Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=68.69' Storage=0.875 af Inflow=11.22 cfs 1.112 af
Outflow=0.44 cfs 0.376 af

Summary for Pond 7P: Detention Basin

Inflow Area = 4.880 ac, 50.00% Impervious, Inflow Depth = 2.73" for 10-Year event
Inflow = 11.22 cfs @ 12.14 hrs, Volume= 1.112 af
Outflow = 0.44 cfs @ 16.05 hrs, Volume= 0.376 af, Atten= 96%, Lag= 234.5 min
Primary = 0.44 cfs @ 16.05 hrs, Volume= 0.376 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 68.69' @ 16.05 hrs Surf.Area= 0.448 ac Storage= 0.875 af

Plug-Flow detention time= 656.4 min calculated for 0.376 af (34% of inflow)
Center-of-Mass det. time= 472.7 min (1,241.6 - 768.9)

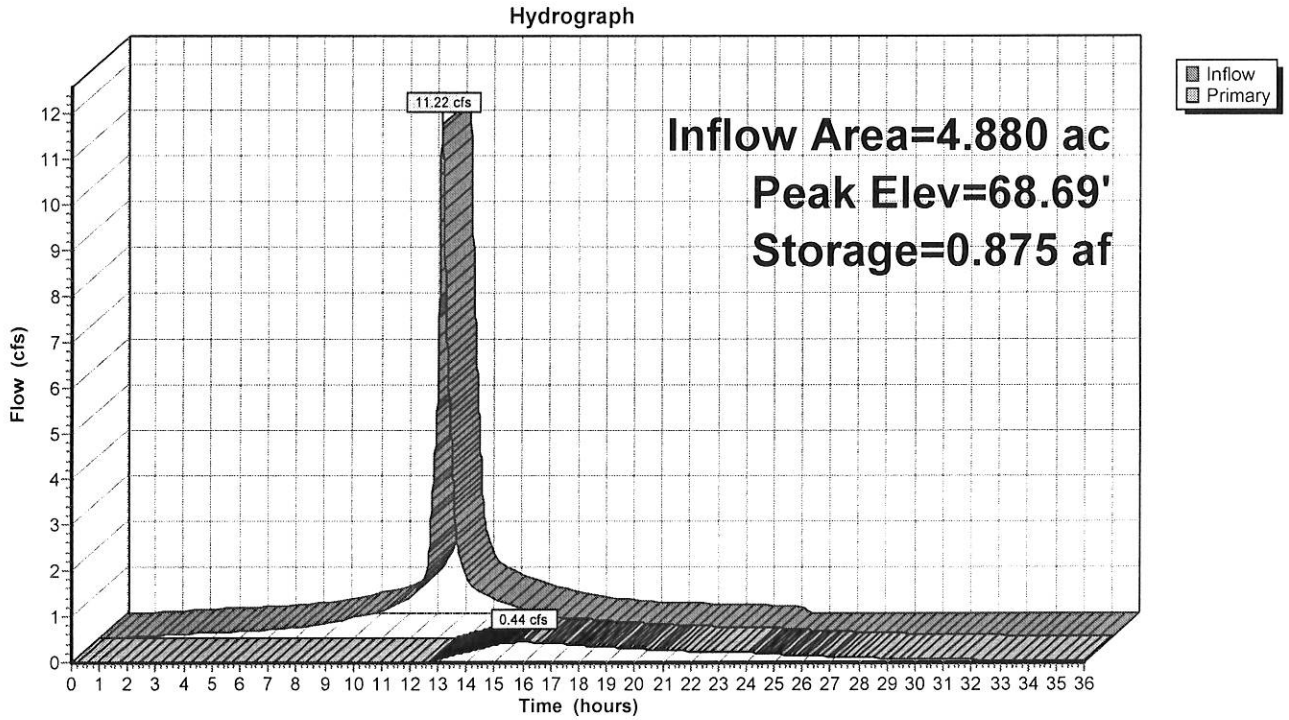
Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

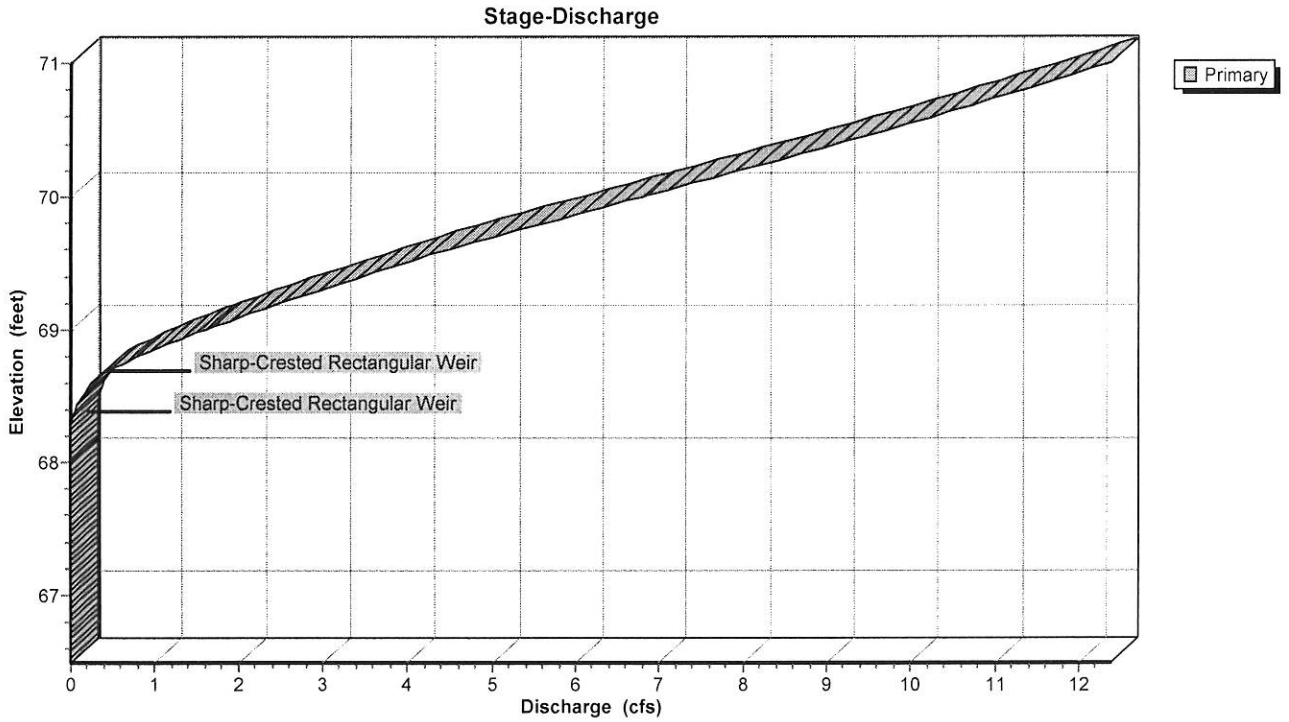
Device	Routing	Invert	Outlet Devices
#1	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 16.05 hrs HW=68.69' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 2.04 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.98 fps)

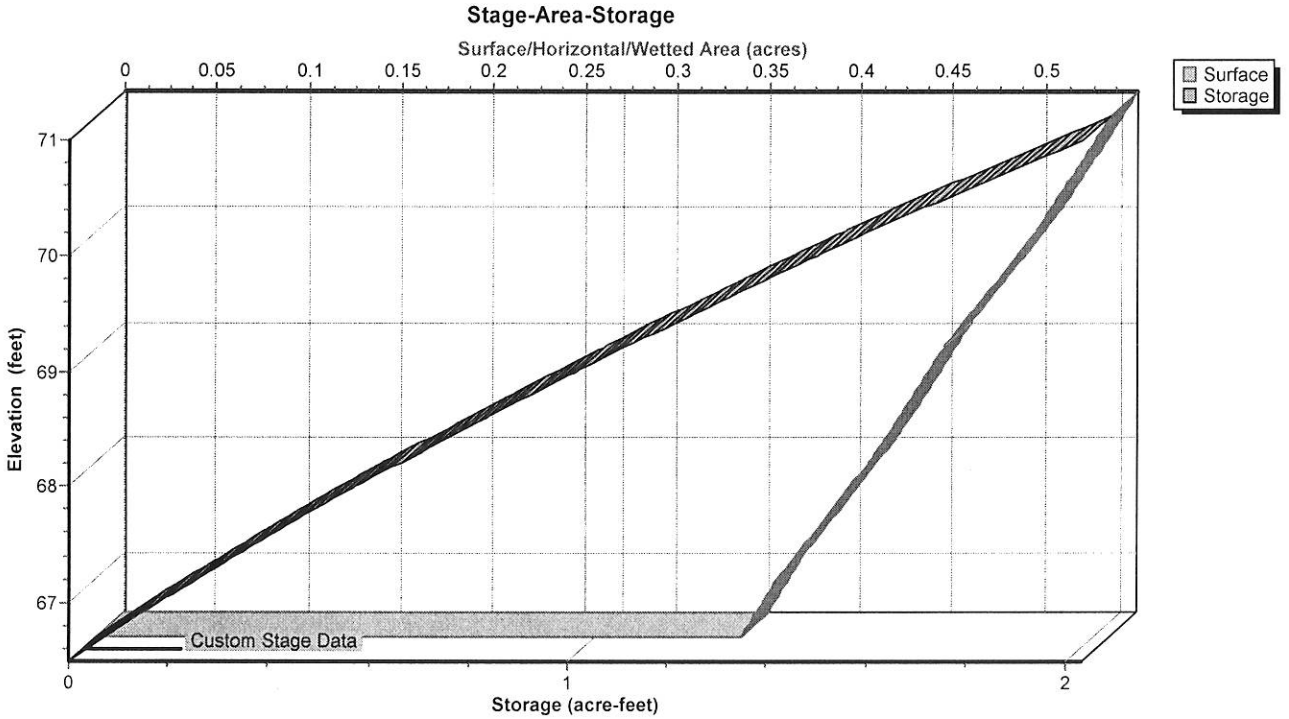
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00
1.00	0.00	0.000	66.50	0.00
2.00	0.05	0.002	66.51	0.00
3.00	0.08	0.008	66.52	0.00
4.00	0.12	0.016	66.55	0.00
5.00	0.14	0.027	66.58	0.00
6.00	0.17	0.040	66.61	0.00
7.00	0.23	0.056	66.66	0.00
8.00	0.30	0.078	66.72	0.00
9.00	0.43	0.108	66.80	0.00
10.00	0.58	0.150	66.92	0.00
11.00	0.87	0.209	67.08	0.00
12.00	**5.84**	0.371	67.50	0.00
13.00	**1.33**	0.760	68.43	0.07
14.00	0.83	0.831	68.59	0.23
15.00	0.63	0.865	68.67	0.38
16.00	0.45	**0.875**	**68.69**	**0.44**
17.00	0.36	**0.871**	**68.68**	**0.42**
18.00	0.28	0.864	68.67	0.38
19.00	0.25	0.856	68.65	0.34
20.00	0.22	0.849	68.63	0.30
21.00	0.20	0.843	68.62	0.27
22.00	0.18	0.838	68.61	0.25
23.00	0.17	0.832	68.60	0.23
24.00	0.15	0.827	68.58	0.22
25.00	0.00	0.812	68.55	0.18
26.00	0.00	0.798	68.52	0.15
27.00	0.00	0.787	68.49	0.13
28.00	0.00	0.777	68.47	0.11
29.00	0.00	0.769	68.45	0.09
30.00	0.00	0.762	68.44	0.08
31.00	0.00	0.756	68.42	0.07
32.00	0.00	0.751	68.41	0.06
33.00	0.00	0.746	68.40	0.05
34.00	0.00	0.742	68.39	0.04
35.00	0.00	0.739	68.38	0.04
36.00	0.00	0.736	68.38	0.03

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
66.50	0.00	69.10	2.07
66.55	0.00	69.15	2.30
66.60	0.00	69.20	2.53
66.65	0.00	69.25	2.77
66.70	0.00	69.30	3.01
66.75	0.00	69.35	3.25
66.80	0.00	69.40	3.49
66.85	0.00	69.45	3.73
66.90	0.00	69.50	3.97
66.95	0.00	69.55	4.20
67.00	0.00	69.60	4.48
67.05	0.00	69.65	4.77
67.10	0.00	69.70	5.05
67.15	0.00	69.75	5.34
67.20	0.00	69.80	5.63
67.25	0.00	69.85	5.92
67.30	0.00	69.90	6.21
67.35	0.00	69.95	6.50
67.40	0.00	70.00	6.80
67.45	0.00	70.05	7.09
67.50	0.00	70.10	7.38
67.55	0.00	70.15	7.67
67.60	0.00	70.20	7.96
67.65	0.00	70.25	8.26
67.70	0.00	70.30	8.55
67.75	0.00	70.35	8.83
67.80	0.00	70.40	9.12
67.85	0.00	70.45	9.41
67.90	0.00	70.50	9.69
67.95	0.00	70.55	9.97
68.00	0.00	70.60	10.25
68.05	0.00	70.65	10.53
68.10	0.00	70.70	10.80
68.15	0.00	70.75	11.07
68.20	0.00	70.80	11.34
68.25	0.00	70.85	11.61
68.30	0.00	70.90	11.87
68.35	0.02	70.95	12.13
68.40	0.05	71.00	**12.38**
68.45	0.09		
68.50	0.13		
68.55	0.18		
68.60	0.24		
68.65	0.33		
68.70	0.47		
68.75	0.63		
68.80	0.80		
68.85	0.99		
68.90	1.19		
68.95	1.40		
69.00	1.62		
69.05	1.84		

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=68.91' Storage=0.976 af Inflow=15.23 cfs 1.479 af
Outflow=1.25 cfs 0.740 af

Summary for Pond 7P: Detention Basin

Inflow Area =	4.880 ac,	50.00% Impervious,	Inflow Depth =	3.64"	for 25-Year event
Inflow =	15.23 cfs @	12.14 hrs,	Volume=	1.479 af	
Outflow =	1.25 cfs @	13.74 hrs,	Volume=	0.740 af,	Atten= 92%, Lag= 96.1 min
Primary =	1.25 cfs @	13.74 hrs,	Volume=	0.740 af	

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 68.91' @ 13.74 hrs Surf.Area= 0.457 ac Storage= 0.976 af

Plug-Flow detention time= 466.4 min calculated for 0.740 af (50% of inflow)
Center-of-Mass det. time= 327.8 min (1,098.2 - 770.4)

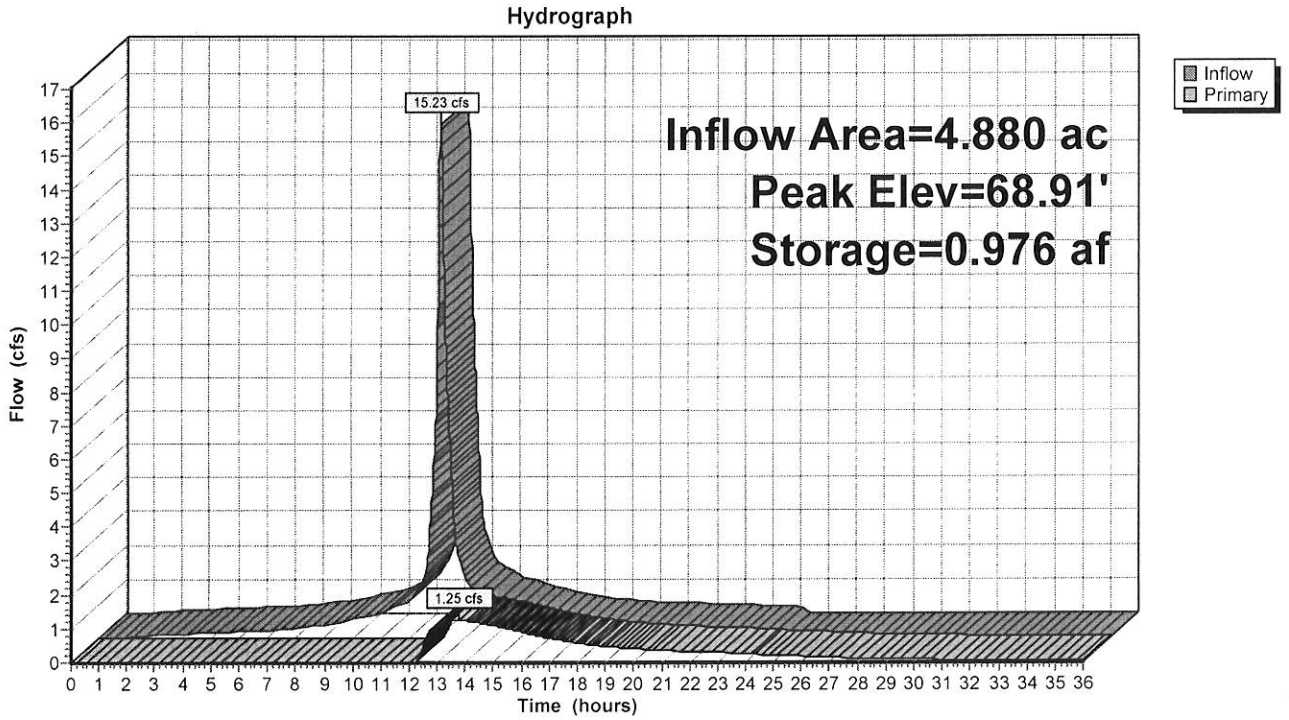
Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

