**H+H Engineering Associates, LLC**
232 Greenmanville Avenue, Suite 201
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860-980-8008
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**Via E-mail**

November 17, 2025

**Town of Montville**
Department of Land Use & Development
310 Norwich-New London Turnpike
Uncasville, CT 06382

Attn: Meredith Badalucca
Assistant Planner

RE: Response to Review Comments
Mt. Kineo Builders, LLC
47 Sharp Hill Road, Montville, CT

Dear Ms. Badalucca:

H+H Engineering Associates, LLC (H+H) is in receipt of the following review comments regarding the Subdivision application (Application 25 Sub 7 & 25 SP 1) for the project located at 47 Sharp Hill Road:

1. Preliminary Staff Technical Review comments received November 14, 2025.
2. Town Consulting Engineer comments dated November 17, 2025.

It is our understanding that the only item the Town has requested a response to is regarding Engineering Comment #28. For convenience, the comment is restated below, followed by our response in *italics*:

**Town Consulting Engineer Review Comments:**

28. The Town has historically had drainage issues around #19 Sharp Hill Road, including runoff issues and icing in Sharp Hill Road. Impacts to the property and catch basin located within #19 Sharp Hill Road and to Sharp Hill Road from the proposed development should be evaluated.

    *Original Response:*

    *The new catch basin in the street will help to collect and convey stormwater to reduce the potential for ponding/icing downgradient of the development.*

    **ADDITIONAL COMMENT:** The Applicants Engineer noted the installation of the new catch basin in Sharp Hill Road will help to collect and convey stormwater to reduce the potential for ponding/icing downgradient of the development. However, the previous icing issues in Sharp Hill Road was primarily from overland flow from the properties surrounding #19 Sharp Hill Road and potentially from the subject property (excerpt of the Town GIS mapping attached). The Town previously installed storm drainage to capture flow and mitigate the icing issues. Please provide commentary on the location and flow from the

H+H ENGINEERING ASSOCIATES

stormwater discharge for this proposed development and potential impacts to the downstream properties, existing stormwater system and Sharp Hill Road. In particular changes in peak flow and runoff volume for the combined Analysis Lines 1, 2, and 4.

*Additional Response:*

*The subject site is upgradient of 19 Sharp Hill Road. Flow within the vicinity of Sharp Hill Road, including the subject site and the off-site property identified, generally travels from west to east toward Maple Avenue before ultimately discharging in Rockland Pond.*

*Based on available mapping, a portion of the subject site (Drainage Areas 1, 2, and 4 as shown on the Pre- and Post-Development Drainage Area Maps) drains onto downgradient abutting properties to the east that convey flow to the Sharp Hill Road drainage system, which eventually discharges to Maple Avenue and Rockland Pond. Those three drainage areas correspond to Analysis Lines 1, 2, and 4.*

*When evaluating the combined pre- and post-development peak rates of runoff and volumes of runoff for these analysis lines, the HydroCAD modeling results indicate a reduction of peak rate of runoff and total volume of runoff to the downgradient properties. A summary of the combined pre- and post-development results is provided below:*

| Runoff Summary – Combined Flow Contributing to Sharp Hill Road Drainage System | | | | | | |
|---|---|---|---|---|---|---|
| Storm Frequency | Existing | | Proposed | | Change | |
| | Peak Rate (CFS) | Volume (CF) | Peak Rate (CFS) | Volume (CF) | Peak Rate (CFS) | Volume (CF) |
| WQS | 0.18 | 3,102 | 0.01 | 166 | -0.17 | -2,936 |
| 1-year | 6.29 | 34,440 | 0.57 | 17,566 | -5.72 | -16,874 |
| 2-year | 9.51 | 49,703 | 1.46 | 32,198 | -8.05 | -17,505 |
| 10-year | 20.86 | 103,522 | 13.25 | 86,821 | -7.61 | -16,701 |
| 25-year | 28.60 | 140,704 | 23.63 | 124,085 | -4.97 | -16,619 |
| 100-year | 41.01 | 201,210 | 31.80 | 184,282 | -9.21 | -16,928 |

*Enclosed herewith are the pre- and post-development HydroCAD reports.*

*Based on the above modeling results, the proposed improvements will reduce peak flow rates and total runoff volumes contributing to the downstream properties and the Sharp Hill Road drainage system.*

If you have any questions, please feel free to contact me at 860-980-8008 (office) or 413-579-4488 (mobile).

Sincerely,

**H+H Engineering Associates, LLC**

Seamus Moran, P.E.
Principal

11/17/2025
Date

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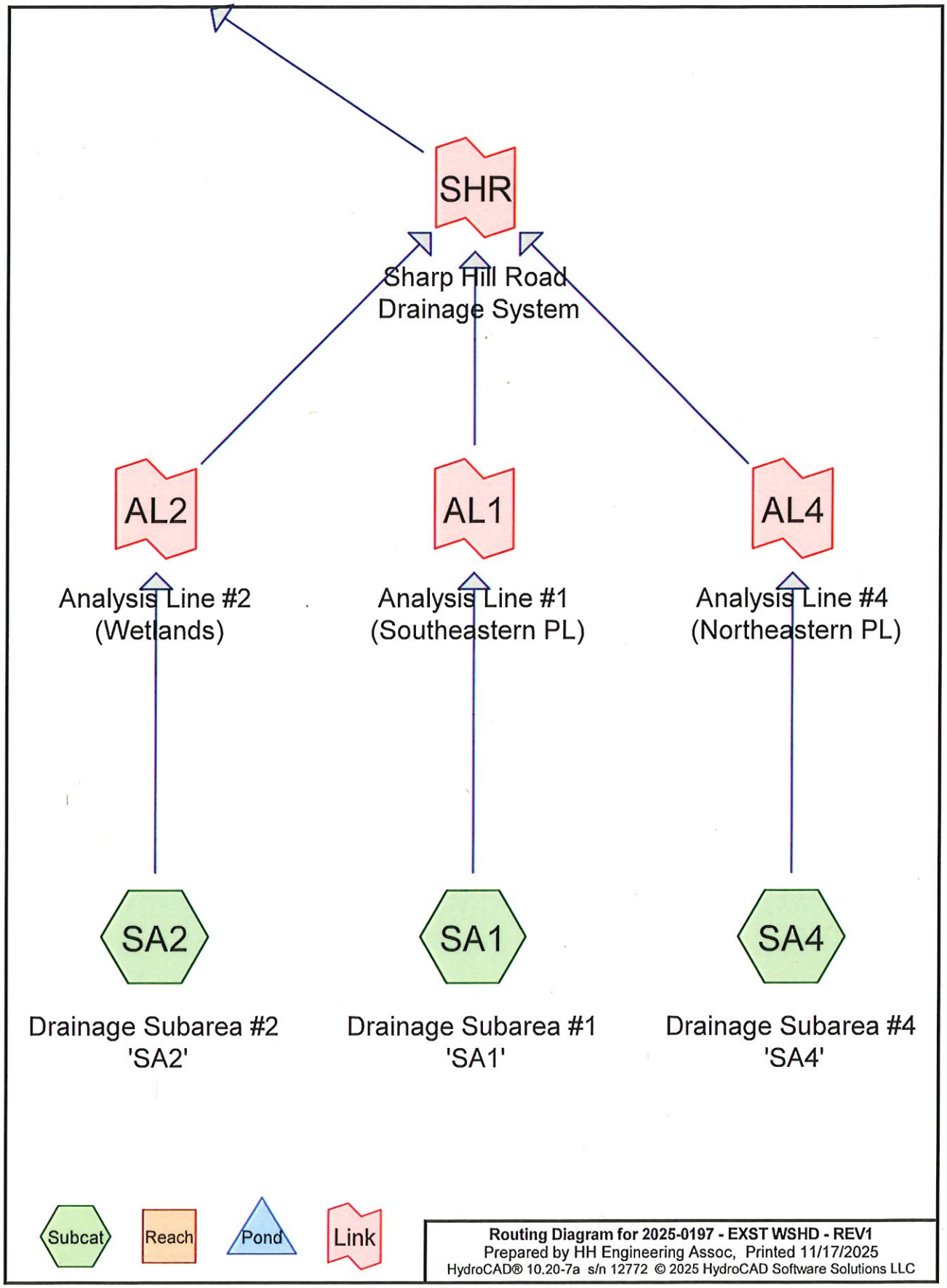

