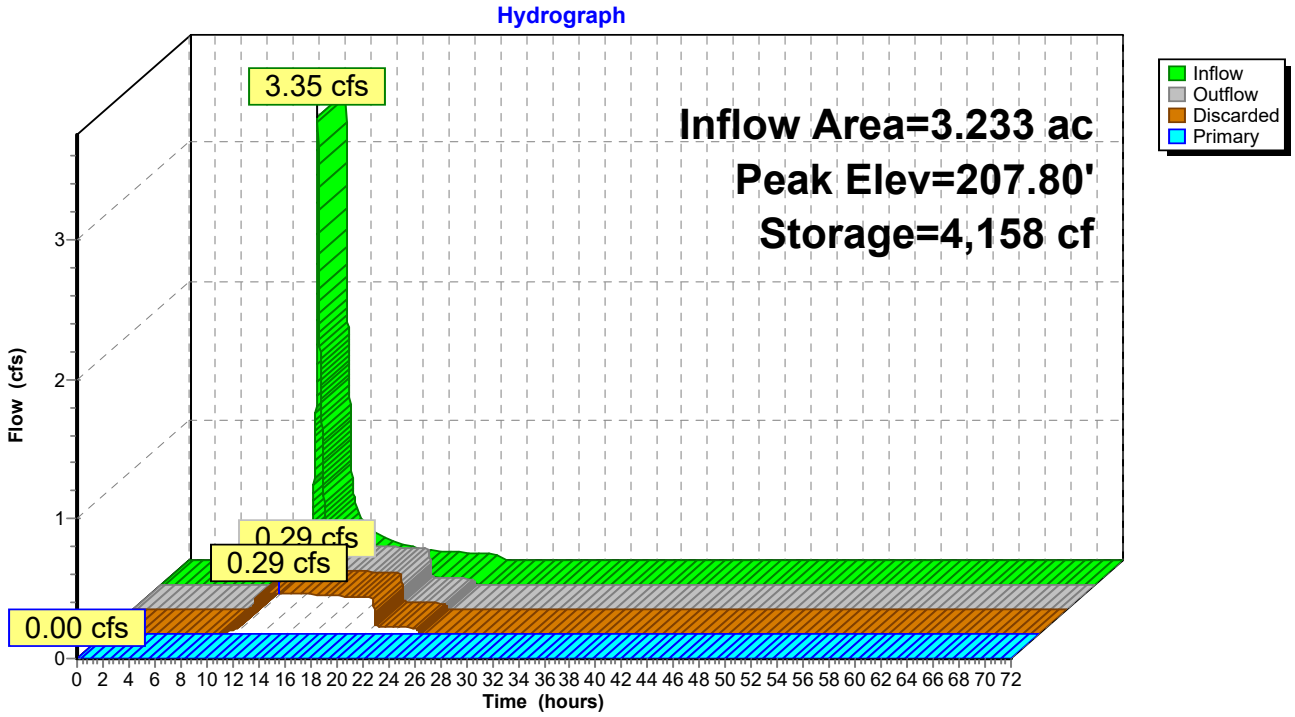
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.00	4,906	0	0	4,906
208.00	5,717	5,306	5,306	5,757
210.00	9,069	14,658	19,964	9,163
211.00	9,500	9,284	29,248	9,713

Device	Routing	Invert	Outlet Devices
#1	Primary	208.75'	**2.0" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 5 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#2	Discarded	207.00'	**2.250 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=0.29 cfs @ 13.35 hrs HW=207.80' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.00' TW=195.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond D3: SMA D3



Summary for Pond DMH 101: DMH 101

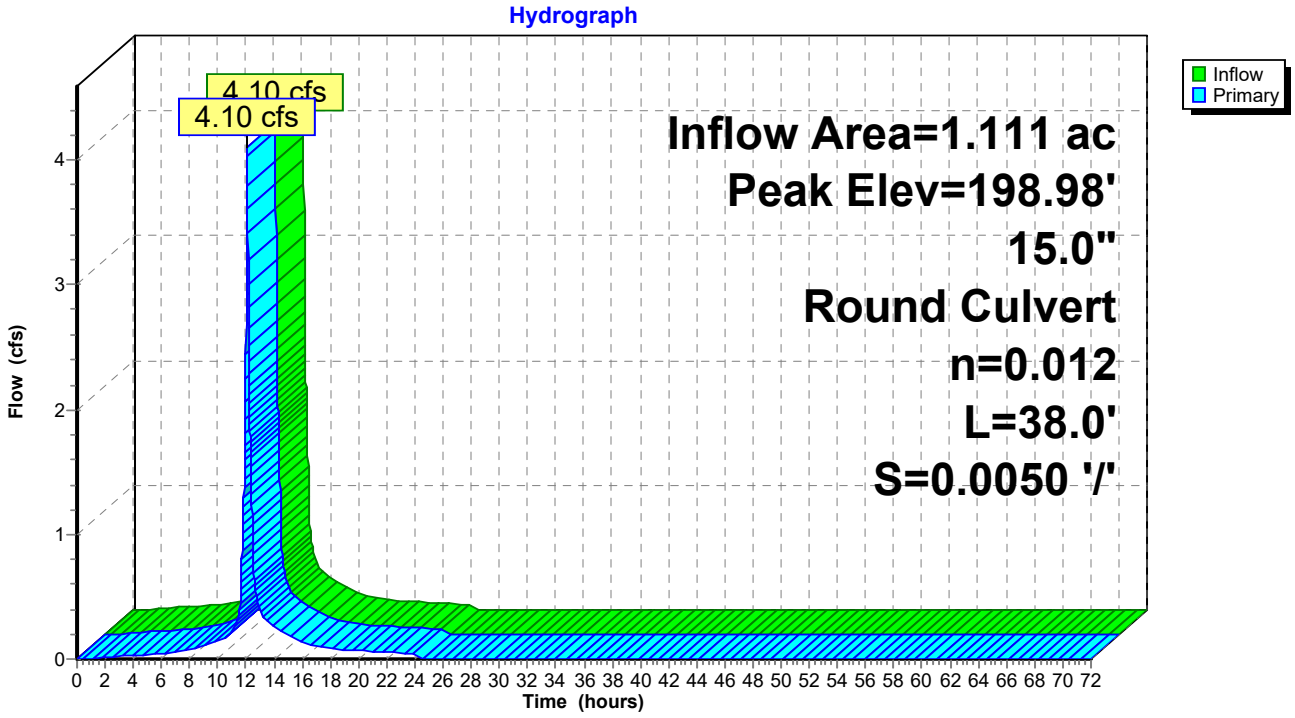
Inflow Area = 1.111 ac, 53.08% Impervious, Inflow Depth = 3.53" for 25-YR event
Inflow = 4.10 cfs @ 12.09 hrs, Volume= 0.327 af
Outflow = 4.10 cfs @ 12.09 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
Primary = 4.10 cfs @ 12.09 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 198.98' @ 12.09 hrs
Flood Elev= 205.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	197.68'	**15.0" Round Culvert** L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 197.68' / 197.49' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.09 cfs @ 12.09 hrs HW=198.98' TW=197.55' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.09 cfs @ 3.99 fps)

Pond DMH 101: DMH 101



Summary for Pond DMH 103: DMH 103

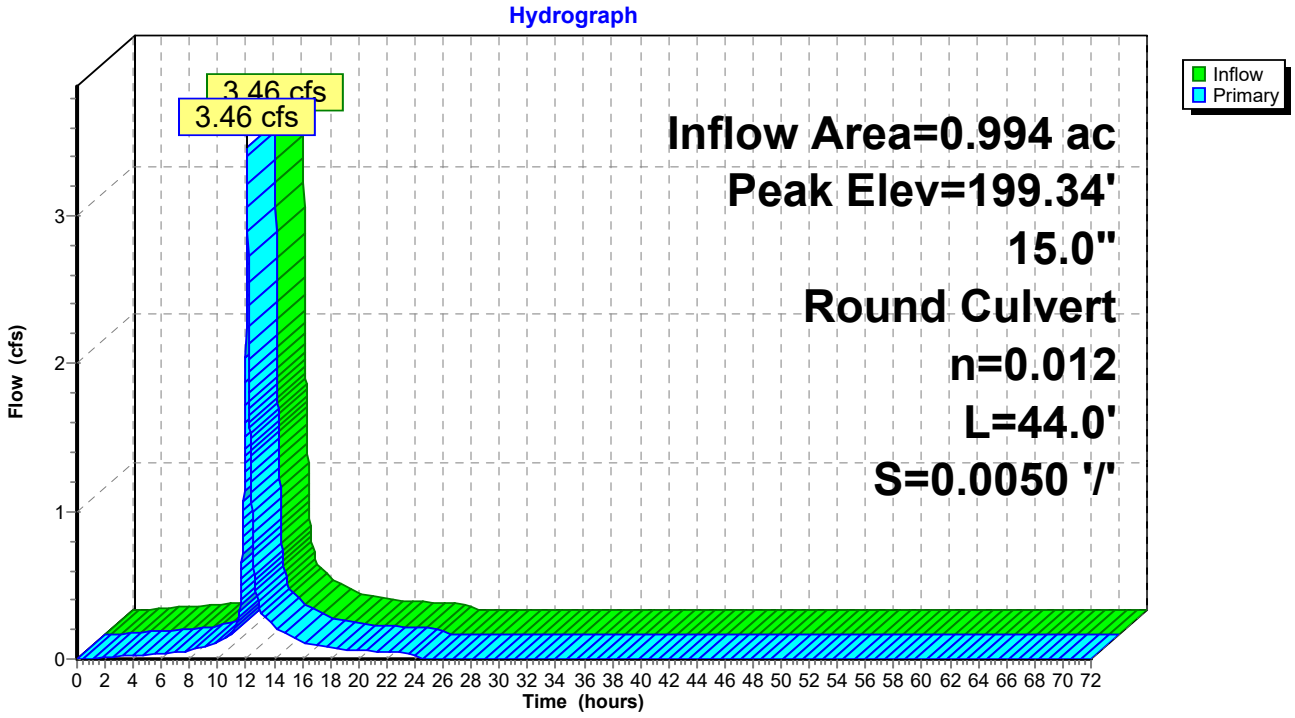
Inflow Area = 0.994 ac, 47.55% Impervious, Inflow Depth = 3.32" for 25-YR event
Inflow = 3.46 cfs @ 12.09 hrs, Volume= 0.275 af
Outflow = 3.46 cfs @ 12.09 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min
Primary = 3.46 cfs @ 12.09 hrs, Volume= 0.275 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 199.34' @ 12.09 hrs
Flood Elev= 205.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	198.00'	**15.0" Round Culvert** L= 44.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 198.00' / 197.78' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.42 cfs @ 12.09 hrs HW=199.33' TW=198.98' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 3.42 cfs @ 3.25 fps)

Pond DMH 103: DMH 103



Summary for Pond DMH 105: DMH 105

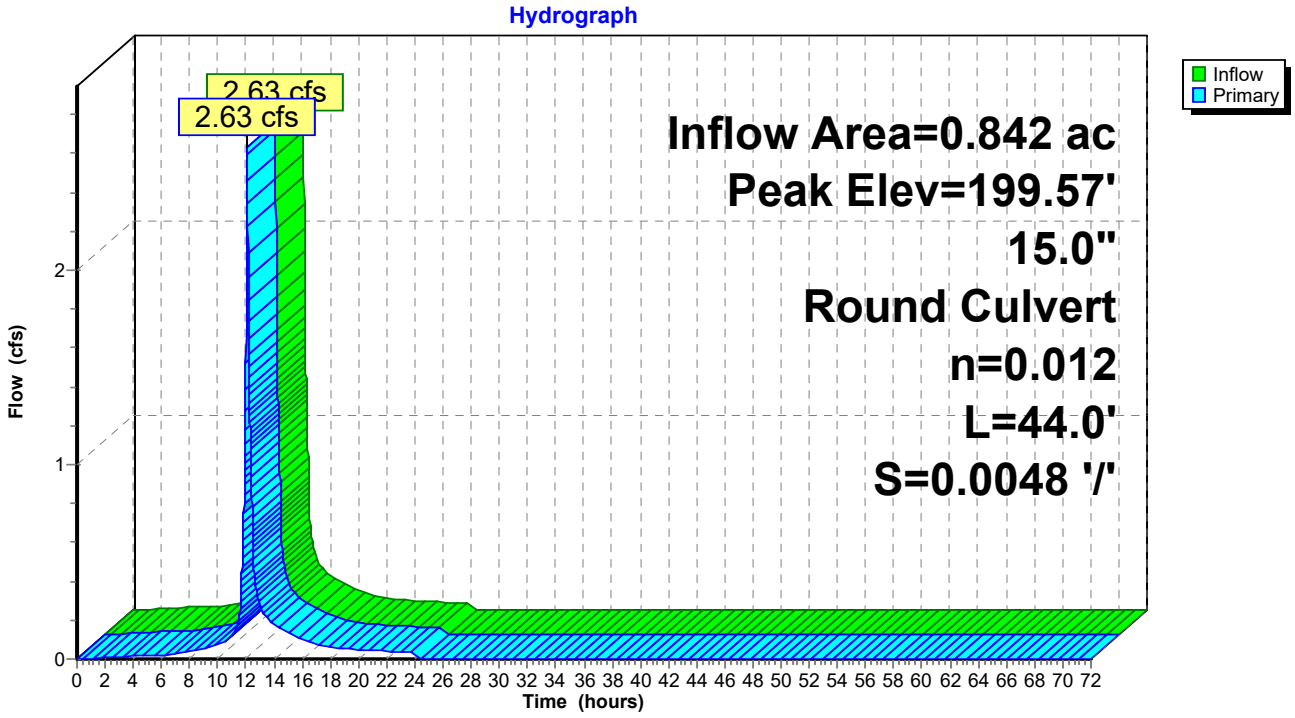
Inflow Area = 0.842 ac, 38.12% Impervious, Inflow Depth = 2.95" for 25-YR event
Inflow = 2.63 cfs @ 12.09 hrs, Volume= 0.207 af
Outflow = 2.63 cfs @ 12.09 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.0 min
Primary = 2.63 cfs @ 12.09 hrs, Volume= 0.207 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 199.57' @ 12.10 hrs
Flood Elev= 205.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	198.31'	**15.0" Round Culvert** L= 44.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 198.31' / 198.10' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.54 cfs @ 12.09 hrs HW=199.56' TW=199.34' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.54 cfs @ 2.57 fps)

Pond DMH 105: DMH 105



Summary for Pond DMH 107: DMH 107

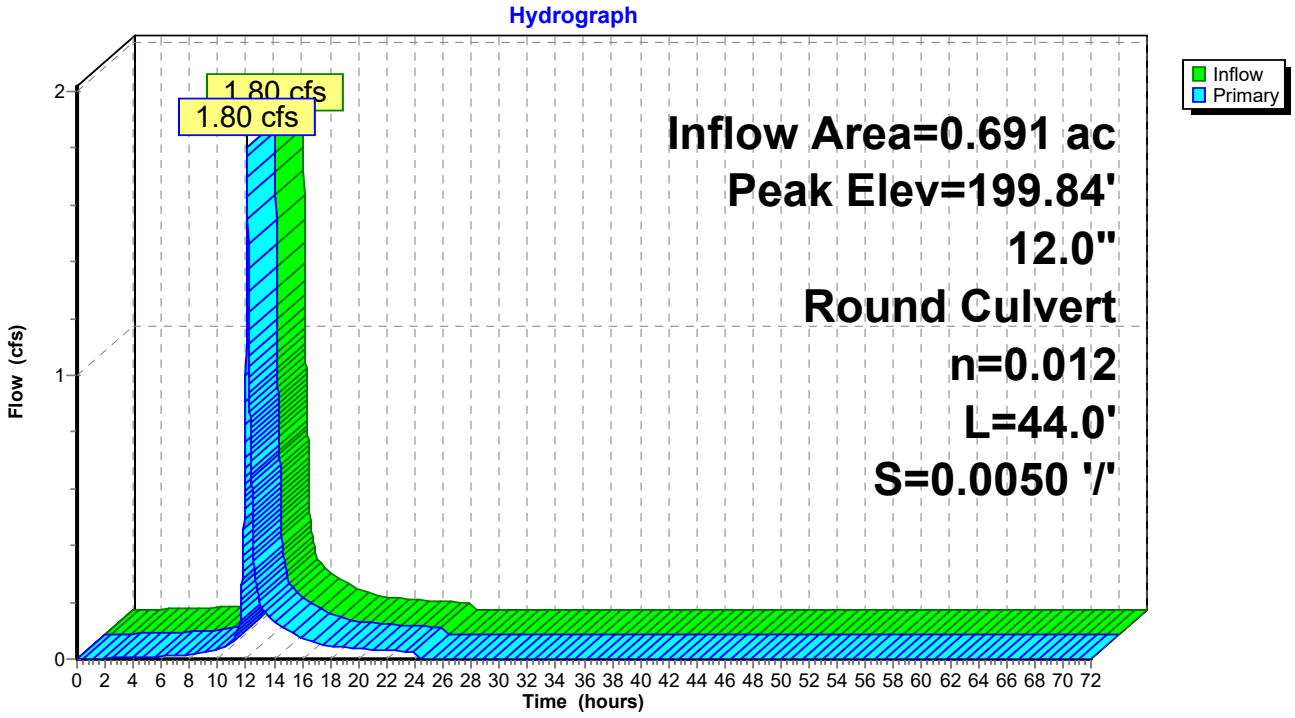
Inflow Area = 0.691 ac, 24.55% Impervious, Inflow Depth = 2.42" for 25-YR event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.139 af
Outflow = 1.80 cfs @ 12.09 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min
Primary = 1.80 cfs @ 12.09 hrs, Volume= 0.139 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 199.84' @ 12.10 hrs
Flood Elev= 205.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	198.79'	**12.0" Round Culvert** L= 44.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 198.79' / 198.57' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.73 cfs @ 12.09 hrs HW=199.83' TW=199.56' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.73 cfs @ 2.64 fps)

Pond DMH 107: DMH 107



Summary for Pond LCB 108: LCB 108

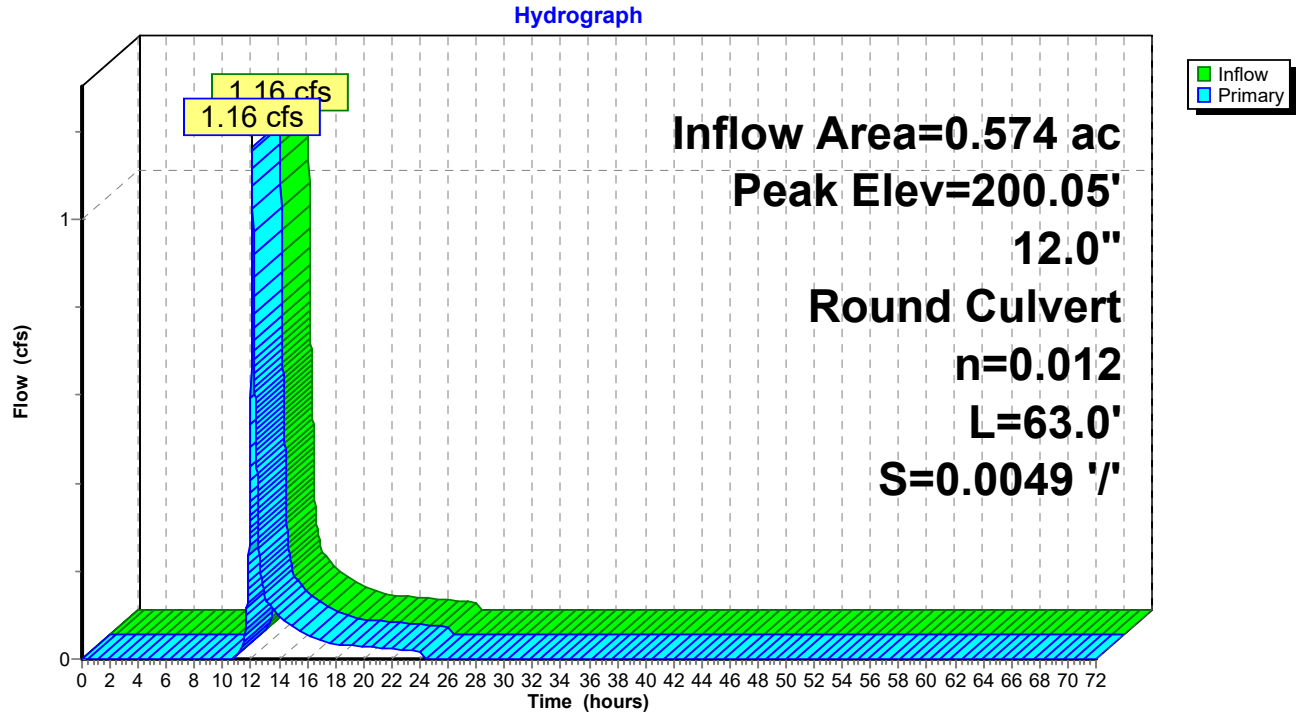
Inflow Area = 0.574 ac, 9.15% Impervious, Inflow Depth = 1.82" for 25-YR event
Inflow = 1.16 cfs @ 12.10 hrs, Volume= 0.087 af
Outflow = 1.16 cfs @ 12.10 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min
Primary = 1.16 cfs @ 12.10 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 200.05' @ 12.11 hrs
Flood Elev= 204.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	199.20'	**12.0" Round Culvert** L= 63.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 199.20' / 198.89' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.10 hrs HW=200.04' TW=199.83' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.11 cfs @ 2.14 fps)

Pond LCB 108: LCB 108



Summary for Pond P1: POND 1

[62] Hint: Exceeded Reach 2R OUTLET depth by 1.77' @ 13.78 hrs

Inflow Area = 141.407 ac, 8.52% Impervious, Inflow Depth = 1.30" for 25-YR event
Inflow = 71.83 cfs @ 12.76 hrs, Volume= 15.298 af
Outflow = 36.70 cfs @ 13.52 hrs, Volume= 15.297 af, Atten= 49%, Lag= 45.3 min
Primary = 36.70 cfs @ 13.52 hrs, Volume= 15.297 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.39' @ 13.52 hrs Surf.Area= 130,053 sf Storage= 120,906 cf

Plug-Flow detention time= 26.3 min calculated for 15.297 af (100% of inflow)
Center-of-Mass det. time= 26.2 min (959.1 - 932.9)

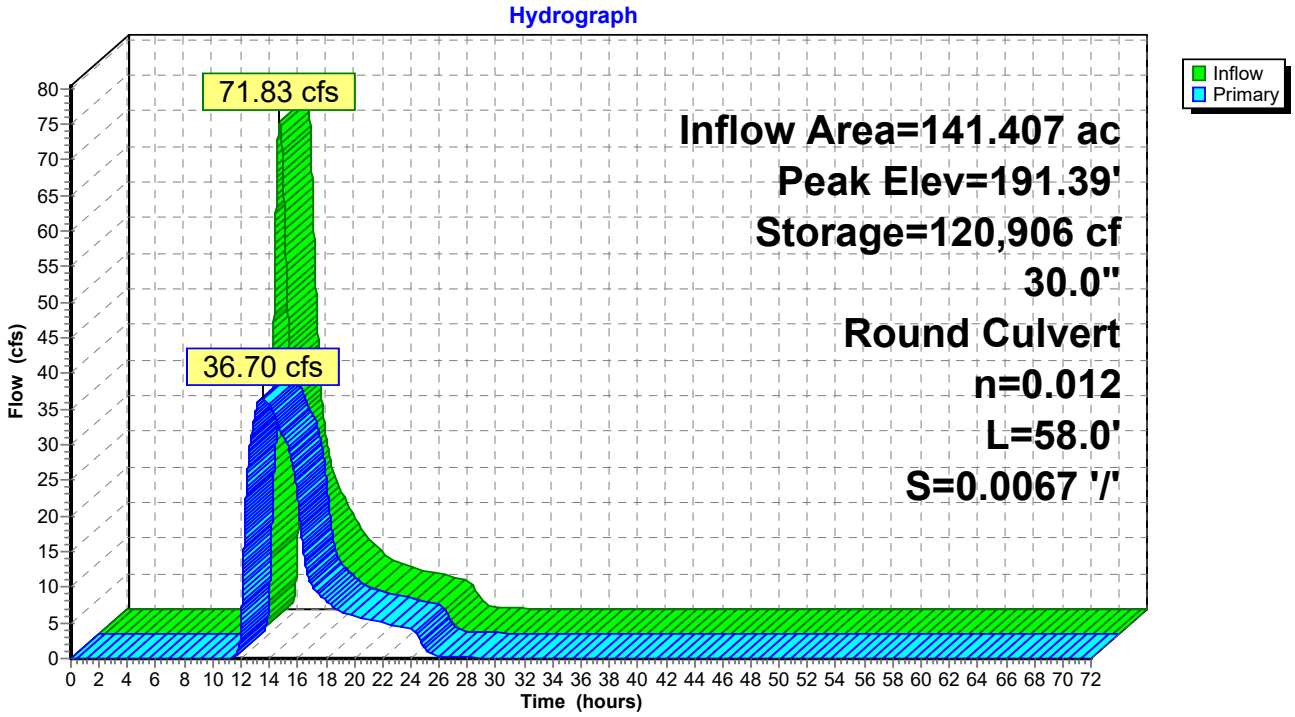
Volume	Invert	Avail.Storage	Storage Description
#1	187.50'	426,640 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
187.50	100	0	0
188.00	1,000	275	275
189.00	2,754	1,877	2,152
190.00	20,973	11,864	14,016
191.00	102,365	61,669	75,685
192.00	173,518	137,942	213,626
193.00	252,510	213,014	426,640

Device	Routing	Invert	Outlet Devices
#1	Primary	187.58'	**30.0" Round Culvert** L= 58.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 187.58' / 187.19' S= 0.0067 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=36.70 cfs @ 13.52 hrs HW=191.39' TW=188.37' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 36.70 cfs @ 7.48 fps)

Pond P1: POND 1



Summary for Pond P2: POND 2

[62] Hint: Exceeded Reach O2R OUTLET depth by 1.18' @ 12.71 hrs

Inflow Area = 34.329 ac, 4.07% Impervious, Inflow Depth = 1.61" for 25-YR event
Inflow = 36.56 cfs @ 12.31 hrs, Volume= 4.619 af
Outflow = 24.82 cfs @ 12.63 hrs, Volume= 4.612 af, Atten= 32%, Lag= 18.9 min
Primary = 24.82 cfs @ 12.63 hrs, Volume= 4.612 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 206.13' @ 12.63 hrs Surf.Area= 28,821 sf Storage= 27,642 cf

Plug-Flow detention time= 15.6 min calculated for 4.612 af (100% of inflow)
Center-of-Mass det. time= 14.6 min (901.4 - 886.8)

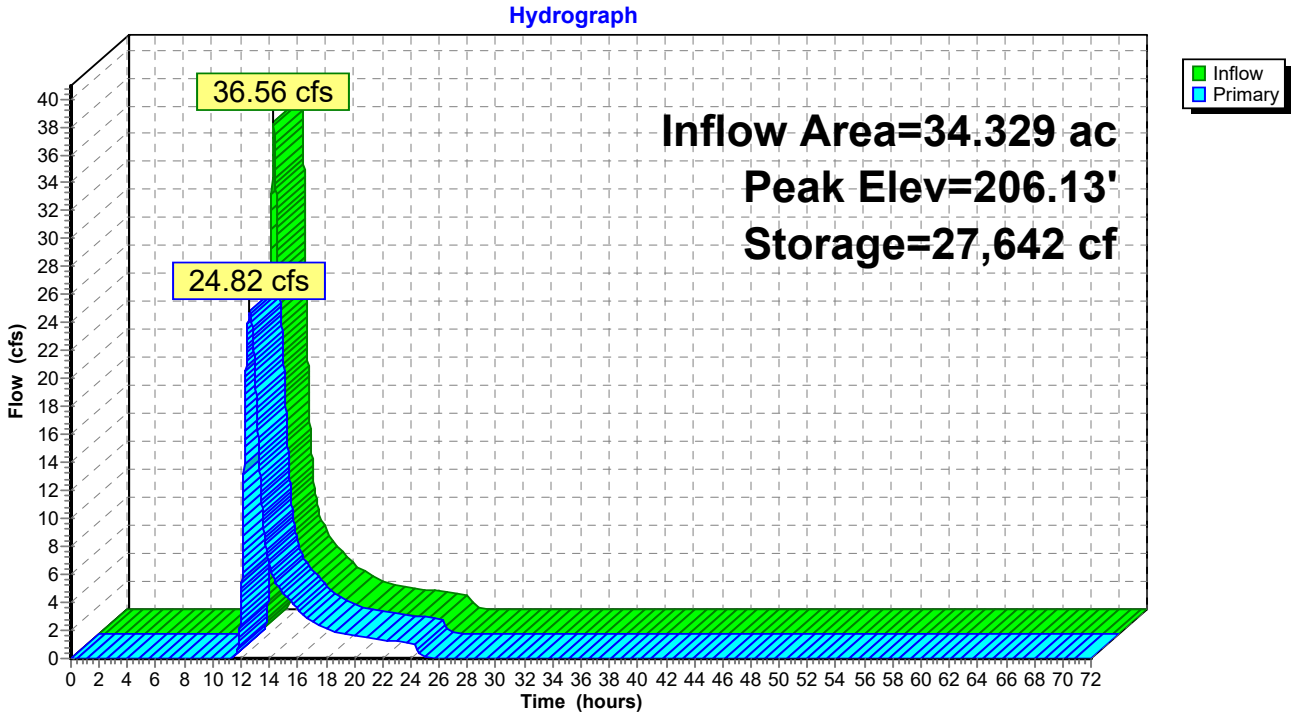
Volume	Invert	Avail.Storage	Storage Description
#1	203.50'	606,242 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
203.50	500	0	0
204.00	2,177	669	669
205.00	9,978	6,078	6,747
206.00	25,067	17,523	24,269
208.00	85,044	110,111	134,380
213.10	100,000	471,862	606,242

Device	Routing	Invert	Outlet Devices
#1	Primary	203.79'	**30.0" Round Culvert** L= 91.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 203.79' / 202.70' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	213.00'	**20.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=24.82 cfs @ 12.63 hrs HW=206.13' TW=201.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 24.82 cfs @ 5.20 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P2: POND 2



Summary for Pond P3: POND 3

Inflow Area = 348.808 ac, 3.50% Impervious, Inflow Depth = 1.67" for 25-YR event
Inflow = 152.69 cfs @ 13.73 hrs, Volume= 48.398 af
Outflow = 152.69 cfs @ 13.73 hrs, Volume= 48.397 af, Atten= 0%, Lag= 0.1 min
Primary = 152.69 cfs @ 13.73 hrs, Volume= 48.397 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 195.70' @ 13.73 hrs Surf.Area= 485 sf Storage= 1,080 cf

Plug-Flow detention time= 0.2 min calculated for 48.397 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (972.8 - 972.7)

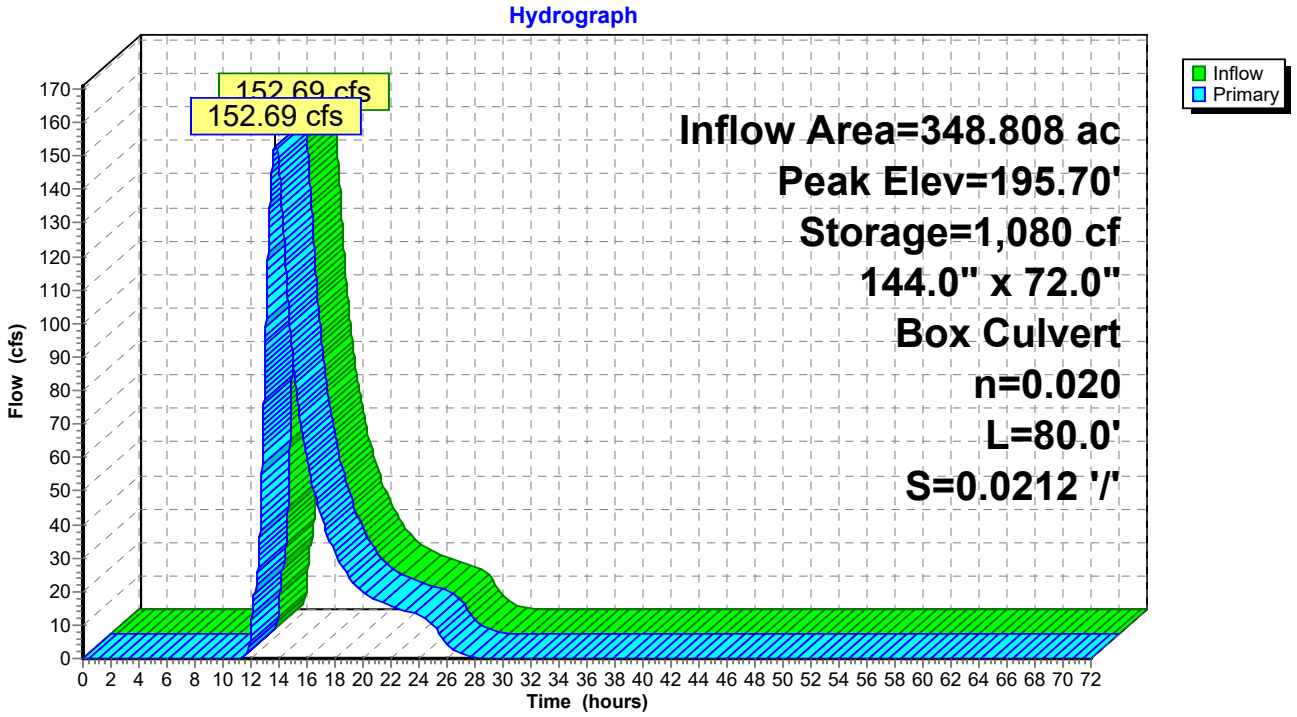
Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	122,014 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.00	250	0	0
194.00	400	325	325
196.00	500	900	1,225
198.00	7,240	7,740	8,965
200.00	26,996	34,236	43,201
202.00	51,817	78,813	122,014

Device	Routing	Invert	Outlet Devices
#1	Primary	193.20'	**144.0" W x 72.0" H Box Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 193.20' / 191.50' S= 0.0212 '/' Cc= 0.900 n= 0.020, Flow Area= 72.00 sf

Primary OutFlow Max=152.69 cfs @ 13.73 hrs HW=195.70' TW=192.82' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 152.69 cfs @ 5.08 fps)

Pond P3: POND 3



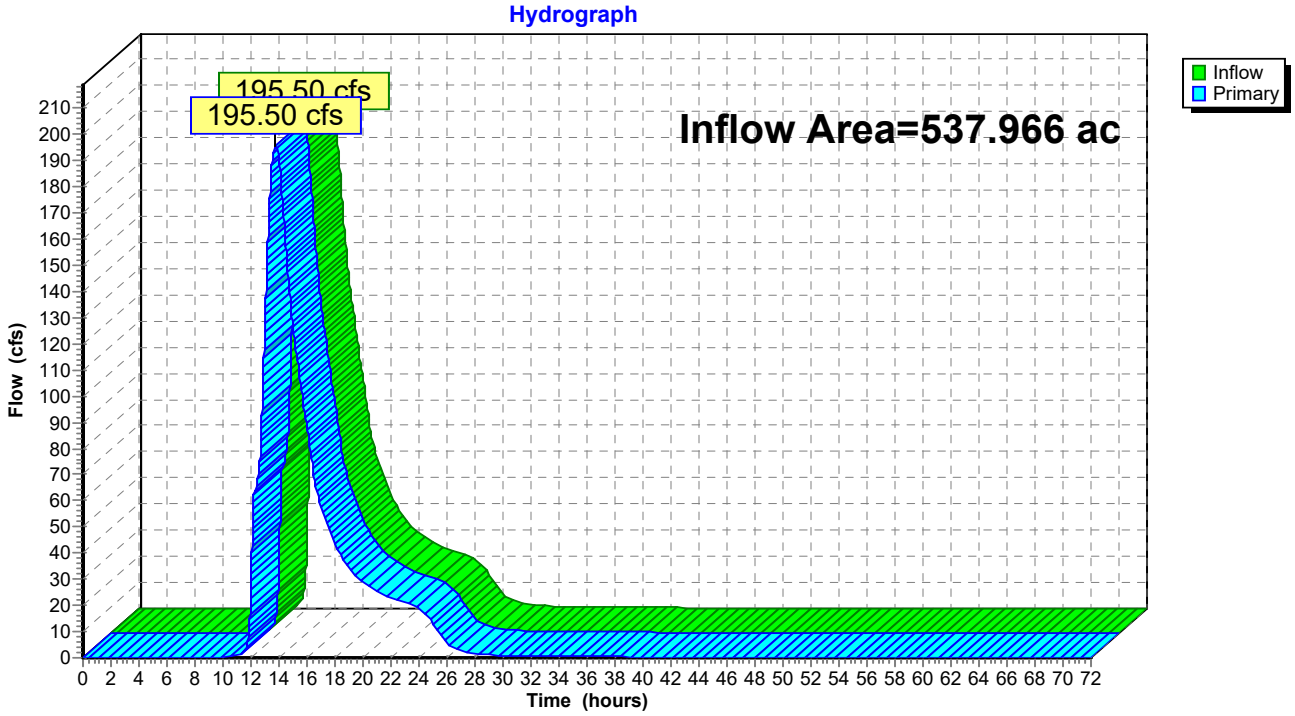
Summary for Pond POA C: POA COMBINED

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 537.966 ac, 6.61% Impervious, Inflow Depth > 1.56" for 25-YR event
Inflow = 195.50 cfs @ 13.74 hrs, Volume= 70.106 af
Primary = 195.50 cfs @ 13.74 hrs, Volume= 70.106 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA C: POA COMBINED



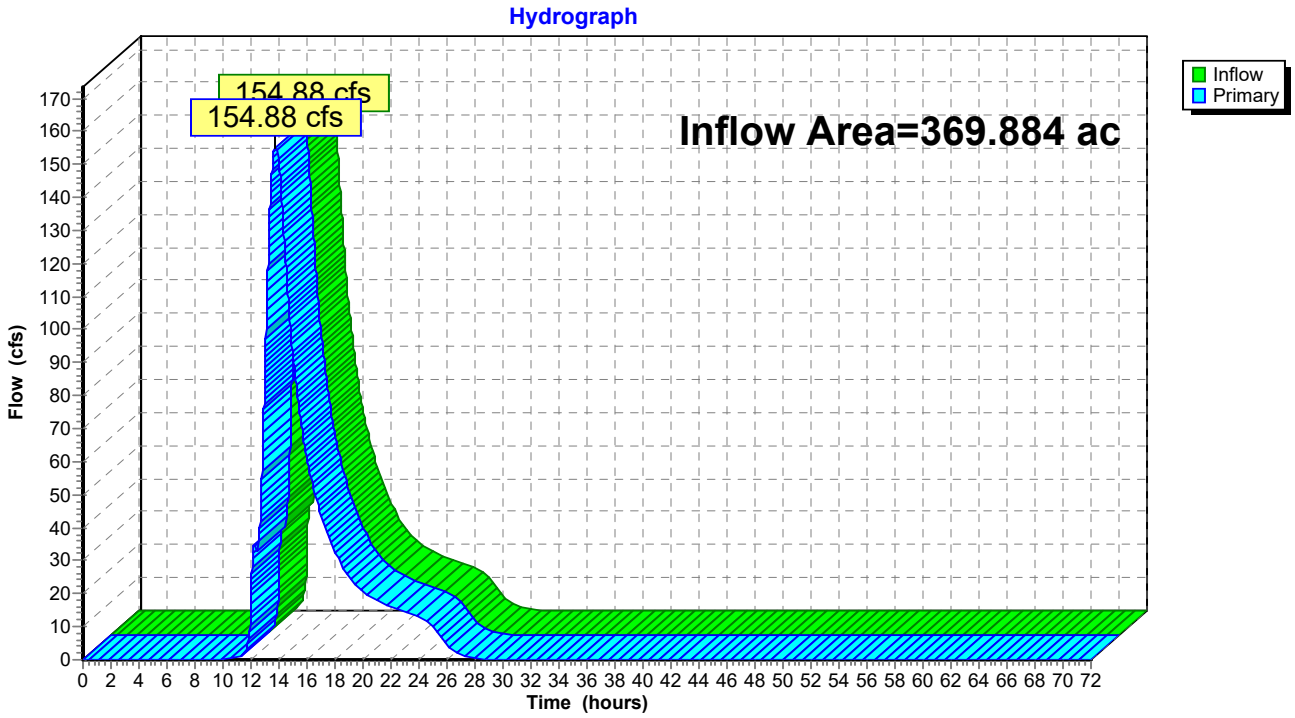
Summary for Pond POA NE: POA NORTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 369.884 ac, 4.59% Impervious, Inflow Depth = 1.63" for 25-YR event
Inflow = 154.88 cfs @ 13.75 hrs, Volume= 50.269 af
Primary = 154.88 cfs @ 13.75 hrs, Volume= 50.269 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NE: POA NORTHEAST



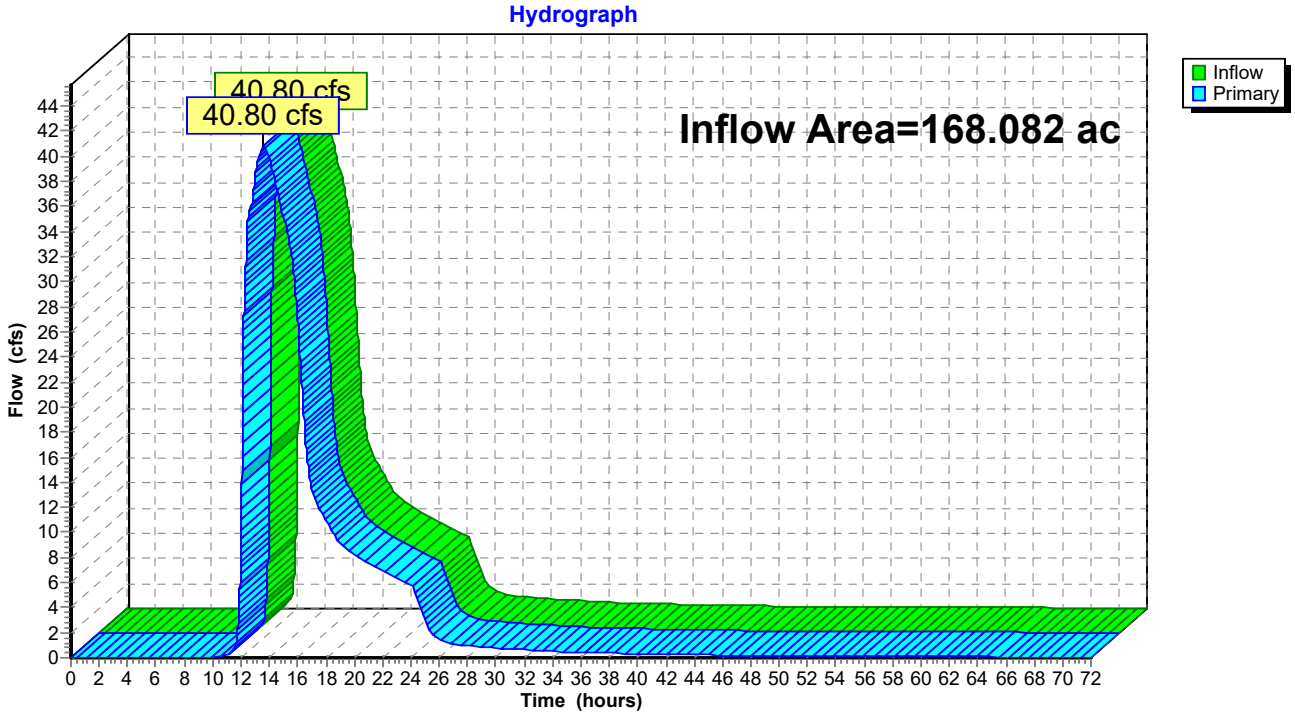
Summary for Pond POA NW: POA NORTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 168.082 ac, 11.08% Impervious, Inflow Depth > 1.42" for 25-YR event
Inflow = 40.80 cfs @ 13.57 hrs, Volume= 19.837 af
Primary = 40.80 cfs @ 13.57 hrs, Volume= 19.837 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NW: POA NORTHWEST



Summary for Pond PP: POROUS PAVEMENT

Inflow Area = 0.424 ac, 21.70% Impervious, Inflow Depth = 1.02" for 25-YR event
Inflow = 0.39 cfs @ 12.11 hrs, Volume= 0.036 af
Outflow = 0.14 cfs @ 12.52 hrs, Volume= 0.036 af, Atten= 65%, Lag= 24.5 min
Discarded = 0.14 cfs @ 12.52 hrs, Volume= 0.036 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.01' @ 12.52 hrs Surf.Area= 0.025 ac Storage= 0.005 af

Plug-Flow detention time= 8.1 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 8.1 min (905.4 - 897.3)

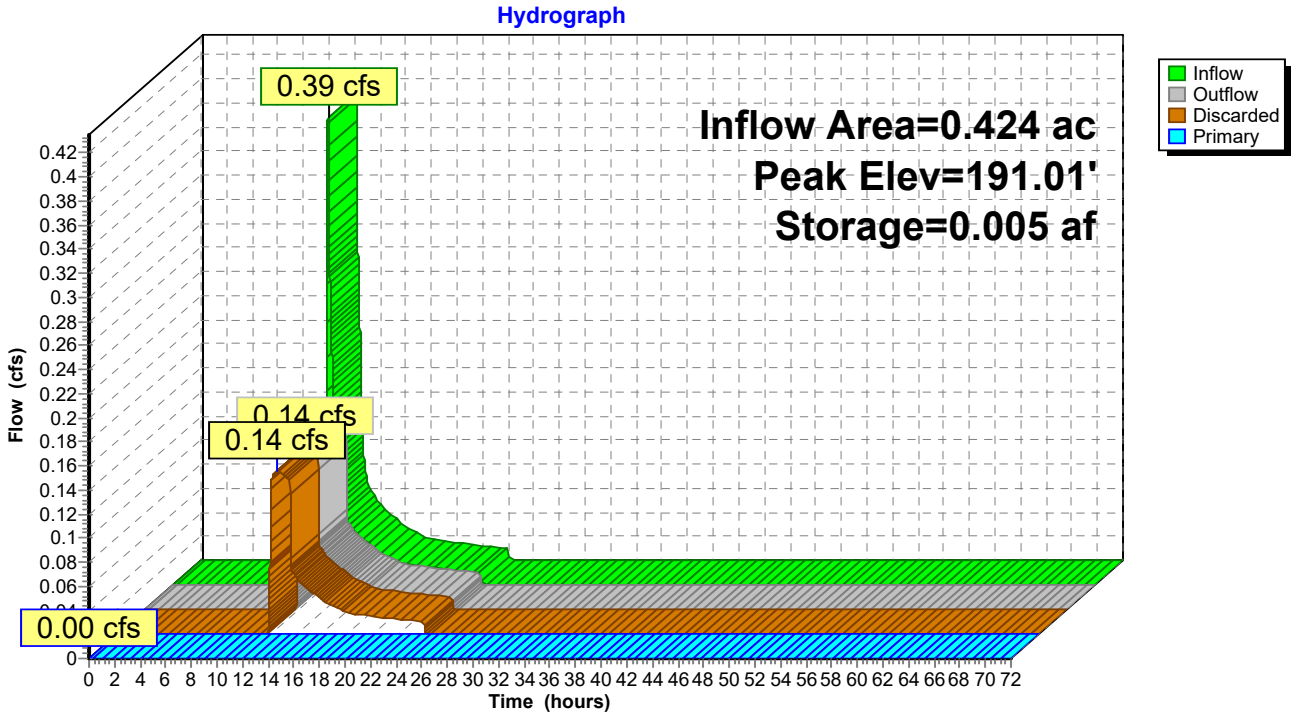
Volume	Invert	Avail.Storage	Storage Description
#1	190.50'	0.010 af	**22.00'W x 50.00'L x 1.00'H Prismatoid** 0.025 af Overall x 40.0% Voids
#2	191.50'	0.011 af	**22.00'W x 50.00'L x 1.50'H Prismatoid** 0.038 af Overall x 30.0% Voids
#3	193.00'	0.000 af	**1.00'W x 1.00'L x 1.00'H Prismatoid** 0.000 af Overall x 40.0% Voids
		0.021 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	190.50'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	193.90'	**2.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.14 cfs @ 12.52 hrs HW=191.01' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=190.50' TW=193.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PP: POROUS PAVEMENT



Summary for Pond SMA A: SMA A

Inflow Area = 1.028 ac, 43.70% Impervious, Inflow Depth = 2.06" for 25-YR event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af
Outflow = 0.45 cfs @ 12.59 hrs, Volume= 0.177 af, Atten= 81%, Lag= 29.6 min
Discarded = 0.45 cfs @ 12.59 hrs, Volume= 0.177 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.89' @ 12.59 hrs Surf.Area= 2,690 sf Storage= 2,283 cf

Plug-Flow detention time= 42.8 min calculated for 0.177 af (100% of inflow)
Center-of-Mass det. time= 42.8 min (897.2 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	190.75'	9,801 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

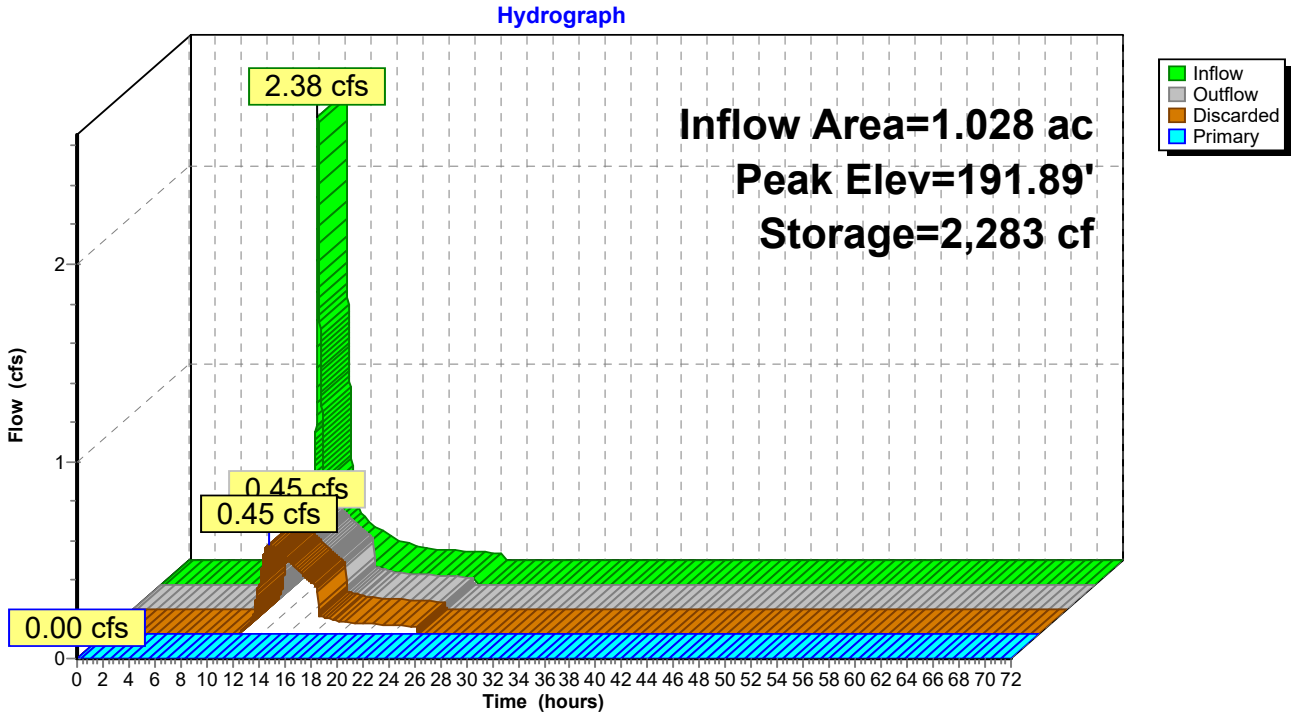
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
190.75	1,376	0	0	1,376
192.00	2,835	2,578	2,578	2,849
193.00	3,819	3,315	5,892	3,854
194.00	4,000	3,909	9,801	4,140

Device	Routing	Invert	Outlet Devices
#1	Discarded	190.75'	**7.200 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	193.00'	**25.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.45 cfs @ 12.59 hrs HW=191.89' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=190.75' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA A: SMA A



Summary for Pond SMA B: SMA B

Inflow Area = 4.997 ac, 33.09% Impervious, Inflow Depth = 2.06" for 25-YR event
Inflow = 11.16 cfs @ 12.11 hrs, Volume= 0.860 af
Outflow = 0.63 cfs @ 15.40 hrs, Volume= 0.827 af, Atten= 94%, Lag= 197.6 min
Primary = 0.63 cfs @ 15.40 hrs, Volume= 0.827 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 189.00' Surf.Area= 24,295 sf Storage= 95,559 cf
Peak Elev= 189.84' @ 15.40 hrs Surf.Area= 27,072 sf Storage= 117,125 cf (21,566 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 613.2 min (1,468.6 - 855.4)

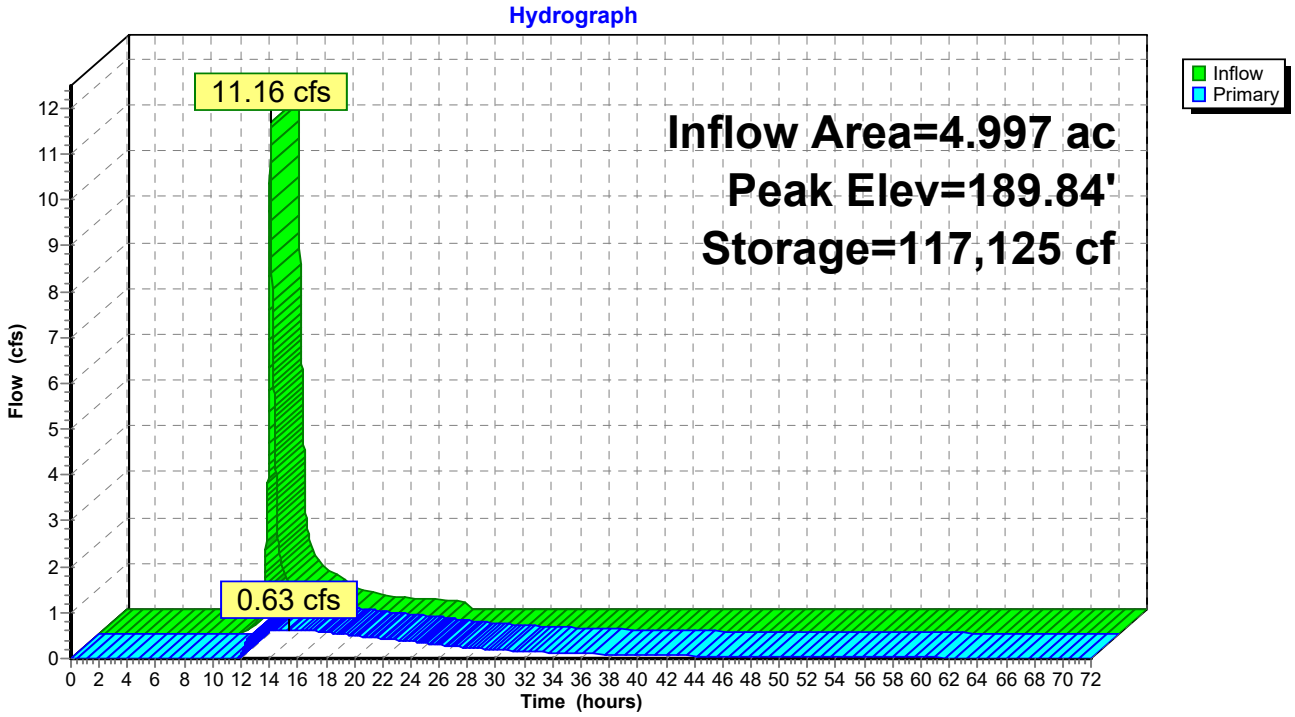
Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	182,293 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	5,185	0	0
184.00	9,240	14,425	14,425
186.00	14,133	23,373	37,798
188.00	20,987	35,120	72,918
190.00	27,602	48,589	121,507
191.00	30,985	29,294	150,801
192.00	32,000	31,493	182,293

Device	Routing	Invert	Outlet Devices
#1	Primary	188.74'	**15.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 188.74' / 188.10' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	189.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 189.00 190.25 190.25 191.00 Width (feet) 0.25 0.25 0.75 0.75

Primary OutFlow Max=0.63 cfs @ 15.40 hrs HW=189.84' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.63 cfs of 4.08 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 0.63 cfs @ 3.00 fps)

Pond SMA B: SMA B



Summary for Pond SMA C: SMA C

Inflow Area = 7.378 ac, 45.52% Impervious, Inflow Depth = 0.89" for 25-YR event
Inflow = 6.71 cfs @ 12.12 hrs, Volume= 0.549 af
Outflow = 0.56 cfs @ 14.47 hrs, Volume= 0.541 af, Atten= 92%, Lag= 140.9 min
Primary = 0.56 cfs @ 14.47 hrs, Volume= 0.541 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 195.00' Surf.Area= 13,868 sf Storage= 63,600 cf
Peak Elev= 195.78' @ 14.47 hrs Surf.Area= 15,369 sf Storage= 74,995 cf (11,394 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 404.4 min (1,276.0 - 871.6)

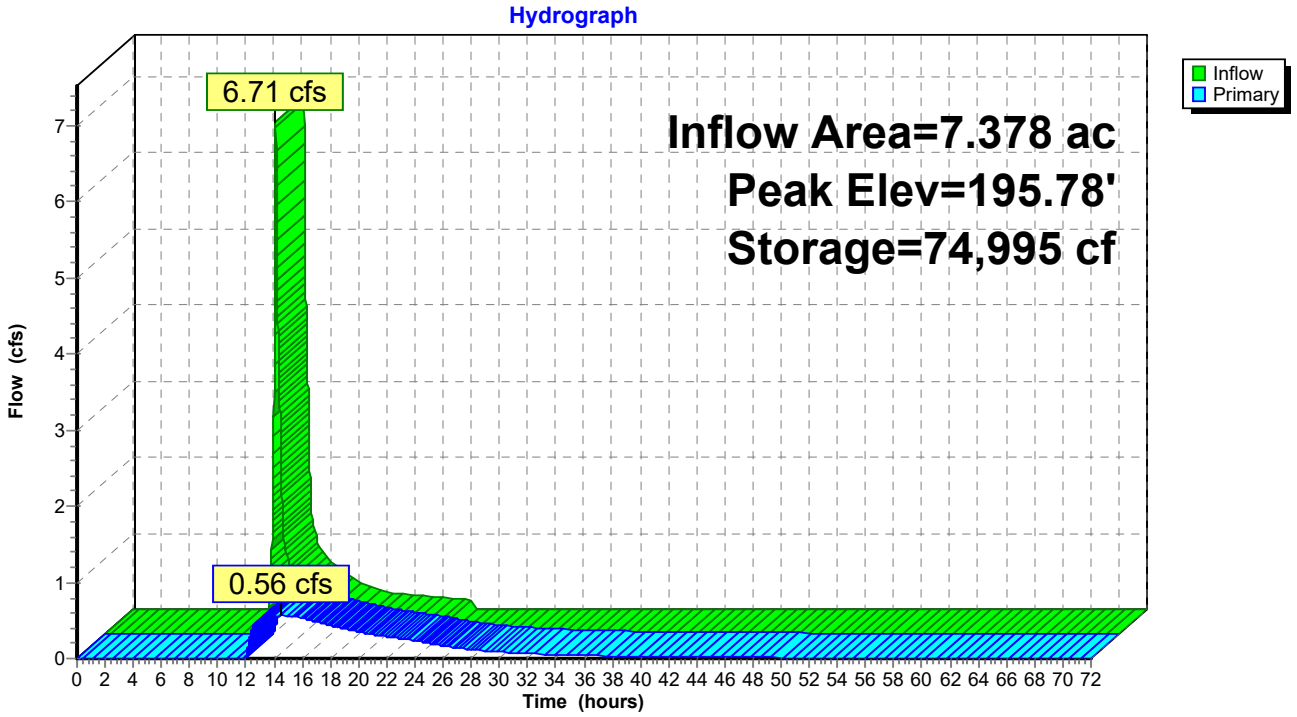
Volume	Invert	Avail.Storage	Storage Description
#1	188.00'	135,283 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
188.00	5,323	0	0
190.00	7,266	12,589	12,589
192.00	9,450	16,716	29,305
194.00	11,941	21,391	50,696
196.00	15,794	27,735	78,431
198.00	20,372	36,166	114,597
199.00	21,000	20,686	135,283

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**15.0" Round Culvert** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 193.00' / 192.25' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	195.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Elev. (feet) 195.00 196.50 196.50 197.00 Width (feet) 0.25 0.25 0.75 0.75

Primary OutFlow Max=0.56 cfs @ 14.47 hrs HW=195.78' TW=191.12' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.56 cfs of 7.81 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 0.56 cfs @ 2.89 fps)

Pond SMA C: SMA C



Summary for Pond SMA E: SMA E

Inflow Area = 9.293 ac, 41.15% Impervious, Inflow Depth = 2.67" for 25-YR event
Inflow = 27.29 cfs @ 12.11 hrs, Volume= 2.067 af
Outflow = 1.35 cfs @ 15.43 hrs, Volume= 1.962 af, Atten= 95%, Lag= 199.2 min
Primary = 1.35 cfs @ 15.43 hrs, Volume= 1.962 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 192.75' Surf.Area= 36,437 sf Storage= 163,773 cf
Peak Elev= 194.15' @ 15.43 hrs Surf.Area= 42,976 sf Storage= 219,337 cf (55,564 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 697.0 min (1,535.5 - 838.4)

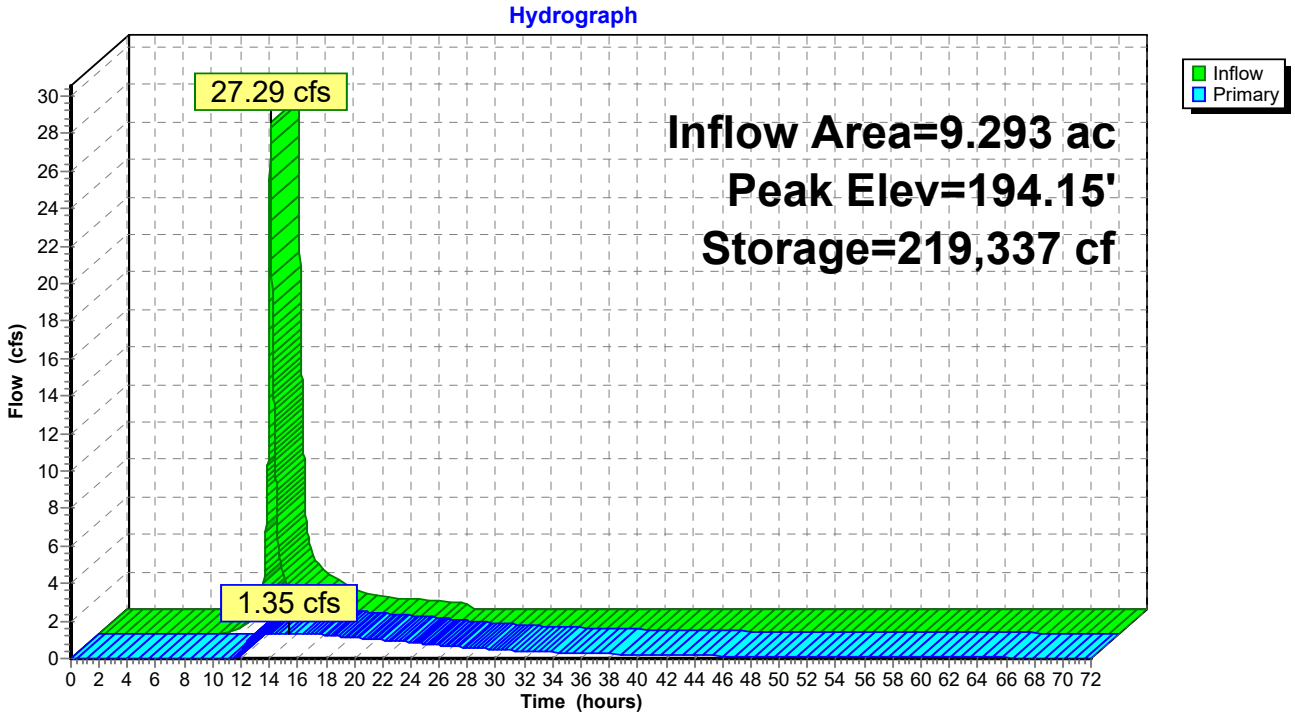
Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	332,216 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
186.00	13,724	0	0
188.00	19,598	33,322	33,322
190.00	25,980	45,578	78,900
192.00	32,894	58,874	137,774
194.00	42,341	75,235	213,009
196.00	50,905	93,246	306,255
196.50	52,938	25,961	332,216

Device	Routing	Invert	Outlet Devices
#1	Primary	191.91'	**15.0" Round Culvert** L= 55.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.91' / 191.00' S= 0.0165 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	192.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 2.00 4.00 Width (feet) 0.25 0.25 0.33 0.33

Primary OutFlow Max=1.35 cfs @ 15.43 hrs HW=194.15' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 1.35 cfs of 7.51 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 1.35 cfs @ 3.87 fps)

Pond SMA E: SMA E



Summary for Pond SMA F: SMA F

[80] Warning: Exceeded Pond PP by 4.01' @ 13.57 hrs (2.62 cfs 1.648 af)

Inflow Area = 1.723 ac, 36.76% Impervious, Inflow Depth = 1.49" for 25-YR event
Inflow = 2.90 cfs @ 12.10 hrs, Volume= 0.215 af
Outflow = 1.68 cfs @ 12.23 hrs, Volume= 0.215 af, Atten= 42%, Lag= 8.2 min
Discarded = 0.13 cfs @ 12.23 hrs, Volume= 0.145 af
Primary = 1.55 cfs @ 12.23 hrs, Volume= 0.070 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 194.59' @ 12.23 hrs Surf.Area= 2,467 sf Storage= 2,413 cf

Plug-Flow detention time= 148.2 min calculated for 0.215 af (100% of inflow)
Center-of-Mass det. time= 148.2 min (1,004.9 - 856.7)

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	4,900 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

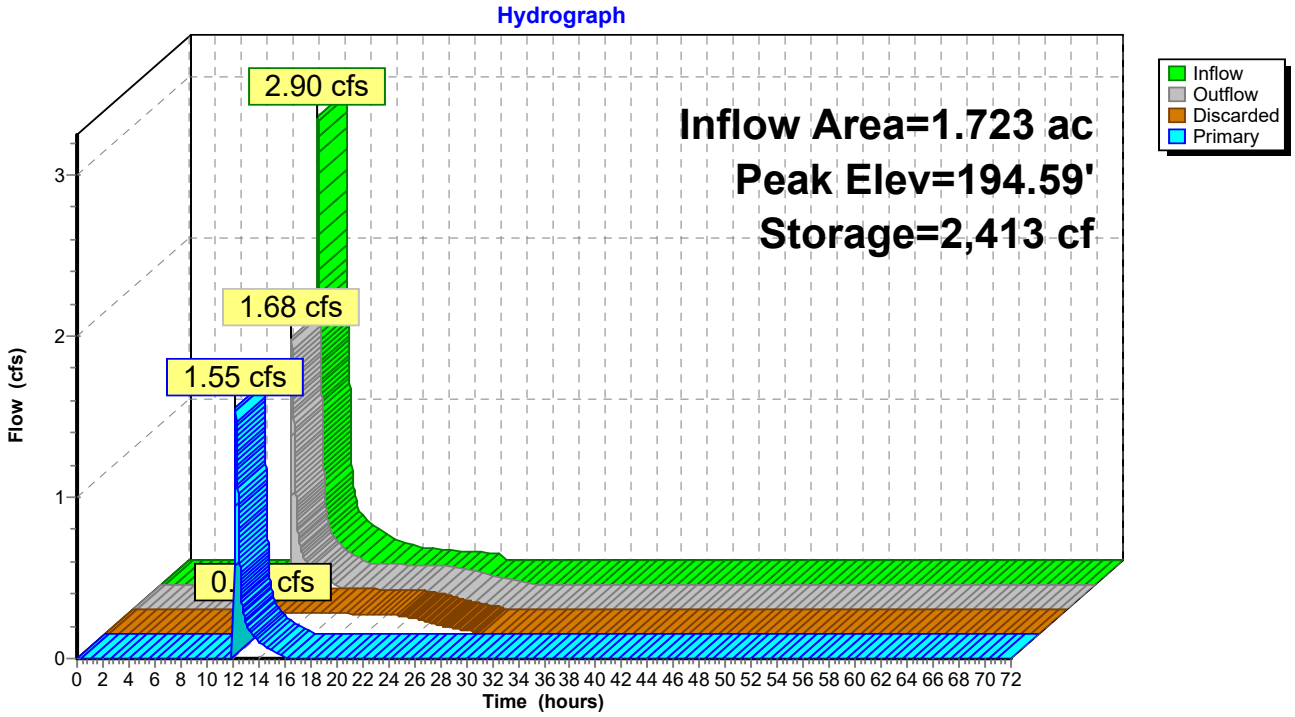
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
193.00	263	0	0	263
194.00	2,150	1,055	1,055	2,153
195.50	3,000	3,845	4,900	3,045

Device	Routing	Invert	Outlet Devices
#1	Discarded	193.00'	**2.300 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	194.50'	**25.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.13 cfs @ 12.23 hrs HW=194.59' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=1.55 cfs @ 12.23 hrs HW=194.59' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.55 cfs @ 0.70 fps)

Pond SMA F: SMA F



Summary for Pond SMA G: SMA G

Inflow Area = 8.523 ac, 27.09% Impervious, Inflow Depth = 2.28" for 25-YR event
Inflow = 20.17 cfs @ 12.04 hrs, Volume= 1.618 af
Outflow = 1.85 cfs @ 13.57 hrs, Volume= 1.618 af, Atten= 91%, Lag= 92.1 min
Discarded = 1.85 cfs @ 13.57 hrs, Volume= 1.618 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 198.65' @ 13.57 hrs Surf.Area= 15,925 sf Storage= 30,662 cf

Plug-Flow detention time= 208.1 min calculated for 1.618 af (100% of inflow)
Center-of-Mass det. time= 208.1 min (1,041.5 - 833.4)

Volume	Invert	Avail.Storage	Storage Description
#1	195.00'	67,994 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

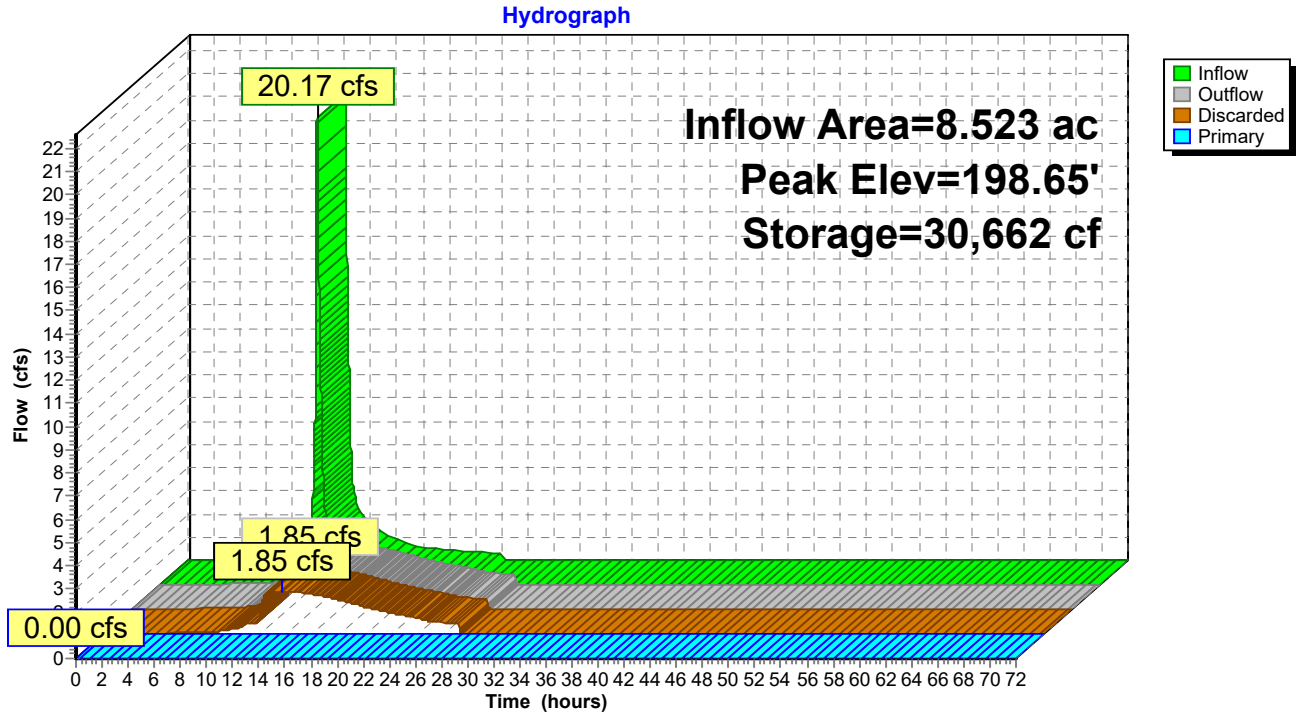
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
195.00	3,642	0	0	3,642
196.00	4,698	4,159	4,159	4,722
198.00	13,033	17,037	21,196	13,083
200.00	22,772	35,355	56,551	22,867
200.50	23,000	11,443	67,994	23,219

Device	Routing	Invert	Outlet Devices
#1	Discarded	195.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	200.25'	**150.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.85 cfs @ 13.57 hrs HW=198.65' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.85 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=195.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA G: SMA G



Summary for Pond SMA H: SMA H

Inflow Area = 1.334 ac, 51.77% Impervious, Inflow Depth = 3.42" for 25-YR event
Inflow = 5.25 cfs @ 12.09 hrs, Volume= 0.380 af
Outflow = 0.14 cfs @ 16.90 hrs, Volume= 0.380 af, Atten= 97%, Lag= 288.6 min
Discarded = 0.14 cfs @ 16.90 hrs, Volume= 0.380 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 209.55' @ 16.90 hrs Surf.Area= 6,197 sf Storage= 10,987 cf

Plug-Flow detention time= 878.3 min calculated for 0.380 af (100% of inflow)
Center-of-Mass det. time= 878.3 min (1,695.7 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	207.00'	36,108 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

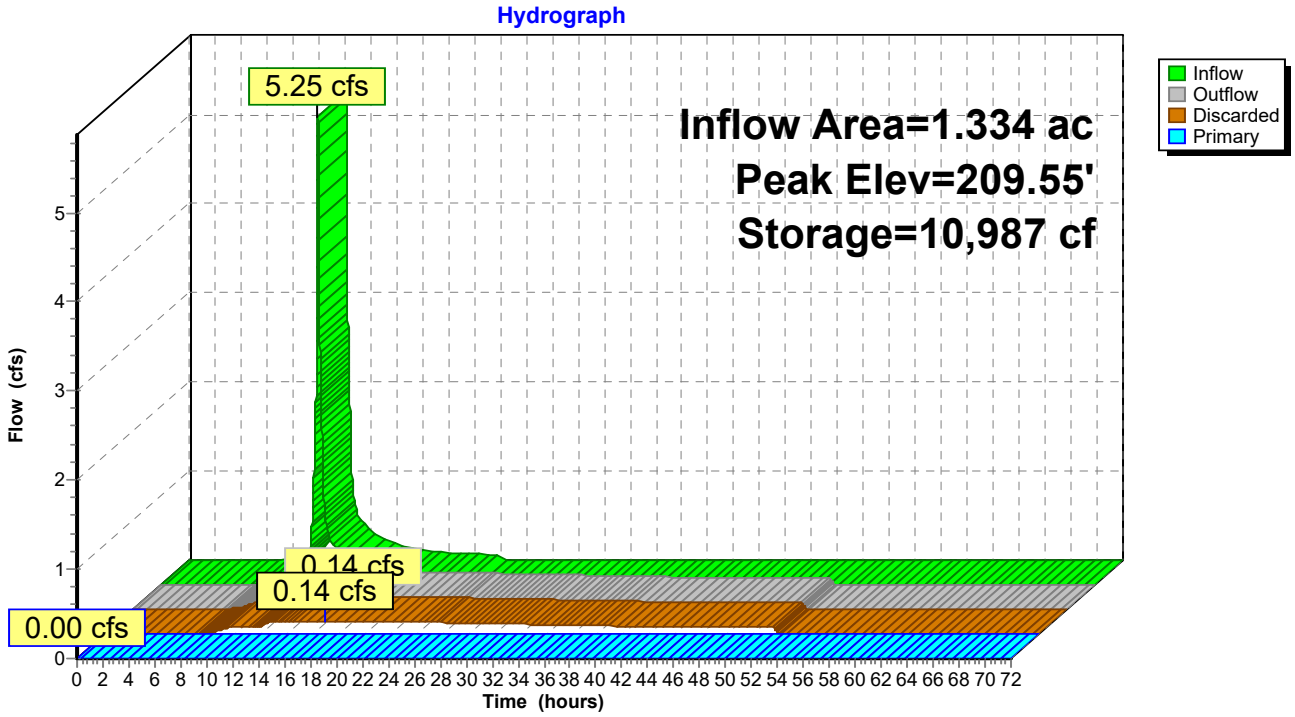
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.00	3,024	0	0	3,024
208.00	3,727	3,369	3,369	3,756
210.00	7,027	10,581	13,950	7,096
212.00	10,078	17,014	30,964	10,216
212.50	10,500	5,144	36,108	10,675

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.00'	**1.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	210.25'	**12.0' long x 16.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.14 cfs @ 16.90 hrs HW=209.55' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.00' TW=200.00' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA H: SMA H



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=45,229 sf 57.20% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=73 Runoff=0.91 cfs 0.070 af

Subcatchment 43: DA 43 Runoff Area=40,098 sf 61.82% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=75 Runoff=0.93 cfs 0.070 af

Subcatchment 44: DA 44 Runoff Area=55,496 sf 68.39% Impervious Runoff Depth=1.20"
Tc=6.0 min CN=80 Runoff=1.76 cfs 0.127 af

Subcatchment 102: DA 102 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment 104: DA 104 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.034 af

Subcatchment 106: DA 106 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.034 af

Subcatchment 108: DA 108 Runoff Area=24,993 sf 9.15% Impervious Runoff Depth=0.37"
Tc=6.0 min CN=62 Runoff=0.14 cfs 0.018 af

Subcatchment 109: DA 109 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment 111: DA 111 Runoff Area=84,131 sf 23.01% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=74 Runoff=1.82 cfs 0.139 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=0.47"
Tc=6.4 min CN=65 Runoff=0.40 cfs 0.041 af

Subcatchment B: DA TO SMA B Runoff Area=217,662 sf 33.09% Impervious Runoff Depth=0.47"
Tc=7.4 min CN=65 Runoff=1.87 cfs 0.198 af

Subcatchment C: DA TO SMA C Runoff Area=180,572 sf 31.94% Impervious Runoff Depth=0.28"
Tc=7.5 min CN=59 Runoff=0.54 cfs 0.097 af

Subcatchment DA G: DA G Runoff Area=5.481 ac 23.26% Impervious Runoff Depth=0.37"
Tc=0.0 min CN=62 Runoff=1.62 cfs 0.169 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=0.77"
Tc=7.7 min CN=72 Runoff=7.05 cfs 0.594 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=0.10"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.01 cfs 0.003 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=0.44"
Tc=6.1 min CN=64 Runoff=0.44 cfs 0.047 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=1.20"
Tc=6.5 min CN=80 Runoff=1.81 cfs 0.133 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=0.31"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=1.59 cfs 0.275 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=471' Tc=17.2 min CN=58 Runoff=0.45 cfs 0.096 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=0.34"
Flow Length=762' Tc=14.8 min CN=61 Runoff=1.71 cfs 0.290 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=0.86"
Flow Length=1,017' Tc=9.3 min CN=74 Runoff=0.91 cfs 0.079 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=1.20"
Tc=6.0 min CN=80 Runoff=4.43 cfs 0.320 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.13"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=1.62 cfs 0.897 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.28"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=2.75 cfs 0.527 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=0.31"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=19.34 cfs 8.693 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=0.34"
Flow Length=330' Tc=11.0 min CN=61 Runoff=0.65 cfs 0.104 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=0.15"
Flow Length=297' Tc=9.1 min UI Adjusted CN=54 Runoff=0.13 cfs 0.039 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=0.31"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=1.34 cfs 0.301 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=0.28"
Flow Length=1,267' Tc=18.5 min CN=59 Runoff=1.62 cfs 0.327 af

Reach 1R: REACH 1 Avg. Flow Depth=0.36' Max Vel=1.12 fps Inflow=4.97 cfs 2.239 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=4.82 cfs 2.239 af

Reach 2R: REACH 2 Avg. Flow Depth=0.26' Max Vel=1.76 fps Inflow=4.49 cfs 1.822 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=4.30 cfs 1.822 af

Reach 3R: REACH 3 Avg. Flow Depth=0.19' Max Vel=0.83 fps Inflow=3.12 cfs 0.821 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=2.98 cfs 0.821 af

Reach 4R: REACH 4 Avg. Flow Depth=0.53' Max Vel=1.99 fps Inflow=19.65 cfs 8.966 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=19.64 cfs 8.966 af

Reach O2R: RO2 Avg. Flow Depth=0.22' Max Vel=1.55 fps Inflow=2.75 cfs 0.527 af
n=0.025 L=680.0' S=0.0096 '/' Capacity=154.12 cfs Outflow=2.55 cfs 0.527 af

Reach O3R: RO3 Avg. Flow Depth=0.45' Max Vel=2.81 fps Inflow=19.34 cfs 8.693 af
n=0.025 L=960.0' S=0.0120 '/' Capacity=1,095.54 cfs Outflow=19.26 cfs 8.693 af

Pond CB 102: CB 102 Peak Elev=200.92' Inflow=0.33 cfs 0.026 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.33 cfs 0.026 af

Pond CB 104: CB 104 Peak Elev=200.97' Inflow=0.43 cfs 0.034 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.43 cfs 0.034 af

Pond CB 106: CB 106 Peak Elev=200.97' Inflow=0.43 cfs 0.034 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.43 cfs 0.034 af

Pond CB 109: CB 109 Peak Elev=200.92' Inflow=0.33 cfs 0.026 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.33 cfs 0.026 af

Pond D1: SMA D1 Peak Elev=210.54' Storage=2,207 cf Inflow=1.76 cfs 0.127 af
Discarded=0.10 cfs 0.100 af Primary=0.14 cfs 0.027 af Outflow=0.24 cfs 0.127 af

Pond D2: SMA D2 Peak Elev=207.39' Storage=1,205 cf Inflow=0.93 cfs 0.097 af
Discarded=0.17 cfs 0.097 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.097 af

Pond D3: SMA D3 Peak Elev=207.12' Storage=589 cf Inflow=0.91 cfs 0.070 af
Discarded=0.26 cfs 0.070 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.070 af

Pond DMH 101: DMH 101 Peak Elev=198.41' Inflow=1.64 cfs 0.139 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=1.64 cfs 0.139 af

Pond DMH 103: DMH 103 Peak Elev=198.70' Inflow=1.31 cfs 0.112 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=1.31 cfs 0.112 af

Pond DMH 105: DMH 105 Peak Elev=198.91' Inflow=0.88 cfs 0.078 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0048 '/' Outflow=0.88 cfs 0.078 af

Pond DMH 107: DMH 107 Peak Elev=199.19' Inflow=0.46 cfs 0.044 af
12.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=0.46 cfs 0.044 af

Pond LCB 108: LCB 108 Peak Elev=199.43' Inflow=0.14 cfs 0.018 af
12.0" Round Culvert n=0.012 L=63.0' S=0.0049 '/' Outflow=0.14 cfs 0.018 af

Pond P1: POND 1 Peak Elev=188.55' Storage=1,082 cf Inflow=5.00 cfs 2.240 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=4.97 cfs 2.239 af

Pond P2: POND 2 Peak Elev=204.48' Storage=2,613 cf Inflow=3.81 cfs 0.828 af
Outflow=3.12 cfs 0.821 af

Pond P3: POND 3 Peak Elev=193.84' Storage=262 cf Inflow=19.65 cfs 8.968 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=19.65 cfs 8.966 af

Pond POA C: POA COMBINED Inflow=24.88 cfs 12.726 af
Primary=24.88 cfs 12.726 af

Pond POA NE: POA NORTHEAST Inflow=20.16 cfs 9.422 af
Primary=20.16 cfs 9.422 af

Pond POA NW: POA NORTHWEST Inflow=5.66 cfs 3.305 af
Primary=5.66 cfs 3.305 af

Pond PP: POROUS PAVEMENT Peak Elev=190.50' Storage=0.000 af Inflow=0.01 cfs 0.003 af
Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af

Pond SMA A: SMA A Peak Elev=190.82' Storage=102 cf Inflow=0.40 cfs 0.041 af
Discarded=0.24 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.041 af

Pond SMA B: SMA B Peak Elev=189.23' Storage=101,131 cf Inflow=1.87 cfs 0.198 af
Outflow=0.09 cfs 0.175 af

Pond SMA C: SMA C Peak Elev=195.17' Storage=65,956 cf Inflow=0.54 cfs 0.097 af
Outflow=0.06 cfs 0.091 af

Pond SMA E: SMA E Peak Elev=193.21' Storage=181,058 cf Inflow=7.05 cfs 0.594 af
Outflow=0.26 cfs 0.522 af

Pond SMA F: SMA F Peak Elev=193.72' Storage=563 cf Inflow=0.44 cfs 0.047 af
Discarded=0.08 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.047 af

Pond SMA G: SMA G Peak Elev=196.30' Storage=5,702 cf Inflow=4.75 cfs 0.447 af
Discarded=0.66 cfs 0.447 af Primary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.447 af

Pond SMA H: SMA H Peak Elev=207.93' Storage=3,109 cf Inflow=1.81 cfs 0.133 af
Discarded=0.09 cfs 0.133 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.133 af

Total Runoff Area = 537.966 ac Runoff Volume = 13.774 af Average Runoff Depth = 0.31"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=45,229 sf 57.20% Impervious Runoff Depth=1.84"
Tc=6.0 min CN=73 Runoff=2.21 cfs 0.159 af

Subcatchment 43: DA 43 Runoff Area=40,098 sf 61.82% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=75 Runoff=2.14 cfs 0.153 af

Subcatchment 44: DA 44 Runoff Area=55,496 sf 68.39% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=80 Runoff=3.59 cfs 0.255 af

Subcatchment 102: DA 102 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.51 cfs 0.041 af

Subcatchment 104: DA 104 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.66 cfs 0.053 af

Subcatchment 106: DA 106 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.66 cfs 0.053 af

Subcatchment 108: DA 108 Runoff Area=24,993 sf 9.15% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=62 Runoff=0.65 cfs 0.053 af

Subcatchment 109: DA 109 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.51 cfs 0.041 af

Subcatchment 111: DA 111 Runoff Area=84,131 sf 23.01% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=74 Runoff=4.30 cfs 0.309 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=1.29"
Tc=6.4 min CN=65 Runoff=1.41 cfs 0.110 af

Subcatchment B: DA TO SMA B Runoff Area=217,662 sf 33.09% Impervious Runoff Depth=1.29"
Tc=7.4 min CN=65 Runoff=6.62 cfs 0.536 af

Subcatchment C: DA TO SMA C Runoff Area=180,572 sf 31.94% Impervious Runoff Depth=0.93"
Tc=7.5 min CN=59 Runoff=3.50 cfs 0.320 af

Subcatchment DA G: DA G Runoff Area=5.481 ac 23.26% Impervious Runoff Depth=1.10"
Tc=0.0 min CN=62 Runoff=7.60 cfs 0.502 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=1.77"
Tc=7.7 min CN=72 Runoff=17.78 cfs 1.370 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=0.52"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.13 cfs 0.018 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=1.22"
Tc=6.1 min CN=64 Runoff=1.69 cfs 0.132 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=2.40"
Tc=6.5 min CN=80 Runoff=3.69 cfs 0.267 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=0.98"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=8.69 cfs 0.876 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=0.87"
Flow Length=471' Tc=17.2 min CN=58 Runoff=2.64 cfs 0.330 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=1.04"
Flow Length=762' Tc=14.8 min CN=61 Runoff=8.13 cfs 0.890 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=1.92"
Flow Length=1,017' Tc=9.3 min CN=74 Runoff=2.17 cfs 0.175 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=80 Runoff=9.04 cfs 0.642 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.61"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=17.90 cfs 4.115 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.93"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=15.29 cfs 1.744 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=0.98"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=82.25 cfs 27.673 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=1.04"
Flow Length=330' Tc=11.0 min CN=61 Runoff=3.27 cfs 0.321 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=0.66"
Flow Length=297' Tc=9.1 min UI Adjusted CN=54 Runoff=1.41 cfs 0.169 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=0.98"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=6.35 cfs 0.959 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=0.93"
Flow Length=1,267' Tc=18.5 min CN=59 Runoff=8.66 cfs 1.081 af

Reach 1R: REACH 1 Avg. Flow Depth=0.76' Max Vel=1.74 fps Inflow=27.05 cfs 8.525 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=26.94 cfs 8.525 af

Reach 2R: REACH 2 Avg. Flow Depth=0.64' Max Vel=2.96 fps Inflow=32.89 cfs 7.132 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=32.17 cfs 7.132 af

Reach 3R: REACH 3 Avg. Flow Depth=0.39' Max Vel=1.27 fps Inflow=14.96 cfs 2.696 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=14.76 cfs 2.696 af

Reach 4R: REACH 4 Avg. Flow Depth=1.02' Max Vel=2.89 fps Inflow=83.19 cfs 28.548 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=83.15 cfs 28.548 af

Reach O2R: RO2 Avg. Flow Depth=0.47' Max Vel=2.42 fps Inflow=15.29 cfs 1.744 af
n=0.025 L=680.0' S=0.0096 '/' Capacity=154.12 cfs Outflow=14.20 cfs 1.744 af

Reach O3R: RO3 Avg. Flow Depth=0.86' Max Vel=4.07 fps Inflow=82.25 cfs 27.673 af
n=0.025 L=960.0' S=0.0120 '/' Capacity=1,095.54 cfs Outflow=82.01 cfs 27.673 af

Pond CB 102: CB 102 Peak Elev=201.00' Inflow=0.51 cfs 0.041 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.51 cfs 0.041 af

Pond CB 104: CB 104 Peak Elev=201.06' Inflow=0.66 cfs 0.053 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.66 cfs 0.053 af

Pond CB 106: CB 106 Peak Elev=201.06' Inflow=0.66 cfs 0.053 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.66 cfs 0.053 af

Pond CB 109: CB 109 Peak Elev=201.00' Inflow=0.51 cfs 0.041 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.51 cfs 0.041 af

Pond D1: SMA D1 Peak Elev=211.59' Storage=4,456 cf Inflow=3.59 cfs 0.255 af
Discarded=0.13 cfs 0.133 af Primary=0.47 cfs 0.122 af Outflow=0.61 cfs 0.255 af

Pond D2: SMA D2 Peak Elev=208.79' Storage=6,458 cf Inflow=2.39 cfs 0.275 af
Discarded=0.23 cfs 0.275 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.275 af

Pond D3: SMA D3 Peak Elev=207.46' Storage=2,336 cf Inflow=2.21 cfs 0.159 af
Discarded=0.28 cfs 0.159 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.159 af

Pond DMH 101: DMH 101 Peak Elev=198.72' Inflow=2.97 cfs 0.240 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=2.97 cfs 0.240 af

Pond DMH 103: DMH 103 Peak Elev=199.04' Inflow=2.46 cfs 0.199 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=2.46 cfs 0.199 af

Pond DMH 105: DMH 105 Peak Elev=199.26' Inflow=1.81 cfs 0.146 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0048 '/' Outflow=1.81 cfs 0.146 af

Pond DMH 107: DMH 107 Peak Elev=199.53' Inflow=1.15 cfs 0.094 af
12.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=1.15 cfs 0.094 af

Pond LCB 108: LCB 108 Peak Elev=199.76' Inflow=0.65 cfs 0.053 af
12.0" Round Culvert n=0.012 L=63.0' S=0.0049 '/' Outflow=0.65 cfs 0.053 af

Pond P1: POND 1 Peak Elev=190.38' Storage=27,664 cf Inflow=35.47 cfs 8.525 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=27.05 cfs 8.525 af

Pond P2: POND 2 Peak Elev=205.44' Storage=12,521 cf Inflow=19.18 cfs 2.702 af
Outflow=14.96 cfs 2.696 af

Pond P3: POND 3 Peak Elev=194.87' Storage=692 cf Inflow=83.19 cfs 28.549 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=83.19 cfs 28.548 af

Pond POA C: POA COMBINED Inflow=111.24 cfs 41.069 af
Primary=111.24 cfs 41.069 af

Pond POA NE: POA NORTHEAST Inflow=84.52 cfs 29.697 af
Primary=84.52 cfs 29.697 af

Pond POA NW: POA NORTHWEST Inflow=29.50 cfs 11.372 af
Primary=29.50 cfs 11.372 af

Pond PP: POROUS PAVEMENT Peak Elev=190.51' Storage=0.000 af Inflow=0.13 cfs 0.018 af
Discarded=0.13 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.018 af

Pond SMA A: SMA A Peak Elev=191.41' Storage=1,123 cf Inflow=1.41 cfs 0.110 af
Discarded=0.35 cfs 0.110 af Primary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.110 af

Pond SMA B: SMA B Peak Elev=189.55' Storage=109,432 cf Inflow=6.62 cfs 0.536 af
Outflow=0.33 cfs 0.506 af

Pond SMA C: SMA C Peak Elev=195.48' Storage=70,512 cf Inflow=3.50 cfs 0.320 af
Outflow=0.27 cfs 0.313 af

Pond SMA E: SMA E Peak Elev=193.72' Storage=201,440 cf Inflow=17.78 cfs 1.370 af
Outflow=0.79 cfs 1.276 af

Pond SMA F: SMA F Peak Elev=194.52' Storage=2,236 cf Inflow=1.69 cfs 0.132 af
Discarded=0.13 cfs 0.124 af Primary=0.12 cfs 0.008 af Outflow=0.25 cfs 0.132 af

Pond SMA G: SMA G Peak Elev=197.72' Storage=17,805 cf Inflow=12.63 cfs 1.052 af
Discarded=1.35 cfs 1.052 af Primary=0.00 cfs 0.000 af Outflow=1.35 cfs 1.052 af

Pond SMA H: SMA H Peak Elev=208.89' Storage=7,287 cf Inflow=3.69 cfs 0.267 af
Discarded=0.12 cfs 0.267 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.267 af

Total Runoff Area = 537.966 ac Runoff Volume = 43.347 af Average Runoff Depth = 0.97"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=45,229 sf 57.20% Impervious Runoff Depth=3.67"
Tc=6.0 min CN=73 Runoff=4.47 cfs 0.318 af

Subcatchment 43: DA 43 Runoff Area=40,098 sf 61.82% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=75 Runoff=4.19 cfs 0.297 af

Subcatchment 44: DA 44 Runoff Area=55,496 sf 68.39% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=80 Runoff=6.54 cfs 0.468 af

Subcatchment 102: DA 102 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.77 cfs 0.063 af

Subcatchment 104: DA 104 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.99 cfs 0.081 af

Subcatchment 106: DA 106 Runoff Area=6,600 sf 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.99 cfs 0.081 af

Subcatchment 108: DA 108 Runoff Area=24,993 sf 9.15% Impervious Runoff Depth=2.58"
Tc=6.0 min CN=62 Runoff=1.69 cfs 0.123 af

Subcatchment 109: DA 109 Runoff Area=5,100 sf 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.77 cfs 0.063 af

Subcatchment 111: DA 111 Runoff Area=84,131 sf 23.01% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=74 Runoff=8.55 cfs 0.607 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=2.86"
Tc=6.4 min CN=65 Runoff=3.36 cfs 0.245 af

Subcatchment B: DA TO SMA B Runoff Area=217,662 sf 33.09% Impervious Runoff Depth=2.86"
Tc=7.4 min CN=65 Runoff=15.78 cfs 1.193 af

Subcatchment C: DA TO SMA C Runoff Area=180,572 sf 31.94% Impervious Runoff Depth=2.29"
Tc=7.5 min CN=59 Runoff=10.12 cfs 0.792 af

Subcatchment DA G: DA G Runoff Area=5.481 ac 23.26% Impervious Runoff Depth=2.58"
Tc=0.0 min CN=62 Runoff=19.76 cfs 1.176 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=3.57"
Tc=7.7 min CN=72 Runoff=36.63 cfs 2.762 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=1.58"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.68 cfs 0.056 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=2.77"
Tc=6.1 min CN=64 Runoff=4.13 cfs 0.300 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=4.41"
Tc=6.5 min CN=80 Runoff=6.72 cfs 0.490 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=2.39"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=24.23 cfs 2.128 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=2.20"
Flow Length=471' Tc=17.2 min CN=58 Runoff=7.95 cfs 0.835 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=2.48"
Flow Length=762' Tc=14.8 min CN=61 Runoff=21.89 cfs 2.121 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=3.77"
Flow Length=1,017' Tc=9.3 min CN=74 Runoff=4.32 cfs 0.344 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=80 Runoff=16.45 cfs 1.178 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.75"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=67.20 cfs 11.785 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=2.29"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=44.27 cfs 4.322 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=2.39"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=225.18 cfs 67.241 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=2.48"
Flow Length=330' Tc=11.0 min CN=61 Runoff=8.80 cfs 0.764 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=1.84"
Flow Length=297' Tc=9.1 min UI Adjusted CN=54 Runoff=5.40 cfs 0.471 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=2.39"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=17.41 cfs 2.329 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=2.29"
Flow Length=1,267' Tc=18.5 min CN=59 Runoff=24.98 cfs 2.680 af

Reach 1R: REACH 1 Avg. Flow Depth=0.93' Max Vel=1.97 fps Inflow=43.48 cfs 22.658 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=43.46 cfs 22.657 af

Reach 2R: REACH 2 Avg. Flow Depth=1.02' Max Vel=3.93 fps Inflow=99.65 cfs 19.194 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=98.51 cfs 19.194 af

Reach 3R: REACH 3 Avg. Flow Depth=0.54' Max Vel=1.53 fps Inflow=30.72 cfs 6.645 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=30.64 cfs 6.645 af

Reach 4R: REACH 4 Avg. Flow Depth=1.56' Max Vel=3.73 fps Inflow=227.60 cfs 69.368 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=227.55 cfs 69.368 af

Reach O2R: RO2 Avg. Flow Depth=0.74' Max Vel=3.18 fps Inflow=44.27 cfs 4.322 af
n=0.025 L=680.0' S=0.0096 '/' Capacity=154.12 cfs Outflow=42.23 cfs 4.322 af

Reach O3R: RO3 Avg. Flow Depth=1.32' Max Vel=5.26 fps Inflow=225.18 cfs 67.241 af
n=0.025 L=960.0' S=0.0120 '/' Capacity=1,095.54 cfs Outflow=224.97 cfs 67.241 af

Pond CB 102: CB 102 Peak Elev=201.10' Inflow=0.77 cfs 0.063 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.77 cfs 0.063 af

Pond CB 104: CB 104 Peak Elev=201.18' Inflow=0.99 cfs 0.081 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.99 cfs 0.081 af

Pond CB 106: CB 106 Peak Elev=201.18' Inflow=0.99 cfs 0.081 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.99 cfs 0.081 af

Pond CB 109: CB 109 Peak Elev=201.11' Inflow=0.77 cfs 0.063 af
12.0" Round Culvert n=0.012 L=90.0' S=0.0050 '/' Outflow=0.77 cfs 0.063 af

Pond D1: SMA D1 Peak Elev=213.15' Storage=9,112 cf Inflow=6.54 cfs 0.468 af
Discarded=0.19 cfs 0.181 af Primary=0.67 cfs 0.287 af Outflow=0.85 cfs 0.468 af

Pond D2: SMA D2 Peak Elev=210.02' Storage=12,308 cf Inflow=4.71 cfs 0.585 af
Discarded=0.29 cfs 0.492 af Primary=0.46 cfs 0.093 af Outflow=0.74 cfs 0.585 af

Pond D3: SMA D3 Peak Elev=208.47' Storage=8,167 cf Inflow=4.47 cfs 0.411 af
Discarded=0.34 cfs 0.411 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.411 af

Pond DMH 101: DMH 101 Peak Elev=199.45' Inflow=5.21 cfs 0.412 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=5.21 cfs 0.412 af

Pond DMH 103: DMH 103 Peak Elev=199.94' Inflow=4.44 cfs 0.349 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=4.44 cfs 0.349 af

Pond DMH 105: DMH 105 Peak Elev=200.27' Inflow=3.45 cfs 0.268 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0048 '/' Outflow=3.45 cfs 0.268 af

Pond DMH 107: DMH 107 Peak Elev=200.66' Inflow=2.45 cfs 0.186 af
12.0" Round Culvert n=0.012 L=44.0' S=0.0050 '/' Outflow=2.45 cfs 0.186 af

Pond LCB 108: LCB 108 Peak Elev=200.87' Inflow=1.69 cfs 0.123 af
12.0" Round Culvert n=0.012 L=63.0' S=0.0049 '/' Outflow=1.69 cfs 0.123 af

Pond P1: POND 1 Peak Elev=192.21' Storage=252,496 cf Inflow=108.09 cfs 22.658 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=43.48 cfs 22.658 af

Pond P2: POND 2 Peak Elev=206.73' Storage=50,519 cf Inflow=55.27 cfs 6.652 af
Outflow=30.72 cfs 6.645 af

Pond P3: POND 3 Peak Elev=196.47' Storage=1,829 cf Inflow=227.60 cfs 69.370 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=227.60 cfs 69.368 af

Pond POA C: POA COMBINED Inflow=279.78 cfs 100.922 af
Primary=279.78 cfs 100.922 af

Pond POA NE: POA NORTHEAST Inflow=230.59 cfs 71.992 af
Primary=230.59 cfs 71.992 af

Pond POA NW: POA NORTHWEST Inflow=49.20 cfs 28.929 af
Primary=49.20 cfs 28.929 af

Pond PP: POROUS PAVEMENT Peak Elev=191.58' Storage=0.011 af Inflow=0.68 cfs 0.056 af
Discarded=0.27 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.056 af

Pond SMA A: SMA A Peak Elev=192.33' Storage=3,559 cf Inflow=3.36 cfs 0.245 af
Discarded=0.53 cfs 0.245 af Primary=0.00 cfs 0.000 af Outflow=0.53 cfs 0.245 af

Pond SMA B: SMA B Peak Elev=190.12' Storage=124,903 cf Inflow=15.78 cfs 1.193 af
Outflow=0.97 cfs 1.158 af

Pond SMA C: SMA C Peak Elev=196.09' Storage=79,858 cf Inflow=10.12 cfs 0.792 af
Outflow=0.93 cfs 0.784 af

Pond SMA E: SMA E Peak Elev=194.55' Storage=236,938 cf Inflow=36.63 cfs 2.762 af
Outflow=1.98 cfs 2.649 af

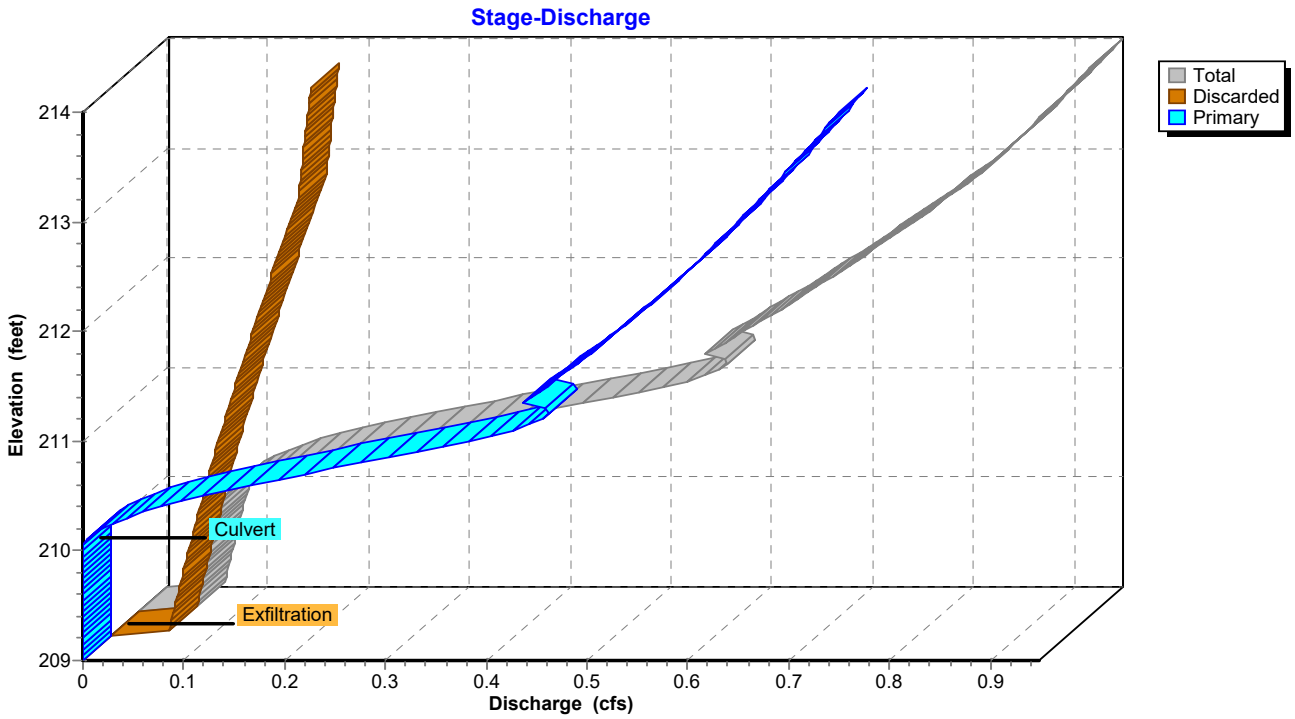
Pond SMA F: SMA F Peak Elev=194.66' Storage=2,581 cf Inflow=4.13 cfs 0.300 af
Discarded=0.13 cfs 0.160 af Primary=3.62 cfs 0.139 af Outflow=3.76 cfs 0.300 af

Pond SMA G: SMA G Peak Elev=199.44' Storage=44,701 cf Inflow=28.08 cfs 2.196 af
Discarded=2.30 cfs 2.196 af Primary=0.00 cfs 0.000 af Outflow=2.30 cfs 2.196 af

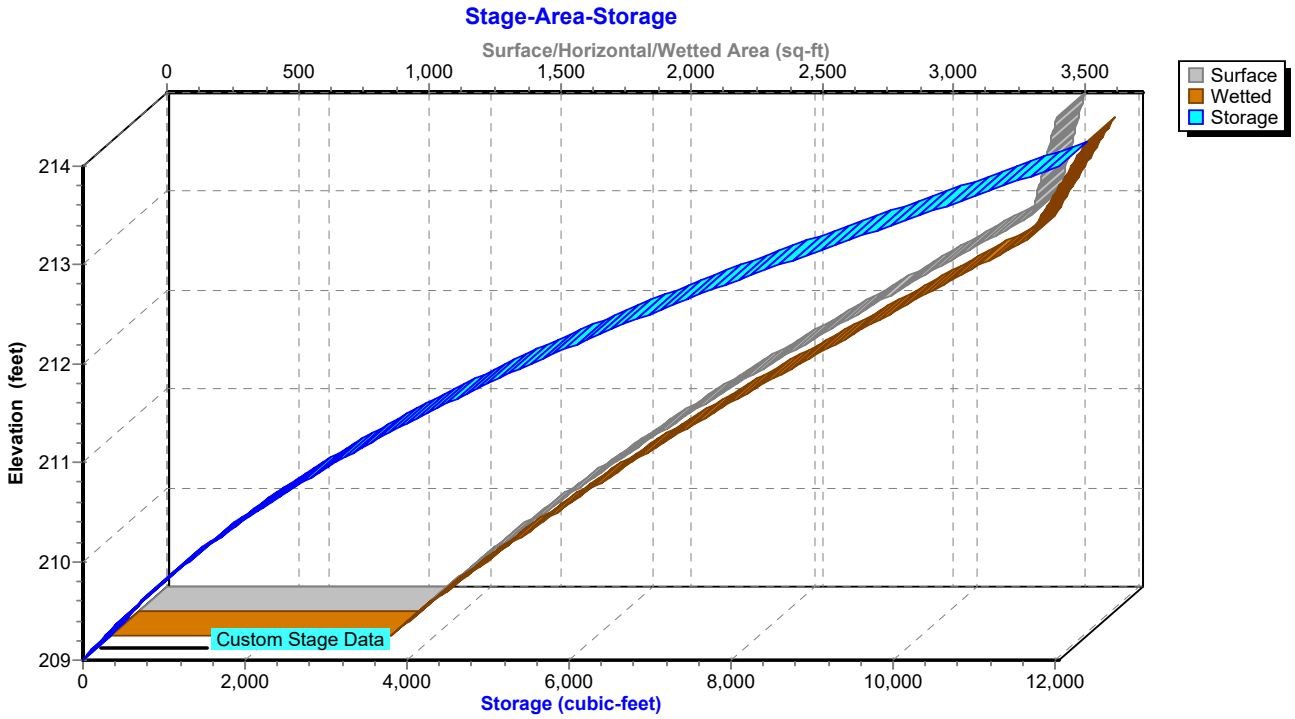
Pond SMA H: SMA H Peak Elev=210.10' Storage=14,665 cf Inflow=6.72 cfs 0.490 af
Discarded=0.17 cfs 0.490 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.490 af

Total Runoff Area = 537.966 ac Runoff Volume = 105.316 af Average Runoff Depth = 2.35"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Pond D1: SMA D1



Pond D1: SMA D1



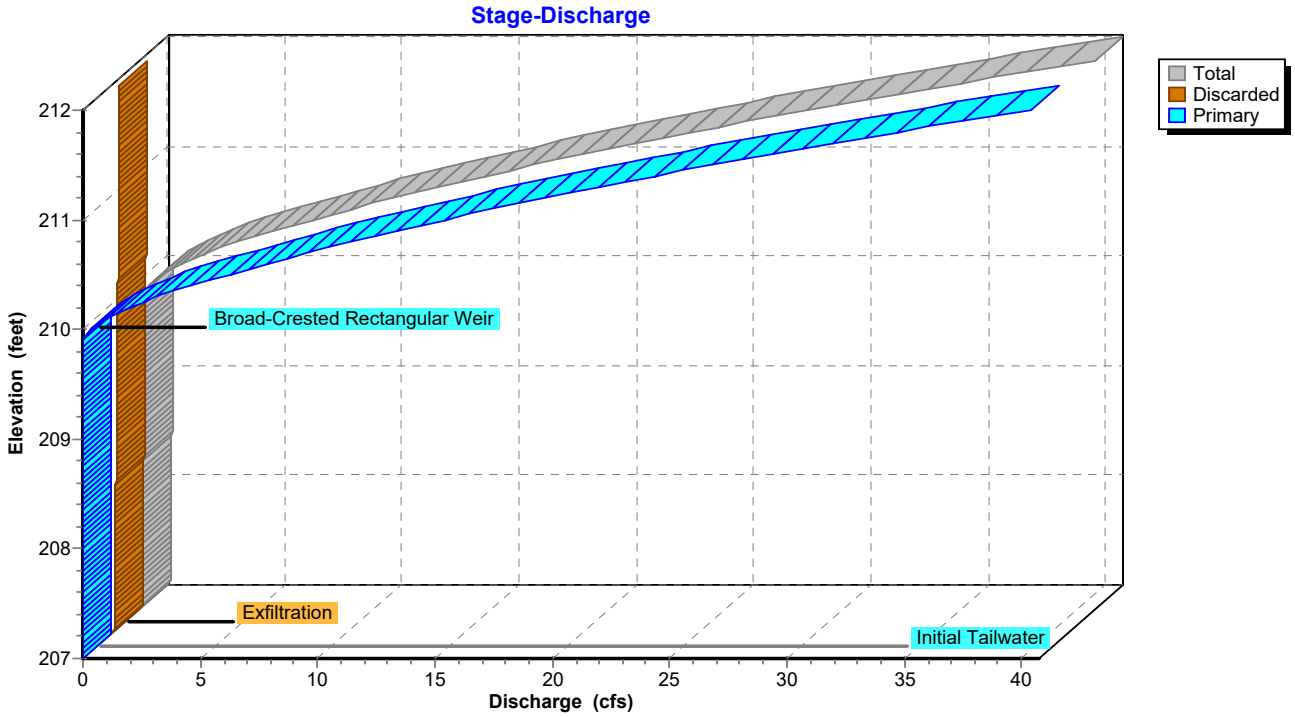
Stage-Discharge for Pond D1: SMA D1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
209.00	0.00	0.00	0.00
209.05	0.06	0.06	0.00
209.10	0.06	0.06	0.00
209.15	0.06	0.06	0.00
209.20	0.06	0.06	0.00
209.25	0.06	0.06	0.00
209.30	0.06	0.06	0.00
209.35	0.07	0.07	0.00
209.40	0.07	0.07	0.00
209.45	0.07	0.07	0.00
209.50	0.07	0.07	0.00
209.55	0.07	0.07	0.00
209.60	0.07	0.07	0.00
209.65	0.07	0.07	0.00
209.70	0.07	0.07	0.00
209.75	0.08	0.08	0.00
209.80	0.08	0.08	0.00
209.85	0.08	0.08	0.00
209.90	0.08	0.08	0.00
209.95	0.08	0.08	0.00
210.00	0.08	0.08	0.00
210.05	0.09	0.08	0.00
210.10	0.09	0.09	0.00
210.15	0.10	0.09	0.01
210.20	0.11	0.09	0.02
210.25	0.12	0.09	0.03
210.30	0.14	0.09	0.04
210.35	0.15	0.09	0.06
210.40	0.17	0.09	0.08
210.45	0.19	0.10	0.10
210.50	0.22	0.10	0.12
210.55	0.24	0.10	0.14
210.60	0.27	0.10	0.17
210.65	0.30	0.10	0.19
210.70	0.32	0.10	0.22
210.75	0.35	0.11	0.25
210.80	0.38	0.11	0.28
210.85	0.41	0.11	0.30
210.90	0.44	0.11	0.33
210.95	0.47	0.11	0.36
211.00	0.50	0.11	0.38
211.05	0.52	0.12	0.41
211.10	0.54	0.12	0.43
211.15	0.56	0.12	0.44
211.20	0.58	0.12	0.46
211.25	0.58	0.12	0.46
211.30	0.58	0.12	0.46
211.35	0.56	0.13	0.44
211.40	0.57	0.13	0.44
211.45	0.58	0.13	0.45
211.50	0.59	0.13	0.46
211.55	0.60	0.13	0.47
211.60	0.61	0.13	0.47
211.65	0.62	0.14	0.48
211.70	0.63	0.14	0.49
211.75	0.64	0.14	0.50
211.80	0.64	0.14	0.50
211.85	0.65	0.14	0.51
211.90	0.66	0.15	0.52
211.95	0.67	0.15	0.52
212.00	0.68	0.15	0.53
212.05	0.69	0.15	0.54
212.10	0.70	0.15	0.54
212.15	0.70	0.15	0.55
212.20	0.71	0.16	0.56
212.25	0.72	0.16	0.56
212.30	0.73	0.16	0.57
212.35	0.74	0.16	0.57
212.40	0.74	0.16	0.58
212.45	0.75	0.17	0.59
212.50	0.76	0.17	0.59
212.55	0.77	0.17	0.60
212.60	0.78	0.17	0.60
212.65	0.78	0.17	0.61
212.70	0.79	0.17	0.62
212.75	0.80	0.18	0.62
212.80	0.81	0.18	0.63
212.85	0.81	0.18	0.63
212.90	0.82	0.18	0.64
212.95	0.83	0.18	0.64
213.00	0.84	0.19	0.65
213.05	0.84	0.19	0.66
213.10	0.85	0.19	0.66
213.15	0.85	0.19	0.67
213.20	0.86	0.19	0.67
213.25	0.87	0.19	0.68
213.30	0.87	0.19	0.68
213.35	0.88	0.19	0.69
213.40	0.88	0.19	0.69
213.45	0.89	0.19	0.70
213.50	0.89	0.19	0.70
213.55	0.90	0.19	0.71
213.60	0.90	0.19	0.71
213.65	0.91	0.19	0.72
213.70	0.92	0.19	0.72
213.75	0.92	0.20	0.73
213.80	0.93	0.20	0.73
213.85	0.93	0.20	0.74
213.90	0.94	0.20	0.74
213.95	0.94	0.20	0.75
214.00	**0.95**	**0.20**	**0.75**

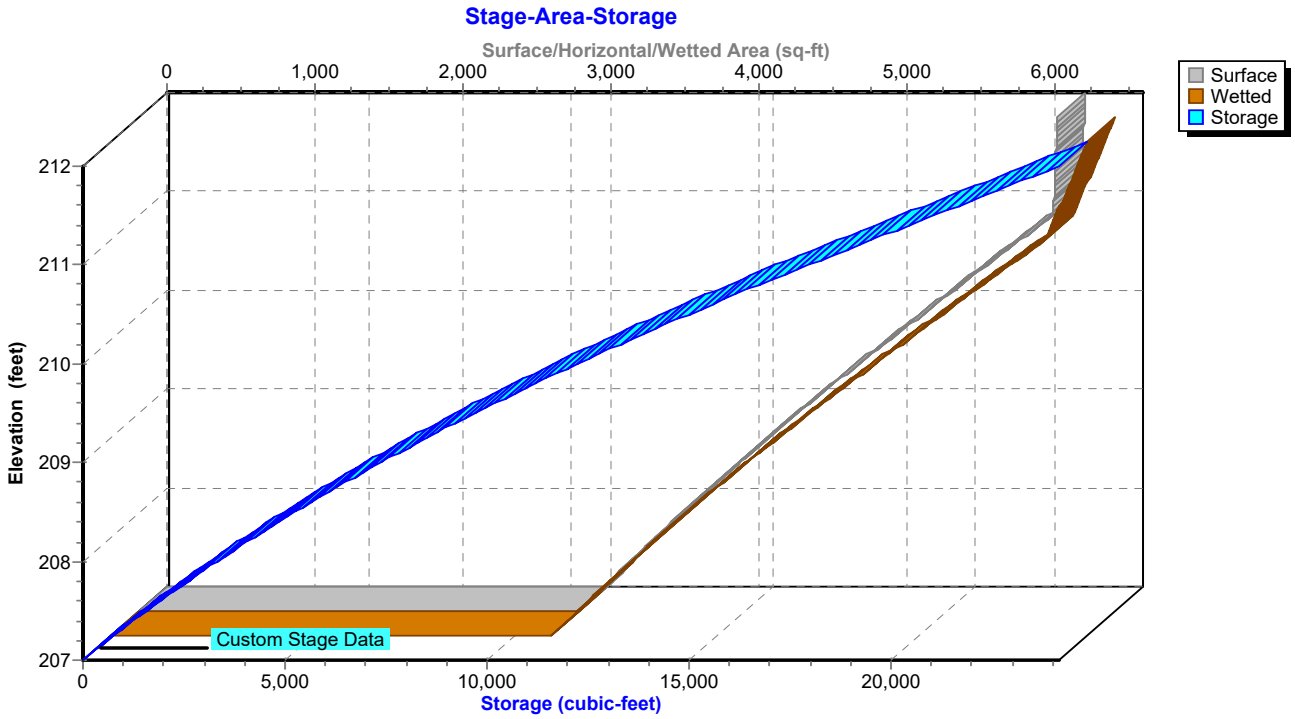
Stage-Area-Storage for Pond D1: SMA D1

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
209.00	1,067	1,067	0
209.10	1,111	1,113	109
209.20	1,156	1,159	222
209.30	1,202	1,206	340
209.40	1,248	1,255	463
209.50	1,296	1,304	590
209.60	1,344	1,354	722
209.70	1,394	1,405	859
209.80	1,444	1,457	1,001
209.90	1,495	1,510	1,147
210.00	1,547	1,564	1,300
210.10	1,598	1,617	1,457
210.20	1,651	1,671	1,619
210.30	1,704	1,726	1,787
210.40	1,758	1,782	1,960
210.50	1,813	1,839	2,139
210.60	1,869	1,897	2,323
210.70	1,925	1,956	2,512
210.80	1,983	2,015	2,708
210.90	2,041	2,076	2,909
211.00	2,100	2,137	3,116
211.10	2,160	2,199	3,329
211.20	2,221	2,262	3,548
211.30	2,282	2,326	3,773
211.40	2,345	2,390	4,004
211.50	2,408	2,456	4,242
211.60	2,472	2,523	4,486
211.70	2,537	2,590	4,736
211.80	2,603	2,658	4,993
211.90	2,669	2,727	5,257
212.00	2,737	2,797	5,527
212.10	2,800	2,863	5,804
212.20	2,865	2,930	6,088
212.30	2,929	2,998	6,377
212.40	2,995	3,066	6,673
212.50	3,061	3,135	6,976
212.60	3,128	3,205	7,286
212.70	3,196	3,276	7,602
212.80	3,265	3,347	7,925
212.90	3,334	3,420	8,255
213.00	3,404	3,492	8,592
213.10	3,414	3,515	8,933
213.20	3,423	3,538	9,275
213.30	3,433	3,561	9,617
213.40	3,442	3,584	9,961
213.50	3,452	3,607	10,306
213.60	3,461	3,630	10,651
213.70	3,471	3,653	10,998
213.80	3,481	3,676	11,346
213.90	3,490	3,699	11,694
214.00	**3,500**	**3,722**	**12,044**

Pond D2: SMA D2



Pond D2: SMA D2



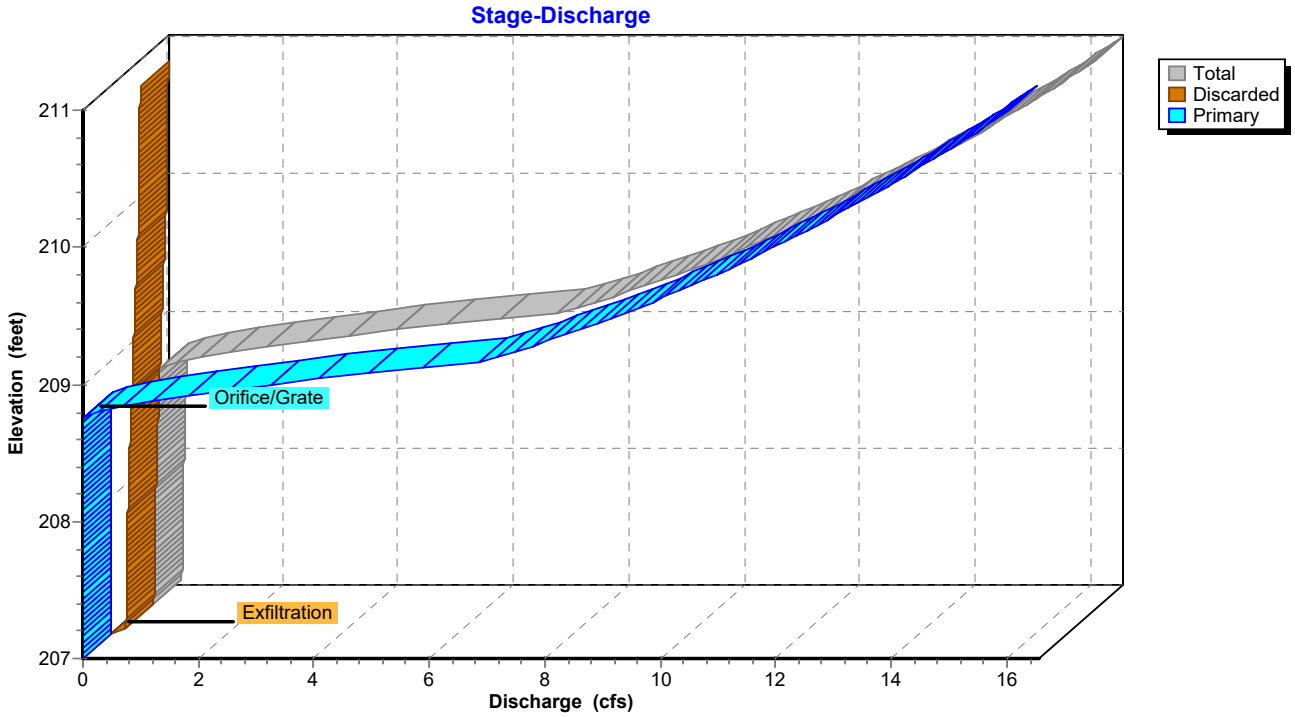
Stage-Discharge for Pond D2: SMA D2

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
207.00	0.00	0.00	0.00
207.05	0.16	0.16	0.00
207.10	0.16	0.16	0.00
207.15	0.16	0.16	0.00
207.20	0.17	0.17	0.00
207.25	0.17	0.17	0.00
207.30	0.17	0.17	0.00
207.35	0.17	0.17	0.00
207.40	0.17	0.17	0.00
207.45	0.18	0.18	0.00
207.50	0.18	0.18	0.00
207.55	0.18	0.18	0.00
207.60	0.18	0.18	0.00
207.65	0.18	0.18	0.00
207.70	0.18	0.18	0.00
207.75	0.19	0.19	0.00
207.80	0.19	0.19	0.00
207.85	0.19	0.19	0.00
207.90	0.19	0.19	0.00
207.95	0.19	0.19	0.00
208.00	0.20	0.20	0.00
208.05	0.20	0.20	0.00
208.10	0.20	0.20	0.00
208.15	0.20	0.20	0.00
208.20	0.21	0.21	0.00
208.25	0.21	0.21	0.00
208.30	0.21	0.21	0.00
208.35	0.21	0.21	0.00
208.40	0.21	0.21	0.00
208.45	0.22	0.22	0.00
208.50	0.22	0.22	0.00
208.55	0.22	0.22	0.00
208.60	0.22	0.22	0.00
208.65	0.22	0.22	0.00
208.70	0.23	0.23	0.00
208.75	0.23	0.23	0.00
208.80	0.23	0.23	0.00
208.85	0.23	0.23	0.00
208.90	0.24	0.24	0.00
208.95	0.24	0.24	0.00
209.00	0.24	0.24	0.00
209.05	0.24	0.24	0.00
209.10	0.24	0.24	0.00
209.15	0.25	0.25	0.00
209.20	0.25	0.25	0.00
209.25	0.25	0.25	0.00
209.30	0.25	0.25	0.00
209.35	0.26	0.26	0.00
209.40	0.26	0.26	0.00
209.45	0.26	0.26	0.00
209.50	0.26	0.26	0.00
209.55	0.27	0.27	0.00
209.60	0.27	0.27	0.00
209.65	0.27	0.27	0.00
209.70	0.27	0.27	0.00
209.75	0.27	0.27	0.00
209.80	0.28	0.28	0.00
209.85	0.28	0.28	0.00
209.90	0.28	0.28	0.00
209.95	0.42	0.28	0.13
210.00	0.66	0.29	0.37
210.05	0.97	0.29	0.68
210.10	1.34	0.29	1.05
210.15	1.78	0.29	1.49
210.20	2.28	0.30	1.99
210.25	2.85	0.30	2.55
210.30	3.46	0.30	3.16
210.35	4.15	0.30	3.85
210.40	4.90	0.31	4.60
210.45	5.71	0.31	5.40
210.50	6.59	0.31	6.27
210.55	7.37	0.31	7.06
210.60	8.19	0.32	7.88
210.65	9.04	0.32	8.72
210.70	9.91	0.32	9.59
210.75	10.82	0.32	10.50
210.80	11.77	0.33	11.44
210.85	12.74	0.33	12.41
210.90	13.73	0.33	13.40
210.95	14.72	0.33	14.39
211.00	15.74	0.34	15.40
211.05	16.77	0.34	16.43
211.10	17.82	0.34	17.48
211.15	18.91	0.34	18.57
211.20	20.02	0.34	19.68
211.25	21.14	0.34	20.80
211.30	22.29	0.34	21.95
211.35	23.48	0.34	23.13
211.40	24.68	0.34	24.34
211.45	25.91	0.34	25.57
211.50	27.16	0.34	26.82
211.55	28.43	0.34	28.08
211.60	29.71	0.34	29.37
211.65	31.02	0.35	30.67
211.70	32.34	0.35	32.00
211.75	33.69	0.35	33.34
211.80	35.05	0.35	34.70
211.85	36.43	0.35	36.08
211.90	37.83	0.35	37.48
211.95	39.27	0.35	38.92
212.00	**40.73**	**0.35**	**40.38**