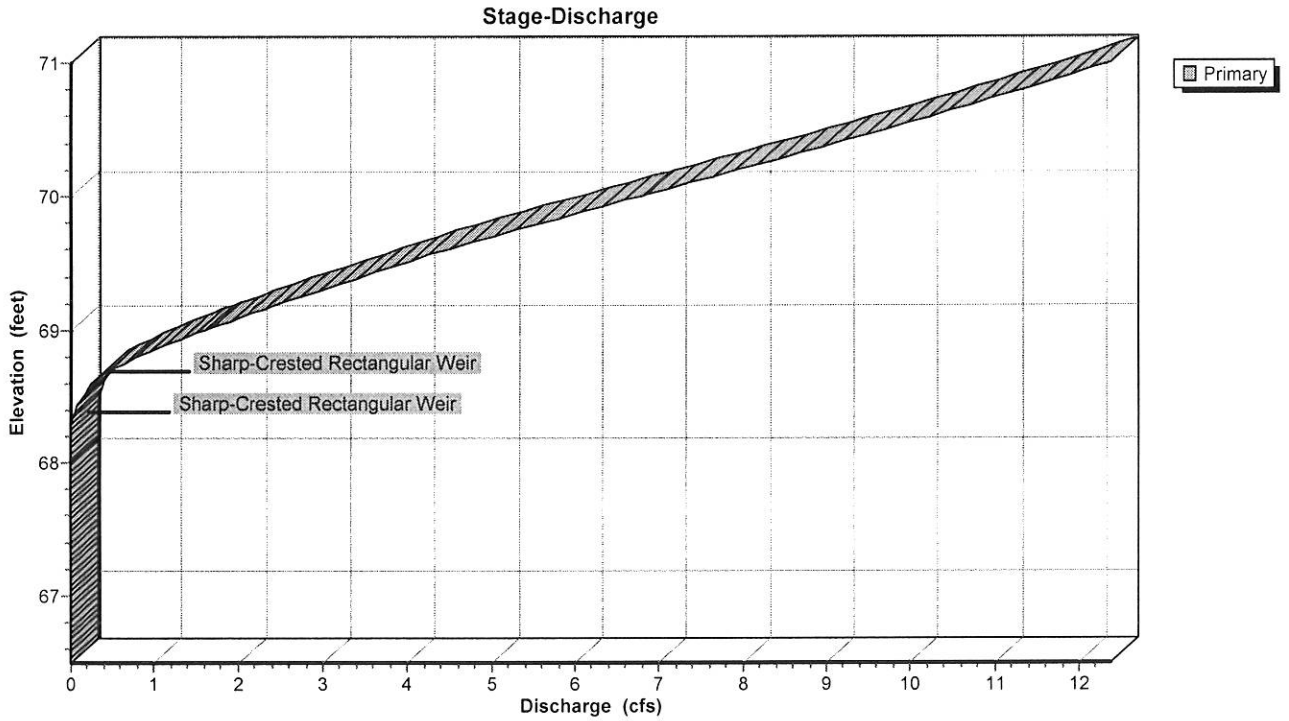
Device	Routing	Invert	Outlet Devices
#1	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.25 cfs @ 13.74 hrs HW=68.91' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.59 cfs @ 2.56 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.66 cfs @ 1.83 fps)

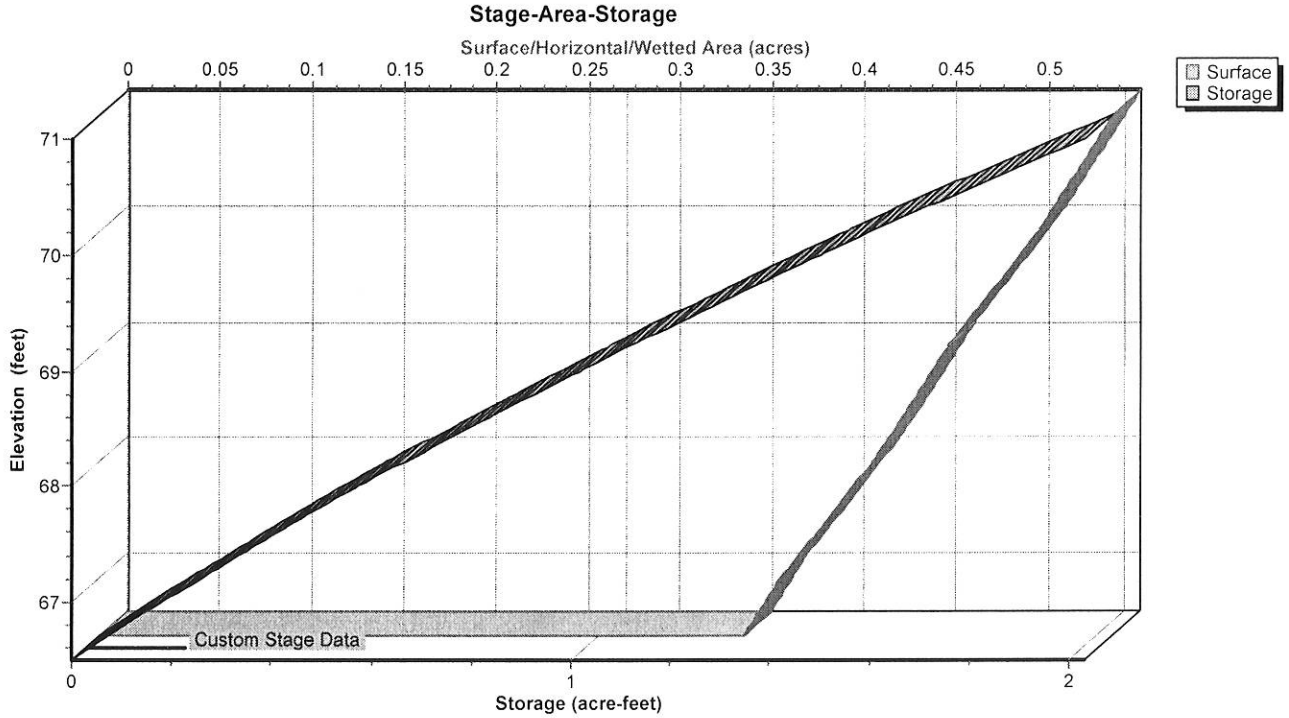
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00
1.00	0.02	0.000	66.50	0.00
2.00	0.08	0.005	66.51	0.00
3.00	0.12	0.013	66.54	0.00
4.00	0.16	0.024	66.57	0.00
5.00	0.19	0.039	66.61	0.00
6.00	0.22	0.056	66.66	0.00
7.00	0.30	0.077	66.72	0.00
8.00	0.38	0.105	66.80	0.00
9.00	0.55	0.143	66.90	0.00
10.00	0.74	0.197	67.04	0.00
11.00	1.09	0.271	67.24	0.00
12.00	**7.54**	0.476	67.76	0.00
13.00	**1.80**	**0.961**	**68.88**	**1.12**
14.00	1.12	**0.974**	**68.91**	**1.24**
15.00	0.85	0.958	68.88	1.09
16.00	0.61	0.936	68.83	0.90
17.00	0.48	0.914	68.78	0.72
18.00	0.38	0.895	68.74	0.59
19.00	0.33	0.880	68.70	0.48
20.00	0.30	0.870	68.68	0.41
21.00	0.27	0.861	68.66	0.36
22.00	0.25	0.855	68.65	0.33
23.00	0.22	0.848	68.63	0.30
24.00	0.20	0.842	68.62	0.27
25.00	0.00	0.825	68.58	0.21
26.00	0.00	0.809	68.54	0.18
27.00	0.00	0.796	68.51	0.15
28.00	0.00	0.785	68.49	0.12
29.00	0.00	0.775	68.47	0.10
30.00	0.00	0.767	68.45	0.09
31.00	0.00	0.761	68.43	0.08
32.00	0.00	0.755	68.42	0.07
33.00	0.00	0.750	68.41	0.06
34.00	0.00	0.745	68.40	0.05
35.00	0.00	0.742	68.39	0.04
36.00	0.00	0.738	68.38	0.04

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
66.50	0.00	69.10	2.07
66.55	0.00	69.15	2.30
66.60	0.00	69.20	2.53
66.65	0.00	69.25	2.77
66.70	0.00	69.30	3.01
66.75	0.00	69.35	3.25
66.80	0.00	69.40	3.49
66.85	0.00	69.45	3.73
66.90	0.00	69.50	3.97
66.95	0.00	69.55	4.20
67.00	0.00	69.60	4.48
67.05	0.00	69.65	4.77
67.10	0.00	69.70	5.05
67.15	0.00	69.75	5.34
67.20	0.00	69.80	5.63
67.25	0.00	69.85	5.92
67.30	0.00	69.90	6.21
67.35	0.00	69.95	6.50
67.40	0.00	70.00	6.80
67.45	0.00	70.05	7.09
67.50	0.00	70.10	7.38
67.55	0.00	70.15	7.67
67.60	0.00	70.20	7.96
67.65	0.00	70.25	8.26
67.70	0.00	70.30	8.55
67.75	0.00	70.35	8.83
67.80	0.00	70.40	9.12
67.85	0.00	70.45	9.41
67.90	0.00	70.50	9.69
67.95	0.00	70.55	9.97
68.00	0.00	70.60	10.25
68.05	0.00	70.65	10.53
68.10	0.00	70.70	10.80
68.15	0.00	70.75	11.07
68.20	0.00	70.80	11.34
68.25	0.00	70.85	11.61
68.30	0.00	70.90	11.87
68.35	0.02	70.95	12.13
68.40	0.05	71.00	**12.38**
68.45	0.09		
68.50	0.13		
68.55	0.18		
68.60	0.24		
68.65	0.33		
68.70	0.47		
68.75	0.63		
68.80	0.80		
68.85	0.99		
68.90	1.19		
68.95	1.40		
69.00	1.62		
69.05	1.84		

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=69.54' Storage=1.269 af Inflow=23.53 cfs 2.214 af
Outflow=4.14 cfs 1.473 af

Summary for Pond 7P: Detention Basin

Inflow Area = 4.880 ac, 50.00% Impervious, Inflow Depth = 5.45" for 100-Year event
Inflow = 23.53 cfs @ 12.14 hrs, Volume= 2.214 af
Outflow = 4.14 cfs @ 12.67 hrs, Volume= 1.473 af, Atten= 82%, Lag= 32.2 min
Primary = 4.14 cfs @ 12.67 hrs, Volume= 1.473 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 69.54' @ 12.67 hrs Surf.Area= 0.487 ac Storage= 1.269 af

Plug-Flow detention time= 339.3 min calculated for 1.473 af (67% of inflow)
Center-of-Mass det. time= 229.9 min (1,001.7 - 771.9)

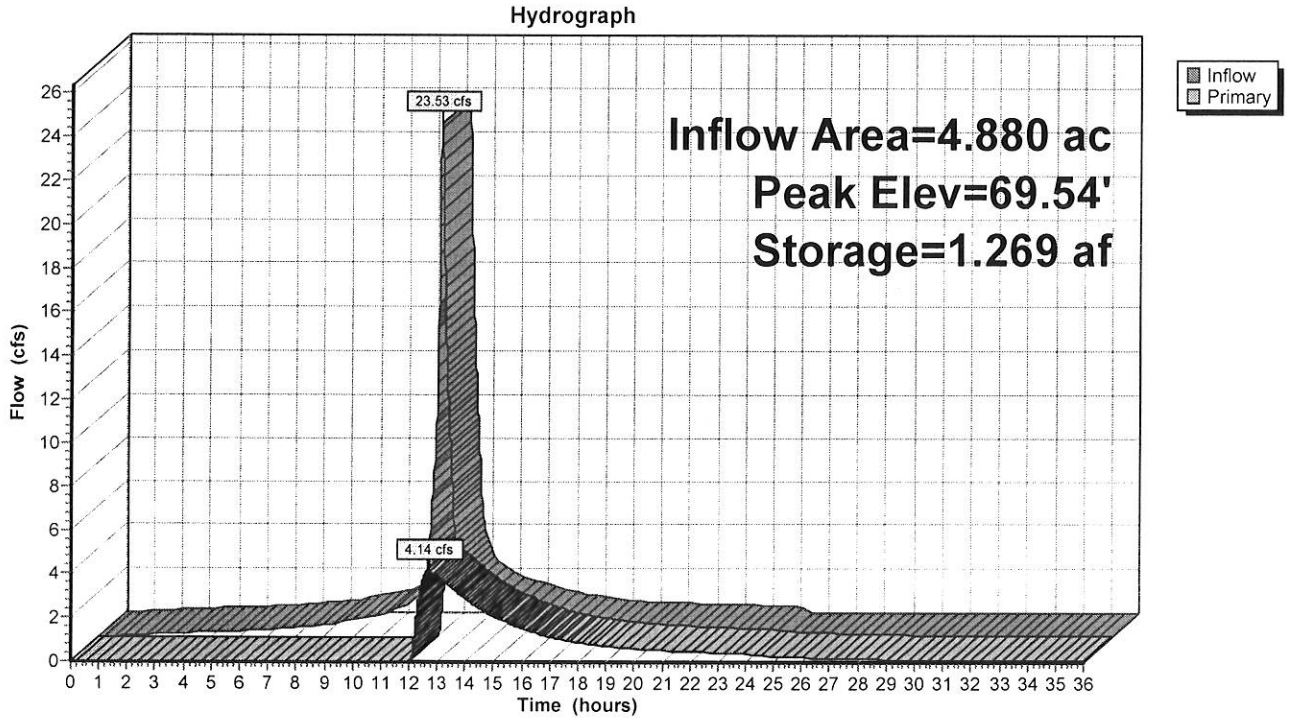
Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

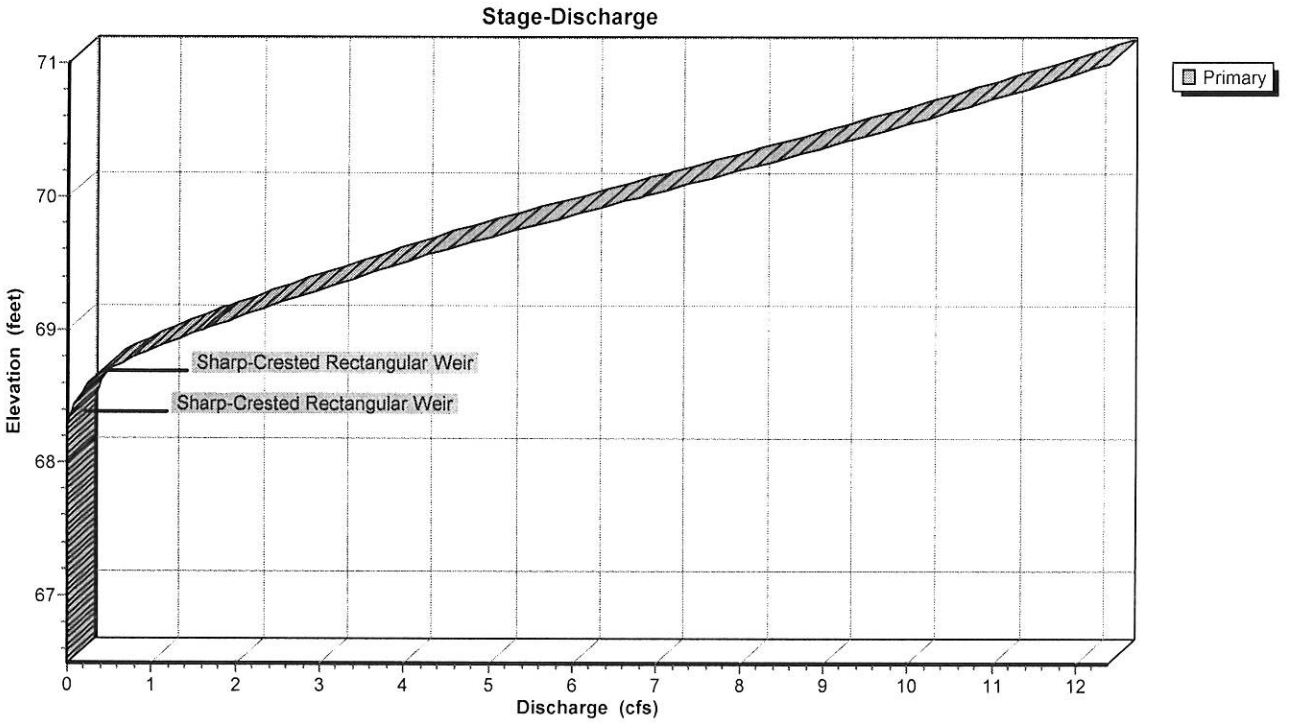
Device	Routing	Invert	Outlet Devices
#1	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.14 cfs @ 12.67 hrs HW=69.54' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.14 cfs @ 3.64 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.00 cfs @ 3.16 fps)

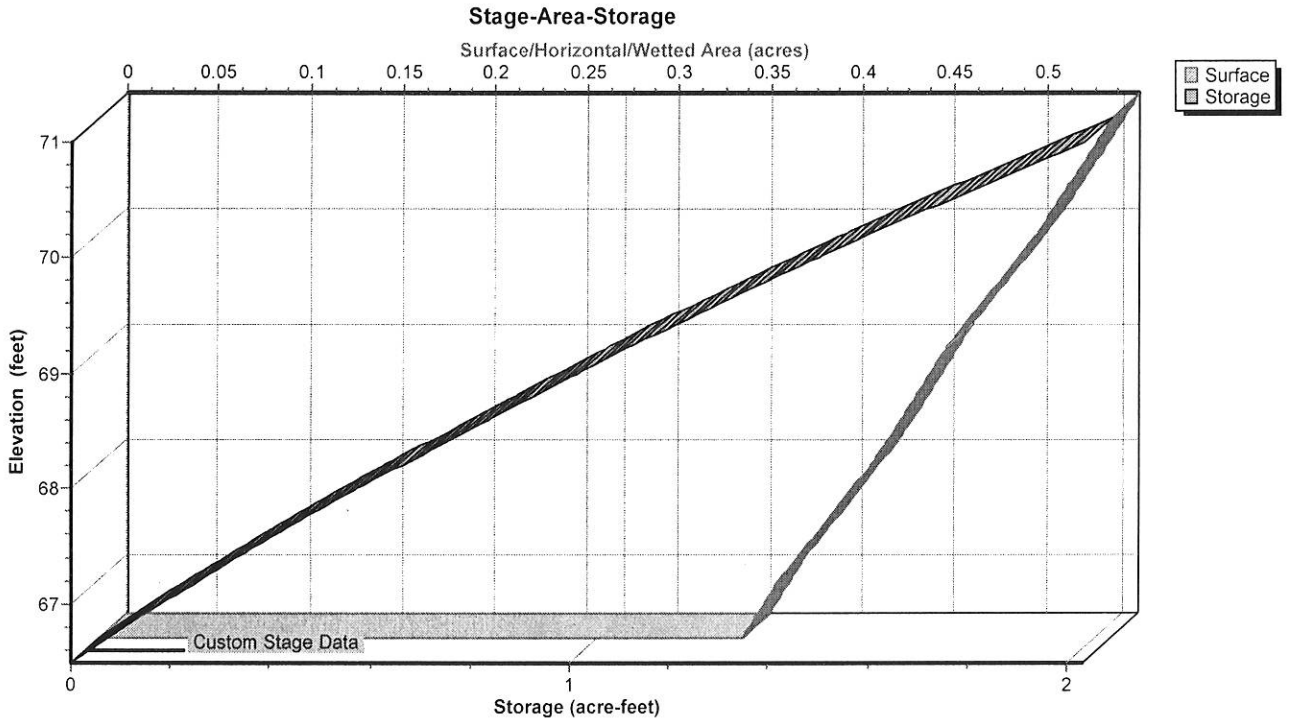
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

