

## Jennifer Lindo

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**From:** Alex Klose  
**Sent:** Friday, December 9, 2022 10:10 AM  
**To:** Jennifer Lindo  
**Subject:** FW: 230 Flanders Road  
**Attachments:** 2002 Connecticut Guidelines for Soil Erosion and Sediment Control - Level Spreaders.pdf; 230 Flanders Road - East Lyme CT - Grading & Drainage Plan (2022-12-05).pdf; 230 Flanders Road - Pond Report.pdf

**From:** Alex Klose  
**Sent:** Monday, December 5, 2022 10:26 AM  
**To:** Gary Goeschel <ggoeschel@eltownhall.com>; Bill Mulholland <billm@eltownhall.com>  
**Cc:** Casey Burch <Casey@sollillc.com>; Anthony Capuano <Anthony@sollillc.com>; Jennifer Lindo <jlindo@eltownhall.com>  
**Subject:** FW: 230 Flanders Road

Gary and Bill,

I reviewed the Wetlands/Zoning application for 230 Flanders Road "Soapy Noble". I asked the applicant's engineer to send me the revised calculation's attached (Jenn please add to the record along with this email) to confirm a couple of questions I had. These will be integrated into the final stormwater report pending either of your comments and/or the commissions' comments.

I appreciate the time the applicant and their engineer took to meet with us to work out many questions ahead of this application which resulted in a very complete application in my opinion.

The engineering department has no further comments at this time for either commission, I believe the design engineer is proposing a good way to handle the site stormwater management and other site features.

As always, I recommend that the engineer of record provide certification upon construction that the stormwater management system was installed per the design along with the as-built survey.

Please let me know if you need anything else from me at this time,

Alex Klose, PE  
Town Engineer  
(860) 691-4112  
[aklose@eltownhall.com](mailto:aklose@eltownhall.com)

Town of East Lyme  
PO Box 519  
108 Pennsylvania Avenue  
Niantic, CT 06357

**From:** Anthony Capuano <Anthony@sollillc.com>  
**Sent:** Monday, December 5, 2022 10:10 AM

To: Alex Klose <[aklose@eltownhall.com](mailto:aklose@eltownhall.com)>

Cc: Casey Burch <[Casey@sollllc.com](mailto:Casey@sollllc.com)>

Subject: 230 Flanders Road

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Alex,

Per our call earlier please find attached:

- Revised pond report correcting the culvert from a 12" to a 24" pipe
- Revised grading plan showing correct level spreader dimensions
  - We had previously shown an oversized 20' x 6' level spreader, which has been corrected to 10' x 6'
- Section from the CT SEC guidelines showing that for 0-10 cfs flows, a 10' x 6' x 0.5 deep level spreader is adequately sized

Let us know if this addresses all of your comments and thank you for turning around this review so quickly, it's a great help to us.

Thank you,

**Anthony Capuano**

Senior Project Engineer



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Norwood, MA 02062

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# 10-Energy Dissipators

## Level Spreader (LS)

### Definition

An outlet for diversions and other water conveyances consisting of an excavated depression with a broad stable point of discharge constructed at zero grade across a slope.

### Purpose

To reduce the depth and velocity of concentrated runoff and release it uniformly as sheet flow onto a stable area.

### Applicability

- Where there is a need to carry storm water away from disturbed areas and to avoid stressing erosion control measures.
- Where sediment reduced runoff can be released in sheet flow over a stabilized slope without causing erosion.
- Where the spreader can be constructed on undisturbed soil.
- Where the area below the level spreader lip has a slope of 5% or flatter and is stabilized by vegetation.

### Planning Considerations

The **Temporary Diversion** measure and the **Water Bar** measure each calls for a stable outlet for concentrated storm water flows. The level spreader is a relatively low-cost structure to release small volumes of concentrated flow where site conditions are suitable.

Check the proposed location of the level spreader to ensure it can be constructed on level, stable, and undisturbed ground. Any depressions in the outlet lip of the spreader could concentrate flow, and result in erosion. Check conditions downslope from the spreader to ensure the runoff water will not reconcentrate after release unless it occurs during interception by another measure (such as a permanent pond or detention basin) located below the level spreader.

For higher design flow conditions, a rigid outlet lip design is required to ensure the desired sheet flow conditions.

Special care should be taken when designing level spreaders on terrace escarpments located in the Connecticut River valley. These areas are very susceptible to erosion by the concentration flows. Consider using alternative methods to discharge runoff through the escarpment area.

### Design Criteria

Slopes shall be sufficiently smooth to preserve sheet flow and prevent flow from concentrating.

Criteria provided below are for flows from a 10-year frequency storm that is equal to or less than 20 cfs ( $Q_{10} \leq 20$  cfs). For higher flows use other standard engineering practices that will result in a diffuse non-erosive

discharge.

### Spreader Dimensions

Determine the size of the level spreader by estimating the peak flow expected from a 10-year storm ( $Q_{10}$ ).

