

## **Point of Analysis B**

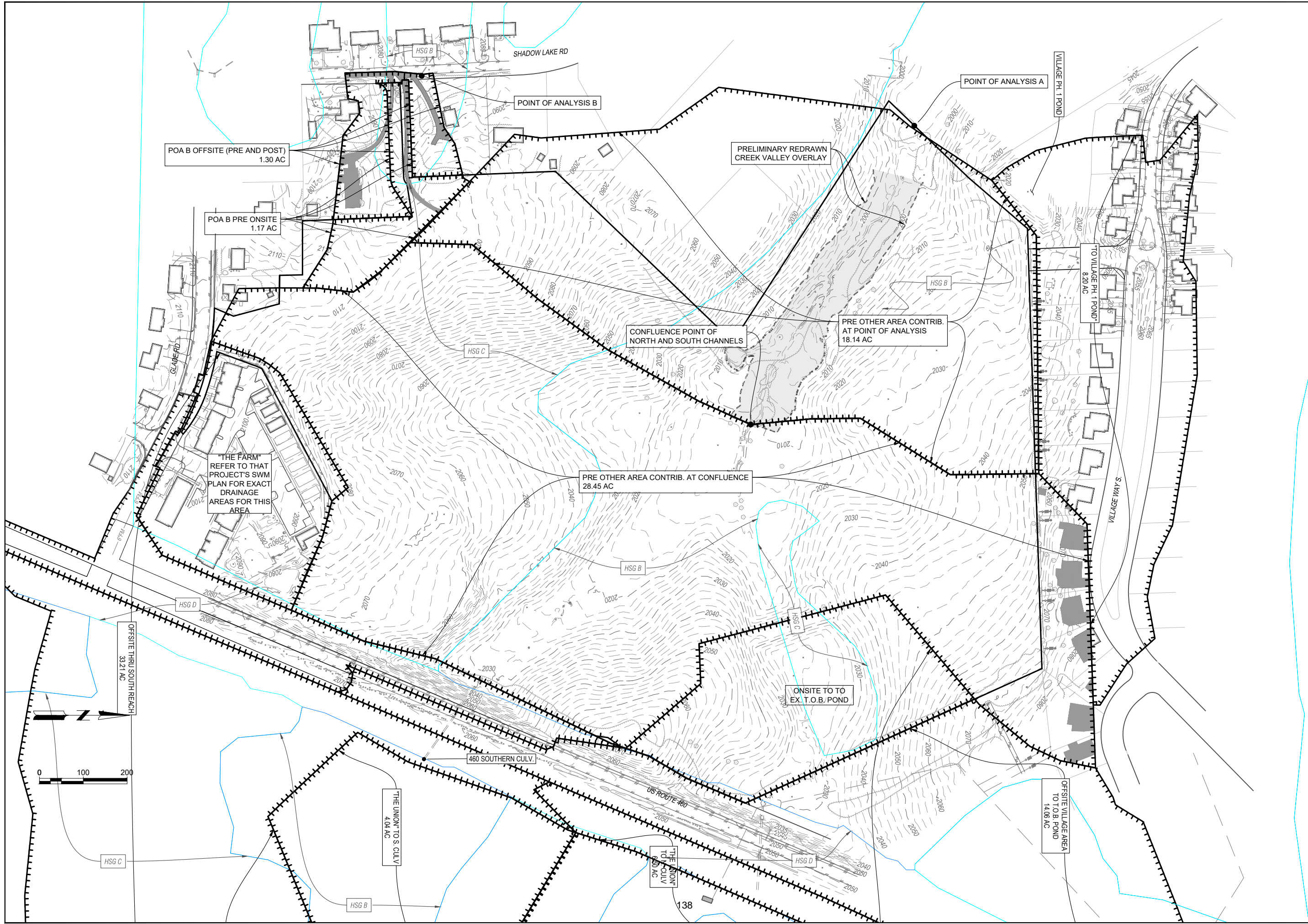
Volume 3 of 3

Vol. 1: pages 1-33

Vol. 2: pages 34-136

Vol. 3: pages 137-241

Z:\PROJECTS\CAD\HOPPER\2023\04\67\04CL - GLADE SPRING CROSSING\IEDEN - GLADE SPRING\CAD\PRELIM PLAT CAD\DRAINAGE-PP PREDEV.DWG  
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| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

**NOT FOR CONSTRUCTION**  
**PREDEVELOPMENT**  
**ONSITE DRAINAGE AREAS**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
 ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
 PROPERTY OF GLADE SPRING CROSSING, LLC  
 TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
 TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
 MONTGOMERY COUNTY, VIRGINIA

|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>-    | Date:<br>11/01/2023 |
| Sheet No.<br>1 of 1 | <b>D2</b>           |

## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA B onsite**

**PREDEVELOPMENT**

| Composite Curve Number (CN) |                       |            |    |               |              | Notes: |
|-----------------------------|-----------------------|------------|----|---------------|--------------|--------|
|                             | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.) | CN*A         |        |
| CN <sub>1</sub>             | B                     | Open space | 61 | 0.21          | 12.94        |        |
| CN <sub>2</sub>             | B                     | Impervious | 98 | 0.06          | 6.13         |        |
| CN <sub>3</sub>             | C                     | Open space | 74 | 0.87          | 64.53        |        |
| CN <sub>4</sub>             | C                     | Impervious | 98 | 0.02          | 1.87         |        |
| CN <sub>5</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>6</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>7</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>8</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>9</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>10</sub>            |                       |            |    |               | 0.00         |        |
| Total                       |                       |            |    | <b>1.17</b>   | <b>85.46</b> |        |
| <b>Composite CN =</b>       |                       |            |    |               | <b>73</b>    |        |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.06          | 10.0                               |
| 2  | Shallow Conc. | Unpaved    | 487         |                     | 0.068         | 1.9                                |
| 3  |               |            |             |                     |               |                                    |
| 4  |               |            |             |                     |               |                                    |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>11.9</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 73    | 73     | 73      |
| Storage (in.) S=1000/CN-10   | 3.70  | 3.70   | 3.70    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.74  | 0.74   | 0.74    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.44  | 1.57   | 3.46    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.04  | 0.15   | 0.34    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 0.64  | 2.62   |         |

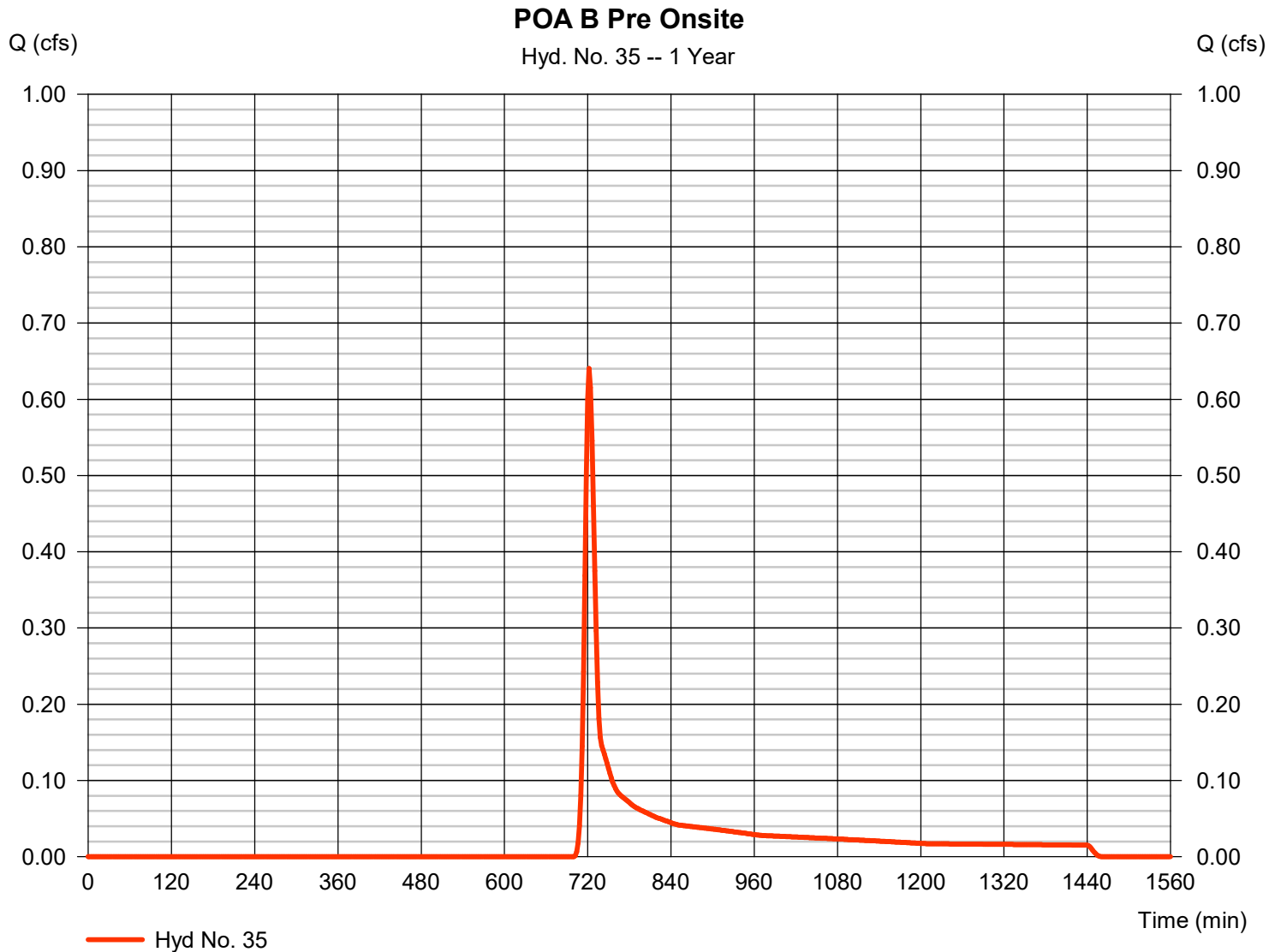
Hydrograph Number:           35

# Hydrograph Report

## Hyd. No. 35

POA B Pre Onsite

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.640 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 1,939 cuft |
| Drainage area   | = 1.170 ac   | Curve number       | = 73         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 11.90 min  |
| Total precip.   | = 2.26 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



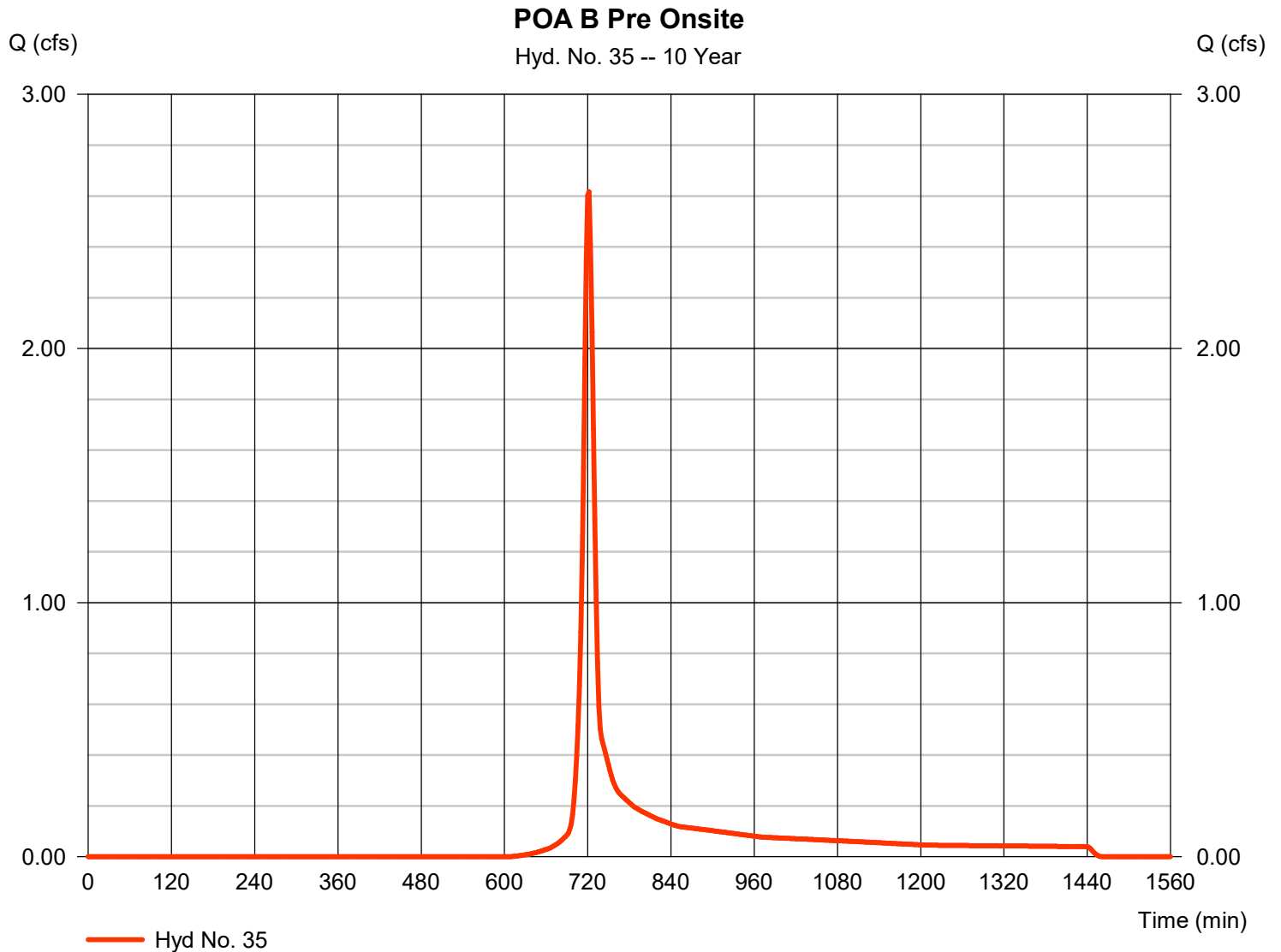


# Hydrograph Report

## Hyd. No. 35

POA B Pre Onsite

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 2.617 cfs  |
| Storm frequency | = 10 yrs     | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 6,879 cuft |
| Drainage area   | = 1.170 ac   | Curve number       | = 73         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 11.90 min  |
| Total precip.   | = 4.06 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA B offsite**

**PRE & POST**

| <b>Composite Curve Number (CN)</b> |                       |            |    |                          |              | <b>Notes:</b> |
|------------------------------------|-----------------------|------------|----|--------------------------|--------------|---------------|
|                                    | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.)            | CN*A         |               |
| CN <sub>1</sub>                    | B                     | Open space | 61 | 0.40                     | 24.49        |               |
| CN <sub>2</sub>                    | B                     | Impervious | 98 | 0.08                     | 8.20         |               |
| CN <sub>3</sub>                    | C                     | Open space | 74 | 0.68                     | 50.47        |               |
| CN <sub>4</sub>                    | C                     | Impervious | 98 | 0.13                     | 13.12        |               |
| CN <sub>5</sub>                    |                       |            |    |                          | 0.00         |               |
| CN <sub>6</sub>                    |                       |            |    |                          | 0.00         |               |
| CN <sub>7</sub>                    |                       |            |    |                          | 0.00         |               |
| CN <sub>8</sub>                    |                       |            |    |                          | 0.00         |               |
| CN <sub>9</sub>                    |                       |            |    |                          | 0.00         |               |
| CN <sub>10</sub>                   |                       |            |    |                          | 0.00         |               |
| Total                              |                       |            |    | <b>1.30</b>              | <b>96.28</b> |               |
|                                    |                       |            |    | <b>Composite CN = 74</b> |              |               |

| <b>Time of Concentration, T<sub>c</sub></b>                |               |            |                            |                     |               |                                    |
|--|---------------|------------|----------------------------|---------------------|---------------|------------------------------------|
|  |               |            | 2 yr. Precip. (in.) = 2.73 |                     |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft)                | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100                        | 0.24                | 0.08          | 8.9                                |
| 2  | Shallow Conc. | Unpaved    | 332                        |                     | 0.063         | 1.4                                |
| 3  |               |            |                            |                     |               |                                    |
| 4  |               |            |                            |                     |               |                                    |
| 5  |               |            |                            |                     |               |                                    |
| 6  |               |            |                            |                     |               |                                    |
| 7  |               |            |                            |                     |               |                                    |
| 8  |               |            |                            |                     |               |                                    |
| 9  |               |            |                            |                     |               |                                    |
| 10   |               |            |                            |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |                            |                     |               | <b>10.2</b>                        |

| <b>Runoff</b>  |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 74    | 74     | 74      |
| Storage (in.) S=1000/CN-10   | 3.51  | 3.51   | 3.51    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.70  | 0.70   | 0.70    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.48  | 1.64   | 3.56    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.05  | 0.18   | 0.39    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 0.79  | 3.04   |         |

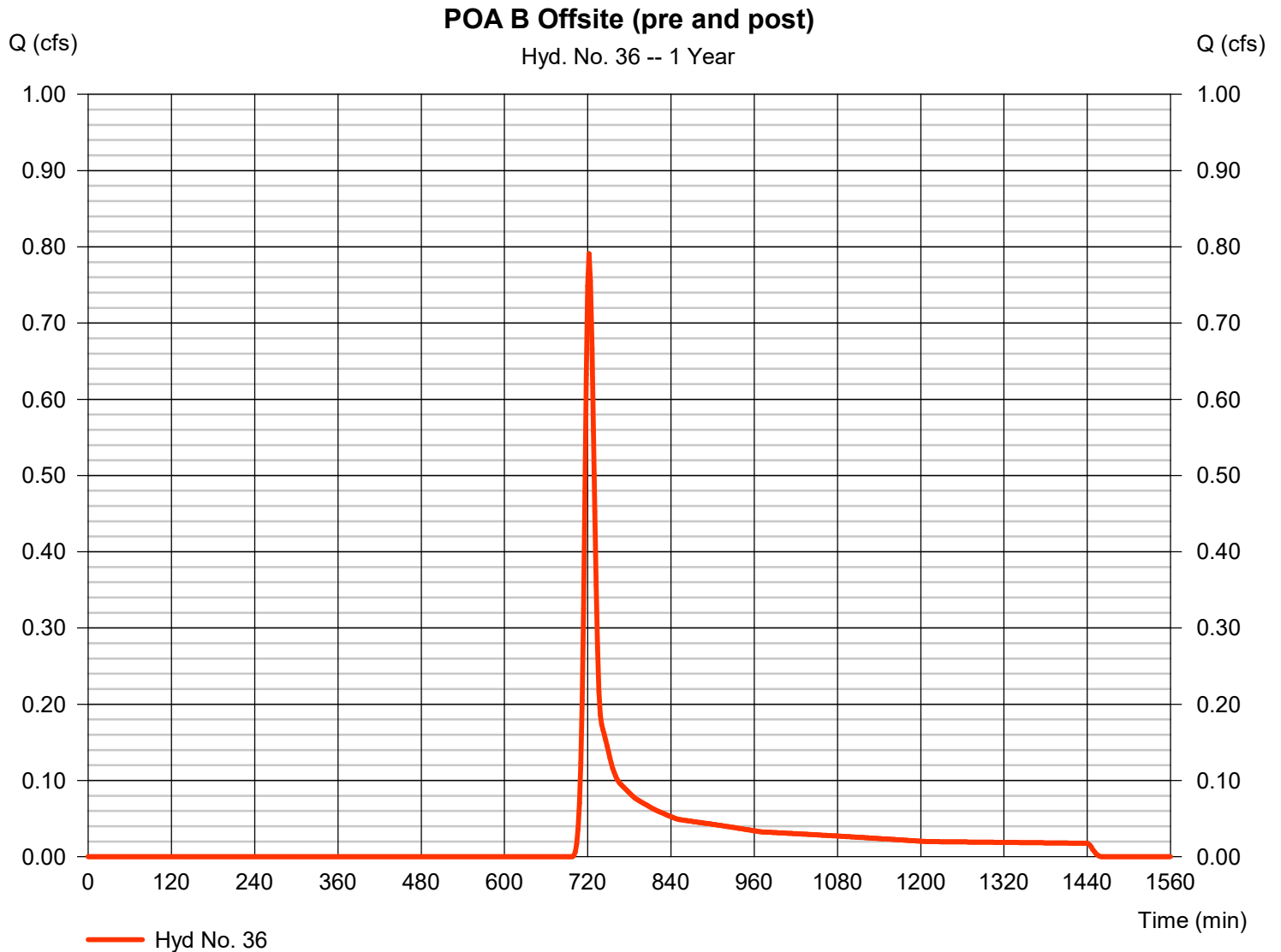
Hydrograph Number: 36

# Hydrograph Report

## Hyd. No. 36

POA B Offsite (pre and post)

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.791 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 2,327 cuft |
| Drainage area   | = 1.300 ac   | Curve number       | = 74         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 10.20 min  |
| Total precip.   | = 2.26 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |

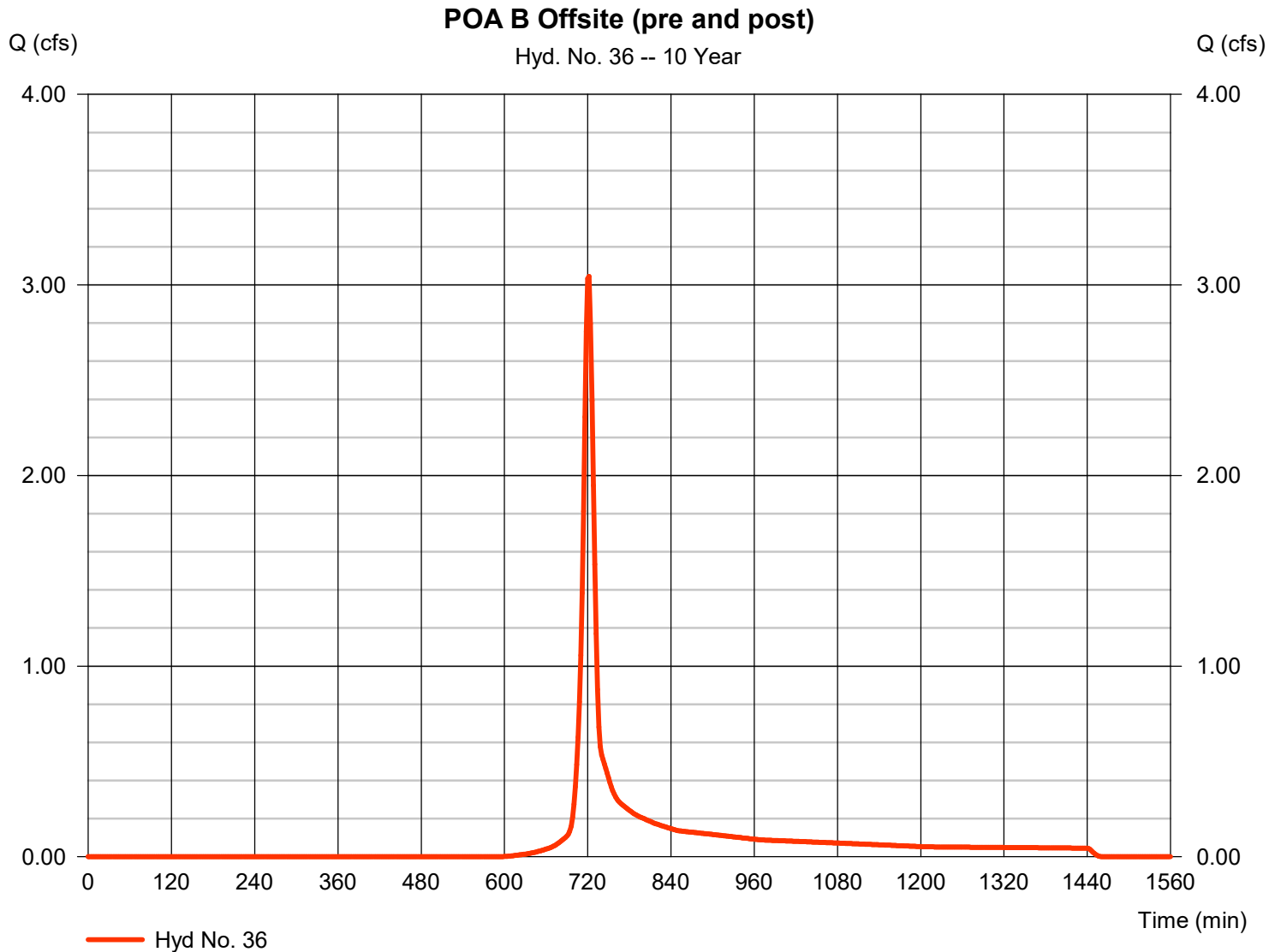


# Hydrograph Report

## Hyd. No. 36

POA B Offsite (pre and post)

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 3.044 cfs  |
| Storm frequency | = 10 yrs     | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 7,983 cuft |
| Drainage area   | = 1.300 ac   | Curve number       | = 74         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 10.20 min  |
| Total precip.   | = 4.06 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



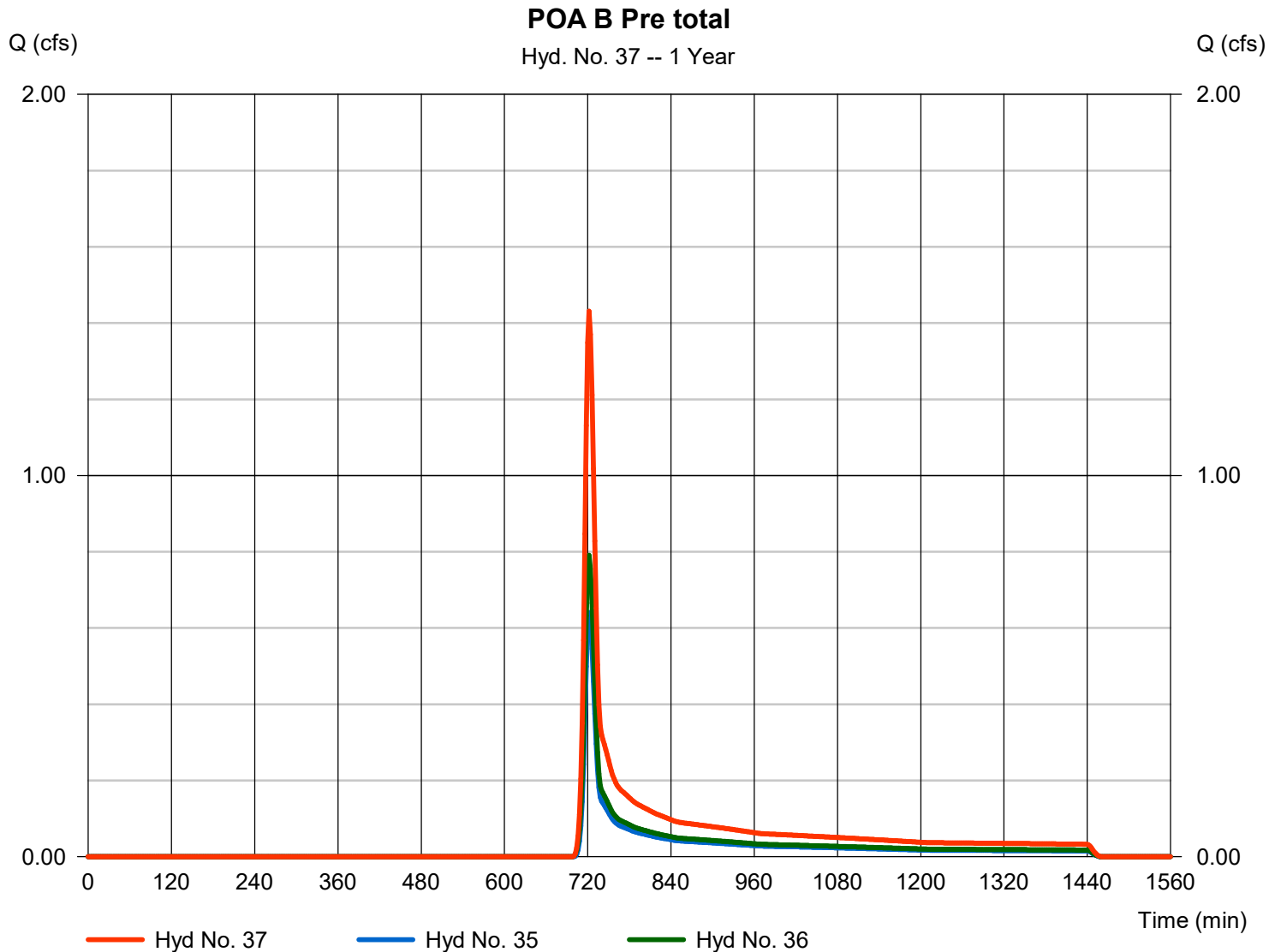
# Hydrograph Report

## Hyd. No. 37

POA B Pre total

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 35, 36

Peak discharge = 1.431 cfs  
Time to peak = 722 min  
Hyd. volume = 4,267 cuft  
Contrib. drain. area = 2.470 ac





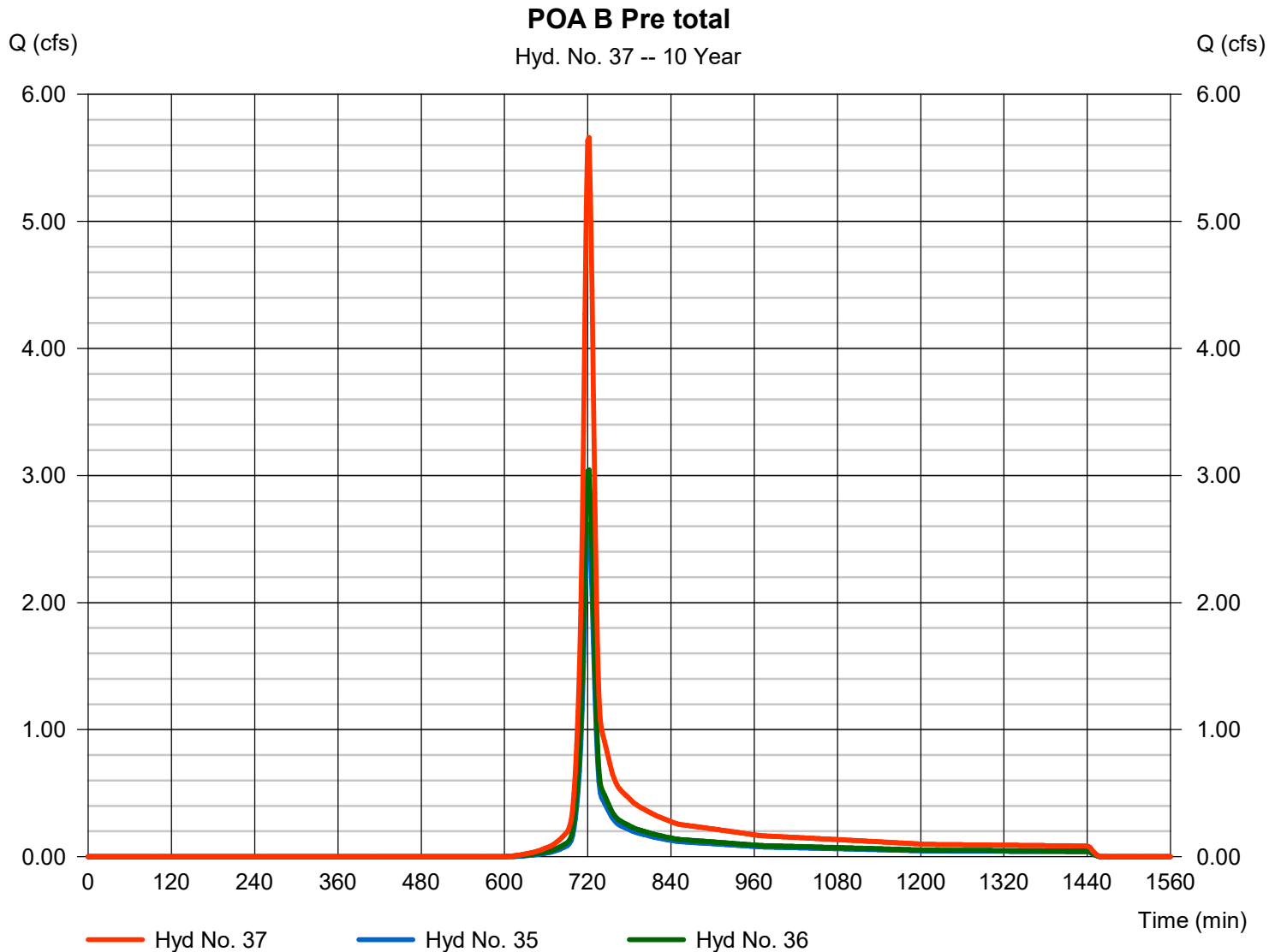
# Hydrograph Report

## Hyd. No. 37

POA B Pre total

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 35, 36

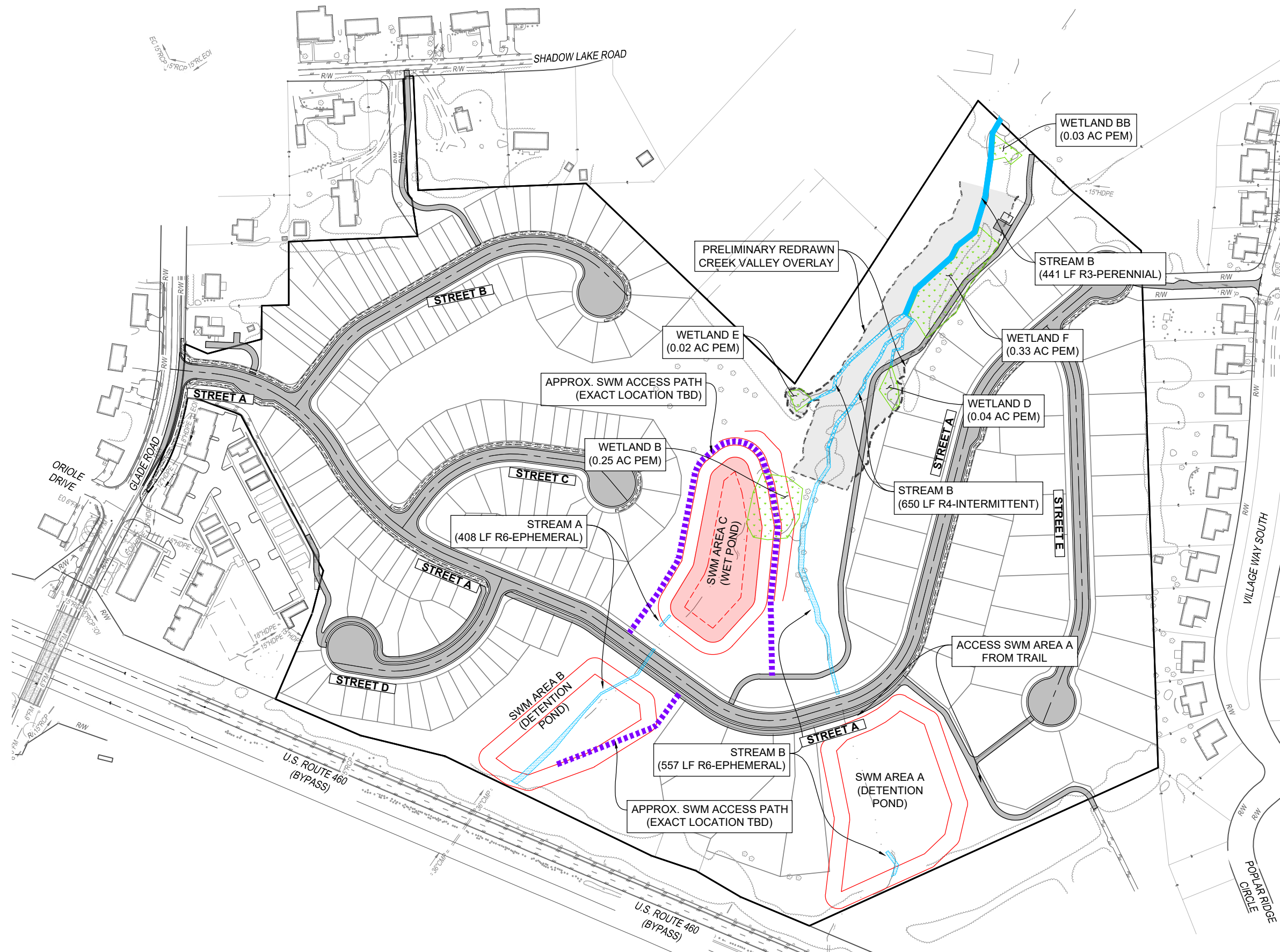
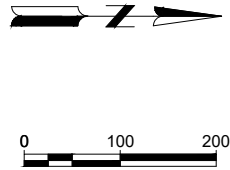
Peak discharge = 5.661 cfs  
Time to peak = 722 min  
Hyd. volume = 14,863 cuft  
Contrib. drain. area = 2.470 ac



## POST-DEVELOPMENT

## **Point of Analysis A**

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| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

**NOT FOR CONSTRUCTION**  
**STORMWATER MANAGEMENT AREAS EXHIBIT**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
PROPERTY OF GLADE SPRING CROSSING, LLC  
TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
MONTGOMERY COUNTY, VIRGINIA




|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>WGB  | Date:<br>02/01/2024 |
| Sheet No.<br>1 of 1 | <b>SWM</b>          |

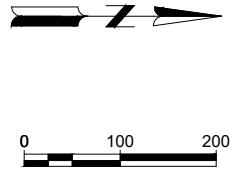
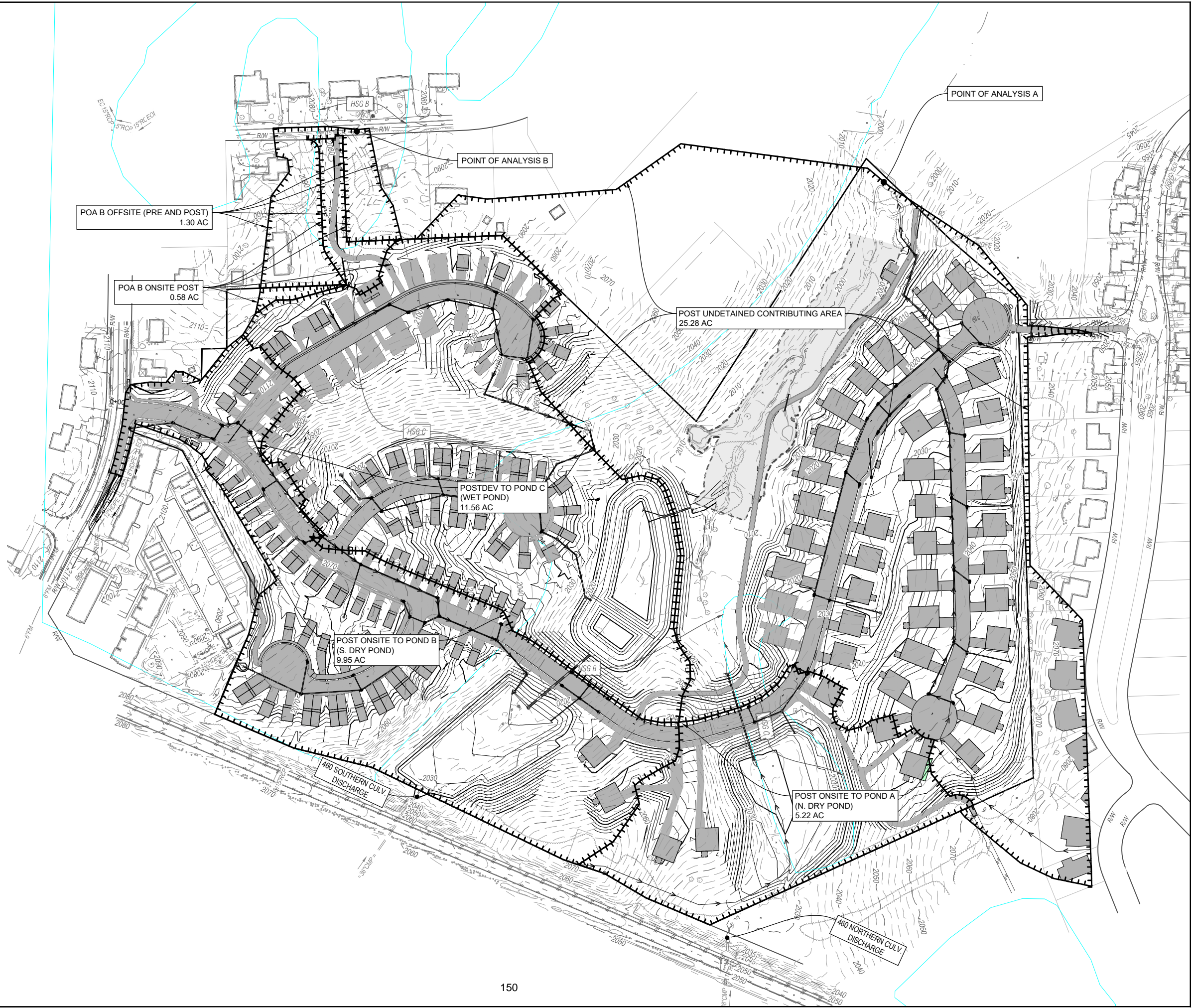
**WK DICKSON**  
community infrastructure consultants  
1700 KRAFT DRIVE, SUITE 2350  
BLACKSBURG, VIRGINIA 24060  
VOICE 540-617-0870



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**LEGEND**

-  DRAINAGE AREA
-  IMPERVIOUS AREA
-  PRELIMINARY REDRAWN CREEK VALLEY OVERLAY



| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

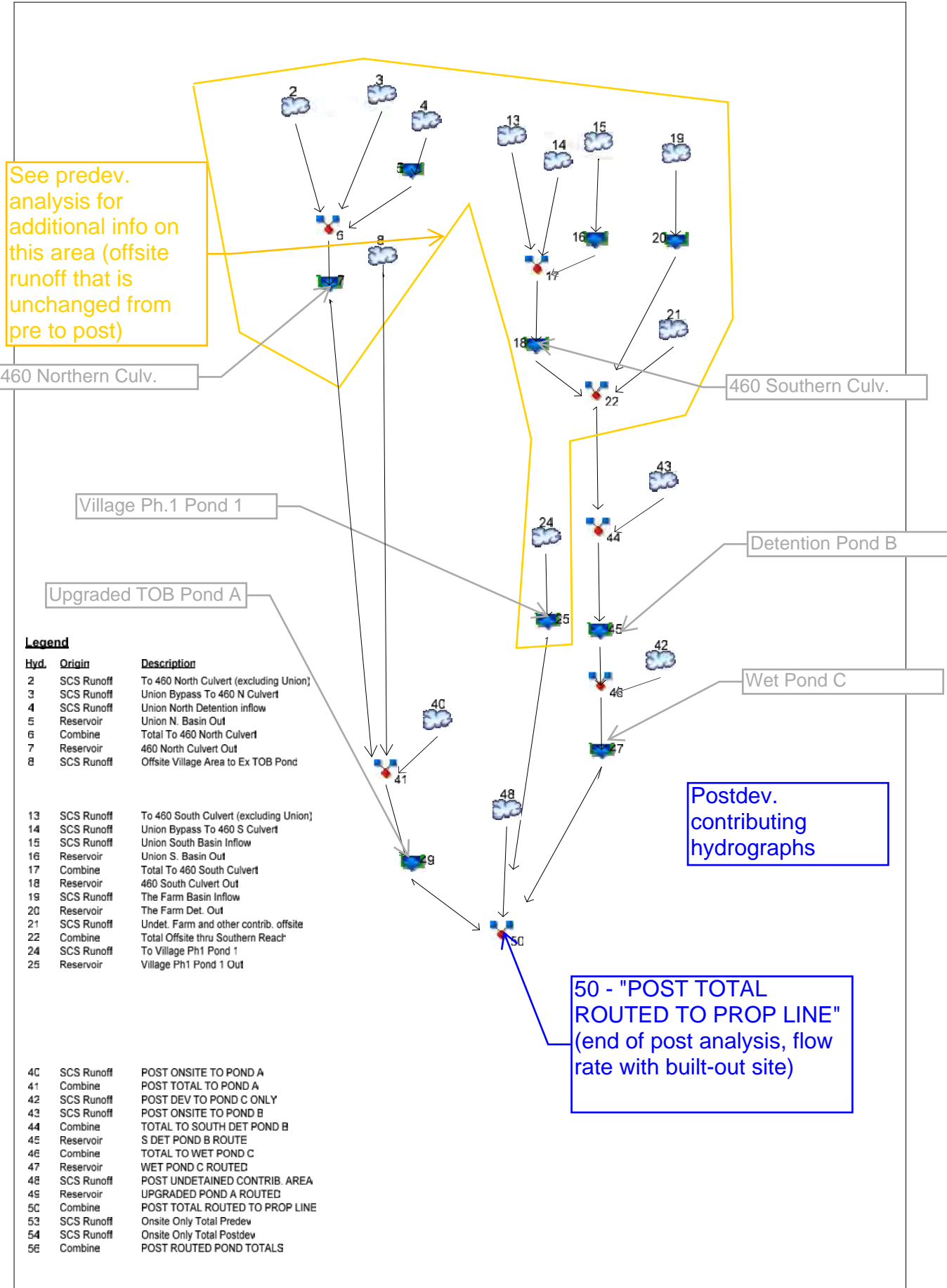
**POSTDEVELOPMENT ONSITE  
DRAINAGE AREAS**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
PROPERTY OF GLADE SPRING CROSSING, LLC  
TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
MONTGOMERY COUNTY, VIRGINIA

|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>MTJ  | Date:<br>10/24/2023 |
| Sheet No.<br>1 of 1 | <b>D3</b>           |



# Watershed Model Schematic



See predev. analysis for additional info on this area (offsite runoff that is unchanged from pre to post)

Postdev. contributing hydrographs

50 - "POST TOTAL ROUTED TO PROP LINE" (end of post analysis, flow rate with built-out site)

**Legend**

| Hyd. | Origin     | Description                            |
|------|------------|--|
| 2    | SCS Runoff | To 460 North Culvert (excluding Union) |
| 3    | SCS Runoff | Union Bypass To 460 N Culvert          |
| 4    | SCS Runoff | Union North Detention Inflow           |
| 5    | Reservoir  | Union N. Basin Out                     |
| 6    | Combine    | Total To 460 North Culvert             |
| 7    | Reservoir  | 460 North Culvert Out                  |
| 8    | SCS Runoff | Offsite Village Area to Ex TOB Pond    |
| 13   | SCS Runoff | To 460 South Culvert (excluding Union) |
| 14   | SCS Runoff | Union Bypass To 460 S Culvert          |
| 15   | SCS Runoff | Union South Basin Inflow               |
| 16   | Reservoir  | Union S. Basin Out                     |
| 17   | Combine    | Total To 460 South Culvert             |
| 18   | Reservoir  | 460 South Culvert Out                  |
| 19   | SCS Runoff | The Farm Basin Inflow                  |
| 20   | Reservoir  | The Farm Det. Out                      |
| 21   | SCS Runoff | Undet. Farm and other contrib. offsite |
| 22   | Combine    | Total Offsite thru Southern Reach      |
| 24   | SCS Runoff | To Village Ph1 Pond 1                  |
| 25   | Reservoir  | Village Ph1 Pond 1 Out                 |
| 40   | SCS Runoff | POST ONSITE TO POND A                  |
| 41   | Combine    | POST TOTAL TO POND A                   |
| 42   | SCS Runoff | POST DEV TO POND C ONLY                |
| 43   | SCS Runoff | POST ONSITE TO POND B                  |
| 44   | Combine    | TOTAL TO SOUTH DET POND B              |
| 45   | Reservoir  | S DET POND B ROUTE                     |
| 46   | Combine    | TOTAL TO WET POND C                    |
| 47   | Reservoir  | WET POND C ROUTED                      |
| 48   | SCS Runoff | POST UNDETAINED CONTRIB. AREA          |
| 49   | Reservoir  | UPGRADED POND A ROUTED                 |
| 50   | Combine    | POST TOTAL ROUTED TO PROP LINE         |
| 53   | SCS Runoff | Onsite Only Total Predev               |
| 54   | SCS Runoff | Onsite Only Total Postdev              |
| 56   | Combine    | POST ROUTED POND TOTALS                |

## Drainage Area Runoff and Time of Concentration

Drainage Area: **POST ONSITE TO POND A (N. DRY POND)**  
**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |                     |    |               |               | Notes:  |
|-----------------------------|-----------------------|---------------------|----|---------------|---------------|---|
|                             | Hydrologic Soil Group | Land Cover          | CN | Area, A (ac.) | CN*A          | Impervious lot area calculated using approx. driveway configurations and actual dwelling dimensions |
| CN <sub>1</sub>             | B                     | Open space          | 61 | 3.24          | 197.50        |   |
| CN <sub>2</sub>             | C                     | Open space          | 74 | 1.08          | 80.11         |   |
| CN <sub>3</sub>             | B                     | Imperv. (measured)  | 98 | 0.37          | 36.20         |   |
| CN <sub>4</sub>             | C                     | Imperv. (measured)  | 98 | 0.07          | 7.15          |   |
| CN <sub>5</sub>             | B                     | Imperv. (est. lots) | 98 | 0.46          | 44.94         |   |
| CN <sub>6</sub>             | C                     | Imperv. (est. lots) | 98 | 0.00          | 0.00          |   |
| CN <sub>7</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>8</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>9</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>10</sub>            |                       |                     |    |               | 0.00          |   |
| Total                       |                       |                     |    | <b>5.22</b>   | <b>365.90</b> |   |
| <b>Composite CN =</b>       |                       |                     |    |               | <b>70</b>     |   |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.08          | 8.9                                |
| 2  | Shallow Conc. | Unpaved    | 151         |                     | 0.1           | 0.5                                |
| 3  | Shallow Conc. | Unpaved    | 235         |                     | 0.05532       | 1.0                                |
| 4  | Shallow Conc. | Unpaved    | 235         |                     | 0.012         | 2.2                                |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>12.6</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 70    | 70     | 70      |
| Storage (in.) S=1000/CN-10   | 4.29  | 4.29   | 4.29    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.86  | 0.86   | 0.86    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.35  | 1.37   | 3.16    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.15  | 0.60   | 1.37    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 1.96  | 10.06  | 23.77   |

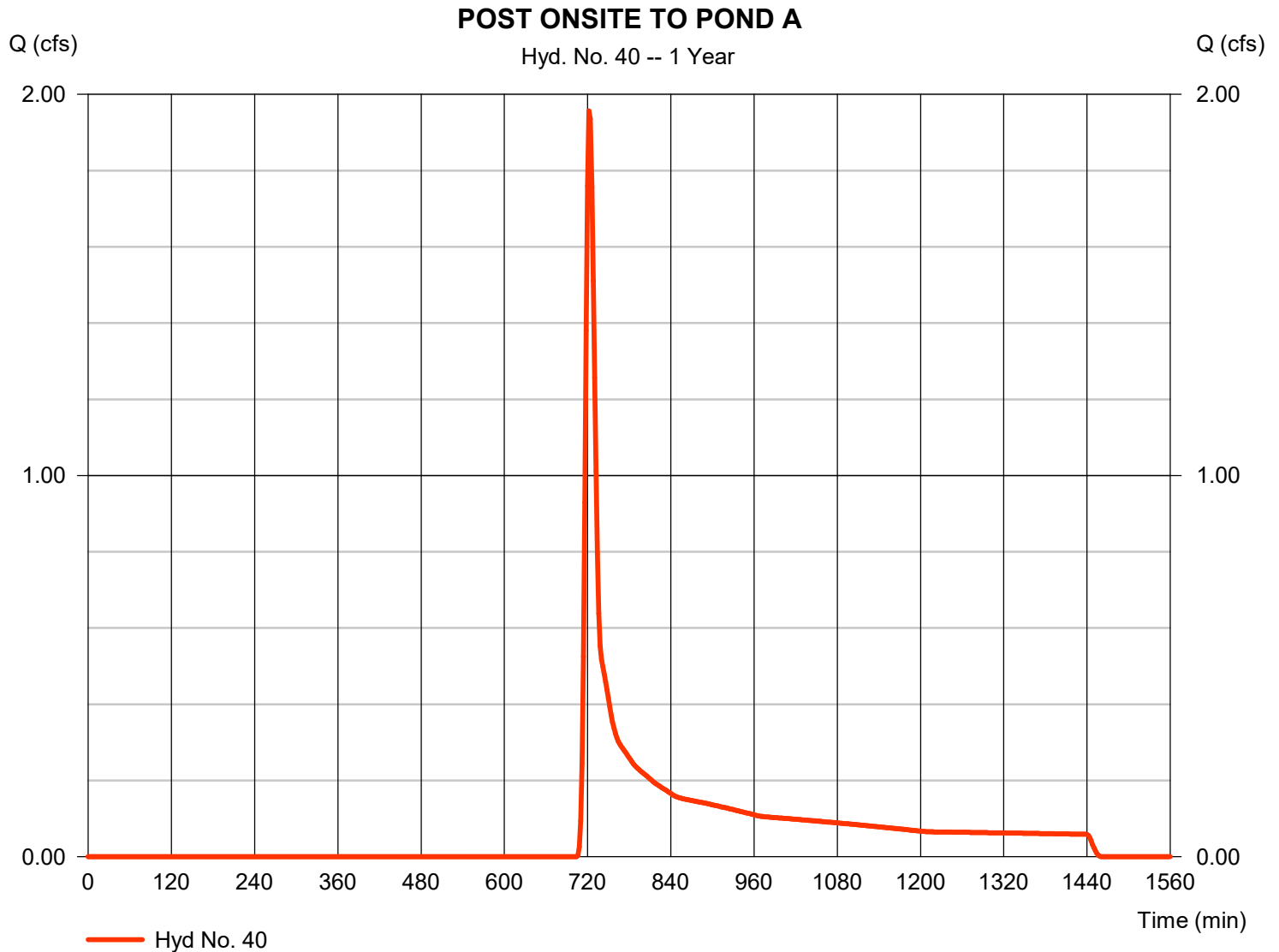
Hydrograph Number: 40

# Hydrograph Report

## Hyd. No. 40

### POST ONSITE TO POND A

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 1.956 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 6,760 cuft |
| Drainage area   | = 5.220 ac   | Curve number       | = 70         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 12.60 min  |
| Total precip.   | = 2.26 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |

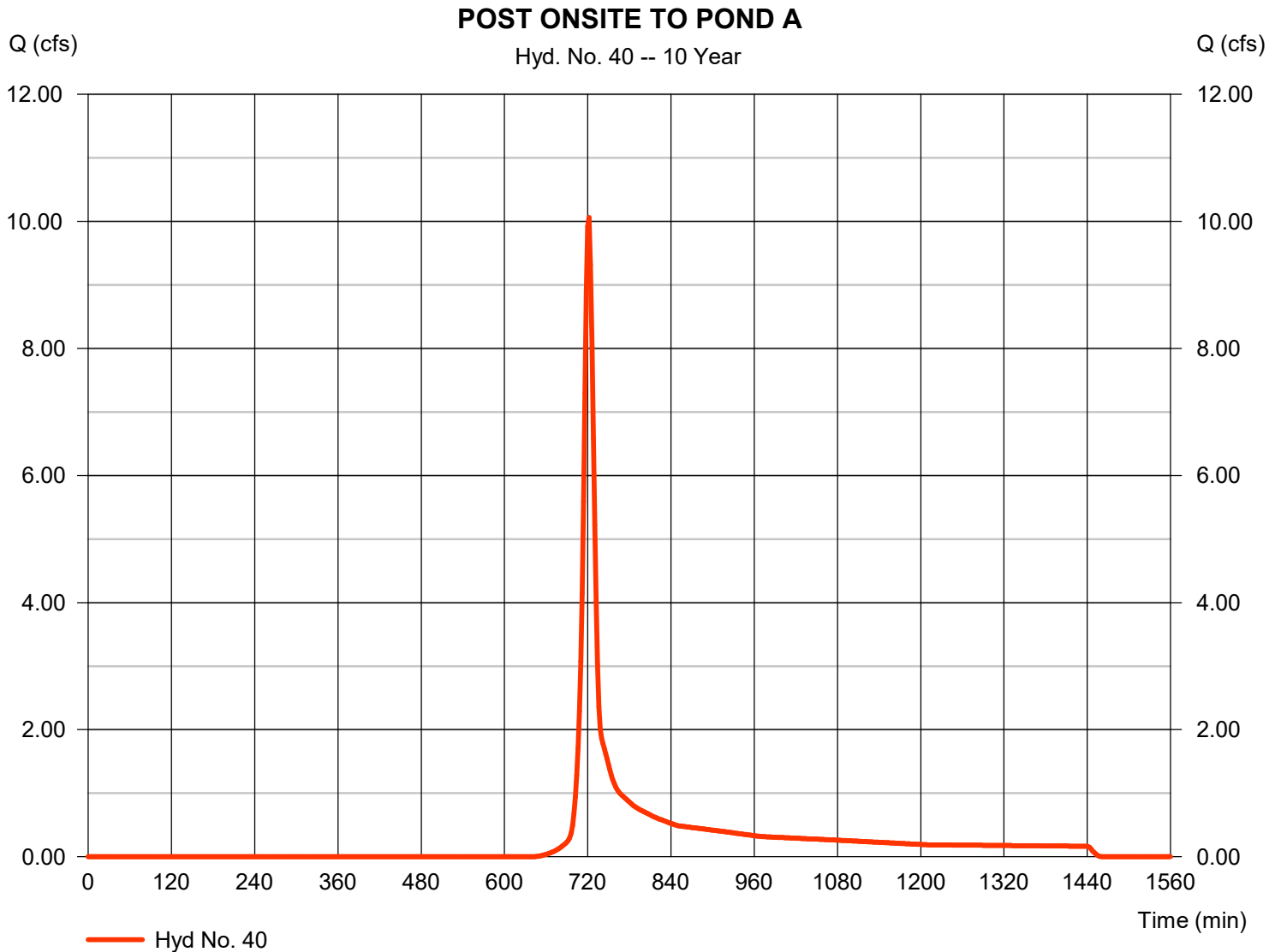


# Hydrograph Report

## Hyd. No. 40

### POST ONSITE TO POND A

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 10.06 cfs   |
| Storm frequency | = 10 yrs     | Time to peak       | = 722 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 26,768 cuft |
| Drainage area   | = 5.220 ac   | Curve number       | = 70          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 12.60 min   |
| Total precip.   | = 4.06 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |

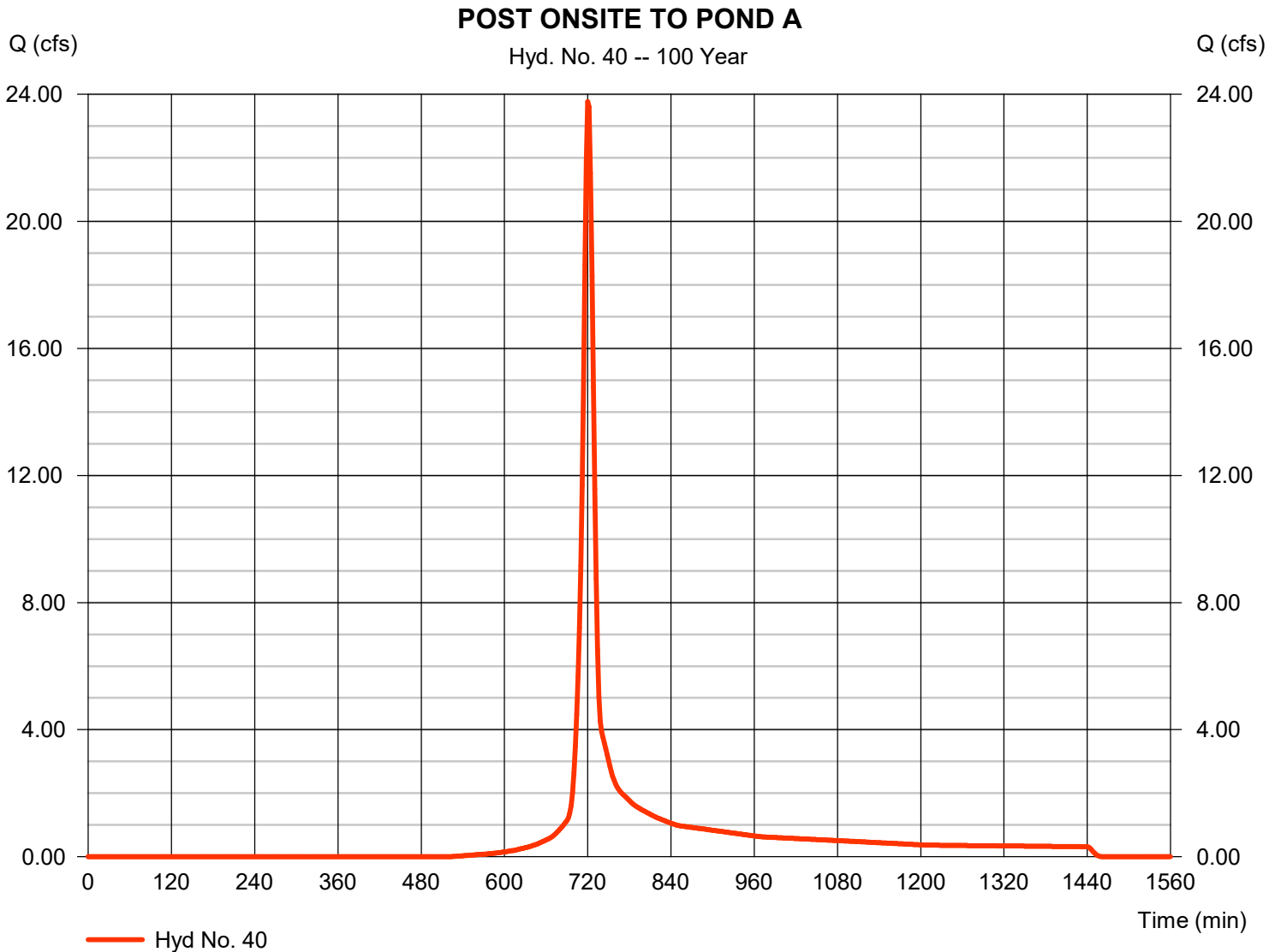


# Hydrograph Report

## Hyd. No. 40

### POST ONSITE TO POND A

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 23.77 cfs   |
| Storm frequency | = 100 yrs    | Time to peak       | = 720 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 61,716 cuft |
| Drainage area   | = 5.220 ac   | Curve number       | = 70          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 12.60 min   |
| Total precip.   | = 6.44 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |