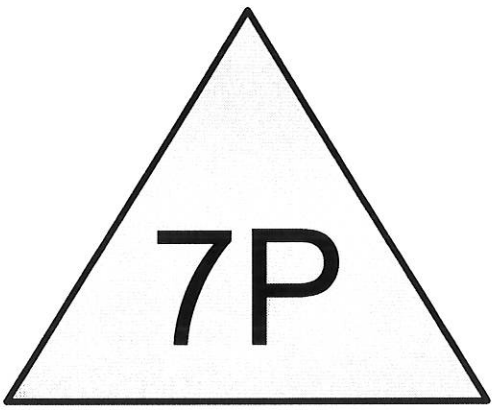
Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00
1.00	0.06	0.001	66.50	0.00
2.00	0.13	0.009	66.53	0.00
3.00	0.19	0.023	66.56	0.00
4.00	0.24	0.040	66.61	0.00
5.00	0.28	0.062	66.68	0.00
6.00	0.32	0.087	66.74	0.00
7.00	0.42	0.117	66.83	0.00
8.00	0.53	0.157	66.94	0.00
9.00	0.77	0.210	67.08	0.00
10.00	1.02	0.284	67.27	0.00
11.00	1.50	0.387	67.54	0.00
12.00	**11.68**	**0.685**	**68.26**	**0.00**
13.00	**2.75**	**1.248**	**69.49**	**3.94**
14.00	1.70	1.141	69.27	2.87
15.00	1.29	1.062	69.10	2.07
16.00	0.92	1.006	68.98	1.53
17.00	0.73	0.964	68.89	1.14
18.00	0.57	0.934	68.82	0.89
19.00	0.50	0.912	68.77	0.71
20.00	0.45	0.897	68.74	0.60
21.00	0.41	0.887	68.72	0.52
22.00	0.37	0.878	68.70	0.47
23.00	0.34	0.871	68.68	0.42
24.00	0.30	0.864	68.67	0.38
25.00	0.00	0.841	68.62	0.26
26.00	0.00	0.822	68.57	0.21
27.00	0.00	0.807	68.54	0.17
28.00	0.00	0.794	68.51	0.14
29.00	0.00	0.783	68.48	0.12
30.00	0.00	0.774	68.46	0.10
31.00	0.00	0.766	68.45	0.09
32.00	0.00	0.759	68.43	0.07
33.00	0.00	0.754	68.42	0.06
34.00	0.00	0.749	68.41	0.05
35.00	0.00	0.745	68.40	0.05
36.00	0.00	0.741	68.39	0.04

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
66.50	0.00	69.10	2.07
66.55	0.00	69.15	2.30
66.60	0.00	69.20	2.53
66.65	0.00	69.25	2.77
66.70	0.00	69.30	3.01
66.75	0.00	69.35	3.25
66.80	0.00	69.40	3.49
66.85	0.00	69.45	3.73
66.90	0.00	69.50	3.97
66.95	0.00	69.55	4.20
67.00	0.00	69.60	4.48
67.05	0.00	69.65	4.77
67.10	0.00	69.70	5.05
67.15	0.00	69.75	5.34
67.20	0.00	69.80	5.63
67.25	0.00	69.85	5.92
67.30	0.00	69.90	6.21
67.35	0.00	69.95	6.50
67.40	0.00	70.00	6.80
67.45	0.00	70.05	7.09
67.50	0.00	70.10	7.38
67.55	0.00	70.15	7.67
67.60	0.00	70.20	7.96
67.65	0.00	70.25	8.26
67.70	0.00	70.30	8.55
67.75	0.00	70.35	8.83
67.80	0.00	70.40	9.12
67.85	0.00	70.45	9.41
67.90	0.00	70.50	9.69
67.95	0.00	70.55	9.97
68.00	0.00	70.60	10.25
68.05	0.00	70.65	10.53
68.10	0.00	70.70	10.80
68.15	0.00	70.75	11.07
68.20	0.00	70.80	11.34
68.25	0.00	70.85	11.61
68.30	0.00	70.90	11.87
68.35	0.02	70.95	12.13
68.40	0.05	71.00	**12.38**
68.45	0.09		
68.50	0.13		
68.55	0.18		
68.60	0.24		
68.65	0.33		
68.70	0.47		
68.75	0.63		
68.80	0.80		
68.85	0.99		
68.90	1.19		
68.95	1.40		
69.00	1.62		
69.05	1.84		

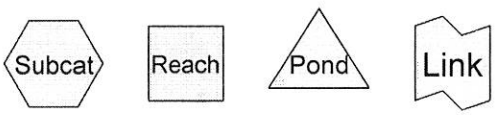
Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**



Detention Basin

(WITH INFILTRATION)



Routing Diagram for CN Community Church Proposed DA 1 with INFILTRATION- COUNTY

Prepared by {enter your company name here}, Printed 4/9/2020

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.000	**0**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=66.65' Storage=0.053 af Inflow=6.01 cfs 0.545 af
Discarded=3.23 cfs 0.545 af Primary=0.00 cfs 0.000 af Outflow=3.23 cfs 0.545 af

Summary for Pond 7P: Detention Basin

Inflow Area =	5.100 ac, 47.84% Impervious, Inflow Depth = 1.28" for 1-Year event				
Inflow =	6.01 cfs @	12.13 hrs,	Volume=	0.545 af	
Outflow =	3.23 cfs @	12.32 hrs,	Volume=	0.545 af,	Atten= 46%, Lag= 10.9 min
Discarded =	3.23 cfs @	12.32 hrs,	Volume=	0.545 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 66.65' @ 12.32 hrs Surf.Area= 0.356 ac Storage= 0.053 af

Plug-Flow detention time= 5.2 min calculated for 0.545 af (100% of inflow)
Center-of-Mass det. time= 5.2 min (769.3 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

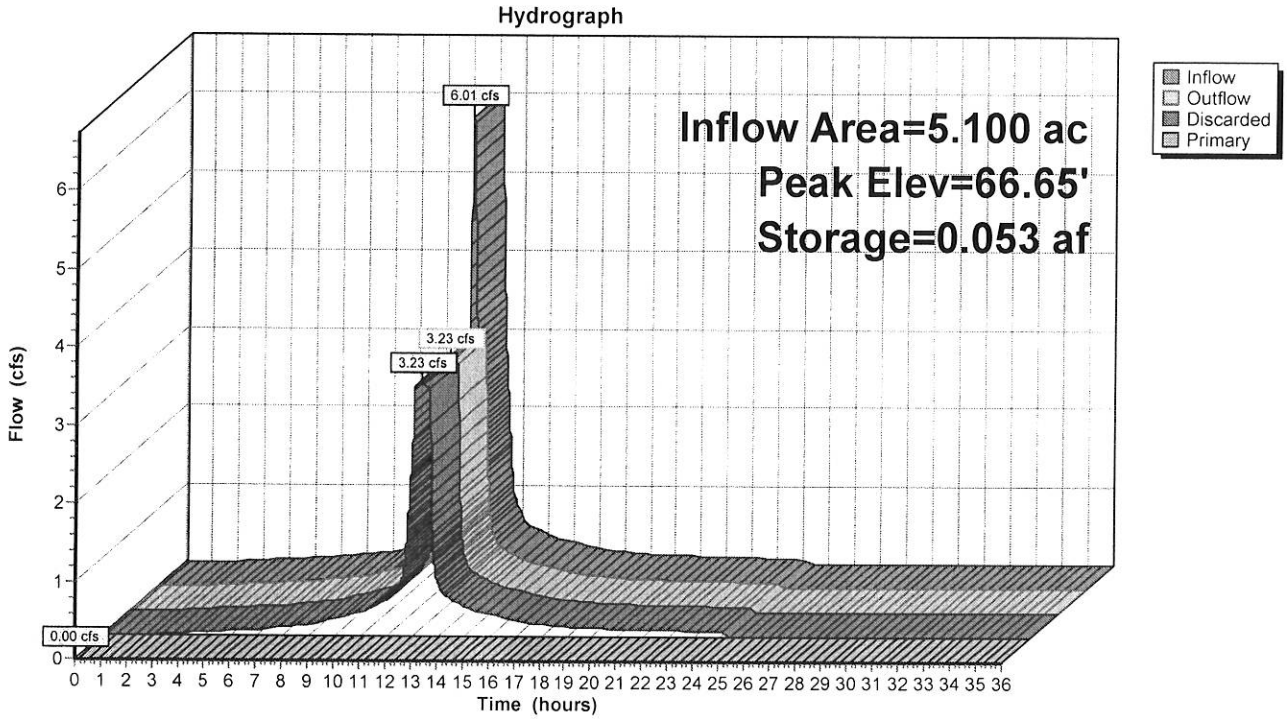
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	**9.000 in/hr Exfiltration over Surface area**
#2	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

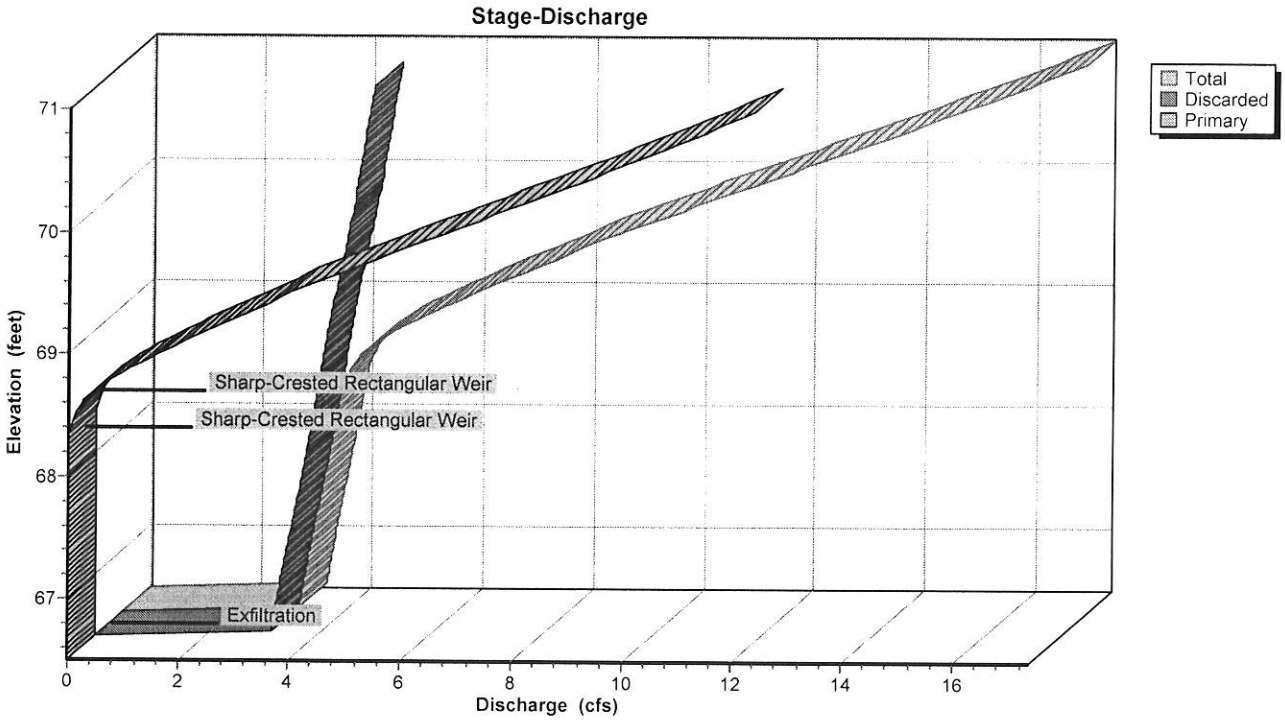
Discarded OutFlow Max=3.23 cfs @ 12.32 hrs HW=66.65' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 3.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
├─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

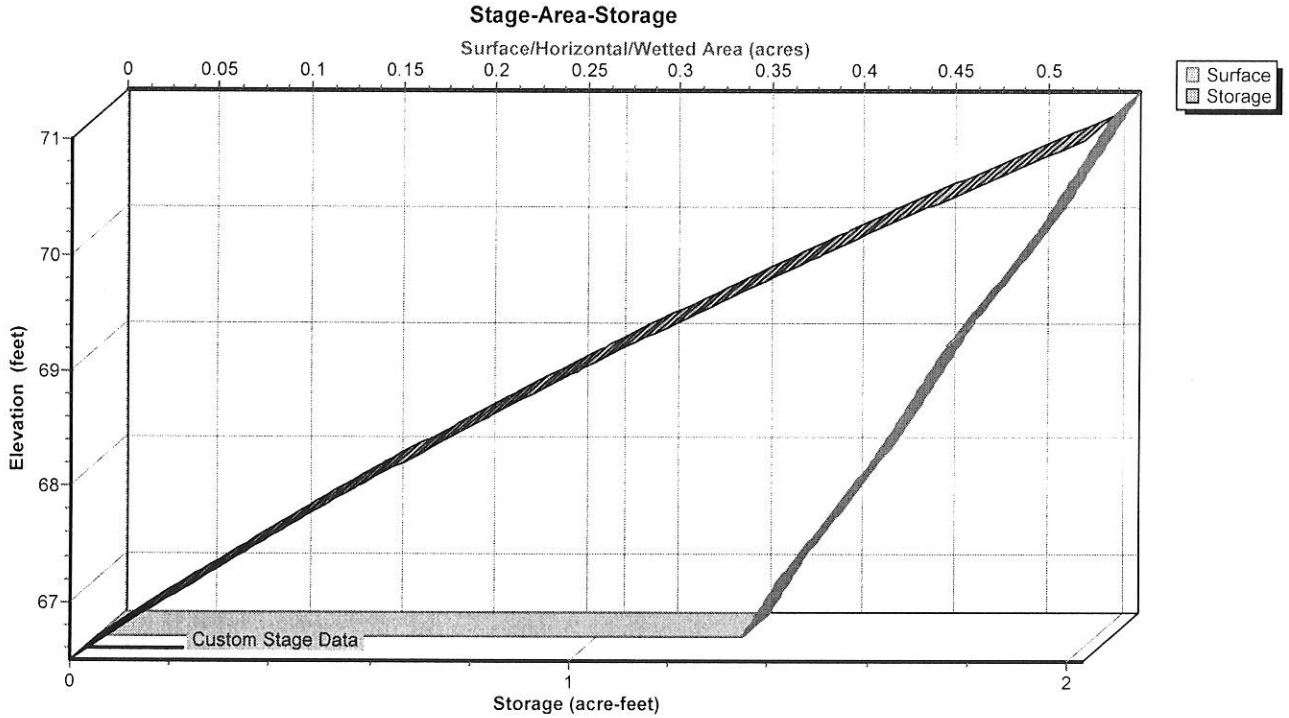
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00	0.00	**0.00**
1.00	0.00	0.000	66.50	0.00	0.00	0.00
2.00	0.01	0.000	66.50	0.01	0.01	0.00
3.00	0.03	0.000	66.50	0.02	0.02	0.00
4.00	0.04	0.000	66.50	0.04	0.04	0.00
5.00	0.06	0.000	66.50	0.06	0.06	0.00
6.00	0.08	0.000	66.50	0.08	0.08	0.00
7.00	0.11	0.001	66.50	0.11	0.11	0.00
8.00	0.15	0.001	66.50	0.15	0.15	0.00
9.00	0.22	0.001	66.50	0.22	0.22	0.00
10.00	0.31	0.001	66.50	0.30	0.30	0.00
11.00	0.47	0.002	66.51	0.46	0.46	0.00
12.00	**3.20**	**0.013**	**66.54**	**2.64**	**2.64**	0.00
13.00	**0.62**	**0.003**	**66.51**	**0.67**	**0.67**	0.00
14.00	0.37	0.002	66.51	0.38	0.38	0.00
15.00	0.28	0.001	66.50	0.28	0.28	0.00
16.00	0.20	0.001	66.50	0.20	0.20	0.00
17.00	0.16	0.001	66.50	0.16	0.16	0.00
18.00	0.12	0.001	66.50	0.12	0.12	0.00
19.00	0.11	0.001	66.50	0.11	0.11	0.00
20.00	0.10	0.000	66.50	0.10	0.10	0.00
21.00	0.09	0.000	66.50	0.09	0.09	0.00
22.00	0.08	0.000	66.50	0.08	0.08	0.00
23.00	0.07	0.000	66.50	0.07	0.07	0.00
24.00	0.07	0.000	66.50	0.07	0.07	0.00
25.00	0.00	0.000	66.50	0.00	0.00	0.00
26.00	0.00	0.000	66.50	0.00	0.00	0.00
27.00	0.00	0.000	66.50	0.00	0.00	0.00
28.00	0.00	0.000	66.50	0.00	0.00	0.00
29.00	0.00	0.000	66.50	0.00	0.00	0.00
30.00	0.00	0.000	66.50	0.00	0.00	0.00
31.00	0.00	0.000	66.50	0.00	0.00	0.00
32.00	0.00	0.000	66.50	0.00	0.00	0.00
33.00	0.00	0.000	66.50	0.00	0.00	0.00
34.00	0.00	0.000	66.50	0.00	0.00	0.00
35.00	0.00	0.000	66.50	0.00	0.00	0.00
36.00	0.00	0.000	66.50	0.00	0.00	0.00