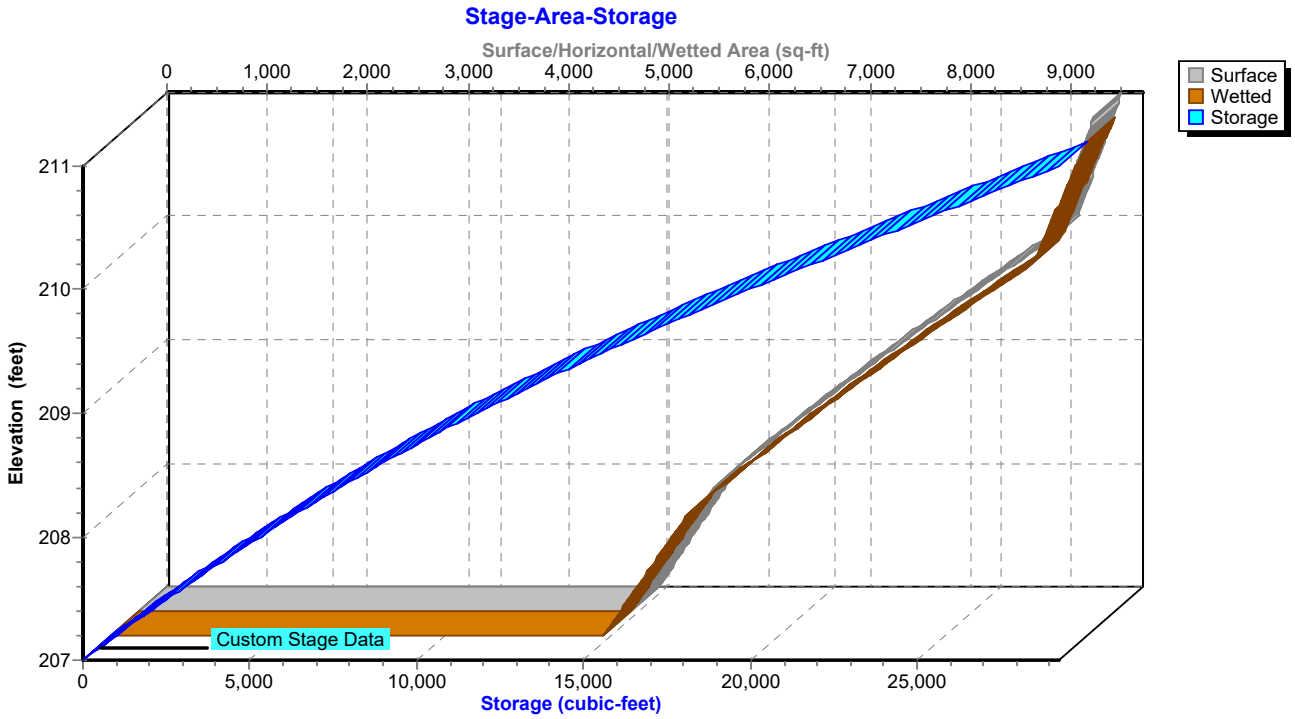
Stage-Area-Storage for Pond D2: SMA D2

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
207.00	2,976	2,976	0
207.10	3,042	3,045	301
207.20	3,109	3,115	608
207.30	3,177	3,185	923
207.40	3,245	3,256	1,244
207.50	3,314	3,328	1,572
207.60	3,384	3,401	1,907
207.70	3,454	3,474	2,248
207.80	3,525	3,549	2,597
207.90	3,597	3,624	2,954
208.00	3,670	3,699	3,317
208.10	3,744	3,776	3,688
208.20	3,819	3,854	4,066
208.30	3,894	3,933	4,451
208.40	3,970	4,012	4,845
208.50	4,047	4,092	5,246
208.60	4,125	4,173	5,654
208.70	4,203	4,255	6,071
208.80	4,283	4,337	6,495
208.90	4,362	4,421	6,927
209.00	4,443	4,505	7,367
209.10	4,524	4,589	7,816
209.20	4,607	4,675	8,272
209.30	4,689	4,761	8,737
209.40	4,773	4,848	9,210
209.50	4,857	4,936	9,692
209.60	4,942	5,025	10,182
209.70	5,028	5,114	10,680
209.80	5,115	5,204	11,187
209.90	5,202	5,295	11,703
210.00	5,290	5,387	12,228
210.10	5,375	5,476	12,761
210.20	5,461	5,565	13,303
210.30	5,547	5,656	13,853
210.40	5,634	5,747	14,412
210.50	5,722	5,838	14,980
210.60	5,810	5,931	15,557
210.70	5,900	6,024	16,142
210.80	5,989	6,118	16,737
210.90	6,080	6,213	17,340
211.00	6,171	6,308	17,953
211.10	6,174	6,336	18,570
211.20	6,177	6,364	19,187
211.30	6,180	6,392	19,805
211.40	6,183	6,420	20,423
211.50	6,185	6,448	21,042
211.60	6,188	6,476	21,660
211.70	6,191	6,504	22,279
211.80	6,194	6,532	22,899
211.90	6,197	6,560	23,518
212.00	**6,200**	**6,588**	**24,138**

Pond D3: SMA D3



Pond D3: SMA D3



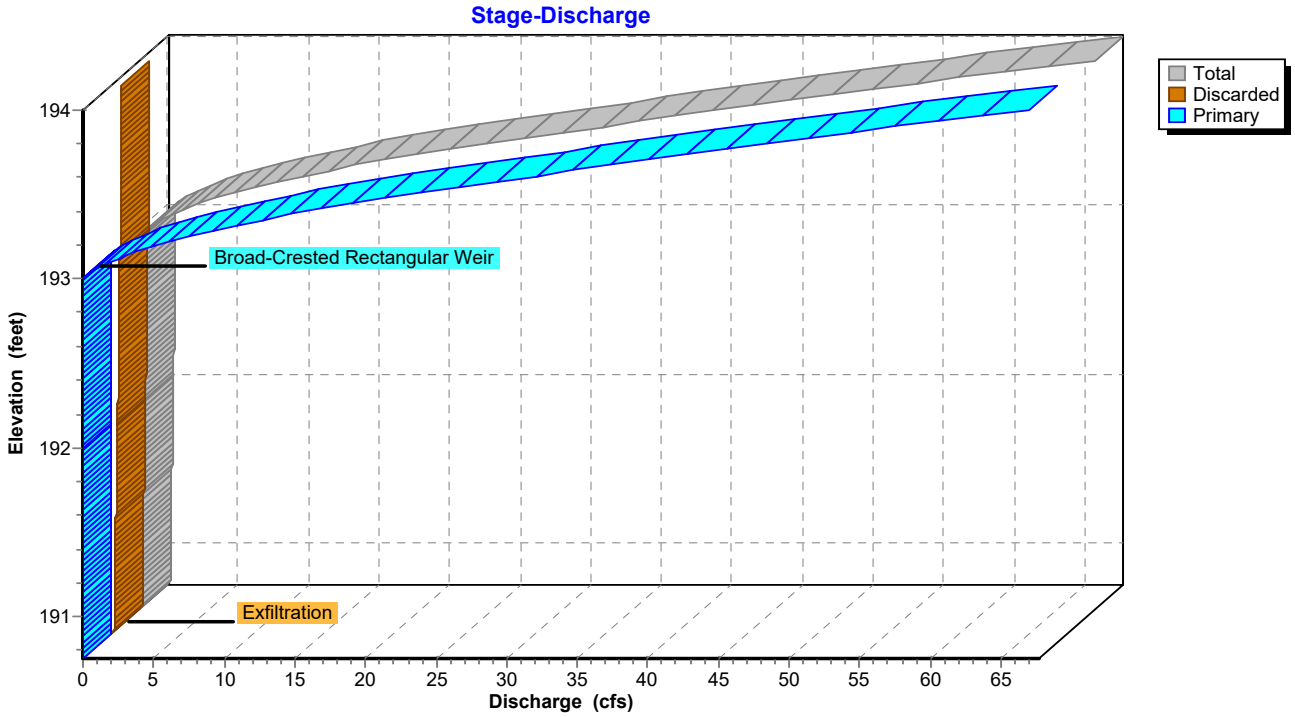
Stage-Discharge for Pond D3: SMA D3

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
207.00	0.00	0.00	0.00
207.05	0.26	0.26	0.00
207.10	0.26	0.26	0.00
207.15	0.26	0.26	0.00
207.20	0.26	0.26	0.00
207.25	0.27	0.27	0.00
207.30	0.27	0.27	0.00
207.35	0.27	0.27	0.00
207.40	0.27	0.27	0.00
207.45	0.28	0.28	0.00
207.50	0.28	0.28	0.00
207.55	0.28	0.28	0.00
207.60	0.28	0.28	0.00
207.65	0.28	0.28	0.00
207.70	0.29	0.29	0.00
207.75	0.29	0.29	0.00
207.80	0.29	0.29	0.00
207.85	0.29	0.29	0.00
207.90	0.30	0.30	0.00
207.95	0.30	0.30	0.00
208.00	0.30	0.30	0.00
208.05	0.30	0.30	0.00
208.10	0.31	0.31	0.00
208.15	0.31	0.31	0.00
208.20	0.32	0.32	0.00
208.25	0.32	0.32	0.00
208.30	0.32	0.32	0.00
208.35	0.33	0.33	0.00
208.40	0.33	0.33	0.00
208.45	0.34	0.34	0.00
208.50	0.34	0.34	0.00
208.55	0.34	0.34	0.00
208.60	0.35	0.35	0.00
208.65	0.35	0.35	0.00
208.70	0.36	0.36	0.00
208.75	0.36	0.36	0.00
208.80	0.66	0.37	0.29
208.85	1.20	0.37	0.83
208.90	1.89	0.37	1.52
208.95	2.72	0.38	2.34
209.00	3.65	0.38	3.27
209.05	4.69	0.39	4.30
209.10	5.81	0.39	5.42
209.15	7.01	0.40	6.62
209.20	7.58	0.40	7.18
209.25	7.97	0.41	7.57
209.30	8.35	0.41	7.94
209.35	8.70	0.42	8.29
209.40	9.05	0.42	8.63
209.45	9.38	0.42	8.95
209.50	9.70	0.43	9.27
209.55	10.00	0.43	9.57
209.60	10.30	0.44	9.86
209.65	10.59	0.44	10.15
209.70	10.88	0.45	10.43
209.75	11.15	0.45	10.70
209.80	11.42	0.46	10.96
209.85	11.68	0.46	11.22
209.90	11.94	0.47	11.47
209.95	12.19	0.47	11.72
210.00	12.44	0.48	11.96
210.05	12.68	0.48	12.20
210.10	12.91	0.48	12.43
210.15	13.14	0.48	12.66
210.20	13.37	0.48	12.88
210.25	13.59	0.48	13.10
210.30	13.81	0.49	13.32
210.35	14.02	0.49	13.53
210.40	14.23	0.49	13.74
210.45	14.44	0.49	13.95
210.50	14.65	0.49	14.15
210.55	14.85	0.49	14.36
210.60	15.05	0.49	14.55
210.65	15.24	0.50	14.75
210.70	15.44	0.50	14.94
210.75	15.63	0.50	15.13
210.80	15.82	0.50	15.32
210.85	16.01	0.50	15.51
210.90	16.19	0.50	15.69
210.95	16.38	0.50	15.87
211.00	**16.56**	**0.51**	**16.05**

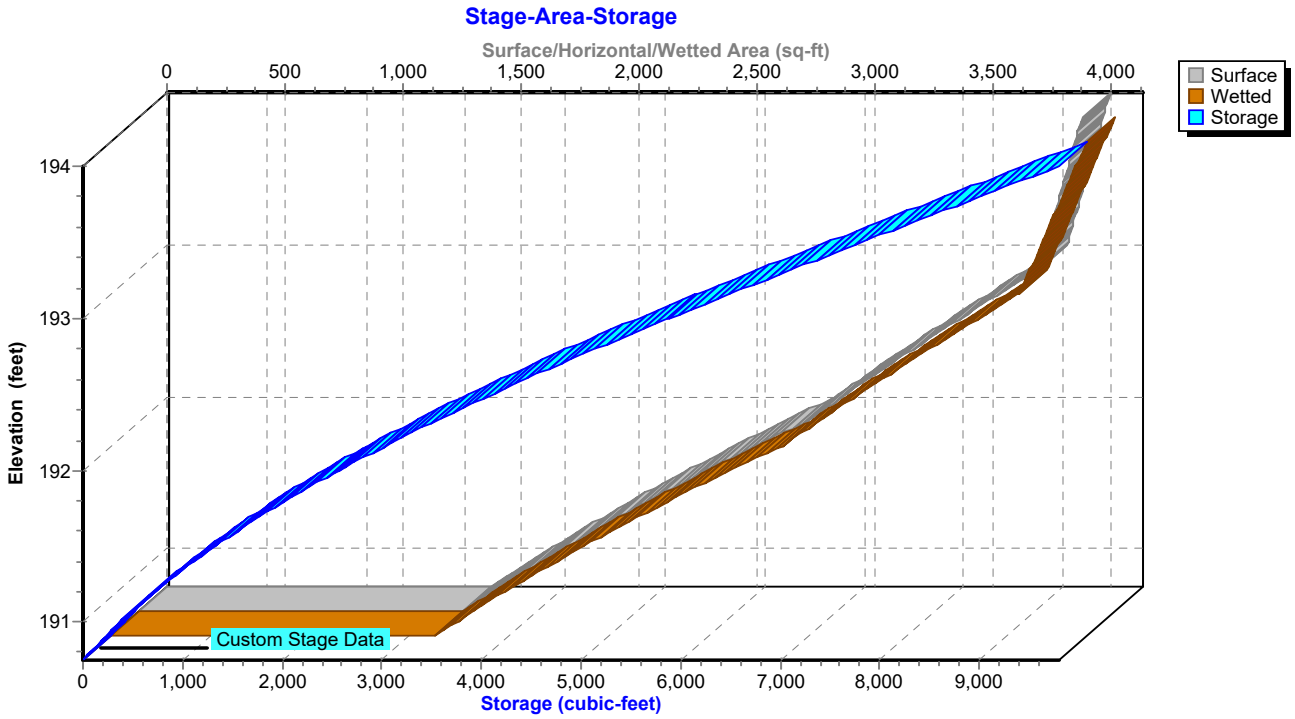
Stage-Area-Storage for Pond D3: SMA D3

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
207.00	4,906	4,906	0
207.10	4,984	4,988	495
207.20	5,063	5,071	997
207.30	5,143	5,154	1,507
207.40	5,223	5,239	2,025
207.50	5,304	5,323	2,552
207.60	5,385	5,409	3,086
207.70	5,467	5,495	3,629
207.80	5,550	5,582	4,180
207.90	5,633	5,669	4,739
208.00	5,717	5,757	5,306
208.10	5,866	5,909	5,885
208.20	6,018	6,063	6,480
208.30	6,171	6,218	7,089
208.40	6,326	6,376	7,714
208.50	6,483	6,535	8,354
208.60	6,642	6,697	9,010
208.70	6,803	6,860	9,683
208.80	6,965	7,026	10,371
208.90	7,130	7,193	11,076
209.00	7,297	7,362	11,797
209.10	7,465	7,534	12,535
209.20	7,636	7,707	13,290
209.30	7,808	7,882	14,062
209.40	7,983	8,059	14,852
209.50	8,159	8,238	15,659
209.60	8,337	8,420	16,484
209.70	8,517	8,603	17,327
209.80	8,699	8,788	18,187
209.90	8,883	8,974	19,066
210.00	9,069	9,163	19,964
210.10	9,112	9,218	20,873
210.20	9,154	9,272	21,786
210.30	9,197	9,327	22,704
210.40	9,240	9,382	23,626
210.50	9,283	9,437	24,552
210.60	9,326	9,492	25,482
210.70	9,370	9,547	26,417
210.80	9,413	9,602	27,356
210.90	9,456	9,658	28,300
211.00	**9,500**	**9,713**	**29,248**

Pond SMA A: SMA A



Pond SMA A: SMA A



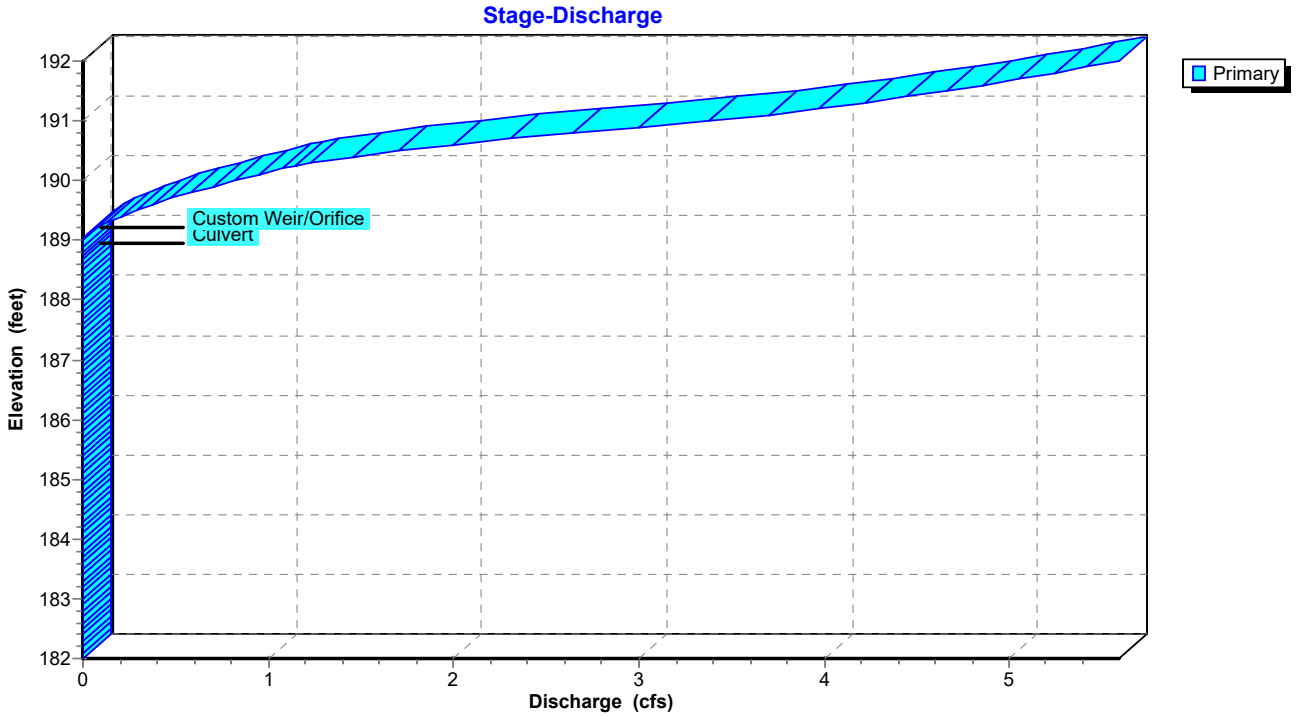
Stage-Discharge for Pond SMA A: SMA A

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
190.75	0.00	0.00	0.00
190.80	0.24	0.24	0.00
190.85	0.25	0.25	0.00
190.90	0.25	0.25	0.00
190.95	0.26	0.26	0.00
191.00	0.27	0.27	0.00
191.05	0.28	0.28	0.00
191.10	0.29	0.29	0.00
191.15	0.30	0.30	0.00
191.20	0.31	0.31	0.00
191.25	0.32	0.32	0.00
191.30	0.33	0.33	0.00
191.35	0.34	0.34	0.00
191.40	0.35	0.35	0.00
191.45	0.36	0.36	0.00
191.50	0.37	0.37	0.00
191.55	0.38	0.38	0.00
191.60	0.39	0.39	0.00
191.65	0.40	0.40	0.00
191.70	0.41	0.41	0.00
191.75	0.42	0.42	0.00
191.80	0.43	0.43	0.00
191.85	0.44	0.44	0.00
191.90	0.45	0.45	0.00
191.95	0.46	0.46	0.00
192.00	0.47	0.47	0.00
192.05	0.48	0.48	0.00
192.10	0.49	0.49	0.00
192.15	0.50	0.50	0.00
192.20	0.51	0.51	0.00
192.25	0.51	0.51	0.00
192.30	0.52	0.52	0.00
192.35	0.53	0.53	0.00
192.40	0.54	0.54	0.00
192.45	0.55	0.55	0.00
192.50	0.56	0.56	0.00
192.55	0.56	0.56	0.00
192.60	0.57	0.57	0.00
192.65	0.58	0.58	0.00
192.70	0.59	0.59	0.00
192.75	0.60	0.60	0.00
192.80	0.61	0.61	0.00
192.85	0.62	0.62	0.00
192.90	0.62	0.62	0.00
192.95	0.63	0.63	0.00
193.00	0.64	0.64	0.00
193.05	1.30	0.64	0.65
193.10	2.50	0.65	1.85
193.15	4.05	0.65	3.40
193.20	5.88	0.65	5.23
193.25	8.09	0.65	7.44
193.30	10.60	0.66	9.94
193.35	13.39	0.66	12.73
193.40	16.47	0.66	15.81
193.45	19.91	0.66	19.24
193.50	23.65	0.67	22.98
193.55	27.69	0.67	27.02
193.60	32.04	0.67	31.37
193.65	35.98	0.67	35.31
193.70	40.06	0.68	39.39
193.75	44.28	0.68	43.60
193.80	48.62	0.68	47.94
193.85	53.19	0.68	52.51
193.90	57.89	0.69	57.21
193.95	62.73	0.69	62.04
194.00	**67.69**	**0.69**	**67.00**

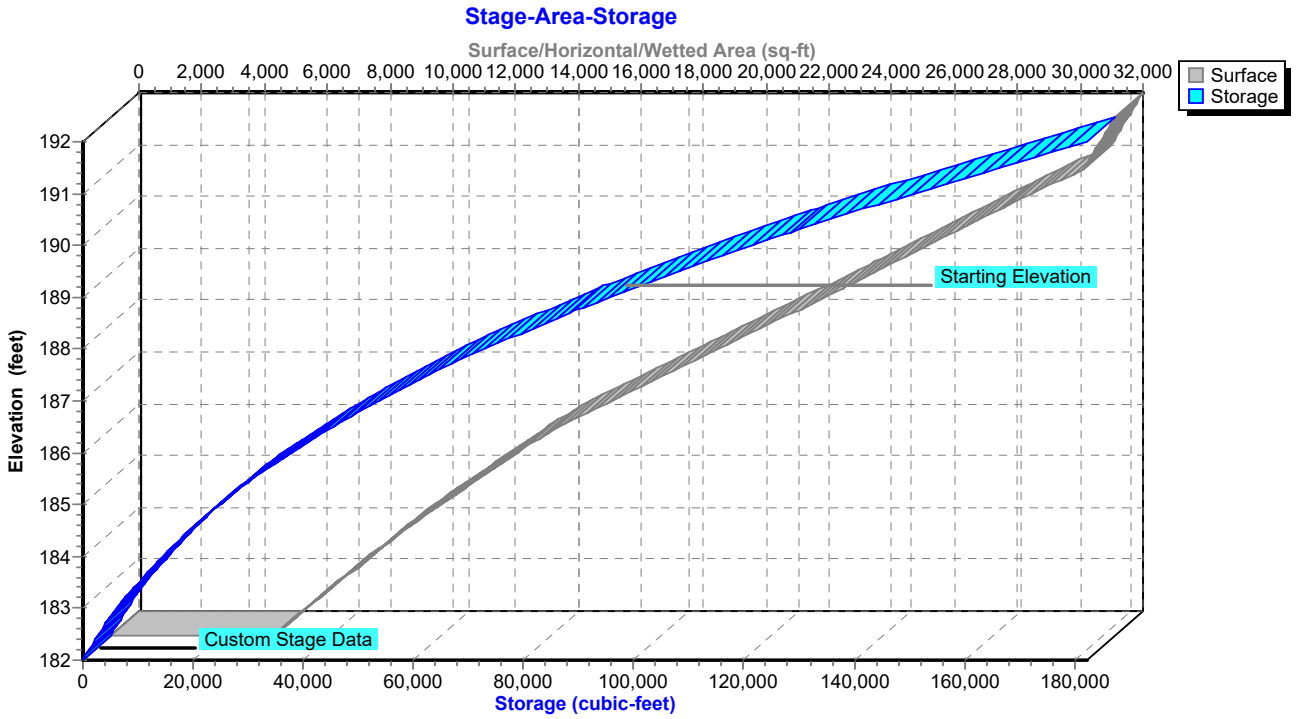
Stage-Area-Storage for Pond SMA A: SMA A

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
190.75	1,376	1,376	0
190.85	1,474	1,474	142
190.95	1,574	1,576	295
191.05	1,679	1,681	457
191.15	1,786	1,790	631
191.25	1,897	1,902	815
191.35	2,011	2,017	1,010
191.45	2,129	2,136	1,217
191.55	2,250	2,258	1,436
191.65	2,374	2,383	1,667
191.75	2,501	2,512	1,911
191.85	2,632	2,644	2,168
191.95	2,767	2,780	2,437
192.05	2,881	2,895	2,720
192.15	2,973	2,990	3,013
192.25	3,067	3,086	3,315
192.35	3,163	3,183	3,627
192.45	3,260	3,282	3,948
192.55	3,358	3,383	4,279
192.65	3,458	3,485	4,619
192.75	3,559	3,588	4,970
192.85	3,662	3,693	5,331
192.95	3,766	3,800	5,703
193.05	3,828	3,868	6,084
193.15	3,846	3,896	6,467
193.25	3,864	3,924	6,853
193.35	3,882	3,953	7,240
193.45	3,900	3,982	7,629
193.55	3,918	4,010	8,020
193.65	3,936	4,039	8,413
193.75	3,954	4,068	8,807
193.85	3,973	4,096	9,204
193.95	**3,991**	**4,125**	**9,602**

Pond SMA B: SMA B



Pond SMA B: SMA B



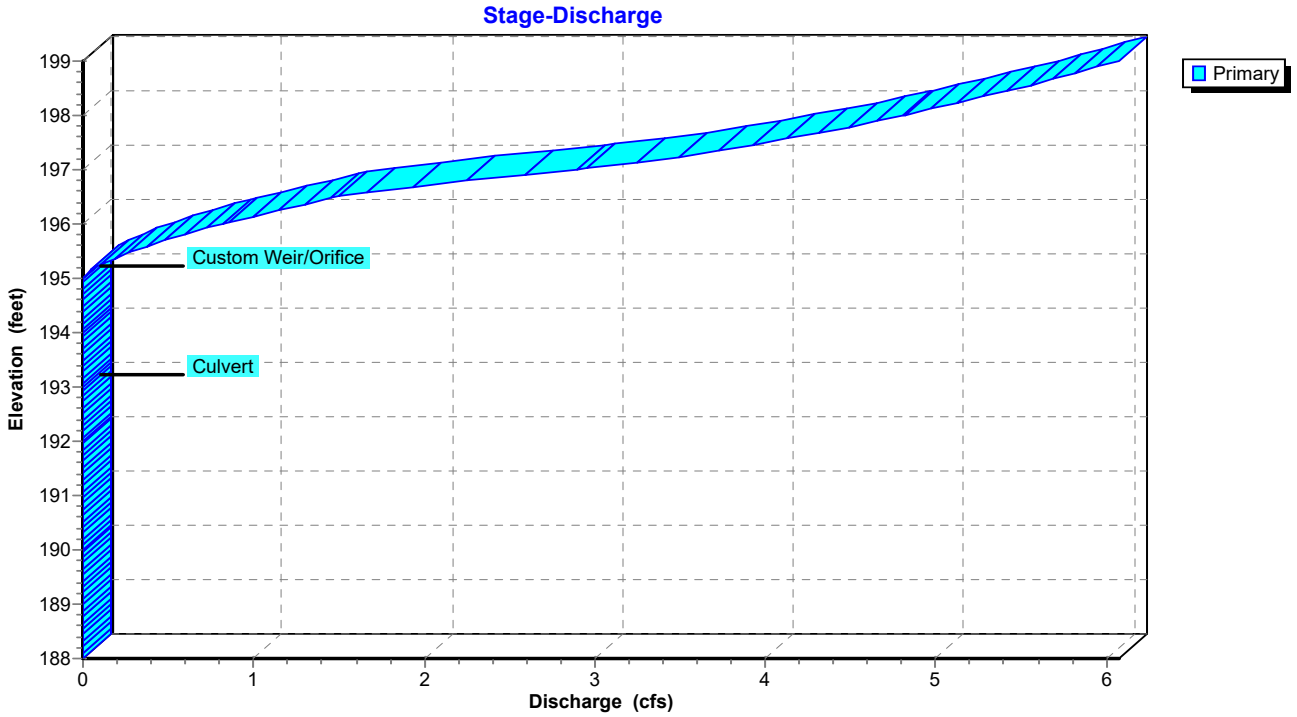
Stage-Discharge for Pond SMA B: SMA B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
182.00	0.00	184.65	0.00	187.30	0.00	189.95	0.76
182.05	0.00	184.70	0.00	187.35	0.00	190.00	0.82
182.10	0.00	184.75	0.00	187.40	0.00	190.05	0.88
182.15	0.00	184.80	0.00	187.45	0.00	190.10	0.94
182.20	0.00	184.85	0.00	187.50	0.00	190.15	1.01
182.25	0.00	184.90	0.00	187.55	0.00	190.20	1.08
182.30	0.00	184.95	0.00	187.60	0.00	190.25	1.14
182.35	0.00	185.00	0.00	187.65	0.00	190.30	1.23
182.40	0.00	185.05	0.00	187.70	0.00	190.35	1.34
182.45	0.00	185.10	0.00	187.75	0.00	190.40	1.45
182.50	0.00	185.15	0.00	187.80	0.00	190.45	1.58
182.55	0.00	185.20	0.00	187.85	0.00	190.50	1.71
182.60	0.00	185.25	0.00	187.90	0.00	190.55	1.85
182.65	0.00	185.30	0.00	187.95	0.00	190.60	2.00
182.70	0.00	185.35	0.00	188.00	0.00	190.65	2.15
182.75	0.00	185.40	0.00	188.05	0.00	190.70	2.31
182.80	0.00	185.45	0.00	188.10	0.00	190.75	2.47
182.85	0.00	185.50	0.00	188.15	0.00	190.80	2.65
182.90	0.00	185.55	0.00	188.20	0.00	190.85	2.82
182.95	0.00	185.60	0.00	188.25	0.00	190.90	3.00
183.00	0.00	185.65	0.00	188.30	0.00	190.95	3.19
183.05	0.00	185.70	0.00	188.35	0.00	191.00	3.38
183.10	0.00	185.75	0.00	188.40	0.00	191.05	3.55
183.15	0.00	185.80	0.00	188.45	0.00	191.10	3.70
183.20	0.00	185.85	0.00	188.50	0.00	191.15	3.84
183.25	0.00	185.90	0.00	188.55	0.00	191.20	3.97
183.30	0.00	185.95	0.00	188.60	0.00	191.25	4.09
183.35	0.00	186.00	0.00	188.65	0.00	191.30	4.21
183.40	0.00	186.05	0.00	188.70	0.00	191.35	4.33
183.45	0.00	186.10	0.00	188.75	0.00	191.40	4.44
183.50	0.00	186.15	0.00	188.80	0.00	191.45	4.55
183.55	0.00	186.20	0.00	188.85	0.00	191.50	4.66
183.60	0.00	186.25	0.00	188.90	0.00	191.55	4.76
183.65	0.00	186.30	0.00	188.95	0.00	191.60	4.86
183.70	0.00	186.35	0.00	189.00	0.00	191.65	4.96
183.75	0.00	186.40	0.00	189.05	0.01	191.70	5.05
183.80	0.00	186.45	0.00	189.10	0.03	191.75	5.15
183.85	0.00	186.50	0.00	189.15	0.05	191.80	5.24
183.90	0.00	186.55	0.00	189.20	0.07	191.85	5.33
183.95	0.00	186.60	0.00	189.25	0.10	191.90	5.42
184.00	0.00	186.65	0.00	189.30	0.13	191.95	5.50
184.05	0.00	186.70	0.00	189.35	0.17	192.00	**5.59**
184.10	0.00	186.75	0.00	189.40	0.21		
184.15	0.00	186.80	0.00	189.45	0.25		
184.20	0.00	186.85	0.00	189.50	0.29		
184.25	0.00	186.90	0.00	189.55	0.33		
184.30	0.00	186.95	0.00	189.60	0.38		
184.35	0.00	187.00	0.00	189.65	0.43		
184.40	0.00	187.05	0.00	189.70	0.48		
184.45	0.00	187.10	0.00	189.75	0.53		
184.50	0.00	187.15	0.00	189.80	0.59		
184.55	0.00	187.20	0.00	189.85	0.64		
184.60	0.00	187.25	0.00	189.90	0.70		

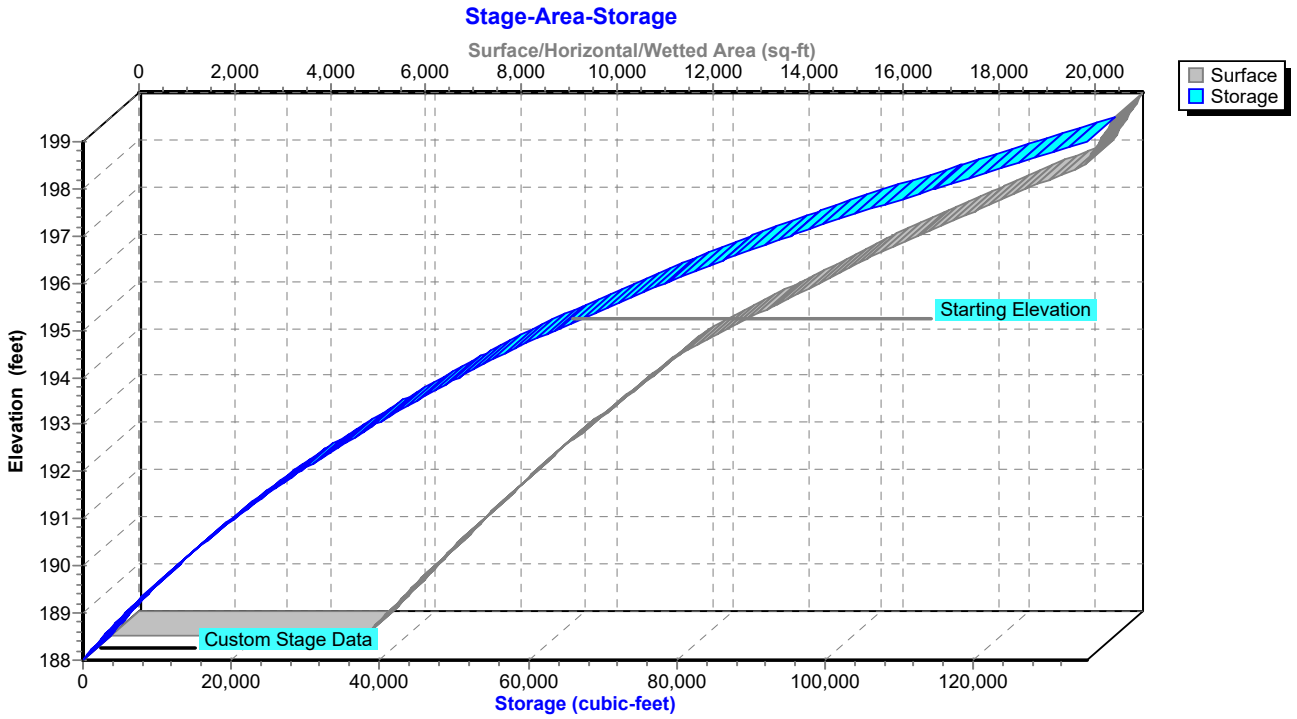
Stage-Area-Storage for Pond SMA B: SMA B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
182.00	5,185	0
182.10	5,388	529
182.20	5,590	1,078
182.30	5,793	1,647
182.40	5,996	2,236
182.50	6,199	2,846
182.60	6,401	3,476
182.70	6,604	4,126
182.80	6,807	4,797
182.90	7,010	5,488
183.00	7,213	6,199
183.10	7,415	6,930
183.20	7,618	7,682
183.30	7,821	8,454
183.40	8,024	9,246
183.50	8,226	10,058
183.60	8,429	10,891
183.70	8,632	11,744
183.80	8,835	12,618
183.90	9,037	13,511
184.00	9,240	14,425
184.10	9,485	15,361
184.20	9,729	16,322
184.30	9,974	17,307
184.40	10,219	18,317
184.50	10,463	19,351
184.60	10,708	20,409
184.70	10,953	21,492
184.80	11,197	22,600
184.90	11,442	23,732
185.00	11,687	24,888
185.10	11,931	26,069
185.20	12,176	27,274
185.30	12,420	28,504
185.40	12,665	29,759
185.50	12,910	31,037
185.60	13,154	32,341
185.70	13,399	33,668
185.80	13,644	35,020
185.90	13,888	36,397
186.00	14,133	37,798
186.10	14,476	39,228
186.20	14,818	40,693
186.30	15,161	42,192
186.40	15,504	43,725
186.50	15,847	45,293
186.60	16,189	46,895
186.70	16,532	48,531
186.80	16,875	50,201
186.90	17,217	51,906
187.00	17,560	53,645
187.10	17,903	55,418
187.20	18,245	57,225
187.30	18,588	59,067
187.40	18,931	60,943
187.50	19,274	62,853
187.60	19,616	64,797
187.70	19,959	66,776
187.80	20,302	68,789
187.90	20,644	70,836
188.00	20,987	72,918
188.10	21,318	75,033
188.20	21,648	77,182
188.30	21,979	79,363
188.40	22,310	81,577
188.50	22,641	83,825
188.60	22,971	86,106
188.70	23,302	88,419
188.80	23,633	90,766
188.90	23,964	93,146
189.00	24,295	95,559
189.10	24,625	98,005
189.20	24,956	100,484
189.30	25,287	102,996
189.40	25,618	105,541
189.50	25,948	108,119
189.60	26,279	110,731
189.70	26,610	113,375
189.80	26,941	116,053
189.90	27,271	118,763
190.00	27,602	121,507
190.10	27,940	124,284
190.20	28,279	127,095
190.30	28,617	129,940
190.40	28,955	132,818
190.50	29,294	135,731
190.60	29,632	138,677
190.70	29,970	141,657
190.80	30,308	144,671
190.90	30,647	147,719
191.00	30,985	150,801
191.10	31,086	153,904
191.20	31,188	157,018
191.30	31,290	160,142
191.40	31,391	163,276
191.50	31,493	166,420
191.60	31,594	169,574
191.70	31,695	172,739
191.80	31,797	175,913
191.90	31,899	179,098
192.00	**32,000**	**182,293**

Pond SMA C: SMA C



Pond SMA C: SMA C



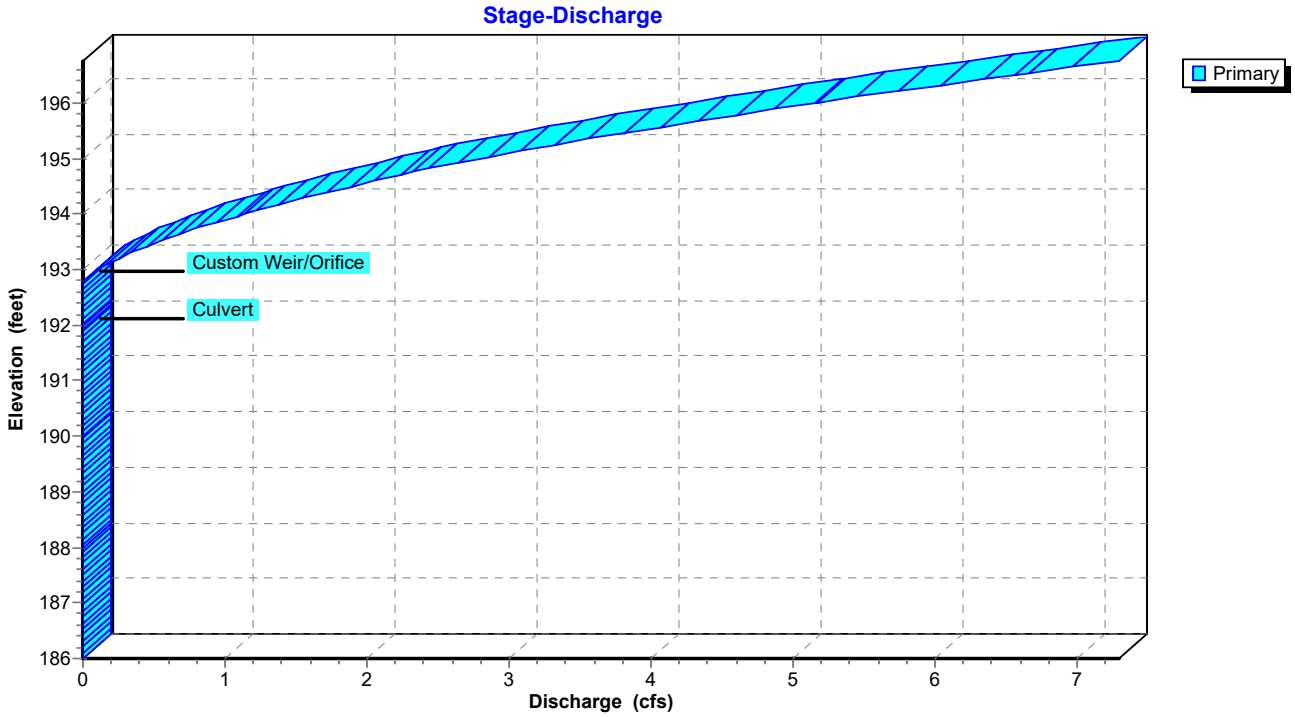
Stage-Discharge for Pond SMA C: SMA C

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
188.00	0.00	193.30	0.00	198.60	5.60
188.10	0.00	193.40	0.00	198.70	5.73
188.20	0.00	193.50	0.00	198.80	5.85
188.30	0.00	193.60	0.00	198.90	5.96
188.40	0.00	193.70	0.00	199.00	**6.08**
188.50	0.00	193.80	0.00		
188.60	0.00	193.90	0.00		
188.70	0.00	194.00	0.00		
188.80	0.00	194.10	0.00		
188.90	0.00	194.20	0.00		
189.00	0.00	194.30	0.00		
189.10	0.00	194.40	0.00		
189.20	0.00	194.50	0.00		
189.30	0.00	194.60	0.00		
189.40	0.00	194.70	0.00		
189.50	0.00	194.80	0.00		
189.60	0.00	194.90	0.00		
189.70	0.00	195.00	0.00		
189.80	0.00	195.10	0.03		
189.90	0.00	195.20	0.07		
190.00	0.00	195.30	0.13		
190.10	0.00	195.40	0.21		
190.20	0.00	195.50	0.29		
190.30	0.00	195.60	0.38		
190.40	0.00	195.70	0.48		
190.50	0.00	195.80	0.59		
190.60	0.00	195.90	0.70		
190.70	0.00	196.00	0.82		
190.80	0.00	196.10	0.94		
190.90	0.00	196.20	1.08		
191.00	0.00	196.30	1.21		
191.10	0.00	196.40	1.36		
191.20	0.00	196.50	1.50		
191.30	0.00	196.60	1.71		
191.40	0.00	196.70	1.96		
191.50	0.00	196.80	2.25		
191.60	0.00	196.90	2.56		
191.70	0.00	197.00	2.89		
191.80	0.00	197.10	3.17		
191.90	0.00	197.20	3.41		
192.00	0.00	197.30	3.62		
192.10	0.00	197.40	3.82		
192.20	0.00	197.50	4.01		
192.30	0.00	197.60	4.18		
192.40	0.00	197.70	4.35		
192.50	0.00	197.80	4.51		
192.60	0.00	197.90	4.66		
192.70	0.00	198.00	4.81		
192.80	0.00	198.10	4.95		
192.90	0.00	198.20	5.09		
193.00	0.00	198.30	5.22		
193.10	0.00	198.40	5.35		
193.20	0.00	198.50	5.48		

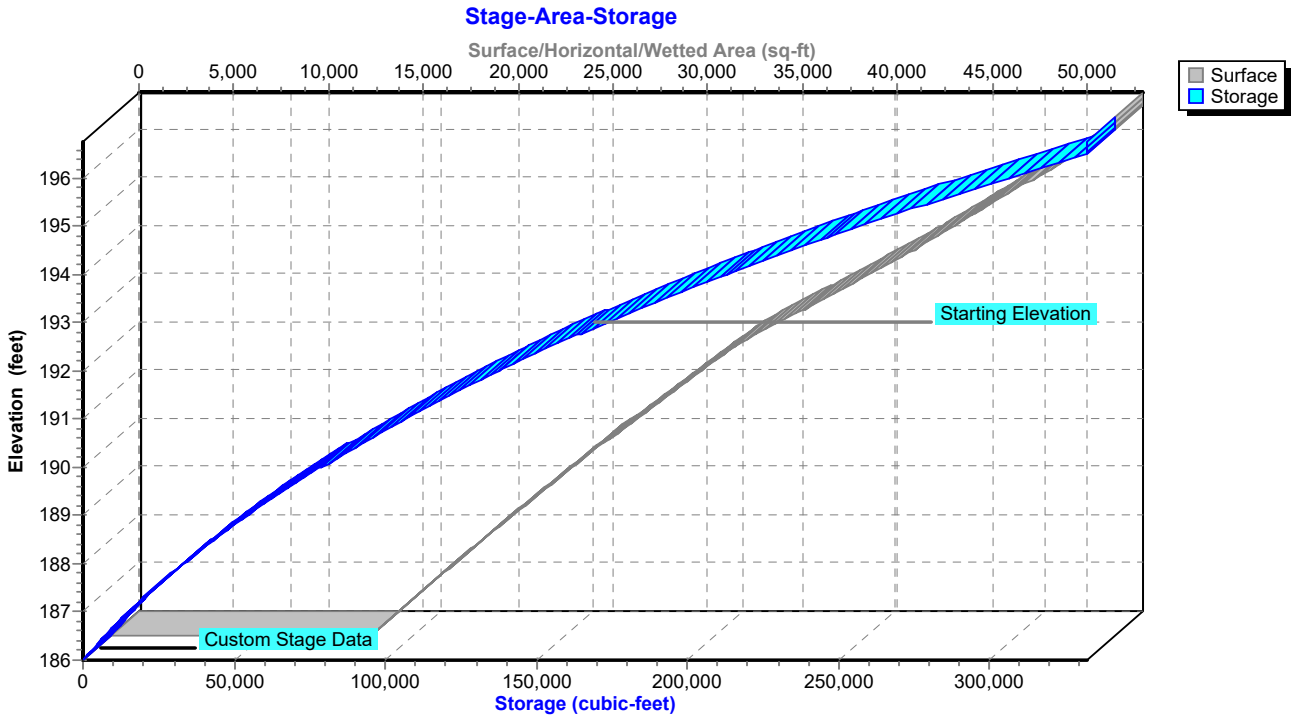
Stage-Area-Storage for Pond SMA C: SMA C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.00	5,323	0
188.20	5,517	1,084
188.40	5,712	2,207
188.60	5,906	3,369
188.80	6,100	4,569
189.00	6,295	5,809
189.20	6,489	7,087
189.40	6,683	8,404
189.60	6,877	9,760
189.80	7,072	11,155
190.00	7,266	12,589
190.20	7,484	14,064
190.40	7,703	15,583
190.60	7,921	17,145
190.80	8,140	18,751
191.00	8,358	20,401
191.20	8,576	22,094
191.40	8,795	23,832
191.60	9,013	25,612
191.80	9,232	27,437
192.00	9,450	29,305
192.20	9,699	31,220
192.40	9,948	33,185
192.60	10,197	35,199
192.80	10,446	37,264
193.00	10,696	39,378
193.20	10,945	41,542
193.40	11,194	43,756
193.60	11,443	46,019
193.80	11,692	48,333
194.00	11,941	50,696
194.20	12,326	53,123
194.40	12,712	55,627
194.60	13,097	58,207
194.80	13,482	60,865
195.00	13,868	63,600
195.20	14,253	66,412
195.40	14,638	69,301
195.60	15,023	72,268
195.80	15,409	75,311
196.00	15,794	78,431
196.20	16,252	81,636
196.40	16,710	84,932
196.60	17,167	88,319
196.80	17,625	91,799
197.00	18,083	95,370
197.20	18,541	99,032
197.40	18,999	102,786
197.60	19,456	106,631
197.80	19,914	110,568
198.00	20,372	114,597
198.20	20,498	118,684
198.40	20,623	122,796
198.60	20,749	126,933
198.80	20,874	131,096
199.00	**21,000**	**135,283**

Pond SMA E: SMA E



Pond SMA E: SMA E



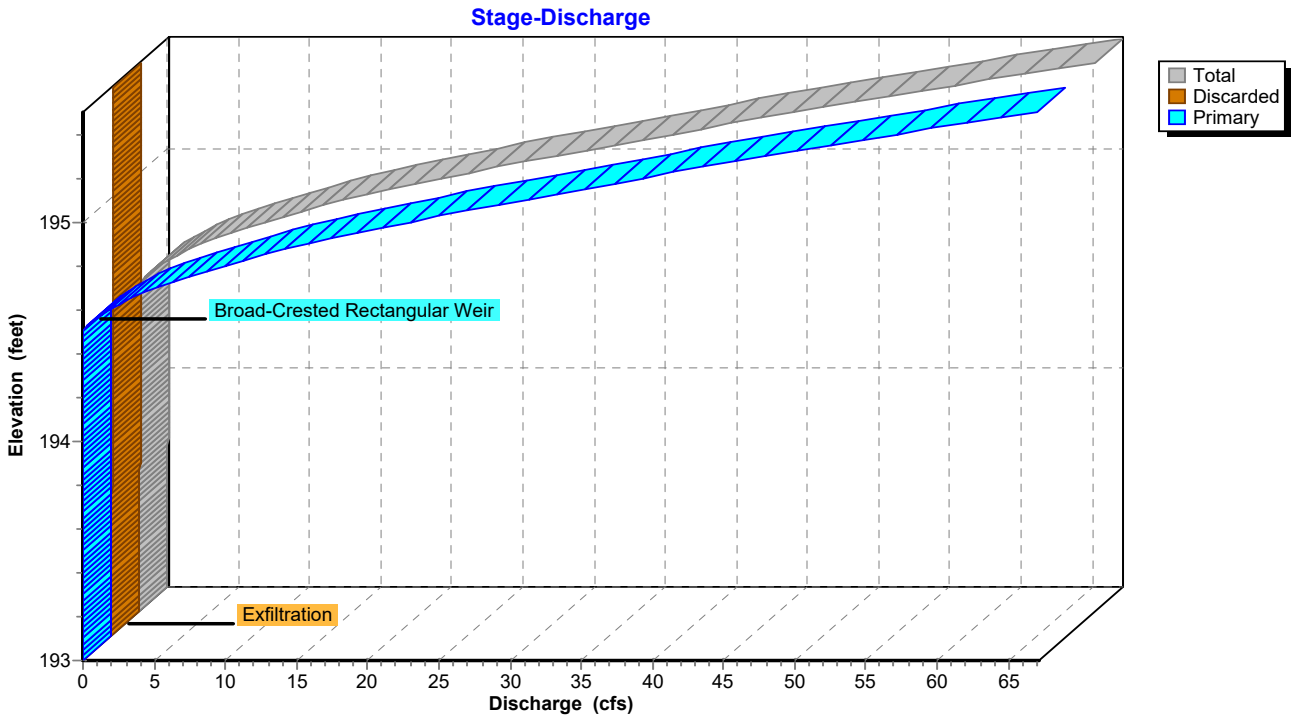
Stage-Discharge for Pond SMA E: SMA E

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
186.00	0.00	191.30	0.00	196.60	6.84
186.10	0.00	191.40	0.00	196.70	**7.14**
186.20	0.00	191.50	0.00		
186.30	0.00	191.60	0.00		
186.40	0.00	191.70	0.00		
186.50	0.00	191.80	0.00		
186.60	0.00	191.90	0.00		
186.70	0.00	192.00	0.00		
186.80	0.00	192.10	0.00		
186.90	0.00	192.20	0.00		
187.00	0.00	192.30	0.00		
187.10	0.00	192.40	0.00		
187.20	0.00	192.50	0.00		
187.30	0.00	192.60	0.00		
187.40	0.00	192.70	0.00		
187.50	0.00	192.80	0.01		
187.60	0.00	192.90	0.05		
187.70	0.00	193.00	0.10		
187.80	0.00	193.10	0.17		
187.90	0.00	193.20	0.25		
188.00	0.00	193.30	0.33		
188.10	0.00	193.40	0.43		
188.20	0.00	193.50	0.53		
188.30	0.00	193.60	0.64		
188.40	0.00	193.70	0.76		
188.50	0.00	193.80	0.88		
188.60	0.00	193.90	1.01		
188.70	0.00	194.00	1.14		
188.80	0.00	194.10	1.28		
188.90	0.00	194.20	1.43		
189.00	0.00	194.30	1.58		
189.10	0.00	194.40	1.74		
189.20	0.00	194.50	1.90		
189.30	0.00	194.60	2.06		
189.40	0.00	194.70	2.23		
189.50	0.00	194.80	2.41		
189.60	0.00	194.90	2.60		
189.70	0.00	195.00	2.80		
189.80	0.00	195.10	3.00		
189.90	0.00	195.20	3.22		
190.00	0.00	195.30	3.44		
190.10	0.00	195.40	3.67		
190.20	0.00	195.50	3.90		
190.30	0.00	195.60	4.14		
190.40	0.00	195.70	4.39		
190.50	0.00	195.80	4.64		
190.60	0.00	195.90	4.90		
190.70	0.00	196.00	5.16		
190.80	0.00	196.10	5.43		
190.90	0.00	196.20	5.70		
191.00	0.00	196.30	5.98		
191.10	0.00	196.40	6.26		
191.20	0.00	196.50	6.55		

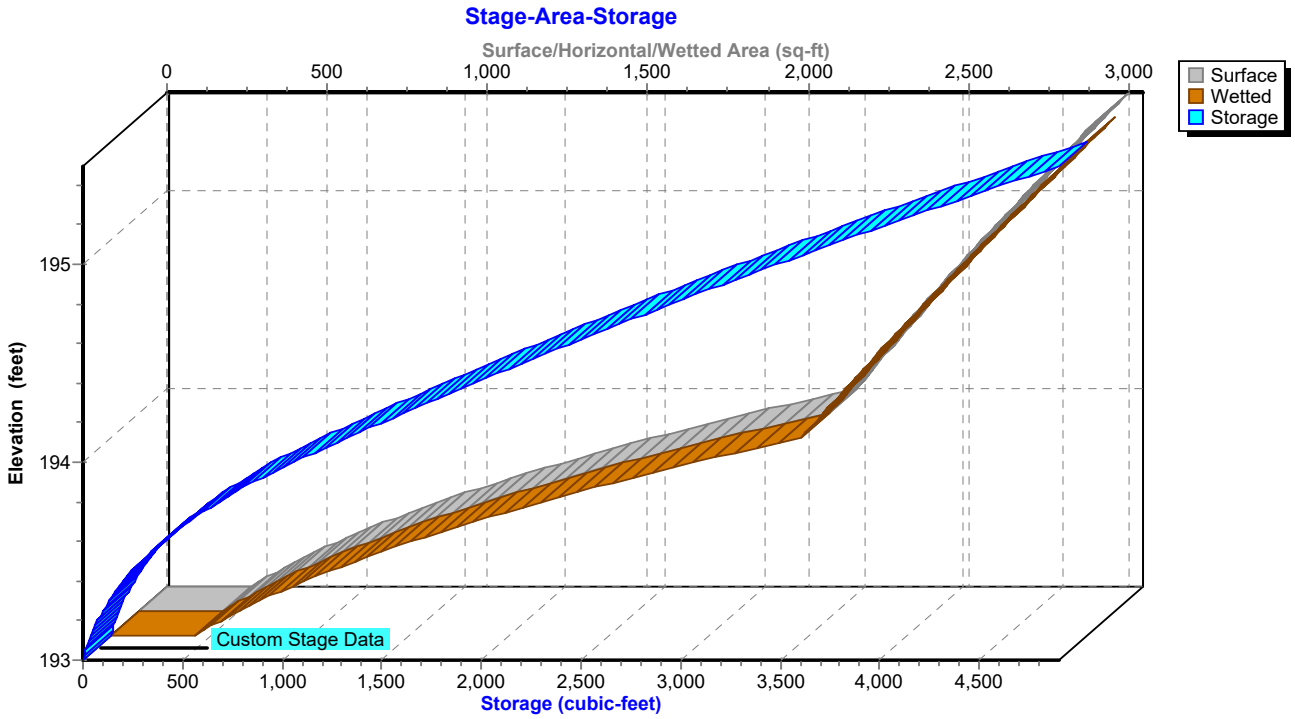
Stage-Area-Storage for Pond SMA E: SMA E

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
186.00	13,724	0
186.20	14,311	2,804
186.40	14,899	5,725
186.60	15,486	8,763
186.80	16,074	11,919
187.00	16,661	15,193
187.20	17,248	18,583
187.40	17,836	22,092
187.60	18,423	25,718
187.80	19,011	29,461
188.00	19,598	33,322
188.20	20,236	37,305
188.40	20,874	41,416
188.60	21,513	45,655
188.80	22,151	50,022
189.00	22,789	54,516
189.20	23,427	59,137
189.40	24,065	63,886
189.60	24,704	68,763
189.80	25,342	73,768
190.00	25,980	78,900
190.20	26,671	84,165
190.40	27,363	89,569
190.60	28,054	95,110
190.80	28,746	100,790
191.00	29,437	106,609
191.20	30,128	112,565
191.40	30,820	118,660
191.60	31,511	124,893
191.80	32,203	131,264
192.00	32,894	137,774
192.20	33,839	144,447
192.40	34,783	151,309
192.60	35,728	158,361
192.80	36,673	165,601
193.00	37,618	173,030
193.20	38,562	180,648
193.40	39,507	188,455
193.60	40,452	196,450
193.80	41,396	204,635
194.00	42,341	213,009
194.20	43,197	221,563
194.40	44,054	230,288
194.60	44,910	239,184
194.80	45,767	248,252
195.00	46,623	257,491
195.20	47,479	266,901
195.40	48,336	276,483
195.60	49,192	286,236
195.80	50,049	296,160
196.00	50,905	306,255
196.20	51,718	316,517
196.40	**52,531**	**326,942**
196.60	**52,938**	**332,216**

Pond SMA F: SMA F



Pond SMA F: SMA F



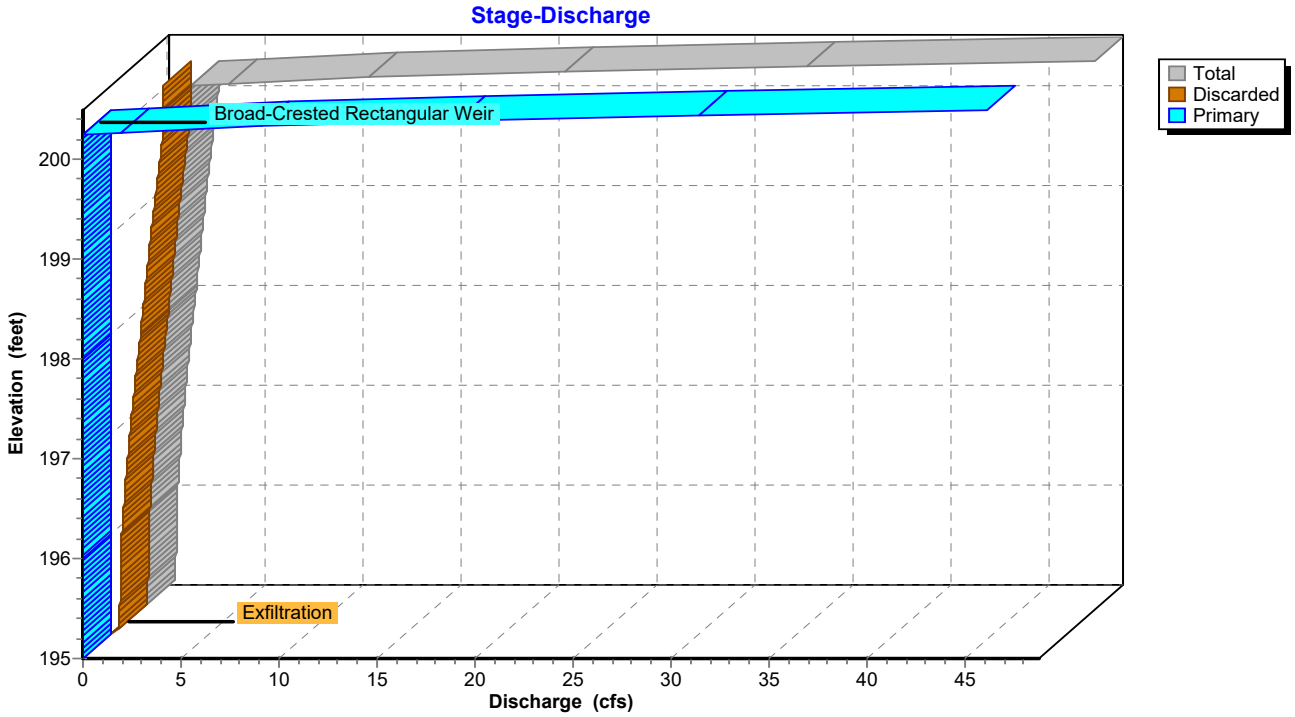
Stage-Discharge for Pond SMA F: SMA F

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
193.00	0.00	0.00	0.00
193.05	0.02	0.02	0.00
193.10	0.02	0.02	0.00
193.15	0.02	0.02	0.00
193.20	0.03	0.03	0.00
193.25	0.03	0.03	0.00
193.30	0.03	0.03	0.00
193.35	0.04	0.04	0.00
193.40	0.04	0.04	0.00
193.45	0.05	0.05	0.00
193.50	0.05	0.05	0.00
193.55	0.06	0.06	0.00
193.60	0.06	0.06	0.00
193.65	0.07	0.07	0.00
193.70	0.07	0.07	0.00
193.75	0.08	0.08	0.00
193.80	0.09	0.09	0.00
193.85	0.09	0.09	0.00
193.90	0.10	0.10	0.00
193.95	0.11	0.11	0.00
194.00	0.11	0.11	0.00
194.05	0.12	0.12	0.00
194.10	0.12	0.12	0.00
194.15	0.12	0.12	0.00
194.20	0.12	0.12	0.00
194.25	0.12	0.12	0.00
194.30	0.12	0.12	0.00
194.35	0.13	0.13	0.00
194.40	0.13	0.13	0.00
194.45	0.13	0.13	0.00
194.50	0.13	0.13	0.00
194.55	0.79	0.13	0.65
194.60	1.98	0.13	1.85
194.65	3.53	0.13	3.40
194.70	5.37	0.14	5.23
194.75	7.57	0.14	7.44
194.80	10.08	0.14	9.94
194.85	12.87	0.14	12.73
194.90	15.95	0.14	15.81
194.95	19.39	0.14	19.24
195.00	23.13	0.15	22.98
195.05	27.17	0.15	27.02
195.10	31.52	0.15	31.37
195.15	35.46	0.15	35.31
195.20	39.54	0.15	39.39
195.25	43.75	0.15	43.60
195.30	48.10	0.16	47.94
195.35	52.66	0.16	52.51
195.40	57.36	0.16	57.21
195.45	62.20	0.16	62.04
195.50	**67.16**	**0.16**	**67.00**

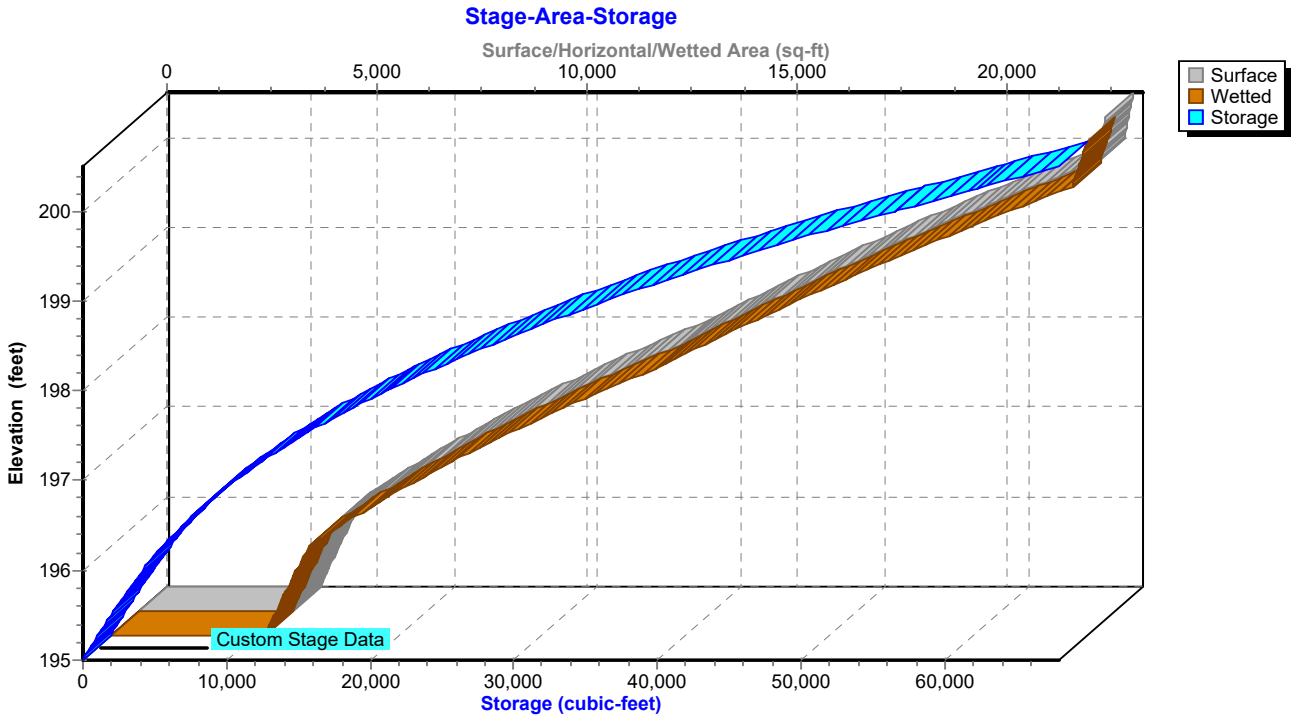
Stage-Area-Storage for Pond SMA F: SMA F

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
193.00	263	263	0
193.05	314	314	14
193.10	370	370	31
193.15	430	430	51
193.20	495	495	75
193.25	564	565	101
193.30	638	639	131
193.35	717	717	165
193.40	800	801	203
193.45	887	888	245
193.50	979	980	292
193.55	1,076	1,077	343
193.60	1,177	1,179	399
193.65	1,283	1,284	461
193.70	1,393	1,395	528
193.75	1,508	1,510	600
193.80	1,627	1,630	678
193.85	1,751	1,754	763
193.90	1,879	1,882	854
193.95	2,012	2,015	951
194.00	2,150	2,153	1,055
194.05	2,176	2,181	1,163
194.10	2,202	2,208	1,273
194.15	2,229	2,236	1,383
194.20	2,255	2,264	1,495
194.25	2,282	2,292	1,609
194.30	2,309	2,320	1,724
194.35	2,336	2,348	1,840
194.40	2,363	2,377	1,957
194.45	2,390	2,405	2,076
194.50	2,418	2,434	2,196
194.55	2,445	2,463	2,318
194.60	2,473	2,492	2,441
194.65	2,501	2,521	2,565
194.70	2,529	2,551	2,691
194.75	2,557	2,580	2,818
194.80	2,586	2,610	2,947
194.85	2,614	2,640	3,077
194.90	2,643	2,670	3,208
194.95	2,672	2,701	3,341
195.00	2,701	2,731	3,475
195.05	2,730	2,762	3,611
195.10	2,760	2,793	3,748
195.15	2,789	2,824	3,887
195.20	2,819	2,855	4,027
195.25	2,849	2,886	4,169
195.30	2,879	2,917	4,312
195.35	2,909	2,949	4,457
195.40	2,939	2,981	4,603
195.45	2,969	3,013	4,751
195.50	**3,000**	**3,045**	**4,900**

Pond SMA G: SMA G



Pond SMA G: SMA G



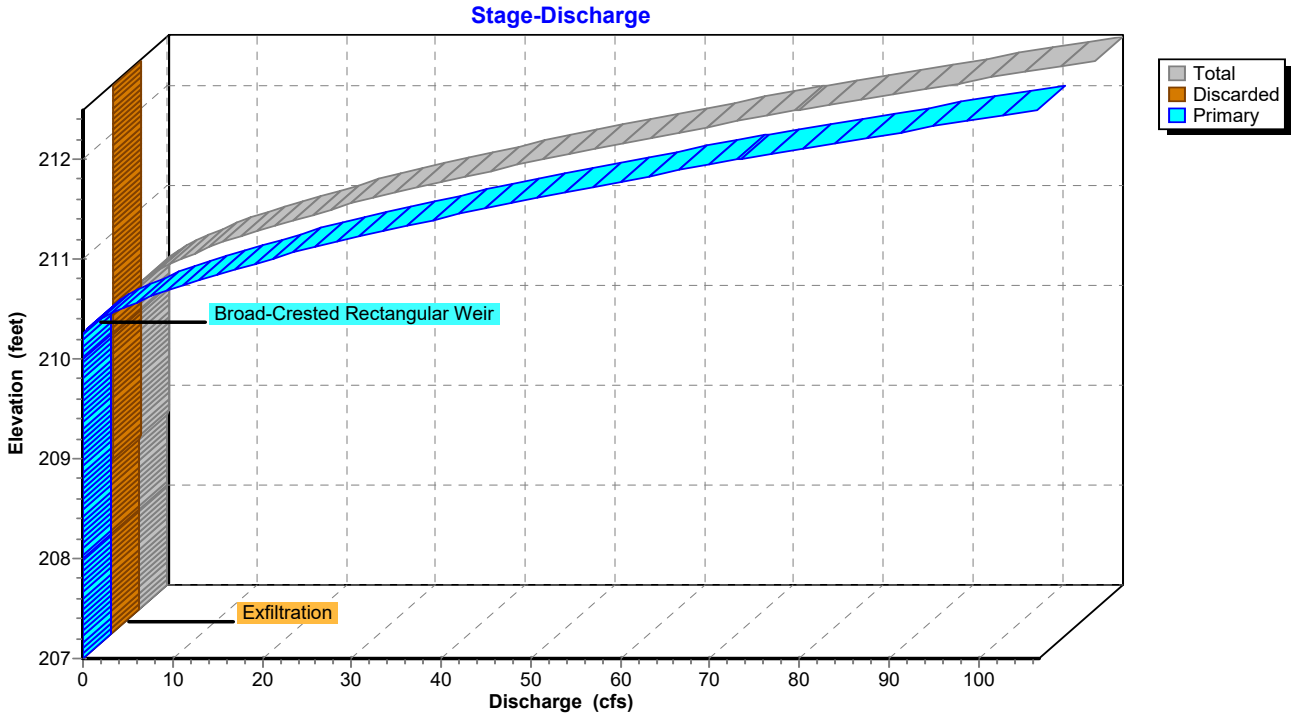
Stage-Discharge for Pond SMA G: SMA G

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
195.00	0.00	0.00	0.00
195.10	0.43	0.43	0.00
195.20	0.45	0.45	0.00
195.30	0.46	0.46	0.00
195.40	0.47	0.47	0.00
195.50	0.48	0.48	0.00
195.60	0.49	0.49	0.00
195.70	0.51	0.51	0.00
195.80	0.52	0.52	0.00
195.90	0.53	0.53	0.00
196.00	0.55	0.55	0.00
196.10	0.58	0.58	0.00
196.20	0.62	0.62	0.00
196.30	0.66	0.66	0.00
196.40	0.70	0.70	0.00
196.50	0.74	0.74	0.00
196.60	0.79	0.79	0.00
196.70	0.83	0.83	0.00
196.80	0.88	0.88	0.00
196.90	0.92	0.92	0.00
197.00	0.97	0.97	0.00
197.10	1.02	1.02	0.00
197.20	1.07	1.07	0.00
197.30	1.12	1.12	0.00
197.40	1.17	1.17	0.00
197.50	1.23	1.23	0.00
197.60	1.28	1.28	0.00
197.70	1.34	1.34	0.00
197.80	1.40	1.40	0.00
197.90	1.45	1.45	0.00
198.00	1.51	1.51	0.00
198.10	1.56	1.56	0.00
198.20	1.61	1.61	0.00
198.30	1.66	1.66	0.00
198.40	1.72	1.72	0.00
198.50	1.77	1.77	0.00
198.60	1.82	1.82	0.00
198.70	1.87	1.87	0.00
198.80	1.93	1.93	0.00
198.90	1.98	1.98	0.00
199.00	2.04	2.04	0.00
199.10	2.10	2.10	0.00
199.20	2.16	2.16	0.00
199.30	2.21	2.21	0.00
199.40	2.27	2.27	0.00
199.50	2.33	2.33	0.00
199.60	2.40	2.40	0.00
199.70	2.46	2.46	0.00
199.80	2.52	2.52	0.00
199.90	2.58	2.58	0.00
200.00	2.65	2.65	0.00
200.10	2.65	2.65	0.00
200.20	2.66	2.66	0.00
200.30	6.75	2.67	4.08
200.40	23.85	2.68	21.18
200.50	**48.77**	**2.69**	**46.08**

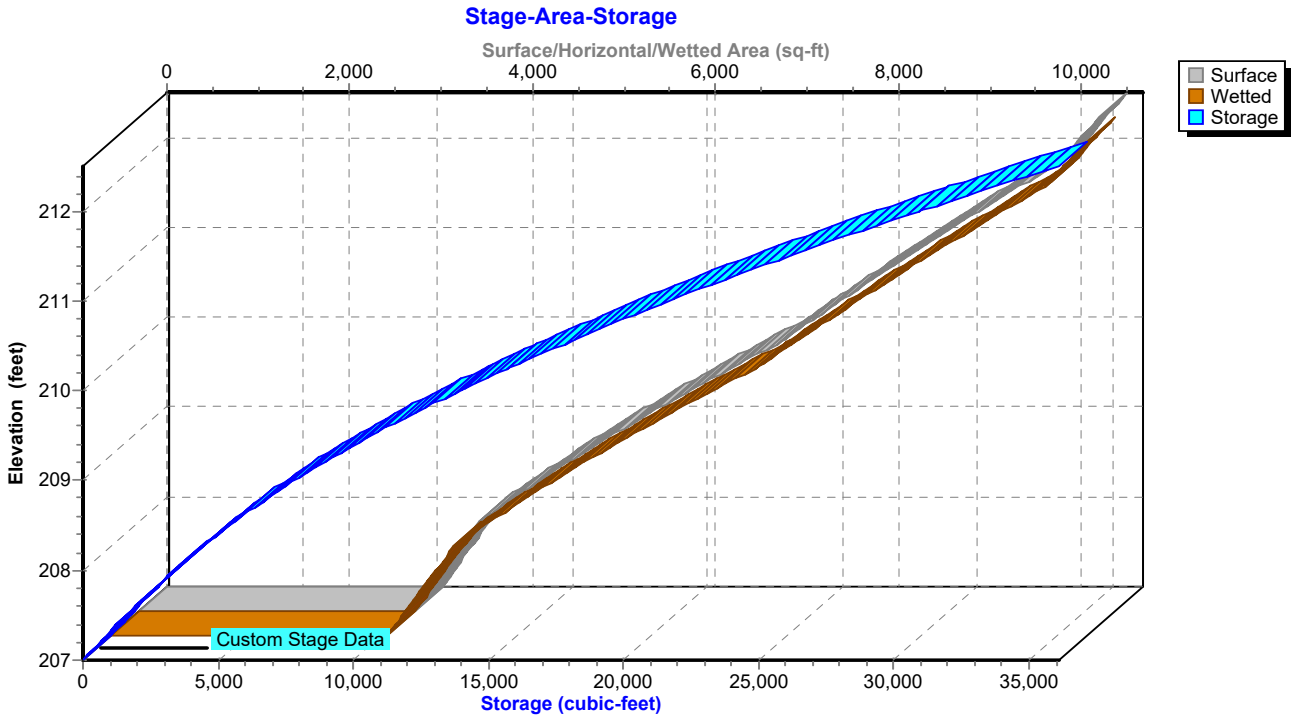
Stage-Area-Storage for Pond SMA G: SMA G

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
195.00	3,642	3,642	0
195.20	3,842	3,847	748
195.40	4,048	4,058	1,537
195.60	4,259	4,274	2,368
195.80	4,476	4,495	3,241
196.00	4,698	4,722	4,159
196.20	5,344	5,371	5,162
196.40	6,032	6,060	6,299
196.60	6,761	6,792	7,578
196.80	7,533	7,565	9,007
197.00	8,345	8,381	10,594
197.20	9,200	9,238	12,347
197.40	10,095	10,136	14,276
197.60	11,033	11,077	16,388
197.80	12,012	12,059	18,692
198.00	13,033	13,083	21,196
198.20	13,885	13,939	23,887
198.40	14,765	14,822	26,752
198.60	15,671	15,733	29,795
198.80	16,605	16,671	33,022
199.00	17,565	17,636	36,439
199.20	18,552	18,628	40,050
199.40	19,567	19,647	43,862
199.60	20,608	20,693	47,879
199.80	21,677	21,766	52,107
200.00	22,772	22,867	56,551
200.20	22,863	23,007	61,115
200.40	**22,954**	**23,148**	**65,696**

Pond SMA H: SMA H



Pond SMA H: SMA H



Stage-Discharge for Pond SMA H: SMA H

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
207.00	0.00	0.00	0.00
207.10	0.07	0.07	0.00
207.20	0.07	0.07	0.00
207.30	0.07	0.07	0.00
207.40	0.08	0.08	0.00
207.50	0.08	0.08	0.00
207.60	0.08	0.08	0.00
207.70	0.08	0.08	0.00
207.80	0.08	0.08	0.00
207.90	0.09	0.09	0.00
208.00	0.09	0.09	0.00
208.10	0.09	0.09	0.00
208.20	0.09	0.09	0.00
208.30	0.10	0.10	0.00
208.40	0.10	0.10	0.00
208.50	0.10	0.10	0.00
208.60	0.11	0.11	0.00
208.70	0.11	0.11	0.00
208.80	0.11	0.11	0.00
208.90	0.12	0.12	0.00
209.00	0.12	0.12	0.00
209.10	0.13	0.13	0.00
209.20	0.13	0.13	0.00
209.30	0.13	0.13	0.00
209.40	0.14	0.14	0.00
209.50	0.14	0.14	0.00
209.60	0.15	0.15	0.00
209.70	0.15	0.15	0.00
209.80	0.16	0.16	0.00
209.90	0.16	0.16	0.00
210.00	0.16	0.16	0.00
210.10	0.17	0.17	0.00
210.20	0.17	0.17	0.00
210.30	0.53	0.17	0.36
210.40	2.05	0.18	1.87
210.50	4.21	0.18	4.03
210.60	6.88	0.18	6.70
210.70	9.97	0.19	9.78
210.80	13.41	0.19	13.22
210.90	17.08	0.20	16.88
211.00	20.89	0.20	20.69
211.10	25.01	0.20	24.80
211.20	29.46	0.21	29.25
211.30	34.20	0.21	33.99
211.40	39.25	0.21	39.03
211.50	44.49	0.22	44.27
211.60	49.91	0.22	49.69
211.70	55.49	0.22	55.26
211.80	61.19	0.23	60.96
211.90	67.12	0.23	66.89
212.00	73.30	0.24	73.06
212.10	79.65	0.24	79.41
212.20	86.18	0.24	85.94
212.30	92.88	0.24	92.63
212.40	99.74	0.24	99.49
212.50	**106.76**	**0.25**	**106.52**

Stage-Area-Storage for Pond SMA H: SMA H

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
207.00	3,024	3,024	0
207.20	3,159	3,164	618
207.40	3,296	3,308	1,264
207.60	3,437	3,454	1,937
207.80	3,581	3,604	2,639
208.00	3,727	3,756	3,369
208.20	4,010	4,043	4,143
208.40	4,304	4,340	4,974
208.60	4,608	4,648	5,865
208.80	4,922	4,966	6,818
209.00	5,247	5,295	7,835
209.20	5,582	5,634	8,918
209.40	5,928	5,984	10,069
209.60	6,284	6,344	11,290
209.80	6,650	6,715	12,583
210.00	7,027	7,096	13,950
210.20	7,307	7,383	15,384
210.40	7,593	7,675	16,874
210.60	7,885	7,973	18,421
210.80	8,182	8,277	20,028
211.00	8,484	8,586	21,694
211.20	8,792	8,901	23,422
211.40	9,105	9,221	25,212
211.60	9,424	9,547	27,064
211.80	9,748	9,879	28,981
212.00	10,078	10,216	30,964
212.20	10,246	10,399	32,996
212.40	**10,415**	**10,583**	**35,062**

Events for Pond SMA A: SMA A

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.40	0.24	0.24	**0.00**	190.82	102
10-YR	1.41	0.35	0.35	0.00	191.41	1,123
25-YR	2.38	0.45	0.45	0.00	191.89	2,283
50-YR	**3.36**	**0.53**	**0.53**	0.00	**192.33**	**3,559**

Events for Pond SMA B: SMA B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.87	0.09	189.23	101,131
10-YR	6.62	0.33	189.55	109,432
25-YR	11.16	0.63	189.84	117,125
50-YR	**15.78**	**0.97**	**190.12**	**124,903**

Events for Pond SMA C: SMA C

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.54	0.06	195.17	65,956
10-YR	3.50	0.27	195.48	70,512
25-YR	6.71	0.56	195.78	74,995
50-YR	**10.12**	**0.93**	**196.09**	**79,858**

Events for Pond D1: SMA D1

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.76	0.24	0.10	0.14	210.54	2,207
10-YR	3.59	0.61	0.13	0.47	211.59	4,456
25-YR	5.10	0.75	0.16	0.59	212.44	6,786
50-YR	**6.54**	**0.85**	**0.19**	**0.67**	**213.15**	**9,112**

Events for Pond D2: SMA D2

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.93	0.17	0.17	0.00	207.39	1,205
10-YR	2.39	0.23	0.23	0.00	208.79	6,458
25-YR	3.62	0.28	0.28	0.00	209.79	11,111
50-YR	**4.71**	**0.74**	**0.29**	**0.46**	**210.02**	**12,308**

Events for Pond D3: SMA D3

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.91	0.26	0.26	**0.00**	207.12	589
10-YR	2.21	0.28	0.28	0.00	207.46	2,336
25-YR	3.35	0.29	0.29	0.00	207.80	4,158
50-YR	**4.47**	**0.34**	**0.34**	0.00	**208.47**	**8,167**

Events for Pond SMA E: SMA E

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	7.05	0.26	193.21	181,058
10-YR	17.78	0.79	193.72	201,440
25-YR	27.29	1.35	194.15	219,337
50-YR	**36.63**	**1.98**	**194.55**	**236,938**

Events for Pond SMA F: SMA F

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.44	0.08	0.08	0.00	193.72	563
10-YR	1.69	0.25	0.13	0.12	194.52	2,236
25-YR	2.90	1.68	0.13	1.55	194.59	2,413
50-YR	**4.13**	**3.76**	**0.13**	**3.62**	**194.66**	**2,581**

Events for Pond SMA G: SMA G

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	4.75	0.66	0.66	**0.00**	196.30	5,702
10-YR	12.63	1.35	1.35	0.00	197.72	17,805
25-YR	20.17	1.85	1.85	0.00	198.65	30,662
50-YR	**28.08**	**2.30**	**2.30**	0.00	**199.44**	**44,701**

Events for Pond SMA H: SMA H

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.81	0.09	0.09	**0.00**	207.93	3,109
10-YR	3.69	0.12	0.12	0.00	208.89	7,287
25-YR	5.25	0.14	0.14	0.00	209.55	10,987
50-YR	**6.72**	**0.17**	**0.17**	0.00	**210.10**	**14,665**

Events for Pond POA NE: POA NORTHEAST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	20.16	20.16	**0.00**	**0.000**
10-YR	84.52	84.52	0.00	0.000
25-YR	154.88	154.88	0.00	0.000
50-YR	**230.59**	**230.59**	0.00	0.000

Events for Pond POA NW: POA NORTHWEST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	5.66	5.66	**0.00**	**0.000**
10-YR	29.50	29.50	0.00	0.000
25-YR	40.80	40.80	0.00	0.000
50-YR	**49.20**	**49.20**	0.00	0.000

Events for Pond POA C: POA COMBINED

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	24.88	24.88	**0.00**	**0.000**
10-YR	111.24	111.24	0.00	0.000
25-YR	195.50	195.50	0.00	0.000
50-YR	**279.78**	**279.78**	0.00	0.000

NHDES ALTERATION OF TERRAIN PERMIT APPLICATION

Rose Meadows

LITCHFIELD TAX MAP 2, LOT 8
HUDSON TAX MAP 114, LOT 1
255 DERRY ROAD
LITCHFIELD, NEW HAMPSHIRE

JUNE 2, 2023

PREPARED FOR:

255 DERRY ROAD, LLC
1 CONTINENTAL DRIVE
LONDONDERRY, NH 03053

PREPARED BY:

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street *131 Middlesex Turnpike*
Nashua, New Hampshire 03062 *Burlington, Massachusetts 01803*
(603) 883-2057 *(781) 203-1501*
www.hayner-swanson.com

Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street, Nashua, NH 03062-3399

LETTER OF TRANSMITTAL

To:	Date: June 2, 2023	#5432
Mr. Ridge Mauck, P.E. NHDES AOT Bureau 29 Hazen Drive, PO Box 95 Concord, NH 03302	Re: Rose Meadows 255 Derry Road (NH Route 102) Litchfield and Hudson, NH	

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via_____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ Permit Application_____

Scope:

COPIES	DATE	NO.	DESCRIPTION
1			NHDES AOT Application Package + Fee
1			Site Plan Set

REMARKS:

Ethan M. Beals
Project Manager

(If enclosures are not as noted, please notify us immediately.)

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors

June 2, 2023
Job #5432

Mr. Ridge Mauck, P.E.
NHDES Land Resources Management
Alteration of Terrain Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

RE: NHDES AOT APPLICATION
ROSE MEDOWS
255 DERRY ROAD (NH ROUTE 102)
LITCHFIELD AND HUDSON, NEW HAMPSHIRE

Dear Mr. Mauck,

Please find enclosed the following information submitted for the Alteration of Terrain Permit for the above referenced project:

- Completed application and checklist for the proposed development including the permit requirements outlined in Env-Wq 1503
- Submittal fee of $26,875.00
- One (1) complete set of site plans

It is requested that the enclosed information be reviewed for approval of the Alteration of Terrain requirements related to this project.

If you have any questions or need further information, please do not hesitate to contact our office.

Sincerely,

Ethan M. Beals
Project Manager
Hayner/Swanson, Inc.

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors

June 2, 2023
Job #5432

Mr. Ridge Mauck, P.E.
NHDES Land Resources Management
Alteration of Terrain Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

RE: NHDES AOT APPLICATION
ROSE MEADOWS
255 DERRY ROAD (NH ROUTE 102)
LITCHFIELD AND HUDSON, NEW HAMPSHIRE

Dear Mr. Mauck,

I certify, per requirements of Env-Wq1503.05(c)(4), a copy of the complete Alteration of Terrain application for the above-referenced project was provided to the Town of Litchfield Planning Department on June 2, 2023.

Sincerely,

Ethan M. Beals
Project Manager
Hayner/Swanson, Inc.

ALTERATION OF TERRAIN PERMIT APPLICATION

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Water Division/ Alteration of Terrain Bureau/ Land Resources Management
Check the Status of your Application: www.des.nh.gov/onestop

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)		
Applicant Name: 255 Derry Road, LLC	Contact Name: Rick Charbonneau	
Email: rcharbonneau@continentalpaving.com	Daytime Telephone: (603) 437-5387	
Mailing Address: 1 Continental Drive		
Town/City: Londonderry	State: NH	Zip Code: 03053
2. APPLICANT'S AGENT INFORMATION If none, check here: ☑		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)		
Applicant Name: Same as Applicant	Contact Name:	
Email:	Daytime Telephone:	
Mailing Address:		
Town/City:	State:	Zip Code:
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☑		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
5. CONSULTANT INFORMATION If none, check here: ☐		
Engineering Firm: Hayner/Swanson, Inc.	Contact Name: Ethan Beals	
Email: ebeals@hayner-swanson.com	Daytime Telephone: (603) 882-2057	
Address: 3 Congress Street		
Town/City: Nashua	State: NH	Zip Code: 03062

6. PROJECT TYPE

☐ Excavation Only ☑ Residential ☐ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☑ Other: Redevelopment

7. PROJECT LOCATION INFORMATION

Project Name: Rose Meadows

Street/Road Address: 255 Derry Road (NH Route 102)

Town/City: Litchfield & Hudson | County: Hillsborough

Tax Map: 2,| Hudson Map 114 | Block: | Lot Number: 8|Hudson Lot 1 | Unit:

Location Coordinates: 42.80510, 71.42649 ☑ Latitude/Longitude ☐ UTM ☐ State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose: Stormwater Management	☑ Yes ☐ No	☐ Withdrawal	☑ Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	☐ Yes ☑ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ☑ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen? ☑ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A Class A surface water or Outstanding Resource Water? ☑ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A lake or pond not covered previously? ☑ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond**

Is the project a High Load area? ☐ Yes ☑ No
If yes, specify the type of high load land use or activity: _____

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ☑ No
Is the project within a Groundwater Protection Area (GPA)? ☑ Yes ☐ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☑ Yes ☐ No

Note: Guidance document titled "*Using NHDES's OneStop WebGIS to Locate Protection Areas*" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ☑ No
If yes: Cut volume: _____ cubic feet within the 100-year floodplain
Fill volume: _____ cubic feet within the 100-year floodplain

☐ Project **IS** within **¼ mile of a designated river** Name of River:
☑ Project is **NOT** within ¼ mile of a designated river

☐ Project **IS** within **a Coastal/Great Bay Region community** - **include info required by Env-Wq 1503.08(l) if applicable**
☑ Project is **NOT** within a Coastal/Great Bay Region community

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

It is proposed to redevelop the existing property to construct a 172-unit multi-family development along with associated site improvements.

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT

N/A

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: 6/ 02/ 23 .
(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: / / .
(Attach proof of delivery) N/A

C. Type of plan required: ☐ Land Conversion ☑ Detailed Development ☐ Excavation, Grading & Reclamation ☐ Steep Slope

D. Additional plans required: ☑ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance: 2,038,250 square feet

F. Additional impervious cover as a result of the project: 442,570 (10.16 ac) square feet (use the "-" symbol to indicate a net reduction in impervious coverage).
Total final impervious cover: 656,625 (15.07 ac) square feet

G. Total undisturbed cover: _____ square feet (44.00 ac / 1,916,525 sf)

H. Number of lots proposed: 0

I. Total length of roadway: 3,800 linear feet

J. Name(s) of receiving water(s): Unnamed wetland/tributary to Chase Brook

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	☐ Yes ☐ No ☑ N/A	☐	Permit number:
2. Wetlands Permit	☑ Yes ☐ No ☐ N/A	☑	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ☑ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☐ No ☑ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ☑ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ☑ N/A	☐	Permit number:
7. Other:	☐ Yes ☐ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern:
NHB Attached

M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."
N/A

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☑ No
If yes, name of staff member:

O. Will blasting of bedrock be required? ☐ Yes ☑ No If yes, estimated quantity of blast rock: _____ cubic yards
If yes, standard blasting BMP notes must be placed on the plans, available at:
http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)

LOOSE:

- ☑ Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)
- ☑ Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm
- ☑ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☑ If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BIND IN A REPORT IN THE FOLLOWING ORDER:

- ☑ Copy of the signed application form & application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)
- ☑ Copy of the check
- ☑ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☑ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- ☑ Web GIS printout with the "Surface Water Impairments" layer turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☑ Web GIS printouts with the AOT screening layers turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☑ NHB letter using DataCheck Tool – www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
- ☑ The Web Soil Survey Map with project's watershed outlined – websoilsurvey.nrcs.usda.gov
- ☑ Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- ☑ Photographs representative of the site
- ☑ Groundwater Recharge Volume calculations (one worksheet for each permit application): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☑ BMP worksheets (one worksheet for each treatment system): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☑ Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- ☐ Riprap apron or other energy dissipation or stability calculations N/A
- ☑ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3*.
- ☑ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- ☐ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): (http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- ☑ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- ☐ Source control plan N/A

PLANS:

- ☑ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- ☑ Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- ☑ Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report. N/A

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☑ See Checklist for Details

☑ **REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

EMB By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☐ **APPLICANT** ☐ **APPLICANT'S AGENT**:

Signature:_____ Date: _____

Name (print or type): _____ Title: _____

☐ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature:_____ Date: _____

Name (print or type): _____ Title: _____

12. REQUIRED SIGNATURES

EMB By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

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- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☐ **APPLICANT** ☑ **APPLICANT'S AGENT**:

Signature: James N. Petropulos Date: 6-1-23

Name (print or type): JAMES N. PETROPULOS Title: PRES. - NSi

☐ PROPERTY OWNER ☑ PROPERTY OWNER'S AGENT:

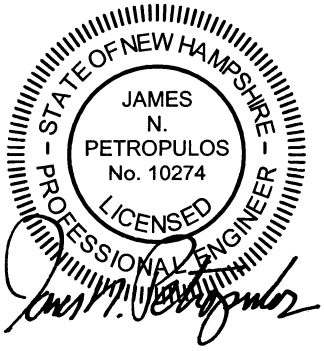
Signature: _____ Date: _____

Name (print or type): _____ Title: _____

STORMWATER MANAGEMENT REPORT

Rose Meadows
Litchfield Tax Map 2, Lot 8
Hudson Tax Map 114, Lot 1
255 Derry Road (NH Route 102)
Litchfield, New Hampshire

June 1, 2023



Prepared for:
255 Derry Road, LLC
1 Continental Drive
Londonderry, NH 03053

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street *131 Middlesex Turnpike*
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TABLE OF CONTENTS

I. INTRODUCTION

A. Abstract

The following is a detailed stormwater study of the proposed Rose Meadows development to be located at 255 Derry Road (NH Route 102) in Litchfield, NH. The purpose of the study is to analyze the qualitative and quantitative stormwater impacts of the proposed development. The goal of the stormwater management system for this project is to meet the stormwater management regulations set forth in the Town of Litchfield Site Plan Review Regulations and the New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AOT) Permit. Reference is made to the drainage area maps included as exhibits to this study.

B. Existing Conditions

The project area under consideration for this application is located at 255 Derry Road in Litchfield, NH. The parcel is known to the Litchfield Assessors Department as Map 2, Lot 8. The parcel is located in Litchfield's R; Residential zoning district and the Multi-Family Overlay District. The site is located in southeast part of Litchfield and is abutted by Derry Road to the west, commercial lots to the north, Hudson parcels to the east and a mix of residential sites/undeveloped land to the south.

The subject site measures 90 acres in size, of which 10 acres are located in Hudson, NH. This property was recently used as a testing facility for BAE Systems and contains a number of testing related structures/site features. Due to the sensitive nature of their business, we are not able to provide photographs of the structures at this time. An aerial showing the property features is included instead. BAE Systems started working out of the property around 2000. Prior to 2000, the property contained a residential use.

The site is partially wooded and the topography of the land is slight, with an overall slope from southeast to northwest. Wetlands have been mapped by Brendan Quigley, CWS #249 in accordance with local, state and federal criteria. In general, there are several watercourses and associated wetlands that run through the property. The wetlands are associated with an unnamed tributary that eventually flows in a northwesterly direction and connects into Chase Brook. A portion of the northernmost wetland lies within the 100-year flood hazard area ('Zone A') as shown on the 2009 Flood Insurance Rate Maps for this part of Litchfield.

Test pits have been performed throughout the property and the logs are included in the Site Plan set. Overall the site contains of sandy soils. Utilities (water, gas, telecommunications and power) are all located in Derry Road and will be extended into the site to service the proposed development.

C. Proposed Development

It is being proposed to develop the land in Litchfield into a 172-unit multi-family development in accordance with the Town of Litchfield Site Plan regulations. The objectives of this type of residential development are to provide a more diverse housing product in Litchfield and a reasonable opportunity for workforce living. As can be seen on the plans the project will contain A total of thirty (30) buildings, each containing between 4 and 6 townhouse-style units. It is anticipated that the project will be phased over a 4-year period, which means that approximately 40+ units will be built each year. Access to the project shall be provided via a new site driveway off of Derry Road. Private roads will loop through the site to provide access and parking for each residential structure. Detached parking garages are provided for most of the residential units. Open space or common land will surround each building. In addition, the land in Hudson will be used for outdoor storage, indoor storage units and a recreational playfield for the sole use by the tenants of this development. A sizeable area of this lot will be set aside as common land and left in its natural state. The proposed residential units will be serviced by the extension of public water (Pennichuck Water Works) within the new streets and individual septic systems for each building. Underground utility lines will be constructed within the project area to service each building.

As a result of the proposed development project, there is a net increase of site impervious area of approximately 442,570 sf (10.16 ac). The site development associated with the overall construction of this project disturbs approximately 2,038,000 square feet of contiguous area, and therefore a NHDES Alteration of Terrain Permit is required. The project will impact approximately 9,140 square feet of wetlands, primarily associated with the construction of two wetland crossings to access additional upland. The project also impacts approximately 83,530 square feet of the 50-foot 'no-disturb' wetland buffer area.

II. STORM DRAINAGE ANALYSES

A. Intent

With regard to stormwater management, it is the intent of this design to address both qualitative and quantitative aspects of the runoff produced by the proposed development project, as best possible, in accordance with the requirements of the Town of Litchfield Site Plan Review Regulations and the NHDES AOT Permit regulations. The aim is to provide permanent methods for protecting water quality and minimize impacts to downstream drainage system.

To meet these goals, the proposed project will include a combination of stormwater management practices, including infiltration basins, stormwater ponds, stormwater wetlands and rain gardens.

- **Infiltration Practices (Env-Wq 1508.06)** are a permanent method for protecting water quality that provide pollutant removal through the use of a vertical filtration through the native soils (infiltration).
- **Stormwater Ponds (Env-Wq 1508.03)** are qualitative treatment practices that provide pollutant removal through the use of a permanent pool.
- **Stormwater Wetlands (Env-Wq 1508.04)** are qualitative treatment practices that provide pollutant removal through the use of a permanent pool. The permanent pool is designed to vary in depth in order to support a wetland plant community.
- **Rain Gardens (Filtering Practices) (Env-Wq 1508.07)** are a permanent method for protecting water quality that provide pollutant removal through the use of vertical filtration through a filter media

Through settling, storage, biological uptake, infiltration and filtration, these practices can achieve high rates of removal for a number of urban pollutants (sediment, trace metals, hydrocarbons, BOD, nutrients, pesticides, etc.) and provide removal of total suspended solids, total nitrogen, and total phosphorous (New Hampshire Stormwater Manual). In addition to water quality benefits, the stormwater management practices will provide flood control during large storm events.

B. Methodology

In accordance with the Town of Litchfield and NHDES AOT requirements, the 2-year, 10-year, 25-year and 50-year storm events were evaluated as part of this study. Evaluation of the quantitative runoff impacts of the proposed development were determined by comparing the post-development peak flows with the pre-development existing conditions of the site.

Total drainage area calculations for pre-development conditions and post development conditions were evaluated and designed using the HydroCAD® version 10.1 stormwater modeling program for the Soil Conservation Service (SCS) type III storm distribution. Values for time of concentration used in the analysis were calculated using the methodology contained within U.S.D.A-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR55).

The Rational Method of determining peak rates of runoff was used to size and design the individual drain lines for this project (see Appendix C). Stormwater Management Areas were designed in accordance with the methodology for the "best management practice" (BMP), as presented in the New Hampshire Department of Environmental Services New Hampshire Stormwater Manual (see Appendix D). A design infiltration rate of five (5) and three (3) inches per hour was used in the analysis based on the classification of the underlying soils from the Site-Specific Soil Mapping provided.

C. Pre-Development Drainage Conditions

As can be seen on the Pre-Development Drainage Area map, the site contains two different unnamed watercourses. One watercourse flows onto the property in the southwest corner of the site and flows along the westerly property boundary before it crosses the existing driveway in an existing 30-inch culvert. This watercourse flows into a wetland in the northwestern corner of the site adjacent to Derry Road before crossing the road in an existing 30-inch culvert just northwest of the site. Runoff from the majority of the site including existing roadway, roof, grassed and wooded areas on the western portion of the property flows in a western direction and into this watercourse. The summation of runoff leaving the site and flowing in a northwestern direction into the 30-inch culvert crossing Derry Road will be analyzed in this study as **Point of Analysis Northwest (POA NW)**.

The second unnamed watercourse flows onto the property along the easterly property boundary. This watercourse runs in a northeastern direction and into a large wetland located on the northeast corner of the property. This watercourse continues to flow in a northeast direction before crossing Derry Road in an existing 48-inch culvert north of the subject site. Runoff from a portion of the site including existing grassed and wooded areas from the eastern portion of the site flows in a northeast direction and into this watercourse. The summation of runoff leaving the site in a northeastern direction and flowing into the 48-inch culvert crossing Derry Road will be analyzed in this study as **Point of Analysis Northeast (POA NE)**

While both of these watercourses flow across the subject site in different directions and cross Derry Road in two different locations, these wetlands/watercourses are associated with a tributary that ultimately flows in a northwesterly direction and connects into Chase Brook. Therefore, the summation of runoff leaving the site and flowing into the Chase Brook Tributary will be analyzed in this study as **Point of Analysis Combined (POA C)**

It is important to note that despite existing as a developed site, the site contains no formal quantitative or qualitive treatment practices.

The pre-development drainage calculations are shown in Appendix A of this study and summarized in Table 1 below.

TABLE 1: SUMMARY OF PRE-DEVELOPMENT PEAK FLOWS

Location	Storm Frequency	Pre-Development Runoff (cfs)
Point of Analysis Northeast (POA NE)	2-year	20.23
	10-year	85.70
	25-year	157.15
	50-year	233.98
Point of Analysis Northwest (POA NW)	2-year	6.36
	10-year	32.98
	25-year	48.51
	50-year	63.04
Point of Analysis Combined (POA C)	2-year	25.30
	10-year	114.44
	25-year	198.54
	50-year	285.71

D. Post-Development Drainage Conditions

As previously stated, it is the intent of the overall stormwater management design to address both qualitative and quantitative aspects of runoff in accordance with the Town of Litchfield and NHDES AOT regulations. The project attempts to take advantage of well-draining soils in select areas of the site by proposing rain gardens and infiltration basins. In other areas of the site with higher groundwater, the project proposes stormwater wetlands and ponds. To meet the regulations, the proposed project utilizes the following practices:

- **Stormwater Management Area A (SMA A)** is a rain garden filtration practice located at the corner of the site entrance driveway and Derry Road. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA A will function as a combination treatment/flood control facility and will provide sufficient storage capacity to fully store, filter and infiltrate up to and including the 50-year storm event.
- **Stormwater Management Area B (SMA B)** is a stormwater wetland extending in a northern direction out from the entrance driveway. SMA B contains a combination of open water and shallow marsh areas to help promote the development of a wetland plant community. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA B will function as a combination treatment/flood control facility and utilizes

an outlet control structure in order to control the rate of runoff discharging from the practice.

- **Stormwater Management Area C (SMA C)** is a stormwater pond located at the intersection of the site entrance drive and the proposed site roadway that runs in a northeastern direction. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA C will function as a combination treatment/flood control facility and utilizes an outlet control structure in order to control the rate of runoff discharging from the practice.
- **Stormwater Management Area D (SMA D)** is a combination rain garden and infiltration trench located along the center of the 'village' located on the southeastern portion of the property. Runoff from the paved portions of this drainage area will be directed to riprap lined swales that convey runoff to three surface rain gardens. The rain gardens will outlet via a catch basin into a subsurface infiltration trench that connects the three rain garden areas. SMA D will function as a combination treatment/flood control facility and will provide sufficient storage capacity to fully store, filter and infiltrate up to and including the 2-year storm event.
- **Stormwater Management Area E (SMA E)** is a stormwater pond located in the northern portion of the site. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA E will function as a combination treatment/flood control facility and utilizes an outlet control structure in order to control the rate of runoff discharging from the practice.
- **Stormwater Management Area F (SMA F)** is a rain garden filtration practice located in the northeastern corner of the site. Pre-treatment is provided by an off-line deep-sump, hooded catch basin that provides for the initial removal of grit and sediment from the runoff. SMA F will function as a combination treatment/flood control facility and will provide sufficient storage capacity to fully store, filter and infiltrate up to and including the 10-year storm event.
- **Stormwater Management Area G (SMA G)** is an infiltration basin located on the Hudson parcel in the eastern portion of the site. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA G will function as a combination treatment/flood control facility and will provide sufficient storage capacity to fully store and infiltrate up to and including the 50-year storm event.
- **Stormwater Management Area H (SMA H)** is an infiltration basin located on the Hudson parcel in the eastern portion of the site. This practice contains a sediment forebay for the initial removal of grit and sediment from the runoff. SMA G will function as a combination treatment/flood control facility and will provide sufficient storage capacity to fully store and infiltrate up to and including the 50-year storm event.

The characteristics of the proposed stormwater management areas are shown below in Table 2.

As previously discussed, post-development drainage patterns will mimic existing conditions as best possible. Similar to the pre-development condition, perimeter drainage areas will continue to flow into the two watercourses that flow across the subject property. The post-development runoff computations are detailed in Appendix B and summarized in Table 3 below.

TABLE 2: SUMMARY OF POST-DEVELOPMENT STORMWATER MANAGEMENT AREA CHARACTERISTICS

Location	Storm Frequency	Inflow (cfs)	Outflow (cfs)	Bottom of Practice Elevation	Top of Practice Elevation	Max. Water Elev.
SMA A	2-year	0.40	0.00	190.50	193.25	190.69
	10-year	1.41	0.00			191.40
	25-year	2.38	0.00			192.00
	50-year	3.36	0.00			192.55
SMA B	2-year	1.87	0.09	189.00*	192.00	189.23
	10-year	6.62	0.33			189.55
	25-year	11.17	0.63			189.84
	50-year	15.79	0.97			190.12
SMA C	2-year	0.45	0.05	195.00*	198.00	195.15
	10-year	5.66	0.32			195.53
	25-year	14.25	0.95			196.10
	50-year	19.23	1.80			196.69
SMA D	2-year	1.74	0.00	203.50	209.50	205.70
	10-year	6.40	2.86			208.98
	25-year	10.05	8.13			209.20
	50-year	10.41	9.71			209.29
SMA E	2-year	7.05	0.26	192.75*	196.50	193.21
	10-year	17.78	0.79			193.72
	25-year	27.29	1.35			194.15
	50-year	36.63	1.98			194.55
SMA F	2-year	0.44	0.14	193.00	194.50	193.60
	10-year	1.69	0.27			194.34
	25-year	2.90	0.29			194.58
	50-year	4.13	0.29			194.64

SMA G	2-year	4.12	0.00	195.00	200.25	196.18
	10-year	12.87	0.00			197.71
	25-year	21.02	0.00			198.66
	50-year	29.23	0.00			199.47
SMA H	2-year	1.81	0.00	207.00	210.50	207.59
	10-year	3.69	0.00			208.39
	25-year	5.25	0.00			208.97
	50-year	6.72	0.00			209.47

* Permanent pool elevation

TABLE 3: COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT PEAK FLOWS

Location	Storm Frequency	Pre-Development Runoff (cfs)	Post-Development Runoff (cfs)
Point of Analysis Northeast (POA NE)	2-year	20.23	20.25
	10-year	85.70	84.72
	25-year	157.15	155.02
	50-year	233.98	230.69
Point of Analysis Northwest (POA NW)	2-year	6.36	6.42
	10-year	32.98	30.69
	25-year	48.51	43.09
	50-year	63.04	54.61
Point of Analysis Combined (POA C)	2-year	25.30	24.97
	10-year	114.44	112.73
	25-year	198.54	196.44
	50-year	285.71	281.47

E. Results

1. Stormwater runoff generated by the proposed development project will be captured through curbing and catch basins and conveyed to one of the several stormwater management areas located within the site. These practices are designed as combination qualitative treatment and flood control facilities and provide runoff treatment on a site that previously did not contain any formal treatment practices.
2. The project provides permanent methods for protecting water quality through the use of 'pre-treatment' practices such as off-line deep-sump catch basins with hoods and sediment forebays and 'primary treatment' practices such as filtration, infiltration and wetland/wet pond systems.

3. The proposed stormwater management areas provide sufficient storage and infiltration capacities so that the post-development peak flows are less than to the pre-development peak flows for the 10, 25 and 50-year storm events to both POA Northeast (POA NE) and POA Northwest (POA NW).
4. While there is a slight increase in peak flows leaving the site in the 2-year storm event to POA NE and POA NW (0.02 cfs and 0.06 cfs respectively), our analysis shows that the summation of the post-development peak rates of runoff leaving the site and ultimately flowing into the wetland/tributary associated with Chase Brook is less than the pre-development condition for the 2, 10, 25 and 50- year storm events.

In summary, it is our opinion that the stormwater management design for the Rose Meadows residential development complies with the stormwater standards set forth by the Town of Litchfield and NHDES Alteration of Terrain Permit regulations.

III. EROSION AND SEDIMENTATION CONTROL PROVISIONS

Temporary and permanent erosion control measures are proposed throughout the project, to ensure that the wetlands and adjacent off-site areas are protected from erosion/siltation and debris during and after construction of this project.

A. Temporary Erosion Control Measures

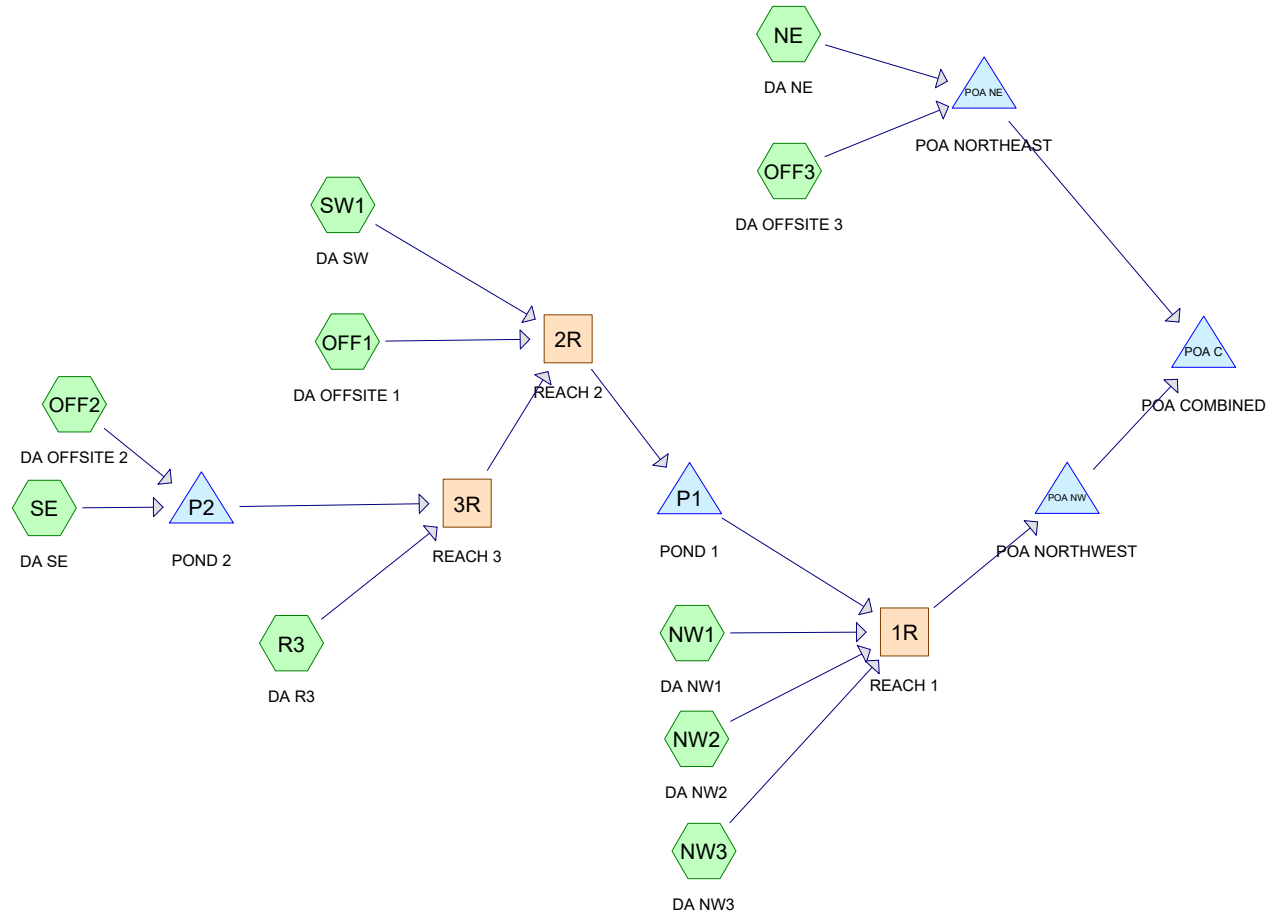
During the construction phase of the project, specific erosion and sedimentation controls have been developed into the design of the project. Proposed locations and construction details of these devices are shown in greater detail on the attached site plans. Reference to the New Hampshire Stormwater Management Manual, Vol. 3, Construction Phase Erosion and Sediment Controls was made for the temporary erosion and sedimentation control devices such as silt fence, erosion control mix berm, silt sacks, straw bale barriers, gravel construction exits, and temporary seeding. The erosion control notes and construction sequence were developed to limit soil loss due to erosion and are therefore directed at minimizing the degradation of water quality on and off the site.

B. Permanent Erosion Control Measures

Permanent erosion control measures have been included in the design of the project to limit long-term erosion conditions. Loam and seed requirements have been specified to establish conditions that minimize erodible conditions. This is complemented by the minimization of stormwater flow lengths to keep runoff quantities and velocities as low as possible. These permanent measures, when completed and in place, provide treatment methods that will maintain long-term water quality in downstream waterways.