Select the appropriate length, width and depth of the spreader from **Figure LS-1**.

Provide a 20-foot transition section in the diversion channel so that the width of the diversion will smoothly transition with the width of the spreader to ensure more uniform outflow.

Make the depth of the level spreader, as measured from the lip, at least 6 inches. The depth may be made greater to increase temporary storage capacity, improve trapping of debris and to enhance settling of any sus-

**Figure LS-1 Minimum Dimensions for Level Spreader**

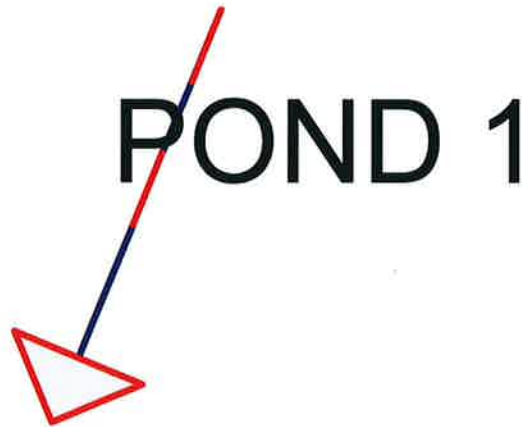
Design Flow, $Q_{10}$ (cfs)	Depth (ft.)	Width of Lower Side Slope of Spreader (ft.)	Length (ft.)
0 – 10	0.5	6	10
10 – 20	0.6	6	20

pended solids.

### Grade

The grade of the channel for the last 20 feet of the dike or diversion entering the level spreader shall be no steeper than 1%.





**East Lyme Hydrology**

Type III 24-hr 2-yr Rainfall=3.45"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=35.27' Storage=1,378 cf Inflow=1.49 cfs 0.135 af  
Primary=0.68 cfs 0.133 af Secondary=0.00 cfs 0.000 af Outflow=0.68 cfs 0.133 af

# East Lyme Hydrology

Type III 24-hr 2-yr Rainfall=3.45"

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## Summary for Pond 7P: POND 1

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 1.89" for 2-yr event  
 Inflow = 1.49 cfs @ 12.19 hrs, Volume= 0.135 af  
 Outflow = 0.68 cfs @ 12.51 hrs, Volume= 0.133 af, Atten= 55%, Lag= 19.1 min  
 Primary = 0.68 cfs @ 12.51 hrs, Volume= 0.133 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 35.27' @ 12.51 hrs Surf.Area= 1,305 sf Storage= 1,378 cf

Plug-Flow detention time= 32.0 min calculated for 0.133 af (98% of inflow)  
 Center-of-Mass det. time= 23.8 min ( 855.5 - 831.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.68 cfs @ 12.51 hrs HW=35.27' (Free Discharge)

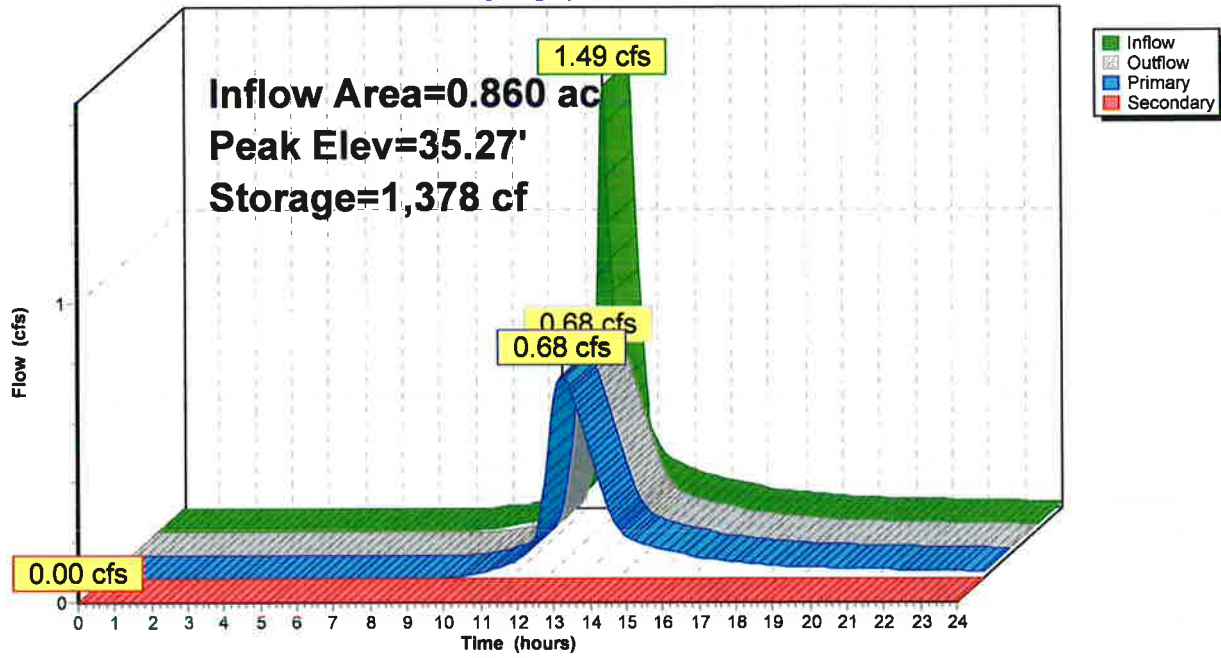
- 1=Culvert (Passes 0.68 cfs of 8.04 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.68 cfs @ 4.95 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)