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
66.50	0.00	0.00	0.00
66.55	3.19	3.19	0.00
66.60	3.21	3.21	0.00
66.65	3.23	3.23	0.00
66.70	3.25	3.25	0.00
66.75	3.27	3.27	0.00
66.80	3.29	3.29	0.00
66.85	3.30	3.30	0.00
66.90	3.32	3.32	0.00
66.95	3.34	3.34	0.00
67.00	3.36	3.36	0.00
67.05	3.38	3.38	0.00
67.10	3.40	3.40	0.00
67.15	3.43	3.43	0.00
67.20	3.45	3.45	0.00
67.25	3.47	3.47	0.00
67.30	3.49	3.49	0.00
67.35	3.52	3.52	0.00
67.40	3.54	3.54	0.00
67.45	3.56	3.56	0.00
67.50	3.58	3.58	0.00
67.55	3.61	3.61	0.00
67.60	3.63	3.63	0.00
67.65	3.65	3.65	0.00
67.70	3.68	3.68	0.00
67.75	3.70	3.70	0.00
67.80	3.72	3.72	0.00
67.85	3.74	3.74	0.00
67.90	3.77	3.77	0.00
67.95	3.79	3.79	0.00
68.00	3.81	3.81	0.00
68.05	3.83	3.83	0.00
68.10	3.85	3.85	0.00
68.15	3.87	3.87	0.00
68.20	3.88	3.88	0.00
68.25	3.90	3.90	0.00
68.30	3.92	3.92	0.00
68.35	3.96	3.94	0.02
68.40	4.01	3.96	0.05
68.45	4.06	3.97	0.09
68.50	4.13	3.99	0.13
68.55	4.20	4.01	0.18
68.60	4.27	4.03	0.24
68.65	4.38	4.05	0.33
68.70	4.54	4.07	0.47
68.75	4.71	4.08	0.63
68.80	4.90	4.10	0.80
68.85	5.11	4.12	0.99
68.90	5.33	4.14	1.19
68.95	5.56	4.16	1.40
69.00	5.79	4.17	1.62
69.05	6.04	4.20	1.84
69.10	6.29	4.22	2.07
69.15	6.54	4.24	2.30
69.20	6.80	4.27	2.53
69.25	7.06	4.29	2.77
69.30	7.32	4.31	3.01
69.35	7.58	4.33	3.25
69.40	7.85	4.36	3.49
69.45	8.11	4.38	3.73
69.50	8.37	4.40	3.97
69.55	8.62	4.42	4.20
69.60	8.93	4.45	4.48
69.65	9.23	4.47	4.77
69.70	9.54	4.49	5.05
69.75	9.85	4.51	5.34
69.80	10.17	4.54	5.63
69.85	10.48	4.56	5.92
69.90	10.79	4.58	6.21
69.95	11.11	4.61	6.50
70.00	11.42	4.63	6.80
70.05	11.73	4.65	7.09
70.10	12.05	4.66	7.38
70.15	12.36	4.68	7.67
70.20	12.67	4.70	7.96
70.25	12.97	4.72	8.26
70.30	13.28	4.74	8.55
70.35	13.59	4.76	8.83
70.40	13.89	4.77	9.12
70.45	14.20	4.79	9.41
70.50	14.50	4.81	9.69
70.55	14.80	4.83	9.97
70.60	15.10	4.85	10.25
70.65	15.39	4.86	10.53
70.70	15.68	4.88	10.80
70.75	15.97	4.90	11.07
70.80	16.26	4.92	11.34
70.85	16.54	4.94	11.61
70.90	16.82	4.95	11.87
70.95	17.10	4.97	12.13
71.00	**17.37**	**4.99**	**12.38**

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=66.72' Storage=0.077 af Inflow=7.08 cfs 0.656 af
Discarded=3.25 cfs 0.656 af Primary=0.00 cfs 0.000 af Outflow=3.25 cfs 0.656 af

Summary for Pond 7P: Detention Basin

Inflow Area =	5.100 ac, 47.84% Impervious, Inflow Depth = 1.54" for 2-Year event				
Inflow =	7.08 cfs @	12.13 hrs,	Volume=	0.656 af	
Outflow =	3.25 cfs @	12.37 hrs,	Volume=	0.656 af,	Atten= 54%, Lag= 14.0 min
Discarded =	3.25 cfs @	12.37 hrs,	Volume=	0.656 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 66.72' @ 12.37 hrs Surf.Area= 0.359 ac Storage= 0.077 af

Plug-Flow detention time= 6.4 min calculated for 0.656 af (100% of inflow)
Center-of-Mass det. time= 6.4 min (771.4 - 765.0)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

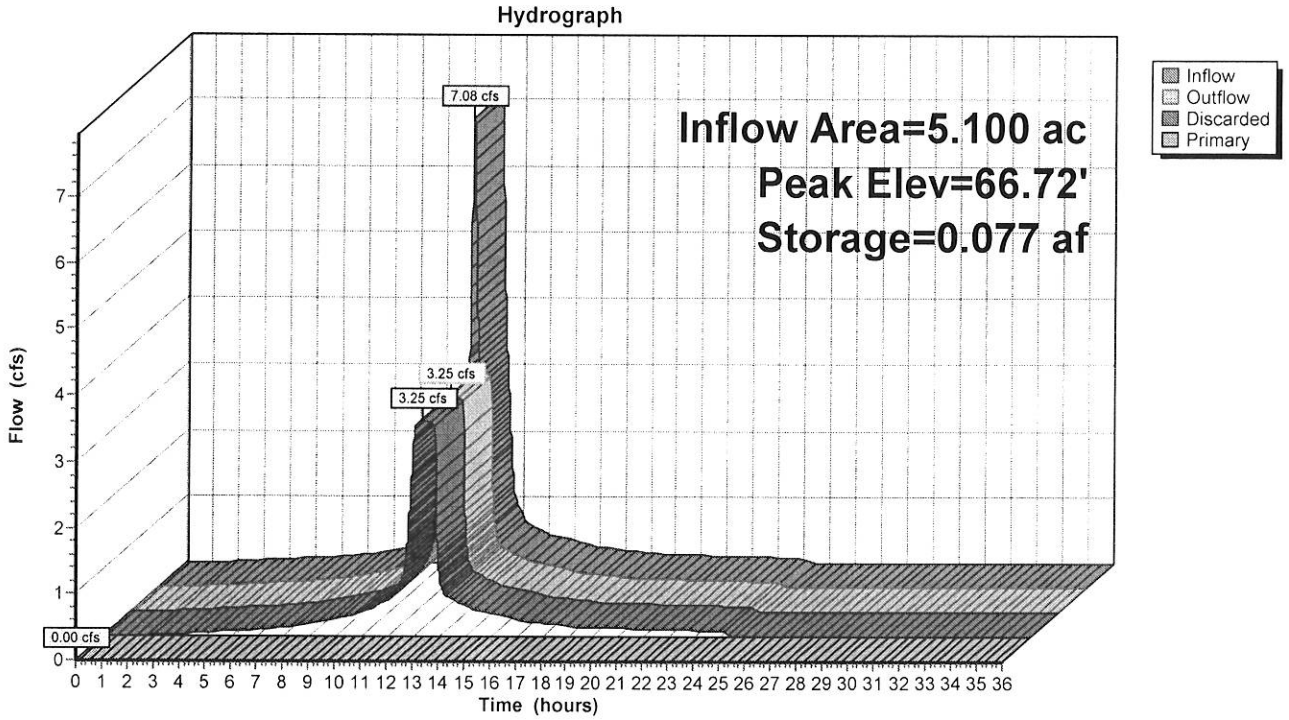
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	**9.000 in/hr Exfiltration over Surface area**
#2	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

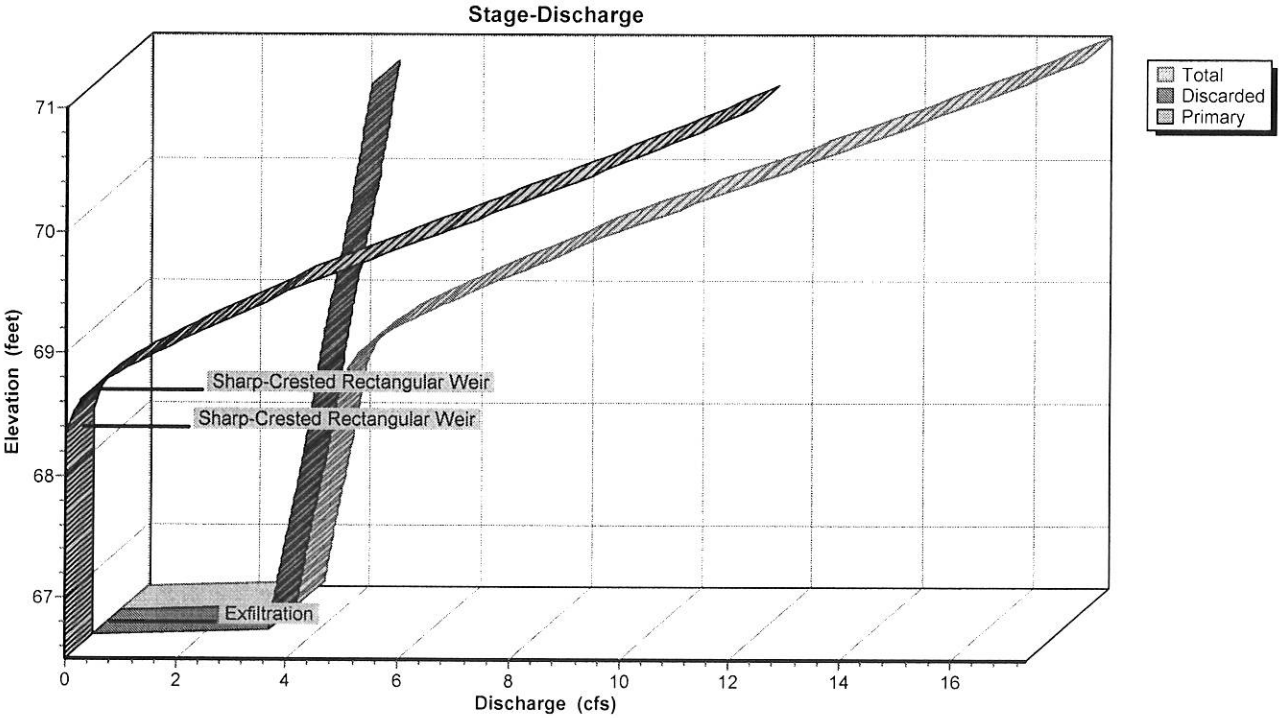
Discarded OutFlow Max=3.25 cfs @ 12.37 hrs HW=66.72' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 3.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
├─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

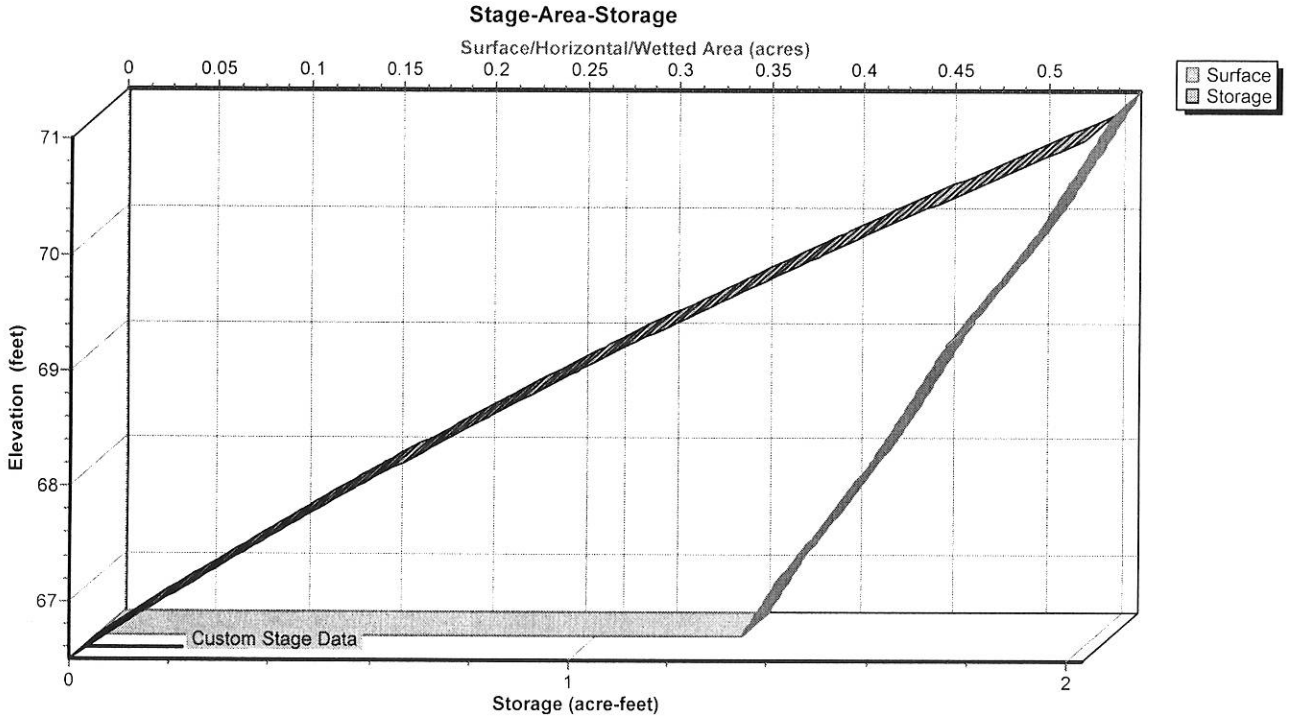
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00	0.00	**0.00**
1.00	0.00	0.000	66.50	0.00	0.00	0.00
2.00	0.02	0.000	66.50	0.01	0.01	0.00
3.00	0.04	0.000	66.50	0.04	0.04	0.00
4.00	0.06	0.000	66.50	0.06	0.06	0.00
5.00	0.08	0.000	66.50	0.08	0.08	0.00
6.00	0.10	0.000	66.50	0.10	0.10	0.00
7.00	0.14	0.001	66.50	0.13	0.13	0.00
8.00	0.18	0.001	66.50	0.18	0.18	0.00
9.00	0.27	0.001	66.50	0.26	0.26	0.00
10.00	0.37	0.002	66.51	0.36	0.36	0.00
11.00	0.55	0.003	66.51	0.54	0.54	0.00
12.00	**3.78**	**0.015**	**66.54**	**3.12**	**3.12**	0.00
13.00	**0.73**	**0.005**	**66.51**	**0.92**	**0.92**	0.00
14.00	0.45	0.002	66.51	0.46	0.46	0.00
15.00	0.35	0.002	66.50	0.35	0.35	0.00
16.00	0.25	0.001	66.50	0.25	0.25	0.00
17.00	0.20	0.001	66.50	0.20	0.20	0.00
18.00	0.15	0.001	66.50	0.16	0.16	0.00
19.00	0.14	0.001	66.50	0.14	0.14	0.00
20.00	0.12	0.001	66.50	0.12	0.12	0.00
21.00	0.11	0.001	66.50	0.11	0.11	0.00
22.00	0.10	0.001	66.50	0.10	0.10	0.00
23.00	0.09	0.000	66.50	0.09	0.09	0.00
24.00	0.08	0.000	66.50	0.08	0.08	0.00
25.00	0.00	0.000	66.50	0.00	0.00	0.00
26.00	0.00	0.000	66.50	0.00	0.00	0.00
27.00	0.00	0.000	66.50	0.00	0.00	0.00
28.00	0.00	0.000	66.50	0.00	0.00	0.00
29.00	0.00	0.000	66.50	0.00	0.00	0.00
30.00	0.00	0.000	66.50	0.00	0.00	0.00
31.00	0.00	0.000	66.50	0.00	0.00	0.00
32.00	0.00	0.000	66.50	0.00	0.00	0.00
33.00	0.00	0.000	66.50	0.00	0.00	0.00
34.00	0.00	0.000	66.50	0.00	0.00	0.00
35.00	0.00	0.000	66.50	0.00	0.00	0.00
36.00	0.00	0.000	66.50	0.00	0.00	0.00