APPENDIX A

PRE-DEVELOPMENT DRAINAGE CALCULATIONS



Subcat Reach Pond Link

Routing Diagram for PRE-DEV
Prepared by Hayner/Swanson, Inc., Printed 6/2/2023
HydroCAD® 10.10-5a s/n 05005 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	5.60	2

PRE-DEV
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
26.091	46	2 acre lots, 12% imp, HSG A (OFF1, OFF3)
45.616	65	2 acre lots, 12% imp, HSG B (OFF1, OFF2, OFF3)
10.394	77	2 acre lots, 12% imp, HSG C (OFF1, OFF3)
2.575	82	2 acre lots, 12% imp, HSG D (OFF1)
23.318	39	>75% Grass cover, Good, HSG A (NE, NW1, NW3, OFF1, R3, SE, SW1)
17.158	61	>75% Grass cover, Good, HSG B (NE, NW1, NW3, OFF1, OFF3, R3, SE, SW1)
4.248	74	>75% Grass cover, Good, HSG C (NE, NW1, NW3, R3, SE, SW1)
0.718	80	>75% Grass cover, Good, HSG D (NW1, SW1)
21.450	96	Gravel surface, HSG A (NW1, OFF3, SE, SW1)
14.282	96	Gravel surface, HSG B (NE, NW1, OFF3)
4.248	96	Gravel surface, HSG C (OFF3)
4.358	98	Paved parking, HSG A (NW1, NW2, NW3, OFF1, SE, SW1)
4.446	98	Paved parking, HSG B (NE, NW3, OFF2, OFF3)
0.152	98	Paved parking, HSG C (NW3)
6.046	98	Water Surface, HSG D (OFF3)
87.391	30	Woods, Good, HSG A (NE, NW1, OFF1, OFF2, OFF3, SE, SW1)
172.442	55	Woods, Good, HSG B (NE, NW1, OFF1, OFF2, OFF3, R3, SE, SW1)
77.045	70	Woods, Good, HSG C (NE, NW1, OFF3, R3, SE, SW1)
15.989	77	Woods, Good, HSG D (NE, OFF1, OFF2, OFF3, SW1)
537.967	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
162.608	HSG A	NE, NW1, NW2, NW3, OFF1, OFF2, OFF3, R3, SE, SW1
253.944	HSG B	NE, NW1, NW3, OFF1, OFF2, OFF3, R3, SE, SW1
96.086	HSG C	NE, NW1, NW3, OFF1, OFF3, R3, SE, SW1
25.328	HSG D	NE, NW1, OFF1, OFF2, OFF3, SW1
0.000	Other	
537.967		**TOTAL AREA**

PRE-DEV
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
26.091	45.616	10.394	2.575	0.000	84.676	2 acre lots, 12% imp	OFF1, OFF2, OFF3
23.318	17.158	4.248	0.718	0.000	45.441	>75% Grass cover, Good	NE, NW1, NW3, OFF1, OFF3, R3, SE, SW1
21.450	14.282	4.248	0.000	0.000	39.980	Gravel surface	NE, NW1, OFF3, SE, SW1
4.358	4.446	0.152	0.000	0.000	8.956	Paved parking	NE, NW1, NW2, NW3, OFF1, OFF2, OFF3, SE, SW1
0.000	0.000	0.000	6.046	0.000	6.046	Water Surface	OFF3
87.391	172.442	77.045	15.989	0.000	352.866	Woods, Good	NE, NW1, OFF1, OFF2, OFF3, R3, SE, SW1
162.608	**253.944**	**96.086**	**25.328**	**0.000**	**537.967**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NE: DA NE Runoff Area=1,090,603 sf 0.02% Impervious Runoff Depth=1.29"
Flow Length=471' Tc=17.0 min CN=55 Runoff=23.26 cfs 2.699 af

Subcatchment NW1: DA NW1 Runoff Area=1,131,197 sf 4.73% Impervious Runoff Depth=1.44"
Flow Length=1,911' Tc=44.0 min CN=57 Runoff=18.31 cfs 3.113 af

Subcatchment NW2: DA NW2 Runoff Area=10,642 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=1.34 cfs 0.109 af

Subcatchment NW3: DA NW3 Runoff Area=47,653 sf 38.47% Impervious Runoff Depth=2.76"
Tc=6.0 min CN=73 Runoff=3.53 cfs 0.252 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.15"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=40.65 cfs 7.752 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=1.59"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=29.33 cfs 2.994 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,944,253 sf 4.13% Impervious Runoff Depth=1.67"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=153.26 cfs 47.603 af

Subcatchment R3: DA R3 Runoff Area=102,563 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=359' Tc=13.6 min CN=61 Runoff=3.52 cfs 0.342 af

Subcatchment SE: DA SE Runoff Area=720,247 sf 3.43% Impervious Runoff Depth=1.59"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=59 Runoff=15.64 cfs 2.189 af

Subcatchment SW1: DA SW Runoff Area=888,500 sf 4.87% Impervious Runoff Depth=1.29"
Flow Length=457' Tc=15.5 min CN=55 Runoff=19.63 cfs 2.199 af

Reach 1R: REACH 1 Avg. Flow Depth=0.98' Max Vel=2.02 fps Inflow=49.15 cfs 18.938 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=48.51 cfs 18.938 af

Reach 2R: REACH 2 Avg. Flow Depth=0.84' Max Vel=3.49 fps Inflow=61.78 cfs 15.464 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=61.21 cfs 15.464 af

Reach 3R: REACH 3 Avg. Flow Depth=0.39' Max Vel=1.25 fps Inflow=14.19 cfs 5.514 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=14.14 cfs 5.514 af

Pond P1: POND 1 Peak Elev=191.20' Storage=97,915 cf Inflow=61.21 cfs 15.464 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=34.63 cfs 15.464 af

Pond P2: POND 2 Peak Elev=206.93' Storage=58,169 cf Inflow=38.66 cfs 5.182 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0082 '/' Outflow=13.06 cfs 5.172 af

Pond POA C: POA COMBINED Inflow=198.54 cfs 69.239 af
Primary=198.54 cfs 69.239 af

Pond POA NE: POA NORTHEAST Inflow=157.15 cfs 50.301 af
Primary=157.15 cfs 50.301 af

Pond POA NW: POA NORTHWEST Inflow=48.51 cfs 18.938 af
Primary=48.51 cfs 18.938 af

Total Runoff Area = 537.967 ac Runoff Volume = 69.250 af Average Runoff Depth = 1.54"
95.32% Pervious = 512.803 ac 4.68% Impervious = 25.164 ac

Summary for Subcatchment NE: DA NE

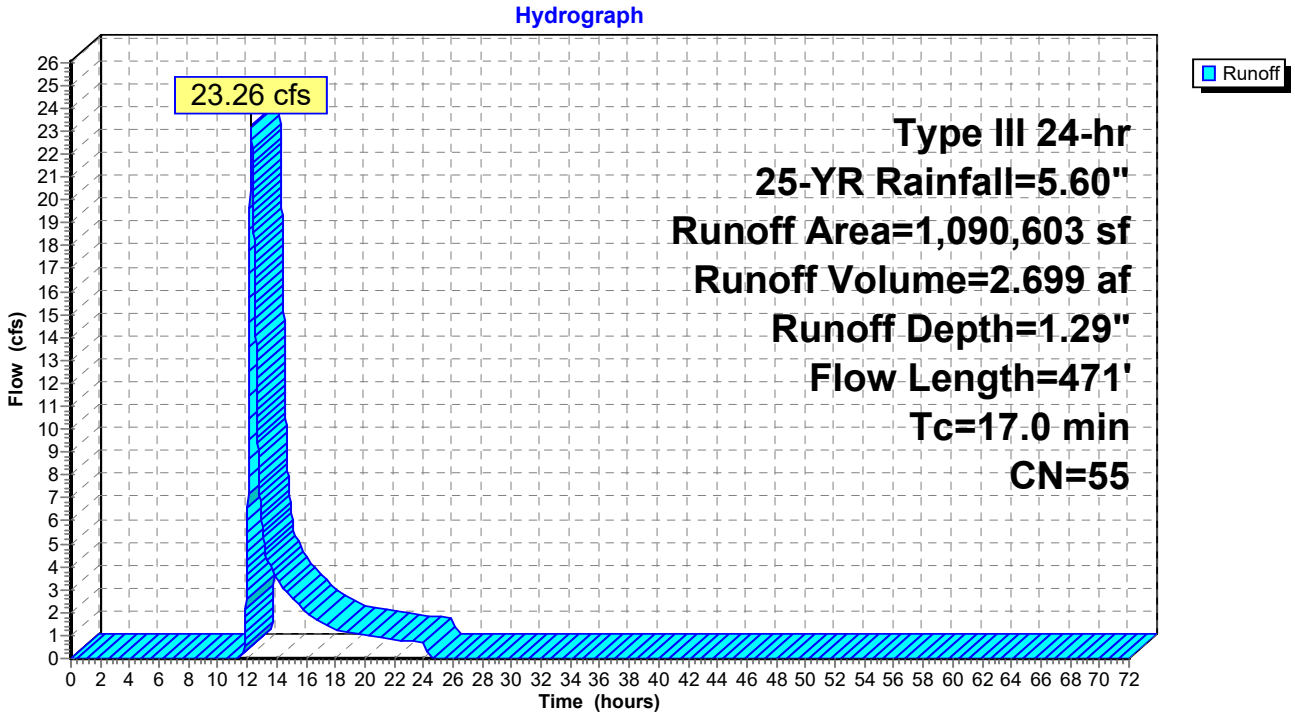
Runoff = 23.26 cfs @ 12.26 hrs, Volume= 2.699 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
257,087	30	Woods, Good, HSG A
59,700	39	>75% Grass cover, Good, HSG A
352,298	55	Woods, Good, HSG B
98,197	61	>75% Grass cover, Good, HSG B
225	98	Paved parking, HSG B
43,371	96	Gravel surface, HSG B
140,964	70	Woods, Good, HSG C
22,780	74	>75% Grass cover, Good, HSG C
115,981	77	Woods, Good, HSG D
1,090,603	55	Weighted Average
1,090,378		99.98% Pervious Area
225		0.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0360	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
6.8	421	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	471	Total			

Subcatchment NE: DA NE



Summary for Subcatchment NW1: DA NW1

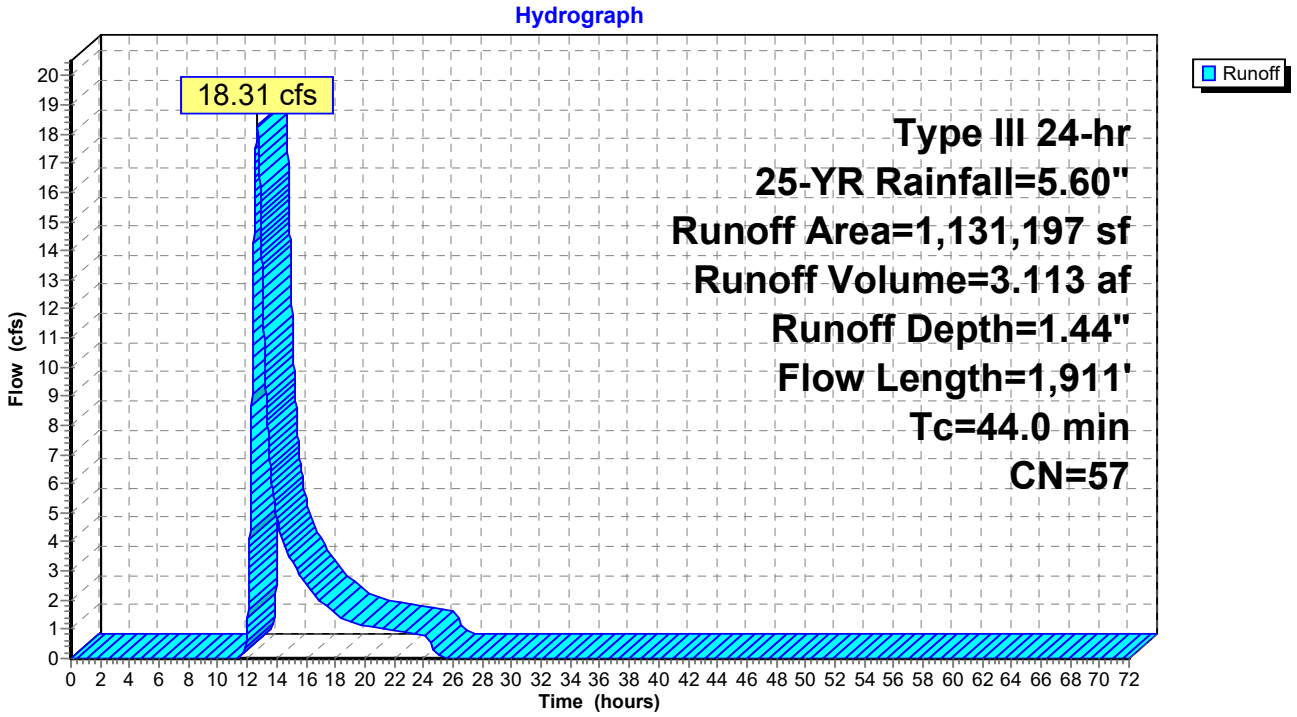
Runoff = 18.31 cfs @ 12.67 hrs, Volume= 3.113 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
4,659	30	Woods, Good, HSG A
425,100	39	>75% Grass cover, Good, HSG A
53,535	98	Paved parking, HSG A
1,804	96	Gravel surface, HSG A
41,523	55	Woods, Good, HSG B
338,968	61	>75% Grass cover, Good, HSG B
5,411	96	Gravel surface, HSG B
170,381	70	Woods, Good, HSG C
63,230	74	>75% Grass cover, Good, HSG C
26,586	80	>75% Grass cover, Good, HSG D
1,131,197	57	Weighted Average
1,077,662		95.27% Pervious Area
53,535		4.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0680	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
2.3	180	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,681	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
44.0	1,911	Total			

Subcatchment NW1: DA NW1



Summary for Subcatchment NW2: DA NW2

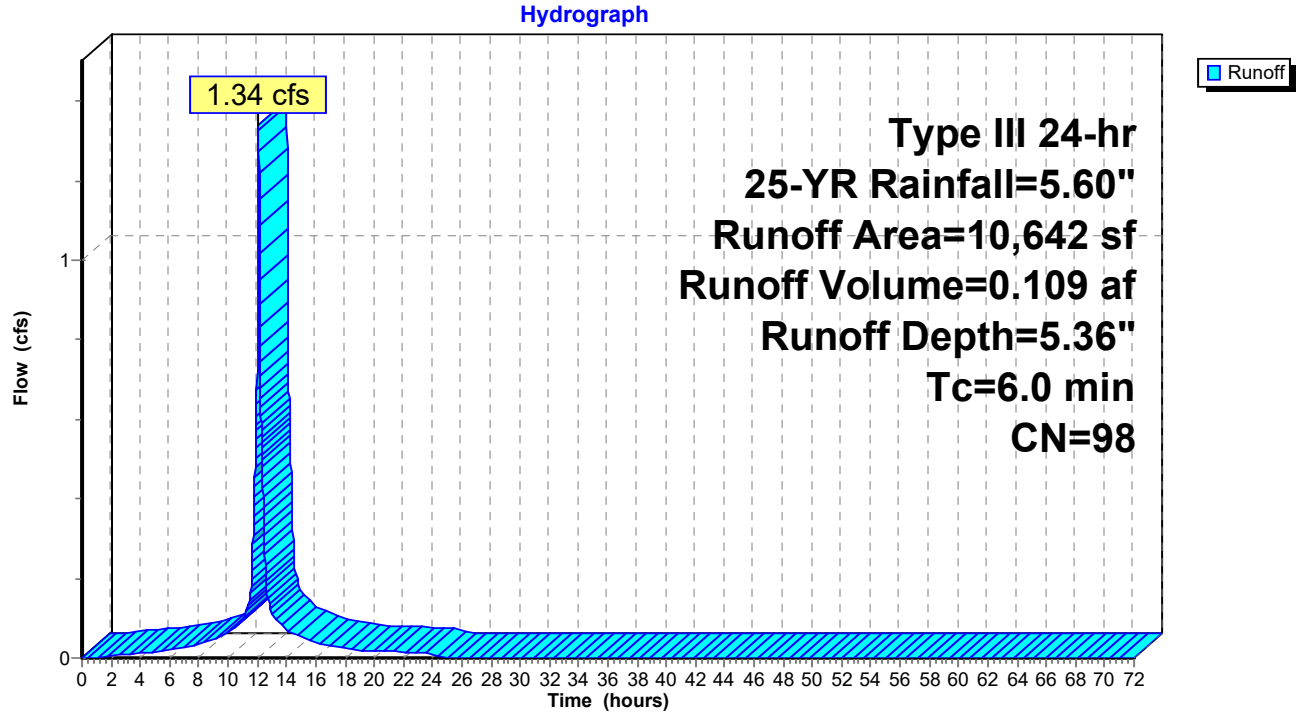
Runoff = 1.34 cfs @ 12.08 hrs, Volume= 0.109 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
10,642	98	Paved parking, HSG A
10,642		100.00% Impervious Area

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

Subcatchment NW2: DA NW2



Summary for Subcatchment NW3: DA NW3

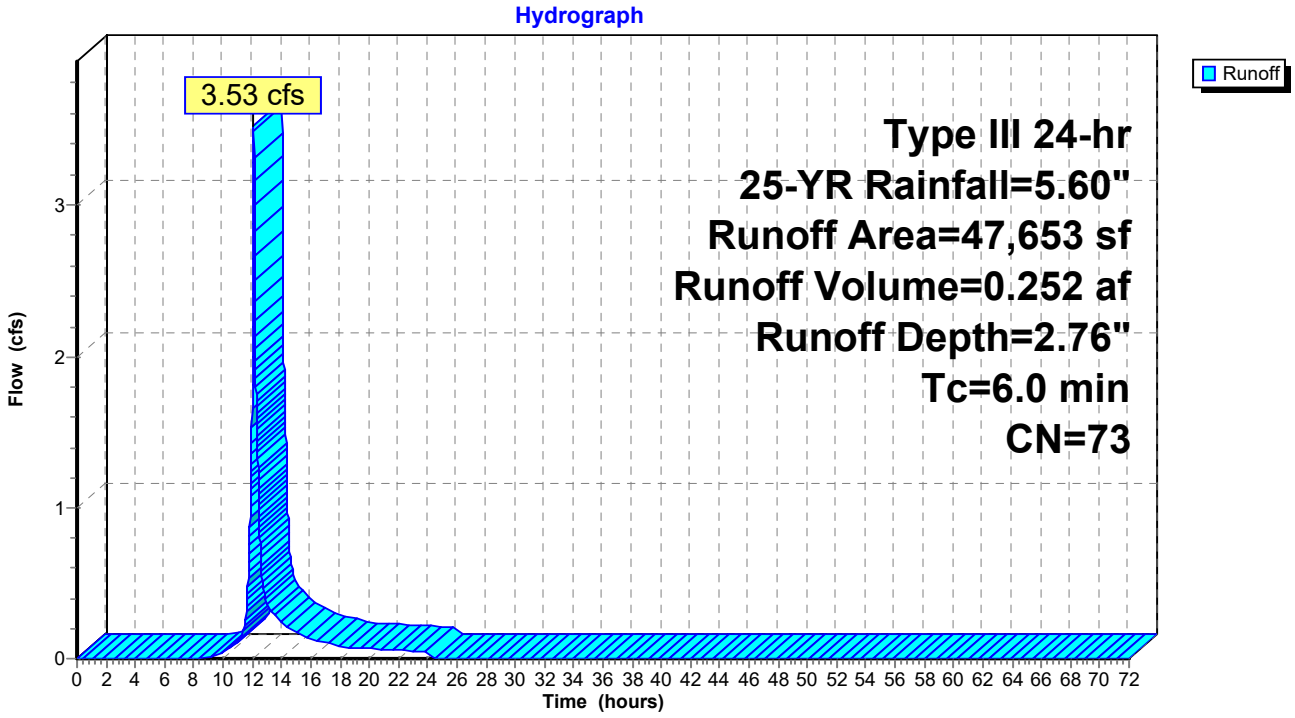
Runoff = 3.53 cfs @ 12.09 hrs, Volume= 0.252 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
11,356	39	>75% Grass cover, Good, HSG A
8,425	98	Paved parking, HSG A
3,285	98	Paved parking, HSG B
5,413	61	>75% Grass cover, Good, HSG B
6,623	98	Paved parking, HSG C
12,551	74	>75% Grass cover, Good, HSG C
47,653	73	Weighted Average
29,320		61.53% Pervious Area
18,333		38.47% Impervious Area

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

Subcatchment NW3: DA NW3



Summary for Subcatchment OFF1: DA OFFSITE 1

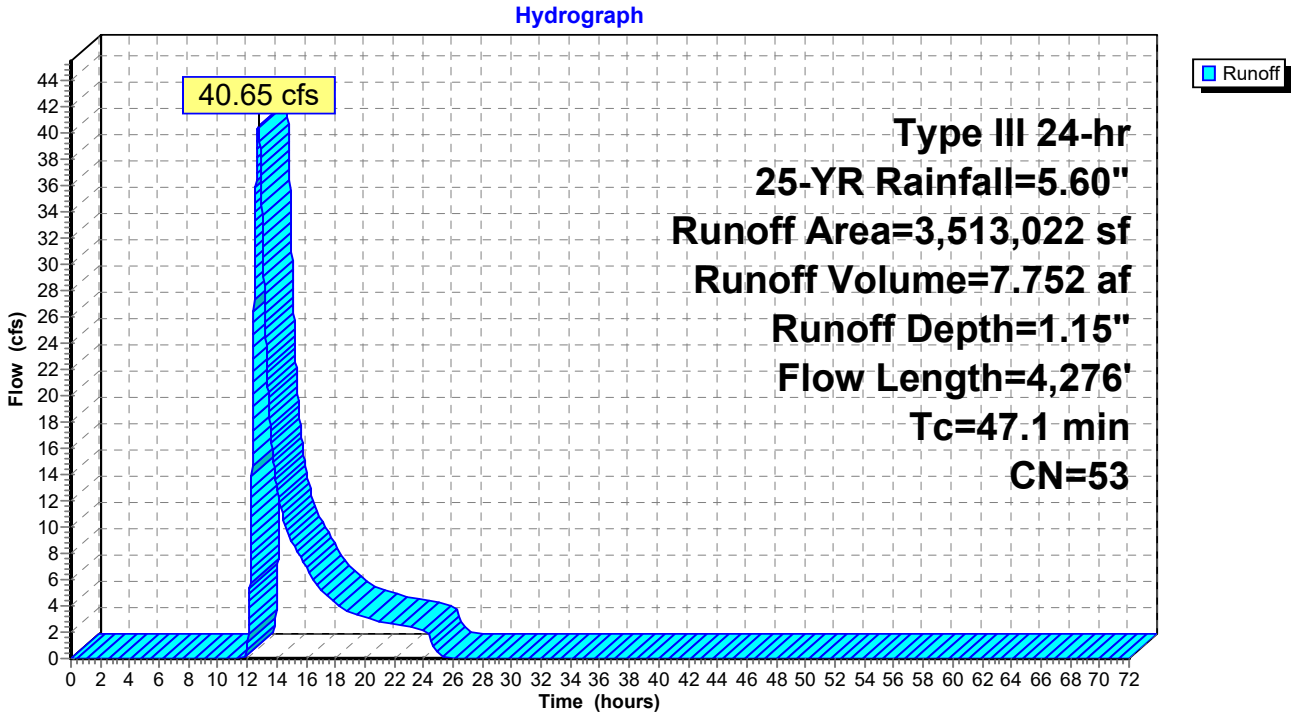
Runoff = 40.65 cfs @ 12.76 hrs, Volume= 7.752 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
605,170	46	2 acre lots, 12% imp, HSG A
995,464	65	2 acre lots, 12% imp, HSG B
173,809	77	2 acre lots, 12% imp, HSG C
112,172	82	2 acre lots, 12% imp, HSG D
897,227	30	Woods, Good, HSG A
305,263	55	Woods, Good, HSG B
208,972	77	Woods, Good, HSG D
117,815	39	>75% Grass cover, Good, HSG A
47,873	61	>75% Grass cover, Good, HSG B
49,257	98	Paved parking, HSG A
3,513,022	53	Weighted Average
3,237,371		92.15% Pervious Area
275,651		7.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0800	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
39.7	4,226	0.1260	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
47.1	4,276	Total			

Subcatchment OFF1: DA OFFSITE 1



Summary for Subcatchment OFF2: DA OFFSITE 2

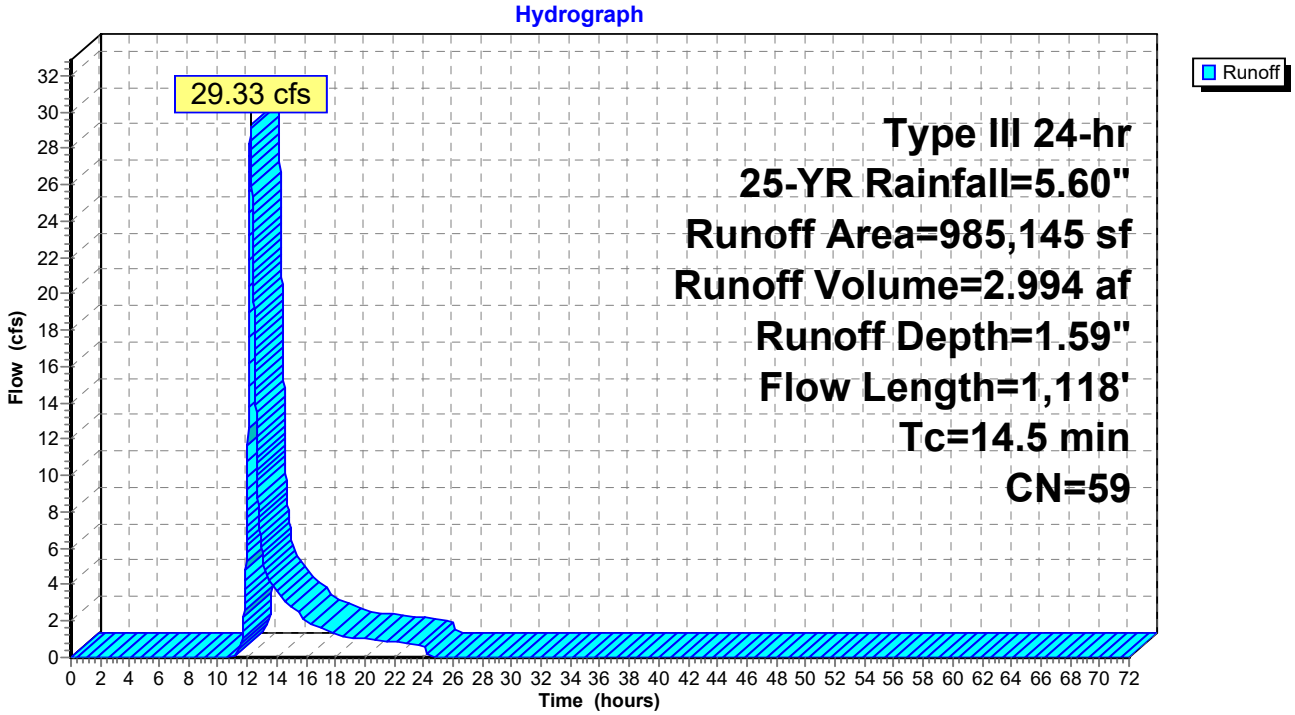
Runoff = 29.33 cfs @ 12.22 hrs, Volume= 2.994 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
8,899	30	Woods, Good, HSG A
674,826	55	Woods, Good, HSG B
43,382	77	Woods, Good, HSG D
233,757	65	2 acre lots, 12% imp, HSG B
24,281	98	Paved parking, HSG B
985,145	59	Weighted Average
932,813		94.69% Pervious Area
52,332		5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
8.2	1,068	0.1900	2.18		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.5	1,118	Total			

Subcatchment OFF2: DA OFFSITE 2



Summary for Subcatchment OFF3: DA OFFSITE 3

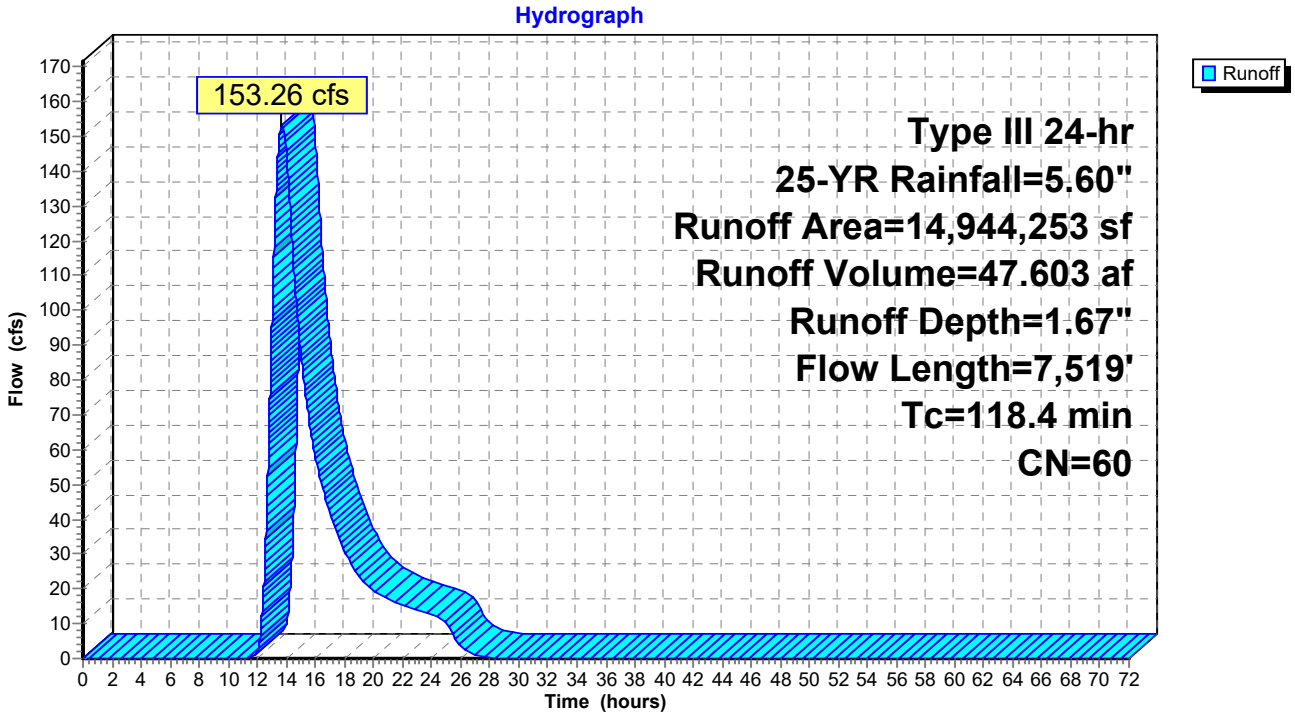
Runoff = 153.26 cfs @ 13.68 hrs, Volume= 47.603 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
531,355	46	2 acre lots, 12% imp, HSG A
757,822	65	2 acre lots, 12% imp, HSG B
278,947	77	2 acre lots, 12% imp, HSG C
919,821	96	Gravel surface, HSG A
573,340	96	Gravel surface, HSG B
185,042	96	Gravel surface, HSG C
2,473,692	30	Woods, Good, HSG A
5,707,310	55	Woods, Good, HSG B
2,621,592	70	Woods, Good, HSG C
238,740	77	Woods, Good, HSG D
165,884	98	Paved parking, HSG B
227,332	61	>75% Grass cover, Good, HSG B
263,376	98	Water Surface, HSG D
14,944,253	60	Weighted Average
14,326,818		95.87% Pervious Area
617,435		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
111.3	7,469	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
118.4	7,519	Total			

Subcatchment OFF3: DA OFFSITE 3



Summary for Subcatchment R3: DA R3

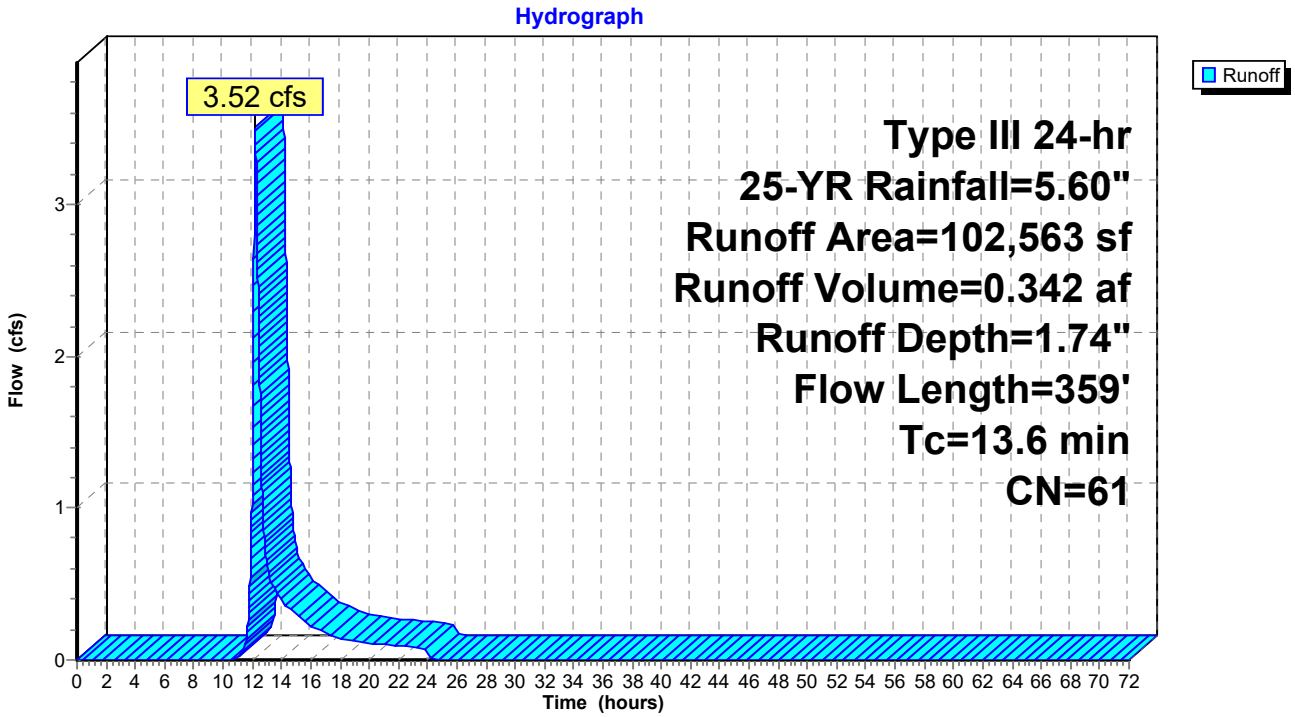
Runoff = 3.52 cfs @ 12.20 hrs, Volume= 0.342 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
7,180	39	>75% Grass cover, Good, HSG A
43,362	55	Woods, Good, HSG B
2,235	61	>75% Grass cover, Good, HSG B
44,628	70	Woods, Good, HSG C
5,158	74	>75% Grass cover, Good, HSG C
102,563	61	Weighted Average
102,563		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0550	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
5.0	309	0.0420	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	359	Total			

Subcatchment R3: DA R3



Summary for Subcatchment SE: DA SE

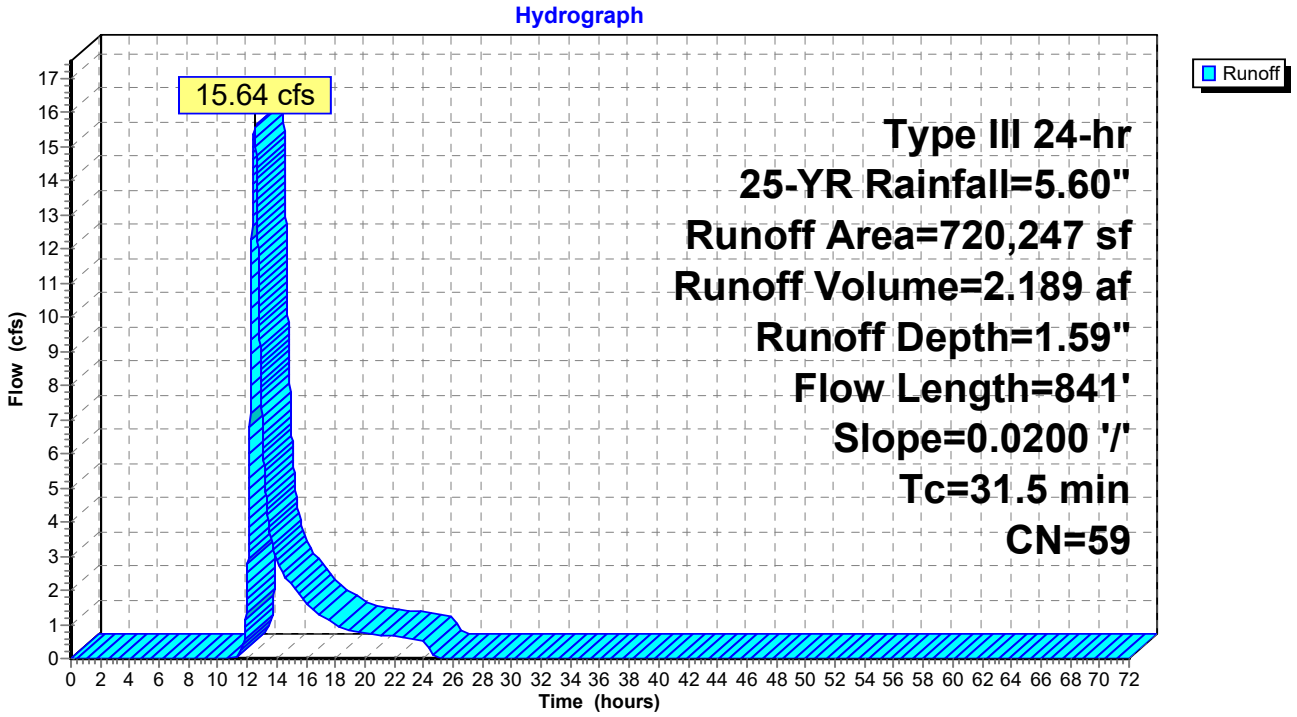
Runoff = 15.64 cfs @ 12.49 hrs, Volume= 2.189 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
7,119	30	Woods, Good, HSG A
173,061	39	>75% Grass cover, Good, HSG A
24,702	98	Paved parking, HSG A
5,915	96	Gravel surface, HSG A
222,450	55	Woods, Good, HSG B
3,891	61	>75% Grass cover, Good, HSG B
229,103	70	Woods, Good, HSG C
54,006	74	>75% Grass cover, Good, HSG C
720,247	59	Weighted Average
695,545		96.57% Pervious Area
24,702		3.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
18.6	791	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.5	841	Total			

Subcatchment SE: DA SE



Summary for Subcatchment SW1: DA SW

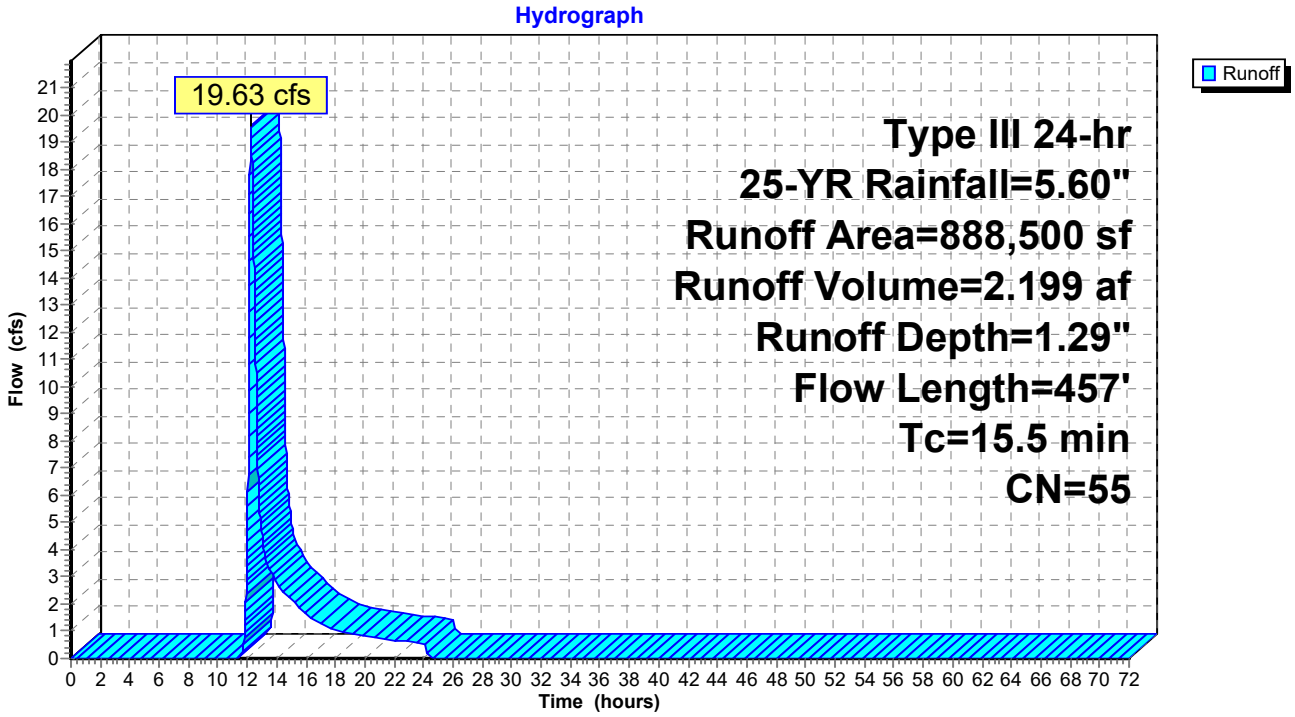
Runoff = 19.63 cfs @ 12.25 hrs, Volume= 2.199 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
158,067	30	Woods, Good, HSG A
221,511	39	>75% Grass cover, Good, HSG A
43,282	98	Paved parking, HSG A
6,836	96	Gravel surface, HSG A
164,529	55	Woods, Good, HSG B
23,486	61	>75% Grass cover, Good, HSG B
149,393	70	Woods, Good, HSG C
27,310	74	>75% Grass cover, Good, HSG C
89,411	77	Woods, Good, HSG D
4,675	80	>75% Grass cover, Good, HSG D
888,500	55	Weighted Average
845,218		95.13% Pervious Area
43,282		4.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
6.6	407	0.0420	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.5	457	Total			

Subcatchment SW1: DA SW



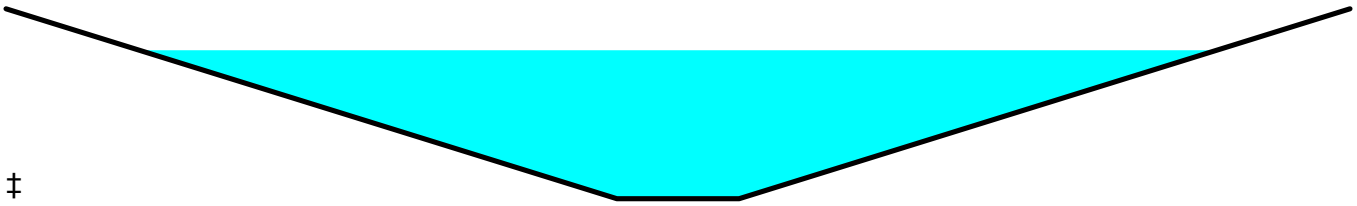
Summary for Reach 1R: REACH 1

Inflow Area = 169.857 ac, 6.47% Impervious, Inflow Depth = 1.34" for 25-YR event
Inflow = 49.15 cfs @ 12.76 hrs, Volume= 18.938 af
Outflow = 48.51 cfs @ 12.83 hrs, Volume= 18.938 af, Atten= 1%, Lag= 4.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.02 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 30.3 min

Peak Storage= 18,405 cf @ 12.83 hrs
Average Depth at Peak Storage= 0.98' , Surface Width= 44.10'
Bank-Full Depth= 1.25' Flow Area= 37.5 sf, Capacity= 88.11 cfs

5.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 55.00'
Length= 767.0' Slope= 0.0026 '/'
Inlet Invert= 187.50', Outlet Invert= 185.50'



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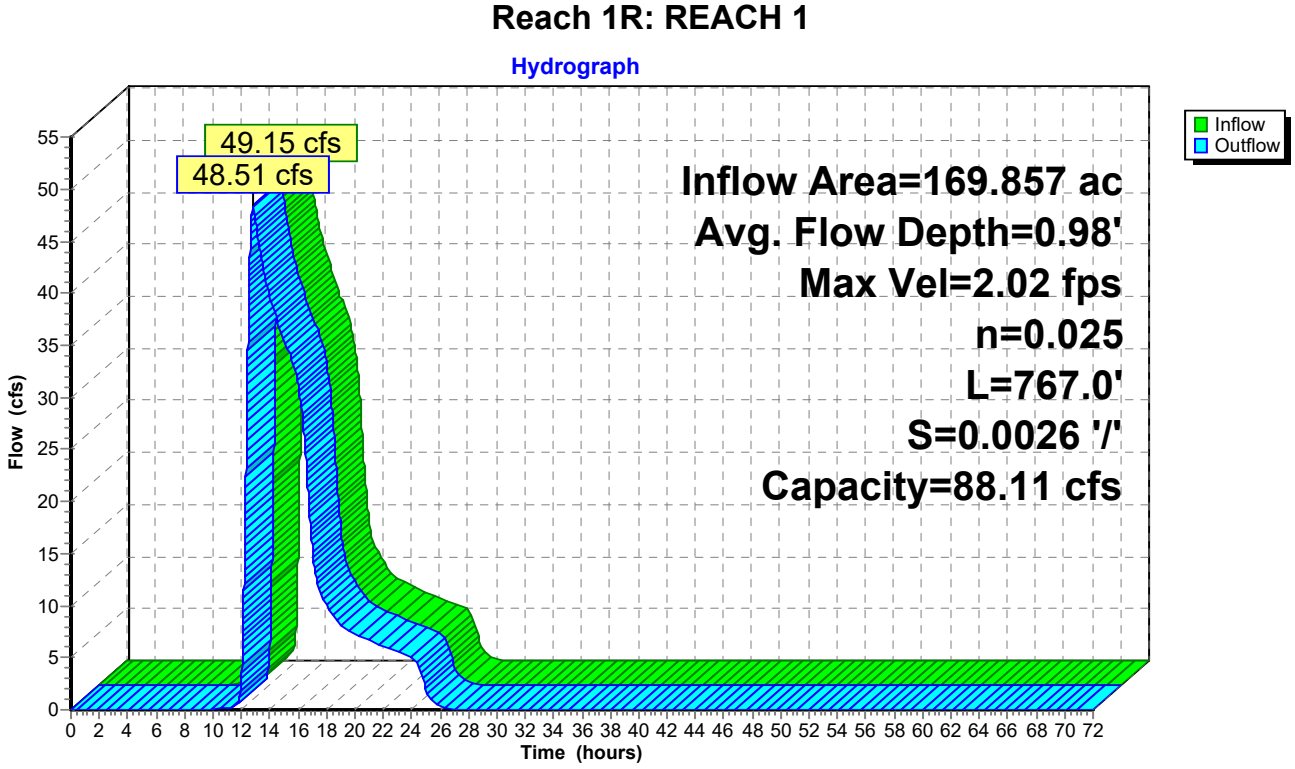


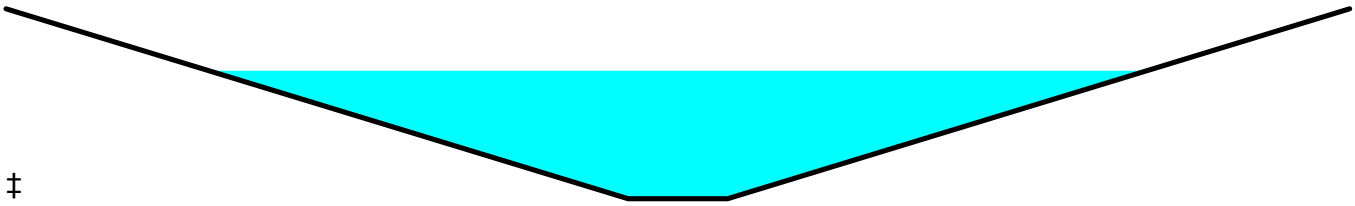
Summary for Reach 2R: REACH 2

Inflow Area = 142.550 ac, 6.38% Impervious, Inflow Depth = 1.30" for 25-YR event
Inflow = 61.78 cfs @ 12.66 hrs, Volume= 15.464 af
Outflow = 61.21 cfs @ 12.74 hrs, Volume= 15.464 af, Atten= 1%, Lag= 4.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 22.3 min

Peak Storage= 20,267 cf @ 12.74 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 37.70'
Bank-Full Depth= 1.25' Flow Area= 36.3 sf, Capacity= 161.16 cfs

4.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 54.00'
Length= 1,154.0' Slope= 0.0095 '/'
Inlet Invert= 200.00', Outlet Invert= 189.00'



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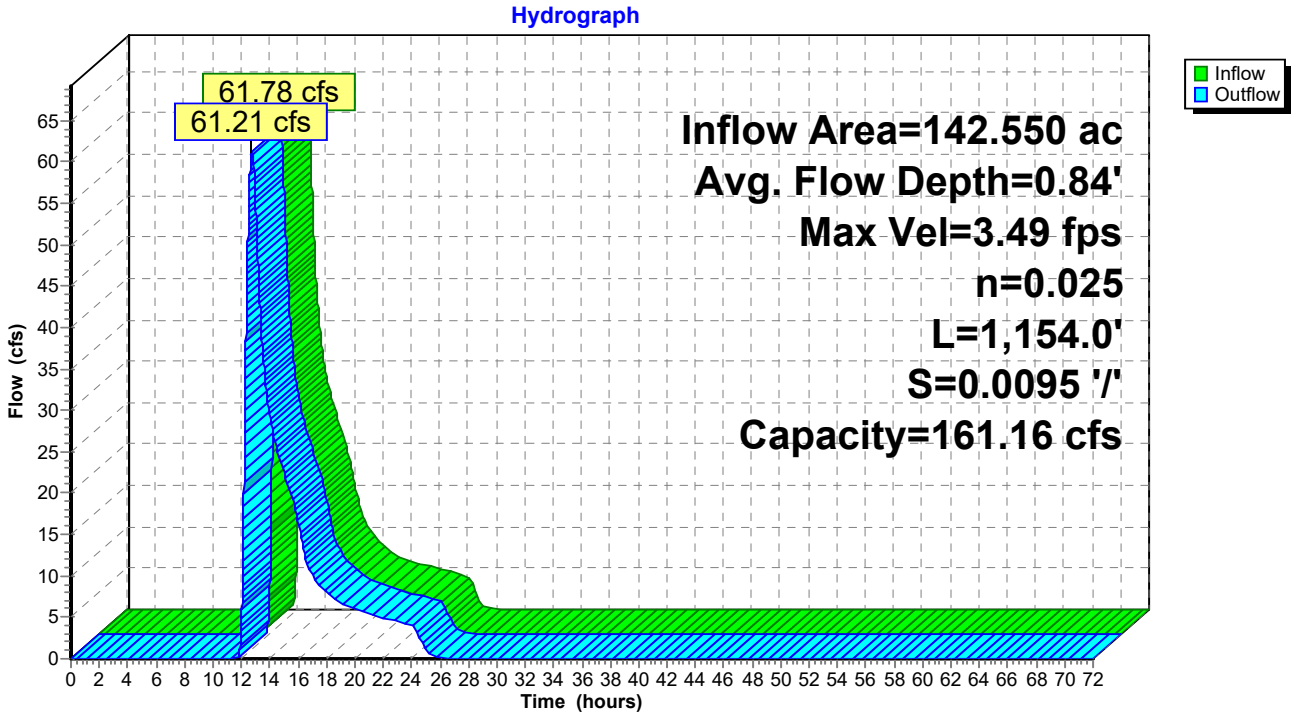
Reach 2R: REACH 2



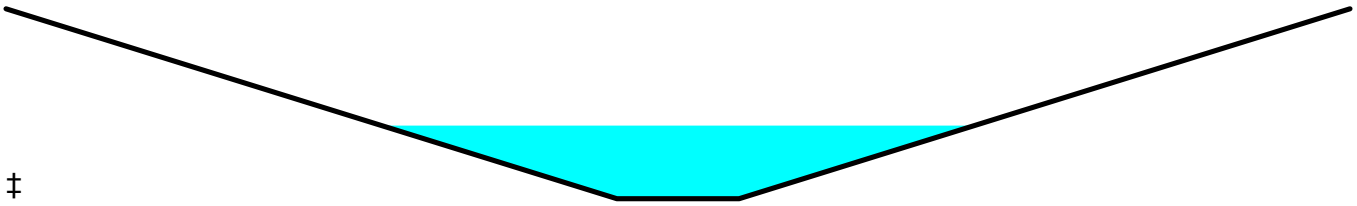
Summary for Reach 3R: REACH 3

Inflow Area = 41.505 ac, 4.26% Impervious, Inflow Depth = 1.59" for 25-YR event
Inflow = 14.19 cfs @ 12.47 hrs, Volume= 5.514 af
Outflow = 14.14 cfs @ 12.54 hrs, Volume= 5.514 af, Atten= 0%, Lag= 4.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.25 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 20.3 min

Peak Storage= 4,308 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 48.53'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 132.87 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 50.0 '/' Top Width= 110.00'
Length= 382.0' Slope= 0.0031 '/'
Inlet Invert= 201.19', Outlet Invert= 200.00'



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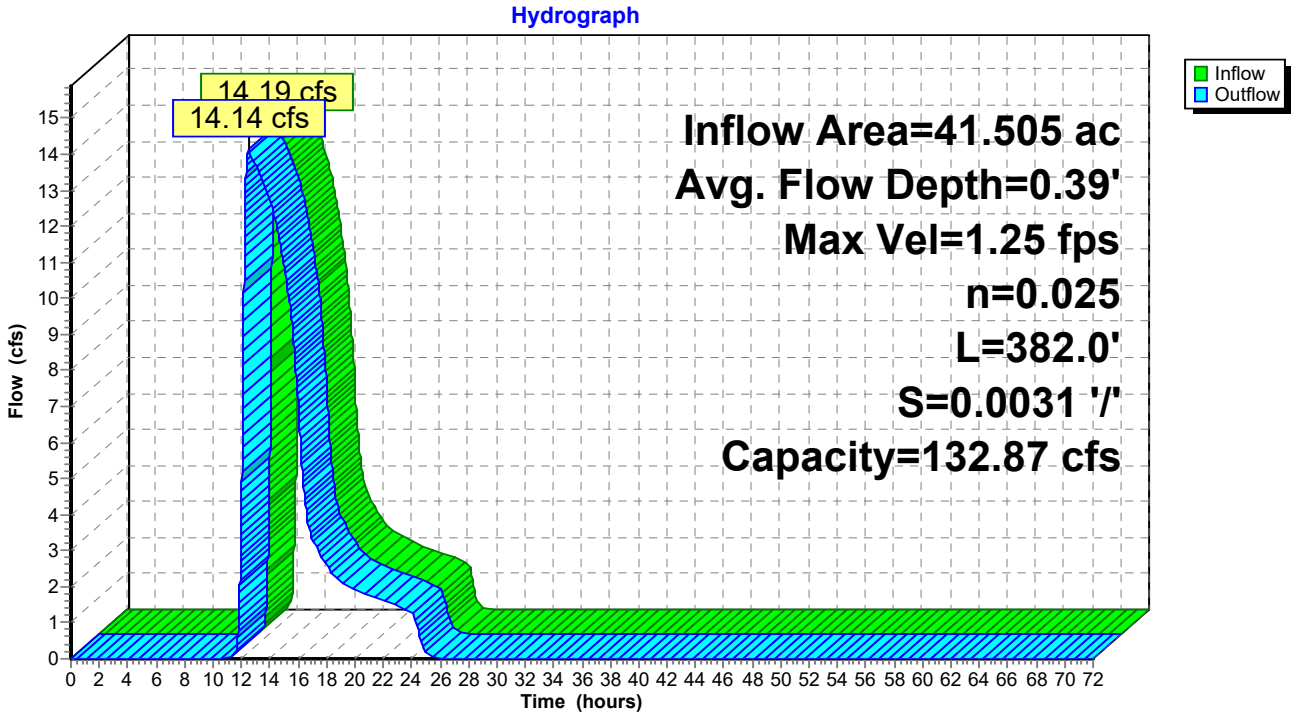


Summary for Pond P1: POND 1

Inflow Area = 142.550 ac, 6.38% Impervious, Inflow Depth = 1.30" for 25-YR event
Inflow = 61.21 cfs @ 12.74 hrs, Volume= 15.464 af
Outflow = 34.63 cfs @ 13.63 hrs, Volume= 15.464 af, Atten= 43%, Lag= 53.0 min
Primary = 34.63 cfs @ 13.63 hrs, Volume= 15.464 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.20' @ 13.63 hrs Surf.Area= 116,800 sf Storage= 97,915 cf

Plug-Flow detention time= 24.9 min calculated for 15.462 af (100% of inflow)
Center-of-Mass det. time= 24.9 min (954.7 - 929.7)

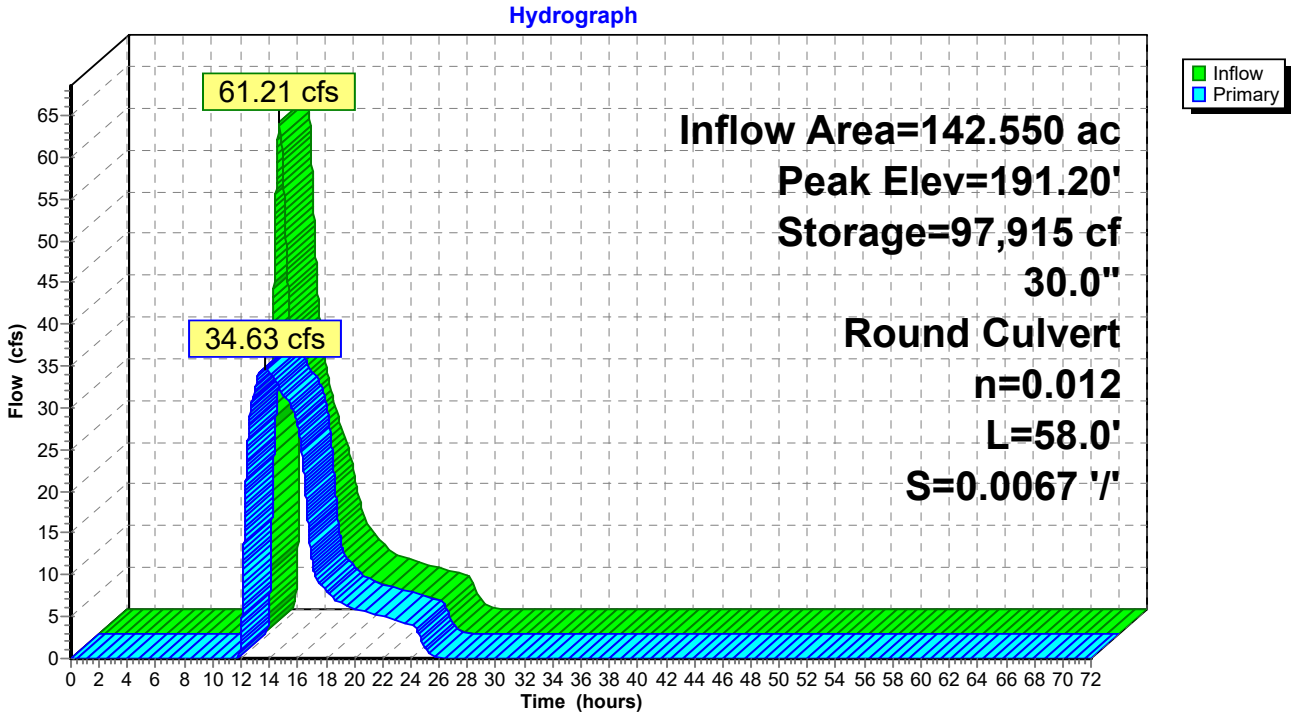
Volume	Invert	Avail.Storage	Storage Description
#1	187.50'	426,640 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
187.50	100	0	0
188.00	1,000	275	275
189.00	2,754	1,877	2,152
190.00	20,973	11,864	14,016
191.00	102,365	61,669	75,685
192.00	173,518	137,942	213,626
193.00	252,510	213,014	426,640

Device	Routing	Invert	Outlet Devices
#1	Primary	187.58'	**30.0" Round Culvert** L= 58.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 187.58' / 187.19' S= 0.0067 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=34.63 cfs @ 13.63 hrs HW=191.20' TW=188.42' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 34.63 cfs @ 7.06 fps)

Pond P1: POND 1



Summary for Pond P2: POND 2

Inflow Area = 39.150 ac, 4.52% Impervious, Inflow Depth = 1.59" for 25-YR event
Inflow = 38.66 cfs @ 12.26 hrs, Volume= 5.182 af
Outflow = 13.06 cfs @ 13.00 hrs, Volume= 5.172 af, Atten= 66%, Lag= 44.0 min
Primary = 13.06 cfs @ 13.00 hrs, Volume= 5.172 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 206.93' @ 13.00 hrs Surf.Area= 51,638 sf Storage= 58,169 cf

Plug-Flow detention time= 40.5 min calculated for 5.172 af (100% of inflow)
Center-of-Mass det. time= 39.3 min (924.0 - 884.7)

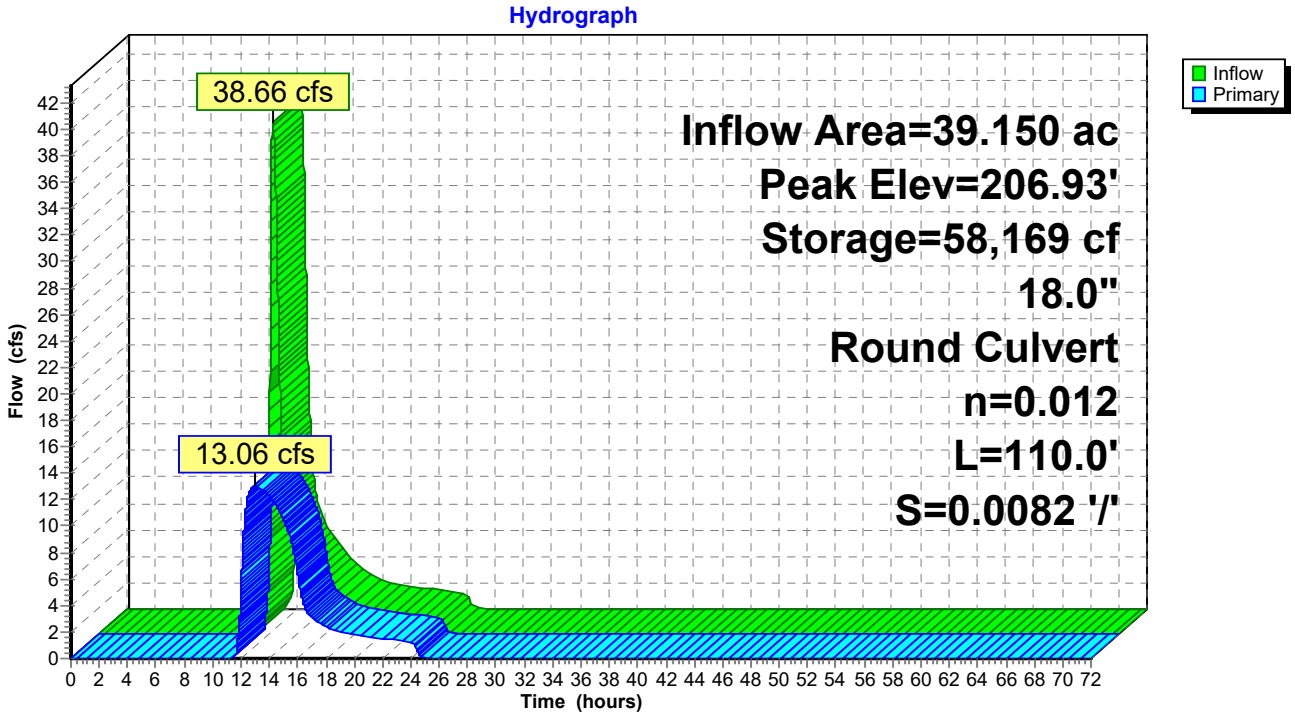
Volume	Invert	Avail.Storage	Storage Description
#1	203.00'	245,790 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
203.00	250	0	0
204.00	1,792	1,021	1,021
205.00	9,294	5,543	6,564
206.00	23,938	16,616	23,180
208.00	83,768	107,706	130,886
209.00	146,040	114,904	245,790

Device	Routing	Invert	Outlet Devices
#1	Primary	203.60'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 203.60' / 202.70' S= 0.0082 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=13.06 cfs @ 13.00 hrs HW=206.93' TW=201.57' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 13.06 cfs @ 7.39 fps)

Pond P2: POND 2

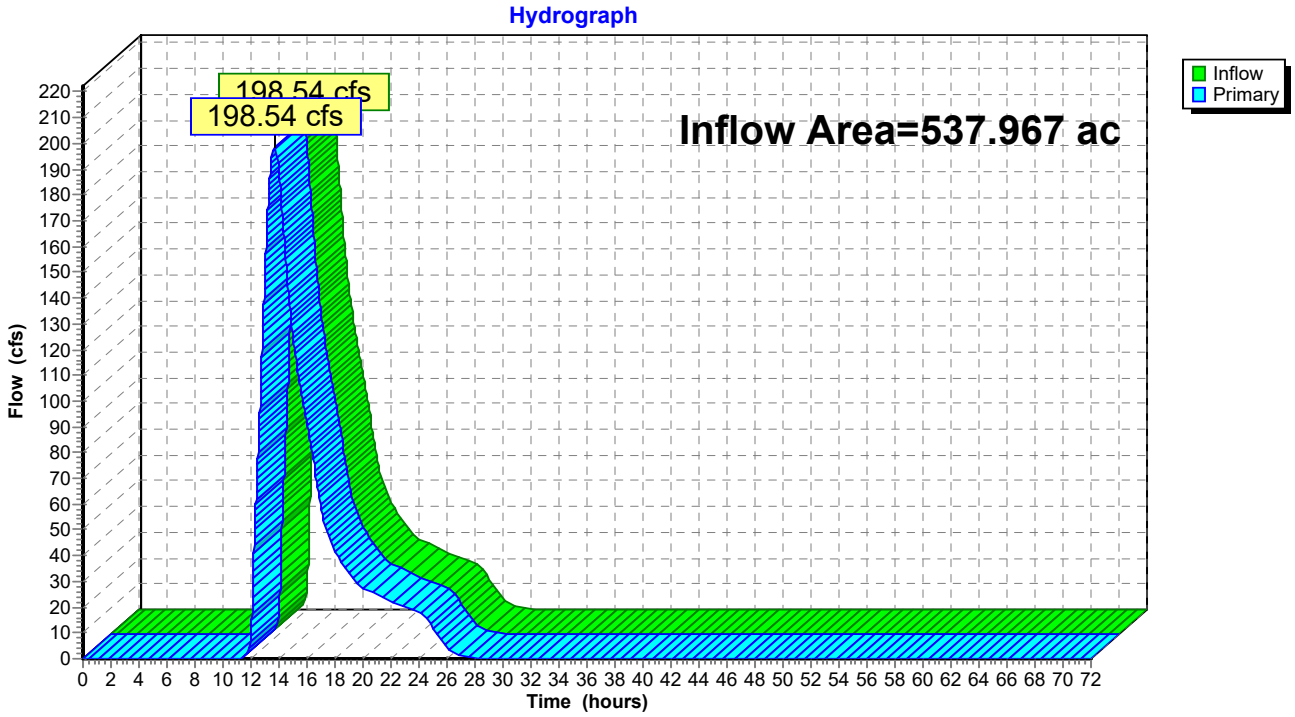


Summary for Pond POA C: POA COMBINED

Inflow Area = 537.967 ac, 4.68% Impervious, Inflow Depth = 1.54" for 25-YR event
Inflow = 198.54 cfs @ 13.68 hrs, Volume= 69.239 af
Primary = 198.54 cfs @ 13.68 hrs, Volume= 69.239 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA C: POA COMBINED

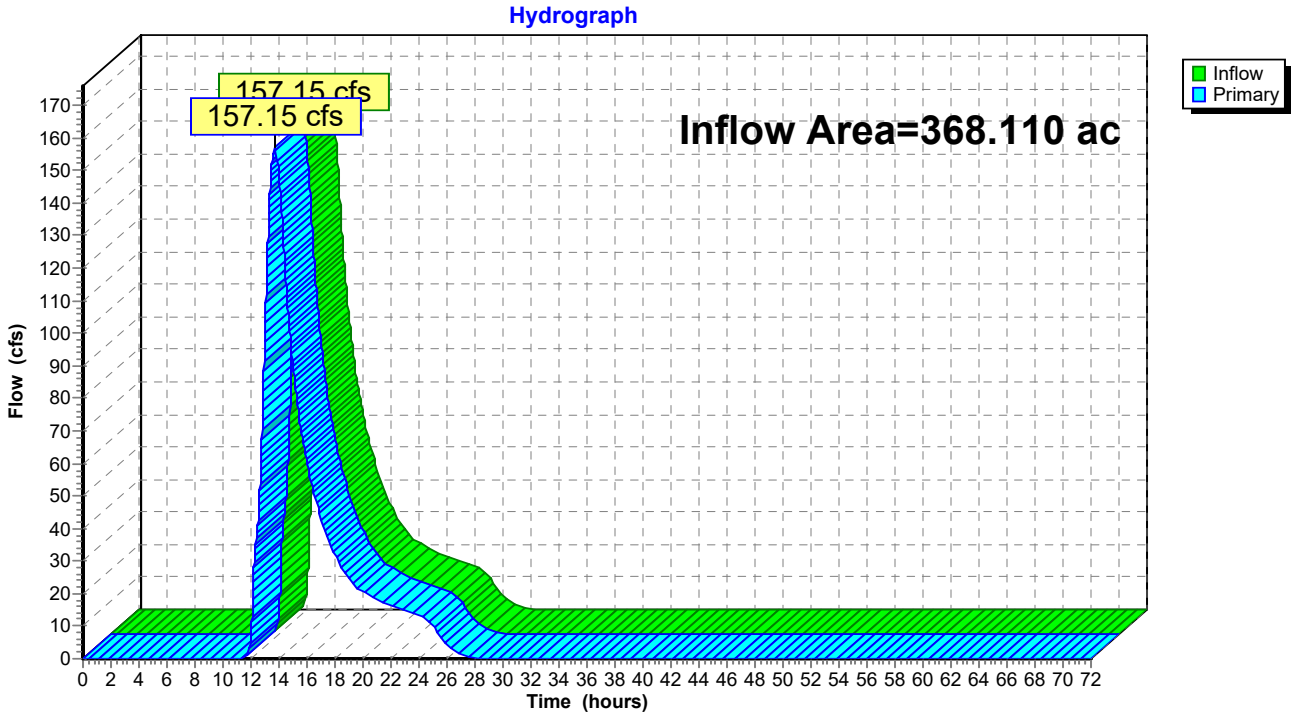


Summary for Pond POA NE: POA NORTHEAST

Inflow Area = 368.110 ac, 3.85% Impervious, Inflow Depth = 1.64" for 25-YR event
Inflow = 157.15 cfs @ 13.68 hrs, Volume= 50.301 af
Primary = 157.15 cfs @ 13.68 hrs, Volume= 50.301 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NE: POA NORTHEAST

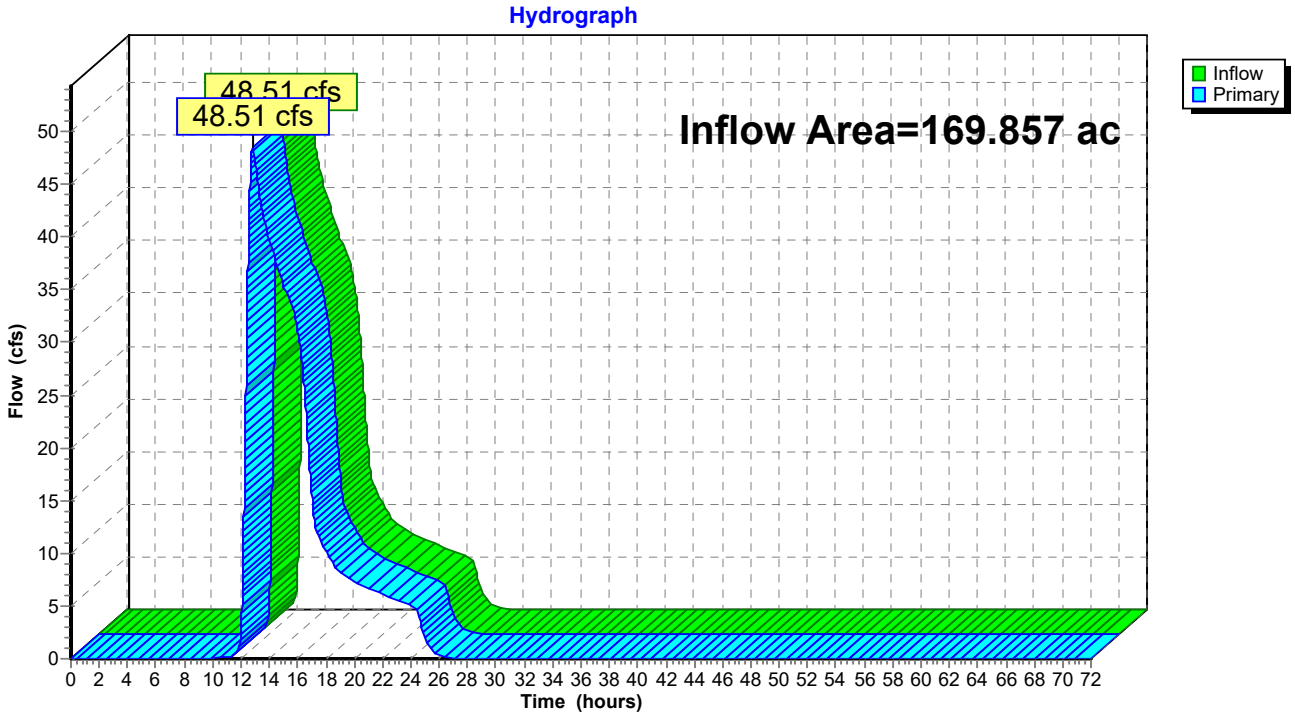


Summary for Pond POA NW: POA NORTHWEST

Inflow Area = 169.857 ac, 6.47% Impervious, Inflow Depth = 1.34" for 25-YR event
Inflow = 48.51 cfs @ 12.83 hrs, Volume= 18.938 af
Primary = 48.51 cfs @ 12.83 hrs, Volume= 18.938 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NW: POA NORTHWEST



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NE: DA NE Runoff Area=1,090,603 sf 0.02% Impervious Runoff Depth=0.18"
Flow Length=471' Tc=17.0 min CN=55 Runoff=1.25 cfs 0.368 af

Subcatchment NW1: DA NW1 Runoff Area=1,131,197 sf 4.73% Impervious Runoff Depth=0.23"
Flow Length=1,911' Tc=44.0 min CN=57 Runoff=1.46 cfs 0.488 af

Subcatchment NW2: DA NW2 Runoff Area=10,642 sf 100.00% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=98 Runoff=0.69 cfs 0.055 af

Subcatchment NW3: DA NW3 Runoff Area=47,653 sf 38.47% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=73 Runoff=0.95 cfs 0.074 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.13"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=1.62 cfs 0.897 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.28"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=2.75 cfs 0.527 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,944,253 sf 4.13% Impervious Runoff Depth=0.31"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=19.63 cfs 8.820 af

Subcatchment R3: DA R3 Runoff Area=102,563 sf 0.00% Impervious Runoff Depth=0.34"
Flow Length=359' Tc=13.6 min CN=61 Runoff=0.40 cfs 0.067 af

Subcatchment SE: DA SE Runoff Area=720,247 sf 3.43% Impervious Runoff Depth=0.28"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=59 Runoff=1.59 cfs 0.385 af

Subcatchment SW1: DA SW Runoff Area=888,500 sf 4.87% Impervious Runoff Depth=0.18"
Flow Length=457' Tc=15.5 min CN=55 Runoff=1.05 cfs 0.300 af

Reach 1R: REACH 1 Avg. Flow Depth=0.40' Max Vel=1.20 fps Inflow=6.55 cfs 2.781 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=6.36 cfs 2.781 af

Reach 2R: REACH 2 Avg. Flow Depth=0.28' Max Vel=1.84 fps Inflow=5.22 cfs 2.165 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=5.07 cfs 2.165 af

Reach 3R: REACH 3 Avg. Flow Depth=0.20' Max Vel=0.86 fps Inflow=3.51 cfs 0.968 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=3.40 cfs 0.968 af

Pond P1: POND 1 Peak Elev=188.55' Storage=1,096 cf Inflow=5.07 cfs 2.165 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=5.04 cfs 2.165 af

Pond P2: POND 2 Peak Elev=204.46' Storage=2,627 cf Inflow=3.94 cfs 0.912 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0082 '/' Outflow=3.29 cfs 0.902 af

Pond POA C: POA COMBINED Inflow=25.30 cfs 11.970 af
Primary=25.30 cfs 11.970 af

Pond POA NE: POA NORTHEAST Inflow=20.23 cfs 9.189 af
Primary=20.23 cfs 9.189 af

Pond POA NW: POA NORTHWEST Inflow=6.36 cfs 2.781 af
Primary=6.36 cfs 2.781 af

Total Runoff Area = 537.967 ac Runoff Volume = 11.980 af Average Runoff Depth = 0.27"
95.32% Pervious = 512.803 ac 4.68% Impervious = 25.164 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NE: DA NE Runoff Area=1,090,603 sf 0.02% Impervious Runoff Depth=0.71"
Flow Length=471' Tc=17.0 min CN=55 Runoff=10.63 cfs 1.484 af

Subcatchment NW1: DA NW1 Runoff Area=1,131,197 sf 4.73% Impervious Runoff Depth=0.82"
Flow Length=1,911' Tc=44.0 min CN=57 Runoff=9.18 cfs 1.765 af

Subcatchment NW2: DA NW2 Runoff Area=10,642 sf 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.085 af

Subcatchment NW3: DA NW3 Runoff Area=47,653 sf 38.47% Impervious Runoff Depth=1.84"
Tc=6.0 min CN=73 Runoff=2.33 cfs 0.168 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.61"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=17.90 cfs 4.115 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.93"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=15.29 cfs 1.744 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,944,253 sf 4.13% Impervious Runoff Depth=0.98"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=83.46 cfs 28.080 af

Subcatchment R3: DA R3 Runoff Area=102,563 sf 0.00% Impervious Runoff Depth=1.04"
Flow Length=359' Tc=13.6 min CN=61 Runoff=1.93 cfs 0.204 af

Subcatchment SE: DA SE Runoff Area=720,247 sf 3.43% Impervious Runoff Depth=0.93"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=59 Runoff=8.26 cfs 1.275 af

Subcatchment SW1: DA SW Runoff Area=888,500 sf 4.87% Impervious Runoff Depth=0.71"
Flow Length=457' Tc=15.5 min CN=55 Runoff=8.93 cfs 1.209 af

Reach 1R: REACH 1 Avg. Flow Depth=0.83' Max Vel=1.83 fps Inflow=33.26 cfs 10.554 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=32.98 cfs 10.554 af

Reach 2R: REACH 2 Avg. Flow Depth=0.64' Max Vel=2.96 fps Inflow=32.29 cfs 8.537 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=31.94 cfs 8.537 af

Reach 3R: REACH 3 Avg. Flow Depth=0.34' Max Vel=1.18 fps Inflow=11.08 cfs 3.213 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=11.04 cfs 3.213 af

Pond P1: POND 1 Peak Elev=190.30' Storage=23,869 cf Inflow=31.94 cfs 8.537 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=26.13 cfs 8.536 af

Pond P2: POND 2 Peak Elev=205.95' Storage=22,002 cf Inflow=19.98 cfs 3.019 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0082 '/' Outflow=10.46 cfs 3.009 af

Pond POA C: POA COMBINED Inflow=114.44 cfs 40.118 af
Primary=114.44 cfs 40.118 af

Pond POA NE: POA NORTHEAST Inflow=85.70 cfs 29.564 af
Primary=85.70 cfs 29.564 af

Pond POA NW: POA NORTHWEST Inflow=32.98 cfs 10.554 af
Primary=32.98 cfs 10.554 af

Total Runoff Area = 537.967 ac Runoff Volume = 40.128 af Average Runoff Depth = 0.90"
95.32% Pervious = 512.803 ac 4.68% Impervious = 25.164 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NE: DA NE Runoff Area=1,090,603 sf 0.02% Impervious Runoff Depth=1.93"
Flow Length=471' Tc=17.0 min CN=55 Runoff=37.31 cfs 4.026 af

Subcatchment NW1: DA NW1 Runoff Area=1,131,197 sf 4.73% Impervious Runoff Depth=2.11"
Flow Length=1,911' Tc=44.0 min CN=57 Runoff=28.29 cfs 4.565 af

Subcatchment NW2: DA NW2 Runoff Area=10,642 sf 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=1.60 cfs 0.131 af

Subcatchment NW3: DA NW3 Runoff Area=47,653 sf 38.47% Impervious Runoff Depth=3.67"
Tc=6.0 min CN=73 Runoff=4.71 cfs 0.335 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.75"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=67.20 cfs 11.785 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=2.29"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=44.27 cfs 4.322 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,944,253 sf 4.13% Impervious Runoff Depth=2.39"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=228.49 cfs 68.229 af

Subcatchment R3: DA R3 Runoff Area=102,563 sf 0.00% Impervious Runoff Depth=2.48"
Flow Length=359' Tc=13.6 min CN=61 Runoff=5.19 cfs 0.487 af

Subcatchment SE: DA SE Runoff Area=720,247 sf 3.43% Impervious Runoff Depth=2.29"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=59 Runoff=23.45 cfs 3.160 af

Subcatchment SW1: DA SW Runoff Area=888,500 sf 4.87% Impervious Runoff Depth=1.93"
Flow Length=457' Tc=15.5 min CN=55 Runoff=31.48 cfs 3.280 af

Reach 1R: REACH 1 Avg. Flow Depth=1.09' Max Vel=2.16 fps Inflow=63.69 cfs 28.054 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=63.04 cfs 28.054 af

Reach 2R: REACH 2 Avg. Flow Depth=1.00' Max Vel=3.88 fps Inflow=94.92 cfs 23.024 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=93.88 cfs 23.024 af

Reach 3R: REACH 3 Avg. Flow Depth=0.41' Max Vel=1.31 fps Inflow=16.74 cfs 7.959 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=16.56 cfs 7.959 af

Pond P1: POND 1 Peak Elev=191.92' Storage=200,163 cf Inflow=93.88 cfs 23.024 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=41.55 cfs 23.023 af

Pond P2: POND 2 Peak Elev=207.66' Storage=103,823 cf Inflow=58.76 cfs 7.482 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0082 '/' Outflow=14.70 cfs 7.472 af

Pond POA C: POA COMBINED Inflow=285.71 cfs 100.309 af
Primary=285.71 cfs 100.309 af

Pond POA NE: POA NORTHEAST Inflow=233.98 cfs 72.255 af
Primary=233.98 cfs 72.255 af

Pond POA NW: POA NORTHWEST Inflow=63.04 cfs 28.054 af
Primary=63.04 cfs 28.054 af

Total Runoff Area = 537.967 ac Runoff Volume = 100.320 af Average Runoff Depth = 2.24"
95.32% Pervious = 512.803 ac 4.68% Impervious = 25.164 ac

PRE-DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond POA NE: POA NORTHEAST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	20.23	20.23	**0.00**	**0.000**
10-YR	85.70	85.70	0.00	0.000
25-YR	157.15	157.15	0.00	0.000
50-YR	**233.98**	**233.98**	0.00	0.000

PRE-DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond POA NW: POA NORTHWEST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	6.36	6.36	**0.00**	**0.000**
10-YR	32.98	32.98	0.00	0.000
25-YR	48.51	48.51	0.00	0.000
50-YR	**63.04**	**63.04**	0.00	0.000

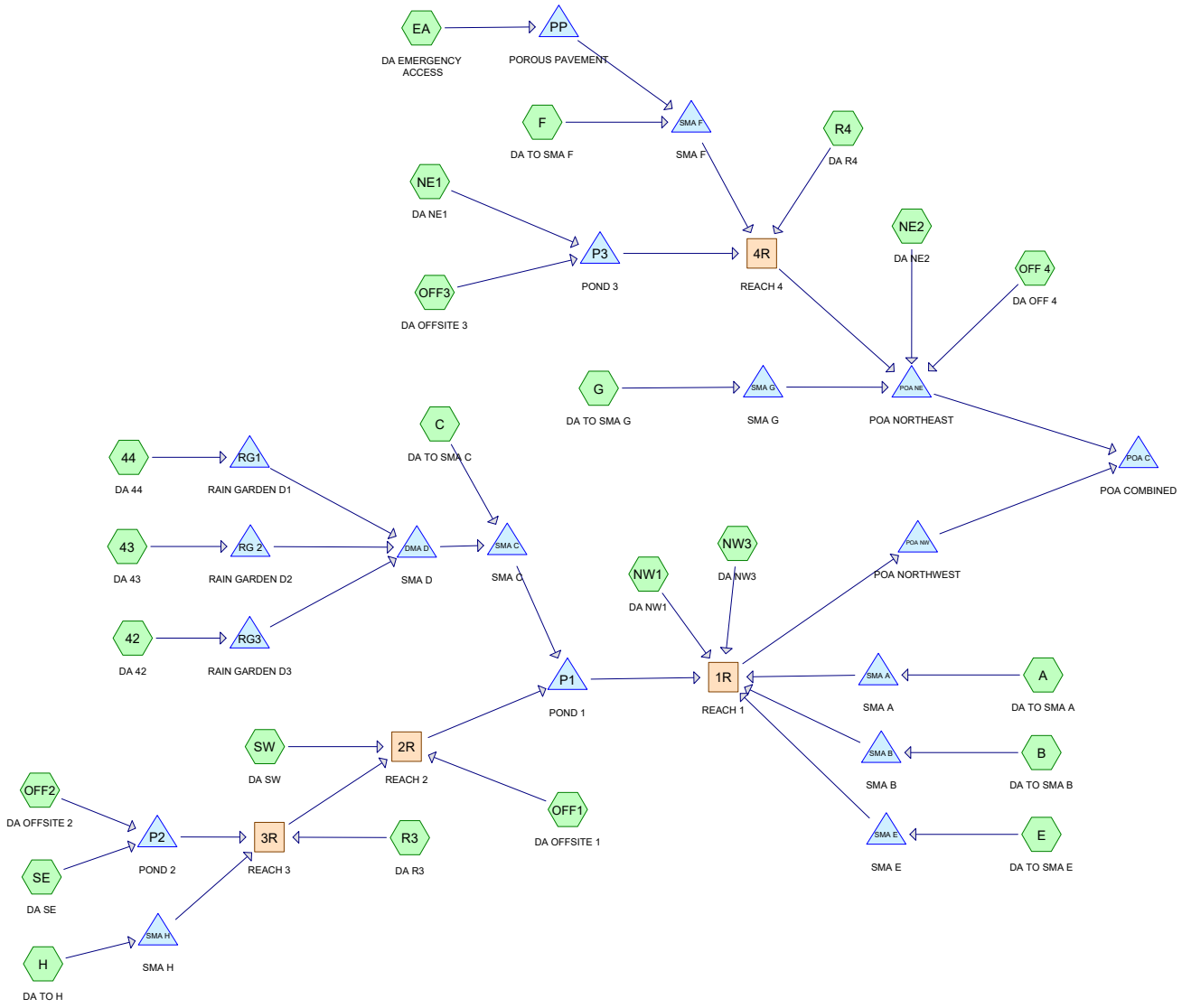
PRE-DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond POA C: POA COMBINED

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	25.30	25.30	**0.00**	**0.000**
10-YR	114.44	114.44	0.00	0.000
25-YR	198.54	198.54	0.00	0.000
50-YR	**285.71**	**285.71**	0.00	0.000

APPENDIX B

POST DEVELOPMENT DRAINAGE CALCULATIONS



Subcat Reach Pond Link

Routing Diagram for POST -DEV
Prepared by Hayner/Swanson, Inc., Printed 6/2/2023
HydroCAD® 10.10-5a s/n 05005 © 2020 HydroCAD Software Solutions LLC

POST -DEV

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	5.60	2

POST -DEV
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
26.091	46	2 acre lots, 12% imp, HSG A (OFF1, OFF3)
45.616	65	2 acre lots, 12% imp, HSG B (OFF1, OFF2, OFF3)
10.394	77	2 acre lots, 12% imp, HSG C (OFF1, OFF3)
2.575	82	2 acre lots, 12% imp, HSG D (OFF1)
23.444	39	>75% Grass cover, Good, HSG A (42, 43, 44, A, B, C, E, EA, F, G, NE1, NE2, NW1, NW3, OFF1, R3, R4, SE, SW)
20.708	61	>75% Grass cover, Good, HSG B (44, A, B, C, E, F, G, H, NE1, NW1, NW3, OFF 4, OFF1, OFF3, R3, R4, SE, SW)
4.097	74	>75% Grass cover, Good, HSG C (C, E, NE1, NW1, NW3, R3, R4, SE, SW)
0.661	80	>75% Grass cover, Good, HSG D (E, NW1, SW)
21.116	96	Gravel surface, HSG A (OFF3)
13.436	96	Gravel surface, HSG B (G, OFF 4, OFF3)
4.248	96	Gravel surface, HSG C (OFF3)
7.422	98	Paved parking, HSG A (42, 43, 44, A, B, C, E, EA, F, G, NW3, OFF1)
7.348	98	Paved parking, HSG B (44, A, B, C, E, G, H, NW3, OFF 4, OFF2, OFF3)
0.289	98	Paved parking, HSG C (C, E, NW3)
1.913	98	Roofs, HSG A (42, 43, 44, A, B, C, E, F, G)
0.783	98	Roofs, HSG B (44, B, C, E, G, H, SE)
0.162	98	Unconnected pavement, HSG A (NW1, R4, SW)
0.050	98	Unconnected pavement, HSG B (B, R4, SE)
1.066	98	Unconnected roofs, HSG A (B, C, E, EA, F, G, NE1, NW1, R3, R4, SE, SW)
0.342	98	Unconnected roofs, HSG B (E, G, NE1, NW1, R4, SW)
6.046	98	Water Surface, HSG D (OFF3)
81.394	30	Woods, Good, HSG A (C, G, NE1, NE2, NW1, OFF1, OFF2, OFF3, R3, R4, SE, SW)
165.660	55	Woods, Good, HSG B (G, NE1, NW1, OFF 4, OFF1, OFF2, OFF3, R3, R4, SE, SW)
77.058	70	Woods, Good, HSG C (NE1, NW1, OFF3, R3, R4, SE, SW)
16.046	77	Woods, Good, HSG D (NE2, OFF1, OFF2, OFF3, SW)
537.967	**60**	**TOTAL AREA**

POST -DEV
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
162.608	HSG A	42, 43, 44, A, B, C, E, EA, F, G, NE1, NE2, NW1, NW3, OFF1, OFF2, OFF3, R3, R4, SE, SW
253.944	HSG B	44, A, B, C, E, F, G, H, NE1, NW1, NW3, OFF 4, OFF1, OFF2, OFF3, R3, R4, SE, SW
96.086	HSG C	C, E, NE1, NW1, NW3, OFF1, OFF3, R3, R4, SE, SW
25.328	HSG D	E, NE2, NW1, OFF1, OFF2, OFF3, SW
0.000	Other	
537.967		**TOTAL AREA**

POST -DEV

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
26.091	45.616	10.394	2.575	0.000	84.676	2 acre lots, 12% imp	OFF1, OFF2, OFF3
23.444	20.708	4.097	0.661	0.000	48.911	>75% Grass cover, Good	42, 43, 44, A, B, C, E, EA, F, G, H, NE1, NE2, NW1, NW3, OFF 4, OFF1, OFF3, R3, R4, SE, SW
21.116	13.436	4.248	0.000	0.000	38.800	Gravel surface	G, OFF 4, OFF3
7.422	7.348	0.289	0.000	0.000	15.059	Paved parking	42, 43, 44, A, B, C, E, EA, F, G, H, NW3, OFF 4, OFF1, OFF2, OFF3
1.913	0.783	0.000	0.000	0.000	2.696	Roofs	42, 43, 44, A, B, C, E, F, G, H, SE
0.162	0.050	0.000	0.000	0.000	0.212	Unconnected pavement	B, NW1, R4, SE, SW
1.066	0.342	0.000	0.000	0.000	1.408	Unconnected roofs	B, C, E, EA, F, G, NE1, NW1, R3, R4, SE, SW
0.000	0.000	0.000	6.046	0.000	6.046	Water Surface	OFF3
81.394	165.660	77.058	16.046	0.000	340.159	Woods, Good	C, G, NE1, NE2, NW1, OFF 4,

POST -DEV

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
162.608	**253.944**	**96.086**	**25.328**	**0.000**	**537.967**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=43,868 sf 57.08% Impervious Runoff Depth=2.76"
Tc=6.0 min CN=73 Runoff=3.25 cfs 0.232 af

Subcatchment 43: DA 43 Runoff Area=42,271 sf 61.07% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=75 Runoff=3.35 cfs 0.238 af

Subcatchment 44: DA 44 Runoff Area=56,504 sf 68.56% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=81 Runoff=5.34 cfs 0.381 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=2.06"
Tc=6.4 min CN=65 Runoff=2.38 cfs 0.177 af

Subcatchment B: DA TO SMA B Runoff Area=217,870 sf 33.06% Impervious Runoff Depth=2.06"
Tc=7.4 min CN=65 Runoff=11.17 cfs 0.861 af

Subcatchment C: DA TO SMA C Runoff Area=178,544 sf 31.74% Impervious Runoff Depth=1.51"
Tc=7.5 min CN=58 Runoff=6.24 cfs 0.517 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=2.67"
Tc=7.7 min CN=72 Runoff=27.29 cfs 2.067 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=1.02"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.39 cfs 0.036 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=1.98"
Tc=6.1 min CN=64 Runoff=2.90 cfs 0.215 af

Subcatchment G: DA TO SMA G Runoff Area=371,288 sf 27.10% Impervious Runoff Depth=2.23"
Tc=7.1 min CN=67 Runoff=21.02 cfs 1.586 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=3.42"
Tc=6.5 min CN=80 Runoff=5.25 cfs 0.380 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=1.67"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=16.27 cfs 1.485 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=471' Tc=17.0 min CN=58 Runoff=5.23 cfs 0.574 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=1.74"
Flow Length=1,911' Tc=44.0 min CN=61 Runoff=9.21 cfs 1.491 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=2.85"
Tc=6.0 min CN=74 Runoff=3.66 cfs 0.260 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=3.42"
Tc=6.0 min CN=80 Runoff=12.84 cfs 0.915 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.15"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=40.65 cfs 7.752 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=1.59"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=29.33 cfs 2.994 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=1.67"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=151.04 cfs 46.913 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=1.74"
Flow Length=210' Tc=9.0 min CN=61 Runoff=6.37 cfs 0.537 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=1.22"
Flow Length=297' Tc=11.5 min UI Adjusted CN=54 Runoff=3.05 cfs 0.313 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=1.67"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=11.74 cfs 1.625 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=1.59"
Flow Length=457' Tc=15.5 min CN=59 Runoff=17.74 cfs 1.856 af

Reach 1R: REACH 1 Avg. Flow Depth=0.93' Max Vel=1.96 fps Inflow=43.20 cfs 19.995 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=43.09 cfs 19.991 af

Reach 2R: REACH 2 Avg. Flow Depth=0.90' Max Vel=3.64 fps Inflow=73.88 cfs 14.762 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=72.70 cfs 14.762 af

Reach 3R: REACH 3 Avg. Flow Depth=0.52' Max Vel=1.50 fps Inflow=28.64 cfs 5.155 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=28.15 cfs 5.155 af

Reach 4R: REACH 4 Avg. Flow Depth=1.32' Max Vel=3.37 fps Inflow=153.42 cfs 48.745 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=153.34 cfs 48.745 af

Pond DMA D: SMA D Peak Elev=209.20' Storage=4,233 cf Inflow=10.05 cfs 0.432 af
Discarded=0.58 cfs 0.249 af Primary=8.13 cfs 0.183 af Outflow=8.71 cfs 0.432 af

Pond P1: POND 1 Peak Elev=191.36' Storage=117,787 cf Inflow=73.61 cfs 15.455 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=36.44 cfs 15.454 af

Pond P2: POND 2 Peak Elev=204.41' Storage=28,530 cf Inflow=36.27 cfs 4.619 af
Outflow=26.54 cfs 4.618 af

Pond P3: POND 3 Peak Elev=195.71' Storage=1,081 cf Inflow=152.99 cfs 48.398 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=152.98 cfs 48.397 af

Pond POA C: POA COMBINED Inflow=196.44 cfs 70.225 af
Primary=196.44 cfs 70.225 af

Pond POA NE: POA NORTHEAST Inflow=155.02 cfs 50.234 af
Primary=155.02 cfs 50.234 af

Pond POA NW: POA NORTHWEST Inflow=43.09 cfs 19.991 af
Primary=43.09 cfs 19.991 af

Pond PP: POROUS PAVEMENT Peak Elev=191.27' Storage=0.008 af Inflow=0.39 cfs 0.036 af
Discarded=0.08 cfs 0.036 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.036 af

Pond RG 2: RAIN GARDEN D2 Peak Elev=210.48' Storage=1,584 cf Inflow=3.35 cfs 0.238 af
Discarded=0.25 cfs 0.151 af Primary=2.86 cfs 0.087 af Outflow=3.11 cfs 0.238 af

Pond RG1: RAIN GARDEN D1 Peak Elev=212.59' Storage=759 cf Inflow=5.34 cfs 0.381 af
Discarded=0.14 cfs 0.117 af Primary=5.12 cfs 0.263 af Outflow=5.25 cfs 0.381 af

Pond RG3: RAIN GARDEN D3 Peak Elev=209.03' Storage=2,517 cf Inflow=3.25 cfs 0.232 af
Discarded=0.40 cfs 0.150 af Primary=2.76 cfs 0.082 af Outflow=2.84 cfs 0.232 af

Pond SMA A: SMA A Peak Elev=192.00' Storage=3,255 cf Inflow=2.38 cfs 0.177 af
Discarded=0.20 cfs 0.177 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.177 af

Pond SMA B: SMA B Peak Elev=189.84' Storage=117,144 cf Inflow=11.17 cfs 0.861 af
Outflow=0.63 cfs 0.828 af

Pond SMA C: SMA C Peak Elev=196.10' Storage=80,095 cf Inflow=14.25 cfs 0.700 af
Outflow=0.95 cfs 0.692 af

Pond SMA E: SMA E Peak Elev=194.15' Storage=219,337 cf Inflow=27.29 cfs 2.067 af
Outflow=1.35 cfs 1.962 af

Pond SMA F: SMA F Peak Elev=194.58' Storage=2,382 cf Inflow=2.90 cfs 0.215 af
Discarded=0.29 cfs 0.179 af Primary=1.23 cfs 0.035 af Outflow=1.52 cfs 0.215 af

Pond SMA G: SMA G Peak Elev=198.66' Storage=30,811 cf Inflow=21.02 cfs 1.586 af
Discarded=1.86 cfs 1.586 af Primary=0.00 cfs 0.000 af Outflow=1.86 cfs 1.586 af

Pond SMA H: SMA H Peak Elev=208.97' Storage=7,682 cf Inflow=5.25 cfs 0.380 af
Discarded=0.36 cfs 0.380 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.380 af

Total Runoff Area = 537.967 ac Runoff Volume = 73.402 af Average Runoff Depth = 1.64"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Summary for Subcatchment 42: DA 42

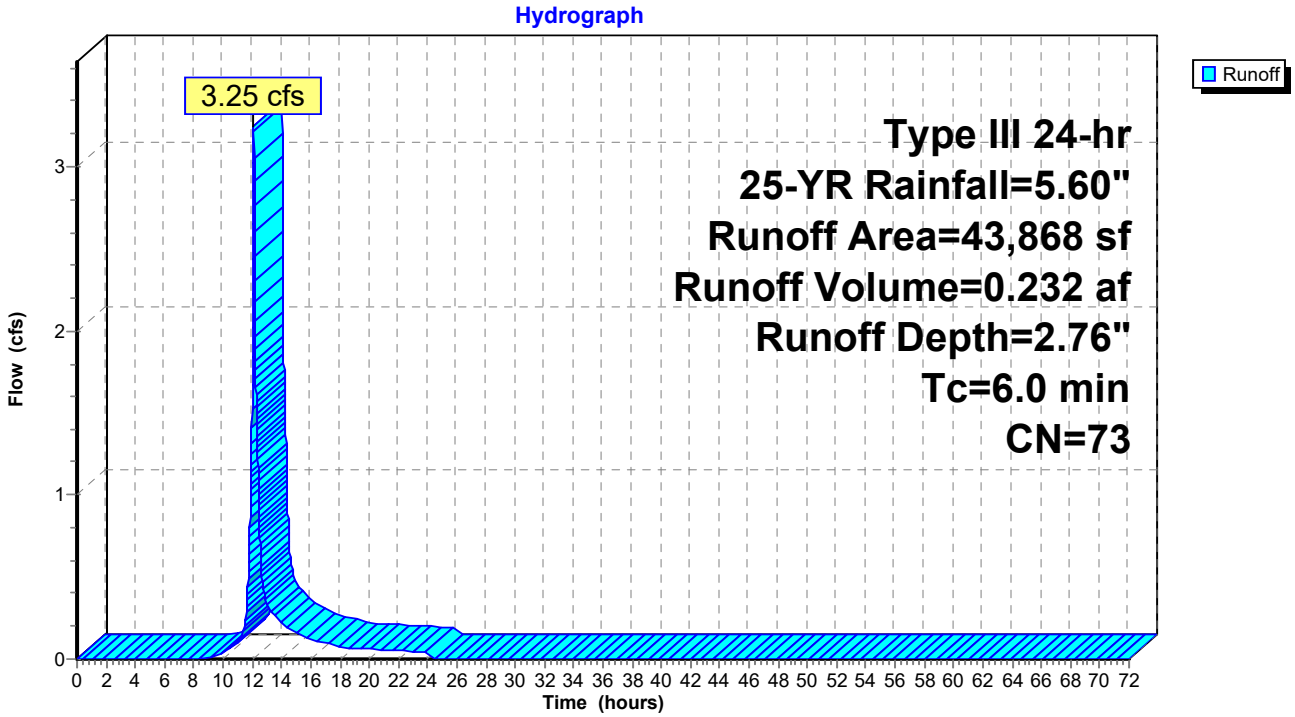
Runoff = 3.25 cfs @ 12.09 hrs, Volume= 0.232 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
16,619	98	Paved parking, HSG A
18,828	39	>75% Grass cover, Good, HSG A
8,421	98	Roofs, HSG A
43,868	73	Weighted Average
18,828		42.92% Pervious Area
25,040		57.08% Impervious Area

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

Subcatchment 42: DA 42



Summary for Subcatchment 43: DA 43

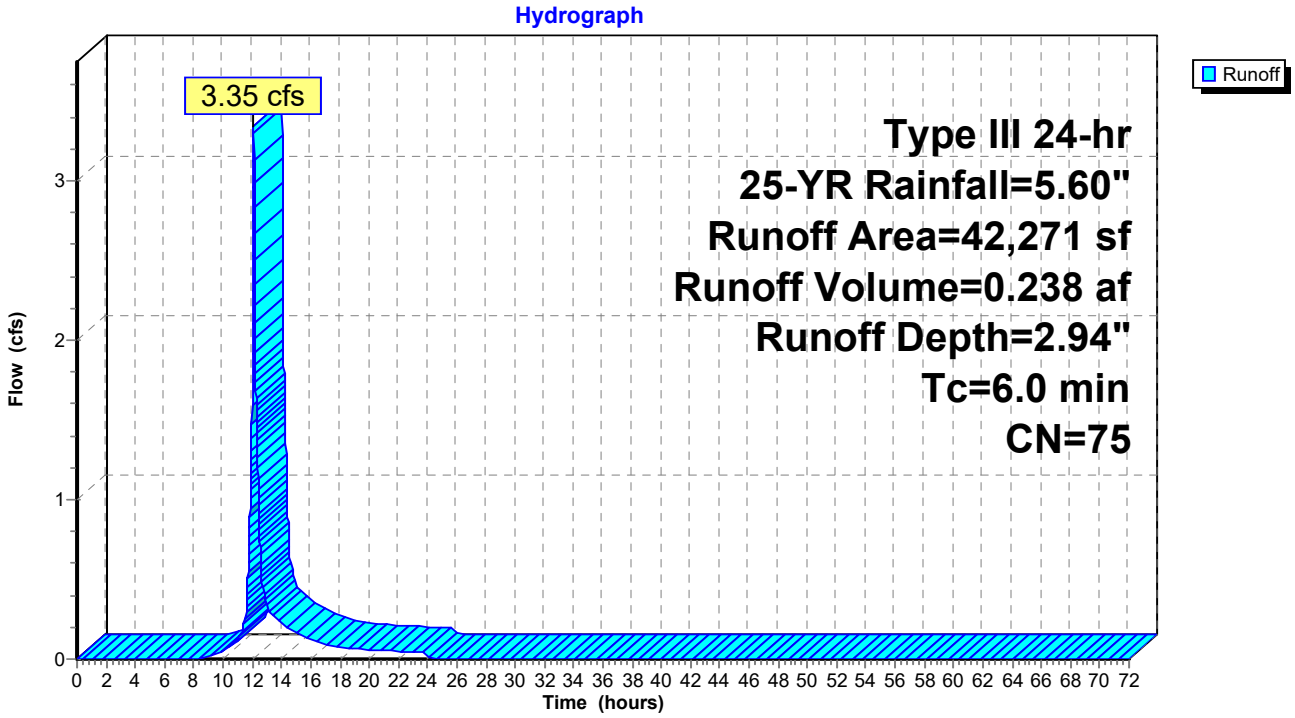
Runoff = 3.35 cfs @ 12.09 hrs, Volume= 0.238 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
17,522	98	Paved parking, HSG A
16,455	39	>75% Grass cover, Good, HSG A
8,294	98	Roofs, HSG A
42,271	75	Weighted Average
16,455		38.93% Pervious Area
25,816		61.07% Impervious Area

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

Subcatchment 43: DA 43



Summary for Subcatchment 44: DA 44

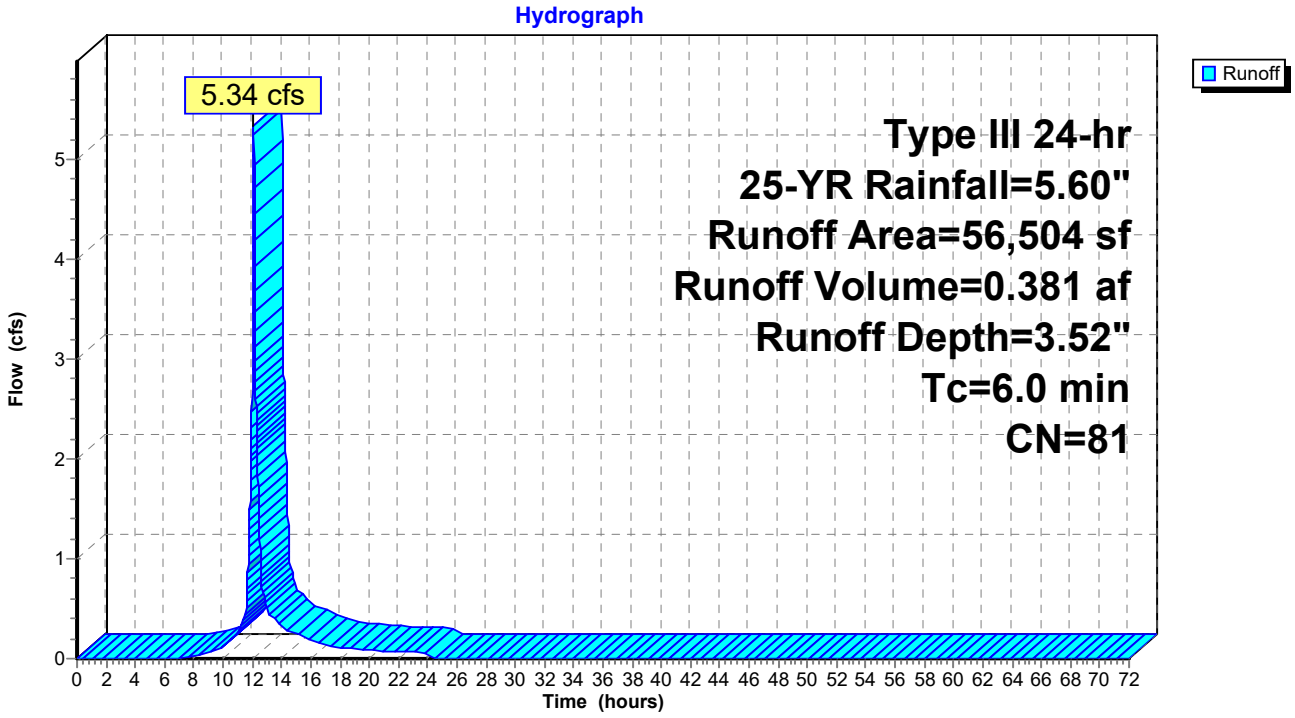
Runoff = 5.34 cfs @ 12.09 hrs, Volume= 0.381 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
22,880	98	Paved parking, HSG A
14,918	39	>75% Grass cover, Good, HSG A
9,693	98	Roofs, HSG A
3,725	98	Paved parking, HSG B
2,846	61	>75% Grass cover, Good, HSG B
2,442	98	Roofs, HSG B
56,504	81	Weighted Average
17,764		31.44% Pervious Area
38,740		68.56% Impervious Area

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

Subcatchment 44: DA 44



Summary for Subcatchment A: DA TO SMA A

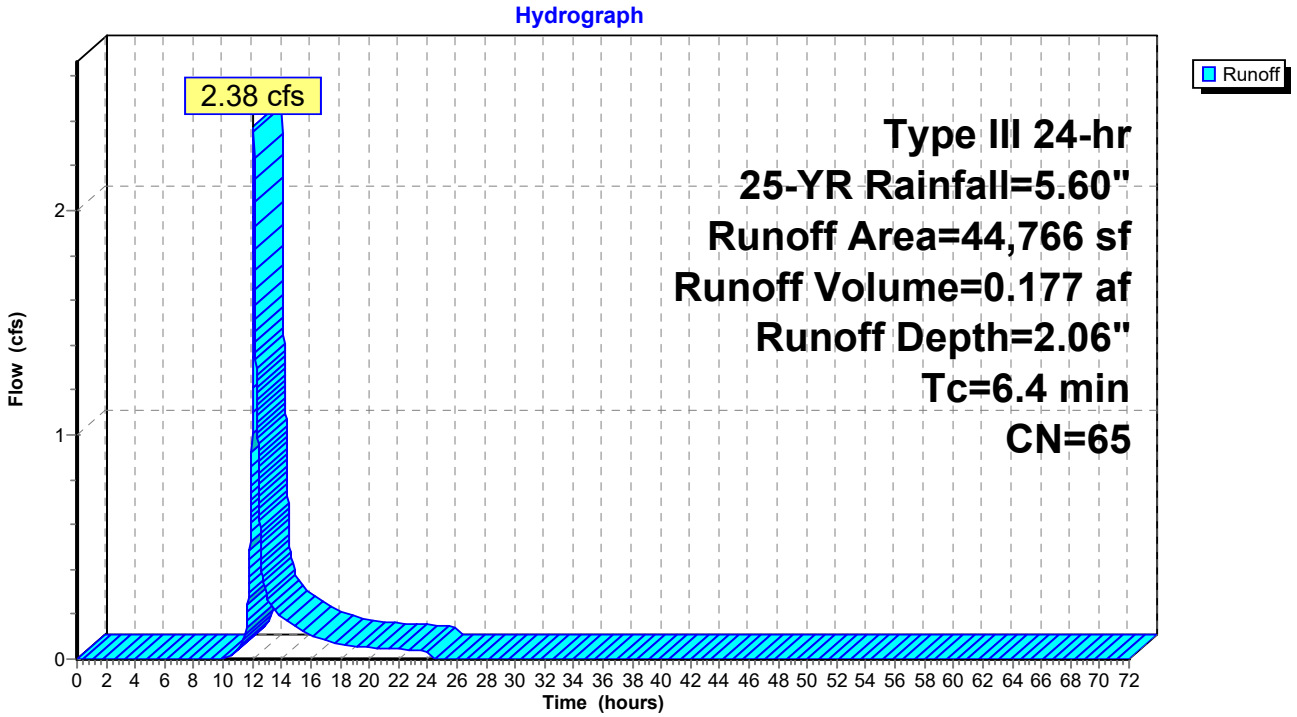
Runoff = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
13,423	98	Paved parking, HSG A
24,647	39	>75% Grass cover, Good, HSG A
4,211	98	Roofs, HSG A
1,929	98	Paved parking, HSG B
556	61	>75% Grass cover, Good, HSG B
44,766	65	Weighted Average
25,203		56.30% Pervious Area
19,563		43.70% Impervious Area

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

Subcatchment A: DA TO SMA A



Summary for Subcatchment B: DA TO SMA B

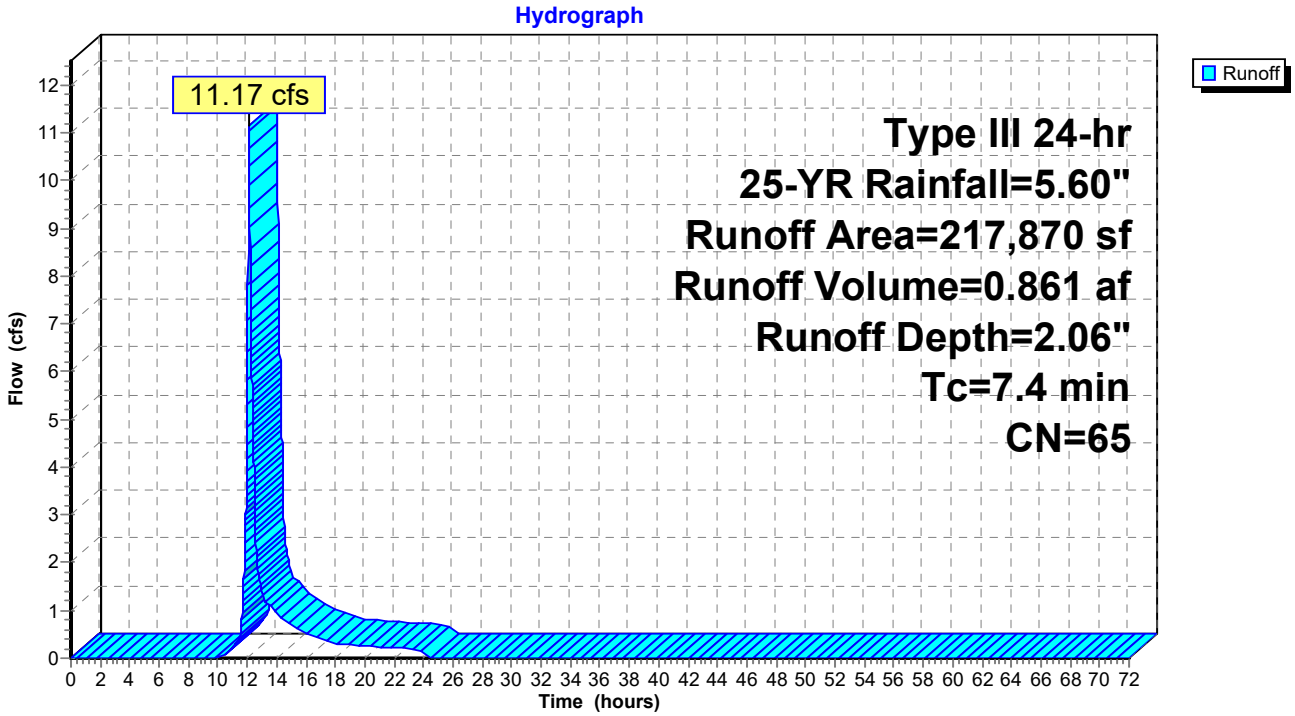
Runoff = 11.17 cfs @ 12.11 hrs, Volume= 0.861 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
39,403	98	Paved parking, HSG A
78,247	39	>75% Grass cover, Good, HSG A
4,782	98	Roofs, HSG A
3,020	98	Unconnected roofs, HSG A
19,543	98	Paved parking, HSG B
67,593	61	>75% Grass cover, Good, HSG B
4,217	98	Roofs, HSG B
1,065	98	Unconnected pavement, HSG B
217,870	65	Weighted Average
145,840		66.94% Pervious Area
72,030		33.06% Impervious Area
4,085		5.67% Unconnected

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

Subcatchment B: DA TO SMA B



Summary for Subcatchment C: DA TO SMA C

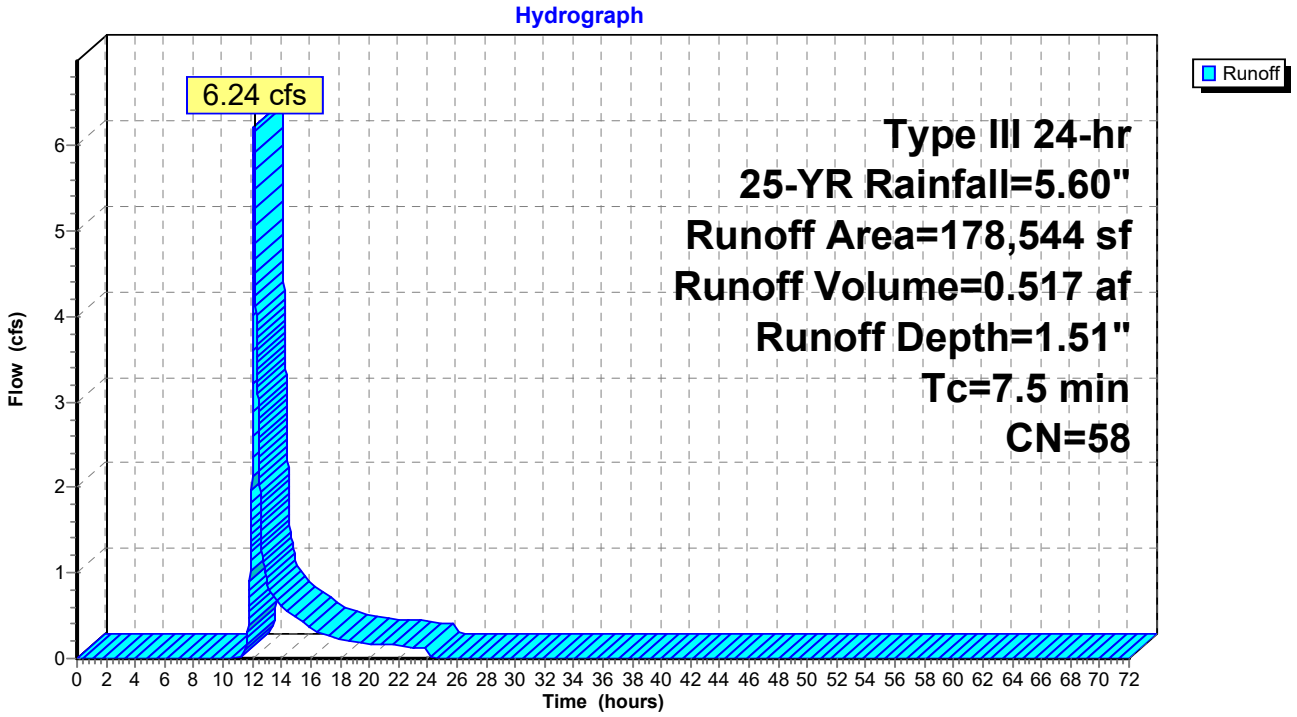
Runoff = 6.24 cfs @ 12.12 hrs, Volume= 0.517 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
34,761	98	Paved parking, HSG A
103,455	39	>75% Grass cover, Good, HSG A
9,496	98	Roofs, HSG A
5,358	98	Unconnected roofs, HSG A
1,350	98	Paved parking, HSG B
6,264	61	>75% Grass cover, Good, HSG B
218	98	Roofs, HSG B
0	98	Unconnected roofs, HSG B
5,489	98	Paved parking, HSG C
2,178	74	>75% Grass cover, Good, HSG C
9,975	30	Woods, Good, HSG A
178,544	58	Weighted Average
121,872		68.26% Pervious Area
56,672		31.74% Impervious Area
5,358		9.45% Unconnected

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

Subcatchment C: DA TO SMA C



Summary for Subcatchment E: DA TO SMA E

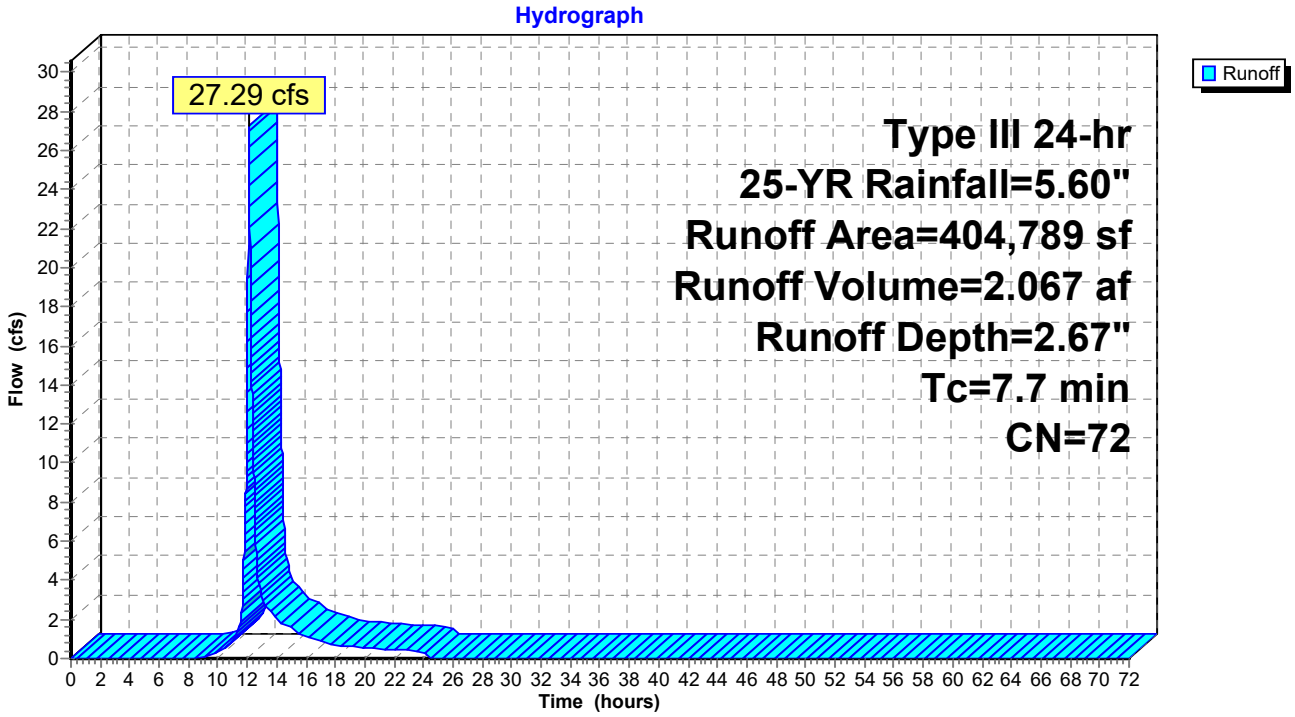
Runoff = 27.29 cfs @ 12.11 hrs, Volume= 2.067 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
73,877	98	Paved parking, HSG A
99,146	39	>75% Grass cover, Good, HSG A
23,409	98	Roofs, HSG A
2,985	98	Unconnected roofs, HSG A
50,502	98	Paved parking, HSG B
113,548	61	>75% Grass cover, Good, HSG B
12,150	98	Roofs, HSG B
3,194	98	Unconnected roofs, HSG B
469	98	Paved parking, HSG C
225	74	>75% Grass cover, Good, HSG C
25,284	80	>75% Grass cover, Good, HSG D
404,789	72	Weighted Average
238,203		58.85% Pervious Area
166,586		41.15% Impervious Area
6,179		3.71% Unconnected

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

Subcatchment E: DA TO SMA E



Summary for Subcatchment EA: DA EMERGENCY ACCESS

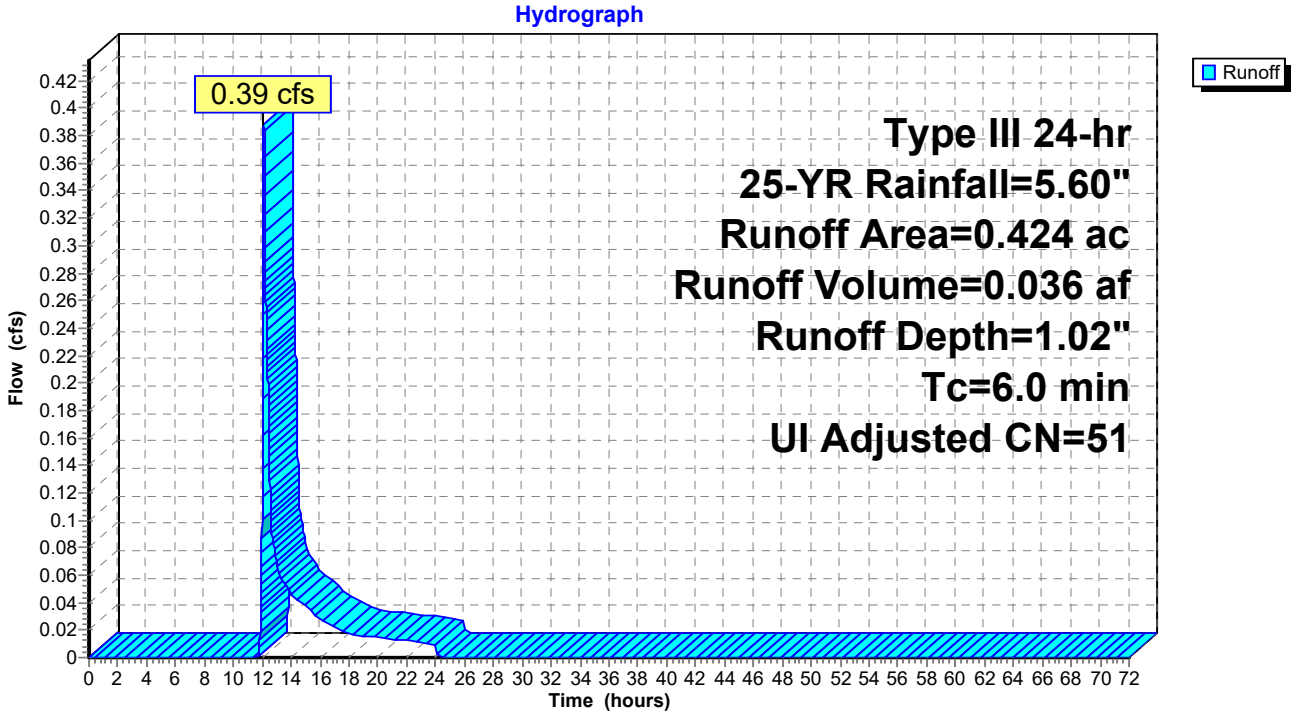
Runoff = 0.39 cfs @ 12.11 hrs, Volume= 0.036 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.010	98		Unconnected roofs, HSG A
0.082	98		Paved parking, HSG A
0.332	39		>75% Grass cover, Good, HSG A
0.424	52	51	Weighted Average, UI Adjusted
0.332			78.30% Pervious Area
0.092			21.70% Impervious Area
0.010			10.87% Unconnected

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

Subcatchment EA: DA EMERGENCY ACCESS



Summary for Subcatchment F: DA TO SMA F

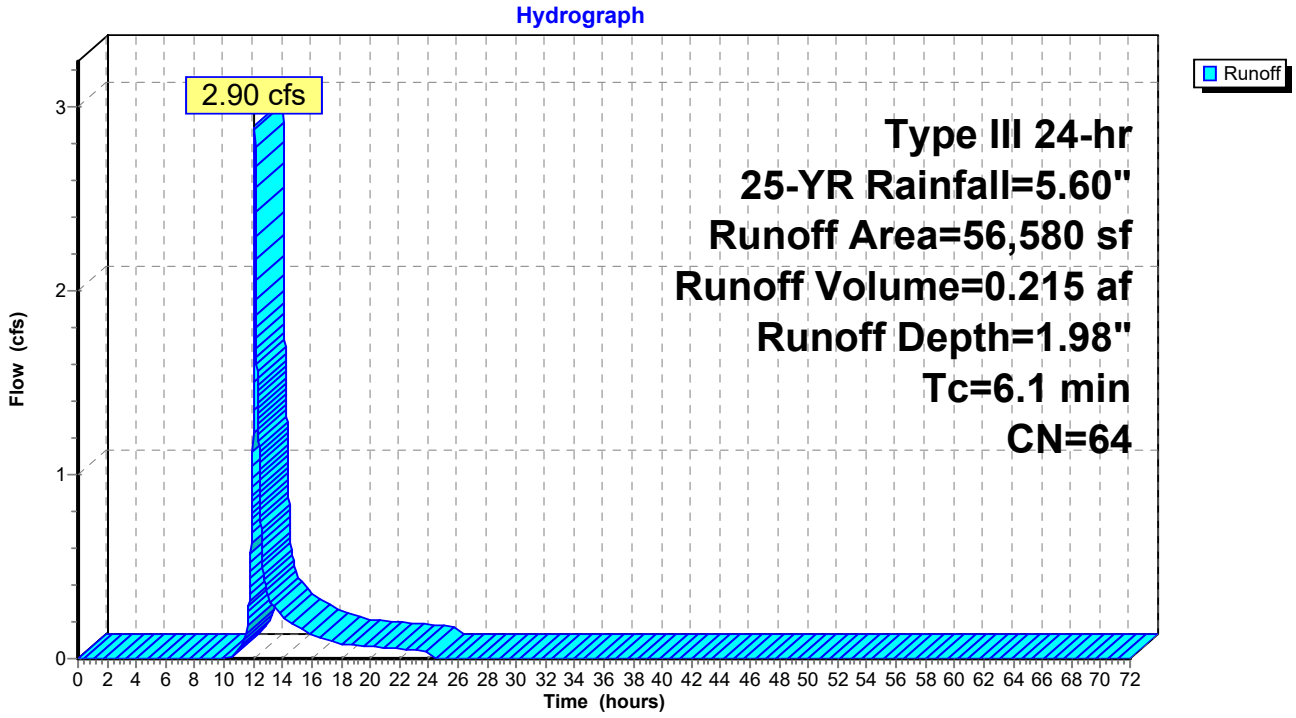
Runoff = 2.90 cfs @ 12.10 hrs, Volume= 0.215 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
15,117	98	Paved parking, HSG A
31,182	39	>75% Grass cover, Good, HSG A
6,199	98	Roofs, HSG A
2,261	98	Unconnected roofs, HSG A
1,821	61	>75% Grass cover, Good, HSG B
56,580	64	Weighted Average
33,003		58.33% Pervious Area
23,577		41.67% Impervious Area
2,261		9.59% Unconnected

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

Subcatchment F: DA TO SMA F



Summary for Subcatchment G: DA TO SMA G

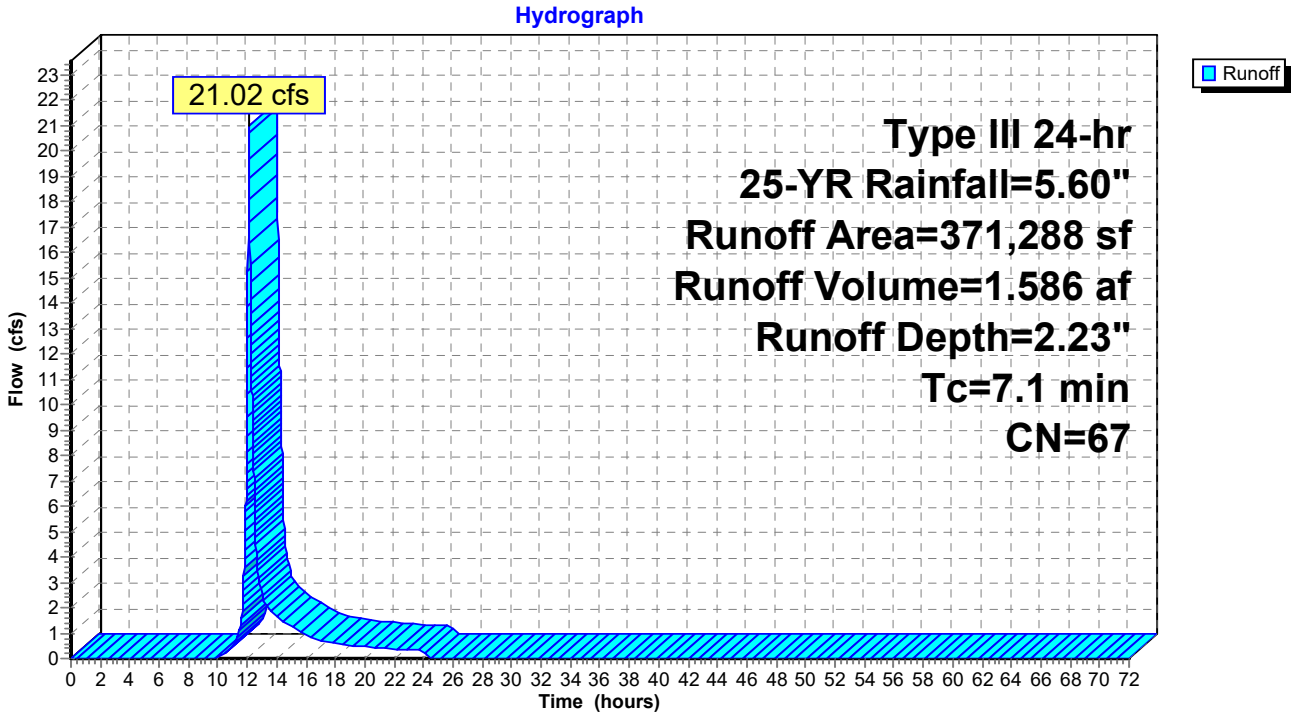
Runoff = 21.02 cfs @ 12.11 hrs, Volume= 1.586 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
28,348	98	Paved parking, HSG A
81,083	39	>75% Grass cover, Good, HSG A
8,808	98	Roofs, HSG A
3,729	98	Unconnected roofs, HSG A
27,781	98	Paved parking, HSG B
106,117	61	>75% Grass cover, Good, HSG B
4,403	98	Roofs, HSG B
482	98	Unconnected roofs, HSG B
13,765	30	Woods, Good, HSG A
8,192	55	Woods, Good, HSG B
11,930	96	Gravel surface, HSG B
27,050	98	Paved parking, HSG B
13,053	96	Gravel surface, HSG B
30,987	61	>75% Grass cover, Good, HSG B
5,560	55	Woods, Good, HSG B
371,288	67	Weighted Average
270,687		72.90% Pervious Area
100,601		27.10% Impervious Area
4,211		4.19% Unconnected

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

Subcatchment G: DA TO SMA G



Summary for Subcatchment H: DA TO H

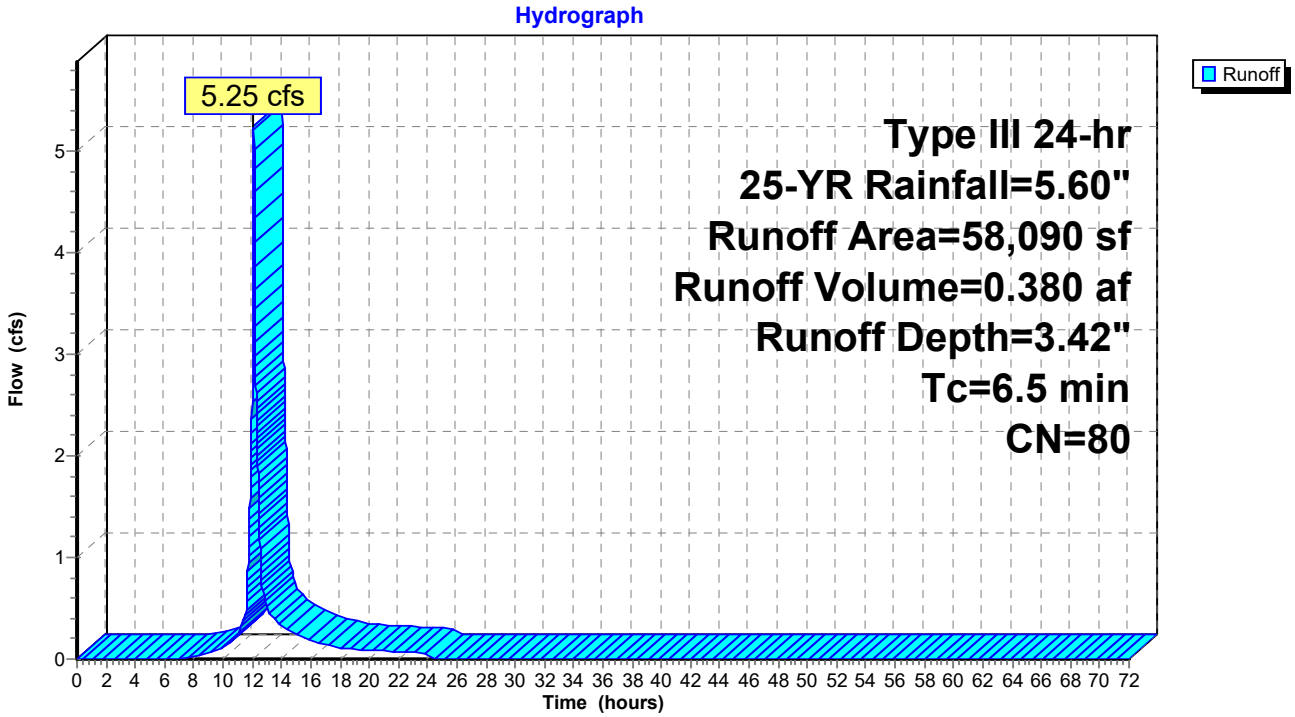
Runoff = 5.25 cfs @ 12.09 hrs, Volume= 0.380 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
21,652	98	Paved parking, HSG B
28,016	61	>75% Grass cover, Good, HSG B
8,422	98	Roofs, HSG B
58,090	80	Weighted Average
28,016		48.23% Pervious Area
30,074		51.77% Impervious Area

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

Subcatchment H: DA TO H



Summary for Subcatchment NE1: DA NE1

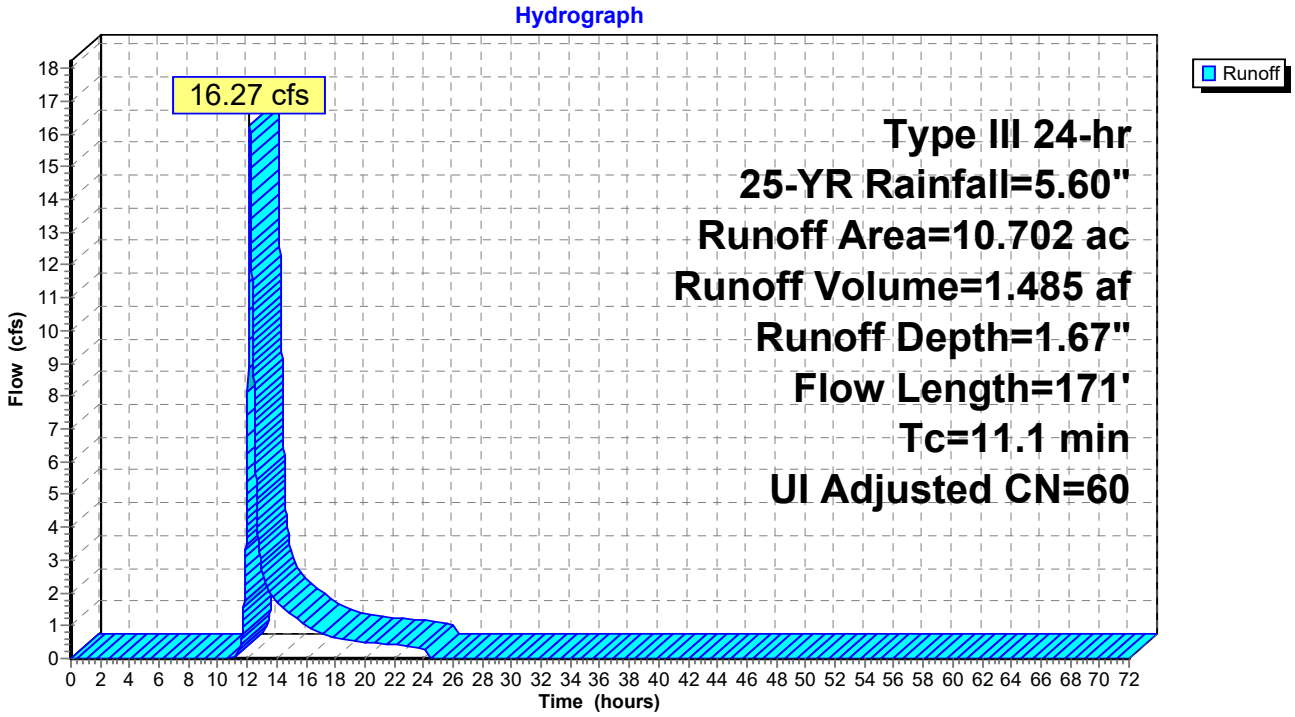
Runoff = 16.27 cfs @ 12.17 hrs, Volume= 1.485 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.145	30		Woods, Good, HSG A
3.645	55		Woods, Good, HSG B
3.253	70		Woods, Good, HSG C
0.805	39		>75% Grass cover, Good, HSG A
2.322	61		>75% Grass cover, Good, HSG B
0.263	74		>75% Grass cover, Good, HSG C
0.096	98		Unconnected roofs, HSG A
0.173	98		Unconnected roofs, HSG B
10.702	61	60	Weighted Average, UI Adjusted
10.433			97.49% Pervious Area
0.269			2.51% Impervious Area
0.269			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0450	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
1.8	121	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	171	Total			

Subcatchment NE1: DA NE1



Summary for Subcatchment NE2: DA NE2

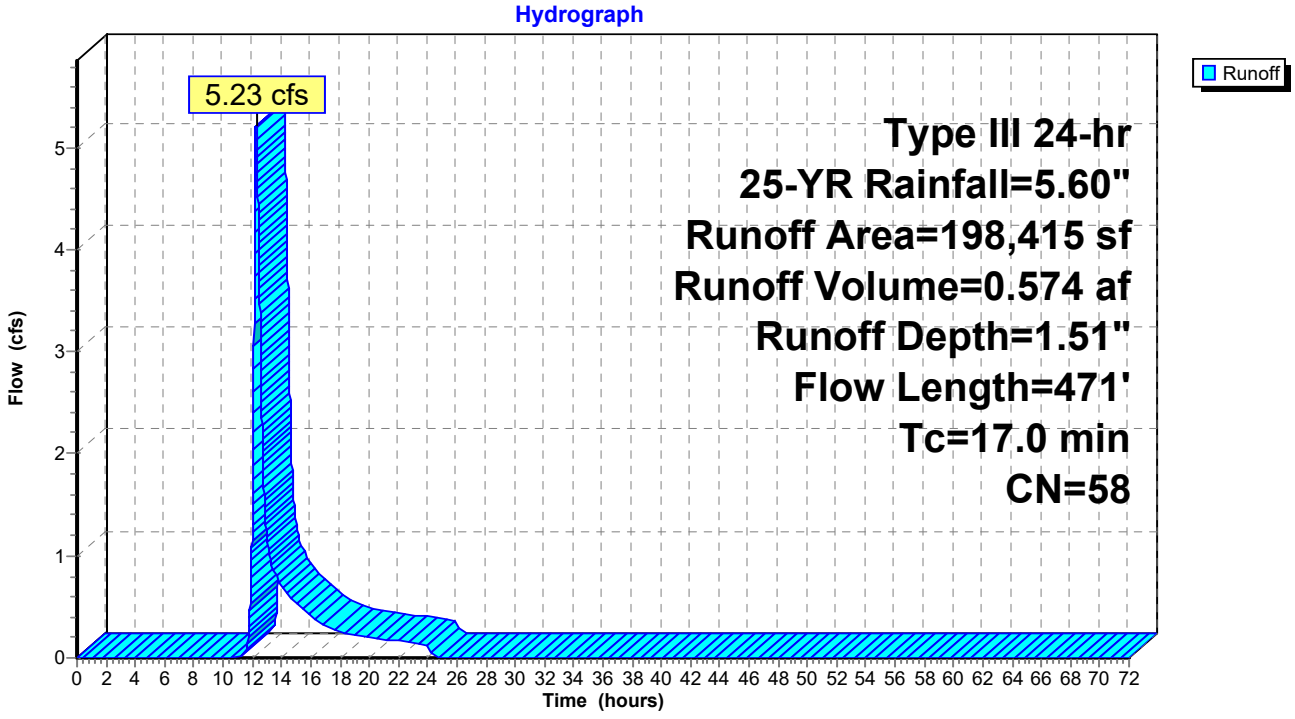
Runoff = 5.23 cfs @ 12.26 hrs, Volume= 0.574 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
115,990	77	Woods, Good, HSG D
68,591	30	Woods, Good, HSG A
13,834	39	>75% Grass cover, Good, HSG A
198,415	58	Weighted Average
198,415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0360	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
6.8	421	0.0430	1.04		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	471	Total			

Subcatchment NE2: DA NE2



Summary for Subcatchment NW1: DA NW1

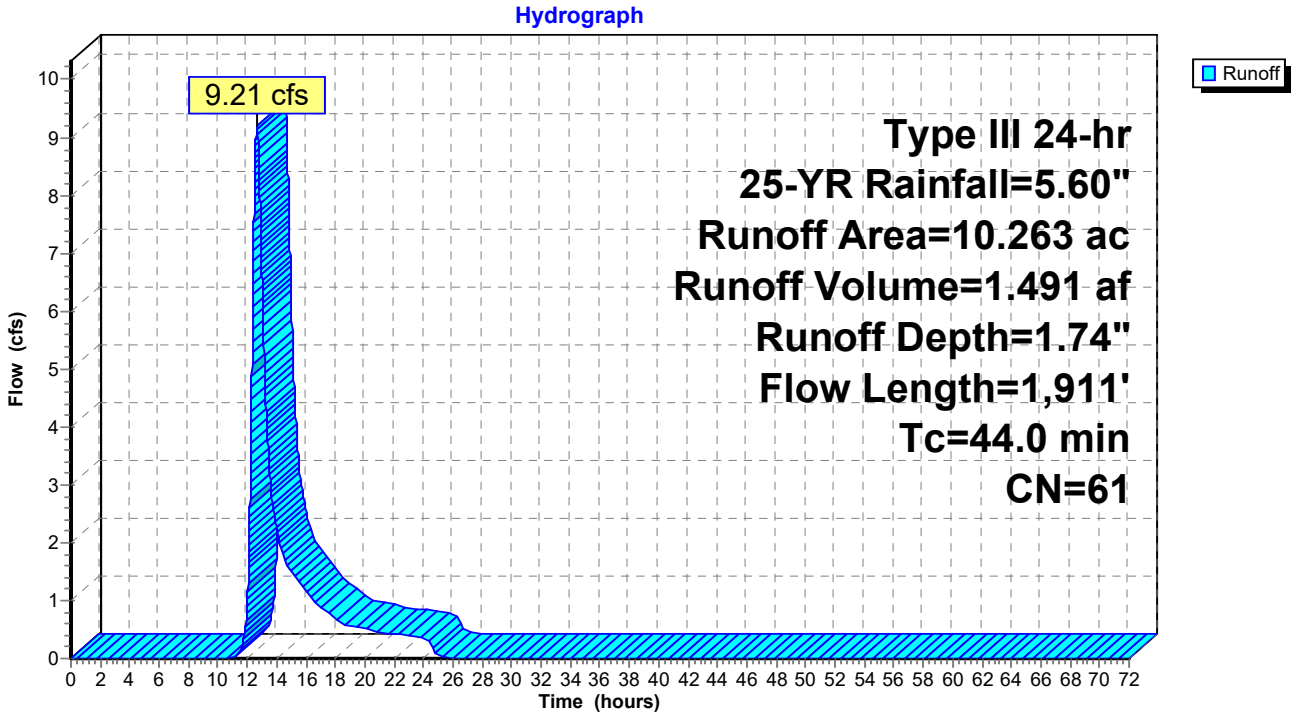
Runoff = 9.21 cfs @ 12.66 hrs, Volume= 1.491 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
2.521	39	>75% Grass cover, Good, HSG A
0.447	55	Woods, Good, HSG B
1.631	61	>75% Grass cover, Good, HSG B
3.945	70	Woods, Good, HSG C
1.419	74	>75% Grass cover, Good, HSG C
0.030	80	>75% Grass cover, Good, HSG D
0.174	98	Unconnected roofs, HSG A
0.006	98	Unconnected roofs, HSG B
0.040	98	Unconnected pavement, HSG A
10.263	61	Weighted Average
10.043		97.86% Pervious Area
0.220		2.14% Impervious Area
0.220		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0680	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
2.3	180	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,681	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
44.0	1,911	Total			