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

Pond 7P: POND 1

Hydrograph





**East Lyme Hydrology**

Type III 24-hr 2-yr Rainfall=3.45"

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**Stage-Discharge for Pond 7P: POND 1**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	<b>55.10</b>	<b>28.30</b>	<b>26.80</b>
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				

**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			

**East Lyme Hydrology**

Type III 24-hr 5-yr Rainfall=4.38"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=35.81' Storage=2,145 cf Inflow=2.12 cfs 0.194 af  
Primary=0.88 cfs 0.192 af Secondary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.192 af

# East Lyme Hydrology

Type III 24-hr 5-yr Rainfall=4.38"

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## Summary for Pond 7P: POND 1

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 2.70" for 5-yr event  
 Inflow = 2.12 cfs @ 12.19 hrs, Volume= 0.194 af  
 Outflow = 0.88 cfs @ 12.53 hrs, Volume= 0.192 af, Atten= 58%, Lag= 20.4 min  
 Primary = 0.88 cfs @ 12.53 hrs, Volume= 0.192 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 35.81' @ 12.53 hrs Surf.Area= 1,506 sf Storage= 2,145 cf

Plug-Flow detention time= 33.4 min calculated for 0.191 af (99% of inflow)  
 Center-of-Mass det. time= 26.7 min ( 848.2 - 821.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=0.88 cfs @ 12.53 hrs HW=35.81' (Free Discharge)

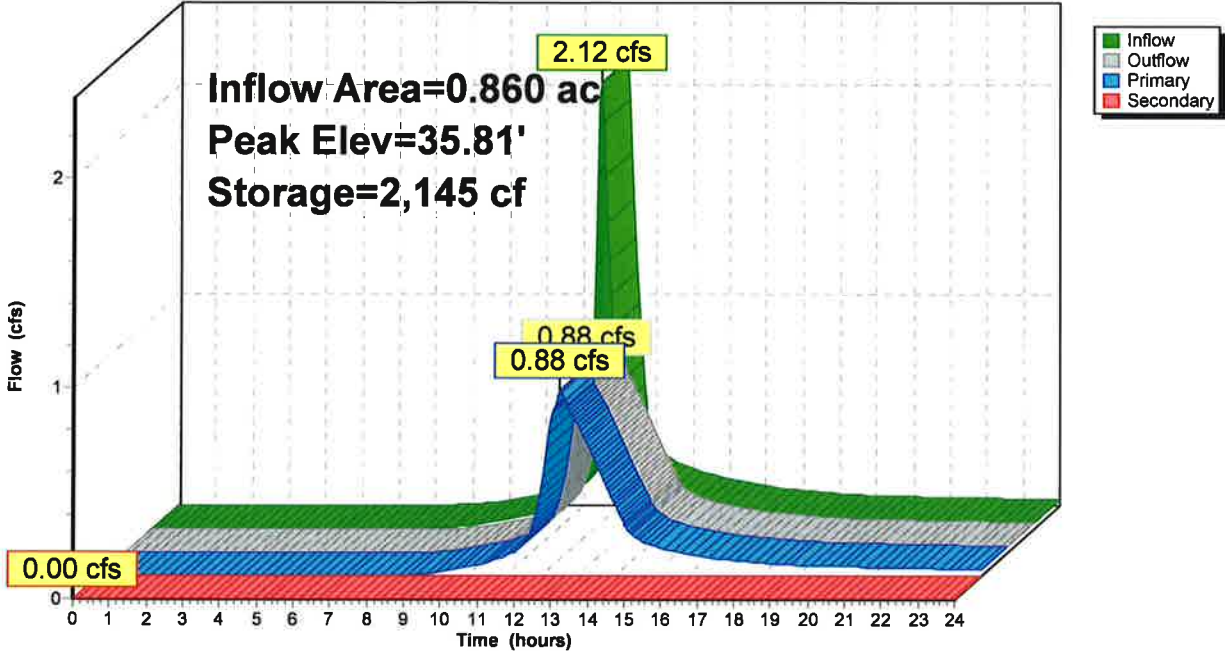
- 1=Culvert (Passes 0.88 cfs of 13.71 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.83 cfs @ 6.10 fps)
- 3=Orifice/Grate (Orifice Controls 0.05 cfs @ 0.80 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)