SHR
Sharp Hill Road
Drainage System
AL2
AL1
AL4
Analysis Line #2
(Wetlands)
Analysis Line #1
(Southeastern PL)
Analysis Line #4
(Northeastern PL)
SA2
SA1
SA4
Drainage Subarea #2
'SA2'
Drainage Subarea #1
'SA1'
Drainage Subarea #4
'SA4'
Subcat
Reach
Pond
Link
Routing Diagram for 2025-0197 - EXST WSHD - REV1
Prepared by HH Engineering Assoc, Printed 11/17/2025
HydroCAD® 10.20-7a s/n 12772 © 2025 HydroCAD Software Solutions LLC

## Area Listing (selected nodes)

| Area (sq-ft) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 27,475 | 98 | Bldgs./Impervious (SA1, SA2) |
| 3,327 | 92 | Compact Gravel (est.), HSG C (SA1, SA2) |
| 122,566 | 74 | Lawn, Good, HSG C (SA1, SA2) |
| 1,708 | 86 | Open Deck (est.), HSG C (SA1, SA2) |
| 2,788 | 55 | Woods, Good, HSG B (SA2) |
| 372,073 | 70 | Woods, Good, HSG C (SA1, SA2, SA4) |
| 392 | 77 | Woods, Good, HSG D (SA2) |
| **530,328** | **72** | **TOTAL AREA** |

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=0.12"
Flow Length=781' Tc=16.3 min CN=76 Runoff=0.09 cfs 819 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=0.06"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=0.12 cfs 2,251 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.00 cfs 32 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.09 cfs 819 cf
Primary=0.09 cfs 819 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=0.12 cfs 2,251 cf
Primary=0.12 cfs 2,251 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.00 cfs 32 cf
Primary=0.00 cfs 32 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=0.18 cfs 3,102 cf
Primary=0.18 cfs 3,102 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 3,102 cf Average Runoff Depth = 0.07"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**

## Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'

Runoff = 0.09 cfs @ 12.46 hrs, Volume= 819 cf, Depth= 0.12"
Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,093 | 98 | Bldgs./Impervious |
| * | 2,325 | 92 | Compact Gravel (est.), HSG C |
| * | 575 | 86 | Open Deck (est.), HSG C |
| * | 46,031 | 74 | Lawn, Good, HSG C |
| * | 26,153 | 70 | Woods, Good, HSG C |
| | 84,177 | 76 | Weighted Average |
| | 75,084 | 73 | 89.20% Pervious Area |
| | 9,093 | 98 | 10.80% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.8 | 106 | 0.0920 | 0.23 | | **Sheet Flow, SF1A, Lawn**<br>n= 0.240 P2= 3.43" |
| 2.9 | 11 | 0.0730 | 0.06 | | **Sheet Flow, SF1B, Woods**<br>n= 0.600 P2= 3.43" |
| 3.5 | 33 | 0.0670 | 0.16 | | **Sheet Flow, SF1C, Lawn**<br>n= 0.240 P2= 3.43" |
| 0.7 | 195 | 0.0760 | 4.44 | | **Shallow Concentrated Flow, SCF1A, Unpaved**<br>Unpaved Kv= 16.1 fps |
| 0.0 | 3 | 0.0670 | 5.25 | | **Shallow Concentrated Flow, SCF1B, Paved**<br>Paved Kv= 20.3 fps |
| 0.1 | 29 | 0.2280 | 7.69 | | **Shallow Concentrated Flow, SCF1C, Unpaved**<br>Unpaved Kv= 16.1 fps |
| 0.0 | 16 | 0.0810 | 5.78 | | **Shallow Concentrated Flow, SCF1D, Paved**<br>Paved Kv= 20.3 fps |
| 0.6 | 158 | 0.0850 | 4.69 | | **Shallow Concentrated Flow, SCF1E, Unpaved**<br>Unpaved Kv= 16.1 fps |
| 0.0 | 4 | 0.0750 | 5.56 | | **Shallow Concentrated Flow, SCF1F, Paved**<br>Paved Kv= 20.3 fps |
| 0.0 | 1 | 0.1000 | 6.42 | | **Shallow Concentrated Flow, SCF1H, Unpaved**<br>Paved Kv= 20.3 fps |
| 0.7 | 225 | 0.1000 | 5.09 | | **Shallow Concentrated Flow, SCF1I, Paved**<br>Unpaved Kv= 16.1 fps |
| 16.3 | 781 | Total | | | |

## Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'

Runoff = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf, Depth= 0.06"
Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.422 | 98 | Bldgs./Impervious |
| * | 0.023 | 92 | Compact Gravel (est.), HSG C |
| * | 0.026 | 86 | Open Deck (est.), HSG C |
| * | 1.757 | 74 | Lawn, Good, HSG C |
| * | 0.064 | 55 | Woods, Good, HSG B |
| * | 7.730 | 70 | Woods, Good, HSG C |
| * | 0.009 | 77 | Woods, Good, HSG D |
| | 10.031 | 72 | Weighted Average |
| | 9.609 | 71 | 95.79% Pervious Area |
| | 0.422 | 98 | 4.21% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.1 | 28 | 0.1680 | 0.22 | | **Sheet Flow, SF2A, Lawn**<br>n= 0.240 P2= 3.43" |
| 18.2 | 122 | 0.0930 | 0.11 | | **Sheet Flow, SF2B, Woods**<br>n= 0.600 P2= 3.43" |
| 3.2 | 958 | 0.0960 | 4.99 | | **Shallow Concentrated Flow, SCF2A, Unpaved**<br>Unpaved Kv= 16.1 fps |
| 23.5 | 1,108 | Total | | | |

## Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'

Runoff = 0.00 cfs @ 13.80 hrs, Volume= 32 cf, Depth= 0.04"
Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,201 | 70 | Woods, Good, HSG C |
| | 9,201 | 70 | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 10.3 | 150 | 0.0930 | 0.24 | | **Sheet Flow, SF4A**<br>n= 0.240 P2= 3.43" |
| 0.2 | 81 | 0.1300 | 5.80 | | **Shallow Concentrated Flow, SCF4A**<br>Unpaved Kv= 16.1 fps |
| 10.5 | 231 | Total | | | |

## Summary for Link AL1: Analysis Line #1 (Southeastern PL)

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 0.12" for WQV event
Inflow = 0.09 cfs @ 12.46 hrs, Volume= 819 cf
Primary = 0.09 cfs @ 12.46 hrs, Volume= 819 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Road Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link AL2: Analysis Line #2 (Wetlands)

Inflow Area = 436,950 sf, 4.21% Impervious, Inflow Depth = 0.06" for WQV event
Inflow = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf
Primary = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Road Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link AL4: Analysis Line #4 (Northeastern PL)

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 0.04" for WQV event
Inflow = 0.00 cfs @ 13.80 hrs, Volume= 32 cf
Primary = 0.00 cfs @ 13.80 hrs, Volume= 32 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Road Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link SHR: Sharp Hill Road Drainage System