Subcatchment NW1: DA NW1



Summary for Subcatchment NW3: DA NW3

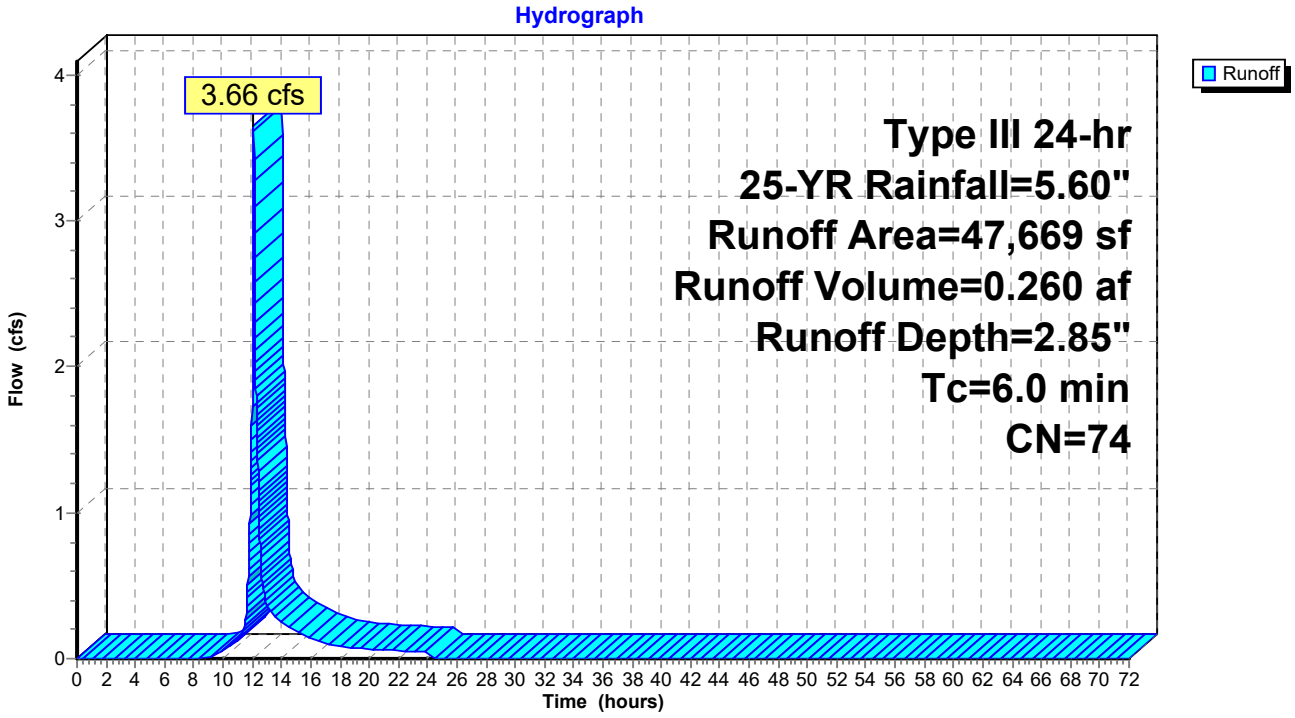
Runoff = 3.66 cfs @ 12.09 hrs, Volume= 0.260 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
11,228	39	>75% Grass cover, Good, HSG A
8,533	98	Paved parking, HSG A
3,448	98	Paved parking, HSG B
5,271	61	>75% Grass cover, Good, HSG B
6,625	98	Paved parking, HSG C
12,564	74	>75% Grass cover, Good, HSG C
47,669	74	Weighted Average
29,063		60.97% Pervious Area
18,606		39.03% Impervious Area

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

Subcatchment NW3: DA NW3



Summary for Subcatchment OFF 4: DA OFF 4

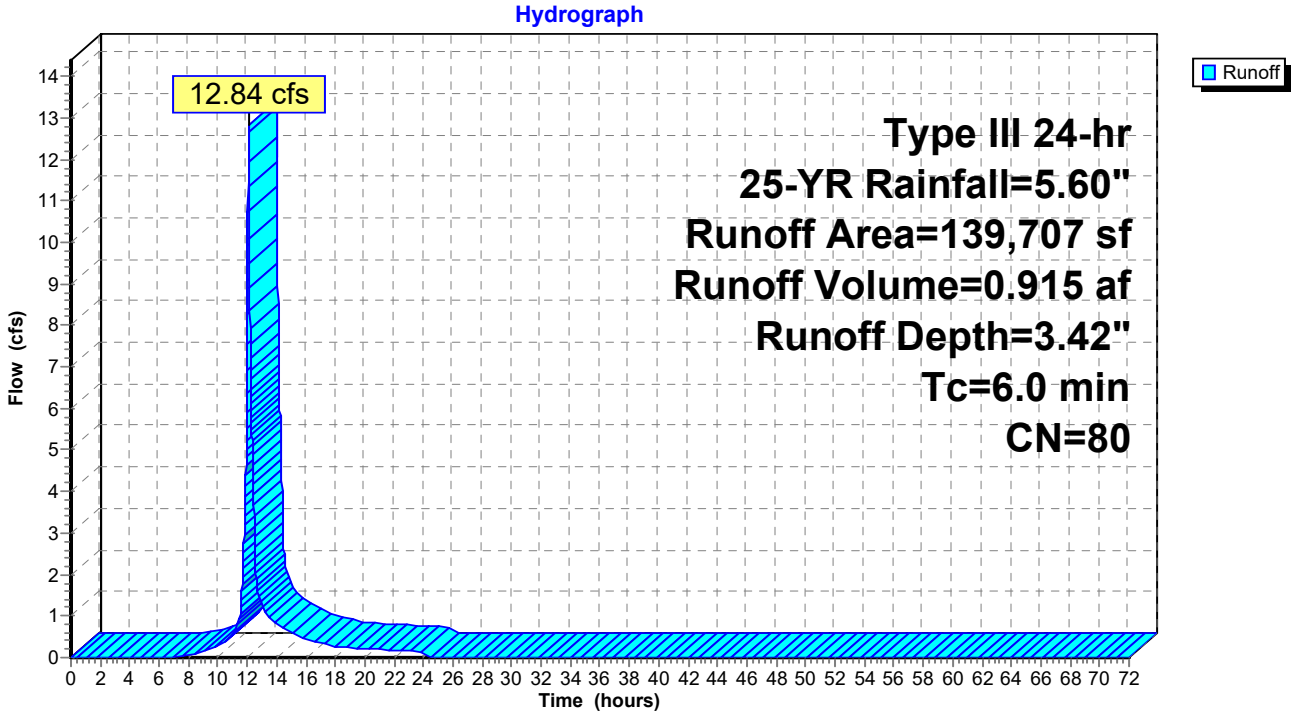
Runoff = 12.84 cfs @ 12.09 hrs, Volume= 0.915 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
32,879	61	>75% Grass cover, Good, HSG B
70,234	98	Paved parking, HSG B
7,602	96	Gravel surface, HSG B
28,992	55	Woods, Good, HSG B
139,707	80	Weighted Average
69,473		49.73% Pervious Area
70,234		50.27% Impervious Area

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

Subcatchment OFF 4: DA OFF 4



Summary for Subcatchment OFF1: DA OFFSITE 1

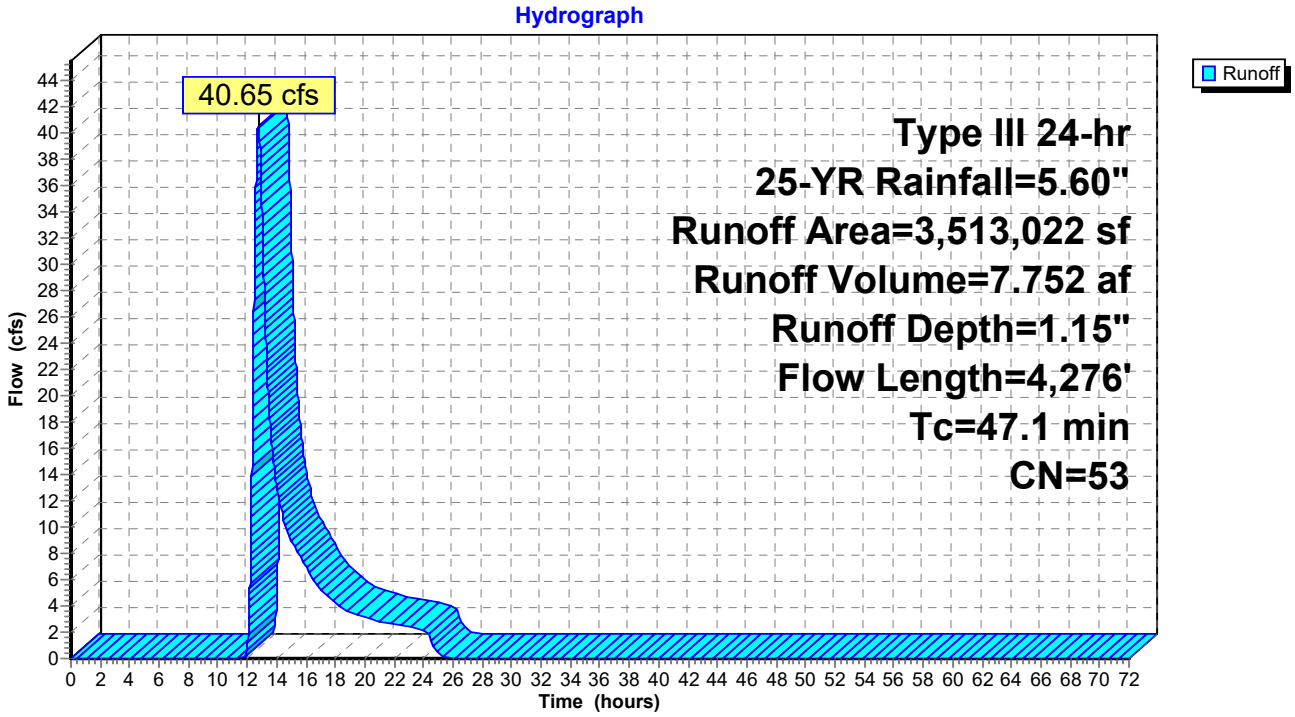
Runoff = 40.65 cfs @ 12.76 hrs, Volume= 7.752 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
605,170	46	2 acre lots, 12% imp, HSG A
995,464	65	2 acre lots, 12% imp, HSG B
173,809	77	2 acre lots, 12% imp, HSG C
112,172	82	2 acre lots, 12% imp, HSG D
897,227	30	Woods, Good, HSG A
305,263	55	Woods, Good, HSG B
208,972	77	Woods, Good, HSG D
117,815	39	>75% Grass cover, Good, HSG A
47,873	61	>75% Grass cover, Good, HSG B
49,257	98	Paved parking, HSG A
3,513,022	53	Weighted Average
3,237,371		92.15% Pervious Area
275,651		7.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0800	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
39.7	4,226	0.1260	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
47.1	4,276	Total			

Subcatchment OFF1: DA OFFSITE 1



Summary for Subcatchment OFF2: DA OFFSITE 2

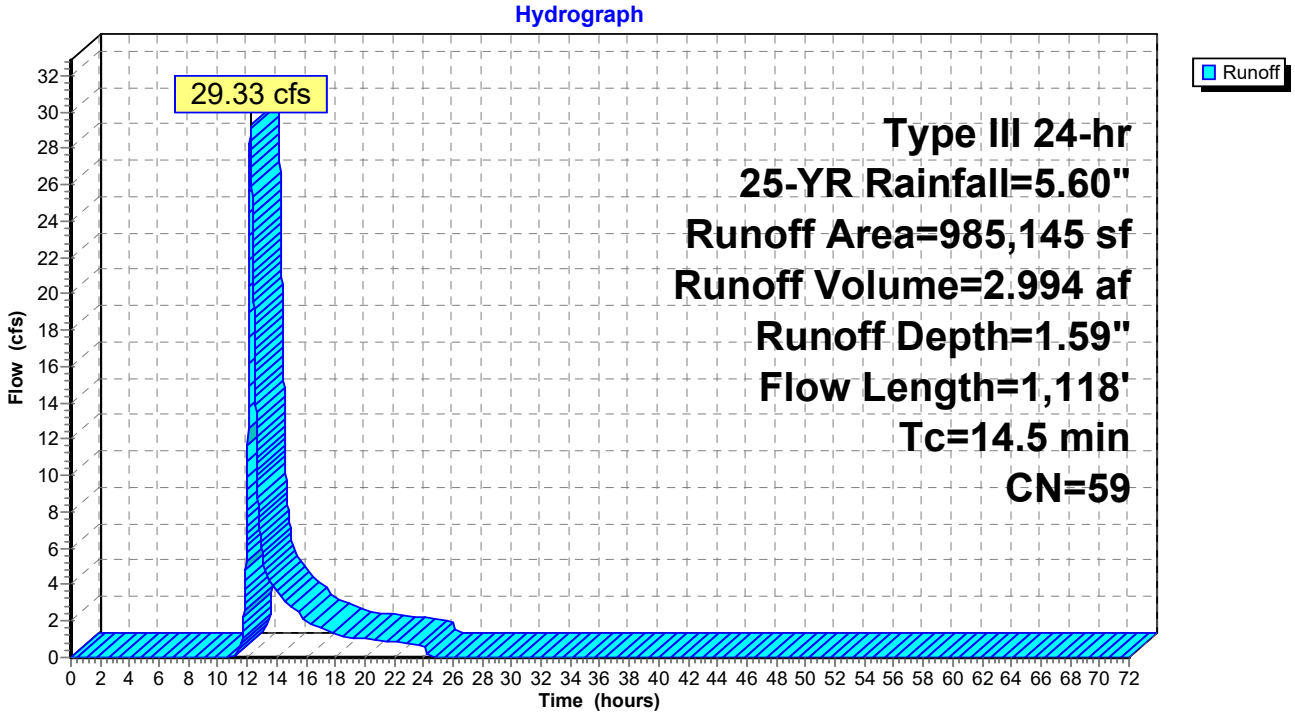
Runoff = 29.33 cfs @ 12.22 hrs, Volume= 2.994 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
8,899	30	Woods, Good, HSG A
674,826	55	Woods, Good, HSG B
43,382	77	Woods, Good, HSG D
233,757	65	2 acre lots, 12% imp, HSG B
24,281	98	Paved parking, HSG B
985,145	59	Weighted Average
932,813		94.69% Pervious Area
52,332		5.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
8.2	1,068	0.1900	2.18		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.5	1,118	Total			

Subcatchment OFF2: DA OFFSITE 2



Summary for Subcatchment OFF3: DA OFFSITE 3

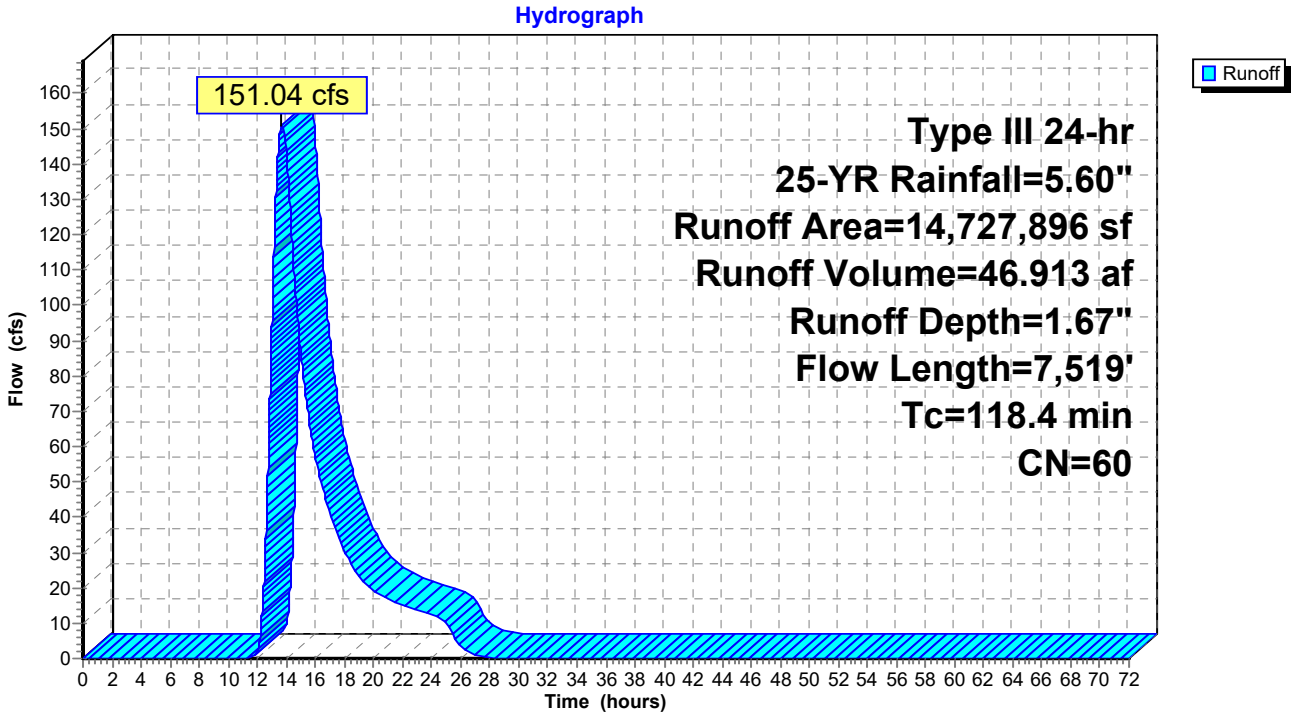
Runoff = 151.04 cfs @ 13.68 hrs, Volume= 46.913 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
531,355	46	2 acre lots, 12% imp, HSG A
757,822	65	2 acre lots, 12% imp, HSG B
278,947	77	2 acre lots, 12% imp, HSG C
919,821	96	Gravel surface, HSG A
552,685	96	Gravel surface, HSG B
185,042	96	Gravel surface, HSG C
2,473,692	30	Woods, Good, HSG A
5,672,758	55	Woods, Good, HSG B
2,621,592	70	Woods, Good, HSG C
238,740	77	Woods, Good, HSG D
68,600	98	Paved parking, HSG B
163,466	61	>75% Grass cover, Good, HSG B
263,376	98	Water Surface, HSG D
14,727,896	60	Weighted Average
14,207,745		96.47% Pervious Area
520,151		3.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
111.3	7,469	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
118.4	7,519	Total			

Subcatchment OFF3: DA OFFSITE 3



Summary for Subcatchment R3: DA R3

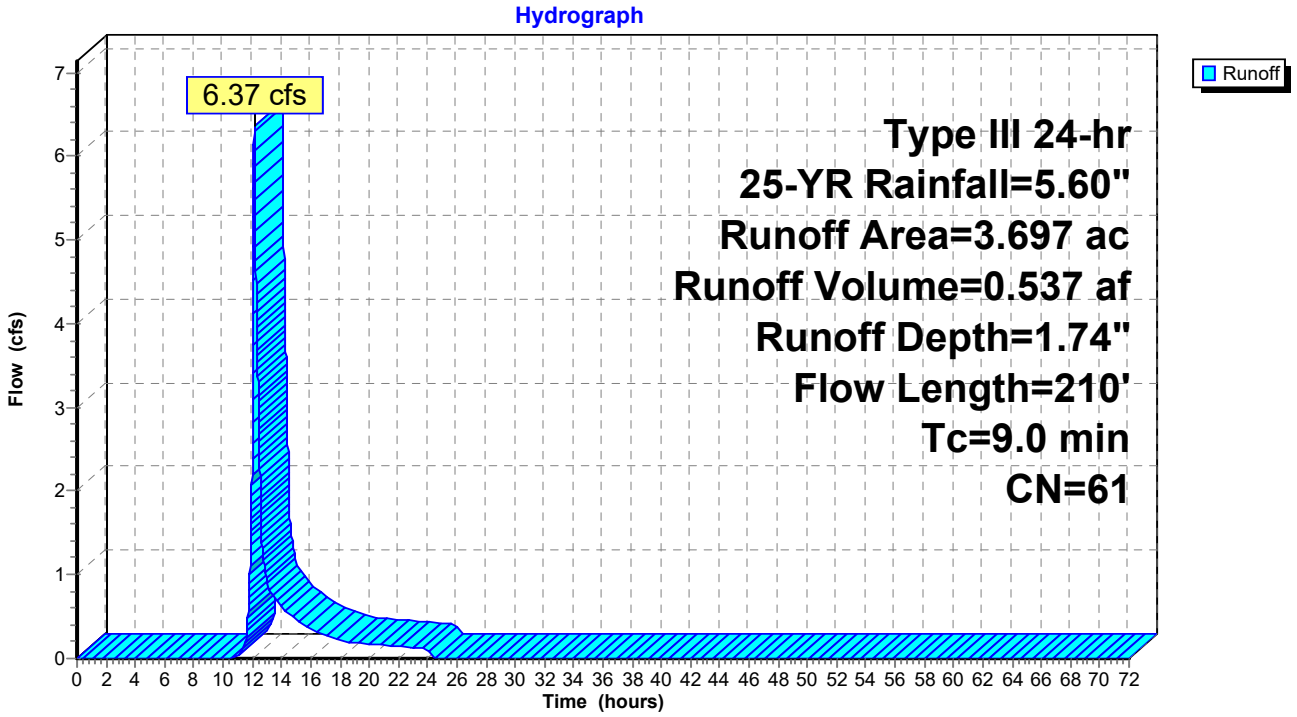
Runoff = 6.37 cfs @ 12.14 hrs, Volume= 0.537 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.007	30	Woods, Good, HSG A
0.965	39	>75% Grass cover, Good, HSG A
0.441	55	Woods, Good, HSG B
0.100	61	>75% Grass cover, Good, HSG B
1.244	70	Woods, Good, HSG C
0.878	74	>75% Grass cover, Good, HSG C
0.062	98	Unconnected roofs, HSG A
3.697	61	Weighted Average
3.635		98.32% Pervious Area
0.062		1.68% Impervious Area
0.062		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	29	0.1000	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.93"
3.4	21	0.1000	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
2.7	160	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.0	210	Total			

Subcatchment R3: DA R3



Summary for Subcatchment R4: DA R4

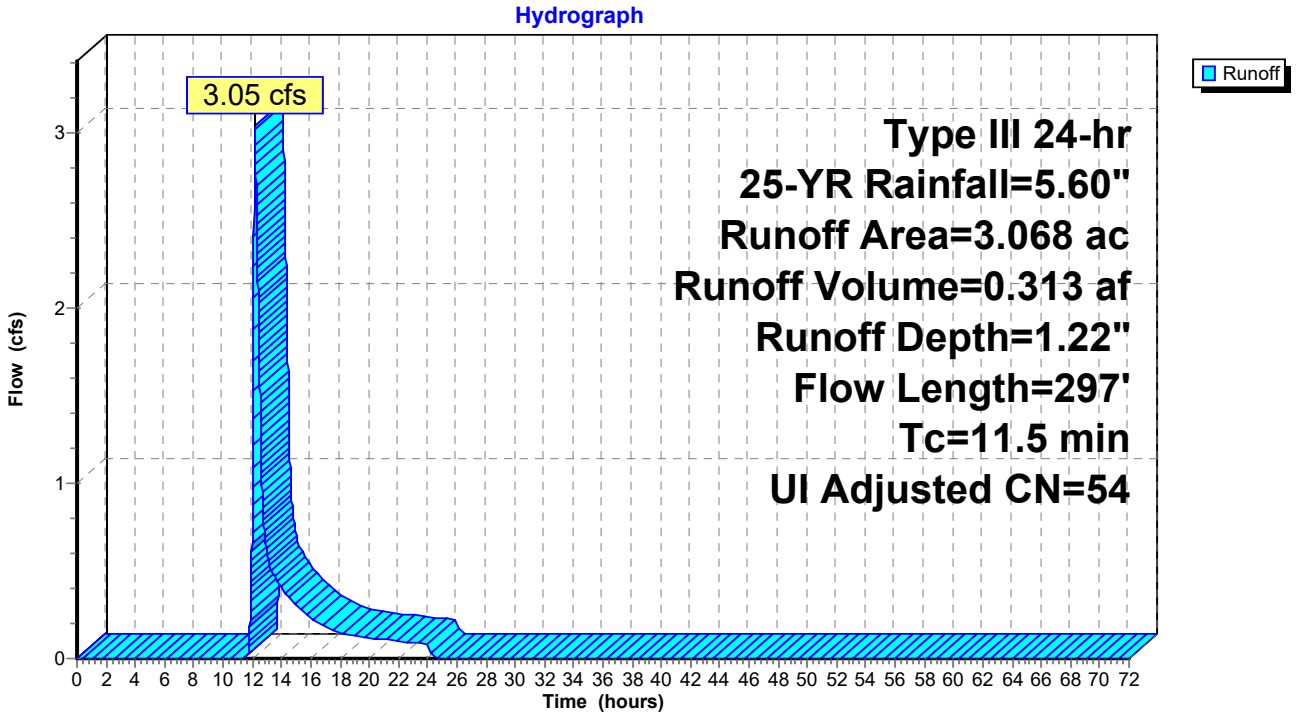
Runoff = 3.05 cfs @ 12.18 hrs, Volume= 0.313 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Adj	Description
0.276	30		Woods, Good, HSG A
0.149	55		Woods, Good, HSG B
0.064	70		Woods, Good, HSG C
0.847	39		>75% Grass cover, Good, HSG A
1.352	61		>75% Grass cover, Good, HSG B
0.183	74		>75% Grass cover, Good, HSG C
0.049	98		Unconnected roofs, HSG A
0.015	98		Unconnected roofs, HSG B
0.116	98		Unconnected pavement, HSG A
0.017	98		Unconnected pavement, HSG B
3.068	55	54	Weighted Average, UI Adjusted
2.871			93.58% Pervious Area
0.197			6.42% Impervious Area
0.197			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.93"
2.9	247	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	297	Total			

Subcatchment R4: DA R4



Summary for Subcatchment SE: DA SE

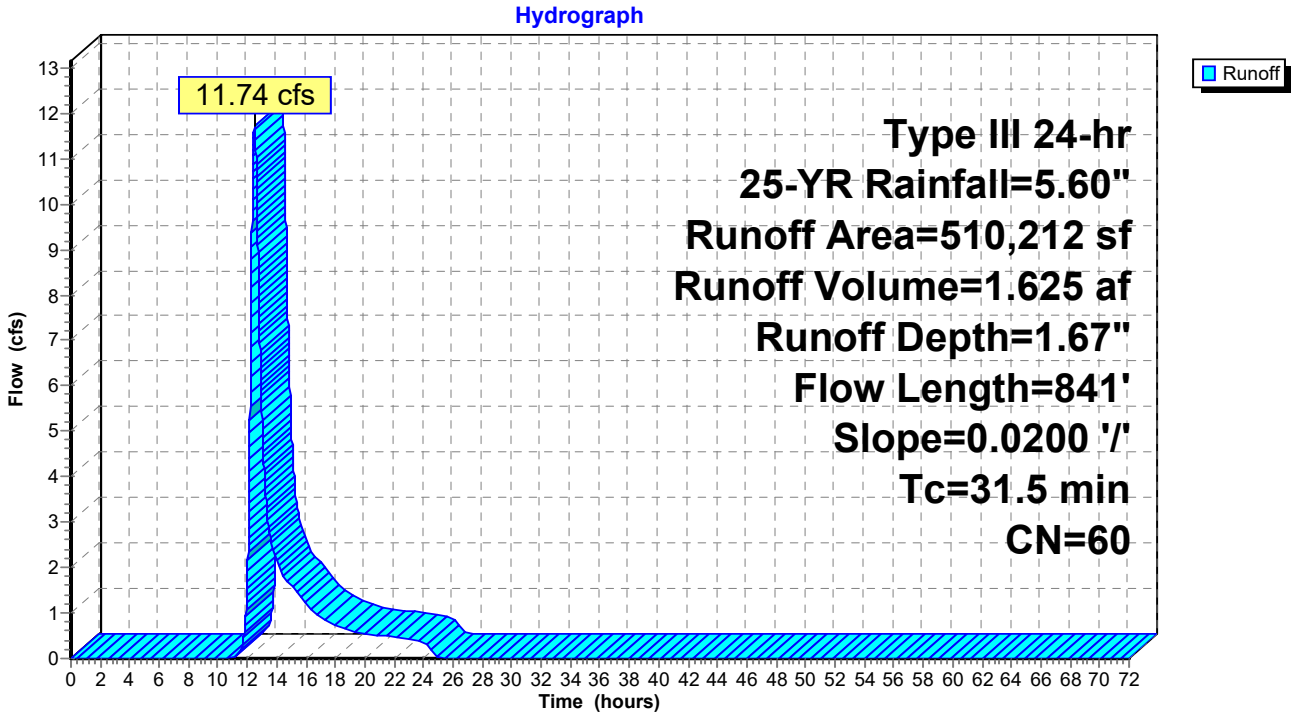
Runoff = 11.74 cfs @ 12.49 hrs, Volume= 1.625 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
5,034	30	Woods, Good, HSG A
74,117	39	>75% Grass cover, Good, HSG A
163,017	55	Woods, Good, HSG B
27,230	61	>75% Grass cover, Good, HSG B
210,136	70	Woods, Good, HSG C
22,121	74	>75% Grass cover, Good, HSG C
5,917	98	Unconnected roofs, HSG A
2,253	98	Roofs, HSG B
387	98	Unconnected pavement, HSG B
510,212	60	Weighted Average
501,655		98.32% Pervious Area
8,557		1.68% Impervious Area
6,304		73.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
18.6	791	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.5	841	Total			

Subcatchment SE: DA SE



Summary for Subcatchment SW: DA SW

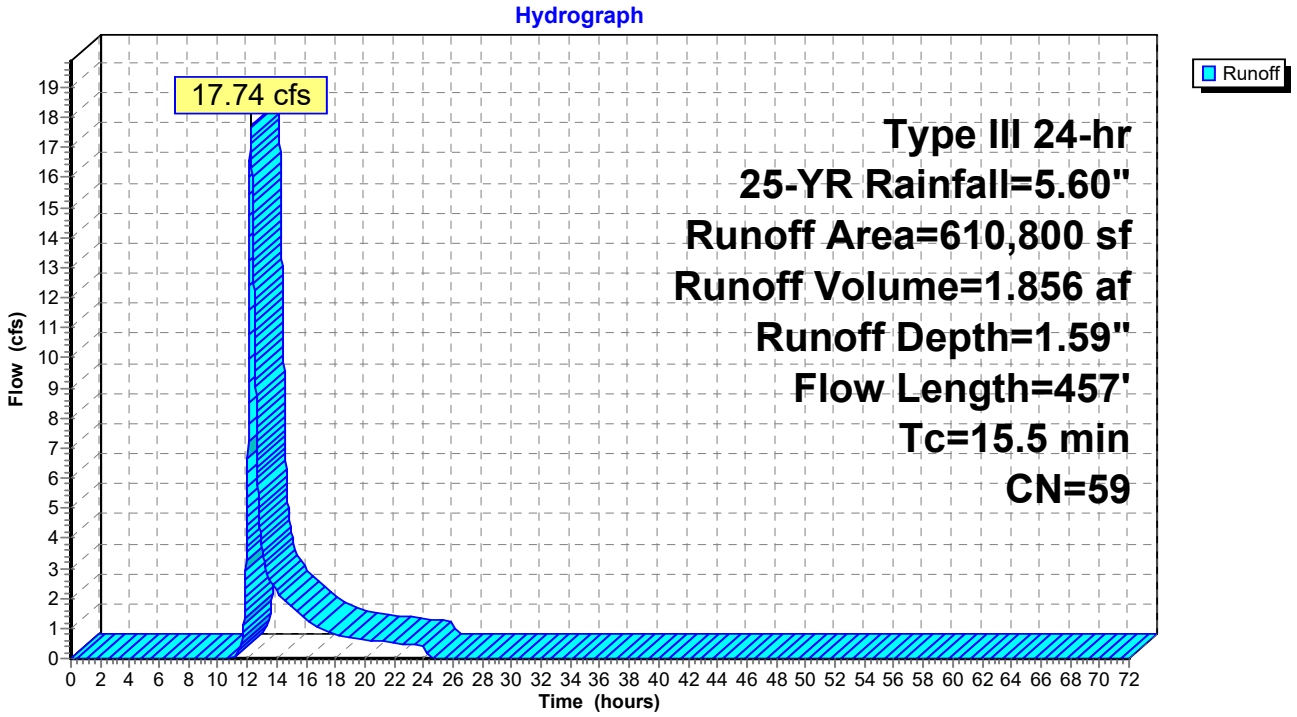
Runoff = 17.74 cfs @ 12.24 hrs, Volume= 1.856 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (sf)	CN	Description
47,522	30	Woods, Good, HSG A
98,012	39	>75% Grass cover, Good, HSG A
153,615	55	Woods, Good, HSG B
32,132	61	>75% Grass cover, Good, HSG B
154,380	70	Woods, Good, HSG C
91,896	77	Woods, Good, HSG D
21,909	74	>75% Grass cover, Good, HSG C
2,189	80	>75% Grass cover, Good, HSG D
6,142	98	Unconnected roofs, HSG A
2,761	98	Unconnected roofs, HSG B
242	98	Unconnected pavement, HSG A
610,800	59	Weighted Average
601,655		98.50% Pervious Area
9,145		1.50% Impervious Area
9,145		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.93"
6.6	407	0.0420	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.5	457	Total			

Subcatchment SW: DA SW



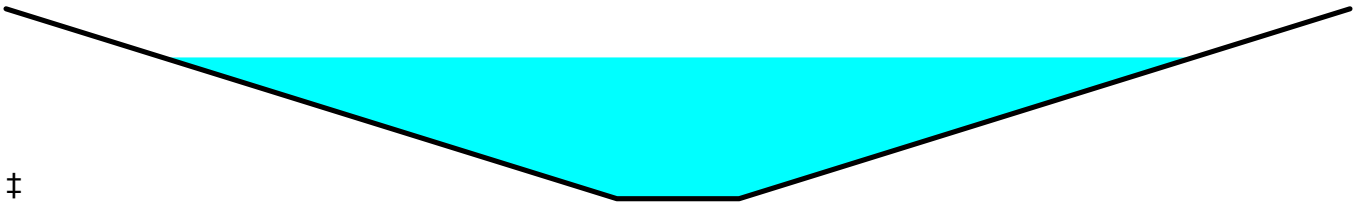
Summary for Reach 1R: REACH 1

Inflow Area = 168.082 ac, 11.08% Impervious, Inflow Depth > 1.43" for 25-YR event
Inflow = 43.20 cfs @ 12.98 hrs, Volume= 19.995 af
Outflow = 43.09 cfs @ 13.08 hrs, Volume= 19.991 af, Atten= 0%, Lag= 6.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.96 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 19.2 min

Peak Storage= 16,846 cf @ 13.08 hrs
Average Depth at Peak Storage= 0.93' , Surface Width= 42.21'
Bank-Full Depth= 1.25' Flow Area= 37.5 sf, Capacity= 88.11 cfs

5.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 55.00'
Length= 767.0' Slope= 0.0026 '/'
Inlet Invert= 187.50', Outlet Invert= 185.50'



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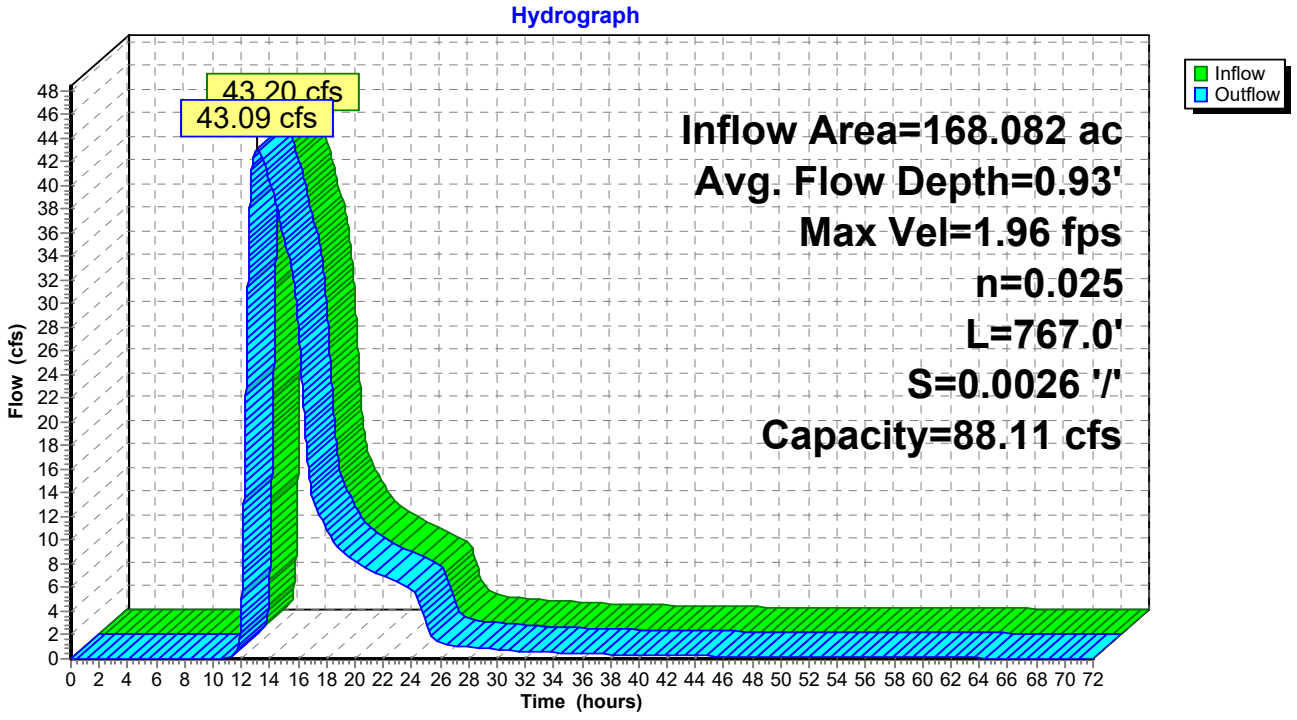
Reach 1R: REACH 1



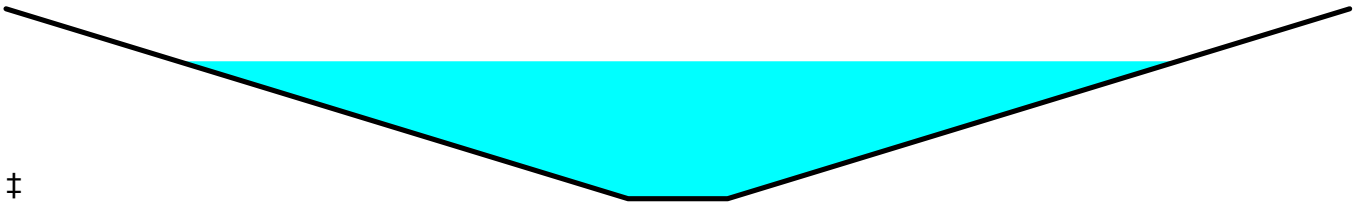
Summary for Reach 2R: REACH 2

Inflow Area = 134.029 ac, 6.48% Impervious, Inflow Depth = 1.32" for 25-YR event
Inflow = 73.88 cfs @ 12.62 hrs, Volume= 14.762 af
Outflow = 72.70 cfs @ 12.71 hrs, Volume= 14.762 af, Atten= 2%, Lag= 5.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 16.1 min

Peak Storage= 23,052 cf @ 12.71 hrs
Average Depth at Peak Storage= 0.90' , Surface Width= 40.17'
Bank-Full Depth= 1.25' Flow Area= 36.3 sf, Capacity= 161.16 cfs

4.00' x 1.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 20.0 '/' Top Width= 54.00'
Length= 1,154.0' Slope= 0.0095 '/'
Inlet Invert= 200.00', Outlet Invert= 189.00'



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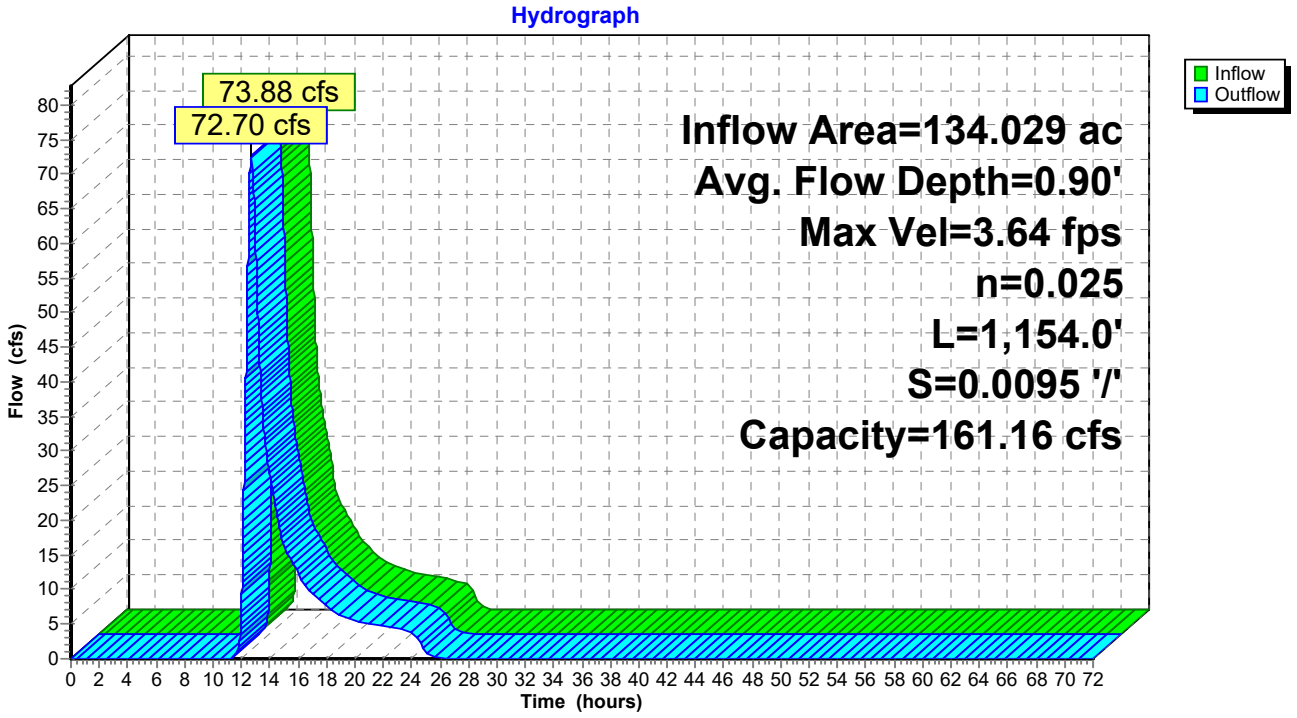
Reach 2R: REACH 2



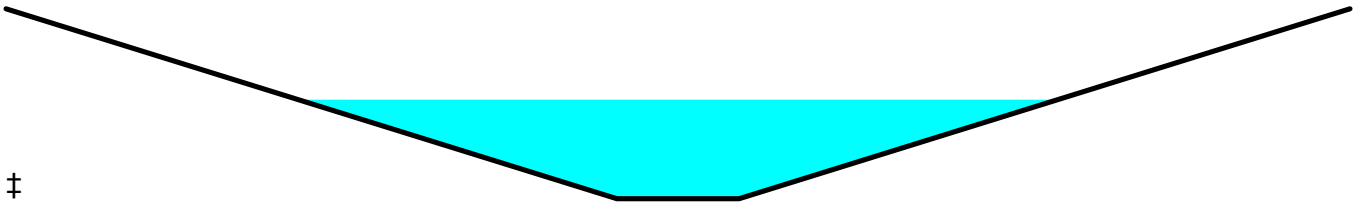
Summary for Reach 3R: REACH 3

Inflow Area = 39.359 ac, 5.46% Impervious, Inflow Depth = 1.57" for 25-YR event
Inflow = 28.64 cfs @ 12.53 hrs, Volume= 5.155 af
Outflow = 28.15 cfs @ 12.58 hrs, Volume= 5.155 af, Atten= 2%, Lag= 3.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.50 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 14.7 min

Peak Storage= 7,190 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 62.16'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 132.87 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 50.0 '/' Top Width= 110.00'
Length= 382.0' Slope= 0.0031 '/'
Inlet Invert= 201.19', Outlet Invert= 200.00'



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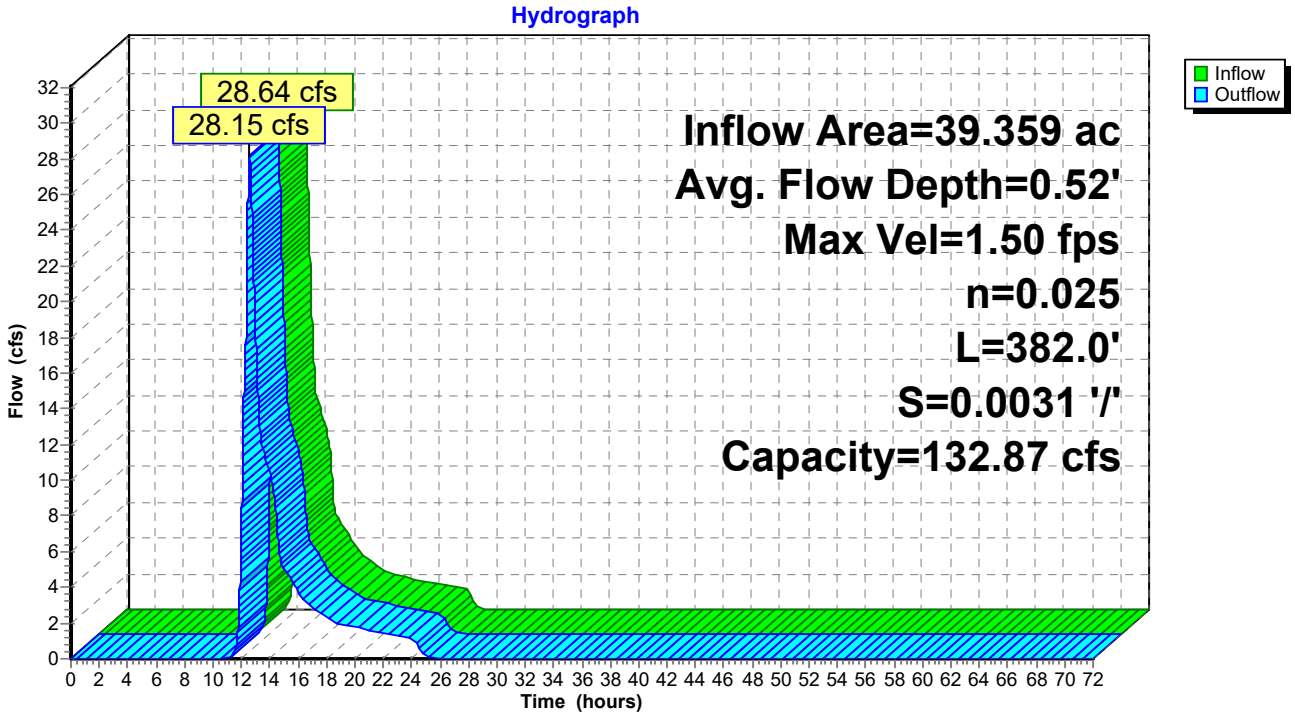


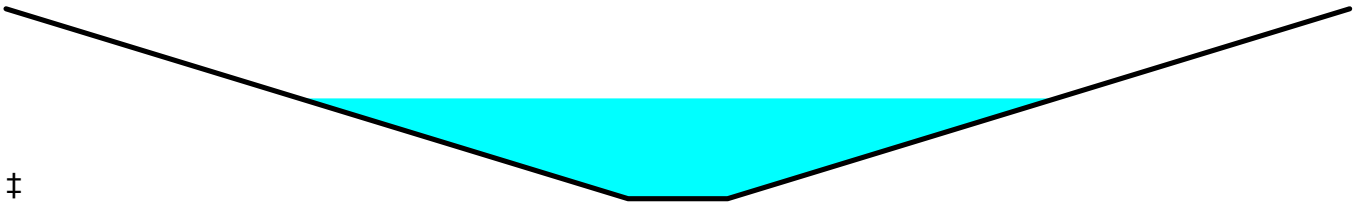
Summary for Reach 4R: REACH 4

Inflow Area = 353.599 ac, 3.69% Impervious, Inflow Depth = 1.65" for 25-YR event
Inflow = 153.42 cfs @ 13.69 hrs, Volume= 48.745 af
Outflow = 153.34 cfs @ 13.70 hrs, Volume= 48.745 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 2.9 min

Peak Storage= 13,273 cf @ 13.70 hrs
Average Depth at Peak Storage= 1.32' , Surface Width= 60.83'
Bank-Full Depth= 2.50' Flow Area= 145.0 sf, Capacity= 722.85 cfs

8.00' x 2.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 108.00'
Length= 292.0' Slope= 0.0068 '/'
Inlet Invert= 191.50', Outlet Invert= 189.50'



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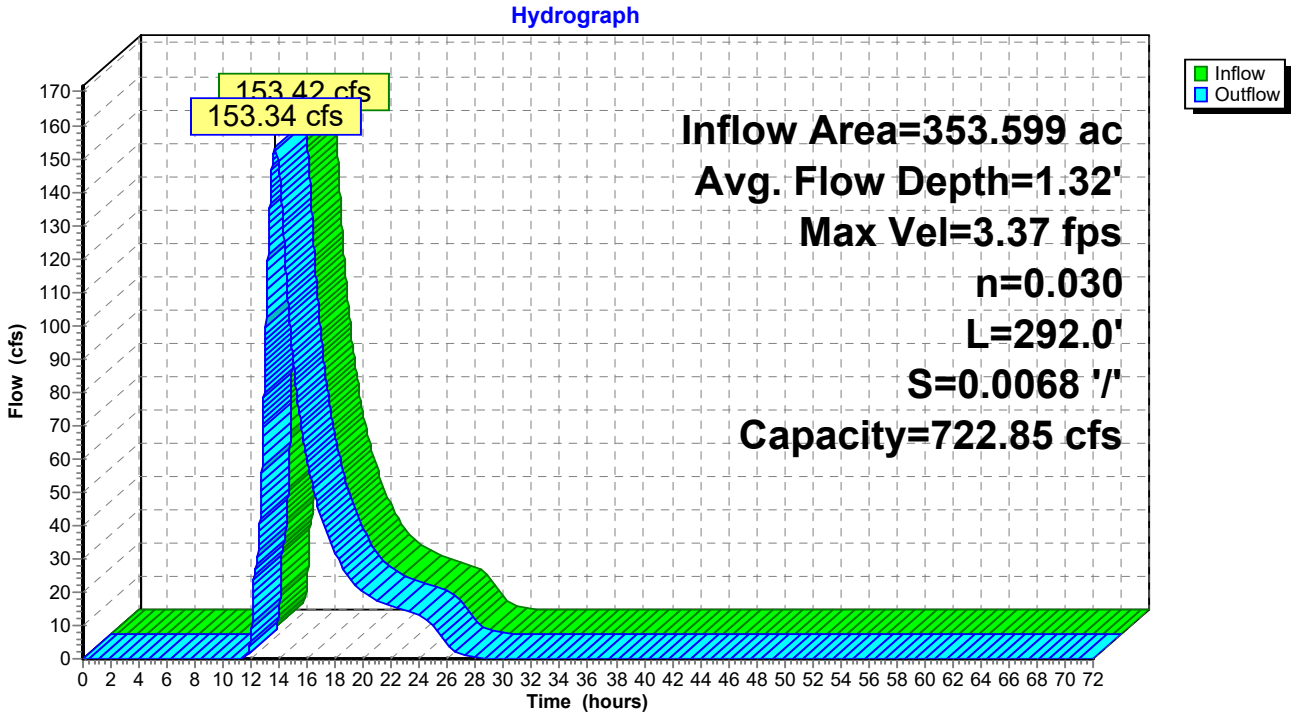
Reach 4R: REACH 4



Summary for Pond DMA D: SMA D

Inflow Area = 3.275 ac, 62.81% Impervious, Inflow Depth = 1.58" for 25-YR event
Inflow = 10.05 cfs @ 12.08 hrs, Volume= 0.432 af
Outflow = 8.71 cfs @ 12.10 hrs, Volume= 0.432 af, Atten= 13%, Lag= 1.5 min
Discarded = 0.58 cfs @ 12.10 hrs, Volume= 0.249 af
Primary = 8.13 cfs @ 12.10 hrs, Volume= 0.183 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 209.20' @ 12.10 hrs Surf.Area= 2,053 sf Storage= 4,233 cf

Plug-Flow detention time= 54.6 min calculated for 0.432 af (100% of inflow)
Center-of-Mass det. time= 54.7 min (813.9 - 759.3)

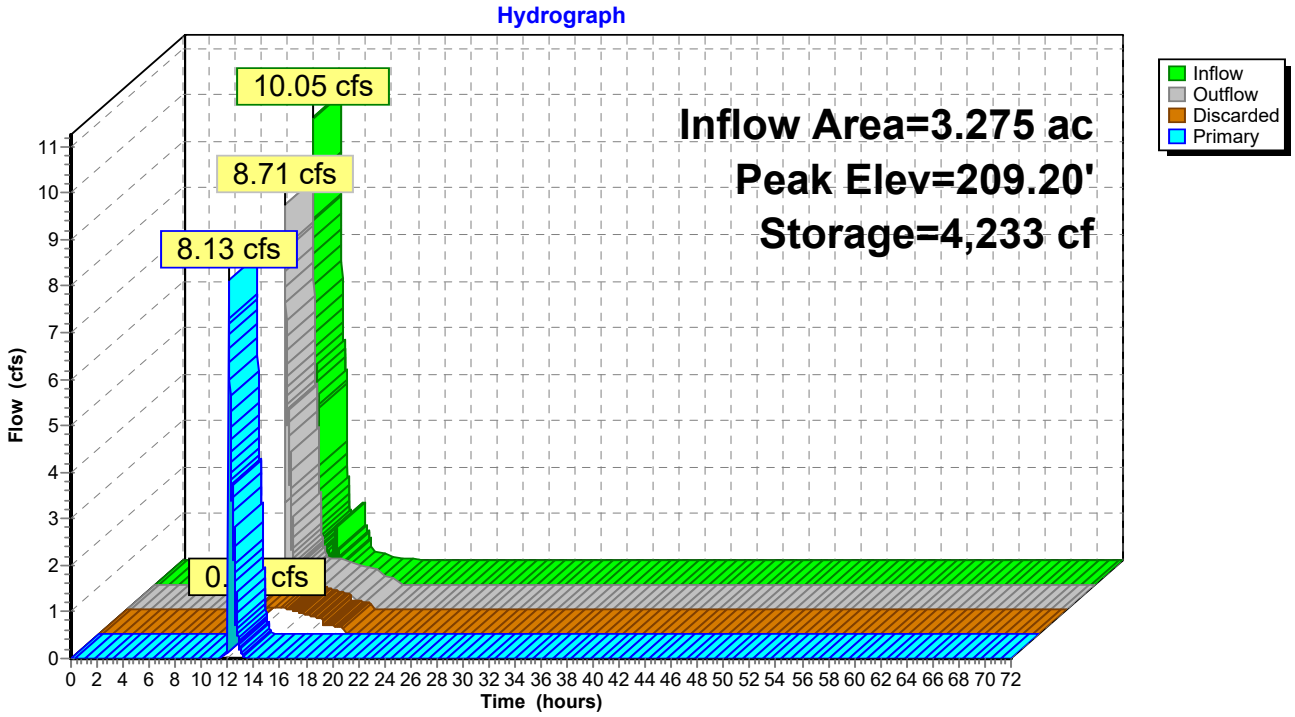
Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	1,352 cf	**6.00'W x 153.00'L x 4.50'H Prismatoid** 4,131 cf Overall - 751 cf Embedded = 3,380 cf x 40.0% Voids
#2	205.75'	751 cf	**30.0" Round Pipe Storage** Inside #1 L= 153.0'
#3	203.50'	1,560 cf	**6.00'W x 187.00'L x 4.00'H Prismatoid** 4,488 cf Overall - 587 cf Embedded = 3,901 cf x 40.0% Voids
#4	204.50'	587 cf	**24.0" Round Pipe Storage** Inside #3 L= 187.0'
#5	201.00'	91 cf	**4.00'D x 7.25'H Vertical Cone/Cylinder**
		4,342 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	201.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	202.20'	**12.0" Round Culvert** L= 20.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 202.20' / 202.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Device 2	208.75'	**2.5" x 4.5" Horiz. Orifice/Grate X 8.00 columns** X 5 rows C= 0.600 in 24.0" x 24.0" Grate (78% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.58 cfs @ 12.10 hrs HW=209.20' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.58 cfs)

Primary OutFlow Max=7.76 cfs @ 12.10 hrs HW=209.19' TW=195.24' (Dynamic Tailwater)
└**2=Culvert** (Passes 7.76 cfs of 9.64 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 7.76 cfs @ 2.18 fps)

Pond DMA D: SMA D



Summary for Pond P1: POND 1

Inflow Area = 141.403 ac, 8.52% Impervious, Inflow Depth = 1.31" for 25-YR event
Inflow = 73.61 cfs @ 12.71 hrs, Volume= 15.455 af
Outflow = 36.44 cfs @ 13.49 hrs, Volume= 15.454 af, Atten= 50%, Lag= 46.9 min
Primary = 36.44 cfs @ 13.49 hrs, Volume= 15.454 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.36' @ 13.49 hrs Surf.Area= 128,336 sf Storage= 117,787 cf

Plug-Flow detention time= 26.8 min calculated for 15.452 af (100% of inflow)
Center-of-Mass det. time= 26.7 min (958.6 - 931.9)

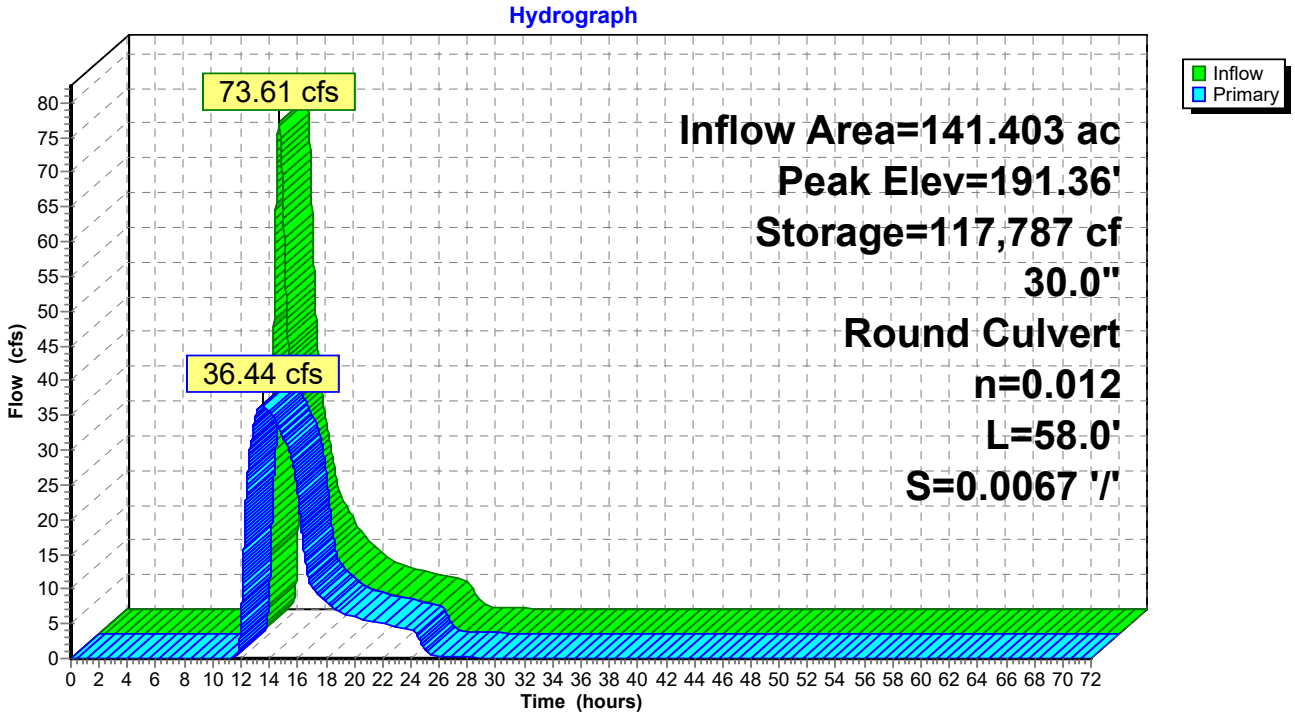
Volume	Invert	Avail.Storage	Storage Description
#1	187.50'	426,640 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
187.50	100	0	0
188.00	1,000	275	275
189.00	2,754	1,877	2,152
190.00	20,973	11,864	14,016
191.00	102,365	61,669	75,685
192.00	173,518	137,942	213,626
193.00	252,510	213,014	426,640

Device	Routing	Invert	Outlet Devices
#1	Primary	187.58'	**30.0" Round Culvert** L= 58.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 187.58' / 187.19' S= 0.0067 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Primary OutFlow Max=36.44 cfs @ 13.49 hrs HW=191.36' TW=188.42' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 36.44 cfs @ 7.42 fps)

Pond P1: POND 1



Summary for Pond P2: POND 2

Inflow Area = 34.329 ac, 4.07% Impervious, Inflow Depth = 1.61" for 25-YR event
Inflow = 36.27 cfs @ 12.25 hrs, Volume= 4.619 af
Outflow = 26.54 cfs @ 12.55 hrs, Volume= 4.618 af, Atten= 27%, Lag= 18.1 min
Primary = 26.54 cfs @ 12.55 hrs, Volume= 4.618 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 204.41' @ 12.55 hrs Surf.Area= 35,169 sf Storage= 28,530 cf

Plug-Flow detention time= 13.0 min calculated for 4.617 af (100% of inflow)
Center-of-Mass det. time= 12.9 min (895.5 - 882.6)

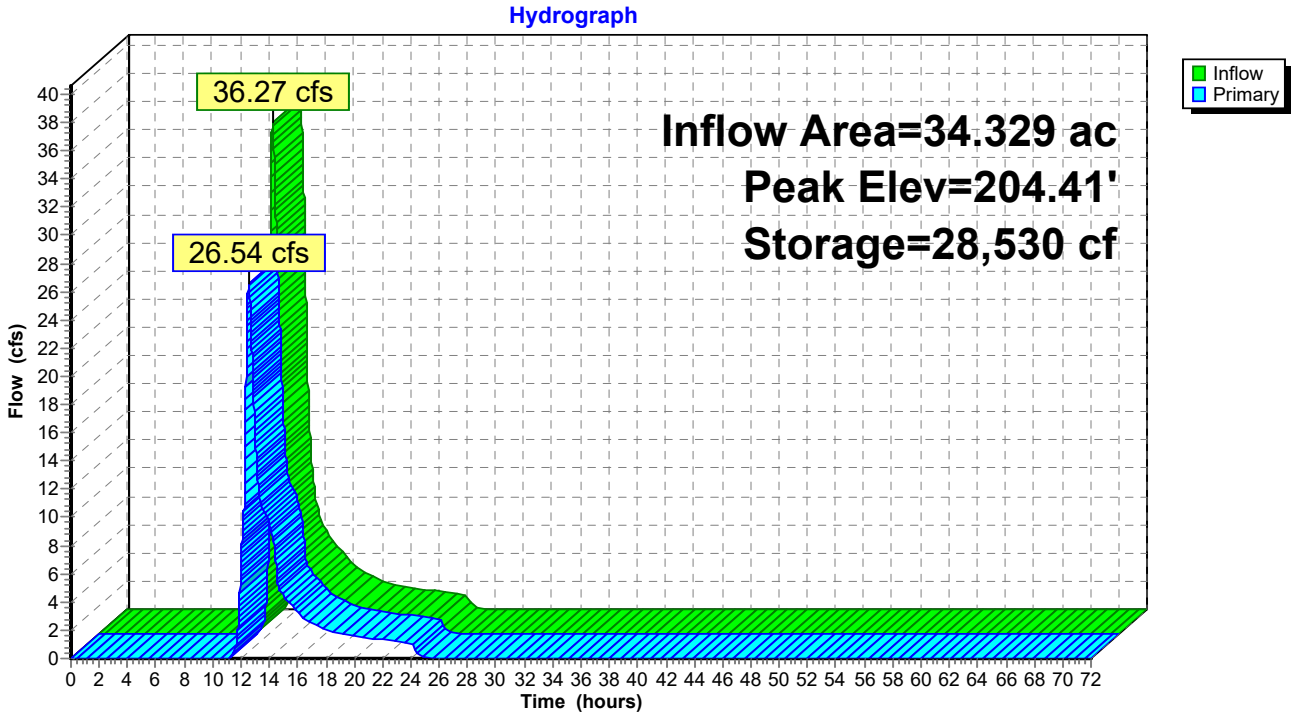
Volume	Invert	Avail.Storage	Storage Description
#1	201.50'	53,111 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.50	500	0	0
202.00	1,000	375	375
203.00	2,087	1,544	1,919
204.00	25,992	14,040	15,958
205.00	48,313	37,153	53,111

Device	Routing	Invert	Outlet Devices
#1	Primary	201.57'	**18.0" Round Culvert** L= 21.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 201.57' / 201.19' S= 0.0181 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Primary	204.00'	**20.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=26.54 cfs @ 12.55 hrs HW=204.41' TW=201.71' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 12.30 cfs @ 6.96 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 14.23 cfs @ 1.73 fps)

Pond P2: POND 2



Summary for Pond P3: POND 3

Inflow Area = 348.808 ac, 3.50% Impervious, Inflow Depth = 1.67" for 25-YR event
Inflow = 152.99 cfs @ 13.68 hrs, Volume= 48.398 af
Outflow = 152.98 cfs @ 13.69 hrs, Volume= 48.397 af, Atten= 0%, Lag= 0.2 min
Primary = 152.98 cfs @ 13.69 hrs, Volume= 48.397 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 195.71' @ 13.69 hrs Surf.Area= 485 sf Storage= 1,081 cf

Plug-Flow detention time= 0.2 min calculated for 48.390 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (968.5 - 968.4)

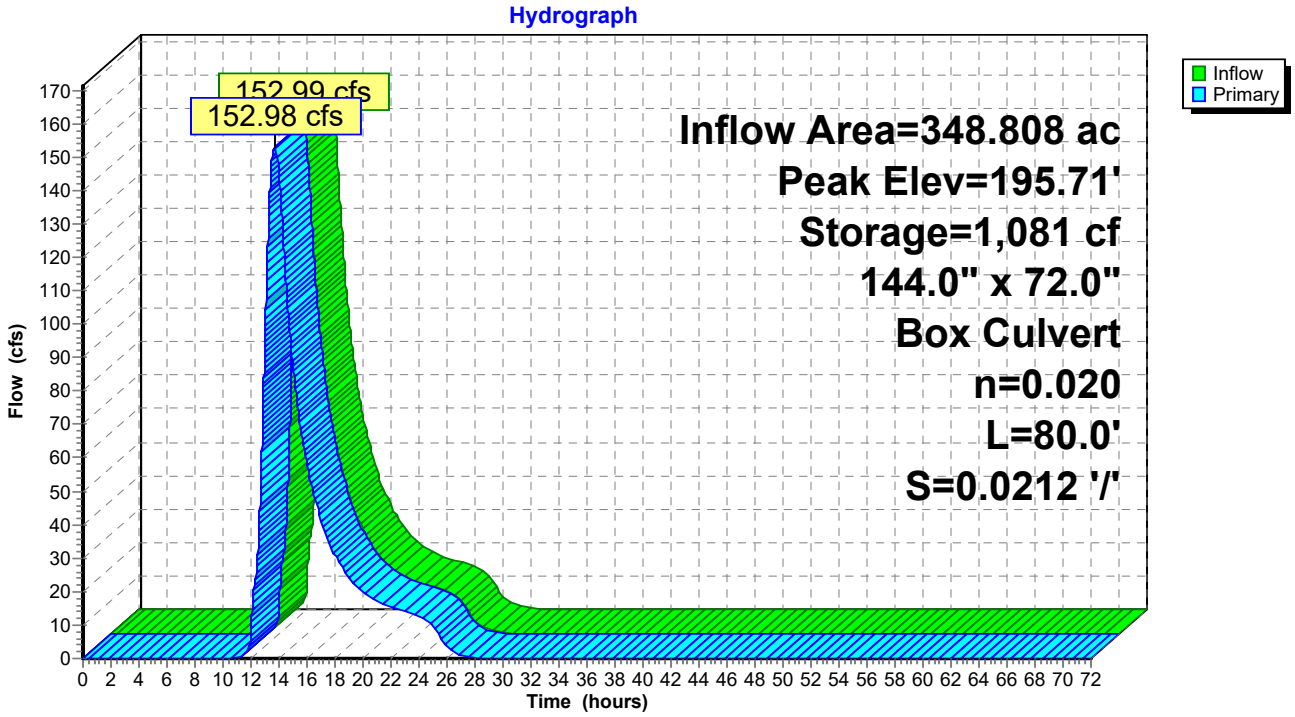
Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	122,014 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.00	250	0	0
194.00	400	325	325
196.00	500	900	1,225
198.00	7,240	7,740	8,965
200.00	26,996	34,236	43,201
202.00	51,817	78,813	122,014

Device	Routing	Invert	Outlet Devices
#1	Primary	193.20'	**144.0" W x 72.0" H Box Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 193.20' / 191.50' S= 0.0212 '/' Cc= 0.900 n= 0.020, Flow Area= 72.00 sf

Primary OutFlow Max=152.97 cfs @ 13.69 hrs HW=195.71' TW=192.82' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 152.97 cfs @ 5.08 fps)

Pond P3: POND 3

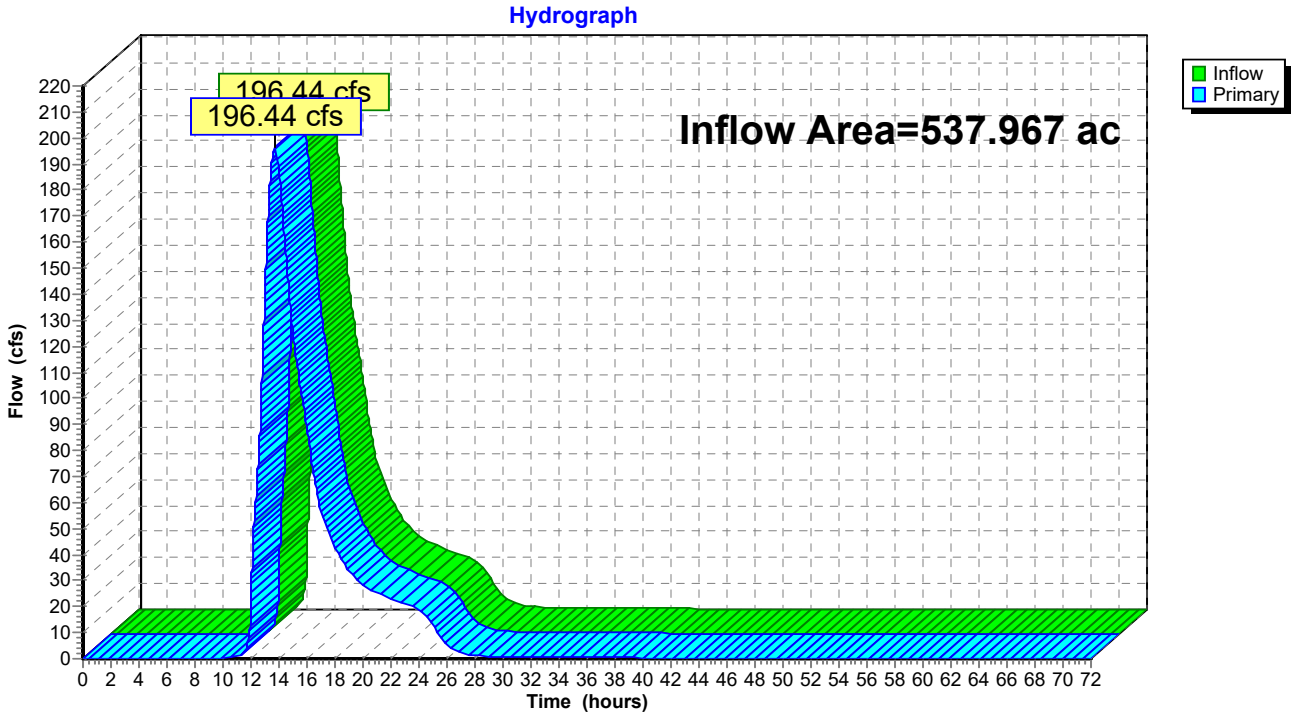


Summary for Pond POA C: POA COMBINED

Inflow Area = 537.967 ac, 6.61% Impervious, Inflow Depth > 1.57" for 25-YR event
Inflow = 196.44 cfs @ 13.69 hrs, Volume= 70.225 af
Primary = 196.44 cfs @ 13.69 hrs, Volume= 70.225 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA C: POA COMBINED

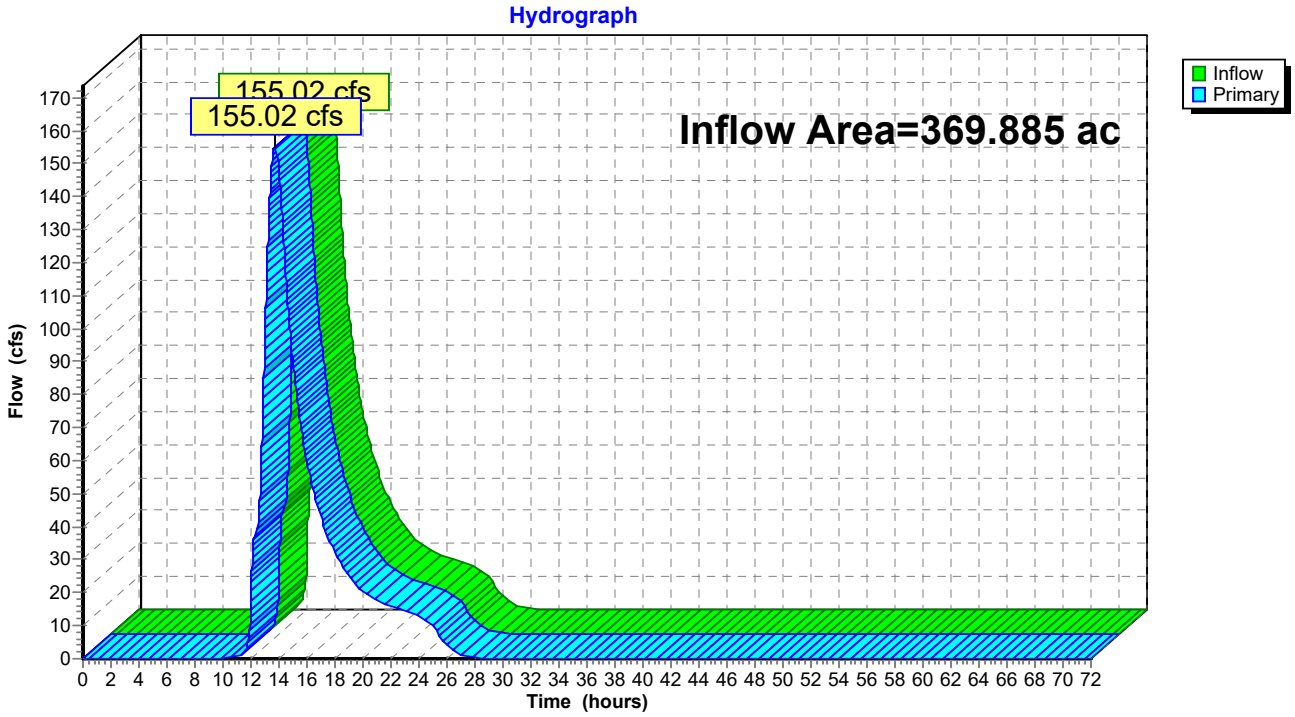


Summary for Pond POA NE: POA NORTHEAST

Inflow Area = 369.885 ac, 4.59% Impervious, Inflow Depth = 1.63" for 25-YR event
Inflow = 155.02 cfs @ 13.70 hrs, Volume= 50.234 af
Primary = 155.02 cfs @ 13.70 hrs, Volume= 50.234 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NE: POA NORTHEAST

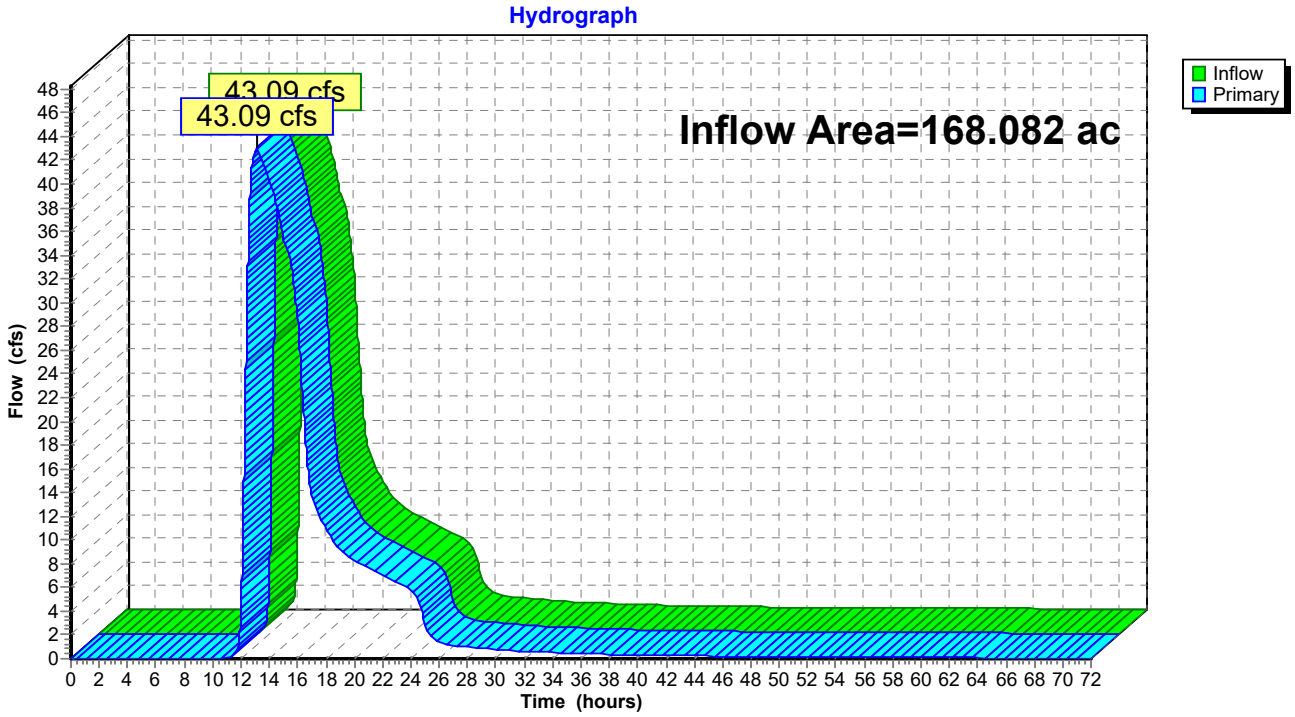


Summary for Pond POA NW: POA NORTHWEST

Inflow Area = 168.082 ac, 11.08% Impervious, Inflow Depth > 1.43" for 25-YR event
Inflow = 43.09 cfs @ 13.08 hrs, Volume= 19.991 af
Primary = 43.09 cfs @ 13.08 hrs, Volume= 19.991 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NW: POA NORTHWEST



Summary for Pond PP: POROUS PAVEMENT

Inflow Area = 0.424 ac, 21.70% Impervious, Inflow Depth = 1.02" for 25-YR event
Inflow = 0.39 cfs @ 12.11 hrs, Volume= 0.036 af
Outflow = 0.08 cfs @ 12.72 hrs, Volume= 0.036 af, Atten= 78%, Lag= 36.5 min
Discarded = 0.08 cfs @ 12.72 hrs, Volume= 0.036 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 191.27' @ 12.72 hrs Surf.Area= 0.025 ac Storage= 0.008 af

Plug-Flow detention time= 28.4 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 28.4 min (925.7 - 897.3)

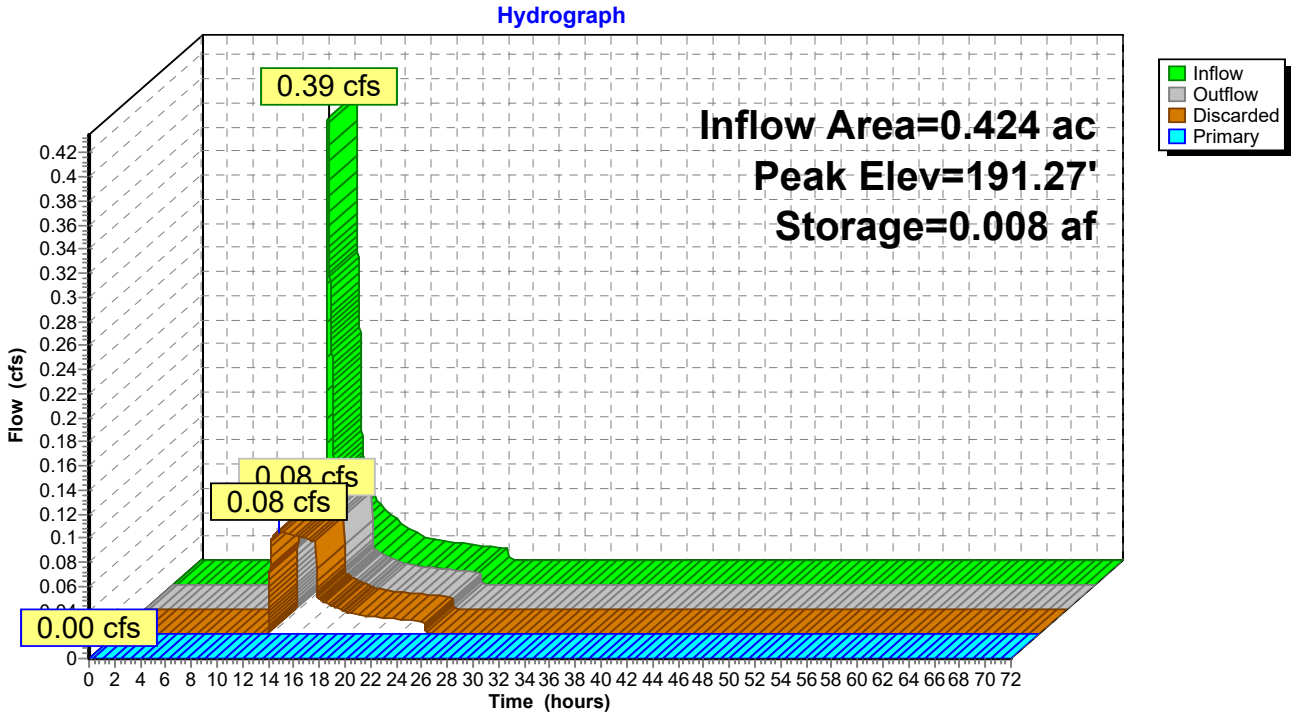
Volume	Invert	Avail.Storage	Storage Description
#1	190.50'	0.010 af	**22.00'W x 50.00'L x 1.00'H Prismatoid** 0.025 af Overall x 40.0% Voids
#2	191.50'	0.011 af	**22.00'W x 50.00'L x 1.50'H Prismatoid** 0.038 af Overall x 30.0% Voids
#3	193.00'	0.000 af	**1.00'W x 1.00'L x 1.00'H Prismatoid** 0.000 af Overall x 40.0% Voids
		0.021 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	190.50'	**3.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	193.90'	**2.0' long x 20.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.08 cfs @ 12.72 hrs HW=191.27' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=190.50' TW=193.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PP: POROUS PAVEMENT



Summary for Pond RG 2: RAIN GARDEN D2

Inflow Area = 0.970 ac, 61.07% Impervious, Inflow Depth = 2.94" for 25-YR event
Inflow = 3.35 cfs @ 12.09 hrs, Volume= 0.238 af
Outflow = 3.11 cfs @ 12.12 hrs, Volume= 0.238 af, Atten= 7%, Lag= 2.0 min
Discarded = 0.25 cfs @ 12.12 hrs, Volume= 0.151 af
Primary = 2.86 cfs @ 12.12 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 210.48' @ 12.12 hrs Surf.Area= 2,153 sf Storage= 1,584 cf

Plug-Flow detention time= 41.1 min calculated for 0.238 af (100% of inflow)
Center-of-Mass det. time= 41.1 min (870.6 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	209.25'	6,645 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

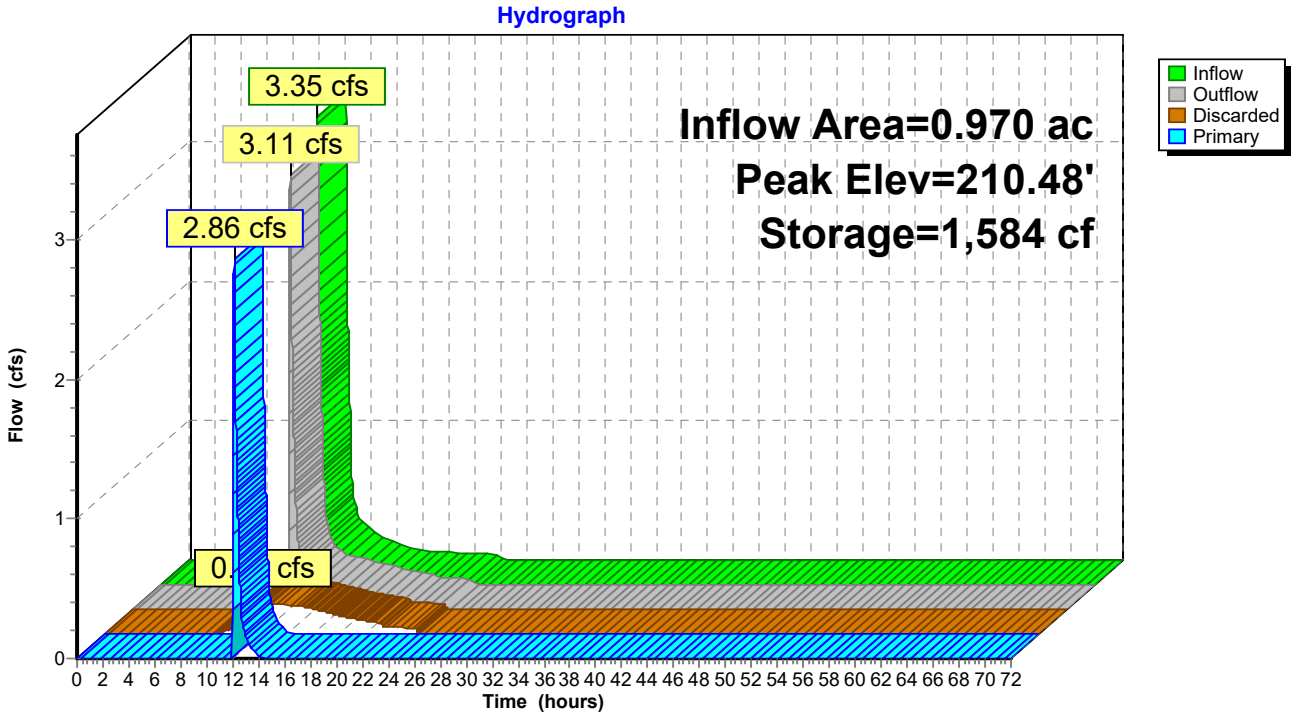
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
209.25	650	0	0	650
210.00	1,382	745	745	1,387
211.00	3,187	2,223	2,968	3,199
212.00	4,191	3,678	6,645	4,226

Device	Routing	Invert	Outlet Devices
#1	Primary	210.25'	**2.0" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 5 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#2	Discarded	209.25'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=0.25 cfs @ 12.12 hrs HW=210.48' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=2.85 cfs @ 12.12 hrs HW=210.48' TW=209.18' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Weir Controls 2.85 cfs @ 1.56 fps)

Pond RG 2: RAIN GARDEN D2



Summary for Pond RG1: RAIN GARDEN D1

Inflow Area = 1.297 ac, 68.56% Impervious, Inflow Depth = 3.52" for 25-YR event
Inflow = 5.34 cfs @ 12.09 hrs, Volume= 0.381 af
Outflow = 5.25 cfs @ 12.10 hrs, Volume= 0.381 af, Atten= 2%, Lag= 0.9 min
Discarded = 0.14 cfs @ 12.10 hrs, Volume= 0.117 af
Primary = 5.12 cfs @ 12.10 hrs, Volume= 0.263 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 212.59' @ 12.10 hrs Surf.Area= 1,187 sf Storage= 759 cf

Plug-Flow detention time= 23.7 min calculated for 0.381 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (838.0 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	211.25'	2,460 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

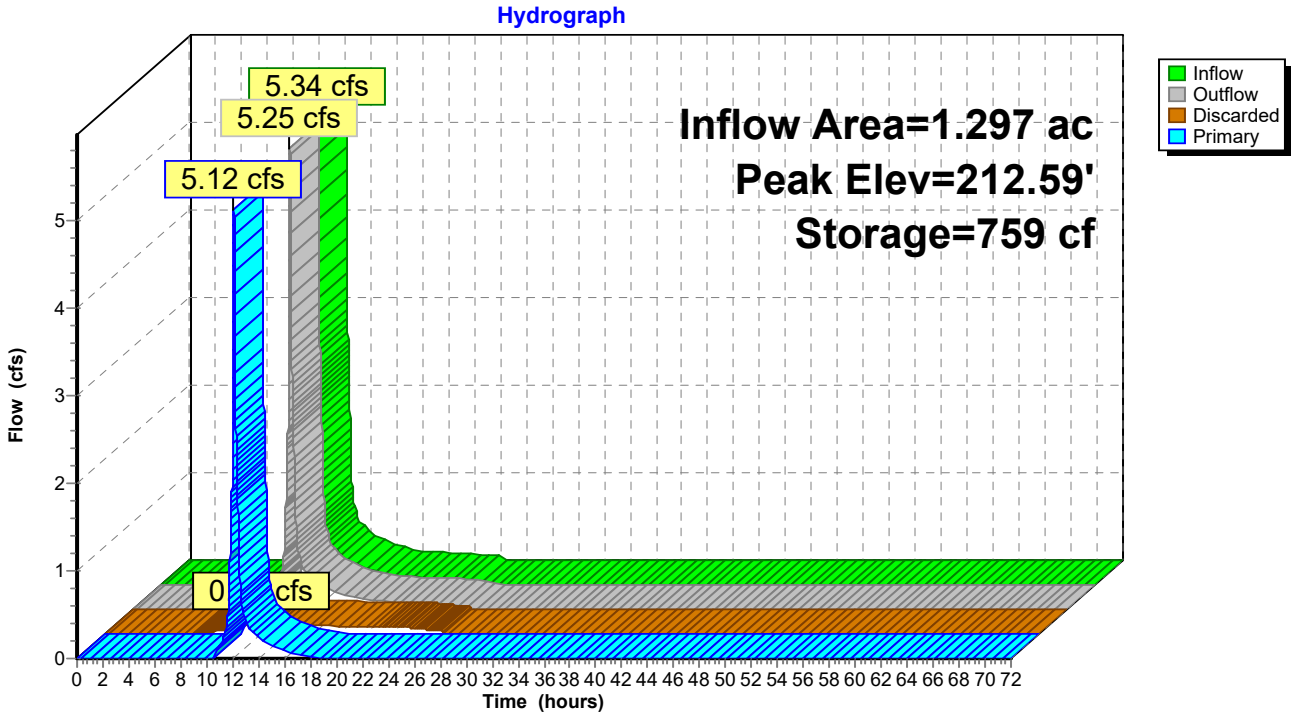
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.25	250	0	0	250
212.00	504	277	277	509
213.00	1,840	1,102	1,380	1,850
213.50	2,500	1,081	2,460	2,515

Device	Routing	Invert	Outlet Devices
#1	Primary	212.25'	**2.0" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 5 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#2	Discarded	211.25'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=0.14 cfs @ 12.10 hrs HW=212.59' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=5.11 cfs @ 12.10 hrs HW=212.59' TW=209.20' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Weir Controls 5.11 cfs @ 1.90 fps)

Pond RG1: RAIN GARDEN D1



Summary for Pond RG3: RAIN GARDEN D3

Inflow Area = 1.007 ac, 57.08% Impervious, Inflow Depth = 2.76" for 25-YR event
Inflow = 3.25 cfs @ 12.09 hrs, Volume= 0.232 af
Outflow = 2.84 cfs @ 12.58 hrs, Volume= 0.232 af, Atten= 13%, Lag= 29.4 min
Discarded = 0.40 cfs @ 12.34 hrs, Volume= 0.150 af
Primary = 2.76 cfs @ 12.08 hrs, Volume= 0.082 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 209.03' @ 12.34 hrs Surf.Area= 3,452 sf Storage= 2,517 cf

Plug-Flow detention time= 47.4 min calculated for 0.232 af (100% of inflow)
Center-of-Mass det. time= 47.4 min (881.8 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1	207.25'	4,576 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

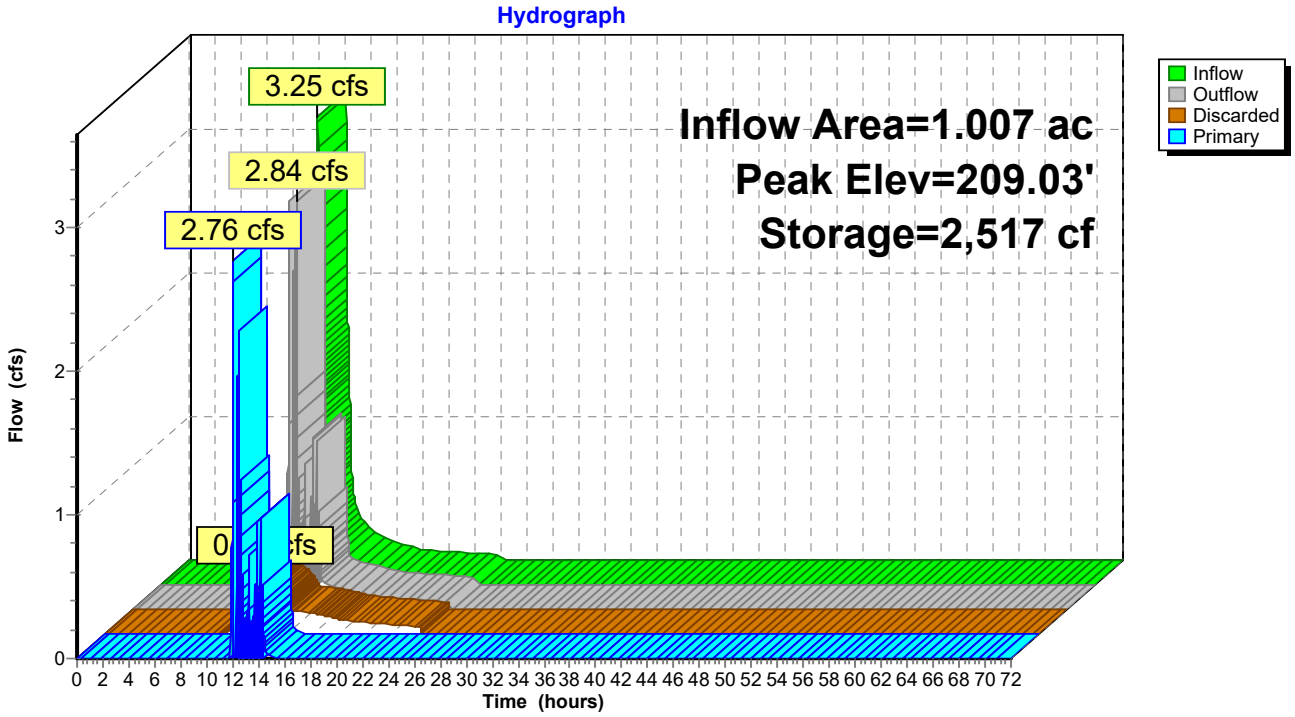
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.25	400	0	0	400
208.00	851	459	459	856
209.00	3,357	1,966	2,425	3,366
209.50	5,325	2,152	4,576	5,338

Device	Routing	Invert	Outlet Devices
#1	Primary	208.25'	**2.0" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 5 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#2	Discarded	207.25'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=0.40 cfs @ 12.34 hrs HW=209.03' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=2.56 cfs @ 12.08 hrs HW=208.46' TW=208.19' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Weir Controls 2.56 cfs @ 1.51 fps)

Pond RG3: RAIN GARDEN D3



Summary for Pond SMA A: SMA A

Inflow Area = 1.028 ac, 43.70% Impervious, Inflow Depth = 2.06" for 25-YR event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.177 af
Outflow = 0.20 cfs @ 13.80 hrs, Volume= 0.177 af, Atten= 91%, Lag= 101.9 min
Discarded = 0.20 cfs @ 13.80 hrs, Volume= 0.177 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 192.00' @ 13.80 hrs Surf.Area= 2,902 sf Storage= 3,255 cf

Plug-Flow detention time= 183.5 min calculated for 0.177 af (100% of inflow)
Center-of-Mass det. time= 183.4 min (1,037.9 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	190.50'	10,523 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
190.50	1,519	0	0	1,519
192.00	2,905	3,262	3,262	2,927
193.00	3,819	3,352	6,614	3,864
194.00	4,000	3,909	10,523	4,150

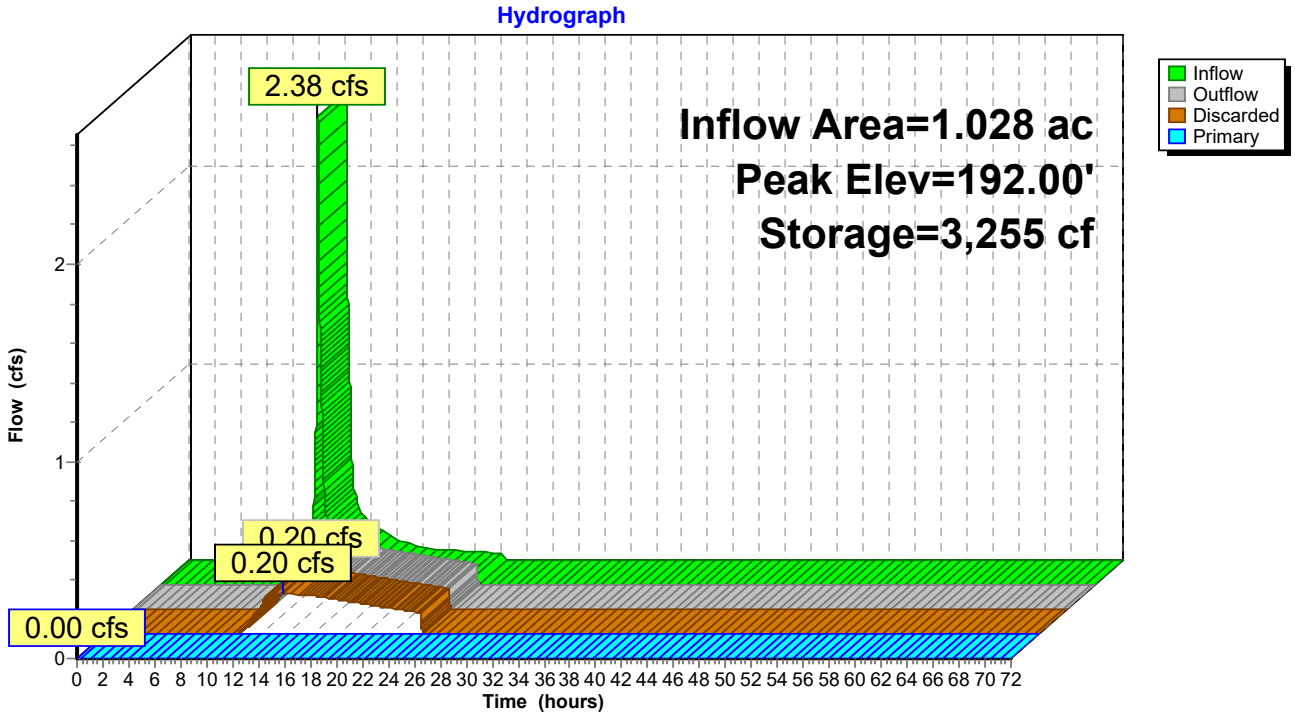
Device	Routing	Invert	Outlet Devices
#1	Discarded	190.50'	**3.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	193.00'	**25.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.20 cfs @ 13.80 hrs HW=192.00' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=190.50' TW=187.50' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

POST -DEV *Type III 24-hr 25-YR Rainfall=5.60"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Pond SMA A: SMA A



Summary for Pond SMA B: SMA B

Inflow Area = 5.002 ac, 33.06% Impervious, Inflow Depth = 2.06" for 25-YR event
Inflow = 11.17 cfs @ 12.11 hrs, Volume= 0.861 af
Outflow = 0.63 cfs @ 15.40 hrs, Volume= 0.828 af, Atten= 94%, Lag= 197.5 min
Primary = 0.63 cfs @ 15.40 hrs, Volume= 0.828 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 189.00' Surf.Area= 24,295 sf Storage= 95,559 cf
Peak Elev= 189.84' @ 15.40 hrs Surf.Area= 27,074 sf Storage= 117,144 cf (21,585 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 613.0 min (1,468.4 - 855.4)

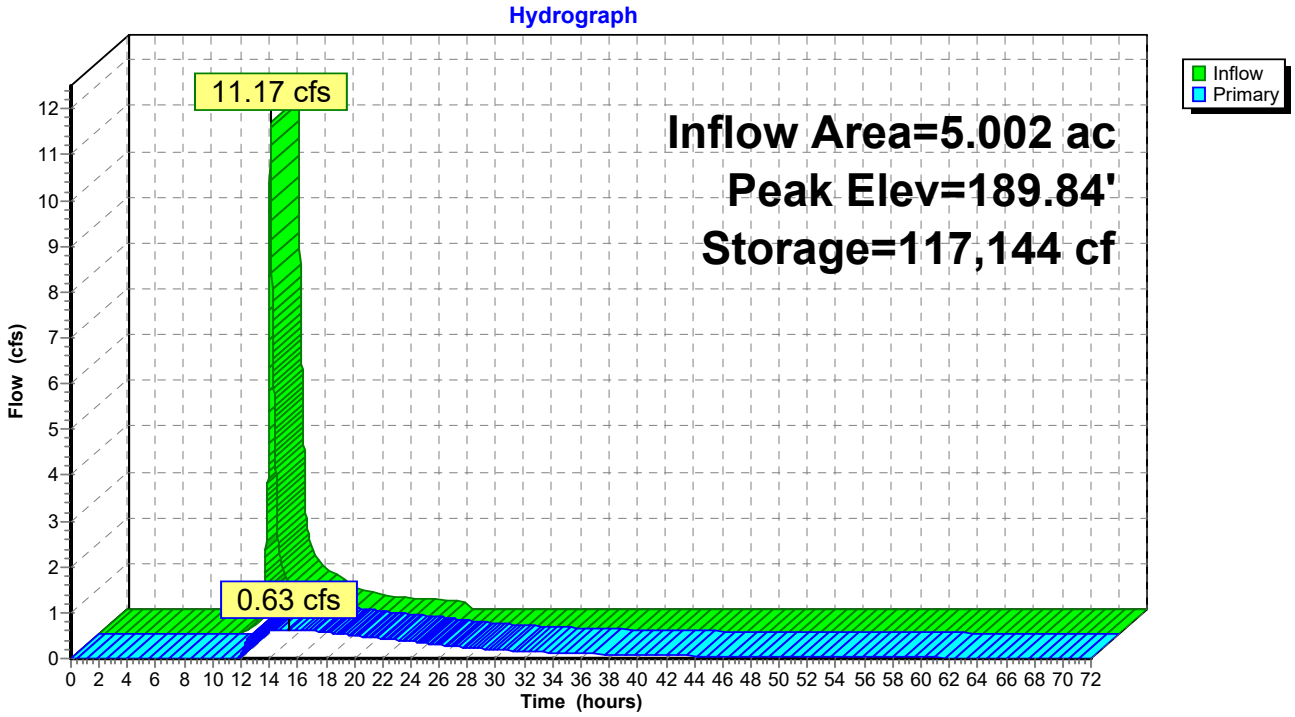
Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	182,293 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	5,185	0	0
184.00	9,240	14,425	14,425
186.00	14,133	23,373	37,798
188.00	20,987	35,120	72,918
190.00	27,602	48,589	121,507
191.00	30,985	29,294	150,801
192.00	32,000	31,493	182,293

Device	Routing	Invert	Outlet Devices
#1	Primary	188.74'	**12.0" Round Culvert** L= 64.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 188.74' / 188.10' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	189.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 0.25 0.25

Primary OutFlow Max=0.63 cfs @ 15.40 hrs HW=189.84' TW=188.34' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.63 cfs of 2.93 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 0.63 cfs @ 3.00 fps)

Pond SMA B: SMA B



Summary for Pond SMA C: SMA C

Inflow Area = 7.373 ac, 45.54% Impervious, Inflow Depth = 1.14" for 25-YR event
Inflow = 14.25 cfs @ 12.10 hrs, Volume= 0.700 af
Outflow = 0.95 cfs @ 13.07 hrs, Volume= 0.692 af, Atten= 93%, Lag= 57.9 min
Primary = 0.95 cfs @ 13.07 hrs, Volume= 0.692 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 195.00' Surf.Area= 13,868 sf Storage= 63,600 cf
Peak Elev= 196.10' @ 13.07 hrs Surf.Area= 16,033 sf Storage= 80,095 cf (16,495 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 368.3 min (1,207.7 - 839.4)

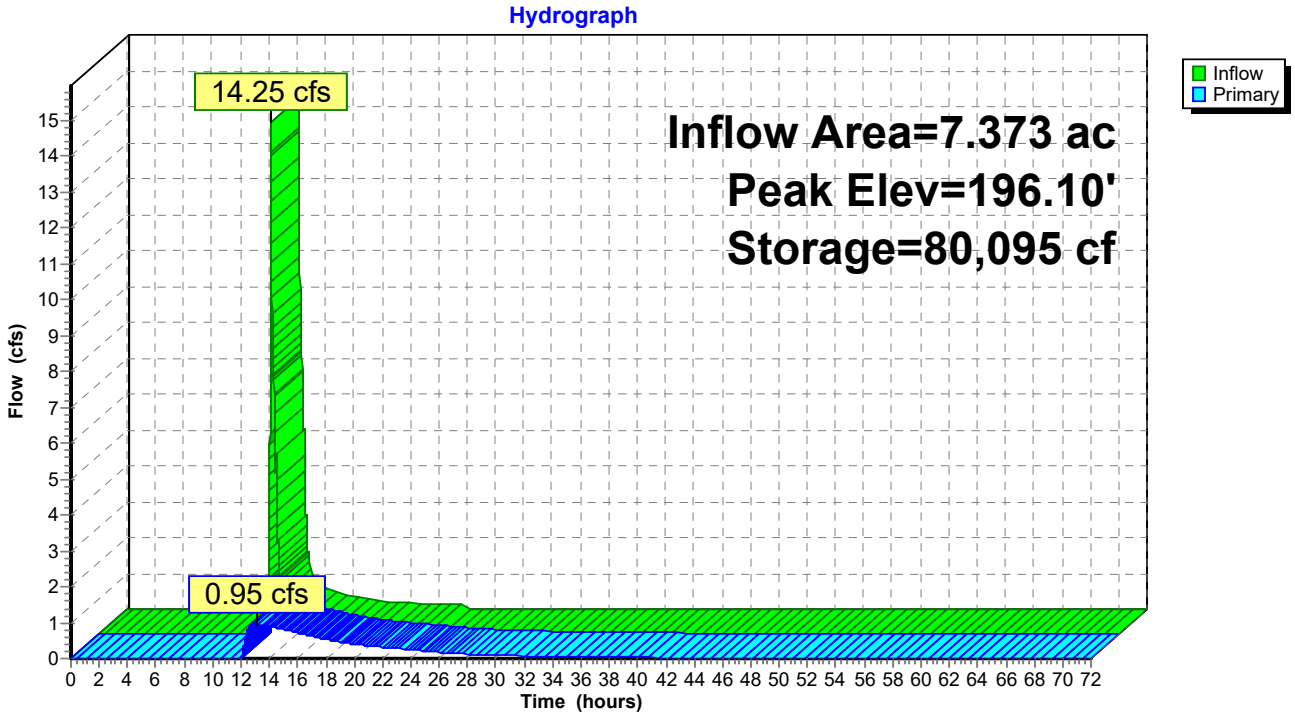
Volume	Invert	Avail.Storage	Storage Description
#1	188.00'	135,283 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
188.00	5,323	0	0
190.00	7,266	12,589	12,589
192.00	9,450	16,716	29,305
194.00	11,941	21,391	50,696
196.00	15,794	27,735	78,431
198.00	20,372	36,166	114,597
199.00	21,000	20,686	135,283

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**15.0" Round Culvert** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 193.00' / 192.25' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	195.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 2.00 4.00 Width (feet) 0.25 0.25 0.33 0.33

Primary OutFlow Max=0.95 cfs @ 13.07 hrs HW=196.10' TW=191.25' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.95 cfs of 8.35 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 0.95 cfs @ 3.44 fps)

Pond SMA C: SMA C



Summary for Pond SMA E: SMA E

Inflow Area = 9.293 ac, 41.15% Impervious, Inflow Depth = 2.67" for 25-YR event
Inflow = 27.29 cfs @ 12.11 hrs, Volume= 2.067 af
Outflow = 1.35 cfs @ 15.43 hrs, Volume= 1.962 af, Atten= 95%, Lag= 199.2 min
Primary = 1.35 cfs @ 15.43 hrs, Volume= 1.962 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 192.75' Surf.Area= 36,437 sf Storage= 163,773 cf
Peak Elev= 194.15' @ 15.43 hrs Surf.Area= 42,976 sf Storage= 219,337 cf (55,564 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 697.0 min (1,535.5 - 838.4)

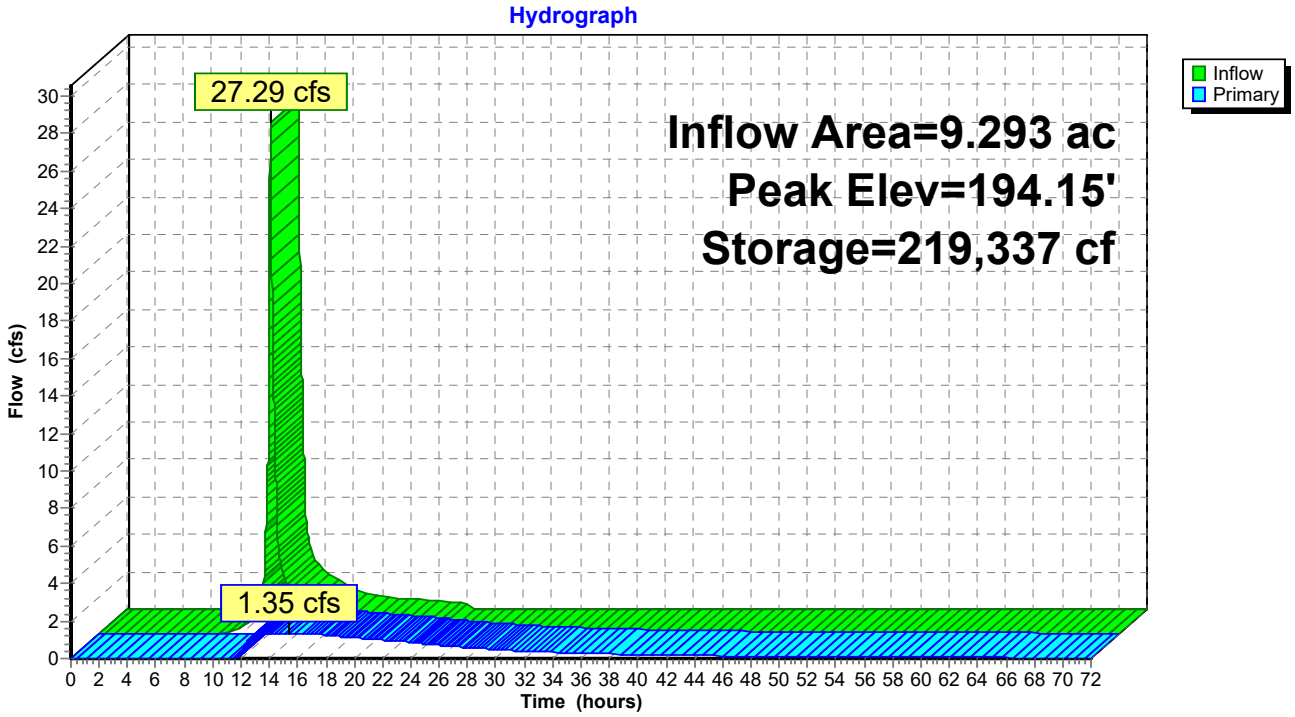
Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	332,216 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
186.00	13,724	0	0
188.00	19,598	33,322	33,322
190.00	25,980	45,578	78,900
192.00	32,894	58,874	137,774
194.00	42,341	75,235	213,009
196.00	50,905	93,246	306,255
196.50	52,938	25,961	332,216

Device	Routing	Invert	Outlet Devices
#1	Primary	191.66'	**15.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.66' / 191.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	192.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 2.00 4.00 Width (feet) 0.25 0.25 0.33 0.33

Primary OutFlow Max=1.35 cfs @ 15.43 hrs HW=194.15' TW=188.34' (Dynamic Tailwater)
↑**1=Culvert** (Passes 1.35 cfs of 8.07 cfs potential flow)
↑**2=Custom Weir/Orifice** (Weir Controls 1.35 cfs @ 3.87 fps)

Pond SMA E: SMA E



Summary for Pond SMA F: SMA F

Inflow Area = 1.723 ac, 36.76% Impervious, Inflow Depth = 1.49" for 25-YR event
Inflow = 2.90 cfs @ 12.10 hrs, Volume= 0.215 af
Outflow = 1.52 cfs @ 12.27 hrs, Volume= 0.215 af, Atten= 48%, Lag= 10.5 min
Discarded = 0.29 cfs @ 12.27 hrs, Volume= 0.179 af
Primary = 1.23 cfs @ 12.27 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 194.58' @ 12.27 hrs Surf.Area= 2,460 sf Storage= 2,382 cf

Plug-Flow detention time= 72.5 min calculated for 0.215 af (100% of inflow)
Center-of-Mass det. time= 72.5 min (929.2 - 856.7)

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	4,900 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

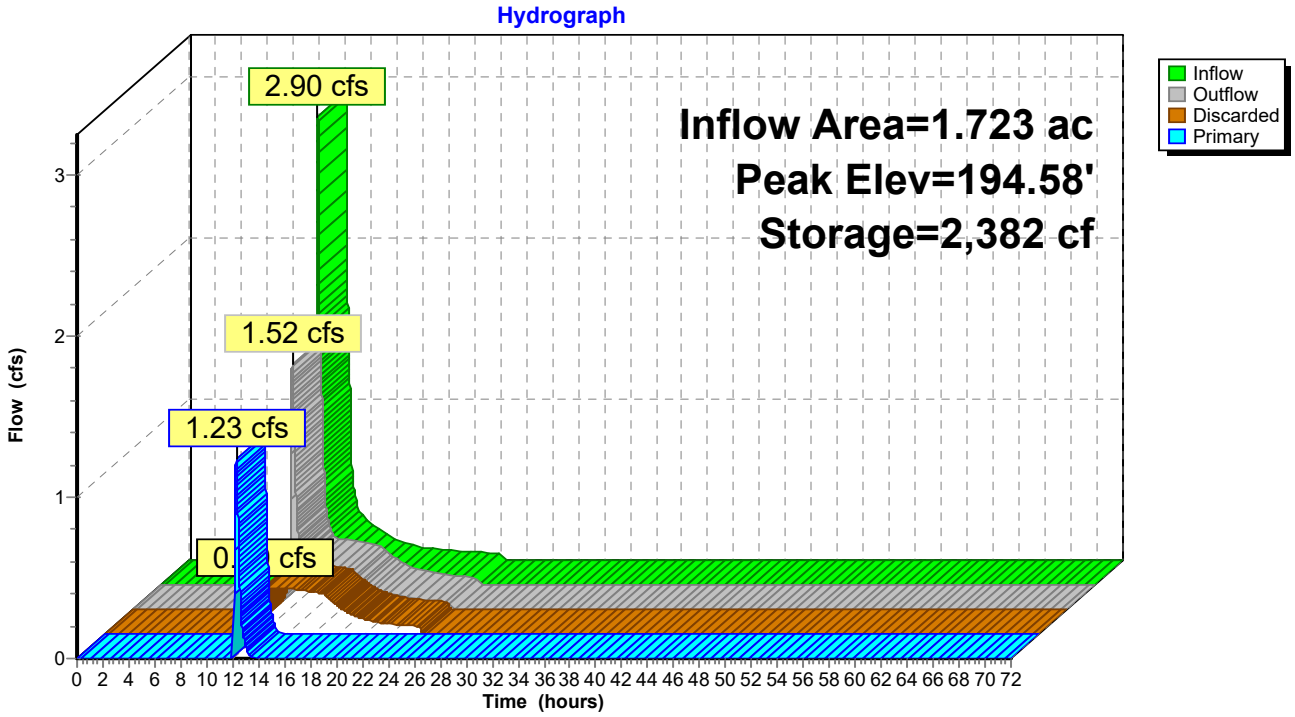
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
193.00	263	0	0	263
194.00	2,150	1,055	1,055	2,153
195.50	3,000	3,845	4,900	3,045

Device	Routing	Invert	Outlet Devices
#1	Discarded	193.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	194.50'	**25.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.29 cfs @ 12.27 hrs HW=194.58' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=1.23 cfs @ 12.27 hrs HW=194.58' TW=192.10' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.23 cfs @ 0.65 fps)

Pond SMA F: SMA F



Summary for Pond SMA G: SMA G

Inflow Area = 8.524 ac, 27.10% Impervious, Inflow Depth = 2.23" for 25-YR event
Inflow = 21.02 cfs @ 12.11 hrs, Volume= 1.586 af
Outflow = 1.86 cfs @ 13.69 hrs, Volume= 1.586 af, Atten= 91%, Lag= 94.9 min
Discarded = 1.86 cfs @ 13.69 hrs, Volume= 1.586 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 198.66' @ 13.69 hrs Surf.Area= 15,968 sf Storage= 30,811 cf

Plug-Flow detention time= 215.2 min calculated for 1.586 af (100% of inflow)
Center-of-Mass det. time= 215.2 min (1,065.2 - 850.1)

Volume	Invert	Avail.Storage	Storage Description
#1	195.00'	67,994 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

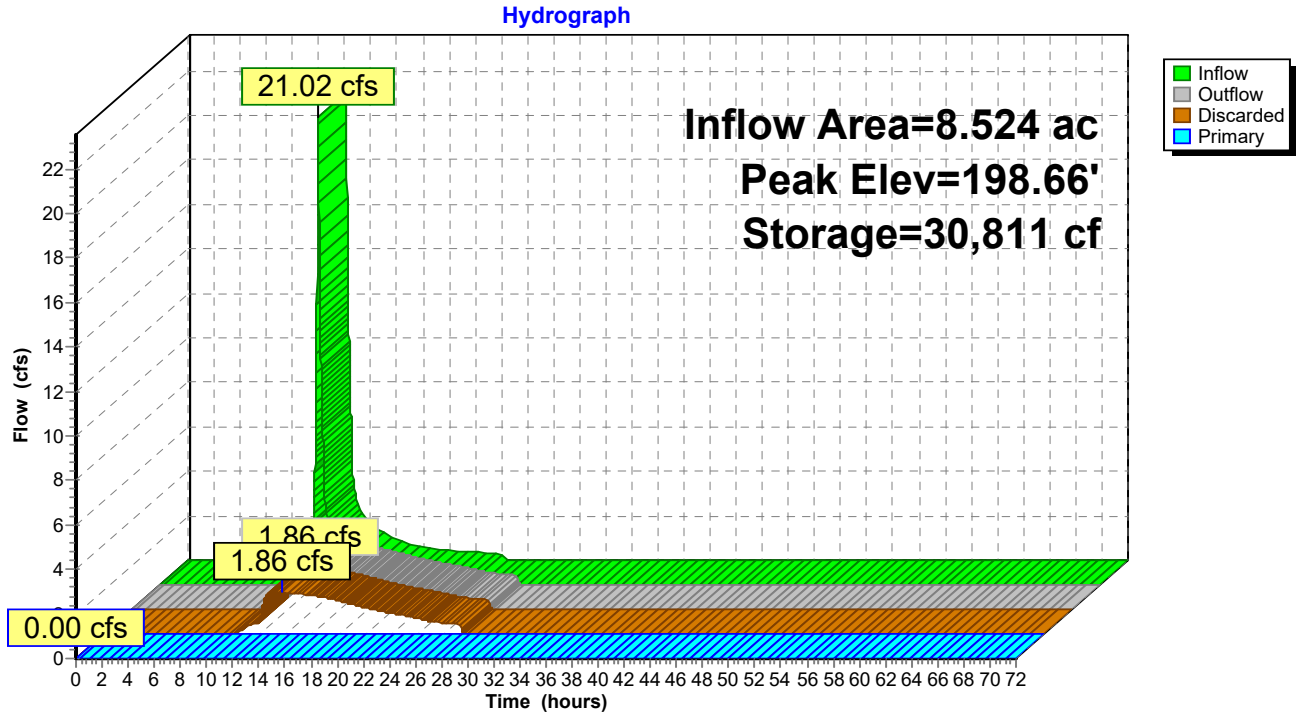
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
195.00	3,642	0	0	3,642
196.00	4,698	4,159	4,159	4,722
198.00	13,033	17,037	21,196	13,083
200.00	22,772	35,355	56,551	22,867
200.50	23,000	11,443	67,994	23,219

Device	Routing	Invert	Outlet Devices
#1	Discarded	195.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	200.25'	**150.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=1.86 cfs @ 13.69 hrs HW=198.66' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.86 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=195.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA G: SMA G



Summary for Pond SMA H: SMA H

Inflow Area = 1.334 ac, 51.77% Impervious, Inflow Depth = 3.42" for 25-YR event
Inflow = 5.25 cfs @ 12.09 hrs, Volume= 0.380 af
Outflow = 0.36 cfs @ 13.77 hrs, Volume= 0.380 af, Atten= 93%, Lag= 100.5 min
Discarded = 0.36 cfs @ 13.77 hrs, Volume= 0.380 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 208.97' @ 13.77 hrs Surf.Area= 5,199 sf Storage= 7,682 cf

Plug-Flow detention time= 230.5 min calculated for 0.380 af (100% of inflow)
Center-of-Mass det. time= 230.5 min (1,048.0 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	207.00'	30,964 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

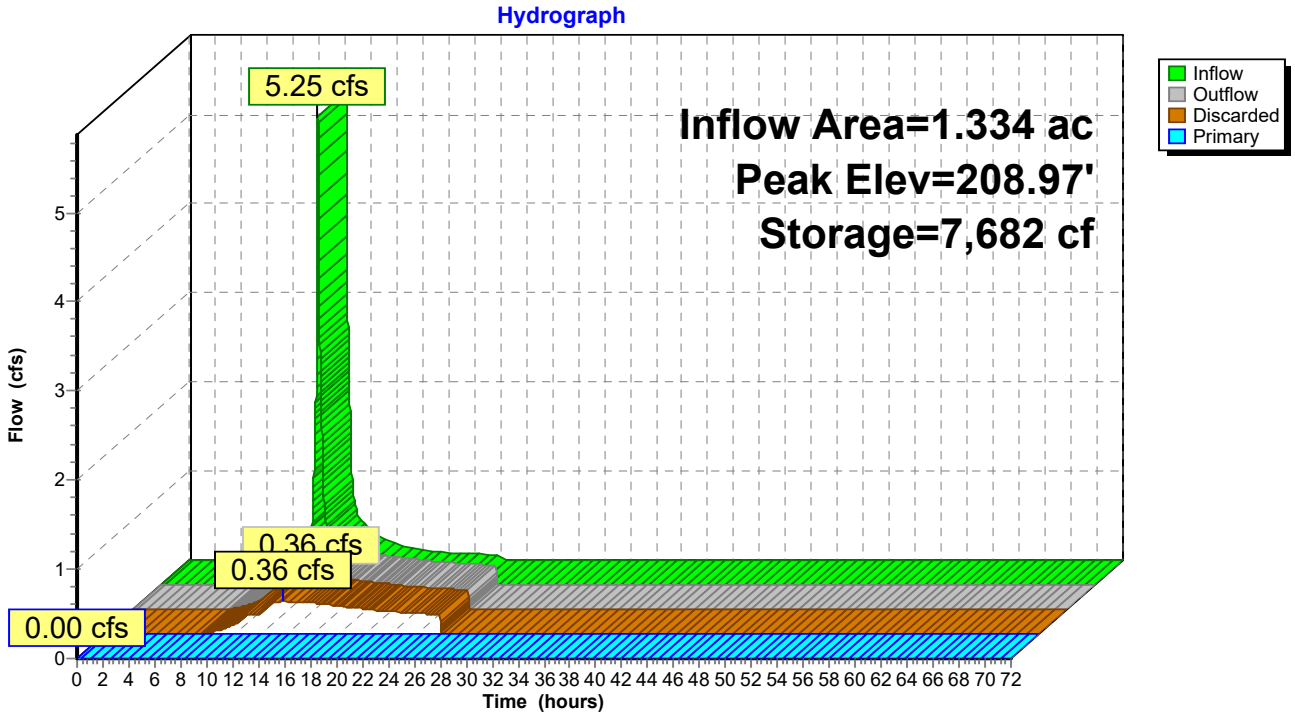
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.00	3,024	0	0	3,024
208.00	3,727	3,369	3,369	3,756
210.00	7,027	10,581	13,950	7,096
212.00	10,078	17,014	30,964	10,216

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.00'	**3.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	210.50'	**12.0' long x 16.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.36 cfs @ 13.77 hrs HW=208.97' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.00' TW=201.19' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond SMA H: SMA H



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=43,868 sf 57.08% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=73 Runoff=0.88 cfs 0.068 af

Subcatchment 43: DA 43 Runoff Area=42,271 sf 61.07% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=75 Runoff=0.98 cfs 0.074 af

Subcatchment 44: DA 44 Runoff Area=56,504 sf 68.56% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=81 Runoff=1.89 cfs 0.136 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=0.47"
Tc=6.4 min CN=65 Runoff=0.40 cfs 0.041 af

Subcatchment B: DA TO SMA B Runoff Area=217,870 sf 33.06% Impervious Runoff Depth=0.47"
Tc=7.4 min CN=65 Runoff=1.87 cfs 0.198 af

Subcatchment C: DA TO SMA C Runoff Area=178,544 sf 31.74% Impervious Runoff Depth=0.25"
Tc=7.5 min CN=58 Runoff=0.45 cfs 0.086 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=0.77"
Tc=7.7 min CN=72 Runoff=7.05 cfs 0.594 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=0.10"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.01 cfs 0.003 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=0.44"
Tc=6.1 min CN=64 Runoff=0.44 cfs 0.047 af

Subcatchment G: DA TO SMA G Runoff Area=371,288 sf 27.10% Impervious Runoff Depth=0.55"
Tc=7.1 min CN=67 Runoff=4.12 cfs 0.391 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=1.20"
Tc=6.5 min CN=80 Runoff=1.81 cfs 0.133 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=0.31"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=1.59 cfs 0.275 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=471' Tc=17.0 min CN=58 Runoff=0.45 cfs 0.096 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=0.34"
Flow Length=1,911' Tc=44.0 min CN=61 Runoff=1.17 cfs 0.290 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=74 Runoff=1.03 cfs 0.079 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=1.20"
Tc=6.0 min CN=80 Runoff=4.43 cfs 0.320 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.13"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=1.62 cfs 0.897 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.28"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=2.75 cfs 0.527 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=0.31"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=19.34 cfs 8.693 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=0.34"
Flow Length=210' Tc=9.0 min CN=61 Runoff=0.68 cfs 0.104 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=0.15"
Flow Length=297' Tc=11.5 min UI Adjusted CN=54 Runoff=0.13 cfs 0.039 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=0.31"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=1.34 cfs 0.301 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=0.28"
Flow Length=457' Tc=15.5 min CN=59 Runoff=1.68 cfs 0.327 af

Reach 1R: REACH 1 Avg. Flow Depth=0.41' Max Vel=1.21 fps Inflow=6.71 cfs 3.301 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=6.42 cfs 3.298 af

Reach 2R: REACH 2 Avg. Flow Depth=0.29' Max Vel=1.86 fps Inflow=5.63 cfs 2.154 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=5.26 cfs 2.154 af

Reach 3R: REACH 3 Avg. Flow Depth=0.21' Max Vel=0.89 fps Inflow=4.11 cfs 0.931 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=3.90 cfs 0.931 af

Reach 4R: REACH 4 Avg. Flow Depth=0.53' Max Vel=1.99 fps Inflow=19.81 cfs 9.006 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=19.78 cfs 9.006 af

Pond DMA D: SMA D Peak Elev=205.70' Storage=1,525 cf Inflow=1.74 cfs 0.066 af
Discarded=0.37 cfs 0.066 af Primary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.066 af

Pond P1: POND 1 Peak Elev=188.57' Storage=1,137 cf Inflow=5.27 cfs 2.235 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=5.23 cfs 2.234 af

Pond P2: POND 2 Peak Elev=202.49' Storage=1,003 cf Inflow=3.80 cfs 0.828 af
Outflow=3.68 cfs 0.827 af

Pond P3: POND 3 Peak Elev=193.84' Storage=263 cf Inflow=19.75 cfs 8.968 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=19.75 cfs 8.966 af

Pond POA C: POA COMBINED Inflow=24.97 cfs 12.720 af
Primary=24.97 cfs 12.720 af

Pond POA NE: POA NORTHEAST Inflow=20.25 cfs 9.422 af
Primary=20.25 cfs 9.422 af

Pond POA NW: POA NORTHWEST Inflow=6.42 cfs 3.298 af
Primary=6.42 cfs 3.298 af

Pond PP: POROUS PAVEMENT Peak Elev=190.50' Storage=0.000 af Inflow=0.01 cfs 0.003 af
Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af

Pond RG 2: RAIN GARDEN D2 Peak Elev=210.14' Storage=955 cf Inflow=0.98 cfs 0.074 af
Discarded=0.18 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.074 af

Pond RG1: RAIN GARDEN D1 Peak Elev=212.41' Storage=575 cf Inflow=1.89 cfs 0.136 af
Discarded=0.11 cfs 0.074 af Primary=1.74 cfs 0.062 af Outflow=1.85 cfs 0.136 af