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

Pond 7P: POND 1

Hydrograph



**Stage-Discharge for Pond 7P: POND 1**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	55.10	28.30	26.80
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				

**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			

**East Lyme Hydrology**

*Type III 24-hr 10-yr Rainfall=5.16"*

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=36.06' Storage=2,530 cf Inflow=2.67 cfs 0.244 af  
Primary=1.45 cfs 0.242 af Secondary=0.00 cfs 0.000 af Outflow=1.45 cfs 0.242 af



**East Lyme Hydrology**

Type III 24-hr 10-yr Rainfall=5.16"

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**Summary for Pond 7P: POND 1**

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 3.41" for 10-yr event  
 Inflow = 2.67 cfs @ 12.19 hrs, Volume= 0.244 af  
 Outflow = 1.45 cfs @ 12.43 hrs, Volume= 0.242 af, Atten= 46%, Lag= 14.8 min  
 Primary = 1.45 cfs @ 12.43 hrs, Volume= 0.242 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 36.06' @ 12.43 hrs Surf.Area= 1,600 sf Storage= 2,530 cf

Plug-Flow detention time= 31.8 min calculated for 0.242 af (99% of inflow)  
 Center-of-Mass det. time= 25.9 min ( 840.8 - 814.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow Max=1.45 cfs @ 12.43 hrs HW=36.06' (Free Discharge)**

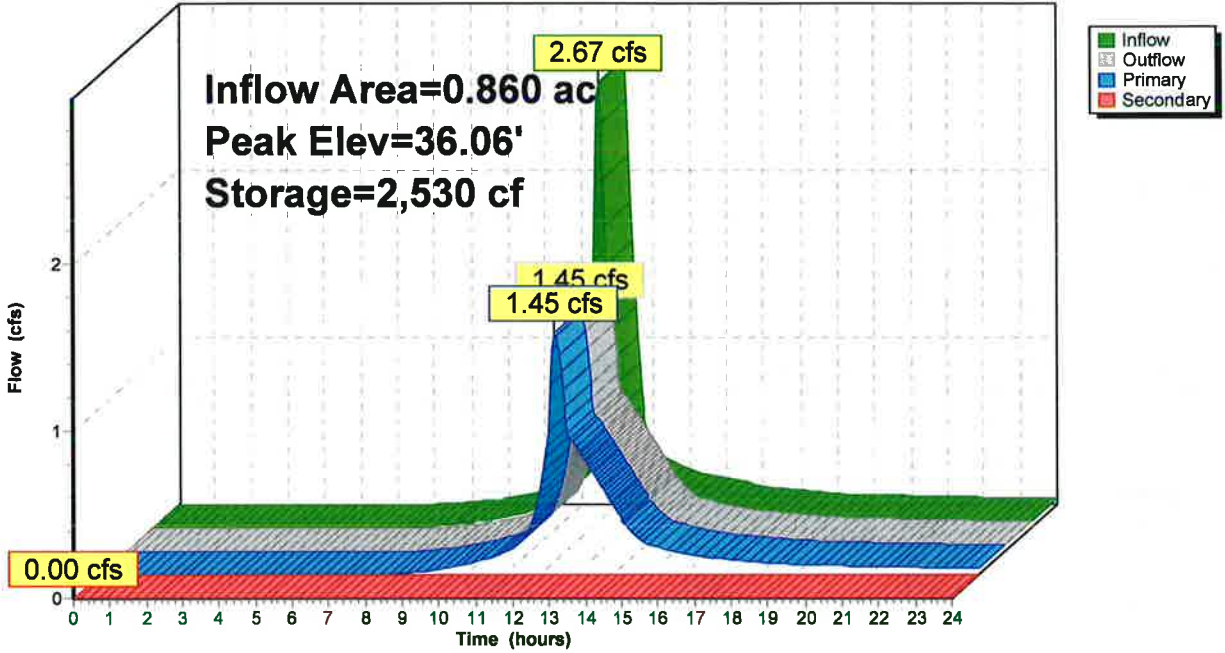
- 1=Culvert (Passes 1.45 cfs of 15.57 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.89 cfs @ 6.55 fps)
- 3=Orifice/Grate (Orifice Controls 0.55 cfs @ 1.79 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)**

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

Pond 7P: POND 1

Hydrograph



**Stage-Discharge for Pond 7P: POND 1**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	55.10	28.30	26.80
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				

**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			

**East Lyme Hydrology**

Type III 24-hr 25-yr Rainfall=6.22"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=36.30' Storage=2,927 cf Inflow=3.41 cfs 0.315 af  
Primary=2.23 cfs 0.312 af Secondary=0.00 cfs 0.000 af Outflow=2.23 cfs 0.312 af

**East Lyme Hydrology**

Type III 24-hr 25-yr Rainfall=6.22"