Inflow Area = 530,328 sf, 5.18% Impervious, Inflow Depth = 0.07" for WQV event
Inflow = 0.18 cfs @ 12.63 hrs, Volume= 3,102 cf
Primary = 0.18 cfs @ 12.63 hrs, Volume= 3,102 cf, Atten= 0%, Lag= 0.0 min
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=0.95"
Flow Length=781' Tc=16.3 min CN=76 Runoff=1.48 cfs 6,652 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=0.75"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=4.94 cfs 27,282 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.12 cfs 506 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=1.48 cfs 6,652 cf
Primary=1.48 cfs 6,652 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=4.94 cfs 27,282 cf
Primary=4.94 cfs 27,282 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.12 cfs 506 cf
Primary=0.12 cfs 506 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=6.29 cfs 34,440 cf
Primary=6.29 cfs 34,440 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 34,440 cf Average Runoff Depth = 0.78"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=1.33"
Flow Length=781' Tc=16.3 min CN=76 Runoff=2.14 cfs 9,324 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=1.09"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=7.56 cfs 39,630 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.98"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.19 cfs 749 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=2.14 cfs 9,324 cf
Primary=2.14 cfs 9,324 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=7.56 cfs 39,630 cf
Primary=7.56 cfs 39,630 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.19 cfs 749 cf
Primary=0.19 cfs 749 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=9.51 cfs 49,703 cf
Primary=9.51 cfs 49,703 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 49,703 cf Average Runoff Depth = 1.12"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=2.63"
Flow Length=781' Tc=16.3 min CN=76 Runoff=4.37 cfs 18,482 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=2.29"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=16.75 cfs 83,410 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.44 cfs 1,630 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=4.37 cfs 18,482 cf
Primary=4.37 cfs 18,482 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=16.75 cfs 83,410 cf
Primary=16.75 cfs 83,410 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.44 cfs 1,630 cf
Primary=0.44 cfs 1,630 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=20.86 cfs 103,522 cf
Primary=20.86 cfs 103,522 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 103,522 cf Average Runoff Depth = 2.34"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=3.52"
Flow Length=781' Tc=16.3 min CN=76 Runoff=5.85 cfs 24,682 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=3.12"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=23.05 cfs 113,774 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=2.93"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.62 cfs 2,249 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=5.85 cfs 24,682 cf
Primary=5.85 cfs 24,682 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=23.05 cfs 113,774 cf
Primary=23.05 cfs 113,774 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.62 cfs 2,249 cf
Primary=0.62 cfs 2,249 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=28.60 cfs 140,704 cf
Primary=28.60 cfs 140,704 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 140,704 cf Average Runoff Depth = 3.18"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=4.94"
Flow Length=781' Tc=16.3 min CN=76 Runoff=8.18 cfs 34,653 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=10.031 ac 4.21% Impervious Runoff Depth=4.48"
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=33.19 cfs 163,292 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=4.26"
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.91 cfs 3,265 cf

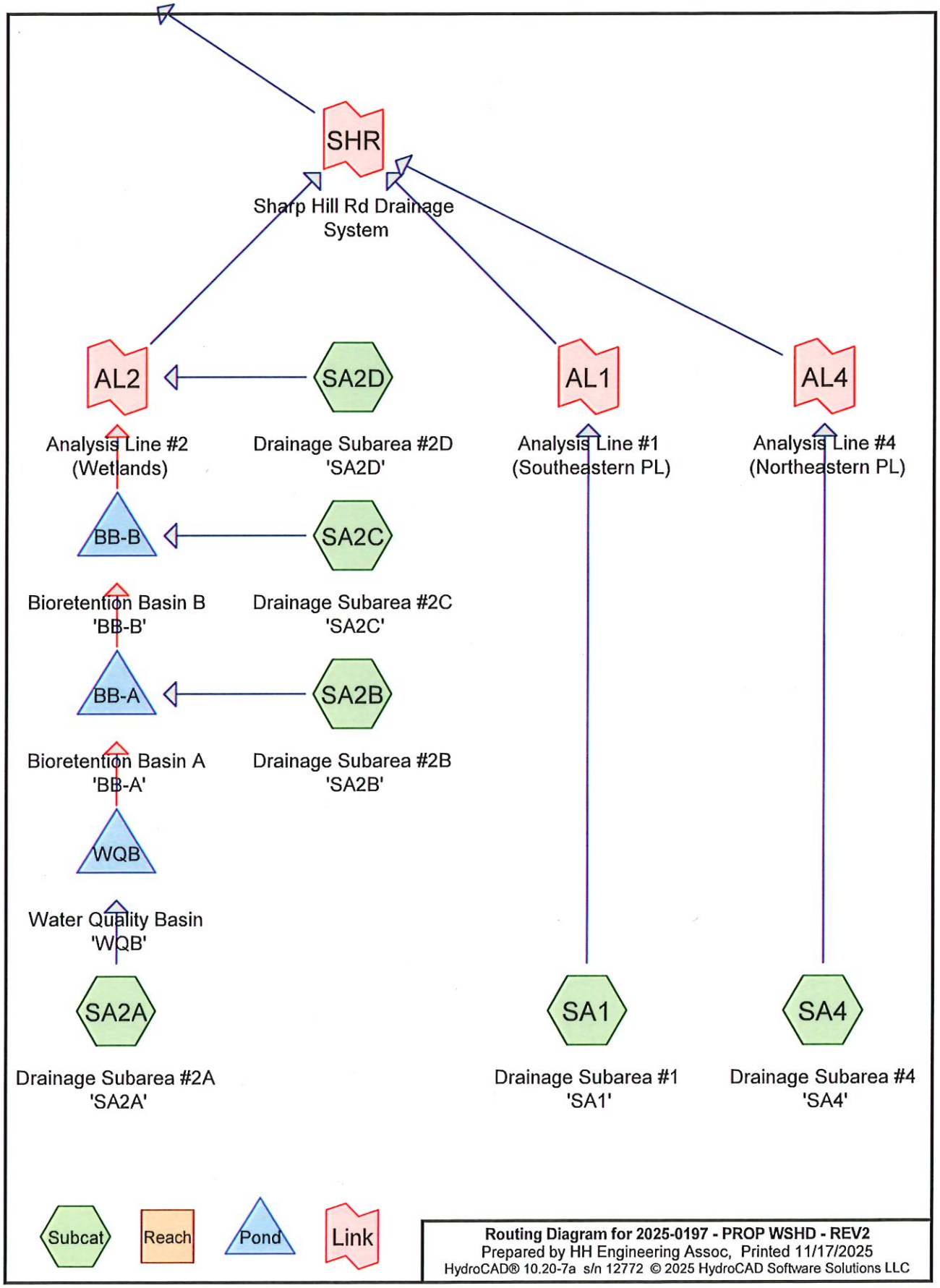
**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=8.18 cfs 34,653 cf
Primary=8.18 cfs 34,653 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=33.19 cfs 163,292 cf
Primary=33.19 cfs 163,292 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.91 cfs 3,265 cf
Primary=0.91 cfs 3,265 cf

**Link SHR: Sharp Hill Road Drainage System** Inflow=41.01 cfs 201,210 cf
Primary=41.01 cfs 201,210 cf

**Total Runoff Area = 530,328 sf Runoff Volume = 201,210 cf Average Runoff Depth = 4.55"**
**94.82% Pervious = 502,853 sf 5.18% Impervious = 27,475 sf**




**Routing Diagram for 2025-0197 - PROP WSHD - REV2**
Prepared by HH Engineering Assoc, Printed 11/17/2025

## Area Listing (selected nodes)

| Area (sq-ft) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 86,843 | 98 | Bldgs./Impervious (SA1, SA2A, SA2B) |
| 2,788 | 92 | Compact Gravel (est.), HSG C (SA2A) |
| 297,941 | 74 | Lawn, Good, HSG C (SA1, SA2A, SA2B, SA2C, SA2D, SA4) |
| 3,485 | 86 | Open Deck (est.), HSG C (SA2A, SA2B) |
| 129,733 | 70 | Woods, Good, HSG C (SA1, SA2A, SA2D, SA4) |
| 390 | 77 | Woods, Good, HSG D (SA2D) |
| **521,180** | **77** | **TOTAL AREA** |

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=74 Runoff=0.01 cfs 80 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=0.15"
Flow Length=697' Tc=20.8 min CN=78 Runoff=0.74 cfs 5,833 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=0.10"
Tc=10.0 min CN=75 Runoff=0.02 cfs 201 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=0.09"
Tc=10.0 min CN=74 Runoff=0.01 cfs 91 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=0.07"
Tc=10.0 min CN=73 Runoff=0.00 cfs 24 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.01 cfs 62 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=343.02' Storage=103 cf Inflow=0.07 cfs 770 cf
Discarded=0.05 cfs 770 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.05 cfs 770 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=337.50' Storage=11 cf Inflow=0.01 cfs 91 cf
Discarded=0.00 cfs 91 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 91 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=355.78' Storage=3,034 cf Inflow=0.74 cfs 5,833 cf
Discarded=0.06 cfs 5,263 cf Primary=0.06 cfs 569 cf Secondary=0.00 cfs 0 cf Outflow=0.12 cfs 5,833 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.01 cfs 80 cf
Primary=0.01 cfs 80 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=0.00 cfs 24 cf
Primary=0.00 cfs 24 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.01 cfs 62 cf
Primary=0.01 cfs 62 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=0.01 cfs 166 cf
Primary=0.01 cfs 166 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 6,291 cf Average Runoff Depth = 0.14"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**

## Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'