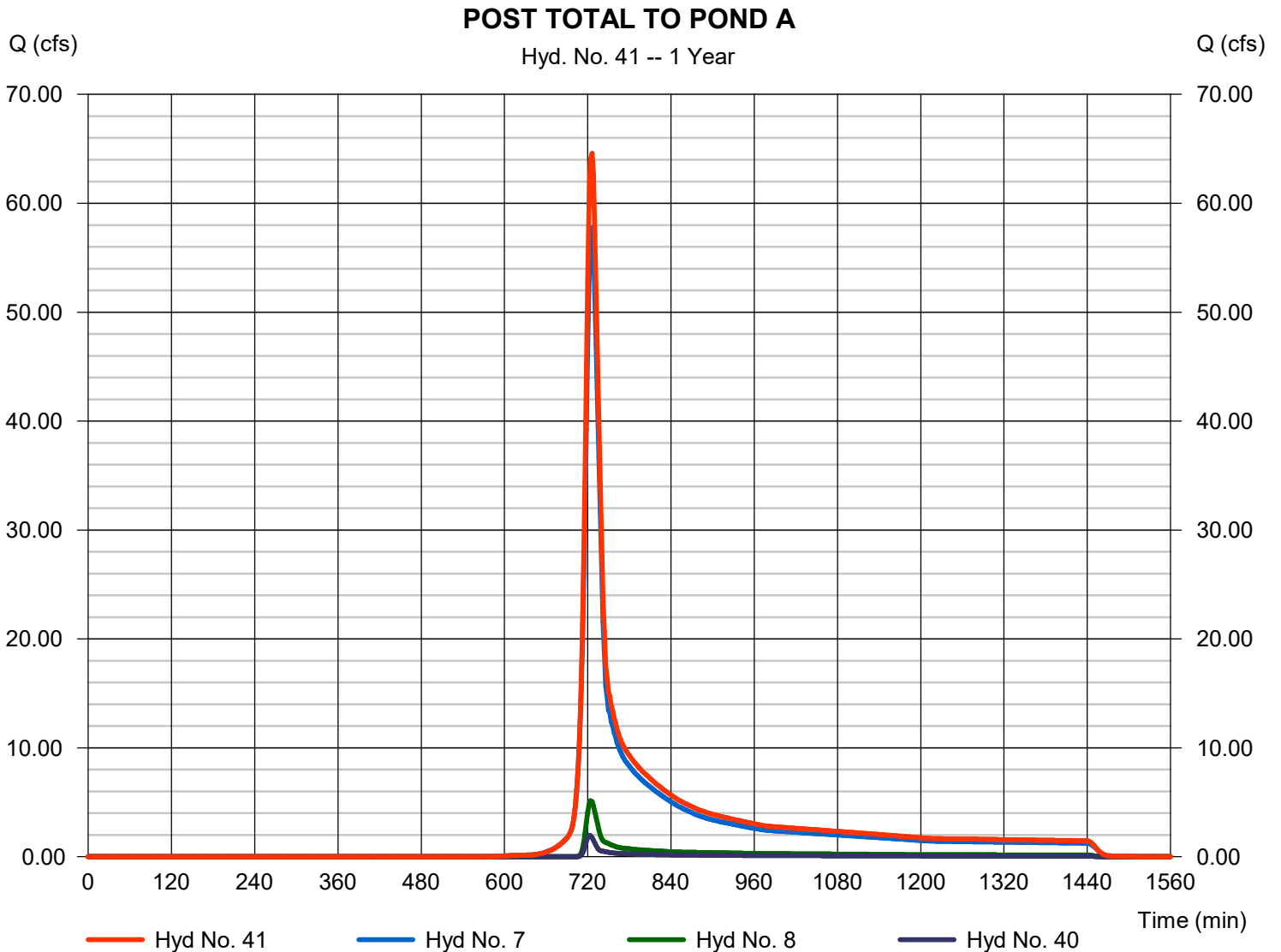
# Hydrograph Report

## Hyd. No. 41

### POST TOTAL TO POND A

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 8, 40

Peak discharge = 64.58 cfs  
Time to peak = 726 min  
Hyd. volume = 235,385 cuft  
Contrib. drain. area = 19.280 ac



# Hydrograph Report

## Hyd. No. 41

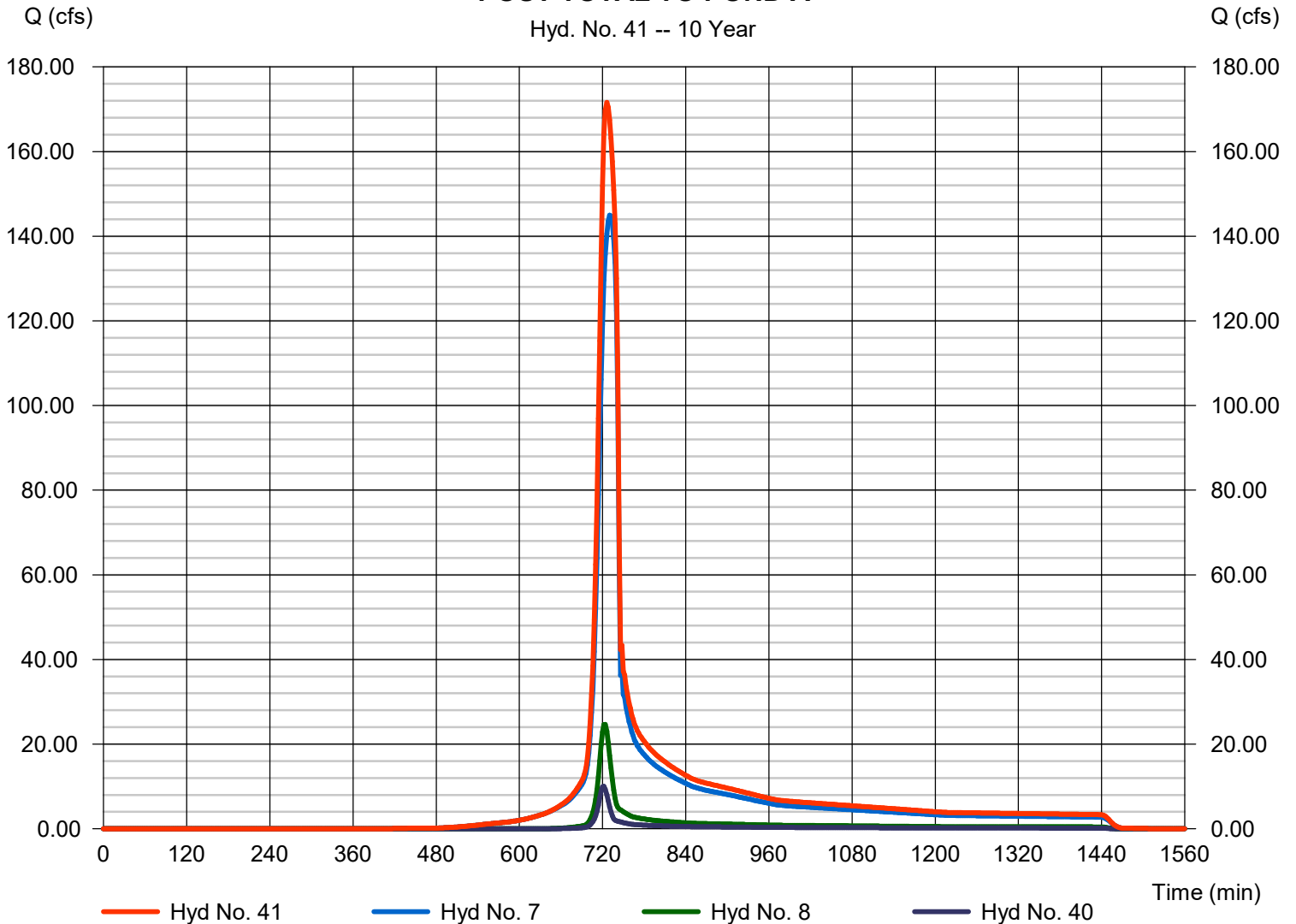
### POST TOTAL TO POND A

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 8, 40

Peak discharge = 171.65 cfs  
Time to peak = 726 min  
Hyd. volume = 670,863 cuft  
Contrib. drain. area = 19.280 ac

### POST TOTAL TO POND A

Hyd. No. 41 -- 10 Year



# Hydrograph Report

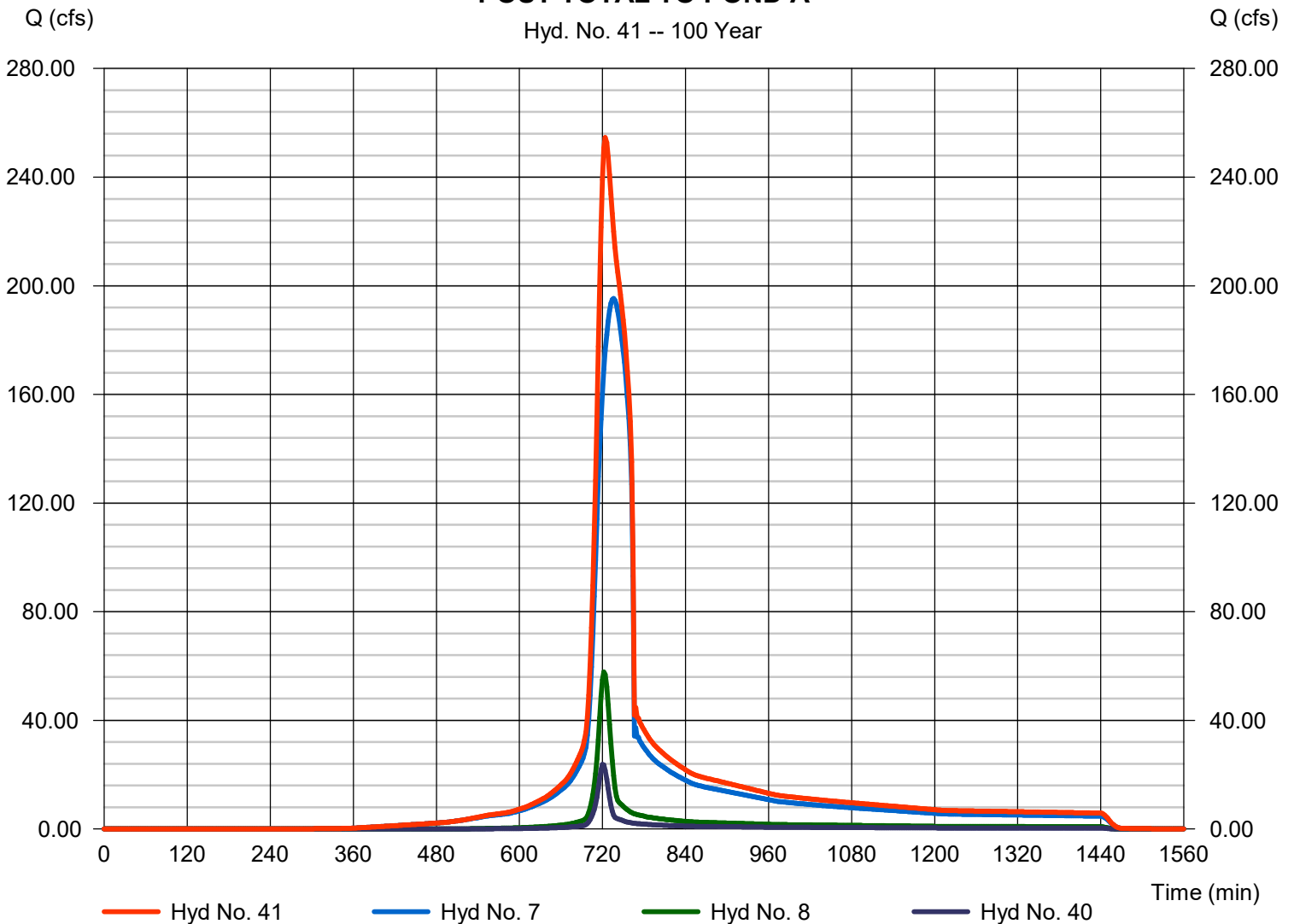
## Hyd. No. 41

### POST TOTAL TO POND A

|                 |            |                      |                  |
|-----------------|------------|----------------------|------------------|
| Hydrograph type | = Combine  | Peak discharge       | = 254.60 cfs     |
| Storm frequency | = 100 yrs  | Time to peak         | = 724 min        |
| Time interval   | = 2 min    | Hyd. volume          | = 1,341,616 cuft |
| Inflow hyds.    | = 7, 8, 40 | Contrib. drain. area | = 19.280 ac      |

### POST TOTAL TO POND A

Hyd. No. 41 -- 100 Year



# Pond Report

## Pond No. 4 - Pond A-Upgraded TOB Pond

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 2018.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 2018.00        | 83                  | 0                    | 0                    |
| 1.00       | 2019.00        | 3,642               | 1,425                | 1,425                |
| 2.00       | 2020.00        | 10,579              | 6,809                | 8,233                |
| 3.00       | 2021.00        | 20,129              | 15,099               | 23,332               |
| 4.00       | 2022.00        | 29,963              | 24,881               | 48,213               |
| 5.00       | 2023.00        | 41,854              | 35,740               | 83,953               |
| 6.00       | 2024.00        | 46,534              | 44,169               | 128,122              |
| 7.00       | 2025.00        | 50,637              | 48,566               | 176,688              |
| 8.00       | 2026.00        | 54,558              | 52,580               | 229,268              |
| 9.00       | 2027.00        | 58,136              | 56,332               | 285,600              |
| 10.00      | 2028.00        | 61,767              | 59,936               | 345,536              |
| 11.00      | 2029.00        | 66,552              | 64,138               | 409,675              |
| 12.00      | 2030.00        | 76,660              | 71,539               | 481,214              |
| 13.00      | 2031.00        | 89,870              | 83,169               | 564,383              |
| 14.00      | 2032.00        | 98,655              | 94,219               | 658,602              |
| 15.00      | 2033.00        | 106,518             | 102,551              | 761,153              |
| 16.00      | 2034.00        | 114,687             | 110,566              | 871,720              |
| 17.00      | 2035.00        | 123,559             | 119,084              | 990,803              |

### Culvert / Orifice Structures

|                 | [A]       | [B]     | [C]      | [PrfRsr] |
|-----------------|-----------|---------|----------|----------|
| Rise (in)       | = 30.00   | 12.00   | Inactive | 0.00     |
| Span (in)       | = 30.00   | 12.00   | 24.00    | 0.00     |
| No. Barrels     | = 1       | 1       | 2        | 0        |
| Invert El. (ft) | = 2017.50 | 2018.01 | 2028.50  | 0.00     |
| Length (ft)     | = 185.00  | 0.50    | 100.00   | 0.00     |
| Slope (%)       | = 1.08    | 1.00    | 5.00     | n/a      |
| N-Value         | = .013    | .013    | .013     | n/a      |
| Orifice Coeff.  | = 0.60    | 0.60    | 0.60     | 0.60     |
| Multi-Stage     | = n/a     | Yes     | No       | No       |

### Weir Structures

|                | [A]                   | [B]      | [C]     | [D]  |
|----------------|-----------------------|----------|---------|------|
| Crest Len (ft) | = 13.20               | Inactive | 1.50    | 0.00 |
| Crest El. (ft) | = 2027.50             | 2029.50  | 2024.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60     | 3.33    | 3.33 |
| Weir Type      | = 1                   | Broad    | Rect    | ---  |
| Multi-Stage    | = Yes                 | No       | Yes     | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |          |         |      |
| TW Elev. (ft)  | = 0.00                |          |         |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

### Stage / Storage / Discharge Table

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 0.00     | 0            | 2018.00      | 0.00      | 0.00      | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.000     |
| 0.10     | 142          | 2018.10      | 1.76 ic   | 0.04 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.036     |
| 0.20     | 285          | 2018.20      | 1.76 ic   | 0.16 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.158     |
| 0.30     | 427          | 2018.30      | 1.76 ic   | 0.35 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.354     |
| 0.40     | 570          | 2018.40      | 1.76 ic   | 0.60 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.605     |
| 0.50     | 712          | 2018.50      | 1.76 ic   | 0.92 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 0.917     |
| 0.60     | 855          | 2018.60      | 1.76 ic   | 1.27 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 1.270     |
| 0.70     | 997          | 2018.70      | 1.76 ic   | 1.64 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 1.638     |
| 0.80     | 1,140        | 2018.80      | 2.09 ic   | 2.02 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 2.023     |
| 0.90     | 1,282        | 2018.90      | 2.46 ic   | 2.37 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 2.372     |
| 1.00     | 1,425        | 2019.00      | 2.73 ic   | 2.66 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 2.657     |
| 1.10     | 2,106        | 2019.10      | 2.90 ic   | 2.90 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 2.904     |
| 1.20     | 2,787        | 2019.20      | 3.17 ic   | 3.14 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 3.141     |
| 1.30     | 3,467        | 2019.30      | 3.36 ic   | 3.36 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 3.361     |
| 1.40     | 4,148        | 2019.40      | 3.64 ic   | 3.57 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 3.567     |
| 1.50     | 4,829        | 2019.50      | 3.81 ic   | 3.76 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 3.762     |
| 1.60     | 5,510        | 2019.60      | 3.98 ic   | 3.95 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 3.947     |
| 1.70     | 6,191        | 2019.70      | 4.16 ic   | 4.12 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.124     |
| 1.80     | 6,872        | 2019.80      | 4.34 ic   | 4.29 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.294     |
| 1.90     | 7,553        | 2019.90      | 4.52 ic   | 4.46 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.458     |
| 2.00     | 8,233        | 2020.00      | 4.71 ic   | 4.62 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.616     |
| 2.10     | 9,743        | 2020.10      | 4.90 ic   | 4.77 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.768     |
| 2.20     | 11,253       | 2020.20      | 4.92 ic   | 4.92 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 4.915     |
| 2.30     | 12,763       | 2020.30      | 5.10 ic   | 5.06 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.059     |
| 2.40     | 14,273       | 2020.40      | 5.30 ic   | 5.20 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.198     |

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 2.50     | 15,783       | 2020.50      | 5.33 ic   | 5.33 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.334     |
| 2.60     | 17,293       | 2020.60      | 5.50 ic   | 5.47 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.466     |
| 2.70     | 18,803       | 2020.70      | 5.71 ic   | 5.60 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.595     |
| 2.80     | 20,312       | 2020.80      | 5.72 ic   | 5.72 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.722     |
| 2.90     | 21,822       | 2020.90      | 5.93 ic   | 5.85 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.845     |
| 3.00     | 23,332       | 2021.00      | 5.97 ic   | 5.97 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 5.967     |
| 3.10     | 25,820       | 2021.10      | 6.14 ic   | 6.09 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.085     |
| 3.20     | 28,308       | 2021.20      | 6.20 ic   | 6.20 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.202     |
| 3.30     | 30,797       | 2021.30      | 6.36 ic   | 6.32 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.316     |
| 3.40     | 33,285       | 2021.40      | 6.42 ic   | 6.42 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.422     |
| 3.50     | 35,773       | 2021.50      | 6.59 ic   | 6.53 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.532     |
| 3.60     | 38,261       | 2021.60      | 6.63 ic   | 6.63 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.627     |
| 3.70     | 40,749       | 2021.70      | 6.82 ic   | 6.73 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.727     |
| 3.80     | 43,237       | 2021.80      | 6.83 ic   | 6.83 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.828     |
| 3.90     | 45,725       | 2021.90      | 7.05 ic   | 6.92 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 6.916     |
| 4.00     | 48,213       | 2022.00      | 7.05 ic   | 7.02 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.019     |
| 4.10     | 51,787       | 2022.10      | 7.10 ic   | 7.10 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.103     |
| 4.20     | 55,361       | 2022.20      | 7.28 ic   | 7.20 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.200     |
| 4.30     | 58,935       | 2022.30      | 7.30 ic   | 7.29 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.295     |
| 4.40     | 62,509       | 2022.40      | 7.52 ic   | 7.38 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.377     |
| 4.50     | 66,083       | 2022.50      | 7.52 ic   | 7.47 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.473     |
| 4.60     | 69,657       | 2022.60      | 7.56 ic   | 7.56 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.558     |
| 4.70     | 73,231       | 2022.70      | 7.76 ic   | 7.64 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.644     |
| 4.80     | 76,805       | 2022.80      | 7.76 ic   | 7.74 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.737     |
| 4.90     | 80,379       | 2022.90      | 7.81 ic   | 7.81 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.815     |
| 5.00     | 83,953       | 2023.00      | 8.00 ic   | 7.90 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.902     |
| 5.10     | 88,370       | 2023.10      | 8.00 ic   | 7.99 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 7.992     |
| 5.20     | 92,787       | 2023.20      | 8.07 ic   | 8.07 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.066     |
| 5.30     | 97,204       | 2023.30      | 8.25 ic   | 8.15 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.152     |
| 5.40     | 101,621      | 2023.40      | 8.25 ic   | 8.24 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.239     |
| 5.50     | 106,037      | 2023.50      | 8.31 ic   | 8.31 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.311     |
| 5.60     | 110,454      | 2023.60      | 8.50 ic   | 8.39 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.394     |
| 5.70     | 114,871      | 2023.70      | 8.50 ic   | 8.48 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.479     |
| 5.80     | 119,288      | 2023.80      | 8.55 ic   | 8.55 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.551     |
| 5.90     | 123,705      | 2023.90      | 8.76 ic   | 8.63 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.630     |
| 6.00     | 128,122      | 2024.00      | 8.76 ic   | 8.71 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.00     | ---      | ---       | ---      | 8.712     |
| 6.10     | 132,979      | 2024.10      | 9.01 ic   | 8.78 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.16     | ---      | ---       | ---      | 8.936     |
| 6.20     | 137,835      | 2024.20      | 9.29 ic   | 8.84 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.45     | ---      | ---       | ---      | 9.286     |
| 6.30     | 142,692      | 2024.30      | 9.79 ic   | 8.89 ic   | 0.00      | ---        | 0.00     | 0.00     | 0.82     | ---      | ---       | ---      | 9.713     |
| 6.40     | 147,548      | 2024.40      | 10.32 ic  | 8.94 ic   | 0.00      | ---        | 0.00     | 0.00     | 1.26     | ---      | ---       | ---      | 10.20     |
| 6.50     | 152,405      | 2024.50      | 10.86 ic  | 8.99 ic   | 0.00      | ---        | 0.00     | 0.00     | 1.77     | ---      | ---       | ---      | 10.75     |
| 6.60     | 157,262      | 2024.60      | 11.41 ic  | 9.04 ic   | 0.00      | ---        | 0.00     | 0.00     | 2.32     | ---      | ---       | ---      | 11.36     |
| 6.70     | 162,118      | 2024.70      | 12.00 ic  | 9.08 ic   | 0.00      | ---        | 0.00     | 0.00     | 2.92     | ---      | ---       | ---      | 12.00     |
| 6.80     | 166,975      | 2024.80      | 12.79 ic  | 9.12 ic   | 0.00      | ---        | 0.00     | 0.00     | 3.57     | ---      | ---       | ---      | 12.69     |
| 6.90     | 171,832      | 2024.90      | 13.42 ic  | 9.15 ic   | 0.00      | ---        | 0.00     | 0.00     | 4.26     | ---      | ---       | ---      | 13.42     |
| 7.00     | 176,688      | 2025.00      | 14.19 ic  | 9.20 ic   | 0.00      | ---        | 0.00     | 0.00     | 4.99     | ---      | ---       | ---      | 14.19     |
| 7.10     | 181,946      | 2025.10      | 15.02 ic  | 9.23 ic   | 0.00      | ---        | 0.00     | 0.00     | 5.76     | ---      | ---       | ---      | 15.00     |
| 7.20     | 187,204      | 2025.20      | 15.85 ic  | 9.27 ic   | 0.00      | ---        | 0.00     | 0.00     | 6.57     | ---      | ---       | ---      | 15.83     |
| 7.30     | 192,462      | 2025.30      | 16.70 ic  | 9.30 ic   | 0.00      | ---        | 0.00     | 0.00     | 7.40     | ---      | ---       | ---      | 16.70     |
| 7.40     | 197,720      | 2025.40      | 17.72 ic  | 9.33 ic   | 0.00      | ---        | 0.00     | 0.00     | 8.27     | ---      | ---       | ---      | 17.60     |
| 7.50     | 202,978      | 2025.50      | 18.53 ic  | 9.36 ic   | 0.00      | ---        | 0.00     | 0.00     | 9.18     | ---      | ---       | ---      | 18.53     |
| 7.60     | 208,236      | 2025.60      | 19.49 ic  | 9.39 ic   | 0.00      | ---        | 0.00     | 0.00     | 10.11    | ---      | ---       | ---      | 19.49     |
| 7.70     | 213,494      | 2025.70      | 20.48 ic  | 9.41 ic   | 0.00      | ---        | 0.00     | 0.00     | 11.07    | ---      | ---       | ---      | 20.48     |
| 7.80     | 218,752      | 2025.80      | 21.52 ic  | 9.43 ic   | 0.00      | ---        | 0.00     | 0.00     | 12.06    | ---      | ---       | ---      | 21.49     |
| 7.90     | 224,010      | 2025.90      | 22.53 ic  | 9.45 ic   | 0.00      | ---        | 0.00     | 0.00     | 13.08    | ---      | ---       | ---      | 22.53     |
| 8.00     | 229,268      | 2026.00      | 23.59 ic  | 9.46 ic   | 0.00      | ---        | 0.00     | 0.00     | 14.13    | ---      | ---       | ---      | 23.59     |
| 8.10     | 234,901      | 2026.10      | 24.68 ic  | 9.48 ic   | 0.00      | ---        | 0.00     | 0.00     | 15.20    | ---      | ---       | ---      | 24.68     |
| 8.20     | 240,535      | 2026.20      | 25.77 ic  | 9.48 ic   | 0.00      | ---        | 0.00     | 0.00     | 16.30    | ---      | ---       | ---      | 25.77     |
| 8.30     | 246,168      | 2026.30      | 26.88 ic  | 9.46 ic   | 0.00      | ---        | 0.00     | 0.00     | 17.42    | ---      | ---       | ---      | 26.88     |
| 8.40     | 251,801      | 2026.40      | 28.02 ic  | 9.45 ic   | 0.00      | ---        | 0.00     | 0.00     | 18.57    | ---      | ---       | ---      | 28.02     |
| 8.50     | 257,434      | 2026.50      | 29.18 ic  | 9.43 ic   | 0.00      | ---        | 0.00     | 0.00     | 19.74    | ---      | ---       | ---      | 29.18     |
| 8.60     | 263,067      | 2026.60      | 30.35 ic  | 9.42 ic   | 0.00      | ---        | 0.00     | 0.00     | 20.94    | ---      | ---       | ---      | 30.35     |
| 8.70     | 268,701      | 2026.70      | 31.55 ic  | 9.39 ic   | 0.00      | ---        | 0.00     | 0.00     | 22.16    | ---      | ---       | ---      | 31.55     |
| 8.80     | 274,334      | 2026.80      | 32.76 ic  | 9.36 ic   | 0.00      | ---        | 0.00     | 0.00     | 23.40    | ---      | ---       | ---      | 32.76     |
| 8.90     | 279,967      | 2026.90      | 33.99 ic  | 9.32 ic   | 0.00      | ---        | 0.00     | 0.00     | 24.67    | ---      | ---       | ---      | 33.99     |
| 9.00     | 285,600      | 2027.00      | 35.24 ic  | 9.28 ic   | 0.00      | ---        | 0.00     | 0.00     | 25.95    | ---      | ---       | ---      | 35.24     |
| 9.10     | 291,594      | 2027.10      | 36.50 ic  | 9.23 ic   | 0.00      | ---        | 0.00     | 0.00     | 27.26    | ---      | ---       | ---      | 36.50     |
| 9.20     | 297,587      | 2027.20      | 37.77 ic  | 9.18 ic   | 0.00      | ---        | 0.00     | 0.00     | 28.59    | ---      | ---       | ---      | 37.77     |
| 9.30     | 303,581      | 2027.30      | 39.06 ic  | 9.12 ic   | 0.00      | ---        | 0.00     | 0.00     | 29.94    | ---      | ---       | ---      | 39.06     |
| 9.40     | 309,575      | 2027.40      | 40.37 ic  | 9.05 ic   | 0.00      | ---        | 0.00     | 0.00     | 31.31    | ---      | ---       | ---      | 40.37     |
| 9.50     | 315,568      | 2027.50      | 41.68 ic  | 8.98 ic   | 0.00      | ---        | 0.00     | 0.00     | 32.71    | ---      | ---       | ---      | 41.68     |
| 9.60     | 321,562      | 2027.60      | 44.25 ic  | 8.74 ic   | 0.00      | ---        | 1.39     | 0.00     | 34.12    | ---      | ---       | ---      | 44.24     |



**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 9.70     | 327,555      | 2027.70      | 47.81 ic  | 8.33 ic   | 0.00      | ---        | 3.93     | 0.00     | 35.55    | ---      | ---       | ---      | 47.81     |
| 9.80     | 333,549      | 2027.80      | 51.98 ic  | 7.76 ic   | 0.00      | ---        | 7.22     | 0.00     | 37.00    | ---      | ---       | ---      | 51.97     |
| 9.90     | 339,543      | 2027.90      | 55.99 oc  | 7.02 ic   | 0.00      | ---        | 11.11    | 0.00     | 37.87 s  | ---      | ---       | ---      | 55.99     |
| 10.00    | 345,536      | 2028.00      | 59.14 oc  | 6.32 ic   | 0.00      | ---        | 15.54    | 0.00     | 37.28 s  | ---      | ---       | ---      | 59.14     |
| 10.10    | 351,950      | 2028.10      | 61.91 oc  | 5.62 ic   | 0.00      | ---        | 20.43    | 0.00     | 35.87 s  | ---      | ---       | ---      | 61.91     |
| 10.20    | 358,364      | 2028.20      | 64.36 oc  | 4.89 ic   | 0.00      | ---        | 25.74    | 0.00     | 33.73 s  | ---      | ---       | ---      | 64.36     |
| 10.30    | 364,778      | 2028.30      | 66.48 oc  | 4.14 ic   | 0.00      | ---        | 31.45    | 0.00     | 30.90 s  | ---      | ---       | ---      | 66.48     |
| 10.40    | 371,192      | 2028.40      | 68.21 oc  | 3.42 ic   | 0.00      | ---        | 37.12 s  | 0.00     | 27.66 s  | ---      | ---       | ---      | 68.21     |
| 10.50    | 377,605      | 2028.50      | 69.17 oc  | 3.04 ic   | 0.00      | ---        | 40.12 s  | 0.00     | 26.01 s  | ---      | ---       | ---      | 69.17     |
| 10.60    | 384,019      | 2028.60      | 69.92 oc  | 2.75 ic   | 0.00      | ---        | 42.38 s  | 0.00     | 24.79 s  | ---      | ---       | ---      | 69.92     |
| 10.70    | 390,433      | 2028.70      | 70.57 oc  | 2.52 ic   | 0.00      | ---        | 44.26 s  | 0.00     | 23.78 s  | ---      | ---       | ---      | 70.56     |
| 10.80    | 396,847      | 2028.80      | 71.14 oc  | 2.33 ic   | 0.00      | ---        | 45.90 s  | 0.00     | 22.90 s  | ---      | ---       | ---      | 71.13     |
| 10.90    | 403,261      | 2028.90      | 71.66 oc  | 2.16 ic   | 0.00      | ---        | 47.35 s  | 0.00     | 22.14 s  | ---      | ---       | ---      | 71.65     |
| 11.00    | 409,675      | 2029.00      | 72.14 oc  | 2.01 ic   | 0.00      | ---        | 48.66 s  | 0.00     | 21.46 s  | ---      | ---       | ---      | 72.13     |
| 11.10    | 416,829      | 2029.10      | 72.59 oc  | 1.88 ic   | 0.00      | ---        | 49.85 s  | 0.00     | 20.86 s  | ---      | ---       | ---      | 72.58     |
| 11.20    | 423,983      | 2029.20      | 73.03 oc  | 1.76 ic   | 0.00      | ---        | 50.95 s  | 0.00     | 20.32 s  | ---      | ---       | ---      | 73.02     |
| 11.30    | 431,136      | 2029.30      | 73.44 oc  | 1.66 ic   | 0.00      | ---        | 51.95 s  | 0.00     | 19.82 s  | ---      | ---       | ---      | 73.44     |
| 11.40    | 438,290      | 2029.40      | 73.84 oc  | 1.57 ic   | 0.00      | ---        | 52.89 s  | 0.00     | 19.37 s  | ---      | ---       | ---      | 73.83     |
| 11.50    | 445,444      | 2029.50      | 74.22 oc  | 1.48 ic   | 0.00      | ---        | 53.77 s  | 0.00     | 18.97 s  | ---      | ---       | ---      | 74.22     |
| 11.60    | 452,598      | 2029.60      | 74.60 oc  | 1.41 ic   | 0.00      | ---        | 54.59 s  | 0.00     | 18.60 s  | ---      | ---       | ---      | 74.60     |
| 11.70    | 459,752      | 2029.70      | 74.97 oc  | 1.34 ic   | 0.00      | ---        | 55.37 s  | 0.00     | 18.25 s  | ---      | ---       | ---      | 74.97     |
| 11.80    | 466,906      | 2029.80      | 75.33 oc  | 1.28 ic   | 0.00      | ---        | 56.10 s  | 0.00     | 17.93 s  | ---      | ---       | ---      | 75.31     |
| 11.90    | 474,060      | 2029.90      | 75.68 oc  | 1.22 ic   | 0.00      | ---        | 56.80 s  | 0.00     | 17.64 s  | ---      | ---       | ---      | 75.66     |
| 12.00    | 481,214      | 2030.00      | 76.03 oc  | 1.17 ic   | 0.00      | ---        | 57.47 s  | 0.00     | 17.37 s  | ---      | ---       | ---      | 76.00     |
| 12.10    | 489,531      | 2030.10      | 76.37 oc  | 1.12 ic   | 0.00      | ---        | 58.12 s  | 0.00     | 17.13 s  | ---      | ---       | ---      | 76.37     |
| 12.20    | 497,848      | 2030.20      | 76.71 oc  | 1.07 ic   | 0.00      | ---        | 58.74 s  | 0.00     | 16.89 s  | ---      | ---       | ---      | 76.70     |
| 12.30    | 506,165      | 2030.30      | 77.05 oc  | 1.03 ic   | 0.00      | ---        | 59.33 s  | 0.00     | 16.68 s  | ---      | ---       | ---      | 77.03     |
| 12.40    | 514,482      | 2030.40      | 77.38 oc  | 0.99 ic   | 0.00      | ---        | 59.88 s  | 0.00     | 16.47 s  | ---      | ---       | ---      | 77.34     |
| 12.50    | 522,799      | 2030.50      | 77.71 oc  | 0.95 ic   | 0.00      | ---        | 60.45 s  | 0.00     | 16.29 s  | ---      | ---       | ---      | 77.69     |
| 12.60    | 531,116      | 2030.60      | 78.04 oc  | 0.92 ic   | 0.00      | ---        | 61.00 s  | 0.00     | 16.11 s  | ---      | ---       | ---      | 78.03     |
| 12.70    | 539,432      | 2030.70      | 78.36 oc  | 0.89 ic   | 0.00      | ---        | 61.51 s  | 0.00     | 15.95 s  | ---      | ---       | ---      | 78.35     |
| 12.80    | 547,749      | 2030.80      | 78.68 oc  | 0.86 ic   | 0.00      | ---        | 61.98 s  | 0.00     | 15.78 s  | ---      | ---       | ---      | 78.62     |
| 12.90    | 556,066      | 2030.90      | 79.00 oc  | 0.83 ic   | 0.00      | ---        | 62.50 s  | 0.00     | 15.65 s  | ---      | ---       | ---      | 78.97     |
| 13.00    | 564,383      | 2031.00      | 79.31 oc  | 0.80 ic   | 0.00      | ---        | 62.98 s  | 0.00     | 15.51 s  | ---      | ---       | ---      | 79.30     |
| 13.10    | 573,805      | 2031.10      | 79.63 oc  | 0.78 ic   | 0.00      | ---        | 63.45 s  | 0.00     | 15.38 s  | ---      | ---       | ---      | 79.61     |
| 13.20    | 583,227      | 2031.20      | 79.94 oc  | 0.76 ic   | 0.00      | ---        | 63.88 s  | 0.00     | 15.26 s  | ---      | ---       | ---      | 79.89     |
| 13.30    | 592,649      | 2031.30      | 80.25 oc  | 0.73 ic   | 0.00      | ---        | 64.35 s  | 0.00     | 15.15 s  | ---      | ---       | ---      | 80.24     |
| 13.40    | 602,071      | 2031.40      | 80.56 oc  | 0.71 ic   | 0.00      | ---        | 64.77 s  | 0.00     | 15.04 s  | ---      | ---       | ---      | 80.52     |
| 13.50    | 611,493      | 2031.50      | 80.86 oc  | 0.69 ic   | 0.00      | ---        | 65.19 s  | 0.00     | 14.94 s  | ---      | ---       | ---      | 80.82     |
| 13.60    | 620,914      | 2031.60      | 81.17 oc  | 0.67 ic   | 0.00      | ---        | 65.64 s  | 0.00     | 14.85 s  | ---      | ---       | ---      | 81.17     |
| 13.70    | 630,336      | 2031.70      | 81.47 oc  | 0.66 ic   | 0.00      | ---        | 66.04 s  | 0.00     | 14.76 s  | ---      | ---       | ---      | 81.46     |
| 13.80    | 639,758      | 2031.80      | 81.78 oc  | 0.64 ic   | 0.00      | ---        | 66.43 s  | 0.00     | 14.67 s  | ---      | ---       | ---      | 81.74     |
| 13.90    | 649,180      | 2031.90      | 82.08 oc  | 0.62 ic   | 0.00      | ---        | 66.78 s  | 0.00     | 14.58 s  | ---      | ---       | ---      | 81.98     |
| 14.00    | 658,602      | 2032.00      | 82.38 oc  | 0.61 ic   | 0.00      | ---        | 67.19 s  | 0.00     | 14.51 s  | ---      | ---       | ---      | 82.30     |
| 14.10    | 668,857      | 2032.10      | 82.67 oc  | 0.59 ic   | 0.00      | ---        | 67.63 s  | 0.00     | 14.45 s  | ---      | ---       | ---      | 82.67     |
| 14.20    | 679,112      | 2032.20      | 82.97 oc  | 0.58 ic   | 0.00      | ---        | 68.01 s  | 0.00     | 14.38 s  | ---      | ---       | ---      | 82.96     |
| 14.30    | 689,367      | 2032.30      | 83.26 oc  | 0.57 ic   | 0.00      | ---        | 68.38 s  | 0.00     | 14.31 s  | ---      | ---       | ---      | 83.26     |
| 14.40    | 699,623      | 2032.40      | 83.56 oc  | 0.55 ic   | 0.00      | ---        | 68.65 s  | 0.00     | 14.23 s  | ---      | ---       | ---      | 83.44     |
| 14.50    | 709,878      | 2032.50      | 83.85 oc  | 0.54 ic   | 0.00      | ---        | 69.09 s  | 0.00     | 14.19 s  | ---      | ---       | ---      | 83.82     |
| 14.60    | 720,133      | 2032.60      | 84.14 oc  | 0.53 ic   | 0.00      | ---        | 69.45 s  | 0.00     | 14.14 s  | ---      | ---       | ---      | 84.12     |
| 14.70    | 730,388      | 2032.70      | 84.43 oc  | 0.52 ic   | 0.00      | ---        | 69.70 s  | 0.00     | 14.06 s  | ---      | ---       | ---      | 84.28     |
| 14.80    | 740,643      | 2032.80      | 84.72 oc  | 0.51 ic   | 0.00      | ---        | 70.04 s  | 0.00     | 14.01 s  | ---      | ---       | ---      | 84.56     |
| 14.90    | 750,898      | 2032.90      | 85.01 oc  | 0.50 ic   | 0.00      | ---        | 70.46 s  | 0.00     | 13.98 s  | ---      | ---       | ---      | 84.94     |
| 15.00    | 761,153      | 2033.00      | 85.30 oc  | 0.49 ic   | 0.00      | ---        | 70.73 s  | 0.00     | 13.92 s  | ---      | ---       | ---      | 85.13     |
| 15.10    | 772,210      | 2033.10      | 85.58 oc  | 0.48 ic   | 0.00      | ---        | 71.18 s  | 0.00     | 13.90 s  | ---      | ---       | ---      | 85.56     |
| 15.20    | 783,266      | 2033.20      | 85.87 oc  | 0.47 ic   | 0.00      | ---        | 71.53 s  | 0.00     | 13.86 s  | ---      | ---       | ---      | 85.86     |
| 15.30    | 794,323      | 2033.30      | 86.15 oc  | 0.46 ic   | 0.00      | ---        | 71.86 s  | 0.00     | 13.83 s  | ---      | ---       | ---      | 86.15     |
| 15.40    | 805,380      | 2033.40      | 86.44 oc  | 0.45 ic   | 0.00      | ---        | 72.08 s  | 0.00     | 13.77 s  | ---      | ---       | ---      | 86.30     |
| 15.50    | 816,436      | 2033.50      | 86.72 oc  | 0.44 ic   | 0.00      | ---        | 72.48 s  | 0.00     | 13.75 s  | ---      | ---       | ---      | 86.67     |
| 15.60    | 827,493      | 2033.60      | 87.00 oc  | 0.43 ic   | 0.00      | ---        | 72.78 s  | 0.00     | 13.71 s  | ---      | ---       | ---      | 86.92     |
| 15.70    | 838,550      | 2033.70      | 87.28 oc  | 0.43 ic   | 0.00      | ---        | 73.06 s  | 0.00     | 13.68 s  | ---      | ---       | ---      | 87.16     |
| 15.80    | 849,606      | 2033.80      | 87.56 oc  | 0.42 ic   | 0.00      | ---        | 73.46 s  | 0.00     | 13.66 s  | ---      | ---       | ---      | 87.55     |
| 15.90    | 860,663      | 2033.90      | 87.84 oc  | 0.41 ic   | 0.00      | ---        | 73.63 s  | 0.00     | 13.61 s  | ---      | ---       | ---      | 87.65     |
| 16.00    | 871,720      | 2034.00      | 88.11 oc  | 0.40 ic   | 0.00      | ---        | 74.04 s  | 0.00     | 13.60 s  | ---      | ---       | ---      | 88.05     |
| 16.10    | 883,628      | 2034.10      | 88.39 oc  | 0.40 ic   | 0.00      | ---        | 74.35 s  | 0.00     | 13.58 s  | ---      | ---       | ---      | 88.32     |
| 16.20    | 895,536      | 2034.20      | 88.67 oc  | 0.39 ic   | 0.00      | ---        | 74.54 s  | 0.00     | 13.53 s  | ---      | ---       | ---      | 88.46     |
| 16.30    | 907,445      | 2034.30      | 88.94 oc  | 0.38 ic   | 0.00      | ---        | 74.95 s  | 0.00     | 13.53 s  | ---      | ---       | ---      | 88.87     |
| 16.40    | 919,353      | 2034.40      | 89.21 oc  | 0.38 ic   | 0.00      | ---        | 75.10 s  | 0.00     | 13.49 s  | ---      | ---       | ---      | 88.97     |
| 16.50    | 931,261      | 2034.50      | 89.49 oc  | 0.37 ic   | 0.00      | ---        | 75.43 s  | 0.00     | 13.47 s  | ---      | ---       | ---      | 89.27     |
| 16.60    | 943,170      | 2034.60      | 89.76 oc  | 0.37 ic   | 0.00      | ---        | 75.71 s  | 0.00     | 13.45 s  | ---      | ---       | ---      | 89.52     |
| 16.70    | 955,078      | 2034.70      | 90.03 oc  | 0.36 ic   | 0.00      | ---        | 76.01 s  | 0.00     | 13.44 s  | ---      | ---       | ---      | 89.81     |
| 16.80    | 966,987      | 2034.80      | 90.30 oc  | 0.35 ic   | 0.00      | ---        | 76.20 s  | 0.00     | 13.40 s  | ---      | ---       | ---      | 89.96     |

Pond A-Upgraded TOB Pond

**Stage / Storage / Discharge Table**

| Stage<br>ft | Storage<br>cuft | Elevation<br>ft | Clv A<br>cfs | Clv B<br>cfs | Clv C<br>cfs | PrfRsr<br>cfs | Wr A<br>cfs | Wr B<br>cfs | Wr C<br>cfs | Wr D<br>cfs | Exfil<br>cfs | User<br>cfs | Total<br>cfs |
|-------------|-----------------|-----------------|--------------|--------------|--------------|---------------|-------------|-------------|-------------|-------------|--------------|-------------|--------------|
| 16.90       | 978,895         | 2034.90         | 90.57 oc     | 0.35 ic      | 0.00         | ---           | 76.69 s     | 0.00        | 13.42 s     | ---         | ---          | ---         | 90.46        |
| 17.00       | 990,803         | 2035.00         | 90.84 oc     | 0.35 ic      | 0.00         | ---           | 77.03 s     | 0.00        | 13.42 s     | ---         | ---          | ---         | 90.79        |

...End

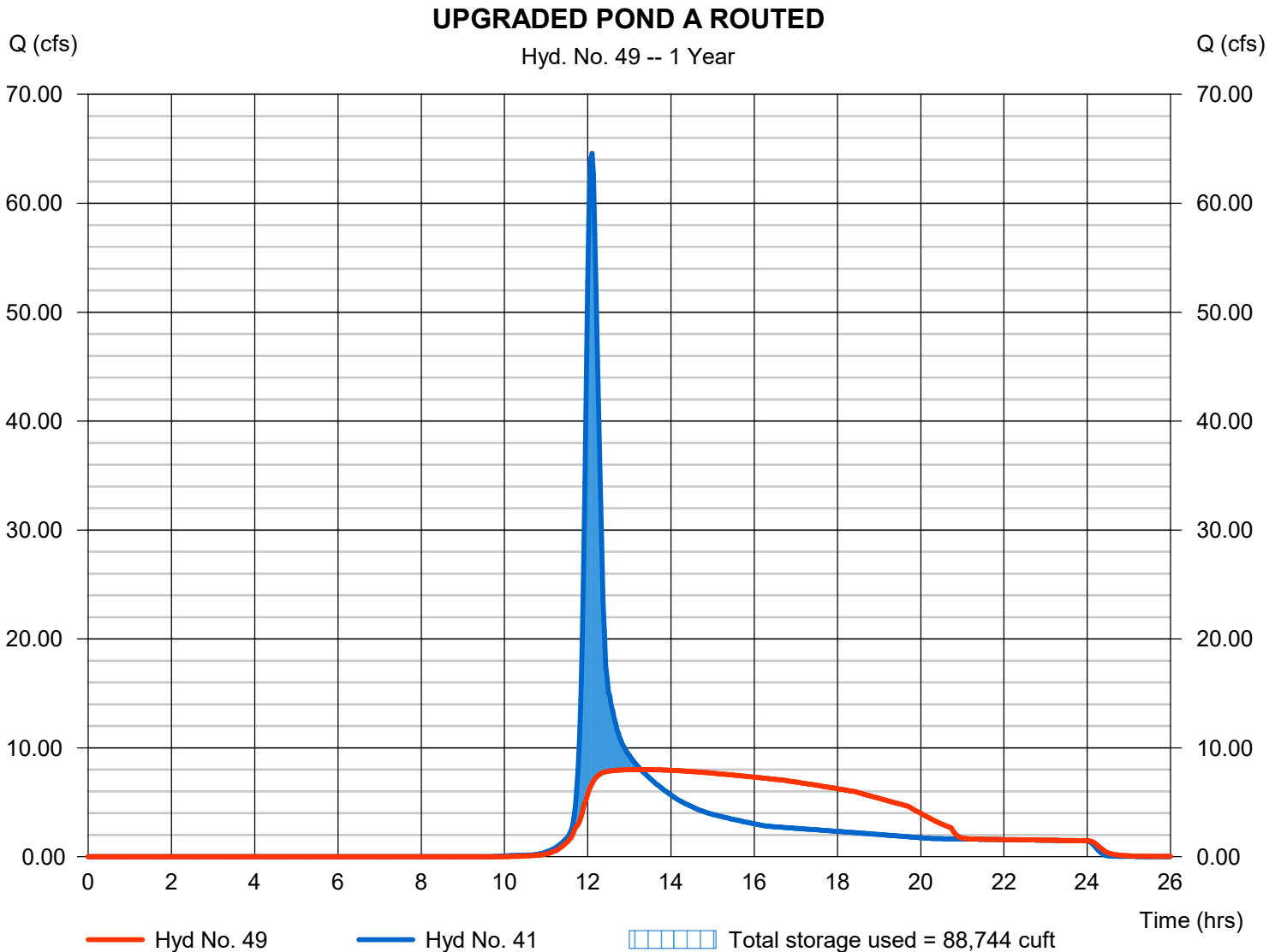
# Hydrograph Report

## Hyd. No. 49

### UPGRADED POND A ROUTED

|                 |                            |                |                |
|-----------------|----------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 7.998 cfs    |
| Storm frequency | = 1 yrs                    | Time to peak   | = 13.27 hrs    |
| Time interval   | = 2 min                    | Hyd. volume    | = 235,381 cuft |
| Inflow hyd. No. | = 41 - POST TOTAL TO POND  | Max. Elevation | = 2023.11 ft   |
| Reservoir name  | = Pond A-Upgraded TOB Pond | Max. Storage   | = 88,744 cuft  |

Storage Indication method used.



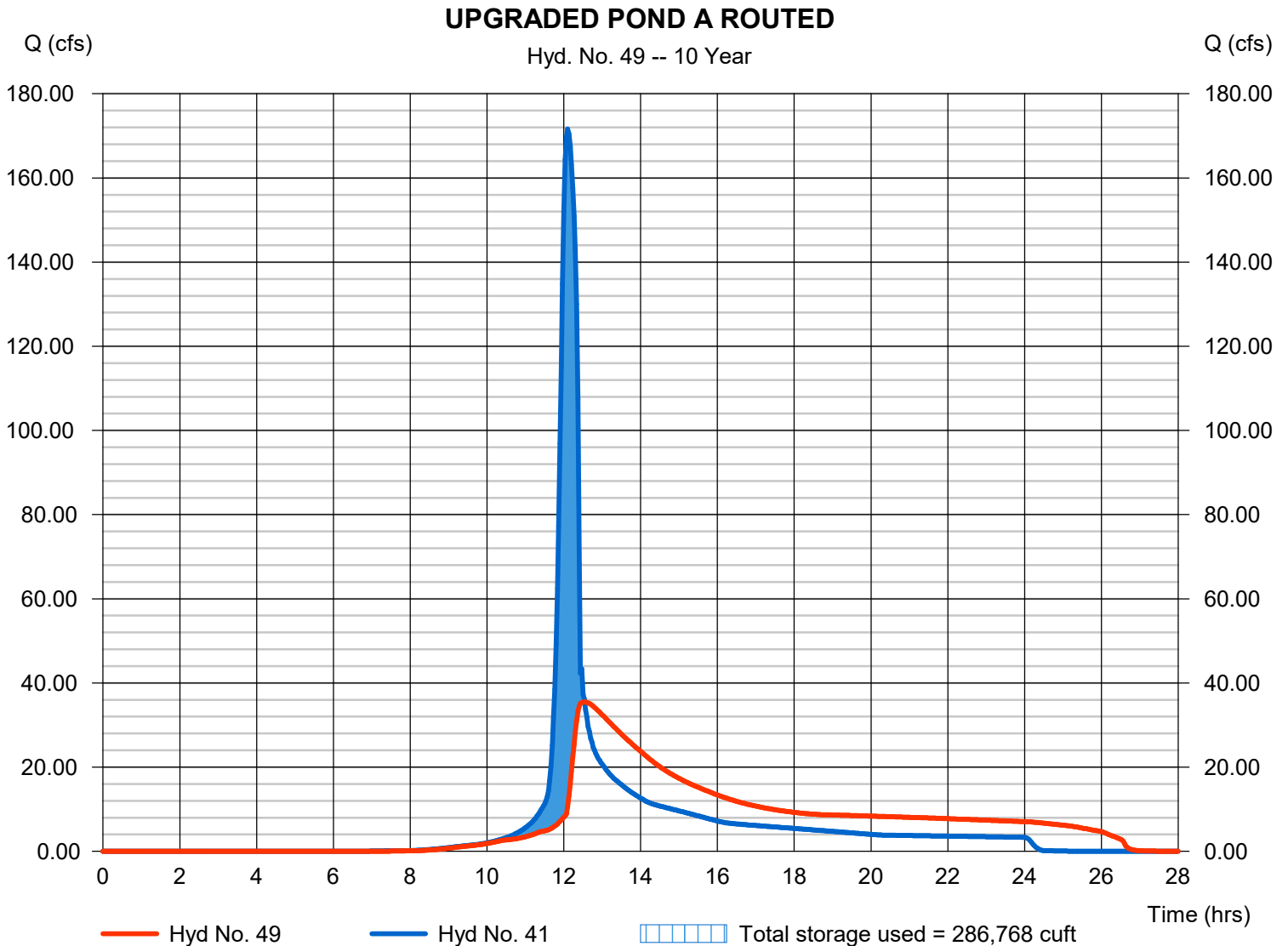
# Hydrograph Report

## Hyd. No. 49

### UPGRADED POND A ROUTED

|                 |                            |                |                |
|-----------------|----------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 35.48 cfs    |
| Storm frequency | = 10 yrs                   | Time to peak   | = 12.53 hrs    |
| Time interval   | = 2 min                    | Hyd. volume    | = 670,858 cuft |
| Inflow hyd. No. | = 41 - POST TOTAL TO POND  | Max. Elevation | = 2027.02 ft   |
| Reservoir name  | = Pond A-Upgraded TOB Pond | Max. Storage   | = 286,768 cuft |

Storage Indication method used.



# Hydrograph Report

## Hyd. No. 49

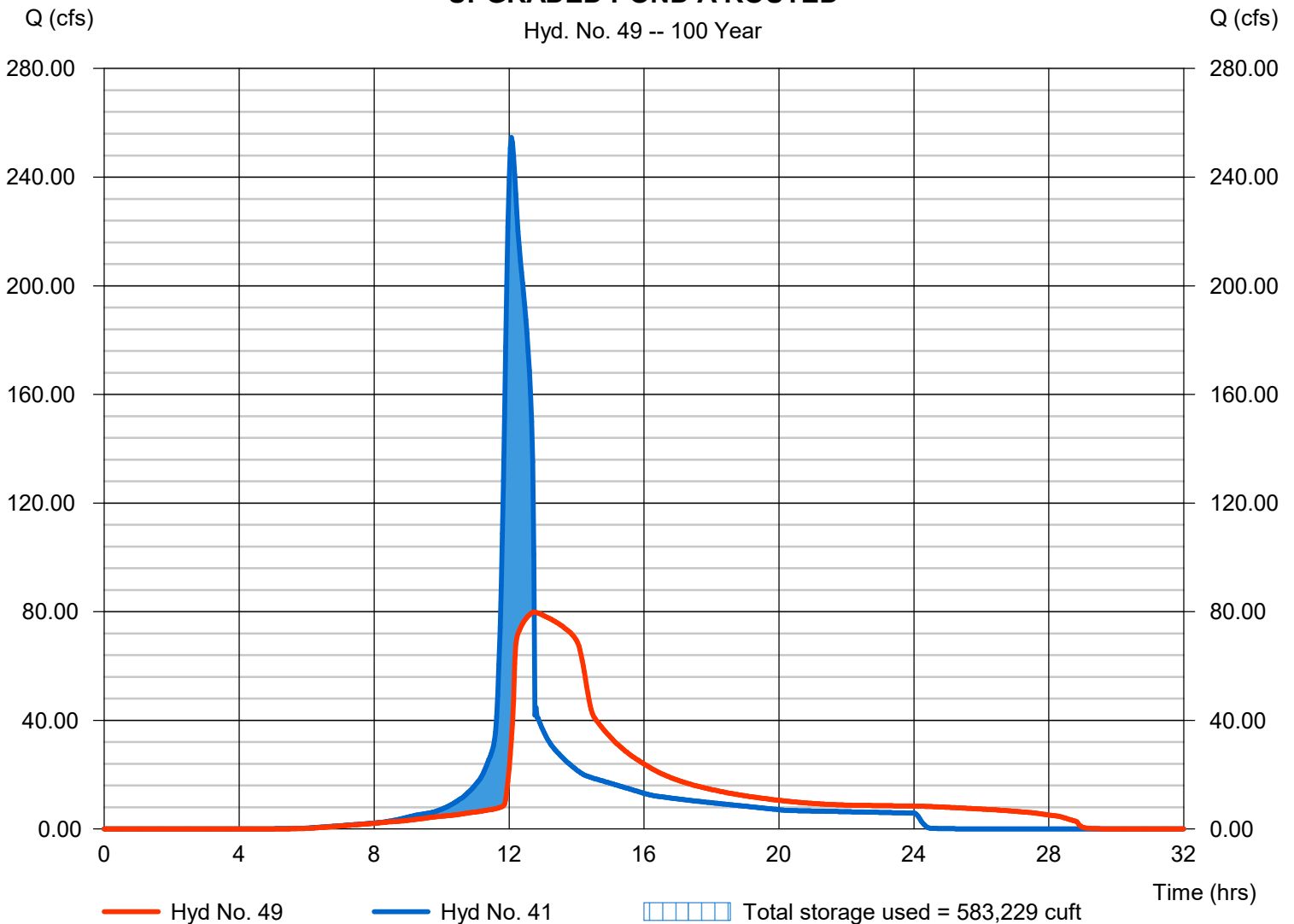
### UPGRADED POND A ROUTED

|                 |                            |                |                  |
|-----------------|----------------------------|----------------|------------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 79.89 cfs      |
| Storm frequency | = 100 yrs                  | Time to peak   | = 12.73 hrs      |
| Time interval   | = 2 min                    | Hyd. volume    | = 1,341,614 cuft |
| Inflow hyd. No. | = 41 - POST TOTAL TO POND  | Max. Elevation | = 2031.20 ft     |
| Reservoir name  | = Pond A-Upgraded TOB Pond | Max. Storage   | = 583,229 cuft   |

Storage Indication method used.