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**Summary for Pond 7P: POND 1**

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 4.39" for 25-yr event  
 Inflow = 3.41 cfs @ 12.19 hrs, Volume= 0.315 af  
 Outflow = 2.23 cfs @ 12.37 hrs, Volume= 0.312 af, Atten= 35%, Lag= 10.8 min  
 Primary = 2.23 cfs @ 12.37 hrs, Volume= 0.312 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 36.30' @ 12.36 hrs Surf.Area= 1,698 sf Storage= 2,927 cf

Plug-Flow detention time= 29.5 min calculated for 0.312 af (99% of inflow)  
 Center-of-Mass det. time= 24.1 min ( 832.0 - 807.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.22 cfs @ 12.37 hrs HW=36.30' (Free Discharge)

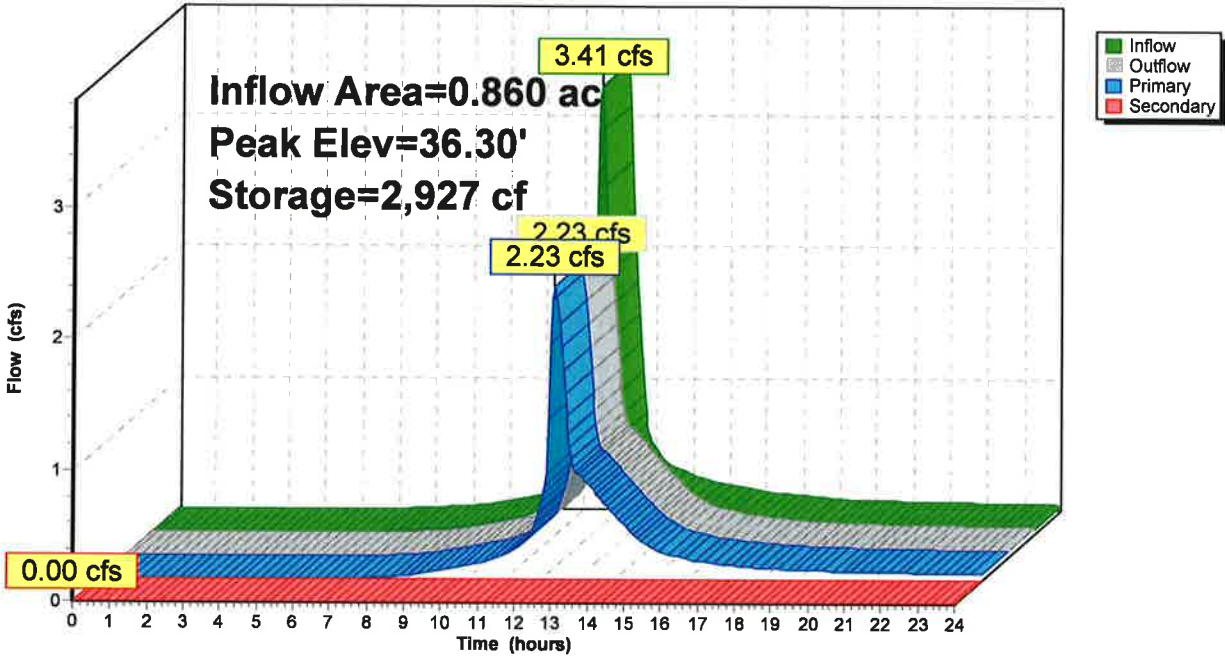
- 1=Culvert (Passes 2.22 cfs of 17.23 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.95 cfs @ 6.96 fps)
- 3=Orifice/Grate (Orifice Controls 1.27 cfs @ 2.54 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)

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

Pond 7P: POND 1

Hydrograph



**East Lyme Hydrology**

Type III 24-hr 25-yr Rainfall=6.22"

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**Stage-Discharge for Pond 7P: POND 1**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	<b>55.10</b>	<b>28.30</b>	<b>26.80</b>
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				



**East Lyme Hydrology**

Type III 24-hr 25-yr Rainfall=6.22"

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**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			

**East Lyme Hydrology**

*Type III 24-hr 50-yr Rainfall=7.01"*

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=36.49' Storage=3,250 cf Inflow=3.96 cfs 0.368 af  
Primary=2.65 cfs 0.365 af Secondary=0.00 cfs 0.000 af Outflow=2.65 cfs 0.365 af

# East Lyme Hydrology

Type III 24-hr 50-yr Rainfall=7.01"

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## Summary for Pond 7P: POND 1

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 5.14" for 50-yr event  
 Inflow = 3.96 cfs @ 12.18 hrs, Volume= 0.368 af  
 Outflow = 2.65 cfs @ 12.35 hrs, Volume= 0.365 af, Atten= 33%, Lag= 10.1 min  
 Primary = 2.65 cfs @ 12.35 hrs, Volume= 0.365 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 36.49' @ 12.35 hrs Surf.Area= 1,774 sf Storage= 3,250 cf