Runoff = 0.01 cfs @ 12.43 hrs, Volume= 80 cf, Depth= 0.09"
Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 159 | 98 | Bldgs./Impervious |
| * | 10,517 | 74 | Lawn, Good, HSG C |
| * | 412 | 70 | Woods, Good, HSG C |
| | 11,088 | 74 | Weighted Average |
| | 10,929 | 74 | 98.57% Pervious Area |
| | 159 | 98 | 1.43% Impervious Area |

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

## Summary for Subcatchment SA2A: Drainage Subarea #2A 'SA2A'

Runoff = 0.74 cfs @ 12.46 hrs, Volume= 5,833 cf, Depth= 0.15"
Routed to Pond WQB : Water Quality Basin 'WQB'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.972 | 98 | Bldgs./Impervious |
| * | 0.064 | 92 | Compact Gravel (est.), HSG C |
| * | 0.077 | 86 | Open Deck (est.), HSG C |
| * | 5.552 | 74 | Lawn, Good, HSG C |
| * | 2.887 | 70 | Woods, Good, HSG C |
| | 10.552 | 78 | Weighted Average |
| | 8.580 | 73 | 81.31% Pervious Area |
| | 1.972 | 98 | 18.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.9 | 59 | 0.0590 | 0.17 | | **Sheet Flow, SF2A, Lawn**<br>n= 0.240 P2= 3.43" |
| 13.1 | 91 | 0.1180 | 0.12 | | **Sheet Flow, SF2B, Woods**<br>n= 0.600 P2= 3.43" |
| 1.8 | 547 | 0.0990 | 5.07 | | **Shallow Concentrated Flow, SCF2A, Unpaved**<br>Unpaved Kv= 16.1 fps |
| 20.8 | 697 | Total | | | |

## Summary for Subcatchment SA2B: Drainage Subarea #2B 'SA2B'

Runoff = 0.02 cfs @ 12.39 hrs, Volume= 201 cf, Depth= 0.10"
Routed to Pond BB-A : Bioretention Basin A 'BB-A'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 784 | 98 | Bldgs./Impervious |
| * | 131 | 86 | Open Deck (est.), HSG C |
| * | 22,913 | 74 | Lawn, Good, HSG C |
| | 23,828 | 75 | Weighted Average |
| | 23,044 | 74 | 96.71% Pervious Area |
| | 784 | 98 | 3.29% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry, Direct** |
| 5.0 | 0 | Total, Increased to minimum Tc = 10.0 min | | | |

## Summary for Subcatchment SA2C: Drainage Subarea #2C 'SA2C'

Runoff = 0.01 cfs @ 12.43 hrs, Volume= 91 cf, Depth= 0.09"
Routed to Pond BB-B : Bioretention Basin B 'BB-B'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 12,571 | 74 | Lawn, Good, HSG C |
| | 12,571 | 74 | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry, Direct** |
| 5.0 | 0 | Total, Increased to minimum Tc = 10.0 min | | | |

## Summary for Subcatchment SA2D: Drainage Subarea #2D 'SA2D'

Runoff = 0.00 cfs @ 12.46 hrs, Volume= 24 cf, Depth= 0.07"
Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,138 | 74 | Lawn, Good, HSG C |
| * | 1,349 | 70 | Woods, Good, HSG C |
| * | 390 | 77 | Woods, Good, HSG D |
| | 3,877 | 73 | Weighted Average |
| | 3,877 | 73 | 100.00% Pervious Area |

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

## Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'

Runoff = 0.01 cfs @ 12.47 hrs, Volume= 62 cf, Depth= 0.07"
Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQV Rainfall=1.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 7,957 | 74 | Lawn, Good, HSG C |
| * | 2,214 | 70 | Woods, Good, HSG C |
| | 10,171 | 73 | Weighted Average |
| | 10,171 | 73 | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 10.0 | 150 | 0.1010 | 0.25 | | **Sheet Flow, SF4A, Lawn** n= 0.240 P2= 3.43" |
| 0.3 | 96 | 0.1280 | 5.76 | | **Shallow Concentrated Flow, SCF4A, Woods** Unpaved Kv= 16.1 fps |
| 10.3 | 246 | Total | | | |

## Summary for Pond BB-A: Bioretention Basin A 'BB-A'

Inflow Area = 483,473 sf, 17.93% Impervious, Inflow Depth = 0.02" for WQV event
Inflow = 0.07 cfs @ 16.18 hrs, Volume= 770 cf
Outflow = 0.05 cfs @ 16.93 hrs, Volume= 770 cf, Atten= 21%, Lag= 45.2 min
Discarded = 0.05 cfs @ 16.93 hrs, Volume= 770 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond BB-B : Bioretention Basin B 'BB-B'
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond BB-B : Bioretention Basin B 'BB-B'

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 343.02' @ 16.93 hrs Surf.Area= 5,189 sf Storage= 103 cf

Plug-Flow detention time= 32.2 min calculated for 770 cf (100% of inflow)
Center-of-Mass det. time= 32.2 min ( 1,061.0 - 1,028.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 343.00' | 37,180 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 343.00 | 5,164 | 425.1 | 0 | 0 | 5,164 |
| 344.00 | 6,467 | 444.0 | 5,803 | 5,803 | 6,541 |
| 345.00 | 7,852 | 466.6 | 7,148 | 12,952 | 8,241 |
| 346.00 | 9,304 | 489.1 | 8,568 | 21,519 | 10,018 |
| 347.00 | 10,823 | 511.6 | 10,054 | 31,573 | 11,878 |
| 347.50 | 11,607 | 522.8 | 5,606 | 37,180 | 12,836 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 339.00' | **24.0" Round Outlet Pipe**<br>L= 38.0' CPP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 339.00' / 338.00' S= 0.0263 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |
| #2 | Device 1 | 344.35' | **5.0" Vert. Low Orifice** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 346.25' | **48.0" W x 6.0" H Vert. Upper Orifice** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Device 1 | 346.65' | **48.0" x 48.0" Horiz. Grate** C= 0.600 |
| #5 | Secondary | 347.00' | **15.0' long + 2.0 '/' SideZ x 5.0' breadth Spillway**<br>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<br>Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |
| #6 | Discarded | 343.00' | **1.000 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.12 cfs @ 16.93 hrs HW=343.02' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.12 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=343.00' (Free Discharge)
└**1=Outlet Pipe** (Passes 0.00 cfs of 26.20 cfs potential flow)
  ├**2=Low Orifice** ( Controls 0.00 cfs)
  ├**3=Upper Orifice** ( Controls 0.00 cfs)
  └**4=Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=343.00' (Free Discharge)
└**5=Spillway** ( Controls 0.00 cfs)