Pond RG3: RAIN GARDEN D3 Peak Elev=208.29' Storage=778 cf Inflow=0.88 cfs 0.068 af
Discarded=0.16 cfs 0.065 af Primary=0.19 cfs 0.004 af Outflow=0.35 cfs 0.068 af

Pond SMA A: SMA A Peak Elev=190.69' Storage=311 cf Inflow=0.40 cfs 0.041 af
Discarded=0.12 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.041 af

Pond SMA B: SMA B Peak Elev=189.23' Storage=101,136 cf Inflow=1.87 cfs 0.198 af
Outflow=0.09 cfs 0.176 af

Pond SMA C: SMA C Peak Elev=195.15' Storage=65,732 cf Inflow=0.45 cfs 0.086 af
Outflow=0.05 cfs 0.081 af

Pond SMA E: SMA E Peak Elev=193.21' Storage=181,058 cf Inflow=7.05 cfs 0.594 af
Outflow=0.26 cfs 0.522 af

Pond SMA F: SMA F Peak Elev=193.60' Storage=396 cf Inflow=0.44 cfs 0.047 af
Discarded=0.14 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.047 af

Pond SMA G: SMA G Peak Elev=196.18' Storage=5,036 cf Inflow=4.12 cfs 0.391 af
Discarded=0.61 cfs 0.391 af Primary=0.00 cfs 0.000 af Outflow=0.61 cfs 0.391 af

Pond SMA H: SMA H Peak Elev=207.59' Storage=1,917 cf Inflow=1.81 cfs 0.133 af
Discarded=0.24 cfs 0.133 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.133 af

Total Runoff Area = 537.967 ac Runoff Volume = 13.718 af Average Runoff Depth = 0.31"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=43,868 sf 57.08% Impervious Runoff Depth=1.84"
Tc=6.0 min CN=73 Runoff=2.14 cfs 0.155 af

Subcatchment 43: DA 43 Runoff Area=42,271 sf 61.07% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=75 Runoff=2.25 cfs 0.161 af

Subcatchment 44: DA 44 Runoff Area=56,504 sf 68.56% Impervious Runoff Depth=2.49"
Tc=6.0 min CN=81 Runoff=3.79 cfs 0.269 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=1.29"
Tc=6.4 min CN=65 Runoff=1.41 cfs 0.110 af

Subcatchment B: DA TO SMA B Runoff Area=217,870 sf 33.06% Impervious Runoff Depth=1.29"
Tc=7.4 min CN=65 Runoff=6.62 cfs 0.536 af

Subcatchment C: DA TO SMA C Runoff Area=178,544 sf 31.74% Impervious Runoff Depth=0.87"
Tc=7.5 min CN=58 Runoff=3.16 cfs 0.297 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=1.77"
Tc=7.7 min CN=72 Runoff=17.78 cfs 1.370 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=0.52"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.13 cfs 0.018 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=1.22"
Tc=6.1 min CN=64 Runoff=1.69 cfs 0.132 af

Subcatchment G: DA TO SMA G Runoff Area=371,288 sf 27.10% Impervious Runoff Depth=1.42"
Tc=7.1 min CN=67 Runoff=12.87 cfs 1.007 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=2.40"
Tc=6.5 min CN=80 Runoff=3.69 cfs 0.267 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=0.98"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=8.69 cfs 0.876 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=0.87"
Flow Length=471' Tc=17.0 min CN=58 Runoff=2.65 cfs 0.330 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=1.04"
Flow Length=1,911' Tc=44.0 min CN=61 Runoff=5.08 cfs 0.890 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=74 Runoff=2.43 cfs 0.175 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=80 Runoff=9.04 cfs 0.642 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=0.61"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=17.90 cfs 4.115 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=0.93"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=15.29 cfs 1.744 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=0.98"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=82.25 cfs 27.673 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=1.04"
Flow Length=210' Tc=9.0 min CN=61 Runoff=3.50 cfs 0.321 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=0.66"
Flow Length=297' Tc=11.5 min UI Adjusted CN=54 Runoff=1.30 cfs 0.169 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=0.98"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=6.35 cfs 0.959 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=0.93"
Flow Length=457' Tc=15.5 min CN=59 Runoff=9.25 cfs 1.081 af

Reach 1R: REACH 1 Avg. Flow Depth=0.81' Max Vel=1.80 fps Inflow=30.81 cfs 11.404 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=30.69 cfs 11.401 af

Reach 2R: REACH 2 Avg. Flow Depth=0.64' Max Vel=2.96 fps Inflow=32.54 cfs 8.218 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=32.23 cfs 8.218 af

Reach 3R: REACH 3 Avg. Flow Depth=0.36' Max Vel=1.20 fps Inflow=12.16 cfs 3.022 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=12.09 cfs 3.022 af

Reach 4R: REACH 4 Avg. Flow Depth=1.02' Max Vel=2.89 fps Inflow=83.68 cfs 28.717 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=83.61 cfs 28.717 af

Pond DMA D: SMA D Peak Elev=208.98' Storage=4,150 cf Inflow=6.40 cfs 0.247 af
Discarded=0.57 cfs 0.199 af Primary=2.86 cfs 0.048 af Outflow=3.43 cfs 0.247 af

Pond P1: POND 1 Peak Elev=190.33' Storage=25,443 cf Inflow=32.50 cfs 8.557 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=26.53 cfs 8.556 af

Pond P2: POND 2 Peak Elev=203.96' Storage=15,022 cf Inflow=18.83 cfs 2.702 af
Outflow=10.91 cfs 2.702 af

Pond P3: POND 3 Peak Elev=194.87' Storage=694 cf Inflow=83.44 cfs 28.549 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=83.43 cfs 28.548 af

Pond POA C: POA COMBINED Inflow=112.73 cfs 41.090 af
Primary=112.73 cfs 41.090 af

Pond POA NE: POA NORTHEAST Inflow=84.72 cfs 29.689 af
Primary=84.72 cfs 29.689 af

Pond POA NW: POA NORTHWEST Inflow=30.69 cfs 11.401 af
Primary=30.69 cfs 11.401 af

Pond PP: POROUS PAVEMENT Peak Elev=190.62' Storage=0.001 af Inflow=0.13 cfs 0.018 af
Discarded=0.08 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.018 af

Pond RG 2: RAIN GARDEN D2 Peak Elev=210.39' Storage=1,409 cf Inflow=2.25 cfs 0.161 af
Discarded=0.23 cfs 0.122 af Primary=1.43 cfs 0.039 af Outflow=1.67 cfs 0.161 af

Pond RG1: RAIN GARDEN D1 Peak Elev=212.52' Storage=679 cf Inflow=3.79 cfs 0.269 af
Discarded=0.13 cfs 0.101 af Primary=3.60 cfs 0.168 af Outflow=3.72 cfs 0.269 af

Pond RG3: RAIN GARDEN D3 Peak Elev=208.75' Storage=1,696 cf Inflow=2.14 cfs 0.155 af
Discarded=0.30 cfs 0.115 af Primary=1.78 cfs 0.040 af Outflow=1.98 cfs 0.155 af

Pond SMA A: SMA A Peak Elev=191.40' Storage=1,705 cf Inflow=1.41 cfs 0.110 af
Discarded=0.16 cfs 0.110 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.110 af

Pond SMA B: SMA B Peak Elev=189.55' Storage=109,443 cf Inflow=6.62 cfs 0.536 af
Outflow=0.33 cfs 0.507 af

Pond SMA C: SMA C Peak Elev=195.53' Storage=71,226 cf Inflow=5.66 cfs 0.345 af
Outflow=0.32 cfs 0.338 af

Pond SMA E: SMA E Peak Elev=193.72' Storage=201,440 cf Inflow=17.78 cfs 1.370 af
Outflow=0.79 cfs 1.276 af

Pond SMA F: SMA F Peak Elev=194.34' Storage=1,827 cf Inflow=1.69 cfs 0.132 af
Discarded=0.27 cfs 0.132 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.132 af

Pond SMA G: SMA G Peak Elev=197.71' Storage=17,597 cf Inflow=12.87 cfs 1.007 af
Discarded=1.34 cfs 1.007 af Primary=0.00 cfs 0.000 af Outflow=1.34 cfs 1.007 af

Pond SMA H: SMA H Peak Elev=208.39' Storage=4,943 cf Inflow=3.69 cfs 0.267 af
Discarded=0.30 cfs 0.267 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.267 af

Total Runoff Area = 537.967 ac Runoff Volume = 43.298 af Average Runoff Depth = 0.97"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 42: DA 42 Runoff Area=43,868 sf 57.08% Impervious Runoff Depth=3.67"
Tc=6.0 min CN=73 Runoff=4.34 cfs 0.308 af

Subcatchment 43: DA 43 Runoff Area=42,271 sf 61.07% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=75 Runoff=4.41 cfs 0.314 af

Subcatchment 44: DA 44 Runoff Area=56,504 sf 68.56% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=81 Runoff=6.80 cfs 0.488 af

Subcatchment A: DA TO SMA A Runoff Area=44,766 sf 43.70% Impervious Runoff Depth=2.86"
Tc=6.4 min CN=65 Runoff=3.36 cfs 0.245 af

Subcatchment B: DA TO SMA B Runoff Area=217,870 sf 33.06% Impervious Runoff Depth=2.86"
Tc=7.4 min CN=65 Runoff=15.79 cfs 1.194 af

Subcatchment C: DA TO SMA C Runoff Area=178,544 sf 31.74% Impervious Runoff Depth=2.20"
Tc=7.5 min CN=58 Runoff=9.52 cfs 0.752 af

Subcatchment E: DA TO SMA E Runoff Area=404,789 sf 41.15% Impervious Runoff Depth=3.57"
Tc=7.7 min CN=72 Runoff=36.63 cfs 2.762 af

Subcatchment EA: DA EMERGENCY Runoff Area=0.424 ac 21.70% Impervious Runoff Depth=1.58"
Tc=6.0 min UI Adjusted CN=51 Runoff=0.68 cfs 0.056 af

Subcatchment F: DA TO SMA F Runoff Area=56,580 sf 41.67% Impervious Runoff Depth=2.77"
Tc=6.1 min CN=64 Runoff=4.13 cfs 0.300 af

Subcatchment G: DA TO SMA G Runoff Area=371,288 sf 27.10% Impervious Runoff Depth=3.06"
Tc=7.1 min CN=67 Runoff=29.23 cfs 2.175 af

Subcatchment H: DA TO H Runoff Area=58,090 sf 51.77% Impervious Runoff Depth=4.41"
Tc=6.5 min CN=80 Runoff=6.72 cfs 0.490 af

Subcatchment NE1: DA NE1 Runoff Area=10.702 ac 2.51% Impervious Runoff Depth=2.39"
Flow Length=171' Tc=11.1 min UI Adjusted CN=60 Runoff=24.23 cfs 2.128 af

Subcatchment NE2: DA NE2 Runoff Area=198,415 sf 0.00% Impervious Runoff Depth=2.20"
Flow Length=471' Tc=17.0 min CN=58 Runoff=7.98 cfs 0.835 af

Subcatchment NW1: DA NW1 Runoff Area=10.263 ac 2.14% Impervious Runoff Depth=2.48"
Flow Length=1,911' Tc=44.0 min CN=61 Runoff=13.52 cfs 2.121 af

Subcatchment NW3: DA NW3 Runoff Area=47,669 sf 39.03% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=74 Runoff=4.84 cfs 0.344 af

Subcatchment OFF 4: DA OFF 4 Runoff Area=139,707 sf 50.27% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=80 Runoff=16.45 cfs 1.178 af

Subcatchment OFF1: DA OFFSITE 1 Runoff Area=3,513,022 sf 7.85% Impervious Runoff Depth=1.75"
Flow Length=4,276' Tc=47.1 min CN=53 Runoff=67.20 cfs 11.785 af

Subcatchment OFF2: DA OFFSITE 2 Runoff Area=985,145 sf 5.31% Impervious Runoff Depth=2.29"
Flow Length=1,118' Tc=14.5 min CN=59 Runoff=44.27 cfs 4.322 af

Subcatchment OFF3: DA OFFSITE 3 Runoff Area=14,727,896 sf 3.53% Impervious Runoff Depth=2.39"
Flow Length=7,519' Tc=118.4 min CN=60 Runoff=225.18 cfs 67.241 af

Subcatchment R3: DA R3 Runoff Area=3.697 ac 1.68% Impervious Runoff Depth=2.48"
Flow Length=210' Tc=9.0 min CN=61 Runoff=9.39 cfs 0.764 af

Subcatchment R4: DA R4 Runoff Area=3.068 ac 6.42% Impervious Runoff Depth=1.84"
Flow Length=297' Tc=11.5 min UI Adjusted CN=54 Runoff=4.99 cfs 0.471 af

Subcatchment SE: DA SE Runoff Area=510,212 sf 1.68% Impervious Runoff Depth=2.39"
Flow Length=841' Slope=0.0200 '/' Tc=31.5 min CN=60 Runoff=17.41 cfs 2.329 af

Subcatchment SW: DA SW Runoff Area=610,800 sf 1.50% Impervious Runoff Depth=2.29"
Flow Length=457' Tc=15.5 min CN=59 Runoff=26.75 cfs 2.680 af

Reach 1R: REACH 1 Avg. Flow Depth=1.03' Max Vel=2.08 fps Inflow=55.00 cfs 29.228 af
n=0.025 L=767.0' S=0.0026 '/' Capacity=88.11 cfs Outflow=54.61 cfs 29.225 af

Reach 2R: REACH 2 Avg. Flow Depth=1.10' Max Vel=4.11 fps Inflow=119.84 cfs 21.879 af
n=0.025 L=1,154.0' S=0.0095 '/' Capacity=161.16 cfs Outflow=118.34 cfs 21.879 af

Reach 3R: REACH 3 Avg. Flow Depth=0.64' Max Vel=1.69 fps Inflow=46.35 cfs 7.415 af
n=0.025 L=382.0' S=0.0031 '/' Capacity=132.87 cfs Outflow=45.80 cfs 7.415 af

Reach 4R: REACH 4 Avg. Flow Depth=1.56' Max Vel=3.73 fps Inflow=228.51 cfs 69.929 af
n=0.030 L=292.0' S=0.0068 '/' Capacity=722.85 cfs Outflow=228.47 cfs 69.929 af

Pond DMA D: SMA D Peak Elev=209.29' Storage=4,264 cf Inflow=10.41 cfs 0.628 af
Discarded=0.58 cfs 0.296 af Primary=9.71 cfs 0.332 af Outflow=10.29 cfs 0.628 af

Pond P1: POND 1 Peak Elev=192.21' Storage=252,541 cf Inflow=120.08 cfs 22.955 af
30.0" Round Culvert n=0.012 L=58.0' S=0.0067 '/' Outflow=43.48 cfs 22.955 af

Pond P2: POND 2 Peak Elev=204.67' Storage=38,567 cf Inflow=54.96 cfs 6.652 af
Outflow=42.72 cfs 6.651 af

Pond P3: POND 3 Peak Elev=196.47' Storage=1,833 cf Inflow=227.83 cfs 69.370 af
144.0" x 72.0" Box Culvert n=0.020 L=80.0' S=0.0212 '/' Outflow=227.81 cfs 69.368 af

Pond POA C: POA COMBINED Inflow=281.47 cfs 101.167 af
Primary=281.47 cfs 101.167 af

Pond POA NE: POA NORTHEAST Inflow=230.69 cfs 71.943 af
Primary=230.69 cfs 71.943 af

Pond POA NW: POA NORTHWEST Inflow=54.61 cfs 29.225 af
Primary=54.61 cfs 29.225 af

Pond PP: POROUS PAVEMENT Peak Elev=191.98' Storage=0.014 af Inflow=0.68 cfs 0.056 af
Discarded=0.17 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.056 af

Pond RG 2: RAIN GARDEN D2 Peak Elev=210.53' Storage=1,701 cf Inflow=4.41 cfs 0.314 af
Discarded=0.26 cfs 0.174 af Primary=3.91 cfs 0.139 af Outflow=4.17 cfs 0.314 af

Pond RG1: RAIN GARDEN D1 Peak Elev=212.65' Storage=834 cf Inflow=6.80 cfs 0.488 af
Discarded=0.15 cfs 0.128 af Primary=6.55 cfs 0.360 af Outflow=6.70 cfs 0.488 af

Pond RG3: RAIN GARDEN D3 Peak Elev=209.21' Storage=3,204 cf Inflow=4.34 cfs 0.308 af
Discarded=0.48 cfs 0.179 af Primary=2.15 cfs 0.129 af Outflow=2.62 cfs 0.308 af

Pond SMA A: SMA A Peak Elev=192.55' Storage=4,980 cf Inflow=3.36 cfs 0.245 af
Discarded=0.24 cfs 0.245 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.245 af

Pond SMA B: SMA B Peak Elev=190.12' Storage=124,929 cf Inflow=15.79 cfs 1.194 af
Outflow=0.97 cfs 1.159 af

Pond SMA C: SMA C Peak Elev=196.69' Storage=89,898 cf Inflow=19.23 cfs 1.084 af
Outflow=1.80 cfs 1.076 af

Pond SMA E: SMA E Peak Elev=194.55' Storage=236,938 cf Inflow=36.63 cfs 2.762 af
Outflow=1.98 cfs 2.649 af

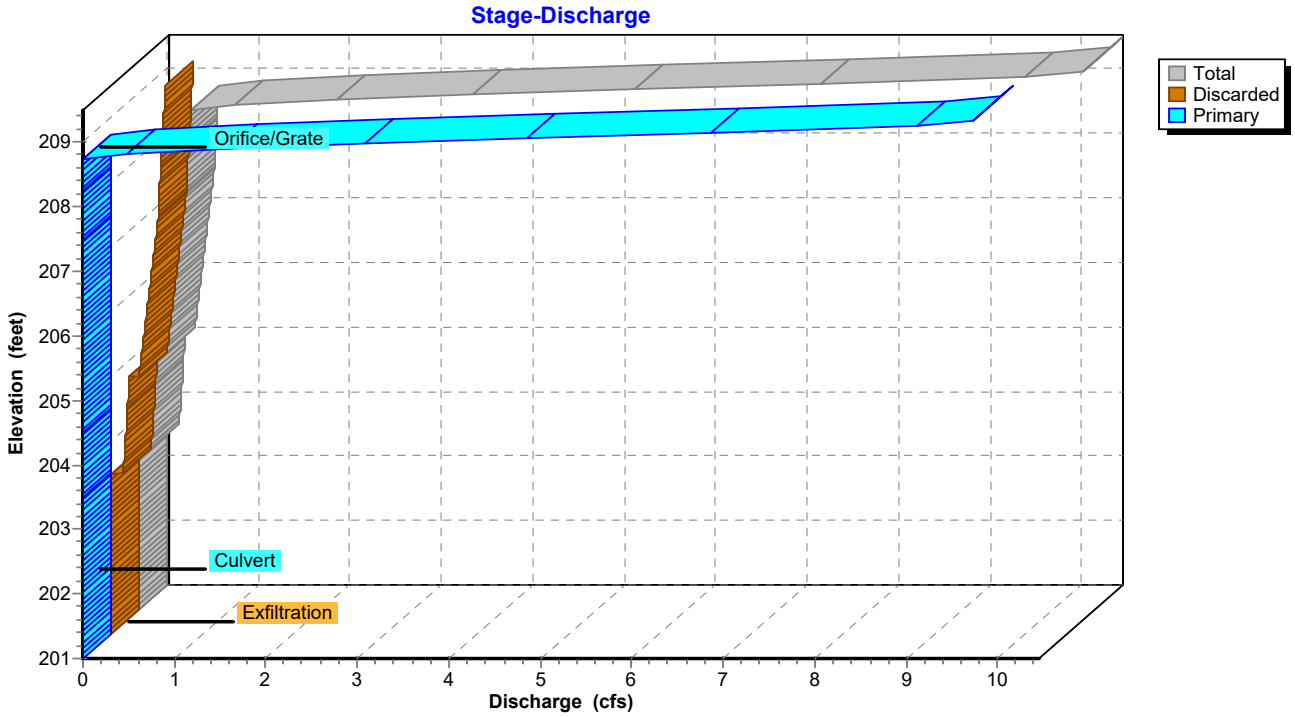
Pond SMA F: SMA F Peak Elev=194.64' Storage=2,552 cf Inflow=4.13 cfs 0.300 af
Discarded=0.29 cfs 0.210 af Primary=3.23 cfs 0.090 af Outflow=3.52 cfs 0.300 af

Pond SMA G: SMA G Peak Elev=199.47' Storage=45,216 cf Inflow=29.23 cfs 2.175 af
Discarded=2.32 cfs 2.175 af Primary=0.00 cfs 0.000 af Outflow=2.32 cfs 2.175 af

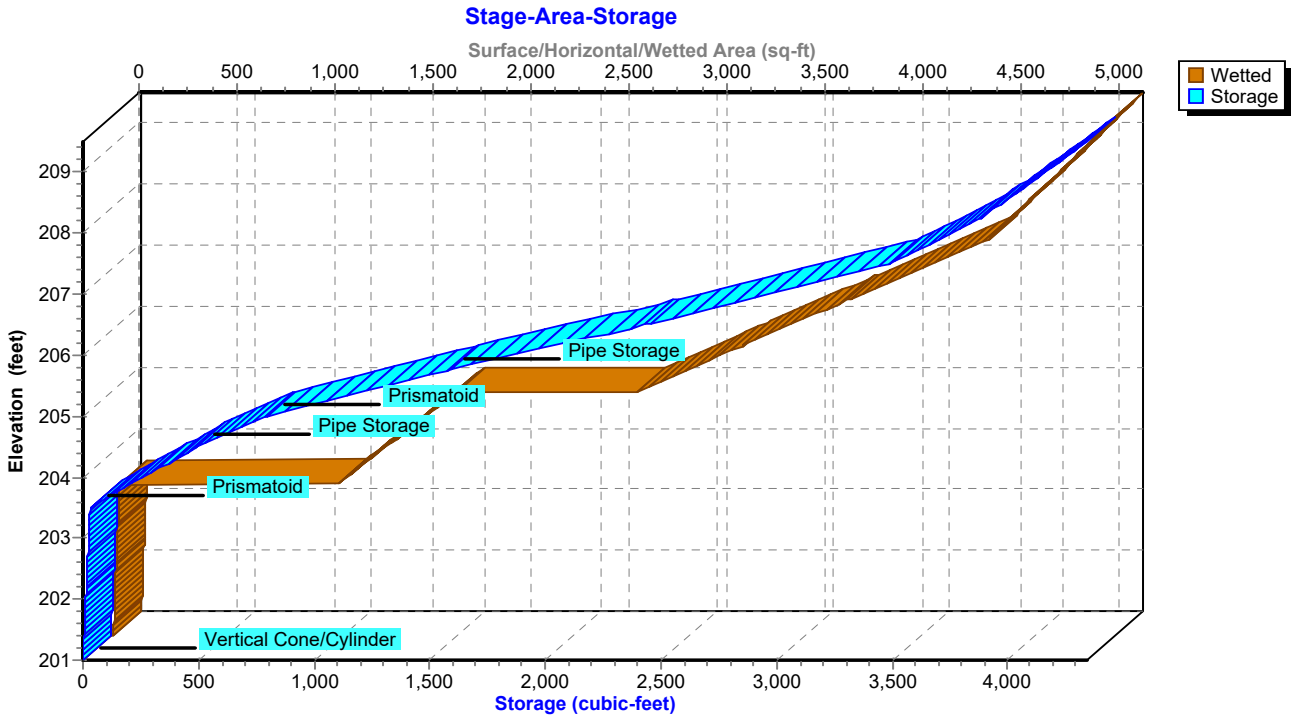
Pond SMA H: SMA H Peak Elev=209.47' Storage=10,474 cf Inflow=6.72 cfs 0.490 af
Discarded=0.42 cfs 0.490 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.490 af

Total Runoff Area = 537.967 ac Runoff Volume = 105.283 af Average Runoff Depth = 2.35"
93.39% Pervious = 502.384 ac 6.61% Impervious = 35.582 ac

Pond DMA D: SMA D



Pond DMA D: SMA D



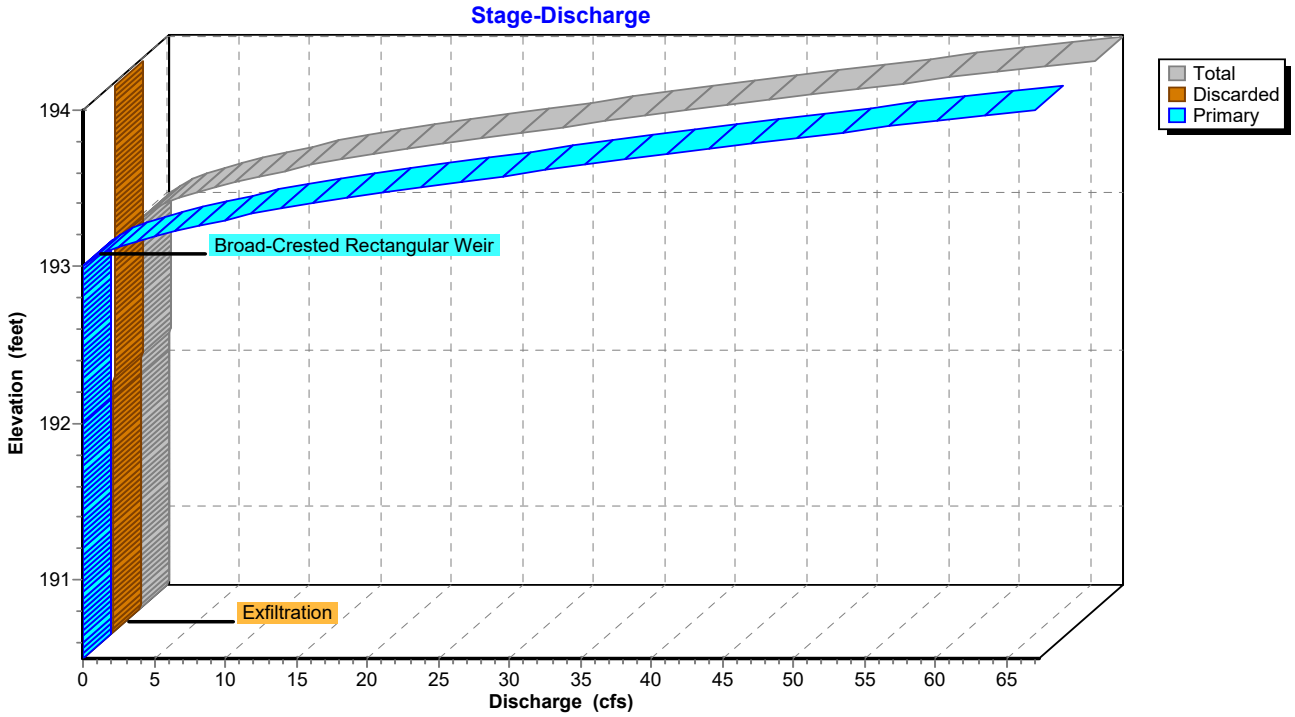
Stage-Discharge for Pond DMA D: SMA D

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
201.00	0.00	0.00	0.00
201.10	0.00	0.00	0.00
201.20	0.00	0.00	0.00
201.30	0.00	0.00	0.00
201.40	0.00	0.00	0.00
201.50	0.00	0.00	0.00
201.60	0.00	0.00	0.00
201.70	0.00	0.00	0.00
201.80	0.00	0.00	0.00
201.90	0.00	0.00	0.00
202.00	0.00	0.00	0.00
202.10	0.00	0.00	0.00
202.20	0.00	0.00	0.00
202.30	0.00	0.00	0.00
202.40	0.00	0.00	0.00
202.50	0.00	0.00	0.00
202.60	0.00	0.00	0.00
202.70	0.00	0.00	0.00
202.80	0.00	0.00	0.00
202.90	0.00	0.00	0.00
203.00	0.00	0.00	0.00
203.10	0.00	0.00	0.00
203.20	0.00	0.00	0.00
203.30	0.00	0.00	0.00
203.40	0.00	0.00	0.00
203.50	0.13	0.13	0.00
203.60	0.14	0.14	0.00
203.70	0.14	0.14	0.00
203.80	0.15	0.15	0.00
203.90	0.15	0.15	0.00
204.00	0.16	0.16	0.00
204.10	0.16	0.16	0.00
204.20	0.17	0.17	0.00
204.30	0.17	0.17	0.00
204.40	0.18	0.18	0.00
204.50	0.18	0.18	0.00
204.60	0.19	0.19	0.00
204.70	0.19	0.19	0.00
204.80	0.19	0.19	0.00
204.90	0.20	0.20	0.00
205.00	0.31	0.31	0.00
205.10	0.32	0.32	0.00
205.20	0.33	0.33	0.00
205.30	0.34	0.34	0.00
205.40	0.34	0.34	0.00
205.50	0.35	0.35	0.00
205.60	0.36	0.36	0.00
205.70	0.37	0.37	0.00
205.80	0.38	0.38	0.00
205.90	0.39	0.39	0.00
206.00	0.39	0.39	0.00
206.10	0.40	0.40	0.00
206.20	0.41	0.41	0.00
206.30	0.42	0.42	0.00
206.40	0.43	0.43	0.00
206.50	0.43	0.43	0.00
206.60	0.44	0.44	0.00
206.70	0.45	0.45	0.00
206.80	0.46	0.46	0.00
206.90	0.47	0.47	0.00
207.00	0.48	0.48	0.00
207.10	0.48	0.48	0.00
207.20	0.49	0.49	0.00
207.30	0.50	0.50	0.00
207.40	0.51	0.51	0.00
207.50	0.52	0.52	0.00
207.60	0.52	0.52	0.00
207.70	0.53	0.53	0.00
207.80	0.53	0.53	0.00
207.90	0.53	0.53	0.00
208.00	0.54	0.54	0.00
208.10	0.54	0.54	0.00
208.20	0.54	0.54	0.00
208.30	0.55	0.55	0.00
208.40	0.55	0.55	0.00
208.50	0.56	0.56	0.00
208.60	0.56	0.56	0.00
208.70	0.56	0.56	0.00
208.80	0.86	0.57	0.29
208.90	2.09	0.57	1.52
209.00	3.84	0.57	3.27
209.10	5.99	0.58	5.42
209.20	8.48	0.58	7.90
209.30	10.30	0.59	9.72
209.40	10.38	0.59	9.79
209.50	**10.45**	**0.59**	**9.86**

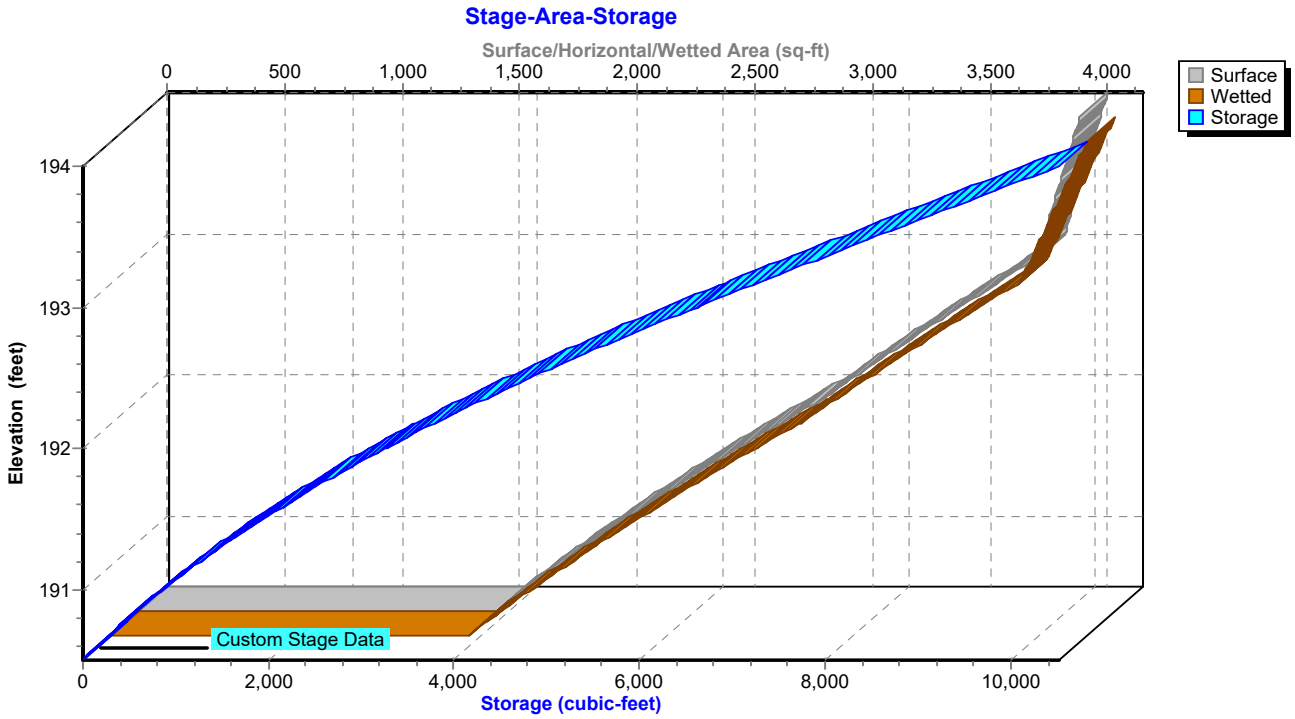
Stage-Area-Storage for Pond DMA D: SMA D

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
201.00	13	0
201.10	14	1
201.20	15	3
201.30	16	4
201.40	18	5
201.50	19	6
201.60	20	8
201.70	21	9
201.80	23	10
201.90	24	11
202.00	25	13
202.10	26	14
202.20	28	15
202.30	29	16
202.40	30	18
202.50	31	19
202.60	33	20
202.70	34	21
202.80	35	23
202.90	36	24
203.00	38	25
203.10	39	26
203.20	40	28
203.30	41	29
203.40	43	30
203.50	1,166	31
203.60	1,206	78
203.70	1,246	124
203.80	1,286	170
203.90	1,325	216
204.00	1,365	262
204.10	1,405	308
204.20	1,445	354
204.30	1,485	401
204.40	1,525	447
204.50	1,565	493
204.60	1,604	546
204.70	1,644	603
204.80	1,684	664
204.90	1,724	728
205.00	2,682	792
205.10	2,753	895
205.20	2,825	999
205.30	2,897	1,104
205.40	2,968	1,209
205.50	3,040	1,314
205.60	3,112	1,419
205.70	3,183	1,524
205.80	3,255	1,631
205.90	3,327	1,744
206.00	3,398	1,859
206.10	3,470	1,976
206.20	3,542	2,092
206.30	3,613	2,208
206.40	3,685	2,322
206.50	3,757	2,433
206.60	3,828	2,537
206.70	3,900	2,642
206.80	3,972	2,747
206.90	4,043	2,853
207.00	4,115	2,958
207.10	4,187	3,064
207.20	4,258	3,170
207.30	4,330	3,275
207.40	4,402	3,380
207.50	4,473	3,484
207.60	4,506	3,543
207.70	4,539	3,600
207.80	4,572	3,657
207.90	4,605	3,712
208.00	4,639	3,764
208.10	4,672	3,815
208.20	4,705	3,862
208.30	4,737	3,901
208.40	4,769	3,938
208.50	4,801	3,975
208.60	4,832	4,011
208.70	4,864	4,048
208.80	4,896	4,085
208.90	4,928	4,121
209.00	4,960	4,158
209.10	4,991	4,195
209.20	5,023	4,232
209.30	5,055	4,268
209.40	5,087	4,305
209.50	**5,119**	**4,342**

Pond SMA A: SMA A



Pond SMA A: SMA A



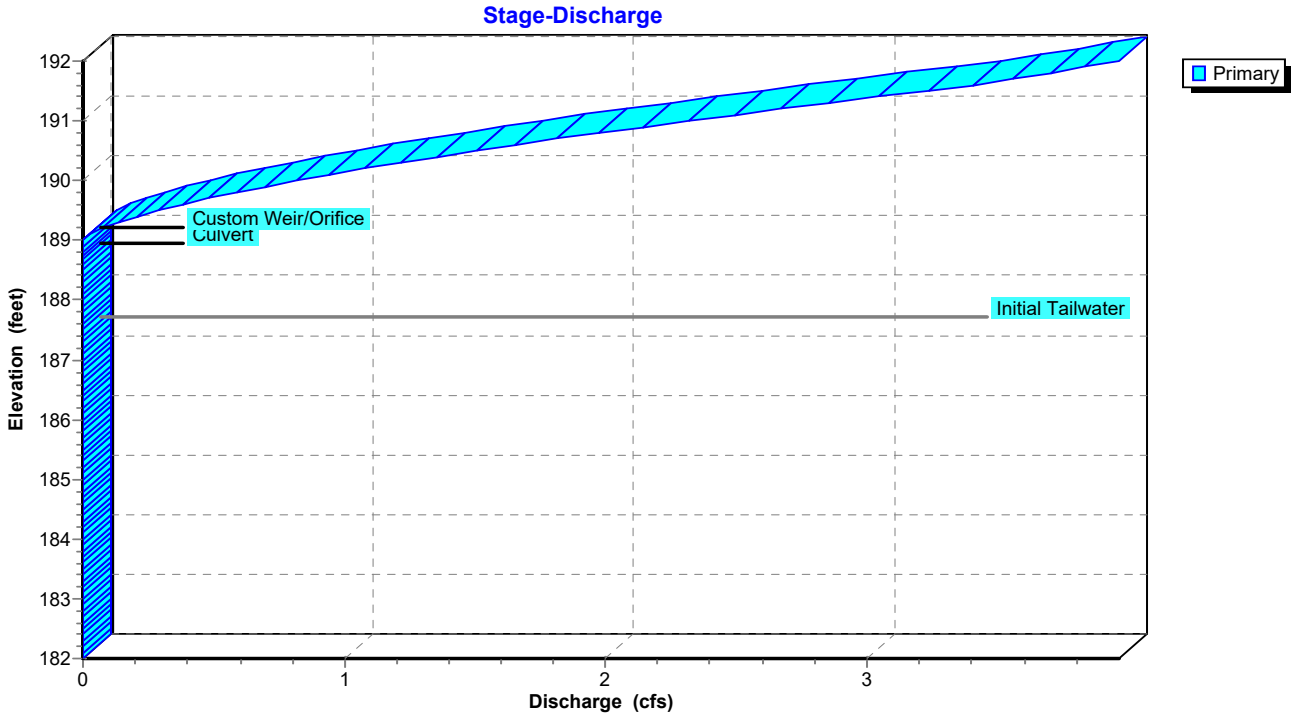
Stage-Discharge for Pond SMA A: SMA A

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
190.50	0.00	0.00	0.00
190.55	0.11	0.11	0.00
190.60	0.11	0.11	0.00
190.65	0.11	0.11	0.00
190.70	0.12	0.12	0.00
190.75	0.12	0.12	0.00
190.80	0.12	0.12	0.00
190.85	0.13	0.13	0.00
190.90	0.13	0.13	0.00
190.95	0.13	0.13	0.00
191.00	0.13	0.13	0.00
191.05	0.14	0.14	0.00
191.10	0.14	0.14	0.00
191.15	0.14	0.14	0.00
191.20	0.15	0.15	0.00
191.25	0.15	0.15	0.00
191.30	0.15	0.15	0.00
191.35	0.16	0.16	0.00
191.40	0.16	0.16	0.00
191.45	0.16	0.16	0.00
191.50	0.17	0.17	0.00
191.55	0.17	0.17	0.00
191.60	0.17	0.17	0.00
191.65	0.18	0.18	0.00
191.70	0.18	0.18	0.00
191.75	0.18	0.18	0.00
191.80	0.19	0.19	0.00
191.85	0.19	0.19	0.00
191.90	0.20	0.20	0.00
191.95	0.20	0.20	0.00
192.00	0.20	0.20	0.00
192.05	0.21	0.21	0.00
192.10	0.21	0.21	0.00
192.15	0.21	0.21	0.00
192.20	0.22	0.22	0.00
192.25	0.22	0.22	0.00
192.30	0.22	0.22	0.00
192.35	0.23	0.23	0.00
192.40	0.23	0.23	0.00
192.45	0.23	0.23	0.00
192.50	0.23	0.23	0.00
192.55	0.24	0.24	0.00
192.60	0.24	0.24	0.00
192.65	0.24	0.24	0.00
192.70	0.25	0.25	0.00
192.75	0.25	0.25	0.00
192.80	0.25	0.25	0.00
192.85	0.26	0.26	0.00
192.90	0.26	0.26	0.00
192.95	0.26	0.26	0.00
193.00	0.27	0.27	0.00
193.05	0.92	0.27	0.65
193.10	2.12	0.27	1.85
193.15	3.67	0.27	3.40
193.20	5.50	0.27	5.23
193.25	7.71	0.27	7.44
193.30	10.22	0.27	9.94
193.35	13.01	0.28	12.73
193.40	16.09	0.28	15.81
193.45	19.52	0.28	19.24
193.50	23.26	0.28	22.98
193.55	27.30	0.28	27.02
193.60	31.65	0.28	31.37
193.65	35.59	0.28	35.31
193.70	39.67	0.28	39.39
193.75	43.88	0.28	43.60
193.80	48.23	0.28	47.94
193.85	52.79	0.29	52.51
193.90	57.49	0.29	57.21
193.95	62.33	0.29	62.04
194.00	**67.29**	**0.29**	**67.00**

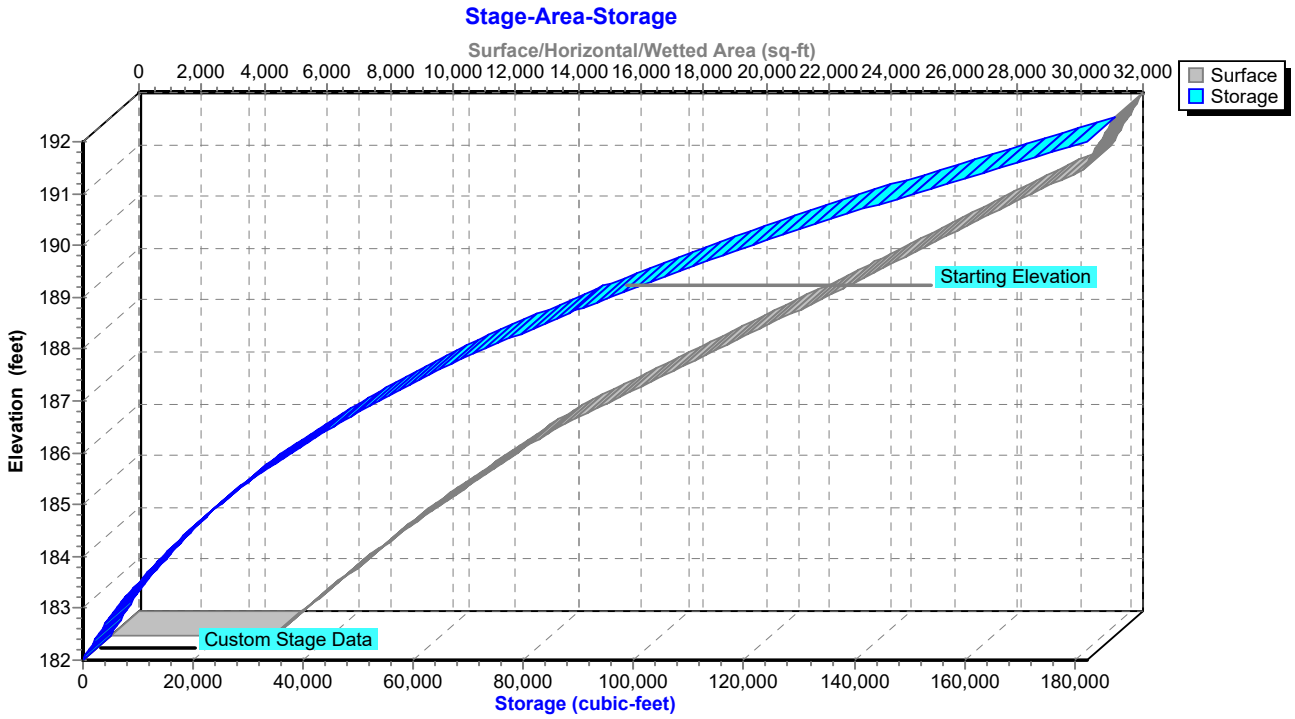
Stage-Area-Storage for Pond SMA A: SMA A

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
190.50	1,519	1,519	0
190.60	1,598	1,599	156
190.70	1,678	1,681	320
190.80	1,761	1,764	491
190.90	1,845	1,850	672
191.00	1,932	1,938	861
191.10	2,020	2,028	1,058
191.20	2,110	2,120	1,265
191.30	2,203	2,214	1,480
191.40	2,297	2,309	1,705
191.50	2,394	2,407	1,940
191.60	2,492	2,507	2,184
191.70	2,592	2,609	2,438
191.80	2,694	2,713	2,703
191.90	2,799	2,819	2,977
192.00	2,905	2,927	3,262
192.10	2,991	3,015	3,557
192.20	3,078	3,104	3,861
192.30	3,166	3,194	4,173
192.40	3,256	3,286	4,494
192.50	3,346	3,379	4,824
192.60	3,438	3,474	5,163
192.70	3,532	3,569	5,512
192.80	3,626	3,666	5,869
192.90	3,722	3,764	6,237
193.00	3,819	3,864	6,614
193.10	3,837	3,892	6,997
193.20	3,855	3,920	7,381
193.30	3,873	3,949	7,768
193.40	3,891	3,977	8,156
193.50	3,909	4,006	8,546
193.60	3,927	4,034	8,938
193.70	3,945	4,063	9,331
193.80	3,963	4,092	9,727
193.90	3,982	4,121	10,124
194.00	**4,000**	**4,150**	**10,523**

Pond SMA B: SMA B



Pond SMA B: SMA B



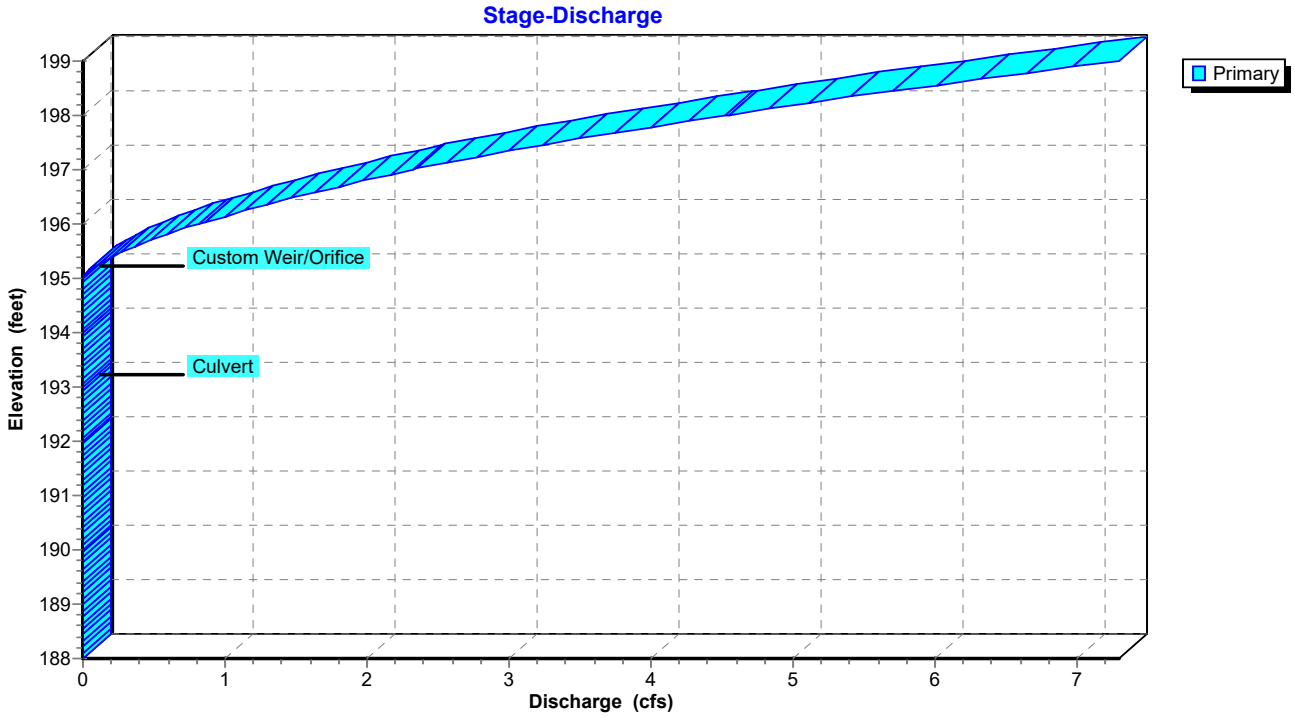
Stage-Discharge for Pond SMA B: SMA B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
182.00	0.00	184.65	0.00	187.30	0.00	189.95	0.76
182.05	0.00	184.70	0.00	187.35	0.00	190.00	0.82
182.10	0.00	184.75	0.00	187.40	0.00	190.05	0.88
182.15	0.00	184.80	0.00	187.45	0.00	190.10	0.94
182.20	0.00	184.85	0.00	187.50	0.00	190.15	1.01
182.25	0.00	184.90	0.00	187.55	0.00	190.20	1.08
182.30	0.00	184.95	0.00	187.60	0.00	190.25	1.14
182.35	0.00	185.00	0.00	187.65	0.00	190.30	1.21
182.40	0.00	185.05	0.00	187.70	0.00	190.35	1.28
182.45	0.00	185.10	0.00	187.75	0.00	190.40	1.36
182.50	0.00	185.15	0.00	187.80	0.00	190.45	1.43
182.55	0.00	185.20	0.00	187.85	0.00	190.50	1.50
182.60	0.00	185.25	0.00	187.90	0.00	190.55	1.58
182.65	0.00	185.30	0.00	187.95	0.00	190.60	1.66
182.70	0.00	185.35	0.00	188.00	0.00	190.65	1.74
182.75	0.00	185.40	0.00	188.05	0.00	190.70	1.81
182.80	0.00	185.45	0.00	188.10	0.00	190.75	1.90
182.85	0.00	185.50	0.00	188.15	0.00	190.80	1.98
182.90	0.00	185.55	0.00	188.20	0.00	190.85	2.06
182.95	0.00	185.60	0.00	188.25	0.00	190.90	2.14
183.00	0.00	185.65	0.00	188.30	0.00	190.95	2.23
183.05	0.00	185.70	0.00	188.35	0.00	191.00	2.32
183.10	0.00	185.75	0.00	188.40	0.00	191.05	2.40
183.15	0.00	185.80	0.00	188.45	0.00	191.10	2.49
183.20	0.00	185.85	0.00	188.50	0.00	191.15	2.58
183.25	0.00	185.90	0.00	188.55	0.00	191.20	2.67
183.30	0.00	185.95	0.00	188.60	0.00	191.25	2.76
183.35	0.00	186.00	0.00	188.65	0.00	191.30	2.86
183.40	0.00	186.05	0.00	188.70	0.00	191.35	2.95
183.45	0.00	186.10	0.00	188.75	0.00	191.40	3.04
183.50	0.00	186.15	0.00	188.80	0.00	191.45	3.14
183.55	0.00	186.20	0.00	188.85	0.00	191.50	3.24
183.60	0.00	186.25	0.00	188.90	0.00	191.55	3.32
183.65	0.00	186.30	0.00	188.95	0.00	191.60	3.41
183.70	0.00	186.35	0.00	189.00	0.00	191.65	3.48
183.75	0.00	186.40	0.00	189.05	0.01	191.70	3.56
183.80	0.00	186.45	0.00	189.10	0.03	191.75	3.63
183.85	0.00	186.50	0.00	189.15	0.05	191.80	3.70
183.90	0.00	186.55	0.00	189.20	0.07	191.85	3.77
183.95	0.00	186.60	0.00	189.25	0.10	191.90	3.84
184.00	0.00	186.65	0.00	189.30	0.13	191.95	3.90
184.05	0.00	186.70	0.00	189.35	0.17	192.00	**3.96**
184.10	0.00	186.75	0.00	189.40	0.21		
184.15	0.00	186.80	0.00	189.45	0.25		
184.20	0.00	186.85	0.00	189.50	0.29		
184.25	0.00	186.90	0.00	189.55	0.33		
184.30	0.00	186.95	0.00	189.60	0.38		
184.35	0.00	187.00	0.00	189.65	0.43		
184.40	0.00	187.05	0.00	189.70	0.48		
184.45	0.00	187.10	0.00	189.75	0.53		
184.50	0.00	187.15	0.00	189.80	0.59		
184.55	0.00	187.20	0.00	189.85	0.64		
184.60	0.00	187.25	0.00	189.90	0.70		

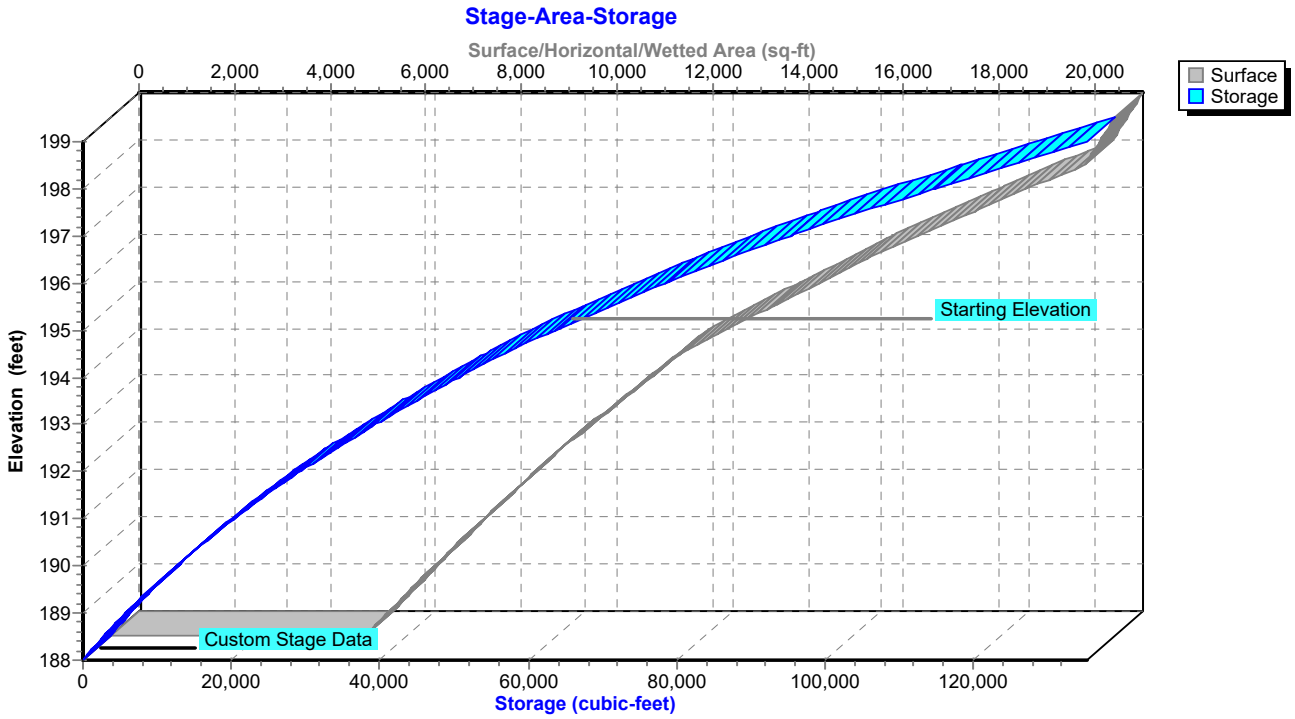
Stage-Area-Storage for Pond SMA B: SMA B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
182.00	5,185	0
182.10	5,388	529
182.20	5,590	1,078
182.30	5,793	1,647
182.40	5,996	2,236
182.50	6,199	2,846
182.60	6,401	3,476
182.70	6,604	4,126
182.80	6,807	4,797
182.90	7,010	5,488
183.00	7,213	6,199
183.10	7,415	6,930
183.20	7,618	7,682
183.30	7,821	8,454
183.40	8,024	9,246
183.50	8,226	10,058
183.60	8,429	10,891
183.70	8,632	11,744
183.80	8,835	12,618
183.90	9,037	13,511
184.00	9,240	14,425
184.10	9,485	15,361
184.20	9,729	16,322
184.30	9,974	17,307
184.40	10,219	18,317
184.50	10,463	19,351
184.60	10,708	20,409
184.70	10,953	21,492
184.80	11,197	22,600
184.90	11,442	23,732
185.00	11,687	24,888
185.10	11,931	26,069
185.20	12,176	27,274
185.30	12,420	28,504
185.40	12,665	29,759
185.50	12,910	31,037
185.60	13,154	32,341
185.70	13,399	33,668
185.80	13,644	35,020
185.90	13,888	36,397
186.00	14,133	37,798
186.10	14,476	39,228
186.20	14,818	40,693
186.30	15,161	42,192
186.40	15,504	43,725
186.50	15,847	45,293
186.60	16,189	46,895
186.70	16,532	48,531
186.80	16,875	50,201
186.90	17,217	51,906
187.00	17,560	53,645
187.10	17,903	55,418
187.20	18,245	57,225
187.30	18,588	59,067
187.40	18,931	60,943
187.50	19,274	62,853
187.60	19,616	64,797
187.70	19,959	66,776
187.80	20,302	68,789
187.90	20,644	70,836
188.00	20,987	72,918
188.10	21,318	75,033
188.20	21,648	77,182
188.30	21,979	79,363
188.40	22,310	81,577
188.50	22,641	83,825
188.60	22,971	86,106
188.70	23,302	88,419
188.80	23,633	90,766
188.90	23,964	93,146
189.00	24,295	95,559
189.10	24,625	98,005
189.20	24,956	100,484
189.30	25,287	102,996
189.40	25,618	105,541
189.50	25,948	108,119
189.60	26,279	110,731
189.70	26,610	113,375
189.80	26,941	116,053
189.90	27,271	118,763
190.00	27,602	121,507
190.10	27,940	124,284
190.20	28,279	127,095
190.30	28,617	129,940
190.40	28,955	132,818
190.50	29,294	135,731
190.60	29,632	138,677
190.70	29,970	141,657
190.80	30,308	144,671
190.90	30,647	147,719
191.00	30,985	150,801
191.10	31,086	153,904
191.20	31,188	157,018
191.30	31,290	160,142
191.40	31,391	163,276
191.50	31,493	166,420
191.60	31,594	169,574
191.70	31,695	172,739
191.80	31,797	175,913
191.90	31,899	179,098
192.00	**32,000**	**182,293**

Pond SMA C: SMA C



Pond SMA C: SMA C



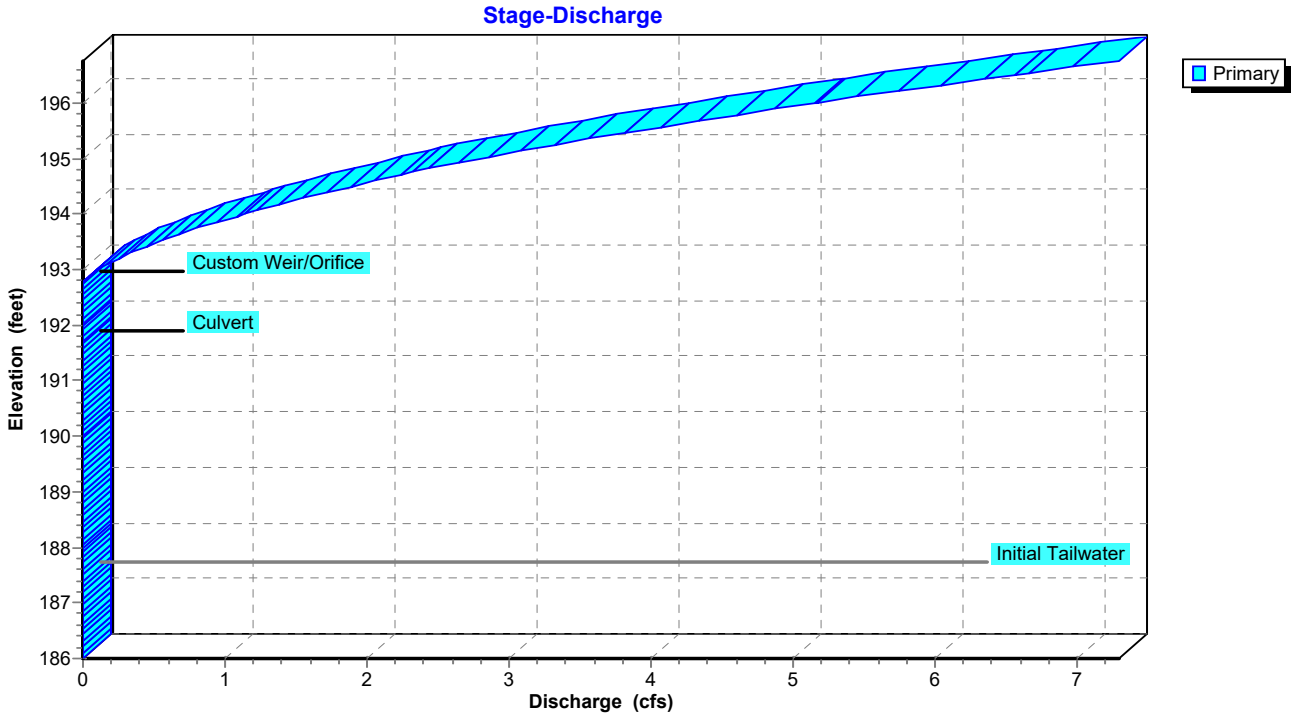
Stage-Discharge for Pond SMA C: SMA C

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
188.00	0.00	193.30	0.00	198.60	6.12
188.10	0.00	193.40	0.00	198.70	6.41
188.20	0.00	193.50	0.00	198.80	6.70
188.30	0.00	193.60	0.00	198.90	6.99
188.40	0.00	193.70	0.00	199.00	**7.29**
188.50	0.00	193.80	0.00		
188.60	0.00	193.90	0.00		
188.70	0.00	194.00	0.00		
188.80	0.00	194.10	0.00		
188.90	0.00	194.20	0.00		
189.00	0.00	194.30	0.00		
189.10	0.00	194.40	0.00		
189.20	0.00	194.50	0.00		
189.30	0.00	194.60	0.00		
189.40	0.00	194.70	0.00		
189.50	0.00	194.80	0.00		
189.60	0.00	194.90	0.00		
189.70	0.00	195.00	0.00		
189.80	0.00	195.10	0.03		
189.90	0.00	195.20	0.07		
190.00	0.00	195.30	0.13		
190.10	0.00	195.40	0.21		
190.20	0.00	195.50	0.29		
190.30	0.00	195.60	0.38		
190.40	0.00	195.70	0.48		
190.50	0.00	195.80	0.59		
190.60	0.00	195.90	0.70		
190.70	0.00	196.00	0.82		
190.80	0.00	196.10	0.94		
190.90	0.00	196.20	1.08		
191.00	0.00	196.30	1.21		
191.10	0.00	196.40	1.36		
191.20	0.00	196.50	1.50		
191.30	0.00	196.60	1.66		
191.40	0.00	196.70	1.81		
191.50	0.00	196.80	1.98		
191.60	0.00	196.90	2.14		
191.70	0.00	197.00	2.32		
191.80	0.00	197.10	2.50		
191.90	0.00	197.20	2.70		
192.00	0.00	197.30	2.90		
192.10	0.00	197.40	3.11		
192.20	0.00	197.50	3.33		
192.30	0.00	197.60	3.55		
192.40	0.00	197.70	3.79		
192.50	0.00	197.80	4.02		
192.60	0.00	197.90	4.27		
192.70	0.00	198.00	4.52		
192.80	0.00	198.10	4.77		
192.90	0.00	198.20	5.03		
193.00	0.00	198.30	5.30		
193.10	0.00	198.40	5.57		
193.20	0.00	198.50	5.84		

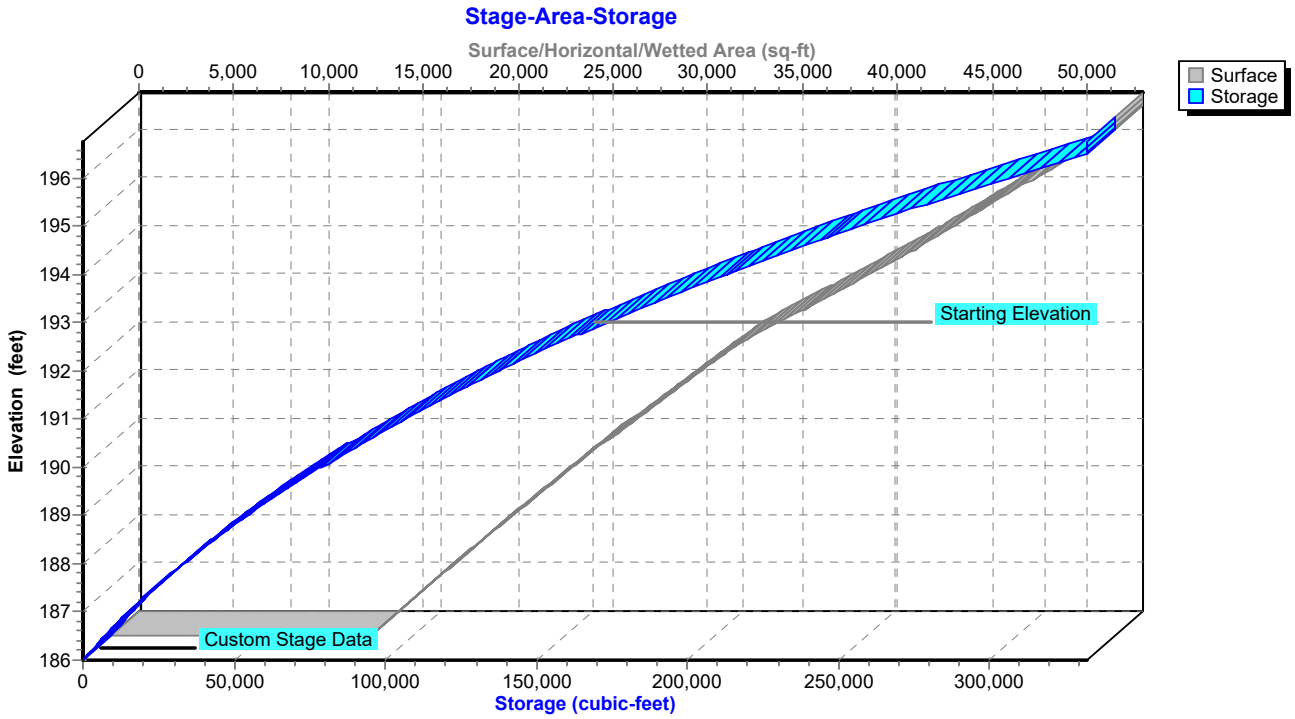
Stage-Area-Storage for Pond SMA C: SMA C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
188.00	5,323	0
188.20	5,517	1,084
188.40	5,712	2,207
188.60	5,906	3,369
188.80	6,100	4,569
189.00	6,295	5,809
189.20	6,489	7,087
189.40	6,683	8,404
189.60	6,877	9,760
189.80	7,072	11,155
190.00	7,266	12,589
190.20	7,484	14,064
190.40	7,703	15,583
190.60	7,921	17,145
190.80	8,140	18,751
191.00	8,358	20,401
191.20	8,576	22,094
191.40	8,795	23,832
191.60	9,013	25,612
191.80	9,232	27,437
192.00	9,450	29,305
192.20	9,699	31,220
192.40	9,948	33,185
192.60	10,197	35,199
192.80	10,446	37,264
193.00	10,696	39,378
193.20	10,945	41,542
193.40	11,194	43,756
193.60	11,443	46,019
193.80	11,692	48,333
194.00	11,941	50,696
194.20	12,326	53,123
194.40	12,712	55,627
194.60	13,097	58,207
194.80	13,482	60,865
195.00	13,868	63,600
195.20	14,253	66,412
195.40	14,638	69,301
195.60	15,023	72,268
195.80	15,409	75,311
196.00	15,794	78,431
196.20	16,252	81,636
196.40	16,710	84,932
196.60	17,167	88,319
196.80	17,625	91,799
197.00	18,083	95,370
197.20	18,541	99,032
197.40	18,999	102,786
197.60	19,456	106,631
197.80	19,914	110,568
198.00	20,372	114,597
198.20	20,498	118,684
198.40	20,623	122,796
198.60	20,749	126,933
198.80	20,874	131,096
199.00	**21,000**	**135,283**

Pond SMA E: SMA E



Pond SMA E: SMA E



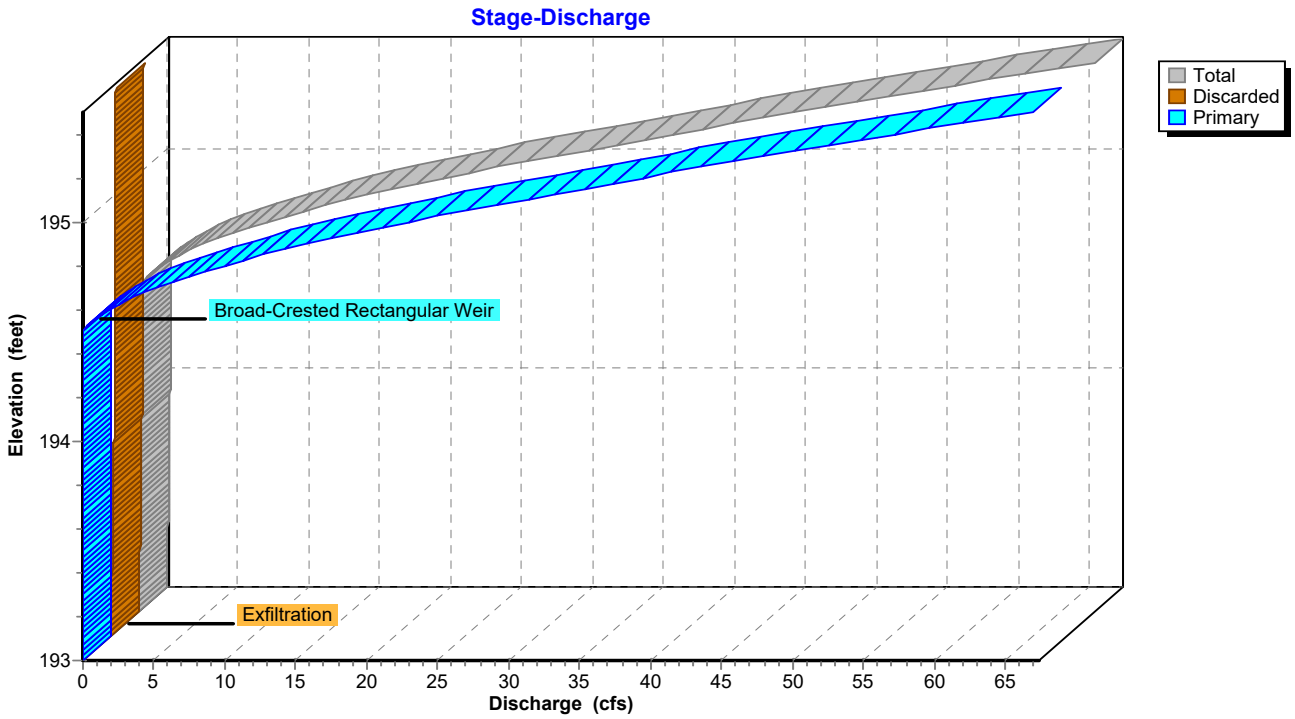
Stage-Discharge for Pond SMA E: SMA E

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
186.00	0.00	191.30	0.00	196.60	6.84
186.10	0.00	191.40	0.00	196.70	**7.14**
186.20	0.00	191.50	0.00		
186.30	0.00	191.60	0.00		
186.40	0.00	191.70	0.00		
186.50	0.00	191.80	0.00		
186.60	0.00	191.90	0.00		
186.70	0.00	192.00	0.00		
186.80	0.00	192.10	0.00		
186.90	0.00	192.20	0.00		
187.00	0.00	192.30	0.00		
187.10	0.00	192.40	0.00		
187.20	0.00	192.50	0.00		
187.30	0.00	192.60	0.00		
187.40	0.00	192.70	0.00		
187.50	0.00	192.80	0.01		
187.60	0.00	192.90	0.05		
187.70	0.00	193.00	0.10		
187.80	0.00	193.10	0.17		
187.90	0.00	193.20	0.25		
188.00	0.00	193.30	0.33		
188.10	0.00	193.40	0.43		
188.20	0.00	193.50	0.53		
188.30	0.00	193.60	0.64		
188.40	0.00	193.70	0.76		
188.50	0.00	193.80	0.88		
188.60	0.00	193.90	1.01		
188.70	0.00	194.00	1.14		
188.80	0.00	194.10	1.28		
188.90	0.00	194.20	1.43		
189.00	0.00	194.30	1.58		
189.10	0.00	194.40	1.74		
189.20	0.00	194.50	1.90		
189.30	0.00	194.60	2.06		
189.40	0.00	194.70	2.23		
189.50	0.00	194.80	2.41		
189.60	0.00	194.90	2.60		
189.70	0.00	195.00	2.80		
189.80	0.00	195.10	3.00		
189.90	0.00	195.20	3.22		
190.00	0.00	195.30	3.44		
190.10	0.00	195.40	3.67		
190.20	0.00	195.50	3.90		
190.30	0.00	195.60	4.14		
190.40	0.00	195.70	4.39		
190.50	0.00	195.80	4.64		
190.60	0.00	195.90	4.90		
190.70	0.00	196.00	5.16		
190.80	0.00	196.10	5.43		
190.90	0.00	196.20	5.70		
191.00	0.00	196.30	5.98		
191.10	0.00	196.40	6.26		
191.20	0.00	196.50	6.55		

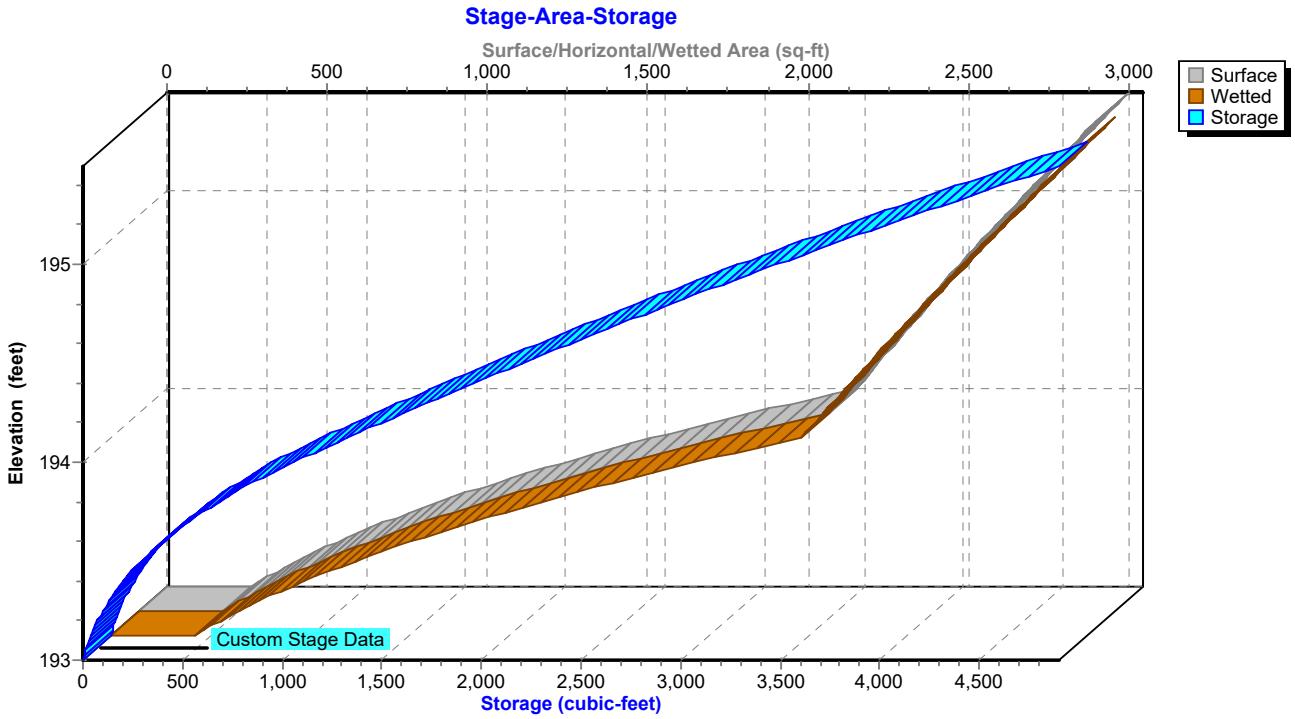
Stage-Area-Storage for Pond SMA E: SMA E

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
186.00	13,724	0
186.20	14,311	2,804
186.40	14,899	5,725
186.60	15,486	8,763
186.80	16,074	11,919
187.00	16,661	15,193
187.20	17,248	18,583
187.40	17,836	22,092
187.60	18,423	25,718
187.80	19,011	29,461
188.00	19,598	33,322
188.20	20,236	37,305
188.40	20,874	41,416
188.60	21,513	45,655
188.80	22,151	50,022
189.00	22,789	54,516
189.20	23,427	59,137
189.40	24,065	63,886
189.60	24,704	68,763
189.80	25,342	73,768
190.00	25,980	78,900
190.20	26,671	84,165
190.40	27,363	89,569
190.60	28,054	95,110
190.80	28,746	100,790
191.00	29,437	106,609
191.20	30,128	112,565
191.40	30,820	118,660
191.60	31,511	124,893
191.80	32,203	131,264
192.00	32,894	137,774
192.20	33,839	144,447
192.40	34,783	151,309
192.60	35,728	158,361
192.80	36,673	165,601
193.00	37,618	173,030
193.20	38,562	180,648
193.40	39,507	188,455
193.60	40,452	196,450
193.80	41,396	204,635
194.00	42,341	213,009
194.20	43,197	221,563
194.40	44,054	230,288
194.60	44,910	239,184
194.80	45,767	248,252
195.00	46,623	257,491
195.20	47,479	266,901
195.40	48,336	276,483
195.60	49,192	286,236
195.80	50,049	296,160
196.00	50,905	306,255
196.20	51,718	316,517
196.40	**52,531**	**326,942**
196.60	**52,938**	**332,216**

Pond SMA F: SMA F



Pond SMA F: SMA F



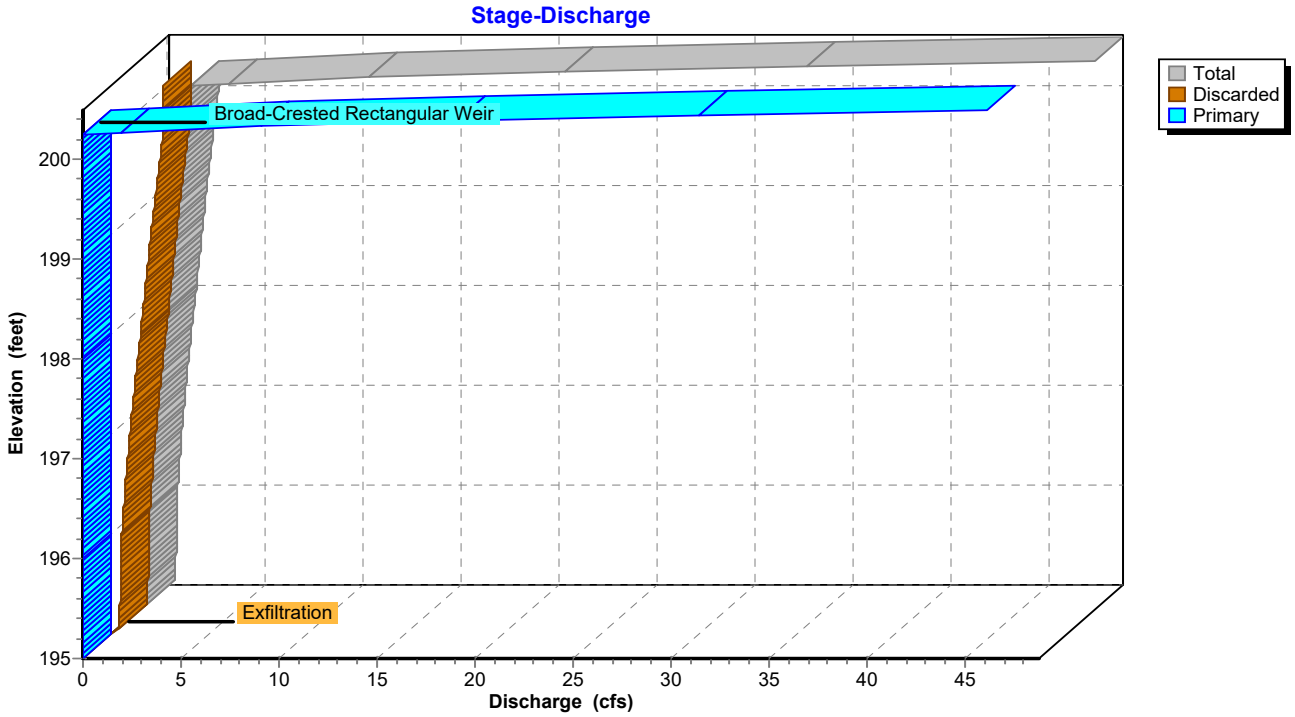
Stage-Discharge for Pond SMA F: SMA F

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
193.00	0.00	0.00	0.00
193.05	0.04	0.04	0.00
193.10	0.04	0.04	0.00
193.15	0.05	0.05	0.00
193.20	0.06	0.06	0.00
193.25	0.07	0.07	0.00
193.30	0.07	0.07	0.00
193.35	0.08	0.08	0.00
193.40	0.09	0.09	0.00
193.45	0.10	0.10	0.00
193.50	0.11	0.11	0.00
193.55	0.12	0.12	0.00
193.60	0.14	0.14	0.00
193.65	0.15	0.15	0.00
193.70	0.16	0.16	0.00
193.75	0.17	0.17	0.00
193.80	0.19	0.19	0.00
193.85	0.20	0.20	0.00
193.90	0.22	0.22	0.00
193.95	0.23	0.23	0.00
194.00	0.25	0.25	0.00
194.05	0.25	0.25	0.00
194.10	0.26	0.26	0.00
194.15	0.26	0.26	0.00
194.20	0.26	0.26	0.00
194.25	0.27	0.27	0.00
194.30	0.27	0.27	0.00
194.35	0.27	0.27	0.00
194.40	0.28	0.28	0.00
194.45	0.28	0.28	0.00
194.50	0.28	0.28	0.00
194.55	0.94	0.29	0.65
194.60	2.14	0.29	1.85
194.65	3.69	0.29	3.40
194.70	5.53	0.30	5.23
194.75	7.74	0.30	7.44
194.80	10.24	0.30	9.94
194.85	13.04	0.31	12.73
194.90	16.12	0.31	15.81
194.95	19.56	0.31	19.24
195.00	23.30	0.32	22.98
195.05	27.34	0.32	27.02
195.10	31.69	0.32	31.37
195.15	35.63	0.33	35.31
195.20	39.72	0.33	39.39
195.25	43.93	0.33	43.60
195.30	48.28	0.34	47.94
195.35	52.85	0.34	52.51
195.40	57.55	0.34	57.21
195.45	62.39	0.35	62.04
195.50	**67.35**	**0.35**	**67.00**

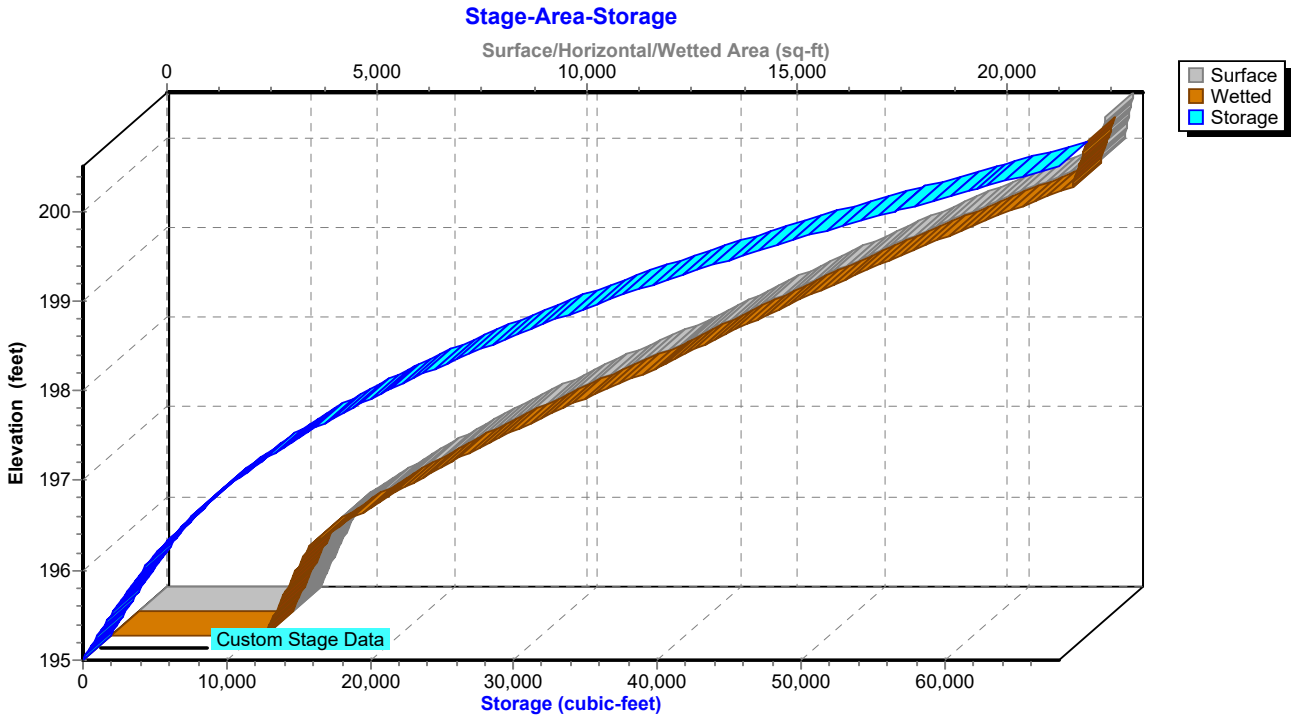
Stage-Area-Storage for Pond SMA F: SMA F

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
193.00	263	263	0
193.05	314	314	14
193.10	370	370	31
193.15	430	430	51
193.20	495	495	75
193.25	564	565	101
193.30	638	639	131
193.35	717	717	165
193.40	800	801	203
193.45	887	888	245
193.50	979	980	292
193.55	1,076	1,077	343
193.60	1,177	1,179	399
193.65	1,283	1,284	461
193.70	1,393	1,395	528
193.75	1,508	1,510	600
193.80	1,627	1,630	678
193.85	1,751	1,754	763
193.90	1,879	1,882	854
193.95	2,012	2,015	951
194.00	2,150	2,153	1,055
194.05	2,176	2,181	1,163
194.10	2,202	2,208	1,273
194.15	2,229	2,236	1,383
194.20	2,255	2,264	1,495
194.25	2,282	2,292	1,609
194.30	2,309	2,320	1,724
194.35	2,336	2,348	1,840
194.40	2,363	2,377	1,957
194.45	2,390	2,405	2,076
194.50	2,418	2,434	2,196
194.55	2,445	2,463	2,318
194.60	2,473	2,492	2,441
194.65	2,501	2,521	2,565
194.70	2,529	2,551	2,691
194.75	2,557	2,580	2,818
194.80	2,586	2,610	2,947
194.85	2,614	2,640	3,077
194.90	2,643	2,670	3,208
194.95	2,672	2,701	3,341
195.00	2,701	2,731	3,475
195.05	2,730	2,762	3,611
195.10	2,760	2,793	3,748
195.15	2,789	2,824	3,887
195.20	2,819	2,855	4,027
195.25	2,849	2,886	4,169
195.30	2,879	2,917	4,312
195.35	2,909	2,949	4,457
195.40	2,939	2,981	4,603
195.45	2,969	3,013	4,751
195.50	**3,000**	**3,045**	**4,900**

Pond SMA G: SMA G



Pond SMA G: SMA G



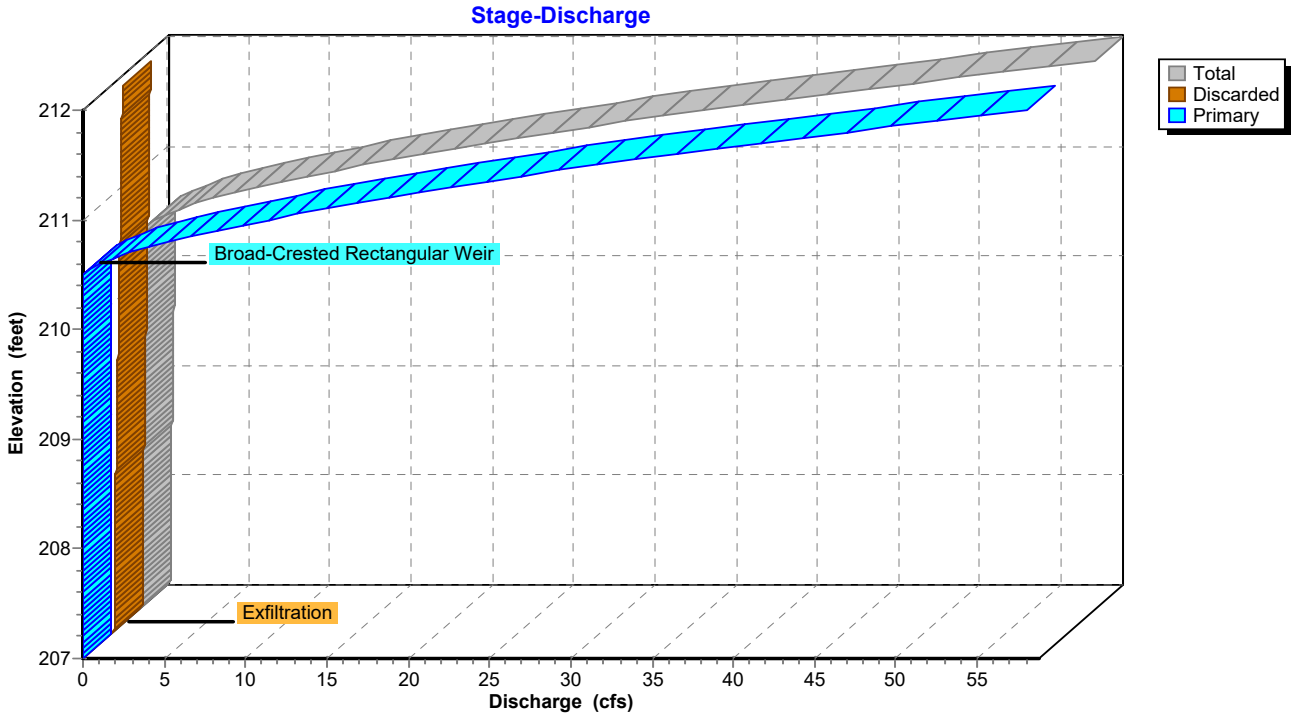
Stage-Discharge for Pond SMA G: SMA G

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
195.00	0.00	0.00	0.00
195.10	0.43	0.43	0.00
195.20	0.45	0.45	0.00
195.30	0.46	0.46	0.00
195.40	0.47	0.47	0.00
195.50	0.48	0.48	0.00
195.60	0.49	0.49	0.00
195.70	0.51	0.51	0.00
195.80	0.52	0.52	0.00
195.90	0.53	0.53	0.00
196.00	0.55	0.55	0.00
196.10	0.58	0.58	0.00
196.20	0.62	0.62	0.00
196.30	0.66	0.66	0.00
196.40	0.70	0.70	0.00
196.50	0.74	0.74	0.00
196.60	0.79	0.79	0.00
196.70	0.83	0.83	0.00
196.80	0.88	0.88	0.00
196.90	0.92	0.92	0.00
197.00	0.97	0.97	0.00
197.10	1.02	1.02	0.00
197.20	1.07	1.07	0.00
197.30	1.12	1.12	0.00
197.40	1.17	1.17	0.00
197.50	1.23	1.23	0.00
197.60	1.28	1.28	0.00
197.70	1.34	1.34	0.00
197.80	1.40	1.40	0.00
197.90	1.45	1.45	0.00
198.00	1.51	1.51	0.00
198.10	1.56	1.56	0.00
198.20	1.61	1.61	0.00
198.30	1.66	1.66	0.00
198.40	1.72	1.72	0.00
198.50	1.77	1.77	0.00
198.60	1.82	1.82	0.00
198.70	1.87	1.87	0.00
198.80	1.93	1.93	0.00
198.90	1.98	1.98	0.00
199.00	2.04	2.04	0.00
199.10	2.10	2.10	0.00
199.20	2.16	2.16	0.00
199.30	2.21	2.21	0.00
199.40	2.27	2.27	0.00
199.50	2.33	2.33	0.00
199.60	2.40	2.40	0.00
199.70	2.46	2.46	0.00
199.80	2.52	2.52	0.00
199.90	2.58	2.58	0.00
200.00	2.65	2.65	0.00
200.10	2.65	2.65	0.00
200.20	2.66	2.66	0.00
200.30	6.75	2.67	4.08
200.40	23.85	2.68	21.18
200.50	**48.77**	**2.69**	**46.08**

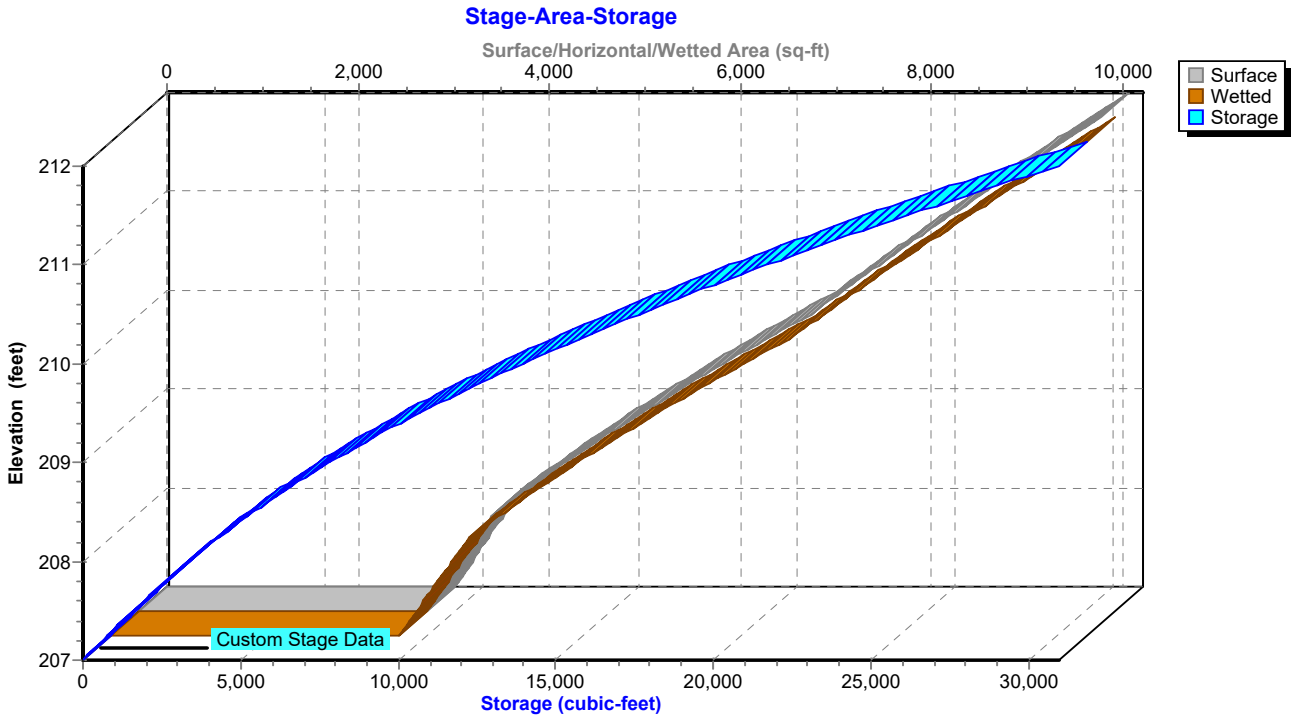
Stage-Area-Storage for Pond SMA G: SMA G

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
195.00	3,642	3,642	0
195.20	3,842	3,847	748
195.40	4,048	4,058	1,537
195.60	4,259	4,274	2,368
195.80	4,476	4,495	3,241
196.00	4,698	4,722	4,159
196.20	5,344	5,371	5,162
196.40	6,032	6,060	6,299
196.60	6,761	6,792	7,578
196.80	7,533	7,565	9,007
197.00	8,345	8,381	10,594
197.20	9,200	9,238	12,347
197.40	10,095	10,136	14,276
197.60	11,033	11,077	16,388
197.80	12,012	12,059	18,692
198.00	13,033	13,083	21,196
198.20	13,885	13,939	23,887
198.40	14,765	14,822	26,752
198.60	15,671	15,733	29,795
198.80	16,605	16,671	33,022
199.00	17,565	17,636	36,439
199.20	18,552	18,628	40,050
199.40	19,567	19,647	43,862
199.60	20,608	20,693	47,879
199.80	21,677	21,766	52,107
200.00	22,772	22,867	56,551
200.20	22,863	23,007	61,115
200.40	**22,954**	**23,148**	**65,696**

Pond SMA H: SMA H



Pond SMA H: SMA H



Stage-Discharge for Pond SMA H: SMA H

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
207.00	0.00	0.00	0.00
207.05	0.21	0.21	0.00
207.10	0.21	0.21	0.00
207.15	0.22	0.22	0.00
207.20	0.22	0.22	0.00
207.25	0.22	0.22	0.00
207.30	0.22	0.22	0.00
207.35	0.23	0.23	0.00
207.40	0.23	0.23	0.00
207.45	0.23	0.23	0.00
207.50	0.23	0.23	0.00
207.55	0.24	0.24	0.00
207.60	0.24	0.24	0.00
207.65	0.24	0.24	0.00
207.70	0.25	0.25	0.00
207.75	0.25	0.25	0.00
207.80	0.25	0.25	0.00
207.85	0.25	0.25	0.00
207.90	0.26	0.26	0.00
207.95	0.26	0.26	0.00
208.00	0.26	0.26	0.00
208.05	0.27	0.27	0.00
208.10	0.27	0.27	0.00
208.15	0.28	0.28	0.00
208.20	0.28	0.28	0.00
208.25	0.29	0.29	0.00
208.30	0.29	0.29	0.00
208.35	0.30	0.30	0.00
208.40	0.30	0.30	0.00
208.45	0.31	0.31	0.00
208.50	0.31	0.31	0.00
208.55	0.32	0.32	0.00
208.60	0.32	0.32	0.00
208.65	0.33	0.33	0.00
208.70	0.33	0.33	0.00
208.75	0.34	0.34	0.00
208.80	0.34	0.34	0.00
208.85	0.35	0.35	0.00
208.90	0.36	0.36	0.00
208.95	0.36	0.36	0.00
209.00	0.37	0.37	0.00
209.05	0.37	0.37	0.00
209.10	0.38	0.38	0.00
209.15	0.39	0.39	0.00
209.20	0.39	0.39	0.00
209.25	0.40	0.40	0.00
209.30	0.40	0.40	0.00
209.35	0.41	0.41	0.00
209.40	0.42	0.42	0.00
209.45	0.42	0.42	0.00
209.50	0.43	0.43	0.00
209.55	0.43	0.43	0.00
209.60	0.44	0.44	0.00
209.65	0.45	0.45	0.00
209.70	0.45	0.45	0.00
209.75	0.46	0.46	0.00
209.80	0.47	0.47	0.00
209.85	0.47	0.47	0.00
209.90	0.48	0.48	0.00
209.95	0.49	0.49	0.00
210.00	0.49	0.49	0.00
210.05	0.50	0.50	0.00
210.10	0.50	0.50	0.00
210.15	0.51	0.51	0.00
210.20	0.51	0.51	0.00
210.25	0.52	0.52	0.00
210.30	0.52	0.52	0.00
210.35	0.53	0.53	0.00
210.40	0.53	0.53	0.00
210.45	0.54	0.54	0.00
210.50	0.54	0.54	0.00
210.55	0.91	0.55	0.36
210.60	1.57	0.55	1.02
210.65	2.43	0.56	1.87
210.70	3.44	0.56	2.88
210.75	4.60	0.57	4.03
210.80	5.88	0.57	5.30
210.85	7.28	0.58	6.70
210.90	8.78	0.59	8.20
210.95	10.37	0.59	9.78
211.00	12.05	0.60	11.46
211.05	13.82	0.60	13.22
211.10	15.67	0.61	15.06
211.15	17.50	0.61	16.88
211.20	19.38	0.62	18.76
211.25	21.32	0.62	20.69
211.30	23.30	0.63	22.67
211.35	25.44	0.63	24.80
211.40	27.64	0.64	27.00
211.45	29.90	0.65	29.25
211.50	32.21	0.65	31.56
211.55	34.65	0.66	33.99
211.60	37.14	0.66	36.48
211.65	39.70	0.67	39.03
211.70	42.32	0.67	41.64
211.75	44.95	0.68	44.27
211.80	47.64	0.69	46.96
211.85	50.38	0.69	49.69
211.90	53.18	0.70	52.48
211.95	55.97	0.70	55.26
212.00	**58.80**	**0.71**	**58.09**

Stage-Area-Storage for Pond SMA H: SMA H

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
207.00	3,024	3,024	0
207.10	3,091	3,094	306
207.20	3,159	3,164	618
207.30	3,227	3,236	938
207.40	3,296	3,308	1,264
207.50	3,366	3,381	1,597
207.60	3,437	3,454	1,937
207.70	3,508	3,529	2,284
207.80	3,581	3,604	2,639
207.90	3,653	3,680	3,000
208.00	3,727	3,756	3,369
208.10	3,867	3,899	3,749
208.20	4,010	4,043	4,143
208.30	4,156	4,190	4,551
208.40	4,304	4,340	4,974
208.50	4,455	4,493	5,412
208.60	4,608	4,648	5,865
208.70	4,764	4,806	6,334
208.80	4,922	4,966	6,818
208.90	5,084	5,129	7,318
209.00	5,247	5,295	7,835
209.10	5,414	5,463	8,368
209.20	5,582	5,634	8,918
209.30	5,754	5,808	9,485
209.40	5,928	5,984	10,069
209.50	6,105	6,163	10,670
209.60	6,284	6,344	11,290
209.70	6,466	6,528	11,927
209.80	6,650	6,715	12,583
209.90	6,837	6,904	13,257
210.00	7,027	7,096	13,950
210.10	7,167	7,239	14,660
210.20	7,307	7,383	15,384
210.30	7,450	7,528	16,122
210.40	7,593	7,675	16,874
210.50	7,738	7,824	17,640
210.60	7,885	7,973	18,421
210.70	8,032	8,124	19,217
210.80	8,182	8,277	20,028
210.90	8,332	8,431	20,854
211.00	8,484	8,586	21,694
211.10	8,637	8,743	22,551
211.20	8,792	8,901	23,422
211.30	8,948	9,060	24,309
211.40	9,105	9,221	25,212
211.50	9,264	9,384	26,130
211.60	9,424	9,547	27,064
211.70	9,585	9,713	28,015
211.80	9,748	9,879	28,981
211.90	9,912	10,047	29,964
212.00	**10,078**	**10,216**	**30,964**

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond SMA A: SMA A

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.40	0.12	0.12	**0.00**	190.69	311
10-YR	1.41	0.16	0.16	0.00	191.40	1,705
25-YR	2.38	0.20	0.20	0.00	192.00	3,255
50-YR	**3.36**	**0.24**	**0.24**	0.00	**192.55**	**4,980**

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond SMA B: SMA B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.87	0.09	189.23	101,136
10-YR	6.62	0.33	189.55	109,443
25-YR	11.17	0.63	189.84	117,144
50-YR	**15.79**	**0.97**	**190.12**	**124,929**

Events for Pond SMA C: SMA C

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.45	0.05	195.15	65,732
10-YR	5.66	0.32	195.53	71,226
25-YR	14.25	0.95	196.10	80,095
50-YR	**19.23**	**1.80**	**196.69**	**89,898**

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond DMA D: SMA D

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.74	0.37	0.37	0.00	205.70	1,525
10-YR	6.40	3.43	0.57	2.86	208.98	4,150
25-YR	10.05	8.71	0.58	8.13	209.20	4,233
50-YR	**10.41**	**10.29**	**0.58**	**9.71**	**209.29**	**4,264**

Events for Pond SMA E: SMA E

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	7.05	0.26	193.21	181,058
10-YR	17.78	0.79	193.72	201,440
25-YR	27.29	1.35	194.15	219,337
50-YR	**36.63**	**1.98**	**194.55**	**236,938**

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Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond SMA F: SMA F

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.44	0.14	0.14	0.00	193.60	396
10-YR	1.69	0.27	0.27	0.00	194.34	1,827
25-YR	2.90	1.52	0.29	1.23	194.58	2,382
50-YR	**4.13**	**3.52**	**0.29**	**3.23**	**194.64**	**2,552**

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond SMA G: SMA G

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	4.12	0.61	0.61	**0.00**	196.18	5,036
10-YR	12.87	1.34	1.34	0.00	197.71	17,597
25-YR	21.02	1.86	1.86	0.00	198.66	30,811
50-YR	**29.23**	**2.32**	**2.32**	0.00	**199.47**	**45,216**

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond SMA H: SMA H

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-YR	1.81	0.24	0.24	**0.00**	207.59	1,917
10-YR	3.69	0.30	0.30	0.00	208.39	4,943
25-YR	5.25	0.36	0.36	0.00	208.97	7,682
50-YR	**6.72**	**0.42**	**0.42**	0.00	**209.47**	**10,474**

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Events for Pond POA NE: POA NORTHEAST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	20.25	20.25	**0.00**	**0.000**
10-YR	84.72	84.72	0.00	0.000
25-YR	155.02	155.02	0.00	0.000
50-YR	**230.69**	**230.69**	0.00	0.000

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
Prepared by Hayner/Swanson, Inc. Printed 6/2/2023

Events for Pond POA NW: POA NORTHWEST

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	6.42	6.42	**0.00**	**0.000**
10-YR	30.69	30.69	0.00	0.000
25-YR	43.09	43.09	0.00	0.000
50-YR	**54.61**	**54.61**	0.00	0.000

POST -DEV *Type III 24-hr 50-YR Rainfall=6.69"*
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Events for Pond POA C: POA COMBINED

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-YR	24.97	24.97	**0.00**	**0.000**
10-YR	112.73	112.73	0.00	0.000
25-YR	196.44	196.44	0.00	0.000
50-YR	**281.47**	**281.47**	0.00	0.000

APPENDIX C

INDIVIDUAL DRAIN LINE SIZING

STORM DRAIN DESIGN

PROJECT:	PROPOSED RESIDENTIAL DEVELOPMENT
HSI JOB #:	5432
DESIGN METHOD:	RATIONAL METHOD
DESIGN STORM EVENT:	25-YR (PER NHDES AOT REGULATIONS)
COMPUTED BY:	EMB
DATE:	6.1.23

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
Tel (603) 883-2057 www.hayner-swanson.com Fax (603) 883-5057

FROM PIPE INLET				TO PIPE OUTLET				SUBCATCHMENT AREA					PIPE SIZE & MATERIAL					PIPE CAPACITY						
LOCATION	RIM	INVERT	COVER	LOCATION	RIM	INVERT	COVER	ACRES (ACRES)	C	CA (ACRES)	ΣCA (ACRES)	Tc (MIN)	LENGTH (FT)	SLOPE (FT/FT)	DIA. (IN)	MATERIAL	n	I (in/hr)	Q_{DESIGN} (cfs)	Q_{FULL} (cfs)	V_{FULL} (fps)	T_{FLOW} (min)	Q CHECK:	
CB 4	196.5	192.75	2.75	CB 3	196.5	192.55	2.95	0.64	0.58	0.37	0.37	6.0	34	0.006	12	HDPE	0.012	6.5	2.41	2.99	3.81	0.1	OK	
CB 3	196.5	192.45	3.05	CB 2	196.2	192.21	2.99	0.11	0.64	0.07	0.44	6.1	34	0.007	12	HDPE	0.012	6.5	2.87	3.23	4.12	0.1	OK	
CB 2	196.2	191.96	2.99	HW 1	-	191.81	-	0.11	0.76	0.08	0.53	6.3	30	0.005	15	HDPE	0.012	6.4	3.36	4.96	4.04	0.1	OK	To SMA A
CB 17	197.0	193.00	3.00	CB 16	197.0	192.89	3.11	0.21	0.64	0.13	0.13	6.0	22	0.005	12	HDPE	0.012	6.5	0.87	2.73	3.48	0.1	OK	
CB 22	199.2	195.20	3.00	CB 22	199.2	194.98	3.22	0.21	0.54	0.11	0.11	6.0	22	0.010	12	HDPE	0.012	6.5	0.74	3.86	4.92	0.1	OK	
CB 24	200.0	196.25	2.75	CB 23	200.7	196.00	3.70	0.36	0.37	0.13	0.13	6.0	50	0.005	12	HDPE	0.012	6.5	0.87	2.73	3.48	0.2	OK	
CB 23	200.7	195.75	3.70	CB 21	199.2	194.95	3.00	0.71	0.75	0.53	0.67	6.2	80	0.010	15	HDPE	0.012	6.4	4.26	7.01	5.71	0.2	OK	
CB 21	199.2	194.85	3.10	CB 18	197.4	193.07	3.08	0.29	0.63	0.18	0.96	6.5	148	0.012	15	HDPE	0.012	6.4	6.16	7.68	6.26	0.4	OK	
																								To SMA B
CB 18	197.4	192.82	3.08	CB 16	197.0	192.48	3.02	0.07	0.76	0.05	1.15	6.9	42	0.008	18	HDPE	0.012	6.2	7.13	10.18	5.76	0.1	OK	
CB 16	197.0	192.38	3.12	CB 13	196.0	191.51	2.99	0.27	0.74	0.20	1.35	7.0	109	0.008	18	HDPE	0.012	6.2	8.37	10.18	5.76	0.3	OK	
CB 15	195.5	191.75	2.75	CB 14	195.5	191.64	2.86	0.19	0.70	0.13	0.13	6.0	22	0.005	12	HDPE	0.012	6.5	0.86	2.73	3.48	0.1	OK	
CB 14	195.5	191.54	2.96	CB 13	196.0	191.20	3.80	0.24	0.76	0.18	0.32	6.1	68	0.005	12	HDPE	0.012	6.5	2.05	2.73	3.48	0.3	OK	
CB 13	196.0	190.95	3.55	HW 12	-	190.75	-	0.05	0.76	0.04	1.70	7.3	20	0.010	18	HDPE	0.012	6.0	10.22	11.38	6.44	0.1	OK	
OCS 32	198.2	193.00	3.95	DMH 31	197.7	192.67	3.78	-	-	-	-	6.0	70	0.005	15	HDPE	0.012	6.5	0.95	4.81	3.92	0.3	OK	
DMH 31	197.7	192.57	3.88	HW 30	-	192.25	-	-	-	-	-	6.3	32	0.010	15	HDPE	0.012	6.4	0.95	7.01	5.71	0.1	OK	
CB 76	200.0	196.50	2.50	CB 73	200.5	196.40	3.10	0.31	0.58	0.18	0.18	6.0	21	0.005	12	HDPE	0.012	6.5	1.17	2.73	3.48	0.1	OK	
CB 75	200.9	197.00	2.90	CB 74	200.5	196.76	2.75	0.34	0.82	0.28	0.28	6.0	49	0.005	12	HDPE	0.012	6.5	1.81	2.73	3.48	0.2	OK	
CB 74	200.5	196.66	2.84	CB 73	200.5	196.51	2.99	0.20	0.57	0.11	0.39	6.2	22	0.007	12	HDPE	0.012	6.4	2.51	3.23	4.12	0.1	OK	
CB 78	202.2	198.20	3.00	CB 77	202.2	198.09	3.11	0.17	0.75	0.13	0.13	6.0	22	0.005	12	HDPE	0.012	6.5	0.83	2.73	3.48	0.1	OK	
CB 77	202.2	197.99	3.21	CB 73	200.5	197.14	2.36	0.21	0.56	0.12	0.25	6.1	170	0.005	12	HDPE	0.012	6.5	1.59	2.73	3.48	0.8	OK	
CB 73	200.5	196.15	3.10	CB 63	198.4	194.13	3.03	0.28	0.46	0.13	0.95	6.9	225	0.009	15	HDPE	0.012	6.2	5.87	6.65	5.42	0.7	OK	
CB 72	199.8	195.55	3.00	CB 64	198.4	194.36	2.79	0.71	0.77	0.55	0.55	6.0	119	0.010	15	HDPE	0.012	6.5	3.55	7.01	5.71	0.3	OK	
CB 64	198.4	194.26	2.89	CB 63	198.4	193.93	3.22	1.22	0.52	0.63	1.18	6.3	22	0.015	15	HDPE	0.012	6.4	7.56	8.58	7.00	0.1	OK	
																								To SMA E
LCB 70	201.0	197.00	3.00	CB 68	200.2	196.28	2.92	0.51	0.36	0.18	0.18	6.0	72	0.010	12	HDPE	0.012	6.5	1.19	3.86	4.92	0.2	OK	
CB 67	201.7	197.70	3.00	CB 66	200.4	196.42	2.98	0.42	0.73	0.31	0.31	6.0	128	0.010	12	HDPE	0.012	6.5	1.99	3.86	4.92	0.4	OK	
CB 66	200.4	196.32	3.08	CB 65	199.4	195.70	2.70	0.34	0.75	0.26	0.56	6.4	62	0.010	12	HDPE	0.012	6.4	3.59	3.86	4.92	0.2	OK	
CB 71	203.0	199.00	3.00	CB 69	200.2	196.52	2.68	0.05	0.69	0.03	0.03	6.0	207	0.012	12	HDPE	0.012	6.5	0.22	4.23	5.39	0.6	OK	
CB 69	200.2	196.42	2.78	CB 68	200.2	196.31	2.89	0.28	0.46	0.13	0.16	6.6	22	0.005	12	HDPE	0.012	6.3	1.03	2.73	3.48	0.1	OK	
CB 68	200.2	196.21	2.99	CB 65	199.4	195.41	2.99	0.20	0.59	0.12	0.46	6.7	80	0.010	12	HDPE	0.012	6.3	2.93	3.86	4.92	0.3	OK	
CB 65	199.4	194.91	2.99	CB 63	198.4	193.89	2.97	0.13	0.60	0.08	1.10	7.0	127	0.008	18	HDPE	0.012	6.1	6.74	10.18	5.76	0.4	OK	
CB 63	198.4	193.38	3.02	HW 62	-	193.09	-	0.18	0.76	0.14	3.37	7.6	36	0.008	24	HDPE	0.012	5.9	19.88	21.92	6.98	0.1	OK	
CB 82	199.7	196.00	2.70	DMH 80	199.2	195.05	3.15	0.57	0.75	0.43	0.43	6.0	86	0.011	12	HDPE	0.012	6.5	2.78	4.05	5.16	0.3	OK	
CB 81	197.4	193.40	2.75	DMH 80	199.2	192.53	5.42	0.63	0.76	0.48	0.48	6.0	174	0.005	15	HDPE	0.012	6.5	3.11	4.96	4.04	0.7	OK	To SMA E
DMH 80	199.2	192.43	5.52	HW 79	-	191.84	-	-	-	-	0.91	6.3	84	0.007	15	HDPE	0.012	6.4	5.80	5.86	4.78	0.3	OK	
OCS 61	196.0	191.91	2.84	HW 60	-	191.00	-	-	-	-		6.0	55	0.017	15	HDPE	0.012	6.5	0.00	9.00	7.34	0.1	OK	
CB 92	198.9	194.69	2.96	HW 91	-	194.56	-	0.62	0.79	0.49	0.49	6.0	27	0.005	15	HDPE	0.012	6.5	3.18	4.86	3.96	0.1	OK	To SMA F
CB 39	208.4	204.40	3.00	CB 38	208.4	204.29	3.11	0.48	0.47	0.23	0.23	6.0	22	0.005	12	HDPE	0.012	6.5	1.47	2.73	3.48	0.1	OK	
CB 41	211.4	207.40	3.00	CB 40	211.4	207.29	3.11	0.15	0.69	0.10	0.10	6.0	22	0.005	12	HDPE	0.012	6.5	0.67	2.73	3.48	0.1	OK	

CB 40	211.4	207.19	3.21	CB 38	208.4	204.37	3.03	0.19	0.77	0.15	0.25	6.1	188	0.015	12	HDPE	0.012	6.5	1.62	4.73	6.03	0.5	OK	
CB 44	212.5	205.75	4.25	CB 43	210.5	205.75	2.25	1.30	0.71	0.92	0.92	6.0	153	0.000	30	HDPE	0.012	6.5	6.00	0.00	0.00	#DIV/0!	NOT OK	
CB 43	210.5	204.50	4.00	CB 42	207.5	204.50	1.00	0.97	0.67	0.65	1.57	6.0	187	0.000	24	HDPE	0.012	6.5	10.22	0.00	0.00	#DIV/0!	NOT OK	
																								To SMA D/C
CB 45	209.2	202.20	5.00	CB 38	208.4	201.99	4.41	-	-	-	-	6.0	30	0.007	24	HDPE	0.012	6.5	8.71	20.65	6.57	0.1	OK	
CB 38	208.4	201.93	4.47	CB 34	206.8	201.67	3.13	0.13	0.75	0.10	0.10	6.1	53	0.005	24	HDPE	0.012	6.5	9.34	17.33	5.52	0.2	OK	
CB 37	210.7	206.70	3.00	CB 36	209.8	205.80	3.00	0.14	0.36	0.05	0.05	6.0	45	0.020	12	HDPE	0.012	6.5	0.33	5.46	6.96	0.1	OK	
CB 36	209.8	205.70	3.10	CB 35	207.1	203.07	3.04	0.49	0.76	0.37	0.42	6.1	155	0.017	12	HDPE	0.012	6.5	2.75	5.04	6.42	0.4	OK	
CB 35	207.1	202.82	3.03	CB 34	206.8	202.50	3.05	0.40	0.80	0.32	0.74	6.5	64	0.005	15	HDPE	0.012	6.3	4.68	4.96	4.04	0.3	OK	
CB 34	206.8	196.73	8.07	HW 33	-	196.10	-	0.08	0.68	0.05	0.89	6.2	63	0.010	24	HDPE	0.012	6.4	14.44	24.51	7.80	0.1	OK	
CB 54	213.8	210.00	2.80	CB 53	213.8	209.56	3.24	0.44	0.76	0.33	0.33	6.0	88	0.005	12	HDPE	0.012	6.5	2.17	2.73	3.48	0.4	OK	**To SMA E**
CB 53	213.8	209.29	3.26	HW 52	-	209.20	-	0.47	0.76	0.36	0.69	6.4	18	0.005	15	HDPE	0.012	6.4	4.43	4.96	4.04	0.1	OK	
CB 109	204.6	200.60	3.00	DMH 107	205.4	200.15	4.25	0.12	0.90	0.11	0.11	6.0	90	0.005	12	HDPE	0.012	6.5	0.70	2.73	3.48	0.4	OK	
CB 106	204.6	200.60	3.00	DMH 105	205.1	200.15	3.95	0.15	0.90	0.14	0.14	6.0	90	0.005	12	HDPE	0.012	6.5	0.88	2.73	3.48	0.4	OK	
CB 104	204.6	200.60	3.00	DMH 103	205.1	200.15	3.95	0.15	0.90	0.14	0.14	6.0	90	0.005	12	HDPE	0.012	6.5	0.88	2.73	3.48	0.4	OK	
CB 102	204.6	200.60	3.00	DMH 101	205.1	200.15	3.95	0.12	0.90	0.11	0.11	6.0	90	0.005	12	HDPE	0.012	6.5	0.70	2.73	3.48	0.4	OK	**To SMA G**
LCB 108	202.7	199.20	2.50	DMH 107	205.4	198.89	5.54	0.78	0.33	0.26	0.26	6.0	63	0.005	12	HDPE	0.012	6.5	1.67	2.73	3.48	0.3	OK	
DMH 107	205.4	198.79	5.63	DMH 105	205.1	198.57	5.53	-	-	-	0.37	6.3	44	0.005	12	HDPE	0.012	6.4	2.34	2.73	3.48	0.2	OK	
DMH 105	205.1	198.32	5.53	DMH 103	205.1	198.10	5.75	-	-	-	0.50	6.5	44	0.005	15	HDPE	0.012	6.3	3.15	4.96	4.04	0.2	OK	
DMH 103	205.1	198.00	5.85	DMH 101	205.1	197.78	6.07	-	-	-	0.64	6.7	44	0.005	15	HDPE	0.012	6.3	4.00	4.96	4.04	0.2	OK	
DMH 101	205.1	197.68	6.17	HW 100	-	197.49	-	-	-	-	0.74	6.9	38	0.005	15	HDPE	0.012	6.2	4.61	4.96	4.04	0.2	OK	

INDIVIDUAL DRAIN LINE DESIGN - DRAINAGE AREAS

DRAINAGE AREA	Cw	WOODS (AC)	OPEN (AC)	ROOF (AC)	PAVED (AC)
2	0.76	0.00	0.03	0.00	0.08
3	0.64	0.00	0.05	0.00	0.06
4	0.58	0.00	0.34	0.10	0.20
13	0.76	0.00	0.01	0.00	0.04
14	0.76	0.00	0.06	0.00	0.19
15	0.70	0.00	0.06	0.00	0.13
16	0.74	0.00	0.07	0.00	0.20
17	0.64	0.00	0.09	0.00	0.12
18	0.76	0.00	0.02	0.00	0.06
21	0.54	0.00	0.13	0.00	0.09
22	0.63	0.00	0.13	0.01	0.15
23	0.75	0.00	0.18	0.15	0.39
24	0.37	0.00	0.32	0.04	0.00
34	0.68	0.00	0.03	0.00	0.05
35	0.80	0.00	0.07	0.11	0.23
36	0.76	0.00	0.12	0.10	0.27
37	0.36	0.00	0.13	0.01	0.00
38	0.75	0.00	0.03	0.00	0.10
39	0.47	0.00	0.13	0.00	0.05
40	0.77	0.00	0.04	0.00	0.15
41	0.69	0.00	0.05	0.00	0.10
42	0.64	0.00	0.43	0.19	0.38
43	0.67	0.00	0.38	0.19	0.40
44	0.71	0.00	0.41	0.28	0.61
53	0.76	0.00	0.11	0.10	0.26
54	0.76	0.00	0.10	0.10	0.23
63	0.76	0.00	0.04	0.00	0.14
64	0.52	0.00	0.77	0.12	0.32
65	0.60	0.00	0.07	0.00	0.07
66	0.75	0.00	0.09	0.07	0.18
67	0.73	0.00	0.12	0.07	0.23
68	0.59	0.00	0.11	0.00	0.10
69	0.46	0.00	0.21	0.01	0.06
70	0.35	0.00	0.46	0.04	0.00
71	0.69	0.00	0.02	0.00	0.03
72	0.77	0.00	0.15	0.15	0.40
73	0.46	0.00	0.20	0.00	0.07
74	0.57	0.00	0.11	0.00	0.09
75	0.82	0.00	0.04	0.07	0.22
76	0.58	0.00	0.16	0.03	0.11
77	0.56	0.00	0.12	0.00	0.09
78	0.75	0.00	0.04	0.00	0.13
81	0.76	0.00	0.14	0.15	0.34
82	0.75	0.00	0.15	0.14	0.28
90	0.35	0.00	0.62	0.05	0.00
92	0.77	0.00	0.14	0.14	0.35
102	0.90	0.00	0.00	0.03	0.08
104	0.90	0.00	0.00	0.07	0.08
106	0.90	0.00	0.00	0.07	0.08
108	0.33	0.21	0.53	0.00	0.05
109	0.90	0.00	0.00	0.03	0.08
111	0.52	0.08	1.13	0.10	0.62

APPENDIX D

NHDES AOT BMP/GRV WORKSHEETS

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Stormwater Management Area 'A' (Rain Garden)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.03	ac	A = Area draining to the practice	
0.45	ac	A_I = Impervious area draining to the practice	
0.44	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.44	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.46	ac-in	WQV= 1" x Rv x A	
1,653	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
413	cf	25% x WQV (check calc for sediment forebay volume)	
1,240	cf	75% x WQV (check calc for surface sand filter volume)	
ment Forebay & Hoode		Method of Pretreatment? (not required for clean or roof runoff)	
385	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,520	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
NA	Yes/No	(Use the calculations below)	
4.4	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
NA	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
NA	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
190.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
NA	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
187.50	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
186.20	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
4.05	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.75	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
192.55	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
193.25	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
NA	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
NA	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	NA	Note what sheet in the plan set contains the filter course specification.	
NA	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
4,016	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
24.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	40	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	40	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
NA		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
NA	acres	A_{SA} = Surface area of the pervious pavement	
#VALUE!	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
NA	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	NA	Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: CB 4 is a deep sump catch basin with a hood that is also used for pretreatment

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

STORMWATER WETLAND DESIGN CRITERIA
(Env-Wq 1508.04)

Type/Node Name: **Stormwater Management Area 'B' (Stormwater Wetland)**

Enter the the node name in the drainage analysis if applicable. DO NOT USE for Gravel Wetlands.

5.00	ac	A = Area draining to the practice	
1.65	ac	A_I = Impervious area draining to the practice	
0.33	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.35	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.74	ac-in	WQV= 1" x Rv x A	
6,311	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
631	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
2,840	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
3,156	cf	50% x WQV (check calc for extended detention volume)	
797	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
95,559	cf	V_{PP} = V permanent pool (attach stage-storage table)	
no		Extended Detention?[1]	
(89,248)	cf	V_{ED} = Extended detention volume	**≤ 50%WQV**
NA	ft	E_{ED} = Elevation of WQV if "yes" is given in box above[2]	
(2.07)	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
NA	cfs	Q_{EDmax} = discharge at the E_{ED} (attach stage-discharge table)	**<$2Q_{avg}$**
-	hours	T_{ED} = drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥3:1**
188.50	ft	Elevation of SHWT	
189.00	ft	Epp = Elev. of the permanent pool (elevation of lowest orifice)[3]	**≤ E_{SHWT} - 2 ft**
7.00	ft	D_{PP}= Depth of permanent pool at deepest location	**≤ 8'**
190.12	ft	E_{50} = Peak elevation of the 50-year storm event	
1.12	ft	D_{50} above the permanent pool (E_{50} - E_{PP})	**≤ 4'**
475.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
56.00	ft	Average Width ([average of the top width + average bottom width]/2)	
8.5	:1	Length to Average Width ratio	**≥ 3:1**
YES	Yes/No	Is the perimeter curvilinear?	**← Yes**
YES	Yes/No	Are the inlet and outlet located as far apart as possible?	**← Yes**
NO	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	**← Yes**
If no state why:		NA	
Self Cleaning Weir Weir Plate		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
190.12	ft	Peak elevation of the 50-year storm event (E_{50})	
192.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**
Qualified professional that developed the planting plan Name, Profession:			

1. If the entire WQV is stored in the perm. pool, there is no extended detention and the following five lines do not apply.

2 This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description (recommended).

3. The permanent pool must be based on an outlet structure (lowest invert) at least 2 feet below SHWT. If less than 2 feet below SHWT, requires impermeable liner or hydrologic budget to demonstrate permanent pool can be maintained.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Type/Node Name: **Stormwater Management Area 'C' (Stormwater Pond)**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable.

4.10	ac	A = Area draining to the practice	
1.30	ac	A_I = Impervious area draining to the practice	
0.32	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.34	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.38	ac-in	WQV= 1" x Rv x A	
4,994	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
499	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
2,497	cf	50% x WQV (check calc for extended detention volume)	
988	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
63,600	cf	V_{PP} = Permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
no	cf	Extended Detention?[1]	**≤ 50% WQV**
-		V_{ED} = Volume of extended detention (if "yes" is given in box above)	
NA		E_{ED} = Elevation of WQV if "yes" is given in box above[2]	
-	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
NA	cfs	Q_{EDmax} = Discharge at the E_{ED} (attach stage-discharge table)	**< $2Q_{avg}$**
-	hours	T_{ED} = Drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥3:1**
195.00	ft	Elevation of seasonal high water table	
195.00	ft	Elevation of lowest pond outlet	
190.00	ft	Max floor = Maximum elevation of pond bottom (ft)	
187.00	ft	Minimum floor (to maintain depth at less than 8')	**≤ 8 ft**
190.00	ft	Elevation of pond floor[3]	**≤ Max floor and > Min floor**
165.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
119.00	ft	Average width ([average of the top width + average bottom width]/2)	
1.39	:1	Length to average width ratio	**≥ 3:1**
YES	Yes/No	Is the perimeter curvilinear.	**← Yes**
YES	Yes/No	Are the inlet and outlet located as far apart as possible.	**← Yes**
NO	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:		NA	
Self Cleaning Weir Plate		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
196.69	ft	Peak elevation of the 50-year storm event	
198.00	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	**←yes**

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.

2. This is the elevation of WQV **if** the hydrologic analysis is set up to include the permanent pool storage in the node description.

3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Stormwater Management Area 'D'**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	**← yes**
3.28	ac	A = Area draining to the practice	
2.06	ac	A_I = Impervious area draining to the practice	
0.63	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.62	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
2.02	ac-in	WQV= 1" x Rv x A	
7,315	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,829	cf	25% x WQV (check calc for sediment forebay volume)	
Rain Garden		Method of pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
4,066	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
2,040	sf	A_{SA} = Surface area of the bottom of the pond	
5.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
8.6	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
203.50	feet	E_{BTM} = Elevation of the bottom of the basin	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	D_{SHWT} = Separation from SHWT	**≥ *** [3]
#VALUE!	feet	D_{ROCK} = Separation from bedrock	**≥ *** [3]
NA	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
4 & 6	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
Yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
Yes		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	**← yes**
NA	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
NA	:1	If a basin is proposed, pond side slopes.	**≥3:1**
208.98	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
209.29	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
209.40	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: Test pits are not able to be excavated due to the existing features of the site in this area, a note has been added to the plans requiring test pits to be performed at the time of construction

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Type/Node Name: **Stormwater Management Area 'E' (Stormwater Pond)**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable.