Plug-Flow detention time= 28.2 min calculated for 0.365 af (99% of inflow)  
 Center-of-Mass det. time= 23.3 min ( 826.8 - 803.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

**Primary OutFlow** Max=2.65 cfs @ 12.35 hrs HW=36.49' (Free Discharge)

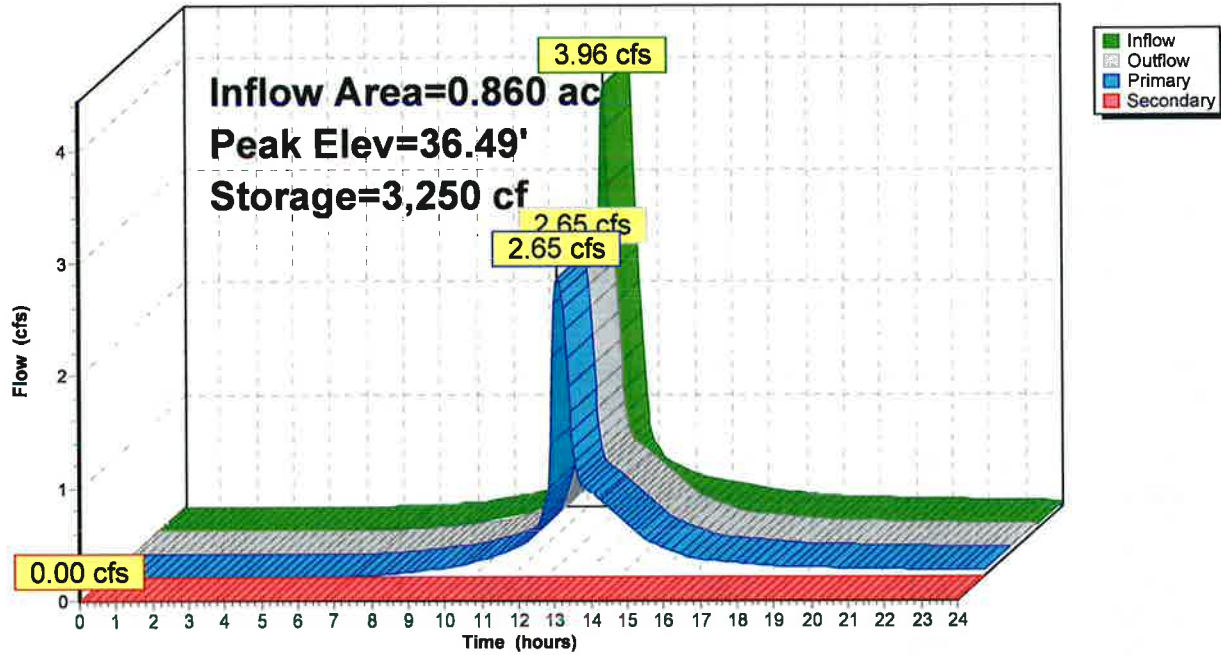
- 1=Culvert (Passes 2.65 cfs of 18.45 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.99 cfs @ 7.27 fps)
- 3=Orifice/Grate (Orifice Controls 1.66 cfs @ 3.32 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)

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

Pond 7P: POND 1

Hydrograph



**East Lyme Hydrology**

Type III 24-hr 50-yr Rainfall=7.01"

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**Stage-Discharge for Pond 7P: POND 1**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	<b>55.10</b>	<b>28.30</b>	<b>26.80</b>
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				

**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			

**East Lyme Hydrology**

Type III 24-hr 100-yr Rainfall=7.86"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Pond 7P: POND 1**

Peak Elev=36.70' Storage=3,642 cf Inflow=4.56 cfs 0.426 af  
Primary=3.05 cfs 0.423 af Secondary=0.00 cfs 0.000 af Outflow=3.05 cfs 0.423 af

**East Lyme Hydrology**

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Type III 24-hr 100-yr Rainfall=7.86"

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**Summary for Pond 7P: POND 1**

Inflow Area = 0.860 ac, 62.79% Impervious, Inflow Depth > 5.95" for 100-yr event  
 Inflow = 4.56 cfs @ 12.18 hrs, Volume= 0.426 af  
 Outflow = 3.05 cfs @ 12.35 hrs, Volume= 0.423 af, Atten= 33%, Lag= 10.1 min  
 Primary = 3.05 cfs @ 12.35 hrs, Volume= 0.423 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 36.70' @ 12.35 hrs Surf.Area= 1,862 sf Storage= 3,642 cf

Plug-Flow detention time= 27.3 min calculated for 0.423 af (99% of inflow)  
 Center-of-Mass det. time= 22.8 min ( 822.2 - 799.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	7,690 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	877	0	0
35.00	1,206	1,042	1,042
36.00	1,575	1,391	2,432
37.00	1,982	1,779	4,211
38.00	2,429	2,206	6,416
38.50	2,667	1,274	7,690