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
66.50	0.00	0.00	0.00
66.55	3.19	3.19	0.00
66.60	3.21	3.21	0.00
66.65	3.23	3.23	0.00
66.70	3.25	3.25	0.00
66.75	3.27	3.27	0.00
66.80	3.29	3.29	0.00
66.85	3.30	3.30	0.00
66.90	3.32	3.32	0.00
66.95	3.34	3.34	0.00
67.00	3.36	3.36	0.00
67.05	3.38	3.38	0.00
67.10	3.40	3.40	0.00
67.15	3.43	3.43	0.00
67.20	3.45	3.45	0.00
67.25	3.47	3.47	0.00
67.30	3.49	3.49	0.00
67.35	3.52	3.52	0.00
67.40	3.54	3.54	0.00
67.45	3.56	3.56	0.00
67.50	3.58	3.58	0.00
67.55	3.61	3.61	0.00
67.60	3.63	3.63	0.00
67.65	3.65	3.65	0.00
67.70	3.68	3.68	0.00
67.75	3.70	3.70	0.00
67.80	3.72	3.72	0.00
67.85	3.74	3.74	0.00
67.90	3.77	3.77	0.00
67.95	3.79	3.79	0.00
68.00	3.81	3.81	0.00
68.05	3.83	3.83	0.00
68.10	3.85	3.85	0.00
68.15	3.87	3.87	0.00
68.20	3.88	3.88	0.00
68.25	3.90	3.90	0.00
68.30	3.92	3.92	0.00
68.35	3.96	3.94	0.02
68.40	4.01	3.96	0.05
68.45	4.06	3.97	0.09
68.50	4.13	3.99	0.13
68.55	4.20	4.01	0.18
68.60	4.27	4.03	0.24
68.65	4.38	4.05	0.33
68.70	4.54	4.07	0.47
68.75	4.71	4.08	0.63
68.80	4.90	4.10	0.80
68.85	5.11	4.12	0.99
68.90	5.33	4.14	1.19
68.95	5.56	4.16	1.40
69.00	5.79	4.17	1.62
69.05	6.04	4.20	1.84
69.10	6.29	4.22	2.07
69.15	6.54	4.24	2.30
69.20	6.80	4.27	2.53
69.25	7.06	4.29	2.77
69.30	7.32	4.31	3.01
69.35	7.58	4.33	3.25
69.40	7.85	4.36	3.49
69.45	8.11	4.38	3.73
69.50	8.37	4.40	3.97
69.55	8.62	4.42	4.20
69.60	8.93	4.45	4.48
69.65	9.23	4.47	4.77
69.70	9.54	4.49	5.05
69.75	9.85	4.51	5.34
69.80	10.17	4.54	5.63
69.85	10.48	4.56	5.92
69.90	10.79	4.58	6.21
69.95	11.11	4.61	6.50
70.00	11.42	4.63	6.80
70.05	11.73	4.65	7.09
70.10	12.05	4.66	7.38
70.15	12.36	4.68	7.67
70.20	12.67	4.70	7.96
70.25	12.97	4.72	8.26
70.30	13.28	4.74	8.55
70.35	13.59	4.76	8.83
70.40	13.89	4.77	9.12
70.45	14.20	4.79	9.41
70.50	14.50	4.81	9.69
70.55	14.80	4.83	9.97
70.60	15.10	4.85	10.25
70.65	15.39	4.86	10.53
70.70	15.68	4.88	10.80
70.75	15.97	4.90	11.07
70.80	16.26	4.92	11.34
70.85	16.54	4.94	11.61
70.90	16.82	4.95	11.87
70.95	17.10	4.97	12.13
71.00	**17.37**	**4.99**	**12.38**

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=67.06' Storage=0.201 af Inflow=11.11 cfs 1.111 af
Discarded=3.38 cfs 1.111 af Primary=0.00 cfs 0.000 af Outflow=3.38 cfs 1.111 af

Summary for Pond 7P: Detention Basin

Inflow Area =	5.100 ac, 47.84% Impervious, Inflow Depth = 2.61" for 10-Year event				
Inflow =	11.11 cfs @	12.14 hrs, Volume=	1.111 af		
Outflow =	3.38 cfs @	12.53 hrs, Volume=	1.111 af, Atten= 70%, Lag= 23.5 min		
Discarded =	3.38 cfs @	12.53 hrs, Volume=	1.111 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 67.06' @ 12.53 hrs Surf.Area= 0.373 ac Storage= 0.201 af

Plug-Flow detention time= 13.8 min calculated for 1.110 af (100% of inflow)
Center-of-Mass det. time= 13.8 min (783.1 - 769.3)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

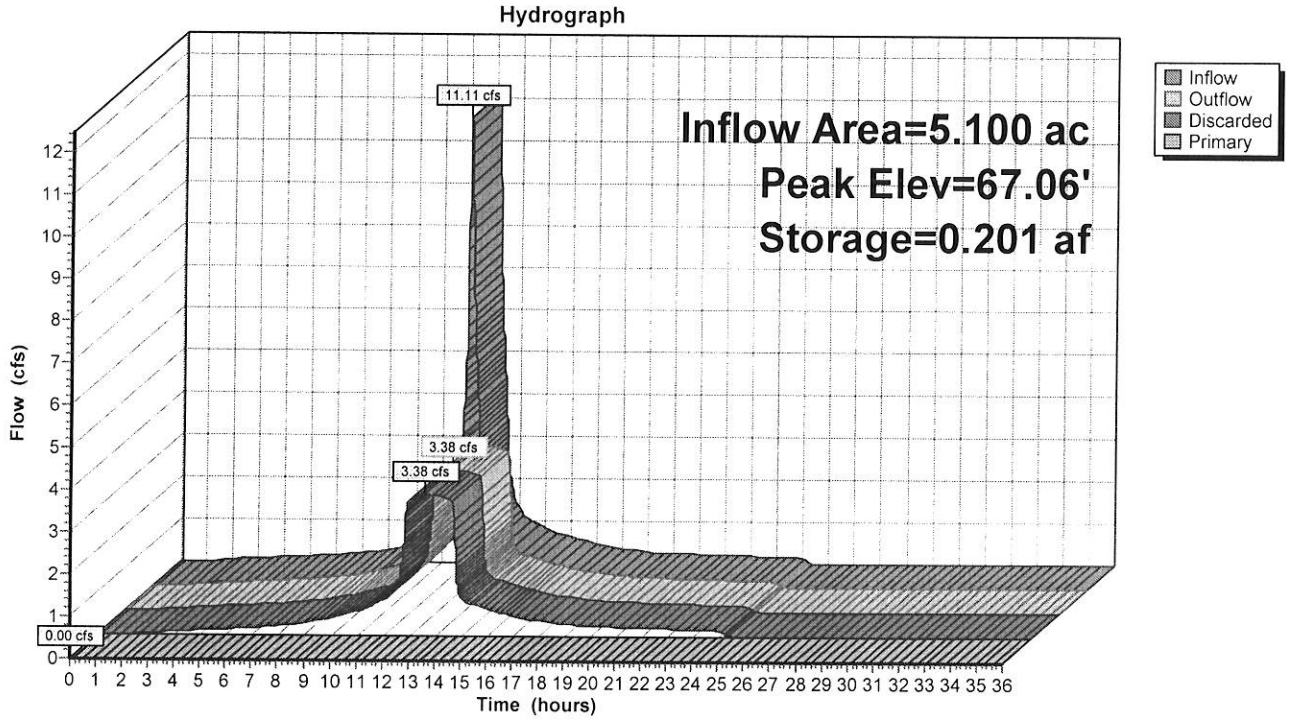
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	**9.000 in/hr Exfiltration over Surface area**
#2	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

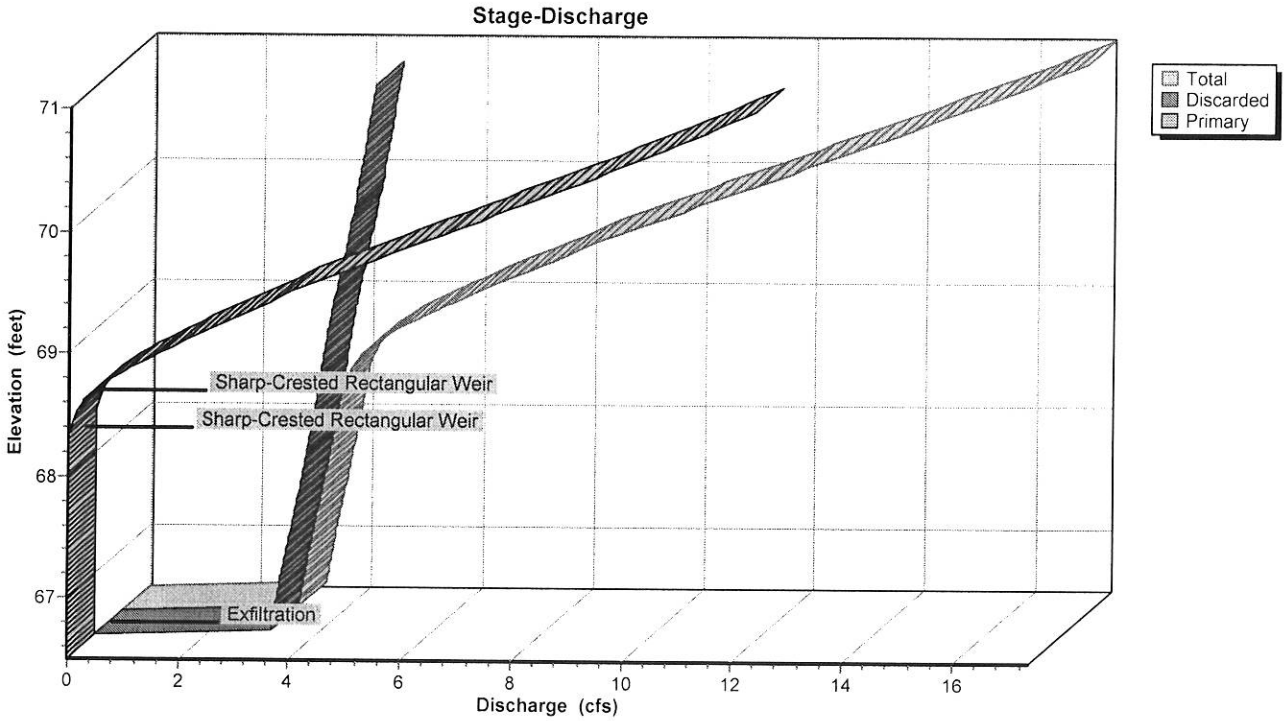
Discarded OutFlow Max=3.38 cfs @ 12.53 hrs HW=67.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.38 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

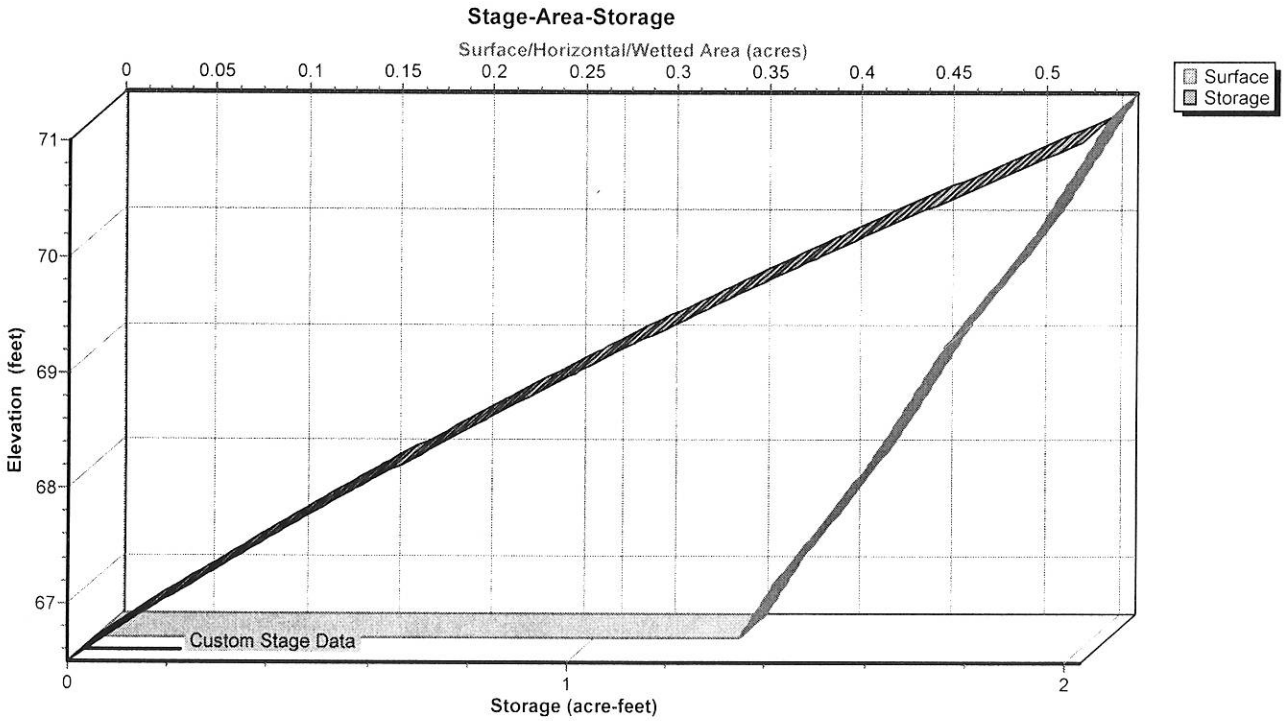
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00	0.00	**0.00**
1.00	0.00	0.000	66.50	0.00	0.00	0.00
2.00	0.05	0.000	66.50	0.05	0.05	0.00
3.00	0.08	0.000	66.50	0.08	0.08	0.00
4.00	0.12	0.001	66.50	0.11	0.11	0.00
5.00	0.14	0.001	66.50	0.14	0.14	0.00
6.00	0.17	0.001	66.50	0.17	0.17	0.00
7.00	0.23	0.001	66.50	0.23	0.23	0.00
8.00	0.30	0.001	66.50	0.29	0.29	0.00
9.00	0.43	0.002	66.51	0.42	0.42	0.00
10.00	0.58	0.003	66.51	0.57	0.57	0.00
11.00	0.87	0.004	66.51	0.85	0.85	0.00
12.00	**5.84**	**0.033**	**66.59**	**3.21**	**3.21**	0.00
13.00	**1.33**	**0.144**	**66.90**	**3.32**	**3.32**	0.00
14.00	0.83	0.004	66.51	0.87	0.87	0.00
15.00	0.63	0.003	66.51	0.64	0.64	0.00
16.00	0.45	0.002	66.51	0.47	0.47	0.00
17.00	0.36	0.002	66.51	0.36	0.36	0.00
18.00	0.28	0.001	66.50	0.28	0.28	0.00
19.00	0.25	0.001	66.50	0.25	0.25	0.00
20.00	0.22	0.001	66.50	0.22	0.22	0.00
21.00	0.20	0.001	66.50	0.21	0.21	0.00
22.00	0.19	0.001	66.50	0.19	0.19	0.00
23.00	0.17	0.001	66.50	0.17	0.17	0.00
24.00	0.15	0.001	66.50	0.15	0.15	0.00
25.00	0.00	0.000	66.50	0.00	0.00	0.00
26.00	0.00	0.000	66.50	0.00	0.00	0.00
27.00	0.00	0.000	66.50	0.00	0.00	0.00
28.00	0.00	0.000	66.50	0.00	0.00	0.00
29.00	0.00	0.000	66.50	0.00	0.00	0.00
30.00	0.00	0.000	66.50	0.00	0.00	0.00
31.00	0.00	0.000	66.50	0.00	0.00	0.00
32.00	0.00	0.000	66.50	0.00	0.00	0.00
33.00	0.00	0.000	66.50	0.00	0.00	0.00
34.00	0.00	0.000	66.50	0.00	0.00	0.00
35.00	0.00	0.000	66.50	0.00	0.00	0.00
36.00	0.00	0.000	66.50	0.00	0.00	0.00

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
66.50	0.00	0.00	0.00
66.55	3.19	3.19	0.00
66.60	3.21	3.21	0.00
66.65	3.23	3.23	0.00
66.70	3.25	3.25	0.00
66.75	3.27	3.27	0.00
66.80	3.29	3.29	0.00
66.85	3.30	3.30	0.00
66.90	3.32	3.32	0.00
66.95	3.34	3.34	0.00
67.00	3.36	3.36	0.00
67.05	3.38	3.38	0.00
67.10	3.40	3.40	0.00
67.15	3.43	3.43	0.00
67.20	3.45	3.45	0.00
67.25	3.47	3.47	0.00
67.30	3.49	3.49	0.00
67.35	3.52	3.52	0.00
67.40	3.54	3.54	0.00
67.45	3.56	3.56	0.00
67.50	3.58	3.58	0.00
67.55	3.61	3.61	0.00
67.60	3.63	3.63	0.00
67.65	3.65	3.65	0.00
67.70	3.68	3.68	0.00
67.75	3.70	3.70	0.00
67.80	3.72	3.72	0.00
67.85	3.74	3.74	0.00
67.90	3.77	3.77	0.00
67.95	3.79	3.79	0.00
68.00	3.81	3.81	0.00
68.05	3.83	3.83	0.00
68.10	3.85	3.85	0.00
68.15	3.87	3.87	0.00
68.20	3.88	3.88	0.00
68.25	3.90	3.90	0.00
68.30	3.92	3.92	0.00
68.35	3.96	3.94	0.02
68.40	4.01	3.96	0.05
68.45	4.06	3.97	0.09
68.50	4.13	3.99	0.13
68.55	4.20	4.01	0.18
68.60	4.27	4.03	0.24
68.65	4.38	4.05	0.33
68.70	4.54	4.07	0.47
68.75	4.71	4.08	0.63
68.80	4.90	4.10	0.80
68.85	5.11	4.12	0.99
68.90	5.33	4.14	1.19
68.95	5.56	4.16	1.40
69.00	5.79	4.17	1.62
69.05	6.04	4.20	1.84
69.10	6.29	4.22	2.07
69.15	6.54	4.24	2.30
69.20	6.80	4.27	2.53
69.25	7.06	4.29	2.77
69.30	7.32	4.31	3.01
69.35	7.58	4.33	3.25
69.40	7.85	4.36	3.49
69.45	8.11	4.38	3.73
69.50	8.37	4.40	3.97
69.55	8.62	4.42	4.20
69.60	8.93	4.45	4.48
69.65	9.23	4.47	4.77
69.70	9.54	4.49	5.05
69.75	9.85	4.51	5.34
69.80	10.17	4.54	5.63
69.85	10.48	4.56	5.92
69.90	10.79	4.58	6.21
69.95	11.11	4.61	6.50
70.00	11.42	4.63	6.80
70.05	11.73	4.65	7.09
70.10	12.05	4.66	7.38
70.15	12.36	4.68	7.67
70.20	12.67	4.70	7.96
70.25	12.97	4.72	8.26
70.30	13.28	4.74	8.55
70.35	13.59	4.76	8.83
70.40	13.89	4.77	9.12
70.45	14.20	4.79	9.41
70.50	14.50	4.81	9.69
70.55	14.80	4.83	9.97
70.60	15.10	4.85	10.25
70.65	15.39	4.86	10.53
70.70	15.68	4.88	10.80
70.75	15.97	4.90	11.07
70.80	16.26	4.92	11.34
70.85	16.54	4.94	11.61
70.90	16.82	4.95	11.87
70.95	17.10	4.97	12.13
71.00	**17.37**	**4.99**	**12.38**

