***Drainage Report***
***Prepared For***
***Block 286 Lot 14.02***
***Hillsborough Township***
***Somerset County, New Jersey***
***Project Number: 1509FS***

***December 15, 2017***
***Revised July 30, 2021***
***Revised March 24, 2022***

***Prepared For***
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# ***Table of Contents***

## 1.0 Introduction

This report outlines the results of a hydrologic and hydraulic stormwater runoff analysis conducted by Van Cleef Engineering Associates (Van Cleef) with regard to the proposed development on Lot 14.02 in Block 286 as designated by the Franklin Township Tax Maps. The tract consists of approximately 2.77 acres and is located in the R-10 District.

This report has been prepared to summarize stormwater analysis design objectives, methodologies and calculations pertaining to the conveyance of the stormwater runoff that is generated by the property under pre-developed and post-developed conditions.

## 2.0 Site Description

### 2.1 Pre-Developed Conditions

Under pre-developed conditions, Lot 14.02 is vacant and consists of woods in good hydrologic condition. The adjacent properties along the northern, southern and western property boundaries are dedicated to residential uses. The adjacent property along the eastern property boundary is dedicated to the Mount Carmel Church. The Existing Drainage Area Map (Appendix K) depicts two drainage areas. Area 1A is comprised of the area of disturbance associated with the proposed development and thus the peak flow rate corresponding to the runoff generated by this area must be sufficiently reduced in accordance with N.J.A.C. 7:8-5.6. Area 1B, on the other hand, is comprised of the remaining area that is drained by the proposed infiltration basin. The peak flow rate corresponding to the runoff generated by this area does not need to be reduced because this area will not be disturbed as a result of the proposed development. The runoff generated by both areas is conveyed toward Belmar Street via overland flow. The boundaries of the drainage areas and the location of the point of analysis are shown on the Existing Drainage Area Map in Appendix K.

### 2.2 Post-Developed Conditions

Under post-developed conditions, Lot 14.02 is subdivided into six lots. The proposed development involves the construction of an infiltration basin, five single-family dwellings and a roadway along with appurtenant driveways. The Proposed Drainage Area Map (Appendix K) depicts two drainage areas. The runoff generated by Area 1A is conveyed to the infiltration basin via a network of storm sewers. The runoff generated by Area 1B will bypass the infiltration basin

via a swale that is adjacent to the northern tract boundary. The boundaries of the drainage areas and the locations of the point of analysis are shown on the Proposed Drainage Area Map in Appendix K. The outflow from the infiltration basin is discharged to the existing storm sewer network. The applicable groundwater recharge, runoff quality and runoff quantity requirements will be addressed by the infiltration basin.

## 3.0 Methodology

The assessment of stormwater runoff has been based upon the Natural Resources Conservation Service Methodology as described in Technical Release 55 (TR-55), "Urban Hydrology for Small Watershed." The theoretical storms that are referenced in this report are modeled via the 24-hour SCS Unit Dimensionless Hydrograph and the rainfall distributions are based on the data provided for Region C by the NOAA. The recurrence intervals of 2, 10 and 100 years were analyzed via Bentley Pond Pack version 8i. The program is tailored to model the SCS Method for hydrograph generations and to perform interactive solutions of continuity equation (outflow = inflow +/- storage) with the intermediate values of the routing curve obtained through linear interpretation.

According to the New Jersey Supplement to Chapter 2 of the Engineering Field Handbook published by the NRCS, the rainfall amounts generated by the 24-hour design storm within Somerset County are as follows:

2-Year = 3.34 inches
10-Year = 5.01 inches
100-Year = 8.21 inches

The Soil Conservation Service Soil Survey (SCS) for Somerset County was utilized in order to classify the soils within the tract.

The Rational Method was utilized to determine whether the capacity provided by the proposed pipes is sufficient for the runoff generated by the 25-year design storm.

| **Soil Symbol** | **Soil Name** | **Hydrologic Soil Group** |
|---|---|---|
| KkoC | Klinesville Channery Loam (6-12% Slopes) | D |

The location of these soils is indicated in Appendix A.

## 4.0 Stormwater Management Objectives

The primary objective of this report is to demonstrate that the proposed stormwater management measures are designed in accordance with all of the applicable regulations pertaining to runoff quantity and quality. The proposed improvements are designed to meet the requirements of Franklin Township, the New Jersey Department of Environmental Protection and the Standards for Soil Erosion and Sediment Control in New Jersey.

## 5.0 Runoff Quantity

The peak flow rates corresponding to the designated point of analysis will be sufficiently reduced via the proposed outlet structure within the infiltration basin. The infiltration basin includes two separate sand beds that individually drain an area below 2.5 acres in size. The results of the routing calculations are tabulated below. These results indicate compliance with N.J.A.C. 7:8-5.6. Refer to the Appendix for further information pertaining to the routing calculations.