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>24.0" Round Culvert</b> L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.25' S= 0.0326 ' S= 0.0326 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	34.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	35.75'	<b>12.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	37.25'	<b>20.4" x 37.2" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	<b>10.0' long x 6.0' breadth Broad-Crested Rectangular Weir</b> 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

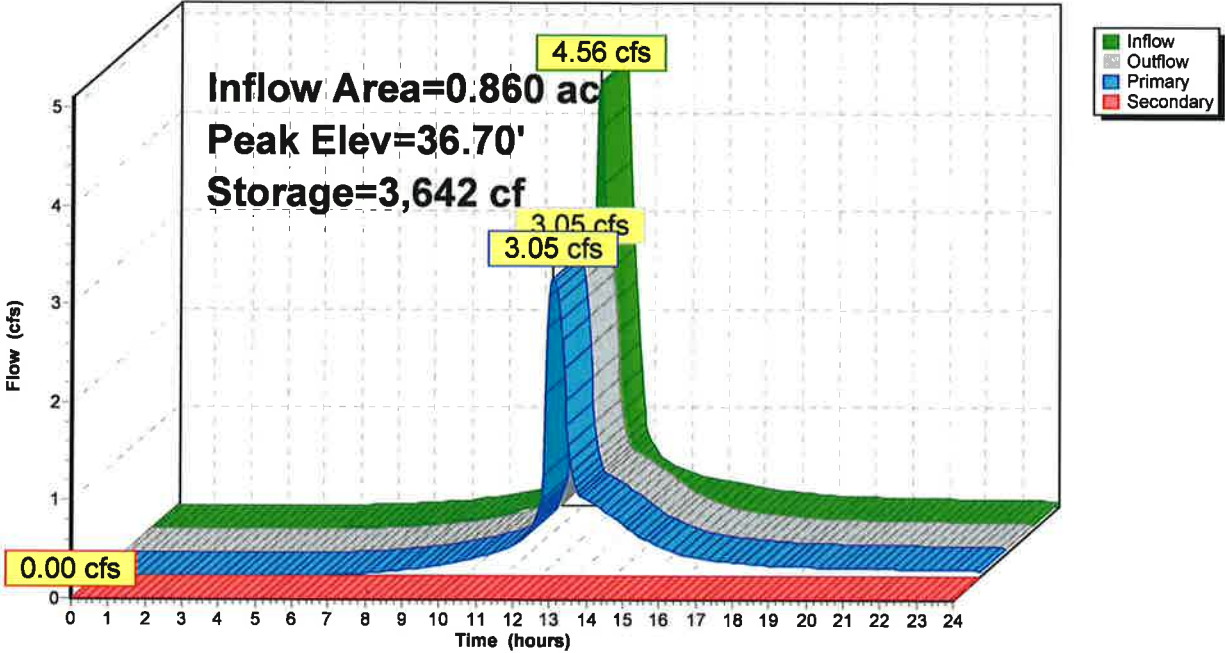
**Primary OutFlow Max=3.05 cfs @ 12.35 hrs HW=36.70' (Free Discharge)**  
 1=Culvert (Passes 3.05 cfs of 19.74 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 1.04 cfs @ 7.61 fps)  
 3=Orifice/Grate (Orifice Controls 2.01 cfs @ 4.02 fps)  
 4=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)**  
 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