### UPGRADED POND A ROUTED

Hyd. No. 49 -- 100 Year



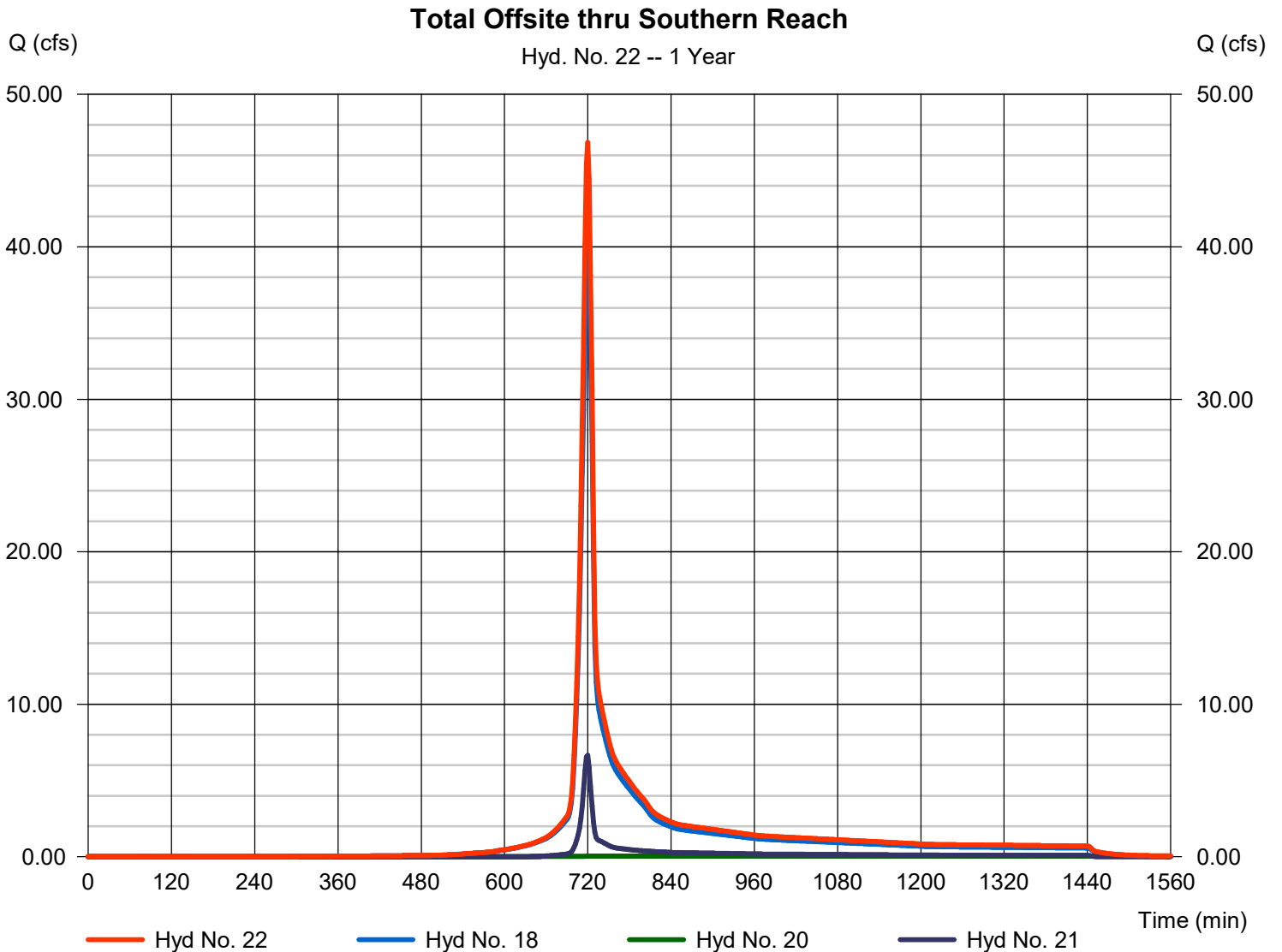
# Hydrograph Report

## Hyd. No. 22

Total Offsite thru Southern Reach

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 18, 20, 21

Peak discharge = 46.84 cfs  
Time to peak = 720 min  
Hyd. volume = 144,746 cuft  
Contrib. drain. area = 5.090 ac



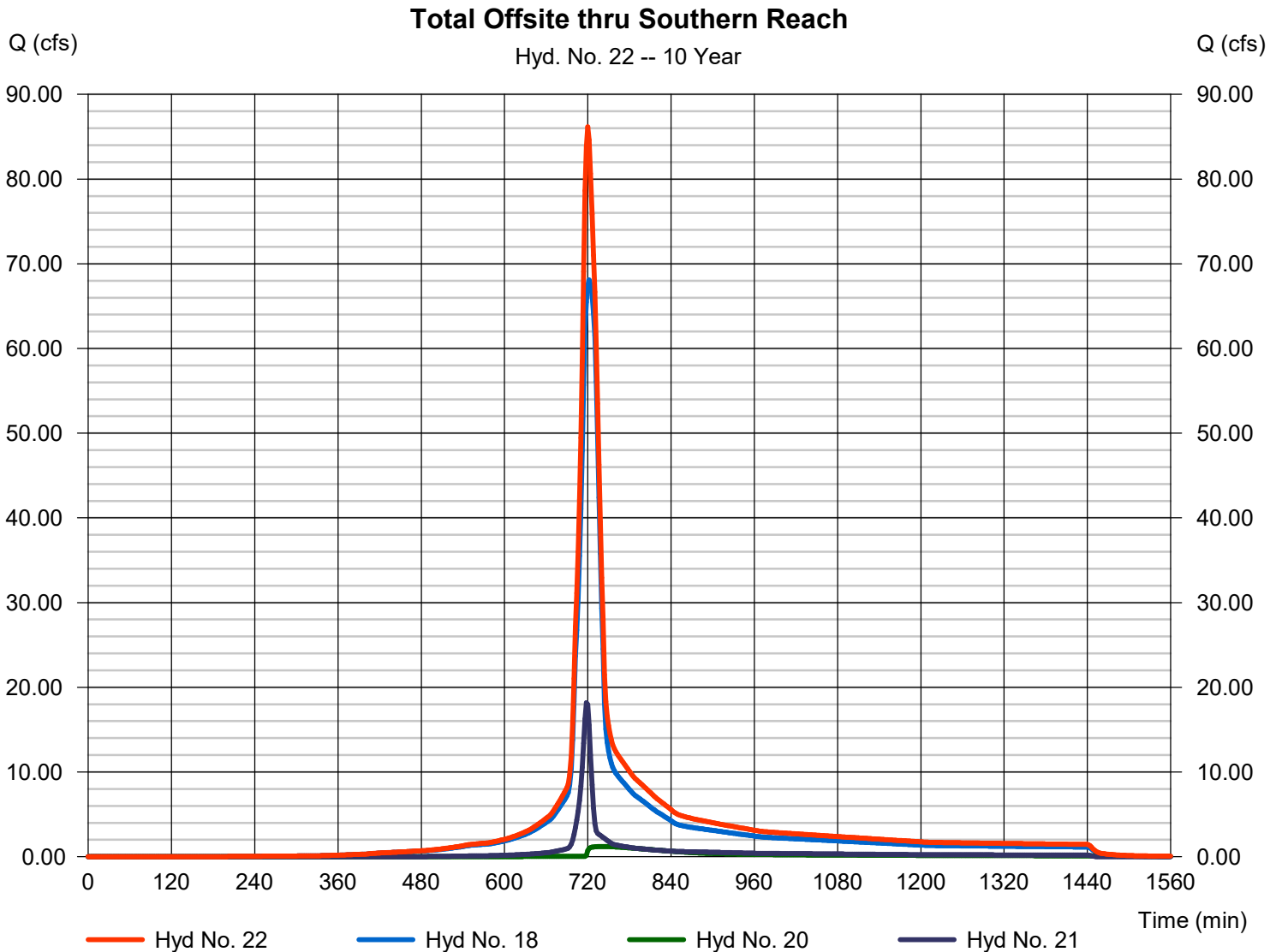
# Hydrograph Report

## Hyd. No. 22

Total Offsite thru Southern Reach

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 18, 20, 21

Peak discharge = 86.16 cfs  
Time to peak = 720 min  
Hyd. volume = 341,950 cuft  
Contrib. drain. area = 5.090 ac



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POST ONSITE TO POND B (S. DRY POND)**  
**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |                     |    |               |               | Notes:  |
|-----------------------------|-----------------------|---------------------|----|---------------|---------------|---|
|                             | Hydrologic Soil Group | Land Cover          | CN | Area, A (ac.) | CN*A          | Impervious lot area calculated using approx. driveway configurations and actual dwelling dimensions |
| CN <sub>1</sub>             | B                     | Open space          | 61 | 3.18          | 193.85        |   |
| CN <sub>2</sub>             | C                     | Open space          | 74 | 3.21          | 237.32        |   |
| CN <sub>3</sub>             | B                     | Imperv. (measured)  | 98 | 0.40          | 39.68         |   |
| CN <sub>4</sub>             | C                     | Imperv. (measured)  | 98 | 1.60          | 157.16        |   |
| CN <sub>5</sub>             | B                     | Imperv. (est. lots) | 98 | 0.16          | 15.34         |   |
| CN <sub>6</sub>             | C                     | Imperv. (est. lots) | 98 | 1.40          | 136.82        |   |
| CN <sub>7</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>8</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>9</sub>             |                       |                     |    |               | 0.00          |   |
| CN <sub>10</sub>            |                       |                     |    |               | 0.00          |   |
| Total                       |                       |                     |    | <b>9.95</b>   | <b>780.17</b> |   |
| <b>Composite CN =</b>       |                       |                     |    |               | <b>78</b>     |   |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.075         | 9.1                                |
| 2  | Shallow Conc. | Paved      | 72          |                     | 0.095         | 0.2                                |
| 3  | Channel       | HDPE Pipe  | 997         | 0.012               | 0.07237       | 1.1                                |
| 4  |               |            |             |                     |               |                                    |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>10.4</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 78    | 78     | 78      |
| Storage (in.) S=1000/CN-10   | 2.82  | 2.82   | 2.82    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.56  | 0.56   | 0.56    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.64  | 1.93   | 3.97    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.53  | 1.60   | 3.29    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 8.68  | 27.73  | 56.76   |

Hydrograph Number: 43

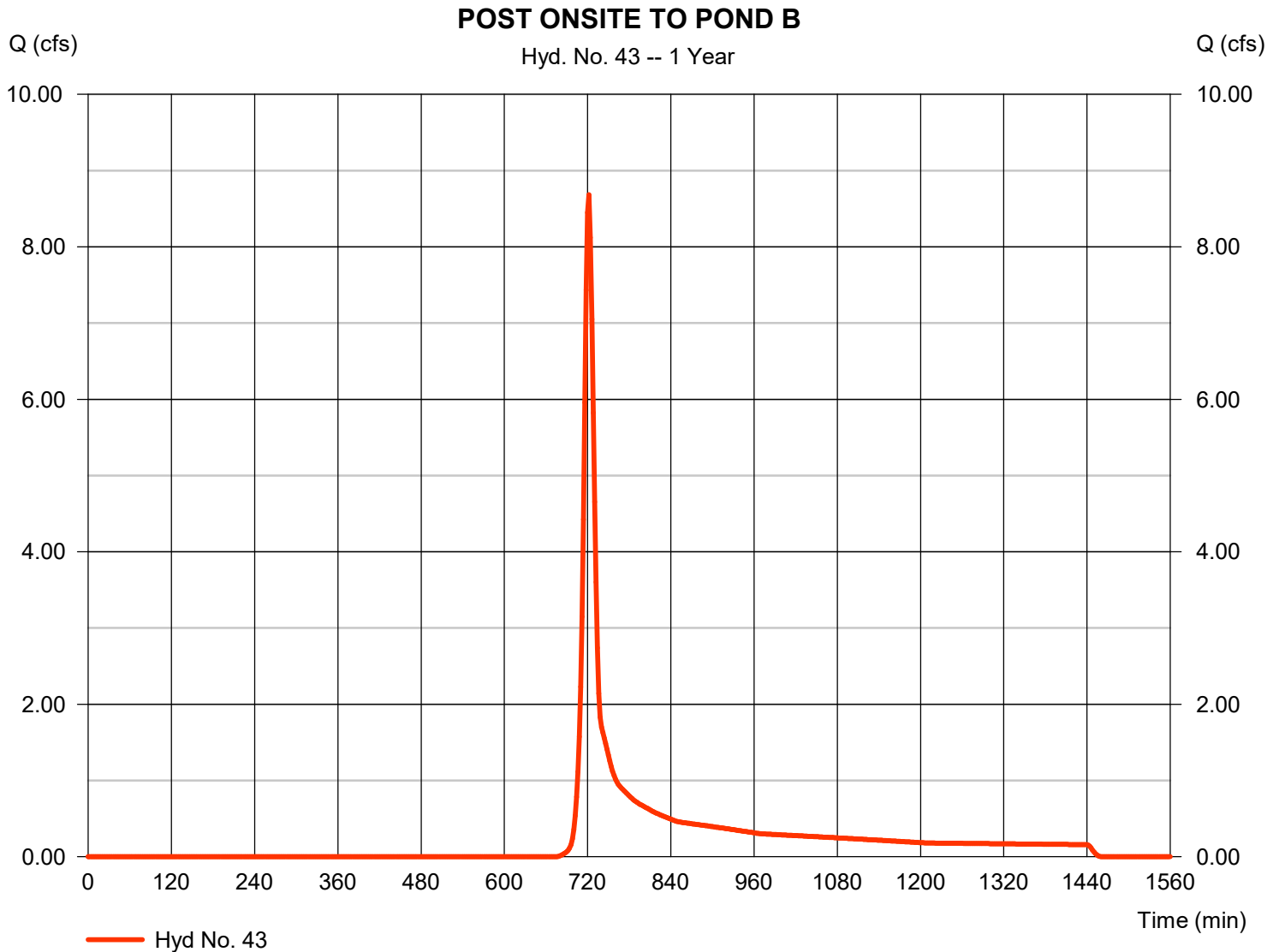


# Hydrograph Report

## Hyd. No. 43

### POST ONSITE TO POND B

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 8.684 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 23,719 cuft |
| Drainage area   | = 9.950 ac   | Curve number       | = 78          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 10.40 min   |
| Total precip.   | = 2.26 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |

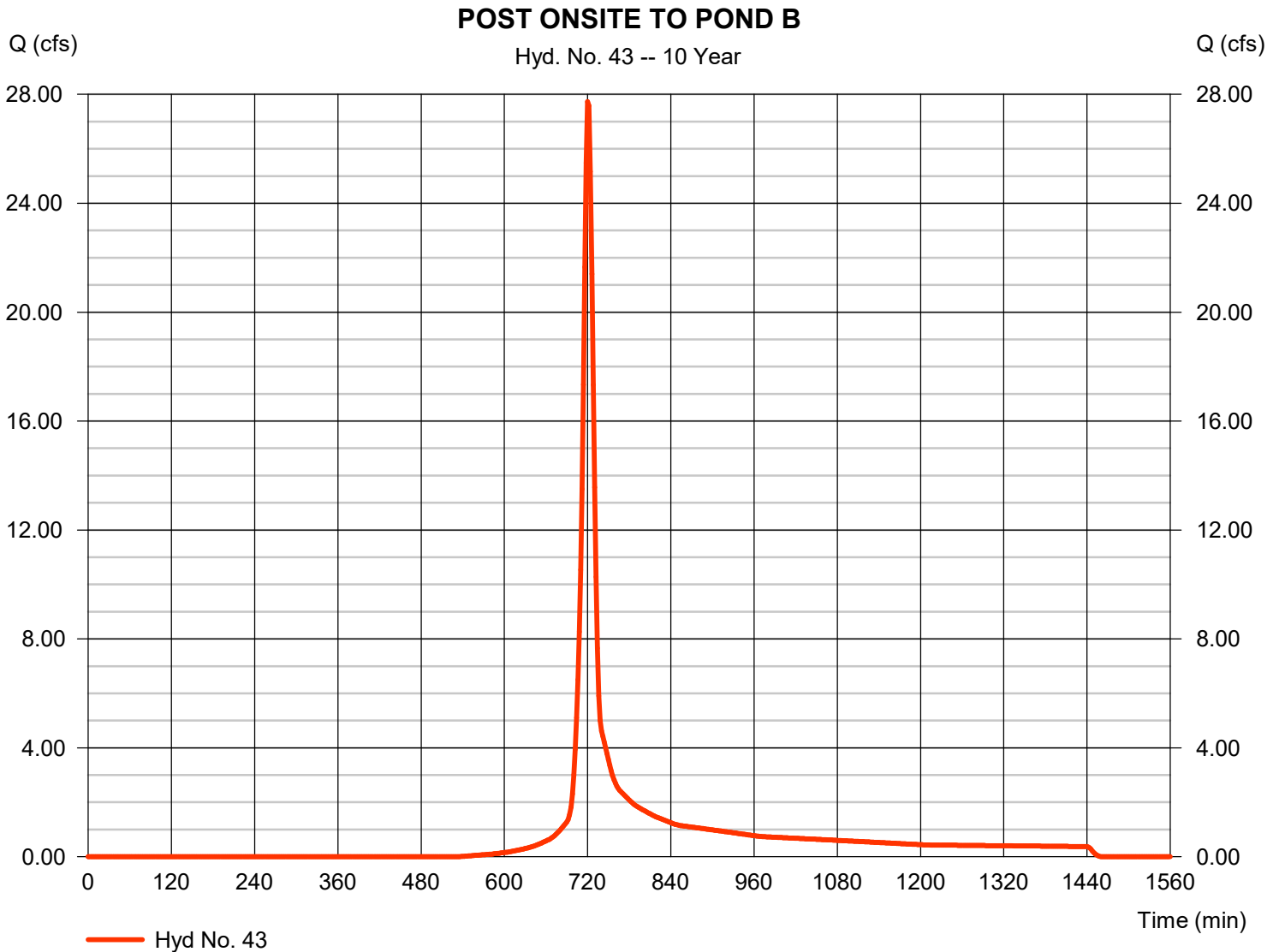


# Hydrograph Report

## Hyd. No. 43

### POST ONSITE TO POND B

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 27.73 cfs   |
| Storm frequency | = 10 yrs     | Time to peak       | = 720 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 72,068 cuft |
| Drainage area   | = 9.950 ac   | Curve number       | = 78          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 10.40 min   |
| Total precip.   | = 4.06 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |



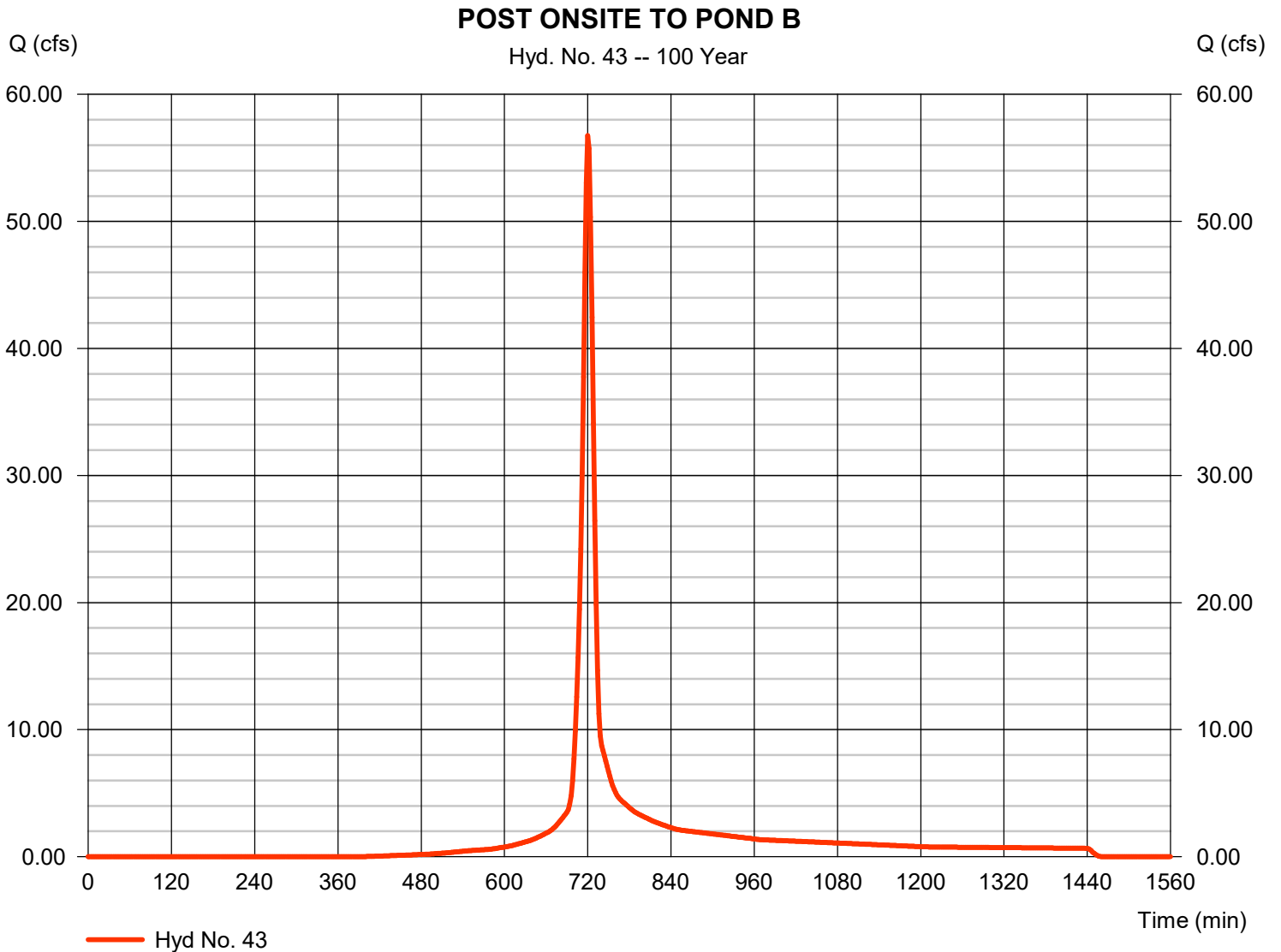
# Hydrograph Report

## Hyd. No. 43

### POST ONSITE TO POND B

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 2 min  
Drainage area = 9.950 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 6.44 in  
Storm duration = 24 hrs

Peak discharge = 56.76 cfs  
Time to peak = 720 min  
Hyd. volume = 147,877 cuft  
Curve number = 78  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 10.40 min  
Distribution = Type II  
Shape factor = 484



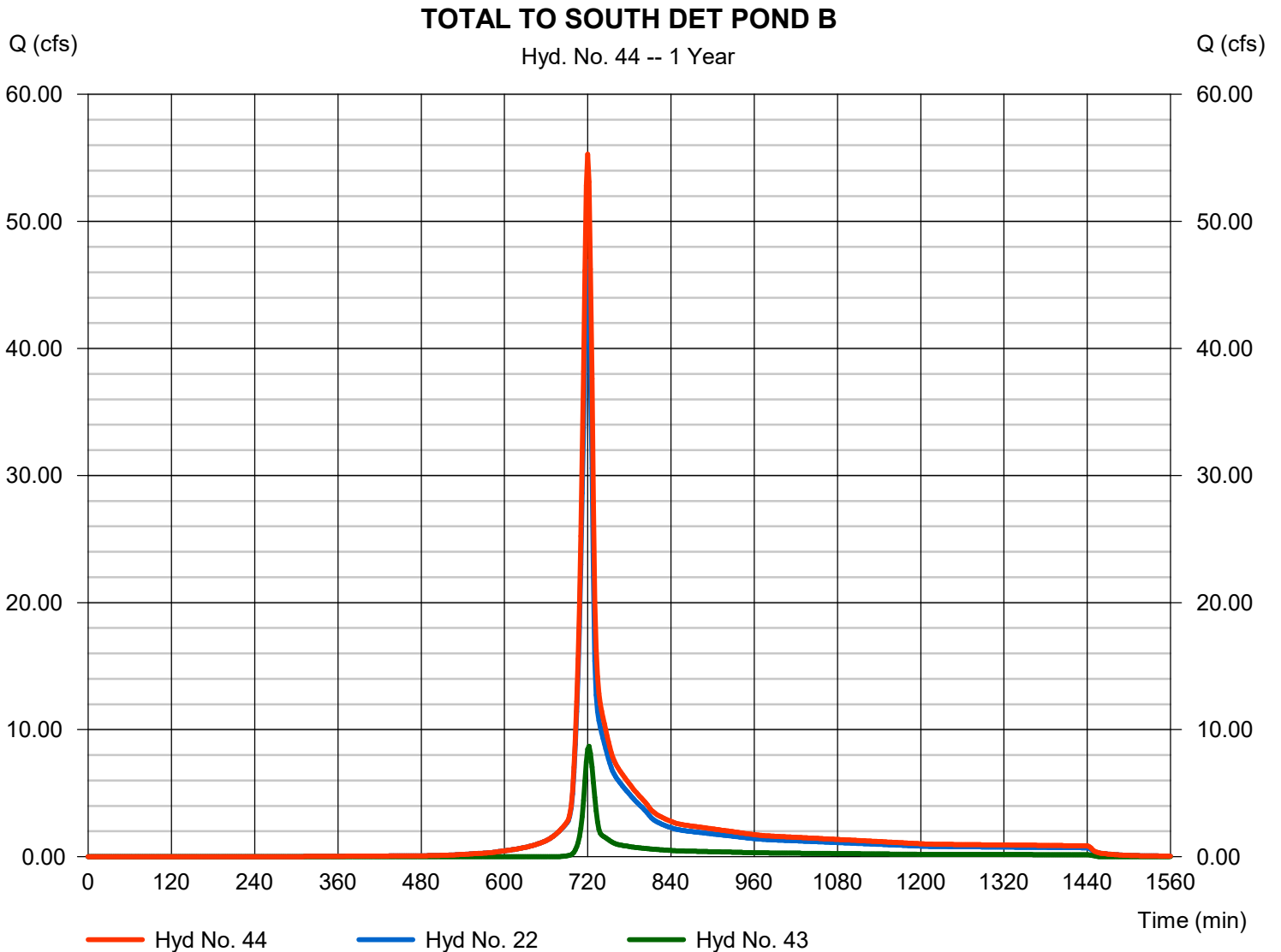
# Hydrograph Report

## Hyd. No. 44

### TOTAL TO SOUTH DET POND B

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 22, 43

Peak discharge = 55.29 cfs  
Time to peak = 720 min  
Hyd. volume = 168,465 cuft  
Contrib. drain. area = 9.950 ac



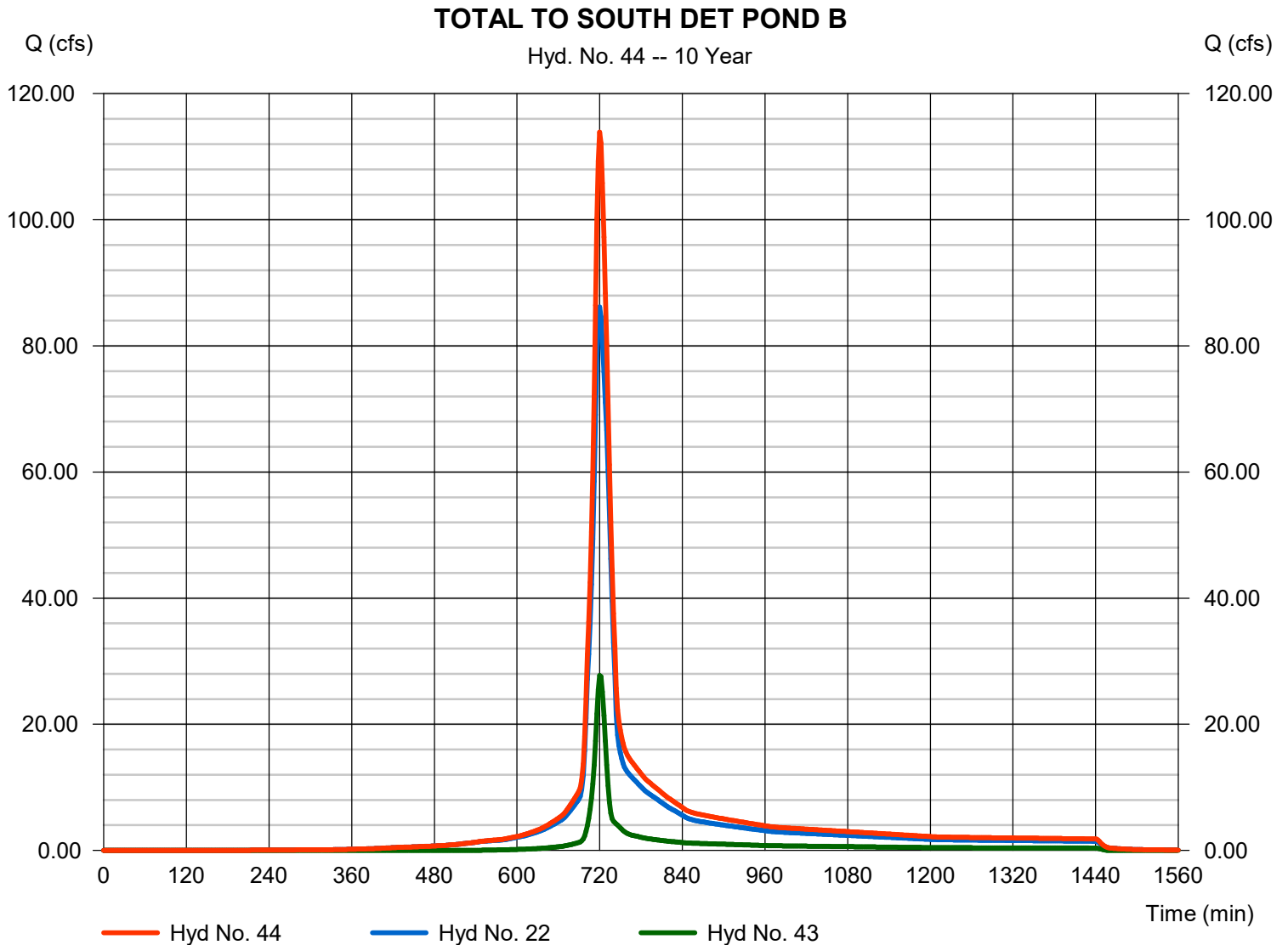
# Hydrograph Report

## Hyd. No. 44

### TOTAL TO SOUTH DET POND B

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 22, 43

Peak discharge = 113.88 cfs  
Time to peak = 720 min  
Hyd. volume = 414,018 cuft  
Contrib. drain. area = 9.950 ac



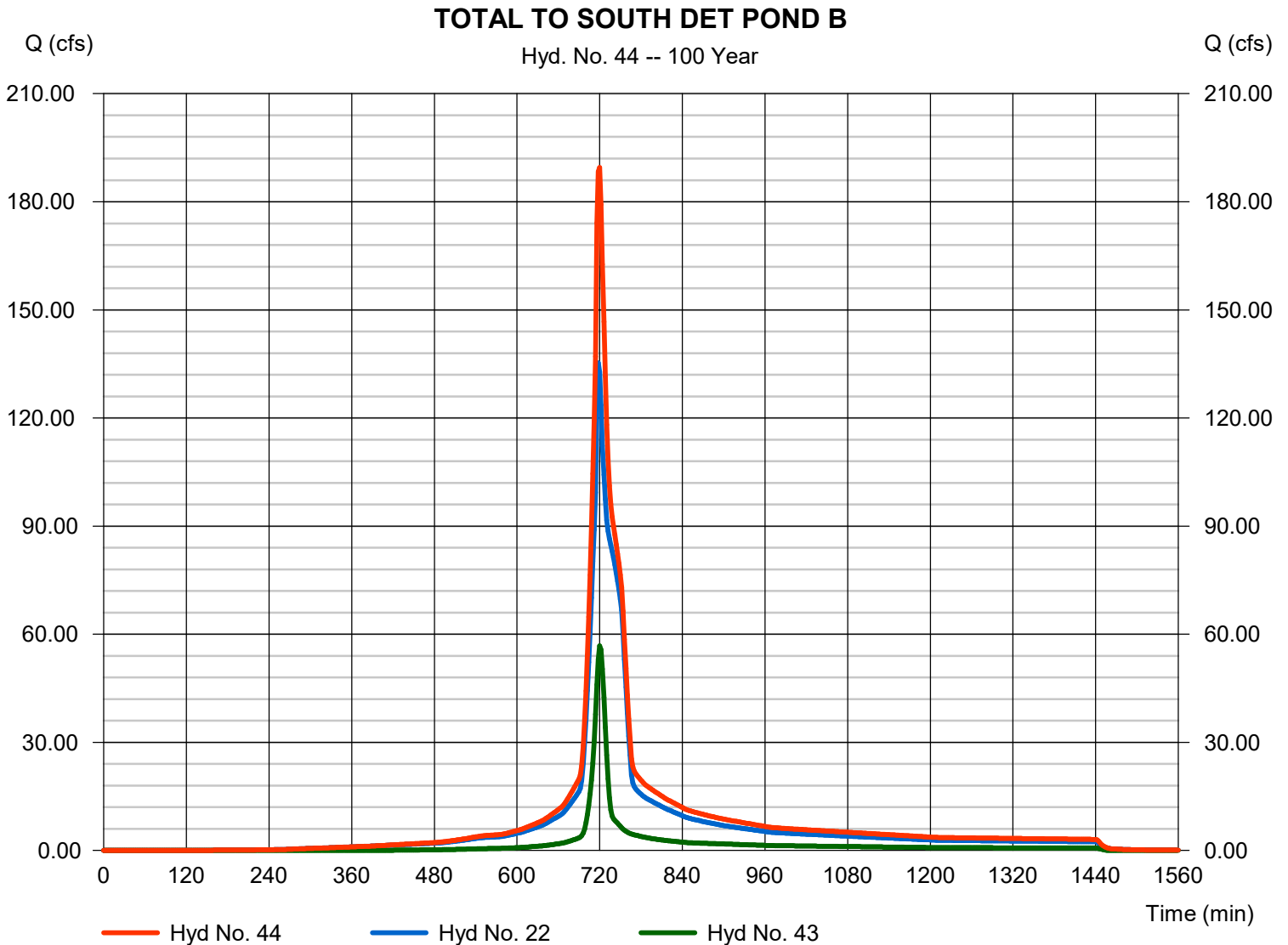
# Hydrograph Report

## Hyd. No. 44

### TOTAL TO SOUTH DET POND B

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 2 min  
Inflow hyds. = 22, 43

Peak discharge = 189.54 cfs  
Time to peak = 720 min  
Hyd. volume = 771,494 cuft  
Contrib. drain. area = 9.950 ac



# Pond Report

## Pond No. 2 - Pond B-South Detention Pond

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 2021.00 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 2021.00        | 24                  | 0                    | 0                    |
| 1.00       | 2022.00        | 2,752               | 1,011                | 1,011                |
| 2.00       | 2023.00        | 9,028               | 5,588                | 6,599                |
| 3.00       | 2024.00        | 16,214              | 12,446               | 19,044               |
| 4.00       | 2025.00        | 23,731              | 19,852               | 38,896               |
| 5.00       | 2026.00        | 31,571              | 27,555               | 66,451               |
| 6.00       | 2027.00        | 38,958              | 35,196               | 101,647              |
| 7.00       | 2028.00        | 44,308              | 41,600               | 143,247              |
| 8.00       | 2029.00        | 48,858              | 46,560               | 189,807              |
| 9.00       | 2030.00        | 52,814              | 50,818               | 240,625              |
| 10.00      | 2031.00        | 56,575              | 54,678               | 295,304              |
| 11.00      | 2032.00        | 60,436              | 58,489               | 353,793              |
| 12.00      | 2033.00        | 64,395              | 62,399               | 416,191              |
| 13.00      | 2034.00        | 68,452              | 66,407               | 482,598              |
| 14.00      | 2035.00        | 72,607              | 70,512               | 553,110              |
| 15.00      | 2036.00        | 76,860              | 74,716               | 627,826              |

### Culvert / Orifice Structures

|                 | [A]       | [B]     | [C]      | [PrfRsr] |
|-----------------|-----------|---------|----------|----------|
| Rise (in)       | = 48.00   | 30.00   | Inactive | 0.00     |
| Span (in)       | = 48.00   | 30.00   | 24.00    | 0.00     |
| No. Barrels     | = 1       | 1       | 1        | 0        |
| Invert El. (ft) | = 2020.00 | 2021.01 | 2027.00  | 0.00     |
| Length (ft)     | = 167.00  | 0.50    | 150.00   | 0.00     |
| Slope (%)       | = 1.01    | 1.00    | 2.00     | n/a      |
| N-Value         | = .013    | .013    | .013     | n/a      |
| Orifice Coeff.  | = 0.60    | 0.60    | 0.60     | 0.60     |
| Multi-Stage     | = n/a     | Yes     | No       | No       |

### Weir Structures

|                | [A]                   | [B]      | [C]  | [D]  |
|----------------|-----------------------|----------|------|------|
| Crest Len (ft) | = 18.85               | Inactive | 0.00 | 0.00 |
| Crest El. (ft) | = 2027.00             | 2028.00  | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60     | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad    | ---  | ---  |
| Multi-Stage    | = Yes                 | No       | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |          |      |      |
| TW Elev. (ft)  | = 0.00                |          |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

### Stage / Storage / Discharge Table

| Stage ft | Storage cuft | Elevation ft | Clv A cfs | Clv B cfs | Clv C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 0.00     | 0            | 2021.00      | 0.00      | 0.00      | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.10     | 101          | 2021.10      | 8.47 ic   | 0.06 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.062     |
| 0.20     | 202          | 2021.20      | 8.47 ic   | 0.26 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.262     |
| 0.30     | 303          | 2021.30      | 8.47 ic   | 0.61 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.610     |
| 0.40     | 404          | 2021.40      | 8.47 ic   | 1.06 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.056     |
| 0.50     | 505          | 2021.50      | 8.47 ic   | 1.66 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.663     |
| 0.60     | 607          | 2021.60      | 8.47 ic   | 2.35 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 2.352     |
| 0.70     | 708          | 2021.70      | 8.47 ic   | 3.18 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 3.182     |
| 0.80     | 809          | 2021.80      | 8.47 ic   | 4.16 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 4.156     |
| 0.90     | 910          | 2021.90      | 8.47 ic   | 5.12 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 5.120     |
| 1.00     | 1,011        | 2022.00      | 8.47 ic   | 6.18 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 6.183     |
| 1.10     | 1,570        | 2022.10      | 8.47 ic   | 7.34 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 7.336     |
| 1.20     | 2,128        | 2022.20      | 8.84 ic   | 8.57 ic   | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 8.569     |
| 1.30     | 2,687        | 2022.30      | 10.25 ic  | 10.06 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 10.06     |
| 1.40     | 3,246        | 2022.40      | 11.79 ic  | 11.42 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 11.42     |
| 1.50     | 3,805        | 2022.50      | 12.89 ic  | 12.82 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 12.82     |
| 1.60     | 4,363        | 2022.60      | 14.64 ic  | 14.23 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 14.23     |
| 1.70     | 4,922        | 2022.70      | 15.87 ic  | 15.65 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 15.65     |
| 1.80     | 5,481        | 2022.80      | 17.23 ic  | 17.23 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 17.23     |
| 1.90     | 6,040        | 2022.90      | 19.19 ic  | 18.77 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 18.77     |
| 2.00     | 6,599        | 2023.00      | 20.61 ic  | 20.22 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 20.22     |
| 2.10     | 7,843        | 2023.10      | 22.07 ic  | 21.59 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 21.59     |
| 2.20     | 9,088        | 2023.20      | 23.58 ic  | 23.06 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 23.06     |
| 2.30     | 10,332       | 2023.30      | 24.35 ic  | 24.31 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 24.31     |
| 2.40     | 11,577       | 2023.40      | 25.92 ic  | 25.48 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 25.48     |
| 2.50     | 12,821       | 2023.50      | 26.72 ic  | 26.36 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 26.36     |
| 2.60     | 14,066       | 2023.60      | 27.53 ic  | 27.36 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 27.36     |

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 2.70     | 15,310       | 2023.70      | 28.36 ic  | 28.36 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 28.36     |
| 2.80     | 16,555       | 2023.80      | 29.33 ic  | 29.33 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 29.33     |
| 2.90     | 17,800       | 2023.90      | 30.86 ic  | 30.26 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 30.26     |
| 3.00     | 19,044       | 2024.00      | 31.71 ic  | 31.17 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 31.17     |
| 3.10     | 21,029       | 2024.10      | 32.57 ic  | 32.06 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 32.06     |
| 3.20     | 23,014       | 2024.20      | 33.43 ic  | 32.92 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 32.92     |
| 3.30     | 25,000       | 2024.30      | 34.30 ic  | 33.75 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 33.75     |
| 3.40     | 26,985       | 2024.40      | 35.18 ic  | 34.57 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 34.57     |
| 3.50     | 28,970       | 2024.50      | 35.37 ic  | 35.37 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 35.37     |
| 3.60     | 30,955       | 2024.60      | 36.15 ic  | 36.15 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 36.15     |
| 3.70     | 32,940       | 2024.70      | 36.94 ic  | 36.91 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 36.91     |
| 3.80     | 34,925       | 2024.80      | 37.83 ic  | 37.66 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 37.66     |
| 3.90     | 36,911       | 2024.90      | 38.73 ic  | 38.24 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 38.24     |
| 4.00     | 38,896       | 2025.00      | 38.85 ic  | 38.85 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 38.85     |
| 4.10     | 41,651       | 2025.10      | 39.62 ic  | 39.45 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 39.45     |
| 4.20     | 44,407       | 2025.20      | 40.52 ic  | 39.94 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 39.94     |
| 4.30     | 47,162       | 2025.30      | 40.58 ic  | 40.58 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 40.58     |
| 4.40     | 49,918       | 2025.40      | 41.42 ic  | 41.10 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 41.10     |
| 4.50     | 52,673       | 2025.50      | 41.62 ic  | 41.62 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 41.62     |
| 4.60     | 55,429       | 2025.60      | 42.32 ic  | 42.24 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 42.24     |
| 4.70     | 58,184       | 2025.70      | 43.22 ic  | 42.69 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 42.69     |
| 4.80     | 60,940       | 2025.80      | 43.29 ic  | 43.29 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 43.29     |
| 4.90     | 63,695       | 2025.90      | 44.13 ic  | 43.79 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 43.79     |
| 5.00     | 66,451       | 2026.00      | 44.30 ic  | 44.30 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 44.30     |
| 5.10     | 69,971       | 2026.10      | 45.03 ic  | 44.86 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 44.86     |
| 5.20     | 73,490       | 2026.20      | 45.29 ic  | 45.29 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 45.29     |
| 5.30     | 77,010       | 2026.30      | 45.94 ic  | 45.90 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 45.90     |
| 5.40     | 80,529       | 2026.40      | 46.84 ic  | 46.32 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 46.32     |
| 5.50     | 84,049       | 2026.50      | 46.89 ic  | 46.89 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 46.89     |
| 5.60     | 87,569       | 2026.60      | 47.74 ic  | 47.33 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 47.33     |
| 5.70     | 91,088       | 2026.70      | 47.85 ic  | 47.85 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 47.85     |
| 5.80     | 94,608       | 2026.80      | 48.64 ic  | 48.33 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 48.33     |
| 5.90     | 98,128       | 2026.90      | 48.80 ic  | 48.80 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 48.80     |
| 6.00     | 101,647      | 2027.00      | 49.53 ic  | 49.30 ic  | 0.00      | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 49.30     |
| 6.10     | 105,807      | 2027.10      | 51.44 ic  | 49.46 ic  | 0.00      | ---        | 1.98     | 0.00     | ---      | ---      | ---       | ---      | 51.44     |
| 6.20     | 109,967      | 2027.20      | 54.97 ic  | 49.36 ic  | 0.00      | ---        | 5.61     | 0.00     | ---      | ---      | ---       | ---      | 54.97     |
| 6.30     | 114,127      | 2027.30      | 59.90 ic  | 49.06 ic  | 0.00      | ---        | 10.32    | 0.00     | ---      | ---      | ---       | ---      | 59.37     |
| 6.40     | 118,287      | 2027.40      | 64.65 ic  | 48.72 ic  | 0.00      | ---        | 15.88    | 0.00     | ---      | ---      | ---       | ---      | 64.60     |
| 6.50     | 122,447      | 2027.50      | 70.35 ic  | 48.16 ic  | 0.00      | ---        | 22.19    | 0.00     | ---      | ---      | ---       | ---      | 70.35     |
| 6.60     | 126,607      | 2027.60      | 76.73 ic  | 47.38 ic  | 0.00      | ---        | 29.17    | 0.00     | ---      | ---      | ---       | ---      | 76.55     |
| 6.70     | 130,767      | 2027.70      | 83.09 ic  | 46.33 ic  | 0.00      | ---        | 36.76    | 0.00     | ---      | ---      | ---       | ---      | 83.09     |
| 6.80     | 134,927      | 2027.80      | 89.75 ic  | 44.83 ic  | 0.00      | ---        | 44.92    | 0.00     | ---      | ---      | ---       | ---      | 89.75     |
| 6.90     | 139,087      | 2027.90      | 96.79 ic  | 43.19 ic  | 0.00      | ---        | 53.60    | 0.00     | ---      | ---      | ---       | ---      | 96.79     |
| 7.00     | 143,247      | 2028.00      | 104.01 ic | 41.24 ic  | 0.00      | ---        | 62.77    | 0.00     | ---      | ---      | ---       | ---      | 104.01    |
| 7.10     | 147,903      | 2028.10      | 111.34 ic | 38.93 ic  | 0.00      | ---        | 72.42    | 0.00     | ---      | ---      | ---       | ---      | 111.34    |
| 7.20     | 152,559      | 2028.20      | 118.73 ic | 36.22 ic  | 0.00      | ---        | 82.51    | 0.00     | ---      | ---      | ---       | ---      | 118.73    |
| 7.30     | 157,215      | 2028.30      | 126.10 ic | 33.05 ic  | 0.00      | ---        | 93.05    | 0.00     | ---      | ---      | ---       | ---      | 126.10    |
| 7.40     | 161,871      | 2028.40      | 133.34 ic | 29.35 ic  | 0.00      | ---        | 103.98   | 0.00     | ---      | ---      | ---       | ---      | 133.33    |
| 7.50     | 166,527      | 2028.50      | 138.63 ic | 26.41 ic  | 0.00      | ---        | 112.21 s | 0.00     | ---      | ---      | ---       | ---      | 138.63    |
| 7.60     | 171,183      | 2028.60      | 142.10 ic | 24.60 ic  | 0.00      | ---        | 117.50 s | 0.00     | ---      | ---      | ---       | ---      | 142.10    |
| 7.70     | 175,839      | 2028.70      | 145.01 ic | 23.09 ic  | 0.00      | ---        | 121.92 s | 0.00     | ---      | ---      | ---       | ---      | 145.01    |
| 7.80     | 180,495      | 2028.80      | 147.58 ic | 21.78 ic  | 0.00      | ---        | 125.80 s | 0.00     | ---      | ---      | ---       | ---      | 147.58    |
| 7.90     | 185,151      | 2028.90      | 149.90 ic | 20.61 ic  | 0.00      | ---        | 129.29 s | 0.00     | ---      | ---      | ---       | ---      | 149.90    |
| 8.00     | 189,807      | 2029.00      | 152.03 ic | 19.57 ic  | 0.00      | ---        | 132.45 s | 0.00     | ---      | ---      | ---       | ---      | 152.02    |
| 8.10     | 194,889      | 2029.10      | 154.00 ic | 18.62 ic  | 0.00      | ---        | 135.37 s | 0.00     | ---      | ---      | ---       | ---      | 153.99    |
| 8.20     | 199,971      | 2029.20      | 155.84 ic | 17.76 ic  | 0.00      | ---        | 138.08 s | 0.00     | ---      | ---      | ---       | ---      | 155.84    |
| 8.30     | 205,053      | 2029.30      | 157.58 ic | 16.97 ic  | 0.00      | ---        | 140.62 s | 0.00     | ---      | ---      | ---       | ---      | 157.58    |
| 8.40     | 210,135      | 2029.40      | 159.24 ic | 16.24 ic  | 0.00      | ---        | 142.99 s | 0.00     | ---      | ---      | ---       | ---      | 159.23    |
| 8.50     | 215,216      | 2029.50      | 160.82 ic | 15.57 ic  | 0.00      | ---        | 145.24 s | 0.00     | ---      | ---      | ---       | ---      | 160.82    |
| 8.60     | 220,298      | 2029.60      | 162.33 ic | 14.95 ic  | 0.00      | ---        | 147.37 s | 0.00     | ---      | ---      | ---       | ---      | 162.33    |
| 8.70     | 225,380      | 2029.70      | 163.79 ic | 14.38 ic  | 0.00      | ---        | 149.41 s | 0.00     | ---      | ---      | ---       | ---      | 163.79    |
| 8.80     | 230,462      | 2029.80      | 165.21 ic | 13.84 ic  | 0.00      | ---        | 151.35 s | 0.00     | ---      | ---      | ---       | ---      | 165.19    |
| 8.90     | 235,544      | 2029.90      | 166.58 ic | 13.35 ic  | 0.00      | ---        | 153.22 s | 0.00     | ---      | ---      | ---       | ---      | 166.57    |
| 9.00     | 240,625      | 2030.00      | 167.91 ic | 12.88 ic  | 0.00      | ---        | 155.01 s | 0.00     | ---      | ---      | ---       | ---      | 167.89    |
| 9.10     | 246,093      | 2030.10      | 169.21 ic | 12.45 ic  | 0.00      | ---        | 156.75 s | 0.00     | ---      | ---      | ---       | ---      | 169.20    |
| 9.20     | 251,561      | 2030.20      | 170.48 ic | 12.04 ic  | 0.00      | ---        | 158.43 s | 0.00     | ---      | ---      | ---       | ---      | 170.47    |
| 9.30     | 257,029      | 2030.30      | 171.72 ic | 11.66 ic  | 0.00      | ---        | 160.05 s | 0.00     | ---      | ---      | ---       | ---      | 171.71    |
| 9.40     | 262,497      | 2030.40      | 172.94 ic | 11.30 ic  | 0.00      | ---        | 161.62 s | 0.00     | ---      | ---      | ---       | ---      | 172.92    |
| 9.50     | 267,964      | 2030.50      | 174.14 ic | 10.96 ic  | 0.00      | ---        | 163.17 s | 0.00     | ---      | ---      | ---       | ---      | 174.13    |
| 9.60     | 273,432      | 2030.60      | 175.31 ic | 10.64 ic  | 0.00      | ---        | 164.66 s | 0.00     | ---      | ---      | ---       | ---      | 175.30    |
| 9.70     | 278,900      | 2030.70      | 176.47 ic | 10.34 ic  | 0.00      | ---        | 166.12 s | 0.00     | ---      | ---      | ---       | ---      | 176.46    |
| 9.80     | 284,368      | 2030.80      | 177.62 ic | 10.05 ic  | 0.00      | ---        | 167.53 s | 0.00     | ---      | ---      | ---       | ---      | 177.58    |



Pond B-South Detention Pond

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 9.90     | 289,836      | 2030.90      | 178.74 ic | 9.78 ic   | 0.00      | ---        | 168.93 s | 0.00     | ---      | ---      | ---       | ---      | 178.71    |
| 10.00    | 295,304      | 2031.00      | 179.85 ic | 9.52 ic   | 0.00      | ---        | 170.31 s | 0.00     | ---      | ---      | ---       | ---      | 179.84    |
| 10.10    | 301,152      | 2031.10      | 180.95 ic | 9.28 ic   | 0.00      | ---        | 171.64 s | 0.00     | ---      | ---      | ---       | ---      | 180.92    |
| 10.20    | 307,001      | 2031.20      | 182.03 ic | 9.05 ic   | 0.00      | ---        | 172.98 s | 0.00     | ---      | ---      | ---       | ---      | 182.03    |
| 10.30    | 312,850      | 2031.30      | 183.11 ic | 8.83 ic   | 0.00      | ---        | 174.24 s | 0.00     | ---      | ---      | ---       | ---      | 183.07    |
| 10.40    | 318,699      | 2031.40      | 184.17 ic | 8.62 ic   | 0.00      | ---        | 175.51 s | 0.00     | ---      | ---      | ---       | ---      | 184.13    |
| 10.50    | 324,548      | 2031.50      | 185.22 ic | 8.42 ic   | 0.00      | ---        | 176.79 s | 0.00     | ---      | ---      | ---       | ---      | 185.21    |
| 10.60    | 330,397      | 2031.60      | 186.26 ic | 8.23 ic   | 0.00      | ---        | 178.03 s | 0.00     | ---      | ---      | ---       | ---      | 186.25    |
| 10.70    | 336,246      | 2031.70      | 187.30 ic | 8.04 ic   | 0.00      | ---        | 179.22 s | 0.00     | ---      | ---      | ---       | ---      | 187.26    |
| 10.80    | 342,095      | 2031.80      | 188.32 ic | 7.87 ic   | 0.00      | ---        | 180.42 s | 0.00     | ---      | ---      | ---       | ---      | 188.29    |
| 10.90    | 347,944      | 2031.90      | 189.33 ic | 7.70 ic   | 0.00      | ---        | 181.57 s | 0.00     | ---      | ---      | ---       | ---      | 189.27    |
| 11.00    | 353,793      | 2032.00      | 190.34 ic | 7.54 ic   | 0.00      | ---        | 182.79 s | 0.00     | ---      | ---      | ---       | ---      | 190.33    |
| 11.10    | 360,032      | 2032.10      | 191.34 ic | 7.38 ic   | 0.00      | ---        | 183.93 s | 0.00     | ---      | ---      | ---       | ---      | 191.32    |
| 11.20    | 366,272      | 2032.20      | 192.33 ic | 7.23 ic   | 0.00      | ---        | 185.03 s | 0.00     | ---      | ---      | ---       | ---      | 192.26    |
| 11.30    | 372,512      | 2032.30      | 193.31 ic | 7.09 ic   | 0.00      | ---        | 186.17 s | 0.00     | ---      | ---      | ---       | ---      | 193.26    |
| 11.40    | 378,752      | 2032.40      | 194.29 ic | 6.96 ic   | 0.00      | ---        | 187.29 s | 0.00     | ---      | ---      | ---       | ---      | 194.24    |
| 11.50    | 384,992      | 2032.50      | 195.26 ic | 6.82 ic   | 0.00      | ---        | 188.38 s | 0.00     | ---      | ---      | ---       | ---      | 195.20    |
| 11.60    | 391,232      | 2032.60      | 196.22 ic | 6.70 ic   | 0.00      | ---        | 189.48 s | 0.00     | ---      | ---      | ---       | ---      | 196.18    |
| 11.70    | 397,472      | 2032.70      | 197.18 ic | 6.58 ic   | 0.00      | ---        | 190.60 s | 0.00     | ---      | ---      | ---       | ---      | 197.18    |
| 11.80    | 403,712      | 2032.80      | 198.13 ic | 6.46 ic   | 0.00      | ---        | 191.58 s | 0.00     | ---      | ---      | ---       | ---      | 198.04    |
| 11.90    | 409,951      | 2032.90      | 199.08 ic | 6.35 ic   | 0.00      | ---        | 192.68 s | 0.00     | ---      | ---      | ---       | ---      | 199.03    |
| 12.00    | 416,191      | 2033.00      | 200.02 ic | 6.24 ic   | 0.00      | ---        | 193.74 s | 0.00     | ---      | ---      | ---       | ---      | 199.98    |
| 12.10    | 422,832      | 2033.10      | 200.95 ic | 6.13 ic   | 0.00      | ---        | 194.76 s | 0.00     | ---      | ---      | ---       | ---      | 200.89    |
| 12.20    | 429,473      | 2033.20      | 201.88 ic | 6.03 ic   | 0.00      | ---        | 195.75 s | 0.00     | ---      | ---      | ---       | ---      | 201.78    |
| 12.30    | 436,113      | 2033.30      | 202.80 ic | 5.93 ic   | 0.00      | ---        | 196.87 s | 0.00     | ---      | ---      | ---       | ---      | 202.80    |
| 12.40    | 442,754      | 2033.40      | 203.72 ic | 5.83 ic   | 0.00      | ---        | 197.82 s | 0.00     | ---      | ---      | ---       | ---      | 203.66    |
| 12.50    | 449,395      | 2033.50      | 204.64 ic | 5.74 ic   | 0.00      | ---        | 198.77 s | 0.00     | ---      | ---      | ---       | ---      | 204.51    |
| 12.60    | 456,035      | 2033.60      | 205.54 ic | 5.65 ic   | 0.00      | ---        | 199.83 s | 0.00     | ---      | ---      | ---       | ---      | 205.48    |
| 12.70    | 462,676      | 2033.70      | 206.45 ic | 5.57 ic   | 0.00      | ---        | 200.79 s | 0.00     | ---      | ---      | ---       | ---      | 206.36    |
| 12.80    | 469,317      | 2033.80      | 207.35 ic | 5.48 ic   | 0.00      | ---        | 201.82 s | 0.00     | ---      | ---      | ---       | ---      | 207.30    |
| 12.90    | 475,957      | 2033.90      | 208.24 ic | 5.40 ic   | 0.00      | ---        | 202.84 s | 0.00     | ---      | ---      | ---       | ---      | 208.24    |
| 13.00    | 482,598      | 2034.00      | 209.13 ic | 5.32 ic   | 0.00      | ---        | 203.71 s | 0.00     | ---      | ---      | ---       | ---      | 209.03    |
| 13.10    | 489,649      | 2034.10      | 210.02 ic | 5.25 ic   | 0.00      | ---        | 204.66 s | 0.00     | ---      | ---      | ---       | ---      | 209.90    |
| 13.20    | 496,700      | 2034.20      | 210.90 ic | 5.17 ic   | 0.00      | ---        | 205.62 s | 0.00     | ---      | ---      | ---       | ---      | 210.79    |
| 13.30    | 503,752      | 2034.30      | 211.78 ic | 5.10 ic   | 0.00      | ---        | 206.56 s | 0.00     | ---      | ---      | ---       | ---      | 211.66    |
| 13.40    | 510,803      | 2034.40      | 212.65 ic | 5.03 ic   | 0.00      | ---        | 207.49 s | 0.00     | ---      | ---      | ---       | ---      | 212.52    |
| 13.50    | 517,854      | 2034.50      | 213.52 ic | 4.96 ic   | 0.00      | ---        | 208.50 s | 0.00     | ---      | ---      | ---       | ---      | 213.46    |
| 13.60    | 524,905      | 2034.60      | 214.38 ic | 4.90 ic   | 0.00      | ---        | 209.41 s | 0.00     | ---      | ---      | ---       | ---      | 214.31    |
| 13.70    | 531,956      | 2034.70      | 215.25 ic | 4.83 ic   | 0.00      | ---        | 210.23 s | 0.00     | ---      | ---      | ---       | ---      | 215.06    |
| 13.80    | 539,008      | 2034.80      | 216.10 ic | 4.77 ic   | 0.00      | ---        | 211.24 s | 0.00     | ---      | ---      | ---       | ---      | 216.01    |
| 13.90    | 546,059      | 2034.90      | 216.96 ic | 4.71 ic   | 0.00      | ---        | 212.07 s | 0.00     | ---      | ---      | ---       | ---      | 216.77    |
| 14.00    | 553,110      | 2035.00      | 217.81 ic | 4.65 ic   | 0.00      | ---        | 213.01 s | 0.00     | ---      | ---      | ---       | ---      | 217.66    |
| 14.10    | 560,582      | 2035.10      | 218.65 ic | 4.59 ic   | 0.00      | ---        | 213.87 s | 0.00     | ---      | ---      | ---       | ---      | 218.46    |
| 14.20    | 568,053      | 2035.20      | 219.50 ic | 4.53 ic   | 0.00      | ---        | 214.86 s | 0.00     | ---      | ---      | ---       | ---      | 219.39    |
| 14.30    | 575,525      | 2035.30      | 220.34 ic | 4.48 ic   | 0.00      | ---        | 215.83 s | 0.00     | ---      | ---      | ---       | ---      | 220.31    |
| 14.40    | 582,997      | 2035.40      | 221.17 ic | 4.43 ic   | 0.00      | ---        | 216.66 s | 0.00     | ---      | ---      | ---       | ---      | 221.09    |
| 14.50    | 590,468      | 2035.50      | 222.01 ic | 4.38 ic   | 0.00      | ---        | 217.60 s | 0.00     | ---      | ---      | ---       | ---      | 221.98    |
| 14.60    | 597,940      | 2035.60      | 222.84 ic | 4.32 ic   | 0.00      | ---        | 218.27 s | 0.00     | ---      | ---      | ---       | ---      | 222.59    |
| 14.70    | 605,412      | 2035.70      | 223.66 ic | 4.28 ic   | 0.00      | ---        | 219.37 s | 0.00     | ---      | ---      | ---       | ---      | 223.65    |
| 14.80    | 612,883      | 2035.80      | 224.48 ic | 4.23 ic   | 0.00      | ---        | 220.21 s | 0.00     | ---      | ---      | ---       | ---      | 224.43    |
| 14.90    | 620,355      | 2035.90      | 225.30 ic | 4.17 ic   | 0.00      | ---        | 220.90 s | 0.00     | ---      | ---      | ---       | ---      | 225.07    |
| 15.00    | 627,826      | 2036.00      | 226.12 ic | 4.13 ic   | 0.00      | ---        | 221.72 s | 0.00     | ---      | ---      | ---       | ---      | 225.85    |

...End

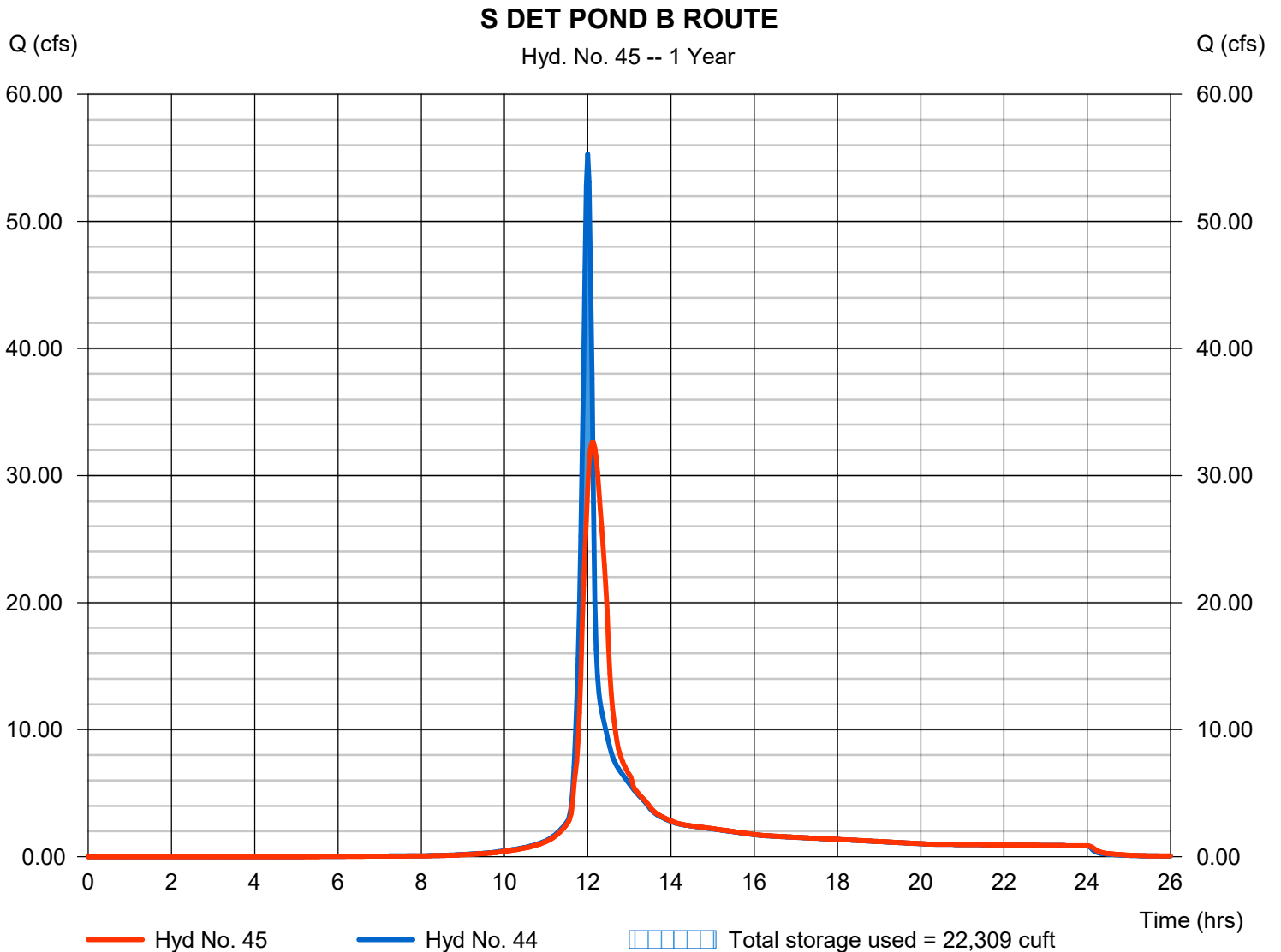
# Hydrograph Report

## Hyd. No. 45

### S DET POND B ROUTE

|                 |                                  |                |                |
|-----------------|----------------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                      | Peak discharge | = 32.61 cfs    |
| Storm frequency | = 1 yrs                          | Time to peak   | = 12.13 hrs    |
| Time interval   | = 2 min                          | Hyd. volume    | = 168,427 cuft |
| Inflow hyd. No. | = 44 - TOTAL TO SOUTH DET POND B | Max. Elevation | = 2024.16 ft   |
| Reservoir name  | = Pond B-South Detention Pond    | Max. Storage   | = 22,309 cuft  |

Storage Indication method used.



# Hydrograph Report

## Hyd. No. 45

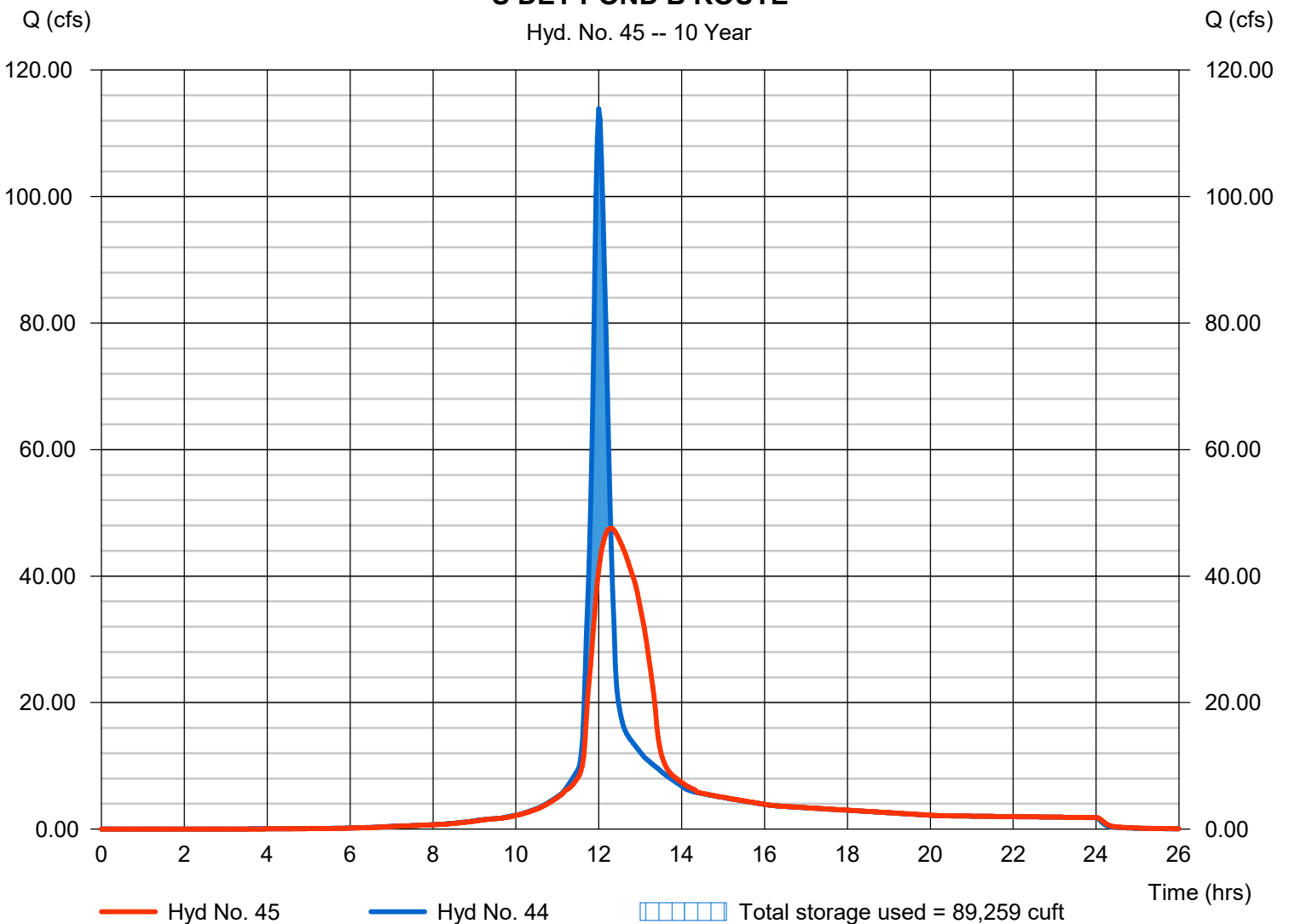
### S DET POND B ROUTE

|                 |                                  |                |                |
|-----------------|----------------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                      | Peak discharge | = 47.58 cfs    |
| Storm frequency | = 10 yrs                         | Time to peak   | = 12.30 hrs    |
| Time interval   | = 2 min                          | Hyd. volume    | = 413,976 cuft |
| Inflow hyd. No. | = 44 - TOTAL TO SOUTH DET POND B | Max. Elevation | = 2026.65 ft   |
| Reservoir name  | = Pond B-South Detention Pond    | Max. Storage   | = 89,259 cuft  |

Storage Indication method used.