## Stage-Discharge for Pond BB-A: Bioretention Basin A 'BB-A'

| Elevation (feet) | Discharge (cfs) | Discarded (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|
| 343.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 343.10 | 0.12 | 0.12 | 0.00 | 0.00 |
| 343.20 | 0.13 | 0.13 | 0.00 | 0.00 |
| 343.30 | 0.13 | 0.13 | 0.00 | 0.00 |
| 343.40 | 0.13 | 0.13 | 0.00 | 0.00 |
| 343.50 | 0.13 | 0.13 | 0.00 | 0.00 |
| 343.60 | 0.14 | 0.14 | 0.00 | 0.00 |
| 343.70 | 0.14 | 0.14 | 0.00 | 0.00 |
| 343.80 | 0.14 | 0.14 | 0.00 | 0.00 |
| 343.90 | 0.15 | 0.15 | 0.00 | 0.00 |
| 344.00 | 0.15 | 0.15 | 0.00 | 0.00 |
| 344.10 | 0.15 | 0.15 | 0.00 | 0.00 |
| 344.20 | 0.16 | 0.16 | 0.00 | 0.00 |
| 344.30 | 0.16 | 0.16 | 0.00 | 0.00 |
| 344.40 | 0.17 | 0.16 | 0.01 | 0.00 |
| 344.50 | 0.22 | 0.17 | 0.06 | 0.00 |
| 344.60 | 0.31 | 0.17 | 0.15 | 0.00 |
| 344.70 | 0.42 | 0.17 | 0.25 | 0.00 |
| 344.80 | 0.50 | 0.18 | 0.32 | 0.00 |
| 344.90 | 0.56 | 0.18 | 0.38 | 0.00 |
| 345.00 | 0.62 | 0.18 | 0.44 | 0.00 |
| 345.10 | 0.67 | 0.18 | 0.48 | 0.00 |
| 345.20 | 0.71 | 0.19 | 0.53 | 0.00 |
| 345.30 | 0.76 | 0.19 | 0.57 | 0.00 |
| 345.40 | 0.80 | 0.19 | 0.60 | 0.00 |
| 345.50 | 0.84 | 0.20 | 0.64 | 0.00 |
| 345.60 | 0.87 | 0.20 | 0.67 | 0.00 |
| 345.70 | 0.91 | 0.20 | 0.70 | 0.00 |
| 345.80 | 0.94 | 0.21 | 0.73 | 0.00 |
| 345.90 | 0.97 | 0.21 | 0.76 | 0.00 |
| 346.00 | 1.00 | 0.22 | 0.79 | 0.00 |
| 346.10 | 1.03 | 0.22 | 0.82 | 0.00 |
| 346.20 | 1.06 | 0.22 | 0.84 | 0.00 |
| 346.30 | 1.24 | 0.23 | 1.01 | 0.00 |
| 346.40 | 1.87 | 0.23 | 1.64 | 0.00 |
| 346.50 | 2.75 | 0.23 | 2.52 | 0.00 |
| 346.60 | 3.83 | 0.24 | 3.60 | 0.00 |
| 346.70 | 22.30 | 0.24 | 22.06 | 0.00 |
| 346.80 | 36.16 | 0.24 | 35.91 | 0.00 |
| 346.90 | 39.98 | 0.25 | 39.73 | 0.00 |
| 347.00 | 40.27 | 0.25 | 40.02 | 0.00 |
| 347.10 | 41.68 | 0.25 | 40.31 | 1.12 |
| 347.20 | 44.05 | 0.26 | 40.59 | 3.21 |
| 347.30 | 47.29 | 0.26 | 40.87 | 6.16 |
| 347.40 | 51.31 | 0.27 | 41.15 | 9.89 |
| 347.50 | **56.22** | **0.27** | **41.43** | **14.52** |

## Stage-Area-Storage for Pond BB-A: Bioretention Basin A 'BB-A'

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 343.00 | 5,164 | 0 |
| 343.05 | 5,226 | 260 |
| 343.10 | 5,288 | 523 |
| 343.15 | 5,350 | 789 |
| 343.20 | 5,413 | 1,058 |
| 343.25 | 5,476 | 1,330 |
| 343.30 | 5,540 | 1,605 |
| 343.35 | 5,603 | 1,884 |
| 343.40 | 5,668 | 2,166 |
| 343.45 | 5,732 | 2,451 |
| 343.50 | 5,797 | 2,739 |
| 343.55 | 5,863 | 3,030 |
| 343.60 | 5,928 | 3,325 |
| 343.65 | 5,994 | 3,623 |
| 343.70 | 6,061 | 3,924 |
| 343.75 | 6,128 | 4,229 |
| 343.80 | 6,195 | 4,537 |
| 343.85 | 6,262 | 4,849 |
| 343.90 | 6,330 | 5,163 |
| 343.95 | 6,398 | 5,482 |
| 344.00 | 6,467 | 5,803 |
| 344.05 | 6,533 | 6,128 |
| 344.10 | 6,599 | 6,457 |
| 344.15 | 6,666 | 6,788 |
| 344.20 | 6,733 | 7,123 |
| 344.25 | 6,801 | 7,462 |
| 344.30 | 6,868 | 7,803 |
| 344.35 | 6,936 | 8,148 |
| 344.40 | 7,005 | 8,497 |
| 344.45 | 7,074 | 8,849 |
| 344.50 | 7,143 | 9,204 |
| 344.55 | 7,212 | 9,563 |
| 344.60 | 7,282 | 9,926 |
| 344.65 | 7,352 | 10,291 |
| 344.70 | 7,422 | 10,661 |
| 344.75 | 7,493 | 11,034 |
| 344.80 | 7,564 | 11,410 |
| 344.85 | 7,636 | 11,790 |
| 344.90 | 7,707 | 12,174 |
| 344.95 | 7,780 | 12,561 |
| 345.00 | 7,852 | 12,952 |
| 345.05 | 7,922 | 13,346 |
| 345.10 | 7,992 | 13,744 |
| 345.15 | 8,062 | 14,145 |
| 345.20 | 8,133 | 14,550 |
| 345.25 | 8,203 | 14,958 |
| 345.30 | 8,275 | 15,370 |
| 345.35 | 8,346 | 15,786 |
| 345.40 | 8,418 | 16,205 |
| 345.45 | 8,490 | 16,628 |
| 345.50 | 8,563 | 17,054 |
| 345.55 | 8,635 | 17,484 |
| 345.60 | 8,708 | 17,918 |
| 345.65 | 8,782 | 18,355 |
| 345.70 | 8,855 | 18,796 |
| 345.75 | 8,929 | 19,240 |
| 345.80 | 9,004 | 19,689 |
| 345.85 | 9,078 | 20,141 |
| 345.90 | 9,153 | 20,596 |
| 345.95 | 9,228 | 21,056 |
| 346.00 | 9,304 | 21,519 |
| 346.05 | 9,377 | 21,986 |
| 346.10 | 9,451 | 22,457 |
| 346.15 | 9,525 | 22,931 |
| 346.20 | 9,599 | 23,410 |
| 346.25 | 9,673 | 23,891 |
| 346.30 | 9,748 | 24,377 |
| 346.35 | 9,823 | 24,866 |
| 346.40 | 9,898 | 25,359 |
| 346.45 | 9,973 | 25,856 |
| 346.50 | 10,049 | 26,356 |
| 346.55 | 10,125 | 26,861 |
| 346.60 | 10,202 | 27,369 |
| 346.65 | 10,278 | 27,881 |
| 346.70 | 10,355 | 28,397 |
| 346.75 | 10,432 | 28,916 |
| 346.80 | 10,510 | 29,440 |
| 346.85 | 10,588 | 29,968 |
| 346.90 | 10,666 | 30,499 |
| 346.95 | 10,744 | 31,034 |
| 347.00 | 10,823 | 31,573 |
| 347.05 | 10,900 | 32,116 |
| 347.10 | 10,978 | 32,663 |
| 347.15 | 11,055 | 33,214 |
| 347.20 | 11,133 | 33,769 |
| 347.25 | 11,212 | 34,327 |
| 347.30 | 11,290 | 34,890 |
| 347.35 | 11,369 | 35,456 |
| 347.40 | 11,448 | 36,027 |
| 347.45 | 11,527 | 36,601 |
| 347.50 | **11,607** | **37,180** |

## Summary for Pond BB-B: Bioretention Basin B 'BB-B'

Inflow Area = 496,044 sf, 17.48% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.01 cfs @ 12.43 hrs, Volume= 91 cf
Outflow = 0.00 cfs @ 13.18 hrs, Volume= 91 cf, Atten= 56%, Lag= 45.1 min
Discarded = 0.00 cfs @ 13.18 hrs, Volume= 91 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link AL2 : Analysis Line #2 (Wetlands)
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link AL2 : Analysis Line #2 (Wetlands)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 337.50' @ 13.18 hrs Surf.Area= 2,412 sf Storage= 11 cf