9.92	ac	A = Area draining to the practice	
3.82	ac	A_I = Impervious area draining to the practice	
0.39	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.40	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.94	ac-in	WQV= 1" x Rv x A	
14,293	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,429	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
7,147	cf	50% x WQV (check calc for extended detention volume)	
3,389	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
163,774	cf	V_{PP} = Permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
no	cf	Extended Detention?[1]	**≤ 50% WQV**
-		V_{ED} = Volume of extended detention (if "yes" is given in box above)	
NA		E_{ED} = Elevation of WQV if "yes" is given in box above[2]	
-	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
NA	cfs	Q_{EDmax} = Discharge at the E_{ED} (attach stage-discharge table)	**< $2Q_{avg}$**
-	hours	T_{ED} = Drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	**≥ 24-hrs**
4.00	:1	Pond side slopes	**≥3:1**
192.90	ft	Elevation of seasonal high water table	
192.75	ft	Elevation of lowest pond outlet	
187.90	ft	Max floor = Maximum elevation of pond bottom (ft)	
184.75	ft	Minimum floor (to maintain depth at less than 8')	**≤ 8 ft**
186.00	ft	Elevation of pond floor[3]	**≤ Max floor and > Min floor**
323.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
100.00	ft	Average width ([average of the top width + average bottom width]/2)	
3.23	:1	Length to average width ratio	**≥ 3:1**
YES	Yes/No	Is the perimeter curvilinear.	**← Yes**
YES	Yes/No	Are the inlet and outlet located as far apart as possible.	**← Yes**
NO	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:		NA	
Self Cleaning Weir Plate		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
194.55	ft	Peak elevation of the 50-year storm event	
196.50	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	**←yes**

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.

2. This is the elevation of WQV **if** the hydrologic analysis is set up to include the permanent pool storage in the node description.

3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Stormwater Management Area 'F' (Rain Garden)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.30	ac	A = Area draining to the practice	
0.54	ac	A_I = Impervious area draining to the practice	
0.42	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.55	ac-in	WQV= 1" x Rv x A	
2,003	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
501	cf	25% x WQV (check calc for sediment forebay volume)	
1,502	cf	75% x WQV (check calc for surface sand filter volume)	
Hooded CB		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
2,150	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
No	Yes/No	(Use the calculations below)	
3.7	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
NA	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
NA	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
192.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
NA	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
191.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
188.20	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.80	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
193.25	ft	Elevation of the top of the practice	
-		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
NA	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
NA	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	NA	Note what sheet in the plan set contains the filter course specification.	
NA	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
21.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
NA		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
NA	acres	A_{SA} = Surface area of the pervious pavement	
#VALUE!	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
NA	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	NA	Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Stormwater Management Area 'G' (Infiltration Basin)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← **yes**
8.52	ac	A = Area draining to the practice	
2.88	ac	A_I = Impervious area draining to the practice	
0.34	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.35	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.02	ac-in	WQV= 1" x Rv x A	
10,969	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
2,742	cf	25% x WQV (check calc for sediment forebay volume)	
Sediment Forebay		Method of pretreatment? (not required for clean or roof runoff)	
3,644	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ **25%WQV**
62,258	cf	V = Volume[1] (attach a stage-storage table)	≥ **WQV**
3,642	sf	A_{SA} = Surface area of the bottom of the pond	
5.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
7.2	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ **72-hrs**
195.00	feet	E_{BTM} = Elevation of the bottom of the basin	
190.90	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
190.20	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.10	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
4.8	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
NA	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ **24"**
NA	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
NA	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←**yes**
NA		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← **yes**
YES	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← **yes**
3.0	:1	If a basin is proposed, pond side slopes.	≥**3:1**
197.71	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
199.47	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
200.25	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← **yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Stormwater Management Area 'H' (Infiltration Basin)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← **yes**
1.33	ac	A = Area draining to the practice	
0.69	ac	A_I = Impervious area draining to the practice	
0.52	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.52	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.69	ac-in	WQV= 1" x Rv x A	
2,496	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
624	cf	25% x WQV (check calc for sediment forebay volume)	
Sediment Forebay		Method of pretreatment? (not required for clean or roof runoff)	
1,107	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ **25%WQV**
17,640	cf	V = Volume[1] (attach a stage-storage table)	≥ **WQV**
3,025	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
3.3	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ **72-hrs**
207.00	feet	E_{BTM} = Elevation of the bottom of the basin	
203.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
196.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
11.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
NA	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ **24"**
NA	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
NA	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←**yes**
NA		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← **yes**
Yes	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← **yes**
3.0	:1	If a basin is proposed, pond side slopes.	≥**3:1**
208.39	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
209.47	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
210.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← **yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Porous Pavement Section**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.42	ac	A = Area draining to the practice	
0.08	ac	A_I = Impervious area draining to the practice	
0.19	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.22	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.09	ac-in	WQV= 1" x Rv x A	
338	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
85	cf	25% x WQV (check calc for sediment forebay volume)	
254	cf	75% x WQV (check calc for surface sand filter volume)	
NA		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,100	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
NA	Yes/No	(Use the calculations below)	
1.2	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
NA	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
NA	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
191.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
NA	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
188.66	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
186.77	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
4.73	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.84	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
191.98	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
193.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
NA	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
NA	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
NA	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
NA	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
NA	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	NA	Note what sheet in the plan set contains the filter course specification	
NA	:1	Pond side slopes	**≥ 3:1**
Sheet	NA	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Asphalt		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.1	acres	A_{SA} = Surface area of the pervious pavement	
4.2	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
.	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	NA	Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
-	inches	Rd = Weighted groundwater recharge depth	
-	ac-in	GRV = AI * Rd	
-	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

APPENDIX E

NHDES AOT SUPPORT MATERIAL

GOVE ENVIRONMENTAL SERVICES, INC.

SITE-SPECIFIC SOIL SURVEY REPORT
for
BAE Systems
255 Derry Road, Litchfield, NH
by GES, Inc.
Project #2022205 Date: 2/8/2023

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced X-X-2023; prepared by Cortney Stevenson (SSA) and reviewed by JP Gove, CSS #004, GES, Inc. The survey area is located in Litchfield, NH.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1” equals 40’

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located primarily on a glaciofluvial outwash plain that has soils with varying proportions of sand, gravels and cobbles. Adjacent to the main building, on the southeastern section of the site, there is a component of till in the upland and wetland areas. This till origin is evidenced by subangular stones and cobbles at the surface and a relatively shallow hardpan observed in the floodplain of an active stream. Some of the test pits note "firm consistence" at depths greater than the particle size control section, which indicates lodgement till at depth with differing amounts of overlying glacial outwash throughout the property. Much of the pasture in the north-central portion of the property has been in open-field conditions since at least 1962, according to historical aerial imagery. Large tracts pine and hardwood forest exist in the western, eastern and southern regions of the site. While segments of the central and eastern area consist of upland hills, the south, east and west sides of the parcel have extensive, interconnected wetlands.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work:

Wetlands flagged in the Fall of 2022, and soil mapping completed in February of 2023.

Date(s) of test pits: 12-06-2022 to 12-08-2022

Test pits recorded by: Paul Carideo, Designer #088, Hayner/Swanson, Inc.

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Litchfield, NH

Location: 255 Derry Rd.

Size of area: ~80 acres

Was the map for the entire lot? No

If no, where was the mapping conducted on the parcel: Litchfield only (excl. Hudson)

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? yes

If no, what was the purpose of the map? n/a

Who was the map prepared for? Hayner/Swanson, Inc

6. SOIL MAP LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
12	Hinckley loamy sand	111	A
24	Agawam sandy loam	211	B
26	Windsor loamy sand	111	A
34	Wareham loamy sand	411	C
115	Scarboro muck	611	D
313	Deerfield loamy sand	311	B
546	Walpole loamy sand	511	C
100B/ehacd	Udorthents, wet substratum	481	C
300B/baaaa	Udipsamments, nearly level	361	A
350B/dbabb	Udipsamments, wet substratum	361	B

Slope Phases:

A: 0-3% B: 3-8% C: 8-15% D: 15-25% E: 25-50% F: >50%

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7. OFFICIAL SOIL SERIES DESCRIPTIONS

HINCKLEY-
Geographic Setting: Hinckley soils are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. The soils formed in glaciofluvial sand and gravel derived principally from granite, gneiss, and schist.

Drainage & Saturated hydraulic conductivity: Excessively drained. Surface runoff is negligible through low. Saturated hydraulic conductivity is high or very high.

Range in Characteristics: Rock fragment content of the solum ranges from 5 through 50 percent gravel, 0 through 30 percent cobbles, and 0 through 3 percent stones. Rock fragment content of individual horizons of the substratum ranges from 10 through 55 percent gravel, 5 through 25 percent cobbles, and 0 through 5 percent stones. In some places gravel content throughout the soil ranges up through 75 percent.

AGAWAM-
Geographic Setting: Agawam soils are level to steep soils on outwash plains and high stream terraces. Steeper slopes are on terrace escarpments and steep sides of gullies in dissected outwash plains. The soils formed in sandy water deposited material derived principally from schist, granite, gneiss, and phyllite.

Drainage & Saturated hydraulic conductivity: Well drained. Runoff and internal drainage are negligible to low. Saturated hydraulic conductivity is moderately high or high in the upper solum and high or very high in the lower solum and substratum.

Range in Characteristics: Solum thickness ranges from 15 to 35 inches. Coarse fragments range from 0 to 10 percent by volume in the surface, 0 to 30 percent in the B and C horizons above a depth of 40 inches and 0 to 60 percent below.

WINDSOR-
Geographic Setting: Windsor soils are nearly level through very steep soils typically on glaciofluvial landforms but include late-Wisconsin-aged dunes. The steeper slopes are typically on terrace escarpments. The soils formed in outwash or eolian deposits of poorly graded sands and loamy sands derived mainly from crystalline rocks.

Drainage & Saturated hydraulic conductivity: Excessively drained. Surface runoff is negligible to medium. Saturated hydraulic conductivity is high or very high.

Range in Characteristics: Thickness of the solum ranges from 10 to 40 in. Rock fragments, dominantly fine gravel, range from 0 through 10 percent by volume in the solum and from 0 to 15 percent in the substratum. Thin strata of gravel or thin subhorizons of coarse sand or loamy coarse sand are present in some pedons.

WAREHAM-
Geographic Setting: Wareham soils are level to gently sloping soils on outwash plains, deltas, and stream terraces in areas that receive run on water. Slope ranges from 0 to 8 percent. The soils formed in sandy glaciofluvial materials derived from granite and gneiss.

Drainage & Saturated hydraulic conductivity: Poorly and somewhat poorly drained. Runoff is negligible or very low. Permeability is rapid.

Range in Characteristics: Solum thickness ranges from 6 to 30 inches. Gravel content to a depth of about 40 inches ranges from 0 to 15 percent. Below 36 inches the gravel content ranges from 0 to 60 percent and cobblestones range from 0 to 3 percent.

SCARBORO-
Geographic Setting: Scarboro soils are in level or nearly level depressions on outwash plains, deltas, and terraces. Slope is less than 3 percent. The soils formed in sandy glaciofluvial deposits.

Drainage & Saturated hydraulic conductivity: Very poorly drained. Saturated hydraulic conductivity is high or very high. Surface runoff is high or very high. The water table is at or near the surface for 6 to 12 months of the year, and many areas are ponded for short periods.

Range in Characteristics: Stones range from 0 through 5 percent by volume near the surface and are absent in substratum. Cobbles range from 0 through 10 percent near the surface and 0 through 5 percent in the substratum. Gravel ranges from 0 through 10 percent by volume near the surface, 0 through 20 percent in the upper substratum to a depth of 30 inches, and 0 through 50 percent in the substratum below a depth of 30 inches.

DEERFIELD-
Geographic Setting: Deerfield soils are level to strongly sloping soils on outwash terraces, outwash deltas, and outwash plains. Slope gradients are commonly 0 to 3 percent, but range to 15 percent. The soils formed in thick deposits of sand derived mainly from granite, gneiss and quartzite, but in places containing materials from schist and sandstone. The sand is poorly graded; medium sand is generally dominant and typically contains little or no gravel.

Drainage & Saturated hydraulic conductivity: Moderately well drained. Runoff is negligible to low. Saturated hydraulic conductivity is high or very high.

Range in Characteristics: Solum thickness ranges from 15 to 40 in. Gravel, generally fine gravel, ranges from 0 to less than 15 percent in the solum and 0 to 20 percent in the substratum. Iron depletions with chroma of two or less are between depths of 15 and 40 in from the mineral soil surface.

WALPOLE-
Geographic Setting: Walpole soils are nearly level and gently sloping soils in shallow drainageways and low-lying areas on terraces and plains. Slope ranges from 0 to 8 percent. The soils formed in sandy glaciofluvial and stratified drift materials derived mainly from crystalline rocks.

Drainage & Saturated hydraulic conductivity: Poorly drained. Surface runoff is slow. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil, and high or very high in the substratum. Walpole soils have a water table at or near the surface much of the year.

Range in Characteristics: Thickness of the solum and depth to sand or loamy sand substratum layers range from 18 to 30 in. Rock fragments range from 0 to 25 percent by volume in the solum and from 0 to 50 percent in individual layers of the substratum. Typically, 70 percent or more of the rock fragments are rounded gravel. Reaction ranges from very strongly acid to neutral throughout.

UDORTHENTS, wet substratum-
Geographic Setting: This map unit consists of areas of disturbed soils where the upper soil material has been removed, filled or graded. Often, filled areas were previously marshes, river flood plains or swamps. This human altered soil is made of gravel and sands overlying natural soil.

Drainage & Saturated hydraulic conductivity: Somewhat poorly drained.

Range in Characteristics: Higher gravel content than Udipsamments, wet substratum.

UDIPSAMMENTS, nearly level-
Geographic Setting: This human altered soil is commonly located on outwash plains and deltas, and are associated with development areas. These areas are nearly level and composed primarily of sandy fill materials over well-excessively drained soils.

Drainage & Saturated hydraulic conductivity: Excessively drained. Permeability is high to very high and seasonal-high water table is located >4ft. depth from the soil surface.

Range in Characteristics: Depth of fill is variable but may range from 1-20ft. Textures are mostly sand where the fill has been placed.

UDIPSAMMENTS, wet substratum-
Geographic Setting: This map unit consists of areas of disturbed soils where the upper soil material has been removed, filled or graded. Often, filled areas were previously marshes, river flood plains or swamps. This human altered soil is made mostly of sandy fill overlying native soil.

Drainage & Saturated hydraulic conductivity: Somewhat poorly drained. Permeability is moderate or slow. Runoff is slow, and water tends to pond on the surface after intensive rain. The seasonal-high water table is in the lower part of the substratum, commonly within 1 to 5 feet below the surface.

Range in Characteristics: The fill generally consists of sands, but loamy textures may be present near the contact with native soils. The depth of fill can be variable, but typically ranges from 1- 20 ft.

8. ONSITE MAP UNIT DESCRIPTIONS

Map Unit 12 (Hinckley loamy sand)

This deep, nearly-level to steep, excessively drained soil is found on outwash plains and glaciofluvial terraces. The unit composes an extensive portion of the existing cleared areas as well as forested portions of the site.

Typically, the surface layer is very friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is friable, brownish yellow gravelly loamy sand. Gravel and cobble content generally increases with depth. The substratum is massive, light yellowish brown gravelly loamy sand to a depth of 80 inches or more.

Included with this soil in mapping are areas of Agawam, Windsor and Deerfield soils, which make up about 20% of the map unit.

Estimated seasonal-high water table ranges from 42-84. Cobbles and stones range from 0-15% in the subsurface.

Map Unit 24 (Agawam sandy loam)

This deep, gently sloping to steep, well-drained soil is on a stream terrace located near the existing inflatable bubble. map unit is of limited extent, northeast of the existing building and inflatable bubble.

Typically, the surface layer is very friable, dark brown sandy loam about 8 inches thick. The subsoil is very friable, yellowish brown sandy loam about 15 inches thick. The substratum is massive, brownish yellow gravelly loamy sand to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Hinckley soils that make up about 10% of this map unit.

Estimated seasonal- high water table ranges from 36-42”. Cobbles and stones range from 5-15% in the subsurface.

Map Unit 26 (Windsor loamy sand)

This deep, nearly-level to steep, excessively drained soil is on outwash plains and glaciofluvial terraces in the northern portion of the property. The unit is extensively present in the cleared areas and forested areas of the site.

Typically, the surface layer is very friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is brownish yellow sand about 24 inches thick. The substratum is light yellowish brown gravelly sand to a depth of 80 inches or more.

Included with this soil in mapping are adjacent areas of Deerfield and Hinckley soils, which compose around 15% of the map unit.

Estimated seasonal-high water table ranges from 42” to over 144”. Cobbles and stones range from 0-15% in the subsoil, with lower portions of the control section having gravelly sand textures with higher percentages of coarse fragments.

Map Unit 34 (Wareham loamy sand)

This deep, gently sloping, poorly drained soil is in glaciofluvial outwash sediments adjacent to active stream channels at the site. The unit is moderately extensive, as it comprises an intergrade from upland soil types to the wetland boundaries.

Typically, the surface layer is very friable, dark brown fine sandy loam about 8 inches thick. The subsoil is very friable, brown fine sandy loam about 12 inches thick. The substratum is massive, gray loamy sand with prominent redox features to a depth of 30 inches or more.

Included with this soil in mapping are small areas of Walpole and Deerfield soils, that make up around 10% of this map unit.

Estimated seasonal-high water table is within 10 inches of the surface, with standing water observed within 4 inches of the surface at each profile. Gravel, cobble and stone content ranges from 0-15% in the subsurface.

Map Unit 115 (Scarboro muck)

This deep, nearly-level, very poorly drained unit is present in the southwest portion of the site in a large, wet depression. The unit comprises a moderate sized wetland with a highly sinuous stream channel and ponded soil surface.

In the observed pit, the mineral surface layer is very friable, very dark brown fine sandy loam about 8 inches thick. Below the surface, a mineral layer of stratified gray loamy sand only about 2 inches thick was present overlying mucky organic material, (likely buried by sandy alluvial deposits from the nearby stream) which extends to a depth of 20 inches or more.

Included with this soil in mapping are areas Whitman, Walpole and Wareham soils which comprise about 20% of the map unit.

Estimated seasonal-high water table is near the surface with varying amounts of mineral material and mucky organic material in the surface due to complex depositional processes.

Map Unit 313 (Deerfield loamy sand)

This deep, nearly-level to steep, moderately-well drained soil is on the outwash plain and other glaciofluvial landforms throughout the property. The unit covers a significant portion of the upland side slopes at the site.

Typically, the surface is very friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is very friable, mottled, brownish yellow gravelly sand about 30 inches thick. The substratum is loose, mottled, light yellowish brown gravelly sand.

Included with this soil in mapping are areas Hinckley, Windsor and Wareham soils which make up about 20% of the map unit.

Estimated seasonal high water table ranges from 24-40”, with prominent strong brown mottles present in the subsoil. The percentage of coarse fragments in the control section varies considerably across the site, with gravel ranging from 0-10% beneath the surface and cobbles/stones ranging from 0-20%.

Map Unit 546 (Walpole loamy sand)

This deep, nearly-level, poorly drained soil covers most of the wetland area on this property. The surface is stony to extremely stony in most areas, primarily subangular.

Typically, the surface layer is friable, black fine sandy loam about 10 inches thick. The subsoil is very friable, very dark gray gravelly loam around 6 inches thick. The subsurface is loose, grayish brown loamy sand.

Included with this soil in mapping are areas of Whitman soils that have a hardpan within 20 inches of the surface. This inclusion makes up about 15% of the map unit, particularly in the southern portion of the parcel.

Estimated seasonal high water table is near the surface, with standing water observed within 4 inches of the surface. Distinct redox features are present in all horizons. Cobbles, stones and boulders range from 0-30% in the substratum depending on the local influence of till.

Map Unit 100B/ehacd (Udorthents, wet substratum)
This disturbed map unit covers a limited extent near a wetland in the northern portion of the site. It consists of 12" of very fine loamy sand fill over Scarboro soil series. This somewhat poorly drained unit covers a very small area near a graded driveway. Estimated seasonal-high water table is 8" and the gleyed loamy sand subsurface has prominent redox features throughout.

Map Unit 300B/baaaa (Udipsamments, nearly level)
This deep, gently sloping, moderately well-drained, anthropogenic soil. This somewhat excessively drained unit covers a relatively large portion of the property where sections have been graded for engineering purposes. The soils are composed ~50-70" of loamy sand and gravelly sand fill overlying an excessively drained soil formed in glacial outwash deposits (e.g. Windsor). The estimated seasonal-high water table is greater than 80".
Cobble and gravel content range from 0-10% in the control section.

Map Unit 350B/dbabb (Udipsamments, wet substratum)
This disturbed map unit of limited extent at the site, only covering a small area of the pasture in the northern portion of the property. This moderately well drained soil is made of ~ 20" of loamy sand and gravelly sand fill material overlying a moderately well drained natural soil. Estimated seasonal-high water table at 30". It covers a limited portion of the northern portion of the site near the property boundary.

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? No

If no, what is the nature of the disturbance?

Many areas have been cleared and previously graded for road engineering and building construction.

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10. RESPONSIBLE SOIL SCIENTIST

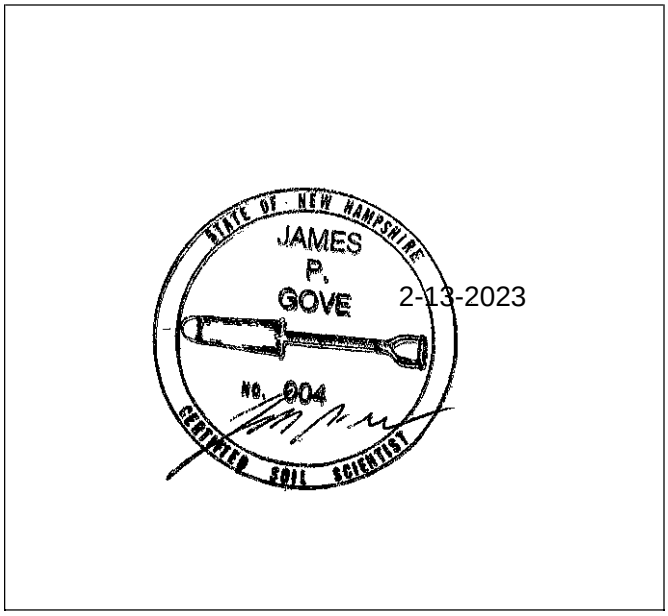
Name: James Gove

Certified Soil Scientist Number: 004

Soil Scientist Apprentice: Cortney Stevenson

Certified Soil Scientist: James Gove

Stamp and Signature:



GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
255 Derry Road, Litchfield NH
Hudson Land
By
GES, Inc.
Project # 2022205
Date: 4-4-2023

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 4-4-2023; prepared by JP Gove, CSS #004, GES, Inc. The survey area is located in Hudson, NH.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1” = 40’

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The Hudson parcel is a transition from a shallow to bedrock glacial till in the southern section to deep outwash in the northern section. The southern hill slopes downward to the north, where a border to outwash lies between the hill and a wetland. The area is mostly forested with the exception of some fill debris along the southern border of the parcel. The shallow to bedrock area is primarily hardwoods, with the outwash area being dominated by white pine.

After the creation of the topography used for the soil mapping, the piles of loam and soil were removed and faded flat. The flat area has a disturbed epipedon, but has natural soil profiles below the graded surface.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 4-4-2023

Date(s) of test pits: 3-29-2023

Test pits recorded by: Paul Carideo, Designer # 068, Hayner Swanson

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Hudson

Location: Access via 255 Derry Road, Litchfield

Size of area: 9.77 acres

Was the map for the entire lot? No

If no, where was the mapping conducted on the parcel: Area of interest, southern portion.

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? yes

If no, what was the purpose of the map? n/a

Who was the map prepared for? Hayner/Swanson Inc.

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
12	Hinckley, loamy sand	111	A
26	Windsor, loamy sand	111	A
189	Charfield Variant moderately well drained)	327	B
313	Deerfield, loamy sand	311	B
115	Sczrboro, muck	611	D

Slope Phase:
A: 0-3%
B: 3-8%
C: 8-15%
D: 15-25%
E: >25%

7. OFFICIAL SOIL SERIES DESCRIPTIONS

HINCKLEY SERIES

The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Saturated hydraulic conductivity is high or very high. Slope ranges from 0 to 60 percent. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1143 mm.

TAXONOMIC CLASS: Sandy-skeletal, mixed, mesic Typic Udorthents

TYPICAL PEDON: Hinckley loamy sand in woodland at an elevation of about 240 meters. (All colors are for moist soil.)

Oe -- 0 to 3 cm; moderately decomposed plant material derived from red pine needles and twigs. (0 to 5 cm thick.)

Ap -- 3 to 20 cm; very dark grayish brown (10YR 3/2) loamy sand; weak fine and medium granular structure; very friable; many fine and medium roots; 5 percent fine gravel; very strongly acid; abrupt smooth boundary. (3 to 25 cm thick.)

Bw1 -- 20 to 28 cm; strong brown (7.5YR 5/6) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 20 percent gravel; very strongly acid; clear smooth boundary.

Bw2 -- 28 to 41 cm; yellowish brown (10YR 5/4) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 25 percent gravel; very strongly acid; clear irregular boundary. (Combined thickness of the Bw horizon is 8 to 41 cm.)

BC -- 41 to 48 cm; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; common fine and medium roots; 40 percent gravel; strongly acid; clear smooth boundary. (0 to 13 cm thick)

C -- 48 to 165 cm; light olive brown (2.5Y 5/4) extremely gravelly sand consisting of stratified sand, gravel and cobbles; single grain; loose; common fine and medium roots in the upper 20 cm and very few below; 60 percent gravel and cobbles; moderately acid.

WINDSOR SERIES

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 10 degrees C and mean annual precipitation is about 1092 mm.

TAXONOMIC CLASS: Mixed, mesic Typic Udipsamments

TYPICAL PEDON: Windsor loamy sand - forested, 3 percent slope, at an elevation of about 24 meters. (Colors are for moist soil.)

Oe--0 to 3 cm; black (10YR 2/1) moderately decomposed forest plant material; many very fine and fine roots; very strongly acid; abrupt smooth boundary. (0 to 8 cm thick.)

A--3 to 8 cm; very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary. (3 to 25 cm thick.)

Bw1--8 to 23 cm; strong brown (7.5YR 5/6) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Bw2--23 to 53 cm; yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

Bw3--53 to 64 cm; light yellowish brown (10YR 6/4) sand; single grain; loose; few coarse roots; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 23 to 86 cm.)

C--64 to 165 cm; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand; single grain; loose; few coarse roots; strongly acid.

CHATFIELD SERIES

The Chatfield series consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 50 to 100 cm. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Chatfield fine sandy loam, on a 13 percent slope in a wooded area. (Colors are for moist soil unless otherwise noted).

Oi -- 0 to 3 cm, slightly decomposed leaf, needle, and twig litter; extremely acid, pH 4.2. (0 to 15 cm thick.)

A -- 3 to 5 cm, very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1), dry; weak fine subangular blocky structure; friable; many fine and medium roots throughout; 5 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt smooth boundary. (1 to 25 cm thick.)

Bw1-- 5 to 33 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine subangular blocky structure; friable; common fine roots throughout and common medium roots throughout; 15 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt wavy boundary.

Bw2 -- 33 to 76 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots throughout; 20 percent mixed rock fragments; very strongly acid, pH 4.5; abrupt irregular boundary. (Combined thickness of the Bw horizons is 10 to 80 cm.)

2R -- 76 cm; fractured slightly-weathered schist bedrock.

DEERFIELD SERIES

The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 9 degrees C. and mean annual precipitation is about 1194 mm.

TAXONOMIC CLASS: Mixed, mesic Aquic Udipsamments

TYPICAL PEDON: Deerfield loamy fine sand in a hayfield at an elevation of about 19 meters. (Colors are for moist soil.)

Ap --0 to 23 cm; very dark brown (10YR 2/2) loamy fine sand; weak fine and medium granular structure; very friable; common fine roots; moderately acid; abrupt smooth boundary. (15 to 30 cm thick)

Bw1 --23 to 43 cm; strong brown (7.5YR 5/6) loamy fine sand; weak fine and medium granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.

Bw2 --43 to 64 cm; yellowish brown (10YR 5/6) loamy fine sand; weak fine granular structure; very friable; few fine faint brownish yellow (10YR 6/6), moist, masses of oxidized iron accumulation; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 13 to 69 cm.)

BC --64 to 84 cm; yellowish brown (10YR 5/6) fine sand; single grain structure; loose; common fine and medium distinct strong brown (7.5YR 5/8) masses of oxidized iron accumulation and common fine and medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; clear broken boundary. (0 to 51 cm thick)

C1 --84 to 102 cm; light brownish gray (10YR 6/2) stratified sand and fine sand; single grain structure; loose; common fine prominent strong brown (7.5YR 5/8) masses of oxidized iron accumulation; strongly acid; clear wavy boundary.

C2 --102 to 152 cm; light brownish gray (10YR 6/2) stratified sand and gravelly sand; single grain structure; loose; common fine and medium prominent strong brown (7.5YR 5/8) masses of oxidized iron accumulation; 10 percent rounded fine granite and quartzite gravel; very strongly acid; individual strata contain up to 20 percent gravel.

SCARBORO SERIES

The Scarboro series consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. Slope ranges from 0 through 3 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 49 degrees F. (9 degrees C.) and the mean annual precipitation is about 44 inches (1118 millimeters).
TAXONOMIC CLASS: Sandy, mixed, mesic Histic Humaquepts

TYPICAL PEDON: Scarboro mucky fine sandy loam woodland; in an area of Scarboro mucky fine sandy loam at an elevation of about 212 meters. (Colors are for moist soil.)

Oi-- 0 to 1 inch (0 to 3 centimeters); slightly decomposed maple leaves and other plant material

Oa-- 1 to 8 inches (3 to 20 centimeters); dark brown (10YR3/3) mucky peat; thin platy structure; friable; common fine roots; very strongly acid; abrupt wavy boundary. (Combined thickness of Oi, Oe, and Oa horizons is 8 to 13 inches (20 to 33 centimeters).)

A-- 8 to 14 inches (20 to 36 centimeters); black (N 2/0) mucky fine sandy loam; weak medium granular structure; friable; common fine roots; very strongly acid; abrupt smooth boundary. (0 to 14 inches (0 to 36 centimeters) thick.)

Cg1-- 14 to 19 inches (36 to 48 centimeters); grayish brown (2.5Y 5/2) loamy sand; massive; friable; many fine roots; very strongly acid; abrupt irregular boundary.

Cg2-- 19 to 22 inches (48 to 56 centimeters); grayish brown (2.5Y 5/2) sand; massive; friable; few fine roots; 10 percent rock fragments; common medium prominent dark brown (7.5YR 3/2) areas of iron depletion and common medium prominent yellowish red (5YR 4/6) masses of iron; very strongly acid; clear wavy boundary.

Cg3-- 22 to 65 inches (56 to 165 centimeters); grayish brown (2.5Y 5/2) gravelly sand; single grain; loose; 15 percent rock fragments; strongly acid.

8. ONSITE MAP UNIT DESCRIPTIONS

The Hinckley loamy sand map unit is located in the northern portion of the site, and lies between the glacial till hill and the wetland. It forms a distinct outwash terrace. From the top of the terrace to the border of the wetlands is a steep slope. The soil profiles are typical of the Hinckley soil series. The inclusions along the edge of the wetlands would be Deerfield loamy sand as a very narrow band (5%). The other inclusions would be bedrock in the soil profiles to the south in the transition to the bedrock controlled glacial till. This is a major soil component of this site.

The Windsor loamy sand map unit is a small component of the site, and is basically a transition from the deep sandy soils to the gravelly coarse sands. The inclusions would be areas of Hinckley loamy sand (10%).

The Chatfield Variant (moderately well drained) is the other major component soil type of this site. The pedons differ from the typical soil series description by having redoximorphic features above the bedrock. This means the two limiting horizons of the soil series is bedrock and estimated season high water table, both less than 40 inches from the soil surface. Inclusions would be Canton fine sandy loam, where the bedrock is deeper than 40 inches (5%) and soil shallower than 20 inches and/or exposed bedrock (5%).

The Deerfield loamy sand is a minor component of the site. It is primarily a transition from the deep moderately well drained sands to the moderately well drained Chatfield Variant. Inclusions would be areas of Windsor or Hinckley with deeper water tables (5%).

The Scarboro muck is in the very northern portion of the parcel, and is a wetland. Inclusions would be poorly drained soils at the transition form wetland to upland, and would be a narrow border (5%).

9. TEST PIT LOGS

Summarizes from the logs:

Hicnkley loamy sand: 6 to 8 inches of 10YR3/3 sandy loam (Ap), 8 to 17 inches of 10YR5/8 sandy loam (Bw), 17 to 100 inches 10YR6/6 to 10YR7/3 gravelly sand. No estimated seasonal high water table within 96 to 100 inches plus (C).

Chatfield Variant (moderately well drained): 8 to 12 inches of 10YR3/3 fine sandy loam (Ap), 8 to 26 inches 10YR6/4 sandy loam (Bw), 26 to 30 inches plus bedrock (R).

Scarboro muck: 8 to 12 inches of sapric (10YR2/1) (Oe) over loamy sand (2.5Y5/1) (Cg).

10. RESPONSIBLE SOIL SCIENTIST

Name: James Gove

Certified Soil Scientist Number: 004

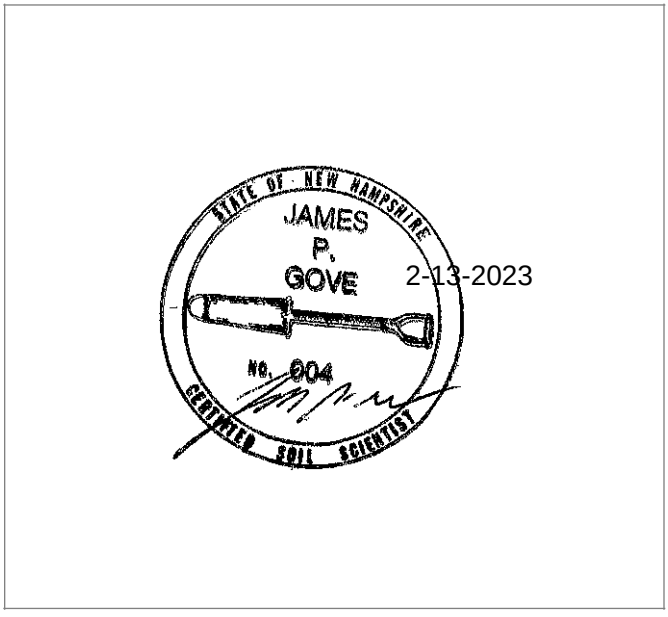
11. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? For the most part.

If no, what is the nature of the disturbance? Typical piles of landscaping soil material was place in the southern part. The piles have been removed and the area graded flat.

Certified Soil Scientist

Name: James Gove



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TEST PIT LOGS

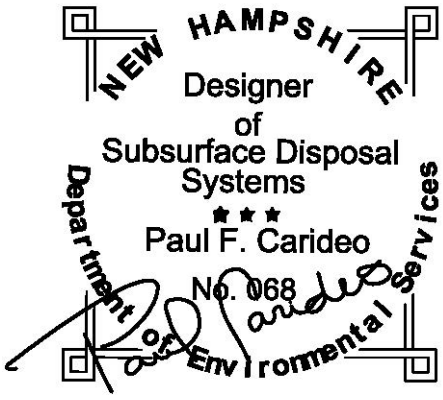
PROPOSED RESIDENTIAL DEVELOPMENT

255 Derry Road
Litchfield, NH

May 2023

Prepared for:
255 Derry Road, LLC
1 Continental Drive
Londonderry, NH 03053

Prepared by:
Hayner/Swanson, Inc.
3 Congress Street, Nashua, NH 03062
131 Middlesex Turnpike, Burlington, MA 01803



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HSI #5432
MAP 2 LOT 8
255 DERRY ROAD, LLC
255 DERRY ROAD
LITCHFIELD, NH

TEST PITS: FOR SEPTIC & DRAINAGE
WEATHER: 12/6/22-40° OVERCAST
WEATHER: 12/7/22-50° RAIN
WEATHER: 12/8/22-40° CLEAR
EQUIPMENT: VOLVO EC300PL
LOGGED BY: PAUL CARIDEO, NHDES PERMIT #68

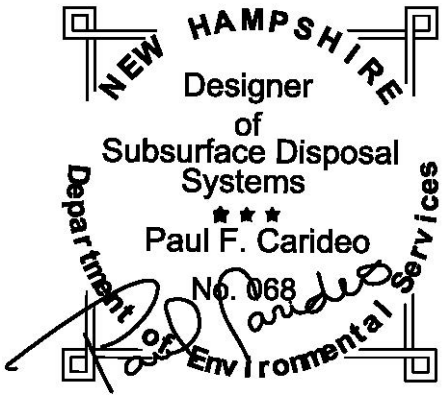
TEST PIT # 1 DATE: 12/7/22

0-18" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, VERY FRIABLE WITH MANY ROOTS
18-26" 10YR 5/8, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
26-32" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
32-48" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS TO 48"
48-70" 10YR 6/8, BROWNISH YELLOW, GRAVELLY COARSE SAND, 5% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 52"+
70-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 52" OWT: 84" ROOTS: 48" LEDGE: NONE OBSERVED

PERCOLATION TEST # 1 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 2 DATE: 12/7/22

0-15" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, VERY FRIABLE WITH MANY ROOTS
15-24" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
24-36" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
36-98" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE AND 10YR 7/4, VERY PALE BROWN, SAND, SINGLE GRAIN, LOOSE IN STRATIFIED LAYERS WITH FEW ROOTS TO 80" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 84"+
98-108" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
70-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY COARSE SAND, 10% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 84" OWT: 102" ROOTS: 80" LEDGE: NONE OBSERVED

PERCOLATION TEST # 2 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

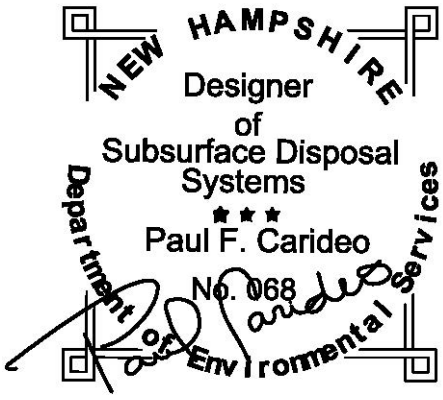
TEST PIT # 3 DATE: 12/6/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, VERY FRIABLE
12-16" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE
16-66" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 5% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 48"+
70-84" 2.5Y 5/2, GRAYISH BROWN, VERY FINE LOAMY SAND, MASSIVE AND FIRM WITH 7.5YR 5/8, STRONG BROWN AND 2.5Y 7/1 LIGHT GRAY REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 48" OWT: 66" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 3 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 4 DATE: 12/6/22 (MOWED FIELD)

0-14" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, VERY FRIABLE
14-24" 2.5Y 4/3, OLIVE BROWN, FINE SAND, WEAK FINE GRANULAR, FRIABLE
24-48" 2.5Y 6/2, LIGHT BROWNISH GRAY, FINE LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
70-84" 10YR 7/3, VERY PALE BROWN, LOAMY SAND, GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 60" ROOTS: NONE LEDGE: NONE OBSERVED

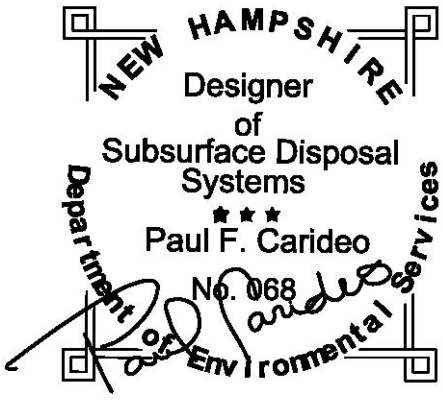
TEST PIT # 5 DATE: 12/6/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, VERY FRIABLE
12-19" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
19-44" 10YR 7/4, VERY PALE BROWN, SAND, FINE GRANULAR AND FRIABLE
44-60" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 48"+
60-96" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 10% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 48" OWT: 70" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 5 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 6 DATE: 12/6/22 (MOWED FIELD AT EDGE OF SITE IMPROVEMENTS)

0-6" 10YR 3/3, DARK BROWN, SANDY LOAM FILL, FINE GRANULAR AND VERY FRIABLE
6-16" 10YR 7/4, VERY PALE BROWN, GRAVELLY SAND FILL, 10% ANGULAR COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
16-58" 10YR 5/3, BROWN, GRAVELLY LOAMY SAND FILL, 15% ANGULAR COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
58-62" 10YR 3/3, DARK BROWN, FINE SANDY LOAM FILL, MASSIVE AND FRIABLE
62-90" 10YR 5/6, YELLOWISH BROWN, GRAVELLY SAND FILL, 10% GRAVEL, 5% ANGULAR COBBLES, FINE GRANULAR AND FRIABLE
90-108" 10YR 5/3, BROWN, GRAVELLY LOAMY SAND FILL, 10% ANGULAR COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE
108-114" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND FRIABLE
114-150" 10YR 6/8, BROWNISH YELLOW, GRAVELLY COARSE SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 120"+

ESHWT: 120" OWT: 132" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 6 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

NEW HAMPSHIRE
Designer
of
Subsurface Disposal
Systems
Paul F. Carideo
No. 068
Department of Environmental Services

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TEST PIT # 7 DATE: 12/6/22 (MOWED FIELD AT EDGE OF SITE IMPROVEMENTS)

0-5" 10YR 3/3, DARK BROWN, SANDY LOAM FILL, FINE GRANULAR AND VERY FRIABLE
5-26" 10YR 7/4, VERY PALE BROWN, GRAVELLY SAND FILL, 10% ANGULAR COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
26-52" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND FILL, 15% ANGULAR COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE
52-70" 10YR 3/3, DARK BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
70-82" 10YR 5/6, YELLOWISH BROWN, GRAVELLY SAND FILL, 5% ROUNDED COBBLES, FINE GRANULAR AND FRIABLE
82-105" 10YR 7/3, VERY PALE BROWN, GRAVELLY COARSE SAND, 10% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
105-156" 10YR 6/8, BROWNISH YELLOW, GRAVELLY COARSE SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 140"+

ESHWT: 140" OWT: 154" ROOTS: NONE LEDGE: NONE OBSERVED

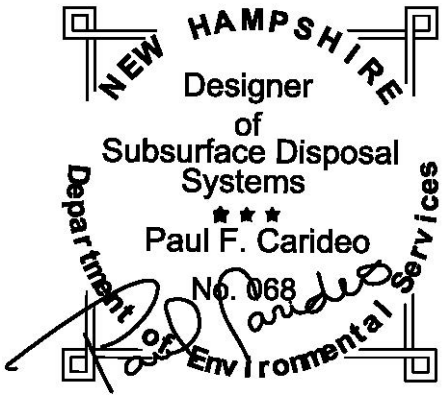
PERCOLATION TEST # 7 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 8 DATE: 12/6/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, VERY FINE LOAMY SAND FILL, MASSIVE, VERY FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW AND 2.5Y 7/1, LIGHT GRAY REDOXIMORPHIC FEATURES AT 8"+
12-22" 2.5Y 2.5/1, BLACK, ALL ORGANIC MATERIAL, MASSIVE, FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW AND 2.5Y 7/1, LIGHT GRAY REDOXIMORPHIC FEATURES THROUGHOUT
22-38" 2.5Y 5/1, GRAY, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
38-46" 2.5Y 5/4, LIGHT OLIVE BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
46-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 8" OWT: 6" ROOTS: NONE LEDGE: NONE OBSERVED



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TEST PIT # 9 DATE: 12/7/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
12-28" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 10% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 24"+
28-37" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
37-56" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
56-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, WEAK FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 24" OWT: 48" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 9 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

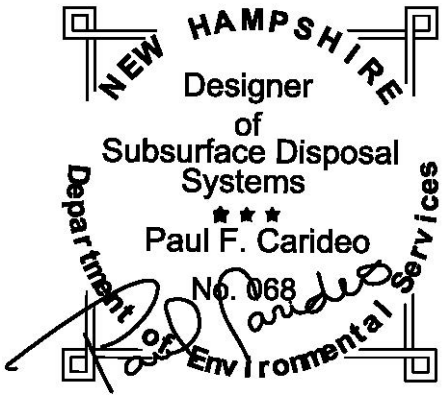
TEST PIT # 10 DATE: 12/7/22 (EDGE OF GRAVEL ACCESS ROAD)

0-2" 10YR 3/3, DARK BROWN, FINE LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE WITH FEW ROOTS
2-16" 10YR 5/3, BROWN, GRAVELLY SAND, 15% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE WITH FEW ROOTS
16-30" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE WITH FEW ROOTS TO 18" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 24"+
30-42" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 10% COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
42-56" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% COBBLES, 10% GRAVEL, SINGLE GRAIN, AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
56-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, WEAK FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 24" OWT: 48" ROOTS: 18" LEDGE: NONE OBSERVED

PERCOLATION TEST # 10 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 11 DATE: 12/7/22 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-16" 10YR 5/8, YELLOWISH BROWN, SAND, SINGLE GRAIN AND LOOSE
16-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
30-60" 10YR 7/4, VERY PALE BROWN, SAND, 2% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
54-72" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, MASSIVE AND FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 66" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 11 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

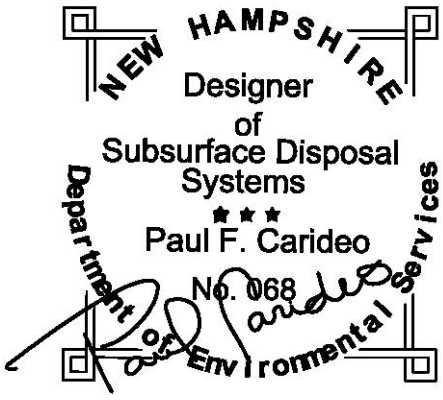
TEST PIT # 12 DATE: 12/7/22 (MOWED FIELD)

0-5" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
5-38" 10YR 6/6, BROWNISH YELLOW, GRAVELLY COARSE SAND, 15% ROUNDED COBBLES, 5% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 36"+
38-72" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY COARSE SAND, 10% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 36" OWT: 60" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 12 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 13 DATE: 12/7/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
12-24" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
24-34" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 26"+
34-42" 10YR 7/4, VERY PALE BROWN, SAND, 2% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
42-72" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 26" OWT: 34" ROOTS: NONE LEDGE: NONE OBSERVED

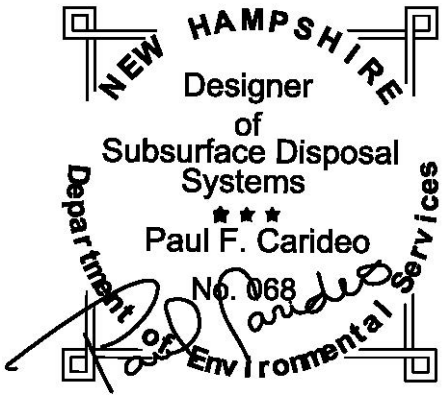
PERCOLATION TEST # 13 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 14 DATE: 12/6/22 (MOWED FIELD)

0-10" 10YR 3/3, DARK BROWN, SANDY LOAM FILL, FINE GRANULAR AND VERY FRIABLE
10-17" 10YR 6/4, LT YELLOWISH BROWN, GRAVELLY SAND FILL, 10% COBBLES, 5% GRAVEL, SINGLE GRAIN AND LOOSE
17-19" 10YR 3/3, DARK BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
19-27" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
27-45" 10YR 5/8, YELLOWISH BROWN, GRAVELLY SAND, 20% ROUNDED COBBLES, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
45-64" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
64-74" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
74-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, SUBANGULAR/BLOCKY AND FIRM WITH 7.5YR 6/8, REDDISH YELLOWREDOXIMORPHIC FEATURES

ESHWT: 30" OWT: 100" ROOTS: NONE LEDGE: NONE OBSERVED



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PERCOLATION TEST # 14 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 15 DATE: 12/6/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, FINE GRANULAR AND VERY FRIABLE
12-20" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
20-34" 10YR 7/4, VERY PALE BROWN, SAND, 5% COBBLES, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
34-50" 2.5Y 6/4, LIGHT YELLOWISH BROWN, FINE SAND, FINE GRANULAR, LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
50-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 72" ROOTS: NONE LEDGE: NONE OBSERVED

TEST PIT # 16 DATE: 12/6/22 (MOWED FIELD)

0-17" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, FINE GRANULAR AND VERY FRIABLE
17-21" 10YR 5/4, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE
21-50" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, WEAK FINE GRANULAR WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 48"+
50-54" 2.5Y 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
54-80" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT
80-100" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 10% GRAVEL, SUB-ANGULAR/BLOCKY AND FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 48" OWT: 94" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 16 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

NEW HAMPSHIRE
Designer
of
Subsurface Disposal
Systems
Paul F. Carideo
No. 068
Department of Environmental Services

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131 Middlesex Turnpike, Burlington, MA 01830 · (781) 203-1501
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TEST PIT # 17 DATE: 12/6/22 (MOWED FIELD)

0-48" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, FINE GRANULAR AND VERY FRIABLE
48-84" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 54"+
84-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% ANGULAR COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 54" OWT: 100" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 17 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

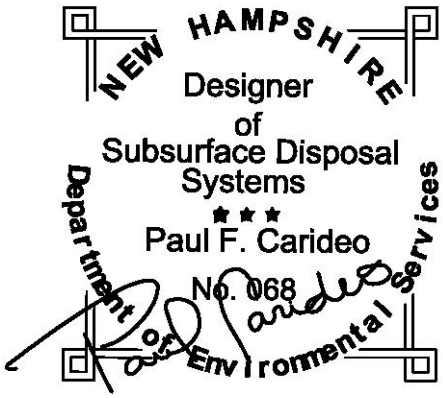
TEST PIT # 18 DATE: 12/6/22 (MOWED FIELD)

0-8" 10YR 3/3, DARK BROWN, SANDY LOAM FILL, FINE GRANULAR AND VERY FRIABLE
8-23" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND FILL, 10% ANGULAR COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE
23-72" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOMY SAND FILL, 10% ANGULAR COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE
72-75" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
75-78" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE
78-84" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE
84-128" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRRAVELLY SAND, 15% ROUNDED COBBLES, 5% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 84"+
128-132" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 84" OWT: 112" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 18 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 19 DATE: 12/6/22 (MOWED FIELD)

0-15" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND FILL, FINE GRANULAR AND VERY FRIABLE
15-28" 10YR 5/4, YELLOWISH BROWN, GRAVELLY SAND FILL, 5% GRAVEL, SINGLE GRAIN AND LOOSE
28-50" 10YR 5/6, YELLOWISH BROWN AND 10YR 7/4 VERY PALE BROWN, GRAVELLY SAND FILL LAYERS, SINGLE GRAIN AND LOOSE
50-54" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
54-84" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN AND LOOSE
84-108" 10YR 7/4, VERY PALE BROWN, SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 96"+
108-118" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 5% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 96" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 19 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

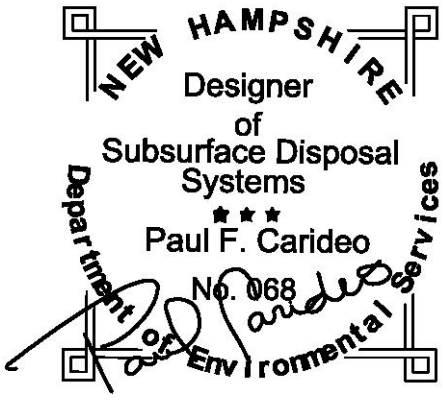
TEST PIT # 20 DATE: 12/6/22 (MOWED FIELD)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
6-17" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
17-32" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, MASSIVE, FRIABLE
32-90" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% ANGULAR COBBLES, 15% GRAVEL, MASSIVE, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 84"+
90-120" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 84" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 20 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 21 DATE: 12/6/22 (MOWED FIELD)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
6-16" 10YR 6/6, BROWNISH YELLOW, FINE SAND, FINE GRANULAR AND FRIABLE
16-26" 10YR 6/4, LIGHT YELLOWISH BROWN, SAND, 2% COBBLES, SINGLE GRAIN AND LOOSE
26-46" 2.5Y 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 42"+
46-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 42" OWT: 66" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 21 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

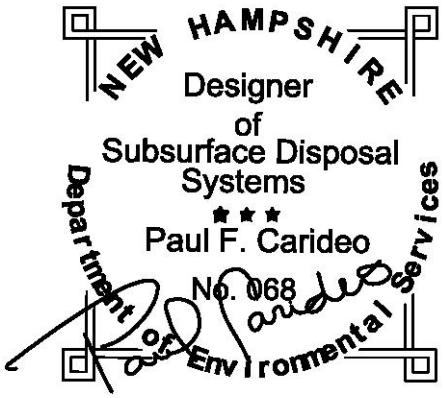
TEST PIT # 22 DATE: 12/6/22 (MOWED FIELD)

0-19" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
19-28" 10YR 6/6, BROWNISH YELLOW, SAND, 2% COBBLES, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 24"+
28-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 24" OWT: 46" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 22 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 23 DATE: 12/6/22 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
12-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% COBBLES, 5% GRAVEL, GRANULAR AND FRIABLE
30-48" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR, FRIABLE WITH 10YR 2/1, BLACK AND 10YR 6/1, GRAY REDOXIMORPHIC FEATURES AT 44"+
48-78" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% 30-48" STONES, 15% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 44" OWT: 70" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 23 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

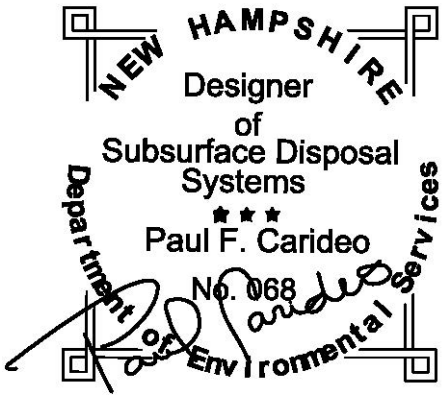
TEST PIT # 24 DATE: 12/7/22 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-17" 10YR 5/6, YELLOWISH BROWN, SAND, SINGLE GRAIN AND LOOSE
17-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% GRAVEL, SINGLE GRAIN AND LOOSE
30-54" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 10% COBBLES, 5% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
54-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, MASSIVE AND FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 68" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 24 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 25 DATE: 12/7/22 (MOWED FIELD)

0-4" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
4-16" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
16-44" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 10% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 40"+
44-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 40" OWT: 60" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 25 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

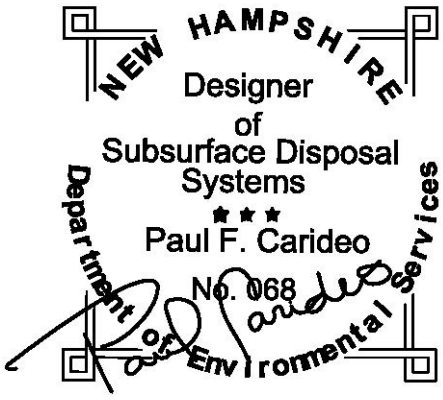
TEST PIT # 26 DATE: 12/7/22 (WOODS)

0-6" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
6-15" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
15-26" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
26-42" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, 2% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 40" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 40"+
42-72" 2.5Y 5/3, BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, 5% STONES 24-36", GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 40" OWT: 65" ROOTS: 40" LEDGE: NONE OBSERVED

PERCOLATION TEST # 26 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 27 DATE: 12/7/22 (WOODS)

0-5" 10YR 3/3, DARK BROWN, SANDY LOAM, WEAK FINE GRANULAR AND VERY FRIABLE WITH MANY ROOTS
5-11" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, 5% GRAVEL, GRANULAR, FRIABLE WITH COMMON ROOTS
11-52" 10YR 6/8, BROWNISH YELLOW, GRAVELLY SAND, 15% ROUND COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH FEW ROOTS
52-144" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY COARSE SAND, 20% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH FEW ROOTS TO 72"

ESHWT: NONE OBSERVED OWT: NONE OBSERVED ROOTS: 72" LEDGE: NONE OBSERVED

PERCOLATION TEST # 27 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

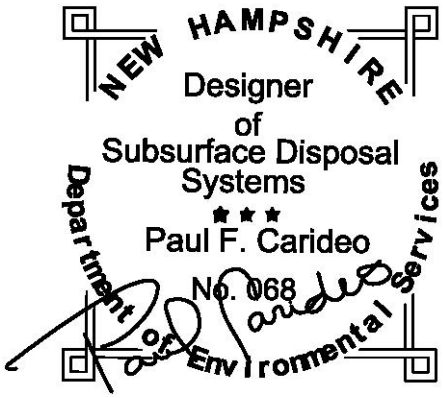
TEST PIT # 28 DATE: 12/7/22 (WOODS)

0-12" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
12-24" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
24-38" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% ROUND COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH FEW ROOTS
38-76" 10YR 6/4, LIGHT YELLOWISH BROWN, SAND, 5% COBBLES, SINGLE GRAIN, LOOSE WITH FEW ROOTS TO 56" WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 72"+
76-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 72" OWT: NONE OBSERVED ROOTS: 56" LEDGE: NONE OBSERVED

PERCOLATION TEST # 28 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 29 DATE: 12/7/22 (WOODS)

0-3" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
3-14" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
14-28" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SANDY LOAM, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
28-75" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 10% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS
75-96" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, 5% COBBLES, GRANULAR, LOOSE WITH FEW ROOTS TO 78" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 90"+
96-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, MASSIVE AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 90" OWT: NONE OBSERVED ROOTS: 78" LEDGE: NONE OBSERVED

PERCOLATION TEST # 29 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

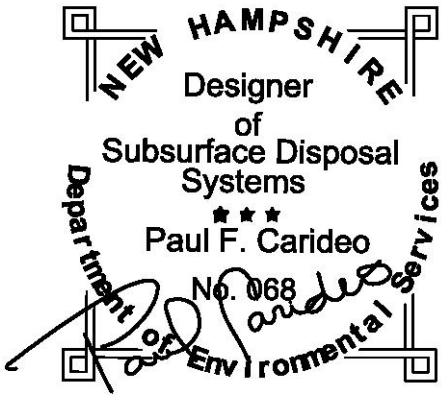
TEST PIT # 30 DATE: 12/7/22 (EDGE OF MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND VERY FRIABLE WITH FEW ROOTS
12-22" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
22-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
30-74" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 56"
74-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 84"+

ESHWT: 84" OWT: NONE OBSERVED ROOTS: 56" LEDGE: NONE OBSERVED

PERCOLATION TEST # 30 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 31 DATE: 12/7/22 (EDGE OF MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND VERY FRIABLE WITH FEW ROOTS
12-22" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
22-34" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
34-78" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 48"
78-90" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 84"+

ESHWT: 84" OWT: NONE OBSERVED ROOTS: 48" LEDGE: NONE OBSERVED

PERCOLATION TEST # 31 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

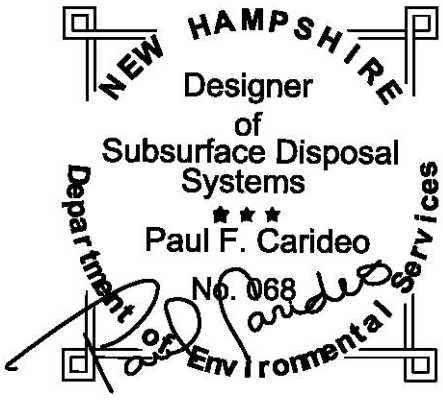
TEST PIT # 32 DATE: 12/7/22 (WOODS)

0-7" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
7-16" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
16-26" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SANDY LOAM, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
26-42" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
42-55" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
55-68" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 60" AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 64"+
96-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 64" OWT: NONE OBSERVED ROOTS: 60" LEDGE: NONE OBSERVED

PERCOLATION TEST # 32 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 33 DATE: 12/7/22 (WOODS)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
6-18" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
18-27" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN, LOOSE WITH FEW ROOTS
27-36" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
36-52" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 5% COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH FEW ROOTS TO 48"
52-64" 10YR 7/4, VERY PALE BROWN, SAND, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 60"+
64-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, MASSIVE AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 60" OWT: NONE OBSERVED ROOTS: 48" LEDGE: NONE OBSERVED

PERCOLATION TEST # 33 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

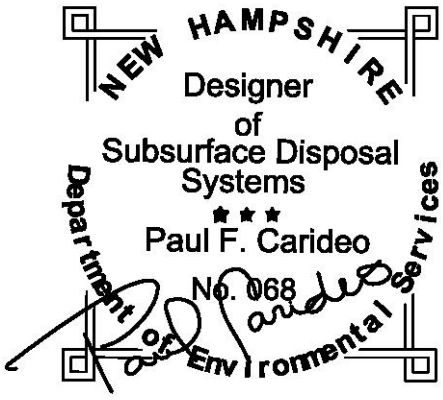
TEST PIT # 34 DATE: 12/7/22 (EDGE OF MOWED FIELD)

0-6" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
6-12" 10YR 5/4, YELLOWISH BROWN, GRAVELLY SANDY LOAM, 10% GRAVEL, GRANULAR, FRIABLE WITH COMMON ROOTS
12-60" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% COBBLES, 5% COBBLES, SINGLE GRAIN, LOOSE WITH FEW ROOTS TO 56"
60-96" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 90"+
96-118" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 90" OWT: NONE OBSERVED ROOTS: 56" LEDGE: NONE OBSERVED

PERCOLATION TEST # 34 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 35 DATE: 12/7/22 (MOWED FIELD)

0-10" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
10-24" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE
24-74" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 60"+
74-88" 10 YR 6/3, PALE BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 60" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 35 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

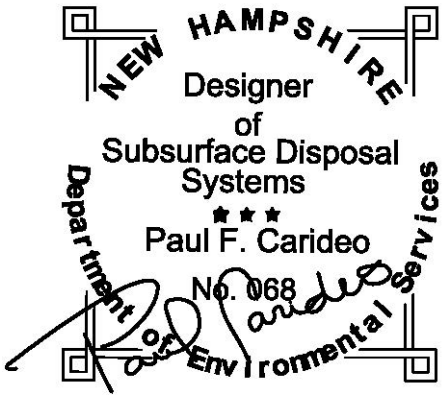
TEST PIT # 36 DATE: 12/7/22 (MOWED FIELD)

0-5" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
5-17" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE
17-44" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE
44-65" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE
65-90" 10 YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 72"+

ESHWT: 72" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 36 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 37 DATE: 12/8/22 (MOWED FIELD)

0-6" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR AND VERY FRIABLE
6-20" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, FINE GRANULAR AND FRIABLE
20-32" 10YR 5/4, YELLOWISH BROWN, GRAVELLY SANDY LOAM, 5% GRAVEL, GRANULAR AND FRIABLE
32-48" 10 YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 42"+
48-72" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 42" OWT: 72" ROOTS: NONE LEDGE: 72"

PERCOLATION TEST # 37 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 38 DATE: 12/8/22 (MOWED FIELD AT EDGE OF SITE IMPROVEMENTS)

0-4" 10YR 3/3, DARK BROWN, SANDY LOAM, WEAK FINE GRANULAR AND VERY FRIABLE
4-12" 10YR 5/8, YELLOWISH BROWN, SANY LOAM, FINE GRANULAR AND FRIABLE
12-48" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% ANGULAR COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE
48"+ SOFT LEDGE

ESHWT: 48" OWT: NONE OBSERVED ROOTS: NONE LEDGE: 48"

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TEST PIT # 39 DATE: 12/8/22 (WOODS)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
6-16" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
16-28" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
28-52" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH FEW ROOTS TO 40" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 42"+
52-84" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, MASSIVE AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 42" OWT: 80" ROOTS: 40" LEDGE: NONE OBSERVED

PERCOLATION TEST # 39 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

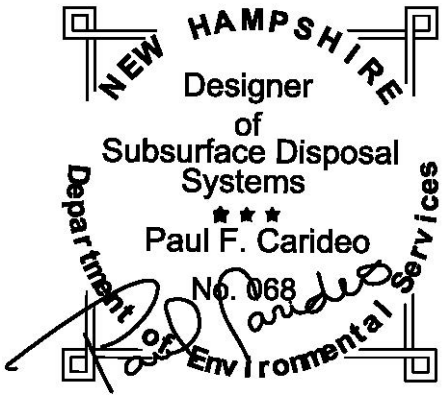
TEST PIT # 40 DATE: 12/8/22 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-17" 10YR 5/8, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE
17-30" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, 2% COBBLES, GRANULAR AND FRIABLE
30-62" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE
62-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 2% STONES 18-24", 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 80"+

ESHWT: 80" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 40 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 41 DATE: 12/8/22 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-18" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE
18-32" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 30"+
32-54" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC THROUGHOUT
54-76" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 72" ROOTS: NONE LEDGE: 76"

PERCOLATION TEST # 41 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

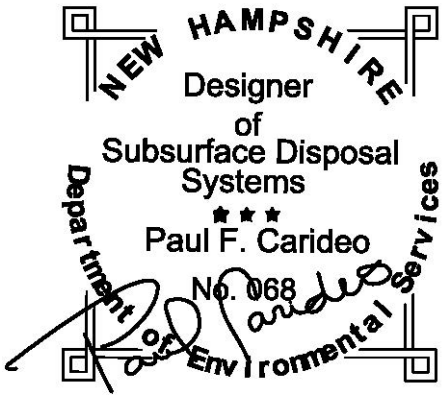
TEST PIT # 42 DATE: 12/8/22 (MOWED FIELD)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
6-15" 10YR 5/8, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR AND FRIABLE
15-36" 10YR 6/6, BROWNISH YELLOW, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
36-64" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE
64-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 2% STONES 18-24", 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 84"+

ESHWT: 84" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 42 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 43 DATE: 12/8/22 (WOODS)

0-11" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
11-22" 10YR 5/4, YELLOWISH BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR AND FRIABLE WITH FEW ROOTS
22-56" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR, FRIABLE WITH FEW ROOTS TO 36" AND 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 32"+
56-66" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
66-90" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
90-120" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 32" OWT: 56" ROOTS: 36" LEDGE: NONE OBSERVED

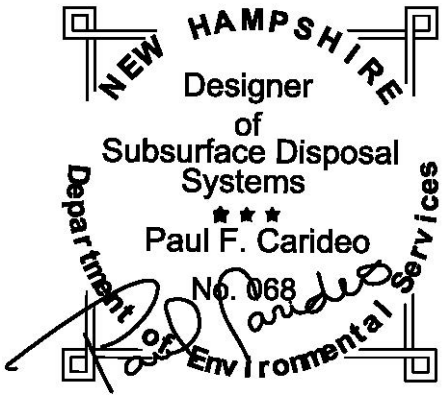
TEST PIT # 44 DATE: 12/8/22 (WOODS)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE, VERY FRIABLE WITH MANY ROOTS
8-18" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
18-38" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 10% COBBLES, 5% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 36"+ AND FEW ROOTS TO 38"
38-75" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% STONES 18-24", 10% COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 36" OWT: 72" ROOTS: 38" LEDGE: NONE OBSERVED

PERCOLATION TEST # 44 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 45 DATE: 12/8/22 (WOODS)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-20" 10YR 5/4, YELLOWISH BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
20-28" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
28-44" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 30"+ AND FEW ROOTS TO 34"
44-54" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC THROUGHOUT

ESHWT: 30" OWT: 48" ROOTS: 34" LEDGE: 54"

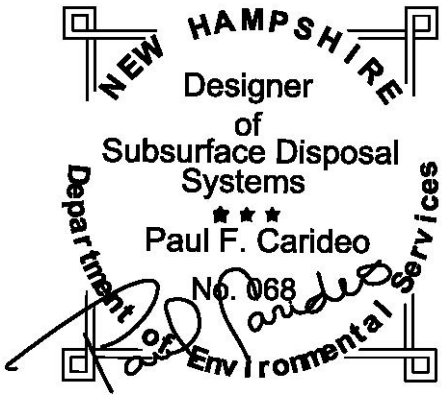
TEST PIT # 46 DATE: 12/8/22 (WOODS)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE, VERY FRIABLE WITH MANY ROOTS
8-16" 10YR 5/6, YELLOWISH BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
16-34" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, WEAK FINE GRANULAR, FRIABLE AND FEW ROOTS
34-52" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE FEW ROOTS TO 38"WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 40"+

ESHWT: 40" OWT: NONE ROOTS: 38" LEDGE: NONE OBSERVED

PERCOLATION TEST # 46 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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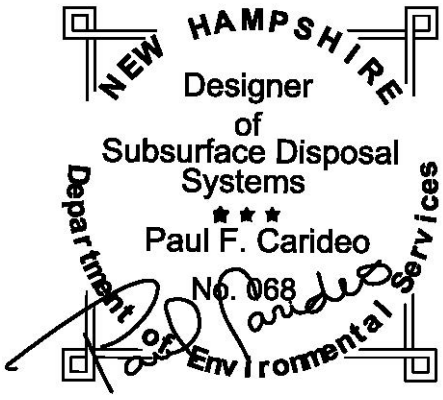
TEST PIT # 47 DATE: 12/8/22 (WOODS)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-20" 10YR 5/4, YELLOWISH BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
20-28" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH FEW ROOTS
28-44" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 30"+ AND FEW ROOTS TO 30"
44-72" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% COBBLES, 10% GRAVEL, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC THROUGHOUT

ESHWT: 30" OWT: 48" ROOTS: 30" LEDGE: 72"

PERCOLATION TEST # 46 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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HSI #5432		TEST PITS:	FOR SEPTIC & DRAINAGE
MAP 2 LOT 8	MAP 114 LOT 1	WEATHER:	3/28/23 35° LIGHT RAIN
255 DERRY ROAD, LLC	255 DERRY ROAD, LLC	WEATHER:	3/29/23 30-35° SUNNY
255 DERRY ROAD	287 DERRY ROAD	EQUIPMENT:	VOLVO EC240C
LITCHFIELD, NH	HUDSON, NH	LOGGED BY:	PAUL CARIDEO, NHDES PERMIT #68

NOTE: TEST PITS 48-65 ARE IN LITCHFIELD AND 66-72 ARE IN HUDSON.

TEST PIT # 48 DATE: 3/28/23 (WOODS)

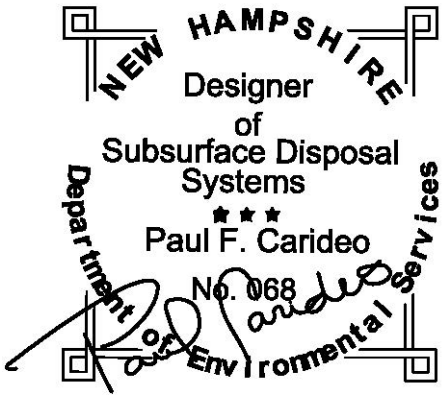
0-8" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-20" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
20-50" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE, FEW ROOTS WITH 7.5YR 5/8, STRONG BROWN, REDOXIMORPHIC FEATURES AT 48"+
30-64" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 5% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN, LOOSE WITH FEW ROOTS AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT THROUGHOUT

ESHWT: 48" OWT: 72" ROOTS: 54" LEDGE: NONE OBSERVED

TEST PIT # 49 DATE: 3/28/23 (MOWED FIELD)

0-14" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
14-24" 2.5Y 4/3, OLIVE BROWN, FINE SAND, WEAK FINE GRANULAR, FRIABLE
24-48" 2.5Y 6/2, LIGHT BROWNISH GRAY, FINE LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
70-84" 10YR 7/3, VERY PALE BROWN, LOAMY SAND, GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 24" OWT: 48" ROOTS: NONE LEDGE: NONE OBSERVED



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TEST PIT # 50 DATE: 3/28/23 (MOWED FIELD)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
6-34" 10YR 6/4, LIGHT YELLOWISH BROWN, COARSE GRAVELLY SAND, 10% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
34-60" 10YR 5/3, BROWN, VERY COARSE GRAVELLY SAND, 2% ROUNDED COBBLES, 15% GRAVEL, 50% ROUNDED PEA STONE, SINGLE GRAIN AND LOOSE

ESHWT: 30" OWT: 36" ROOTS: NONE LEDGE: NONE OBSERVED

TEST PIT # 51 DATE: 3/28/23 (MOWED FIELD)

0-12" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
12-24" 10YR 7/4, VERY PALE BROWN, COARSE GRAVELLY SAND, 2% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE
24-40" 10YR 7/4, VERY PALE BROWN, SAND, SINGLE GRAIN AND LOOSE
40-65" 10YR 6/4, LIGHT YELLOWISH BROWN, COARSE SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 60"+
65-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, WEAK FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 60" OWT: 74" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 51 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

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TEST PIT # 52 DATE: 3/28/23 (MOWED FIELD)

0-22" 10YR 3/3, DARK BROWN, SANDY LOAM FILL, FINE GRANULAR AND VERY FRIABLE
22-32" 10YR 5/6, YELLOWISH BROWN, GRAVELLY SAND, 5% ROUNDED COBBLES, FINE GRANULAR AND FRIABLE
32-54" 10YR 7/3, VERY PALE BROWN, GRAVELLY COARSE SAND, 10% ROUNDED COBBLES, 10% GRAVEL, SINGLE GRAIN AND LOOSE
54-96" 10YR 6/8, BROWNISH YELLOW, GRAVELLY COARSE SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 78"+

ESHWT: 78" OWT: 84" ROOTS: NONE LEDGE: NONE OBSERVED

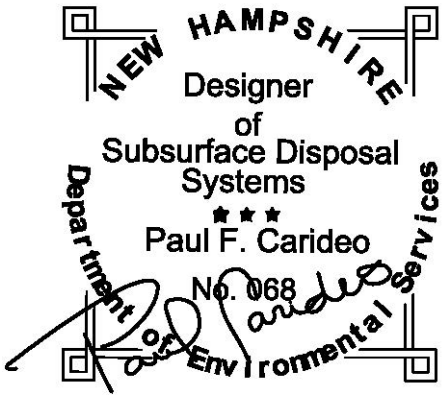
PERCOLATION TEST # 52 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 53 DATE: 3/28/23 (MOWED FIELD)

0-20" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
20-24" 10YR 7/4, VERY PALE BROWN, FINE LOAMY SAND, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 24"+
24-36" 10YR 6/6, BROWNISH YELLOW, COARSE SAND, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
34-46" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SAND, 15% GRAVEL, 2% COBBLES, SINGLE GRAIN, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT
46-72" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% COBBLES, 5% GRAVEL, MASSIVE AND FRIABLE TO FIRM WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 24" OWT: 36" ROOTS: NONE LEDGE: NONE OBSERVED



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TEST PIT # 54 DATE: 3/28 (MOWED FIELD)

0-9" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, FINE GRANULAR AND VERY FRIABLE
9-18" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, FINE GRANULAR AND FRIABLE
18-42" 10YR 7/4, VERY PALE BROWN, LOAMY SAND, 2% COBBLES, SINGLE GRAIN AND LOOSE
42-66" 2.5Y 6/4, LIGHT YELLOWISH BROWN, FINE SAND, FINE GRANULAR, LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 54"+

ESHWT: 54" OWT: 58" ROOTS: NONE LEDGE: NONE OBSERVED

TEST PIT # 55 DATE: 3/28/23 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-21" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, WEAK FINE GRANULAR AND FRIABLE
21-54" 10YR 6/6, BROWNISH YELLOW, SAND, SINGLE GRAIN AND LOOSE
54-84" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% ANGULAR COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 50"+

ESHWT: 50" OWT: 52 ROOTS: NONE LEDGE: NONE OBSERVED

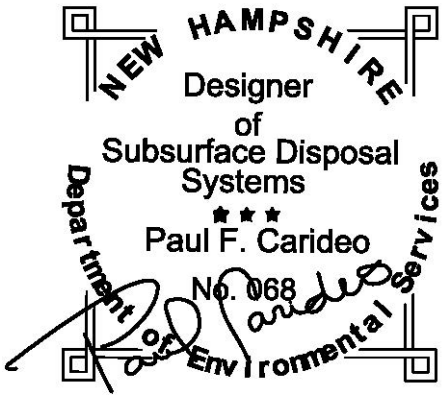
TEST PIT # 56 DATE: 3/28/23 (MOWED FIELD)

0-8" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE
8-42" 10YR 5/6, YELLOWISH BROWN, GRAVELLY SAND, 15% GRAVEL, 5% COBBLES, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES AT 30"+
42-72" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND,1 5% COBBLES, 5% GRAVEL, FINE GRANULAR AND FIRM WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 30" OWT: 38" ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 56 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 57 DATE: 3/28/23 (WOODS)

0-10" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
10-22" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
22-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
30-64" 10YR 6/4, LIGHT YELLOWISH BROWN, SAND, SINGLE GRAIN, LOOSE WITH FEW ROOTS AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 60"+
64-96" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, MASSIVE, FRIABLE TO FIRM WITH FEW ROOTS TO 68" AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 60" OWT: 64" ROOTS: 68" LEDGE: NONE OBSERVED

PERCOLATION TEST # 57 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

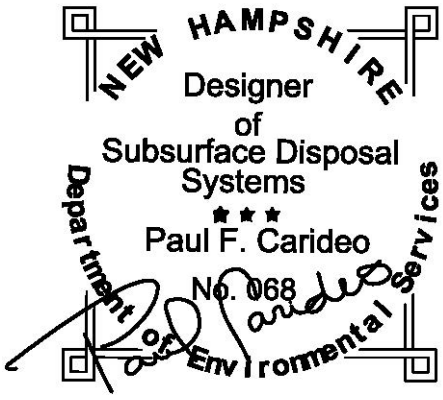
TEST PIT # 58 DATE:

NOT DUG DUE TO UNDERGROUND GAS LINE

TEST PIT # 59 DATE: 3/28/23 (WOODS)

0-10" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, MASSIVE AND VERY FRIABLE WITH FEW ROOTS
10-24" 10YR 5/6, YELLOWISH BROWN, LOAMY SAND, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
24-48" 10YR 6/6, BROWNISH YELLOW, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS
48-82" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 60" AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 54"+
82-108" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 5% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 54" OWT: 60" ROOTS: 60" LEDGE: NONE OBSERVED



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PERCOLATION TEST # 59 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 60 DATE: 3/28/23 (WOODS)

0-8" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-18" 10YR 5/6, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
18-22" 10YR 6/6, BROWNISH YELLOW, GRAVELLY SANDY LOAM, 10% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE WITH FEW ROOTS TO 22"

ESHWT: 22" OWT: NONE OBSERVED ROOTS: 22" LEDGE: 22"

PERCOLATION TEST # 60 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

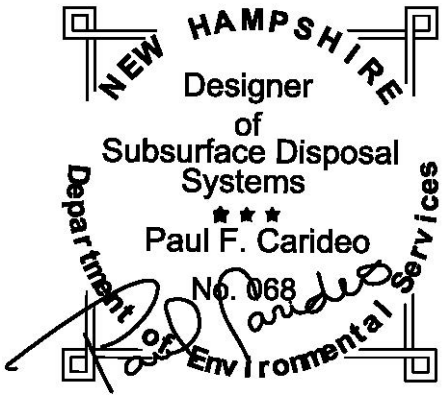
TEST PIT # 61 DATE: 3/28/23 (EDGE OF MOWED FIELD AT STONE WALL)

0-24" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
34-34" 10YR 5/4, YELLOWISH BROWN, GRAVELLY SANDY LOAM, 10% GRAVEL, GRANULAR, FRIABLE WITH COMMON ROOTS
34-64" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SAND, 15% COBBLES, 5% COBBLES, SINGLE GRAIN, LOOSE
64-96" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 5% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 84" AND 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 108"+
96-132" 2.5Y 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% COBBLES, 10% GRAVEL, GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 108" OWT: NONE OBSERVED ROOTS: 84" LEDGE: NONE OBSERVED

PERCOLATION TEST # 61 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP



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TEST PIT # 62 DATE: 3/28/23 (MOWED FIELD)

0-8" 10YR 3/2, VERY DARK GRAYISH BROWN, LOAMY SAND, WEAK FINE GRANULAR AND VERY FRIABLE
8-20" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE
20-90" 10YR 7/4, VERY PALE BROWN, GRAVELLY LOAMY SAND, 15% COBBLES, 10% GRAVEL, FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 84"+
90-144" 10 YR 6/3, PALE BROWN, GRAVELLY LOAMY SAND, 25% COBBLES, 15% GRAVEL, WEAK FINE GRANULAR AND FRIABLE WITH 7.5YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES THROUGHOUT

ESHWT: 84" OWT: NONE OBSERVED ROOTS: NONE LEDGE: NONE OBSERVED

PERCOLATION TEST # 62 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

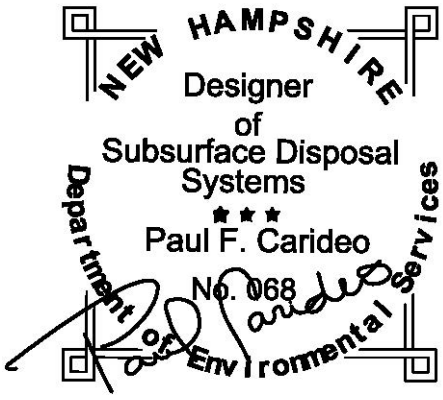
TEST PIT # 63 DATE:

NOT DUG DUE TO EXISTING SEPTIC SYSTEM COMPONANTS

TEST PIT # 64 DATE: 3/28/23 (MOWED FIELD AT EDGE OF SITE IMPROVEMENTS)

0-12" 10YR 7/6, YELLOW, 3/4" CRUSHED GRAVEL, SINGLE GRAIN AND LOOSE
12-24" 10YR 5/4, YELLOWISH BROWN, GRAVELLY SANDY LOAM, 5% GRAVEL, GRANULAR AND FRIABLE
12-48" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 20% ANGULAR COBBLES, 5% GRAVEL, FINE GRANULAR AND FRIABLE
40"+ SOFT LEDGE

ESHWT: 40" OWT: NONE OBSERVED ROOTS: NONE LEDGE: 40"



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TEST PIT # 65 DATE: 3/28/23 (WOODS)

0-6" 10YR 3/2, VERY DARK GRAYISH BROWN, FINE SANDY LOAM, MASSIVE, VERY FRIABLE WITH MANY ROOTS
6-14" 10YR 5/6, YELLOWISH BROWN, FINE SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH FEW ROOTS
14-54" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, 2% COBBLES, WEAK FINE GRANULAR, FRIABLE AND FEW ROOTS
54-96" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 5% GRAVEL, FINE GRANULAR, FRIABLE FEW ROOTS TO 62" WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 60"+

ESHWT: 60" OWT: 78 ROOTS: 62" LEDGE: NONE OBSERVED

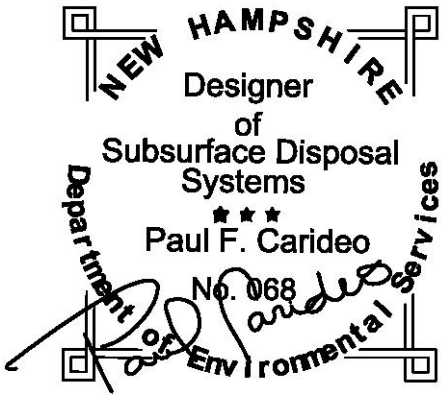
PERCOLATION TEST # 65 DATE:

RATE: _____MINUTES / INCH AT _____" DEEP

TEST PIT # 66 DATE: 3/29/23 (WOODS)

0-6" 10YR 3/3, DARK BROWN, SANDY LOAM, WEAK FINE GRANULAR AND VERY FRIABLE WITH MANY ROOTS
6-18" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, 5% GRAVEL, GRANULAR, FRIABLE WITH COMMON ROOTS
18-30" 10YR 6/6, BROWNISH YELLOW, GRAVELLY FINE SAND, 10% GRAVEL, GRANULAR AND FRIABLE WITH FEW ROOTS
30-68" 10YR 6/6, BROWNISH YELLOW, GRAVELLY COARSE SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH FEW ROOTS TO 68"
68-120" 10YR 7/3, VERY PALE BROWN, GRAVELLY SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 96"+

ESHWT: 96" OWT: 100" ROOTS: 68" LEDGE: NONE OBSERVED



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TEST PIT # 67 DATE: 3/29/23 (WOODS)

0-12" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
12-24" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, WEAK FINE GRANULAR, FRIABLE WITH COMMON ROOTS
24-38" 10YR 6/4, LIGHT YELLOWISH BROWN, MEDIUM TO COARSE SAND, SINGLE GRAIN, LOOSE WITH FEW ROOTS
38-48" 10YR 6/4, LIGHT YELLOWISH BROWN, LOAMY SAND, FINE GRANULAR, FRIABLE AND FEW ROOTS TO 42"

ESHWT: 48" OWT: NONE ROOTS: 42" LEDGE: 48" ERATIC & SOFT

TEST PIT # 68 DATE: 3/29/23 (REGRADED DISTURBED AREA)

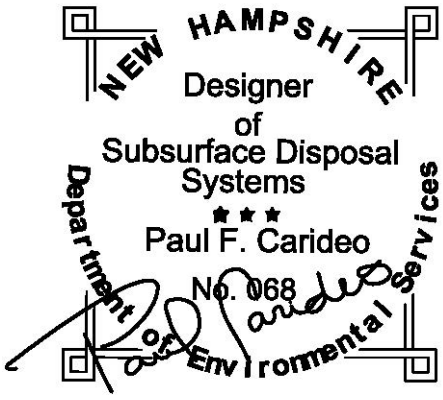
0-16" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE
16-24" 2.5Y 5/4, LT OLIVE BROWN, GRAVELLY LOAMY SAND, 2% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR AND FRIABLE
24-36" 2.5Y 6/3, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 5% COBBLES, 10% GRAVEL, WEAK FINE GRANULAR, FRIABLE WITH 7.5 YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 30"+

ESHWT: 30" OWT: NONE ROOTS: NONE" LEDGE: 36" FLAT & SOFT

TEST PIT # 69 DATE: 3/29/23 (WOODS)

0-3" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
3-16" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, 5% COBBLES, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
16-26" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY SANDY LOAM, 5% COBBLES, 10% GRAVEL, GRANULAR, FRIABLE WITH FEW ROOTS TO 22" AND 7.5 YR 6/8, REDDISH YELLOW REDOXIMORPHIC FEATURES AT 24"

ESHWT: 30" OWT: NONE ROOTS: NONE LEDGE: 26" FLAT, SLOPPING NE'LY



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TEST PIT # 70 DATE: 3/29/23 (WOODS)

0-8" 10YR 3/3, DARK BROWN, FINE SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-16" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
16-26" 10YR 6/4, LIGHT YELLOWISH BROWN, GRAVELLY LOAMY SAND, 10% GRAVEL, FINEGRANULAR, FRIABLE WITH FEW ROOTS

ESHWT: FOLLOWS LEDGE OWT: NONE ROOTS: 14-24" LEDGE: VARIES 17-48"

TEST PIT # 71 DATE: 3/29/23 (WOODS)

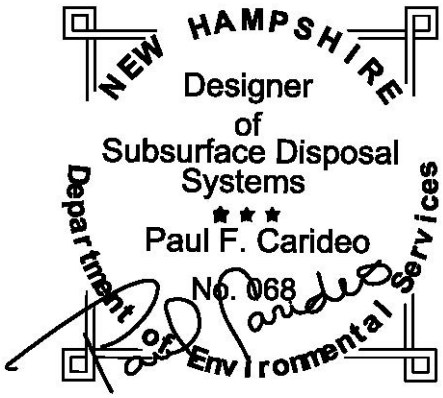
0-8" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
8-17" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
17-28" 10YR 6/6, BROWNISH YELLOW, GRAVELLY FINE SAND, 10% GRAVEL, GRANULAR AND FRIABLE WITH FEW ROOTS
28-72" 10YR 7/3, VERY PALE BROWN, COARSE SAND, 15% ROUNDED PEA STONE, SINGLE GRAIN AND LOOSE WITH FEW ROOTS TO 68"
72-90" 10YR 6/4, LIGHT YELLOWISH BROWN, COARSE SAND, SINGLE GRAIN, LOOSE AND FEW ROOTS
90-144" 10YR 7/3, VERY PALE BROWN, GRAVELLY SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 96"+

ESHWT: 136" OWT: 140" ROOTS: 102" LEDGE: NONE OBSERVED

TEST PIT # 72 DATE: 3/29/23 (WOODS)

0-7" 10YR 3/3, DARK BROWN, SANDY LOAM, MASSIVE AND VERY FRIABLE WITH MANY ROOTS
7-19" 10YR 5/8, YELLOWISH BROWN, SANDY LOAM, 5% ROUNDED COBBLES, FINE GRANULAR, FRIABLE WITH COMMON ROOTS
19-60" 10YR 6/6, BROWNISH YELLOW, GRAVELLY COARSE SAND, 15% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN AND LOOSE WITH FEW ROOTS
60-108" 10YR 7/3, VERY PALE BROWN, GRAVELLY SAND, 25% ROUNDED COBBLES, 15% GRAVEL, SINGLE GRAIN WITH FEW ROOTS AT 84" AND LOOSE WITH 7.5YR 5/8, STRONG BROWN REDOXIMORPHIC AT 104"+

ESHWT: 104" OWT: NONE ROOTS: 84" LEDGE: 108" FLAT ENTIRE PIT BOTTOM



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INFILTRATION FEASIBILITY REPORT

Rose Meadows
255 Derry Road (NH Route 102)
Litchfield and Hudson, NH

The proposed project contains several stormwater management practices, all of which either require infiltration or the use of a permanent pool to function property. The project proposes three infiltration basins, two filtration areas and three wetland/ponds.

A. Location of the practice:

- Stormwater Management Area A (SMA A) – Located in western portion of the site adjacent to the intersection of the site driveway and Derry Road
- Stormwater Management Area B (SMA B) – Located in the western portion of the site extending out from the site driveway in a northern direction
- Stormwater Management Area C (SMA C) – Located in the central portion of the site at the corner of the site driveway and the proposed roadway that extends in a northeast direction
- Stormwater Management Area D (SMA D) – Located in the center of the 'village' in the southeast portion of the site
- Stormwater Management Area E (SMA E) – Located in the northern portion of the site
- Stormwater Management Area F (SMA F) – Located in the northeast corner of the site
- Stormwater Management Area G (SMA G) – Located in the eastern portion of the site on the Hudson parcel
- Stormwater Management Area H (SMA H) –Located in the southern portion of the site

B. Existing Topography:

This property is currently developed and was recently used as a testing facility for BAE Systems and contains a number of testing related structures/site features. BAE Systems started working out of the property around 2000. Prior to 2000, the property was used as a residential property.

The site is partially wooded and the topography of the land is slight, with an overall slope from southeast to northwest. Wetlands have been mapped in accordance with local, state and federal criteria. In general, there are several water courses and associated wetlands that run through the property. The wetlands are associated with a tributary that eventually flows in a northwesterly direction and connects into Chase Brook.

C. Test Pit Logs/Locations:

Several test pits were performed throughout the property and are shown on the Site Plan set. A copy of the test pit logs is included in this submittal. Overall the site contains of sandy soils. A note has been added to the plan requiring additional test pits in the vicinity of SMA D once the existing structures are demolished.

D. Soil Plan in the area of the proposed stormwater practices:

A Site-Specific Soil Survey was conducted on the property. While there is large variability in the type and classification of on-site soils, generally the central portion of the site contains well-draining soils which transitions to poorly drained and very poorly drained soils in and around the wetland areas. A site-specific soil report is included herewith.

E. Infiltration rate:

Based on the underlying soils identified by the Site-Specific Soil Survey, A design infiltration rate of 3-inches/hour and 5-inches/hour was utilized in the analysis depending on the location of the practice.

F. Summary of Estimated Seasonal High-Water Table (ESWHT) at proposed stormwater practices:

Practice Location	Bottom of Practice Elevation	Test Pit Location	ESHWT Elevation
SMA A	190.50	TP-48	187.50
SMA B	182.00	TP-49	190.60
		TP-4	188.40
SMA C	190.00	TP-33	194.70
SMA E	186.00	TP-8	194.40
		TP-53	192.90
		TP-13	195.00
SMA F	193.00	TP-55	191.00
SMA G	195.00	TP-71	190.80
SMA H	207.00	TP-43	203.00

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 1	
Invert:	191.81	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	3.36	cfs
Q_F =	4.96	cfs
Q_{25}/Q_F =	68	%
d/D =	61	%
Tw =	0.76	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	16	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	10	ft
Median Stone =	1	in
Maximum Size of Stone =	2	in
Minimum Depth of Stone =	3	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 10	
Invert:	188.10	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	0.63	cfs
Q_F =	7.01	cfs
Q_{25}/Q_F =	9	%
d/D =	20	%
Tw =	0.25	ft
	Tw < Do/2	
B. Design Parameters		
Apron Length =	10	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	13	ft
Median Stone =	0	in
Maximum Size of Stone =	1	in
Minimum Depth of Stone =	1	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 12	
Invert:	190.75	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	10.22	cfs
Q_F =	11.38	cfs
Q_{25}/Q_F =	90	%
d/D =	74	%
Tw =	0.93	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	31	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	16	ft
Median Stone =	5	in
Maximum Size of Stone =	7	in
Minimum Depth of Stone =	10	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 30	
Invert:	192.25	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	0.95	cfs
Q_F =	7.01	cfs
Q_{25}/Q_F =	14	%
d/D =	25	%
Tw =	0.31	ft
	Tw < Do/2	
B. Design Parameters		
Apron Length =	10	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	14	ft
Median Stone =	1	in
Maximum Size of Stone =	1	in
Minimum Depth of Stone =	1	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 33	
Invert:	200.50	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	14.84	cfs
Q_F =	31.42	cfs
Q_{25}/Q_F =	47	%
d/D =	48	%
Tw =	0.60	ft
	Tw < Do/2	
B. Design Parameters		
Apron Length =	28	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	32	ft
Median Stone =	12	in
Maximum Size of Stone =	18	in
Minimum Depth of Stone =	26	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 52	
Invert:	209.20	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	4.43	cfs
Q_F =	4.96	cfs
Q_{25}/Q_F =	89	%
d/D =	73	%
Tw =	0.91	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	18	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	11	ft
Median Stone =	2	in
Maximum Size of Stone =	2	in
Minimum Depth of Stone =	3	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	SMA H Spillway	
Invert:	210.50	
A. Conditions:		
Pipe D_o =	0	ft
Q_{25}=	0	cfs
Q_F =	0	cfs
Q_{25}/Q_F =	#DIV/0!	%
d/D =	0	%
Tw =	0.00	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	#DIV/0!	ft
Apron Width at Culvert Outlet =	0	ft
Apron Width at End of Apron =	#DIV/0!	ft
Median Stone =	#DIV/0!	in
Maximum Size of Stone =	#DIV/0!	in
Minimum Depth of Stone =	#DIV/0!	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 60	
Invert:	191.00	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	1.35	cfs
Q_F =	7.01	cfs
Q_{25}/Q_F =	19	%
d/D =	30	%
Tw =	0.38	ft
	Tw < Do/2	
B. Design Parameters		
Apron Length =	10	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	14	ft
Median Stone =	1	in
Maximum Size of Stone =	1	in
Minimum Depth of Stone =	2	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 62	
Invert:	193.09	
A. Conditions:		
Pipe D_o =	2	ft
Q_{25}=	19.88	cfs
Q_F =	21.92	cfs
Q_{25}/Q_F =	91	%
d/D =	74	%
Tw =	1.48	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	35	ft
Apron Width at Culvert Outlet =	6	ft
Apron Width at End of Apron =	20	ft
Median Stone =	4	in
Maximum Size of Stone =	7	in
Minimum Depth of Stone =	10	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 79	
Invert:	191.84	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	5.8	cfs
Q_F =	5.86	cfs
Q_{25}/Q_F =	99	%
d/D =	81	%
Tw =	1.01	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	21	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	12	ft
Median Stone =	2	in
Maximum Size of Stone =	3	in
Minimum Depth of Stone =	4	in

Outlet Protection		
Reference: NH Stormwater Manual: Volume 2 Revision 1.0		
Job #:	5432	
Project:	Rose Meadows	
Design by:	EMB	
Date:	6.1.23	
Structure:	HW 100	
Invert:	197.49	
A. Conditions:		
Pipe D_o =	1.25	ft
Q_{25}=	4.61	cfs
Q_F =	4.96	cfs
Q_{25}/Q_F =	93	%
d/D =	76	%
Tw =	0.95	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	19	ft
Apron Width at Culvert Outlet =	4	ft
Apron Width at End of Apron =	11	ft
Median Stone =	2	in
Maximum Size of Stone =	2	in
Minimum Depth of Stone =	3	in

The H.L. Turner Group Inc.

27 Locke Road Concord, NH 03301 **t:** 603.228.1122 **hlturner.com**

May 31, 2023 *VIA EMAIL*

James N. Petropulos, P.E., President
Hayner/Swanson, Inc.
3 Congress Street
Nashua, N.H. 03062

SUBJECT: FEMA Zone A Determination
255 Derry Road Project
Litchfield, New Hampshire

Dear Mr. Petropulos:

Per your request, we have analyzed the FEMA Zone A area at the 255 Derry Road project site, and have concluded that the 100-year flood elevation ranges from 192.7 to 213.3 ft NAVD88 in the project area. A delineation of this flood elevation on the topographies provided by Hayner Swanson, Inc (HSI) shows that there are no impacts to flood elevations as a result of the proposed project development.

EXISTING INFORMATION & RESOURCES

The current effective flood insurance rate map (FIRM) including the subject property is dated September 25, 2009 (Map No. 33011C0516D). The FIRM identifies the limit of the flood insurance study (FIS) detailed study is immediately upstream of the Derry Road crossing of Tributary B No. 1, at cross section "G". Per Table 8 in Volume 1 of the FIS, the base flood elevation (BFE) for Tributary B No. 1 at cross section G is 192.7 feet NAVD. The 100-year flood flow for Tributary B No. 1, defined in the FIS Volume 1 Table 5, is 190 cfs at the Litchfield corporate limit, approximately 2,850-feet upstream of cross section G, with a contributing drainage area of 1.14 square miles (730 acres). Streamstats, the USGS online GIS based tool for evaluating drainage areas, does not provide an accurate drainage area delineation for the project site.

Haynor/Swanson Incorporated (HSI) provided topographic survey plans of the existing conditions, and proposed conditions plans including proposed grading and structures for the subject project. Elevation data beyond the limits of HSI's survey were obtained from NH GRANIT LiDar data. LiDar data was consistent with the HSI survey in areas of overlap.

METHODOLOGIES/ANALYSES

The Federal Emergency Management Agency (FEMA) April 1995 document "Managing Floodplain Development in Approximate Zone A Areas; A Guide for Obtaining and Developing Base (100-Year) Flood Elevations" provides guidance for simple and detailed methodologies for determining base flood elevations (BFEs) in areas where a detailed flood study has not been completed. Detailed methodologies require three factors be determined:

1. Floodplain geometry (topography),
2. Flood discharge and/or volume (hydrology), and
3. Flood height (hydraulics).

This study used a detailed methodology to determine the BFE for the existing conditions of the subject property, and determine if the proposed site development would have any impact on BFEs and floodplain storage.

Hydrology

A HydroCad® hydrologic model for the 730 acre contributing drainage area to the proposed project site was created to develop an inflow hydrograph for comparison of the hydrograph peak flow to FEMA flood flows. The drainage area was delineated using the GeoHECRAS watershed delineation tool; the tool delineates a watershed upstream of the hydraulic model stream reach, and a downstream watershed to the hydraulic model extents (Tributary B No. 1 confluence with Chase Brook). The delineated watersheds were then imported to the NRCS Web Soil Survey to determine the hydrologic soil group (HSG) for soils in the contributing watershed. Land cover was determined by analysis of aerial photographs.

A subcatchment node (1S) was developed to include the HSG data, modeled as predominately forested, with a time of concentration determined using the LAG CN method, with the hydraulic path starting at the intersection of Sousa Boulevard and Greely Street. Precipitation data for the site is based on NOAA Atlas 14 extreme precipitation tables.

A reach section node (2R) was added to the model, representing Tributary B No. 1, from the limit of detailed flood study cross section G, to the reach section upstream of the prosed

project, with profile based on LiDar elevations, and section based on an assumed parabolic channel.

Hydraulics

A Hydrologic Engineering Center River Analysis System (HEC-RAS) hydraulic model was created on Civil Geo's "GeoHECRAS" platform. The existing conditions of the reach section of Tributary B No. 1 between the Litchfield corporate limits and Derry Road were modeled, using HSI survey for cross section geometry, supplementing with LiDar derived contours beyond the limits of survey. A total of seventeen cross sections were used to define the reach section and overbanks, using Manning's "n" values for the channel and overbanks of Tributary B No. 1 based on the defined range of Manning's values in Table 7 of Volume 1 of the current effective FIS.

The existing conditions model was run in steady state backwater analysis using the FEMA defined 100-year flood flow, with a downstream boundary condition of the known WSEL of 192.7 ft NAVD 88, and a normal depth upstream boundary condition. The steady state model was found consistent with the FEMA FIS profile; the model was deemed appropriate for use in the analysis.

The existing conditions model was then revised with HSI proposed conditions grading and potential floodplain impacts, and saved as the "Proposed Conditions" model.

RESULTS

The HydroCad® hydrologic model of the 730 acre contributing drainage area for the 100-year storm event had a peak inflow of 130 cfs. This is consistent with, but less than, the FEMA defined 100-year peak flow of 190 cfs. Conservatively, the FEMA flood flow was used in the analysis of the hydraulic models for the existing and proposed conditions.

Table 1 below provides a comparison of the WSELs between the existing and proposed conditions HEC-RAS models. As demonstrated in the results, the downstream boundary condition of FEMA's defined peak WSEL controls the backwater analysis, and impacts from the proposed project have no significant effect on flood storage in Tributary B No. 1 floodplains.

To confirm the area of floodplains is not altered by the proposed site development, the 100-year flood delineation for the existing and proposed plans were plotted on the HSI survey;

there are no changes to the floodplain location as a result of the proposed project (see attached).

Table 1 – Summary Comparison of Existing and Proposed Conditions HEC-RAS Model				
Cross Section No.	Flow (cfs)	Existing Conditions Peak WSEL (ft NAVD88	Proposed Conditions Peak WSEL (ft NAVD88)	Difference (Prop – Exist)
1596	190	192.7	192.7	0.0
1635	190	192.7	192.7	0.0
1698	190	192.7	192.7	0.0
1769	190	192.7	192.7	0.0
1895	190	192.7	192.7	0.0
2139	190	192.7	192.7	0.0
2313	190	192.7	192.7	0.0
2478	190	192.7	192.7	0.0
2719	190	192.7	192.7	0.0
2972	190	192.5	192.5	0.0
3099	190	194.9	194.9	0.0
3173 - Bridge	190	NA	197.7 to 194.9	NA
3236	190	197.7	197.7	0.0
3520	190	200.9	200.9	0.0
4058	190	206.7	206.7	0.0
4357	190	210.9	210.9	0.0
4626	190	213.3	213.3	0.0

CONCLUSIONS / RECOMMENDATIONS

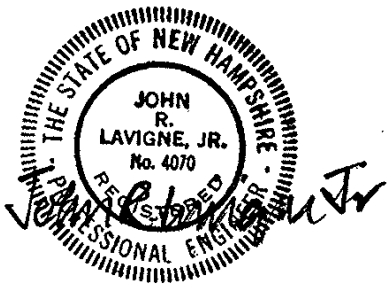
The proposed site development as depicted on the HSI drawing set titled 5432 Site Base Prop, dated 16 May, 2023 (3 drawing sheets) does not encroach on the 100-year floodplain of Tributary B No.1 and therefore has no impact on the BFEs determined by a detailed methodology as described in the FEMA guidance manual for development in Zone A flood hazard areas.

This concludes our determination of BFEs within the FEMA Zone A at 255 Derry Road in Litchfield, N.H., and our findings of no impacts as a result of the proposed development. Should have any questions or require additional information, please contact us at (603) 228-1122, extension 149 for John Lavigne, or extension 129 for Bob Carter.

Sincerely,
The H.L. Turner Group, Inc.

Robert K Carter, CSS, CFM
Senior Project Engineer / Associate

John R. Lavigne, Jr., P.E.
Lead Civil Engineer / Senior Associate



ATTACHMENTS

1. FEMA CURRENT EFFECTIVE FIRM AND FIRMETTE
2. FEMA CURRENT EFFECTIVE FIS TABLES 5, 7 & 8
3. FEMA CURRENT EFFECTIVE FIS FLOOD PROFILE 347P
4. HEC-RAS MODEL PLAN OF CROSS SECTION LOCATIONS
5. HEC-RAS SUMMARY OUTPUT FOR EXISTING AND PROPOSED CONDITIONS
6. PLAN OF EXISTING AND PROPOSED 100-YEAR FLOOD DELINATIONS

TURNER GROUP

ttg

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was New Hampshire State Plane (FIPSZONE 2800). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the **same vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1998 or later. These images were recast by NH GRANIT onto the NH State Plane coordinate system.

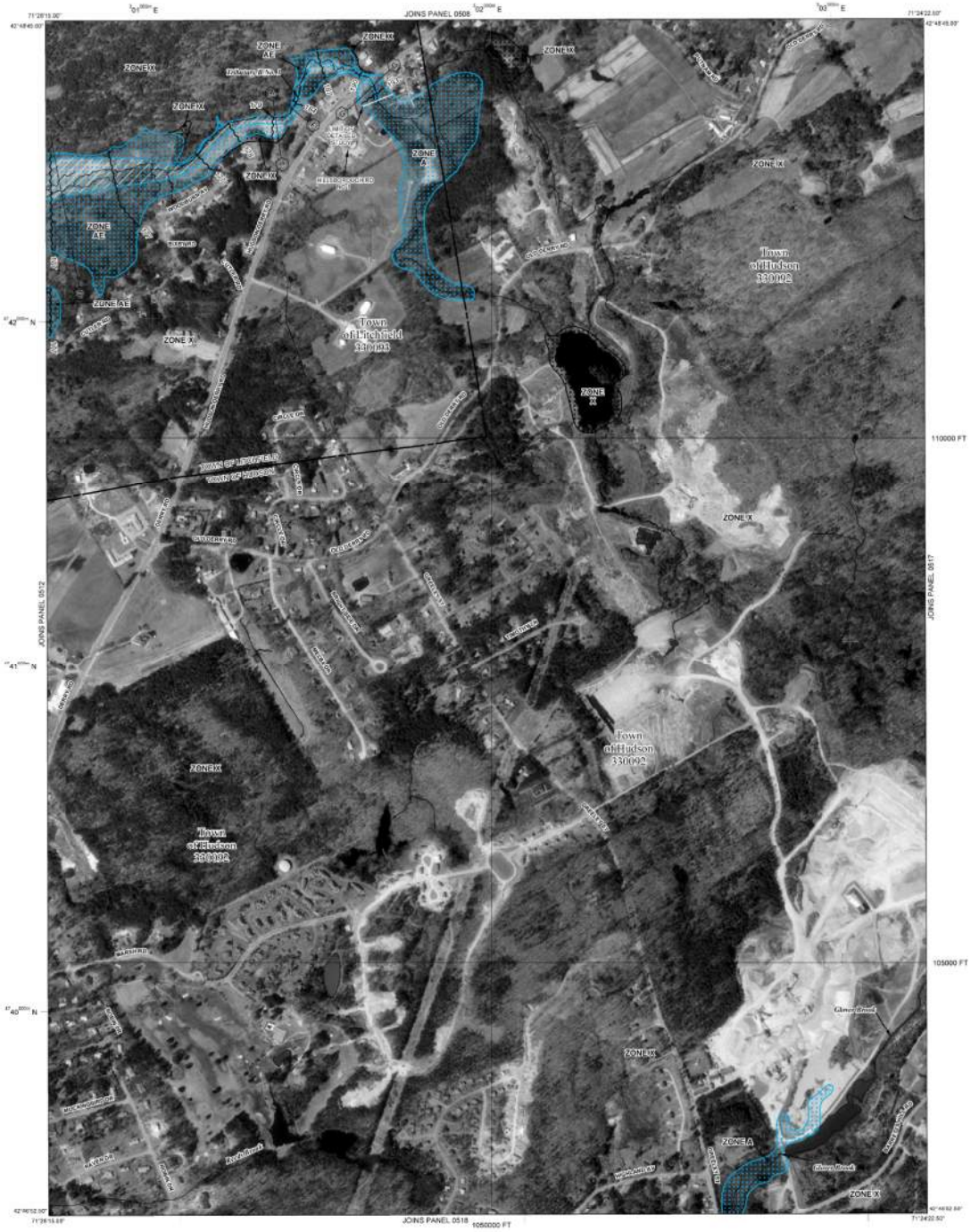
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report* (which contains authoritative *hydraulic data*) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL. 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 19
- 1000000 FT — 5000-foot grid values: New Hampshire State Plane coordinate system, (FIPSZONE 2800), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 25, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0516D

FIRM
FLOOD INSURANCE RATE MAP

HILLSBOROUGH COUNTY, NEW HAMPSHIRE
(ALL JURISDICTIONS)

PANEL 516 OF 701
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HUDSON, TOWN OF	330092	0516	D
LITCHFIELD, TOWN OF	330093	0516	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
33011C0516D
EFFECTIVE DATE
SEPTEMBER 25, 2009

Federal Emergency Management Agency

Meeting Date: 11/29/23 SP #07-23 Rose Meadows SitePlan - Attachment F

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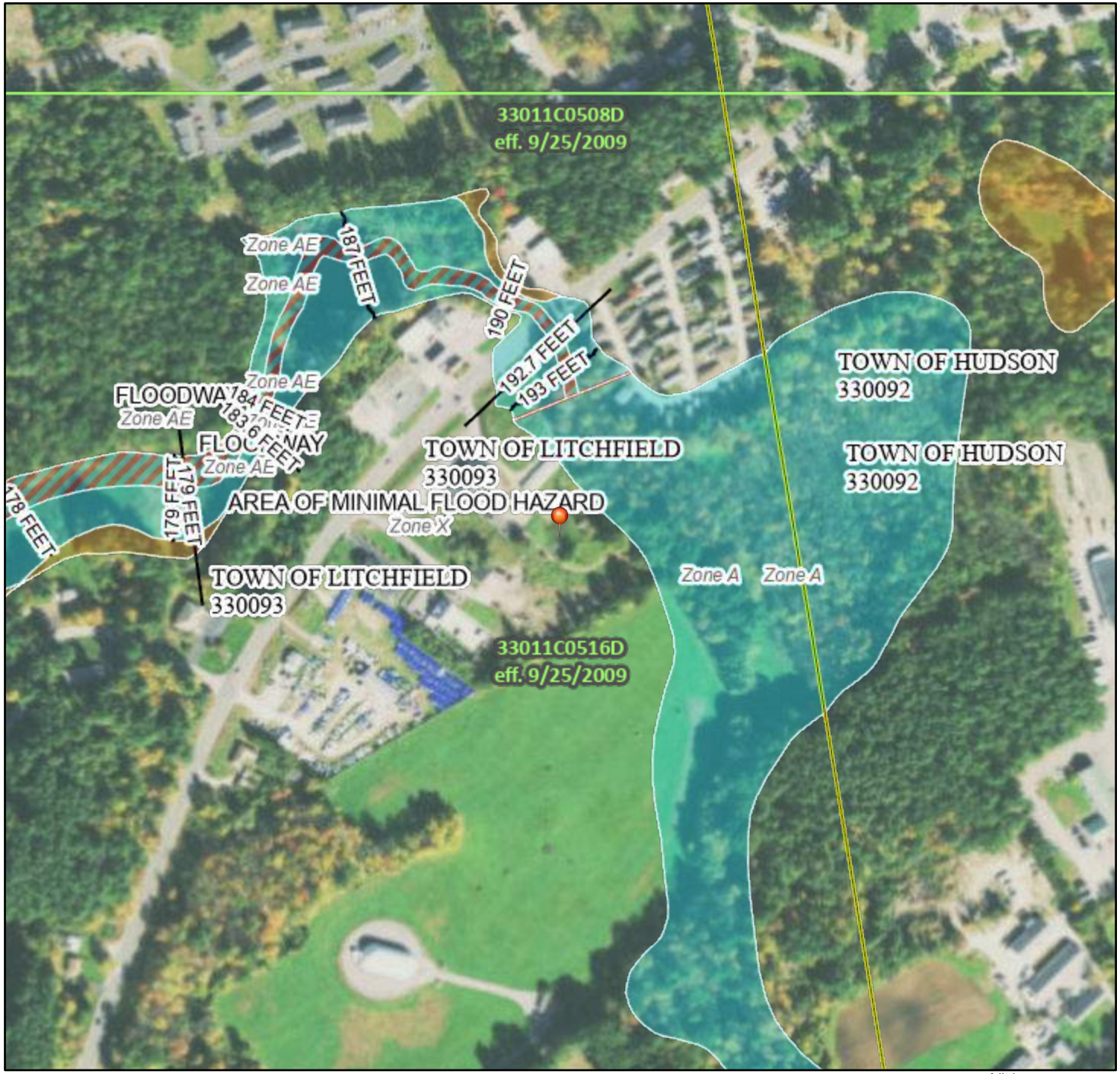
FEMA



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=RQH;

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(IIHFWLYH'DWH

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DWHU6XUIDFH(OHYDWLRQ
&RDVWDO7UDQVHFW
%DVH)ORRG(OHYDWLRQ/LQH %()
/LPLW R6WUXFWXUHV
-XULVGLFWLRQ%RXQGDU\
&RDVWDO7UDQVHFW%DVHOLQH
3URJUHVV%DVHOLQH
+LJKZDWU\)ORRGXUH

/LWWRDWDV$VVRFLDWHG
5HVWULFWHG'DWD$VVRFLDWHG
&RPSXWHG

7KHSLQGLVSODFHGRQWKHPDSVRDQDSSUR[LPDWH
SRQW VHOHFWHGEWKHXVHU DQGGRHVQRW UHSUHV
DQDWKRULWDWLYHSURSHUW\ORFDWLRQ

7KLVPDFROLHVZLWKJ8VWDQGDUGIRUWKHXHR
GL.LWDO IORRGPS/LI LW LVQRW YRLGV/GHVFULEHGEHORZ
7KHEDVHPS VKRZQFROLHVZLWKJ8VEDVHPS
DFFXUDWWDQGGUG/

7KHIORRGKDUGLQRUPDWLQLVGHULYHGLUHFWO\IURPWKH
DWKRULWDWLYHJZEEVHUYLFHVSURYLGHGEJ8 7KLVPS
ZVHSFUWHGRQ 'DW 3 DQGGRHVQRW
UHOHFW FKDQJHV RU DPQGPQWV VXEVHTXQW WR WKLVGDWHDQG
WLFI 7KHJHDQGHIHFWLYHLQRUPDWLQRPDKQHRU
EHFRPXSHUVHGHGEQHZGDWDRYHU WLFI

7KLVPSLDHLVYRLGLI WKHIQHRU RUHR WKHIOORZLQJPS
HOHPQWV GRQW DSSHDU EDVHPSLDHU\ IORRGJRQHODEHOV
OHHQG VFDOHEDU PSFUHDWLRQGDWH FRRQLW\LGHQWLILHUV
)5$0DQ QHU DQG)5$IHFWLYHGDWH DSLDHV IRU
XQPSSHGDQGXQPRGHUQL}GDUHDV FDQQRW EHXVHGIRU
UHJXODWRU\SURSRVH

TABLE 5 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
TIOGA RIVER					
At confluence with Merrimack River	3.32	220	350	415	620
At U.S. Route 3	2.87	190	305	365	545
At Patten Road	2.13	160	250	300	450
TRIBUTARY A					
At mouth at Souhegan River (Greenville)	1.1	115	185	225	340
TRIBUTARY B NO. 1					
At confluence with Chase Brook	1.96	120	230	300	490
At Litchfield corporate limit	1.14	80	150	190	310
TRIBUTARY B NO. 2					
At Greenfield-Lyndeborough corporate limits	3.1	355	1,100	1,375	2,965
At Miner Road	2.3	305	850	1,030	2,060
TUCKER BROOK					
At mouth	4.1	330	640	780	1,230
At new State Route 101	2.6	270	550	640	1,070
WITCHES BROOK					
Mouth of Pennichuck Brook	11.98	340	575	700	1,020
Amherst Town boundary	5.41	200	330	400	570

The stillwater elevations have been determined for the 10-, 50-, 100-, and 500-year floods for the flooding sources studied by detailed methods and are summarized in Table 6, “Summary of Stillwater Elevations.”

TABLE 7 – MANNING'S "n" VALUES - continued

Stream	Channel "n"	Overbank "n"
Lyle Reed Brook	0.015-0.040	0.015-0.100
McQuade Brook	0.025-0.070	0.055-0.200
Merrimack River	0.025-0.070	0.060-0.200
Middle Branch Piscataquog Brook	0.030-0.040	0.040-0.120
Mill Brook	0.030-0.045	0.050-0.075
Moose Brook	0.050-0.090	0.080-0.150
Nashua Brook	0.025-0.070	0.060-0.100
Naticook Brook	0.025-0.070	0.055-0.100
Nesenkeag Brook	0.030-0.060	0.070-0.100
New Meadow Brook	0.030-0.050	0.055-0.090
Nissitissit River	0.045-0.050	0.060-0.100
North Branch	0.030-0.035	0.080
North Branch Contoocook River	0.030-0.035	0.070
North Channel Piscataquog River	0.035-0.070	0.065-0.100
Nubanusit Brook	0.014-0.040	0.020-0.100
Otter Brook	0.020-0.040	0.040-0.090
Otter Lake Brook	0.030-0.040	0.040-0.060
Ox Brook	0.030	0.060
Parkhurst Brook	0.025-0.050	0.060-0.090
Peacock Brook	0.025-0.050	0.060-0.090
Pennichuck Brook	0.015-0.070	0.015-0.100
Piscataquog River	0.030-0.070	0.045 -0.120
Pointer Club Brook	0.040-0.100	0.070-0.100
Pulpit Brook	0.025-0.050	0.060-0.090
Purgatory Brook	0.037-0.050	0.050-0.150
Riddle Brook	0.025-0.070	0.055-0.100
Salmon Brook	0.015-0.040	0.015-0.100
Sand Brook	0.025-0.030	0.080
Second Brook	0.026-0.064	0.060-0.200
Shedd Brook	0.035	0.080
Sherburn Mill Brook	0.025-0.050	0.060-0.090
Simpson Mill Brook	0.030-0.050	0.055-0.090
Souhegan River	0.020-0.070	0.055-0.150
South Branch Piscataquog River	0.030-0.060	0.035-0.120
Stony Brook	0.030-0.045	0.050-0.075
Spit Brook	0.015-0.040	0.015-0.100
Tioga River	0.030-0.040	0.070-0.090
Tributary A	0.025-0.070	0.055-0.100
Tributary B No. 1	0.060-0.150	0.045-0.200
Tributary B No. 2	0.030-0.050	0.060-0.100
Tucker Brook	0.030-0.050	0.060-0.120
Witches Brook	0.025-0.070	0.055-0.100

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary B No. 1								
A	238[1]	61	244	1.2	170.1	170.1	171.1	1.0
B	944[1]	63	243	1.2	171.2	171.2	171.6	0.4
C	2,257[1]	162	1,110	0.3	176.6	176.6	177.6	1.0
D	3,652[1]	361	2,009	0.2	176.7	176.7	177.7	1.0
E	6,080[1]	75	208	0.9	179.0	179.0	180.0	1.0
F	6,285[1]	31	32	5.8	183.6	183.6	183.7	0.1
G	7,605[1]	30	206	0.9	192.7	192.7	193.0	0.3
Tributary B No. 2								
A	0.091[2]	70	484	2.8	820.6	820.6	820.7	0.1
B	0.800[2]	330	872	1.3	837.2	837.2	838.2	1.0
C	1.019[2]	120	244	4.5	856.4	856.4	857.3	0.9
Tucker Brook								
A	2,292[3]	150	390	2.0	249.9	248.1[4]	249.0	0.9
B	4,187[3]	45	170	4.6	251.4	251.4	252.1	0.7
C	4,747[3]	130	411	1.9	253.1	253.1	253.9	0.8
D	5,317[3]	20	134	5.8	254.7	254.7	255.4	0.7
E	5,618[3]	20	95	8.2	258.1	258.1	258.1	0.0
F	6,790[3]	85	433	1.8	258.8	258.8	259.4	0.6
G	7,862[3]	90	390	2.0	259.3	259.3	260.2	0.9
H	10,307[3]	115	223	3.5	265.8	265.8	266.5	0.7
I	10,782[3]	205	371	2.1	270.4	270.4	271.3	0.9
J	11,294[3]	20	72	6.4	273.0	273.0	273.2	0.2
K	11,616[3]	20	34	13.7	279.0	279.0	279.1	0.1

[1]Feet above confluence with Chase Brook
[2]Miles above Town of Greenfield corporate limits
[3]Feet above confluence with Souhegan River
[4]Elevation computed without consideration of flooding controlled by Souhegan River

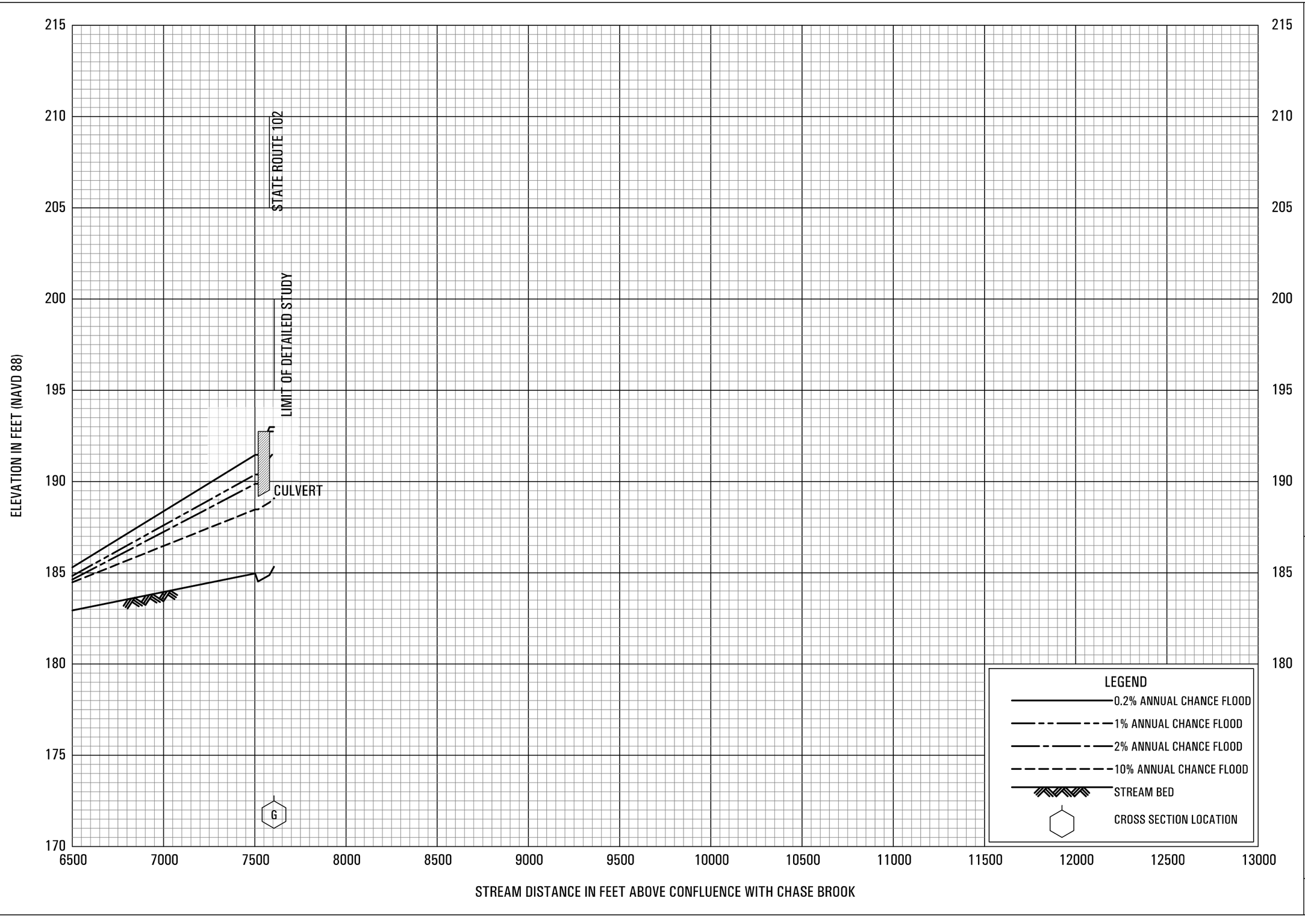
TABLE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY

HILLSBOROUGH COUNTY, NH
(ALL JURISDICTIONS)

FLOODWAY DATA

TRIBUTARY B NO. 1 – TRIBUTARY B NO. 2 - TUCKER BROOK



FLOOD PROFILES

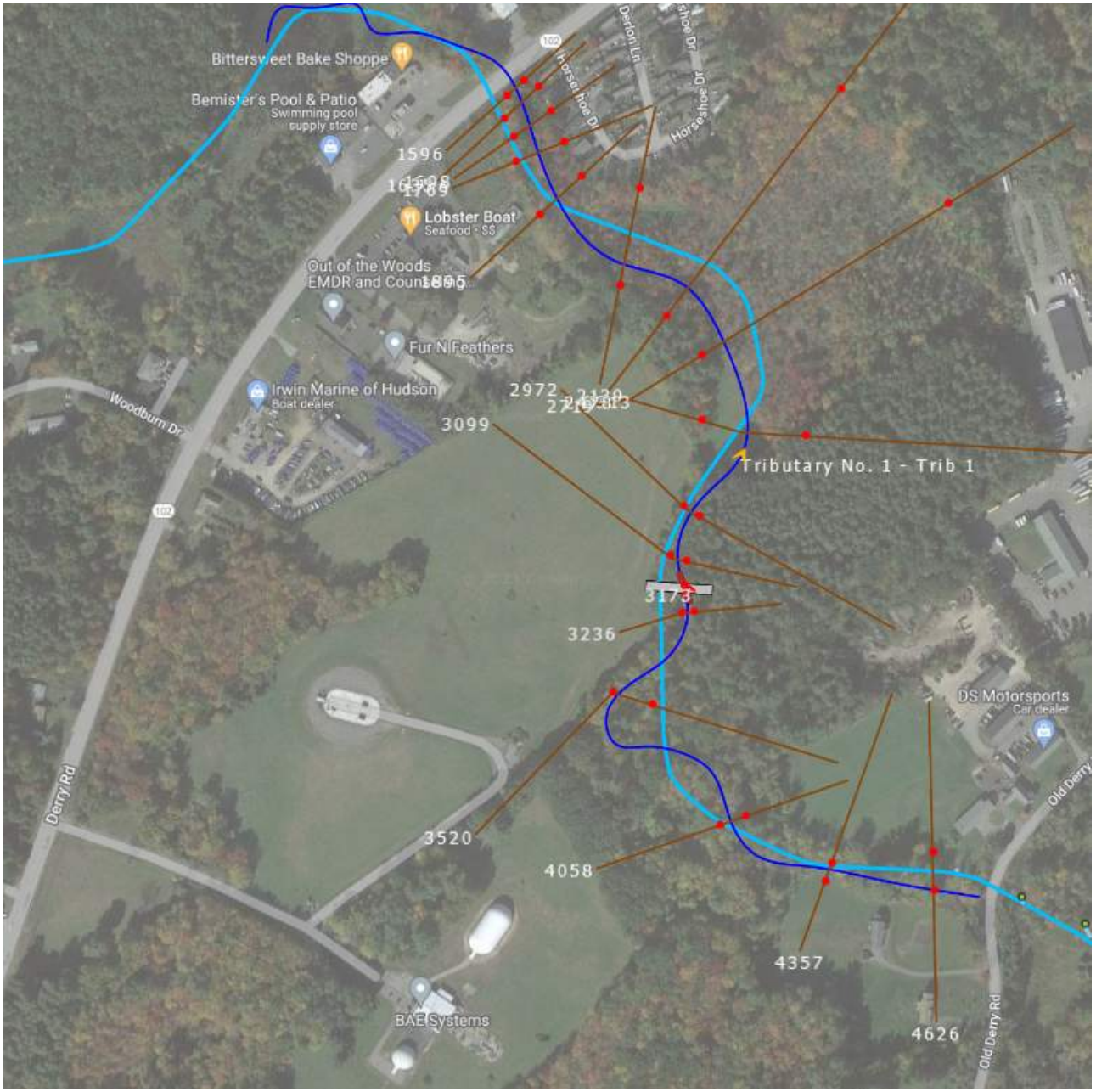
TRIBUTARY B NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

HILLSBOROUGH COUNTY, NH

(ALL JURISDICTIONS)

347P

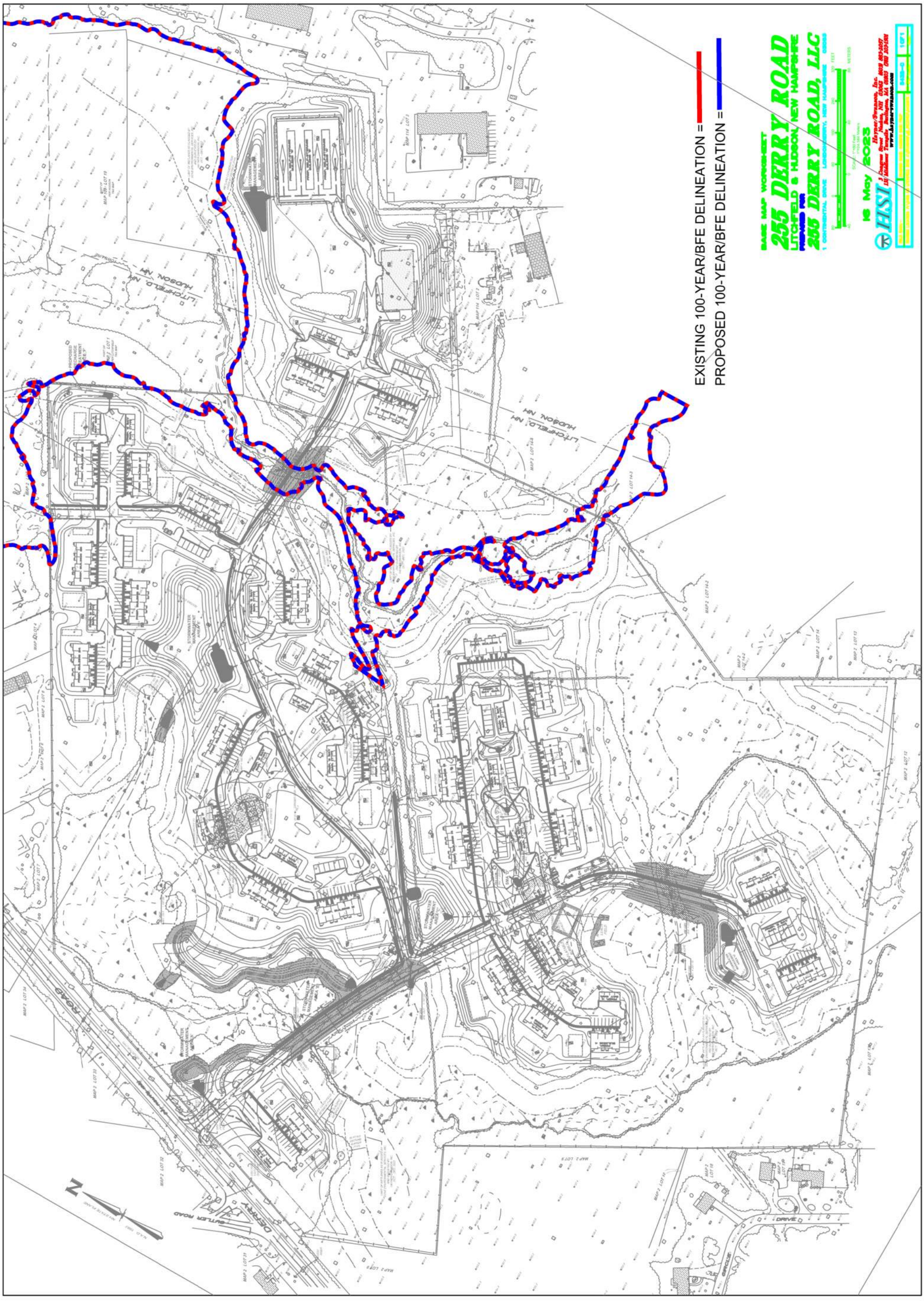

Bittersweet Bake Shoppe
Bemister's Pool & Patio
Swimming pool supply store
1596
Lobster Boat
Seafood · $$
Out of the Woods
Fur N Feathers
Irwin Marine of Hudson
Boat dealer
Woodburn Dr
2972
3099
Tributary No. 1 - Trib 1
3236
DS Motorsports
Car dealer
Derry Rd
3520
4058
4357
4626
BAE Systems
Old Derry Rd
Horseshoe Dr

HEC-RAS Plan: Existing Cond River: Tributary No. 1 Reach: Trib 1 Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Trib 1	1596	100-year	190.00	185.42	192.700	187.46	192.70	0.000015	0.54	664.37	388.51	0.04
Trib 1	1635	100-year	190.00	186.25	192.704		192.71	0.000018	0.31	703.52	287.65	0.02
Trib 1	1698	100-year	190.00	186.35	192.705		192.71	0.000012	0.27	858.45	295.88	0.02
Trib 1	1769	100-year	190.00	186.36	192.706		192.71	0.000009	0.24	949.64	288.45	0.02
Trib 1	1895	100-year	190.00	186.40	192.707		192.71	0.000002	0.20	1116.60	285.90	0.01
Trib 1	2139	100-year	190.00	187.00	192.707		192.71	0.000004	0.14	1433.06	326.74	0.01
Trib 1	2313	100-year	190.00	188.00	192.708		192.71	0.000001	0.06	3486.24	840.70	0.00
Trib 1	2478	100-year	190.00	188.00	192.708		192.71	0.000001	0.06	3231.89	873.82	0.01
Trib 1	2719	100-year	190.00	189.00	192.708		192.71	0.000021	0.23	867.81	349.89	0.02
Trib 1	2972	100-year	190.00	191.00	192.501	192.50	193.00	0.055120	5.68	33.45	34.19	1.01
Trib 1	3099	100-year	190.00	193.00	194.865		194.98	0.007039	2.73	75.46	62.95	0.39
Trib 1	3236	100-year	190.00	195.00	197.693	197.69	198.16	0.047248	5.55	37.29	48.75	0.93
Trib 1	3520	100-year	190.00	199.00	200.891		200.93	0.003999	1.66	129.81	131.76	0.28
Trib 1	4058	100-year	190.00	206.00	206.731	206.73	207.06	0.061273	4.61	41.24	63.23	1.01
Trib 1	4357	100-year	190.00	209.00	210.920	210.20	211.00	0.005541	2.41	92.16	84.85	0.35
Trib 1	4626	100-year	190.00	212.00	213.259		213.39	0.016296	2.89	65.70	75.01	0.54

HEC-RAS Plan: Prop conditions River: Tributary No. 1 Reach: Trib 1 Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Trib 1	1596	100-year	190.00	185.42	192.700	187.46	192.70	0.000015	0.54	664.37	388.51	0.04
Trib 1	1635	100-year	190.00	186.25	192.704		192.71	0.000018	0.31	703.52	287.65	0.02
Trib 1	1698	100-year	190.00	186.35	192.705		192.71	0.000012	0.27	858.45	295.88	0.02
Trib 1	1769	100-year	190.00	186.36	192.706		192.71	0.000009	0.24	949.64	288.45	0.02
Trib 1	1895	100-year	190.00	186.40	192.707		192.71	0.000002	0.20	1116.60	285.90	0.01
Trib 1	2139	100-year	190.00	187.00	192.707		192.71	0.000004	0.14	1433.06	326.74	0.01
Trib 1	2313	100-year	190.00	188.00	192.708		192.71	0.000001	0.06	3486.24	840.70	0.00
Trib 1	2478	100-year	190.00	188.00	192.708		192.71	0.000001	0.06	3231.89	873.82	0.01
Trib 1	2719	100-year	190.00	189.00	192.708		192.71	0.000021	0.23	867.81	349.89	0.02
Trib 1	2972	100-year	190.00	191.00	192.501	192.50	193.00	0.055120	5.68	33.45	34.19	1.01
Trib 1	3099	100-year	190.00	193.00	194.884		194.99	0.006724	2.69	76.45	61.11	0.38
Trib 1	3173		Culvert									
Trib 1	3236	100-year	190.00	195.00	197.693	197.69	198.16	0.047248	5.55	37.29	48.75	0.93
Trib 1	3520	100-year	190.00	199.00	200.891		200.93	0.003998	1.66	129.83	131.77	0.28
Trib 1	4058	100-year	190.00	206.00	206.731	206.73	207.06	0.061273	4.61	41.24	63.23	1.01
Trib 1	4357	100-year	190.00	209.00	210.920	210.20	211.00	0.005541	2.41	92.16	84.85	0.35
Trib 1	4626	100-year	190.00	212.00	213.259		213.39	0.016296	2.89	65.70	75.01	0.54


EXISTING 100-YEAR/BFE DELINEATION =
PROPOSED 100-YEAR/BFE DELINEATION =
FIRM MAP WORKSHEET
255 DERRY ROAD
LITCHFIELD & HUDSON, NEW HAMPSHIRE
PREPARED FOR
255 DERRY ROAD, LLC
1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053
16 May 2023
HSI
Harper/Swanson, Inc.
SHEET 1 OF 1
LITCHFIELD, NH
HUDSON, NH
DERRY ROAD
DRIVE
CIRCLE
N

INSPECTION & MAINTENANCE (I&M) MANUAL

Rose Meadows
Litchfield Tax Map 2, Lot 8
Hudson Tax Map 114, Lot 1
255 Derry Road (NH Route 102)
Litchfield & Hudson, New Hampshire

June 2023

Prepared for:
255 Derry Road, LLC
1 Continental Drive
Londonderry, New Hampshire 03053

Prepared by:
Hayner/Swanson, Inc.
3 Congress Street
Nashua, NH 03062

In accordance with Env-Wq 1507.08, the mechanism for providing long-term inspection and maintenance of stormwater management practices for this development are as follows:

I. RESPONSIBLE MAINTENANCE PARTY

255 Derry Road, LLC
1 Continental Drive
Londonderry, New Hampshire 03053

II. MAINTENANCE RECOMMENDATIONS FOR BMP's

The following recommendations are to be used as a guide for the inspection and maintenance of the permanent erosion and sediment control measures.