### S DET POND B ROUTE

Hyd. No. 45 -- 10 Year



# Hydrograph Report

## Hyd. No. 45

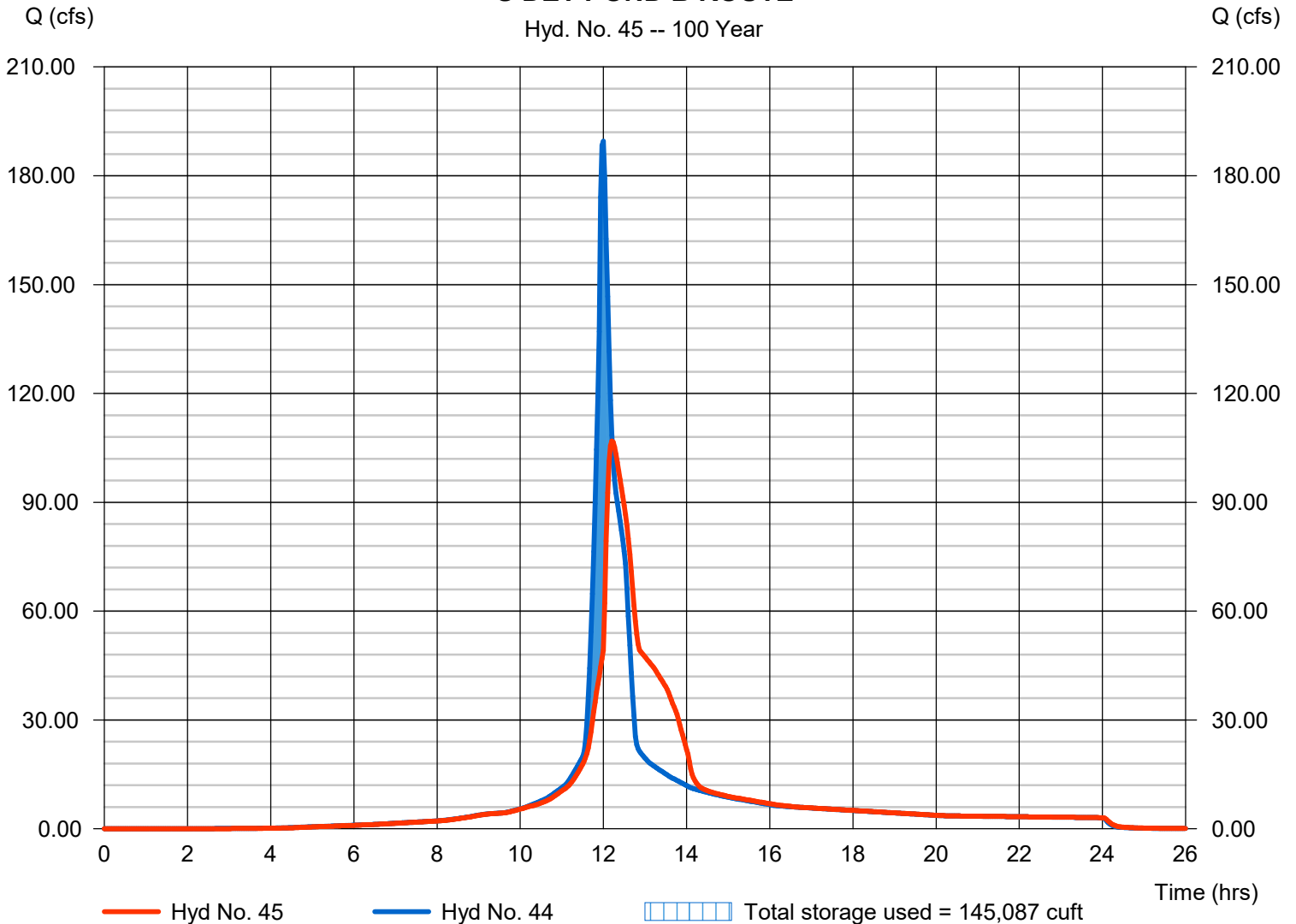
### S DET POND B ROUTE

|                 |                                  |                |                |
|-----------------|----------------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                      | Peak discharge | = 106.90 cfs   |
| Storm frequency | = 100 yrs                        | Time to peak   | = 12.20 hrs    |
| Time interval   | = 2 min                          | Hyd. volume    | = 771,452 cuft |
| Inflow hyd. No. | = 44 - TOTAL TO SOUTH DET POND B | Max. Elevation | = 2028.04 ft   |
| Reservoir name  | = Pond B-South Detention Pond    | Max. Storage   | = 145,087 cuft |

Storage Indication method used.

### S DET POND B ROUTE

Hyd. No. 45 -- 100 Year



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POSTDEV TO POND C (WETPOND)**

**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |                       |    |               |               | Notes:   |
|-----------------------------|-----------------------|-----------------------|----|---------------|---------------|--|
|                             | Hydrologic Soil Group | Land Cover            | CN | Area, A (ac.) | CN*A          |  |
| CN <sub>1</sub>             | B                     | Open space            | 61 | 2.28          | 139.29        | 1) Impervious lot area calculated using approx. driveway configurations and actual dwelling dimensions<br>2) Wet pond normal pool water surface area is counted as impervious area for hydrology |
| CN <sub>2</sub>             | C                     | Open space            | 74 | 5.13          | 379.42        |  |
| CN <sub>3</sub>             | B                     | Imperv. (measured)    | 98 | 0.25          | 24.04         |  |
| CN <sub>4</sub>             | C                     | Imperv. (measured)    | 98 | 0.97          | 95.10         |  |
| CN <sub>5</sub>             | B                     | Imperv. (est. lots)   | 98 | 0.20          | 19.90         |  |
| CN <sub>6</sub>             | C                     | Imperv. (est. lots)   | 98 | 1.84          | 180.17        |  |
| CN <sub>7</sub>             | B                     | Imperv. (water surf.) | 98 | 0.89          | 87.37         |  |
| CN <sub>8</sub>             |                       |                       |    |               | 0.00          |  |
| CN <sub>9</sub>             |                       |                       |    |               | 0.00          |  |
| CN <sub>10</sub>            |                       |                       |    |               | 0.00          |  |
| Total                       |                       |                       |    | <b>11.56</b>  | <b>925.30</b> |  |
| <b>Composite CN =</b>       |                       |                       |    |               | <b>80</b>     |  |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.058         | 10.1                               |
| 2  | Shallow Conc. | Unpaved    | 102         |                     | 0.096         | 0.3                                |
| 3  | Channel       | HDPE Pipe  | 1308        | 0.012               | 0.05864       | 1.6                                |
| 4  |               |            |             |                     |               |                                    |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>12.0</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 80    | 80     | 80      |
| Storage (in.) S=1000/CN-10   | 2.50  | 2.50   | 2.50    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.50  | 0.50   | 0.50    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.73  | 2.09   | 4.18    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.70  | 2.01   | 4.03    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 11.76 | 34.90  | 69.13   |

Hydrograph Number: 42

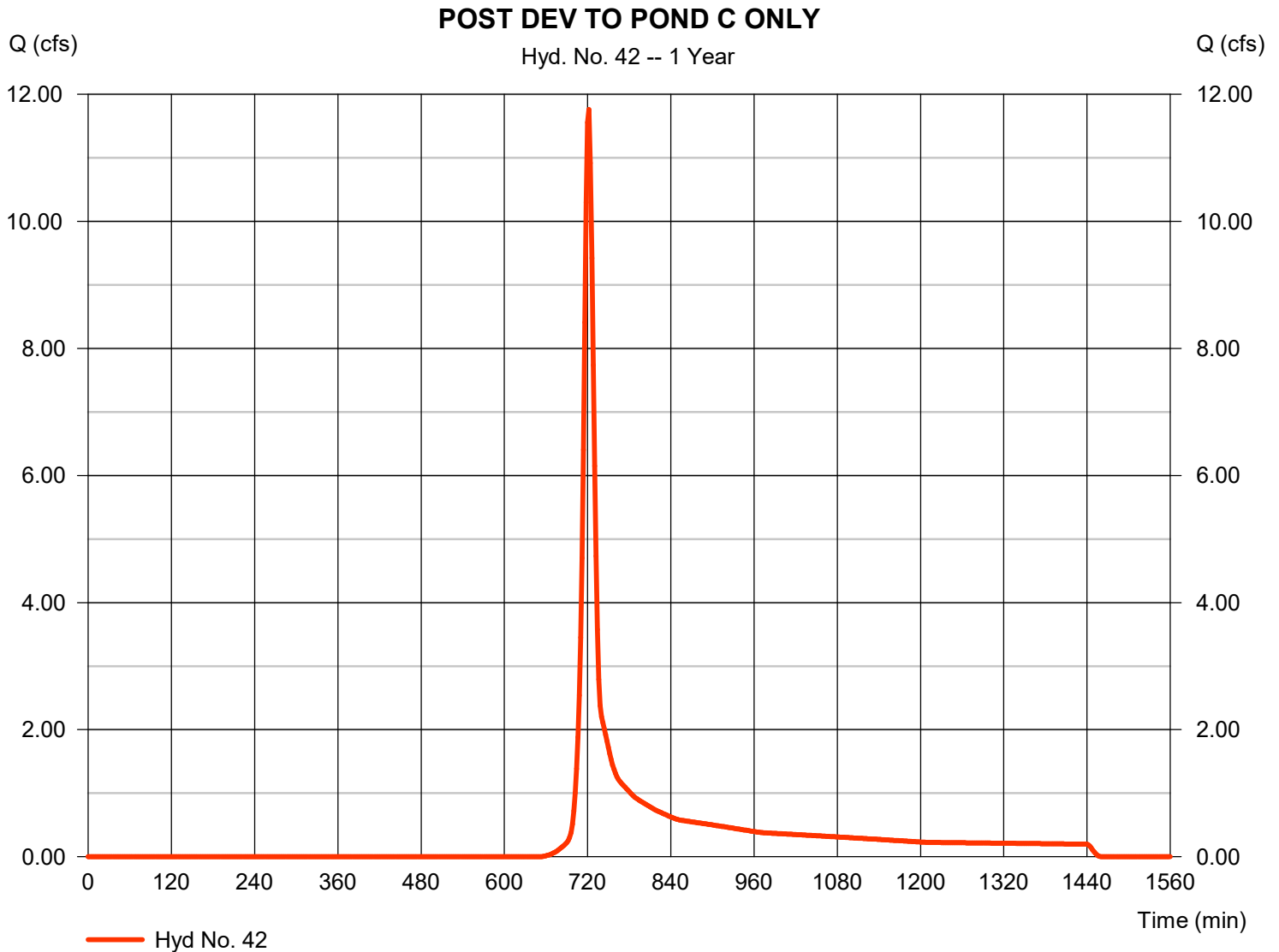
# Hydrograph Report

## Hyd. No. 42

POST DEV TO POND C ONLY

Hydrograph type = SCS Runoff  
Storm frequency = 1 yrs  
Time interval = 2 min  
Drainage area = 11.560 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 2.26 in  
Storm duration = 24 hrs

Peak discharge = 11.76 cfs  
Time to peak = 722 min  
Hyd. volume = 31,466 cuft  
Curve number = 80  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 12.00 min  
Distribution = Type II  
Shape factor = 484



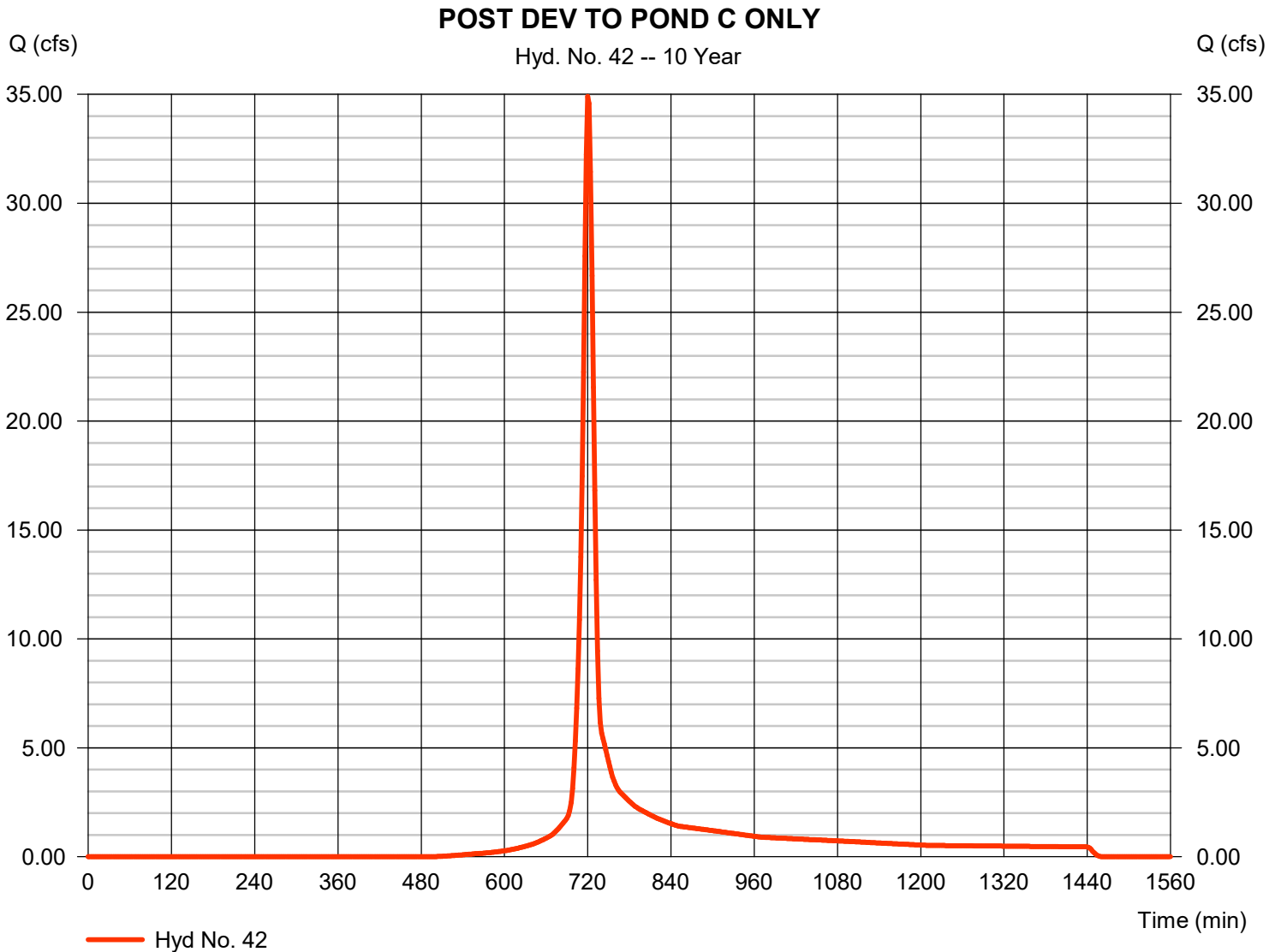
# Hydrograph Report

## Hyd. No. 42

POST DEV TO POND C ONLY

Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 2 min  
Drainage area = 11.560 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 4.06 in  
Storm duration = 24 hrs

Peak discharge = 34.90 cfs  
Time to peak = 720 min  
Hyd. volume = 90,501 cuft  
Curve number = 80  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 12.00 min  
Distribution = Type II  
Shape factor = 484



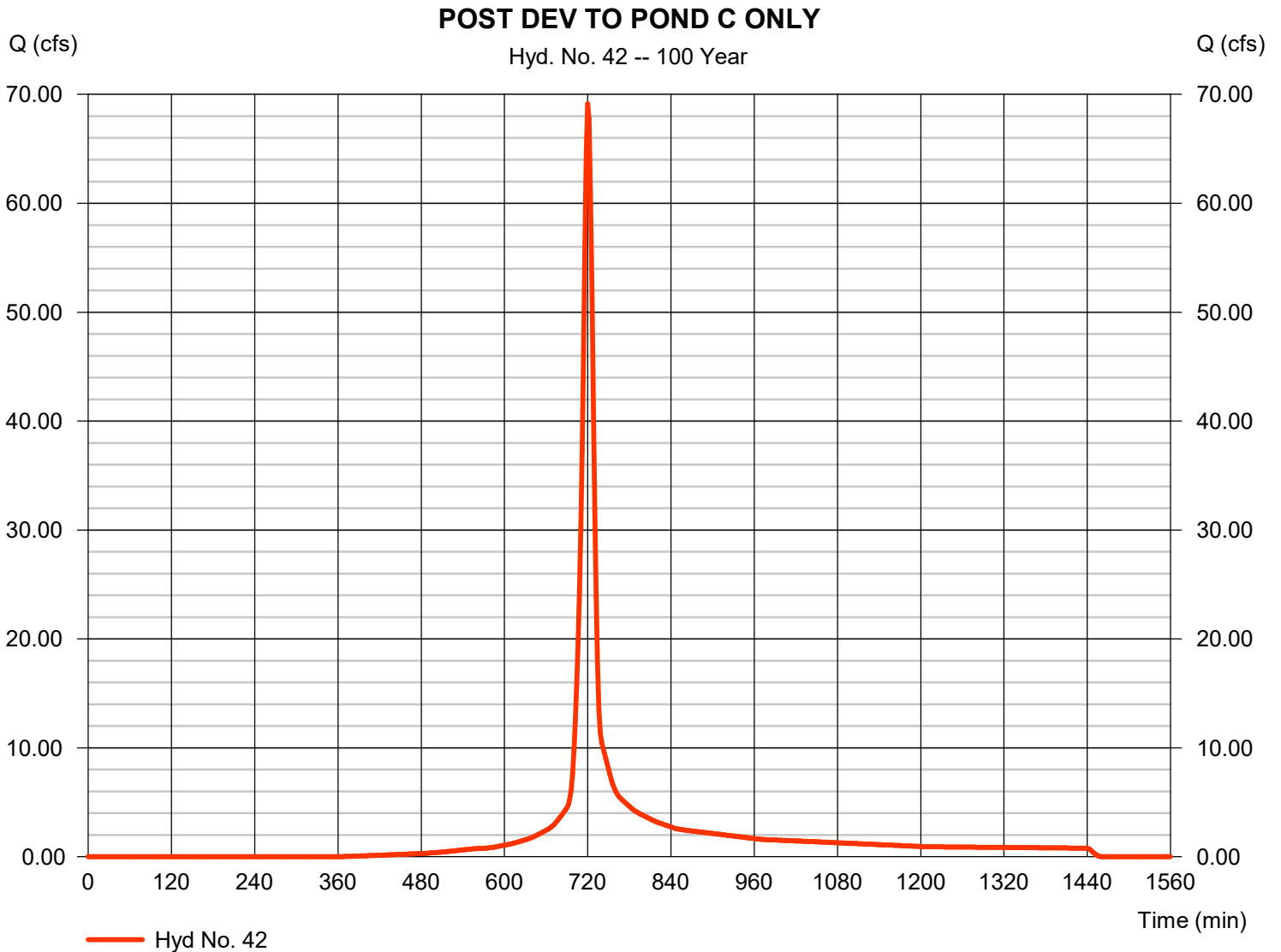
# Hydrograph Report

## Hyd. No. 42

POST DEV TO POND C ONLY

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 2 min  
Drainage area = 11.560 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 6.44 in  
Storm duration = 24 hrs

Peak discharge = 69.13 cfs  
Time to peak = 720 min  
Hyd. volume = 180,909 cuft  
Curve number = 80  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 12.00 min  
Distribution = Type II  
Shape factor = 484





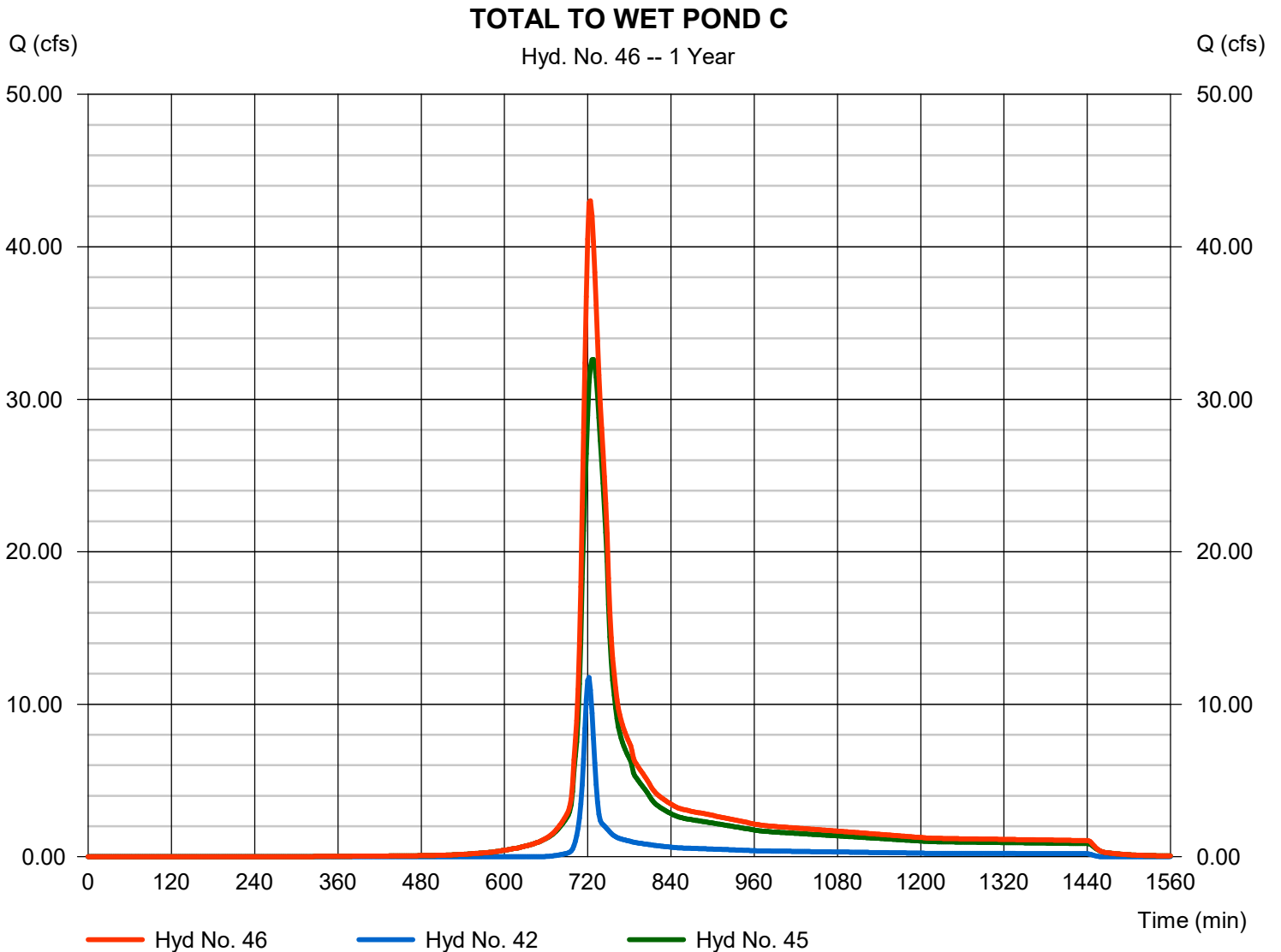
# Hydrograph Report

## Hyd. No. 46

### TOTAL TO WET POND C

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 42, 45

Peak discharge = 43.03 cfs  
Time to peak = 724 min  
Hyd. volume = 199,894 cuft  
Contrib. drain. area = 11.560 ac



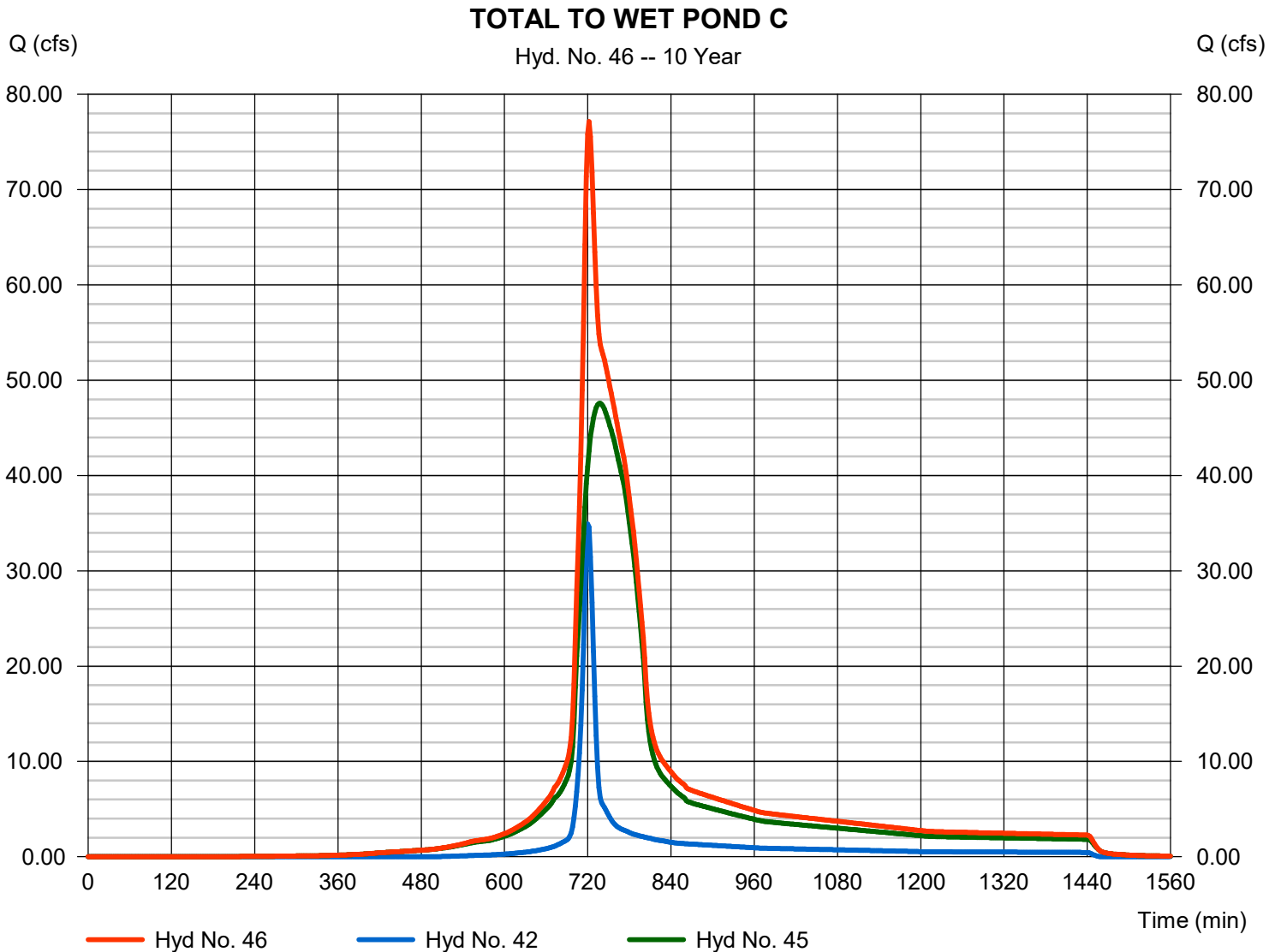
# Hydrograph Report

## Hyd. No. 46

### TOTAL TO WET POND C

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 42, 45

Peak discharge = 77.15 cfs  
Time to peak = 722 min  
Hyd. volume = 504,477 cuft  
Contrib. drain. area = 11.560 ac



# Hydrograph Report

## Hyd. No. 46

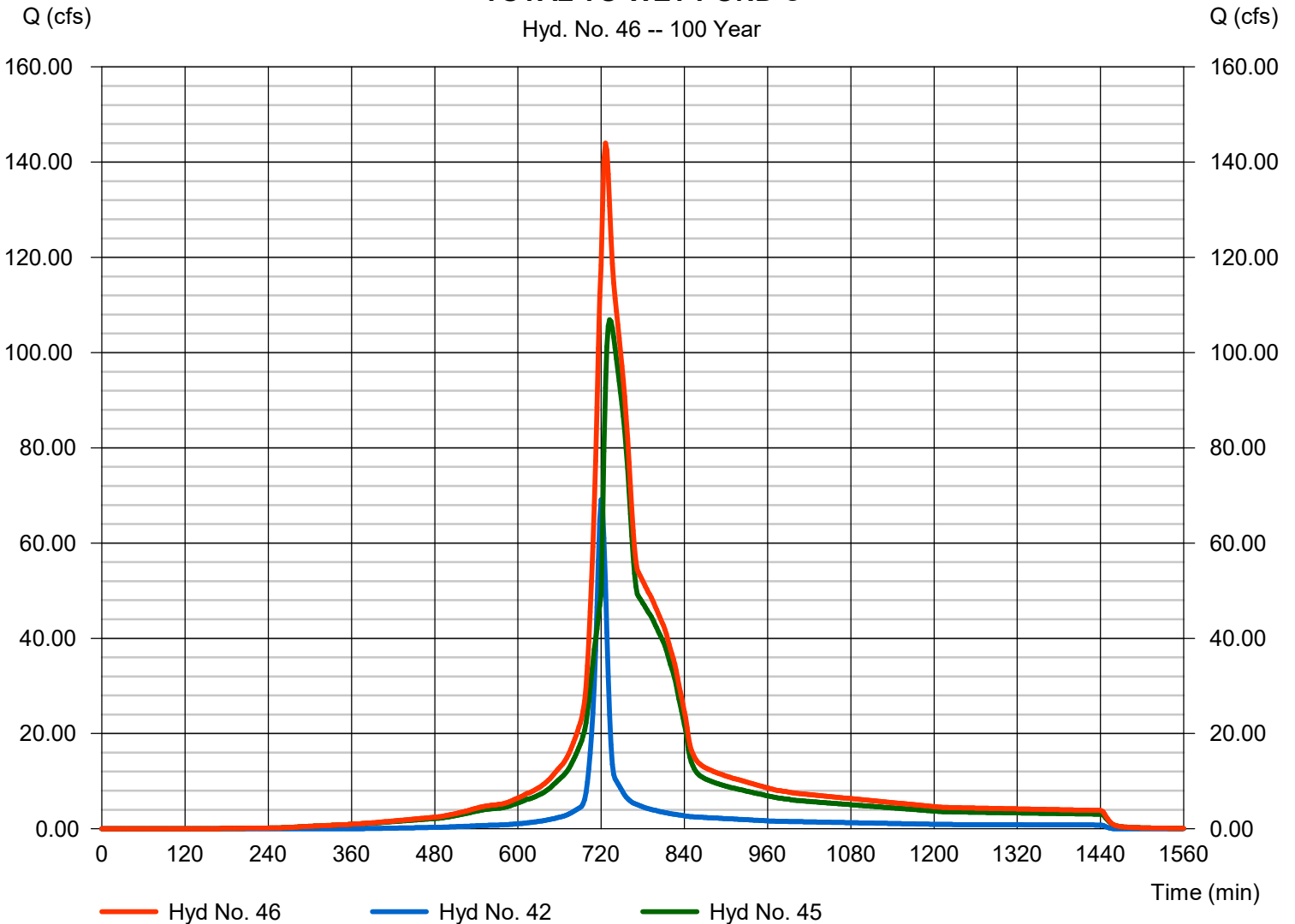
### TOTAL TO WET POND C

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 2 min  
Inflow hyds. = 42, 45

Peak discharge = 144.01 cfs  
Time to peak = 726 min  
Hyd. volume = 952,360 cuft  
Contrib. drain. area = 11.560 ac

### TOTAL TO WET POND C

Hyd. No. 46 -- 100 Year



# Pond Report

## Pond No. 5 - Pond C-Wet pond

### Pond Data

Pond storage is based on user-defined values.

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00       | 2009.00        | n/a                 | 0                    | 0                    |
| 1.00       | 2010.00        | n/a                 | 10,279               | 10,279               |
| 2.00       | 2011.00        | n/a                 | 17,652               | 27,931               |
| 3.00       | 2012.00        | n/a                 | 20,140               | 48,071               |
| 4.00       | 2013.00        | n/a                 | 22,759               | 70,830               |
| 5.00       | 2014.00        | n/a                 | 25,507               | 96,337               |
| 6.00       | 2015.00        | n/a                 | 29,714               | 126,051              |
| 6.30       | 2015.30        | n/a                 | 10,705               | 136,756              |
| 7.00       | 2016.00        | n/a                 | 30,778               | 167,534              |
| 8.00       | 2017.00        | n/a                 | 50,486               | 218,020              |
| 9.00       | 2018.00        | n/a                 | 53,320               | 271,340              |
| 10.00      | 2019.00        | n/a                 | 56,195               | 327,535              |
| 11.00      | 2020.00        | n/a                 | 59,146               | 386,681              |

### Culvert / Orifice Structures

|                 | [A]       | [B]     | [C]  | [PrfRsr] |
|-----------------|-----------|---------|------|----------|
| Rise (in)       | = 36.00   | 8.00    | 0.00 | 0.00     |
| Span (in)       | = 36.00   | 8.00    | 0.00 | 0.00     |
| No. Barrels     | = 1       | 1       | 0    | 0        |
| Invert El. (ft) | = 2008.00 | 2015.30 | 0.00 | 0.00     |
| Length (ft)     | = 58.50   | 0.50    | 0.00 | 0.00     |
| Slope (%)       | = 1.70    | 1.00    | 0.00 | n/a      |
| N-Value         | = .013    | .013    | .013 | n/a      |
| Orifice Coeff.  | = 0.60    | 0.60    | 0.60 | 0.60     |
| Multi-Stage     | = n/a     | Yes     | No   | No       |

### Weir Structures

|                | [A]                   | [B]     | [C]  | [D]  |
|----------------|-----------------------|---------|------|------|
| Crest Len (ft) | = 15.70               | 20.00   | 0.00 | 0.00 |
| Crest El. (ft) | = 2016.70             | 2018.80 | 0.00 | 0.00 |
| Weir Coeff.    | = 3.33                | 2.60    | 3.33 | 3.33 |
| Weir Type      | = 1                   | Broad   | ---  | ---  |
| Multi-Stage    | = Yes                 | No      | No   | No   |
| Exfil.(in/hr)  | = 0.000 (by Wet area) |         |      |      |
| TW Elev. (ft)  | = 0.00                |         |      |      |

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

### Stage / Storage / Discharge Table

| Stage ft | Storage cuft | Elevation ft | Clv A cfs | Clv B cfs | Clv C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 0.00     | 0            | 2009.00      | 0.00      | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.10     | 1,028        | 2009.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.20     | 2,056        | 2009.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.30     | 3,084        | 2009.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.40     | 4,112        | 2009.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.50     | 5,140        | 2009.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.60     | 6,167        | 2009.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.70     | 7,195        | 2009.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.80     | 8,223        | 2009.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 0.90     | 9,251        | 2009.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.00     | 10,279       | 2010.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.10     | 12,044       | 2010.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.20     | 13,809       | 2010.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.30     | 15,575       | 2010.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.40     | 17,340       | 2010.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.50     | 19,105       | 2010.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.60     | 20,870       | 2010.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.70     | 22,635       | 2010.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.80     | 24,401       | 2010.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 1.90     | 26,166       | 2010.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.00     | 27,931       | 2011.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.10     | 29,945       | 2011.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.20     | 31,959       | 2011.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.30     | 33,973       | 2011.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.40     | 35,987       | 2011.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.50     | 38,001       | 2011.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.60     | 40,015       | 2011.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.70     | 42,029       | 2011.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.80     | 44,043       | 2011.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 2.90     | 46,057       | 2011.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.00     | 48,071       | 2012.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |

**Stage / Storage / Discharge Table**

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrfRsr cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | User cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|------------|----------|----------|----------|----------|-----------|----------|-----------|
| 3.10     | 50,347       | 2012.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.20     | 52,623       | 2012.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.30     | 54,899       | 2012.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.40     | 57,175       | 2012.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.50     | 59,450       | 2012.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.60     | 61,726       | 2012.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.70     | 64,002       | 2012.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.80     | 66,278       | 2012.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 3.90     | 68,554       | 2012.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.00     | 70,830       | 2013.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.10     | 73,381       | 2013.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.20     | 75,931       | 2013.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.30     | 78,482       | 2013.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.40     | 81,033       | 2013.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.50     | 83,584       | 2013.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.60     | 86,134       | 2013.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.70     | 88,685       | 2013.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.80     | 91,236       | 2013.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 4.90     | 93,786       | 2013.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.00     | 96,337       | 2014.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.10     | 99,308       | 2014.10      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.20     | 102,280      | 2014.20      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.30     | 105,251      | 2014.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.40     | 108,223      | 2014.40      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.50     | 111,194      | 2014.50      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.60     | 114,165      | 2014.60      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.70     | 117,137      | 2014.70      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.80     | 120,108      | 2014.80      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 5.90     | 123,080      | 2014.90      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.00     | 126,051      | 2015.00      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.03     | 127,122      | 2015.03      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.06     | 128,192      | 2015.06      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.09     | 129,263      | 2015.09      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.12     | 130,333      | 2015.12      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.15     | 131,404      | 2015.15      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.18     | 132,474      | 2015.18      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.21     | 133,545      | 2015.21      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.24     | 134,615      | 2015.24      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.27     | 135,686      | 2015.27      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.30     | 136,756      | 2015.30      | 7.16 ic   | 0.00      | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.000     |
| 6.37     | 139,834      | 2015.37      | 7.16 ic   | 0.02 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.018     |
| 6.44     | 142,912      | 2015.44      | 7.16 ic   | 0.07 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.069     |
| 6.51     | 145,989      | 2015.51      | 7.16 ic   | 0.15 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.148     |
| 6.58     | 149,067      | 2015.58      | 7.16 ic   | 0.25 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.252     |
| 6.65     | 152,145      | 2015.65      | 7.16 ic   | 0.38 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.380     |
| 6.72     | 155,223      | 2015.72      | 7.16 ic   | 0.51 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.513     |
| 6.79     | 158,301      | 2015.79      | 7.16 ic   | 0.66 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.661     |
| 6.86     | 161,378      | 2015.86      | 7.16 ic   | 0.80 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.799     |
| 6.93     | 164,456      | 2015.93      | 7.16 ic   | 0.92 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 0.923     |
| 7.00     | 167,534      | 2016.00      | 7.16 ic   | 1.02 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.018     |
| 7.10     | 172,583      | 2016.10      | 7.16 ic   | 1.15 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.148     |
| 7.20     | 177,631      | 2016.20      | 7.16 ic   | 1.26 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.265     |
| 7.30     | 182,680      | 2016.30      | 7.16 ic   | 1.37 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.372     |
| 7.40     | 187,728      | 2016.40      | 7.16 ic   | 1.47 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.471     |
| 7.50     | 192,777      | 2016.50      | 7.16 ic   | 1.56 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.564     |
| 7.60     | 197,826      | 2016.60      | 7.16 ic   | 1.65 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.652     |
| 7.70     | 202,874      | 2016.70      | 7.16 ic   | 1.74 ic   | ---       | ---        | 0.00     | 0.00     | ---      | ---      | ---       | ---      | 1.736     |
| 7.80     | 207,923      | 2016.80      | 7.16 ic   | 1.82 ic   | ---       | ---        | 1.66     | 0.00     | ---      | ---      | ---       | ---      | 3.471     |
| 7.90     | 212,971      | 2016.90      | 7.16 ic   | 1.89 ic   | ---       | ---        | 4.68     | 0.00     | ---      | ---      | ---       | ---      | 6.570     |
| 8.00     | 218,020      | 2017.00      | 10.75 ic  | 1.96 ic   | ---       | ---        | 8.59     | 0.00     | ---      | ---      | ---       | ---      | 10.56     |
| 8.10     | 223,352      | 2017.10      | 15.45 ic  | 2.04 ic   | ---       | ---        | 13.23    | 0.00     | ---      | ---      | ---       | ---      | 15.26     |
| 8.20     | 228,684      | 2017.20      | 20.62 ic  | 2.10 ic   | ---       | ---        | 18.48    | 0.00     | ---      | ---      | ---       | ---      | 20.59     |
| 8.30     | 234,016      | 2017.30      | 26.71 ic  | 2.17 ic   | ---       | ---        | 24.30    | 0.00     | ---      | ---      | ---       | ---      | 26.47     |
| 8.40     | 239,348      | 2017.40      | 32.93 ic  | 2.23 ic   | ---       | ---        | 30.62    | 0.00     | ---      | ---      | ---       | ---      | 32.86     |
| 8.50     | 244,680      | 2017.50      | 39.75 ic  | 2.30 ic   | ---       | ---        | 37.41    | 0.00     | ---      | ---      | ---       | ---      | 39.71     |
| 8.60     | 250,012      | 2017.60      | 47.00 ic  | 2.36 ic   | ---       | ---        | 44.64    | 0.00     | ---      | ---      | ---       | ---      | 47.00     |
| 8.70     | 255,344      | 2017.70      | 54.70 ic  | 2.42 ic   | ---       | ---        | 52.28    | 0.00     | ---      | ---      | ---       | ---      | 54.70     |
| 8.80     | 260,676      | 2017.80      | 62.80 ic  | 2.47 ic   | ---       | ---        | 60.32    | 0.00     | ---      | ---      | ---       | ---      | 62.80     |
| 8.90     | 266,008      | 2017.90      | 71.26 ic  | 2.53 ic   | ---       | ---        | 68.73    | 0.00     | ---      | ---      | ---       | ---      | 71.26     |
| 9.00     | 271,340      | 2018.00      | 80.08 ic  | 2.59 ic   | ---       | ---        | 77.50    | 0.00     | ---      | ---      | ---       | ---      | 80.08     |
| 9.10     | 276,960      | 2018.10      | 88.85 ic  | 2.24 ic   | ---       | ---        | 86.61    | 0.00     | ---      | ---      | ---       | ---      | 88.85     |
| 9.20     | 282,579      | 2018.20      | 93.51 ic  | 1.80 ic   | ---       | ---        | 91.71 s  | 0.00     | ---      | ---      | ---       | ---      | 93.51     |

Pond C-Wet pond

**Stage / Storage / Discharge Table**

| Stage<br>ft | Storage<br>cuft | Elevation<br>ft | Clv A<br>cfs | Clv B<br>cfs | Clv C<br>cfs | PrfRsr<br>cfs | Wr A<br>cfs | Wr B<br>cfs | Wr C<br>cfs | Wr D<br>cfs | Exfil<br>cfs | User<br>cfs | Total<br>cfs |
|-------------|-----------------|-----------------|--------------|--------------|--------------|---------------|-------------|-------------|-------------|-------------|--------------|-------------|--------------|
| 9.30        | 288,199         | 2018.30         | 95.44 ic     | 1.62 ic      | ---          | ---           | 93.82 s     | 0.00        | ---         | ---         | ---          | ---         | 95.44        |
| 9.40        | 293,818         | 2018.40         | 96.95 ic     | 1.49 ic      | ---          | ---           | 95.46 s     | 0.00        | ---         | ---         | ---          | ---         | 96.95        |
| 9.50        | 299,438         | 2018.50         | 98.22 ic     | 1.37 ic      | ---          | ---           | 96.84 s     | 0.00        | ---         | ---         | ---          | ---         | 98.22        |
| 9.60        | 305,057         | 2018.60         | 99.34 ic     | 1.28 ic      | ---          | ---           | 98.06 s     | 0.00        | ---         | ---         | ---          | ---         | 99.34        |
| 9.70        | 310,677         | 2018.70         | 100.34 ic    | 1.19 ic      | ---          | ---           | 99.15 s     | 0.00        | ---         | ---         | ---          | ---         | 100.34       |
| 9.80        | 316,296         | 2018.80         | 101.27 ic    | 1.12 ic      | ---          | ---           | 100.14 s    | 0.00        | ---         | ---         | ---          | ---         | 101.26       |
| 9.90        | 321,916         | 2018.90         | 102.12 ic    | 1.06 ic      | ---          | ---           | 101.07 s    | 1.64        | ---         | ---         | ---          | ---         | 103.76       |
| 10.00       | 327,535         | 2019.00         | 102.93 ic    | 1.00 ic      | ---          | ---           | 101.93 s    | 4.65        | ---         | ---         | ---          | ---         | 107.58       |
| 10.10       | 333,450         | 2019.10         | 103.69 ic    | 0.94 ic      | ---          | ---           | 102.74 s    | 8.54        | ---         | ---         | ---          | ---         | 112.23       |
| 10.20       | 339,364         | 2019.20         | 104.42 ic    | 0.90 ic      | ---          | ---           | 103.52 s    | 13.15       | ---         | ---         | ---          | ---         | 117.57       |
| 10.30       | 345,279         | 2019.30         | 105.12 ic    | 0.85 ic      | ---          | ---           | 104.25 s    | 18.38       | ---         | ---         | ---          | ---         | 123.49       |
| 10.40       | 351,193         | 2019.40         | 105.80 ic    | 0.81 ic      | ---          | ---           | 104.98 s    | 24.17       | ---         | ---         | ---          | ---         | 129.96       |
| 10.50       | 357,108         | 2019.50         | 106.46 ic    | 0.78 ic      | ---          | ---           | 105.67 s    | 30.45       | ---         | ---         | ---          | ---         | 136.90       |
| 10.60       | 363,023         | 2019.60         | 107.09 ic    | 0.74 ic      | ---          | ---           | 106.34 s    | 37.20       | ---         | ---         | ---          | ---         | 144.29       |
| 10.70       | 368,937         | 2019.70         | 107.72 ic    | 0.71 ic      | ---          | ---           | 106.99 s    | 44.39       | ---         | ---         | ---          | ---         | 152.09       |
| 10.80       | 374,852         | 2019.80         | 108.33 ic    | 0.69 ic      | ---          | ---           | 107.62 s    | 52.00       | ---         | ---         | ---          | ---         | 160.31       |
| 10.90       | 380,766         | 2019.90         | 108.93 ic    | 0.66 ic      | ---          | ---           | 108.27 s    | 59.99       | ---         | ---         | ---          | ---         | 168.92       |
| 11.00       | 386,681         | 2020.00         | 109.52 ic    | 0.63 ic      | ---          | ---           | 108.86 s    | 68.35       | ---         | ---         | ---          | ---         | 177.85       |

...End

### Pond C Storage Volumes

| Permanent Pool Storage Volume |                 |                 |                            |                      |                      |                    |                    |                              |                        |                        |  |        |
|-------------------------------|-----------------|-----------------|----------------------------|----------------------|----------------------|--------------------|--------------------|------------------------------|------------------------|------------------------|--|--------|
| Elevation<br>(msl)            | Forebay<br>(sf) | Forebay<br>(ac) | Incr. FB Volume<br>(cu-ft) | FB Volume<br>(cu-ft) | FB Volume<br>(ac-ft) | Perm. Pool<br>(sf) | Perm. Pool<br>(ac) | Pool Incr. Volume<br>(cu-ft) | Pool Volume<br>(cu-ft) | Pool Volume<br>(ac-ft) | Total Avail. Treatment<br>Volume (FB Vol. + Pool Vol.) |        |
| 2009                          | 2231            | 0.0000          | 0.0                        | 0                    | 0.0000               | 1888               | 0.1474             | 0.0                          | 0                      | 0.0000                 | 0  | 0.0000 |
| 2010                          | 2881            | 0.0661          | 2556.0                     | 2556                 | 0.0587               | 13558              | 0.3112             | 7723.0                       | 7723                   | 0.1773                 | 10279  | 0.2360 |
| 2011                          | 3597            | 0.0826          | 3239.0                     | 5795                 | 0.1330               | 15267              | 0.3505             | 14412.5                      | 22136                  | 0.5082                 | 27931  | 0.6412 |
| 2012                          | 4379            | 0.1005          | 3988.0                     | 9783                 | 0.2246               | 17038              | 0.3911             | 16152.5                      | 38288                  | 0.8790                 | 48071  | 1.1036 |
| 2013                          | 5227            | 0.1200          | 4803.0                     | 14586                | 0.3348               | 18873              | 0.4333             | 17955.5                      | 56244                  | 1.2912                 | 70830  | 1.6260 |
| 2014                          | 6142            | 0.1410          | 5684.5                     | 20271                | 0.4653               | 20772              | 0.4769             | 19822.5                      | 76066                  | 1.7462                 | 96337  | 2.2116 |
| 2015                          | 7897            | 0.1813          | 7019.5                     | 27290                | 0.6265               | 24617              | 0.5651             | 22694.5                      | 98761                  | 2.2672                 | 126051   | 2.8937 |
| 2015.3                        | 9852            | 0.2262          | 2662.3                     | 29952                | 0.6876               | 29004              | 0.6658             | 8043.1                       | 106804                 | 2.4519                 | 136756   | 3.1395 |

<-Perm. Pool WSE

|  |  |             |              |
|--|--|-------------|--------------|
| <b>Required forebay<br/>volume range</b> | Contrib. imperv. Area =                              | 30.07 ac    |              |
|  | Min. = 0.1 in. per imperv. Acre =                    | 10915 cu-ft | 0.2506 ac-ft |
|  | Max. = 0.25 in. per imperv. Acre =                   | 27289 cu-ft | 0.6265 ac-ft |
|  | Designed forebay vol. @ 2015.3 =                     | 29952 cu-ft | 0.6876 ac-ft |
|  | <b>Conclusion: Adequate volume has been provided</b> |             |              |

|   |  |              |              |
|---|--|--------------|--------------|
| <b>Required permanent<br/>pool volume</b> | VRRM BMP Tv (min. permanent pool vol.) =             | 122454 cu-ft | 2.8112 ac-ft |
|   | Designed permanent pool vol. @ 2015.3 =              | 136756 cu-ft | 3.1395 ac-ft |
|   | <b>Conclusion: Adequate volume has been provided</b> |              |              |

| Dry Detention Storage Volume |                          |                          |                                  |                            |                            |  |         |
|------------------------------|--------------------------|--------------------------|----------------------------------|----------------------------|----------------------------|--|---------|
| Elevation<br>(msl)           | Dry Det. Contour<br>(sf) | Dry Det. Contour<br>(ac) | Incr. Dry Det. Volume<br>(cu-ft) | Dry Det. Volume<br>(cu-ft) | Dry Det. Volume<br>(ac-ft) | Total Pond Volume (Wet<br>Treatment volume total + Det.<br>Volume) |         |
|                              |                          |                          |                                  |                            |                            | (cu-ft)  | (ac-ft) |
| 2015.3                       | 38856                    | 0.8920                   | 0.0                              | 0                          | 0.0000                     | 136756   | 3.1395  |
| 2016                         | 49082                    | 1.1268                   | 30778.3                          | 30778                      | 0.7066                     | 167534   | 3.8461  |
| 2017                         | 51889                    | 1.1912                   | 50485.5                          | 81264                      | 1.8656                     | 218020   | 5.0050  |
| 2018                         | 54751                    | 1.2569                   | 53320.0                          | 134584                     | 3.0896                     | 271340   | 6.2291  |
| 2019                         | 57640                    | 1.3232                   | 56195.5                          | 190779                     | 4.3797                     | 327535   | 7.5192  |
| 2020                         | 60651                    | 1.3924                   | 59145.5                          | 249925                     | 5.7375                     | 386681   | 8.8770  |

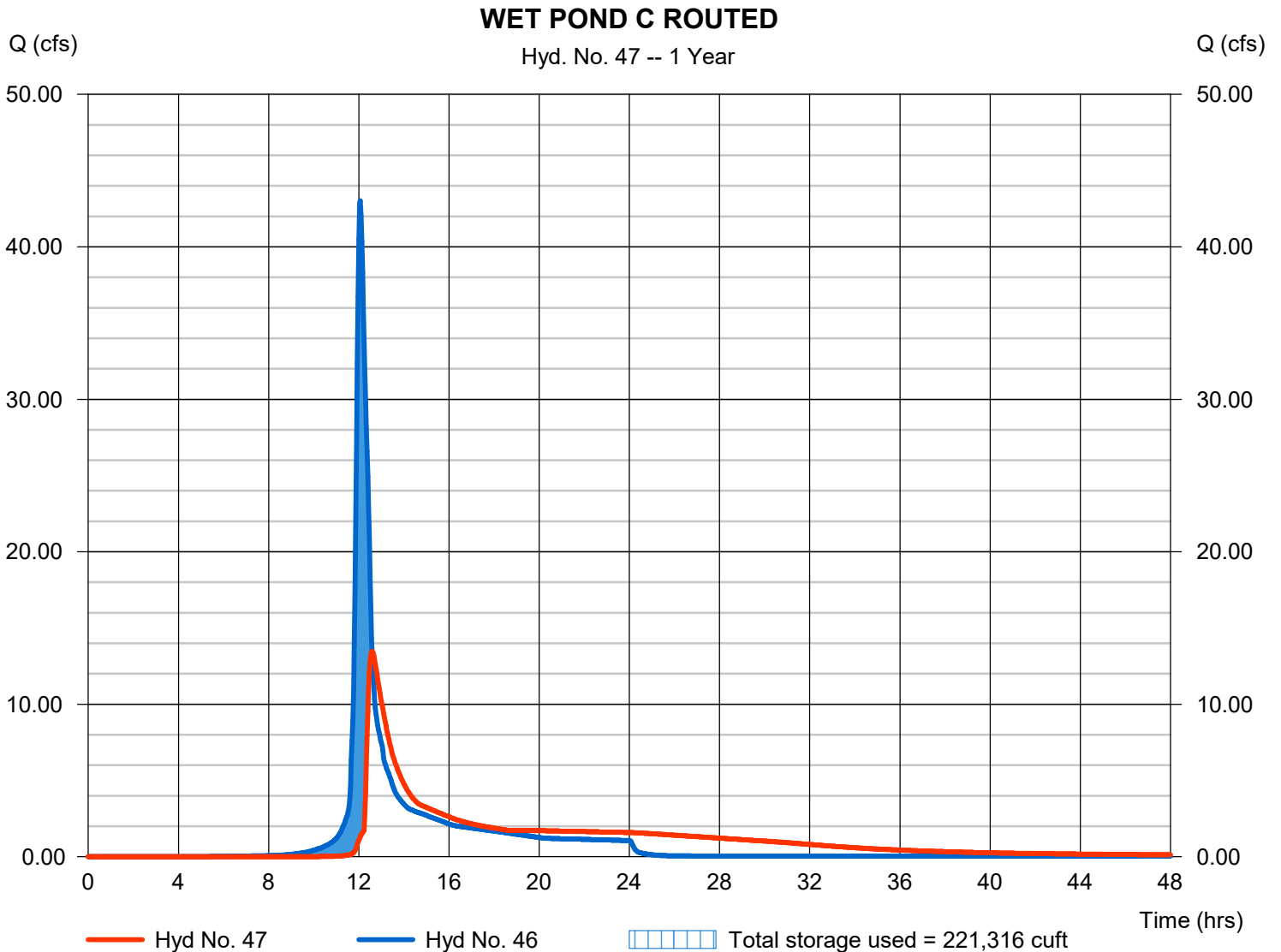
# Hydrograph Report

## Hyd. No. 47

### WET POND C ROUTED

|                 |                            |                |                |
|-----------------|----------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 13.47 cfs    |
| Storm frequency | = 1 yrs                    | Time to peak   | = 12.60 hrs    |
| Time interval   | = 2 min                    | Hyd. volume    | = 196,004 cuft |
| Inflow hyd. No. | = 46 - TOTAL TO WET POND C | Max. Elevation | = 2017.06 ft   |
| Reservoir name  | = Pond C-Wet pond          | Max. Storage   | = 221,316 cuft |

Storage Indication method used. Wet pond routing start elevation = 2015.30 ft.





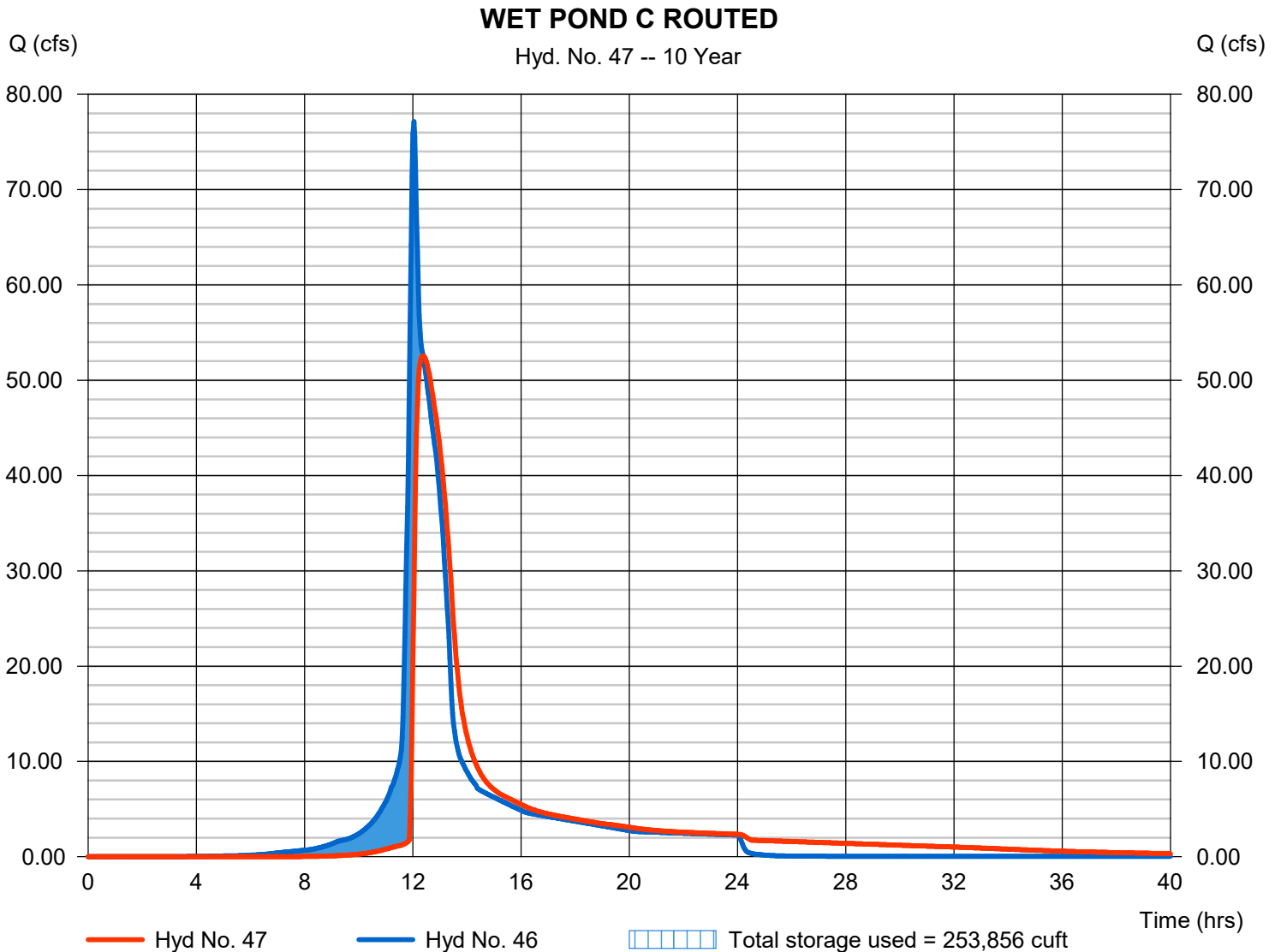
# Hydrograph Report

## Hyd. No. 47

### WET POND C ROUTED

|                 |                            |                |                |
|-----------------|----------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 52.55 cfs    |
| Storm frequency | = 10 yrs                   | Time to peak   | = 12.37 hrs    |
| Time interval   | = 2 min                    | Hyd. volume    | = 500,397 cuft |
| Inflow hyd. No. | = 46 - TOTAL TO WET POND C | Max. Elevation | = 2017.67 ft   |
| Reservoir name  | = Pond C-Wet pond          | Max. Storage   | = 253,856 cuft |

Storage Indication method used. Wet pond routing start elevation = 2015.30 ft.



# Hydrograph Report

## Hyd. No. 47

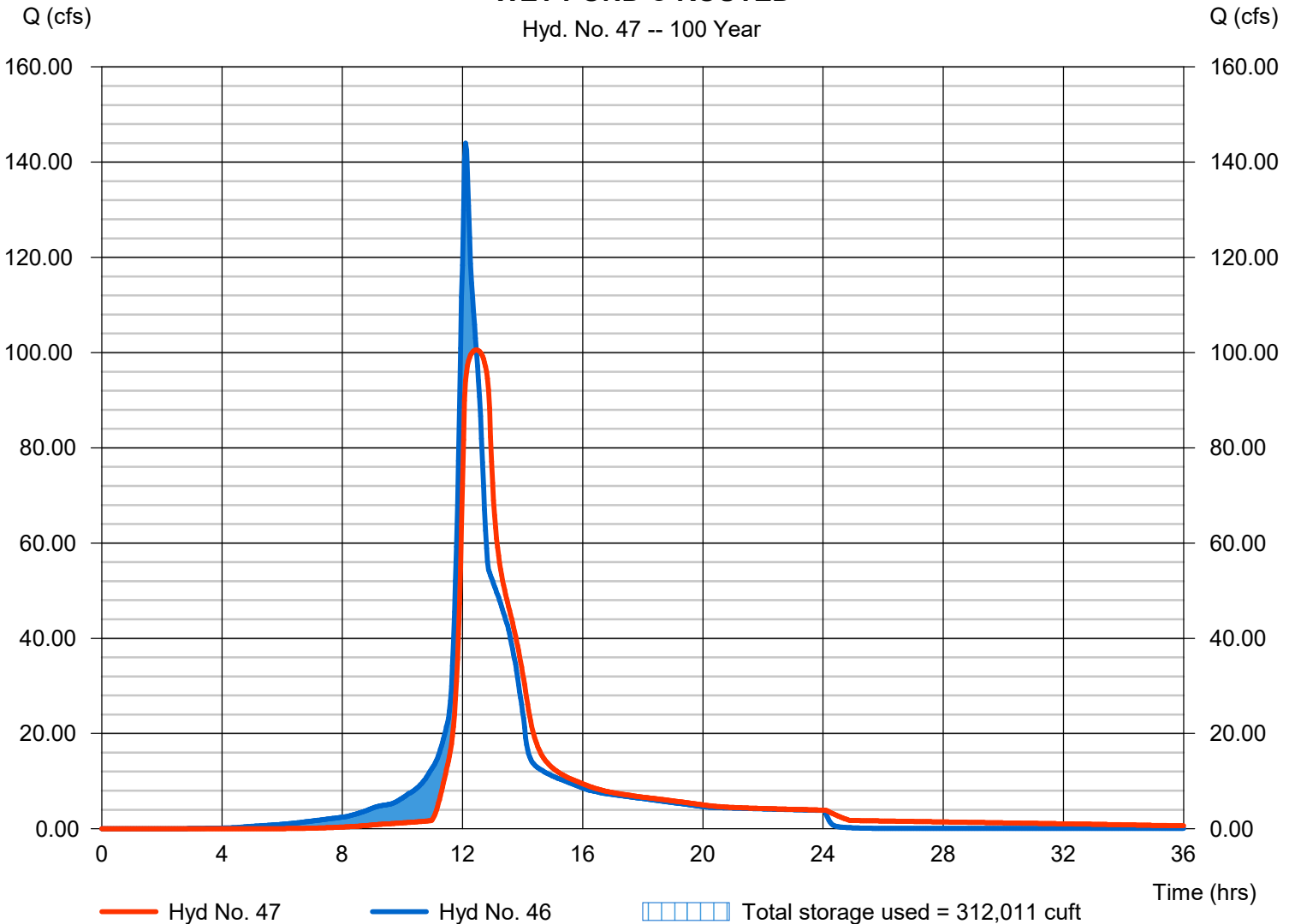
### WET POND C ROUTED

|                 |                            |                |                |
|-----------------|----------------------------|----------------|----------------|
| Hydrograph type | = Reservoir                | Peak discharge | = 100.56 cfs   |
| Storm frequency | = 100 yrs                  | Time to peak   | = 12.47 hrs    |
| Time interval   | = 2 min                    | Hyd. volume    | = 948,269 cuft |
| Inflow hyd. No. | = 46 - TOTAL TO WET POND C | Max. Elevation | = 2018.72 ft   |
| Reservoir name  | = Pond C-Wet pond          | Max. Storage   | = 312,011 cuft |

Storage Indication method used. Wet pond routing start elevation = 2015.30 ft.