In order to determine whether the emergency spillway pertaining to the bioretention system is sufficient, routing calculations were performed under the assumption that the outlet structure is blocked. The results of these calculations are included in Appendix H.

| **Peak Flow Rate Reductions** | | | | |
|---|---|---|---|---|
| **Storm Frequency** | **Pre-Developed Peak Flow – Area 1A (CFS)** | **Pre-Developed Peak Flow – Area 1B (CFS)** | **Allowable Peak Flow (CFS)** | **Post-Developed Peak Flow (CFS)** |
| 2 | 2.53 | 0.42 | 2.53*0.50 + 0.42 = 1.69 | 0.43 |
| 10 | 5.32 | 0.81 | 5.32*0.75 + 0.81 = 4.80 | 2.02 |
| 100 | 11.01 | 1.59 | 11.01*0.80 + 1.59 = 10.40 | 10.31 |

## 6.0 Water Surface Elevation Summary

A summary of the water surface elevations and outflows corresponding to the 2-, 10- and 100-year design storms are shown below:

| Infiltration Basin | | |
|---|---|---|
| **Storm Frequency** | **Water Surface Elevation (FT)** | **Outflow (CFS)** |
| **WQDS** | 95.86 | 0.00 |
| **2** | 97.40 | 0.28 |
| **10** | 98.38 | 1.88 |
| **100** | 99.49 | 9.53 |

## 7.0 Runoff Quality

In order to fulfill the runoff quality requirements that are applicable to this development, the runoff generated by the proposed motor vehicle surface area during the Water Quality Design Storm will be treated via the infiltration basin which is designed to achieve a TSS removal rate of 80% and thus comply with N.J.A.C. 7:8-5.5. The calculations pertaining to this stormwater management facility are included in Appendix I.

## 8.0 Groundwater Recharge

The total annual groundwater recharge volumes under pre-developed and post-developed conditions were determined via the New Jersey Groundwater Recharge Spreadsheet, which is included in Appendix J. The total annual recharge volume under pre-developed conditions is 153,032 cubic feet whereas the corresponding volume under post-developed conditions is 89,622 cubic feet. This results in a post-developed annual recharge deficit of 63,410 cubic feet. The infiltration basin will provide an annual recharge volume of 124,954 cubic feet. Therefore, 100% of the pre-developed annual recharge volume is preserved.

## 9.0 Storm Sewer Design

The storm sewer network was designed to convey the runoff generated by the 25-year design storm. The appropriate size of the sewers was determined via the application of the Manning Formula and a Manning's Roughness Coefficient of 0.013. The runoff coefficients were determined via a weighted average and are dependent on the land cover. The times of concentration associated with the drainage areas that correspond to the proposed catch basins were assumed to be 10 minutes which is the minimum. The drainage areas are shown in the Inlet Drainage Area Map in Appendix K. Flow rates

were computed via the application of the Rational method (Q = CIA). Calculations are provided in Appendix F.

## 10.0 Conclusion

The proposed development will sufficiently reduce the peak flow rates corresponding to the 2-, 10- and 100-year design storms. Furthermore, 80% of the TSS within the runoff generated by the proposed motor vehicle surfaces will be removed. The drainage patterns under post-developed conditions are very similar to the corresponding patterns under pre-developed conditions. Therefore the proposed development will not negatively impact any off-site or downstream properties. This project has been designed in accordance with the standards set forth by various regulatory agencies including Franklin Township, the New Jersey Department of Environmental Protection, and the Somerset-Union Soil Conservation District. All engineering calculations and the associated drainage area maps are incorporated in the Appendix for further review.

## 11.0 References


1. Urban Hydrology for Small Watersheds, TR-55, USDA Soil Conservation Service, June 1986.

2. Stormwater Management, N.J.A.C. 7:8, March 2, 2020.

3. Web Soil Survey, United States Department of Agriculture, Natural Resource Conservation Service, Version 8, 2008.

4. Bentley, StormCAD®, Version 8.11.02.75, 2011.

5. Bentley, PondPack version 8i, 2012.

# Appendix A

## Soil Map, Runoff Curve Numbers & Time of Concentration

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:1,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Somerset County, New Jersey
Survey Area Data: Version 15, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 26, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| KkoC | Klinesville channery loam, 6 to 12 percent slopes | 4.7 | 100.0% |
| **Totals for Area of Interest** | | **4.7** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Worksheet 2: Runoff Curve Number

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |
| Select One: | Pre-Developed | | | | |
| Area Name | Area 1A | | | | |

1. Runoff Curve Number

| Names | Cover Description | CN | | | Area | Product |
|---|---|---|---|---|---|---|
| Soil Name and Hydrologic Group (appendix A) | (cover type, treatment, and hydrologic condition; percent impervious; unconnected/ connected area ratio) | Tab 2-2 | Fig 2-3 | Fig 2-4 | acres miles % | CN x area |
| D | Woods - Good Condition | 77 | | | 2.88 | 221.76 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Totals | 2.88 | 221.76 |

CN (weighted) = total product/ total area= 221.76 / 2.88

Use CN = 77.0

Worksheet 3: Time of Concentration (Tc) or Travel Time (Tt)

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |

Select One: Pre-Developed
Select One: Time of Concentration
Area Name Area 1A

Notes: Space for as many as two segements per flow type can be used for each worksheet
Include a Map, schematic, or description of flow segments