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=67.40' Storage=0.331 af Inflow=15.11 cfs 1.481 af
Discarded=3.54 cfs 1.481 af Primary=0.00 cfs 0.000 af Outflow=3.54 cfs 1.481 af

Summary for Pond 7P: Detention Basin

Inflow Area =	5.100 ac, 47.84% Impervious, Inflow Depth = 3.48" for 25-Year event				
Inflow =	15.11 cfs @	12.14 hrs, Volume=	1.481 af		
Outflow =	3.54 cfs @	12.60 hrs, Volume=	1.481 af,	Atten= 77%,	Lag= 27.4 min
Discarded =	3.54 cfs @	12.60 hrs, Volume=	1.481 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 67.40' @ 12.60 hrs Surf.Area= 0.390 ac Storage= 0.331 af

Plug-Flow detention time= 23.1 min calculated for 1.481 af (100% of inflow)
Center-of-Mass det. time= 23.1 min (794.4 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

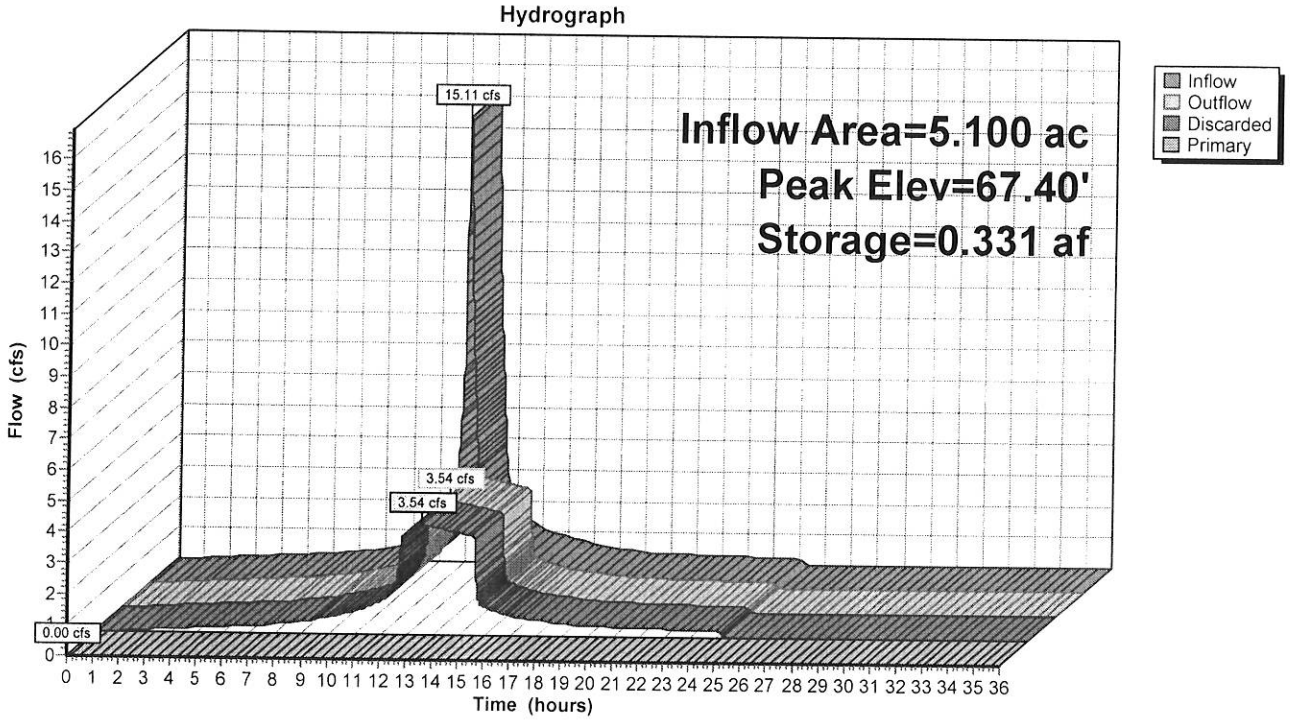
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	**9.000 in/hr Exfiltration over Surface area**
#2	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

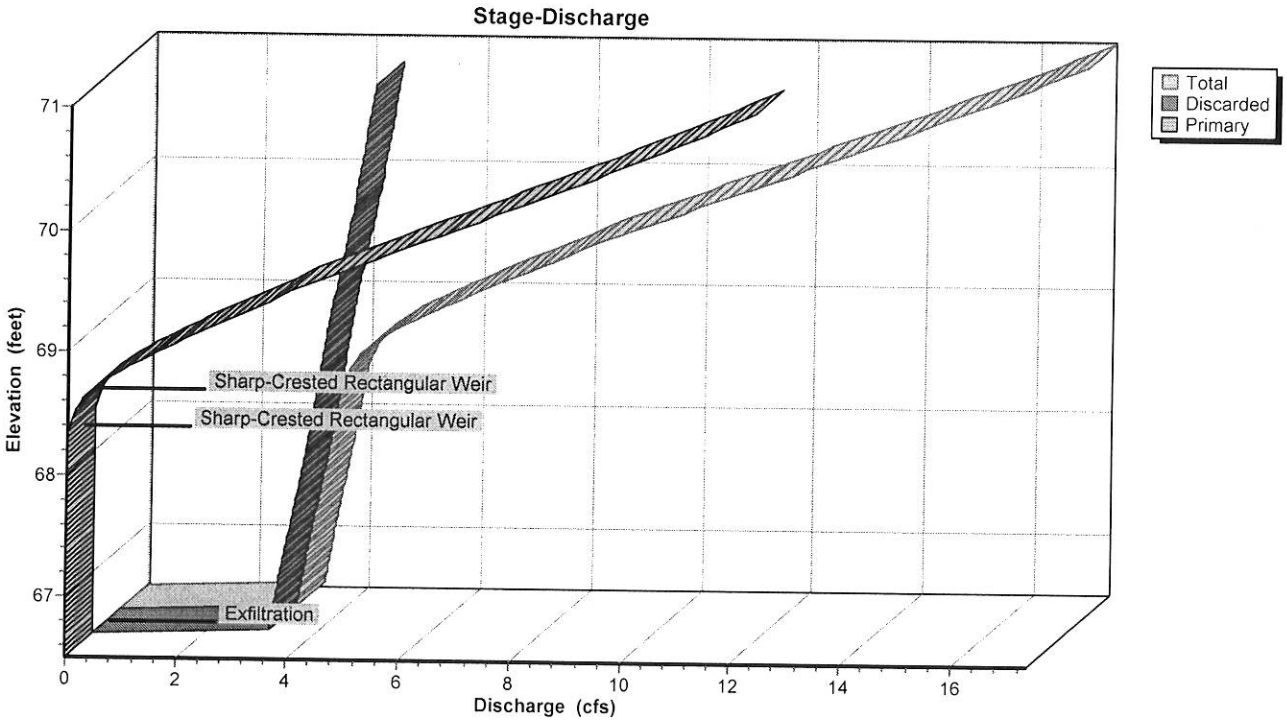
Discarded OutFlow Max=3.54 cfs @ 12.60 hrs HW=67.40' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.54 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

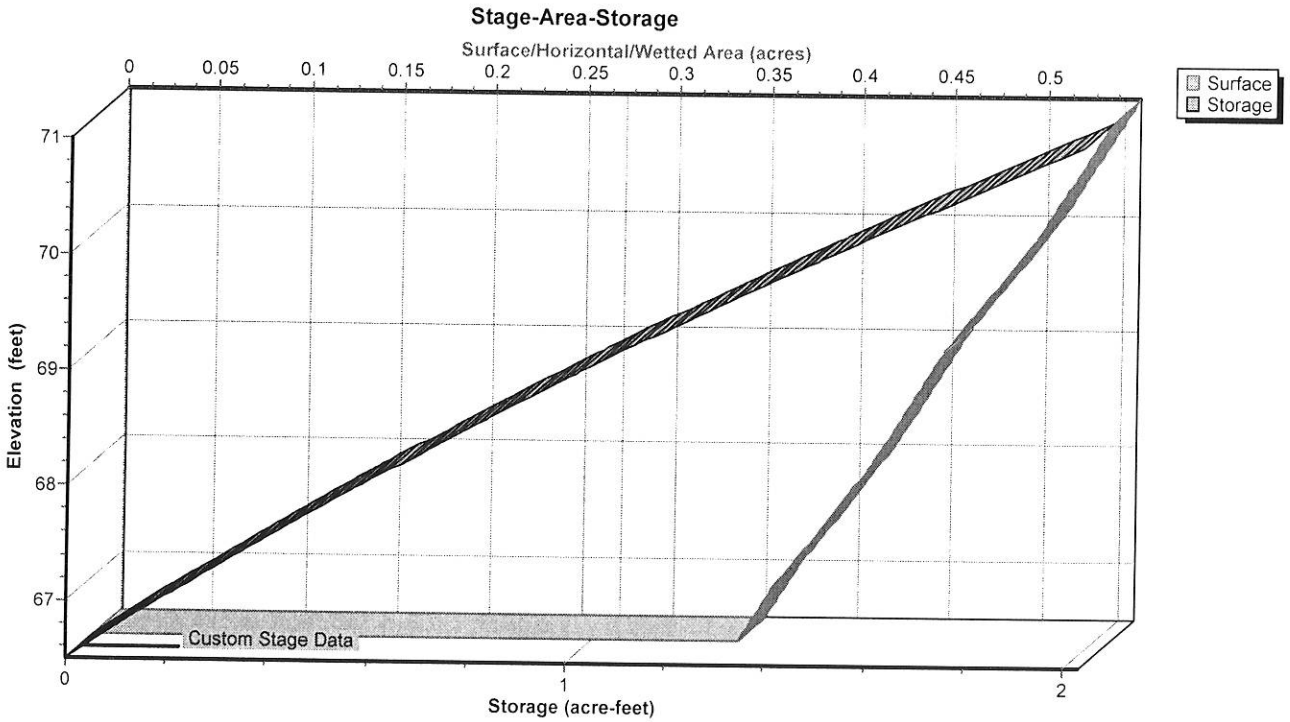
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00	0.00	**0.00**
1.00	0.02	0.000	66.50	0.02	0.02	0.00
2.00	0.08	0.000	66.50	0.07	0.07	0.00
3.00	0.12	0.001	66.50	0.12	0.12	0.00
4.00	0.16	0.001	66.50	0.16	0.16	0.00
5.00	0.19	0.001	66.50	0.19	0.19	0.00
6.00	0.22	0.001	66.50	0.22	0.22	0.00
7.00	0.30	0.001	66.50	0.29	0.29	0.00
8.00	0.38	0.002	66.51	0.38	0.38	0.00
9.00	0.55	0.003	66.51	0.54	0.54	0.00
10.00	0.74	0.004	66.51	0.73	0.73	0.00
11.00	1.09	0.005	66.52	1.07	1.07	0.00
12.00	**7.46**	**0.052**	**66.65**	**3.23**	**3.23**	0.00
13.00	**1.81**	**0.292**	**67.30**	**3.49**	**3.49**	0.00
14.00	1.13	0.126	66.85	3.30	3.30	0.00
15.00	0.86	0.004	66.51	0.88	0.88	0.00
16.00	0.62	0.003	66.51	0.63	0.63	0.00
17.00	0.49	0.002	66.51	0.50	0.50	0.00
18.00	0.38	0.002	66.51	0.39	0.39	0.00
19.00	0.34	0.002	66.50	0.34	0.34	0.00
20.00	0.30	0.002	66.50	0.30	0.30	0.00
21.00	0.28	0.001	66.50	0.28	0.28	0.00
22.00	0.25	0.001	66.50	0.25	0.25	0.00
23.00	0.23	0.001	66.50	0.23	0.23	0.00
24.00	0.20	0.001	66.50	0.20	0.20	0.00
25.00	0.00	0.000	66.50	0.00	0.00	0.00
26.00	0.00	0.000	66.50	0.00	0.00	0.00
27.00	0.00	0.000	66.50	0.00	0.00	0.00
28.00	0.00	0.000	66.50	0.00	0.00	0.00
29.00	0.00	0.000	66.50	0.00	0.00	0.00
30.00	0.00	0.000	66.50	0.00	0.00	0.00
31.00	0.00	0.000	66.50	0.00	0.00	0.00
32.00	0.00	0.000	66.50	0.00	0.00	0.00
33.00	0.00	0.000	66.50	0.00	0.00	0.00
34.00	0.00	0.000	66.50	0.00	0.00	0.00
35.00	0.00	0.000	66.50	0.00	0.00	0.00
36.00	0.00	0.000	66.50	0.00	0.00	0.00

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
66.50	0.00	0.00	0.00
66.55	3.19	3.19	0.00
66.60	3.21	3.21	0.00
66.65	3.23	3.23	0.00
66.70	3.25	3.25	0.00
66.75	3.27	3.27	0.00
66.80	3.29	3.29	0.00
66.85	3.30	3.30	0.00
66.90	3.32	3.32	0.00
66.95	3.34	3.34	0.00
67.00	3.36	3.36	0.00
67.05	3.38	3.38	0.00
67.10	3.40	3.40	0.00
67.15	3.43	3.43	0.00
67.20	3.45	3.45	0.00
67.25	3.47	3.47	0.00
67.30	3.49	3.49	0.00
67.35	3.52	3.52	0.00
67.40	3.54	3.54	0.00
67.45	3.56	3.56	0.00
67.50	3.58	3.58	0.00
67.55	3.61	3.61	0.00
67.60	3.63	3.63	0.00
67.65	3.65	3.65	0.00
67.70	3.68	3.68	0.00
67.75	3.70	3.70	0.00
67.80	3.72	3.72	0.00
67.85	3.74	3.74	0.00
67.90	3.77	3.77	0.00
67.95	3.79	3.79	0.00
68.00	3.81	3.81	0.00
68.05	3.83	3.83	0.00
68.10	3.85	3.85	0.00
68.15	3.87	3.87	0.00
68.20	3.88	3.88	0.00
68.25	3.90	3.90	0.00
68.30	3.92	3.92	0.00
68.35	3.96	3.94	0.02
68.40	4.01	3.96	0.05
68.45	4.06	3.97	0.09
68.50	4.13	3.99	0.13
68.55	4.20	4.01	0.18
68.60	4.27	4.03	0.24
68.65	4.38	4.05	0.33
68.70	4.54	4.07	0.47
68.75	4.71	4.08	0.63
68.80	4.90	4.10	0.80
68.85	5.11	4.12	0.99
68.90	5.33	4.14	1.19
68.95	5.56	4.16	1.40
69.00	5.79	4.17	1.62
69.05	6.04	4.20	1.84
69.10	6.29	4.22	2.07
69.15	6.54	4.24	2.30
69.20	6.80	4.27	2.53
69.25	7.06	4.29	2.77
69.30	7.32	4.31	3.01
69.35	7.58	4.33	3.25
69.40	7.85	4.36	3.49
69.45	8.11	4.38	3.73
69.50	8.37	4.40	3.97
69.55	8.62	4.42	4.20
69.60	8.93	4.45	4.48
69.65	9.23	4.47	4.77
69.70	9.54	4.49	5.05
69.75	9.85	4.51	5.34
69.80	10.17	4.54	5.63
69.85	10.48	4.56	5.92
69.90	10.79	4.58	6.21
69.95	11.11	4.61	6.50
70.00	11.42	4.63	6.80
70.05	11.73	4.65	7.09
70.10	12.05	4.66	7.38
70.15	12.36	4.68	7.67
70.20	12.67	4.70	7.96
70.25	12.97	4.72	8.26
70.30	13.28	4.74	8.55
70.35	13.59	4.76	8.83
70.40	13.89	4.77	9.12
70.45	14.20	4.79	9.41
70.50	14.50	4.81	9.69
70.55	14.80	4.83	9.97
70.60	15.10	4.85	10.25
70.65	15.39	4.86	10.53
70.70	15.68	4.88	10.80
70.75	15.97	4.90	11.07
70.80	16.26	4.92	11.34
70.85	16.54	4.94	11.61
70.90	16.82	4.95	11.87
70.95	17.10	4.97	12.13
71.00	**17.37**	**4.99**	**12.38**

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 7P: Detention Basin Peak Elev=68.14' Storage=0.633 af Inflow=23.58 cfs 2.230 af
Discarded=3.86 cfs 2.230 af Primary=0.00 cfs 0.000 af Outflow=3.86 cfs 2.230 af

Summary for Pond 7P: Detention Basin

Inflow Area =	5.100 ac, 47.84% Impervious, Inflow Depth = 5.25" for 100-Year event				
Inflow =	23.58 cfs @	12.14 hrs, Volume=	2.230 af		
Outflow =	3.86 cfs @	12.71 hrs, Volume=	2.230 af, Atten= 84%, Lag= 34.5 min		
Discarded =	3.86 cfs @	12.71 hrs, Volume=	2.230 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 68.14' @ 12.71 hrs Surf.Area= 0.425 ac Storage= 0.633 af

Plug-Flow detention time= 47.8 min calculated for 2.229 af (100% of inflow)
Center-of-Mass det. time= 47.8 min (821.1 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	2.030 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