A. DRIVEWAY, ROADWAY AND PARKING AREA SWEEPING

- Inspect parking lot areas at least semi-annually for the accumulation of sediment along drainage flow lines. Additional inspections recommended particularly during and after the winter months if the ice conditions during the winter were severe.
- Sweep parking lot areas to remove sediment buildup along and drainage flow lines.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.

B. CATCH BASINS & YARD DRAINS

- Inspect catch basins and yard drains at least semi-annually at the same time that the roadway/driveways are inspected.
- Vacuum the sediment in the basins when the sediment reaches one-half the depth from the bottom of the catch basin to the invert of the outlet pipe.
- Repair damaged catch basin and yard drain grates immediately after the inspection.
- Repair pavement damage around catch basins and yard drains immediately after the inspection to prevent further damage to the structures.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.

C. INFILTRATION BASINS (SMA D, SMA G, SMA H)

- Inspect the infiltration basins at least twice annually, and following any rainfall event exceeding 2.5-inches in a 24- hour period, with maintenance or rehabilitation as warranted by such inspection.
- Inspect, repair and remove debris from sediment forebays, associated headwalls and outlet catch basin as needed.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.
- If the system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or reconstruction.

D. STORMWATER POND/ STORMWATER WETLAND (SMA B, SMA C & SMA E)

- Stormwater pond/wetlands should be inspected at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance and rehabilitation conducted as warranted by such inspection.
- Inspect, repair and remove debris from the sediment forebay and outlet control structure. Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.
- Periodic mowing of embankments.
- Removal of woody vegetation from embankments.
- Removal of invasive species from permanent pool area.
- Monitoring and replanting, if necessary, of wetland vegetation
- Inspection and repair of embankments, inlet and outlet control structures, and appurtenances.

E. RAIN GARDEN (SMA A, SMA F & RG 42, RG 43 & RG44)

- Inspect the rain garden systems at least twice annually, and following any rainfall event exceeding 2.5-inches in a 24-hour period, with maintenance or rehabilitation as warranted by such inspection.
- Inspect, repair and remove debris from sediment forebays, grass swales and areas around the associated headwalls and catch basins as needed.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.
- If the system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or reconstruction.

III. INSPECTION CHECKLIST/MAINTENANCE AND DEICING LOGS

The accompanying sheets to this section are to be used as a guide for the inspection reporting for this project. Inspection reports shall include photographs of the above-referenced practices.

IV. BMP SITE MAINTENANCE PLAN

The accompanying plan identifies the stormwater practices that will need to be inspected as part of this I & M program.

V. INVASIVE SPECIES RESPONSE

Attached is information provided by the New Hampshire Department of Agriculture, Markets & Food related to the identification and control of invasive species. During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Inspection Checklist & Maintenance Log

Project Name: Rose Meadows, Litchfield, NH

☐ Driveway/roadway/parking areas

☐ Catch basins and yard drains

☐ Infiltration basins (SMA D, SMA G & SMA H)

☐ Stormwater ponds/wetland (SMA B, SMA C & SMA E)

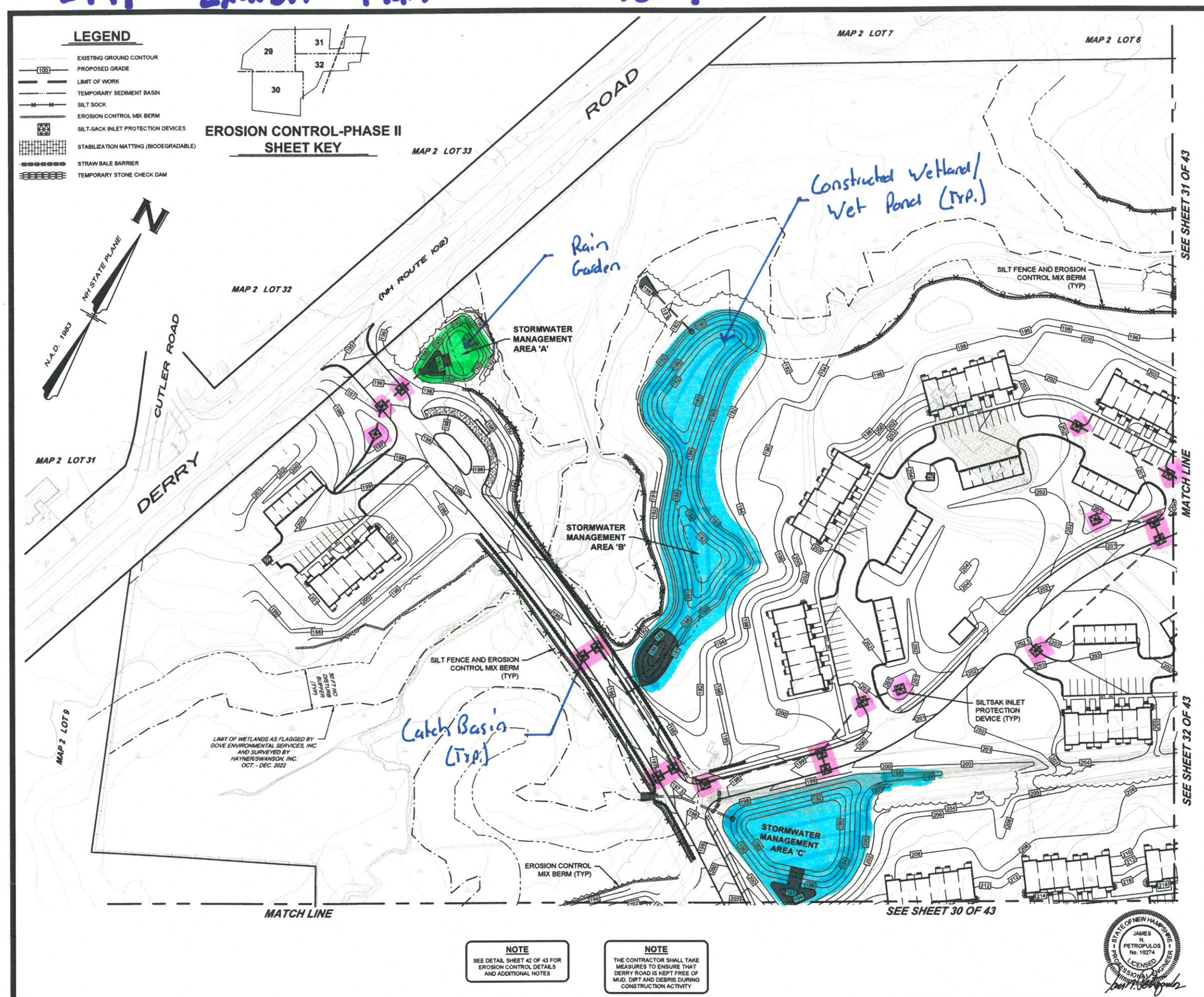
☐ Rain Gardens (SMA A, SMA F, RG 42, RG 43 & RG 44)

Inspection Date	Inspector Name(s)	Description of BMP Condition	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Deicing Log

Project Name: Rose Meadows, Litchfield, NH

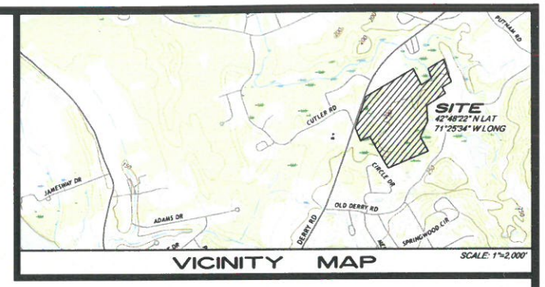
Application Date	Application	Type of Deicer	Amount of Deicer



NOTE
SEE DETAIL SHEET 42 OF 43 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES

NOTE
THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THAT DERRY ROAD IS KEPT FREE OF MUD, DIRT AND DEBRIS DURING CONSTRUCTION ACTIVITY

STATE OF NEW HAMPSHIRE JAMES N. PETROPULOS No. 10274 LICENSED PROFESSIONAL ENGINEER



CONSTRUCTION SEQUENCE: (PHASE II)

1. INSTALLATION OF UNDERGROUND UTILITIES AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT IN ACCORDANCE WITH THE "SILTSAK DETAIL". THE INLET CONTROLS SHALL REMAIN UNTIL THE SITE IS SUFFICIENTLY STABILIZED. RIPRAP SHALL BE PLACED AT EACH HEADWALL OUTLET.
2. AS THE ROADWAY AND BUILDINGS ARE COMPLETED, ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED.
3. NO PORTION OF THE PROJECT SHALL BE LEFT DISTURBED AND UNSTABILIZED FOR A PERIOD OF GREATER THAN 45 DAYS. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO WINTER CONDITIONS. STABILIZATION SHALL BE DEFINED AS 85% VEGETATIVE GROWTH BY OCTOBER 15TH OR INSTALLATION OF EROSION CONTROL MATTING.
4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
   B. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
   C. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
   D. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
5. COMPLETED AREAS SHALL BE STABILIZED 72 HOURS AFTER COMPLETION.
6. ALL PERMANENT STORMWATER MANAGEMENT MEASURES SHALL HAVE A HEALTHY STAND OF VEGETATION ESTABLISHED PRIOR TO DIRECTING RUNOFF INTO THEM
7. FINAL PAVING OF DRIVEWAYS.
8. LOAM AND SEED ALL DISTURBED AREAS.
9. INSPECTION OF ALL SEDIMENT AND EROSION CONTROL MEASURES.
10. SITE LANDSCAPING ALONG WITH PERMANENT SEEDING OF ALL DISTURBED AREAS.
11. REMOVE ANY TEMPORARY EROSION CONTROL MEASURES NOT NEEDED.

GENERAL NOTES: (PHASE II)

1. ALL MEASURES STATED ON THIS EROSION CONTROL PLAN, AND IN THE STORMWATER POLLUTION PREVENTION PLAN, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETE PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT.
2. SILT FENCE AND EROSION CONTROL MIX BERM SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT REACHES ONE-THIRD (1/3) THE HEIGHT OF THE BARRIER.
3. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.
4. ALL SEEDED AREAS SHALL BE CHECK REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED AND RESEEDED AS NEEDED.
5. THE CONSTRUCTION EXITS SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION EXIT AS CONDITIONS DEMAND.

APPROVED BY THE LITCHFIELD PLANNING BOARD ON

_____, 20 ____

_____, CHAIRMAN

_____, VICE-CHAIRMAN

No.	DATE	REVISION	BY

EROSION CONTROL PLAN - PHASE II

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102
LITCHFIELD, NEW HAMPSHIRE
& HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:
255 DERRY ROAD, LLC
1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

60 0 60 120 180 240 FEET
30 0 30 60 METERS
SCALE: 1"=60 Feet
1"=18.288 Meters

31 MAY 2023

Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-ER81	5432 File Number	29 OF 43 Sheet
DRAWING LOC: J:\5000\5432\DWG\5432 SITE			

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

SEE SHEET 29 OF 43

MATCH LINE

SEE SHEET 32 OF 43

MATCH LINE

MAP 2 LOT 9

MAP 2 LOT 10

MAP 2 LOT 18

MAP 2 LOT 19

MAP 2 LOT 131

MAP 2 LOT 14-2

MAP 2 LOT 13

MAP 2 LOT 12

SMA 'D'

SMA 'D'

STORMWATER MANAGEMENT AREA 'N'

EROSION CONTROL MIX BERM (TYP)

SILT FENCE AND EROSION CONTROL MIX BERM (TYP)

SILTSAK INLET PROTECTION DEVICE (TYP)

LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT. - DEC. 2022

Rain Garden (Typ.)

Infiltration Trench

Catch Basin (Typ.)

Infiltration Basin

N

NH STATE PLANE

N.A.D. 1983

29 31 32 30

EROSION CONTROL-PHASE II SHEET KEY

STATE OF NEW HAMPSHIRE JAMES N. PETROPULOS No. 10274 LICENSED PROFESSIONAL ENGINEER

APPROVED BY THE LITCHFIELD PLANNING BOARD ON

_____, 20 ____

_____, CHAIRMAN

_____, VICE-CHAIRMAN

No.	DATE	REVISION	BY

EROSION CONTROL PLAN - PHASE II

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE & HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

60 0 60 120 180 240 FEET

30 0 30 60 METERS

SCALE: 1"=60 Feet
1"=18.288 Meters

31 MAY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-ER81	5432	30 OF 43
DRAWING LOC: J:\5000\5432\DWG\5432 SITE		File Number	Sheet

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

MAP 2 LOT 2
MAP 2 LOT 4
MAP 2 LOT 6
MATCH LINE
SEE SHEET 29 OF 43
SILT FENCE (TYP)
STORMWATER MANAGEMENT AREA 'E'
Rain Garden
PART OF MAP 2 LOT 1 PER LITCHFIELD TAX MAP
SILTSAK INLET PROTECTION DEVICE (TYP)
Catch Basin (Typ.)
SILT FENCE AND EROSION CONTROL MIX BERM (TYP)
50 FT NO DISTURB BUFFER (TYP)
STORMWATER MANAGEMENT AREA 'E'
Stormwater Pond
LITCHFIELD, NH — TOWN LINE — HUDSON, NH
PART OF MAP 109 LOT 19 PER HUDSON TAX MAP
Infiltration Basin
LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT. - DEC. 2022
50 FT WETLAND BUFFER (TYP)
WETLAND CONSERVATION OVERLAY DISTRICT (TYP)
EROSION CONTROL MIX BERM (TYP)
STORMWATER MANAGEMENT AREA 'G'
MAP 114 LOT 3
MATCH LINE
SEE SHEET 32 OF 43

N
NH STATE PLANE
N.A.D. 1983

29 30 31 32

EROSION CONTROL-PHASE II SHEET KEY

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING: _____

CHAIRMAN: _____ SIGNATURE DATE: _____

SECRETARY: _____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR TWO (2) YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECIEVES FINAL APPROVAL.

STATE OF NEW HAMPSHIRE — JAMES N. PETROPULOS No. 10274 LICENSED PROFESSIONAL ENGINEER

APPROVED BY THE LITCHFIELD PLANNING BOARD ON

_____, 20 ____

_____, CHAIRMAN

_____, VICE-CHAIRMAN

NO.	DATE	REVISION	BY

EROSION CONTROL PLAN - PHASE II

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE & HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

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30 0 30 60 METERS

SCALE: 1"=60 Feet
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FIELD BOOK: 5432	DRAWING NAME: 5432SITE-ER81	5432 File Number	31 OF 43 Sheet
DRAWING LOC: J:\5000\5432\DWG\5432 SITE			

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

MATCH LINE

SEE SHEET 31 OF 43

SEE SHEET 29 OF 43

SILT FENCE AND EROSION CONTROL MIX BERM (TYP)

SILTSAK INLET PROTECTION DEVICE (TYP)

Catch Basin (TYP)

LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT. - DEC. 2022

EROSION CONTROL MIX BERM (TYP)

50 FT NO DISTURBANCE BUFFER (TYP)

MAP 114 LOT 3

MAP 114 LOT 2

TOWN LINE

MATCH LINE

N

N.A.D. 1983 NH STATE PLANE

MAP 2 LOT 14-4

LITCHFIELD, NH
HUDSON, NH

SEE SHEET 30 OF 43

MAP 2 LOT 14-3

MAP 2 LOT 14-2

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

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STATE OF NEW HAMPSHIRE · JAMES N. PETROPULOS No. 10274 LICENSED PROFESSIONAL ENGINEER

29 31 32 30

EROSION CONTROL-PHASE II SHEET KEY

APPROVED BY THE LITCHFIELD PLANNING BOARD ON

_____, 20 ____

_____, CHAIRMAN

_____, VICE-CHAIRMAN

No.	DATE	REVISION	BY

EROSION CONTROL PLAN - PHASE II

ROSE MEADOWS

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FIELD BOOK: 5432	DRAWING NAME: 5432SITE-ER81	5432 File Number	32 OF 43 Sheet
DRAWING LOC: J:\5000\5432\DWG\5432 SITE			

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

Control of Invasive Plants

New Hampshire
Department of Agriculture,
Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.
Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.
Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.
Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.
MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.
Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control*: (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

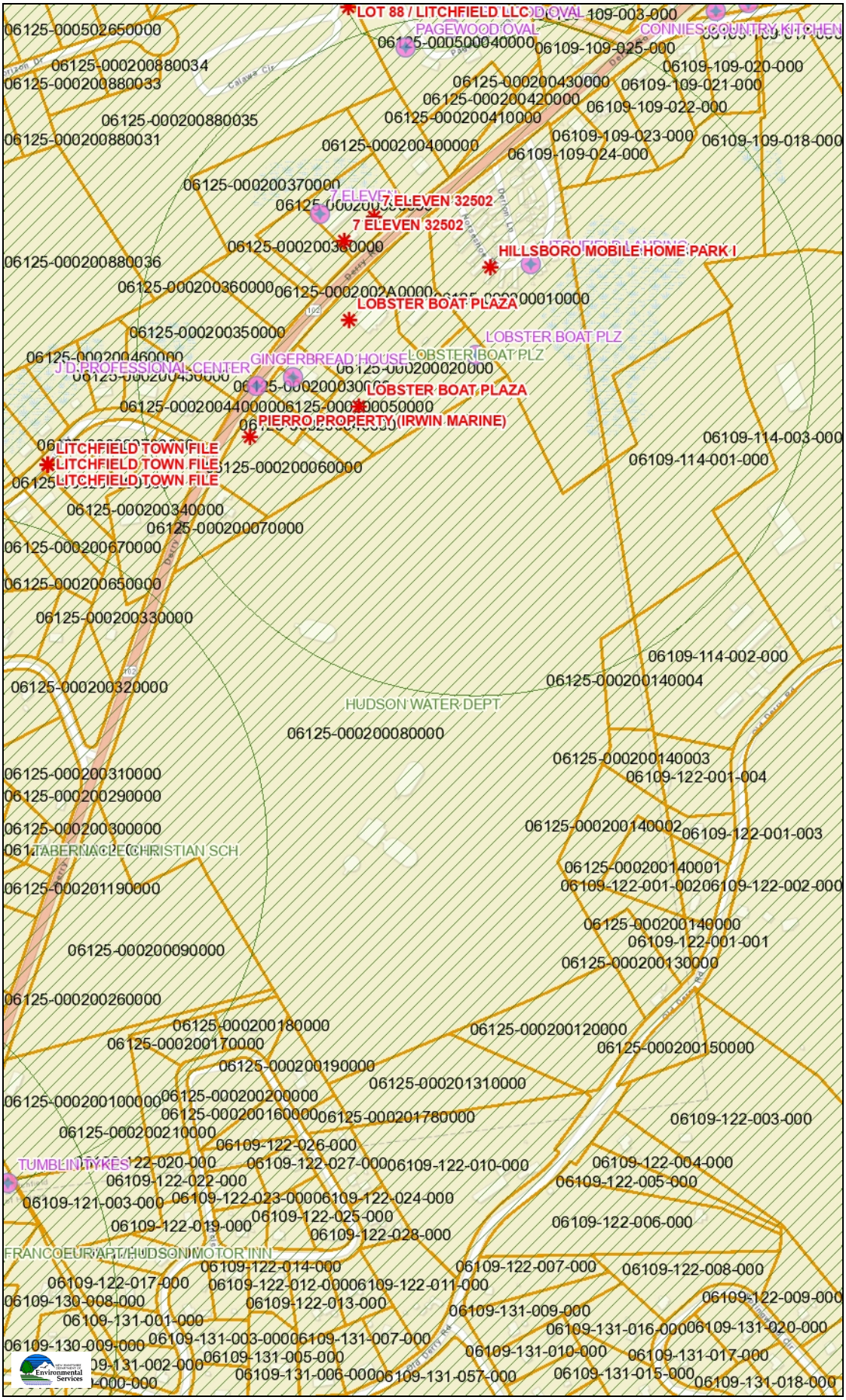
(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
(9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
(11) FOLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Meeting Date: 11/29/23

SP #07-23 Rose Meadows Site Plan - Attachment F

Map By



Legend

- Surface Waters with Impairm 2022 with Quarter Mile Buffe
- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Watersheds with Chloride Impairments

Parcels

- Parcel Polygons
- Attributes for Additional Lines

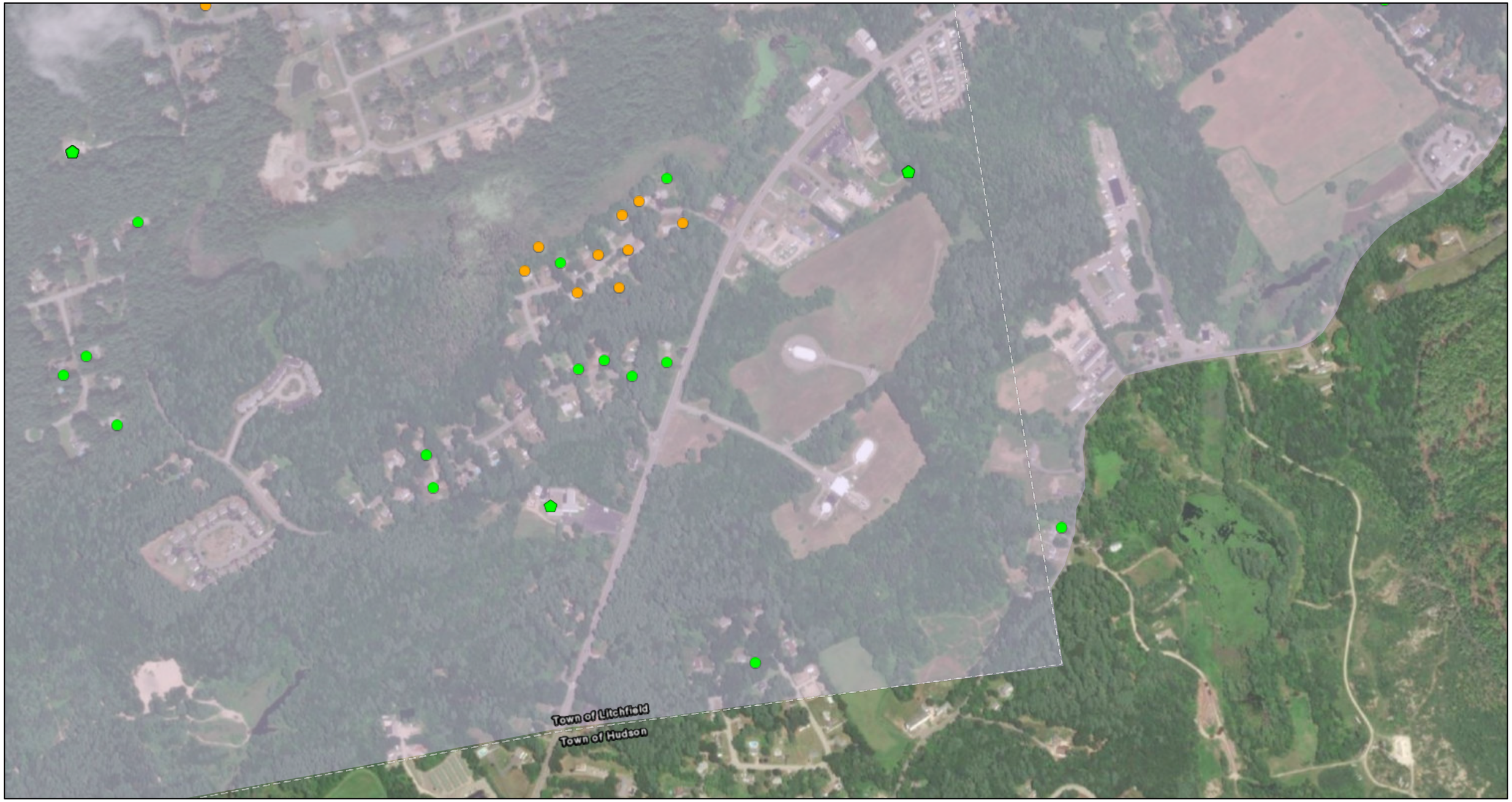
Map Scale

1: 6,494

Map Generated: 2/20/2023

Notes

5432 PFAS Map



February 20, 2023

Groundwater Samples

- PFAS > AGQS / MCL
- PFAS ≤ AGQS / MCL

PWS Samples

- PWS ≤ AGQS / MCL
- Saint-Gobain Consent Decree Outer Boundary

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Esri, HERE, Garmin, iPC, Maxar

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	42.806 degrees North
Longitude	71.428 degrees West
Elevation	60 feet
Date/Time	Mon Feb 20 2023 15:37:21 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.73	1.01	1.23	1.55	1.95	2.46	2.70	**1yr**	2.18	
2yr	0.33	0.51	0.63	0.83	1.05	1.32	**2yr**	0.90	1.21	1.52	1.89	2.36	2.93	3.26	**2yr**	2.60	
5yr	0.39	0.61	0.76	1.02	1.31	1.66	**5yr**	1.13	1.51	1.92	2.40	2.99	3.70	4.15	**5yr**	3.28	
10yr	0.44	0.69	0.87	1.19	1.55	1.98	**10yr**	1.33	1.79	2.30	2.88	3.58	4.43	4.98	**10yr**	3.92	
25yr	0.52	0.83	1.06	1.46	1.93	2.50	**25yr**	1.67	2.23	2.91	3.66	4.55	5.60	6.34	**25yr**	4.95	
50yr	0.59	0.94	1.21	1.70	2.29	2.99	**50yr**	1.98	2.65	3.50	4.40	5.45	6.69	7.62	**50yr**	5.92	
100yr	0.68	1.09	1.41	1.99	2.72	3.56	**100yr**	2.34	3.14	4.18	5.26	6.52	8.00	9.17	**100yr**	7.08	
200yr	0.77	1.25	1.63	2.33	3.22	4.26	**200yr**	2.78	3.73	5.01	6.31	7.82	9.58	11.03	**200yr**	8.48	1
500yr	0.92	1.52	1.98	2.88	4.05	5.39	**500yr**	3.49	4.67	6.35	8.02	9.94	12.15	14.10	**500yr**	10.75	1

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2
1yr	0.22	0.35	0.42	0.57	0.70	0.81	**1yr**	0.60	0.79	1.06	1.31	1.66	2.29	2.54	**1yr**	2.03	
2yr	0.31	0.48	0.60	0.81	0.99	1.19	**2yr**	0.86	1.17	1.36	1.78	2.29	2.84	3.17	**2yr**	2.51	
5yr	0.36	0.55	0.68	0.94	1.19	1.41	**5yr**	1.03	1.38	1.62	2.10	2.68	3.47	3.85	**5yr**	3.07	
10yr	0.39	0.60	0.75	1.04	1.35	1.60	**10yr**	1.16	1.56	1.82	2.37	3.02	4.00	4.45	**10yr**	3.54	
25yr	0.44	0.68	0.84	1.20	1.58	1.87	**25yr**	1.36	1.83	2.14	2.79	3.51	4.83	5.35	**25yr**	4.27	
50yr	0.48	0.74	0.92	1.32	1.77	2.13	**50yr**	1.53	2.08	2.43	3.17	3.95	5.58	6.16	**50yr**	4.94	
100yr	0.53	0.80	1.00	1.45	1.99	2.40	**100yr**	1.71	2.35	2.75	3.55	4.44	6.13	7.10	**100yr**	5.43	
200yr	0.58	0.88	1.11	1.61	2.24	2.73	**200yr**	1.93	2.67	3.10	4.03	5.03	7.00	8.17	**200yr**	6.20	
500yr	0.66	0.98	1.27	1.84	2.61	3.24	**500yr**	2.26	3.17	3.66	4.78	5.95	8.33	9.88	**500yr**	7.37	

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2
1yr	0.31	0.47	0.58	0.78	0.96	1.12	**1yr**	0.83	1.09	1.26	1.64	2.08	2.64	2.85	**1yr**	2.34	
2yr	0.35	0.54	0.67	0.90	1.11	1.31	**2yr**	0.96	1.28	1.48	1.91	2.45	3.04	3.39	**2yr**	2.69	
5yr	0.43	0.67	0.83	1.14	1.45	1.66	**5yr**	1.25	1.62	1.88	2.41	3.02	4.00	4.46	**5yr**	3.54	
10yr	0.52	0.81	1.00	1.40	1.80	2.02	**10yr**	1.56	1.97	2.27	2.88	3.59	4.96	5.52	**10yr**	4.39	
25yr	0.68	1.03	1.28	1.83	2.41	2.61	**25yr**	2.08	2.55	2.93	3.64	4.46	6.60	7.32	**25yr**	5.84	
50yr	0.82	1.25	1.56	2.24	3.02	3.18	**50yr**	2.60	3.11	3.55	4.36	5.27	8.19	9.08	**50yr**	7.25	
100yr	1.00	1.52	1.90	2.75	3.77	3.88	**100yr**	3.25	3.79	4.31	5.28	6.23	10.23	11.26	**100yr**	9.05	1
200yr	1.22	1.84	2.33	3.38	4.71	4.72	**200yr**	4.07	4.61	5.21	6.32	7.37	12.72	13.96	**200yr**	11.26	1
500yr	1.60	2.38	3.07	4.46	6.34	6.12	**500yr**	5.47	5.98	6.73	8.02	9.20	17.00	18.57	**500yr**	15.04	1

Powered by ACIS Northeast Regional Climate Center

GOVE ENVIRONMENTAL SERVICES, INC.

June 1, 2023

NH Fish and Game Department
Attn. Wildlife Division, Nongame Program
11 Hazen Drive
Concord, N.H. 03301

Re: Request for NHFG Fis 1004 Consultation
NHB23-0586
Proposed Residential Development
255 Derry Road
Litchfield, NH

Dear NHF&G Reviewer:

We are pleased to provide the following information and enclosed documents in support of a consultation under Fis1004 for the remediation and redevelopment of the former Mohawk Tannery site and other adjacent property in Nashua, NH. Several figures depicting the location of the site and proposed work have been attached along with photographs of the site. A wetland report and fill set of plans are included under separate cover.

Fis 1004.03 (c) The following information shall be provided to the department:

(1) A copy of the department of natural and cultural resources NHB DataCheck tool results letter, dated within one year of the date of the consultation request, and which includes the DataCheck tool results letter number;

DataCheck #NHB23-0586 is attached and identified Blanding's turtle (*Emydoidea blandingii*), Wood Turtle (*Glyptemys insculpta),* Eastern Hognose Snake *(Heterodon platirhinos*), and Spotted Turtle *(Clemmys guttata)*

(2) though (4) The applicant's full name; mailing address; telephone number and email address to be used for the purpose of contact;

255 Derry Road, LLC
1 Continental Drive
Londonderry, New Hampshire, 03053

(5) If the applicant is a corporation, firm, partnership, association, institution, or public or private agency, the name, mailing address, and email address of the person who will respond to requests for information on behalf of the applicant;

Brendan Quigley, Gove Environmental Services Inc.
bquigley@gesinc.biz
603-686-0086

James Petropulos, Hayner/Swanson, Inc.
Jpetropulos@hayner-swanson.com
603-883-2057

(6) The name, mailing address, and email address of any person acting as an agent of the applicant, or any consultant who will submit information to the department on behalf of the applicant;

Brendan Quigley, Gove Environmental Services Inc.
bquigley@gesinc.biz
603-686-0086

James Petropulos, Hayner/Swanson, Inc.
Jpetropulos@hayner-swanson.com
603-883-2057

(7) Description of the proposed action

The proposed project involves the development of a 172- unit multifamily residential development and associated site improvements. The development will utilize the upland areas of the site, requiring wetland impacts at two crossing locations for access. A total of 9,140 SF of wetland impact is proposed.

(8) Description of the project parcel by reference to street address and town, and, if available, a geographical information system defined project boundary;

The project site is located at 255 Derry Road in Litchfield and is comprised of two lots totaling approximately 90 acres. The bulk of the site is located in Litchfield (Assesros Map 1 Lot 8) with a 10-acre portion located in Hudson (Assessor's Map 114 Lot 1)

(9) A listing of any state or federal permits which have been applied for, have been granted, or which will be necessary for the proposed action to proceed;

NHDES Alteration of Terrain Permit
NHDES Dredge and Fill Permit

(10) The current condition of the action area prior to any proposed modifications, including a description of known or discernible actions within the preceding 24 months that have altered the site, including but not limited to, timber harvests, significant impact

UPLANDS

The property is occupied by BAE Systems which operates a testing facility occupying approximately 35 acres, most of which is maintained field. Other upland on the site consists of Appalachian oak pine forest and areas that are thickly overgrown with early successional and invasive species such as multiflora rose, common and glossy buckthorn, and bush honeysuckle. Some of this dense woody growth was cut in the late fall and early winter of 2022/2023 to facilitate survey and geotechnical planning work for the project. This was accomplished without ground disturbance (see photos).

WETLANDS

The attached Wetland Report provides details on all the wetlands identified on the property as well as the results of the Vernal Pool Survey conducted in the spring of 2023.

(11) Any habitat features supporting or that could support threatened and endangered species that have been identified; and

NHB23-0586 identified the following species, provided below with their basic habitat requirements:

Blanding's Turtle (*Emydoidea blandingii*)
Found in wetland habitats with permanent shallow water and emergent vegetation such as marshes, swamps, bogs, and ponds. Use vernal pools extensively in spring and while traveling through the landscape. May use slow rivers and streams as mechanisms for dispersal between wetlands. Extensive use of terrestrial habitats for nesting and travel among wetlands.

Wood Turtle (*Glyptemys insculpta*)
Found in slow-moving streams and channels with sandy bottoms. Extensive use of terrestrial habitats during summer, including floodplains, meadows, woodlands, fields, as well as wetlands.

Spotted Turtle *(Clemmys guttata)*
Spotted Turtles utilize a variety of wetlands such as marshes, wet meadows, swamps, ponds, rivers and slow-moving streams. This species requires with shallow permanent water Emergent vegetation and canopied uplands for egg laying but have been known to lay on human altered sites.

Eastern Hognose Snake *(Heterodon platirhinos*)
Found in sandy, gravely soils in open fields, river valleys, pine forests and upland hill sides. Eggs are laid in loose soil and brumation occurs in abandoned mammal tunnels. Requires wetlands and vernal pools as habitat components as its diet is primarily amphibians.

Based on habitat needs of these species, all may be expected to utilize habitat on this site. The stream and better quality red maple swamp, located south of the existing driveway and in the northeast corner of the site in Hudson, stand out as some of the better wetland habitat on the property. The Site also contains a variety of upland habitat types ranging from small islands of upland in the wetland areas to the large fields. The BAE facility is a secure site with a perimeter fence that may restrict movement by turtle species to some degree.

(12) A description of any conservation measures proposed by the applicant to avoid, minimize, or mitigate potential harm to threatened and endangered species and habitat determined to be critical

The project overwhelmingly limits development to the existing developed areas of the property with two wetland crossings to access additional uplands. At Wetland Impact Area B , which is a stream crossing, an open bottom box culvert is being used to maintain connectivity.

Fis 1004.03 (d): An applicant seeking consultation to meet permit requirements under Env-Wt 311, Env-Wq 1406.06, or Env-Wq 1503.05, shall provide the following additional information to the department to initiate consultation:

(1) A topographic map identifying the action area at a scale of 1:24,000 or closer, and which shows property lines and the limits of proposed disturbance;

(2) ***An aerial photograph identifying the current condition of the action area at a scale of 1:24,000 or closer and which shows property lines and the limits of proposed disturbance;***

A USGS locus map and Aerial Photo are attached to this letter.

(3) ***Site photographs with dates and a photograph location plan, showing existing conditions, habitat features, and possible locations of identified threatened and endangered species, if known;***

Photographs of the property are attached to this letter and their locations are indicated in the Aerial Photo Figure. Additional photos can be found in the wetlands report provided under separate cover.

(4) ***Project site plan sheets showing the area of proposed disturbance and location of any proposed new or modified structures*;**

The full set of plans is provided under separate cover.

(5) ***Any reports created to assess the site, including but not limited to wetland assessments, vernal pool surveys, or other site visit observations; and***

The wetland report which includes the results of a vernal pool survey conducted in the spring of 2023 is attached to this letter.

(6) **Any other available information, from whatever source, that describes the potential impacts of the proposed action on listed species or habitat.**

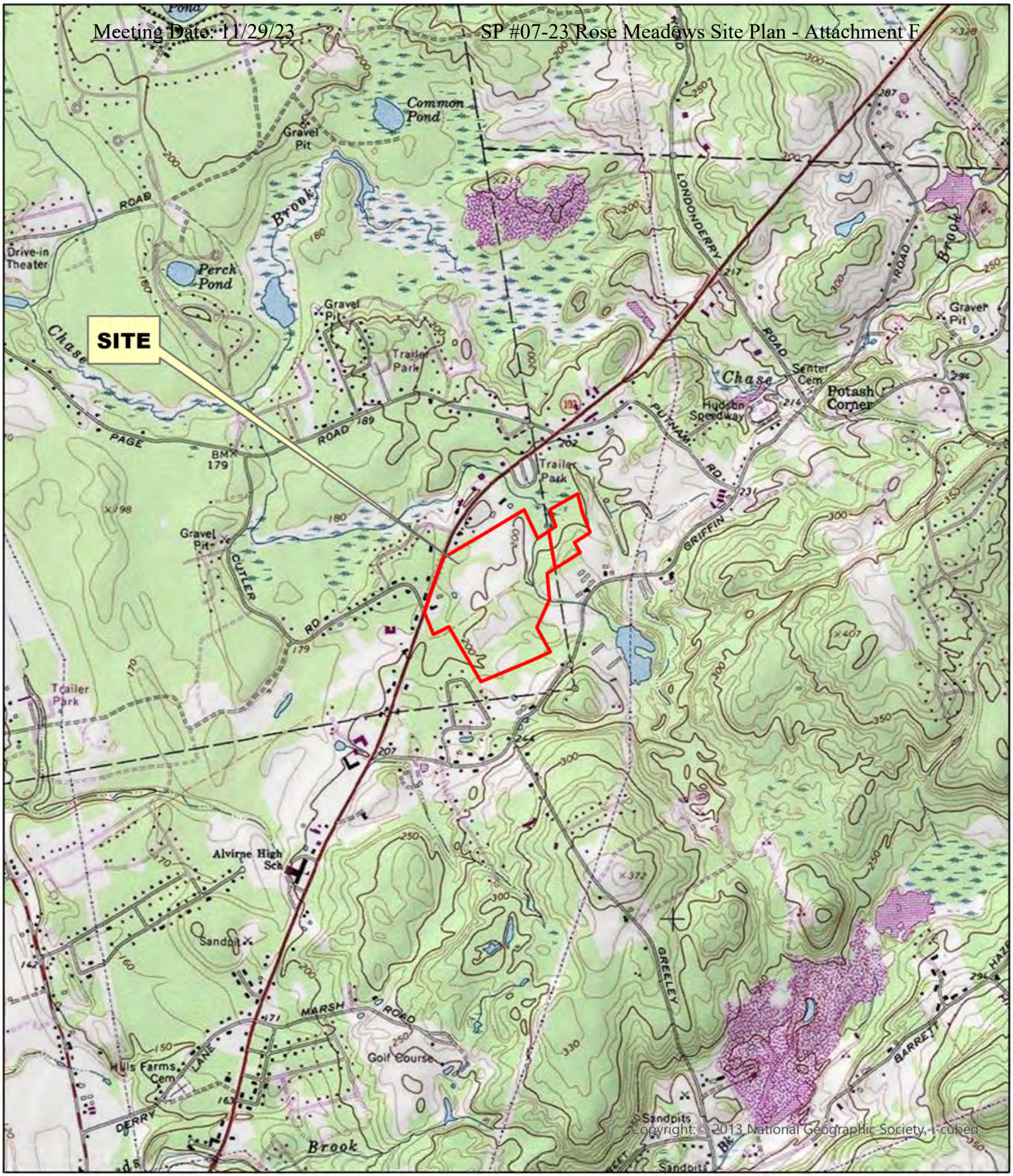
No additional information is available at this time.

If you should have any questions or request for additional information, please don't hesitate to contact me directly. I look forward to your comments.

Sincerely,

Brendan Quigley
Gove Environmental Services, Inc.

Attachments: NHB Data Check Results Letter
USGS Locus Map
Aerial Photo
Photographs
Wetland Delineation Report by Gove Environmental Services (under separate cover)
full project plan set (under separate cover)



1:24,000

Locus Map

255 Derry Road
Litchfield, NH

Gove Environmental Services, Inc.
8 Continental Drive Bldg 2 Unit H Exeter NH 03833 603.778.0644

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: Ethan Beals
3 Congress Street
Nashua, NH 03062

From: NHB Review, NH Natural Heritage Bureau
Date: 2/24/2023 (valid until 02/24/2024)
Re: Review by NH Natural Heritage Bureau
Permits: MUNICIPAL POR - Litchfield/Hudson, NHDES - Alteration of Terrain Permit, NHDES - Wetland Standard Dredge & Fill - Major, USEPA - Stormwater Pollution Prevention

NHB ID: **NHB23-0586** Town: LITCHFIELD Location: 255 Derry Road
Description: The main body of the site is in Litchfield, A small portion of the property is Map 114 Lot 1 in Hudson. It is being proposed to construct a 172-townhouse unit residential development along with associated site improvements.
cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: No comments at this time.**
F&G: Please refer to NHFG consultation requirements below.

Vertebrate species	State[1]	Federal	Notes
Blanding's Turtle (*Emydoidea blandingii*)	E	--	Contact the NH Fish & Game Dept (see below).
Eastern Hognose Snake (*Heterodon platirhinos*)	E	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle (*Clemmys guttata*)	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle (*Glyptemys insculpta*)	SC	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://wildlife.state.nh.us/wildlife/environmental-review.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule)*, coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle *kim.tuttle@wildlife.nh.gov* with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and "review request" in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

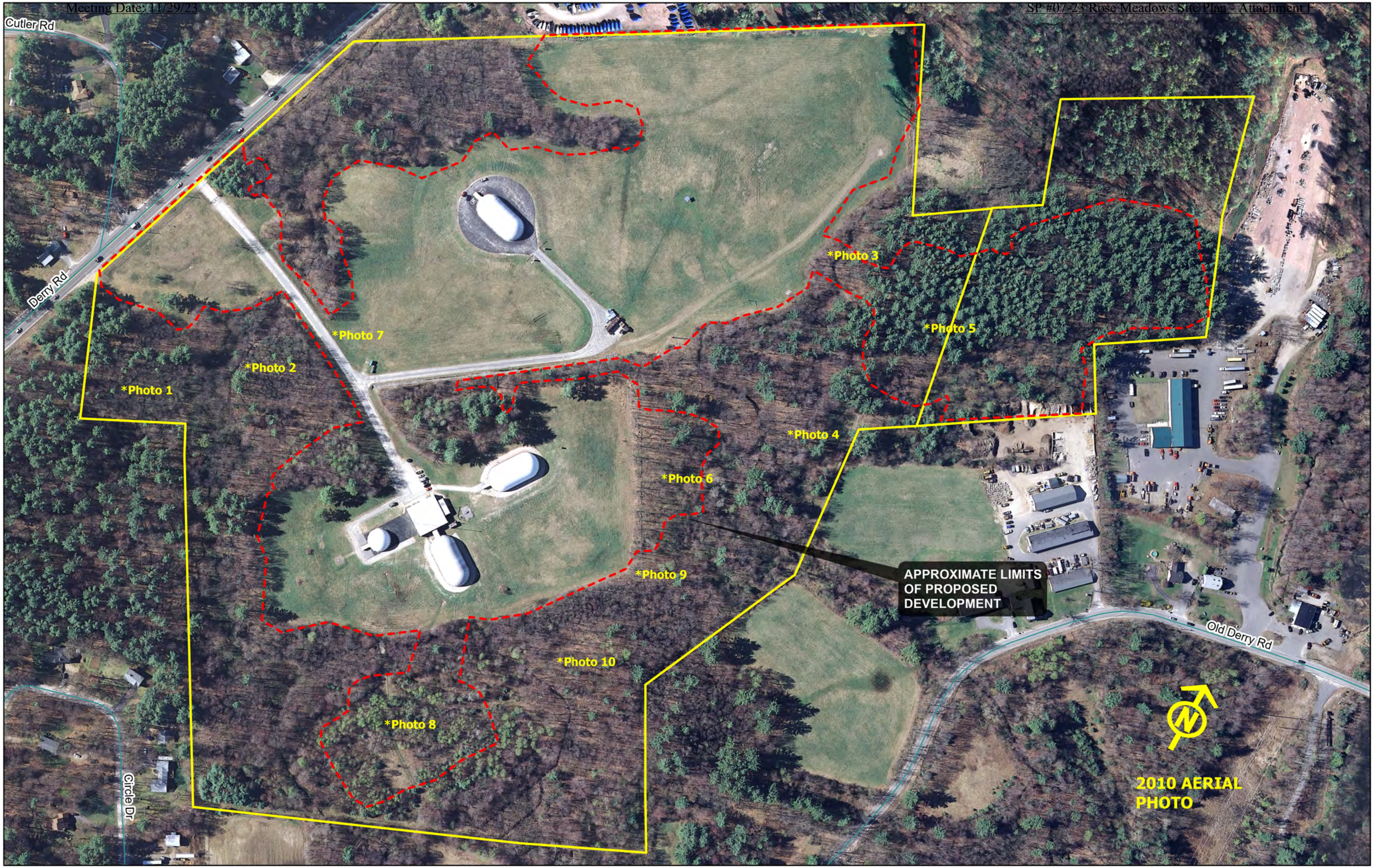

Cutler Rd
Derry Rd
*Photo 1
*Photo 2
*Photo 3
*Photo 4
*Photo 5
*Photo 6
*Photo 7
*Photo 8
*Photo 9
*Photo 10
APPROXIMATE LIMITS OF PROPOSED DEVELOPMENT
Old Derry Rd
Circle Dr
N
2010 AERIAL PHOTO

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

GOVE ENVIRONMENTAL SERVICES, INC.

May 24, 2023

Jim Petropulos
Hayner/Swanson, Inc.
3 Congress Street
Nashua, NH 03062

Subject: Wetland Delineation Report
255 Derry Road
Litchfield, NH

Dear Mr. Petropulos:

This letter is to document the results of the wetland delineation, vernal pool survey, and functional assessment performed by Gove Environmental Services, Inc. for 255 Derry Road in Litchfield, NH. The property totals approximately 90 acres with 80 acres located in Litchfield (lot 2-8) and an additional 10 acres located in Hudson (lot 11-1) (the Site). The Site is currently occupied by BAE Systems and consists of a mix of maintained field and wooded areas surrounded by a perimeter security fence. A figure depicting the approximate location of the resources is attached to this report along with wetland assessment forms and photos.

WETLANDS

The delineation work was performed in October of 2022 by Brendan Quigley, NHCWS #249. Vegetated wetland boundaries were evaluated utilizing the following standards:

1. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region,* (Version 2.0) January 2012, U.S. Army Corps of Engineers.
2. *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils*, Version 8.2. United States Department of Agriculture (2018).
3. *New England Hydric Soils Technical Committee. 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England.* New England Interstate Water Pollution Control Commission, Lowell, MA.
4. *U.S. Army Corps of Engineers National Wetland Plant List, version 3.5*. (2020)

There are two (2) main areas of wetland on the Site, generally located in the wooded areas surrounding the maintained fields and BAE Systems facilities. These areas have been identified on the attached sketch as Wetlands A and B and are discussed below.

Wetland A

This wetland system is made up of three sections of wetland on the western and southern portion of the property. All three sections of this wetland system are connected by culverts under the existing driveway to the site and an unused access road to the rear portion of the property. Aside from limited areas extending into the adjacent maintained fields, the wetland is a forested swamp dominated by red maple

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

and skunk cabbage (POF1E)[1]. The interior areas contain very poorly drained organic soils and retain a more natural character than areas near the wetland boundary. These areas are predominantly poorly drained mineral soil and tend to be thickly overgrown with early successional and invasive species such as multiflora rose, common and glossy buckthorn, and bush honeysuckle. This condition also extends into the upland buffer in nearly all areas except where adjacent to maintained field. Wetland A is associated with an intermittent stream which appears to originate in the wetlands just south of the property and flows north towards Derry Road. This stream, labeled stream A on the attached sketch, has a sand and mud substrate, and is classified as R4SB4/5.

The NHDES Wetland Permit and Planning Tool (WPPT) indicates that a portion of Wetland A is a "Bog" which is a Priority Resource Area per Env-Wt 103.66(b). This is not accurate. Although the wetland does contain areas of organic soil, which may be characterized as a type of peat, these areas are more accurately described as a temperate swamp which lacks all the characteristics of a bog as defined in the rules. This can be clearly seen in the wetland photos included with this report.

Wetland B

Wetland B is located on the eastern portion of the property and is also a forested swamp (PFO1E) with the dominant tree species being red maple. Wetland B, however, has less good quality swamp area with very poorly drained soil and more dense growth of woody invasive species. This type of wetland is concentrated in its lowermost section where the Site extends into Hudson. Wetland B is associated with a more substantial stream that originates off site to the south and flows south through the wetland toward Derry Road. The stream has been labeled Stream B on the attached sketch. It has a gravel and cobble substrate and is indicated as perennial on the USGS map, though it has been observed dry during the October 2022 field season. The stream has been classified as R2UB3. FEMA mapping also indicates a 100-year floodplain extends along course of this stream through the property.

The WPPT indicates that the wetland that falls within the floodplain of the perennial stream is Priority Resource Area in accordance with Env-Wt 103.66(c). However, both USGS stream stats and the WPPT basin delineator tool indicate that this stream has a contributing watershed of only 0.08 square miles (53 ac.), far less than the minimum 640-acre watershed that defines a tier 3 water course. The WPPT therefore appears to be incorrect, there is no Priority resource Area associated with this stream.

VERNAL POOLS

The Site was surveyed for vernal pools on 5/2/23. Only limited shallow ponding was observed within the wetlands on the property none of which contained vernal pool indicators.

FUNCTIONAL ASSESSMENT

A wetland function and value assessment was conducted using the US Army Corps Highway Methodology guidelines. Functions are self-sustaining properties of wetlands which exist in the absence of human involvement. Values refers to the benefits gained by society from a given wetland or ecosystem by their inherent functions. Functions and values identified as "primary" have been determined to be

[1] *Classification of Wetlands and Deepwater Habitats of the United States*. USFW Manual FWS/OBS–79/31 (1979).

significant features of the wetland being evaluated. An important distinction is that the primary functions and values of a particular wetland don't necessarily indicate the wetland supports them at a significant *level* in comparison to other wetlands in the region or even near the site.

The Highway Methodology considers 13 functions and values:

1. **Groundwater recharge/discharge:** This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
2. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
3. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shellfish habitat.
4. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
5. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
6. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.
7. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.
8. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.
9. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.
10. **Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.
11. **Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
12. **Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.

Threatened or Endangered Species Habitat: This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

The wetlands were also evaluated for "Ecological Integrity" utilizing Section 1 of the NH Method for the Evaluation of Freshwater Wetlands. Rather than relating to a single function or value, ecological integrity considers the overall health and completeness of the wetland system in the context of the larger ecosystem. The NH method also produces a numeric score for Ecological Integrity from 1 to 10. Generally, a wetland in an untouched area of wilderness would have the highest score of 10 while one in the middle of a busy city would have the lowest score near 1. The results of the functional assessment are discussed in the following sections. The functional assessment data forms have been attached to this report.

Wetland A

The principal functions of Wetland A were determined to be related to water quality (Sediment/Toxicant Retention & Nutrient Transformation) and wildlife habitat. The water quality function of the wetland is derived from its association with an intermittent stream, broad areas of deep organic soils, and restricted flow pattern. This function is supported throughout the wetland. Wetland specific wildlife habitat is likely to be more concentrated within the areas of better-quality temperate swamp and nearest the stream channel, mostly contained within the interior of the wetland. Connectivity between the habitat on this site and nearby areas is limited by surrounding development and, for some species, by the perimeter fence around the facility. The wetland system also supports some flood flow alteration, groundwater recharge, and production import function but to a more limited degree due to characteristics of the wetland and its setting.

Wetland B

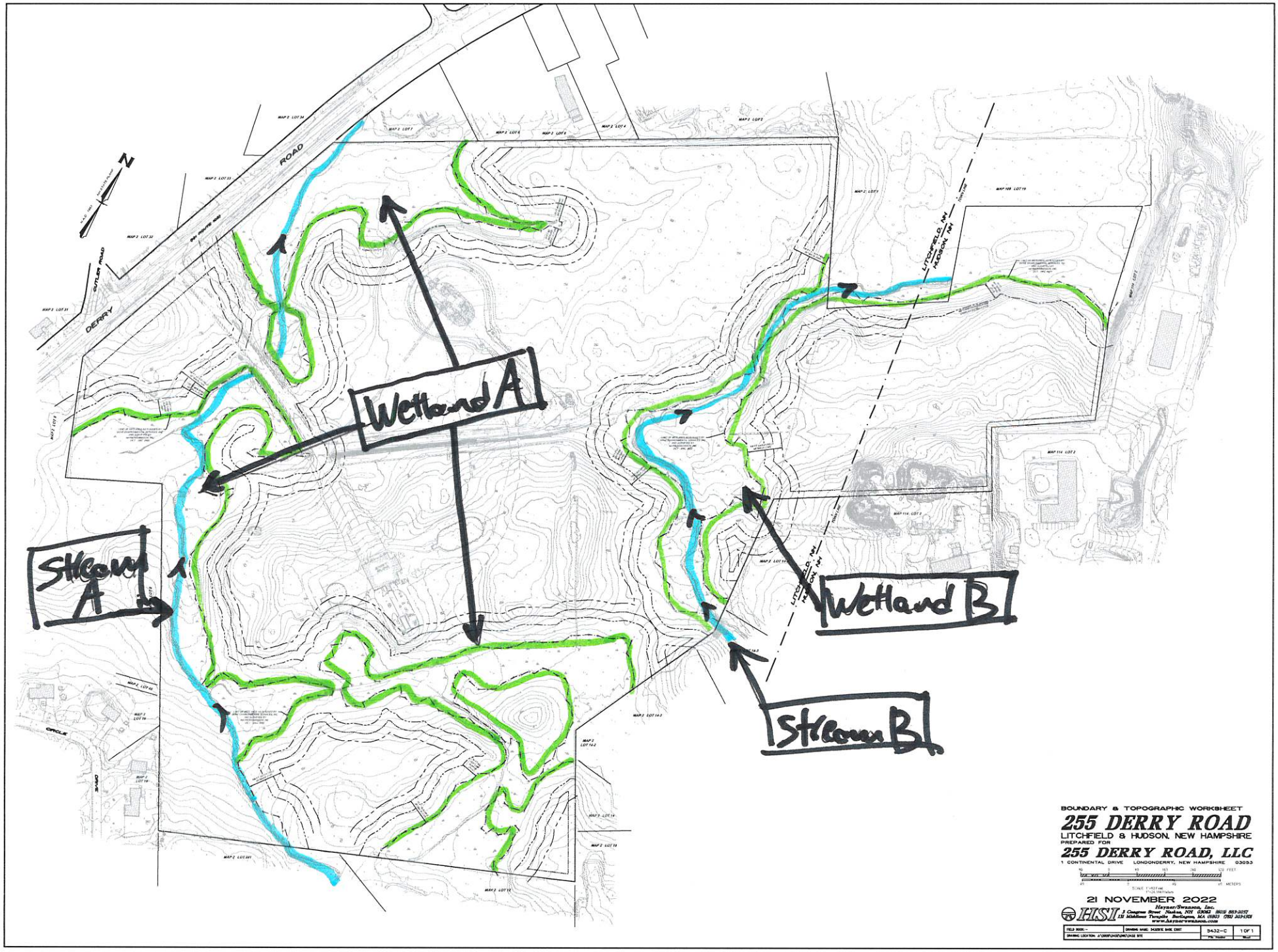
The presence of a perennial stream and 100-year floodplain and a within Wetland B are the characteristics most relevant to the principal functions of the wetland which were determined to be Flood flow Alteration, Bank Stabilization, and Wildlife Habitat. The 100-year floodplain indicates potential for significant flows which can be mitigated in the associated wetlands through storage and decrease in velocity. This function is supported more clearly in the lower section of the wetland where grades flatten out and stream flow becomes more convoluted. The upper sections of the wetlands are characterized by more channelized flows and provide less opportunity for water to spread out beyond the channel. This limits the degree to which the wetland can mitigate flood flow but highlights the importance of the adjacent forested wetland in stabilizing the banks of the stream. The more channelized nature of the upper part of the wetland is also why water quality function was determined to be limited to the lower reaches of the wetland and not principal functions of the wetland overall. The habitat associated with Wetland B is largely similar to Wetland A but with the added characteristic of a perennial stream. This greatly increases the wetland specific habitat available in the wetland.

This concludes the wetland delineation report. If I can be of further assistance, please feel free to contact me at (603) 778-0644.

Sincerely,

Brendan Quigley, NHCWS
Gove Environmental Services, Inc.

Enc. Wetlands Sketch Figure
Functional Assessment Forms
Wetland Photos


Wetland A
Stream A
Wetland B
Stream B
DERRY
ROAD
CUTLER ROAD
LITCHFIELD, NH
HUDSON, NH
BOUNDARY & TOPOGRAPHIC WORKSHEET
255 DERRY ROAD
LITCHFIELD & HUDSON, NEW HAMPSHIRE
PREPARED FOR
255 DERRY ROAD, LLC
1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053
21 NOVEMBER 2022
HSI
5432-C
1 OF 1

Wetland Function-Value Evaluation Form

Total area of wetland ~20 ac Human made? no Is wetland part of a wildlife corridor? NO or a "habitat island"? YES

Adjacent land use Commercial/Residential Development Distance to nearest roadway or other development <10'

Dominant wetland systems present PFO1E, R4SB4/5 Contiguous undeveloped buffer zone present NO

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland A

Latitude 42.80367 Longitude 71.42843

Prepared by: BJQ Date 5/23/23

Wetland Impact:
Type crossing Area ~6700SF

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	13		organic soils in aquifer area; limited transmissivety
Floodflow Alteration	Y	3,6,7,8,13,18		storage potential, organic soil
Fish and Shellfish Habitat	N			no permanent surface water
Sediment/Toxicant Retention	Y	1,4,10	X	adj sources, constricted outlet, organic soils
Nutrient Removal	Y	4,5,6,7,14	X	adj sources, constricted outlet, organic soils, long retention time following high water
Production Export	Y	1		common wildlife food sources assoc with forest
Sediment/Shoreline Stabilization	N			associated with intermittent stream only
Wildlife Habitat	Y	8,10,17	X	limited area of quality temperate swamp, poor connectivity, function as habitat island
Recreation	N			no surface water or wet-specific rec., private
Educational/Scientific Value	N			private, limited wetland type
Uniqueness/Heritage	N			common forested wetland
Visual Quality/Aesthetics	N			as open space only; common wetland type
ES Endangered Species Habitat	N			none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~6 ac Human made? no Is wetland part of a wildlife corridor? NO or a "habitat island"? YES

Adjacent land use Commercial/Residential Development Distance to nearest roadway or other development <10'

Dominant wetland systems present PFO1E, R2UB3 Contiguous undeveloped buffer zone present NO

Is the wetland a separate hydraulic system? no If not, where does the wetland lie in the drainage basin? low

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland B

Latitude 42.80754 Longitude 71.42416

Prepared by: BJQ Date 5/23/23

Wetland Impact:
Type crossing Area ~2380SF

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	Y	13		organic soils in aquifer area; limited by low transmissivety aquifer
Floodflow Alteration	Y	3,6,7,8,13,18	X	storage potential, portion in 100-year floodplain
Fish and Shellfish Habitat	N			perennial stream but observed dry, also likely barriers to fish passage
Sediment/Toxicant Retention	Y	1,5,10,11,12,		limited to lower area mostly off-site,upgradient areas predominantly channelized flow
Nutrient Removal	Y	4,10,11,13,14		imited to lower area mostly off-site, upgradient areas predominantly channelized flow
Production Export	Y	1		common wildlife food sources assoc with forest
Sediment/Shoreline Stabilization	Y	1,2,5	X	signs of high flow in channel, vegetation along bank provides stability
Wildlife Habitat	Y	7,8,10,17	X	limited area of quality temperate swamp, poor connectivity, function as habitat island
Recreation	N			no wet-specific rec., private
Educational/Scientific Value	N			private, limited wetland type
Uniqueness/Heritage	N			common forested wetland
Visual Quality/Aesthetics	N			as open space only; common wetland type
ES Endangered Species Habitat	N			none identified
Other				

Notes:

* Refer to backup list of numbered considerations.

Photos 1 and 2: Examples of good quality red maple swamp contained in Wetland A. Also shows intermittent stream, flowing following heavy rain.

Photo 3. Wetland A with adjacent maintained field in background

Photo 4. Typical area of dense invasive type growth at wetland edge and buffers

Photo 5. Pernnial Stream in Wetlabnd B. Strong fklow following heavy rain

Photo 6. Interior of Wetland B

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

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To: Ethan Beals
3 Congress Street
Nashua, NH 03062

From: NHB Review, NH Natural Heritage Bureau
Date: 2/24/2023 (valid until 02/24/2024)
Re: Review by NH Natural Heritage Bureau
Permits: MUNICIPAL POR - Litchfield/Hudson, NHDES - Alteration of Terrain Permit, NHDES - Wetland Standard Dredge & Fill - Major, USEPA - Stormwater Pollution Prevention

NHB ID: **NHB23-0586** Town: LITCHFIELD Location: 255 Derry Road
Description: The main body of the site is in Litchfield, A small portion of the property is Map 114 Lot 1 in Hudson. It is being proposed to construct a 172-townhouse unit residential development along with associated site improvements.
cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: No comments at this time.**
F&G: Please refer to NHFG consultation requirements below.

Vertebrate species	State[1]	Federal	Notes
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Eastern Hognose Snake (*Heterodon platirhinos*)	E	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle (*Clemmys guttata*)	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle (*Glyptemys insculpta*)	SC	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://wildlife.state.nh.us/wildlife/environmental-review.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

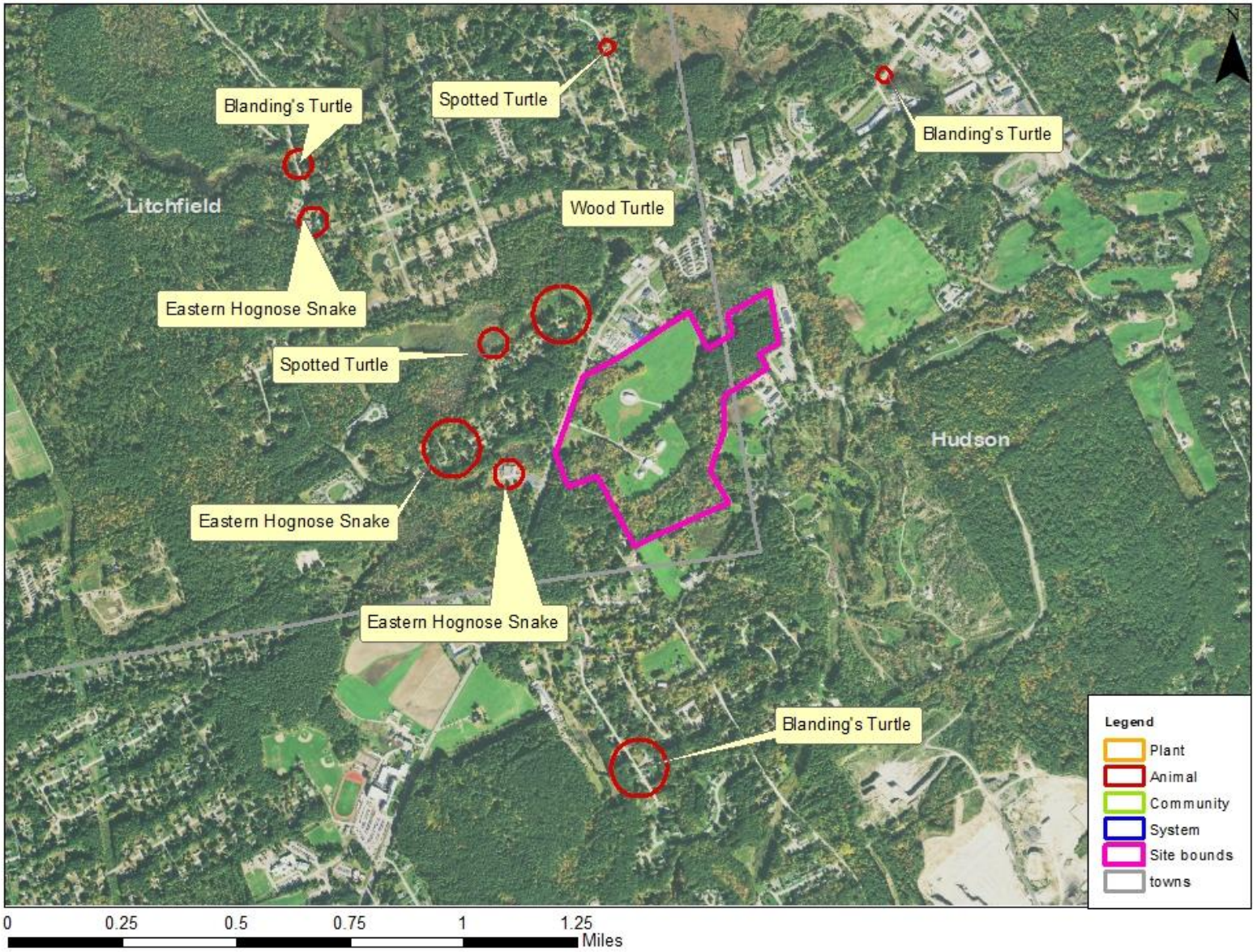
If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule)*, coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle *kim.tuttle@wildlife.nh.gov* with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and "review request" in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review



New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2003: Area 565: 1 adult. Plastron about 8" long.
General Area:	2003: Area 565: Terrestrial - floodplain forest habitat along Chase Brook is a series of forested wetlands, swamps, and marshes. The road crossing at Albuquerque is a narrow section and has forested wetland with maples and pines to the east. The stream to the west quickly leads to an extensive cattail/loosestrife beaver marsh.
General Comments:	--
Management Comments:	--

Location

Survey Site Name:	Nesenkeag Brook
Managed By:	Litchfield- Albuquerque Ave
County:	Hillsborough
Town(s):	Litchfield
Size:	1.9 acres
Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2003: Area 565: Albuquerque Ave at the crossing of Chase brook with Albuquerque Ave.

Dates documented

First reported:	2003	Last reported:	2003

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2018: Area 14520: 1 adult observed, sex unknown.
General Area: 2018: Area 14520: Road crossing between forested wetland and shrub wetland.
General Comments: --
Management Comments: --

Location

Survey Site Name: Nesenkeag Brook
Managed By:

County: Hillsborough
Town(s): Hudson
Size: .4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2018: Area 14520: Derry Road, Hudson, at the crossing of Chase Brook.

Dates documented

First reported: 2018-05-08 Last reported: 2018-05-08

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2009: Area 12302: 1 observed; shell was 10-12" long.
General Area: 2009: Area 12302: Backyard water garden.
General Comments: --
Management Comments: --

Location

Survey Site Name: Robinson Pond
Managed By:

County: Hillsborough
Town(s): Hudson
Size: 7.7 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2009: Area 12302: 16 Melba Drive, Hudson.

Dates documented

First reported: 2009-06-27 Last reported: 2009-06-27

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Eastern Hognose Snake (*Heterodon platirhinos*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2013: Area 13481: 1 adult observed sex unknown. 2011: Area 12922: 3 hatchlings observed. 2005: Area 11711: 1 adult seen.
General Area:	2013: Area 13481: Residential area with coniferous forest. 2011; Area 12922: At door of school. 2005: Area 11711: Residential garden.
General Comments:	2013: Area 13481: Observation comment: snake was killed by landowner.
Management Comments:	--

Location

Survey Site Name: Cutler Road, Litchfield
Managed By:

County: Hillsborough
Town(s): Litchfield
Size: 11.5 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13481: Between #65 and #61 Page Road, Litchfield. 2011: Area 12922: Tabernacle Christian School in Litchfield. 2005: Area 11711: 21 Cutler Road, approx 200' off of road in garden.

Dates documented

First reported: 2005-08-15 Last reported: 2013-05-10

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Spotted Turtle (*Clemmys guttata*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank:	--
Detailed Description:	2015: Area 14083: 1 adult observed, sex unknown. 2005: Area 9306: 1 adult male turtle observed. 1992: Four adult turtles observed: one 12-14 year old with carapace 114 cm and plastron 92 cm, sex undetermined; one ca. 12 year old very active female with carapace 125 cm and plastron 100 cm; one 11 or 12 year old very inactive female with carapace 127 cm and plastron 100 cm; and one 14-15 year old female with carapace 115 cm and plastron 92 cm.
General Area:	2015: Area 14083: Residential yard [property backs up to wetlands associated with Chase Brook]. 2005: Area 9306: Residential lot surrounded by some agriculture. 1992: Adjacent to a large wetland.
General Comments:	1992: Drawings of each turtle's most distinctive spots and other markings included.
Management Comments:	--

Location

Survey Site Name: Cutler Road, north of
Managed By:

County: Hillsborough
Town(s): Litchfield
Size: 2.6 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2015: Area 14083: In yard at 21 Mayflower Drive, Litchfield. 2005: Area 9306: [Rte 3A ca. 2.8 miles north of the junction with Rte. 111 in Nashua.] 1992: Adjacent to a large wetland at 19 Woodburn Drive, near Cutler Road, [west of Rte. 102, in the southeast corner of Litchfield.]

Dates documented

First reported: 1992-06-08 Last reported: 2015-06-15

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Wood Turtle (*Glyptemys insculpta*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Rare or uncommon
State:	Special Concern	State:	Rare or uncommon

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank: --

Detailed Description: 2008: Area 11578: 1 adult seen.
General Area: 2008: Area 11578: In backyard of observer.
General Comments: --
Management Comments: --

Location

Survey Site Name: Cutler Road, north of
Managed By:

County: Hillsborough
Town(s): Litchfield
Size: 7.7 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

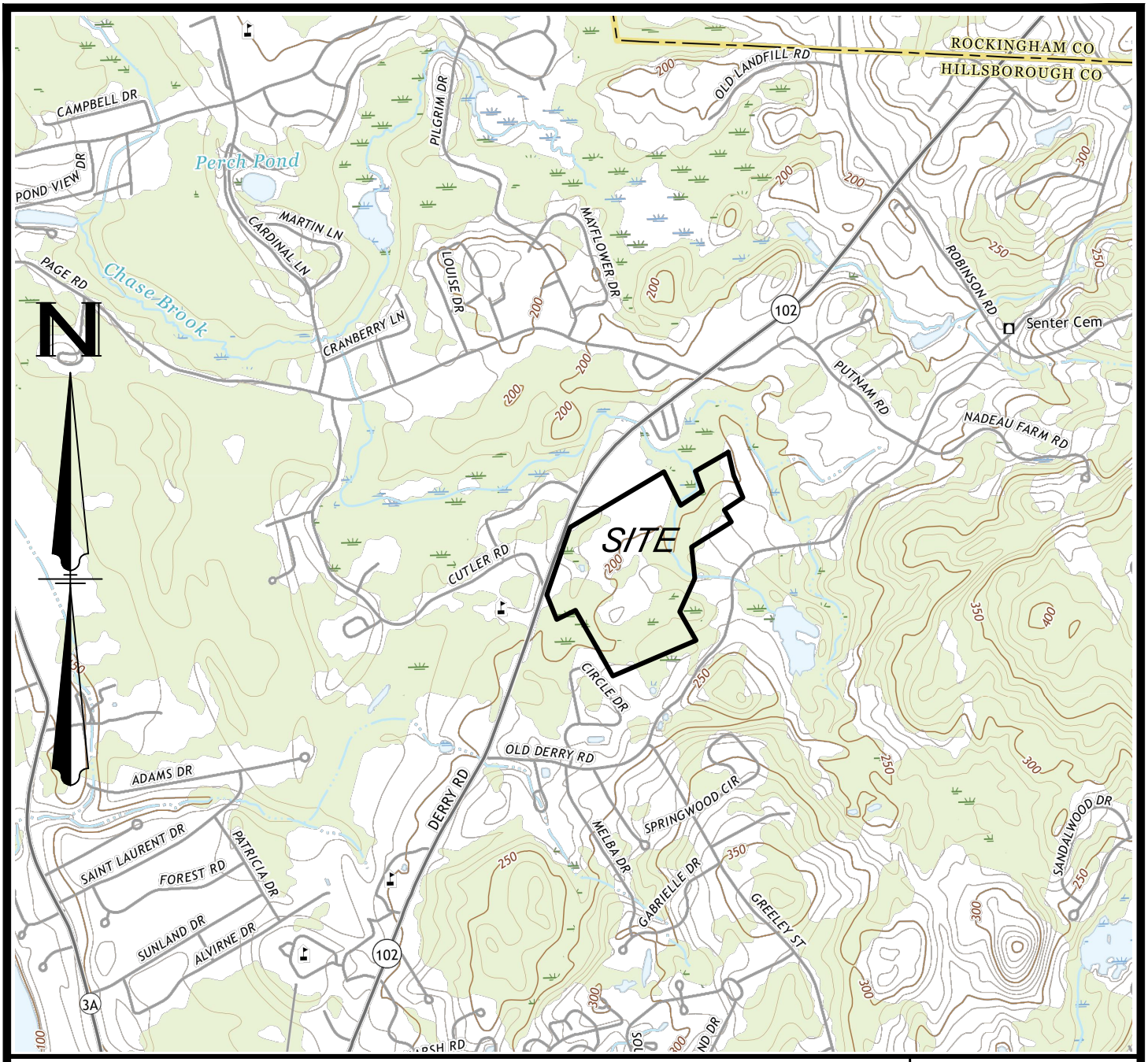
Directions: 2008: Area 11578: 5 Woodburn Drive, Litchfield.

Dates documented

First reported:	2008-06-21	Last reported:	2008-06-21

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

EXHIBITS



1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

NASHUA NORTH, NH
QUAD MAP (2021)

FIG. 1

VICINITY PLAN

PROPOSED RESIDENTIAL DEVELOPMENT

255 DERRY ROAD

LITCHFIELD/HUDSON, NH

PREPARED FOR:

255 DERRY ROAD, LLC

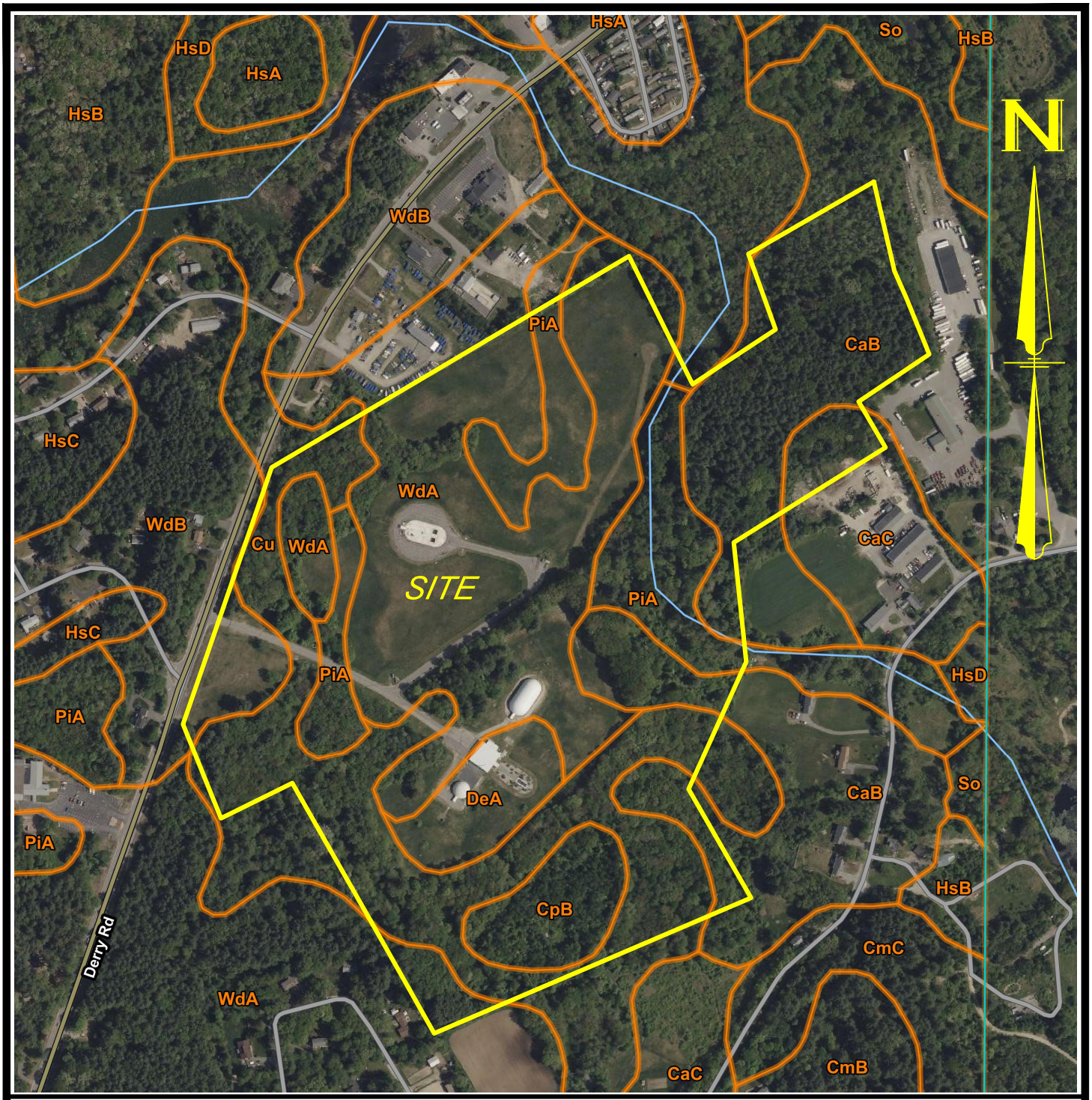
1 CONTINENTAL DRIVE LONDONDERRY, NH 03053

FEBRUARY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 5432SITE-USGS
Location: J:\5000\5432\DWG\5432 SITE

5432
File Number



0 500 1,000 1,500 FEET

SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPT. OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/ ACCESSED DECEMBER 22 2022.

FIG. 2

NRCS SOILS MAP

PROPOSED RESIDENTIAL DEVELOPMENT

255 DERRY ROAD

LITCHFIELD/HUDSON, NH

PREPARED FOR:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NH 03053

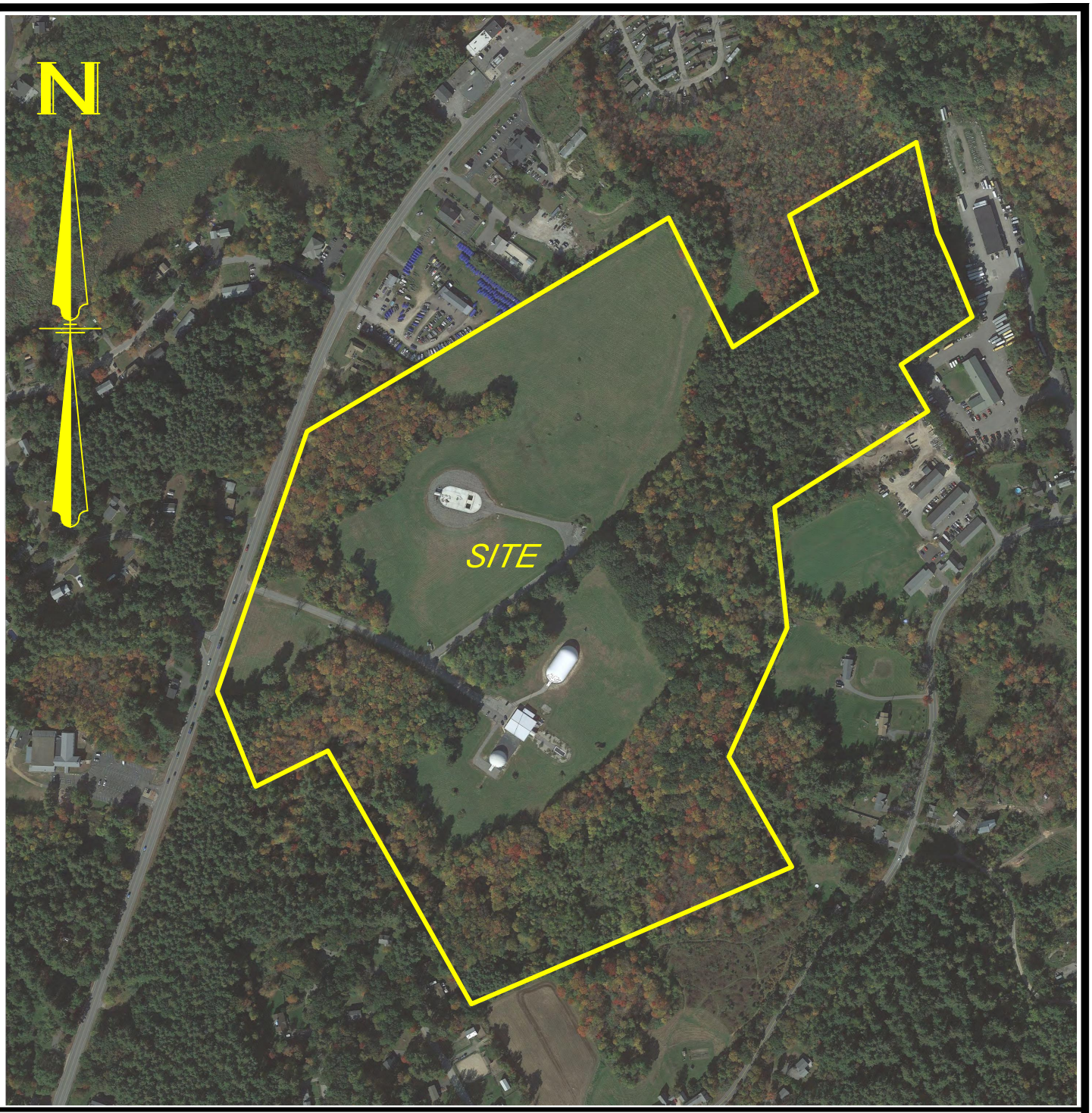
FEBRUARY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 5432SITE-USGS

Location: J:\5000\5432\DWG\5432 SITE

5432 File Number



0 500 1,000 1,500 FEET

AERIAL DISPLAY PLAN

PROPOSED RESIDENTIAL DEVELOPMENT

255 DERRY ROAD

LITCHFIELD/HUDSON, NH

FIG. 3

PREPARED FOR:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NH 03053

FEBRUARY 2023

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131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 5432SITE-USGS

Location: J:\5000\5432\DWG\5432 SITE

5432 File Number

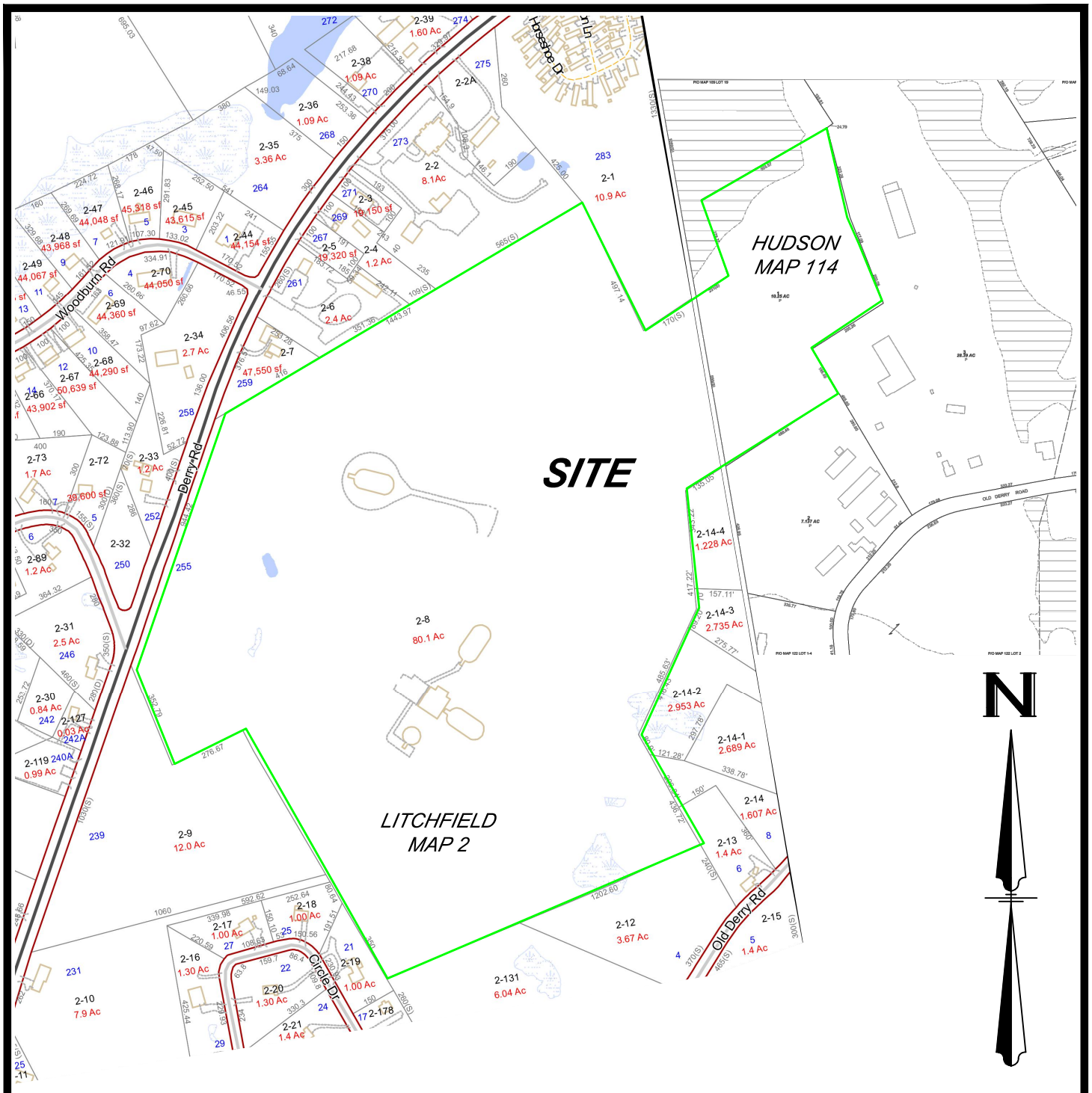


FIG. 4

TAX MAP

PROPOSED RESIDENTIAL DEVELOPMENT

255 DERRY ROAD

LITCHFIELD/HUDSON, NH

PREPARED FOR:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NH 03053

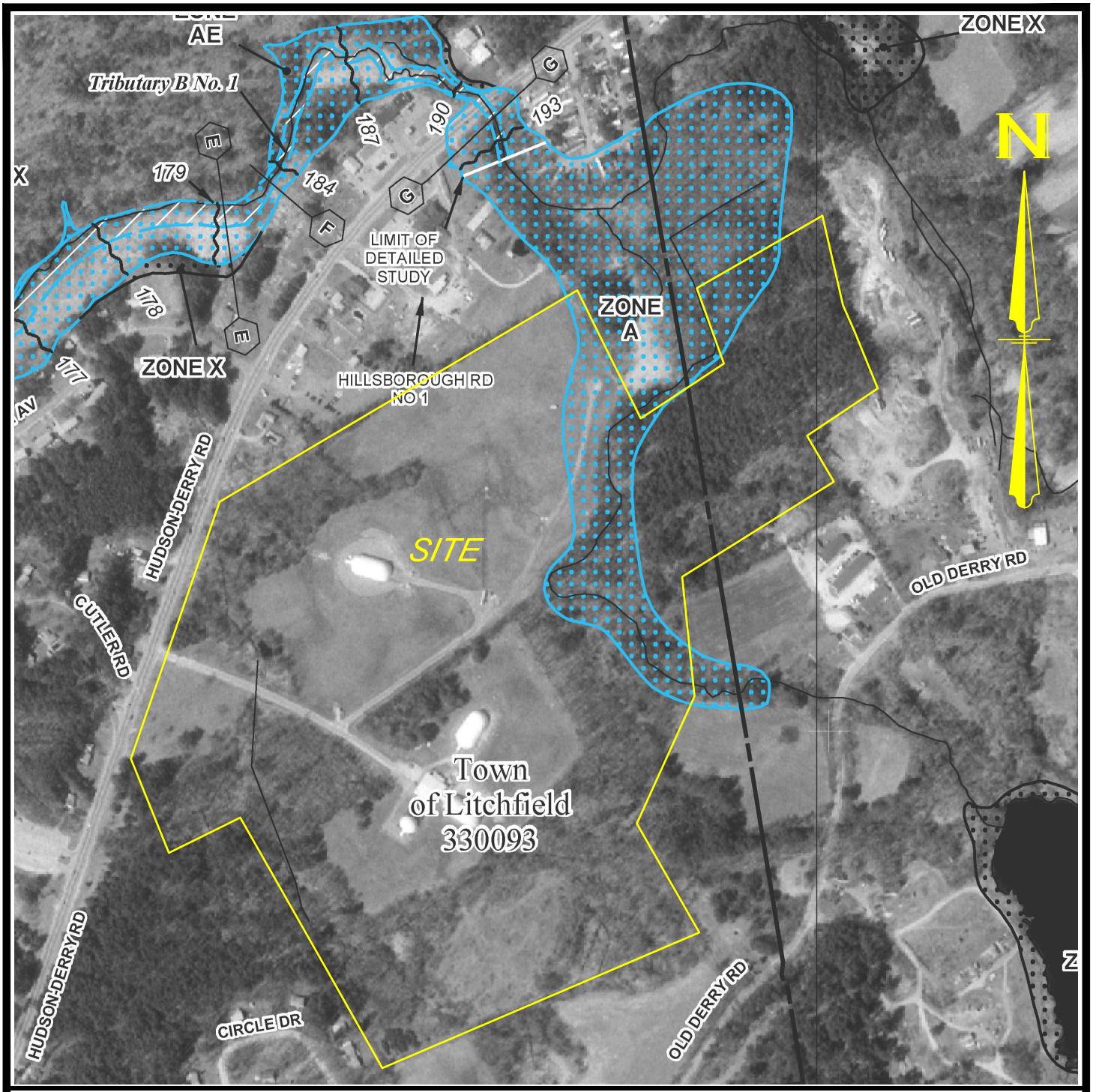
FEBRUARY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 5432SITE-USGS

Location: J:\5000\5432\DWG\5432 SITE

5432 File Number



0 500 1,000 1,500 FEET

FIRM: HILLSBOROUGH COUNTY, NEW HAMPSHIRE
TOWN OF HUDSON COMMUNITY No. 330092
TOWN OF LITCHFIELD COMMUNITY No. 330093
MAP No. 33011C0516D
EFFECTIVE DATE: SEPTEMBER 25, 2009

FLOOD INSURANCE RATE MAP
PROPOSED RESIDENTIAL DEVELOPMENT
255 DERRY ROAD
LITCHFIELD/HUDSON, NH

FIG. 5

PREPARED FOR:
255 DERRY ROAD, LLC
1 CONTINENTAL DRIVE LONDONDERRY, NH 03053
FEBRUARY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 5432SITE-USGS
Location: J:\5000\5432\DWG\5432 SITE

5432
File Number

N

N.H. STATE PLANE

N.A.D. 1983

POA COMBINED

POA NORTHWEST

POA NORTHEAST

POND 1

POND 2

NW1

NW2

NW3

R1

R2

R3

NE

SW

SE

OFF 1

OFF 2

OFF 3

MAP 2 LOT 34

MAP 2 LOT 33

MAP 2 LOT 32

MAP 2 LOT 31

MAP 2 LOT 7

MAP 2 LOT 6

MAP 2 LOT 6

MAP 2 LOT 4

MAP 2 LOT 2

MAP 2 LOT 1

MAP 2 LOT 9

MAP 2 LOT 10

MAP 2 LOT 18

MAP 2 LOT 19

MAP 2 LOT 131

MAP 2 LOT 12

MAP 2 LOT 13

MAP 2 LOT 14

MAP 2 LOT 14-2

MAP 2 LOT 14-3

MAP 2 LOT 14-4

MAP 114 LOT 1

MAP 114 LOT 2

MAP 114 LOT 3

PART OF MAP 2 LOT 1 PER LITCHFIELD TAX MAP

PART OF MAP 109 LOT 19 PER HUDSON TAX MAP

ROAD

DERRY

CUTLER ROAD

NH ROUTE 102

CIRCLE

DRIVE

TOWN LINE

LITCHFIELD, NH

HUDSON, NH

LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT - DEC. 2022

fc

LEGEND

- fc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT
- SOIL TYPE BOUNDARY
- 12B — SOIL TYPE

PRELIMINARY
DESIGN REVIEW

No.	DATE	REVISION	BY

PRE-DEVELOPMENT COLORED SOILS MAP

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE & HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

80 0 80 160 240 320 FEET

40 0 40 80 METERS

SCALE: 1"=80 Feet
1"=24.384 Meters

28 FEBRUARY 2023

Hayner/Swanson, Inc.
HSI 3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-DAMAP COLORED SOILS	5637 SITE	FIG. 6
DRAWING LOC: J: \5000\5432\DWG\5432 SITE		File Number	Sheet

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

N

N.H. STATE PLANE

N.A.D. 1983

POA COMBINED

POA NORTHWEST

POA NORTHEAST

POND 1

POND 2

POND 3

R1 R2 R3 R4 NW1 NW3 SW NE1 NE2 SE

OFF 1 OFF 2 OFF 3 OFF 4

MAP 2 LOT 34

MAP 2 LOT 7

MAP 2 LOT 6

MAP 2 LOT 4

MAP 2 LOT 2

MAP 2 LOT 33

MAP 2 LOT 32

MAP 2 LOT 31

MAP 2 LOT 9

MAP 2 LOT 10

MAP 2 LOT 18

MAP 2 LOT 19

MAP 2 LOT 131

MAP 2 LOT 12

MAP 2 LOT 13

MAP 2 LOT 14

MAP 2 LOT 14-2

MAP 2 LOT 14-3

MAP 2 LOT 14-4

PART OF MAP 2 LOT 1 PER LITCHFIELD TAX MAP

PART OF MAP 109 LOT 19 PER HUDSON TAX MAP

MAP 114 LOT 3

MAP 114 LOT 2

MAP 114 LOT 3

CIRCLE

DRIVE

LITCHFIELD, NH

HUDSON, NH

LEGEND

- Tc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT
- SOIL TYPE BOUNDARY
- 12B — SOIL TYPE
- DA TO SMA 'A'
- DA TO SMA 'B'
- DA TO SMA 'C'
- DA TO SMA 'E'
- DA TO SMA 'H'
- DA TO SMA 'G'

PRELIMINARY
DESIGN REVIEW

No.	DATE	REVISION	BY

POST-DEVELOPMENT COLORED SOILS MAP

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE
& HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

80 0 80 160 240 320 FEET

40 0 40 80 METERS

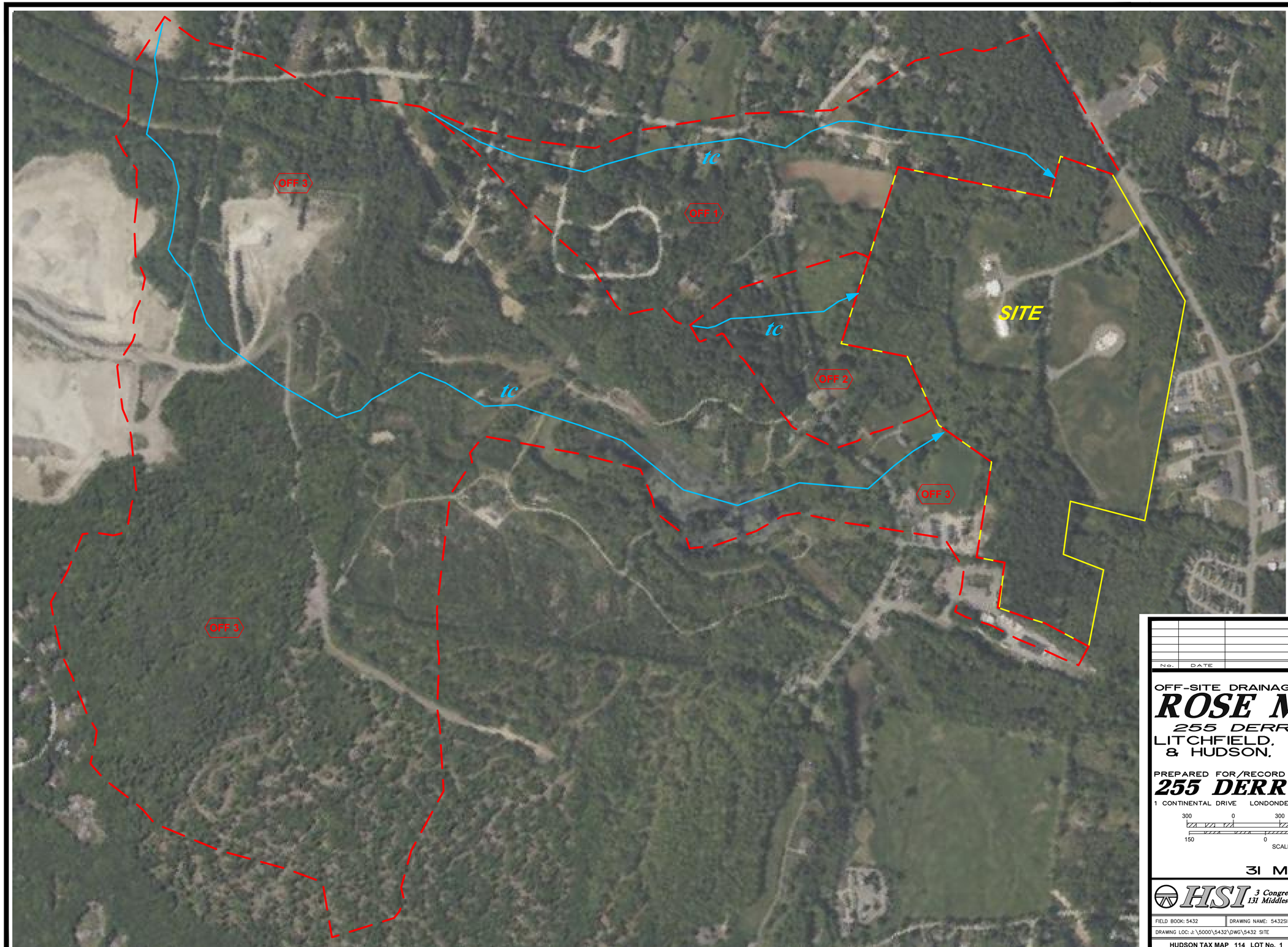
SCALE: 1"=80 Feet
1"=24.384 Meters

28 FEBRUARY 2023

Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-DAMAP COLORED SOILS	5637 SITE	FIG. 7
DRAWING LOC: J:\5000\5432\DWG\5432 SITE		File Number	Sheet

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8



No.	DATE	REVISION	BY

OFF-SITE DRAINAGE AREA MAP

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE
& HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

300 0 300 600 900 1,200 FEET

150 0 150 300 METERS

SCALE: 1"=300 Feet
1"=91.441 Meters

31 MAY 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-DAMAP OFFSITE	5432 File Number	1 OF 1 Sheet
DRAWING LOC: J:\5000\5432\DWG\5432 SITE			

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

N

N.H. STATE PLANE

N.A.D. 1983

POA COMBINED

POA NORTHWEST

POA NORTHEAST

POND 1

POND 2

NW1

NW2

NW3

NE

SE

SW

R1

R2

R3

OFF 1

OFF 2

OFF 3

ROAD

DERRY

ROUTE 102

CUTLER ROAD

CIRCLE

DRIVE

LITCHFIELD, NH

HUDSON, NH

TOWN LINE

MAP 2 LOT 34

MAP 2 LOT 33

MAP 2 LOT 32

MAP 2 LOT 31

MAP 2 LOT 1

MAP 2 LOT 7

MAP 2 LOT 6

MAP 2 LOT 5

MAP 2 LOT 4

MAP 2 LOT 2

MAP 2 LOT 9

MAP 2 LOT 10

MAP 2 LOT 18

MAP 2 LOT 19

MAP 2 LOT 131

MAP 2 LOT 12

MAP 2 LOT 14

MAP 2 LOT 13

MAP 2 LOT 14-2

MAP 2 LOT 14-3

MAP 2 LOT 14-4

PART OF MAP 2 LOT 1 PER LITCHFIELD TAX MAP

PART OF MAP 109 LOT 19 PER HUDSON TAX MAP

MAP 114 LOT 1

MAP 114 LOT 2

MAP 114 LOT 3

LIMIT OF WETLANDS AS FLAGGED BY GOVE ENVIRONMENTAL SERVICES, INC. AND SURVEYED BY HAYNER/SWANSON, INC. OCT. - DEC. 2022

tc

LEGEND

- tc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT
- SOIL TYPE BOUNDARY
- 12B — SOIL TYPE

PRELIMINARY
DESIGN REVIEW

No.	DATE	REVISION	BY

PRE-DEVELOPMENT DRAINAGE AREA MAP

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE
& HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

80 0 80 160 240 320 FEET

40 0 40 80 METERS

SCALE: 1"=80 Feet
1"=24.384 Meters

28 FEBRUARY 2023

Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432 | DRAWING NAME: 5432SITE-DAMAP | 5637 SITE | FIG. 6

DRAWING LOC: J:\5000\5432\DWG\5432 SITE | File Number | Sheet

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

N

N.A.D. 1983 NH STATE PLANE

POA COMBINED

POA NORTHWEST

POA NORTHEAST

POND 1

POND 2

POND 3

MAP 2 LOT 34

MAP 2 LOT 33

MAP 2 LOT 32

MAP 2 LOT 31

MAP 2 LOT 9

MAP 2 LOT 7

MAP 2 LOT 6

MAP 2 LOT 4

MAP 2 LOT 2

PART OF MAP 2 LOT 1 PER LITCHFIELD TAX MAP

PART OF MAP 109 LOT 19 PER HUDSON TAX MAP

MAP 114 LOT 3

MAP 114 LOT 2

MAP 2 LOT 14-4

MAP 2 LOT 14-3

MAP 2 LOT 14-2

MAP 2 LOT 14

MAP 2 LOT 13

MAP 2 LOT 12

MAP 2 LOT 131

MAP 2 LOT 10

MAP 2 LOT 18

MAP 2 LOT 19

LITCHFIELD, NH

HUDSON, NH

CIRCLE

DRIVE

NW1 NW3 R1 R2 R3 R4 SW SE NE1 NE2 OFF 1 OFF 2 OFF 3 OFF 4

LEGEND

- Tc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT
- SOIL TYPE BOUNDARY
- 12B — SOIL TYPE
- DA TO SMA 'A'
- DA TO SMA 'B'
- DA TO SMA 'C'
- DA TO SMA 'E'
- DA TO SMA 'H'
- DA TO SMA 'G'

PRELIMINARY
DESIGN REVIEW

No.	DATE	REVISION	BY

POST-DEVELOPMENT DRAINAGE AREA MAP

ROSE MEADOWS

255 DERRY ROAD NH ROUTE 102

LITCHFIELD, NEW HAMPSHIRE
& HUDSON, NEW HAMPSHIRE

PREPARED FOR/RECORD OWNER:

255 DERRY ROAD, LLC

1 CONTINENTAL DRIVE LONDONDERRY, NEW HAMPSHIRE 03053 (603) 437-5387

80 0 80 160 240 320 FEET

40 0 40 80 METERS

SCALE: 1"=80 Feet
1"=24.384 Meters

28 FEBRUARY 2023

Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 5432	DRAWING NAME: 5432SITE-DAMAP	5637 SITE	FIG. 7
DRAWING LOC: J:\5000\5432\DWG\5432 SITE		File Number	Sheet

HUDSON TAX MAP 114 LOT No. 1 LITCHFIELD TAX MAP 2 LOT No. 8

TRAFFIC IMPACT AND ACCESS STUDY

RESIDENTIAL DEVELOPMENT
LITCHFIELD, NEW HAMPSHIRE

GPI

116 South River Road
Building B, Suite 1
Bedford, NH 03110
(603) 766-5229

SUBMITTED TO:

255 Derry Road, LLC
1 Continental Drive
Londonderry, New Hampshire 03053

May 2023

(GPI Project No.: NEX-2200467.00)

255 Derry Road, LLC
Residential Development
Traffic Impact and Access Study
May 30, 2023

TECHNICAL MEMORANDUM

REF: NEX-2200467.00

DATE: May 30, 2023

TO: 255 Derry Road, LLC
1 Continental Drive
Londonderry, NH 03053

FROM: Mr. Robert E. Bollinger, P.E., PTOE, Traffic Engineering Department Head
Ms. Cecilia Donaldson, Assistant Designer

RE: Traffic Impact and Access Study
Residential Development
255 Derry Road (NH Route 102)
Litchfield, New Hampshire

INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed residential development to be located at 255 Derry Road (NH Route 102) in Litchfield, New Hampshire. The site is currently occupied by a BAE Systems testing facility. The project consists of razing all existing on-site structures and constructing 172 townhouse style single-family residential homes. Access and egress are proposed to the site via the existing full-access driveway on the east side of Derry Road, approximately 250-feet north of Cutler Road. The site location in relation to the surrounding roadways is shown on the map on Figure 1.

EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets. In preparing the TIAS for the proposed site, the following unsignalized intersections have been analyzed and evaluated:

- Derry Road at the Site Driveway
- Derry Road at Cutler Road

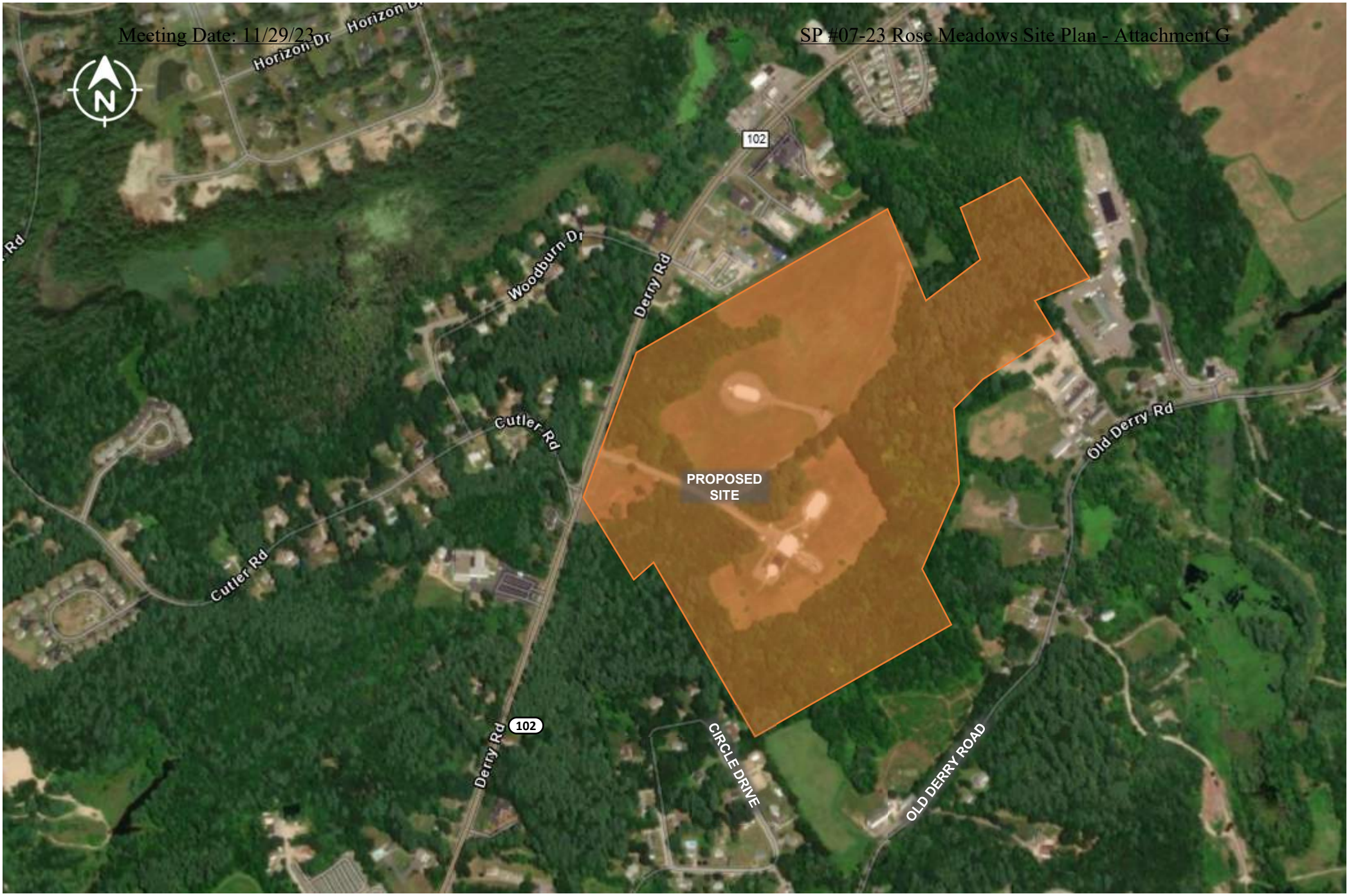


FIGURE 1
SITE LOCATION MAP

GPI Greenman-Pedersen, Inc.
RESIDENTIAL DEVELOPMENT – LITCHFIELD, NEW HAMPSHIRE

Derry Road (NH Route 102)

Derry Road is classified as an urban principal arterial under the jurisdiction of the New Hampshire Department of Transportation (NHDOT). Derry Road runs in a general northeast/southwest direction in the study area, with one general purpose trave lane in each direction, separated by a double-yellow centerline. Five- to six-foot paved shoulders are provided on both sides of the roadway, and are delineated by single white edge lines. Land uses along Derry Road consist of residential, commercial, and institutional properties, along with areas of wooded space. Neither pedestrian nor bicycle accommodations are provided. The posted speed limit is 45 mph in both directions.

Cutler Road

Cutler Road is classified as a local road under the jurisdiction of the Town of Litchfield, that runs between Derry Road and Page Road to the north. Cutler Road is approximately 20-feet in width, accommodating two-way travel separated by a double-yellow centerline. One- to two-foot paved are provided on both sides of the roadway, and are delineated by single white edge lines. Land uses along Cutler Road are primarily residential, with areas of wooded space. Neither pedestrian nor bicycle accommodations are provided. The posted speed limit is 30 mph; however, it should be noted that there are several advisory speed limit warning signs (25 mph) west of Derry Road.

Derry Road at the Existing Site Driveway

The existing site driveway intersects Derry Road from the east to form this three-legged “T” type intersection with the minor approach (existing site driveway) operating under stop control; however, there is neither a stop sign, nor supplemental stop line provided. The driveway is a private roadway that provides access to the BAE facility. At the intersection, the existing site driveway approach measures approximately 25 feet with no pavement markings separating travel directions. The northbound and southbound Derry Road approaches are each comprised of a 12-foot general purpose travel from which all maneuvers are completed.

Derry Road at Cutler Road

Cutler Road intersects Derry Road from the west to form this three-legged intersection with the minor approach (Cutler Road) operating under stop-sign control. Cutler Road bifurcates on its approach to Derry Road, via a grass channelization island, allowing two-way traffic on all three sides of the island. This geometric configuration creates many more conflict points than are normally associated with a three-legged intersection. Field observations indicate that the southerly spur of the Cutler Road approach to Derry Road primarily accommodates traffic volume movements to and from the south on Derry Road, while the northerly spur of the Cutler Road approach to Derry Road primarily accommodates traffic volume movements to and from the north on Derry Road. Each respective Cutler Road spur provides a 10- to 11-foot wide approach lane. The northbound and southbound Derry Road approaches are each comprised of a 12-foot general purpose travel from which all maneuvers are completed.

Public Transportation

No public transportation facilities were identified in the Town of Litchfield. The closest public transportation provider is the Nashua Transit System, which operates multiple bus lines within the city of Nashua. The System originates from the Transit Center on Elm Street in downtown Nashua, approximately 5 miles from the subject site. There are seven different routes during the weekday, two (one north and one south) during weekday nights, and three (one north, one south, one central) during Saturdays. Summary sheets on the bus lines are located in the appendix.

Traffic Volumes

Baseline traffic conditions within the study area were developed by conducting manual-turning movement counts (TMCs) and vehicle classification counts in February 2023. The counts were performed during the weekday AM peak period (7:00 to 9:00 AM), weekday PM peak period (4:00 to 6:00 PM). These data were supplemented by automatic traffic recorder (ATR) counts, also taken in February 2023, to obtain weekday daily traffic volumes and speed data on Derry Road, just north of the existing site driveway. Due to equipment malfunction, the ATR counts were conducted the week after the TMCs were collected. All traffic-count data are provided in the Appendix.

COVID-19 Pandemic Adjustment

Due to the COVID-19 pandemic, current traffic volumes may vary from typical historic conditions. In order to determine what additional data adjustment may be required to reflect pre-pandemic traffic conditions, traffic-count data from a NHDOT continuous count station[1] were reviewed. The count station was chosen based on proximity, functional classification, and average daily volume. A comparative analysis was conducted between the full month of December 2019 and December 2023, the last full month for which data were available at the time of publication of this study.

The results of this analysis indicate the following upward adjustments in order to reflect pre-pandemic traffic-volume conditions:

- Weekday Daily 1.01
- Weekday AM Peak Hour 1.01
- Weekday PM Peak Hour 1.02

Supporting documentation for these results is included in the Appendix.

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. Based on NHDOT guidelines for the preparation of a traffic study, existing traffic volumes must represent the peak of the monthly average peak-hour conditions. To determine if the data needed to be adjusted to account for this fluctuation, seasonal adjustment and historical count data provided by NHDOT were reviewed.[2] This information revealed that February traffic volumes are 18-percent lower than peak-month conditions. Therefore, the traffic counts were upwardly adjusted to reflect peak-month conditions, as needed. The NHDOT seasonal adjustment factors are provided in the Appendix.

Table 1 summarizes the existing daily and peak-hour traffic volumes on Derry Road, north of the existing site driveway. The 2023 Existing traffic-flow networks for the weekday AM, weekday PM peak hours are shown graphically on Figure 2.

[1] *NHDOT Count Station 02489001 – NH 28 South of Libbey Rd North Intersection (SB-NB) – Windham.*

[2] *NHDOT Data Management System*; Group 4 (Urban Highways) Averages, 2019.

TABLE 1
Existing Traffic Volume Summary

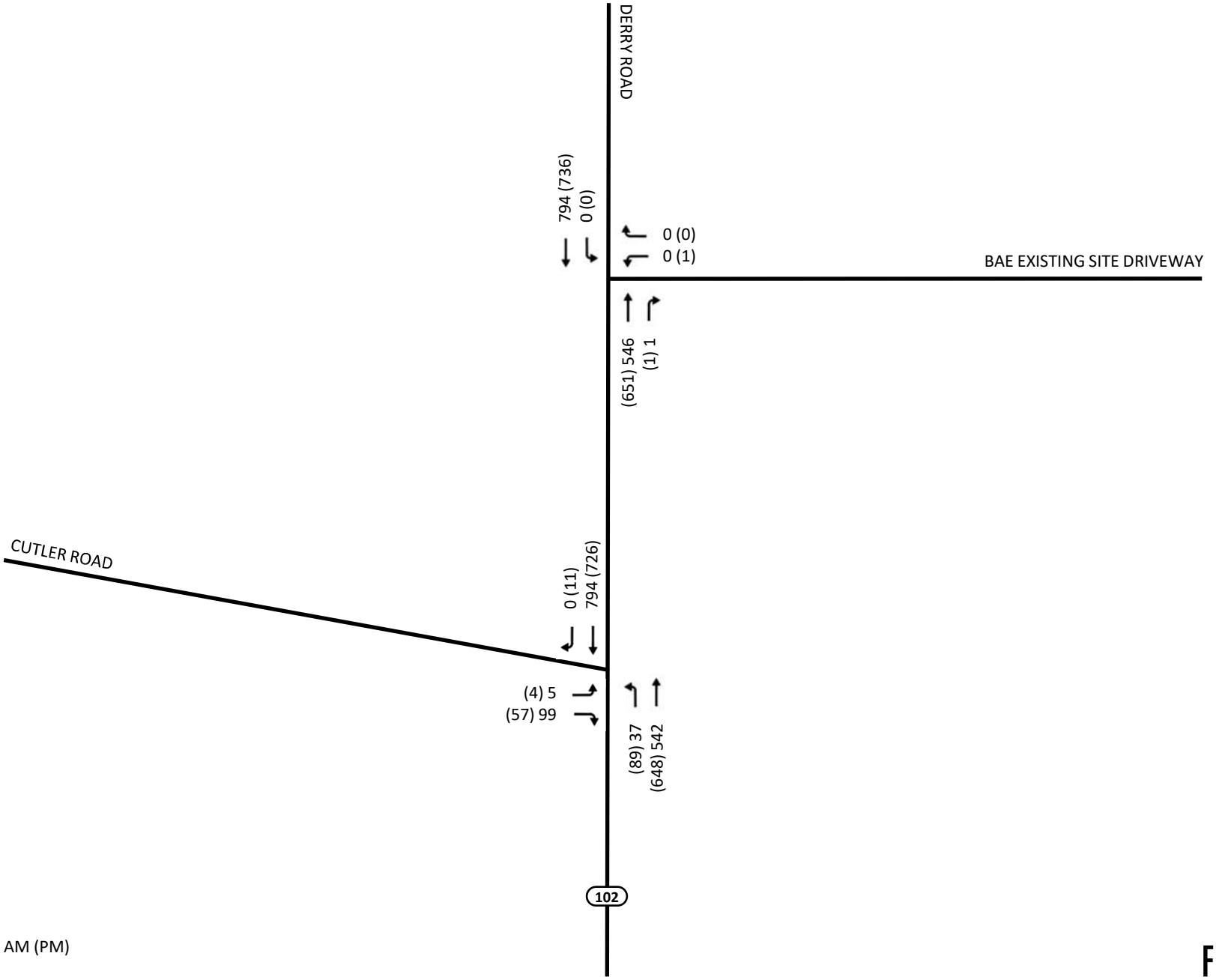
Location/Time Period	Daily Volume (vpd) [a]	Peak Hour Volume (vph) [b]	K Factor (%) [c]	Directional Distribution [d]
Derry Road, north of Existing Site Driveway:				
Weekday Daily	16,650			
Weekday AM Peak Hour		1,340	8.1	59% SB
Weekday PM Peak Hour		1,387	8.3	53% SB

[a] In vehicles per day. Based on ATR count collected on Tuesday, February 14, 2023, upward adjusted to represent pre-pandemic, peak-month conditions.

[b] In vehicles per hour. Volumes obtained from Figure 2.

[c] Percentage of daily traffic occurring during the peak hour.

[d] NB = northbound, SB = southbound. Percentages from volumes on Figure 2.



XX (XX) = AM (PM)

FIGURE 2

2023 EXISTING PEAK HOUR TRAFFIC VOLUMES

Collisions

Collision data from NHDOT for the study areas was researched for the latest five-year period available. The intersection of Derry Road at Cutler Road experienced two collisions over the study period of five years, for an average of 0.2 collisions per year. Both of the collisions resulted in property damage only. One crash was identified as a head on collision, while the other was identified as a rear end. One crash occurred during wet/icy conditions, and one crash occurred during the commuter peak. Despite the unconventional geometric configuration of the intersection of Derry Road at Cutler Road, there does not appear to be a significant crash history, nor is there any discernable crash pattern. The intersection of Derry Road and the existing site driveway did not experience any collisions during the five-year study period. A separate request for collision data was made to the Litchfield Police Department; however, at the time of publication of this report, no data had been received.

Vehicle Speeds

Vehicle speed measurements were conducted along Derry Street via pneumatic tubes as part of the data collected in February 2023. The primary use of this information is explained in the *Sight Distance* section where the speeds are correlated to sight distance measurements taken at the site driveway location to assure that adequate sight distances exist to provide safe operation. The speed data is provided in the Appendix and the results of the speed measurements are summarized in Table 2.

TABLE 2
Observed Travel Speeds

Location/Direction	Posted Speed Limit [a]	Average Speed [b]	85th Percentile Speed [c]
Derry Road, north of the existing site driveway:			
Southbound	45	40	45
Northbound	45	41	44

[a] In miles per hour (mph).

[b] Average speed at which observed vehicles travel.

[c] Speed at or below which 85 percent of all observed vehicles travel.

As shown in Table 2, the average and 85th percentile speeds demonstrate general compliance with the posted speed limit of 45 mph on Derry Road adjacent to the proposed site.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway on Derry Road to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[3] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. In addition, the available sight distances were compared with the NHDOT requirement of 400-feet of All-Season Safe Sight Distance.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveway on Derry Road were measured and compared to minimum requirements as established by AASHTO. Based on the posted and observed speeds, the SSD and ISD requirements were calculated. The sight distance calculations are provided in the Appendix. The required minimum sight distances are compared to the available distances, as shown in Table 3.

[3] *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2018.

TABLE 3
Sight Distance Summary

	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
Location/Direction	**Measured**	**Minimum Required [a]**	**Measured**	**Minimum Required [b]**	**Desirable [c]**
Derry Road at the proposed site driveway:					
North of driveway (SB)	500+	360	500+	360	500
South of driveway (NB)	500+	360	500+	360	430

[a] Values based on the 85th percentile speeds of 45 mph southbound and the speed limit on Derry Road of 45 mph northbound, since the 85th percentile speed was lower than the speed limit.

[b] Values based on AASHTO requirements for SSD.

[c] Values based on AASHTO requirements for ISD for posted speed limit of 45 mph on Derry Road.

As indicated in Table 3, the available sight distances for the proposed site driveway on Derry Road exceed the minimum and desirable SSD and ISD requirements for safe operation as well as the NHDOT requirement of 400-feet of All-Season Safe Sight Distance.

To ensure that sight lines remain unobstructed, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site driveways be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from Derry Road so as not to restrict the available sight lines.

FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the expected opening year (2024) of the Project and to the future year of 2034. These design horizons were chosen to be consistent with NHDOT guidelines for the preparation of a traffic study. Traffic volumes on the roadway network at these times will include existing traffic, new traffic due to normal background traffic growth, and traffic related to any significant development by others expected to be completed within the area by the 2024 and 2034 design years. Consideration of these factors resulted in the development of 2024 No-Build and 2034 No-Build traffic volumes, which projects traffic without the proposed Project built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

Traffic Growth

To develop the 2024 No-Build and 2034 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined based on the historical traffic count data obtained from NHDOT.[4] The historical traffic count data indicate that traffic volumes have been increasing by 0.11 percent in the period between 2010 and 2019. In order to provide a conservative (worst-case) analysis scenario, a compounded annual traffic growth rate of 1.0 percent per year was assumed to account

[4] *NHDOT Transportation Data Management System.*

for general population growth and the traffic generated by smaller area developments. The NHDOT data is provided in the Appendix.