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sheet Flow (Applicable to Tc only) | | | Segment ID | C-E | | |
| | | | | | | |
| 1 | Surface Description (table 3-1) | | | Woods | | |
| 2 | Mannings Roughness Coeff.,n (table 3-1) | | | 0.4 | | |
| 3 | Flow Length, L (total L < 300 ft) | | ft | 100 | | |
| 4 | Two-yr 24-hr rainfall, $P_2$ | | in | 3.34 | | |
| 5 | land slope, s | | ft/ft | 0.026 | | |
| 6 | $T_t$=(0.007*(nL)^0.8/((P2^0.5)*(s^0.4)) | Compute $T_t$ | hr | 0.32 | | 0.32 |
| Shallow Concentrated Flow | | | Segment ID | E-POA | | |
| | | | | | | |
| 7 | Surface Description (paved or unpaved) | | | Unpaved | | |
| 8 | Flow Length, L | | ft | 686 | | |
| 9 | Watercourse Slope, s | | ft/ft | 0.013 | | |
| 10 | Average velocity, V (figure 3-1) | | ft/s | 1.8 | | |
| 11 | $T_t$ = L/(3600*V) | Compute Tt | hr | 0.11 | | 0.11 |
| Channel Flow | | | Segment ID | | | |
| | | | | | | |
| 12 | Cross sectional flow area, a | | ft^2 | | | |
| 13 | Wetted Perimeter, Pw | | ft | | | |
| 14 | Hydraulic Radius, r=a/Pw Compute r | | ft | | | |
| 15 | Channel Slope, s | | ft/ft | | | |
| 16 | Mannings roughness Coeff., n | | | | | |
| 17 | V = 1.49(r^(2/3))*(s^(1/2))/n | Compute V | ft/s | | | |
| 18 | Flow Length, L | | ft | | | |
| 19 | $T_t$ = L/(3600*V) | Compute Tt | hr | | | 0.00 |
| 20 | Water shed or Subarea Tc or Tt (add Tt in steps 6, 11,19) | | hr | | | 0.42 |
| | | | min | | | 25.28 |

Worksheet 2: Runoff Curve Number

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |
| Select One: | Pre-Developed | | | | |
| Area Name | Area 1B | | | | |

1. Runoff Curve Number

| Names | Cover Description | CN | | | Area | Product |
|---|---|---|---|---|---|---|
| Soil Name and Hydrologic Group (appendix A) | (cover type, treatment, and hydrologic condition; percent impervious; unconnected/ connected area ratio) | Tab 2-2 | Fig 2-3 | Fig 2-4 | acres miles % | CN x area |
| D | Woods - Good Condition | 77 | | | 0.14 | 10.78 |
| D | Open Space - Good Condition | 80 | | | 0.20 | 16 |
| | Impervious Areas | 98 | | | 0.04 | 3.92 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Totals | 0.38 | 30.7 |

CN (weighted) = total product/ total area= 30.7 / 0.38

Use CN = 80.8

Worksheet 3: Time of Concentration (Tc) or Travel Time (Tt)

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |

Select One: Pre-Developed
Select One: Time of Concentration
Area Name Area 1B

Notes: Space for as many as two segements per flow type can be used for each worksheet
Include a Map, schematic, or description of flow segments

| | | | | | | |
|---|---|---|---|---|---|---|
| Sheet Flow (Applicable to Tc only) | | | Segment ID | A-B | B-D | |
| | | | | | | |
| 1 | Surface Description (table 3-1) | | | Grass | Woods | |
| 2 | Mannings Roughness Coeff.,n (table 3-1) | | | 0.24 | 0.4 | |
| 3 | Flow Length, L (total L < 300 ft) | | ft | 56 | 44 | |
| 4 | Two-yr 24-hr rainfall, $P_2$ | | in | 3.34 | 3.34 | |
| 5 | land slope, s | | ft/ft | 0.026 | 0.033 | |
| 6 | $T_t$=(0.007*(nL)^0.8/((P2^0.5)*(s^0.4)) | Compute $T_t$ | hr | 0.13 | 0.15 | 0.28 |
| Shallow Concentrated Flow | | | Segment ID | D-POA | | |
| | | | | | | |
| 7 | Surface Description (paved or unpaved) | | | Unpaved | | |
| 8 | Flow Length, L | | ft | 773 | | |
| 9 | Watercourse Slope, s | | ft/ft | 0.014 | | |
| 10 | Average velocity, V (figure 3-1) | | ft/s | 1.9 | | |
| 11 | $T_t$ = L/(3600*V) | Compute Tt | hr | 0.11 | | 0.11 |
| Channel Flow | | | Segment ID | | | |
| | | | | | | |
| 12 | Cross sectional flow area, a | | ft^2 | | | |
| 13 | Wetted Perimeter, Pw | | ft | | | |
| 14 | Hydraulic Radius, r=a/Pw | Compute r | ft | | | |
| 15 | Channel Slope, s | | ft/ft | | | |
| 16 | Mannings roughness Coeff., n | | | | | |
| 17 | V = 1.49(r^(2/3))*(s^(1/2))/n | Compute V | ft/s | | | |
| 18 | Flow Length, L | | ft | | | |
| 19 | $T_t$ = L/(3600*V) | Compute Tt | hr | | | 0.00 |
| 20 | Water shed or Subarea Tc or Tt (add Tt in steps 6, 11,19) | | hr | | | 0.39 |
| | | | min | | | 23.61 |