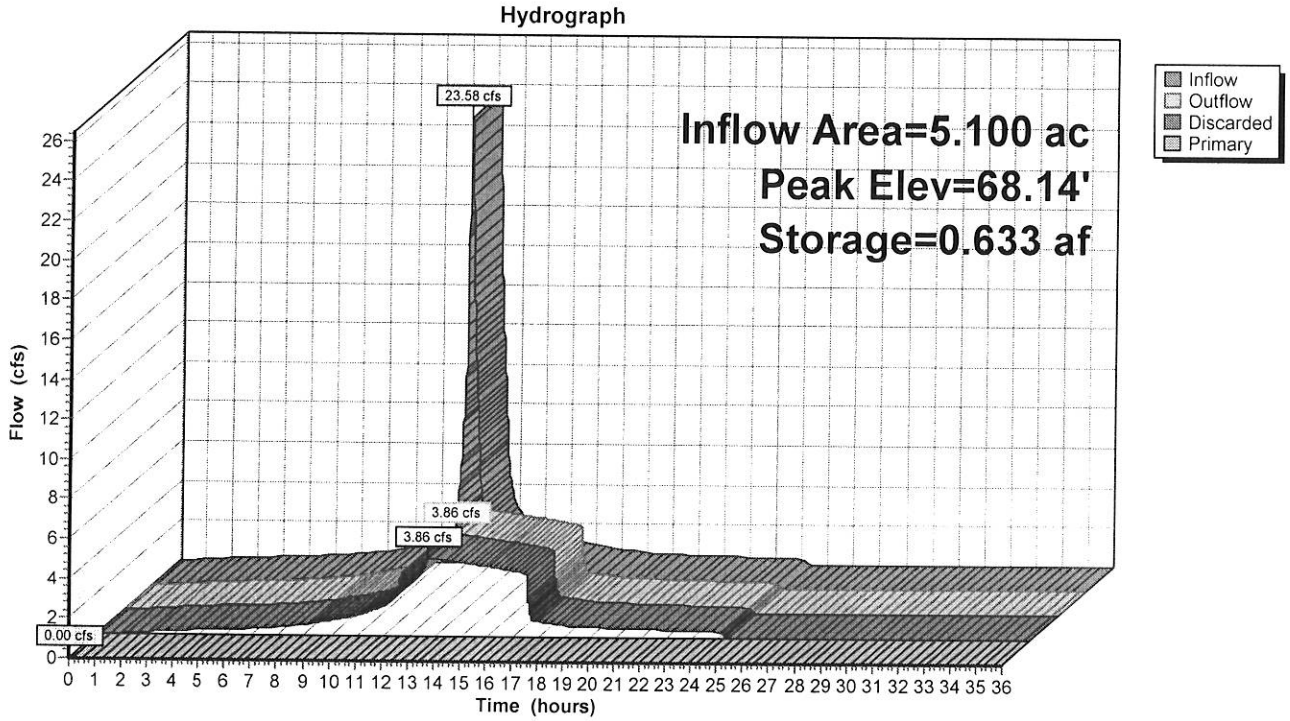
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
66.50	0.350	0.000	0.000
67.00	0.370	0.180	0.180
68.00	0.420	0.395	0.575
69.00	0.460	0.440	1.015
70.00	0.510	0.485	1.500
71.00	0.550	0.530	2.030

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.50'	**9.000 in/hr Exfiltration over Surface area**
#2	Primary	68.30'	**0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	68.60'	**1.2' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

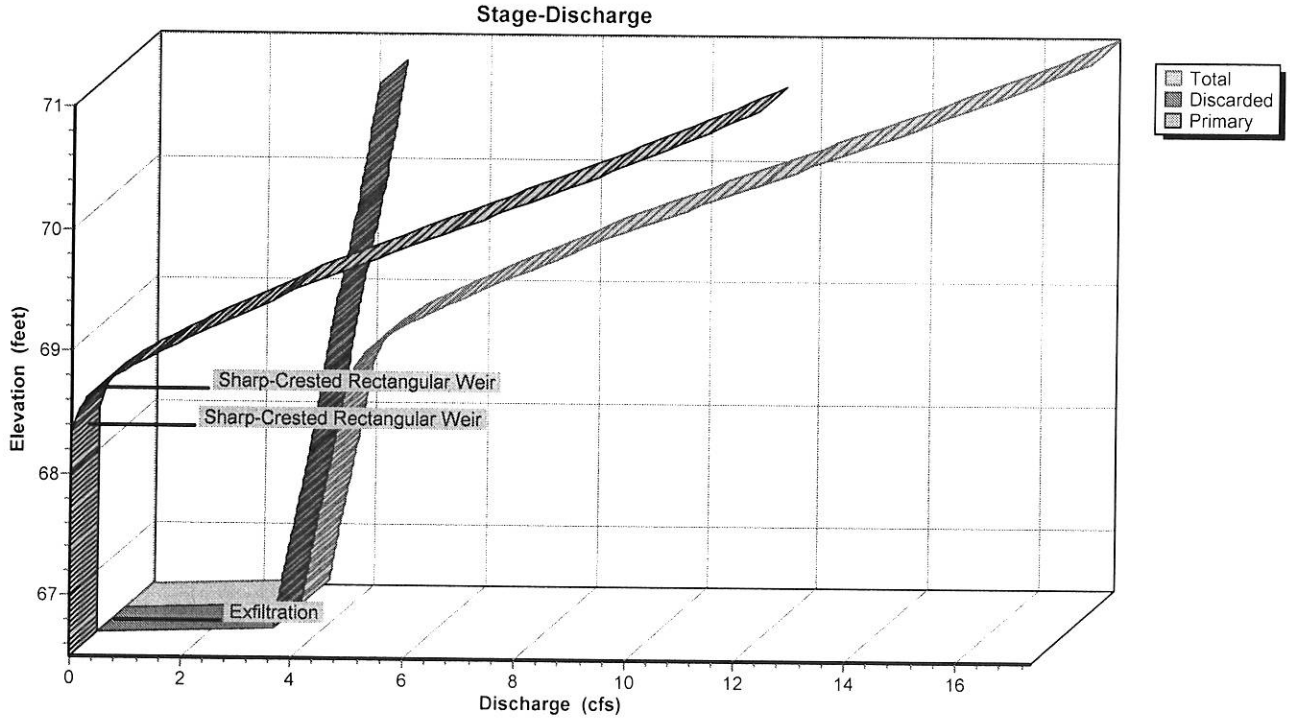
Discarded OutFlow Max=3.86 cfs @ 12.71 hrs HW=68.14' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 3.86 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.50' (Free Discharge)
├─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

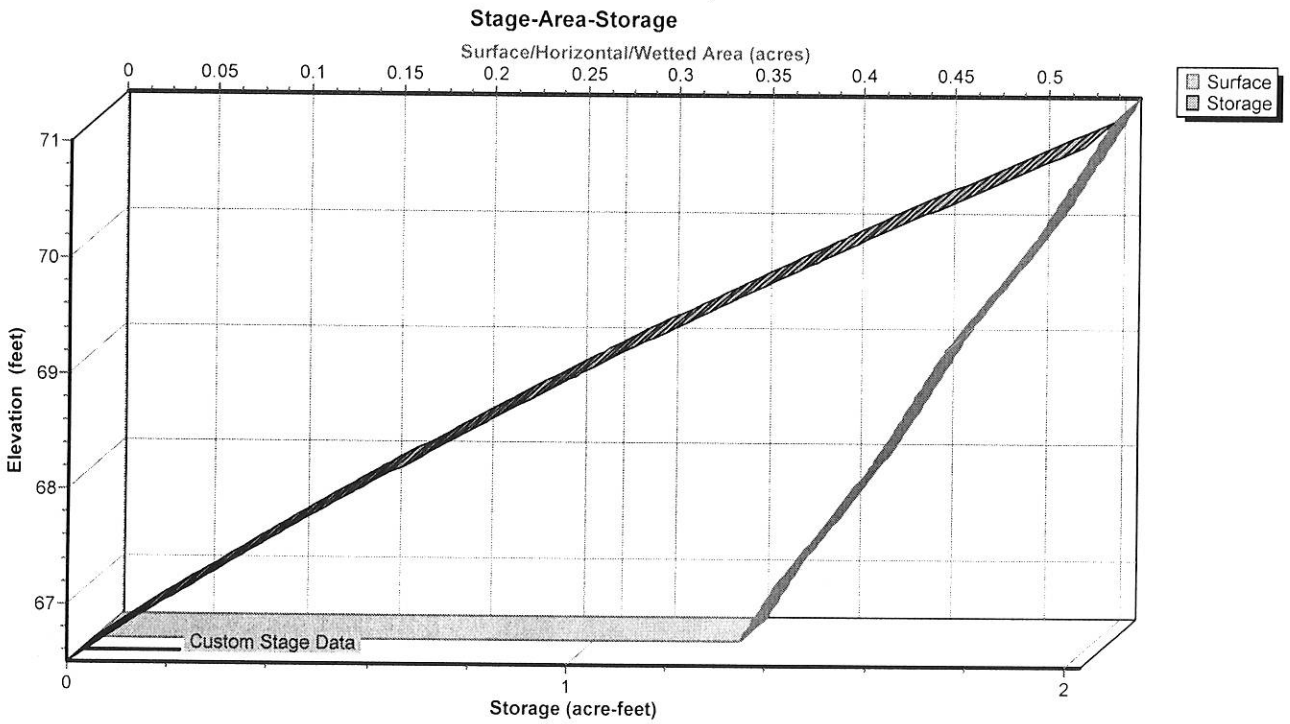
Pond 7P: Detention Basin



Pond 7P: Detention Basin



Pond 7P: Detention Basin



Hydrograph for Pond 7P: Detention Basin

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	66.50	0.00	0.00	**0.00**
1.00	0.06	0.000	66.50	0.05	0.05	0.00
2.00	0.13	0.001	66.50	0.13	0.13	0.00
3.00	0.19	0.001	66.50	0.19	0.19	0.00
4.00	0.24	0.001	66.50	0.24	0.24	0.00
5.00	0.28	0.001	66.50	0.28	0.28	0.00
6.00	0.32	0.002	66.50	0.32	0.32	0.00
7.00	0.42	0.002	66.51	0.42	0.42	0.00
8.00	0.53	0.003	66.51	0.53	0.53	0.00
9.00	0.77	0.004	66.51	0.75	0.75	0.00
10.00	1.02	0.005	66.51	1.01	1.01	0.00
11.00	1.50	0.007	66.52	1.47	1.47	0.00
12.00	**11.63**	**0.111**	**66.81**	**3.29**	**3.29**	0.00
13.00	**2.79**	**0.619**	**68.10**	**3.85**	**3.85**	0.00
14.00	1.73	0.482	67.77	3.71	3.71	0.00
15.00	1.31	0.307	67.34	3.51	3.51	0.00
16.00	0.94	0.119	66.83	3.30	3.30	0.00
17.00	0.74	0.004	66.51	0.75	0.75	0.00
18.00	0.58	0.003	66.51	0.59	0.59	0.00
19.00	0.51	0.003	66.51	0.51	0.51	0.00
20.00	0.46	0.002	66.51	0.46	0.46	0.00
21.00	0.42	0.002	66.51	0.42	0.42	0.00
22.00	0.38	0.002	66.51	0.38	0.38	0.00
23.00	0.34	0.002	66.50	0.35	0.35	0.00
24.00	0.30	0.002	66.50	0.31	0.31	0.00
25.00	0.00	0.000	66.50	0.00	0.00	0.00
26.00	0.00	0.000	66.50	0.00	0.00	0.00
27.00	0.00	0.000	66.50	0.00	0.00	0.00
28.00	0.00	0.000	66.50	0.00	0.00	0.00
29.00	0.00	0.000	66.50	0.00	0.00	0.00
30.00	0.00	0.000	66.50	0.00	0.00	0.00
31.00	0.00	0.000	66.50	0.00	0.00	0.00
32.00	0.00	0.000	66.50	0.00	0.00	0.00
33.00	0.00	0.000	66.50	0.00	0.00	0.00
34.00	0.00	0.000	66.50	0.00	0.00	0.00
35.00	0.00	0.000	66.50	0.00	0.00	0.00
36.00	0.00	0.000	66.50	0.00	0.00	0.00

Stage-Discharge for Pond 7P: Detention Basin

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
66.50	0.00	0.00	0.00
66.55	3.19	3.19	0.00
66.60	3.21	3.21	0.00
66.65	3.23	3.23	0.00
66.70	3.25	3.25	0.00
66.75	3.27	3.27	0.00
66.80	3.29	3.29	0.00
66.85	3.30	3.30	0.00
66.90	3.32	3.32	0.00
66.95	3.34	3.34	0.00
67.00	3.36	3.36	0.00
67.05	3.38	3.38	0.00
67.10	3.40	3.40	0.00
67.15	3.43	3.43	0.00
67.20	3.45	3.45	0.00
67.25	3.47	3.47	0.00
67.30	3.49	3.49	0.00
67.35	3.52	3.52	0.00
67.40	3.54	3.54	0.00
67.45	3.56	3.56	0.00
67.50	3.58	3.58	0.00
67.55	3.61	3.61	0.00
67.60	3.63	3.63	0.00
67.65	3.65	3.65	0.00
67.70	3.68	3.68	0.00
67.75	3.70	3.70	0.00
67.80	3.72	3.72	0.00
67.85	3.74	3.74	0.00
67.90	3.77	3.77	0.00
67.95	3.79	3.79	0.00
68.00	3.81	3.81	0.00
68.05	3.83	3.83	0.00
68.10	3.85	3.85	0.00
68.15	3.87	3.87	0.00
68.20	3.88	3.88	0.00
68.25	3.90	3.90	0.00
68.30	3.92	3.92	0.00
68.35	3.96	3.94	0.02
68.40	4.01	3.96	0.05
68.45	4.06	3.97	0.09
68.50	4.13	3.99	0.13
68.55	4.20	4.01	0.18
68.60	4.27	4.03	0.24
68.65	4.38	4.05	0.33
68.70	4.54	4.07	0.47
68.75	4.71	4.08	0.63
68.80	4.90	4.10	0.80
68.85	5.11	4.12	0.99
68.90	5.33	4.14	1.19
68.95	5.56	4.16	1.40
69.00	5.79	4.17	1.62
69.05	6.04	4.20	1.84
69.10	6.29	4.22	2.07
69.15	6.54	4.24	2.30
69.20	6.80	4.27	2.53
69.25	7.06	4.29	2.77
69.30	7.32	4.31	3.01
69.35	7.58	4.33	3.25
69.40	7.85	4.36	3.49
69.45	8.11	4.38	3.73
69.50	8.37	4.40	3.97
69.55	8.62	4.42	4.20
69.60	8.93	4.45	4.48
69.65	9.23	4.47	4.77
69.70	9.54	4.49	5.05
69.75	9.85	4.51	5.34
69.80	10.17	4.54	5.63
69.85	10.48	4.56	5.92
69.90	10.79	4.58	6.21
69.95	11.11	4.61	6.50
70.00	11.42	4.63	6.80
70.05	11.73	4.65	7.09
70.10	12.05	4.66	7.38
70.15	12.36	4.68	7.67
70.20	12.67	4.70	7.96
70.25	12.97	4.72	8.26
70.30	13.28	4.74	8.55
70.35	13.59	4.76	8.83
70.40	13.89	4.77	9.12
70.45	14.20	4.79	9.41
70.50	14.50	4.81	9.69
70.55	14.80	4.83	9.97
70.60	15.10	4.85	10.25
70.65	15.39	4.86	10.53
70.70	15.68	4.88	10.80
70.75	15.97	4.90	11.07
70.80	16.26	4.92	11.34
70.85	16.54	4.94	11.61
70.90	16.82	4.95	11.87
70.95	17.10	4.97	12.13
71.00	**17.37**	**4.99**	**12.38**

Stage-Area-Storage for Pond 7P: Detention Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
66.50	0.350	0.000
66.55	0.352	0.018
66.60	0.354	0.035
66.65	0.356	0.053
66.70	0.358	0.071
66.75	0.360	0.089
66.80	0.362	0.107
66.85	0.364	0.125
66.90	0.366	0.143
66.95	0.368	0.162
67.00	0.370	0.180
67.05	0.372	0.199
67.10	0.375	0.217
67.15	0.378	0.236
67.20	0.380	0.255
67.25	0.383	0.274
67.30	0.385	0.293
67.35	0.387	0.313
67.40	0.390	0.332
67.45	0.393	0.352
67.50	0.395	0.371
67.55	0.397	0.391
67.60	0.400	0.411
67.65	0.403	0.431
67.70	0.405	0.451
67.75	0.408	0.472
67.80	0.410	0.492
67.85	0.412	0.513
67.90	0.415	0.533
67.95	0.418	0.554
68.00	0.420	0.575
68.05	0.422	0.596
68.10	0.424	0.617
68.15	0.426	0.638
68.20	0.428	0.660
68.25	0.430	0.681
68.30	0.432	0.703
68.35	0.434	0.724
68.40	0.436	0.746
68.45	0.438	0.768
68.50	0.440	0.790
68.55	0.442	0.812
68.60	0.444	0.834
68.65	0.446	0.856
68.70	0.448	0.879
68.75	0.450	0.901
68.80	0.452	0.924
68.85	0.454	0.946
68.90	0.456	0.969
68.95	0.458	0.992
69.00	0.460	1.015
69.05	0.462	1.038
69.10	0.465	1.061
69.15	0.468	1.085
69.20	0.470	1.108
69.25	0.472	1.132
69.30	0.475	1.155
69.35	0.477	1.179
69.40	0.480	1.203
69.45	0.483	1.227
69.50	0.485	1.251
69.55	0.487	1.276
69.60	0.490	1.300
69.65	0.493	1.325
69.70	0.495	1.349
69.75	0.497	1.374
69.80	0.500	1.399
69.85	0.502	1.424
69.90	0.505	1.449
69.95	0.508	1.475
70.00	0.510	1.500
70.05	0.512	1.526
70.10	0.514	1.551
70.15	0.516	1.577
70.20	0.518	1.603
70.25	0.520	1.629
70.30	0.522	1.655
70.35	0.524	1.681
70.40	0.526	1.707
70.45	0.528	1.734
70.50	0.530	1.760
70.55	0.532	1.787
70.60	0.534	1.813
70.65	0.536	1.840
70.70	0.538	1.867
70.75	0.540	1.894
70.80	0.542	1.921
70.85	0.544	1.948
70.90	0.546	1.975
70.95	0.548	2.003
71.00	**0.550**	**2.030**