### WET POND C ROUTED

Hyd. No. 47 -- 100 Year



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POST UNDETAILED CONTRIB. AREA**  
**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |                     |    |               |                | Notes: |
|-----------------------------|-----------------------|---------------------|----|---------------|----------------|--------|
|                             | Hydrologic Soil Group | Land Cover          | CN | Area, A (ac.) | CN*A           |        |
| CN <sub>1</sub>             | B                     | Open space          | 61 | 11.85         | 723.03         |        |
| CN <sub>2</sub>             | C                     | Open space          | 74 | 1.22          | 89.98          |        |
| CN <sub>3</sub>             | B                     | Imperv. (measured)  | 98 | 1.79          | 175.36         |        |
| CN <sub>4</sub>             | C                     | Imperv. (measured)  | 98 | 0.07          | 7.15           |        |
| CN <sub>5</sub>             | B                     | Imperv. (est. lots) | 98 | 3.18          | 311.39         |        |
| CN <sub>6</sub>             | C                     | Imperv. (est. lots) | 98 | 0.02          | 1.51           |        |
| CN <sub>7</sub>             | B                     | Woods (good)        | 55 | 2.27          | 124.85         |        |
| CN <sub>8</sub>             | C                     | Woods (good)        | 70 | 4.89          | 342.25         |        |
| CN <sub>9</sub>             |                       |                     |    |               | 0.00           |        |
| CN <sub>10</sub>            |                       |                     |    |               | 0.00           |        |
| Total                       |                       |                     |    | <b>25.28</b>  | <b>1775.52</b> |        |
| <b>Composite CN =</b>       |                       |                     |    |               | <b>70</b>      |        |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.06          | 10.0                               |
| 2  | Shallow Conc. | Unpaved    | 171         |                     | 0.105         | 0.5                                |
| 3  | Shallow Conc. | Unpaved    | 50          |                     | 0.33          | 0.1                                |
| 4  | Shallow Conc. | Unpaved    | 99          |                     | 0.01          | 1.0                                |
| 5  | Shallow Conc. | Paved      | 81          |                     | 0.02          | 0.5                                |
| 6  | Channel       | HDPE Pipe  | 1058        | 0.012               | 0.04272       | 1.7                                |
| 7  | Channel       | Grass      | 120         | 0.03                | 0.01417       | 0.8                                |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>14.6</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 70    | 70     | 70      |
| Storage (in.) S=1000/CN-10   | 4.29  | 4.29   | 4.29    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.86  | 0.86   | 0.86    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.35  | 1.37   | 3.16    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.73  | 2.89   | 6.65    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 8.06  | 42.08  | 100.62  |

Hydrograph Number: 48

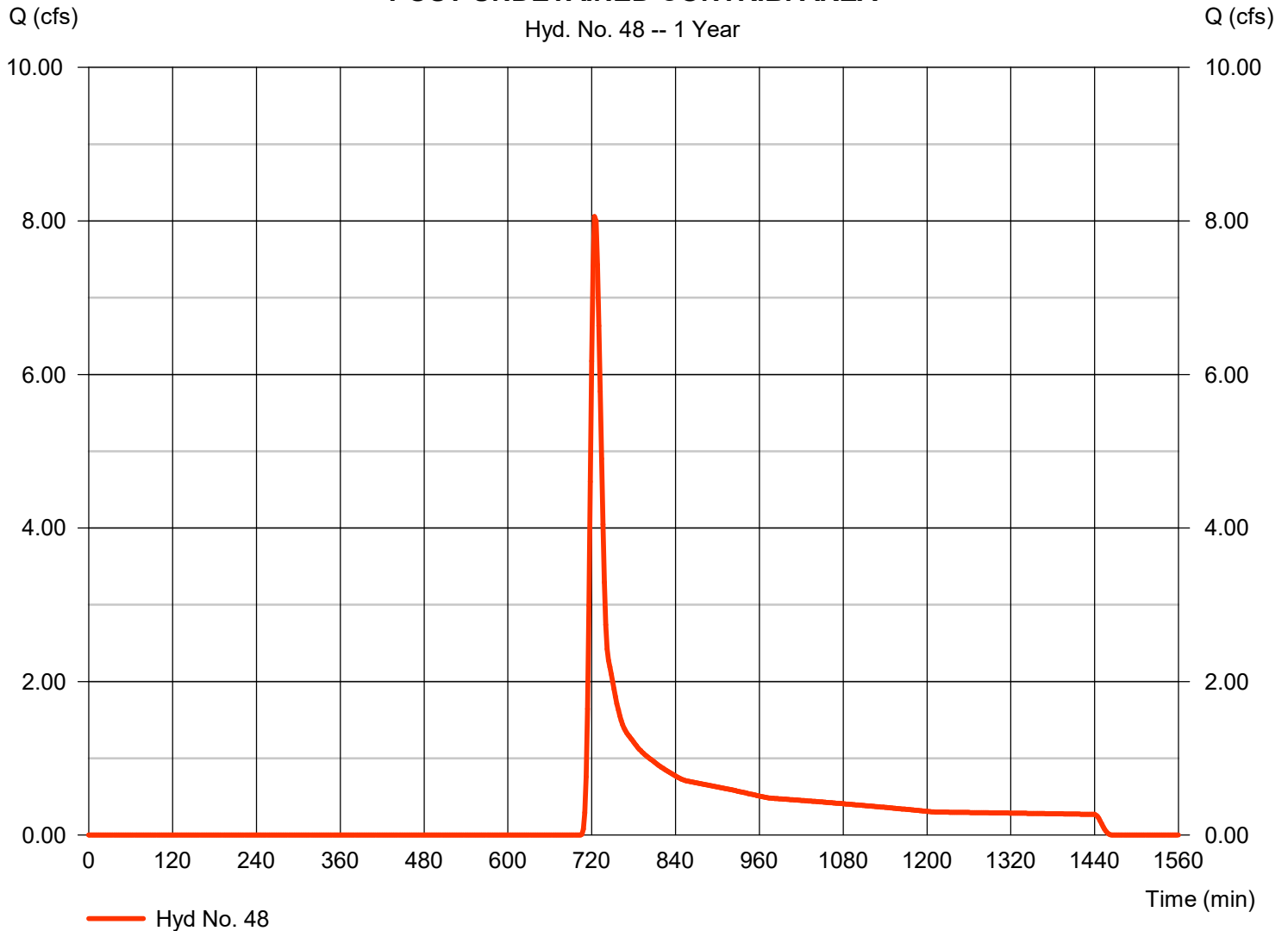
# Hydrograph Report

## Hyd. No. 48

### POST UNDETAINED CONTRIB. AREA

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 8.056 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 724 min     |
| Time interval   | = 2 min      | Hyd. volume        | = 30,952 cuft |
| Drainage area   | = 25.280 ac  | Curve number       | = 70          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 14.60 min   |
| Total precip.   | = 2.26 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |

### POST UNDETAINED CONTRIB. AREA



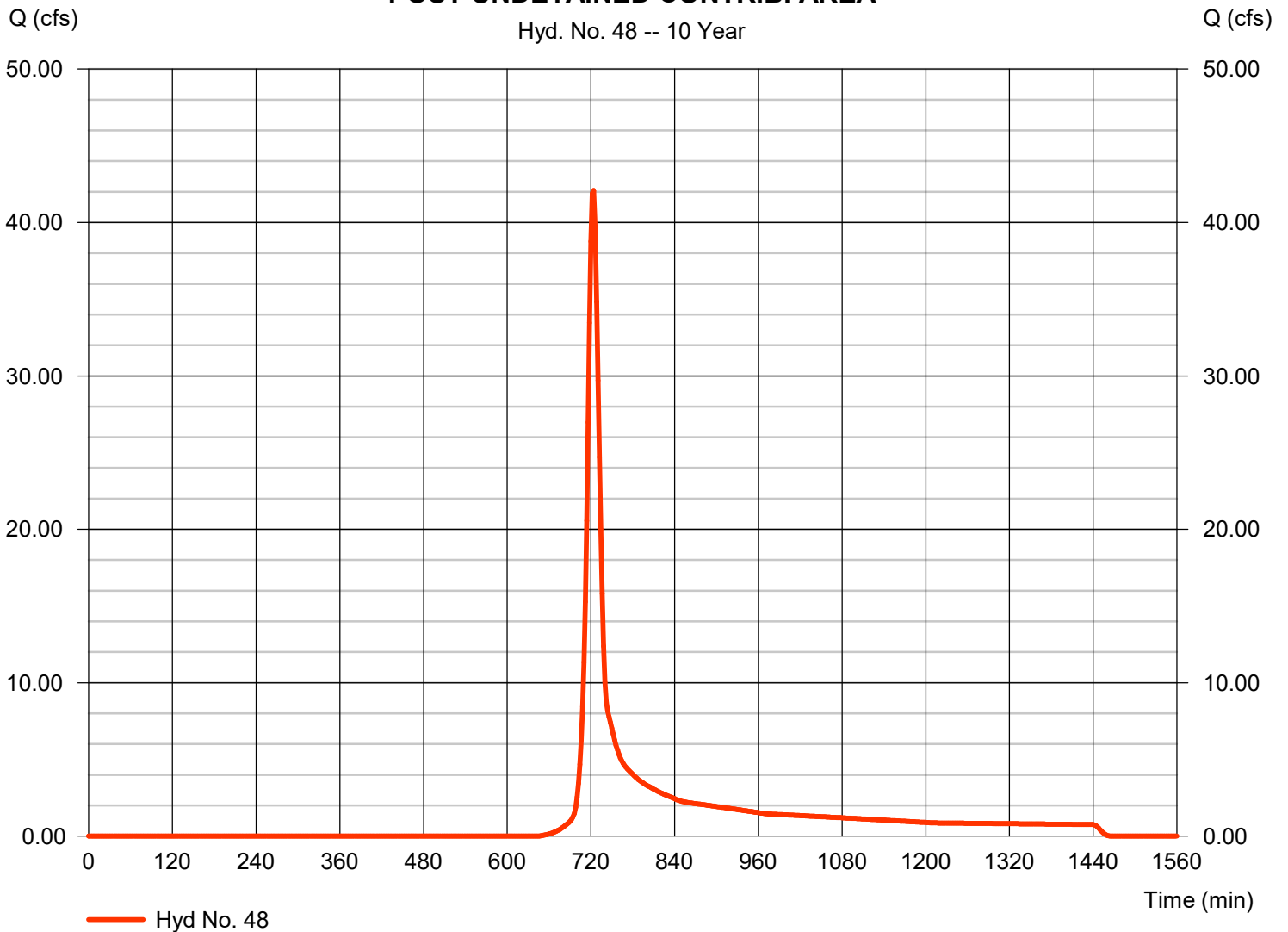
# Hydrograph Report

## Hyd. No. 48

### POST UNDETAINED CONTRIB. AREA

|                 |              |                    |                |
|-----------------|--------------|--------------------|----------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 42.08 cfs    |
| Storm frequency | = 10 yrs     | Time to peak       | = 724 min      |
| Time interval   | = 2 min      | Hyd. volume        | = 122,564 cuft |
| Drainage area   | = 25.280 ac  | Curve number       | = 70           |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft         |
| Tc method       | = User       | Time of conc. (Tc) | = 14.60 min    |
| Total precip.   | = 4.06 in    | Distribution       | = Type II      |
| Storm duration  | = 24 hrs     | Shape factor       | = 484          |

### POST UNDETAINED CONTRIB. AREA



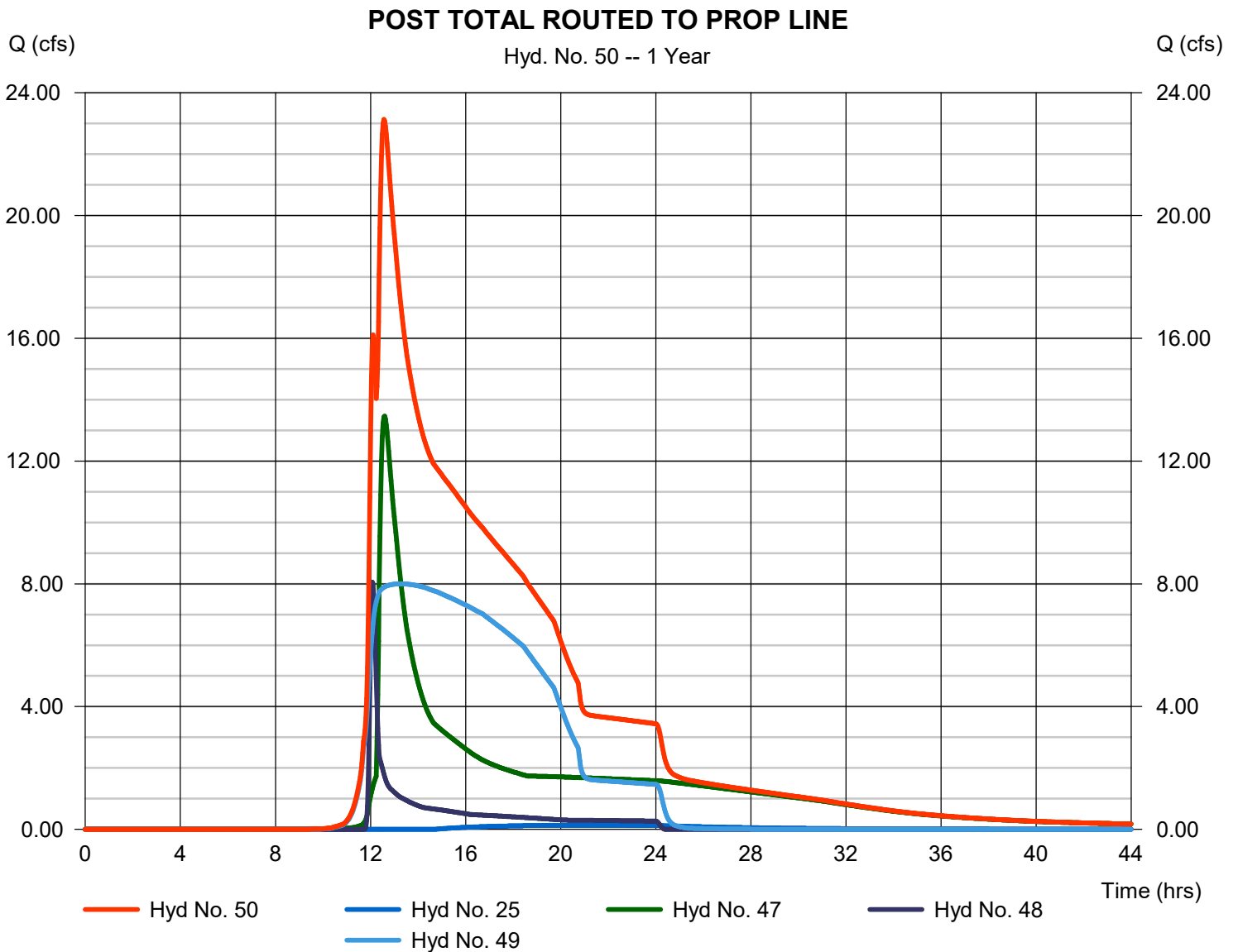
# Hydrograph Report

## Hyd. No. 50

### POST TOTAL ROUTED TO PROP LINE

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 25, 47, 48, 49

Peak discharge = 23.13 cfs  
Time to peak = 12.57 hrs  
Hyd. volume = 467,983 cuft  
Contrib. drain. area = 25.280 ac



# Hydrograph Report

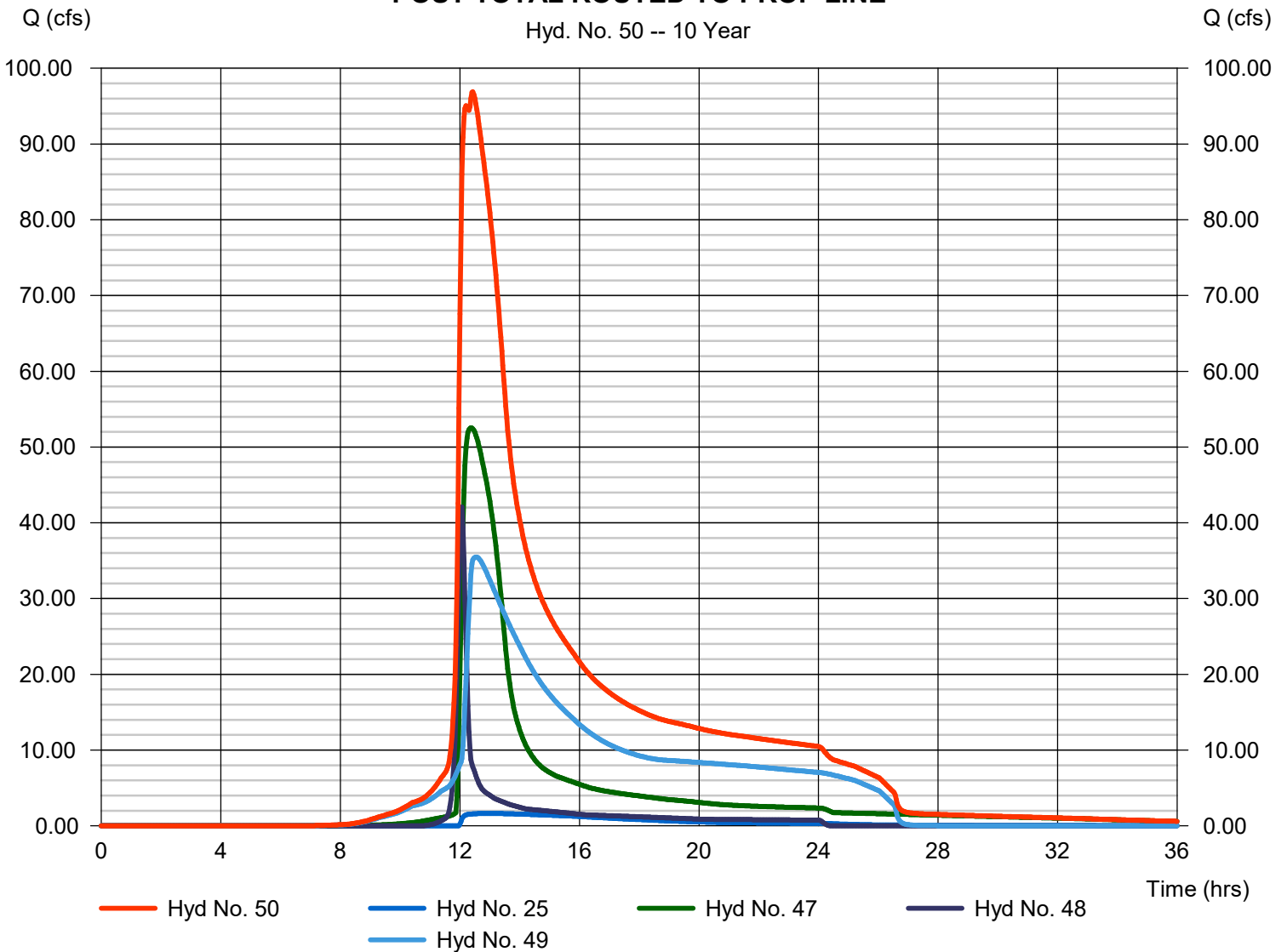
## Hyd. No. 50

### POST TOTAL ROUTED TO PROP LINE

|                 |                  |                      |                  |
|-----------------|------------------|----------------------|------------------|
| Hydrograph type | = Combine        | Peak discharge       | = 96.89 cfs      |
| Storm frequency | = 10 yrs         | Time to peak         | = 12.43 hrs      |
| Time interval   | = 2 min          | Hyd. volume          | = 1,336,195 cuft |
| Inflow hyds.    | = 25, 47, 48, 49 | Contrib. drain. area | = 25.280 ac      |

### POST TOTAL ROUTED TO PROP LINE

Hyd. No. 50 -- 10 Year



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA A onsite**

**PREDEVELOPMENT**

| Composite Curve Number (CN) |                       |            |    |               |                | Notes:   |
|-----------------------------|-----------------------|------------|----|---------------|----------------|--|
|                             | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.) | CN*A           | <u>Informational sheet (1 of 7):</u><br>This sheet is used to demonstrate the required reduction in the 1-year event if the "energy balance" equation were applied ONLY to the project site (i.e. offsite flows were treated as pass-through and added to the allowable rate calculated here). The predev. flow rate assumes no detention onsite and does not include offsite flows. |
| CN <sub>1</sub>             | B                     | Open space | 61 | 27.70         | 1689.46        |  |
| CN <sub>2</sub>             | C                     | Open space | 74 | 16.18         | 1197.32        |  |
| CN <sub>3</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>4</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>5</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>6</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>7</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>8</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>9</sub>             |                       |            |    |               | 0.00           |  |
| CN <sub>10</sub>            |                       |            |    |               | 0.00           |  |
| Total                       |                       |            |    | <b>43.88</b>  | <b>2886.78</b> |  |
| <b>Composite CN =</b>       |                       |            |    |               | <b>66</b>      |  |

| Time of Concentration, T <sub>c</sub>                      |               |            |                            |                     |               |                                    |
|--|---------------|------------|----------------------------|---------------------|---------------|------------------------------------|
|  |               |            | 2 yr. Precip. (in.) = 2.73 |                     |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft)                | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100                        | 0.24                | 0.05          | 10.7                               |
| 2  | Shallow Conc. | Grass      | 1100                       |                     | 0.091         | 3.8                                |
| 3  | Channel       | Grass      | 834                        | 0.03                | 0.019         | 3.7                                |
| 4  |               |            |                            |                     |               |                                    |
| 5  |               |            |                            |                     |               |                                    |
| 6  |               |            |                            |                     |               |                                    |
| 7  |               |            |                            |                     |               |                                    |
| 8  |               |            |                            |                     |               |                                    |
| 9  |               |            |                            |                     |               |                                    |
| 10   |               |            |                            |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |                            |                     |               | <b>18.2</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 66    | 66     | 66      |
| Storage (in.) S=1000/CN-10   | 5.15  | 5.15   | 5.15    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 1.03  | 1.03   | 1.03    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.24  | 1.12   | 2.77    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.87  | 4.10   | 10.13   |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 6.31  | 52.52  |         |

Hydrograph Number: 53



# Hydrograph Report

## Hyd. No. 53

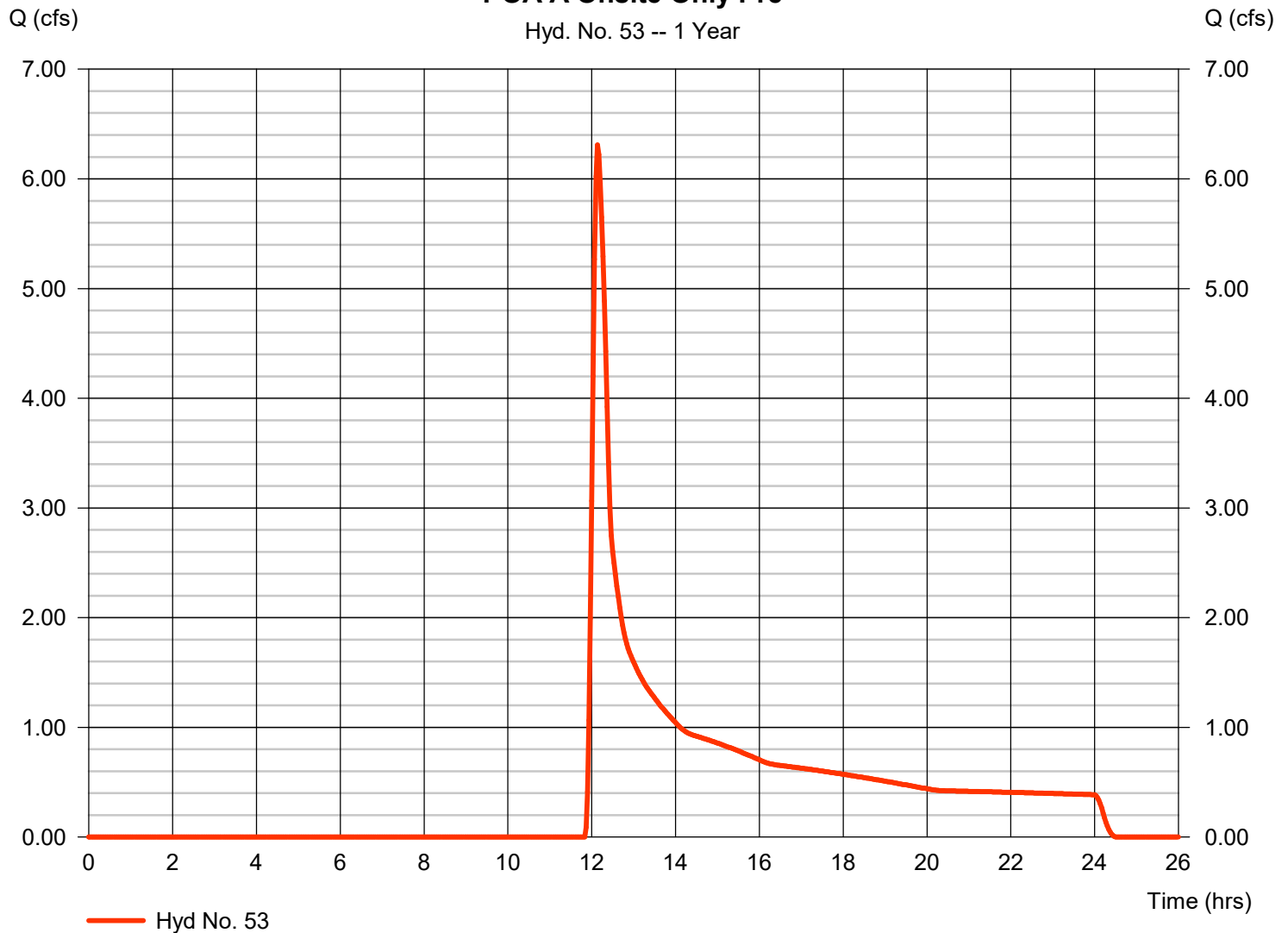
### POA A Onsite Only Pre

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 6.311 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 12.13 hrs   |
| Time interval   | = 2 min      | Hyd. volume        | = 37,718 cuft |
| Drainage area   | = 43.880 ac  | Curve number       | = 66          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 18.20 min   |
| Total precip.   | = 2.26 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |

**Informational sheet (2 of 7):**

This sheet is used to demonstrate the required reduction in the 1-year event if the "energy balance" equation were applied ONLY to the project site (i.e. offsite flows were treated as pass-through and added to the allowable rate calculated here). The predev. flow rate assumes no detention onsite and does not include offsite flows.

### POA A Onsite Only Pre



# Hydrograph Report

## Hyd. No. 53

### POA A Onsite Only Pre

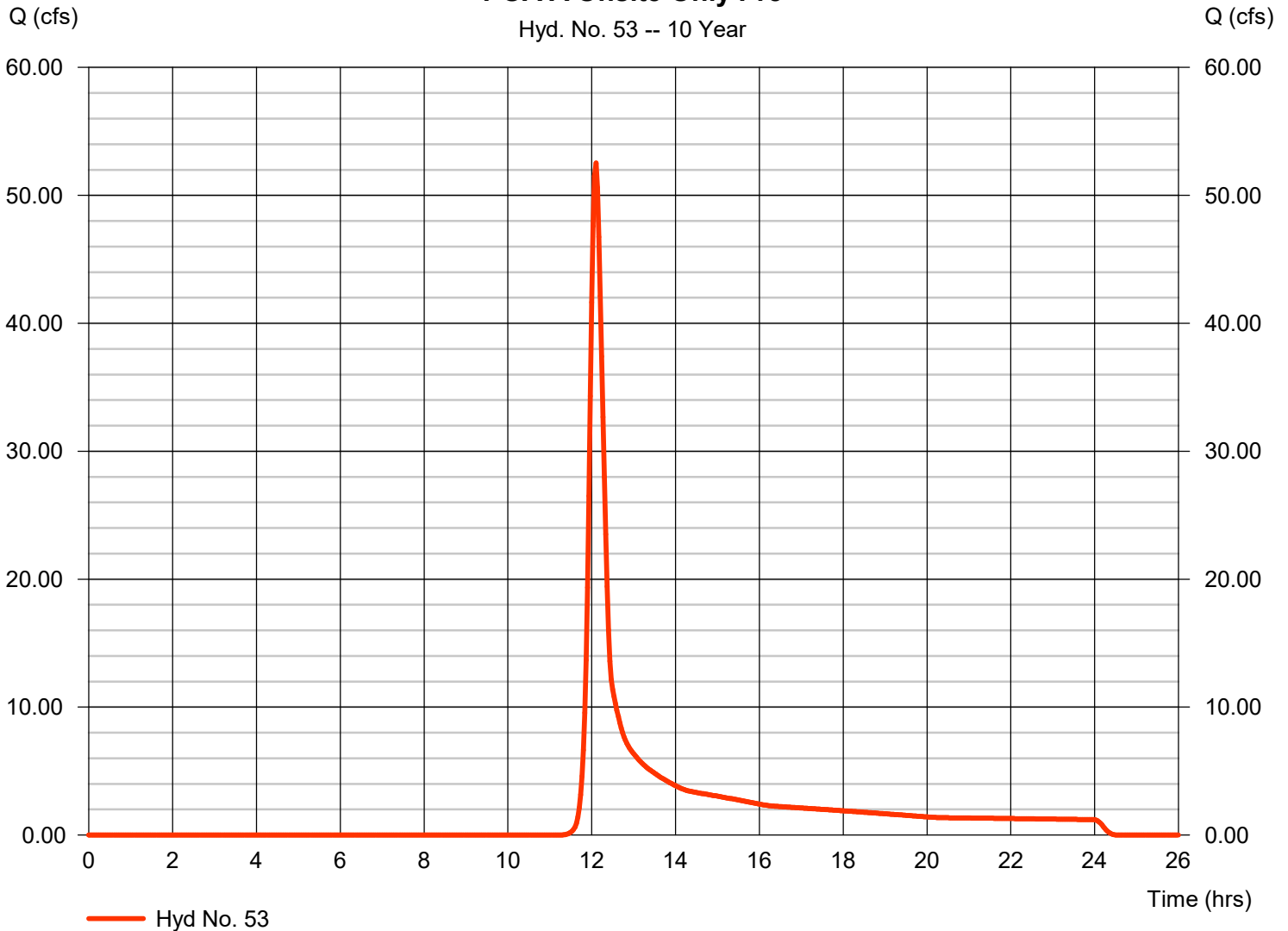
|                 |              |                    |                |
|-----------------|--------------|--------------------|----------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 52.52 cfs    |
| Storm frequency | = 10 yrs     | Time to peak       | = 12.10 hrs    |
| Time interval   | = 2 min      | Hyd. volume        | = 178,712 cuft |
| Drainage area   | = 43.880 ac  | Curve number       | = 66           |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft         |
| Tc method       | = User       | Time of conc. (Tc) | = 18.20 min    |
| Total precip.   | = 4.06 in    | Distribution       | = Type II      |
| Storm duration  | = 24 hrs     | Shape factor       | = 484          |

**Informational sheet (3 of 7):**

This sheet is used to determine the 10-year target for ONLY project site runoff (i.e. offsite flows were treated as pass-through and would be added to the allowable rate calculated here). The predev. flow rate assumes no detention onsite and does not include offsite flows.

### POA A Onsite Only Pre

Hyd. No. 53 -- 10 Year



## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA A onsite**

**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |            |    |               |                | Notes:  |
|-----------------------------|-----------------------|------------|----|---------------|----------------|---|
|                             | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.) | CN*A           | Informational sheet (4 of 7):<br>This sheet is used to demonstrate the required reduction in the 1-year event if the "energy balance" equation were applied ONLY to the project site (i.e. offsite flows were treated as pass-through and added to the allowable rate calculated here). The predev. flow rate assumes no detention onsite and does not include offsite flows. |
| CN <sub>1</sub>             | B                     | Open space | 61 | 21.37         | 1303.30        |   |
| CN <sub>2</sub>             | B                     | Impervious | 98 | 6.42          | 629.14         |   |
| CN <sub>3</sub>             | C                     | Open space | 74 | 10.91         | 807.02         |   |
| CN <sub>4</sub>             | C                     | Impervious | 98 | 6.06          | 593.55         |   |
| CN <sub>5</sub>             |                       |            |    |               | 0.00           |   |
| CN <sub>6</sub>             |                       |            |    |               | 0.00           |   |
| CN <sub>7</sub>             |                       |            |    |               | 0.00           |   |
| CN <sub>8</sub>             |                       |            |    |               | 0.00           |   |
| CN <sub>9</sub>             |                       |            |    |               | 0.00           |   |
| CN <sub>10</sub>            |                       |            |    |               | 0.00           |   |
| Total                       |                       |            |    | <b>44.75</b>  | <b>3333.00</b> |   |
| <b>Composite CN =</b>       |                       |            |    |               | <b>74</b>      |   |

| Time of Concentration, T <sub>c</sub>                      |             |            |                            |                     |               |                                    |
|--|-------------|------------|----------------------------|---------------------|---------------|------------------------------------|
|  |             |            | 2 yr. Precip. (in.) = 2.73 |                     |               |                                    |
| Flow Segment   | Flow Regime | Land Cover | Length (ft)                | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  |             |            |                            |                     |               |                                    |
| 2  |             |            |                            |                     |               |                                    |
| 3  |             |            |                            |                     |               |                                    |
| 4  |             |            |                            |                     |               |                                    |
| 5  |             |            |                            |                     |               |                                    |
| 6  |             |            |                            |                     |               |                                    |
| 7  |             |            |                            |                     |               |                                    |
| 8  |             |            |                            |                     |               |                                    |
| 9  |             |            |                            |                     |               |                                    |
| 10   |             |            |                            |                     |               | 10.0                               |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |             |            |                            |                     |               | <b>10.0</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 74    | 74     | 74      |
| Storage (in.) S=1000/CN-10   | 3.51  | 3.51   | 3.51    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.70  | 0.70   | 0.70    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.48  | 1.64   | 3.56    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 1.78  | 6.12   | 13.27   |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   |       |        |         |

Hydrograph Number: 54

# Hydrograph Report

## Hyd. No. 54

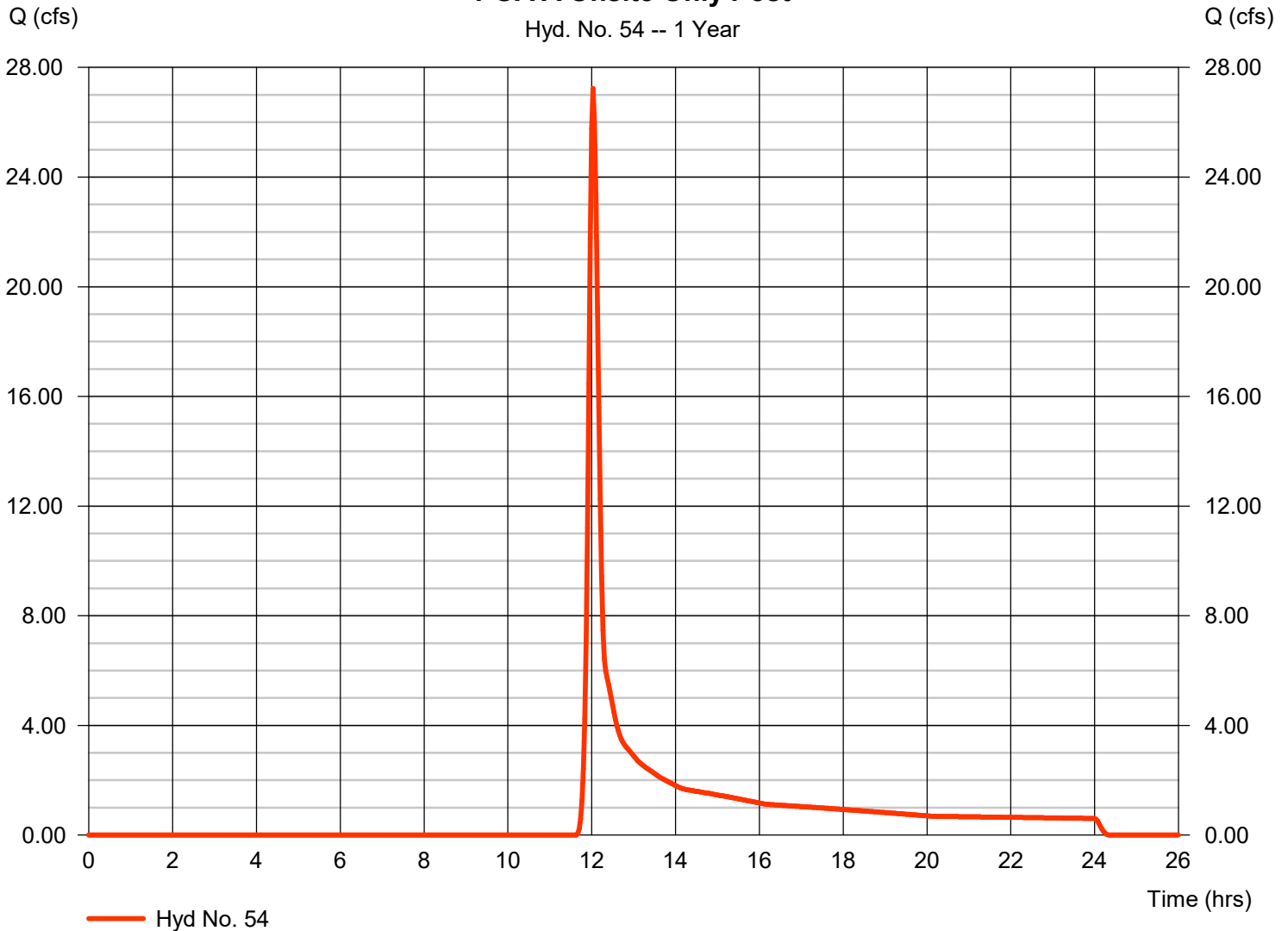
### POA A Onsite Only Post

|                 |              |                    |               |
|-----------------|--------------|--------------------|---------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 27.23 cfs   |
| Storm frequency | = 1 yrs      | Time to peak       | = 12.03 hrs   |
| Time interval   | = 2 min      | Hyd. volume        | = 80,114 cuft |
| Drainage area   | = 44.750 ac  | Curve number       | = 74          |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft        |
| Tc method       | = User       | Time of conc. (Tc) | = 10.00 min   |
| Total precip.   | = 2.26 in    | Distribution       | = Type II     |
| Storm duration  | = 24 hrs     | Shape factor       | = 484         |

**Informational sheet (5 of 7):**

This sheet provides a reference point for the undetained peak flow rate from ONLY the onsite area in the post-developed condition. The flow rate assumes no detention onsite and does not include offsite flows.

### POA A Onsite Only Post



# Hydrograph Report

## Hyd. No. 54

### POA A Onsite Only Post

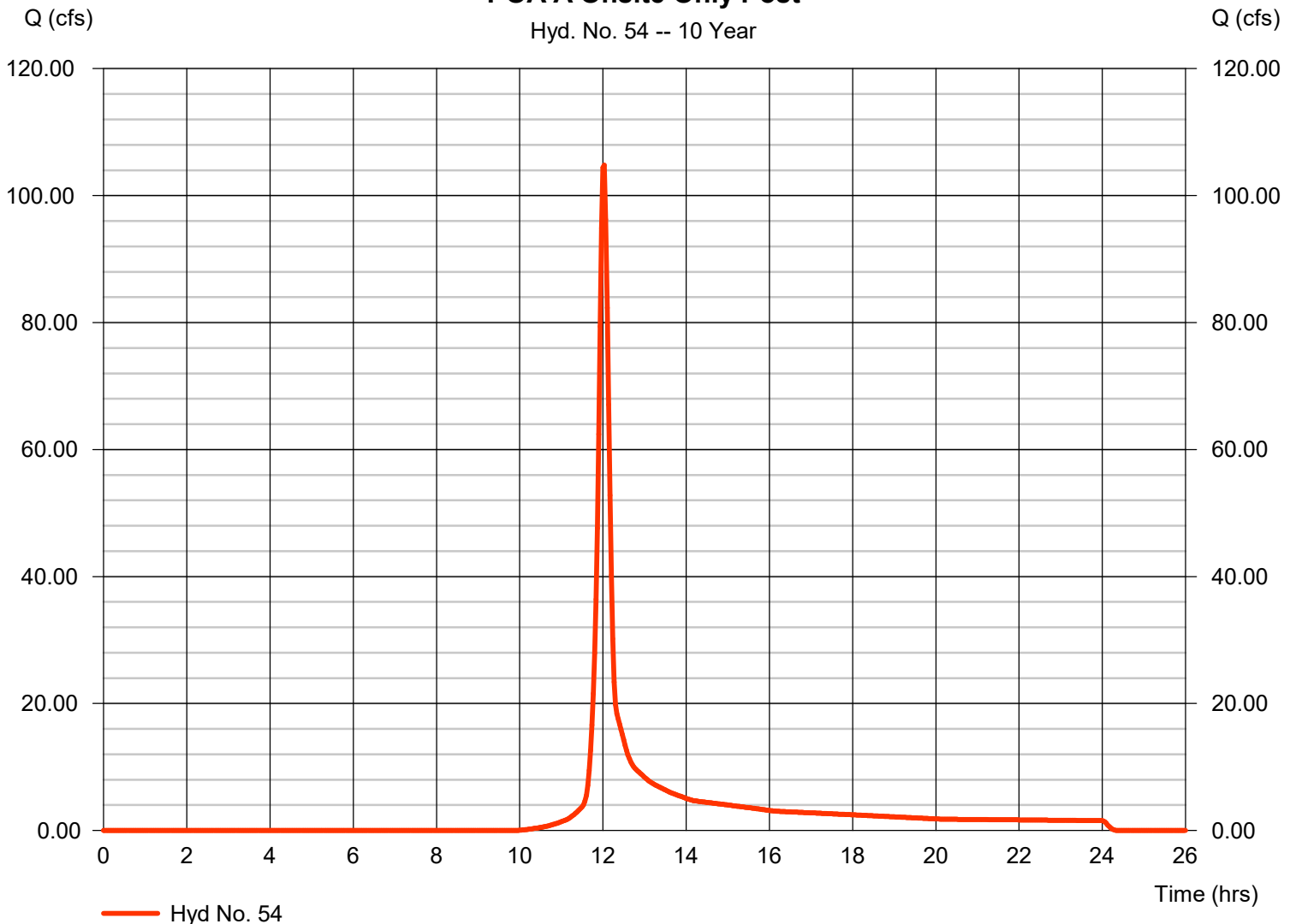
|                 |              |                    |                |
|-----------------|--------------|--------------------|----------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 104.79 cfs   |
| Storm frequency | = 10 yrs     | Time to peak       | = 12.03 hrs    |
| Time interval   | = 2 min      | Hyd. volume        | = 274,812 cuft |
| Drainage area   | = 44.750 ac  | Curve number       | = 74           |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft         |
| Tc method       | = User       | Time of conc. (Tc) | = 10.00 min    |
| Total precip.   | = 4.06 in    | Distribution       | = Type II      |
| Storm duration  | = 24 hrs     | Shape factor       | = 484          |

**Informational sheet (6 of 7):**

This sheet provides a reference point for the undetained peak flow rate from ONLY the onsite area in the post-developed condition. The flow rate assumes no detention onsite and does not include offsite flows.

### POA A Onsite Only Post

Hyd. No. 54 -- 10 Year



## Stormwater Quantity Compliance (9VAC25-870-66)

|                                    |         |          |
|------------------------------------|---------|----------|
| <b>Drainage Area: POA A onsite</b> |         |          |
|                                    | Predev. | Postdev. |
| Area (ac.)                         | 43.88   | 44.75    |
| T <sub>c</sub> (min.)              | 18.2    | 10.0     |

|                    |         |
|--------------------|---------|
| Precipitation Data |         |
| Return Frequency   | P (in.) |
| 1 Yr.              | 2.26    |
| 10 Yr.             | 4.06    |

|  | 1 Yr.   |          | 10 Yr.  |          |
|--|---------|----------|---------|----------|
|  | Predev. | Postdev. | Predev. | Postdev. |
| VRRM CN  | 66      | 74       | 66      | 74       |
| Storage (in.) S=1000/CN-10                         | 5.15    | 3.51     | 5.15    | 3.51     |
| Initial abstraction (in.), I <sub>a</sub> =0.2S    | 1.03    | 0.70     | 1.03    | 0.70     |
| Runoff depth (in.), $Q=(P-0.2S)^2/[(P-I_a)+S]$     | 0.24    | 0.48     | 1.12    | 1.64     |
| Runoff volume (ac-ft), RV = Q/12*A                 | 0.87    | 1.78     | 4.10    | 6.12     |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph | 6.311   |          | 52.52   |          |

| <b>1 Year Channel Protection (9VAC25-870-66.B)</b>                                     |      |  |
|--|------|--|
| $q_{\text{allowable}} \leq I.F. * (q_{\text{pre}} * RV_{\text{pre}})/RV_{\text{post}}$ |      | Addressed by alternative method (if needed): |
| Improvement Factor (I.F.)  | 0.8  |  |
| q <sub>pre</sub> (cfs)   | 6.31 |  |
| RV <sub>pre</sub> (ac-ft)  | 0.87 |  |
| RV <sub>post</sub> (with runoff reduction) (ac-ft)                                     | 1.78 |  |
| q <sub>allowable</sub> (cfs)   | 2.45 |  |
| q <sub>post</sub> (cfs)  |      |  |
| Check (q <sub>post</sub> ≤ q <sub>allowable</sub> )                                    |      |  |

| <b>10 Year Flood Protection (9VAC25-870-66.C)</b> |       |  |
|---|-------|--|
| q <sub>post</sub> ≤ q <sub>pre</sub>              |       | Addressed by alternative method (if needed): |
| q <sub>pre</sub> (cfs)                            | 52.52 |  |
| q <sub>post</sub> (cfs)                           |       |  |
| Check (q <sub>post</sub> ≤ q <sub>pre</sub> )     |       |  |

Other notes: This sheet is included only to detail the required channel protection reduction in flow rate if the project were evaluated as an individual site (i.e. offsite areas are treated as "bypass/pass-through" flow and only onsite areas are plugged into the "energy balance" equation.

**1 year reduction required: 6.31 cfs - 2.45 cfs = 3.86 cfs**

3.86 cfs represents the reduction in peak flow rate the project would be required to demonstrate at the point of discharge.

**Informational sheet (7 of 7):**

This sheet is used to demonstrate the required reduction in the 1-year event if the "energy balance" equation were applied ONLY to the project site (i.e. offsite flows were treated as pass-through and added to the allowable rate calculated here). The predev. flow rate assumes no detention onsite and does not include offsite flows. Undetained post-dev. flows from pages 5 and 6 are omitted because they represent and undetained condition. Those flows would need to be reduced via detention facilities to the targets on this sheet if the site were developed without regional detention in mind.

| <b>Point of Analysis A Regulatory Req. and Regional Stormwater Agreement Analysis</b> |  |  |   |  |
|---|--|--|---|--|
|   |  | <b>1 yr</b>  | <b>10 yr</b>  | <b>Reference</b>   |
| Subdivision development WITHOUT regional stormwater management                        | Predevelopment-Onsite area only  | 6.31 cfs   | 52.52 cfs   | Hyd. 53  |
|   | Change required per regulations  | Post-dev. peak flow rate must be less than the "energy balance" equation result (2.45 cfs) | Post-dev. peak flow rate must be less than the Predev. peak flow rate above | Quantity Compliance Sheet (Info. Sheet 7 of 7) for "energy balance" solution |
|   | Net change required from predev. peak flow rate to meet 9VAC25-870-66. regulations   | $2.45 - 6.61 = -3.86$ cfs  | 0 cfs   | NA   |
|   | Predevelopment-Entire contributing drainage area (flow currently experienced at the downstream property line; includes onsite and offsite areas)                                       | 75.45 cfs  | 175.77 cfs  | Hyd. 32  |
|   | Max. allowable peak flow rate at property line   | $75.45 - 3.86 = 71.59$ cfs   | 175.77 cfs  | NA   |
| Subdivision development WITH regional stormwater management                           | Post-development-Entire contributing drainage area (flow experienced at downstream property line after conceptual SWM improvements; includes fully developed onsite and offsite areas) | 23.13 cfs  | 96.89 cfs   | Hyd. 50  |
|   | Net change achieved  | $23.13 - 71.59 = -48.46$ cfs   | $96.89 - 175.77 = -78.88$ cfs   | NA   |
| Regional Stormwater Agreement Analysis  | Percent reduction required   | 60% (+/-10%)   | 48% (+/-10%)  | NA   |
|   | Percent reduction achieved   | $48.46/75.45 = 64\%$   | $78.88/175.77 = 45\%$   | NA   |
|   | Conclusions  | Regulatory compliance achieved and Agreement requirements met                              | Regulatory compliance achieved and Agreement requirements met               | NA   |




**NOTE:** The data above reflect the impact of construction of the ponds and subdivision depicted in this document. The data is preliminary in nature and subject to change during engineering design.

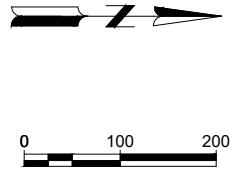
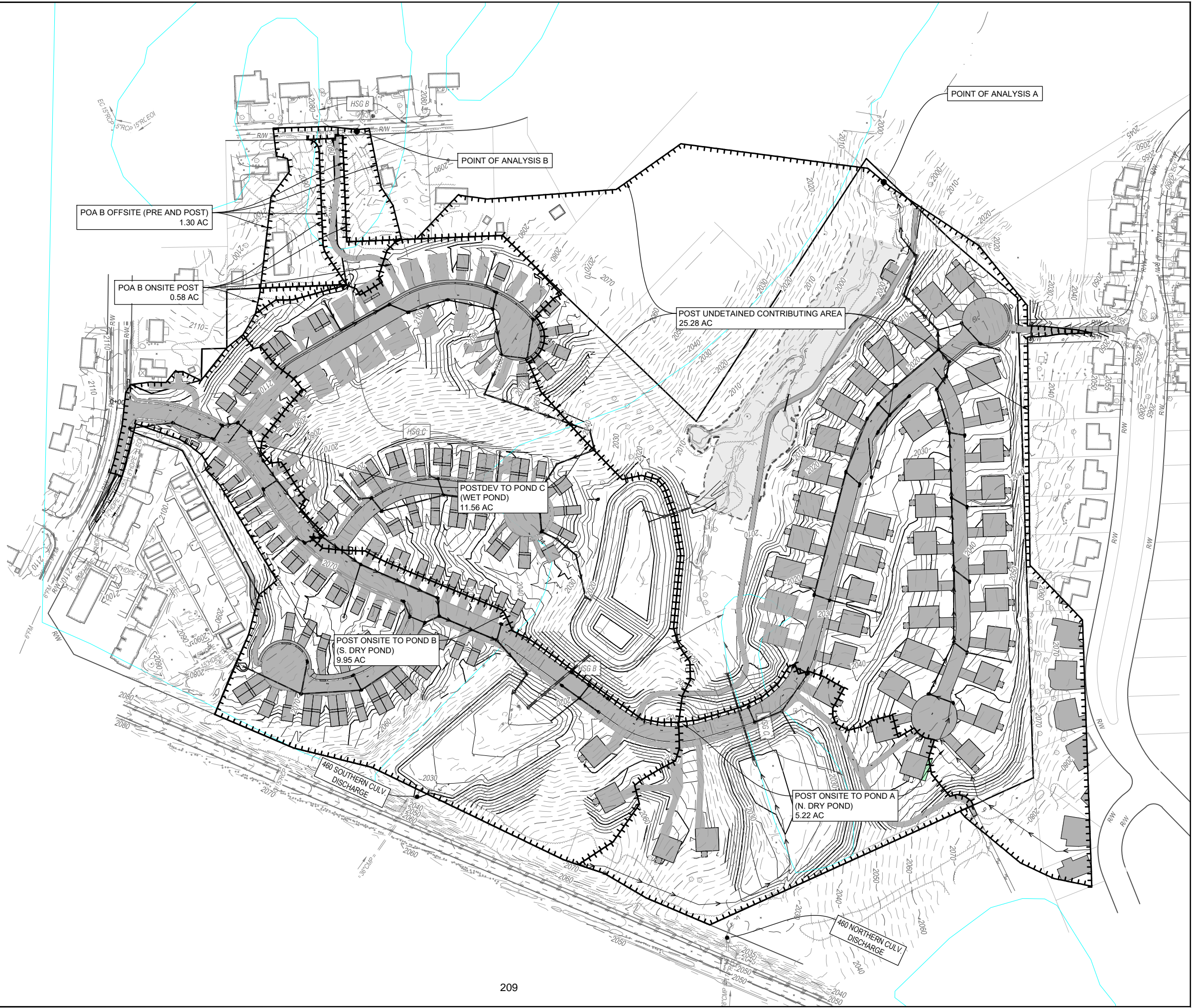
## **Point of Analysis B**



Z:\PROJECTS\CAD\HOPPER\2023\04\CL - GLADE SPRING CROSSING\EDEN - GLADE SPRING CROSSING\PRELIM PLAT CAD\DRAINAGE-POST ONSITE.DWG  
10/31/2023 8:19:34 PM

**LEGEND**

-  DRAINAGE AREA
-  IMPERVIOUS AREA
-  PRELIMINARY REDRAWN CREEK VALLEY OVERLAY



| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

**POSTDEVELOPMENT ONSITE  
DRAINAGE AREAS**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
PROPERTY OF GLADE SPRING CROSSING, LLC  
TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
MONTGOMERY COUNTY, VIRGINIA

|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>MTJ  | Date:<br>10/24/2023 |
| Sheet No.<br>1 of 1 | <b>D3</b>           |

## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA B offsite**

**PRE & POST**

| Composite Curve Number (CN) |                       |            |    |               |              | Notes: |
|-----------------------------|-----------------------|------------|----|---------------|--------------|--------|
|                             | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.) | CN*A         |        |
| CN <sub>1</sub>             | B                     | Open space | 61 | 0.40          | 24.49        |        |
| CN <sub>2</sub>             | B                     | Impervious | 98 | 0.08          | 8.20         |        |
| CN <sub>3</sub>             | C                     | Open space | 74 | 0.68          | 50.47        |        |
| CN <sub>4</sub>             | C                     | Impervious | 98 | 0.13          | 13.12        |        |
| CN <sub>5</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>6</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>7</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>8</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>9</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>10</sub>            |                       |            |    |               | 0.00         |        |
| Total                       |                       |            |    | <b>1.30</b>   | <b>96.28</b> |        |
| <b>Composite CN =</b>       |                       |            |    |               | <b>74</b>    |        |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.08          | 8.9                                |
| 2  | Shallow Conc. | Unpaved    | 332         |                     | 0.063         | 1.4                                |
| 3  |               |            |             |                     |               |                                    |
| 4  |               |            |             |                     |               |                                    |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>10.2</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 74    | 74     | 74      |
| Storage (in.) S=1000/CN-10   | 3.51  | 3.51   | 3.51    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.70  | 0.70   | 0.70    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.48  | 1.64   | 3.56    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.05  | 0.18   | 0.39    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 0.79  | 3.04   |         |

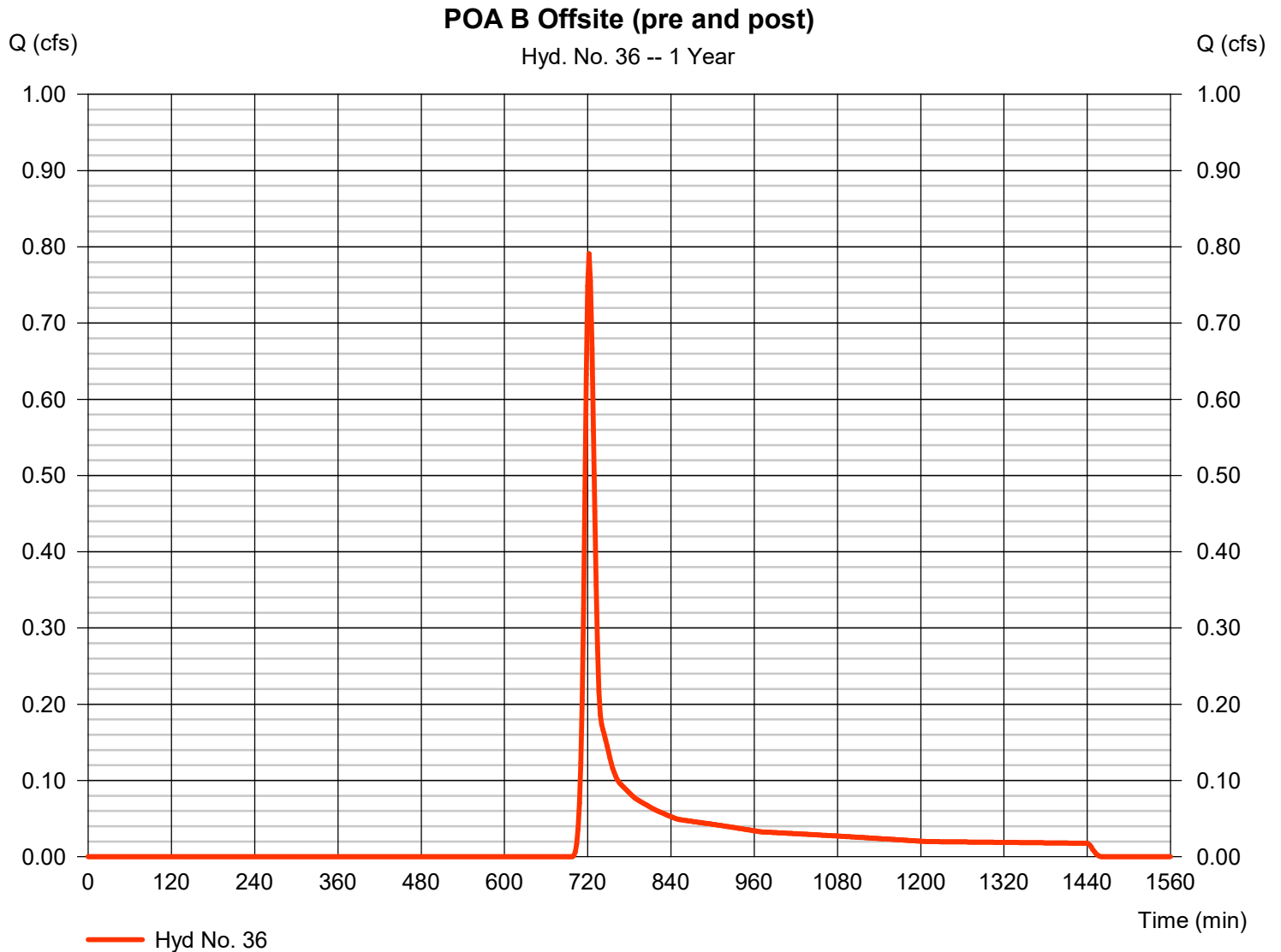
Hydrograph Number:           36

# Hydrograph Report

## Hyd. No. 36

POA B Offsite (pre and post)

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.791 cfs  |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 2,327 cuft |
| Drainage area   | = 1.300 ac   | Curve number       | = 74         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 10.20 min  |
| Total precip.   | = 2.26 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |

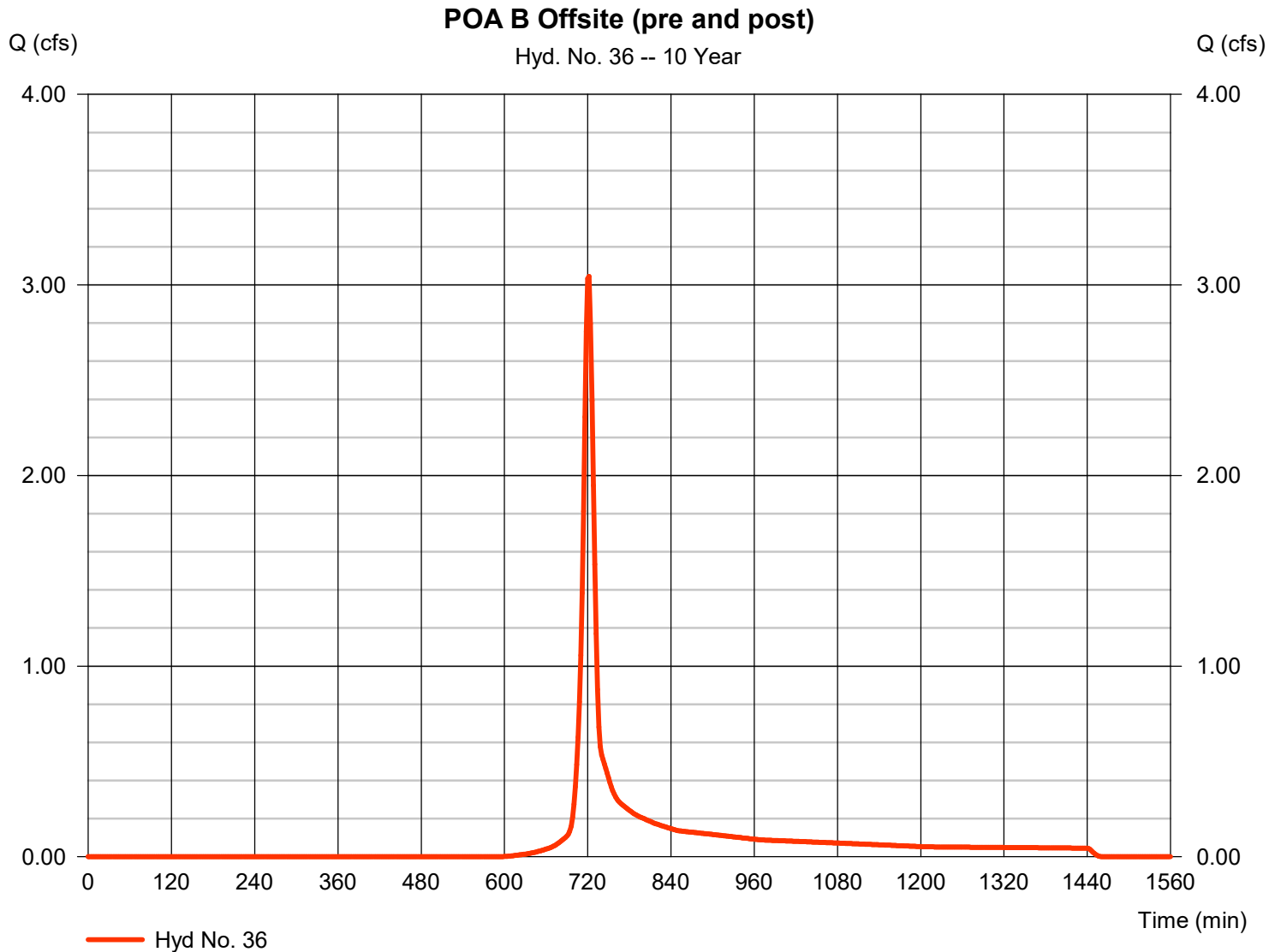


# Hydrograph Report

## Hyd. No. 36

POA B Offsite (pre and post)

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 3.044 cfs  |
| Storm frequency | = 10 yrs     | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 7,983 cuft |
| Drainage area   | = 1.300 ac   | Curve number       | = 74         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 10.20 min  |
| Total precip.   | = 4.06 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |





## Drainage Area Runoff and Time of Concentration

Drainage Area: **POA B onsite**

**POSTDEVELOPMENT**

| Composite Curve Number (CN) |                       |            |    |               |              | Notes: |
|-----------------------------|-----------------------|------------|----|---------------|--------------|--------|
|                             | Hydrologic Soil Group | Land Cover | CN | Area, A (ac.) | CN*A         |        |
| CN <sub>1</sub>             | B                     | Open space | 61 | 0.22          | 13.24        |        |
| CN <sub>2</sub>             | B                     | Impervious | 98 | 0.06          | 5.64         |        |
| CN <sub>3</sub>             | C                     | Open space | 74 | 0.27          | 19.64        |        |
| CN <sub>4</sub>             | C                     | Impervious | 98 | 0.04          | 4.22         |        |
| CN <sub>5</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>6</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>7</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>8</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>9</sub>             |                       |            |    |               | 0.00         |        |
| CN <sub>10</sub>            |                       |            |    |               | 0.00         |        |
| Total                       |                       |            |    | <b>0.58</b>   | <b>42.74</b> |        |
| <b>Composite CN =</b>       |                       |            |    |               | <b>73</b>    |        |

| Time of Concentration, T <sub>c</sub>                      |               |            |             |                     |               |                                    |
|--|---------------|------------|-------------|---------------------|---------------|------------------------------------|
| 2 yr. Precip. (in.) =                                      |               |            |             | 2.73                |               |                                    |
| Flow Segment   | Flow Regime   | Land Cover | Length (ft) | Roughness Coeff., n | Slope (ft/ft) | Travel Time, T <sub>t</sub> (min.) |
| 1  | Sheet Flow    | Grass      | 100         | 0.24                | 0.07          | 9.4                                |
| 2  | Shallow Conc. | Unpaved    | 375         |                     | 0.067         | 1.5                                |
| 3  |               |            |             |                     |               |                                    |
| 4  |               |            |             |                     |               |                                    |
| 5  |               |            |             |                     |               |                                    |
| 6  |               |            |             |                     |               |                                    |
| 7  |               |            |             |                     |               |                                    |
| 8  |               |            |             |                     |               |                                    |
| 9  |               |            |             |                     |               |                                    |
| 10   |               |            |             |                     |               |                                    |
| <b>Total Time of Concentration, T<sub>c</sub> (min.) =</b> |               |            |             |                     |               | <b>10.9</b>                        |

| Runoff   |       |        |         |
|--|-------|--------|---------|
|  | 1 Yr. | 10 Yr. | 100 Yr. |
| Precipitation (in.), P   | 2.26  | 4.06   | 6.44    |
| Composite CN   | 73    | 73     | 73      |
| Storage (in.) S=1000/CN-10   | 3.70  | 3.70   | 3.70    |
| Initial abstraction (in.), I <sub>a</sub> =0.2S                      | 0.74  | 0.74   | 0.74    |
| Runoff depth (in.), Q=(P-0.2S) <sup>2</sup> /[(P-I <sub>a</sub> )+S] | 0.44  | 1.57   | 3.46    |
| Runoff volume (ac-ft), RV = Q/12*A                                   | 0.02  | 0.08   | 0.17    |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph                   | 0.32  | 1.30   |         |

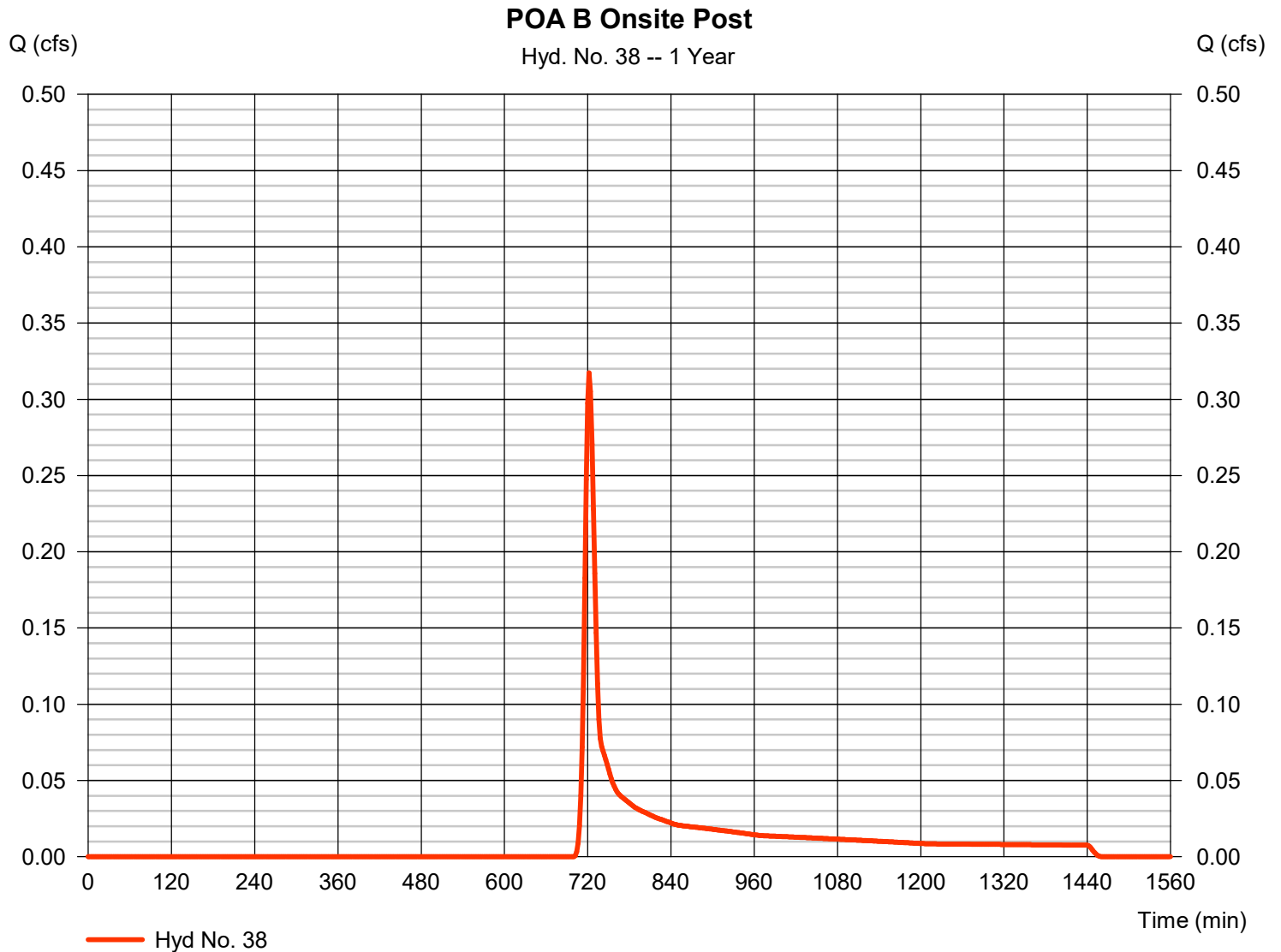
Hydrograph Number: 38

# Hydrograph Report

## Hyd. No. 38

POA B Onsite Post

|                 |              |                    |             |
|-----------------|--------------|--------------------|-------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 0.317 cfs |
| Storm frequency | = 1 yrs      | Time to peak       | = 722 min   |
| Time interval   | = 2 min      | Hyd. volume        | = 961 cuft  |
| Drainage area   | = 0.580 ac   | Curve number       | = 73        |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft      |
| Tc method       | = User       | Time of conc. (Tc) | = 10.90 min |
| Total precip.   | = 2.26 in    | Distribution       | = Type II   |
| Storm duration  | = 24 hrs     | Shape factor       | = 484       |

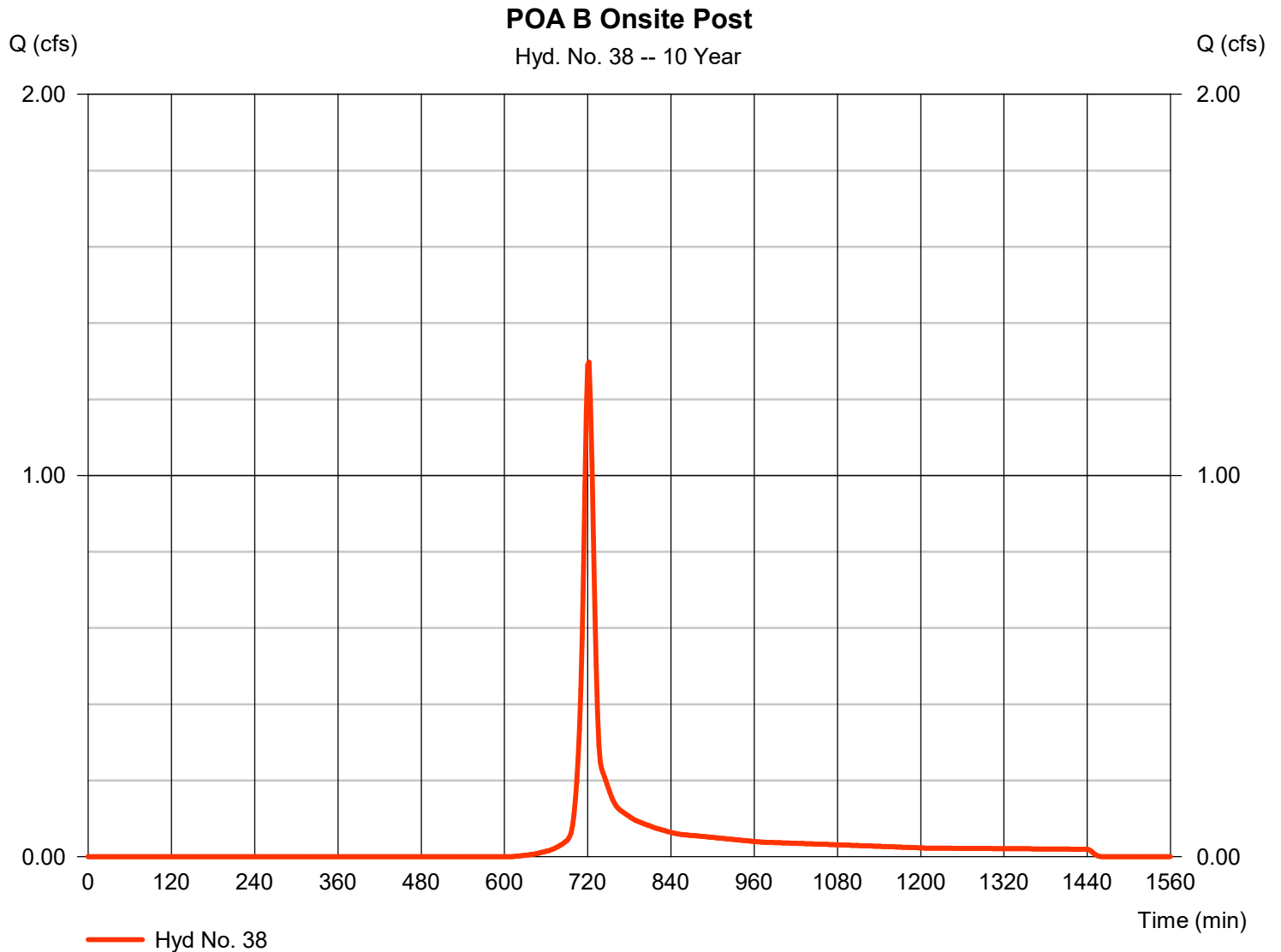


# Hydrograph Report

## Hyd. No. 38

POA B Onsite Post

|                 |              |                    |              |
|-----------------|--------------|--------------------|--------------|
| Hydrograph type | = SCS Runoff | Peak discharge     | = 1.297 cfs  |
| Storm frequency | = 10 yrs     | Time to peak       | = 722 min    |
| Time interval   | = 2 min      | Hyd. volume        | = 3,410 cuft |
| Drainage area   | = 0.580 ac   | Curve number       | = 73         |
| Basin Slope     | = 0.0 %      | Hydraulic length   | = 0 ft       |
| Tc method       | = User       | Time of conc. (Tc) | = 10.90 min  |
| Total precip.   | = 4.06 in    | Distribution       | = Type II    |
| Storm duration  | = 24 hrs     | Shape factor       | = 484        |



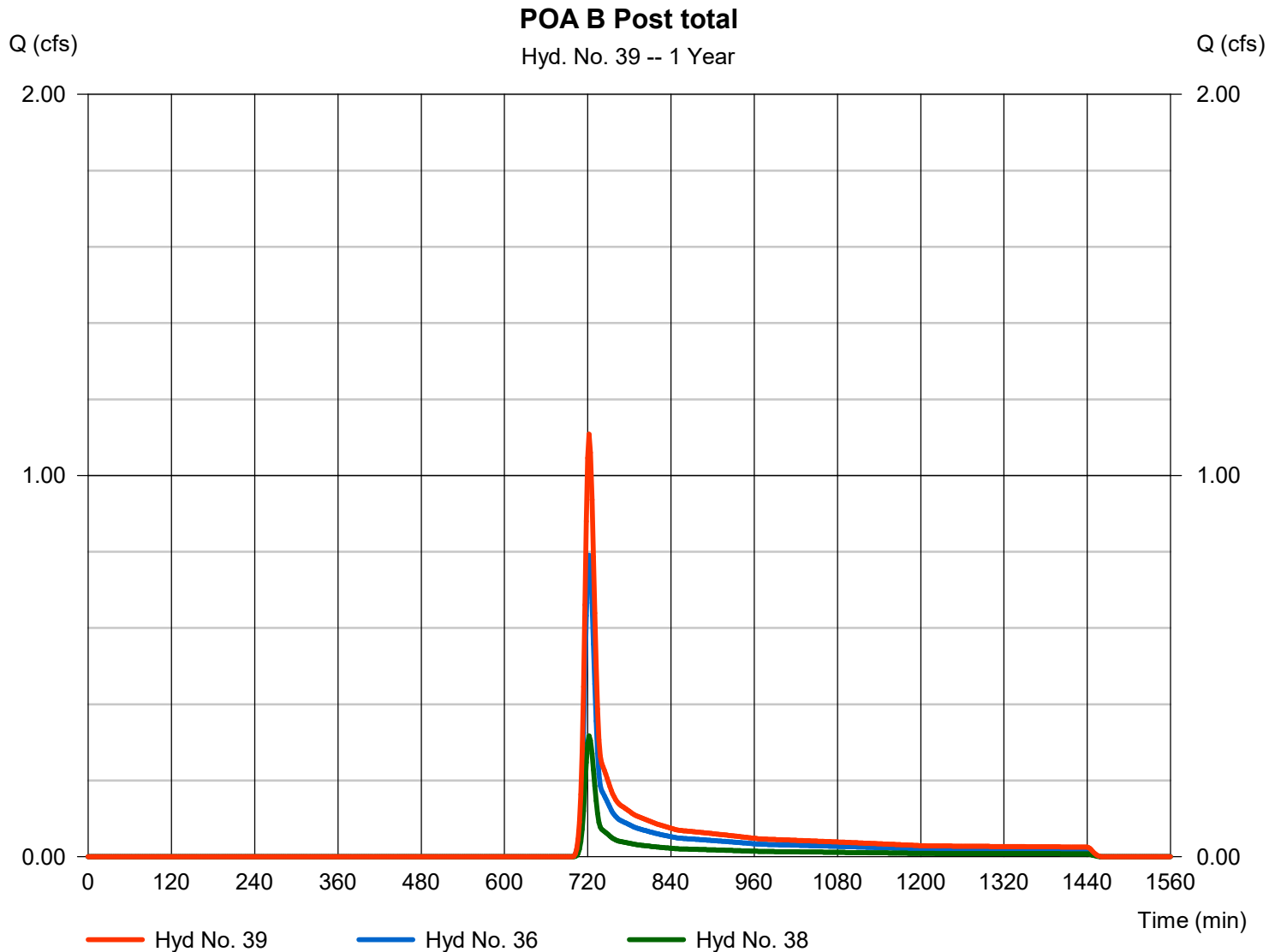
# Hydrograph Report

## Hyd. No. 39

POA B Post total

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 36, 38

Peak discharge = 1.109 cfs  
Time to peak = 722 min  
Hyd. volume = 3,289 cuft  
Contrib. drain. area = 1.880 ac





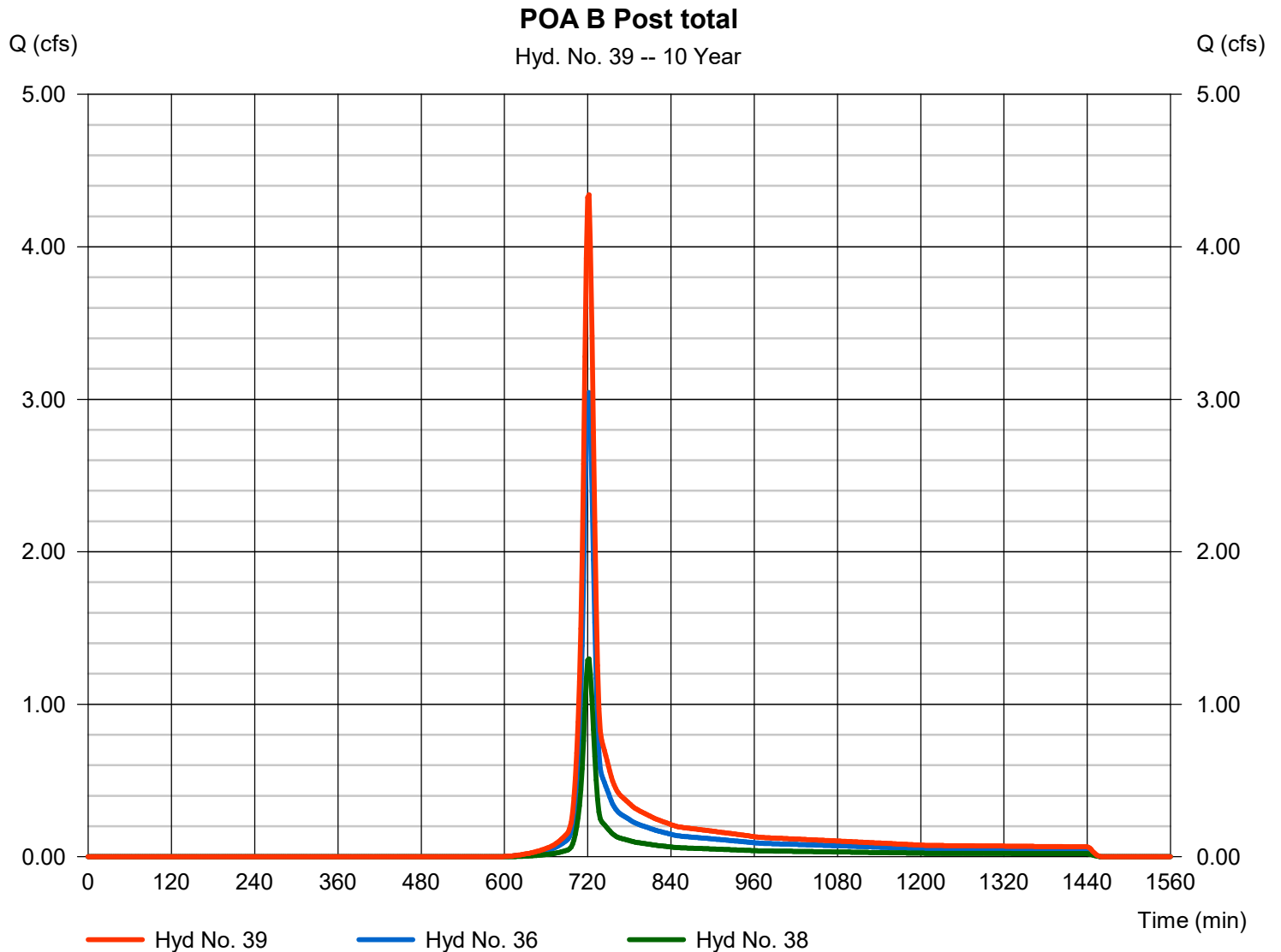
# Hydrograph Report

## Hyd. No. 39

POA B Post total

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 36, 38

Peak discharge = 4.342 cfs  
Time to peak = 722 min  
Hyd. volume = 11,394 cuft  
Contrib. drain. area = 1.880 ac



## Stormwater Quantity Compliance (9VAC25-870-66)

| Drainage Area: POA B onsite |         |          |
|-----------------------------|---------|----------|
|                             | Predev. | Postdev. |
| Area (ac.)                  | 1.17    | 0.58     |
| T <sub>c</sub> (min.)       | 11.9    | 10.9     |

| Precipitation Data |         |
|--------------------|---------|
| Return Frequency   | P (in.) |
| 1 Yr.              | 2.26    |
| 10 Yr.             | 4.06    |

|  | 1 Yr.   |          | 10 Yr.  |          |
|--|---------|----------|---------|----------|
|  | Predev. | Postdev. | Predev. | Postdev. |
| VRRM CN  | 73      | 73       | 73      | 73       |
| Storage (in.) S=1000/CN-10                         | 3.70    | 3.70     | 3.70    | 3.70     |
| Initial abstraction (in.), I <sub>a</sub> =0.2S    | 0.74    | 0.74     | 0.74    | 0.74     |
| Runoff depth (in.), $Q=(P-0.2S)^2/[(P-I_a)+S]$     | 0.44    | 0.44     | 1.57    | 1.57     |
| Runoff volume (ac-ft), RV = Q/12*A                 | 0.04    | 0.02     | 0.15    | 0.08     |
| Flow rate (cfs), q <sub>peak</sub> from hydrograph | 0.64    | 0.317    | 2.617   | 1.297    |

| 1 Year Channel Protection (9VAC25-870-66.B)  |           |  |
|--|-----------|--|
| q <sub>allowable</sub> ≤ I.F. * (q <sub>pre</sub> * RV <sub>pre</sub> )/RV <sub>post</sub> |           | Addressed by alternative method (if needed):<br><br>Note: energy balance result is less than the predev. peak flow rate, therefore, the allowable peak flow rate = the predev. peak flow rate. |
| Improvement Factor (I.F.)  | 0.8       |  |
| q <sub>pre</sub> (cfs)   | 0.64      |  |
| RV <sub>pre</sub> (ac-ft)  | 0.04      |  |
| RV <sub>post</sub> (with runoff reduction) (ac-ft)   | 0.02      |  |
| q <sub>allowable</sub> (cfs)   | 0.64      |  |
| q <sub>post</sub> (cfs)  | 0.317     |  |
| Check (q <sub>post</sub> ≤ q <sub>allowable</sub> )  | <b>OK</b> |  |

| 10 Year Flood Protection (9VAC25-870-66.C)    |           |  |
|---|-----------|--|
| q <sub>post</sub> ≤ q <sub>pre</sub>          |           | Addressed by alternative method (if needed): |
| q <sub>pre</sub> (cfs)                        | 2.617     |  |
| q <sub>post</sub> (cfs)                       | 1.297     |  |
| Check (q <sub>post</sub> ≤ q <sub>pre</sub> ) | <b>OK</b> |  |

Other notes: This sheet is included only to determine the req. reduction with only onsite areas and flow rates being plugged into the "energy balance" equation. This reduction is subtracted from the total combined pre. flow to determine the allowable flow rate at Pt. of Analysis B.

**1 year reduction required: 0.64 cfs - 0.64 cfs = 0.00 cfs**

0.00 cfs represents the reduction in peak flow rate the project would be required to demonstrate at the point of discharge.

| Point of Analysis B Regulatory Req. |   |  |   |   |
|-------------------------------------|---|--|---|---|
|                                     |   | 1 yr   | 10 yr   | Reference   |
| Predev.                             | Predevelopment-Onsite area only   | 0.64 cfs   | 2.62 cfs  | Hyd. 35   |
|                                     | Change required per regulations   | Post-dev. peak flow rate must be less than the "energy balance" equation result (0.64 cfs) | Post-dev. peak flow rate must be less than the Predev. peak flow rate above | Quantity Compliance Sheet for "energy balance" solution |
|                                     | Net change required from predev. peak flow rate to meet 9VAC25-870-66. regulations                | $0.64 - 0.64 = 0.00$ cfs   | 0 cfs   | NA  |
|                                     | Predevelopment-Entire contributing drainage area (includes onsite and offsite areas)              | 1.43 cfs   | 5.66 cfs  | Hyd. 37   |
|                                     | Max. allowable peak flow rate at property line, $Q_{allow}$                                       | $1.43 - 0.00 = 1.43$ cfs   | 5.66 cfs  | NA  |
| Postdev.                            | Postdevelopment-Entire contributing drainage area (includes onsite and offsite areas), $Q_{post}$ | 1.11 cfs   | 4.34 cfs  | Hyd. 39   |
|                                     | Regs. Met?  | $Q_{post} < Q_{allow} \therefore$ Yes  | $Q_{post} < Q_{allow} \therefore$ Yes                                       | NA  |

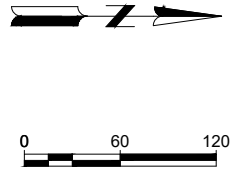
NOTE: The data above reflect the impact of construction of the ponds and subdivision depicted in this document. The data is preliminary in nature and subject to change during engineering design.

## CONVEYANCE SIZING EVALUATION

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**LEGEND**  

 IMPERVIOUS AREA  
 PRELIMINARY REDRAWN CREEK VALLEY OVERLAY



| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

**CONVEYANCE DRAINAGE AREAS**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
 ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
 PROPERTY OF GLADE SPRING CROSSING, LLC  
 TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
 TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
 MONTGOMERY COUNTY, VIRGINIA

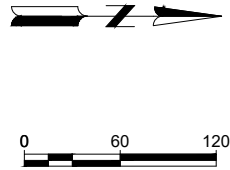
|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>MTJ  | Date:<br>11/01/2023 |
| Sheet No.<br>1 of 2 | <b>D4</b>           |



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11/1/2023 10:31:26 AM

**LEGEND**

- IMPERVIOUS AREA
- PRELIMINARY REDRAWN CREEK VALLEY OVERLAY



**WK DICKSON**  
community infrastructure consultants  
1700 KRAFT DRIVE, SUITE 2350  
BLACKSBURG, VIRGINIA 24060  
VOICE 540-617-0870

| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

PRELIMINARY

**CONVEYANCE DRAINAGE  
AREAS**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
PROPERTY OF GLADE SPRING CROSSING, LLC  
TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
TOWN OF BLACKSBURG-PRICES FORK DISTRICT  
MONTGOMERY COUNTY, VIRGINIA

|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>MTJ  | Date:<br>11/01/2023 |
| Sheet No.<br>2 of 2 | <b>D5</b>           |

STORMWATER CURB INLET COMPUTATION SHEET

RTE 0

PROJ Glade Spring Crossing

DATE November 1, 2023

SHEET OF 1/1

| NUMBER | INLET |             | STATION | A, DRAINAGE AREA (AC) | C    | C x A | sum C x A | I (IN/HR) | Q INCR (CFS) | Q <sub>b</sub> , CARRYOVER (CFS) | Q <sub>T</sub> , GUTTER FLOW (CFS) | S, GUTTER SLOPE (FT/FT) | S <sub>x</sub> , CROSS SLOPE (FT/FT) | T, SPREAD (FT) | W (FT) | W / T | S <sub>w</sub> (FT/FT) | S <sub>w</sub> / S <sub>x</sub> | E <sub>o</sub> (App. 9C-8) | a=12W(S <sub>w</sub> -S <sub>x</sub> )+Loc Dep | S' <sub>w</sub> =a/(12W) | S <sub>e</sub> (FT/FT) = S <sub>x</sub> +S' <sub>w</sub> E <sub>o</sub> | COMPUTED LENGTH L <sub>i</sub> (FT) (App. 9C-17) | SPECIFIED LENGTH L <sub>s</sub> (FT) | L / L <sub>t</sub> | E (App. 9C-18) | Q <sub>i</sub> , INTERCEPTED (CFS) | Q <sub>b</sub> , BYPASS (CFS) | Sag Inlets Only |       |         |                      | REMARKS |    |
|--------|-------|-------------|---------|-----------------------|------|-------|-----------|-----------|--------------|----------------------------------|------------------------------------|-------------------------|--------------------------------------|----------------|--------|-------|------------------------|---------------------------------|----------------------------|--|--------------------------|---|--|--------------------------------------|--------------------|----------------|------------------------------------|-------------------------------|-----------------|-------|---------|----------------------|---------|----|
|        | TYPE  | LENGTH (FT) |         |                       |      |       |           |           |              |                                  |                                    |                         |                                      |                |        |       |                        |                                 |                            |  |                          |   |  |                                      |                    |                |                                    |                               | d(FT)           | h(FT) | d / h   | T, SPREAD @ SAG (FT) |         |    |
| 1      | (2)   | (3)         | (4)     | (5)                   | (6)  | (7)   | (8)       | (9)       | (10)         | (11)                             | (12)                               | (13)                    | (14)                                 | (15)           | (16)   | (17)  | (18)                   | (19)                            | (20)                       | (21)   | (22)                     | (23)  | (24)   | (25)                                 | (26)               | (27)           | (28)                               | (29)                          | (30)            | (31)  | (32)    | (33)                 |         |    |
| D1     | DI-3B | 4           | +       | 0.05                  | 0.65 | 0.034 | 0.034     | 4         | 0.13         | 0.000                            | 0.13                               | 0.010                   | 0.021                                | 1.4            | 1.67   | 1.224 | 0.083                  | 3.968                           | 1.000                      | 3.2  | 0.162                    | 0.183   | 2.23   | 4.00                                 | 1.79               | 1              | 0.135                              | 0                             |                 |       |         |                      | OK      |    |
| D2     | DI-3B | 4           | +       | 0.07                  | 0.65 | 0.046 | 0.046     | 4         | 0.18         | 0.000                            | 0.18                               | 0.045                   | 0.021                                | 1.2            | 1.67   | 1.450 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.98   | 4.00                                 | 1.00               | 1              | 0.182                              | 0                             |                 |       |         |                      | OK      |    |
| D3     | DI-3B | 8           | +       | 0.04                  | 0.65 | 0.028 | 0.028     | 4         | 0.11         | 0.000                            | 0.11                               | 0.095                   | 0.021                                | 0.8            | 1.67   | 2.012 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.04   | 8.00                                 | 1.98               | 1              | 0.110                              | 0                             |                 |       |         |                      | OK      |    |
| D9     | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.098 | 0.098     | 4         | 0.39         | 0.000                            | 0.39                               | 0.100                   | 0.021                                | 1.3            | 1.67   | 1.265 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.97   | 6.00                                 | 0.86               | 0.97137        | 0.379                              | 0.0112                        |                 |       |         |                      | OK      |    |
| D13    | DI-3B | 8           | +       | 0.24                  | 0.65 | 0.155 | 0.155     | 4         | 0.62         | 0.011                            | 0.63                               | 0.069                   | 0.021                                | 2.0            | 1.67   | 0.825 | 0.083                  | 4.006                           | 0.999                      | 3.3  | 0.162                    | 0.183   | 7.63   | 8.00                                 | 1.05               | 1              | 0.630                              | 0                             |                 |       |         |                      | OK      |    |
| D20    | DI-3B | 8           | +       | 0.31                  | 0.65 | 0.203 | 0.203     | 4         | 0.81         | 0.000                            | 0.81                               | 0.073                   | 0.021                                | 2.4            | 1.67   | 0.699 | 0.083                  | 4.006                           | 0.992                      | 3.3  | 0.162                    | 0.182   | 8.67   | 8.00                                 | 0.92               | 0.99008        | 0.805                              | 0.0081                        |                 |       |         |                      | OK      |    |
| D141   | DI-3C | 6           | +       | 0.35                  | 0.65 | 0.227 | 0.227     | 4         | 0.91         | 0.000                            | 0.91                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | Sump            | 0.104 | 0.5     | 0.20782              | 5.0     | OK |
| D142   | DI-3B | 6           | +       | 0.09                  | 0.65 | 0.060 | 0.060     | 4         | 0.24         | 0.000                            | 0.24                               | 0.092                   | 0.021                                | 1.1            | 1.67   | 1.498 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.53   | 6.00                                 | 1.09               | 1              | 0.238                              | 0                             |                 |       |         |                      | OK      |    |
| D21    | DI-3B | 6           | +       | 0.49                  | 0.65 | 0.320 | 0.320     | 4         | 1.28         | 0.008                            | 1.29                               | 0.000                   | 0.021                                | 5.00           | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.5   | 0.20782 | 5.0                  | OK      |    |
| D140   | DI-3B | 6           | +       | 0.1                   | 0.65 | 0.065 | 0.065     | 4         | 0.26         | 0.000                            | 0.26                               | 0.045                   | 0.021                                | 1.3            | 1.67   | 1.271 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.61   | 6.00                                 | 1.30               | 1              | 0.258                              | 0                             |                 |       |         |                      | OK      |    |
| D143   | DI-3B | 6           | +       | 0.14                  | 0.65 | 0.092 | 0.092     | 4         | 0.37         | 0.000                            | 0.37                               | 0.067                   | 0.021                                | 1.4            | 1.67   | 1.201 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.02   | 6.00                                 | 1.00               | 0.99996        | 0.367                              | 1E-05                         |                 |       |         |                      | OK      |    |
| D144   | DI-3B | 6           | +       | 0.14                  | 0.65 | 0.092 | 0.092     | 4         | 0.37         | 0.000                            | 0.37                               | 0.040                   | 0.021                                | 1.5            | 1.67   | 1.087 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.17   | 6.00                                 | 1.16               | 1              | 0.370                              | 0                             |                 |       |         |                      | OK      |    |
| D22    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.086 | 0.086     | 4         | 0.34         | 0.000                            | 0.34                               | 0.022                   | 0.021                                | 1.7            | 1.67   | 1.000 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.19   | 6.00                                 | 1.43               | 1              | 0.343                              | 0                             |                 |       |         |                      | OK      |    |
| D19    | DI-3B | 4           | +       | 0.02                  | 0.65 | 0.016 | 0.016     | 4         | 0.06         | 0.000                            | 0.06                               | 0.082                   | 0.021                                | 0.7            | 1.67   | 2.390 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.09   | 4.00                                 | 1.29               | 1              | 0.065                              | 0                             |                 |       |         |                      | OK      |    |
| D24    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.087 | 0.087     | 4         | 0.35         | 0.000                            | 0.35                               | 0.082                   | 0.021                                | 1.3            | 1.67   | 1.273 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.26   | 6.00                                 | 0.96               | 0.99682        | 0.347                              | 0.0011                        |                 |       |         |                      | OK      |    |
| D31    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.086 | 0.086     | 4         | 0.34         | 0.001                            | 0.35                               | 0.023                   | 0.021                                | 1.7            | 1.67   | 1.005 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.26   | 6.00                                 | 1.41               | 1              | 0.346                              | 0                             |                 |       |         |                      | OK      |    |
| D33    | DI-3B | 6           | +       | 0.34                  | 0.65 | 0.218 | 0.218     | 4         | 0.87         | 0.000                            | 0.87                               | 0.024                   | 0.021                                | 4.0            | 1.67   | 0.413 | 0.083                  | 4.006                           | 0.897                      | 3.3  | 0.162                    | 0.166   | 6.75   | 6.00                                 | 0.89               | 0.98087        | 0.857                              | 0.0167                        |                 |       |         |                      | OK      |    |
| D32    | DI-3B | 6           | +       | 0.11                  | 0.65 | 0.073 | 0.073     | 4         | 0.29         | 0.017                            | 0.31                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |    |

STORMWATER CURB INLET COMPUTATION SHEET

RTE 0

PROJ Glade Spring Crossing

DATE November 1, 2023

SHEET OF 1/1

| INLET  |       |             | STATION | A, DRAINAGE AREA (AC) | C    | C x A | sum C x A | I (IN/HR) | Q INCR (CFS) | Q <sub>b</sub> , CARRYOVER (CFS) | Q <sub>T</sub> , GUTTER FLOW (CFS) | S, GUTTER SLOPE (FT/FT) | S <sub>x</sub> , CROSS SLOPE (FT/FT) | T, SPREAD (FT) | W (FT) | W / T | S <sub>w</sub> (FT/FT) | S <sub>w</sub> / S <sub>x</sub> | E <sub>o</sub> (App. 9C-8) | a=12W(S <sub>w</sub> -S <sub>x</sub> )+Loc Dep | S' <sub>w</sub> =a/(12W) | S <sub>e</sub> (FT/FT) = S <sub>x</sub> +S' <sub>w</sub> E <sub>o</sub> | COMPUTED LENGTH L <sub>i</sub> (FT) (App. 9C-17) | SPECIFIED LENGTH L <sub>i</sub> (FT) | L / L <sub>i</sub> | E (App. 9C-18) | Q <sub>i</sub> , INTERCEPTED (CFS) | Q <sub>b</sub> , BYPASS (CFS) | Sag Inlets Only |       |         |                      | REMARKS |
|--------|-------|-------------|---------|-----------------------|------|-------|-----------|-----------|--------------|----------------------------------|------------------------------------|-------------------------|--------------------------------------|----------------|--------|-------|------------------------|---------------------------------|----------------------------|--|--------------------------|---|--|--------------------------------------|--------------------|----------------|------------------------------------|-------------------------------|-----------------|-------|---------|----------------------|---------|
| NUMBER | TYPE  | LENGTH (FT) |         |                       |      |       |           |           |              |                                  |                                    |                         |                                      |                |        |       |                        |                                 |                            |  |                          |   |  |                                      |                    |                |                                    |                               | d(FT)           | h(FT) | d / h   | T, SPREAD @ SAG (FT) |         |
| 1      | (2)   | (3)         | (4)     | (5)                   | (6)  | (7)   | (8)       | (9)       | (10)         | (11)                             | (12)                               | (13)                    | (14)                                 | (15)           | (16)   | (17)  | (18)                   | (19)                            | (20)                       | (21)   | (22)                     | (23)  | (24)   | (25)                                 | (26)               | (27)           | (28)                               | (29)                          | (30)            | (31)  | (32)    | (33)                 |         |
| D4     | DI-3B | 8           | +       | 0.29                  | 0.65 | 0.185 | 0.185     | 4         | 0.74         | 0.000                            | 0.74                               | 0.092                   | 0.021                                | 2.0            | 1.67   | 0.824 | 0.083                  | 4.006                           | 0.999                      | 3.3  | 0.162                    | 0.183   | 8.91   | 8.00                                 | 0.90               | 0.98359        | 0.730                              | 0.0122                        |                 |       |         |                      | OK      |
| D5     | DI-3B | 6           | +       | 0.3                   | 0.65 | 0.192 | 0.192     | 4         | 0.77         | 0.012                            | 0.78                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |
| D6     | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.098 | 0.098     | 4         | 0.39         | 0.000                            | 0.39                               | 0.021                   | 0.021                                | 2.2            | 1.67   | 0.752 | 0.083                  | 4.006                           | 0.996                      | 3.3  | 0.162                    | 0.182   | 4.38   | 6.00                                 | 1.37               | 1              | 0.391                              | 0                             |                 |       |         |                      | OK      |
| D7     | DI-3B | 4           | +       | 0.05                  | 0.65 | 0.030 | 0.030     | 4         | 0.12         | 0.000                            | 0.12                               | 0.091                   | 0.021                                | 0.9            | 1.67   | 1.941 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.11   | 4.00                                 | 0.97               | 0.99848        | 0.119                              | 0.0002                        |                 |       |         |                      | OK      |
| D12    | DI-3B | 8           | +       | 0.25                  | 0.65 | 0.161 | 0.161     | 4         | 0.64         | 0.000                            | 0.64                               | 0.068                   | 0.021                                | 2.1            | 1.67   | 0.813 | 0.083                  | 4.006                           | 0.998                      | 3.3  | 0.162                    | 0.183   | 7.67   | 8.00                                 | 1.04               | 1              | 0.643                              | 0                             |                 |       |         |                      | OK      |
| D129   | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.106 | 0.106     | 4         | 0.42         | 0.000                            | 0.42                               | 0.052                   | 0.021                                | 1.5            | 1.67   | 1.085 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.93   | 6.00                                 | 1.01               | 1              | 0.424                              | 0                             |                 |       |         |                      | OK      |
| D134   | DI-3B | 8           | +       | 0.22                  | 0.65 | 0.146 | 0.146     | 4         | 0.58         | 0.000                            | 0.58                               | 0.093                   | 0.021                                | 1.6            | 1.67   | 1.074 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 8.07   | 8.00                                 | 0.99               | 0.99982        | 0.582                              | 0.0001                        |                 |       |         |                      | OK      |
| D136   | DI-3B | 8           | +       | 0.25                  | 0.65 | 0.162 | 0.162     | 4         | 0.65         | 0.000                            | 0.65                               | 0.062                   | 0.021                                | 2.1            | 1.67   | 0.789 | 0.083                  | 4.006                           | 0.998                      | 3.3  | 0.162                    | 0.183   | 7.49   | 8.00                                 | 1.07               | 1              | 0.649                              | 0                             |                 |       |         |                      | OK      |
| D121   | DI-3B | 4           | +       | 0.1                   | 0.65 | 0.066 | 0.066     | 4         | 0.27         | 0.000                            | 0.27                               | 0.031                   | 0.021                                | 1.4            | 1.67   | 1.173 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.17   | 4.00                                 | 0.96               | 0.99676        | 0.265                              | 0.0009                        |                 |       |         |                      | OK      |
| D130   | DI-3B | 6           | +       | 0.11                  | 0.65 | 0.069 | 0.069     | 4         | 0.27         | 0.000                            | 0.27                               | 0.087                   | 0.021                                | 1.2            | 1.67   | 1.407 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.76   | 6.00                                 | 1.04               | 1              | 0.274                              | 0                             |                 |       |         |                      | OK      |
| D131   | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.098 | 0.098     | 4         | 0.39         | 0.000                            | 0.39                               | 0.098                   | 0.021                                | 1.3            | 1.67   | 1.257 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.95   | 6.00                                 | 0.86               | 0.9723         | 0.382                              | 0.0109                        |                 |       |         |                      | OK      |
| D135   | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.104 | 0.104     | 4         | 0.41         | 0.011                            | 0.43                               | 0.065                   | 0.021                                | 1.5            | 1.67   | 1.130 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.35   | 6.00                                 | 0.95               | 0.99461        | 0.423                              | 0.0023                        |                 |       |         |                      | OK      |
| D122   | DI-3B | 8           | +       | 0.53                  | 0.65 | 0.346 | 0.346     | 4         | 1.38         | 0.003                            | 1.39                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 8.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |



STORMWATER CURB INLET COMPUTATION SHEET

RTE 0

PROJ Glade Spring Crossing

DATE November 1, 2023

SHEET OF 1/1

| INLET  |       |             | STATION | A, DRAINAGE AREA (AC) | C    | C x A | sum C x A | I (IN/HR) | Q INCR (CFS) | Q <sub>b</sub> , CARRYOVER (CFS) | Q <sub>T</sub> , GUTTER FLOW (CFS) | S <sub>i</sub> , GUTTER SLOPE (FT/FT) | S <sub>x</sub> , CROSS SLOPE (FT/FT) | T, SPREAD (FT) | W (FT) | W / T | S <sub>w</sub> (FT/FT) | S <sub>w</sub> / S <sub>x</sub> | E <sub>o</sub> (App. 9C-8) | a=12W(S <sub>w</sub> -S <sub>x</sub> )+Loc Dep | S' <sub>w</sub> =a/(12W) | S <sub>e</sub> (FT/FT) = S <sub>x</sub> +S' <sub>w</sub> E <sub>o</sub> | COMPUTED LENGTH L <sub>i</sub> (FT) (App. 9C-17) | SPECIFIED LENGTH L <sub>i</sub> (FT) | L / L <sub>i</sub> | E (App. 9C-18) | Q <sub>i</sub> , INTERCEPTED (CFS) | Q <sub>b</sub> , BYPASS (CFS) | Sag Inlets Only |       |         |                      | REMARKS |  |
|--------|-------|-------------|---------|-----------------------|------|-------|-----------|-----------|--------------|----------------------------------|------------------------------------|---------------------------------------|--------------------------------------|----------------|--------|-------|------------------------|---------------------------------|----------------------------|--|--------------------------|---|--|--------------------------------------|--------------------|----------------|------------------------------------|-------------------------------|-----------------|-------|---------|----------------------|---------|--|
| NUMBER | TYPE  | LENGTH (FT) |         |                       |      |       |           |           |              |                                  |                                    |                                       |                                      |                |        |       |                        |                                 |                            |  |                          |   |  |                                      |                    |                |                                    |                               | d(FT)           | h(FT) | d / h   | T, SPREAD @ SAG (FT) |         |  |
| 1      | (2)   | (3)         | (4)     | (5)                   | (6)  | (7)   | (8)       | (9)       | (10)         | (11)                             | (12)                               | (13)                                  | (14)                                 | (15)           | (16)   | (17)  | (18)                   | (19)                            | (20)                       | (21)   | (22)                     | (23)  | (24)   | (25)                                 | (26)               | (27)           | (28)                               | (29)                          | (30)            | (31)  | (32)    | (33)                 |         |  |
| D16    | DI-3B | 4           | +       | 0.04                  | 0.65 | 0.023 | 0.023     | 4         | 0.09         | 0.000                            | 0.09                               | 0.055                                 | 0.021                                | 0.9            | 1.67   | 1.930 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.20   | 4.00                                 | 1.25               | 1              | 0.094                              | 0                             |                 |       |         |                      | OK      |  |
| D18    | DI-3B | 6           | +       | 0.19                  | 0.65 | 0.125 | 0.125     | 4         | 0.50         | 0.000                            | 0.50                               | 0.081                                 | 0.021                                | 1.5            | 1.67   | 1.110 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 7.25   | 6.00                                 | 0.83               | 0.95774        | 0.477                              | 0.0211                        |                 |       |         |                      | OK      |  |
| D23    | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.107 | 0.107     | 4         | 0.43         | 0.021                            | 0.45                               | 0.080                                 | 0.021                                | 1.5            | 1.67   | 1.151 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.91   | 6.00                                 | 0.87               | 0.97383        | 0.437                              | 0.0117                        |                 |       |         |                      | OK      |  |
| D28    | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.097 | 0.097     | 4         | 0.39         | 0.012                            | 0.40                               | 0.024                                 | 0.021                                | 2.1            | 1.67   | 0.780 | 0.083                  | 4.006                           | 0.997                      | 3.3  | 0.162                    | 0.183   | 4.59   | 6.00                                 | 1.31               | 1              | 0.398                              | 0                             |                 |       |         |                      | OK      |  |
| D30    | DI-3B | 4           | +       | 0.08                  | 0.65 | 0.050 | 0.050     | 4         | 0.20         | 0.000                            | 0.20                               | 0.022                                 | 0.021                                | 1.4            | 1.67   | 1.228 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.33   | 4.00                                 | 1.20               | 1              | 0.198                              | 0                             |                 |       |         |                      | OK      |  |
| D29    | DI-3B | 6           | +       | 0.04                  | 0.65 | 0.029 | 0.029     | 4         | 0.12         | 0.000                            | 0.12                               | 0.000                                 | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |  |
| D103   | DI-3B | 6           | +       | 0.38                  | 0.65 | 0.249 | 0.249     | 4         | 1.00         | 0.000                            | 1.00                               | 0.020                                 | 0.021                                | 4.7            | 1.67   | 0.357 | 0.083                  | 4.006                           | 0.845                      | 3.3  | 0.162                    | 0.158   | 6.97   | 6.00                                 | 0.86               | 0.97145        | 0.968                              | 0.0284                        |                 |       |         |                      | OK      |  |
| D109   | DI-3B | 8           | +       | 0.32                  | 0.65 | 0.206 | 0.206     | 4         | 0.82         | 0.028                            | 0.85                               | 0.077                                 | 0.021                                | 2.4            | 1.67   | 0.687 | 0.083                  | 4.006                           | 0.991                      | 3.3  | 0.162                    | 0.182   | 8.99   | 8.00                                 | 0.89               | 0.98129        | 0.836                              | 0.0159                        |                 |       |         |                      | OK      |  |
| D110   | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.096 | 0.096     | 4         | 0.38         | 0.016                            | 0.40                               | 0.045                                 | 0.021                                | 1.5            | 1.67   | 1.079 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.54   | 6.00                                 | 1.08               | 1              | 0.401                              | 0                             |                 |       |         |                      | OK      |  |
| D104   | DI-3B | 6           | +       | 0.31                  | 0.65 | 0.201 | 0.201     | 4         | 0.80         | 0.000                            | 0.80                               | 0.020                                 | 0.021                                | 4.1            | 1.67   | 0.411 | 0.083                  | 4.006                           | 0.895                      | 3.3  | 0.162                    | 0.166   | 6.17   | 6.00                                 | 0.97               | 0.99838        | 0.802                              | 0.0013                        |                 |       |         |                      | OK      |  |
| D105   | DI-3B | 6           | +       | 0.08                  | 0.65 | 0.052 | 0.052     | 4         | 0.21         | 0.001                            | 0.21                               | 0.067                                 | 0.021                                | 1.1            | 1.67   | 1.486 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.74   | 6.00                                 | 1.26               | 1              | 0.208                              | 0                             |                 |       |         |                      | OK      |  |
| D106   | DI-3B | 6           | +       | 0.09                  | 0.65 | 0.060 | 0.060     | 4         | 0.24         | 0.000                            | 0.24                               | 0.087                                 | 0.021                                | 1.1            | 1.67   | 1.479 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.45   | 6.00                                 | 1.10               | 1              | 0.240                              | 0                             |                 |       |         |                      | OK      |  |
| D112   | DI-3B | 6           | +       | 0.14                  | 0.65 | 0.092 | 0.092     | 4         | 0.37         | 0.000                            | 0.37                               | 0.061                                 | 0.021                                | 1.4            | 1.67   | 1.181 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.85   | 6.00                                 | 1.03               | 1              | 0.366                              | 0                             |                 |       |         |                      | OK      |  |
| D111   | DI-3B | 6           | +       | 0.49                  | 0.65 | 0.319 | 0.319     | 4         | 1.28         | 0.000                            | 1.28                               | 0.000                                 | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |  |
|        |       | 0           |         |                       |      |       |           |           |              |                                  |                                    |                                       |                                      |                |        |       |                        |                                 |                            |  |                          |   |  |                                      |                    |                |                                    |                               |                 |       |         |                      |         |  |
| D35    | DI-3B | 4           | +       | 0.07                  | 0.65 | 0.044 | 0.044     | 4         | 0.18         | 0.000                            | 0.18                               | 0.020                                 | 0.021                                | 1.3            | 1.67   | 1.256 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.09   | 4.00                                 | 1.29               | 1              | 0.178                              | 0                             |                 |       |         |                      | OK      |  |
| D37    | DI-3B | 6           | +       | 0.06                  | 0.65 | 0.042 | 0.042     | 4         | 0.17         | 0.000                            | 0.17                               | 0.022                                 | 0.021                                | 1.3            | 1.67   | 1.310 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.10   | 6.00                                 | 1.94               | 1              | 0.167                              | 0                             |                 |       |         |                      | OK      |  |
| D43    | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.104 | 0.104     | 4         | 0.41         | 0.000                            | 0.41                               | 0.028                                 | 0.021                                | 2.1            | 1.67   | 0.799 | 0.083                  | 4.006                           | 0.998                      | 3.3  | 0.162                    | 0.183   | 4.89   | 6.00                                 | 1.23               | 1              | 0.415                              | 0                             |                 |       |         |                      | OK      |  |
| D44    | DI-3B | 6           | +       | 0.3                   | 0.65 | 0.194 | 0.194     | 4         | 0.78         | 0.000                            | 0.78                               | 0.028                                 | 0.021                                | 3.5            | 1.67   | 0.476 | 0.083                  | 4.006                           | 0.937                      | 3.3  | 0.162                    | 0.173   | 6.57   | 6.00                                 | 0.91               | 0.98759        | 0.766                              | 0.0096                        |                 |       |         |                      | OK      |  |
| D49    | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.099 | 0.099     | 4         | 0.40         | 0.010                            | 0.41                               | 0.018                                 | 0.021                                | 2.4            | 1.67   | 0.685 | 0.083                  | 4.006                           | 0.991                      | 3.3  | 0.162                    | 0.182   | 4.26   | 6.00                                 | 1.41               | 1              | 0.408                              | 0                             |                 |       |         |                      | OK      |  |
| D63    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.084 | 0.084     | 4         | 0.33         | 0.000                            | 0.33                               | 0.045                                 | 0.021                                | 1.4            | 1.67   | 1.154 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 5.14   | 6.00                                 | 1.17               | 1              | 0.334                              | 0                             |                 |       |         |                      | OK      |  |
| D52    | DI-3B | 4           | +       | 0.12                  | 0.65 | 0.076 | 0.076     | 4         | 0.31         | 0.000                            | 0.31                               | 0.025                                 | 0.021                                | 1.6            | 1.67   | 1.069 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.15   | 4.00                                 | 0.96               | 0.99743        | 0.305                              | 0.0008                        |                 |       |         |                      | OK      |  |
| D51    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.085 | 0.085     | 4         | 0.34         | 0.001                            | 0.34                               | 0.024                                 | 0.021                                | 1.6            | 1.67   | 1.020 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.28   | 6.00                                 | 1.40               | 1              | 0.340                              | 0                             |                 |       |         |                      | OK      |  |
| D50    | DI-3B | 6           | +       | 0.13                  | 0.65 | 0.082 | 0.082     | 4         | 0.33         | 0.000                            | 0.33                               | 0.000                                 | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | 0.104           | 0.37  | 0.28468 | 5.0                  | OK      |  |

STORMWATER CURB INLET COMPUTATION SHEET

RTE 0

PROJ Glade Spring Crossing

DATE November 1, 2023

SHEET OF 1/1

| INLET  |       |             | STATION | A, DRAINAGE AREA (AC) | C    | C x A | sum C x A | I (IN/HR) | Q INCR (CFS) | Q <sub>b</sub> , CARRYOVER (CFS) | Q <sub>T</sub> , GUTTER FLOW (CFS) | S, GUTTER SLOPE (FT/FT) | S <sub>x</sub> , CROSS SLOPE (FT/FT) | T, SPREAD (FT) | W (FT) | W / T | S <sub>w</sub> (FT/FT) | S <sub>w</sub> / S <sub>x</sub> | E <sub>o</sub> (App. 9C-8) | a=12W(S <sub>w</sub> -S <sub>x</sub> )+Loc Dep | S' <sub>w</sub> =a/(12W) | S <sub>e</sub> (FT/FT) = S <sub>x</sub> +S' <sub>w</sub> E <sub>o</sub> | COMPUTED LENGTH L <sub>i</sub> (FT) (App. 9C-17) | SPECIFIED LENGTH L <sub>i</sub> (FT) | L / L <sub>i</sub> | E (App. 9C-18) | Q <sub>i</sub> , INTERCEPTED (CFS) | Q <sub>b</sub> , BYPASS (CFS) | Sag Inlets Only |       |       |                      | REMARKS |    |
|--------|-------|-------------|---------|-----------------------|------|-------|-----------|-----------|--------------|----------------------------------|------------------------------------|-------------------------|--------------------------------------|----------------|--------|-------|------------------------|---------------------------------|----------------------------|--|--------------------------|---|--|--------------------------------------|--------------------|----------------|------------------------------------|-------------------------------|-----------------|-------|-------|----------------------|---------|----|
| NUMBER | TYPE  | LENGTH (FT) |         |                       |      |       |           |           |              |                                  |                                    |                         |                                      |                |        |       |                        |                                 |                            |  |                          |   |  |                                      |                    |                |                                    |                               | d(FT)           | h(FT) | d / h | T, SPREAD @ SAG (FT) |         |    |
| 1      | (2)   | (3)         | (4)     | (5)                   | (6)  | (7)   | (8)       | (9)       | (10)         | (11)                             | (12)                               | (13)                    | (14)                                 | (15)           | (16)   | (17)  | (18)                   | (19)                            | (20)                       | (21)   | (22)                     | (23)  | (24)   | (25)                                 | (26)               | (27)           | (28)                               | (29)                          | (30)            | (31)  | (32)  | (33)                 |         |    |
| D36    | DI-3B | 4           | +       | 0.17                  | 0.65 | 0.108 | 0.108     | 4         | 0.43         | 0.000                            | 0.43                               | 0.020                   | 0.021                                | 2.4            | 1.67   | 0.686 | 0.083                  | 4.006                           | 0.991                      | 3.3  | 0.162                    | 0.182   | 4.50   | 4.00                                 | 0.89               | 0.98069        | 0.422                              | 0.0083                        |                 |       |       |                      | OK      |    |
| D38    | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.107 | 0.107     | 4         | 0.43         | 0.008                            | 0.44                               | 0.019                   | 0.021                                | 2.5            | 1.67   | 0.660 | 0.083                  | 4.006                           | 0.988                      | 3.3  | 0.162                    | 0.181   | 4.47   | 6.00                                 | 1.34               | 1              | 0.436                              | 0                             |                 |       |       |                      | OK      |    |
| D42    | DI-3B | 6           | +       | 0.26                  | 0.65 | 0.170 | 0.170     | 4         | 0.68         | 0.000                            | 0.68                               | 0.028                   | 0.021                                | 3.2            | 1.67   | 0.529 | 0.083                  | 4.006                           | 0.959                      | 3.3  | 0.162                    | 0.176   | 6.15   | 6.00                                 | 0.98               | 0.99882        | 0.680                              | 0.0008                        |                 |       |       |                      | OK      |    |
| D45    | DI-3B | 8           | +       | 0.41                  | 0.65 | 0.266 | 0.266     | 4         | 1.06         | 0.001                            | 1.06                               | 0.029                   | 0.021                                | 4.3            | 1.67   | 0.386 | 0.083                  | 4.006                           | 0.874                      | 3.3  | 0.162                    | 0.163   | 7.86   | 8.00                                 | 1.02               | 1              | 1.063                              | 0                             |                 |       |       |                      | OK      |    |
| D46    | DI-3B | 8           | +       | 0.55                  | 0.65 | 0.357 | 0.357     | 4         | 1.43         | 0.000                            | 1.43                               | 0.025                   | 0.021                                | 5.4            | 1.67   | 0.309 | 0.083                  | 4.006                           | 0.784                      | 3.3  | 0.162                    | 0.148   | 9.01   | 8.00                                 | 0.89               | 0.98065        | 1.399                              | 0.0276                        |                 |       |       |                      | OK      |    |
| D146   | DI-3B | 6           | +       | 0.2                   | 0.65 | 0.131 | 0.131     | 4         | 0.53         | 0.000                            | 0.53                               | 0.026                   | 0.021                                | 2.6            | 1.67   | 0.645 | 0.083                  | 4.006                           | 0.986                      | 3.3  | 0.162                    | 0.181   | 5.31   | 6.00                                 | 1.13               | 1              | 0.526                              | 0                             |                 |       |       |                      | OK      |    |
| D147   | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.099 | 0.099     | 4         | 0.39         | 0.000                            | 0.39                               | 0.027                   | 0.021                                | 2.1            | 1.67   | 0.807 | 0.083                  | 4.006                           | 0.998                      | 3.3  | 0.162                    | 0.183   | 4.73   | 6.00                                 | 1.27               | 1              | 0.395                              | 0                             |                 |       |       |                      | OK      |    |
| D151   | DI-3B | 6           | +       | 0.18                  | 0.65 | 0.119 | 0.119     | 4         | 0.47         | 0.000                            | 0.47                               | 0.025                   | 0.021                                | 2.4            | 1.67   | 0.695 | 0.083                  | 4.006                           | 0.992                      | 3.3  | 0.162                    | 0.182   | 5.02   | 6.00                                 | 1.20               | 1              | 0.475                              | 0                             |                 |       |       |                      | OK      |    |
| D154   | DI-3B | 6           | +       | 0.15                  | 0.65 | 0.098 | 0.098     | 4         | 0.39         | 0.000                            | 0.39                               | 0.063                   | 0.021                                | 1.4            | 1.67   | 1.160 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.07   | 6.00                                 | 0.99               | 0.99969        | 0.390                              | 0.0001                        |                 |       |       |                      | OK      |    |
| D156   | DI-3B | 6           | +       | 0.16                  | 0.65 | 0.104 | 0.104     | 4         | 0.42         | 0.000                            | 0.42                               | 0.063                   | 0.021                                | 1.5            | 1.67   | 1.133 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.23   | 6.00                                 | 0.96               | 0.99736        | 0.415                              | 0.0011                        |                 |       |       |                      | OK      |    |
| D58    | DI-3B | 6           | +       | 0.06                  | 0.65 | 0.041 | 0.041     | 4         | 0.17         | 0.001                            | 0.17                               | 0.034                   | 0.021                                | 1.2            | 1.67   | 1.422 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.53   | 6.00                                 | 1.70               | 1              | 0.167                              | 0                             |                 |       |       |                      | OK      |    |
| D48    | DI-3B | 6           | +       | 0.18                  | 0.65 | 0.120 | 0.120     | 4         | 0.48         | 0.000                            | 0.48                               | 0.025                   | 0.021                                | 2.4            | 1.67   | 0.690 | 0.083                  | 4.006                           | 0.991                      | 3.3  | 0.162                    | 0.182   | 5.03   | 6.00                                 | 1.19               | 1              | 0.478                              | 0                             |                 |       |       |                      | OK      |    |
| D47    | DI-3B | 6           | +       | 0.26                  | 0.65 | 0.168 | 0.168     | 4         | 0.67         | 0.028                            | 0.70                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | Sump            | 0.104 | 0.37  | 0.28468              | 5.0     | OK |
| D145   | DI-3B | 6           | +       | 0.35                  | 0.65 | 0.229 | 0.229     | 4         | 0.92         | 0.000                            | 0.92                               | 0.025                   | 0.021                                | 4.1            | 1.67   | 0.405 | 0.083                  | 4.006                           | 0.891                      | 3.3  | 0.162                    | 0.165   | 7.00   | 6.00                                 | 0.86               | 0.97001        | 0.889                              | 0.0275                        |                 |       |       |                      | OK      |    |
| D149   | DI-3B | 6           | +       | 0.17                  | 0.65 | 0.108 | 0.108     | 4         | 0.43         | 0.027                            | 0.46                               | 0.024                   | 0.021                                | 2.4            | 1.67   | 0.700 | 0.083                  | 4.006                           | 0.992                      | 3.3  | 0.162                    | 0.182   | 4.89   | 6.00                                 | 1.23               | 1              | 0.460                              | 0                             |                 |       |       |                      | OK      |    |
| D150   | DI-3B | 6           | +       | 0.26                  | 0.65 | 0.166 | 0.166     | 4         | 0.67         | 0.000                            | 0.67                               | 0.025                   | 0.021                                | 3.2            | 1.67   | 0.514 | 0.083                  | 4.006                           | 0.954                      | 3.3  | 0.162                    | 0.176   | 5.90   | 6.00                                 | 1.02               | 1              | 0.665                              | 0                             |                 |       |       |                      | OK      |    |
| D153   | DI-3B | 6           | +       | 0.2                   | 0.65 | 0.131 | 0.131     | 4         | 0.52         | 0.000                            | 0.52                               | 0.063                   | 0.021                                | 1.6            | 1.67   | 1.038 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 6.87   | 6.00                                 | 0.87               | 0.97568        | 0.512                              | 0.0128                        |                 |       |       |                      | OK      |    |
| D155   | DI-3B | 6           | +       | 0.23                  | 0.65 | 0.148 | 0.148     | 4         | 0.59         | 0.013                            | 0.60                               | 0.063                   | 0.021                                | 2.0            | 1.67   | 0.825 | 0.083                  | 4.006                           | 0.999                      | 3.3  | 0.162                    | 0.183   | 7.29   | 6.00                                 | 0.82               | 0.95581        | 0.576                              | 0.0266                        |                 |       |       |                      | OK      |    |
| D62    | DI-3B | 6           | +       | 0.09                  | 0.65 | 0.059 | 0.059     | 4         | 0.24         | 0.000                            | 0.24                               | 0.057                   | 0.021                                | 1.2            | 1.67   | 1.375 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 4.77   | 6.00                                 | 1.26               | 1              | 0.236                              | 0                             |                 |       |       |                      | OK      |    |
| D60    | DI-3B | 4           | +       | 0.08                  | 0.65 | 0.050 | 0.050     | 4         | 0.20         | 0.000                            | 0.20                               | 0.026                   | 0.021                                | 1.3            | 1.67   | 1.264 | 0.083                  | 4.006                           | 1.000                      | 3.3  | 0.162                    | 0.183   | 3.51   | 4.00                                 | 1.14               | 1              | 0.199                              | 0                             |                 |       |       |                      | OK      |    |
| D59    | DI-3B | 6           | +       | 0.39                  | 0.65 | 0.251 | 0.251     | 4         | 1.01         | 0.027                            | 1.03                               | 0.000                   | 0.021                                | 5.0            | 1.67   | Sump  | 0.083                  | 4.006                           | Sump                       | 3.3  | 0.162                    | Sump  | Sump   | 6.00                                 | Sump               | Sump           | Sump                               | Sump                          | Sump            | 0.104 | 0.37  | 0.28468              | 5.0     | OK |