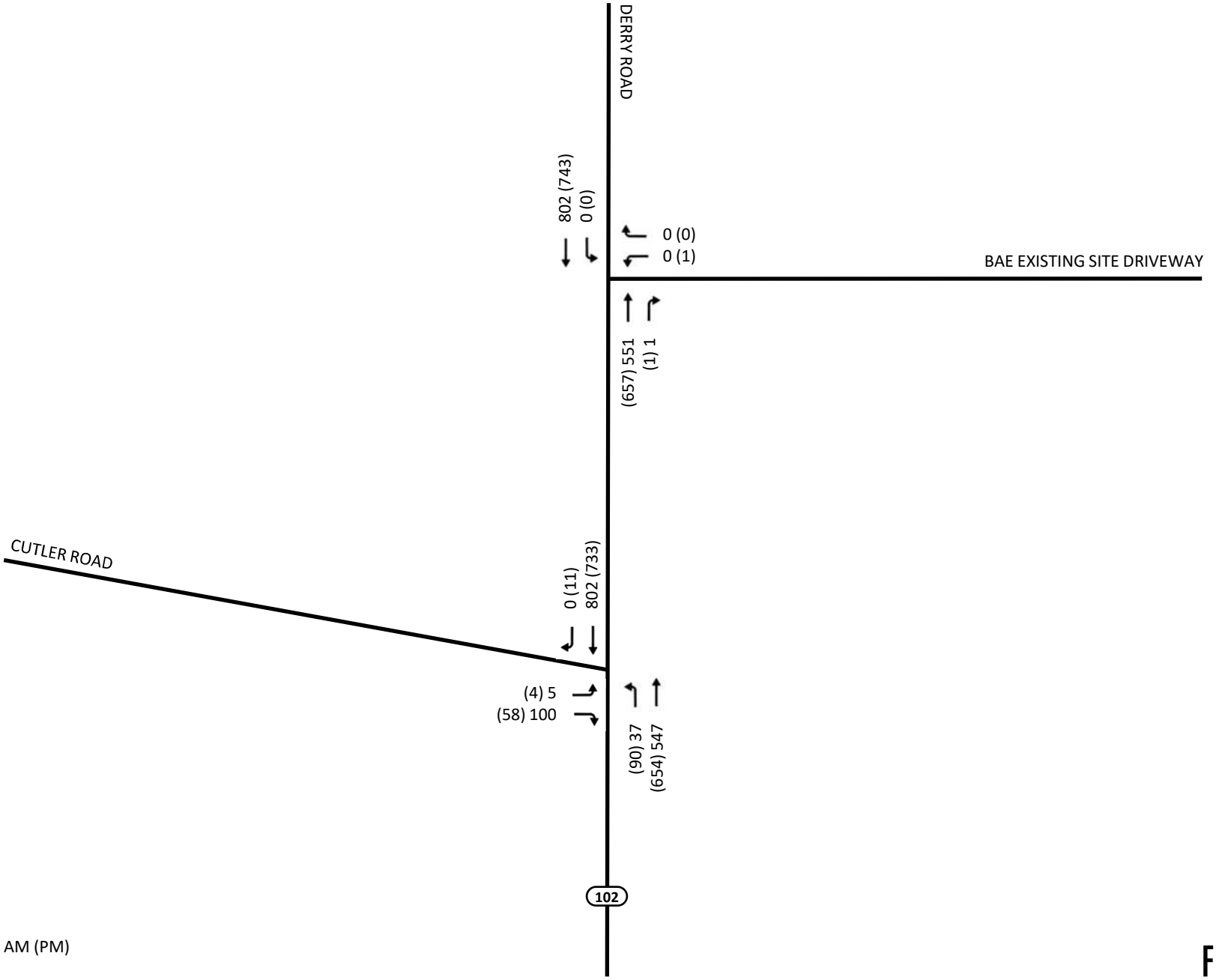
Second, any traffic that may be generated by planned developments that may add a substantial volume of traffic through the study area during the design horizons was considered. Based on discussions with the Town of Litchfield and Hudson, no other developments were identified.

Planned Roadway Improvements

Based on the NHDOT Projects website and correspondence with the Town of Lichfield and Hudson, no roadway improvement projects are planned in the vicinity of the project area.

No-Build Conditions

The 2024 No-Build peak-hour traffic volumes were developed by applying a 1.0-percent compounded annual traffic growth rate (1.0 percent compounded over one year) to the 2023 Existing traffic. The 2034 No-Build peak hour traffic volumes were developed by applying an 11.6-percent compounded annual traffic growth rate (1.0 percent compounded over eleven years) to the 2023 Existing traffic volumes. The 2024 and 2034 No-Build peak-hour traffic volumes are shown graphically on Figure 3 and Figure 4, respectively.



XX (XX) = AM (PM)

FIGURE 3

2024 NO-BUILD PEAK HOUR TRAFFIC VOLUMES

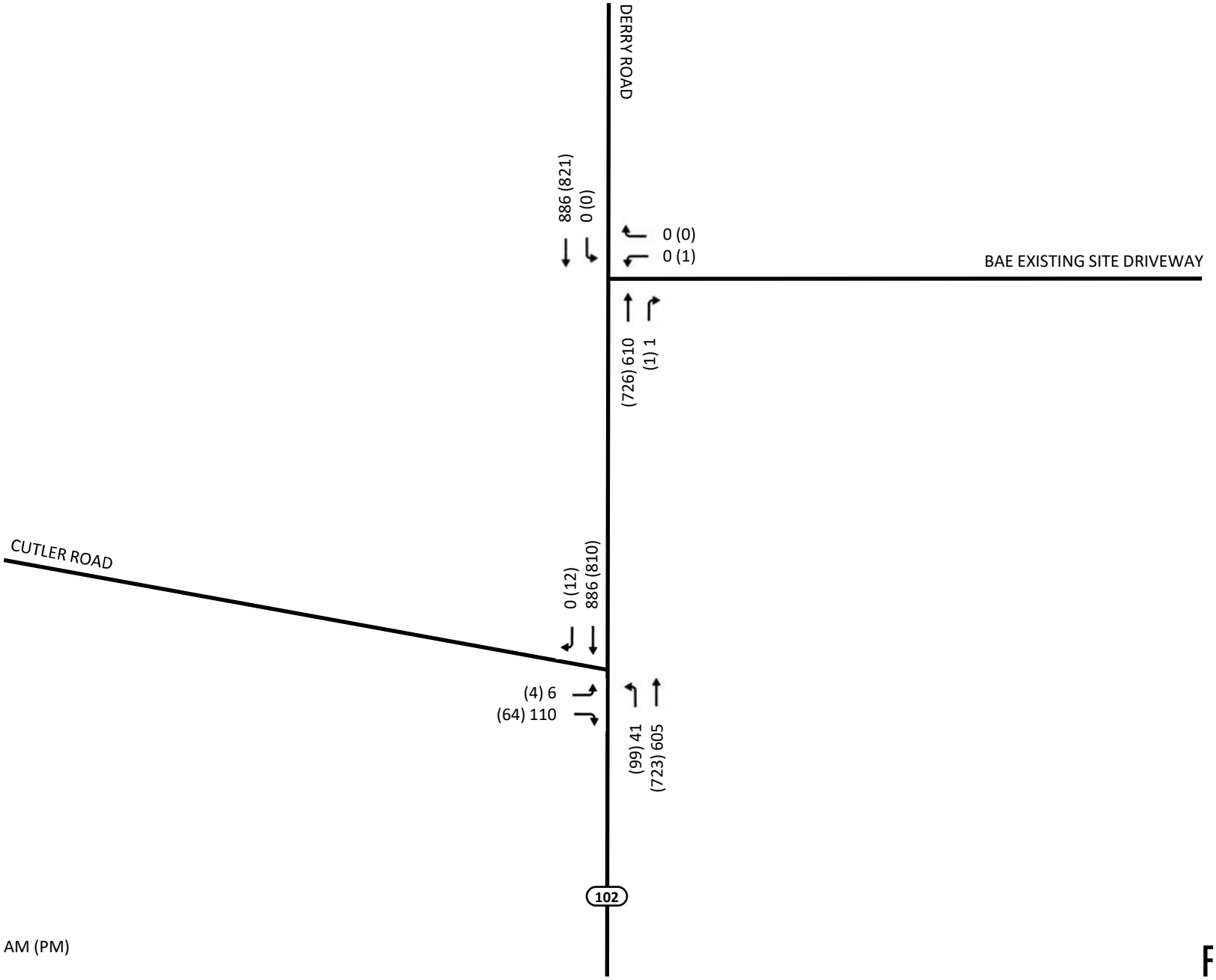


FIGURE 4

2034 NO-BUILD PEAK HOUR TRAFFIC VOLUMES

Trip Generation

The site is currently occupied by BAE Systems. The project consists of razing all existing structures and constructing 172 townhouse style single-family residential homes. Traffic to be generated by the proposed development was forecasted using trip data published in the ITE *Trip Generation Manual, 11th Edition*[5] for Land Use Code (LUC) 215 (Single Family Attached Housing). All trip-generation data are provided in the Appendix. Table 4 summarizes the results of the trip-generation estimates.

TABLE 4
Trip-Generation Summary

Peak Hour/Direction	Proposed Trips [a]	Existing Trips [b]	New Trips
Weekday Daily:	1260	--	1260
Weekday AM Peak Hour:			
Enter	21	1	20
Exit	63	0	63
Total	84	1	83
Weekday PM Peak Hour:			
Enter	58	1	57
Exit	41	1	40
Total	99	2	97

[a] Based on ITE (LUC) 215 (Single Family Attached Housing) for 172 units.
[b] From traffic volume counts, exiting and entering the BAE Systems driveway

As shown in Table 4, the proposed development is expected to generate 83 *new* vehicles trips (20 entering and 63 exiting) during the weekday AM peak hour, 97 *new* vehicles trips (57entering and 40 exiting) during the weekday PM peak hour.

Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. The distribution of proposed residential site traffic on the area roadways is based on United States Census Bureau 2011-2015 Journey-to-Work information. Accordingly, 55 percent of the site traffic is expected to/from the north along Derry Road, 40 percent is expected to/from the south along Derry Road, and 5 percent is expected to/from the west along Cutler Road. The Journey-to-Work data is provided in the Appendix.

[5] *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers; Washington, DC; 2021.

Build Traffic Volumes

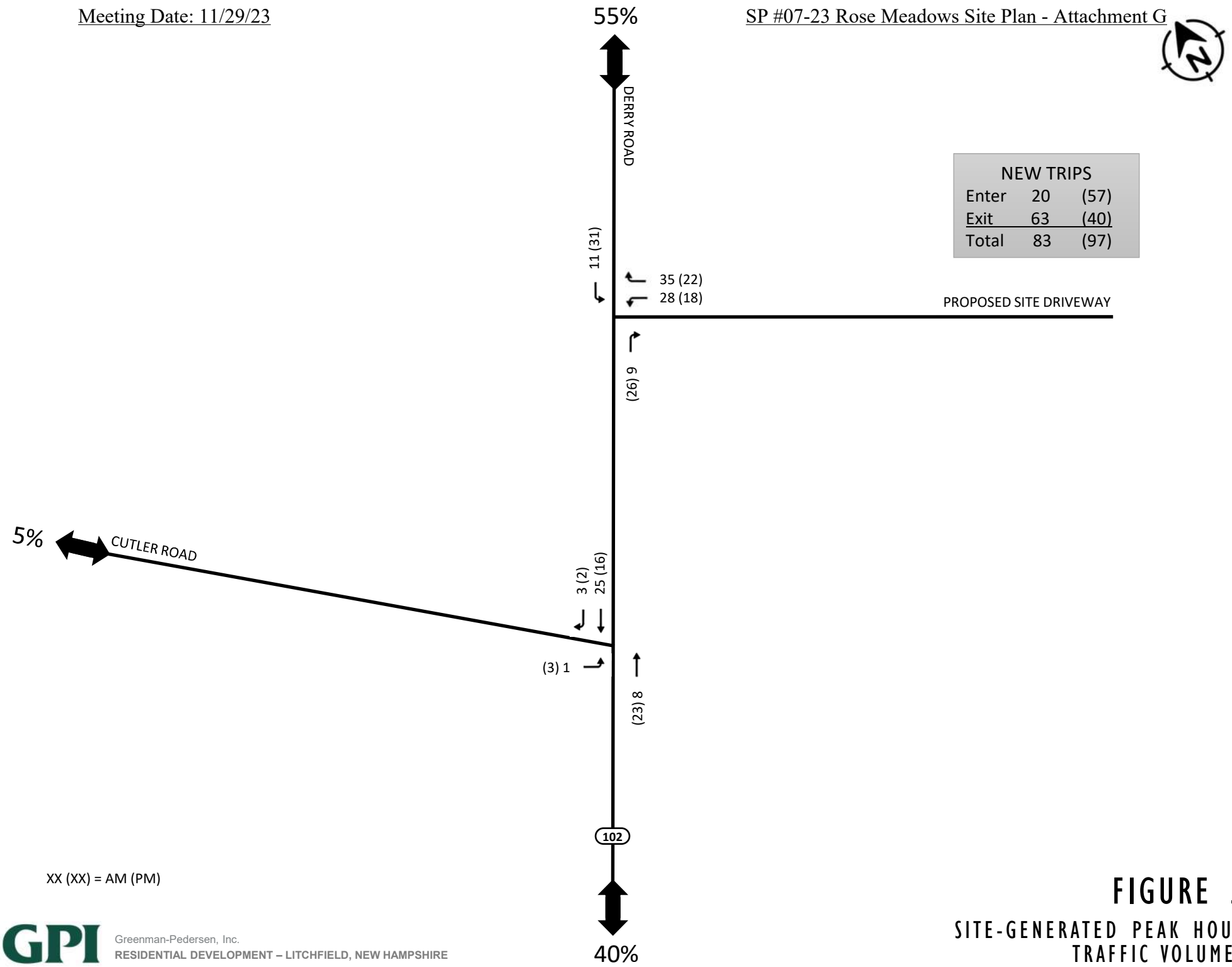
Based on the traffic generation and distribution estimates for this project, the traffic volumes associated with the proposed development were assigned to the roadway network. The site-generated traffic networks are shown on Figure 5 for the weekday AM, weekday PM. The site-generated traffic volumes were then added to the No-Build traffic volumes to develop the Build peak-hour traffic-volumes networks. The 2024 and 2034 Build peak-hour flow networks are graphically depicted on Figures 6 and 7, respectively.

Traffic Increases

The proposed development will result in increases in traffic on the study area roadways. As shown on Figure 5, traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 4 to 53 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 1 to 15 minutes during the peak hours.

Site Access

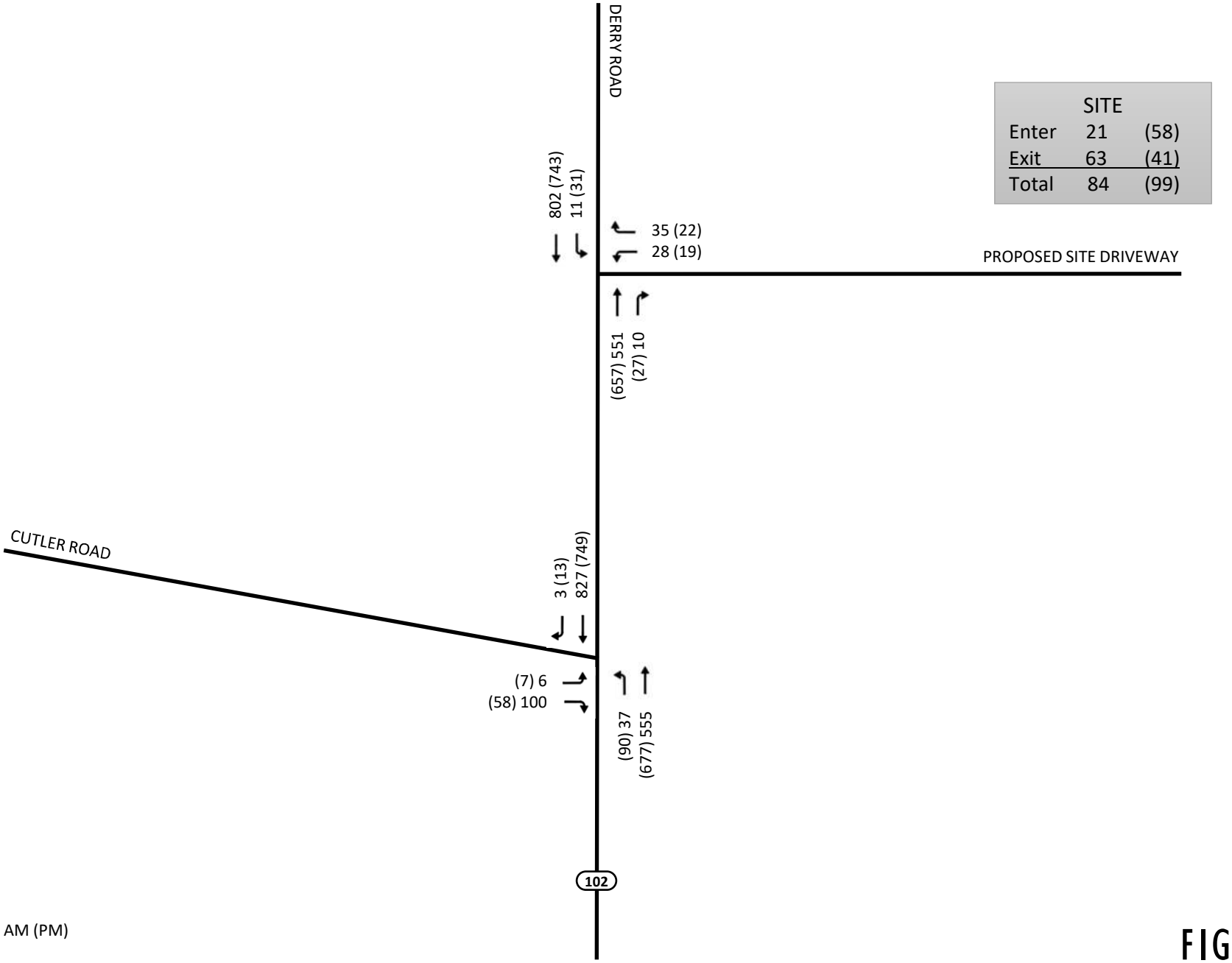
In order to determine the appropriate geometric configuration of Derry Road on its approaches to the site driveway, auxiliary turn lane warrant analyses were conducted. These analyses assessed the need for separate left- and right-turn lanes on the mainline approaches to the site driveway. Analyses of 2024 and 2034 Build conditions indicate that a separate southbound left-turn lane on Derry Road is warranted under all Build scenarios. The analysis further demonstrates that a separate northbound right-turn lane on Derry Road is only warranted during the weekday PM peak hour period.



XX (XX) = AM (PM)

FIGURE 5

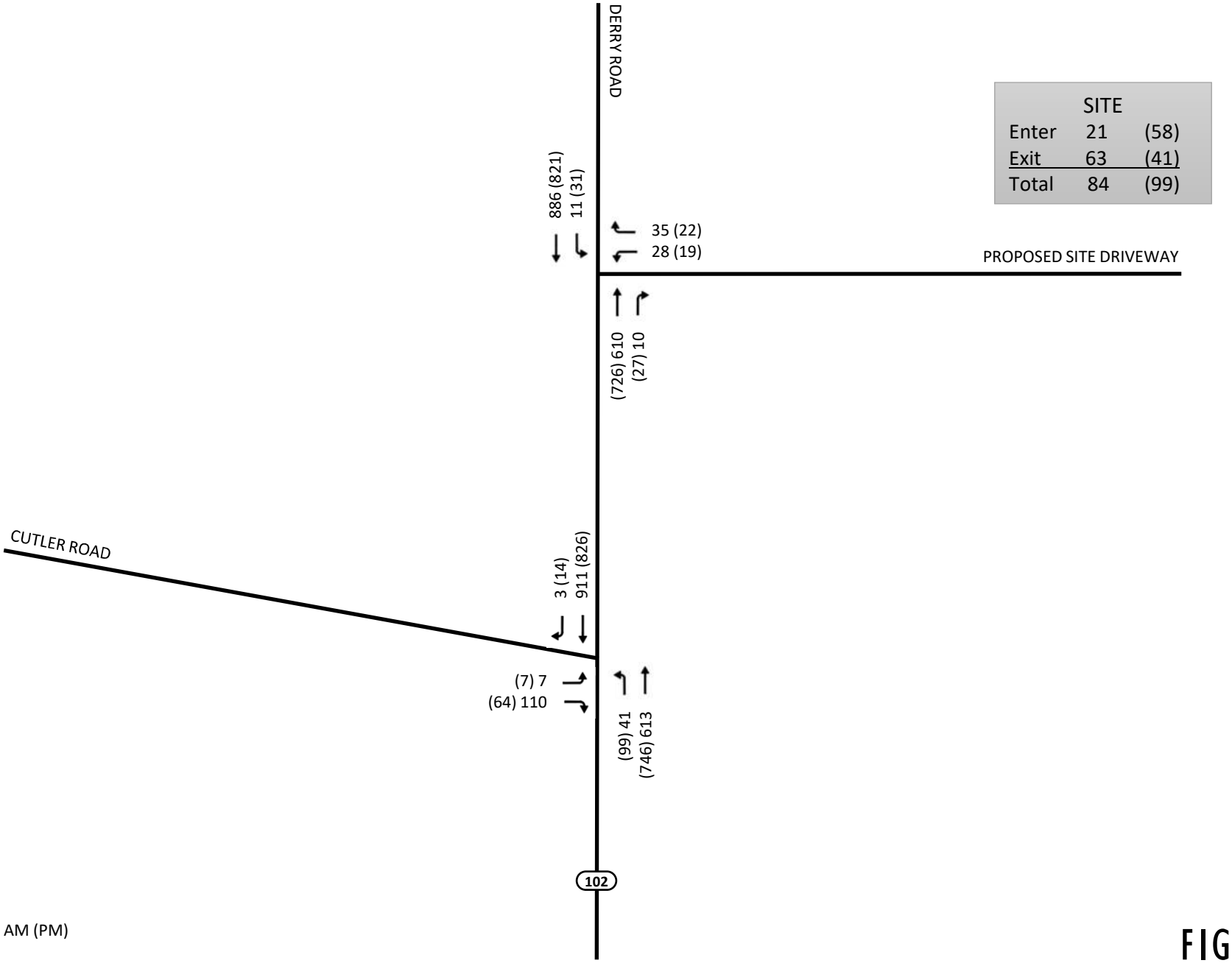
SITE-GENERATED PEAK HOUR TRAFFIC VOLUMES



XX (XX) = AM (PM)

FIGURE 6

2024 BUILD PEAK HOUR TRAFFIC VOLUMES



XX (XX) = AM (PM)

FIGURE 7

2034 BUILD PEAK HOUR TRAFFIC VOLUMES

CAPACITY AND QUEUE ANALYSIS

Capacity and queue analyses were conducted at all study area locations under 2023 Existing, 2024 No-Build, 2034 No-Build, 2024 Build, and 2034 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing No-Build conditions to Build conditions.

Methodology

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)[6] and is described in the Appendix.

For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

Analysis Results

The results of the level-of-service (LOS) and queue analyses are shown in Table 5 and Table 6 and are discussed below. Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software.[7] The capacity and queue analysis worksheets for all conditions are provided in the Appendix.

Derry Road at Site Driveway

Under existing and future traffic-volume conditions, the Derry Road southbound left-turn movement into the site driveway operates at optimal levels (LOS A) with queue lengths of one vehicle or less during the weekday peak hours. Under future conditions without the proposed development in place, the site driveway is expected to operate at LOS A during the weekday AM peak hour and LOS D/E during the weekday PM peak hour.

Given the anticipated disparity in delays between left- and right-turn maneuvers from the site driveway approach, separate left- and right-turn lanes are advisable, and are proposed as part of this application. With the proposed residential development in place, the site driveway right-turn movement is expected to operate at LOS B and the left-turn movement is expected to operate at LOS E during the opening year (2024 conditions) and LOS F during the 2034 future conditions. Anticipated queue lengths on the site driveway approach lanes under the proposed Build conditions are expected to be two vehicles or less. The volume-to-capacity (v/c) ratios are well below 1.00 indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

As the analyses of 2024 and 2034 Build conditions indicate that a separate southbound left-turn lane on Derry Road is warranted under all Build scenarios, a Conceptual Offsite Improvement Plan is provided in the Appendix along with the capacity and queue analyses under this mitigation condition. As a result of the southbound left-turn lane on Derry Road, the analysis results remain the same for the Derry Road southbound left-turn movement and the site driveway right-turn movement. The delay for the site driveway left-turn movement is expected to minimally improve by less than three seconds.

6 *Highway Capacity Manual 6th* Edition, Transportation Research Board; Washington, D.C.; 2018.

7 *Synchro plus SimTraffic 11*; Trafficware LLC.; Sugar Land, TX; 2019.

Derry Road at Cutler Road

Under existing and future traffic-volume conditions, the Derry Road northbound left-turn movement onto Cutler Road operates at LOS A/B with queue lengths of one vehicle or less during the weekday peak hours. The Cutler Road eastbound right-turn movement operates at LOS C/D with queue lengths of two vehicles or less. The Cutler Road eastbound left-turn movement is anticipated to operate with long delays (LOS E/F) under future conditions, with or without the proposed residential project in place. As a result of the project, increases in delay to the eastbound left-turn movement are anticipated to be less than 4 seconds during the weekday AM peak hour and less than 8 seconds during the weekday PM peak hour. Although attendant levels of short-term delay are expected, the queue length under the proposed Build conditions remain at one vehicle or less. Additionally, the v/c ratios are well below 1.00 indicating there will be adequate capacity to accommodate the anticipated traffic volume.

TABLE 5
Intersection Capacity Analysis Summary – 2024 Conditions

Intersection/Peak Hour/Lane Group	2023 Existing				2024 No-Build				2024 Build			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Derry Road at Site Driveway												
Weekday AM:												
Site Driveway WB Left-Turn	--	--	--	--/--	--	--	--	--/--	0.24	41.9	E	--/<25
Site Driveway WB Right-Turn	--	--	--	--/--	--	--	--	--/--	0.08	12.9	B	--/<25
Site Driveway WB Approach	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	--	--	--	--/--
Derry Road SB Left-Turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.01	8.8	A	--/<25
Weekday PM:												
Site Driveway WB Left-Turn	--	--	--	--/--	--	--	--	--/--	0.18	41.3	E	--/<25
Site Driveway WB Right-Turn	--	--	--	--/--	--	--	--	--/--	0.06	13.8	B	--/<25
Site Driveway WB Approach	0.03	30.5	D	--/<25	0.03	31.1	D	--/<25	--	--	--	--/--
Derry Road SB Left-Turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.04	9.2	A	--/<25
Derry Road at Cutler Road												
Weekday AM:												
Derry Road NB Left-Turn	0.05	10.0	A	--/<25	0.05	10.0	B	--/<25	0.05	10.2	B	--/<25
Cutler Road EB Left-Turn	0.05	37.5	E	--/<25	0.05	38.4	E	--/<25	0.07	40.8	E	--/<25
Cutler Road EB Right-Turn	0.35	20.9	C	--/38	0.36	21.3	C	--/40	0.38	22.4	C	--/43
Weekday PM:												
Derry Road NB Left-Turn	0.11	9.6	A	--/<25	0.11	9.7	A	--/<25	0.11	9.8	A	--/<25
Cutler Road EB Left-Turn	0.06	44.0	E	--/<25	0.06	45.3	E	--/<25	0.11	50.6	F	--/<25
Cutler Road EB Right-Turn	0.20	15.6	C	--/<25	0.20	15.8	C	--/<25	0.21	16.1	C	--/<25

[a] Volume-to-capacity ratio.

[b] Average control delay in seconds per vehicle.

[c] Level of service.

[d] Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 6
Intersection Capacity Analysis Summary – 2034 Conditions

Intersection/Peak Hour/Lane Group	2023 Existing				2034 No-Build				2034 Build			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Derry Road at Site Driveway												
Weekday AM:												
Site Driveway WB Left-Turn	--	--	--	--/--	--	--	--	--/--	0.31	55.1	F	--/30
Site Driveway WB Right-Turn	--	--	--	--/--	--	--	--	--/--	0.09	13.6	B	--/<25
Site Driveway WB Approach	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	--	--	--	--/--
Derry Road SB Left-Turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.01	9.0	A	--/<25
Weekday PM:												
Site Driveway WB Left-Turn	--	--	--	--/--	--	--	--	--/--	0.22	53.4	F	--/<25
Site Driveway WB Right-Turn	--	--	--	--/--	--	--	--	--/--	0.06	14.7	B	--/<25
Site Driveway WB Approach	0.03	30.5	D	--/<25	0.01	36.6	E	--/<25	--	--	--	--/--
Derry Road SB Left-Turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.04	9.5	A	--/<25
Derry Road at Cutler Road												
Weekday AM:												
Derry Road NB Left-Turn	0.05	10.0	A	--/<25	0.06	10.5	B	--/<25	0.07	10.7	B	--/<25
Cutler Road EB Left-Turn	0.05	37.5	E	--/<25	0.08	48.7	E	--/<25	0.09	52.2	F	--/<25
Cutler Road EB Right-Turn	0.35	20.9	C	--/38	0.40	24.7	C	--/48	0.42	26.0	D	--/50
Weekday PM:												
Derry Road NB Left-Turn	0.11	9.6	A	--/<25	0.13	10.1	B	--/<25	0.13	10.2	B	--/<25
Cutler Road EB Left-Turn	0.06	44.0	E	--/<25	0.06	59.1	F	--/<25	0.12	66.7	F	--/<25
Cutler Road EB Right-Turn	0.20	15.6	C	--/<25	0.19	16.8	C	--/<25	0.19	17.1	C	--/<25

[a] Volume-to-capacity ratio.

[b] Average control delay in seconds per vehicle.

[c] Level of service.

[d] Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

CONCLUSIONS

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed residential development. Conclusions of this effort are presented below.

- The residential development to be located at 255 Derry Road (NH Route 102) in Litchfield, New Hampshire. The site is currently occupied by a BAE Systems testing facility. The project consists of razing all existing on-site structures and constructing 172 townhouse style single-family residential homes. Access and egress are proposed to the site via the existing driveway on the east side of Derry Road, approximately 250-feet north of Cutler Road.

- The proposed development is expected to generate 83 *new* vehicles trips (20 entering and 63 exiting) during the weekday AM peak hour, 97 *new* vehicles trips (57 entering and 40 exiting) during the weekday PM peak hour. Traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 4 to 53 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 1 to 15 minutes during the peak hours.

- Available sight distances for the proposed site driveway on Derry Road exceed the minimum and desirable SSD and ISD requirements for safe operation as well as the NHDOT requirement of 400-feet of All-Season Safe Sight Distance. To ensure that sight lines remain unobstructed, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site driveways be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from Derry Road so as not to restrict the available sight lines.

- Derry Road at Site Driveway

  Under existing and future traffic-volume conditions, the Derry Road southbound left-turn movement into the site driveway operates at optimal levels (LOS A) with queue lengths of one vehicle or less during the weekday peak hours. Under future conditions without the proposed development in place, the site driveway is expected to operate at LOS A during the weekday AM peak hour and LOS D/E during the weekday PM peak hour.

  Given the anticipated disparity in delays between left- and right-turn maneuvers from the site driveway approach, separate left- and right-turn lanes are advisable, and are proposed as part of this application. With the proposed residential development in place, the site driveway right-turn movement is expected to operate at LOS B and the left-turn movement is expected to operate at LOS E during the opening year (2024 conditions) and LOS F during the 2034 future conditions. Anticipated queue lengths on the site driveway approach lanes under the proposed Build conditions are expected to be two vehicles or less. The volume-to-capacity (v/c) ratios are well below 1.00 indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

  As the analyses of 2024 and 2034 Build conditions indicate that a separate southbound left-turn lane on Derry Road is warranted under all Build scenarios, the capacity and queue analyses were run accordingly. As a result of the southbound left-turn lane on Derry Road, the analysis results remain the same for the Derry Road southbound left-turn movement and the site driveway right-turn movement. The delay for the site driveway left-turn movement is expected to minimally improve by less than three seconds. The provision for the construction of a southbound left-turn lane on Derry Road at the site driveway should be considered, and will be further evaluated during the NHDOT permitting process.

Derry Road at Cutler Road

Under existing and future traffic-volume conditions, the Derry Road northbound left-turn movement onto Cutler Road operates at LOS A/B with queue lengths of one vehicle or less during the weekday peak hours. The Cutler Road eastbound right-turn movement operates at LOS C/D with queue lengths of two vehicles or less. The Cutler Road eastbound left-turn movement is anticipated to operate with long delays (LOS E/F) under future conditions, with or without the proposed residential project in place. As a result of the project, increases in delay to the eastbound left-turn movement are anticipated to be less than 4 seconds during the weekday AM peak hour and less than 8 seconds during the weekday PM peak hour. Although attendant levels of short-term delay are expected, the queue length under the proposed Build conditions remain at one vehicle or less. Additionally, the v/c ratios are well below 1.00 indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

Based on the findings above, the proposed residential development can be safely and efficiently accommodated along the existing roadway network. This section of Derry Road is under the jurisdiction of NHDOT. Accordingly, a NHDOT Driveway Permit will be required and the provision for the construction of a southbound left-turn lane on Derry Road at the site driveway will be further evaluated during the NHDOT permitting process.

- APPENDIX

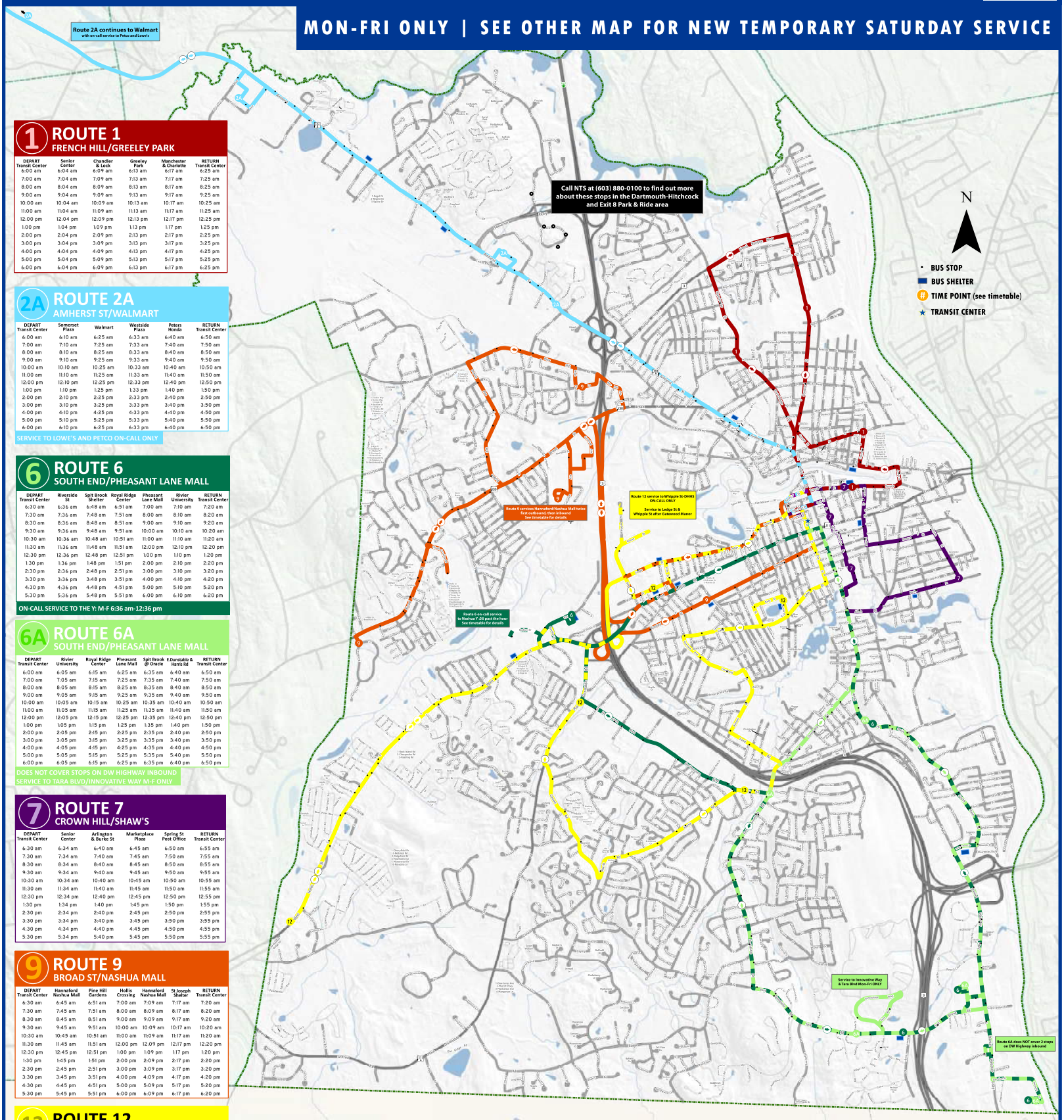
- ***Public Transportation***
- ***Traffic Count Data***
- ***Traffic Volume Adjustment Data***
- ***Sight Distance Calculations***
- ***Trip Generation Calculations***
- ***Trip Distribution Data***
- ***Auxiliary Lane Warrants Analysis***
- ***Capacity Analysis Methodology***
- ***Capacity and Queue Analysis Worksheets***
- ***Conceptual Offsite Improvement Plan***

PUBLIC TRANSPORTATION

TEMPORARY WEEKDAY SERVICE MAP

NTS Nashua Transit System

MON-FRI ONLY | SEE OTHER MAP FOR NEW TEMPORARY SATURDAY SERVICE



1 ROUTE 1
FRENCH HILL/GREELEY PARK

DEPART Transit Center	Senior Center	Chandler & Lock	Greeley Park	Manchester & Charlotte	RETURN Transit Center
6:00 am	6:04 am	6:09 am	6:13 am	6:17 am	6:25 am
7:00 am	7:04 am	7:09 am	7:13 am	7:17 am	7:25 am
8:00 am	8:04 am	8:09 am	8:13 am	8:17 am	8:25 am
9:00 am	9:04 am	9:09 am	9:13 am	9:17 am	9:25 am
10:00 am	10:04 am	10:09 am	10:13 am	10:17 am	10:25 am
11:00 am	11:04 am	11:09 am	11:13 am	11:17 am	11:25 am
12:00 pm	12:04 pm	12:09 pm	12:13 pm	12:17 pm	12:25 pm
1:00 pm	1:04 pm	1:09 pm	1:13 pm	1:17 pm	1:25 pm
2:00 pm	2:04 pm	2:09 pm	2:13 pm	2:17 pm	2:25 pm
3:00 pm	3:04 pm	3:09 pm	3:13 pm	3:17 pm	3:25 pm
4:00 pm	4:04 pm	4:09 pm	4:13 pm	4:17 pm	4:25 pm
5:00 pm	5:04 pm	5:09 pm	5:13 pm	5:17 pm	5:25 pm
6:00 pm	6:04 pm	6:09 pm	6:13 pm	6:17 pm	6:25 pm

2A ROUTE 2A
AMHERST ST/WALMART

DEPART Transit Center	Somerset Plaza	Walmart	Westside Plaza	Peters Honda	RETURN Transit Center
6:00 am	6:10 am	6:25 am	6:33 am	6:40 am	6:50 am
7:00 am	7:10 am	7:25 am	7:33 am	7:40 am	7:50 am
8:00 am	8:10 am	8:25 am	8:33 am	8:40 am	8:50 am
9:00 am	9:10 am	9:25 am	9:33 am	9:40 am	9:50 am
10:00 am	10:10 am	10:25 am	10:33 am	10:40 am	10:50 am
11:00 am	11:10 am	11:25 am	11:33 am	11:40 am	11:50 am
12:00 pm	12:10 pm	12:25 pm	12:33 pm	12:40 pm	12:50 pm
1:00 pm	1:10 pm	1:25 pm	1:33 pm	1:40 pm	1:50 pm
2:00 pm	2:10 pm	2:25 pm	2:33 pm	2:40 pm	2:50 pm
3:00 pm	3:10 pm	3:25 pm	3:33 pm	3:40 pm	3:50 pm
4:00 pm	4:10 pm	4:25 pm	4:33 pm	4:40 pm	4:50 pm
5:00 pm	5:10 pm	5:25 pm	5:33 pm	5:40 pm	5:50 pm
6:00 pm	6:10 pm	6:25 pm	6:33 pm	6:40 pm	6:50 pm

SERVICE TO LOWE'S AND PETCO ON-CALL ONLY

6 ROUTE 6
SOUTH END/PHEASANT LANE MALL

DEPART Transit Center	Riverside St	Spit Brook Shelter	Royal Ridge Center	Pheasant Lane Mall	Rivier University	RETURN Transit Center
6:30 am	6:36 am	6:48 am	6:51 am	7:00 am	7:10 am	7:20 am
7:30 am	7:36 am	7:48 am	7:51 am	8:00 am	8:10 am	8:20 am
8:30 am	8:36 am	8:48 am	8:51 am	9:00 am	9:10 am	9:20 am
9:30 am	9:36 am	9:48 am	9:51 am	10:00 am	10:10 am	10:20 am
10:30 am	10:36 am	10:48 am	10:51 am	11:00 am	11:10 am	11:20 am
11:30 am	11:36 am	11:48 am	11:51 am	12:00 pm	12:10 pm	12:20 pm
12:30 pm	12:36 pm	12:48 pm	12:51 pm	1:00 pm	1:10 pm	1:20 pm
1:30 pm	1:36 pm	1:48 pm	1:51 pm	2:00 pm	2:10 pm	2:20 pm
2:30 pm	2:36 pm	2:48 pm	2:51 pm	3:00 pm	3:10 pm	3:20 pm
3:30 pm	3:36 pm	3:48 pm	3:51 pm	4:00 pm	4:10 pm	4:20 pm
4:30 pm	4:36 pm	4:48 pm	4:51 pm	5:00 pm	5:10 pm	5:20 pm
5:30 pm	5:36 pm	5:48 pm	5:51 pm	6:00 pm	6:10 pm	6:20 pm

ON-CALL SERVICE TO THE Y: M-F 6:36 am-12:36 pm

6A ROUTE 6A
SOUTH END/PHEASANT LANE MALL

DEPART Transit Center	Rivier University	Royal Ridge Center	Pheasant Lane Mall	Spit Brook @ Oracle	E.Dunstable & Harris Rd	RETURN Transit Center
6:00 am	6:05 am	6:15 am	6:25 am	6:35 am	6:40 am	6:50 am
7:00 am	7:05 am	7:15 am	7:25 am	7:35 am	7:40 am	7:50 am
8:00 am	8:05 am	8:15 am	8:25 am	8:35 am	8:40 am	8:50 am
9:00 am	9:05 am	9:15 am	9:25 am	9:35 am	9:40 am	9:50 am
10:00 am	10:05 am	10:15 am	10:25 am	10:35 am	10:40 am	10:50 am
11:00 am	11:05 am	11:15 am	11:25 am	11:35 am	11:40 am	11:50 am
12:00 pm	12:05 pm	12:15 pm	12:25 pm	12:35 pm	12:40 pm	12:50 pm
1:00 pm	1:05 pm	1:15 pm	1:25 pm	1:35 pm	1:40 pm	1:50 pm
2:00 pm	2:05 pm	2:15 pm	2:25 pm	2:35 pm	2:40 pm	2:50 pm
3:00 pm	3:05 pm	3:15 pm	3:25 pm	3:35 pm	3:40 pm	3:50 pm
4:00 pm	4:05 pm	4:15 pm	4:25 pm	4:35 pm	4:40 pm	4:50 pm
5:00 pm	5:05 pm	5:15 pm	5:25 pm	5:35 pm	5:40 pm	5:50 pm
6:00 pm	6:05 pm	6:15 pm	6:25 pm	6:35 pm	6:40 pm	6:50 pm

DOES NOT COVER STOPS ON DW HIGHWAY INBOUND
SERVICE TO TARA BLVD/INNOVATIVE WAY M-F ONLY

7 ROUTE 7
CROWN HILL/SHAW'S

DEPART Transit Center	Senior Center	Arlington & Burke St	Marketplace Plaza	Spring St Post Office	RETURN Transit Center
6:30 am	6:34 am	6:40 am	6:45 am	6:50 am	6:55 am
7:30 am	7:34 am	7:40 am	7:45 am	7:50 am	7:55 am
8:30 am	8:34 am	8:40 am	8:45 am	8:50 am	8:55 am
9:30 am	9:34 am	9:40 am	9:45 am	9:50 am	9:55 am
10:30 am	10:34 am	10:40 am	10:45 am	10:50 am	10:55 am
11:30 am	11:34 am	11:40 am	11:45 am	11:50 am	11:55 am
12:30 pm	12:34 pm	12:40 pm	12:45 pm	12:50 pm	12:55 pm
1:30 pm	1:34 pm	1:40 pm	1:45 pm	1:50 pm	1:55 pm
2:30 pm	2:34 pm	2:40 pm	2:45 pm	2:50 pm	2:55 pm
3:30 pm	3:34 pm	3:40 pm	3:45 pm	3:50 pm	3:55 pm
4:30 pm	4:34 pm	4:40 pm	4:45 pm	4:50 pm	4:55 pm
5:30 pm	5:34 pm	5:40 pm	5:45 pm	5:50 pm	5:55 pm

9 ROUTE 9
BROAD ST/NASHUA MALL

DEPART Transit Center	Hannaford Nashua Mall	Pine Hill Gardens	Hollis Crossing	Hannaford Nashua Mall	St Joseph Shelter	RETURN Transit Center
6:30 am	6:45 am	6:51 am	7:00 am	7:09 am	7:17 am	7:20 am
7:30 am	7:45 am	7:51 am	8:00 am	8:09 am	8:17 am	8:20 am
8:30 am	8:45 am	8:51 am	9:00 am	9:09 am	9:17 am	9:20 am
9:30 am	9:45 am	9:51 am	10:00 am	10:09 am	10:17 am	10:20 am
10:30 am	10:45 am	10:51 am	11:00 am	11:09 am	11:17 am	11:20 am
11:30 am	11:45 am	11:51 am	12:00 pm	12:09 pm	12:17 pm	12:20 pm
12:30 pm	12:45 pm	12:51 pm	1:00 pm	1:09 pm	1:17 pm	1:20 pm
1:30 pm	1:45 pm	1:51 pm	2:00 pm	2:09 pm	2:17 pm	2:20 pm
2:30 pm	2:45 pm	2:51 pm	3:00 pm	3:09 pm	3:17 pm	3:20 pm
3:30 pm	3:45 pm	3:51 pm	4:00 pm	4:09 pm	4:17 pm	4:20 pm
4:30 pm	4:45 pm	4:51 pm	5:00 pm	5:09 pm	5:17 pm	5:20 pm
5:30 pm	5:45 pm	5:51 pm	6:00 pm	6:09 pm	6:17 pm	6:20 pm

12 ROUTE 12
WEST HOLLIS ST/LEDGE ST

DEPART Transit Center	Arel Manor Lake St	Harris Rd Greenbriar	Main Dunstable & NE Blvd	West Hollis @ J Doni's	Will St Gatewood	RETURN Transit Center
6:00 am	6:05 am	6:13 am	6:19 am	6:30 am	6:38 am	6:50 am
7:00 am	7:05 am	7:13 am	7:19 am	7:30 am	7:38 am	7:50 am
8:00 am	8:05 am	8:13 am	8:19 am	8:30 am	8:38 am	8:50 am
9:00 am	9:05 am	9:13 am	9:19 am	9:30 am	9:38 am	9:50 am
10:00 am	10:05 am	10:13 am	10:19 am	10:30 am	10:38 am	10:50 am
11:00 am	11:05 am	11:13 am	11:19 am	11:30 am	11:38 am	11:50 am
12:00 pm	12:05 pm	12:13 pm	12:19 pm	12:30 pm	12:38 pm	12:50 pm
1:00 pm	1:05 pm	1:13 pm	1:19 pm	1:30 pm	1:38 pm	1:50 pm
2:00 pm	2:05 pm	2:13 pm	2:19 pm	2:30 pm	2:38 pm	2:50 pm
3:00 pm	3:05 pm	3:13 pm	3:19 pm	3:30 pm	3:38 pm	3:50 pm
4:00 pm	4:05 pm	4:13 pm	4:19 pm	4:30 pm	4:38 pm	4:50 pm
5:00 pm	5:05 pm	5:13 pm	5:19 pm	5:30 pm	5:38 pm	5:50 pm
6:00 pm	6:05 pm	6:13 pm	6:19 pm	6:30 pm	6:38 pm	6:50 pm

SCHEDULES

Buses DO NOT operate on Sundays, New Years Day, Memorial Day, 4th of July, Labor Day, Thanksgiving, and Christmas Day

Christmas Eve & New Year's Eve:
Last bus departs the Transit Center at 5pm

See other map for new temporary Saturday service

NRPC
Map by Nashua Regional Planning Commission
Date: 2/3/2023
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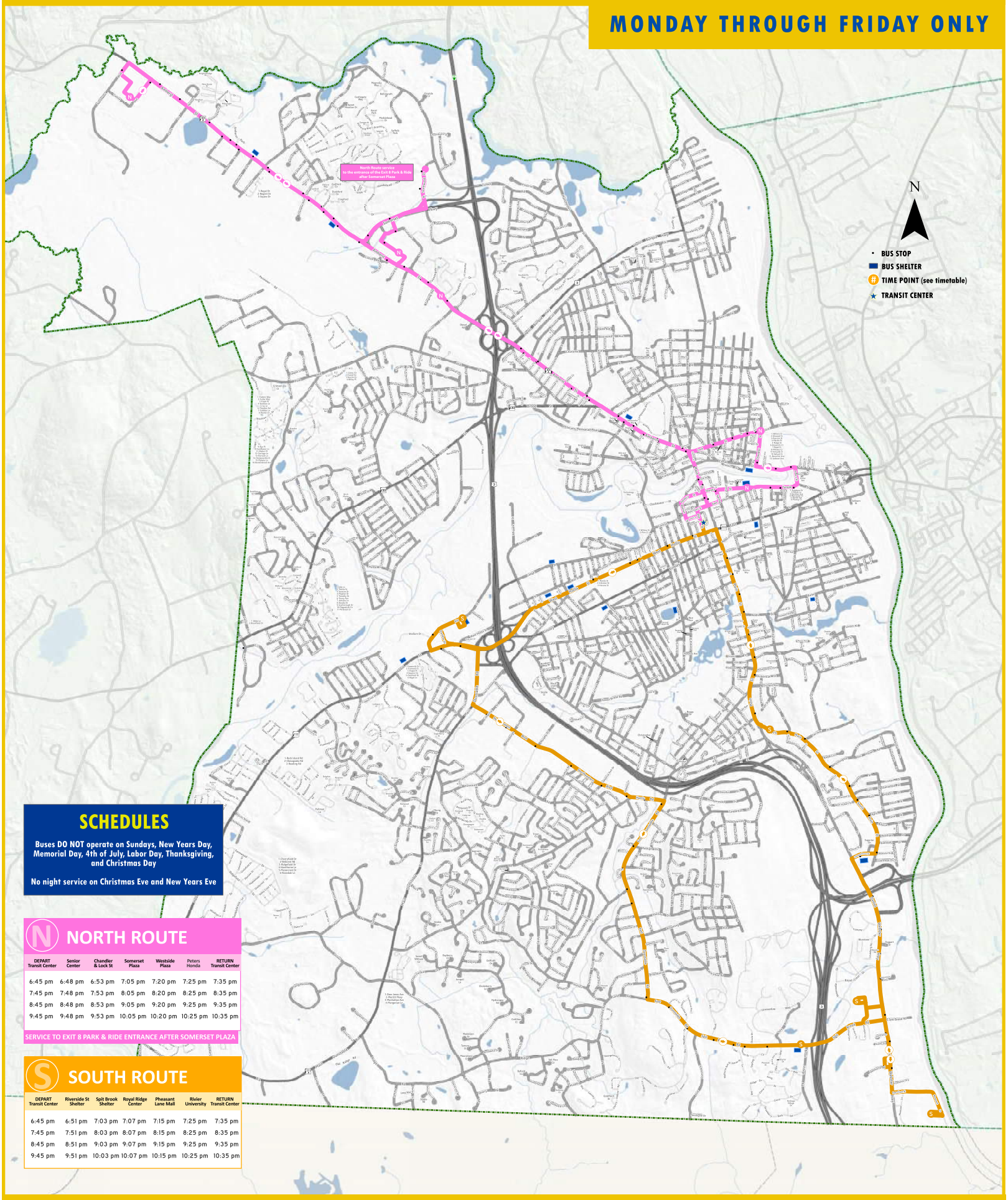
www.ridebigblue.com | 603.880.0100

Effective January 23, 2023
printed January 2023

TEMPORARY NIGHT SERVICE MAP

NTS Nashua Transit System

MONDAY THROUGH FRIDAY ONLY



SCHEDULES

Buses DO NOT operate on Sundays, New Years Day, Memorial Day, 4th of July, Labor Day, Thanksgiving, and Christmas Day

No night service on Christmas Eve and New Years Eve

N NORTH ROUTE

DEPART Transit Center	Senior Center	Chandler & Lock St	Somerset Plaza	Westside Plaza	Peters Honda	RETURN Transit Center
6:45 pm	6:48 pm	6:53 pm	7:05 pm	7:20 pm	7:25 pm	7:35 pm
7:45 pm	7:48 pm	7:53 pm	8:05 pm	8:20 pm	8:25 pm	8:35 pm
8:45 pm	8:48 pm	8:53 pm	9:05 pm	9:20 pm	9:25 pm	9:35 pm
9:45 pm	9:48 pm	9:53 pm	10:05 pm	10:20 pm	10:25 pm	10:35 pm

SERVICE TO EXIT 8 PARK & RIDE ENTRANCE AFTER SOMERSET PLAZA

S SOUTH ROUTE

DEPART Transit Center	Riverside St Shelter	Spit Brook Shelter	Royal Ridge Center	Pheasant Lane Mall	Rivier University	RETURN Transit Center
6:45 pm	6:51 pm	7:03 pm	7:07 pm	7:15 pm	7:25 pm	7:35 pm
7:45 pm	7:51 pm	8:03 pm	8:07 pm	8:15 pm	8:25 pm	8:35 pm
8:45 pm	8:51 pm	9:03 pm	9:07 pm	9:15 pm	9:25 pm	9:35 pm
9:45 pm	9:51 pm	10:03 pm	10:07 pm	10:15 pm	10:25 pm	10:35 pm

NRPC

Map by Nashua Regional Planning Commission
Date: 1/1/2023
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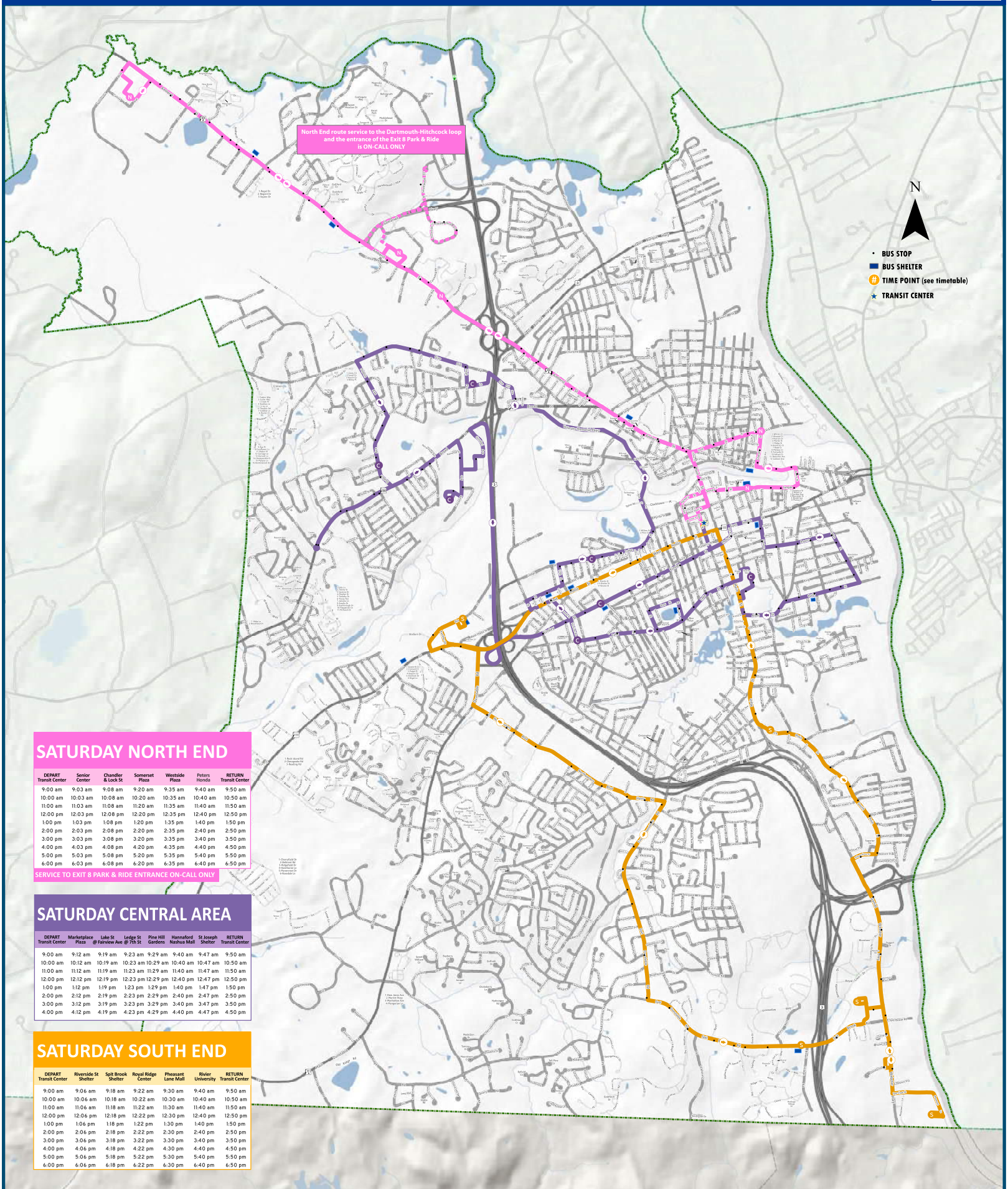
Effective January 23, 2023
printed January 2023

TEMPORARY SATURDAY SERVICE MAP



SATURDAY NORTH END

DEPART Transit Center	Senior Center	Chandler & Lock St	Somerset Plaza	Westside Plaza	Peters Honda	RETURN Transit Center
9:00 am	9:03 am	9:08 am	9:20 am	9:35 am	9:40 am	9:50 am
10:00 am	10:03 am	10:08 am	10:20 am	10:35 am	10:40 am	10:50 am
11:00 am	11:03 am	11:08 am	11:20 am	11:35 am	11:40 am	11:50 am
12:00 pm	12:03 pm	12:08 pm	12:20 pm	12:35 pm	12:40 pm	12:50 pm
1:00 pm	1:03 pm	1:08 pm	1:20 pm	1:35 pm	1:40 pm	1:50 pm
2:00 pm	2:03 pm	2:08 pm	2:20 pm	2:35 pm	2:40 pm	2:50 pm
3:00 pm	3:03 pm	3:08 pm	3:20 pm	3:35 pm	3:40 pm	3:50 pm
4:00 pm	4:03 pm	4:08 pm	4:20 pm	4:35 pm	4:40 pm	4:50 pm
5:00 pm	5:03 pm	5:08 pm	5:20 pm	5:35 pm	5:40 pm	5:50 pm
6:00 pm	6:03 pm	6:08 pm	6:20 pm	6:35 pm	6:40 pm	6:50 pm

SERVICE TO EXIT 8 PARK & RIDE ENTRANCE ON-CALL ONLY

SATURDAY CENTRAL AREA

DEPART Transit Center	Marketplace Plaza	Lake St @ Fairview Ave	Ledge St @ 7th St	Pine Hill Gardens	Hannaford Nashua Mall	St Joseph Shelter	RETURN Transit Center
9:00 am	9:12 am	9:19 am	9:23 am	9:29 am	9:40 am	9:47 am	9:50 am
10:00 am	10:12 am	10:19 am	10:23 am	10:29 am	10:40 am	10:47 am	10:50 am
11:00 am	11:12 am	11:19 am	11:23 am	11:29 am	11:40 am	11:47 am	11:50 am
12:00 pm	12:12 pm	12:19 pm	12:23 pm	12:29 pm	12:40 pm	12:47 pm	12:50 pm
1:00 pm	1:12 pm	1:19 pm	1:23 pm	1:29 pm	1:40 pm	1:47 pm	1:50 pm
2:00 pm	2:12 pm	2:19 pm	2:23 pm	2:29 pm	2:40 pm	2:47 pm	2:50 pm
3:00 pm	3:12 pm	3:19 pm	3:23 pm	3:29 pm	3:40 pm	3:47 pm	3:50 pm
4:00 pm	4:12 pm	4:19 pm	4:23 pm	4:29 pm	4:40 pm	4:47 pm	4:50 pm

SATURDAY SOUTH END

DEPART Transit Center	Riverside St Shelter	Spit Brook Shelter	Royal Ridge Center	Pheasant Lane Mall	Rivier University	RETURN Transit Center
9:00 am	9:06 am	9:18 am	9:22 am	9:30 am	9:40 am	9:50 am
10:00 am	10:06 am	10:18 am	10:22 am	10:30 am	10:40 am	10:50 am
11:00 am	11:06 am	11:18 am	11:22 am	11:30 am	11:40 am	11:50 am
12:00 pm	12:06 pm	12:18 pm	12:22 pm	12:30 pm	12:40 pm	12:50 pm
1:00 pm	1:06 pm	1:18 pm	1:22 pm	1:30 pm	1:40 pm	1:50 pm
2:00 pm	2:06 pm	2:18 pm	2:22 pm	2:30 pm	2:40 pm	2:50 pm
3:00 pm	3:06 pm	3:18 pm	3:22 pm	3:30 pm	3:40 pm	3:50 pm
4:00 pm	4:06 pm	4:18 pm	4:22 pm	4:30 pm	4:40 pm	4:50 pm
5:00 pm	5:06 pm	5:18 pm	5:22 pm	5:30 pm	5:40 pm	5:50 pm
6:00 pm	6:06 pm	6:18 pm	6:22 pm	6:30 pm	6:40 pm	6:50 pm

NRPC
Map by Nashua Regional Planning Commission
Date: 1/26/2023
J:\GIS\NTS\poster_saturday_2023.mxd

www.ridebigblue.com | 603.880.0100

Effective January 28, 2023
printed January 2023

TRAFFIC COUNT DATA

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 1
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	Cutler Road
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	10	96	0	0	0	186	0	0	2	0	18	0	0	0	0
7:15 AM	0	6	121	0	0	0	162	0	0	0	0	21	0	0	0	0
7:30 AM	0	9	113	0	0	0	164	0	0	0	0	19	0	0	0	0
7:45 AM	0	6	125	0	0	0	154	0	0	2	0	25	0	0	0	0
8:00 AM	0	18	93	0	0	0	137	3	0	1	0	20	0	0	0	0
8:15 AM	0	6	97	0	0	0	128	2	0	2	0	10	0	0	0	0
8:30 AM	0	8	94	0	0	0	137	1	0	2	0	13	0	0	0	0
8:45 AM	0	9	99	0	0	0	109	0	0	0	0	8	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	13	148	0	0	0	127	2	0	0	0	15	0	0	0	0
4:15 PM	0	16	163	0	0	0	121	1	0	1	0	12	0	0	0	0
4:30 PM	0	17	134	0	0	0	148	3	0	1	0	12	0	0	0	0
4:45 PM	0	17	142	0	0	0	153	2	0	2	0	16	0	0	0	0
5:00 PM	0	13	134	0	0	0	151	2	0	0	0	8	0	0	0	0
5:15 PM	0	27	128	0	0	0	151	2	0	0	0	11	0	0	0	0
5:30 PM	0	21	96	0	0	0	119	0	0	0	0	8	0	0	0	0
5:45 PM	0	9	99	0	0	0	107	2	0	2	0	9	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**31**	**455**	**0**	**0**	**0**	**666**	**0**	**0**	**4**	**0**	**83**	**0**	**0**	**0**	**0**
PHF	**0.93**				**0.90**				**0.81**				**0.00**			
HV %	**0.0%**	**0.0%**	**2.9%**	**0.0%**	**0.0%**	**0.0%**	**3.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**74**	**538**	**0**	**0**	**0**	**603**	**9**	**0**	**3**	**0**	**47**	**0**	**0**	**0**	**0**
PHF	**0.96**				**0.99**				**0.69**				**0.00**			
HV %	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 1
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	Cutler Road
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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www.BostonTrafficData.com

HEAVY VEHICLES

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	5	0	0	0	8	0	0	0	0	1	0	0	0	0
7:30 AM	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
8:00 AM	0	9	2	0	0	0	1	2	0	0	0	0	0	0	0	0
8:15 AM	0	0	3	0	0	0	5	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	3	0	0	0	6	0	0	0	0	0	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	8	0	0	0	7	0	0	0	0	2	0	0	0	0
4:15 PM	0	0	3	0	0	0	2	0	0	0	0	1	0	0	0	0
4:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**11**	**0**	**0**	**0**	**18**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.45**				**0.63**				**0.25**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**15**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
PHF	**0.47**				**0.50**				**0.38**				**0.00**			

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 1
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	Cutler Road
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
7:00 AM to 8:00 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Derry Road Northbound				Derry Road Southbound				Cutler Road Eastbound				Westbound			
4:30 PM to 5:30 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 2
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	BAE Systems Driveway
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	97	1	0	0	186	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	120	0	0	0	162	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	114	0	0	0	164	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	126	0	0	0	154	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	95	0	0	0	140	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	99	0	0	0	130	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	96	0	0	0	137	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	99	0	0	0	110	0	0	0	0	0	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	148	0	0	0	129	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	164	0	0	0	122	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	135	0	0	0	148	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	144	0	0	0	158	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	134	0	0	0	149	0	0	0	0	0	0	1	0	0
5:15 PM	0	0	127	1	0	0	156	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	96	0	0	0	119	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	101	0	0	0	109	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**457**	**1**	**0**	**0**	**666**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF			**0.91**				**0.90**				**0.00**				**0.00**	
HV %	**0.0%**	**0.0%**	**3.7%**	**0.0%**	**0.0%**	**0.0%**	**3.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**577**	**0**	**0**	**0**	**577**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
PHF			**0.88**				**0.91**				**0.00**				**0.25**	
HV %	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 2
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	BAE Systems Driveway
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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HEAVY VEHICLES

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	3	0	0	0	6	0	0	0	0	0	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	7	0	0	0	6	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**17**	**0**	**0**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.71**				**0.72**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**12**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.43**				**0.42**				**0.00**				**0.00**			

Client:	Robert Bollinger, P.E., PTOE
Project #:	1177_1_GPI
BTD #:	Location 2
Location:	Litchfield, NH
Street 1:	Derry Road
Street 2:	BAE Systems Driveway
Count Date:	2/7/2023
Day of Week:	Tuesday
Weather:	Clouds & Sun, 40°F

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PEDESTRIANS & BICYCLES

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:00 AM to 8:00 AM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Derry Road Northbound				Derry Road Southbound				Eastbound				BAE Systems Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Classification Report

Job # 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Direction Northbound
Tuesday, February 14, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	19	0	15	4	0	0	0	0	0	0	0	0	0	0
0100	12	0	9	3	0	0	0	0	0	0	0	0	0	0
0200	14	0	13	1	0	0	0	0	0	0	0	0	0	0
0300	16	0	14	1	0	1	0	0	0	0	0	0	0	0
0400	73	0	56	15	1	0	0	0	0	0	0	0	0	1
0500	174	1	137	33	0	2	1	0	0	0	0	0	0	0
0600	308	0	255	47	3	2	0	0	0	1	0	0	0	0
0700	425	0	375	42	2	1	3	0	0	1	1	0	0	0
0800	470	0	402	54	7	2	2	1	0	1	0	0	0	1
0900	380	0	317	49	0	4	4	0	0	4	0	0	0	2
1000	346	1	296	36	4	4	2	0	0	2	1	0	0	0
1100	381	0	317	51	4	2	4	2	0	1	0	0	0	0
1200	394	0	328	52	4	3	5	0	1	1	0	0	0	0
1300	349	2	288	53	0	1	2	0	0	3	0	0	0	0
1400	505	0	425	63	6	4	4	0	1	1	1	0	0	0
1500	645	3	557	69	3	7	5	1	0	0	0	0	0	0
1600	621	0	532	82	3	1	3	0	0	0	0	0	0	0
1700	548	0	492	52	0	2	2	0	0	0	0	0	0	0
1800	404	1	353	49	0	0	1	0	0	0	0	0	0	0
1900	243	0	220	23	0	0	0	0	0	0	0	0	0	0
2000	189	0	178	9	1	1	0	0	0	0	0	0	0	0
2100	122	0	109	11	1	1	0	0	0	0	0	0	0	0
2200	76	0	69	7	0	0	0	0	0	0	0	0	0	0
2300	46	0	43	3	0	0	0	0	0	0	0	0	0	0
Total	**6760**	**8**	**5800**	**809**	**39**	**38**	**38**	**4**	**2**	**15**	**3**	**0**	**0**	**4**
	100.00%	**0.12%**	**85.80%**	**11.97%**	**0.58%**	**0.56%**	**0.56%**	**0.06%**	**0.03%**	**0.22%**	**0.04%**	**0.00%**	**0.00%**	**0.06%**

Classification Report

Job # 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Direction Northbound
Wednesday, February 15, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	20	0	18	2	0	0	0	0	0	0	0	0	0	0
0100	8	0	7	1	0	0	0	0	0	0	0	0	0	0
0200	16	0	10	4	0	0	2	0	0	0	0	0	0	0
0300	22	0	20	2	0	0	0	0	0	0	0	0	0	0
0400	61	0	46	14	0	0	1	0	0	0	0	0	0	0
0500	169	0	131	35	0	1	2	0	0	0	0	0	0	0
0600	302	0	248	47	2	1	1	0	0	3	0	0	0	0
0700	473	1	406	57	2	3	3	0	0	1	0	0	0	0
0800	454	0	375	68	5	2	1	1	0	2	0	0	0	0
0900	322	0	269	42	3	3	2	1	0	2	0	0	0	0
1000	310	0	249	52	3	4	0	1	0	1	0	0	0	0
1100	334	1	263	60	3	4	3	0	0	0	0	0	0	0
1200	399	0	339	47	4	0	1	2	0	6	0	0	0	0
1300	363	1	290	55	2	6	6	1	0	2	0	0	0	0
1400	464	2	387	59	4	3	5	1	0	3	0	0	0	0
1500	593	2	513	63	4	3	6	0	0	2	0	0	0	0
1600	581	4	507	63	2	3	2	0	0	0	0	0	0	0
1700	561	0	515	46	0	0	0	0	0	0	0	0	0	0
1800	393	1	353	39	0	0	0	0	0	0	0	0	0	0
1900	255	0	223	30	2	0	0	0	0	0	0	0	0	0
2000	186	0	170	16	0	0	0	0	0	0	0	0	0	0
2100	131	0	122	9	0	0	0	0	0	0	0	0	0	0
2200	79	1	68	10	0	0	0	0	0	0	0	0	0	0
2300	49	0	45	3	0	1	0	0	0	0	0	0	0	0
Total	**6545**	**13**	**5574**	**824**	**36**	**34**	**35**	**7**	**0**	**22**	**0**	**0**	**0**	**0**
	100.00%	**0.20%**	**85.16%**	**12.59%**	**0.55%**	**0.52%**	**0.53%**	**0.11%**	**0.00%**	**0.34%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Direction Southbound
Tuesday, February 14, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	19	0	16	2	0	1	0	0	0	0	0	0	0	0
0100	11	0	10	1	0	0	0	0	0	0	0	0	0	0
0200	12	0	9	2	0	0	1	0	0	0	0	0	0	0
0300	19	0	8	7	0	1	1	0	0	2	0	0	0	0
0400	84	0	57	21	1	1	1	0	0	3	0	0	0	0
0500	230	0	158	59	1	4	3	0	0	5	0	0	0	0
0600	448	1	327	98	7	10	5	0	0	0	0	0	0	0
0700	647	0	540	98	0	2	5	0	0	2	0	0	0	0
0800	588	0	481	91	5	9	1	0	0	1	0	0	0	0
0900	394	1	295	81	2	9	4	0	0	2	0	0	0	0
1000	408	1	323	68	2	10	1	1	0	2	0	0	0	0
1100	386	0	289	79	5	6	4	1	0	2	0	0	0	0
1200	411	1	318	68	6	13	1	1	0	2	1	0	0	0
1300	400	0	310	73	4	10	2	0	0	1	0	0	0	0
1400	449	1	364	76	1	2	1	0	0	3	1	0	0	0
1500	519	1	399	106	5	8	0	0	0	0	0	0	0	0
1600	592	1	469	110	4	8	0	0	0	0	0	0	0	0
1700	551	0	478	65	0	8	0	0	0	0	0	0	0	0
1800	386	0	335	43	0	8	0	0	0	0	0	0	0	0
1900	216	0	191	25	0	0	0	0	0	0	0	0	0	0
2000	184	0	156	25	3	0	0	0	0	0	0	0	0	0
2100	113	0	96	14	1	2	0	0	0	0	0	0	0	0
2200	77	0	65	10	0	1	1	0	0	0	0	0	0	0
2300	37	0	33	3	0	1	0	0	0	0	0	0	0	0
Total	**7181**	**7**	**5727**	**1225**	**47**	**114**	**31**	**3**	**0**	**25**	**2**	**0**	**0**	**0**
	100.00%	**0.10%**	**79.75%**	**17.06%**	**0.65%**	**1.59%**	**0.43%**	**0.04%**	**0.00%**	**0.35%**	**0.03%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Direction Southbound
Wednesday, February 15, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	17	0	14	2	0	1	0	0	0	0	0	0	0	0
0100	9	0	9	0	0	0	0	0	0	0	0	0	0	0
0200	14	0	11	2	0	0	0	0	0	1	0	0	0	0
0300	16	0	11	4	0	0	1	0	0	0	0	0	0	0
0400	76	0	50	18	0	2	4	0	0	1	1	0	0	0
0500	226	1	144	71	2	3	3	0	0	2	0	0	0	0
0600	423	0	315	94	4	6	4	0	0	0	0	0	0	0
0700	714	0	569	125	9	5	2	0	1	3	0	0	0	0
0800	570	0	443	96	11	15	2	0	1	2	0	0	0	0
0900	369	2	291	66	3	4	1	0	0	2	0	0	0	0
1000	396	0	298	77	3	11	3	1	1	1	1	0	0	0
1100	376	0	295	64	7	6	3	0	0	1	0	0	0	0
1200	385	0	286	77	6	10	2	1	0	3	0	0	0	0
1300	398	3	306	76	4	3	4	0	0	2	0	0	0	0
1400	476	1	369	93	4	6	2	0	0	1	0	0	0	0
1500	535	3	403	115	5	7	1	0	0	1	0	0	0	0
1600	559	2	451	91	4	10	0	0	0	1	0	0	0	0
1700	536	3	450	68	0	14	1	0	0	0	0	0	0	0
1800	362	1	300	53	2	6	0	0	0	0	0	0	0	0
1900	270	0	224	41	1	4	0	0	0	0	0	0	0	0
2000	203	1	174	28	0	0	0	0	0	0	0	0	0	0
2100	106	0	94	12	0	0	0	0	0	0	0	0	0	0
2200	90	0	74	15	0	1	0	0	0	0	0	0	0	0
2300	43	0	40	2	0	0	0	0	0	0	1	0	0	0
Total	**7169**	**17**	**5621**	**1290**	**65**	**114**	**33**	**2**	**3**	**21**	**3**	**0**	**0**	**0**
	100.00%	**0.24%**	**78.41%**	**17.99%**	**0.91%**	**1.59%**	**0.46%**	**0.03%**	**0.04%**	**0.29%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**

Volume Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Tuesday, February 14, 2023

Time	Total		NB		SB	
0000	12		5		7	
0015	8		5		3	
0030	13		8		5	
0045	5	38	1	19	4	19
0100	5		3		2	
0115	8		5		3	
0130	6		3		3	
0145	4	23	1	12	3	11
0200	5		3		2	
0215	8		7		1	
0230	5		1		4	
0245	8	26	3	14	5	12
0300	7		4		3	
0315	11		4		7	
0330	6		2		4	
0345	11	35	6	16	5	19
0400	25		15		10	
0415	32		14		18	
0430	53		24		29	
0445	47	157	20	73	27	84
0500	70		34		36	
0515	89		44		45	
0530	115		45		70	
0545	130	404	51	174	79	230
0600	141		66		75	
0615	179		63		116	
0630	197		81		116	
0645	239	756	98	308	141	448
0700	270		92		178	
0715	278		102		176	
0730	256		101		155	
0745	268	1072	130	425	138	647
0800	278		111		167	
0815	253		103		150	
0830	268		120		148	
0845	259	1058	136	470	123	588
0900	205		96		109	
0915	202		98		104	
0930	186		82		104	
0945	181	774	104	380	77	394
1000	182		81		101	
1015	201		100		101	
1030	188		84		104	
1045	183	754	81	346	102	408
1100	185		89		96	
1115	191		104		87	
1130	178		81		97	
1145	213	767	107	381	106	386
1200	202		89		113	
1215	210		106		104	
1230	199		98		101	
1245	194	805	101	394	93	411
1300	195		83		112	
1315	202		96		106	
1330	189		91		98	
1345	163	749	79	349	84	400
1400	243		119		124	
1415	256		147		109	
1430	223		110		113	
1445	232	954	129	505	103	449
1500	260		134		126	
1515	280		164		116	
1530	296		168		128	
1545	328	1164	179	645	149	519
1600	291		149		142	
1615	306		163		143	
1630	302		147		155	
1645	314	1213	162	621	152	592
1700	320		148		172	
1715	317		162		155	
1730	239		112		127	
1745	223	1099	126	548	97	551
1800	212		121		91	
1815	232		123		109	
1830	180		87		93	
1845	166	790	73	404	93	386
1900	133		73		60	
1915	105		54		51	
1930	116		57		59	
1945	105	459	59	243	46	216
2000	114		61		53	
2015	94		45		49	
2030	91		44		47	
2045	74	373	39	189	35	184
2100	65		32		33	
2115	58		31		27	
2130	64		34		30	
2145	48	235	25	122	23	113
2200	59		28		31	
2215	27		16		11	
2230	44		17		27	
2245	23	153	15	76	8	77
2300	20		12		8	
2315	22		14		8	
2330	23		14		9	
2345	18	83	6	46	12	37
Total	**13941**		**6760**		**7181**	

Volume Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, February 15, 2023

Time	Total		NB		SB	
0000	13		5		8	
0015	8		3		5	
0030	4		3		1	
0045	12	37	9	20	3	17
0100	5		1		4	
0115	7		4		3	
0130	3		2		1	
0145	2	17	1	8	1	9
0200	6		1		5	
0215	10		7		3	
0230	10		7		3	
0245	4	30	1	16	3	14
0300	5		4		1	
0315	10		3		7	
0330	8		4		4	
0345	15	38	11	22	4	16
0400	19		8		11	
0415	26		9		17	
0430	43		20		23	
0445	49	137	24	61	25	76
0500	63		31		32	
0515	77		37		40	
0530	116		49		67	
0545	139	395	52	169	87	226
0600	135		58		77	
0615	163		67		96	
0630	207		90		117	
0645	220	725	87	302	133	423
0700	273		103		170	
0715	302		124		178	
0730	314		129		185	
0745	298	1187	117	473	181	714
0800	266		104		162	
0815	269		121		148	
0830	234		104		130	
0845	255	1024	125	454	130	570
0900	167		70		97	
0915	187		84		103	
0930	183		88		95	
0945	154	691	80	322	74	369
1000	182		78		104	
1015	172		85		87	
1030	175		73		102	
1045	177	706	74	310	103	396
1100	157		84		73	
1115	186		79		107	
1130	195		88		107	
1145	172	710	83	334	89	376
1200	185		100		85	
1215	205		113		92	
1230	213		97		116	
1245	181	784	89	399	92	385
1300	198		102		96	
1315	192		102		90	
1330	180		76		104	
1345	191	761	83	363	108	398
1400	236		118		118	
1415	233		126		107	
1430	237		112		125	
1445	234	940	108	464	126	476
1500	274		145		129	
1515	263		143		120	
1530	312		172		140	
1545	279	1128	133	593	146	535
1600	292		141		151	
1615	274		147		127	
1630	292		138		154	
1645	282	1140	155	581	127	559
1700	305		145		160	
1715	299		149		150	
1730	266		135		131	
1745	227	1097	132	561	95	536
1800	200		106		94	
1815	234		132		102	
1830	142		67		75	
1845	179	755	88	393	91	362
1900	150		76		74	
1915	137		73		64	
1930	115		63		52	
1945	123	525	43	255	80	270
2000	108		48		60	
2015	96		44		52	
2030	91		47		44	
2045	94	389	47	186	47	203
2100	75		42		33	
2115	67		40		27	
2130	56		26		30	
2145	39	237	23	131	16	106
2200	43		19		24	
2215	45		27		18	
2230	42		19		23	
2245	39	169	14	79	25	90
2300	16		10		6	
2315	34		20		14	
2330	28		13		15	
2345	14	92	6	49	8	43
Total	**13714**		**6545**		**7169**	

Speed Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Dir Northbound
Tuesday, February 14, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	19	0	0	0	0	0	0	2	8	6	3	0	0	0	0	0	0
0100	12	0	0	0	0	0	0	3	7	2	0	0	0	0	0	0	0
0200	14	0	0	0	0	0	0	0	10	4	0	0	0	0	0	0	0
0300	16	0	0	0	0	0	0	3	6	6	1	0	0	0	0	0	0
0400	73	0	0	0	0	0	0	2	42	26	3	0	0	0	0	0	0
0500	174	0	0	0	0	1	0	10	70	81	12	0	0	0	0	0	0
0600	308	0	0	0	0	0	0	9	110	157	32	0	0	0	0	0	0
0700	425	0	0	0	0	0	0	12	171	215	27	0	0	0	0	0	0
0800	470	0	0	0	0	0	0	23	209	214	22	1	1	0	0	0	0
0900	380	0	0	0	0	0	2	6	150	205	16	1	0	0	0	0	0
1000	346	0	0	0	0	0	0	9	139	168	28	2	0	0	0	0	0
1100	381	0	0	0	0	0	0	9	118	215	37	2	0	0	0	0	0
1200	394	0	0	0	0	0	1	13	108	221	49	2	0	0	0	0	0
1300	349	0	0	0	0	0	1	3	89	206	50	0	0	0	0	0	0
1400	505	0	0	0	0	0	2	21	228	204	44	5	1	0	0	0	0
1500	645	0	0	0	0	0	1	24	287	286	47	0	0	0	0	0	0
1600	621	0	0	0	0	0	0	6	210	366	38	1	0	0	0	0	0
1700	548	0	0	0	0	0	1	23	242	257	23	2	0	0	0	0	0
1800	404	0	0	0	0	0	0	15	173	193	23	0	0	0	0	0	0
1900	243	0	0	0	0	0	1	8	95	127	11	1	0	0	0	0	0
2000	189	0	0	0	0	0	0	8	78	91	12	0	0	0	0	0	0
2100	122	0	0	0	0	0	0	1	42	68	11	0	0	0	0	0	0
2200	76	0	0	0	0	0	0	3	31	23	16	2	1	0	0	0	0
2300	46	0	0	0	0	0	0	1	24	16	5	0	0	0	0	0	0
Total	**6760**	**0**	**0**	**0**	**0**	**1**	**9**	**214**	**2647**	**3357**	**510**	**19**	**3**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.01%**	**0.13%**	**3.17%**	**39.16%**	**49.66%**	**7.54%**	**0.28%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 59.0 mph, Minimum = 22.1 mph, Mean = 40.6 mph
85% Speed = 43.68 mph, 95% Speed = 45.75 mph, Median = 40.54 mph
10 mph Pace = 36 - 46, Number in Pace = 6056 (89.73%)
Variance = 10.06, Standard Deviation = 3.17 mph

Speed Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Dir Northbound
Wednesday, February 15, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	20	0	0	0	0	0	0	1	8	9	2	0	0	0	0	0	0
0100	8	0	0	0	0	0	0	2	3	3	0	0	0	0	0	0	0
0200	16	0	0	0	0	0	0	1	7	8	0	0	0	0	0	0	0
0300	22	0	0	0	0	0	0	2	12	7	0	1	0	0	0	0	0
0400	61	0	0	0	0	0	0	1	22	29	9	0	0	0	0	0	0
0500	169	0	0	0	0	0	0	7	77	73	12	0	0	0	0	0	0
0600	302	0	0	0	0	0	0	6	116	156	23	1	0	0	0	0	0
0700	473	0	0	0	0	0	0	31	174	241	22	4	1	0	0	0	0
0800	454	0	0	0	0	0	0	19	228	185	21	1	0	0	0	0	0
0900	322	0	0	0	0	0	0	17	154	139	10	2	0	0	0	0	0
1000	310	0	0	0	0	0	0	20	116	153	18	3	0	0	0	0	0
1100	334	0	0	0	0	0	0	12	123	168	28	3	0	0	0	0	0
1200	399	0	0	0	0	0	0	7	101	256	34	1	0	0	0	0	0
1300	363	0	0	0	0	0	0	5	96	233	26	3	0	0	0	0	0
1400	464	0	0	1	1	0	1	14	144	267	30	6	0	0	0	0	0
1500	593	0	0	0	0	0	0	11	195	321	62	4	0	0	0	0	0
1600	581	0	0	0	1	3	3	14	152	338	67	3	0	0	0	0	0
1700	561	0	0	0	0	0	0	9	210	299	41	1	1	0	0	0	0
1800	393	0	0	0	0	0	0	27	160	184	22	0	0	0	0	0	0
1900	255	0	0	0	0	0	0	7	85	138	24	1	0	0	0	0	0
2000	186	0	0	0	0	0	0	6	64	97	18	1	0	0	0	0	0
2100	131	0	0	0	0	0	0	2	46	72	9	2	0	0	0	0	0
2200	79	0	0	0	0	0	0	7	22	42	8	0	0	0	0	0	0
2300	49	0	0	0	0	0	0	5	18	22	4	0	0	0	0	0	0
Total	**6545**	**0**	**0**	**1**	**2**	**3**	**4**	**233**	**2333**	**3440**	**490**	**37**	**2**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.02%**	**0.03%**	**0.05%**	**0.06%**	**3.56%**	**35.65%**	**52.56%**	**7.49%**	**0.57%**	**0.03%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 57.5 mph, Minimum = 13.2 mph, Mean = 40.8 mph
85% Speed = 43.91 mph, 95% Speed = 45.80 mph, Median = 40.82 mph
10 mph Pace = 36 - 46, Number in Pace = 5845 (89.30%)
Variance = 10.47, Standard Deviation = 3.24 mph

Speed Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Dir Southbound
Tuesday, February 14, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	19	0	0	0	0	0	0	4	6	6	3	0	0	0	0	0	0
0100	11	0	0	0	0	0	0	3	3	2	3	0	0	0	0	0	0
0200	12	0	0	0	0	0	0	2	3	5	2	0	0	0	0	0	0
0300	19	0	0	0	0	0	0	2	9	5	3	0	0	0	0	0	0
0400	84	0	0	0	0	0	0	9	26	39	10	0	0	0	0	0	0
0500	230	0	0	0	0	0	2	14	109	92	13	0	0	0	0	0	0
0600	448	0	0	0	0	0	3	36	207	162	38	2	0	0	0	0	0
0700	647	0	0	0	0	6	5	91	281	213	44	7	0	0	0	0	0
0800	588	0	0	0	0	0	7	70	239	216	48	7	1	0	0	0	0
0900	394	0	0	0	0	1	4	52	141	145	43	8	0	0	0	0	0
1000	408	0	0	0	0	0	7	35	166	154	40	6	0	0	0	0	0
1100	386	0	0	0	0	0	1	17	128	179	51	9	1	0	0	0	0
1200	411	0	0	0	0	0	3	25	122	198	61	2	0	0	0	0	0
1300	400	0	0	0	0	0	2	23	160	175	40	0	0	0	0	0	0
1400	449	0	0	2	2	1	3	36	175	154	70	6	0	0	0	0	0
1500	519	0	0	0	0	1	6	61	172	211	66	2	0	0	0	0	0
1600	592	0	0	0	0	1	2	38	228	226	87	8	2	0	0	0	0
1700	551	0	0	0	0	0	9	34	235	216	52	4	1	0	0	0	0
1800	386	0	0	0	0	0	4	43	149	154	35	1	0	0	0	0	0
1900	216	0	0	0	0	0	3	25	89	68	27	4	0	0	0	0	0
2000	184	0	0	0	0	2	1	17	76	64	21	3	0	0	0	0	0
2100	113	0	0	0	0	0	0	8	40	42	18	5	0	0	0	0	0
2200	77	0	0	0	0	0	0	6	30	28	9	4	0	0	0	0	0
2300	37	0	0	0	0	0	0	4	9	10	10	4	0	0	0	0	0
Total	**7181**	**0**	**0**	**2**	**2**	**12**	**62**	**655**	**2803**	**2764**	**794**	**82**	**5**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.03%**	**0.03%**	**0.17%**	**0.86%**	**9.12%**	**39.03%**	**38.49%**	**11.06%**	**1.14%**	**0.07%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 57.5 mph, Minimum = 11.6 mph, Mean = 40.2 mph
85% Speed = 44.55 mph, 95% Speed = 47.46 mph, Median = 40.07 mph
10 mph Pace = 35 - 45, Number in Pace = 5524 (77.10%)
Variance = 19.60, Standard Deviation = 4.43 mph

Speed Report

Job 1177_1_GPI_ATR 1
Area Litchfield, NH
Location Derry Road, north of BAE Driveway
Dir Southbound
Wednesday, February 15, 2023

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	17	0	0	0	0	0	0	3	9	3	2	0	0	0	0	0	0
0100	9	0	0	0	0	0	0	1	3	4	1	0	0	0	0	0	0
0200	14	0	0	0	0	0	0	1	8	4	1	0	0	0	0	0	0
0300	16	0	0	0	0	0	0	2	4	8	2	0	0	0	0	0	0
0400	76	0	0	0	0	0	0	3	34	26	13	0	0	0	0	0	0
0500	226	0	0	0	0	0	2	28	98	79	18	1	0	0	0	0	0
0600	423	0	0	1	2	2	5	19	151	197	42	4	0	0	0	0	0
0700	714	0	0	0	0	0	4	63	351	251	42	3	0	0	0	0	0
0800	570	0	0	0	0	1	2	69	234	220	41	3	0	0	0	0	0
0900	369	0	0	0	0	0	1	33	117	172	44	2	0	0	0	0	0
1000	396	0	0	0	0	0	5	38	141	176	33	2	1	0	0	0	0
1100	376	0	0	0	0	0	4	29	147	145	49	2	0	0	0	0	0
1200	385	0	0	0	0	0	1	15	125	179	56	8	1	0	0	0	0
1300	398	0	0	0	0	0	2	35	123	166	59	11	2	0	0	0	0
1400	476	0	0	0	0	0	3	35	154	212	66	6	0	0	0	0	0
1500	535	0	0	0	0	0	7	62	191	192	72	10	1	0	0	0	0
1600	559	0	0	0	0	1	5	43	211	242	49	7	1	0	0	0	0
1700	536	0	0	0	0	0	8	59	196	225	45	3	0	0	0	0	0
1800	362	0	0	0	0	2	4	62	138	126	26	4	0	0	0	0	0
1900	270	0	0	0	0	0	1	29	89	110	38	3	0	0	0	0	0
2000	203	0	0	0	0	0	1	16	72	82	27	4	1	0	0	0	0
2100	106	0	0	0	0	0	4	9	29	37	21	6	0	0	0	0	0
2200	90	0	0	0	0	0	0	6	29	36	14	4	1	0	0	0	0
2300	43	0	0	0	0	0	2	2	20	13	5	1	0	0	0	0	0
Total	**7169**	**0**	**0**	**1**	**2**	**6**	**61**	**662**	**2674**	**2905**	**766**	**84**	**8**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.01%**	**0.03%**	**0.08%**	**0.85%**	**9.23%**	**37.30%**	**40.52%**	**10.68%**	**1.17%**	**0.11%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 58.3 mph, Minimum = 12.7 mph, Mean = 40.3 mph
85% Speed = 44.44 mph, 95% Speed = 47.23 mph, Median = 40.24 mph
10 mph Pace = 35 - 45, Number in Pace = 5585 (77.90%)
Variance = 19.13, Standard Deviation = 4.37 mph

TRAFFIC VOLUME ADJUSTMENT DATA

Traffic Volume Adjustments Summary

	Used	
COVID-19 Adjustment	1.01	AM Peak Hour
	1.02	PM Peak Hour
	1.01	Weekday Daily
Seasonal Adjustment (peak month)	1.18	
Historical Growth	1.0%	

NOTES

Traffic counts were conducted on:
Tuesday February 14, 2023 and Wednesday February 15, 2023

COVID-19 Adjustment

Count 1

N/A For Aggregated Counts

INTERVAL:60-MIN

Time	60-min Interval 1st	2nd	3rd	4th	Hourly Count	% Diff
0:00-1:00	-	-	-	-	44	75.0
1:00-2:00	-	-	-	-	24	18.2
2:00-3:00	-	-	-	-	21	47.1
3:00-4:00	-	-	-	-	34	-11.1
4:00-5:00	-	-	-	-	108	-0.9
5:00-6:00	-	-	-	-	222	-16.9
6:00-7:00	-	-	-	-	437	-9.0
7:00-8:00	-	-	-	-	585	-11.3
8:00-9:00	-	-	-	-	540	-17.3
9:00-10:00	-	-	-	-	460	3.8
10:00-11:00	-	-	-	-	458	-7.0
11:00-12:00	-	-	-	-	483	-18.4
12:00-13:00	-	-	-	-	531	-7.8
13:00-14:00	-	-	-	-	534	-1.1
14:00-15:00	-	-	-	-	600	-18.7
15:00-16:00	-	-	-	-	711	-14.4
16:00-17:00	-	-	-	-	783	-3.6
17:00-18:00	-	-	-	-	809	9.6
18:00-19:00	-	-	-	-	563	12.9
19:00-20:00	-	-	-	-	380	4.6
20:00-21:00	-	-	-	-	290	19.7
21:00-22:00	-	-	-	-	220	32.8
22:00-23:00	-	-	-	-	155	42.2
23:00-24:00	-	-	-	-	93	73.5
Total	Counts = 22				9085	-2.9

Count Criteria

Local Id	02489001
Start Date	12/01/2019
End Date	12/31/2019
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

Count 2

N/A For Aggregated Counts

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count	% Diff
0:00-1:00	8	6	6	5	25	22.2
1:00-2:00	5	5	5	3	18	-10.5
2:00-3:00	4	4	4	3	15	14.3
3:00-4:00	6	7	6	8	27	-33.8
4:00-5:00	14	20	28	35	97	-11.7
5:00-6:00	44	48	65	65	222	-16.9
6:00-7:00	87	90	115	112	404	-16.8
7:00-8:00	115	138	146	139	538	-19.6
8:00-9:00	145	154	157	126	582	-9.8
9:00-10:00	119	116	125	115	475	7.0
10:00-11:00	125	124	136	131	516	5.0
11:00-12:00	138	138	139	141	556	-4.4
12:00-13:00	152	143	148	144	587	2.2
13:00-14:00	144	148	149	149	590	8.8
14:00-15:00	170	172	180	187	709	-2.1
15:00-16:00	201	201	207	198	807	-1.7
16:00-17:00	200	199	205	192	796	-2.0
17:00-18:00	205	186	159	139	689	-6.5
18:00-19:00	130	117	113	105	465	-6.3
19:00-20:00	92	79	74	70	315	-14.2
20:00-21:00	75	63	61	54	253	6.1
21:00-22:00	50	45	42	38	175	10.2
22:00-23:00	35	30	26	21	112	10.3
23:00-24:00	22	15	14	12	63	37.7
Total	Counts = 22				9036	-3.5

Count Criteria

Local Id	02489001
Start Date	12/01/2022
End Date	12/31/2022
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

LOCATION INFO	
Location ID	02489001
Type	SPOT
Fnct'l Class	4
Located On	Rockingham Rd
Loc On Alias	NH 28 SOUTH OF LIBBEY RD NORTH INTERSECTION (SB-NB) (01489005-01489006)
Direction	2-WAY
County	ROCKINGHAM
Community	WINDHAM
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

Weekday AM Peak Hour

585 / 582 = 1.01

Weekday PM Peak Hour

809 / 796 = 1.02

Weekday Daily

9085 / 9036 = 1.01

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*

Traffic Growth Rate[a]

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Rate
STATION 22229021 - NH 102 (DERRY ROAD) AT LITCHFIELD TL				14000			14257			14897	1.04%
STATION 82229041 - NH 102 (DERRY ROAD) NORTH OF EASY ST				15,000			15,674			15,394	0.44%
STATION 82229031 - NH 3A/NH 102 (DERRY ROAD) NORTH OF LEDGE RD		26000			24,000			24,256			-1.14%
STATION 82269050 - NH 102 (NASHUA ROAD) AT HUDSON TL (EB-WB)			14000			14,000			14,306		0.36%

Average Annual Growth Rate = 0.18%

USE 1.0%

Per NHDOT current standard

[a] Source: Based upon historical data; NHDOT Transportation Data Management System.

SIGHT DISTANCE CALCULATIONS

AASHTO Recommended Sight Distance Summary
(Passenger Vehicles)

LOCATION: Derry Road (NH Route 102) at Proposed Site Driveway

Side Street Direction:	WB
Number of Lanes on Mainline =	2
Median Width (Feet) =	0

STOPPING SIGHT DISTANCE

Mainline Direction:	NB	
85th Percentile Speed (V) =	45	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	360	FT
SSD =	**360**	**FT**

Mainline Direction:	SB	
85th Percentile Speed (V) =	45	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	360	FT
SSD =	**360**	**FT**

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP:	South	of Driveway
Posted Speed (V) =	45	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	6.5	seconds
ISD (Right Turn from Stop) = 1.47 * t_g * V =	430	FT
ISD (Right Turn from Stop) =	**430**	**FT**

LEFT TURN FROM STOP:	North	of Driveway
Posted Speed (V) =	45	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	7.5	seconds
ISD (Left Turn from Stop) = 1.47 * t_g * V =	497	FT
ISD (Left Turn from Stop) =	**500**	**FT**

TRIP GENERATION CALCULATIONS

EXISTING

BAE Systems

PROPOSED

172 Units Single Family Attached Housing

	LUC 215		
	Proposed	**Existing**	**New Trips**
Weekday Daily			
In	630	0	630
Out	630	0	630
Total	1,260	0	1,260
Weekday AM			
In	21	1	20
Out	63	0	63
Total	84	1	83
Weekday PM			
In	58	1	57
Out	41	1	40
Total	99	2	97

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 215 - Single-Family Attached Housing

General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 172

AVERAGE WEEKDAY DAILY

T = 7.62 * (X) - 50.48
T = 7.62 * 172 - 50.48
T = 1260.16
T = 1,260 vehicle trips
with 50% (630 vpd) entering and 50% (630 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.52 * (X) - 5.70
T = 0.52 * 172 - 5.70
T = 83.74
T = 84 vehicle trips
with 25% (21 vpd) entering and 75% (63 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.60 * (X) - 3.93
T = 0.6 * 172 - 3.93
T = 99.27
T = 99 vehicle trips
with 59% (58 vpd) entering and 41% (41 vpd) exiting.

SATURDAY DAILY

T = 13.21 * (X) - 444.34
T = 13.21 * 172 - 444.34
T = 1827.78
T = 1,828 vehicle trips
with 50% (914 vpd) entering and 50% (914 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

Ln T = 0.82 Ln (X) + 0.43
Ln T = 0.82 Ln(172) - 0.43
Ln T = 4.65
T = 104.68
T = 105 vehicle trips
with 48% (50 vpd) entering and 52% (55 vpd) exiting.

TRIP DISTRIBUTION DATA

Residence		Place of Work		Commuting Flow	To/From North	To/From South	To/From West	To/From North	To/From South	To/From West	
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	Derry Rd	Derry Rd	Cutler Rd	Derry Rd	Derry Rd	Cutler Rd	
New Hampshire	Litchfield town	New Hampshire	Nashua city	663		100%		0	663	0	
New Hampshire	Litchfield town	New Hampshire	Manchester city	654	100%			654	0	0	
New Hampshire	Litchfield town	New Hampshire	Litchfield town	445	80%	10%	10%	356	44.5	44.5	
New Hampshire	Litchfield town	New Hampshire	Londonderry town	435	100%			435	0	0	
New Hampshire	Litchfield town	New Hampshire	Hudson town	269		100%		0	269	0	
New Hampshire	Litchfield town	New Hampshire	Merrimack town	135	50%	50%		67.5	67.5	0	
New Hampshire	Litchfield town	New Hampshire	Salem town	131	75%	25%		98.25	32.75	0	
New Hampshire	Litchfield town	New Hampshire	Concord city	119	100%			119	0	0	
New Hampshire	Litchfield town	New Hampshire	Amherst town	107	50%	50%		53.5	53.5	0	
New Hampshire	Litchfield town	New Hampshire	Bedford town	92	90%		10%	82.8	0	9.2	
New Hampshire	Litchfield town	Massachusetts	Chelmsford town	84		100%		0	84	0	
New Hampshire	Litchfield town	Massachusetts	Lowell city	80		100%		0	80	0	
New Hampshire	Litchfield town	Massachusetts	Worcester city	66		100%		0	66	0	
New Hampshire	Litchfield town	Massachusetts	North Andover town	58	55%	45%		31.9	26.1	0	
New Hampshire	Litchfield town	Massachusetts	Boston city	50	50%	50%		25	25	0	
New Hampshire	Litchfield town	Massachusetts	Tewksbury town	47	50%	50%		23.5	23.5	0	
New Hampshire	Litchfield town	Massachusetts	Tyngsborough town	43		100%		0	43	0	
New Hampshire	Litchfield town	Massachusetts	Lynnfield town	41	55%	45%		22.55	18.45	0	
New Hampshire	Litchfield town	Massachusetts	Andover town	39	55%	45%		21.45	17.55	0	
New Hampshire	Litchfield town	Massachusetts	Dracut town	39		100%		0	39	0	
New Hampshire	Litchfield town	New Hampshire	Hooksett town	39	85%	10%	5%	33.15	3.9	1.95	
New Hampshire	Litchfield town	Massachusetts	Billerica town	38		100%		0	38	0	
New Hampshire	Litchfield town	New Hampshire	Weare town	37	85%	15%		31.45	5.55	0	
New Hampshire	Litchfield town	Massachusetts	Lawrence city	36	50%	50%		18	18	0	
New Hampshire	Litchfield town	Massachusetts	Bedford town	35		100%		0	35	0	
New Hampshire	Litchfield town	Massachusetts	Burlington town	35	40%	60%		14	21	0	
New Hampshire	Litchfield town	New Hampshire	Hampton town	34	100%			34	0	0	
New Hampshire	Litchfield town	New Hampshire	Goffstown town	30	85%		15%	25.5	0	4.5	
New Hampshire	Litchfield town	New Hampshire	Derry town	28	100%			28	0	0	
							Σ	2174.55	1674.3	60.15	3909
							Calculated	55.63%	42.83%	1.54%	
							USE	55%	40%	5%	

AUXILIARY LANE WARRANTS ANALYSIS

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	561
Right-turn volume, veh/h:	10

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	29
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

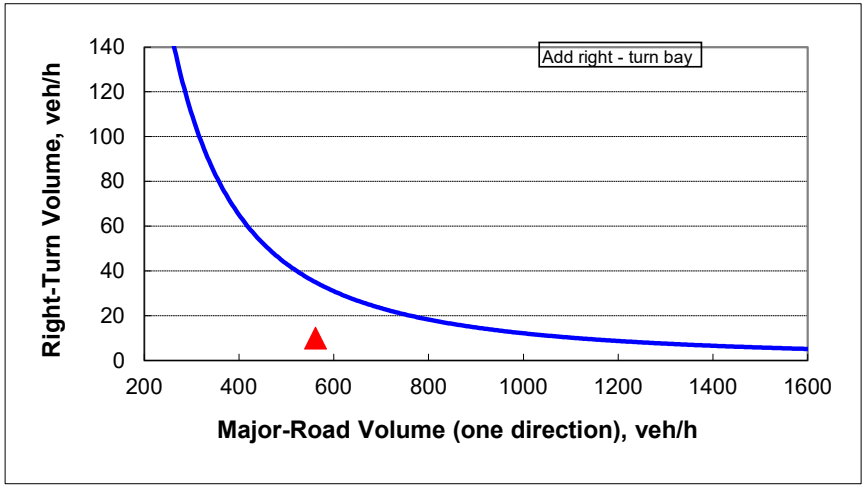


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	684
Right-turn volume, veh/h:	27

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	24
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	

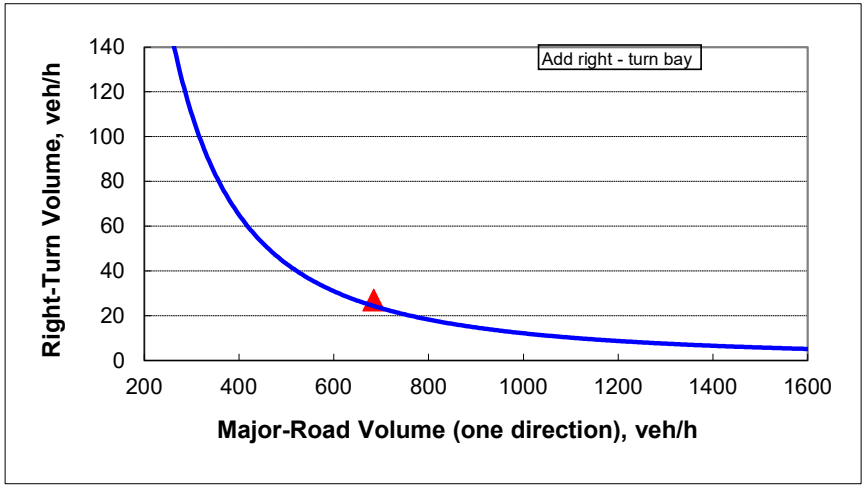


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	620
Right-turn volume, veh/h:	10

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	29
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

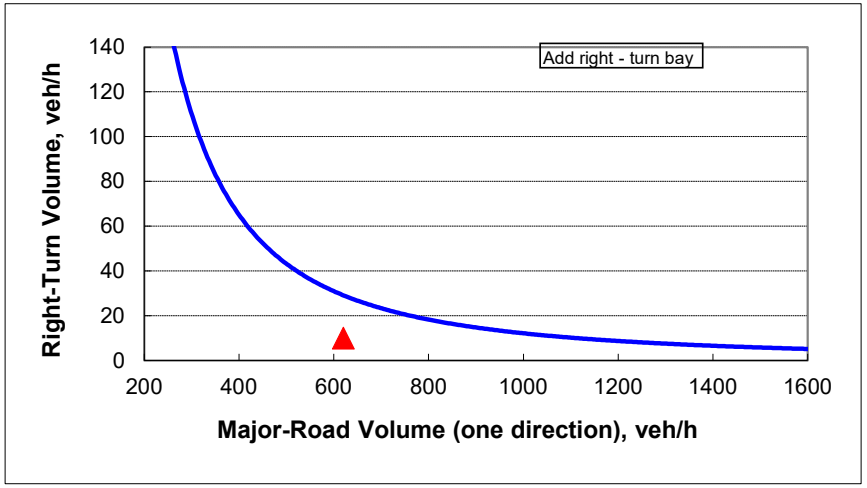


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	753
Right-turn volume, veh/h:	27

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	20
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	

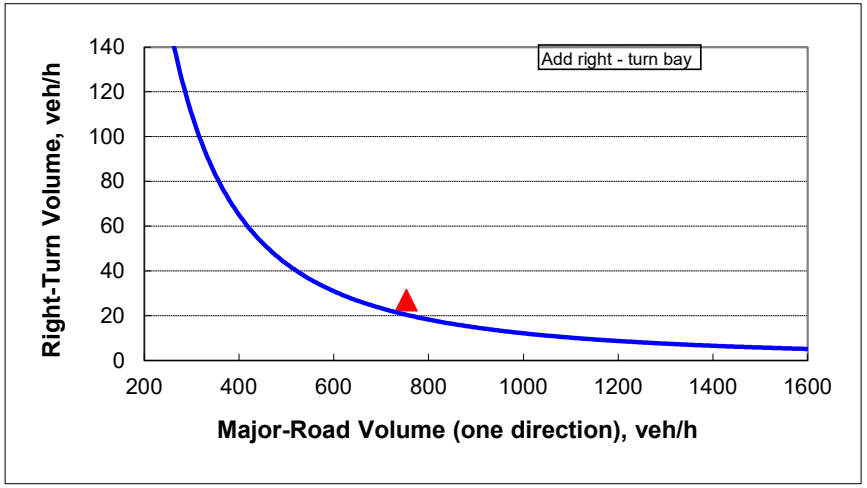


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

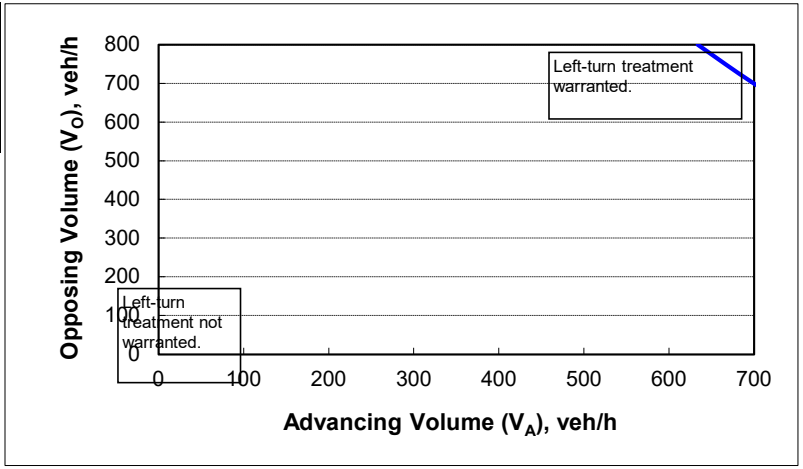
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	44
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	813
Opposing volume (V_O), veh/h:	561

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	758
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

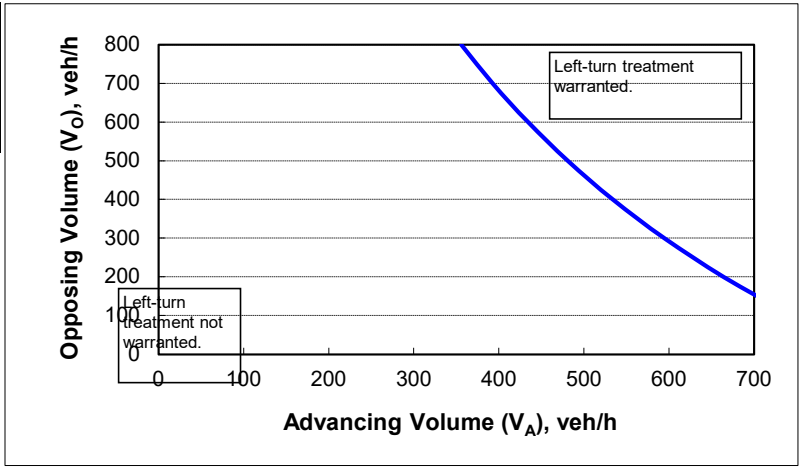
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	44
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	774
Opposing volume (V_O), veh/h:	684

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	399
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

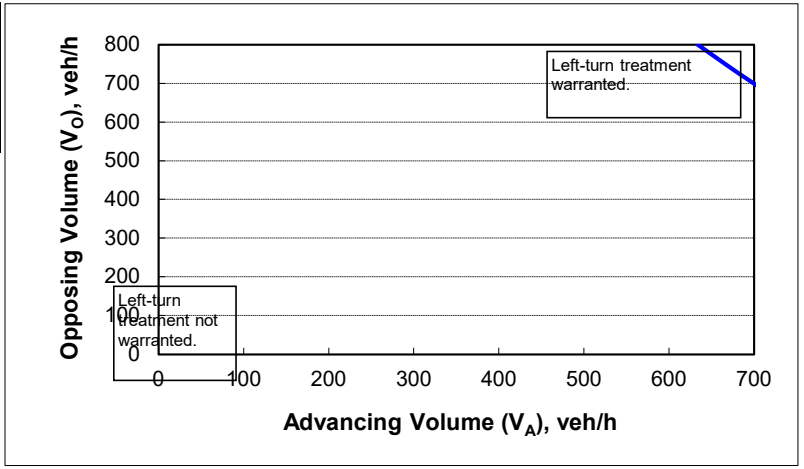
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	44
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	897
Opposing volume (V_O), veh/h:	620

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	758
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

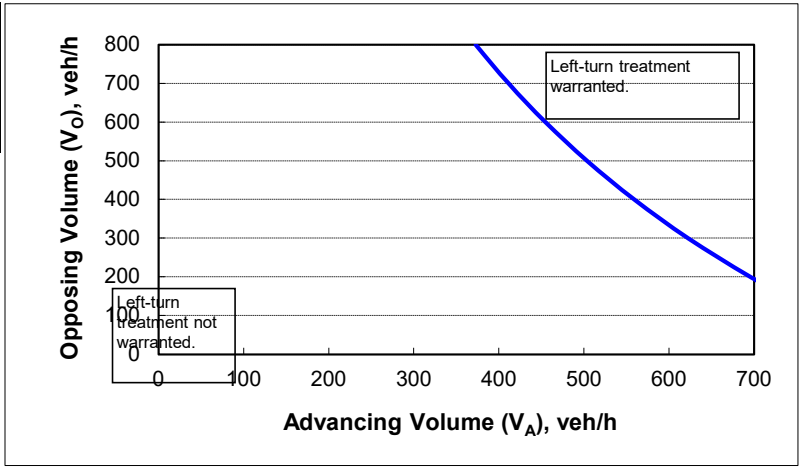
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	44
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	852
Opposing volume (V_O), veh/h:	753

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	390
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

CAPACITY ANALYSIS METHODOLOGY

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[8] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-2.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table A-2 summarizes the relationship between level of service and average control delay.

[8] *Highway Capacity Manual 6th Edition*, Transportation Research Board; Washington, D.C.; 2016.

TABLE A-2
Level-of-Service Criteria for Intersections

Level of Service	Unsignalized Intersection Criteria Average Control Delay (Seconds per Vehicle)	Signalized Intersection Criteria Average Control Delay (Seconds per Vehicle)
A	≤10	≤10
B	>10 and ≤15	>10 and ≤20
C	>15 and ≤25	>20 and ≤35
D	>25 and ≤35	>35 and ≤55
E	>35 and ≤50	>55 and ≤80
F	>50 or v/c > 1.0	>80 or v/c > 1.0

Source *Highway Capacity Manual 6th Edition*, Transportation Research Board; Washington, D.C.; 2016. Pages 19-16, 20-6, and 21-9.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups or to individual intersection approaches.

CAPACITY AND QUEUE ANALYSIS WORKSHEETS

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	546	1	0	794
Future Vol, veh/h	0	0	546	1	0	794
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	0	0	600	1	0	882

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1483	601	0	0	601	0
Stage 1	601	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	139	504	-	-	971	-
Stage 1	551	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	139	504	-	-	971	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	408	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	971	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	99	37	542	794	0
Future Vol, veh/h	5	99	37	542	794	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	93	93	90	90
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	6	122	40	583	882	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1545	882	882	0	-	0
Stage 1	882	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	127	347	763	-	-	-
Stage 1	406	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	117	347	763	-	-	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	374	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.7	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	763	-	117	347	-	-
HCM Lane V/C Ratio	0.052	-	0.053	0.352	-	-
HCM Control Delay (s)	10	0	37.5	20.9	-	-
HCM Lane LOS	A	A	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	1.5	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	651	1	0	736
Future Vol, veh/h	1	0	651	1	0	736
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	4	0	693	1	0	759

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1453	694	0	0	694	0
Stage 1	694	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	145	446	-	-	906	-
Stage 1	499	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	145	446	-	-	906	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	145	906	-
HCM Lane V/C Ratio	-	-	0.028	-	-
HCM Control Delay (s)	-	-	30.5	0	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	57	89	648	726	11
Future Vol, veh/h	4	57	89	648	726	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	96	96	99	99
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	6	83	93	675	733	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1600	739	744	0	-	0
Stage 1	739	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	118	421	868	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	98	421	868	-	-	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	417	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.5	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	868	-	98	421	-	-
HCM Lane V/C Ratio	0.107	-	0.059	0.196	-	-
HCM Control Delay (s)	9.6	0	44	15.6	-	-
HCM Lane LOS	A	A	E	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.7	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	551	1	0	802
Future Vol, veh/h	0	0	551	1	0	802
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	0	0	605	1	0	891

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1497	606	0	0	606	0
Stage 1	606	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	136	501	-	-	967	-
Stage 1	548	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	136	501	-	-	967	-
Mov Cap-2 Maneuver	136	-	-	-	-	-
Stage 1	548	-	-	-	-	-
Stage 2	404	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	967	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	100	37	547	802	0
Future Vol, veh/h	5	100	37	547	802	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	93	93	90	90
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	6	123	40	588	891	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1559	891	891	0	-	0
Stage 1	891	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	124	343	757	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	114	343	757	-	-	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	512	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	757	-	114	343	-	-
HCM Lane V/C Ratio	0.053	-	0.054	0.36	-	-
HCM Control Delay (s)	10	0	38.4	21.3	-	-
HCM Lane LOS	B	A	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	1.6	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	657	1	0	743
Future Vol, veh/h	1	0	657	1	0	743
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	4	0	699	1	0	766

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1466	700	0	0	700	0
Stage 1	700	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	142	443	-	-	902	-
Stage 1	496	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	142	443	-	-	902	-
Mov Cap-2 Maneuver	142	-	-	-	-	-
Stage 1	496	-	-	-	-	-
Stage 2	462	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.1	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	142	902	-
HCM Lane V/C Ratio	-	-	0.028	-	-
HCM Control Delay (s)	-	-	31.1	0	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	58	90	654	733	11
Future Vol, veh/h	4	58	90	654	733	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	96	96	99	99
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	6	84	94	681	740	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1615	746	751	0	-	0
Stage 1	746	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	115	417	863	-	-	-
Stage 1	472	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	95	417	863	-	-	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	414	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	863	-	95	417	-	-
HCM Lane V/C Ratio	0.109	-	0.061	0.202	-	-
HCM Control Delay (s)	9.7	0	45.3	15.8	-	-
HCM Lane LOS	A	A	E	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.7	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	35	551	10	11	802
Future Vol, veh/h	28	35	551	10	11	802
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	31	39	605	11	12	891

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1526	611	0	0	616	0
Stage 1	611	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	131	497	-	-	959	-
Stage 1	546	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	128	497	-	-	959	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	384	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.8	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	128	497	959	-
HCM Lane V/C Ratio	-	-	0.243	0.078	0.013	-
HCM Control Delay (s)	-	-	41.9	12.9	8.8	0
HCM Lane LOS	-	-	E	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.3	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	100	37	555	827	3
Future Vol, veh/h	6	100	37	555	827	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	93	93	90	90
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	7	123	40	597	919	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1598	921	922	0	-	0
Stage 1	921	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	118	329	737	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	108	329	737	-	-	-
Mov Cap-2 Maneuver	108	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.4	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	737	-	108	329	-	-
HCM Lane V/C Ratio	0.054	-	0.069	0.375	-	-
HCM Control Delay (s)	10.2	0	40.8	22.4	-	-
HCM Lane LOS	B	A	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	1.7	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	22	657	27	31	743
Future Vol, veh/h	19	22	657	27	31	743
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	21	24	699	29	32	766

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1544	714	0	0	728	0
Stage 1	714	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	128	435	-	-	880	-
Stage 1	489	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	120	435	-	-	880	-
Mov Cap-2 Maneuver	120	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.5	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	120	435	880	-
HCM Lane V/C Ratio	-	-	0.176	0.056	0.036	-
HCM Control Delay (s)	-	-	41.3	13.8	9.2	0
HCM Lane LOS	-	-	E	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	58	90	677	749	13
Future Vol, veh/h	7	58	90	677	749	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	96	96	99	99
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	10	84	94	705	757	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1657	764	770	0	-	0
Stage 1	764	-	-	-	-	-
Stage 2	893	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	109	407	849	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	403	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	89	407	849	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	403	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.8	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	849	-	89	407	-	-
HCM Lane V/C Ratio	0.11	-	0.114	0.207	-	-
HCM Control Delay (s)	9.8	0	50.6	16.1	-	-
HCM Lane LOS	A	A	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.4	0.8	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	610	1	0	886
Future Vol, veh/h	0	0	610	1	0	886
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	0	0	670	1	0	984

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1655	671	0	0	671	0
Stage 1	671	-	-	-	-	-
Stage 2	984	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	109	460	-	-	915	-
Stage 1	512	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	109	460	-	-	915	-
Mov Cap-2 Maneuver	109	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	365	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	915	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	110	41	605	886	0
Future Vol, veh/h	6	110	41	605	886	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	93	93	90	90
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	7	122	44	651	984	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1723	984	984	0	-	0
Stage 1	984	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	99	303	698	-	-	-
Stage 1	364	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	89	303	698	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	328	-	-	-	-	-
Stage 2	474	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.9	0.7	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	698	-	89	303	-	-
HCM Lane V/C Ratio	0.063	-	0.075	0.403	-	-
HCM Control Delay (s)	10.5	0	48.7	24.7	-	-
HCM Lane LOS	B	A	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	1.9	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	726	1	0	821
Future Vol, veh/h	1	0	726	1	0	821
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	1	0	772	1	0	846

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1619	773	0	0	773	0
Stage 1	773	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	115	402	-	-	847	-
Stage 1	459	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	115	402	-	-	847	-
Mov Cap-2 Maneuver	115	-	-	-	-	-
Stage 1	459	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.6	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	115	847	-
HCM Lane V/C Ratio	-	-	0.01	-	-
HCM Control Delay (s)	-	-	36.6	0	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	64	99	723	810	12
Future Vol, veh/h	4	64	99	723	810	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	99	99
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	4	71	103	753	818	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1783	824	830	0	-	0
Stage 1	824	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	91	376	806	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	71	376	806	-	-	-
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	339	-	-	-	-	-
Stage 2	375	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.3	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	806	-	71	376	-	-
HCM Lane V/C Ratio	0.128	-	0.063	0.189	-	-
HCM Control Delay (s)	10.1	0	59.1	16.8	-	-
HCM Lane LOS	B	A	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.7	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	35	610	10	11	886
Future Vol, veh/h	28	35	610	10	11	886
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	31	39	670	11	12	984

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1684	676	0	0	681	0
Stage 1	676	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	105	457	-	-	907	-
Stage 1	509	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	102	457	-	-	907	-
Mov Cap-2 Maneuver	102	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	102	457	907	-
HCM Lane V/C Ratio	-	-	0.305	0.085	0.013	-
HCM Control Delay (s)	-	-	55.1	13.6	9	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.3	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	110	41	613	911	3
Future Vol, veh/h	7	110	41	613	911	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	93	93	90	90
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	8	122	44	659	1012	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1761	1014	1015	0	-	0
Stage 1	1014	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	93	291	679	-	-	-
Stage 1	352	-	-	-	-	-
Stage 2	470	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	84	291	679	-	-	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	316	-	-	-	-	-
Stage 2	470	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.6	0.7	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	679	-	84	291	-	-
HCM Lane V/C Ratio	0.065	-	0.093	0.42	-	-
HCM Control Delay (s)	10.7	0	52.2	26	-	-
HCM Lane LOS	B	A	F	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	2	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	22	726	27	31	821
Future Vol, veh/h	19	22	726	27	31	821
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	21	24	772	29	32	846

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1697	787	0	0	801	0
Stage 1	787	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	103	395	-	-	827	-
Stage 1	452	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	95	395	-	-	827	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	367	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.6	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	95	395	827	-
HCM Lane V/C Ratio	-	-	0.222	0.062	0.039	-
HCM Control Delay (s)	-	-	53.4	14.7	9.5	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	64	99	746	826	14
Future Vol, veh/h	7	64	99	746	826	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	35	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	99	99
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	8	71	103	777	834	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1824	841	848	0	-	0
Stage 1	841	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	86	368	794	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	66	368	794	-	-	-
Mov Cap-2 Maneuver	66	-	-	-	-	-
Stage 1	329	-	-	-	-	-
Stage 2	366	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	794	-	66	368	-	-
HCM Lane V/C Ratio	0.13	-	0.118	0.193	-	-
HCM Control Delay (s)	10.2	0	66.7	17.1	-	-
HCM Lane LOS	B	A	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.4	0.7	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	35	551	10	11	802
Future Vol, veh/h	28	35	551	10	11	802
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	31	39	605	11	12	891

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1526	611	0	0	616	0
Stage 1	611	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	131	497	-	-	959	-
Stage 1	546	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	129	497	-	-	959	-
Mov Cap-2 Maneuver	129	-	-	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	389	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.7	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	129	497	959	-
HCM Lane V/C Ratio	-	-	0.241	0.078	0.013	-
HCM Control Delay (s)	-	-	41.6	12.9	8.8	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	22	657	27	31	743
Future Vol, veh/h	19	22	657	27	31	743
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	21	24	699	29	32	766

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1544	714	0	0	728	0
Stage 1	714	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	128	435	-	-	880	-
Stage 1	489	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	123	435	-	-	880	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	123	435	880	-
HCM Lane V/C Ratio	-	-	0.172	0.056	0.036	-
HCM Control Delay (s)	-	-	40.2	13.8	9.2	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	35	610	10	11	886
Future Vol, veh/h	28	35	610	10	11	886
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	91	91	90	90
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	31	39	670	11	12	984

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1684	676	0	0	681	0
Stage 1	676	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	105	457	-	-	907	-
Stage 1	509	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	104	457	-	-	907	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	351	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.5	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	104	457	907	-
HCM Lane V/C Ratio	-	-	0.299	0.085	0.013	-
HCM Control Delay (s)	-	-	53.8	13.6	9	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0.3	0	-

Intersection	
Int Delay, s/veh	1

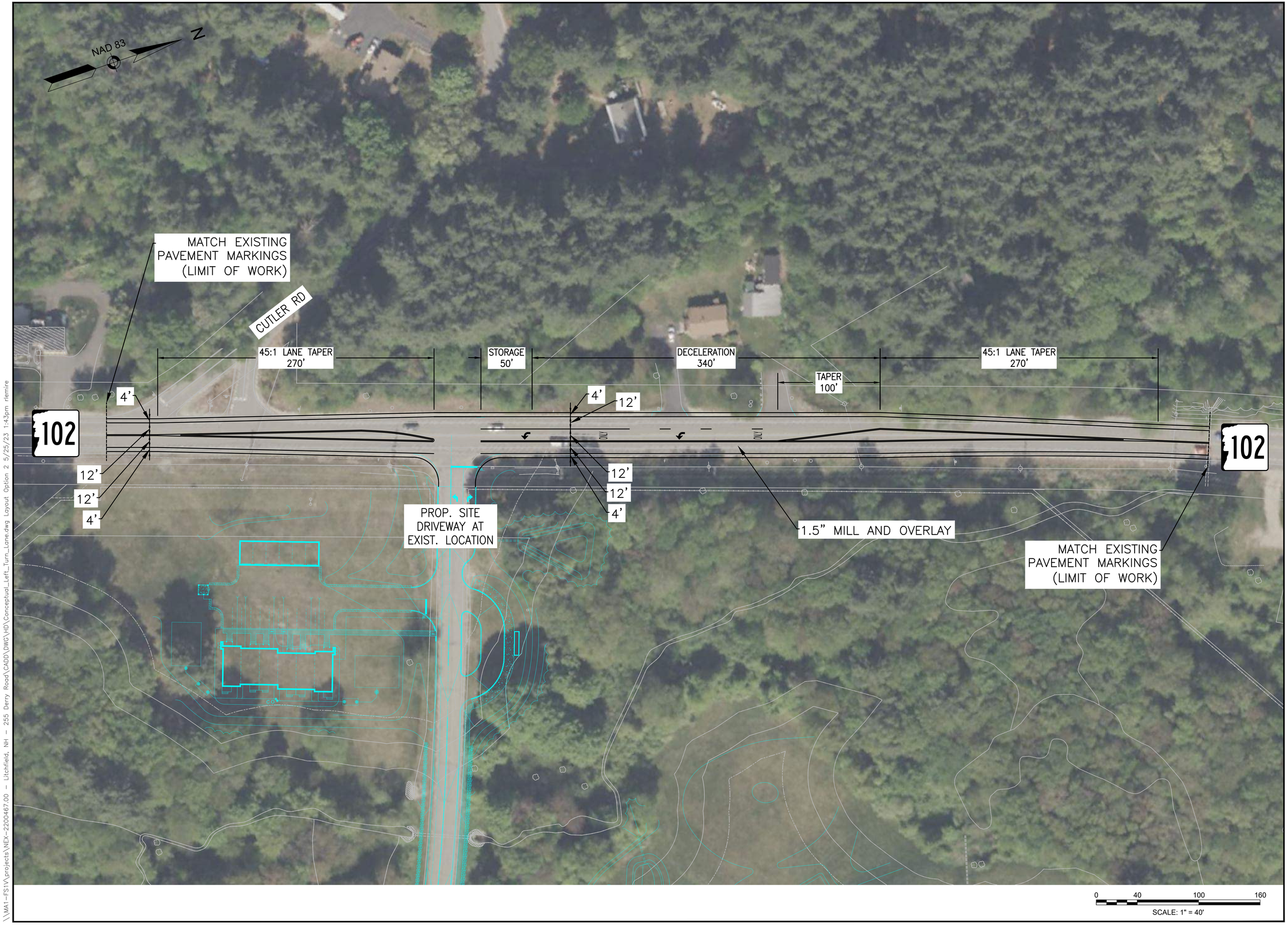
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	22	726	27	31	821
Future Vol, veh/h	19	22	726	27	31	821
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	290	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	94	94	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	21	24	772	29	32	846

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1697	787	0	0	801	0
Stage 1	787	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	103	395	-	-	827	-
Stage 1	452	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	99	395	-	-	827	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	381	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.5	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	99	395	827	-
HCM Lane V/C Ratio	-	-	0.213	0.062	0.039	-
HCM Control Delay (s)	-	-	51	14.7	9.5	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.2	0.1	-

CONCEPTUAL OFFSITE IMPROVEMENT PLAN



GPI Engineering Design Planning Construction Management
Greenman-Pedersen, Inc.
44 Stiles Road, Suite One
Salem, NH 03079

255 DERRY ROAD, LLC
ONE CONTINENTAL DRIVE
LONDONDERRY, NH

MAP 2 LOT 8
255 DERRY ROAD
LITCHFIELD, NEW HAMPSHIRE

REVISIONS

NO.	REVISION	DATE

May 25, 2023

DRAWN/DESIGN BY	CHECKED BY
RDL	MJD

CONCEPTUAL OFFSITE IMPROVEMENTS

SCALE: 1"=40'

PROJECT NO. NEX-2200467

1 OF 1

\\MA1-FS1\Projects\NEX-2200467.00 - Litchfield, NH - 255 Derry Road\CADD\DWG\HD\Conceptual_Left_Turn_Lane.dwg Layout Option 2 5/25/23 1:43pm rlemire