Appendix 4
Storm Sewer Pipe Calculations
Conduit Outlet Protection Calculations
Emergency Spillway Calculations

STORM SEWER TABULATION

SHEET 1 OF 3

PROJECT NO.: 18130
LOCATION: BLOCK 33, LOT 21, COLTS NECK
COMPUTED BY: ASG DATE: 4-6-20
CHECKED BY: DATE:

DESIGN STORM FREQUENCY: 25 YEAR
INTENSITY CURVE: NJDEP

LOCATION: STRUCTURE NO.[1] UPSTREAM (1)	DOWNSTREAM (2)	RUNOFF DATA: AREA (Ac) (3)	WEIGHTED RUNOFF COEFFICIENT[3] $\bar{C}$ (4)	A x $\bar{C}$ (5)=(3)x(4)	TOTAL (ΣA x $\bar{C}$) (6)=Σ(5)	TIME OF CONCENTRATION: OVERLAND THROUGH AREA (T_A) (MIN) (7)	THROUGH PIPE (T_P) (MIN) (8)	ACCUMULATED T_C (MIN.) (9)	RAINFALL INTENSITY (IN/HR) (10)	PEAK RUNOFF Q (CFS) (11)	SEWER DESIGN DATA (PIPE MATERIAL[2] RCP, MANNINGS 'n' 0.013): DIAMETER (INCHES) (12)	LENGTH (FT) (13)	SLOPE (%) (14)	CAPACITY AT FULL FLOW (CFS) (15)	VELOCITY AT FULL FLOW V_F (FPS) (16)	VELOCITY ACTUAL V_A (FPS) (17)	SEWER INVERT (IN) (18)	SEWER INVERT (OUT) (19)	TG
22	21	0.04	0.99	0.04	0.04	10	0.2	10	6.8	0.27	15	25	1.0	6.5	5.3	2.5	—	80.00	83.00
21	19	0.22	0.39	0.09	0.13	10	0.4	10.2	6.8	0.88	15	112	2.57	10.4	8.5	5.0	79.75	79.75	83.00
20	19	0.16	0.68	0.11	0.11	10	0.1	10	6.8	0.75	15	13	1.0	6.5	5.3	3.4	—	77.00	80.00
19	18	0.12	0.77	0.09	0.33	10	0.2	10.6	6.8	2.24	15	84	2.23	9.7	7.9	6.4	76.87	76.87	80.00
18	16	0.16	0.74	0.12	0.45	10	0.2	10.8	6.8	3.1	15	50	1.00	6.5	5.3	5.2	75.00	75.00	78.00
17	16	0.11	0.74	0.08	0.08	10	0.2	10	6.8	0.54	15	50	3.00	11.2	9.1	4.9	—	76.00	79.00
16	15	0.09	0.75	0.07	0.60	10	0.1	11	6.8	4.1	15	24	2.08	9.3	7.6	7.4	74.50	74.50	78.00
15	14	0.48	0.71	0.34	0.94	10	0.3	11.1	6.8	6.4	15	122	1.20	7.1	5.8	6.6	74.00	74.00	77.00
14	13	0.21	.99	0.21	1.15	10	0.3	11.4	6.7	7.7	18	114	1.00	10.5	5.9	6.4	72.54	72.29	77.50
13	12	0.19	.99	.19	1.34	10	0.3	11.7	6.5	8.7	18	102	1.0	10.5	5.9	6.6	71.15	71.15	75.50
12	9	0.07	.99	.07	1.41	10	0.2	12.0	6.2	8.7	18	90	1.0	10.5	5.9	6.6	70.13	70.13	74.60

NOTES 1 – SEE CONSTRUCTION PLANS FOR PROFILE INFORMATION.
2 – PIPE CLASS SHALL BE AS SHOWN ON THE CONSTRUCTION PLANS.
3 – SEE APPENDIX FOR CHARTS AND NOMOGRAPHS USED HEREIN

SHEET 2 OF 3

PROJECT NO.: 18130
LOCATION: BLOCK 33, LOT 21, COUTS NECK
COMPUTED BY: AJG DATE: 4-6-20
CHECKED BY: DATE:

DESIGN STORM FREQUENCY: 25 YEAR
INTENSITY CURVE: NJDEP

LOCATION: STRUCTURE NO.[1] UPSTREAM	DOWNSTREAM	RUNOFF DATA: AREA (Ac)	WEIGHTED RUNOFF COEFFICIENT[3] C̄	A x C̄	TOTAL (ΣA x C̄)	TIME OF CONCENTRATION: OVERLAND THROUGH AREA (T_A) (MIN)	THROUGH PIPE (T_P) (MIN)	ACCUMULATED T_C (MIN.)	RAINFALL INTENSITY (IN/HR)	PEAK RUNOFF Q (CFS)	SEWER DESIGN DATA (PIPE MATERIAL[2] RCP, MANNINGS 'n' 0.013): DIAMETER (INCHES)	LENGTH (FT)	SLOPE (%)	CAPACITY AT FULL FLOW (CFS)	VELOCITY AT FULL FLOW V_F (FPS)	VELOCITY ACTUAL V_A (FPS)	SEWER INVERT (IN)	SEWER INVERT (OUT)	TG
(1)	(2)	(3)	(4)	(5)=(3)x(4)	(6)=Σ(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
11	10	0.18	.25	.05	.05	10	0.1	10	6.8	0.34	15	65	0.5	4.6	3.7	2.1	—	68.23	71.00
10	9	0.12	.99	.12	.17	10	0.5	10.1	6.8	1.16	15	84	0.5	4.6	3.7	3.1	67.90	67.90	70.90
9	6	0.16	.99	.16	1.74	10	0.2	12.2	6.2	10.5	18	82	1.38	12.3	7.0	7.7	67.48	67.23	71.00
7	6	0.16	.80	.13	.13	10	—	10	6.8	0.88	15	12	7.1	17.2	14.1	8.1	—	67.00	70.00
8	6	0.15	.99	.15	.15	10	—	10	6.8	1.0	15	101	3.3	11.8	9.6	5.7	—	69.50	72.50
6	HW 5	0.31	.69	.21	2.02	10	—	17.4	6.2	12.5	18	20	2.0	14.8	8.4	9.4	66.15 65.90	65.90	70.00
HW 5																	65.50		

NOTES 1 – SEE CONSTRUCTION PLANS FOR PROFILE INFORMATION.
2 – PIPE CLASS SHALL BE AS SHOWN ON THE CONSTRUCTION PLANS.
3 – SEE APPENDIX FOR CHARTS AND NOMOGRAPHS USED HEREIN

PROJECT NO: 18130
LOCATION: Block 33, Lot 21, Colts Neck
COMPUTED BY: ASG DATE: 4-6-20
CHECKED BY: DATE:

DESIGN STORM FREQUENCY: 25 YEAR
INTENSITY CURVE: NJDOT

LOCATION: STRUCTURE NO.[1] UPSTREAM (1)	DOWNSTREAM (2)	RUNOFF DATA: AREA (Ac) (3)	WEIGHTED RUNOFF COEFFICIENT[3] C (4)	A x C (5)=(3)x(4)	TOTAL (Σ A x C) (6)=Σ(5)	TIME OF CONCENTRATION: OVERLAND THROUGH AREA (T_A) (MIN) (7)	THROUGH PIPE (T_P) (MIN) (8)	ACCUMULATED T_C (MIN.) (9)	RAINFALL INTENSITY (IN/HR) (10)	PEAK RUNOFF Q (CFS) (11)	SEWER DESIGN DATA (PIPE MATERIAL[2] RCP, MANNINGS 'n' 0.013): DIAMETER (INCHES) (12)	LENGTH (FT) (13)	SLOPE (%) (14)	CAPACITY AT FULL FLOW (CFS) (15)	VELOCITY AT FULL FLOW V_F (FPS) (16)	VELOCITY ACTUAL V_A (FPS) (17)	SEWER INVERT (IN) (18)	SEWER INVERT (OUT) (19)	
																			TG
27	26	0.47	.25	0.12	0.12	10	0.3	10	6.8	0.82	15	70	2.86	10.9	8.9	4.2	—	79.50	82.50
26	25	0.21	.85	0.18	0.30	10	0.3	10.3	6.8	2.0	15	110	3.18	11.5	9.4	7.1	77.50	77.50	80.50
25	24	0.49	.93	0.46	0.76	10	0.3	10.6	6.8	5.2	15	134	1.49	7.9	6.4	6.8	74.00	74.00	77.00
24	HW23	0.15	.99	0.15	0.91	10	—	10.9	6.8	6.2	15	83	6.63	16.7	13.6	12.5	72.00	70.00	76.50
HW23																	65.50		
																			RIM
OS 4	MH3								*	2.36	15	70	5.00	14.5	11.8	9.2	65.50	65.50	—
MH3	MH2								*	2.36	15	35	10.00	20.5	16.7	10.9	62.00	55.50	65.0
MH2	HW1								*	2.36	15	40	10.00	20.5	16.7	10.9	52.00	47.00	55.0
																	43.00	43.00	

NOTES 1 – SEE CONSTRUCTION PLANS FOR PROFILE INFORMATION.
2 – PIPE CLASS SHALL BE AS SHOWN ON THE CONSTRUCTION PLANS.
3 – SEE APPENDIX FOR CHARTS AND NOMOGRAPHS USED HEREIN

* 100 YEAR ROUTED OUTFLOW

Two River Engineering

P.O. Box 155
Colts Neck, NJ 07722

Tel: 732.866.0111
Fax: 732.866.4348

JOB:	Colts Neck Community Church HW 5		
BY:	AJG		
DATE:	4/8/2020	REV:	
SOIL TYPE:	Freehold / Tinton		
HYDROLOGIC GROUP:	A/B		

CONDUIT OUTLET PROTECTION CALCULATION - Structure 5

CONDUIT EXIT VELOCITY: 9.4 F.P.S. <-- From Storm Sewer Tabulation
VELOCITY EXCEEDS VALUES PROVIDED IN TABLE 12-1, THEREFORE
CONDUIT OUTLET PROTECTION IS REQUIRED.

CONDUIT DESCRIPTION:	RIPRAP	
CONDUIT INVERT:	65.50 FT.	
TAILWATER ELEV.:	69.04 FT.	<-- 25 year W.S.E.

$$L_{APRON} = \left(3\frac{q}{D_o^{1/2}}\right) \quad \text{for} \quad TW > \tfrac{1}{2}D_o$$

CONDUIT HEIGHT:	15.00 IN.	
CONDUIT WIDTH:	15.00 IN.	
FLOW RATE:	12.50 C.F.S.	<-- From Storm Sewer Tabulation
UNIT DISCHARGE:	10.00 S.F.S.	
APRON LENGTH:	26.83 FT.	
USE:	**27.00** FT.	

$$W_{APRON} = 3W_o + 0.4L_{APRON}$$

APRON WIDTH:	14.55
USE:	**15.00** FT.

$$D_{50} = \frac{0.016}{T_w}q^{1.33}$$

RIPRAP MEDIAN STONE DIA.:	0.0966 FT.
USE:	~~**2.00** IN.~~ 3"
APRON VOLUME (w/ fltr. fabric)	7.6 CY

https://d.docs.live.net/646a0865c584ba58/AJ One Drive/Documents/2018/18130 (Colts Neck Community Church)/conduit outlet protection - HW 5.xls

Two River Engineering

P.O. Box 155
Colts Neck, NJ 07722

Tel: 732.866.0111
Fax: 732.866.4348

JOB:	Colts Neck Community Church HW 23		
BY:	AJG		
DATE:	4/8/2020	REV:	
SOIL TYPE:	Freehold / Tinton		
HYDROLOGIC GROUP:	A/B		

CONDUIT OUTLET PROTECTION CALCULATION - Structure 23

CONDUIT EXIT VELOCITY: 12.5 F.P.S. <-- From Storm Sewer Tabulation
VELOCITY EXCEEDS VALUES PROVIDED IN TABLE 12-1, THEREFORE
CONDUIT OUTLET PROTECTION IS REQUIRED.

CONDUIT DESCRIPTION:	RIPRAP	
CONDUIT INVERT:	65.50 FT.	
TAILWATER ELEV.:	69.04 FT.	<-- 25 year W.S.E.

$$L_{APRON} = \left(3\frac{q}{D_o^{1/2}}\right) \quad \text{for} \quad TW > \tfrac{1}{2}D_o$$

CONDUIT HEIGHT:	15.00 IN.	
CONDUIT WIDTH:	15.00 IN.	
FLOW RATE:	6.20 C.F.S.	<-- From Storm Sewer Tabulation
UNIT DISCHARGE:	4.96 S.F.S.	
APRON LENGTH:	13.31 FT.	
USE:	**14.00** FT.	

$$W_{APRON} = 3W_o + 0.4L_{APRON}$$

APRON WIDTH:	9.35
USE:	**10.00** FT.

$$D_{50} = \frac{0.016}{T_w}q^{1.33}$$

RIPRAP MEDIAN STONE DIA.:	0.0380 FT.	
USE:	~~**1.00** IN.~~	3"
APRON VOLUME (w/ fltr. fabric)	3.7 CY	

https://d.docs.live.net/646a0865c584ba58/AJ One Drive/Documents/2018/18130 (Colts Neck Community Church)/conduit outlet protection - HW 23.xls

Two River Engineering

P.O. Box 155
Colts Neck, NJ 07722

Tel: 732.866.0111
Fax: 732.866.4348

JOB:	CN Com. Church
JOB NUMBER:	18130
BY:	AJG
DATE:	4/8/2020
SOIL TYPE:	Freehold / Tinton
HYDROLOGIC:	A/B

Cells in Gray require user input
Cells in Blue are calculated

EMERGENCY SPILLWAY CALCULATION

TYPE: DETENTION POND
CLASSIFICATION: N.A.

100 YEAR INFLOW:	23.58	C.F.S
150% OF INFLOW:	35.37	C.F.S
SPILLWAY ELEV.:	69.50	FT.
WEIR COOEF.:	3.20	
SPILLWAY LENGTH:	35.00	FT.

EQUATION: $Q = C_W L(H)^{3/2}$

DEPTH OF FLOW:	0.35	FT.
FREEBOARD:	0.00	FT.
BASIN BERM ELEV.:	69.85	FT.

CROSS-SECTIONAL AREA OF FLOW:	12.39	S.F.

EQUATION: $Q = V A$

SPILLWAY VELOCITY:	1.90	F.P.S.

PURSUANT TO THE NEW JERSEY STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL, JULY 1999, THE MAXIMUM PERMISSIBLE NON-EROSIVE VELOCITY IN A SEEDED, GRASS WATERWAY IS 2 F.P.S. (PAGE 18-2)

Appendix 5
GSR-32 Groundwater Recharge Analysis Spreadsheet

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
MONMOUTH CO., COLTS NECK TWP	45.2	1.45

Project Name:	Colts Neck Community Church
Description:	Colts Neck, NJ
Analysis Date:	07/20/20

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.68	Open Space	Freehold	13.6	33,455
2	0.1	Gravel, dirt	Freehold	8.8	3,180
3	7.07	Open Space	Tinton	15.6	400,206
4	0.38	Woods-grass combination	Tinton	14.9	20,519
5	0.72	Impervious areas	Tinton	0.0	-
6	0.05	Gravel, dirt	Tinton	13.4	2,432
7	0.35	Open Space	Colts Neck	13.6	17,309
8	0.04	Impervious areas	Colts Neck	0.0	-
9					
10					
11					
12					
13					
14					
15					
Total =	9.4			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				14.0	477,101

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.56	Open space	Freehold	13.6	27,552
2	0.05	Impervious areas	Freehold	0.0	-
3	6.25	Open space	Tinton	15.6	353,789
4	2.1	Impervious areas	Tinton	0.0	-
5	0.4	Open space	Colts Neck	13.6	19,781
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
Total =	9.4	Warning: make total area equal to Pre-Developed Conditions		Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				11.8	401,122
				Total Impervious Area (sq.ft)	
				93,654	

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	
Post-Development Annual Recharge Deficit=	***75,979***	(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	2.47	(in)	DRWC=	2.47	(in)
ERWC =	0.68	(in)	EDRWC=	0.68	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
Colts Neck Community Ch	Colts Neck, NJ	07/20/20	Infiltration Basin

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	8272.6	sq.ft
BMP Effective Depth, this is the design variable	dBMP	1.8	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-42.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	1	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	1.58	in
ERWC Modified to consider dEXC	EDRWC	1.58	in
Empty Portion of RWC under Infilt. BMP	RERWC	1.28	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	0.16	in
Inches of Rainfall to capture	Pdesign	0.23	in
Recharge Provided Avg. over Imp. Area		2.8	in
Runoff Captured Avg. over imp. Area		11.0	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.09	unitless
BMP Volume	VBMP	1,265	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	75,979	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	93,654	sq.ft
Root Zone Water Capacity	RWC	5.74	in
RWC Modified to consider dEXC	DRWC	5.74	in
Climatic Factor	C-factor	1.45	no units
Average Annual P	Pavg	45.2	in
Recharge Requirement over Imp. Area	dr	9.7	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		22,179	cu.ft
Avg BMP Recharge Efficiency		25.7%	Represents % Infiltration Recharged
%Rainfall became Runoff		77.8%	%
%Runoff Infiltrated		31.4%	%
%Runoff Recharged		8.1%	%
%Rainfall Recharged		6.3%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.