Worksheet 2: Runoff Curve Number

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |
| Select One: | Post-Developed | | | | |
| Area Name | Area 1A (Pervious) | | | | |

1. Runoff Curve Number

| Names | Cover Description | CN | | | Area | Product |
|---|---|---|---|---|---|---|
| Soil Name and Hydrologic Group (appendix A) | (cover type, treatment, and hydrologic condition; percent impervious; unconnected/ connected area ratio) | Tab 2-2 | Fig 2-3 | Fig 2-4 | acres miles % | CN x area |
| D | Woods - Good Condition | 77 | | | 0.14 | 10.78 |
| D | Open Space - Good Condition | 80 | | | 1.68 | 134.4 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Totals | 1.82 | 145.18 |

CN (weighted) = total product/ total area= 145.18 / 1.82

Use CN = 79.8

Worksheet 2: Runoff Curve Number

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |
| Select One: | Post-Developed | | | | |
| Area Name | Area 1A (Impervious) | | | | |

1. Runoff Curve Number

| Names | Cover Description | CN | | | Area | Product |
|---|---|---|---|---|---|---|
| Soil Name and Hydrologic Group (appendix A) | (cover type, treatment, and hydrologic condition; percent impervious; unconnected/ connected area ratio) | Tab 2-2 | Fig 2-3 | Fig 2-4 | acres miles % | CN x area |
| | Impervious Areas | 98 | | | 1.18 | 115.64 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Totals | 1.18 | 115.64 |

CN (weighted) = total product/ total area= 115.64 / 1.18

Use CN = 98.0

Worksheet 3: Time of Concentration (Tc) or Travel Time (Tt)

Project 1509FS By KH Date 2/21/2022
Location Franklin Township Checked Date
Select One: Post-Developed
Select One: Time of Concentration
Area Name Area 1A

Notes: Space for as many as two segements per flow type can be used for each worksheet
Include a Map, schematic, or description of flow segments

| Sheet Flow (Applicable to Tc only) | | Segment ID | A-B | B-C | |
|---|---|---|---|---|---|
| 1 Surface Description (table 3-1) | | | Grass | Woods | |
| 2 Mannings Roughness Coeff.,n (table 3-1) | | | 0.24 | 0.4 | |
| 3 Flow Length, L (total L < 300 ft) | | ft | 61 | 30 | |
| 4 Two-yr 24-hr rainfall, $P_2$ | | in | 3.34 | 3.34 | |
| 5 land slope, s | | ft/ft | 0.025 | 0.029 | |
| 6 $T_t$=(0.007*(nL)^0.8/((P2^0.5)*(s^0.4)) | Compute $T_t$ | hr | 0.14 | 0.12 | 0.26 |

| Shallow Concentrated Flow | | Segment ID | C-D | | |
|---|---|---|---|---|---|
| 7 Surface Description (paved or unpaved) | | | Unpaved | | |
| 8 Flow Length, L | | ft | 318 | | |
| 9 Watercourse Slope, s | | ft/ft | 0.024 | | |
| 10 Average velocity, V (figure 3-1) | | ft/s | 2.5 | | |
| 11 $T_t$ = L/(3600*V) | Compute Tt | hr | 0.04 | | 0.04 |

| Channel Flow | | Segment ID | D-E | | |
|---|---|---|---|---|---|
| 12 Cross sectional flow area, a | | ft^2 | | | |
| 13 Wetted Perimeter, Pw | | ft | | | |
| 14 Hydraulic Radius, r=a/Pw Compute r | | ft | | | |
| 15 Channel Slope, s | | ft/ft | | | |
| 16 Mannings roughness Coeff., n | | | | | |
| 17 V = 1.49(r^(2/3))*(s^(1/2))/n | Compute V | ft/s | 2 | (Assumed) | |
| 18 Flow Length, L | | ft | 429 | | |
| 19 $T_t$ = L/(3600*V) | Compute Tt | hr | 0.06 | | 0.06 |
| 20 Water shed or Subarea Tc or Tt (add Tt in steps 6, 11,19) | | hr | | | 0.35 |
| | | min | | | 21.21 |

Worksheet 2: Runoff Curve Number

| | | | | | |
|---|---|---|---|---|---|
| Project | 1509FS | By | KH | Date | 2/21/2022 |
| Location | Franklin Township | Checked | | Date | |
| Select One: | Post-Developed | | | | |
| Area Name | Area 1B | | | | |

1. Runoff Curve Number

| Names | Cover Description | CN | | | Area | Product |
|---|---|---|---|---|---|---|
| Soil Name and Hydrologic Group (appendix A) | (cover type, treatment, and hydrologic condition; percent impervious; unconnected/ connected area ratio) | Tab 2-2 | Fig 2-3 | Fig 2-4 | acres miles % | CN x area |
| D | Open Space - Good Condition | 80 | | | 0.26 | 20.8 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Totals | 0.26 | 20.8 |