**10-YEAR HGL (D27 OUTFALL)**

| #Line | Pipe             | From | To   | 3D Length               |                        | Drainage            |           | Runoff   | Area X   | Area X | Time of Concentration | Time of Concentration | Runoff           |                    | Velocity | Velocity | Sec Time | Invert Elevation | Invert Elevation | Crown | Slope    |             |              |                    |
|-------|------------------|------|------|-------------------------|------------------------|---------------------|-----------|----------|----------|--------|-----------------------|-----------------------|------------------|--------------------|----------|----------|----------|------------------|------------------|-------|----------|-------------|--------------|--------------------|
|       |                  |      |      | - Center to Center (ft) | Drainage Area (sq. ft) | Area Total (sq. ft) | Coeff "C" |          |          |        |                       |                       | "C" Inc (sq. ft) | "C" Total (sq. ft) |          |          |          |                  |                  |       |          | Inlet (min) | System (min) | Rain "I" (inch/hr) |
| 1     | Pipe - (20) D26  | D27  | D27  | 21.628                  | 0                      | 224442.8            | 0         | 0        | 137980.8 | 0      | 7.096                 | 5.338                 | 17.049           | 0                  | 18.249   | 2        | 28.893   | 9.197            | 9.72             | 0.037 | 2022.5   | 2022.2      | N/A          | 1.39%              |
| 2     | Pipe - (19) D25  | D26  | D26  | 22.203                  | 0                      | 224442.8            | 0         | 0        | 137980.8 | 0      | 7.069                 | 5.343                 | 17.065           | 0                  | 18.265   | 2        | 45.85    | 14.595           | 13.757           | 0.027 | 2026.684 | 2025.909    | N/A          | 3.49%              |
| 3     | Pipe - (18) D24  | D25  | D25  | 94.996                  | 5825.52                | 224442.8            | 0.65      | 3786.58  | 137980.8 | 5      | 6.975                 | 5.36                  | 17.118           | 0                  | 18.318   | 2        | 59.799   | 19.035           | 16.722           | 0.095 | 2036.505 | 2030.87     | N/A          | 5.94%              |
| 4     | Pipe - (17) D23  | D24  | D24  | 35.136                  | 7168.86                | 7168.86             | 0.65      | 4659.76  | 4659.76  | 5      | 5                     | 5.711                 | 0.616            | 0                  | 0.616    | 1.5      | 13.589   | 7.69             | 3.89             | 0.151 | 2039.4   | 2038.9      | N/A          | 1.42%              |
| 5     | Pipe - (35) D19  | D24  | D24  | 130.659                 | 1086.48                | 211448.4            | 0.65      | 706.21   | 129534.5 | 5      | 6.782                 | 5.394                 | 16.173           | 0                  | 17.373   | 2        | 35.794   | 11.393           | 11.301           | 0.193 | 2042.643 | 2039.862    | N/A          | 2.13%              |
| 6     | Pipe - (16) D22  | D19  | D19  | 32.667                  | 5742.73                | 76666.27            | 0.65      | 3732.78  | 49833.07 | 5      | 5.971                 | 5.538                 | 6.388            | 0                  | 7.588    | 2        | 32.633   | 10.387           | 8.456            | 0.064 | 2049.6   | 2049.022    | N/A          | 1.77%              |
| 7     | Pipe - (15) D21  | D22  | D22  | 34.169                  | 21438.64               | 35063.84            | 0.65      | 13935.11 | 22791.5  | 5      | 5.102                 | 5.692                 | 3.003            | 0                  | 3.003    | 1.25     | 7.579    | 6.176            | 5.814            | 0.098 | 2050.1   | 2049.7      | N/A          | 1.17%              |
| 8     | Pipe - (14) D20  | D21  | D21  | 33.713                  | 13625.21               | 13625.21            | 0.65      | 8856.39  | 8856.39  | 5      | 5                     | 5.711                 | 1.171            | 0                  | 1.171    | 1.25     | 10.191   | 8.305            | 5.526            | 0.102 | 2056.104 | 2055.391    | N/A          | 2.12%              |
| 9     | Pipe - (58) D144 | D22  | D22  | 98.775                  | 6192.13                | 35859.69            | 0.65      | 4024.88  | 23308.8  | 5      | 5.765                 | 5.575                 | 3.008            | 0                  | 4.208    | 1.5      | 17.003   | 9.622            | 7.97             | 0.207 | 2055     | 2052.8      | N/A          | 2.23%              |
| 10    | Pipe - (57) D143 | D144 | D144 | 100.052                 | 6142.83                | 29667.56            | 0.65      | 3992.84  | 19283.92 | 5      | 5.52                  | 5.618                 | 2.508            | 0                  | 3.708    | 1.5      | 14.351   | 8.121            | 6.808            | 0.245 | 2057.1   | 2055.512    | N/A          | 1.59%              |
| 11    | Pipe - (57) D140 | D143 | D143 | 126.1                   | 4330.29                | 19530.18            | 0.65      | 2814.69  | 12694.62 | 5      | 5.265                 | 5.663                 | 1.664            | 0                  | 2.864    | 1.5      | 20.821   | 11.782           | 8.26             | 0.254 | 2064.5   | 2060.289    | N/A          | 3.34%              |
| 12    | Pipe - (57) D141 | D140 | D140 | 67.844                  | 15199.89               | 15199.89            | 0.65      | 9879.93  | 9879.93  | 5      | 5                     | 5.711                 | 1.306            | 0                  | 1.306    | 1.5      | 11.303   | 6.396            | 4.263            | 0.265 | 2065.268 | 2064.6      | N/A          | 0.99%              |
| 13    | Pipe - (84) D139 | D140 | D140 | 134.259                 | 0                      | 0                   | 0         | 0        | 0        | 0      | 0                     | 0                     | 0                | 1.2                | 1.2      | 1.5      | 29.486   | 16.686           | 8.172            | 0.274 | 2077     | 2068.023    | N/A          | 6.70%              |
| 14    | Pipe - (85) D142 | D143 | D143 | 34.905                  | 3994.55                | 3994.55             | 0.65      | 2596.46  | 2596.46  | 5      | 5                     | 5.711                 | 0.343            | 0                  | 0.343    | 1.25     | 7.499    | 6.111            | 3.1              | 0.188 | 2057.6   | 2057.2      | N/A          | 1.15%              |
| 15    | Pipe - (13) D18  | D19  | D19  | 38.393                  | 8348.73                | 133695.6            | 0.65      | 5426.67  | 78995.2  | 5      | 6.718                 | 5.405                 | 9.884            | 0                  | 9.884    | 2        | 37.564   | 11.957           | 10.074           | 0.064 | 2046.9   | 2046        | N/A          | 2.35%              |
| 16    | Pipe - (33) D16  | D18  | D18  | 176.222                 | 1572.15                | 125346.9            | 0.65      | 1021.89  | 73568.53 | 5      | 6.492                 | 5.445                 | 9.273            | 0                  | 9.273    | 2        | 54.633   | 17.39            | 12.95            | 0.227 | 2058.7   | 2049.97     | N/A          | 4.96%              |
| 17    | Pipe - (32) D12  | D16  | D16  | 101.362                 | 10776.55               | 93739.25            | 0.65      | 7004.76  | 57528.88 | 5      | 6.315                 | 5.477                 | 7.293            | 0                  | 7.293    | 2        | 39.295   | 12.508           | 9.555            | 0.177 | 2062.9   | 2060.3      | N/A          | 2.57%              |
| 18    | Pipe - (31) D8   | D12  | D12  | 148.834                 | 0                      | 62142.45            | 0         | 0        | 38558.29 | 0      | 6.106                 | 5.514                 | 4.922            | 0                  | 4.922    | 1.5      | 27.83    | 15.748           | 11.866           | 0.209 | 2078.25  | 2069.381    | N/A          | 5.97%              |
| 19    | Pipe - (6) D7    | D8   | D8   | 50.92                   | 1991.17                | 41129.05            | 0.65      | 1294.26  | 26733.88 | 5      | 6.023                 | 5.529                 | 3.421            | 0                  | 3.421    | 1.5      | 26.15    | 14.798           | 10.225           | 0.083 | 2085     | 2082.32     | N/A          | 5.27%              |
| 20    | Pipe - (5) D6    | D7   | D7   | 63.389                  | 6549.08                | 39137.87            | 0.65      | 4256.9   | 25439.62 | 5      | 5.883                 | 5.553                 | 3.27             | 0                  | 3.27     | 1.5      | 17.524   | 9.917            | 7.587            | 0.139 | 2087.5   | 2086        | N/A          | 2.37%              |
| 21    | Pipe - (4) D5    | D6   | D6   | 34.169                  | 12852.35               | 32588.8             | 0.65      | 8354.03  | 21182.72 | 5      | 5.782                 | 5.572                 | 2.732            | 0                  | 2.732    | 1.5      | 12.325   | 6.974            | 5.602            | 0.102 | 2088     | 2087.6      | N/A          | 1.17%              |
| 22    | Pipe - (3) D4    | D5   | D5   | 32.313                  | 12426.72               | 19736.45            | 0.65      | 8077.37  | 12828.69 | 5      | 5.675                 | 5.591                 | 1.66             | 0                  | 1.66     | 1.25     | 7.794    | 6.351            | 5.044            | 0.107 | 2092.7   | 2092.3      | N/A          | 1.24%              |
| 23    | Pipe - (2) D3    | D4   | D4   | 34.173                  | 1848.83                | 7309.73             | 0.65      | 1201.74  | 4751.32  | 5      | 5.522                 | 5.618                 | 0.618            | 0                  | 0.618    | 1.25     | 7.579    | 6.176            | 3.717            | 0.153 | 2093.2   | 2092.8      | N/A          | 1.17%              |
| 24    | Pipe - (1) D2    | D3   | D3   | 93.654                  | 3050.9                 | 5460.9              | 0.65      | 1983.09  | 3549.58  | 5      | 5.302                 | 5.657                 | 0.465            | 0                  | 0.465    | 1.25     | 21.588   | 17.591           | 7.117            | 0.219 | 2103.209 | 2094.353    | N/A          | 9.50%              |
| 25    | Pipe - (92) D1   | D2   | D2   | 90.447                  | 2410                   | 2410                | 0.65      | 1566.5   | 1566.5   | 5      | 5                     | 5.711                 | 0.207            | 0                  | 0.207    | 1.25     | 18.38    | 14.977           | 4.984            | 0.302 | 2109.421 | 2103.209    | N/A          | 6.89%              |
| 26    | Pipe - (40) D9   | D8   | D8   | 34.181                  | 8784.69                | 21013.41            | 0.65      | 5710.05  | 11824.41 | 5      | 5.358                 | 5.647                 | 1.546            | 0                  | 1.546    | 1.25     | 8.478    | 6.909            | 5.251            | 0.108 | 2079.001 | 2078.5      | N/A          | 1.47%              |
| 27    | Pipe - (7) D10   | D9   | D9   | 12.561                  | 0                      | 12228.72            | 0         | 0        | 6114.36  | 0      | 5.308                 | 5.656                 | 0.8              | 0                  | 0.8      | 1.25     | 8.059    | 6.567            | 4.188            | 0.05  | 2079.267 | 2079.101    | N/A          | 1.32%              |
| 28    | Pipe - (8) D11   | D10  | D10  | 67.255                  | 12228.72               | 12228.72            | 0.5       | 6114.36  | 6114.36  | 5      | 5                     | 5.711                 | 0.808            | 0                  | 0.808    | 1.25     | 6.586    | 5.367            | 3.64             | 0.308 | 2079.861 | 2079.267    | N/A          | 0.88%              |
| 29    | Pipe - (9) D13   | D12  | D12  | 37.434                  | 10371.38               | 20820.25            | 0.65      | 6741.4   | 11965.83 | 5      | 5.412                 | 5.637                 | 1.561            | 0                  | 1.561    | 1.25     | 11.168   | 9.1              | 6.41             | 0.097 | 2066.408 | 2065.457    | N/A          | 2.54%              |
| 30    | Pipe - (10) D14  | D13  | D13  | 20.085                  | 0                      | 10448.87            | 0         | 0        | 5224.44  | 0      | 5.326                 | 5.653                 | 0.684            | 0                  | 0.684    | 1.25     | 7.731    | 6.3              | 3.883            | 0.086 | 2070.124 | 2069.88     | N/A          | 1.22%              |
| 31    | Pipe - (11) D15  | D14  | D14  | 66.493                  | 10448.87               | 10448.87            | 0.5       | 5224.44  | 5224.44  | 5      | 5                     | 5.711                 | 0.691            | 0                  | 0.691    | 1.25     | 6.376    | 5.196            | 3.398            | 0.326 | 2070.675 | 2070.124    | N/A          | 0.83%              |
| 32    | Pipe - (12) D17  | D16  | D16  | 115.594                 | 30035.51               | 30035.51            | 0.5       | 15017.76 | 15017.76 | 5      | 5                     | 5.711                 | 1.985            | 0                  | 1.985    | 1.25     | 5.822    | 4.744            | 4.291            | 0.449 | 2060.632 | 2059.834    | N/A          | 0.69%              |

| #Line | Struct. ID | D (ft) | Q (cu. ft./sec) | L (ft)  | V (ft/s) | d (ft) | dc (ft) | v^2/2g (ft) | EGLo (ft) | HGLo (ft) | Sf    | Total Pipe (ft) | EGLi (ft) | HGLi (ft) | Ea (ft) | EGLa (ft) | U/S TOC (ft) | Surface E (ft) | Step4* (ft) | Step7* (ft) | Step14* (ft) |
|-------|------------|--------|-----------------|---------|----------|--------|---------|-------------|-----------|-----------|-------|-----------------|-----------|-----------|---------|-----------|--------------|----------------|-------------|-------------|--------------|
| 0     | D27        |        |                 |         |          |        |         |             | 2023.969  | 2023.969  |       |                 |           |           |         |           | 2024.2       | 2024.854       |             |             |              |
| 1     | D26        | 2      | 18.249          | 21.628  | 9.72     | 1.154  | 1.539   | 1.469       | 2026.037  | 2025.438  | 0     | 0               | 2026.037  | 2024.568  | 3.537   | 2026.037  | 2027.909     | 2028.639       | N/A         | Case E      | N/A          |
| 2     | D25        | 2      | 18.265          | 22.203  | 13.757   | 0.878  | 1.539   | 2.942       | 2029.73   | 2026.787  | 0     | 0               | 2030.505  | 2027.562  | 3.821   | 2030.505  | 2032.87      | 2035.375       | N/A         | Case B      | N/A          |
| 3     | D24        | 2      | 18.318          | 94.996  | 16.722   | 0.76   | 1.542   | 4.348       | 2035.977  | 2031.63   | 0     | 0               | 2041.613  | 2037.265  | 5.108   | 2041.613  | 2041.862     | 2043.676       | N/A         | Case A      | N/A          |
| 4     | D23        | 1.5    | 0.616           | 35.136  | 0.349    | 1.5    | n/a     | 0.002       | 2041.613  | 2041.611  | 0     | 0.001           | 2041.614  | 2041.612  | 2.215   | 2041.615  | ---          | 2044.144       | Case B      | N/A         | Case A       |
| 5     | D19        | 2      | 17.373          | 130.659 | 11.301   | 0.983  | 1.503   | 1.986       | 2041.833  | 2041.281  | 0     | 0               | 2045.612  | 2043.627  | 2.969   | 2045.612  | 2051.022     | 2054.308       | N/A         | Case F      | N/A          |
| 6     | D22        | 2      | 7.588           | 32.667  | 8.456    | 0.656  | 0.979   | 1.112       | 2050.79   | 2049.678  | 0     | 0               | 2051.368  | 2050.256  | 1.768   | 2051.368  | 2050.95      | 2057.819       | N/A         | Case A      | N/A          |
| 7     | D21        | 1.25   | 3.003           | 34.169  | 2.447    | 1.25   | n/a     | 0.093       | 2051.405  | 2051.312  | 0.002 | 0.063           | 2051.468  | 2051.375  | 1.41    | 2051.51   | 2056.641     | 2057.819       | Case B      | N/A         | Case A       |
| 8     | D20        | 1.25   | 1.171           | 33.713  | 5.526    | 0.286  | 0.426   | 0.475       | 2056.152  | 2055.677  | 0     | 0               | 2056.865  | 2056.39   | 0.761   | 2056.865  | ---          | 2060.79        | N/A         | Case A      | N/A          |
| 9     | D144       | 1.5    | 4.208           | 98.775  | 7.97     | 0.509  | 0.786   | 0.988       | 2054.296  | 2053.309  | 0     | 0               | 2056.497  | 2055.509  | 1.496   | 2056.497  | 2057.012     | 2060.698       | N/A         | Case A      | N/A          |
| 10    | D143       | 1.5    | 3.708           | 100.052 | 6.808    | 0.52   | 0.736   | 0.721       | 2056.553  | 2056.412  | 0     | 0               | 2058.341  | 2057.62   | 1.241   | 2058.341  | 2061.789     | 2065.196       | N/A         | Case F      | N/A          |
| 11    | D140       | 1.5    | 2.864           | 126.1   | 8.26     | 0.376  | 0.643   | 1.061       | 2061.726  | 2060.665  | 0     | 0               | 2065.937  | 2064.876  | 1.437   | 2065.937  | 2066.1       | 2073.551       | N/A         | Case A      | N/A          |
| 12    | D141       | 1.5    | 1.306           | 67.844  | 4.263    | 0.344  | 0.428   | 0.283       | 2065.941  | 2065.931  | 0     | 0               | 2065.941  | 2065.658  | 0.673   | 2065.941  | ---          | 2072.845       | N/A         | Case F      | N/A          |
| 13    | D139       | 1.5    | 1.2             | 134.259 | 8.172    | 0.207  | 0.41    | 1.038       | 2069.268  | 2068.23   | 0     | 0               | 2078.245  | 2077.207  | 1.245   | 2078.245  | ---          | 2079.133       | N/A         | Case A      | N/A          |
| 14    | D142       | 1.25   | 0.343           | 34.905  | 3.1      | 0.182  | 0.227   | 0.149       | 2058.342  | 2058.34   | 0     | 0               | 2058.342  | 2058.192  | 0.742   | 2058.342  | ---          | 2065.443       | N/A         | Case F      | N/A          |
| 15    | D18        | 2      | 9.884           | 38.393  | 10.074   | 0.701  | 1.125   | 1.578       | 2048.279  | 2046.701  | 0     | 0               | 2049.179  | 2047.601  | 2.279   | 2049.179  | 2051.97      | 2055.72        | N/A         | Case A      | N/A          |
| 16    | D16        | 2      | 9.273           | 176.222 | 12.95    | 0.558  | 1.088   | 2.607       | 2053.135  | 2050.528  | 0     | 0               | 2061.865  | 2059.258  | 3.165   | 2061.865  | 2062.3       | 2068.075       | N/A         | Case A      | N/A          |
| 17    | D12        | 2      | 7.293           | 101.362 | 9.555    | 0.584  | 0.959   | 1.419       | 2061.913  | 2061.794  | 0     | 0               | 2064.903  | 2063.484  | 2.003   | 2064.903  | 2070.881     | 2073.589       | N           |             |              |

|        |      |       |         |       |       |       |       |          |          |       |       |          |          |       |          |          |          |        |        |        |
|--------|------|-------|---------|-------|-------|-------|-------|----------|----------|-------|-------|----------|----------|-------|----------|----------|----------|--------|--------|--------|
| 21 D5  | 1.5  | 2.732 | 34.169  | 5.602 | 0.48  | 0.627 | 0.488 | 2088.853 | 2088.805 | 0     | 0     | 2088.968 | 2088.48  | 0.968 | 2088.968 | 2093.55  | 2097.998 | N/A    | Case F | N/A    |
| 22 D4  | 1.25 | 1.66  | 32.313  | 5.044 | 0.392 | 0.511 | 0.396 | 2093.087 | 2092.692 | 0     | 0     | 2093.487 | 2093.092 | 0.787 | 2093.487 | 2094.05  | 2101.236 | N/A    | Case A | N/A    |
| 23 D3  | 1.25 | 0.618 | 34.173  | 3.717 | 0.241 | 0.307 | 0.215 | 2093.492 | 2093.48  | 0     | 0     | 2093.656 | 2093.441 | 0.456 | 2093.656 | 2095.603 | 2101.261 | N/A    | Case F | N/A    |
| 24 D2  | 1.25 | 0.465 | 93.654  | 7.117 | 0.127 | 0.265 | 0.787 | 2095.268 | 2094.48  | 0     | 0     | 2104.123 | 2103.335 | 0.914 | 2104.123 | 2104.459 | 2109.271 | N/A    | Case A | N/A    |
| 25 D1  | 1.25 | 0.207 | 90.447  | 4.984 | 0.093 | 0.176 | 0.386 | 2104.123 | 2104.123 | 0     | 0     | 2109.901 | 2109.515 | 0.479 | 2109.901 | ---      | 2114.055 | N/A    | Case F | N/A    |
| 26 D9  | 1.25 | 1.546 | 34.181  | 1.259 | 1.25  | n/a   | 0.025 | 2080.876 | 2080.851 | 0     | 0.017 | 2080.893 | 2080.868 | 1.903 | 2080.904 | 2080.351 | 2086.396 | Case B | N/A    | Case A |
| 27 D10 | 1.25 | 0.8   | 12.561  | 0.652 | 1.25  | n/a   | 0.007 | 2080.907 | 2080.9   | 0     | 0.002 | 2080.908 | 2080.902 | 1.646 | 2080.913 | 2080.517 | 2085.377 | Case B | N/A    | Case A |
| 28 D11 | 1.25 | 0.808 | 67.255  | 0.659 | 0.296 | 0.352 | 0.007 | 2080.915 | 2080.909 | 0     | 0.009 | 2080.924 | 2080.918 | 1.064 | 2080.926 | ---      | 2084.498 | Case B | N/A    | Case B |
| 29 D13 | 1.25 | 1.561 | 37.434  | 6.41  | 0.316 | 0.495 | 0.639 | 2066.412 | 2065.773 | 0     | 0     | 2067.363 | 2066.724 | 0.955 | 2067.363 | 2071.13  | 2074.541 | N/A    | Case A | N/A    |
| 30 D14 | 1.25 | 0.684 | 20.085  | 3.883 | 0.251 | 0.323 | 0.234 | 2070.366 | 2070.131 | 0     | 0     | 2070.61  | 2070.376 | 0.486 | 2070.61  | 2071.374 | 2075.92  | N/A    | Case A | N/A    |
| 31 D15 | 1.25 | 0.691 | 66.493  | 3.398 | 0.278 | 0.325 | 0.18  | 2070.625 | 2070.587 | 0     | 0     | 2071.133 | 2070.953 | 0.457 | 2071.133 | ---      | 2075.378 | N/A    | Case F | N/A    |
| 32 D17 | 1.25 | 1.985 | 115.594 | 1.618 | 1.25  | n/a   | 0.041 | 2061.881 | 2061.841 | 0.001 | 0.093 | 2061.974 | 2061.934 | 1.351 | 2061.983 | ---      | 2064.991 | Case B | N/A    | Case A |

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| #Line | Struct. ID | Exit Ho (ft) | Hf (ft) | Hb (ft) | Hc (ft) | He (ft) | Hj (ft) | Total (ft) | Ei (ft) | $\gamma(P/\text{gam}_i \text{ DI})$ (ft) | Eai (ft) | CB    | C-theta | Cp | Ha (ft) | Ea (ft) |       |       |
|-------|------------|--------------|---------|---------|---------|---------|---------|------------|---------|--|----------|-------|---------|----|---------|---------|-------|-------|
| 0     | D27        |              |         |         |         |         |         |            |         |  |          |       |         |    |         |         |       |       |
| 1     | D26        | 1.469        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 3.537                                    | 2.068    | 0.724 | 2.578   | 0  | 0       | 0.416   | 0     | 3.537 |
| 2     | D25        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 3.821                                    | 0.878    | 0.725 | 2.58    | 0  | 0       | 0.805   | 0     | 3.821 |
| 3     | D24        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 5.108                                    | 0.76     | 0.727 | 2.585   | 0  | 0.073   | 0.366   | 0     | 5.108 |
| 4     | D23        | 0.001        | 0.001   | 0       | 0       | 0       | 0       | 0          | 0.001   | 2.214                                    | 2.212    | 0.05  | 2.215   | 0  | 0       | 0       | 0     | 2.215 |
| 5     | D19        | 0.221        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 2.969                                    | 0.983    | 0.69  | 2.494   | 0  | 0       | 1.093   | 0     | 2.969 |
| 6     | D22        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.768                                    | 0.656    | 0.301 | 1.432   | 0  | 0.708   | 0.49    | 0     | 1.768 |
| 7     | D21        | 0.037        | 0.063   | 0       | 0       | 0       | 0       | 0          | 0.063   | 1.368                                    | 1.275    | 0.386 | 1.387   | 0  | 0       | 1.217   | 0.023 | 1.41  |
| 8     | D20        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.761                                    | 0.286    | 0.15  | 0.562   | 0  | 0       | 0       | 0     | 0.761 |
| 9     | D144       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.496                                    | 0.509    | 0.343 | 1.171   | 0  | 0.876   | 0       | 0     | 1.496 |
| 10    | D143       | 0.057        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.241                                    | 0.52     | 0.302 | 1.076   | 0  | 0.313   | 1.088   | 0     | 1.241 |
| 11    | D140       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.437                                    | 0.376    | 0.233 | 0.905   | 0  | 1.622   | 0.731   | 0     | 1.437 |
| 12    | D141       | 0.004        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.673                                    | 0.39     | 0.106 | 0.535   | 0  | 0       | 0       | 0     | 0.673 |
| 13    | D139       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.245                                    | 0.207    | 0.098 | 0.505   | 0  | 0       | 0       | 0     | 1.245 |
| 14    | D142       | 0.001        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.742                                    | 0.592    | 0.044 | 0.247   | 0  | 0       | 0       | 0     | 0.742 |
| 15    | D18        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 2.279                                    | 0.701    | 0.392 | 1.709   | 0  | 0       | 0.638   | 0     | 2.279 |
| 16    | D16        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 3.165                                    | 0.558    | 0.368 | 1.638   | 0  | 1.171   | 0       | 0     | 3.165 |
| 17    | D12        | 0.048        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 2.003                                    | 0.584    | 0.289 | 1.395   | 0  | 0       | 1.841   | 0     | 2.003 |
| 18    | D8         | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 2.616                                    | 0.427    | 0.401 | 1.301   | 0  | 0.951   | 1.283   | 0     | 2.616 |
| 19    | D7         | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.992                                    | 0.367    | 0.279 | 1.02    | 0  | 0.414   | 0.165   | 0     | 1.992 |
| 20    | D6         | 0.043        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 1.334                                    | 0.439    | 0.266 | 0.989   | 0  | 0.914   | 0       | 0     | 1.334 |
| 21    | D5         | 0.019        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.968                                    | 0.48     | 0.223 | 0.877   | 0  | 0       | 1.387   | 0     | 0.968 |
| 22    | D4         | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.787                                    | 0.392    | 0.213 | 0.71    | 0  | 0.682   | 0       | 0     | 0.787 |
| 23    | D3         | 0.005        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.456                                    | 0.241    | 0.079 | 0.366   | 0  | 0       | 0.474   | 0     | 0.456 |
| 24    | D2         | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.914                                    | 0.127    | 0.06  | 0.303   | 0  | 0.512   | 0       | 0     | 0.914 |
| 25    | D1         | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.479                                    | 0.093    | 0.027 | 0.176   | 0  | 0       | 0       | 0     | 0.479 |
| 26    | D9         | 0.01         | 0.017   | 0       | 0       | 0       | 0       | 0          | 0.017   | 1.892                                    | 1.867    | 0.199 | 1.897   | 0  | 1.273   | 0       | 0.006 | 1.903 |
| 27    | D10        | 0.003        | 0.002   | 0       | 0       | 0       | 0       | 0          | 0.002   | 1.641                                    | 1.635    | 0.103 | 1.643   | 0  | 2.472   | 0       | 0.003 | 1.646 |
| 28    | D11        | 0.003        | 0.009   | 0       | 0       | 0       | 0       | 0          | 0.009   | 1.063                                    | 1.056    | 0.104 | 1.064   | 0  | 0       | 0       | 0     | 1.064 |
| 29    | D13        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.955                                    | 0.316    | 0.201 | 0.682   | 0  | 0       | 0.977   | 0     | 0.955 |
| 30    | D14        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.486                                    | 0.251    | 0.088 | 0.392   | 0  | 2.752   | 0       | 0     | 0.486 |
| 31    | D15        | 0.015        | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.457                                    | 0.278    | 0.089 | 0.395   | 0  | 0       | 0       | 0     | 0.457 |
| 32    | D17        | 0.016        | 0.093   | 0       | 0       | 0       | 0       | 0          | 0.093   | 1.342                                    | 1.302    | 0.255 | 1.351   | 0  | 0       | 0       | 0     | 1.351 |

**10-YEAR HGL (D34 OUTFALL)**

| #Line | Pipe             | From | To  | 3D Length               |                            | Drainage            |       | Runoff Coeff "C" | Area X "C" Inc (sq. ft) | Area X "C" Total (sq. ft) | Time of Concentration (min) | Time of Concentration (min) | Runoff |                    | Known Q (cu. ft/sec) | Total Q (cu. ft/sec) | Pipe Dia. (ft) | Full Q (cu. ft/sec) | Full Velocity (ft/s) | Design Velocity (ft/s) | Sec Time (min) | Invert Elevation (ft) | Invert Elevation (ft) | Crown Drop (ft) | Slope |
|-------|------------------|------|-----|-------------------------|----------------------------|---------------------|-------|------------------|-------------------------|---------------------------|-----------------------------|-----------------------------|--------|--------------------|----------------------|----------------------|----------------|---------------------|----------------------|------------------------|----------------|-----------------------|-----------------------|-----------------|-------|
|       |                  |      |     | - Center to Center (ft) | Drainage Area Inc (sq. ft) | Area Total (sq. ft) | Inlet |                  |                         |                           |                             |                             | System | Rain "I" (inch/hr) |                      |                      |                |                     |                      |                        |                |                       |                       |                 |       |
| 1     | Pipe - (39) D32  |      | D34 | 76.584                  | 4887.1                     | 37059.16            | 0.65  | 3176.61          | 24088.45                | 5                         | 5.408                       | 5.638                       | 3.144  | 0                  | 3.144                | 1.25                 | 7.159          | 5.834               | 5.641                | 0.226                  | 2022.8         | 2022                  | N/A                   | 1.05%           |       |
| 2     | Pipe - (23) D31  |      | D32 | 44.644                  | 5775.72                    | 5775.72             | 0.65  | 3754.22          | 3754.22                 | 5                         | 5                           | 5.711                       | 0.496  | 0                  | 0.496                | 1.25                 | 8.601          | 7.009               | 3.809                | 0.195                  | 2030.96        | 2030.287              | N/A                   | 1.51%           |       |
| 3     | Pipe - (24) D33  |      | D32 | 50.215                  | 14636.61                   | 14636.61            | 0.65  | 9513.8           | 9513.8                  | 5                         | 5                           | 5.711                       | 1.258  | 0                  | 1.258                | 1.25                 | 7.005          | 5.708               | 4.319                | 0.194                  | 2031.171       | 2030.669              | N/A                   | 1.00%           |       |
| 4     | Pipe - (132) D29 |      | D32 | 33.879                  | 1957.66                    | 11759.73            | 0.65  | 1272.48          | 7643.83                 | 5                         | 5.277                       | 5.661                       | 1.002  | 0                  | 1.002                | 1.25                 | 7.612          | 6.202               | 4.293                | 0.132                  | 2027.3         | 2026.9                | N/A                   | 1.18%           |       |
| 5     | Pipe - (22) D30  |      | D29 | 46.429                  | 3323.14                    | 3323.14             | 0.65  | 2160.04          | 2160.04                 | 5                         | 5                           | 5.711                       | 0.286  | 0                  | 0.286                | 1.25                 | 7.005          | 5.708               | 2.798                | 0.277                  | 2031.168       | 2030.704              | N/A                   | 1.00%           |       |
| 6     | Pipe - (21) D28  |      | D29 | 45.667                  | 6478.93                    | 6478.93             | 0.65  | 4211.31          | 4211.31                 | 5                         | 5                           | 5.711                       | 0.557  | 0                  | 0.557                | 1.25                 | 7.005          | 5.708               | 3.41                 | 0.223                  | 2031.135       | 2030.679              | N/A                   | 1.00%           |       |

| #Line | Struct. ID | D (ft) | Q (cu. ft/sec) | L (ft) | V (ft/s) | d (ft) | dc (ft) | v <sup>2</sup> /2g (ft) | EGLo (ft) | HGLo (ft) | Sf       | Total Pipe (ft) | EGLi (ft) | HGLi (ft) | Ea (ft)  | EGLa (ft) | U/S TOC (ft) | Surface E (ft) | Step4*   | Step7* | Step14* |     |
|-------|------------|--------|----------------|--------|----------|--------|---------|-------------------------|-----------|-----------|----------|-----------------|-----------|-----------|----------|-----------|--------------|----------------|----------|--------|---------|-----|
| 0     | D34        |        |                |        |          |        |         |                         | 2022.982  | 2022.982  |          |                 |           |           |          |           | 2023.25      | 2023.858       |          |        |         |     |
| 1     | D32        |        | 1.25           | 3.144  | 76.584   | 5.641  | 0.58    | 0.714                   | 0.495     | 2023.62   | 2023.477 | 0               | 0         | 2023.875  | 2023.38  | 1.146     | 2023.946     | 2031.537       | 2035.167 | N/A    | Case E  | N/A |
| 2     | D31        |        | 1.25           | 0.496  | 44.644   | 3.809  | 0.204   | 0.274                   | 0.226     | 2030.717  | 2030.491 | 0               | 0         | 2031.39   | 2031.164 | 0.429     | 2031.39      | ---            | 2035.549 | N/A    | Case A  | N/A |
| 3     | D33        |        | 1.25           | 1.258  | 50.215   | 4.319  | 0.359   | 0.443                   | 0.29      | 2031.318  | 2031.027 | 0               | 0         | 2031.82   | 2031.53  | 0.649     | 2031.82      | ---            | 2035.626 | N/A    | Case A  | N/A |
| 4     | D29        |        | 1.25           | 1.002  | 33.879   | 4.293  | 0.306   | 0.393                   | 0.286     | 2027.493  | 2027.206 | 0               | 0         | 2027.893  | 2027.606 | 0.593     | 2027.893     | 2031.954       | 2035.168 | N/A    | Case A  | N/A |
| 5     | D30        |        | 1.25           | 0.286  | 46.429   | 2.798  | 0.172   | 0.207                   | 0.122     | 2030.998  | 2030.876 | 0               | 0         | 2031.462  | 2031.34  | 0.294     | 2031.462     | ---            | 2035.607 | N/A    | Case A  | N/A |
| 6     | D28        |        | 1.25           | 0.557  | 45.667   | 3.41   | 0.238   | 0.291                   | 0.181     | 2031.098  | 2030.917 | 0               | 0         | 2031.554  | 2031.374 | 0.419     | 2031.554     | ---            | 2035.574 | N/A    | Case A  | N/A |

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| #Line | Struct. ID | Exit Ho (ft) | Hf (ft) | Hb (ft) | Hc (ft) | He (ft) | Hj (ft) | Total (ft) | Ei (ft) | y+(P/gam <sub>l</sub> DI (ft) | Eai (ft) | CB    | C-theta | Cp | Ha (ft) | Ea (ft) |       |       |
|-------|------------|--------------|---------|---------|---------|---------|---------|------------|---------|-------------------------------|----------|-------|---------|----|---------|---------|-------|-------|
| 0     | D34        |              |         |         |         |         |         |            |         |                               |          |       |         |    |         |         |       |       |
| 1     | D32        |              | 0.495   | 0       | 0       | 0       | 0       | 0          | 0       | 1.075                         | 0.58     | 0.404 | 1.09    | 0  | 0       | 3.745   | 0.057 | 1.146 |
| 2     | D31        |              | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.429                         | 0.064    | 0.316 | 0       | 0  | 0       | 0       | 0.429 |       |
| 3     | D33        |              | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.649                         | 0.359    | 0.162 | 0.59    | 0  | 0       | 0       | 0.649 |       |
| 4     | D29        |              | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.593                         | 0.306    | 0.129 | 0.506   | 0  | 0       | 1.938   | 0     | 0.593 |
| 5     | D30        |              | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.294                         | 0.172    | 0.037 | 0.218   | 0  | 0       | 0       | 0     | 0.294 |
| 6     | D28        |              | 0       | 0       | 0       | 0       | 0       | 0          | 0       | 0.419                         | 0.238    | 0.072 | 0.342   | 0  | 0       | 0       | 0     | 0.419 |

**10-YEAR HGL (D40 OUTFALL)**

| #Line | Pipe            | From | To  | 3D Length               |                            | Drainage Area       |       | Runoff Coeff "C" | Area X "C" Inc (sq. ft) | Area X "C" Total (sq. ft) | Time of Concentration (min) | Time of Concentration (min) | Runoff |                    | Known Q (cu. ft/sec) | Total Q (cu. ft/sec) | Pipe Dia. (ft) | Full Q (cu. ft/sec) | Full Velocity (ft/s) | Velocity Design (ft/s) | Sec Time (min) | Invert U/S (ft) | Invert Elevation D/S (ft) | Crown Drop (ft) | Slope |
|-------|-----------------|------|-----|-------------------------|----------------------------|---------------------|-------|------------------|-------------------------|---------------------------|-----------------------------|-----------------------------|--------|--------------------|----------------------|----------------------|----------------|---------------------|----------------------|------------------------|----------------|-----------------|---------------------------|-----------------|-------|
|       |                 |      |     | - Center to Center (ft) | Drainage Area Inc (sq. ft) | Area Total (sq. ft) | inlet |                  |                         |                           |                             |                             | System | Rain "I" (inch/hr) |                      |                      |                |                     |                      |                        |                |                 |                           |                 |       |
| 1     | Pipe - (29) D39 |      | D40 | 54.286                  | 0                          | 20154.93            | 0     | 0                | 13100.71                | 0                         | 5.627                       | 5.599                       | 1.698  | 0                  | 1.698                | 1.25                 | 15.632         | 12.738              | 8.338                | 0.109                  | 2024.7         | 2022            | N/A                       | 4.98%           |       |
| 2     | Pipe - (28) D38 |      | D39 | 95.928                  | 7170.25                    | 9966.39             | 0.65  | 4660.66          | 6478.15                 | 5                         | 5.203                       | 5.674                       | 0.851  | 0                  | 0.851                | 1.25                 | 6.785          | 5.529               | 3.773                | 0.424                  | 2025.7         | 2024.8          | N/A                       | 0.94%           |       |
| 3     | Pipe - (27) D37 |      | D38 | 34.169                  | 2796.14                    | 2796.14             | 0.65  | 1817.49          | 1817.49                 | 5                         | 5                           | 5.711                       | 0.24   | 0                  | 0.24                 | 1.25                 | 7.579          | 6.176               | 2.808                | 0.203                  | 2026.2         | 2025.8          | N/A                       | 1.17%           |       |
| 4     | Pipe - (26) D36 |      | D39 | 61.875                  | 7209.01                    | 10188.55            | 0.65  | 4685.85          | 6622.55                 | 5                         | 5.199                       | 5.675                       | 0.87   | 0                  | 0.87                 | 1.25                 | 8.449          | 6.884               | 4.437                | 0.232                  | 2028.6         | 2027.7          | N/A                       | 1.46%           |       |
| 5     | Pipe - (25) D35 |      | D36 | 34.171                  | 2979.54                    | 2979.54             | 0.65  | 1936.7           | 1936.7                  | 5                         | 5                           | 5.711                       | 0.256  | 0                  | 0.256                | 1.25                 | 7.579          | 6.176               | 2.86                 | 0.199                  | 2029.1         | 2028.7          | N/A                       | 1.17%           |       |

| #Line | Struct. ID | D (ft) | Q (cu. ft/sec) | L (ft) | V (ft/s) | d (ft) | dc (ft) | v^2/2g (ft) | EGLo (ft) | HGLo (ft) | Sf | Total Pipe (ft) | EGLi (ft) | HGLi (ft) | Ea (ft) | EGLa (ft) | U/S TOC (ft) | Surface E (ft) | Step4* | Step7* | Step14* |
|-------|------------|--------|----------------|--------|----------|--------|---------|-------------|-----------|-----------|----|-----------------|-----------|-----------|---------|-----------|--------------|----------------|--------|--------|---------|
| 0     | D40        |        |                |        |          |        |         |             | 2022.884  | 2022.884  |    |                 |           |           |         |           | 2023.25      | 2023.858       |        |        |         |
| 1     | D39        | 1.25   | 1.698          | 54.286 | 8.338    | 0.278  | 0.517   | 1.081       | 2024.017  | 2023.965  | 0  | 0               | 2026.059  | 2024.978  | 1.359   | 2026.059  | 2026.05      | 2035.737       | N/A    | Case E | N/A     |
| 2     | D38        | 1.25   | 0.851          | 95.928 | 0.693    | 0.299  | 0.362   | 0.007       | 2026.062  | 2026.055  | 0  | 0.014           | 2026.076  | 2026.069  | 0.528   | 2026.228  | 2027.05      | 2033.824       | Case B | N/A    | Case B  |
| 3     | D37        | 1.25   | 0.24           | 34.169 | 2.808    | 0.153  | 0.189   | 0.123       | 2026.231  | 2026.224  | 0  | 0               | 2026.475  | 2026.353  | 0.275   | 2026.475  | ---          | 2033.822       | N/A    | Case F | N/A     |
| 4     | D36        | 1.25   | 0.87           | 61.875 | 4.437    | 0.271  | 0.366   | 0.306       | 2028.277  | 2027.971  | 0  | 0               | 2029.177  | 2028.871  | 0.577   | 2029.177  | 2029.95      | 2036.696       | N/A    | Case A | N/A     |
| 5     | D35        | 1.25   | 0.256          | 34.171 | 2.86     | 0.157  | 0.196   | 0.127       | 2029.179  | 2029.174  | 0  | 0               | 2029.385  | 2029.257  | 0.285   | 2029.385  | ---          | 2036.702       | N/A    | Case F | N/A     |

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| #Line | Struct. ID | Exit Ho (ft) | Hf (ft) | Hb (ft) | Hc (ft) | He (ft) | Hj (ft) | Total (ft) | Ei (ft) | y+(P/gamı DI (ft) | Eai (ft) | CB    | C-theta | Cp    | Ha (ft) | Ea (ft) |       |
|-------|------------|--------------|---------|---------|---------|---------|---------|------------|---------|-------------------|----------|-------|---------|-------|---------|---------|-------|
| 0     | D40        |              |         |         |         |         |         |            |         |                   |          |       |         |       |         |         |       |
| 1     | D39        | 1.081        | 0       | 0       | 0       | 0       | 0       | 0          | 1.359   | 0.278             | 0.218    | 0.721 | 0       | 1.207 | 0.934   | 0       | 1.359 |
| 2     | D38        | 0.003        | 0.014   | 0       | 0       | 0       | 0       | 0.014      | 0.376   | 0.369             | 0.109    | 0.454 | 0       | 0.958 | 0       | 0.074   | 0.528 |
| 3     | D37        | 0.003        | 0       | 0       | 0       | 0       | 0       | 0          | 0.275   | 0.153             | 0.031    | 0.195 | 0       | 0     | 0       | 0       | 0.275 |
| 4     | D36        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0.577   | 0.271             | 0.112    | 0.461 | 0       | 0.935 | 0       | 0       | 0.577 |
| 5     | D35        | 0.002        | 0       | 0       | 0       | 0       | 0       | 0          | 0.285   | 0.157             | 0.033    | 0.203 | 0       | 0     | 0       | 0       | 0.285 |

**10-YEAR HGL (D27 OUTFALL)**

| #Line | Pipe              | From | To   | 3D Length<br>(ft) | Drainage A<br>(sq. ft) | Drainage P<br>(sq. ft) | Runoff Co | Area X "C"<br>(sq. ft) | Area X "C"<br>(sq. ft) | Time of<br>(min) | CoTime of<br>(min) | CoRain "I"<br>(inch/hr) | Runoff "Q" Known<br>(cu. ft/sec) | Total Q<br>(cu. ft/sec) | Pipe Dia.<br>(ft) | Full Q<br>(cu. ft/sec) | Velocity Fl<br>(ft/s) | Velocity Dr<br>(ft/s) | Sec Time<br>(min) | Invert Elev<br>(ft) | Invert Elev<br>(ft) | Crown Elev<br>(ft) | DrC Slope |       |
|-------|-------------------|------|------|-------------------|------------------------|------------------------|-----------|------------------------|------------------------|------------------|--------------------|-------------------------|----------------------------------|-------------------------|-------------------|------------------------|-----------------------|-----------------------|-------------------|---------------------|---------------------|--------------------|-----------|-------|
| 1     | Pipe - (42) D56   | D57  | D56  | 32.024            | 0                      | 383045.2               | 0         | 0                      | 233490                 | 0                | 10.568             | 4.721                   | 25.515                           | 0                       | 25.515            | 2.5                    | 49.711                | 10.127                | 10.186            | 0.052               | 1996.4              | 1996               | N/A       | 1.25% |
| 2     | Pipe - (41) D55   | D56  | D56  | 84.205            | 0                      | 383045.2               | 0         | 0                      | 233490                 | 0                | 10.485             | 4.736                   | 25.595                           | 0                       | 25.595            | 2.5                    | 98.778                | 20.123                | 16.883            | 0.083               | 2001.712            | 1997.564           | N/A       | 4.93% |
| 3     | Pipe - (40) D54   | D55  | D54  | 43.641            | 0                      | 383045.2               | 0         | 0                      | 233490                 | 0                | 10.442             | 4.743                   | 25.637                           | 0                       | 25.637            | 2.5                    | 97.623                | 19.888                | 16.747            | 0.043               | 2004.6              | 2002.5             | N/A       | 4.82% |
| 4     | Pipe - (39) D53   | D54  | D53  | 58.742            | 0                      | 383045.2               | 0         | 0                      | 233490                 | 0                | 10.38              | 4.754                   | 25.695                           | 0                       | 25.695            | 2.5                    | 91.242                | 18.588                | 15.958            | 0.061               | 2011.3              | 2008.83            | N/A       | 4.21% |
| 5     | Pipe - (38) D52   | D53  | D53  | 40.115            | 5125.33                | 347040.4               | 0.65      | 3331.47                | 215376.5               | 5                | 6.853              | 5.381                   | 26.828                           | 0                       | 26.828            | 2.5                    | 45.92                 | 9.355                 | 9.71              | 0.069               | 2011.728            | 2011.3             | N/A       | 1.07% |
| 6     | Pipe - (37) D51   | D52  | D51  | 117.206           | 5676.6                 | 161639.8               | 0.65      | 3689.79                | 105065.9               | 5                | 6.449              | 5.453                   | 13.262                           | 0                       | 13.262            | 2                      | 24.531                | 7.808                 | 7.955             | 0.246               | 2013.4              | 2012.228           | N/A       | 1.00% |
| 7     | Pipe - (36) D50   | D51  | D50  | 52.731            | 5522.53                | 155963.2               | 0.65      | 3589.65                | 101376.1               | 5                | 6.338              | 5.473                   | 12.843                           | 0                       | 12.843            | 2                      | 24.531                | 7.808                 | 7.893             | 0.111               | 2014.027            | 2013.5             | N/A       | 1.00% |
| 8     | Pipe - (35) D49   | D50  | D49  | 38.869            | 6667.83                | 107229.3               | 0.65      | 4334.09                | 69699.04               | 5                | 6.247              | 5.489                   | 8.856                            | 0                       | 8.856             | 2                      | 24.531                | 7.808                 | 7.171             | 0.09                | 2014.516            | 2014.127           | N/A       | 1.00% |
| 9     | Pipe - (70) D44   | D49  | D44  | 119.705           | 13002.56               | 100561.5               | 0.65      | 8451.66                | 65364.95               | 5                | 6.044              | 5.525                   | 8.36                             | 0                       | 8.36              | 2                      | 38.647                | 12.302                | 9.813             | 0.203               | 2017.586            | 2014.616           | N/A       | 2.48% |
| 10    | Pipe - (32) D43   | D44  | D43  | 265.037           | 6949.89                | 69764.88               | 0.65      | 4517.43                | 45347.17               | 5                | 5.389              | 5.641                   | 5.922                            | 0                       | 5.922             | 1.5                    | 11.958                | 6.767                 | 6.745             | 0.655               | 2021.443            | 2018.522           | N/A       | 1.10% |
| 11    | Pipe - (31) D42   | D43  | D42  | 34.265            | 11409.61               | 62814.99               | 0.65      | 7416.25                | 40829.75               | 5                | 5.299              | 5.657                   | 5.347                            | 0                       | 5.347             | 1.5                    | 11.391                | 6.446                 | 6.339             | 0.09                | 2021.886            | 2021.543           | N/A       | 1.00% |
| 12    | Pipe - (30) D41   | D42  | D41  | 108.159           | 51405.38               | 51405.38               | 0.65      | 33413.5                | 33413.5                | 5                | 5                  | 5.711                   | 4.417                            | 0                       | 4.417             | 1.25                   | 7.005                 | 5.708                 | 6.031             | 0.299               | 2023.067            | 2021.986           | N/A       | 1.00% |
| 13    | Pipe - (73) D45   | D44  | D45  | 38.916            | 17794.02               | 17794.02               | 0.65      | 11566.11               | 11566.11               | 5                | 5                  | 5.711                   | 1.529                            | 0                       | 1.529             | 1.25                   | 10.044                | 8.185                 | 5.908             | 0.11                | 2018.325            | 2017.525           | N/A       | 2.06% |
| 14    | Pipe - (75) D47   | D50  | D47  | 34.01             | 11289.65               | 43211.38               | 0.65      | 7338.27                | 28087.4                | 5                | 5.278              | 5.661                   | 3.681                            | 0                       | 3.681             | 1.25                   | 6.828                 | 5.564                 | 5.664             | 0.1                 | 2015.1              | 2014.777           | N/A       | 0.95% |
| 15    | Pipe - (33) D46   | D47  | D46  | 42.43             | 23907.34               | 23907.34               | 0.65      | 15539.77               | 15539.77               | 5                | 5                  | 5.711                   | 2.054                            | 0                       | 2.054             | 1.25                   | 6.801                 | 5.542                 | 4.85              | 0.146               | 2015.6              | 2015.2             | N/A       | 0.94% |
| 16    | Pipe - (34) D48   | D47  | D48  | 57.641            | 8014.39                | 8014.39                | 0.65      | 5209.36                | 5209.36                | 5                | 5                  | 5.711                   | 0.689                            | 0                       | 0.689             | 1.25                   | 6.524                 | 5.316                 | 3.451             | 0.278               | 2015.7              | 2015.2             | N/A       | 0.87% |
| 17    | Pipe - (77) D60   | D52  | D60  | 34.689            | 3341.61                | 180275.2               | 0.65      | 2172.05                | 106979.2               | 5                | 6.807              | 5.389                   | 13.346                           | 0                       | 13.346            | 2                      | 45.064                | 14.344                | 12.486            | 0.046               | 2013.4              | 2012.23            | N/A       | 3.38% |
| 18    | Pipe - (44) D59   | D60  | D59  | 30.278            | 16850.01               | 176933.6               | 0.65      | 10952.5                | 104807.2               | 5                | 6.75               | 5.399                   | 13.1                             | 0                       | 13.1              | 2                      | 28.197                | 8.975                 | 8.804             | 0.057               | 2013.9              | 2013.5             | N/A       | 1.32% |
| 19    | Pipe - (43) D58   | D59  | D58  | 34.741            | 2773.27                | 160083.6               | 0.65      | 1802.62                | 93854.64               | 5                | 6.692              | 5.41                    | 11.753                           | 0                       | 11.753            | 2                      | 34.825                | 11.085                | 9.998             | 0.058               | 2014.7              | 2014               | N/A       | 2.02% |
| 20    | Pipe - (93) D156  | D58  | D156 | 93.528            | 6962.03                | 157310.3               | 0.65      | 4525.32                | 92052.02               | 5                | 6.529              | 5.439                   | 11.589                           | 0                       | 11.589            | 2                      | 33.075                | 10.528                | 9.592             | 0.163               | 2016.5              | 2014.8             | N/A       | 1.82% |
| 21    | Pipe - (84) D154  | D156 | D154 | 136.332           | 6541.19                | 140463.7               | 0.65      | 4251.77                | 81101.71               | 5                | 6.341              | 5.472                   | 10.273                           | 0                       | 10.273            | 1.5                    | 21.559                | 12.2                  | 12.045            | 0.189               | 2027                | 2022.119           | N/A       | 3.58% |
| 22    | Pipe - (83) D151  | D154 | D151 | 150.233           | 7955.45                | 79417.6                | 0.65      | 5171.04                | 48278.45               | 5                | 6.067              | 5.521                   | 6.17                             | 0                       | 6.17              | 1.5                    | 17.8                  | 10.073                | 9.15              | 0.274               | 2034.37             | 2030.702           | N/A       | 2.44% |
| 23    | Pipe - (82) D147  | D151 | D147 | 152.028           | 6611.06                | 60314.6                | 0.65      | 4297.19                | 35861.5                | 5                | 5.617              | 5.601                   | 4.649                            | 0                       | 4.649             | 1.5                    | 10.204                | 5.774                 | 5.636             | 0.45                | 2038.52             | 2037.3             | N/A       | 0.80% |
| 24    | Pipe - (87) D146  | D147 | D146 | 119.958           | 8804.93                | 24163.26               | 0.65      | 5723.21                | 15706.12               | 5                | 5.209              | 5.673                   | 2.063                            | 0                       | 2.063             | 1.5                    | 11.391                | 6.446                 | 4.889             | 0.409               | 2041.26             | 2040.06            | N/A       | 1.00% |
| 25    | Pipe - (86) D145  | D146 | D145 | 53.806            | 15358.32               | 15358.32               | 0.65      | 9982.91                | 9982.91                | 5                | 5                  | 5.711                   | 1.32                             | 0                       | 1.32              | 1.5                    | 11.391                | 6.446                 | 4.299             | 0.209               | 2041.898            | 2041.36            | N/A       | 1.00% |
| 26    | Pipe - (89) D149  | D147 | D149 | 35.189            | 7253.66                | 29540.28               | 0.65      | 4714.88                | 15858.19               | 5                | 5.344              | 5.649                   | 2.074                            | 0                       | 2.074             | 1.5                    | 11.557                | 6.54                  | 4.948             | 0.119               | 2038.979            | 2038.617           | N/A       | 1.03% |
| 27    | Pipe - (88) D148  | D149 | D148 | 93.149            | 22286.62               | 22286.62               | 0.5       | 11143.31               | 11143.31               | 5                | 5                  | 5.711                   | 1.473                            | 0                       | 1.473             | 1.25                   | 7.005                 | 5.708                 | 4.517             | 0.344               | 2043.586            | 2042.655           | N/A       | 1.00% |
| 28    | Pipe - (94) D150  | D151 | D150 | 41.419            | 11147.56               | 11147.56               | 0.65      | 7245.91                | 7245.91                | 5                | 5                  | 5.711                   | 0.958                            | 0                       | 0.958             | 1.5                    | 21.684                | 12.27                 | 6.159             | 0.112               | 2035.8              | 2034.3             | N/A       | 3.62% |
| 29    | Pipe - (96) D153  | D154 | D153 | 37.923            | 8793.59                | 54504.9                | 0.65      | 5715.83                | 28571.49               | 5                | 5.259              | 5.664                   | 3.746                            | 0                       | 3.746             | 1.5                    | 21.893                | 12.389                | 9.247             | 0.068               | 2028.5              | 2027.1             | N/A       | 3.69% |
| 30    | Pipe - (95) D152  | D153 | D152 | 91.53             | 45711.31               | 45711.31               | 0.5       | 22855.66               | 22855.66               | 5                | 5                  | 5.711                   | 3.021                            | 0                       | 3.021             | 1.25                   | 7.679                 | 6.258                 | 5.879             | 0.259               | 2032.8              | 2031.7             | N/A       | 1.20% |
| 31    | Pipe - (97) D155  | D156 | D155 | 32.901            | 9884.6                 | 9884.6                 | 0.65      | 6424.99                | 6424.99                | 5                | 5                  | 5.711                   | 0.849                            | 0                       | 0.849             | 1.5                    | 20.833                | 11.789                | 5.777             | 0.095               | 2019.5              | 2018.4             | N/A       | 3.35% |
| 32    | Pipe - (176) D 61 | D53  | D61  | 52.183            | 5604.04                | 36004.84               | 0.65      | 3642.62                | 18113.47               | 5                | 10.212             | 4.784                   | 2.006                            | 0                       | 2.006             | 1.25                   | 7.511                 | 6.121                 | 5.178             | 0.168               | 2015.4              | 2014.8             | N/A       | 1.15% |
| 33    | Pipe - (46) D62   | D61  | D62  | 58.462            | 3952.4                 | 30400.81               | 0.65      | 2569.06                | 14470.84               | 5                | 10.087             | 4.806                   | 1.61                             | 0                       | 1.61              | 1.25                   | 14.492                | 11.809                | 7.781             | 0.125               | 2018                | 2015.5             | N/A       | 4.28% |
| 34    | Pipe - (45) D61   | D62  | D61  | 41.377            | 26448.41               | 26448.41               | 0.45      | 11901.78               | 11901.78               | 10               | 10                 | 4.822                   | 1.328                            | 0                       | 1.328             | 1.25                   | 16.076                | 13.1                  | 7.916             | 0.087               | 2020.276            | 2018.1             | N/A       | 5.27% |

| #Line | Struct. ID | D    | Q            | L       | V      | d     | dc    | v^2/2g | EGLo     | HGLo     | Sf    | Total Pipe | EGLi     | HGLi     | Ea    | EGLa     | U/S TOC  | Surface E | Step4* | Step7* | Step14* |
|-------|------------|------|--------------|---------|--------|-------|-------|--------|----------|----------|-------|------------|----------|----------|-------|----------|----------|-----------|--------|--------|---------|
|       | (ft)       | (ft) | (cu. ft/sec) | (ft)    | (ft/s) | (ft)  | (ft)  | (ft)   | (ft)     | (ft)     |       | (ft)       | (ft)     | (ft)     | (ft)  | (ft)     | (ft)     | (ft)      |        |        |         |
| 0     | D57        |      |              |         |        |       |       |        | 1998.111 | 1998.111 |       |            |          |          |       |          | 1998.5   | 1999.212  |        |        |         |
| 1     | D56        | 2.5  | 25.515       | 32.024  | 10.186 | 1.27  | 1.722 | 1.613  | 2000.242 | 1999.724 | 0     | 0          | 2000.242 | 1998.629 | 3.842 | 2000.242 | 2000.064 | 2001.741  | N/A    | Case E | N/A     |
| 2     | D55        | 2.5  | 25.595       | 84.205  | 16.883 | 0.869 | 1.724 | 4.431  | 2000.411 | 1999.988 | 0.003 | 0          | 2007.012 | 2002.58  | 5.3   | 2007.012 | 2005     | 2007.814  | Case B | N/A    | Case D  |
| 3     | D54        | 2.5  | 25.637       | 43.641  | 5.223  | 0.875 | 1.726 | 0.424  | 2007.181 | 2006.757 | 0.003 | 0.145      | 2007.327 | 2006.903 | 2.86  | 2007.46  | 2011.33  | 2013.984  | Case B | N/A    | Case B  |
| 4     | D53        | 2.5  | 25.695       | 58.742  | 15.958 | 0.908 | 1.728 | 3.959  | 2013.697 | 2009.738 | 0     | 0          | 2016.167 | 2012.208 | 4.867 | 2016.167 | 2013.8   | 2023.179  | N/A    | Case A | N/A     |
| 5     | D52        | 2.5  | 26.828       | 40.115  | 5.465  | 2.5   | n/a   | 0.464  | 2016.353 | 2015.888 | 0.004 | 0.146      | 2016.499 | 2016.035 | 5.024 | 2016.751 | 2014.228 | 2022.813  | Case B | N/A    | Case A  |
| 6     | D51        | 2    | 13.262       | 117.206 | 4.221  | 2     | n/a   | 0.277  | 2016.862 | 2016.585 | 0.003 | 0.343      | 2017.205 | 2016.928 | 3.871 | 2017.27  | 2015.5   | 2019.867  | Case B | N/A    | Case A  |
| 7     | D50        | 2    | 12.843       | 52.731  | 4.088  | 2     | n/a   | 0.26   | 2017.374 | 2017.114 | 0.003 | 0.145      | 2017.519 | 2017.259 | 3.607 | 2017.634 | 2016.127 | 2019.377  | Case B | N/A    | Case A  |
| 8     | D49        | 2    | 8.856        | 38.869  | 2.819  | 2     | n/a   | 0.124  | 2017.684 | 2017.56  | 0.001 | 0.051      | 2017.734 | 2017.611 | 3.257 | 2017.773 | 2016.616 | 2019.614  | Case B | N/A    | Case A  |
| 9     | D44        | 2    | 8.36         | 119.705 | 9.813  | 0.632 | 1.03  | 1.497  | 2017.817 | 2017.706 | 0.001 | 0          | 2019.715 | 2018.218 | 2.129 | 2019.715 | 2020.022 | 2022.585  | Case B | N/A    | Case D  |
| 10    | D43        | 1.5  | 5.922        | 265.037 | 6.745  | 0.746 | 0.94  | 0.707  | 2019.811 | 2019.571 | 0     | 0          | 2022.897 | 2022.189 | 1.526 | 2022.969 | 2023.043 | 2030.133  | N/A    | Case F | N/A     |
| 11    | D42        | 1.5  | 5.347        | 34.265  | 6.339  | 0.723 | 0.891 | 0.625  | 2023.028 | 2022.88  | 0     | 0          | 2023.234 | 2022.609 | 1.379 | 2023.265 | 2023.236 | 2030.206  | N/A    | Case F | N/A     |
| 12    | D41        | 1.25 | 4.417        | 108.159 | 6.031  | 0.72  | 0.852 | 0.565  | 2023.346 | 2023.144 | 0.004 | 0          | 2024.353 | 2023.788 | 1.369 | 2024.436 | ---      | 2026.925  | Case B | N/A    | Case D  |
| 13    | D45        | 1.25 | 1.529        | 38.916  | 1.246  | 1.25  | n/a   | 0.024  | 2019.725 | 2019.7   | 0     | 0.019      | 2019.743 | 2019.719 | 1.423 | 2019.748 | ---      | 2023.079  | Case B | N/A    | Case A  |
| 14    | D47        | 1.25 | 3.681        | 34.01   | 2.999  | 1.25  | n/a   | 0.14   | 2017.69  | 2017.55  | 0.003 | 0.094      | 2017.784 | 2017.644 | 2.774 | 2017.874 | 2016.45  | 2019.38   |        |        |         |

|    |      |      |       |         |       |       |       |       |          |          |       |       |          |          |       |          |          |          |        |        |        |
|----|------|------|-------|---------|-------|-------|-------|-------|----------|----------|-------|-------|----------|----------|-------|----------|----------|----------|--------|--------|--------|
| 22 | D151 | 1.5  | 6.17  | 150.233 | 9.15  | 0.61  | 0.96  | 1.302 | 2032.614 | 2031.312 | 0     | 0     | 2036.281 | 2034.98  | 1.911 | 2036.281 | 2038.8   | 2042.729 | N/A    | Case A | N/A    |
| 23 | D147 | 1.5  | 4.649 | 152.028 | 5.636 | 0.711 | 0.828 | 0.494 | 2038.505 | 2038.011 | 0     | 0     | 2039.725 | 2039.231 | 1.299 | 2039.819 | 2041.56  | 2046.676 | N/A    | Case A | N/A    |
| 24 | D146 | 1.5  | 2.063 | 119.958 | 4.889 | 0.432 | 0.542 | 0.372 | 2040.865 | 2040.493 | 0     | 0     | 2042.064 | 2041.692 | 0.804 | 2042.064 | 2042.86  | 2049.584 | N/A    | Case A | N/A    |
| 25 | D145 | 1.5  | 1.32  | 53.806  | 4.299 | 0.345 | 0.43  | 0.287 | 2042.08  | 2042.04  | 0     | 0     | 2042.53  | 2042.243 | 0.632 | 2042.53  | ---      | 2049.589 | N/A    | Case F | N/A    |
| 26 | D149 | 1.5  | 2.074 | 35.189  | 4.948 | 0.43  | 0.544 | 0.381 | 2039.83  | 2039.801 | 0     | 0     | 2039.83  | 2039.45  | 0.852 | 2039.83  | 2043.905 | 2047.038 | N/A    | Case F | N/A    |
| 27 | D148 | 1.25 | 1.473 | 93.149  | 4.517 | 0.389 | 0.481 | 0.317 | 2043.361 | 2043.044 | 0     | 0     | 2044.293 | 2043.976 | 0.707 | 2044.293 | ---      | 2047.945 | N/A    | Case A | N/A    |
| 28 | D150 | 1.5  | 0.958 | 41.419  | 0.542 | 0.215 | 0.365 | 0.005 | 2036.283 | 2036.279 | 0     | 0.003 | 2036.286 | 2036.282 | 0.487 | 2036.287 | ---      | 2043.388 | Case B | N/A    | Case B |
| 29 | D153 | 1.5  | 3.746 | 37.923  | 2.12  | 0.42  | 0.74  | 0.07  | 2030.013 | 2029.943 | 0.001 | 0.041 | 2030.054 | 2029.984 | 1.58  | 2030.08  | 2032.95  | 2036.598 | Case B | N/A    | Case B |
| 30 | D152 | 1.25 | 3.021 | 91.53   | 5.879 | 0.545 | 0.699 | 0.537 | 2032.782 | 2032.245 | 0     | 0     | 2033.882 | 2033.345 | 1.082 | 2033.882 | ---      | 2037.599 | N/A    | Case A | N/A    |
| 31 | D155 | 1.5  | 0.849 | 32.901  | 5.777 | 0.207 | 0.343 | 0.519 | 2019.115 | 2019.099 | 0     | 0     | 2020.226 | 2019.707 | 0.726 | 2020.226 | ---      | 2027.182 | N/A    | Case F | N/A    |
| 32 | D 61 | 1.25 | 2.006 | 52.183  | 1.635 | 0.441 | 0.564 | 0.042 | 2016.184 | 2016.142 | 0.001 | 0.043 | 2016.227 | 2016.185 | 0.851 | 2016.251 | 2016.75  | 2024.975 | Case B | N/A    | Case B |
| 33 | D62  | 1.25 | 1.61  | 58.462  | 7.781 | 0.281 | 0.503 | 0.941 | 2016.278 | 2016.21  | 0     | 0     | 2019.223 | 2018.281 | 1.223 | 2019.223 | 2019.35  | 2025.3   | N/A    | Case F | N/A    |
| 34 | D61  | 1.25 | 1.328 | 41.377  | 7.916 | 0.243 | 0.455 | 0.974 | 2019.231 | 2019.211 | 0     | 0     | 2021.493 | 2020.519 | 1.217 | 2021.493 | ---      | 2025.294 | N/A    | Case F | N/A    |