Plug-Flow detention time= 46.4 min calculated for 91 cf (100% of inflow)
Center-of-Mass det. time= 46.3 min ( 1,017.9 - 971.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 337.50' | 36,426 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 337.50 | 2,408 | 287.3 | 0 | 0 | 2,408 |
| 339.00 | 3,765 | 315.6 | 4,592 | 4,592 | 3,839 |
| 340.00 | 4,739 | 334.4 | 4,243 | 8,835 | 4,864 |
| 341.00 | 5,771 | 353.3 | 5,247 | 14,081 | 5,954 |
| 342.00 | 6,859 | 372.1 | 6,307 | 20,388 | 7,099 |
| 343.00 | 8,004 | 391.0 | 7,424 | 27,813 | 8,308 |
| 344.00 | 9,237 | 411.1 | 8,613 | 36,426 | 9,652 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 335.00' | **21.0" Round Outlet Pipe**<br>L= 47.0' CPP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 335.00' / 334.00' S= 0.0213 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |
| #2 | Device 1 | 337.75' | **5.0" Vert. Low Orifice** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 338.70' | **48.0" W x 6.0" H Vert. Middle Orifice** C= 0.600<br>Limited to weir flow at low heads |
| #4 | Device 1 | 340.90' | **48.0" W x 6.0" H Vert. Upper Orifice** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Device 1 | 341.60' | **48.0" x 48.0" Horiz. Grate** C= 0.600<br>Limited to weir flow at low heads |
| #6 | Secondary | 343.00' | **15.0' long + 2.0 '/' SideZ x 5.0' breadth Spillway**<br>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<br>Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |
| #7 | Discarded | 337.50' | **1.000 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.06 cfs @ 13.18 hrs HW=337.50' (Free Discharge)
└─**7=Exfiltration** (Exfiltration Controls 0.06 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=337.50' (Free Discharge)
└─**1=Outlet Pipe** (Passes 0.00 cfs of 14.76 cfs potential flow)
  ├─**2=Low Orifice** ( Controls 0.00 cfs)
  ├─**3=Middle Orifice** ( Controls 0.00 cfs)
  ├─**4=Upper Orifice** ( Controls 0.00 cfs)
  └─**5=Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=337.50' (Free Discharge)
└─**6=Spillway** ( Controls 0.00 cfs)

## Stage-Discharge for Pond BB-B: Bioretention Basin B 'BB-B'

| Elevation (feet) | Discharge (cfs) | Discarded (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|
| 337.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| 337.70 | 0.06 | 0.06 | 0.00 | 0.00 |
| 337.90 | 0.12 | 0.06 | 0.06 | 0.00 |
| 338.10 | 0.31 | 0.07 | 0.25 | 0.00 |
| 338.30 | 0.46 | 0.07 | 0.38 | 0.00 |
| 338.50 | 0.56 | 0.08 | 0.48 | 0.00 |
| 338.70 | 0.65 | 0.08 | 0.57 | 0.00 |
| 338.90 | 1.87 | 0.08 | 1.79 | 0.00 |
| 339.10 | 4.04 | 0.09 | 3.95 | 0.00 |
| 339.30 | 6.42 | 0.09 | 6.32 | 0.00 |
| 339.50 | 7.99 | 0.10 | 7.89 | 0.00 |
| 339.70 | 9.27 | 0.10 | 9.17 | 0.00 |
| 339.90 | 10.38 | 0.11 | 10.27 | 0.00 |
| 340.10 | 11.38 | 0.11 | 11.27 | 0.00 |
| 340.30 | 12.29 | 0.12 | 12.18 | 0.00 |
| 340.50 | 13.14 | 0.12 | 13.02 | 0.00 |
| 340.70 | 13.94 | 0.13 | 13.82 | 0.00 |
| 340.90 | 14.70 | 0.13 | 14.56 | 0.00 |
| 341.10 | 16.56 | 0.14 | 16.42 | 0.00 |
| 341.30 | 19.34 | 0.14 | 19.20 | 0.00 |
| 341.50 | 22.31 | 0.15 | 22.17 | 0.00 |
| 341.70 | 26.12 | 0.15 | 25.97 | 0.00 |
| 341.90 | 28.58 | 0.16 | 28.43 | 0.00 |
| 342.10 | 29.06 | 0.16 | 28.90 | 0.00 |
| 342.30 | 29.52 | 0.17 | 29.36 | 0.00 |
| 342.50 | 29.98 | 0.17 | 29.81 | 0.00 |
| 342.70 | 30.43 | 0.18 | 30.26 | 0.00 |
| 342.90 | 30.88 | 0.18 | 30.70 | 0.00 |
| 343.10 | 32.44 | 0.19 | 31.13 | 1.12 |
| 343.30 | 37.91 | 0.19 | 31.56 | 6.16 |
| 343.50 | 46.70 | 0.20 | 31.98 | 14.52 |
| 343.70 | 58.00 | 0.21 | 32.40 | 25.40 |
| 343.90 | **70.64** | **0.21** | **32.81** | **37.62** |

## Stage-Area-Storage for Pond BB-B: Bioretention Basin B 'BB-B'

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 337.50 | 2,408 | 0 |
| 337.60 | 2,489 | 245 |
| 337.70 | 2,571 | 498 |
| 337.80 | 2,655 | 759 |
| 337.90 | 2,740 | 1,029 |
| 338.00 | 2,827 | 1,307 |
| 338.10 | 2,915 | 1,594 |
| 338.20 | 3,004 | 1,890 |
| 338.30 | 3,094 | 2,195 |
| 338.40 | 3,186 | 2,509 |
| 338.50 | 3,279 | 2,832 |
| 338.60 | 3,374 | 3,165 |
| 338.70 | 3,469 | 3,507 |
| 338.80 | 3,567 | 3,859 |
| 338.90 | 3,665 | 4,221 |
| 339.00 | 3,765 | 4,592 |
| 339.10 | 3,857 | 4,973 |
| 339.20 | 3,951 | 5,364 |
| 339.30 | 4,045 | 5,763 |
| 339.40 | 4,141 | 6,173 |
| 339.50 | 4,238 | 6,592 |
| 339.60 | 4,336 | 7,020 |
| 339.70 | 4,435 | 7,459 |
| 339.80 | 4,535 | 7,907 |
| 339.90 | 4,637 | 8,366 |
| 340.00 | 4,739 | 8,835 |
| 340.10 | 4,838 | 9,313 |
| 340.20 | 4,937 | 9,802 |
| 340.30 | 5,038 | 10,301 |
| 340.40 | 5,140 | 10,810 |
| 340.50 | 5,242 | 11,329 |
| 340.60 | 5,346 | 11,858 |
| 340.70 | 5,451 | 12,398 |
| 340.80 | 5,556 | 12,949 |
| 340.90 | 5,663 | 13,510 |
| 341.00 | 5,771 | 14,081 |
| 341.10 | 5,876 | 14,664 |
| 341.20 | 5,981 | 15,256 |
| 341.30 | 6,088 | 15,860 |
| 341.40 | 6,195 | 16,474 |
| 341.50 | 6,303 | 17,099 |
| 341.60 | 6,413 | 17,735 |
| 341.70 | 6,523 | 18,381 |
| 341.80 | 6,634 | 19,039 |
| 341.90 | 6,746 | 19,708 |
| 342.00 | 6,859 | 20,388 |
| 342.10 | 6,970 | 21,080 |
| 342.20 | 7,081 | 21,782 |
| 342.30 | 7,193 | 22,496 |
| 342.40 | 7,306 | 23,221 |
| 342.50 | 7,420 | 23,957 |
| 342.60 | 7,535 | 24,705 |
| 342.70 | 7,651 | 25,464 |
| 342.80 | 7,768 | 26,235 |
| 342.90 | 7,886 | 27,018 |
| 343.00 | 8,004 | 27,813 |
| 343.10 | 8,123 | 28,619 |
| 343.20 | 8,244 | 29,437 |
| 343.30 | 8,365 | 30,268 |
| 343.40 | 8,487 | 31,110 |
| 343.50 | 8,609 | 31,965 |
| 343.60 | 8,733 | 32,832 |
| 343.70 | 8,858 | 33,712 |
| 343.80 | 8,983 | 34,604 |
| 343.90 | 9,110 | 35,508 |
| 344.00 | **9,237** | **36,426** |

## Summary for Pond WQB: Water Quality Basin 'WQB'

Inflow Area = 459,645 sf, 18.69% Impervious, Inflow Depth = 0.15" for WQV event
Inflow = 0.74 cfs @ 12.46 hrs, Volume= 5,833 cf
Outflow = 0.12 cfs @ 16.18 hrs, Volume= 5,833 cf, Atten= 84%, Lag= 223.3 min
Discarded = 0.06 cfs @ 16.18 hrs, Volume= 5,263 cf
Primary = 0.06 cfs @ 16.18 hrs, Volume= 569 cf
Routed to Pond BB-A : Bioretention Basin A 'BB-A'
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond BB-A : Bioretention Basin A 'BB-A'

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 355.78' @ 16.18 hrs Surf.Area= 2,444 sf Storage= 3,034 cf