CN (weighted) = total product/ total area= 20.8 / 0.26

Use CN = 80.0

Worksheet 3: Time of Concentration (Tc) or Travel Time (Tt)

Project 1509FS By KH Date 2/21/2022
Location Franklin Township Checked Date
Select One: Post-Developed
Select One: Time of Concentration
Area Name Area 1B

Notes: Space for as many as two segements per flow type can be used for each worksheet
Include a Map, schematic, or description of flow segments

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sheet Flow (Applicable to Tc only) | | | Segment ID | A-B | | |
| | | | | | | |
| 1 | Surface Description (table 3-1) | | | Grass | | |
| 2 | Mannings Roughness Coeff.,n (table 3-1) | | | 0.24 | | |
| 3 | Flow Length, L (total L < 300 ft) | | ft | 100 | | |
| 4 | Two-yr 24-hr rainfall, $P_2$ | | in | 3.34 | | |
| 5 | land slope, s | | ft/ft | 0.023 | | |
| 6 | $T_t$=(0.007*(nL)^0.8/((P2^0.5)*(s^0.4)) | Compute $T_t$ | hr | 0.22 | | 0.22 |
| Shallow Concentrated Flow | | | Segment ID | B-C | | |
| | | | | | | |
| 7 | Surface Description (paved or unpaved) | | | Unpaved | | |
| 8 | Flow Length, L | | ft | 500 | | |
| 9 | Watercourse Slope, s | | ft/ft | 0.014 | | |
| 10 | Average velocity, V (figure 3-1) | | ft/s | 1.8 | | |
| 11 | $T_t$ = L/(3600*V) | Compute Tt | hr | 0.08 | | 0.08 |
| Channel Flow | | | Segment ID | C-POA | | |
| | | | | | | |
| 12 | Cross sectional flow area, a | | ft^2 | | | |
| 13 | Wetted Perimeter, Pw | | ft | | | |
| 14 | Hydraulic Radius, r=a/Pw Compute r | | ft | | | |
| 15 | Channel Slope, s | | ft/ft | | | |
| 16 | Mannings roughness Coeff., n | | | | | |
| 17 | V = 1.49(r^(2/3))*(s^(1/2))/n | Compute V | ft/s | 2 | (Assumed) | |
| 18 | Flow Length, L | | ft | 156 | | |
| 19 | $T_t$ = L/(3600*V) | Compute Tt | hr | 0.02 | | 0.02 |
| 20 | Water shed or Subarea Tc or Tt (add Tt in steps 6, 11,19) | | hr | | | 0.32 |
| | | | min | | | 19.14 |

# Appendix B

## Infiltration Basin Report

Subsection: Master Network Summary

## Catchments Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|---|---|---|---|---|---|
| Area 1A Imervious (Post-Developed) | WQDS | 1 | 4,425.000 | 75.00 | 2.17 |
| Area 1A Imervious (Post-Developed) | 2-Year | 2 | 13,142.000 | 735.00 | 2.45 |
| Area 1A Imervious (Post-Developed) | 10-Year | 10 | 20,410.000 | 735.00 | 3.74 |
| Area 1A Imervious (Post-Developed) | 100-Year | 100 | 34,108.000 | 735.00 | 6.16 |
| Area 1A Pervious (Post-Developed) | WQDS | 1 | 1,115.000 | 81.00 | 0.48 |
| Area 1A Pervious (Post-Developed) | 2-Year | 2 | 9,689.000 | 735.00 | 1.99 |
| Area 1A Pervious (Post-Developed) | 10-Year | 10 | 19,000.000 | 735.00 | 3.95 |
| Area 1A Pervious (Post-Developed) | 100-Year | 100 | 38,263.000 | 735.00 | 7.84 |
| Area 1B (Post-Developed) | WQDS | 1 | 163.000 | 78.00 | 0.07 |
| Area 1B (Post-Developed) | 2-Year | 2 | 1,396.000 | 735.00 | 0.30 |
| Area 1B (Post-Developed) | 10-Year | 10 | 2,730.000 | 735.00 | 0.59 |
| Area 1B (Post-Developed) | 100-Year | 100 | 5,486.000 | 732.00 | 1.16 |
| Area 1A (Pre-Developed) | WQDS | 1 | 1,225.000 | 84.00 | 0.45 |
| Area 1A (Pre-Developed) | 2-Year | 2 | 13,424.000 | 738.00 | 2.53 |
| Area 1A (Pre-Developed) | 10-Year | 10 | 27,428.000 | 738.00 | 5.32 |
| Area 1A (Pre-Developed) | 100-Year | 100 | 57,074.000 | 738.00 | 11.01 |
| Area 1B (Pre-Developed) | WQDS | 1 | 262.000 | 81.00 | 0.11 |
| Area 1B (Pre-Developed) | 2-Year | 2 | 2,115.000 | 738.00 | 0.42 |
| Area 1B (Pre-Developed) | 10-Year | 10 | 4,091.000 | 738.00 | 0.81 |
| Area 1B (Pre-Developed) | 100-Year | 100 | 8,145.000 | 735.00 | 1.59 |