Pond 7P: POND 1

Hydrograph



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00	36.65	2.95	2.95	0.00
34.05	0.01	0.01	0.00	36.70	3.04	3.04	0.00
34.10	0.03	0.03	0.00	36.75	3.12	3.12	0.00
34.15	0.06	0.06	0.00	36.80	3.20	3.20	0.00
34.20	0.10	0.10	0.00	36.85	3.28	3.28	0.00
34.25	0.15	0.15	0.00	36.90	3.35	3.35	0.00
34.30	0.20	0.20	0.00	36.95	3.43	3.43	0.00
34.35	0.25	0.25	0.00	37.00	3.50	3.50	0.00
34.40	0.29	0.29	0.00	37.05	3.57	3.57	0.00
34.45	0.32	0.32	0.00	37.10	3.64	3.64	0.00
34.50	0.35	0.35	0.00	37.15	3.70	3.70	0.00
34.55	0.38	0.38	0.00	37.20	3.77	3.77	0.00
34.60	0.41	0.41	0.00	37.25	3.83	3.83	0.00
34.65	0.44	0.44	0.00	37.30	4.25	4.25	0.00
34.70	0.46	0.46	0.00	37.35	4.95	4.95	0.00
34.75	0.48	0.48	0.00	37.40	5.84	5.84	0.00
34.80	0.51	0.51	0.00	37.45	6.89	6.89	0.00
34.85	0.53	0.53	0.00	37.50	8.06	8.06	0.00
34.90	0.55	0.55	0.00	37.55	9.62	9.35	0.26
34.95	0.57	0.57	0.00	37.60	11.50	10.75	0.75
35.00	0.58	0.58	0.00	37.65	13.63	12.25	1.38
35.05	0.60	0.60	0.00	37.70	15.96	13.84	2.12
35.10	0.62	0.62	0.00	37.75	18.52	15.52	3.01
35.15	0.64	0.64	0.00	37.80	21.29	17.28	4.01
35.20	0.65	0.65	0.00	37.85	24.24	19.11	5.12
35.25	0.67	0.67	0.00	37.90	27.38	21.03	6.35
35.30	0.69	0.69	0.00	37.95	30.73	23.01	7.72
35.35	0.70	0.70	0.00	38.00	34.28	25.07	9.21
35.40	0.72	0.72	0.00	38.05	37.24	26.42	10.82
35.45	0.73	0.73	0.00	38.10	39.18	26.63	12.55
35.50	0.75	0.75	0.00	38.15	40.97	26.85	14.12
35.55	0.76	0.76	0.00	38.20	42.81	27.06	15.75
35.60	0.77	0.77	0.00	38.25	44.71	27.27	17.44
35.65	0.79	0.79	0.00	38.30	46.66	27.48	19.18
35.70	0.80	0.80	0.00	38.35	48.69	27.69	21.00
35.75	0.82	0.82	0.00	38.40	50.77	27.89	22.88
35.80	0.86	0.86	0.00	38.45	52.91	28.10	24.82
35.85	0.94	0.94	0.00	38.50	55.10	28.30	26.80
35.90	1.04	1.04	0.00				
35.95	1.15	1.15	0.00				
36.00	1.28	1.28	0.00				
36.05	1.42	1.42	0.00				
36.10	1.57	1.57	0.00				
36.15	1.73	1.73	0.00				
36.20	1.90	1.90	0.00				
36.25	2.07	2.07	0.00				
36.30	2.22	2.22	0.00				
36.35	2.35	2.35	0.00				
36.40	2.47	2.47	0.00				
36.45	2.58	2.58	0.00				
36.50	2.68	2.68	0.00				
36.55	2.77	2.77	0.00				
36.60	2.87	2.87	0.00				

**Stage-Area-Storage for Pond 7P: POND 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	877	0	36.65	1,840	3,542
34.05	893	44	36.70	1,860	3,634
34.10	910	89	36.75	1,880	3,728
34.15	926	135	36.80	1,901	3,822
34.20	943	182	36.85	1,921	3,918
34.25	959	230	36.90	1,941	4,014
34.30	976	278	36.95	1,962	4,112
34.35	992	327	37.00	1,982	4,211
34.40	1,009	377	37.05	2,004	4,310
34.45	1,025	428	37.10	2,027	4,411
34.50	1,042	480	37.15	2,049	4,513
34.55	1,058	532	37.20	2,071	4,616
34.60	1,074	585	37.25	2,094	4,720
34.65	1,091	640	37.30	2,116	4,825
34.70	1,107	695	37.35	2,138	4,932
34.75	1,124	750	37.40	2,161	5,039
34.80	1,140	807	37.45	2,183	5,148
34.85	1,157	864	37.50	2,206	5,257
34.90	1,173	923	37.55	2,228	5,368
34.95	1,190	982	37.60	2,250	5,480
35.00	1,206	1,042	37.65	2,273	5,593
35.05	1,224	1,102	37.70	2,295	5,707
35.10	1,243	1,164	37.75	2,317	5,823
35.15	1,261	1,227	37.80	2,340	5,939
35.20	1,280	1,290	37.85	2,362	6,057
35.25	1,298	1,355	37.90	2,384	6,175
35.30	1,317	1,420	37.95	2,407	6,295
35.35	1,335	1,486	38.00	2,429	6,416
35.40	1,354	1,553	38.05	2,453	6,538
35.45	1,372	1,622	38.10	2,477	6,661
35.50	1,391	1,691	38.15	2,500	6,786
35.55	1,409	1,761	38.20	2,524	6,911
35.60	1,427	1,832	38.25	2,548	7,038
35.65	1,446	1,903	38.30	2,572	7,166
35.70	1,464	1,976	38.35	2,596	7,295
35.75	1,483	2,050	38.40	2,619	7,426
35.80	1,501	2,124	38.45	2,643	7,557
35.85	1,520	2,200	38.50	2,667	7,690
35.90	1,538	2,276			
35.95	1,557	2,354			
36.00	1,575	2,432			
36.05	1,595	2,511			
36.10	1,616	2,592			
36.15	1,636	2,673			
36.20	1,656	2,755			
36.25	1,677	2,838			
36.30	1,697	2,923			
36.35	1,717	3,008			
36.40	1,738	3,095			
36.45	1,758	3,182			
36.50	1,779	3,270			
36.55	1,799	3,360			
36.60	1,819	3,450			