Plug-Flow detention time= 606.7 min calculated for 5,832 cf (100% of inflow)
Center-of-Mass det. time= 606.8 min ( 1,546.7 - 940.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 354.00' | 6,684 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 354.00 | 1,014 | 251.0 | 0 | 0 | 1,014 |
| 355.00 | 1,803 | 271.5 | 1,390 | 1,390 | 1,906 |
| 356.00 | 2,645 | 290.3 | 2,211 | 3,600 | 2,792 |
| 357.00 | 3,545 | 309.2 | 3,084 | 6,684 | 3,742 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 345.00' | **24.0" Round Outlet Pipe**<br>L= 50.0' CPP, end-section conforming to fill, Ke= 0.500<br>Inlet / Outlet Invert= 345.00' / 343.50' S= 0.0300 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |
| #2 | Device 1 | 355.75' | **48.0" W x 6.0" H Vert. Orifice** C= 0.600<br>Limited to weir flow at low heads |
| #3 | Device 1 | 356.25' | **48.0" x 48.0" Horiz. Grate** C= 0.600 |
| #4 | Secondary | 356.50' | **15.0' long + 2.0 '/' SideZ x 5.0' breadth Spillway**<br>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<br>Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |
| #5 | Discarded | 354.00' | **1.000 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.06 cfs @ 16.18 hrs HW=355.78' (Free Discharge)
└─**5=Exfiltration** (Exfiltration Controls 0.06 cfs)

**Primary OutFlow** Max=0.06 cfs @ 16.18 hrs HW=355.78' (Free Discharge)
└─**1=Outlet Pipe** (Passes 0.06 cfs of 47.30 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.06 cfs @ 0.53 fps)
  └─**3=Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=354.00' (Free Discharge)
└─**4=Spillway** ( Controls 0.00 cfs)

## Stage-Discharge for Pond WQB: Water Quality Basin 'WQB'

| Elevation (feet) | Discharge (cfs) | Discarded (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|
| 354.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 354.10 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.20 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.30 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.40 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.50 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.60 | 0.03 | 0.03 | 0.00 | 0.00 |
| 354.70 | 0.04 | 0.04 | 0.00 | 0.00 |
| 354.80 | 0.04 | 0.04 | 0.00 | 0.00 |
| 354.90 | 0.04 | 0.04 | 0.00 | 0.00 |
| 355.00 | 0.04 | 0.04 | 0.00 | 0.00 |
| 355.10 | 0.04 | 0.04 | 0.00 | 0.00 |
| 355.20 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.30 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.40 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.50 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.60 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.70 | 0.05 | 0.05 | 0.00 | 0.00 |
| 355.80 | 0.20 | 0.06 | 0.14 | 0.00 |
| 355.90 | 0.81 | 0.06 | 0.75 | 0.00 |
| 356.00 | 1.67 | 0.06 | 1.60 | 0.00 |
| 356.10 | 2.72 | 0.06 | 2.66 | 0.00 |
| 356.20 | 3.94 | 0.07 | 3.88 | 0.00 |
| 356.30 | 22.39 | 0.07 | 22.32 | 0.00 |
| 356.40 | 35.89 | 0.07 | 35.82 | 0.00 |
| 356.50 | 45.33 | 0.07 | 45.25 | 0.00 |
| 356.60 | 50.44 | 0.07 | 49.25 | 1.12 |
| 356.70 | 52.76 | 0.08 | 49.48 | 3.21 |
| 356.80 | 55.94 | 0.08 | 49.71 | 6.16 |
| 356.90 | 59.91 | 0.08 | 49.94 | 9.89 |
| 357.00 | **64.78** | **0.08** | **50.17** | **14.52** |

## Stage-Area-Storage for Pond WQB: Water Quality Basin 'WQB'

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 354.00 | 1,014 | 0 |
| 354.05 | 1,048 | 52 |
| 354.10 | 1,083 | 105 |
| 354.15 | 1,118 | 160 |
| 354.20 | 1,154 | 217 |
| 354.25 | 1,190 | 275 |
| 354.30 | 1,227 | 336 |
| 354.35 | 1,264 | 398 |
| 354.40 | 1,303 | 462 |
| 354.45 | 1,341 | 528 |
| 354.50 | 1,380 | 596 |
| 354.55 | 1,420 | 666 |
| 354.60 | 1,460 | 738 |
| 354.65 | 1,501 | 812 |
| 354.70 | 1,543 | 888 |
| 354.75 | 1,585 | 967 |
| 354.80 | 1,627 | 1,047 |
| 354.85 | 1,670 | 1,129 |
| 354.90 | 1,714 | 1,214 |
| 354.95 | 1,758 | 1,301 |
| 355.00 | 1,803 | 1,390 |
| 355.05 | 1,841 | 1,481 |
| 355.10 | 1,880 | 1,574 |
| 355.15 | 1,919 | 1,669 |
| 355.20 | 1,959 | 1,766 |
| 355.25 | 1,998 | 1,865 |
| 355.30 | 2,039 | 1,966 |
| 355.35 | 2,079 | 2,069 |
| 355.40 | 2,120 | 2,174 |
| 355.45 | 2,162 | 2,281 |
| 355.50 | 2,204 | 2,390 |
| 355.55 | 2,246 | 2,501 |
| 355.60 | 2,289 | 2,614 |
| 355.65 | 2,332 | 2,730 |
| 355.70 | 2,376 | 2,848 |
| 355.75 | 2,419 | 2,967 |
| 355.80 | 2,464 | 3,090 |
| 355.85 | 2,508 | 3,214 |
| 355.90 | 2,554 | 3,340 |
| 355.95 | 2,599 | 3,469 |
| 356.00 | 2,645 | 3,600 |
| 356.05 | 2,687 | 3,734 |
| 356.10 | 2,729 | 3,869 |
| 356.15 | 2,772 | 4,007 |
| 356.20 | 2,814 | 4,146 |
| 356.25 | 2,858 | 4,288 |
| 356.30 | 2,901 | 4,432 |
| 356.35 | 2,945 | 4,578 |
| 356.40 | 2,989 | 4,726 |
| 356.45 | 3,034 | 4,877 |
| 356.50 | 3,079 | 5,030 |
| 356.55 | 3,124 | 5,185 |
| 356.60 | 3,169 | 5,342 |
| 356.65 | 3,215 | 5,502 |
| 356.70 | 3,261 | 5,664 |
| 356.75 | 3,308 | 5,828 |
| 356.80 | 3,354 | 5,994 |
| 356.85 | 3,402 | 6,163 |
| 356.90 | 3,449 | 6,335 |
| 356.95 | 3,497 | 6,508 |
| 357.00 | **3,545** | **6,684** |

## Summary for Link AL1: Analysis Line #1 (Southeastern PL)

Inflow Area = 11,088 sf, 1.43% Impervious, Inflow Depth = 0.09" for WQV event
Inflow = 0.01 cfs @ 12.43 hrs, Volume= 80 cf
Primary = 0.01 cfs @ 12.43 hrs, Volume= 80 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Rd Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link AL2: Analysis Line #2 (Wetlands)

Inflow Area = 499,921 sf, 17.34% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 12.46 hrs, Volume= 24 cf
Primary = 0.00 cfs @ 12.46 hrs, Volume= 24 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Rd Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link AL4: Analysis Line #4 (Northeastern PL)

Inflow Area = 10,171 sf, 0.00% Impervious, Inflow Depth = 0.07" for WQV event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 62 cf
Primary = 0.01 cfs @ 12.47 hrs, Volume= 62 cf, Atten= 0%, Lag= 0.0 min
Routed to Link SHR : Sharp Hill Rd Drainage System