## Node Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|---|---|---|---|---|---|
| POA 1 (Post-Developed) | WQDS | 1 | 163.000 | 78.00 | 0.07 |

Subsection: Master Network Summary

## Node Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|---|---|---|---|---|---|
| POA 1 (Post-Developed) | 2-Year | 2 | 18,641.000 | 741.00 | 0.43 |
| POA 1 (Post-Developed) | 10-Year | 10 | 36,548.000 | 771.00 | 2.02 |
| POA 1 (Post-Developed) | 100-Year | 100 | 72,260.000 | 747.00 | 10.31 |
| POA 1 (Pre-Developed - Area 1A) | WQDS | 1 | 1,225.000 | 84.00 | 0.45 |
| POA 1 (Pre-Developed - Area 1A) | 2-Year | 2 | 13,424.000 | 738.00 | 2.53 |
| POA 1 (Pre-Developed - Area 1A) | 10-Year | 10 | 27,428.000 | 738.00 | 5.32 |
| POA 1 (Pre-Developed - Area 1A) | 100-Year | 100 | 57,074.000 | 738.00 | 11.01 |
| POA 1 (Pre-Developed - Area 1B) | WQDS | 1 | 262.000 | 81.00 | 0.11 |
| POA 1 (Pre-Developed - Area 1B) | 2-Year | 2 | 2,115.000 | 738.00 | 0.42 |
| POA 1 (Pre-Developed - Area 1B) | 10-Year | 10 | 4,091.000 | 738.00 | 0.81 |
| POA 1 (Pre-Developed - Area 1B) | 100-Year | 100 | 8,145.000 | 735.00 | 1.59 |

## Pond Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) | Maximum Water Surface Elevation (ft) | Maximum Pond Storage (ft³) |
|---|---|---|---|---|---|---|---|
| Infiltration Basin (IN) | WQDS | 1 | 5,540.000 | 75.00 | 2.58 | (N/A) | (N/A) |
| Infiltration Basin (OUT) | WQDS | 1 | 0.000 | 0.00 | 0.00 | 95.86 | 5,540.000 |
| Infiltration Basin (IN) | 2-Year | 2 | 22,831.000 | 735.00 | 4.44 | (N/A) | (N/A) |
| Infiltration Basin (OUT) | 2-Year | 2 | 17,245.000 | 936.00 | 0.28 | 97.40 | 15,551.000 |
| Infiltration Basin (IN) | 10-Year | 10 | 39,410.000 | 735.00 | 7.69 | (N/A) | (N/A) |
| Infiltration Basin (OUT) | 10-Year | 10 | 33,818.000 | 771.00 | 1.88 | 98.38 | 21,903.000 |
| Infiltration Basin (IN) | 100-Year | 100 | 72,371.000 | 735.00 | 14.00 | (N/A) | (N/A) |
| Infiltration Basin (OUT) | 100-Year | 100 | 66,774.000 | 747.00 | 9.53 | 99.49 | 29,057.000 |

Subsection: Outlet Input Data
Label: OCS
Scenario: 100-Year

Return Event: 100 years
Storm Event: 100-Year

| Requested Pond Water Surface Elevations | |
|---|---|
| Minimum (Headwater) | 95.00 ft |
| Increment (Headwater) | 0.50 ft |
| Maximum (Headwater) | 101.00 ft |

## Outlet Connectivity

| Structure Type | Outlet ID | Direction | Outfall | E1 (ft) | E2 (ft) |
|---|---|---|---|---|---|
| Orifice-Circular | 3" Orifice | Forward | TW | 95.86 | 101.00 |
| Rectangular Weir | 6" Weir | Forward | TW | 97.40 | 101.00 |
| Rectangular Weir | 15" Weir | Forward | TW | 98.35 | 101.00 |
| Tailwater Settings | Tailwater | | | (N/A) | (N/A) |

| Structure ID: 3" Orifice<br>Structure Type: Orifice-Circular | |
|---|---|
| Number of Openings | 1 |
| Elevation | 95.86 ft |
| Orifice Diameter | 3.0 in |
| Orifice Coefficient | 0.6 |

| Structure ID: 15" Weir<br>Structure Type: Rectangular Weir | |
|---|---|
| Number of Openings | 1 |
| Elevation | 98.35 ft |
| Weir Length | 1.25 ft |
| Weir Coefficient | 3.00 (ft^0.5)/s |

| Structure ID: 6" Weir<br>Structure Type: Rectangular Weir | |
|---|---|
| Number of Openings | 1 |
| Elevation | 97.40 ft |
| Weir Length | 0.50 ft |
| Weir Coefficient | 3.00 (ft^0.5)/s |

| Structure ID: TW<br>Structure Type: TW Setup, DS Channel | |
|---|---|
| Tailwater Type | Free Outfall |

| Convergence Tolerances | |
|---|---|
| Maximum Iterations | 30 |
| Tailwater Tolerance (Minimum) | 0.01 ft |
| Tailwater Tolerance (Maximum) | 0.50 ft |
| Headwater Tolerance (Minimum) | 0.01 ft |
| Headwater Tolerance (Maximum) | 0.50 ft |
| Flow Tolerance (Minimum) | 0.001 ft³/s |
| Flow Tolerance (Maximum) | 10.000 ft³/s |