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| #Line | Struct. ID | Exit Ho (ft) | Hf (ft) | Hb (ft) | Hc (ft) | He (ft) | Hj (ft) | Total (ft) | Ei (ft) | y+(P/gam <sub>w</sub> DI (ft) | Eai (ft) | CB    | C-theta | Cp    | Ha (ft) | Ea (ft) |
|-------|------------|--------------|---------|---------|---------|---------|---------|------------|---------|-------------------------------|----------|-------|---------|-------|---------|---------|
| 0     | D57        |              |         |         |         |         |         |            |         |                               |          |       |         |       |         |         |
| 1     | D56        | 1.613        | 0       | 0       | 0       | 0       | 0       | 0          | 3.842   | 2.229                         | 0.58     | 2.776 | 0       | 2.182 | 0       | 3.842   |
| 2     | D55        | 0.169        | 0       | 0       | 0       | 0       | 0       | 0          | 5.3     | 0.869                         | 0.582    | 2.782 | 0       | 2.455 | 0       | 5.3     |
| 3     | D54        | 0.17         | 0.145   | 0       | 0       | 0       | 0       | 0.145      | 2.727   | 2.303                         | 0.582    | 2.811 | 0       | 0     | 0.569   | 2.86    |
| 4     | D53        | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 4.867   | 0.908                         | 0.584    | 2.789 | 0       | 1.602 | 0.022   | 4.867   |
| 5     | D52        | 0.186        | 0.146   | 0       | 0       | 0       | 0       | 0.146      | 4.772   | 4.307                         | 0.61     | 4.864 | 0       | 1.717 | 0       | 5.024   |
| 6     | D51        | 0.111        | 0.343   | 0       | 0       | 0       | 0       | 0.343      | 3.806   | 3.529                         | 0.526    | 3.861 | 0       | 0.168 | 0       | 3.871   |
| 7     | D50        | 0.104        | 0.145   | 0       | 0       | 0       | 0       | 0.145      | 3.492   | 3.232                         | 0.51     | 3.544 | 0       | 1.218 | 0       | 3.607   |
| 8     | D49        | 0.049        | 0.051   | 0       | 0       | 0       | 0       | 0.051      | 3.219   | 3.095                         | 0.351    | 3.243 | 0       | 0.546 | 0       | 3.257   |
| 9     | D44        | 0.044        | 0       | 0       | 0       | 0       | 0       | 0          | 2.129   | 0.632                         | 0.332    | 1.528 | 0       | 0.704 | 0       | 2.129   |
| 10    | D43        | 0.096        | 0       | 0       | 0       | 0       | 0       | 0          | 1.454   | 0.746                         | 0.482    | 1.473 | 0       | 2.76  | 0       | 1.526   |
| 11    | D42        | 0.059        | 0       | 0       | 0       | 0       | 0       | 0          | 1.348   | 0.723                         | 0.436    | 1.375 | 0       | 0.146 | 0       | 1.379   |
| 12    | D41        | 0.081        | 0       | 0       | 0       | 0       | 0       | 0          | 1.286   | 0.72                          | 0.568    | 1.369 | 0       | 0     | 0       | 1.369   |
| 13    | D45        | 0.01         | 0.019   | 0       | 0       | 0       | 0       | 0.019      | 1.418   | 1.394                         | 0.196    | 1.423 | 0       | 0     | 0       | 1.423   |
| 14    | D47        | 0.056        | 0.094   | 0       | 0       | 0       | 0       | 0.094      | 2.684   | 2.544                         | 0.473    | 2.712 | 0       | 2.194 | 0       | 2.774   |
| 15    | D46        | 0.017        | 0.037   | 0       | 0       | 0       | 0       | 0.037      | 2.327   | 2.284                         | 0.264    | 2.336 | 0       | 0     | 0       | 2.336   |
| 16    | D48        | 0.002        | 0.006   | 0       | 0       | 0       | 0       | 0.006      | 2.181   | 2.176                         | 0.089    | 2.182 | 0       | 0     | 0       | 2.182   |
| 17    | D60        | 0.112        | 0.103   | 0       | 0       | 0       | 0       | 0.103      | 3.567   | 3.286                         | 0.53     | 3.623 | 0       | 2.012 | 0       | 3.736   |
| 18    | D59        | 0.108        | 0.087   | 0       | 0       | 0       | 0       | 0.087      | 3.43    | 3.16                          | 0.52     | 3.484 | 0       | 0.769 | 0       | 3.526   |
| 19    | D58        | 0.087        | 0.08    | 0       | 0       | 0       | 0       | 0.08       | 2.893   | 2.675                         | 0.466    | 2.936 | 0       | 1.923 | 0       | 3.02    |
| 20    | D156       | 0.085        | 0.209   | 0       | 0       | 0       | 0       | 0.209      | 1.514   | 1.302                         | 0.46     | 1.902 | 0       | 0.174 | 1.648   | 2.609   |
| 21    | D154       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 2.985   | 0.73                          | 0.837    | 2.13  | 0       | 0.797 | 0.629   | 2.985   |
| 22    | D151       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 1.911   | 0.61                          | 0.503    | 1.514 | 0       | 0.301 | 0.711   | 1.911   |
| 23    | D147       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 1.205   | 0.711                         | 0.379    | 1.252 | 0       | 0.888 | 0.085   | 1.299   |
| 24    | D146       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0.804   | 0.432                         | 0.168    | 0.727 | 0       | 2.129 | 0       | 0.804   |
| 25    | D145       | 0.016        | 0       | 0       | 0       | 0       | 0       | 0          | 0.632   | 0.345                         | 0.108    | 0.539 | 0       | 0     | 0       | 0.632   |
| 26    | D149       | 0.012        | 0       | 0       | 0       | 0       | 0       | 0          | 0.852   | 0.471                         | 0.169    | 0.729 | 0       | 0     | 1.395   | 0.852   |
| 27    | D148       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0.707   | 0.389                         | 0.189    | 0.656 | 0       | 0     | 0       | 0.707   |
| 28    | D150       | 0.002        | 0.003   | 0       | 0       | 0       | 0       | 0.003      | 0.486   | 0.482                         | 0.078    | 0.487 | 0       | 0     | 0       | 0.487   |
| 29    | D153       | 0.028        | 0.041   | 0       | 0       | 0       | 0       | 0.041      | 1.554   | 1.484                         | 0.305    | 1.568 | 0       | 0     | 0.877   | 1.58    |
| 30    | D152       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 1.082   | 0.545                         | 0.388    | 1.061 | 0       | 0     | 0       | 1.082   |
| 31    | D155       | 0.007        | 0       | 0       | 0       | 0       | 0       | 0          | 0.726   | 0.207                         | 0.069    | 0.401 | 0       | 0     | 0       | 0.726   |
| 32    | D 61       | 0.017        | 0.043   | 0       | 0       | 0       | 0       | 0.043      | 0.827   | 0.785                         | 0.258    | 0.835 | 0       | 1.911 | 0       | 0.851   |
| 33    | D62        | 0.027        | 0       | 0       | 0       | 0       | 0       | 0          | 1.223   | 0.281                         | 0.207    | 0.696 | 0       | 0.919 | 0       | 1.223   |
| 34    | D61        | 0.008        | 0       | 0       | 0       | 0       | 0       | 0          | 1.217   | 0.243                         | 0.171    | 0.612 | 0       | 0     | 0       | 1.217   |



**10-YEAR HGL (D126 OUTFALL)**

| #Line | Pipe              | From | To   | 3D Length               |                            | Drainage Area  |                    | Runoff Coeff "C" | Area X "C" Inc (sq. ft) | Area X "C" Total (sq. ft) | Time of Concentration Inlet (min) | Time of Concentration System (min) | Runoff Rain "I" (inch/hr) | Runoff "Q" (cu. ft./sec) | Known Q (cu. ft./sec) | Total Q (cu. ft./sec) | Pipe Dia. (ft) | Velocity    |               | Sec Time (min) | Invert Elevation |                    |                     | Slope  |
|-------|-------------------|------|------|-------------------------|----------------------------|----------------|--------------------|------------------|-------------------------|---------------------------|-----------------------------------|------------------------------------|---------------------------|--------------------------|-----------------------|-----------------------|----------------|-------------|---------------|----------------|------------------|--------------------|---------------------|--------|
|       |                   |      |      | - Center to Center (ft) | Drainage Area Inc (sq. ft) | Total (sq. ft) | Full (cu. ft./sec) |                  |                         |                           |                                   |                                    |                           |                          |                       |                       |                | Full (ft/s) | Design (ft/s) |                | U/S (ft)         | Elevation D/S (ft) | Elevation Drop (ft) |        |
| 1     | Pipe - (74) D125  | D125 | D126 | 13.272                  | 0                          | 356546.8       | 0                  | 0                | 199952.3                | 0                         | 11.105                            | 4.625                              | 21.409                    | 0                        | 21.409                | 2                     | 14.202         | 4.521       | 6.815         | 0.032          | 2015.544         | 2015.5             | N/A                 | 0.34%  |
| 2     | Pipe - (73) D124  | D124 | D125 | 89.879                  | 45468.8                    | 356546.8       | 0.55               | 25007.84         | 199952.3                | 5                         | 10.995                            | 4.645                              | 21.499                    | 0                        | 21.499                | 2                     | 42.962         | 13.675      | 13.668        | 0.11           | 2018.4           | 2015.644           | N/A                 | 3.07%  |
| 3     | Pipe - (72) D123  | D123 | D124 | 51.068                  | 23172.87                   | 311078         | 0.65               | 15062.37         | 174944.4                | 5                         | 10.935                            | 4.656                              | 18.853                    | 0                        | 18.853                | 2                     | 47.281         | 15.05       | 14.19         | 0.06           | 2023.9           | 2022.004           | N/A                 | 3.72%  |
| 4     | Pipe - (71) D122  | D122 | D123 | 36.84                   | 0                          | 287905.1       | 0                  | 0                | 159882.1                | 0                         | 10.886                            | 4.664                              | 17.263                    | 0                        | 17.263                | 2                     | 40.424         | 12.867      | 12.351        | 0.05           | 2025             | 2024               | N/A                 | 2.72%  |
| 5     | Pipe - (70) D121  | D121 | D122 | 81.377                  | 4449.64                    | 287905.1       | 0.65               | 2892.27          | 159882.1                | 5                         | 10.762                            | 4.686                              | 17.344                    | 0                        | 17.344                | 2                     | 34.4           | 10.95       | 10.965        | 0.124          | 2026.7           | 2025.1             | N/A                 | 1.97%  |
| 6     | Pipe - (56) D136  | D121 | D121 | 71.607                  | 10874.07                   | 138834.1       | 0.65               | 7068.14          | 66997.87                | 5                         | 10.674                            | 4.702                              | 7.292                     | 0                        | 7.292                 | 2                     | 64.246         | 20.45       | 13.56         | 0.088          | 2032             | 2027.1             | N/A                 | 6.86%  |
| 7     | Pipe - (82) D135  | D136 | D136 | 39.383                  | 6939.63                    | 107070.6       | 0.65               | 4510.76          | 51573.92                | 5                         | 10.569                            | 4.721                              | 5.636                     | 0                        | 5.636                 | 2                     | 24.176         | 7.696       | 6.269         | 0.105          | 2032.483         | 2032.1             | N/A                 | 0.97%  |
| 8     | Pipe - (49) D131  | D135 | D135 | 105.585                 | 6582.15                    | 100130.9       | 0.65               | 4278.4           | 47063.16                | 5                         | 10.415                            | 4.748                              | 5.173                     | 0                        | 5.173                 | 1.5                   | 25.795         | 14.597      | 11.398        | 0.154          | 2042.7           | 2037.292           | N/A                 | 5.13%  |
| 9     | Pipe - (78) D130  | D131 | D131 | 133.235                 | 4595.12                    | 40002.7        | 0.65               | 2986.83          | 18927.07                | 5                         | 5.548                             | 5.613                              | 2.459                     | 0                        | 2.459                 | 1.5                   | 30.894         | 17.482      | 10.448        | 0.213          | 2056.32          | 2046.545           | N/A                 | 7.36%  |
| 10    | Pipe - (77) D129  | D130 | D130 | 35.236                  | 7108.85                    | 35407.58       | 0.65               | 4620.75          | 15940.25                | 5                         | 5.429                             | 5.634                              | 2.079                     | 0                        | 2.079                 | 1.5                   | 11.4           | 6.451       | 4.903         | 0.12           | 2056.773         | 2056.42            | N/A                 | 1.00%  |
| 11    | Pipe - (76) D128  | D129 | D129 | 25.924                  | 0                          | 28298.73       | 0                  | 0                | 11319.49                | 0                         | 5.277                             | 5.661                              | 1.483                     | 0                        | 1.483                 | 1.5                   | 6.113          | 3.459       | 2.85          | 0.152          | 2060.495         | 2060.42            | N/A                 | 0.29%  |
| 12    | Pipe - (75) D127  | D128 | D128 | 63.258                  | 28298.73                   | 28298.73       | 0.4                | 11319.49         | 11319.49                | 5                         | 5                                 | 5.711                              | 1.496                     | 0                        | 1.496                 | 1.5                   | 9.118          | 5.16        | 3.805         | 0.277          | 2061             | 2060.595           | N/A                 | 0.64%  |
| 13    | Pipe - (81) D134  | D131 | D131 | 36.966                  | 9757.04                    | 53546.09       | 0.65               | 6342.08          | 23857.69                | 5                         | 10.3                              | 4.769                              | 2.633                     | 0                        | 2.633                 | 1.5                   | 11.721         | 6.633       | 5.348         | 0.115          | 2043.191         | 2042.8             | N/A                 | 1.06%  |
| 14    | Pipe - (80) D133  | D134 | D134 | 17.174                  | 0                          | 43789.04       | 0                  | 0                | 17515.62                | 0                         | 10.248                            | 4.778                              | 1.937                     | 0                        | 1.937                 | 1.25                  | 8.367          | 6.818       | 5.543         | 0.052          | 2047.795         | 2047.55            | N/A                 | 1.43%  |
| 15    | Pipe - (79) D132  | D133 | D133 | 67.471                  | 43789.04                   | 43789.04       | 0.4                | 17515.62         | 17515.62                | 10                        | 10                                | 4.822                              | 1.955                     | 0                        | 1.955                 | 1.25                  | 6.32           | 5.15        | 4.536         | 0.248          | 2048.445         | 2047.895           | N/A                 | 0.81%  |
| 16    | Pipe - (164) D138 | D136 | D136 | 18.176                  | 0                          | 20889.5        | 0                  | 0                | 8355.8                  | 0                         | 5.263                             | 5.664                              | 1.095                     | 0                        | 1.095                 | 1.25                  | 7.005          | 5.708       | 4.152         | 0.073          | 2035.684         | 2035.502           | N/A                 | 1.00%  |
| 17    | Pipe - (83) D137  | D138 | D138 | 65.654                  | 20889.5                    | 20889.5        | 0.4                | 8355.8           | 8355.8                  | 5                         | 5                                 | 5.711                              | 1.105                     | 0                        | 1.105                 | 1.25                  | 7.005          | 5.708       | 4.162         | 0.263          | 2036.44          | 2035.784           | N/A                 | 1.00%  |
| 18    | Pipe - (69) D120  | D121 | D121 | 71.635                  | 16047.76                   | 144621.4       | 0.4                | 6419.1           | 89991.94                | 5                         | 6.897                             | 5.373                              | 11.193                    | 0                        | 11.193                | 2                     | 17.689         | 5.631       | 5.954         | 0.201          | 2027.172         | 2026.8             | N/A                 | 0.52%  |
| 19    | Pipe - (68) D119  | D120 | D120 | 84.024                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.776                             | 5.395                              | 10.437                    | 0                        | 10.437                | 2                     | 44.476         | 14.157      | 11.554        | 0.121          | 2030.033         | 2027.272           | N/A                 | 3.29%  |
| 20    | Pipe - (67) D118  | D119 | D119 | 41.195                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.733                             | 5.402                              | 10.451                    | 0                        | 10.451                | 2                     | 70.991         | 22.597      | 16.155        | 0.043          | 2033.571         | 2030.133           | N/A                 | 8.38%  |
| 21    | Pipe - (66) D117  | D118 | D118 | 46.025                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.69                              | 5.41                               | 10.466                    | 0                        | 10.466                | 2                     | 80.666         | 25.677      | 17.699        | 0.043          | 2040.367         | 2035.419           | N/A                 | 10.81% |
| 22    | Pipe - (65) D116  | D117 | D117 | 53.529                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.643                             | 5.419                              | 10.482                    | 0                        | 10.482                | 2                     | 87.568         | 27.874      | 18.77         | 0.048          | 2048.955         | 2042.189           | N/A                 | 12.74% |
| 23    | Pipe - (64) D115  | D116 | D116 | 38.172                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.602                             | 5.426                              | 10.497                    | 0                        | 10.497                | 2                     | 67.285         | 21.418      | 15.568        | 0.041          | 2054.526         | 2051.662           | N/A                 | 7.52%  |
| 24    | Pipe - (63) D114  | D115 | D115 | 38.221                  | 0                          | 128573.6       | 0                  | 0                | 83572.84                | 0                         | 6.563                             | 5.433                              | 10.51                     | 0                        | 10.51                 | 2                     | 73.907         | 23.525      | 16.651        | 0.038          | 2060.779         | 2057.324           | N/A                 | 9.08%  |
| 25    | Pipe - (62) D113  | D114 | D114 | 58.099                  | 18553.28                   | 128573.6       | 0.65               | 12059.63         | 83572.84                | 5                         | 6.49                              | 5.446                              | 10.535                    | 0                        | 10.535                | 2                     | 52.911         | 16.842      | 13.124        | 0.074          | 2066.2           | 2063.5             | N/A                 | 4.65%  |
| 26    | Pipe - (61) D112  | D113 | D113 | 88.911                  | 6132.27                    | 110020.3       | 0.65               | 3985.98          | 71513.2                 | 5                         | 6.33                              | 5.474                              | 9.062                     | 0                        | 9.062                 | 2                     | 34.692         | 11.043      | 9.285         | 0.16           | 2069.06          | 2067.282           | N/A                 | 2.00%  |
| 27    | Pipe - (60) D111  | D112 | D112 | 52.749                  | 21365.02                   | 27808.16       | 0.65               | 13887.27         | 18075.31                | 5                         | 5.294                             | 5.658                              | 2.367                     | 0                        | 2.367                 | 1.5                   | 19.741         | 11.171      | 7.527         | 0.117          | 2070.743         | 2069.16            | N/A                 | 3.00%  |
| 28    | Pipe - (59) D110  | D111 | D111 | 82.613                  | 6443.14                    | 6443.14        | 0.65               | 4188.04          | 4188.04                 | 5                         | 5                                 | 5.711                              | 0.554                     | 0                        | 0.554                 | 1.5                   | 18.54          | 10.492      | 4.684         | 0.294          | 2073.031         | 2070.843           | N/A                 | 2.65%  |
| 29    | Pipe - (1) D106   | D112 | D112 | 99.081                  | 4017.75                    | 76079.88       | 0.65               | 2611.54          | 49451.92                | 5                         | 6.208                             | 5.496                              | 6.291                     | 0                        | 6.291                 | 1.5                   | 30.387         | 17.195      | 13.548        | 0.122          | 2077.152         | 2070.119           | N/A                 | 7.12%  |
| 30    | Pipe - (55) D105  | D106 | D106 | 96.282                  | 3460.47                    | 45369.22       | 0.65               | 2249.31          | 29489.99                | 5                         | 6.084                             | 5.518                              | 3.767                     | 0                        | 3.767                 | 1.5                   | 34.839         | 19.715      | 12.888        | 0.125          | 2086.55          | 2077.582           | N/A                 | 9.36%  |
| 31    | Pipe - (54) D104  | D105 | D105 | 86.008                  | 13454.08                   | 41908.74       | 0.65               | 8745.15          | 27240.68                | 5                         | 5.925                             | 5.546                              | 3.497                     | 0                        | 3.497                 | 1.5                   | 21.806         | 12.34       | 9.041         | 0.159          | 2089.8           | 2086.65            | N/A                 | 3.67%  |
| 32    | Pipe - (53) D103  | D104 | D104 | 43.321                  | 16691.78                   | 28454.67       | 0.65               | 10849.66         | 18495.53                | 5                         | 5.76                              | 5.575                              | 2.387                     | 0                        | 2.387                 | 1.5                   | 9.209          | 5.211       | 4.373         | 0.165          | 2090.183         | 2089.9             | N/A                 | 0.65%  |
| 33    | Pipe - (52) D102  | D103 | D103 | 114.945                 | 0                          | 11762.88       | 0                  | 0                | 7645.87                 | 0                         | 5.287                             | 5.66                               | 1.002                     | 0                        | 1.002                 | 1.25                  | 7.005          | 5.708       | 4.046         | 0.473          | 2091.433         | 2090.283           | N/A                 | 1.00%  |
| 34    | Pipe - (51) D101  | D102 | D102 | 69.762                  | 11762.88                   | 11762.88       | 0.65               | 7645.87          | 7645.87                 | 5                         | 5                                 | 5.711                              | 1.011                     | 0                        | 1.011                 | 1.25                  | 7.005          | 5.708       | 4.057         | 0.287          | 2092.23          | 2091.533           | N/A                 | 1.00%  |
| 35    | Pipe - (58) D109  | D106 | D106 | 35.549                  | 13790.28                   | 26692.91       | 0.65               | 8963.68          | 17350.39                | 5                         | 5.383                             | 5.642                              | 2.266                     | 0                        | 2.266                 | 1.5                   | 19.519         | 11.046      | 7.372         | 0.08           | 2078.296         | 2077.252           | N/A                 | 2.94%  |
| 36    | Pipe - (57) D108  | D109 | D109 | 26.167                  | 0                          | 12902.63       | 0                  | 0                | 8386.71                 | 0                         | 5.278                             | 5.661                              | 1.099                     | 0                        | 1.099                 | 1.25                  | 7.005          | 5.708       | 4.156         | 0.105          | 2078.657         | 2078.396           | N/A                 | 1.00%  |
| 37    | Pipe - (56) D107  | D108 | D108 | 69.49                   | 12902.63                   | 12902.63       | 0.65               | 8386.71          | 8386.71                 | 5                         | 5                                 | 5.711                              | 1.109                     | 0                        | 1.109                 | 1.25                  | 7.005          | 5.708       | 4.166         | 0.278          | 2079.452         | 2078.757           | N/A                 | 1.00%  |

| #Line | Struct. ID | D (ft) | Q (cu. ft./sec) | L (ft)  | V (ft/s) | d (ft) | dc (ft) | v*2/2g (ft) | EGLo (ft) | HGLo (ft) | Sf    | Total Pipe (ft) | EGLi (ft) | HGLi (ft) | Ea (ft) | EGLa (ft) | U/S TOC (ft) | Surface E (ft) | Step4* (ft) | Step7* (ft) | Step14* (ft) |
|-------|------------|--------|-----------------|---------|----------|--------|---------|-------------|-----------|-----------|-------|-----------------|-----------|-----------|---------|-----------|--------------|----------------|-------------|-------------|--------------|
| 0     | D126       |        |                 |         |          |        |         |             | 2017.328  | 2017.328  |       |                 |           |           |         |           | 2017.5       | 2018.154       |             |             |              |
| 1     | D125       | 2      | 21.409          | 13.272  | 6.815    | 2      | n/a     | 0.722       | 2018.222  | 2017.5    | 0.003 | 0.044           | 2018.266  | 2017.544  | 3.125   | 2018.67   | 2017.644     | 2019.538       | N/A         | Case C      | Case A       |
| 2     | D124       | 2      | 21.499          | 89.879  | 13.668   | 1.001  | 1.659   | 2.905       | 2018.961  | 2018.233  | 0.008 | 0               | 2022.306  | 2019.401  | 3.906   | 2022.306  | 2024.004     | 2025           | Case B      | N/A         | Case D       |
| 3     | D123       | 2      | 18.853          | 51.068  | 14.19    | 0.879  | 1.563   | 3.131       | 2026.013  | 2022.883  | 0     | 0               | 2027.909  | 2024.779  | 4.009   | 2027.909  | 2026         | 2035.174       | N/A         | Case B      | N/A          |
| 4     | D122       | 2      | 17.263          | 36.84   | 5.495    | 2      | n/a     | 0.469       | 2028.097  | 2027.628  | 0.005 | 0.183           | 2028.28   | 2027.81   | 3.584   | 2028.584  | 2027.1       | 2035.92        | Case B      | N/A         | Case A       |
| 5     | D121       | 2      | 17.344          | 81.377  | 5.521    | 2      | n/a     | 0.474       | 2028.774  | 2028.3    | 0.005 | 0.408           | 2029.182  | 2028.708  | 2.776   | 2029.476  | 2029.1       | 2037.64        | Case B      | N/A         | Case A       |
| 6     | D136       | 2      | 7.292           | 71.607  | 13.56    | 0.455  | 0.959   | 2.859       | 2029.509  | 2029.426  | 0.001 | 0               | 2035.314  | 2032.455  | 3.314   | 2035.314  | 2036.752     | 2040.675       | Case B      | N/A         | Case D       |
| 7     | D135       | 2      | 5.636           | 39.383  | 1.794    | 2      | n/a     | 0.05        | 2035.334  | 2035.284  | 0.001 | 0.021           | 2035.355  | 2035.305  | 2.891   | 2035.373  | 2038.792     | 2041.821       | Case B      | N/A         | Case A       |
| 8     | D131       | 1.5    | 5.173           | 105.585 | 11.398   | 0.456  | 0.876   | 2.02        | 2039.768  | 2037.748  | 0     | 0               | 2045.176  | 2043.156  | 2.476   | 2045.176  | 2048.045     | 2050.792       | N/A         | Case A      | N/A          |
| 9     | D130       | 1.5    | 2.459           | 133.235 | 10.448   | 0.286  | 0.594   | 1.697       | 2048.529  | 2046.832  | 0     | 0               | 2058.304  | 2056.606  | 1.984   | 2058.304  | 2057.92      | 2064.742       | N/A         | Case A      | N/A          |
| 10    | D129       | 1.5    | 2.079           | 35.236  | 1.176    | 1.5    | n/a     | 0.022       | 2058.312  | 2058.291  | 0     | 0.012           | 2058.324  | 2058.302  | 1.56    | 2058.333  | 2061.92      | 2064.886       | Case B      | N/A         | Case A       |
| 11    | D128       | 1.5    | 1.483           | 25.924  | 2.85     | 0.503  | 0.457   | 0.126       | 2061.05   | 2060.923  | 0.003 | 0.075           |           |           |         |           |              |                |             |             |              |

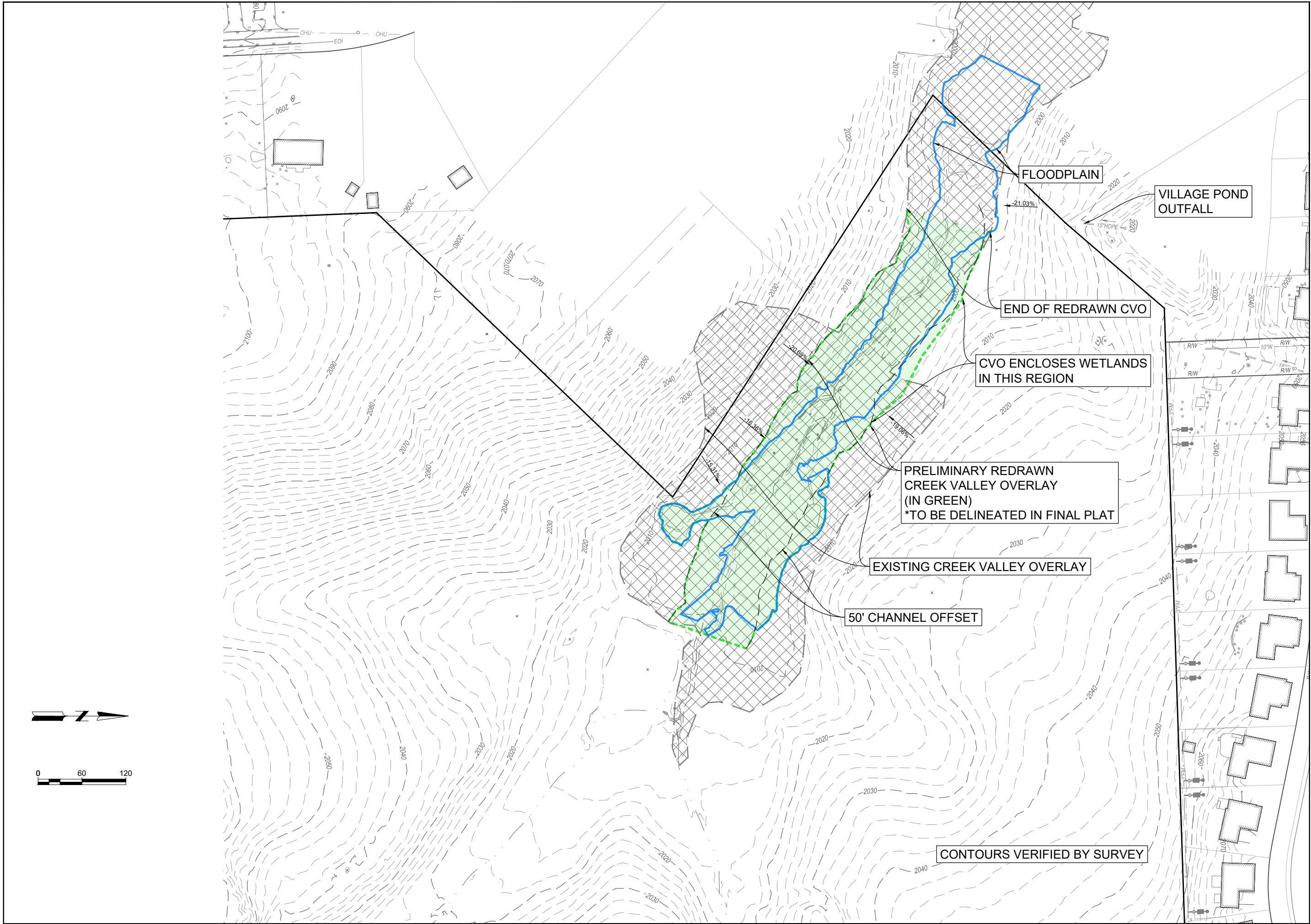
|    |      |      |        |         |        |       |       |       |          |          |       |       |          |          |       |          |          |          |        |        |        |
|----|------|------|--------|---------|--------|-------|-------|-------|----------|----------|-------|-------|----------|----------|-------|----------|----------|----------|--------|--------|--------|
| 16 | D138 | 1.25 | 1.095  | 18.176  | 4.152  | 0.334 | 0.412 | 0.268 | 2036.104 | 2035.836 | 0     | 0     | 2036.286 | 2036.018 | 0.602 | 2036.286 | 2037.034 | 2041.778 | N/A    | Case A | N/A    |
| 17 | D137 | 1.25 | 1.105  | 65.654  | 4.162  | 0.336 | 0.414 | 0.269 | 2036.322 | 2036.233 | 0     | 0     | 2037.045 | 2036.776 | 0.605 | 2037.045 | ---      | 2041.062 | N/A    | Case F | N/A    |
| 18 | D120 | 2    | 11.193 | 71.635  | 3.563  | 2     | n/a   | 0.197 | 2029.555 | 2029.357 | 0.002 | 0.149 | 2029.704 | 2029.507 | 2.624 | 2029.796 | 2029.272 | 2032.5   | Case B | N/A    | Case A |
| 19 | D119 | 2    | 10.437 | 84.024  | 11.554 | 0.66  | 1.157 | 2.075 | 2029.865 | 2029.693 | 0.002 | 0     | 2032.768 | 2030.693 | 2.735 | 2032.768 | 2032.133 | 2035.392 | Case B | N/A    | Case D |
| 20 | D118 | 2    | 10.451 | 41.195  | 16.155 | 0.519 | 1.158 | 4.057 | 2032.837 | 2032.665 | 0.002 | 0     | 2038.147 | 2034.09  | 4.576 | 2038.147 | 2037.419 | 2040.838 | Case B | N/A    | Case D |
| 21 | D117 | 2    | 10.466 | 46.025  | 17.699 | 0.487 | 1.159 | 4.87  | 2038.216 | 2038.044 | 0.002 | 0     | 2045.724 | 2040.854 | 5.357 | 2045.724 | 2044.189 | 2047.176 | Case B | N/A    | Case D |
| 22 | D116 | 2    | 10.482 | 53.529  | 18.77  | 0.467 | 1.16  | 5.478 | 2045.793 | 2045.62  | 0.002 | 0     | 2054.9   | 2049.422 | 5.945 | 2054.9   | 2053.662 | 2056.649 | Case B | N/A    | Case D |
| 23 | D115 | 2    | 10.497 | 38.172  | 15.568 | 0.534 | 1.161 | 3.768 | 2054.969 | 2054.796 | 0.002 | 0     | 2058.828 | 2055.06  | 4.303 | 2058.828 | 2059.324 | 2062.312 | Case B | N/A    | Case D |
| 24 | D114 | 2    | 10.51  | 38.221  | 16.651 | 0.51  | 1.162 | 4.311 | 2058.935 | 2058.668 | 0     | 0     | 2065.6   | 2061.289 | 4.82  | 2065.6   | 2065.5   | 2068.157 | N/A    | Case F | N/A    |
| 25 | D113 | 2    | 10.535 | 58.099  | 13.124 | 0.605 | 1.163 | 2.678 | 2065.67  | 2065.495 | 0.002 | 0     | 2069.483 | 2066.805 | 3.283 | 2069.483 | 2069.282 | 2072.838 | Case B | N/A    | Case D |
| 26 | D112 | 2    | 9.062  | 88.911  | 9.285  | 0.698 | 1.075 | 1.34  | 2069.535 | 2069.406 | 0.001 | 0     | 2071.098 | 2069.758 | 2.038 | 2071.098 | 2071.619 | 2075.686 | Case B | N/A    | Case D |
| 27 | D111 | 1.5  | 2.367  | 52.749  | 7.527  | 0.351 | 0.582 | 0.881 | 2071.109 | 2071.081 | 0     | 0     | 2071.975 | 2071.094 | 1.232 | 2071.975 | 2072.343 | 2074.458 | Case B | N/A    | Case D |
| 28 | D110 | 1.5  | 0.554  | 82.613  | 4.684  | 0.178 | 0.276 | 0.341 | 2071.976 | 2071.974 | 0     | 0     | 2073.55  | 2073.209 | 0.519 | 2073.55  | ---      | 2077.874 | N/A    | Case F | N/A    |
| 29 | D106 | 1.5  | 6.291  | 99.081  | 13.548 | 0.463 | 0.97  | 2.854 | 2071.263 | 2070.851 | 0     | 0     | 2080.47  | 2077.616 | 3.317 | 2080.47  | 2079.082 | 2082.216 | N/A    | Case F | N/A    |
| 30 | D105 | 1.5  | 3.767  | 96.282  | 12.888 | 0.333 | 0.742 | 2.583 | 2080.498 | 2080.427 | 0.001 | 0     | 2089.466 | 2086.883 | 2.916 | 2089.466 | 2088.15  | 2091.283 | Case B | N/A    | Case D |
| 31 | D104 | 1.5  | 3.497  | 86.008  | 9.041  | 0.406 | 0.714 | 1.271 | 2089.49  | 2089.429 | 0.001 | 0     | 2091.477 | 2090.206 | 1.677 | 2091.477 | 2091.4   | 2095.368 | Case B | N/A    | Case D |
| 32 | D103 | 1.5  | 2.387  | 43.321  | 1.351  | 0.521 | 0.585 | 0.028 | 2091.489 | 2091.46  | 0     | 0.019 | 2091.508 | 2091.479 | 1.335 | 2091.518 | 2091.533 | 2095.902 | Case B | N/A    | Case B |
| 33 | D102 | 1.25 | 1.002  | 114.945 | 4.046  | 0.32  | 0.393 | 0.255 | 2091.522 | 2091.512 | 0     | 0     | 2092.007 | 2091.752 | 0.574 | 2092.007 | 2092.783 | 2098.292 | N/A    | Case F | N/A    |
| 34 | D101 | 1.25 | 1.011  | 69.762  | 4.057  | 0.321 | 0.395 | 0.256 | 2092.042 | 2091.954 | 0     | 0     | 2092.807 | 2092.551 | 0.577 | 2092.807 | ---      | 2096.588 | N/A    | Case F | N/A    |
| 35 | D109 | 1.5  | 2.266  | 35.549  | 1.282  | 1.5   | n/a   | 0.026 | 2080.48  | 2080.454 | 0     | 0.014 | 2080.494 | 2080.468 | 2.21  | 2080.506 | 2079.646 | 2082.792 | Case B | N/A    | Case A |
| 36 | D108 | 1.25 | 1.099  | 26.167  | 0.896  | 1.25  | n/a   | 0.012 | 2080.511 | 2080.498 | 0     | 0.006 | 2080.517 | 2080.505 | 1.869 | 2080.527 | 2080.007 | 2084.807 | Case B | N/A    | Case A |
| 37 | D107 | 1.25 | 1.109  | 69.49   | 0.903  | 0.336 | 0.415 | 0.013 | 2080.532 | 2080.519 | 0     | 0.017 | 2080.549 | 2080.536 | 1.099 | 2080.552 | ---      | 2083.514 | Case B | N/A    | Case B |

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| #Line | Struct. ID | Exit Ho (ft) | Hf (ft) | Hb (ft) | Hc (ft) | He (ft) | Hj (ft) | Total (ft) | Ei (ft) | y+(P/gam <sub>w</sub> D) | Eai (ft) | CB    | C-theta | Cp    | Ha (ft) | Ea (ft) |       |
|-------|------------|--------------|---------|---------|---------|---------|---------|------------|---------|--------------------------|----------|-------|---------|-------|---------|---------|-------|
| 0     | D126       |              |         |         |         |         |         |            |         |                          |          |       |         |       |         |         |       |
| 1     | D125       | 0.722        | 0.044   | 0       | 0       | 0       | 0       | 0.044      | 2.722   | 2                        | 0.85     | 2.869 | 0       | 1.739 | 0       | 0.256   | 3.125 |
| 2     | D124       | 0.291        | 0       | 0       | 0       | 0       | 0       | 0          | 3.906   | 1.001                    | 0.853    | 2.877 | 0       | 0     | 0.319   | 0       | 3.906 |
| 3     | D123       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 4.009   | 0.879                    | 0.748    | 2.635 | 0       | 0.505 | 0       | 0       | 4.009 |
| 4     | D122       | 0.188        | 0.183   | 0       | 0       | 0       | 0       | 0.183      | 3.28    | 2.81                     | 0.685    | 3.374 | 0       | 2.246 | 0       | 0.211   | 3.584 |
| 5     | D121       | 0.19         | 0.408   | 0       | 0       | 0       | 0       | 0.408      | 2.482   | 2.008                    | 0.688    | 2.576 | 0       | 2.105 | 0       | 0.199   | 2.776 |
| 6     | D136       | 0.034        | 0       | 0       | 0       | 0       | 0       | 0          | 3.314   | 0.455                    | 0.289    | 1.394 | 0       | 1.817 | 0.158   | 0       | 3.314 |
| 7     | D135       | 0.02         | 0.021   | 0       | 0       | 0       | 0       | 0.021      | 2.872   | 2.822                    | 0.224    | 2.882 | 0       | 0     | 0.885   | 0.009   | 2.891 |
| 8     | D131       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 2.476   | 0.456                    | 0.421    | 1.345 | 0       | 1.214 | 0.792   | 0       | 2.476 |
| 9     | D130       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 1.984   | 0.286                    | 0.2      | 0.817 | 0       | 2.077 | 0       | 0       | 1.984 |
| 10    | D129       | 0.009        | 0.012   | 0       | 0       | 0       | 0       | 0.012      | 1.551   | 1.53                     | 0.169    | 1.555 | 0       | 0     | 0.995   | 0.004   | 1.56  |
| 11    | D128       | 0            | 0.075   | 0       | 0       | 0       | 0       | 0.075      | 0.63    | 0.503                    | 0.121    | 0.655 | 0       | 2.131 | 0       | 0.054   | 0.709 |
| 12    | D127       | 0.031        | 0       | 0       | 0       | 0       | 0       | 0          | 0.636   | 0.411                    | 0.122    | 0.586 | 0       | 0     | 0       | 0       | 0.636 |
| 13    | D134       | 0.014        | 0.02    | 0       | 0       | 0       | 0       | 0.02       | 2.018   | 1.983                    | 0.215    | 2.025 | 0       | 0     | 1.145   | 0.008   | 2.033 |
| 14    | D133       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0.887   | 0.409                    | 0.249    | 0.788 | 0       | 2.697 | 0       | 0       | 0.887 |
| 15    | D132       | 0.036        | 0       | 0       | 0       | 0       | 0       | 0          | 0.797   | 0.478                    | 0.251    | 0.793 | 0       | 0     | 0       | 0       | 0.797 |
| 16    | D138       | 0            | 0       | 0       | 0       | 0       | 0       | 0          | 0.602   | 0.334                    | 0.141    | 0.538 | 0       | 2.747 | 0       | 0       | 0.602 |
| 17    | D137       | 0.036        | 0       | 0       | 0       | 0       | 0       | 0          | 0.605   | 0.336                    | 0.142    | 0.541 | 0       | 0     | 0       | 0       | 0.605 |
| 18    | D120       | 0.079        | 0.149   | 0       | 0       | 0       | 0       | 0.149      | 2.532   | 2.334                    | 0.444    | 2.571 | 0       | 1.325 | 0       | 0.052   | 2.624 |
| 19    | D119       | 0.069        | 0       | 0       | 0       | 0       | 0       | 0          | 2.735   | 0.66                     | 0.414    | 1.773 | 0       | 2.995 | 0       | 0       | 2.735 |
| 20    | D118       | 0.069        | 0       | 0       | 0       | 0       | 0       | 0          | 4.576   | 0.519                    | 0.415    | 1.775 | 0       | 0     | 0.037   | 0       | 4.576 |
| 21    | D117       | 0.069        | 0       | 0       | 0       | 0       | 0       | 0          | 5.357   | 0.487                    | 0.415    | 1.776 | 0       | 0     | 0.023   | 0       | 5.357 |
| 22    | D116       | 0.069        | 0       | 0       | 0       | 0       | 0       | 0          | 5.945   | 0.467                    | 0.416    | 1.778 | 0       | 0     | 0.465   | 0       | 5.945 |
| 23    | D115       | 0.069        | 0       | 0       | 0       | 0       | 0       | 0          | 4.303   | 0.534                    | 0.417    | 1.78  | 0       | 0     | 0.51    | 0       | 4.303 |
| 24    | D114       | 0.107        | 0       | 0       | 0       | 0       | 0       | 0          | 4.82    | 0.51                     | 0.417    | 1.781 | 0       | 0     | 0.471   | 0       | 4.82  |
| 25    | D113       | 0.07         | 0       | 0       | 0       | 0       | 0       | 0          | 3.283   | 0.605                    | 0.418    | 1.784 | 0       | 2.882 | 0       | 0       | 3.283 |
| 26    | D112       | 0.052        | 0       | 0       | 0       | 0       | 0       | 0          | 2.038   | 0.698                    | 0.36     | 1.613 | 0       | 1.681 | 0       | 0       | 2.038 |
| 27    | D111       | 0.011        | 0       | 0       | 0       | 0       | 0       | 0          | 1.232   | 0.351                    | 0.193    | 0.797 | 0       | 0.733 | 0       | 0       | 1.232 |
| 28    | D110       | 0.001        | 0       | 0       | 0       | 0       | 0       | 0          | 0.519   | 0.178                    | 0.045    | 0.301 | 0       | 0     | 0       | 0       | 0.519 |
| 29    | D106       | 0.165        | 0       | 0       | 0       | 0       | 0       | 0          | 3.317   | 0.463                    | 0.513    | 1.534 | 0       | 1.855 | 0       | 0       | 3.317 |
| 30    | D105       | 0.028        | 0       | 0       | 0       | 0       | 0       | 0          | 2.916   | 0.333                    | 0.307    | 1.088 | 0       | 1.05  | 0       | 0       | 2.916 |
| 31    | D104       | 0.024        | 0       | 0       | 0       | 0       | 0       | 0          | 1.677   | 0.406                    | 0.285    | 1.035 | 0       | 1.035 | 0       | 0       | 1.677 |
| 32    | D103       | 0.011        | 0.019   | 0       | 0       | 0       | 0       | 0.019      | 1.324   | 1.296                    | 0.194    | 1.33  | 0       | 0.796 | 0       | 0.005   | 1.335 |
| 33    | D102       | 0.004        | 0       | 0       | 0       | 0       | 0       | 0          | 0.574   | 0.32                     | 0.129    | 0.506 | 0       | 3.164 | 0       | 0       | 0.574 |
| 34    | D101       | 0.035        | 0       | 0       | 0       | 0       | 0       | 0          | 0.577   | 0.321                    | 0.13     | 0.509 | 0       | 0     | 0       | 0       | 0.577 |
| 35    | D109       | 0.01         | 0.014   | 0       | 0       | 0       | 0       | 0.014      | 2.198   | 2.173                    | 0.185    | 2.203 | 0       | 1.286 | 0       | 0.007   | 2.21  |

|         |       |       |   |   |   |   |       |       |       |       |       |   |       |   |       |       |
|---------|-------|-------|---|---|---|---|-------|-------|-------|-------|-------|---|-------|---|-------|-------|
| 36 D108 | 0.005 | 0.006 | 0 | 0 | 0 | 0 | 0.006 | 1.86  | 1.847 | 0.141 | 1.862 | 0 | 2.804 | 0 | 0.007 | 1.869 |
| 37 D107 | 0.005 | 0.017 | 0 | 0 | 0 | 0 | 0.017 | 1.097 | 1.084 | 0.142 | 1.099 | 0 | 0     | 0 | 0     | 1.099 |

**APPENDIX A: PRELIMINARY REDRAWN CREEK VALLEY OVERLAY**



| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

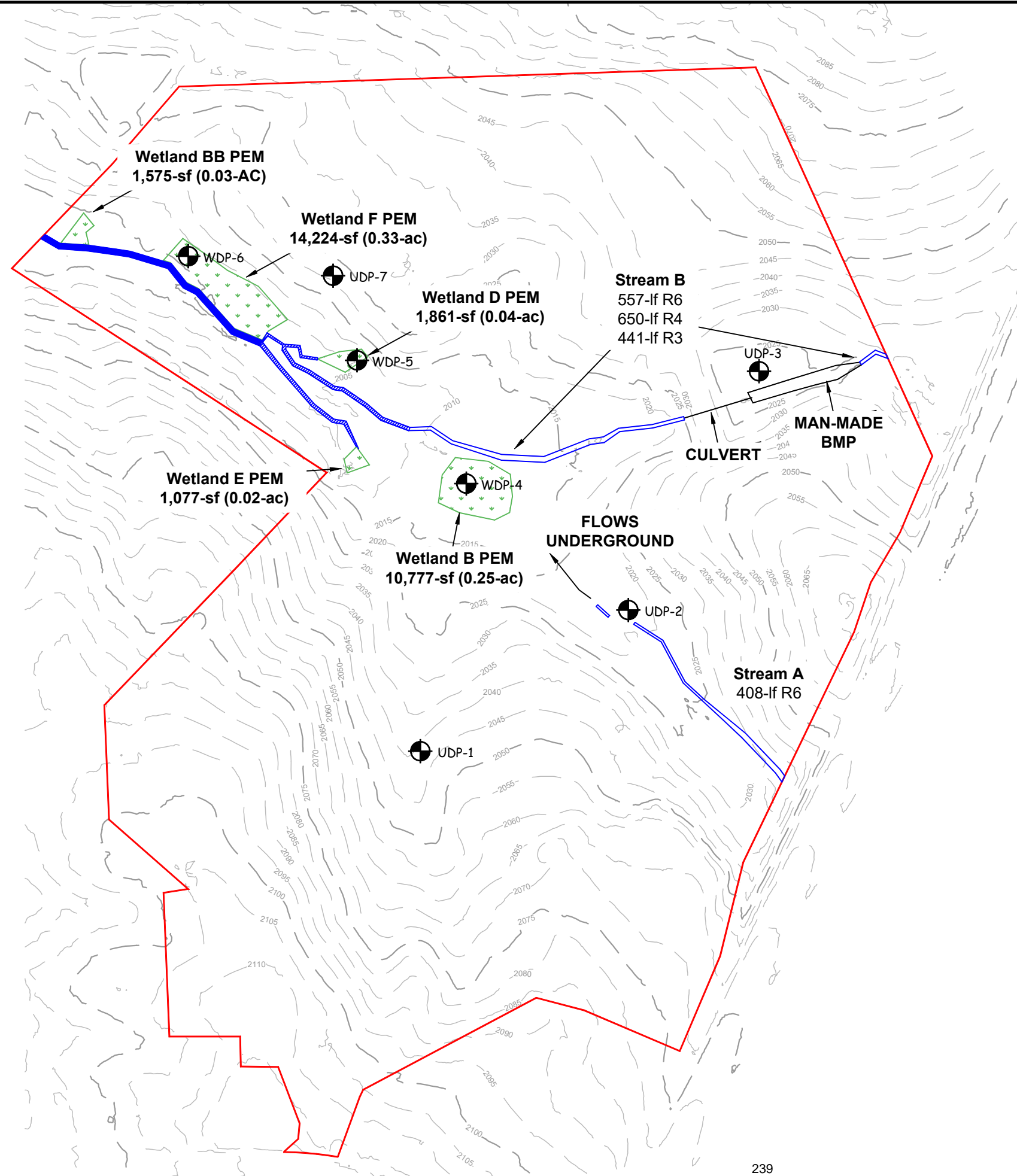
**PRELIMINARY**

**NOT FOR CONSTRUCTION**  
**PROPOSED CREEK VALLEY OVERLAY MODIFICATION EXHIBIT**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
 ZONED PLANNED RESIDENTIAL - ORDINANCE 2007  
 PROPERTY OF GLADE SPRING CROSSING, LLC  
 TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.  
 TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
 MONTGOMERY COUNTY, VIRGINIA

|                     |                     |
|---------------------|---------------------|
| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>WGB  | Date:<br>02/01/2024 |
| Sheet No.<br>1 of 1 | 2                   |

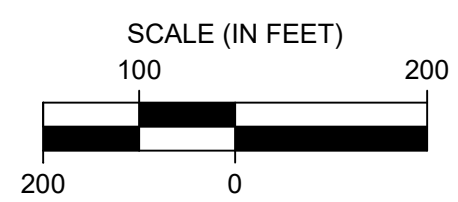
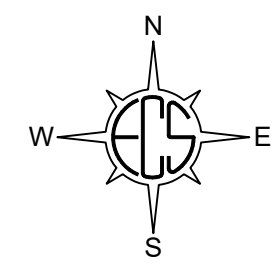
**APPENDIX B: PRELIMINARY WETLANDS AND JURISDICTIONAL  
WATERS EVALUATION**



- LEGEND**
- PERENNIAL STREAM CHANNEL (R3)
  - INTERMITTENT STREAM CHANNEL (R4)
  - EPHEMERAL STREAM CHANNEL (R6)
  - PALUSTRINE EMERGENT WETLAND (PEM)
  - APPROXIMATE WETLAND DATAPOINT LOCATION
  - STUDY AREA
  - MAN-MADE BMP

\*WATER FEATURES WERE DELINEATED BY ECS ON FEBRUARY 17, 2022 AND LOCATED USING A SUB-METER ACCURACY GPS UNIT.

\*\*WATER FEATURES DEPICTED HEREIN SHOULD BE CONSIDERED PRELIMINARY UNTIL CONFIRMED BY THE U.S. ARMY CORPS OF ENGINEERS.



**GLADE ROAD PROPERTY**  
**1000 GLADE ROAD**  
**BLACKSBURG, VIRGINIA**



**WATERS OF THE U.S.**  
**DELINEATION MAP**  
**CARY HOPPER**

|               |          |
|---------------|----------|
| ECS REVISIONS |          |
|               |          |
|               |          |
| ENGINEER      | DRAFTING |
| AMM           | JMH      |
| SCALE         |          |
| AS SHOWN      |          |
| PROJECT NO.   |          |
| 47:13438-A    |          |
| SHEET         |          |
| 1 OF 1        |          |
| DATE          |          |
| FEBRUARY 2022 |          |

## Michael Formica

---

**From:** Justin M. Hughes, CHMM, PWS <JHughes@ecslimited.com>  
**Sent:** Thursday, July 14, 2022 5:21 PM  
**To:** Michael Formica; Meredith Jones; caryhopper@msn.com  
**Cc:** Steven S. Hay  
**Subject:** RE: Glade Road Waters of the US Draft Map

Thank you for sending, Michael.

Meredith, I overlaid the wetland/stream features on the proposed grading contours and came up with 537 lf R6 stream impacts and 0.11-ac PEM wetland proposed impacts. Also, for planning purposes if we cannot get that central feature ruled as non-jurisdictional that would add 0.25-ac of PFO wetland impacts. PEM wetland impacts are mitigation on a 1:1 basis and PFO on a 2:1 basis. We talked to some mitigation banks in the area and found credits for \$425/linear foot of stream and \$50,000/acre of wetland impacts.

Stream

537 lf x \$425=\$228,225

Wetland

PEM 0.11-ac x \$50k = \$5,500

PFO (if needed) 0.5-ac x \$50k = \$25,000

Total \$233,725

Total with PFO \$258,725

This is a good ballpark number to use during your meetings with the City but I do think we can get it down some as the streams proposed for impact are not of very good quality so we will likely not have to mitigate for each LF based on their USM scores. Please let me know if you have any questions!

Thanks,

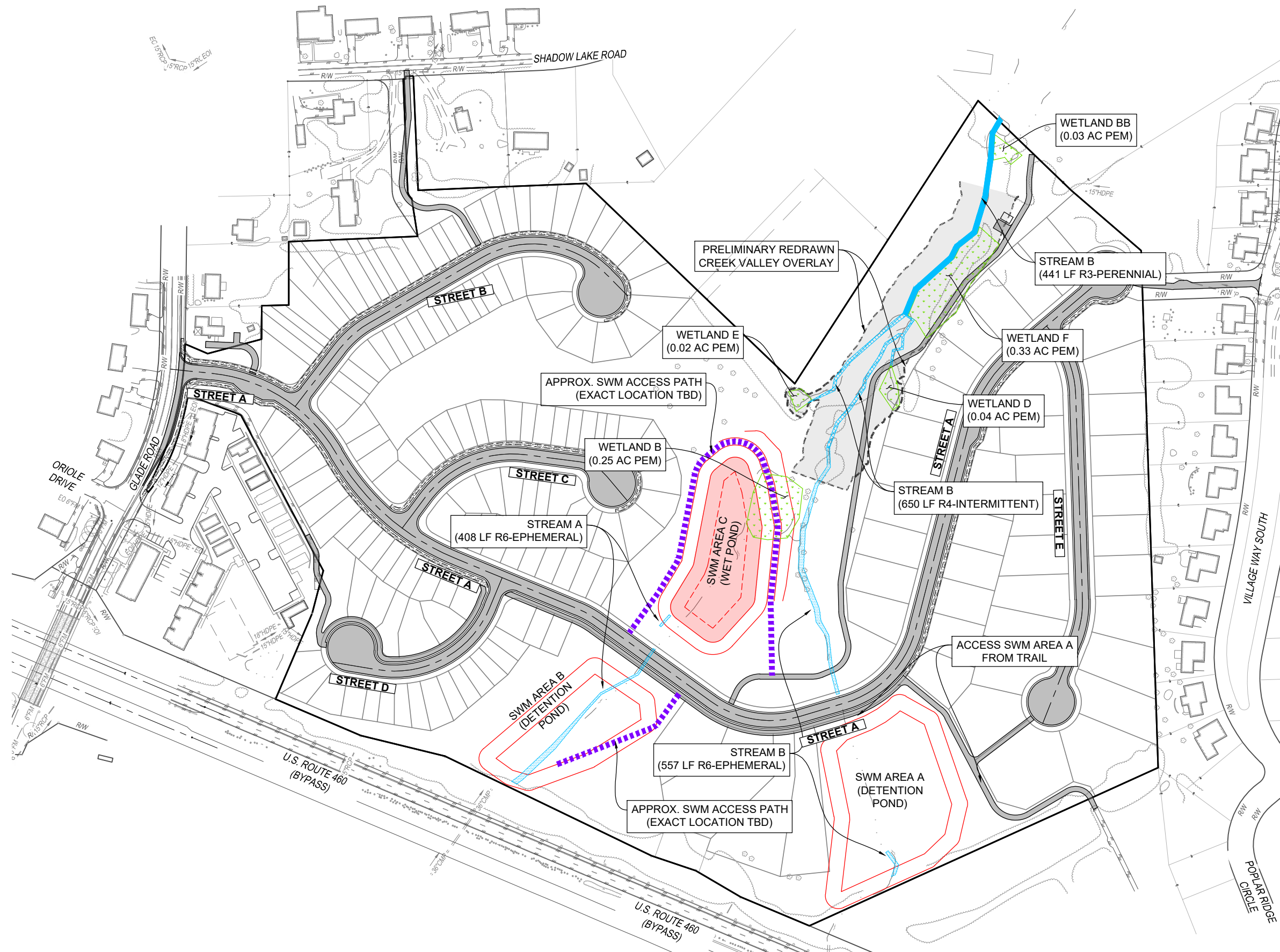
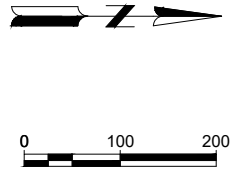
**JUSTIN M. HUGHES, CHMM, PWS** | Environmental Senior Project Manager  
**ECS MID-ATLANTIC, LLC** | T 804.353.6333 D 804.299.4880 C 804.971.3576  
JHughes@ecslimited.com | www.ecslimited.com

*Confidential/proprietary message/attachments. Delete message/attachments if not intended recipient.*

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Z:\PROJECTS\GLADE SPRING CROSSING\EDEN - GLADE SPRING\CAD\PRELIM PLAT CAD\PP-SWM.DWG  
2/1/2024 10:49:13 AM



| No. | Revision / Issue | Date |
|-----|------------------|------|
|     |                  |      |

**PRELIMINARY**

**NOT FOR CONSTRUCTION**

**STORMWATER MANAGEMENT AREAS EXHIBIT**

PROPOSED DEVELOPMENT OF  
**GLADE SPRING CROSSING**  
ZONED PLANNED RESIDENTIAL - ORDINANCE 2007

PROPERTY OF GLADE SPRING CROSSING, LLC  
TM# 225-(A)-3, 225-(A)-4, & 224-(A)-57, 45,0976 AC.

TOWN OF BLACKSBURG - PRICES FORK DISTRICT  
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|                     |                     |
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| Drawn By:<br>MSF    | Scale:<br>AS SHOWN  |
| Checked By:<br>WGB  | Date:<br>02/01/2024 |
| Sheet No.<br>1 of 1 | <b>SWM</b>          |

**WK DICKSON**  
community infrastructure consultants

1700 KRAFT DRIVE, SUITE 2350  
BLACKSBURG, VIRGINIA 24060  
VOICE 540-617-0870