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

## Summary for Link SHR: Sharp Hill Rd Drainage System

Inflow Area = 521,180 sf, 16.66% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.01 cfs @ 12.45 hrs, Volume= 166 cf
Primary = 0.01 cfs @ 12.45 hrs, Volume= 166 cf, Atten= 0%, Lag= 0.0 min
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=0.85"
Tc=10.0 min CN=74 Runoff=0.20 cfs 781 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=1.06"
Flow Length=697' Tc=20.8 min CN=78 Runoff=8.35 cfs 40,532 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=0.90"
Tc=10.0 min CN=75 Runoff=0.47 cfs 1,779 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=0.85"
Tc=10.0 min CN=74 Runoff=0.23 cfs 886 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=0.80"
Tc=10.0 min CN=73 Runoff=0.07 cfs 257 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=0.80"
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.17 cfs 675 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=345.64' Storage=18,234 cf Inflow=8.59 cfs 36,519 cf
Discarded=0.20 cfs 17,347 cf Primary=0.68 cfs 19,172 cf Secondary=0.00 cfs 0 cf Outflow=0.88 cfs 36,519 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=338.65' Storage=3,321 cf Inflow=0.70 cfs 20,057 cf
Discarded=0.08 cfs 4,205 cf Primary=0.54 cfs 15,852 cf Secondary=0.00 cfs 0 cf Outflow=0.62 cfs 20,057 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=356.26' Storage=4,311 cf Inflow=8.35 cfs 40,532 cf
Discarded=0.07 cfs 5,792 cf Primary=8.28 cfs 34,740 cf Secondary=0.00 cfs 0 cf Outflow=8.35 cfs 40,532 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.20 cfs 781 cf
Primary=0.20 cfs 781 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=0.55 cfs 16,110 cf
Primary=0.55 cfs 16,110 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.17 cfs 675 cf
Primary=0.17 cfs 675 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=0.57 cfs 17,566 cf
Primary=0.57 cfs 17,566 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 44,911 cf Average Runoff Depth = 1.03"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=1.21"
Tc=10.0 min CN=74 Runoff=0.30 cfs 1,114 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=1.46"
Flow Length=697' Tc=20.8 min CN=78 Runoff=11.75 cfs 55,904 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=1.27"
Tc=10.0 min CN=75 Runoff=0.68 cfs 2,515 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=1.21"
Tc=10.0 min CN=74 Runoff=0.34 cfs 1,263 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=1.15"
Tc=10.0 min CN=73 Runoff=0.10 cfs 370 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=1.15"
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.26 cfs 971 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=346.39' Storage=25,307 cf Inflow=12.14 cfs 52,488 cf
Discarded=0.23 cfs 19,102 cf Primary=1.60 cfs 33,386 cf Secondary=0.00 cfs 0 cf Outflow=1.83 cfs 52,488 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=338.85' Storage=4,049 cf Inflow=1.64 cfs 34,649 cf
Discarded=0.08 cfs 4,906 cf Primary=1.40 cfs 29,743 cf Secondary=0.00 cfs 0 cf Outflow=1.48 cfs 34,649 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=356.27' Storage=4,333 cf Inflow=11.75 cfs 55,904 cf
Discarded=0.07 cfs 5,931 cf Primary=11.68 cfs 49,973 cf Secondary=0.00 cfs 0 cf Outflow=11.75 cfs 55,904 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.30 cfs 1,114 cf
Primary=0.30 cfs 1,114 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=1.41 cfs 30,113 cf
Primary=1.41 cfs 30,113 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.26 cfs 971 cf
Primary=0.26 cfs 971 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=1.46 cfs 32,198 cf
Primary=1.46 cfs 32,198 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 62,137 cf Average Runoff Depth = 1.43"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=2.46"
Tc=10.0 min CN=74 Runoff=0.64 cfs 2,273 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=2.81"
Flow Length=697' Tc=20.8 min CN=78 Runoff=23.07 cfs 107,781 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=2.55"
Tc=10.0 min CN=75 Runoff=1.42 cfs 5,057 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=2.46"
Tc=10.0 min CN=74 Runoff=0.72 cfs 2,577 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=2.37"
Tc=10.0 min CN=73 Runoff=0.21 cfs 767 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=2.37"
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.56 cfs 2,013 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=346.70' Storage=28,434 cf Inflow=23.93 cfs 106,524 cf
Discarded=0.24 cfs 21,507 cf Primary=22.42 cfs 85,018 cf Secondary=0.00 cfs 0 cf Outflow=22.66 cfs 106,524 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=340.47' Storage=11,184 cf Inflow=22.81 cfs 87,595 cf
Discarded=0.12 cfs 5,828 cf Primary=12.91 cfs 81,767 cf Secondary=0.00 cfs 0 cf Outflow=13.03 cfs 87,595 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=356.30' Storage=4,445 cf Inflow=23.07 cfs 107,781 cf
Discarded=0.07 cfs 6,315 cf Primary=23.00 cfs 101,467 cf Secondary=0.00 cfs 0 cf Outflow=23.07 cfs 107,781 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.64 cfs 2,273 cf
Primary=0.64 cfs 2,273 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=12.96 cfs 82,534 cf
Primary=12.96 cfs 82,534 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.56 cfs 2,013 cf
Primary=0.56 cfs 2,013 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=13.25 cfs 86,821 cf
Primary=13.25 cfs 86,821 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 120,470 cf Average Runoff Depth = 2.77"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=3.32"
Tc=10.0 min CN=74 Runoff=0.87 cfs 3,068 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=3.72"
Flow Length=697' Tc=20.8 min CN=78 Runoff=30.51 cfs 142,513 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=3.42"
Tc=10.0 min CN=75 Runoff=1.92 cfs 6,789 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=3.32"
Tc=10.0 min CN=74 Runoff=0.98 cfs 3,478 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=3.22"
Tc=10.0 min CN=73 Runoff=0.29 cfs 1,041 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=3.22"
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.76 cfs 2,731 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=346.76' Storage=29,033 cf Inflow=31.66 cfs 142,785 cf
Discarded=0.24 cfs 22,725 cf Primary=31.18 cfs 120,061 cf Secondary=0.00 cfs 0 cf Outflow=31.43 cfs 142,785 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=341.57' Storage=17,533 cf Inflow=31.77 cfs 123,538 cf
Discarded=0.15 cfs 6,292 cf Primary=22.95 cfs 117,246 cf Secondary=0.00 cfs 0 cf Outflow=23.10 cfs 123,538 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=356.35' Storage=4,591 cf Inflow=30.51 cfs 142,513 cf
Discarded=0.07 cfs 6,516 cf Primary=30.42 cfs 135,997 cf Secondary=0.00 cfs 0 cf Outflow=30.49 cfs 142,513 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.87 cfs 3,068 cf
Primary=0.87 cfs 3,068 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=23.05 cfs 118,287 cf
Primary=23.05 cfs 118,287 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.76 cfs 2,731 cf
Primary=0.76 cfs 2,731 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=23.63 cfs 124,085 cf
Primary=23.63 cfs 124,085 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 159,619 cf Average Runoff Depth = 3.68"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**

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

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=4.71"
Tc=10.0 min CN=74 Runoff=1.23 cfs 4,354 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=5.17"
Flow Length=697' Tc=20.8 min CN=78 Runoff=42.19 cfs 198,016 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,828 sf 3.29% Impervious Runoff Depth=4.83"
Tc=10.0 min CN=75 Runoff=2.70 cfs 9,582 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=4.71"
Tc=10.0 min CN=74 Runoff=1.39 cfs 4,936 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=4.60"
Tc=10.0 min CN=73 Runoff=0.42 cfs 1,485 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=4.60"
Flow Length=246' Tc=10.3 min CN=73 Runoff=1.09 cfs 3,897 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=346.97' Storage=31,250 cf Inflow=43.75 cfs 200,819 cf
Discarded=0.25 cfs 24,283 cf Primary=39.94 cfs 176,536 cf Secondary=0.00 cfs 0 cf Outflow=40.19 cfs 200,819 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=343.00' Storage=27,821 cf Inflow=40.65 cfs 181,472 cf
Discarded=0.19 cfs 6,926 cf Primary=30.92 cfs 174,546 cf Secondary=0.01 cfs 0 cf Outflow=31.11 cfs 181,472 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=356.46' Storage=4,918 cf Inflow=42.19 cfs 198,016 cf
Discarded=0.07 cfs 6,779 cf Primary=42.05 cfs 191,237 cf Secondary=0.00 cfs 0 cf Outflow=42.12 cfs 198,016 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=1.23 cfs 4,354 cf
Primary=1.23 cfs 4,354 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=31.05 cfs 176,032 cf
Primary=31.05 cfs 176,032 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=1.09 cfs 3,897 cf
Primary=1.09 cfs 3,897 cf

**Link SHR: Sharp Hill Rd Drainage System** Inflow=31.80 cfs 184,282 cf
Primary=31.80 cfs 184,282 cf

**Total Runoff Area = 521,180 sf Runoff Volume = 222,270 cf Average Runoff Depth = 5.12"**
**83.34% Pervious = 434,337 sf 16.66% Impervious = 86,843 sf**