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Infiltration Basin
Scenario: 100-Year

Return Event: 100 years
Storm Event: 100-Year

| Infiltration | |
|---|---|
| Infiltration Method (Computed) | No Infiltration |

| Initial Conditions | |
|---|---|
| Elevation (Water Surface, Initial) | 95.00 ft |
| Volume (Initial) | 0.000 ft³ |
| Flow (Initial Outlet) | 0.00 ft³/s |
| Flow (Initial Infiltration) | 0.00 ft³/s |
| Flow (Initial, Total) | 0.00 ft³/s |
| Time Increment | 3.00 min |

| Elevation (ft) | Outflow (ft³/s) | Storage (ft³) | Area (acres) | Infiltration (ft³/s) | Flow (Total) (ft³/s) | 2S/t + O (ft³/s) |
|---|---|---|---|---|---|---|
| 95.00 | 0.00 | 0.000 | 0.15 | 0.00 | 0.00 | 0.00 |
| 95.50 | 0.00 | 3,237.000 | 0.15 | 0.00 | 0.00 | 35.97 |
| 95.86 | 0.00 | 5,567.640 | 0.15 | 0.00 | 0.00 | 61.86 |
| 96.00 | 0.03 | 6,474.000 | 0.15 | 0.00 | 0.03 | 71.96 |
| 96.50 | 0.17 | 9,711.000 | 0.15 | 0.00 | 0.17 | 108.07 |
| 97.00 | 0.24 | 12,948.000 | 0.15 | 0.00 | 0.24 | 144.10 |
| 97.40 | 0.28 | 15,537.600 | 0.15 | 0.00 | 0.28 | 172.92 |
| 97.50 | 0.34 | 16,185.000 | 0.15 | 0.00 | 0.34 | 180.17 |
| 98.00 | 1.03 | 19,422.000 | 0.15 | 0.00 | 1.03 | 216.83 |
| 98.35 | 1.75 | 21,687.900 | 0.15 | 0.00 | 1.75 | 242.73 |
| 98.50 | 2.32 | 22,659.000 | 0.15 | 0.00 | 2.32 | 254.09 |
| 99.00 | 5.41 | 25,896.000 | 0.15 | 0.00 | 5.41 | 293.14 |
| 99.50 | 9.63 | 29,133.000 | 0.15 | 0.00 | 9.63 | 333.33 |
| 100.00 | 14.71 | 32,370.000 | 0.15 | 0.00 | 14.71 | 374.38 |
| 100.50 | 20.51 | 35,607.000 | 0.15 | 0.00 | 20.51 | 416.14 |
| 101.00 | 26.95 | 38,844.000 | 0.15 | 0.00 | 26.95 | 458.55 |

# Appendix C

## Pre-Developed Hydrographs

Subsection: Unit Hydrograph Summary
Label: Area 1A (Pre-Developed)
Scenario: WQDS

Return Event: 1 years
Storm Event: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

| | |
|---|---|
| Computational Time Increment | 3.37 min |
| Time to Peak (Computed) | 84.27 min |
| Flow (Peak, Computed) | 0.45 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 84.00 min |
| Flow (Peak Interpolated Output) | 0.45 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 77.0 |
| Area (User Defined) | 2.88 acres |
| Maximum Retention (Pervious) | 3.0 in |
| Maximum Retention (Pervious, 20 percent) | 0.6 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 0.1 in |
| Runoff Volume (Pervious) | 1,223.305 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 1,225.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 25.28 min |
| Computational Time Increment | 3.37 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 7.74 ft³/s |

Subsection: Unit Hydrograph Summary
Label: Area 1A (Pre-Developed)
Scenario: WQDS

Return Event: 1 years
Storm Event: WQDS

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 16.85 min |
| Unit receding limb, Tr | 67.41 min |
| Total unit time, Tb | 84.27 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Area 1A (Pre-Developed) Storm Event: WQDS
Scenario: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 60.00 | 0.00 | 0.01 | 0.04 | 0.10 | 0.19 |
| 75.00 | 0.28 | 0.36 | 0.42 | 0.45 | 0.44 |
| 90.00 | 0.42 | 0.40 | 0.38 | 0.36 | 0.34 |
| 105.00 | 0.32 | 0.31 | 0.29 | 0.27 | 0.24 |
| 120.00 | 0.22 | 0.19 | 0.16 | 0.14 | 0.11 |
| 135.00 | 0.09 | 0.07 | 0.05 | 0.04 | 0.03 |
| 150.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 |
| 165.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 180.00 | 0.00 | (N/A) | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

| | |
|---|---|
| Computational Time Increment | 3.37 min |
| Time to Peak (Computed) | 738.18 min |
| Flow (Peak, Computed) | 2.54 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 738.00 min |
| Flow (Peak Interpolated Output) | 2.53 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 77.0 |
| Area (User Defined) | 2.88 acres |
| Maximum Retention (Pervious) | 3.0 in |
| Maximum Retention (Pervious, 20 percent) | 0.6 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 1.3 in |
| Runoff Volume (Pervious) | 13,420.827 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 13,424.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 25.28 min |
| Computational Time Increment | 3.37 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 7.74 ft³/s |

Subsection: Unit Hydrograph Summary
Label: Area 1A (Pre-Developed)
Scenario: 2-Year

Return Event: 2 years
Storm Event: 2-Year

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 16.85 min |
| Unit receding limb, Tr | 67.41 min |
| Total unit time, Tb | 84.27 min |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 603.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 618.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 633.00 | 0.02 | 0.03 | 0.03 | 0.03 | 0.04 |
| 648.00 | 0.04 | 0.05 | 0.05 | 0.06 | 0.06 |
| 663.00 | 0.06 | 0.07 | 0.08 | 0.08 | 0.09 |
| 678.00 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 |
| 693.00 | 0.16 | 0.18 | 0.20 | 0.24 | 0.29 |
| 708.00 | 0.35 | 0.44 | 0.55 | 0.70 | 0.90 |
| 723.00 | 1.17 | 1.51 | 1.86 | 2.19 | 2.42 |
| 738.00 | 2.53 | 2.52 | 2.42 | 2.27 | 2.09 |
| 753.00 | 1.90 | 1.70 | 1.52 | 1.34 | 1.19 |
| 768.00 | 1.05 | 0.94 | 0.85 | 0.78 | 0.72 |
| 783.00 | 0.66 | 0.62 | 0.58 | 0.55 | 0.52 |
| 798.00 | 0.49 | 0.47 | 0.46 | 0.44 | 0.43 |
| 813.00 | 0.42 | 0.41 | 0.40 | 0.39 | 0.39 |
| 828.00 | 0.38 | 0.37 | 0.37 | 0.36 | 0.35 |
| 843.00 | 0.35 | 0.34 | 0.33 | 0.33 | 0.32 |
| 858.00 | 0.32 | 0.31 | 0.31 | 0.30 | 0.30 |
| 873.00 | 0.29 | 0.29 | 0.29 | 0.28 | 0.28 |
| 888.00 | 0.28 | 0.27 | 0.27 | 0.27 | 0.26 |
| 903.00 | 0.26 | 0.26 | 0.25 | 0.25 | 0.25 |
| 918.00 | 0.24 | 0.24 | 0.24 | 0.23 | 0.23 |
| 933.00 | 0.23 | 0.22 | 0.22 | 0.22 | 0.21 |
| 948.00 | 0.21 | 0.21 | 0.20 | 0.20 | 0.19 |
| 963.00 | 0.19 | 0.19 | 0.18 | 0.18 | 0.18 |
| 978.00 | 0.18 | 0.17 | 0.17 | 0.17 | 0.17 |
| 993.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,008.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,023.00 | 0.15 | 0.15 | 0.15 | 0.14 | 0.14 |
| 1,038.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.13 |
| 1,053.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,068.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,083.00 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,098.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1A (Pre-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,113.00 | 0.11 | 0.11 | 0.10 | 0.10 | 0.10 |
| 1,128.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,143.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,158.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,173.00 | 0.10 | 0.10 | 0.10 | 0.09 | 0.09 |
| 1,188.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,203.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,218.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,233.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,248.00 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,263.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,278.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,293.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,308.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,323.00 | 0.08 | 0.08 | 0.08 | 0.07 | 0.07 |
| 1,338.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,353.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,368.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,383.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,398.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,413.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,428.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,443.00 | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 |
| 1,458.00 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 |
| 1,473.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,488.00 | 0.00 | 0.00 | 0.00 | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

| | |
|---|---|
| Computational Time Increment | 3.37 min |
| Time to Peak (Computed) | 738.18 min |
| Flow (Peak, Computed) | 5.33 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 738.00 min |
| Flow (Peak Interpolated Output) | 5.32 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 77.0 |
| Area (User Defined) | 2.88 acres |
| Maximum Retention (Pervious) | 3.0 in |
| Maximum Retention (Pervious, 20 percent) | 0.6 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 2.6 in |
| Runoff Volume (Pervious) | 27,421.772 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 27,428.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 25.28 min |
| Computational Time Increment | 3.37 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 7.74 ft³/s |

Subsection: Unit Hydrograph Summary
Label: Area 1A (Pre-Developed)
Scenario: 10-Year

Return Event: 10 years
Storm Event: 10-Year

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 16.85 min |
| Unit receding limb, Tr | 67.41 min |
| Total unit time, Tb | 84.27 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1A (Pre-Developed) Storm Event: 10-Year
Scenario: 10-Year

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 504.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 519.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 534.00 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 |
| 549.00 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 |
| 564.00 | 0.05 | 0.05 | 0.06 | 0.06 | 0.07 |
| 579.00 | 0.07 | 0.08 | 0.08 | 0.08 | 0.09 |
| 594.00 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 |
| 609.00 | 0.12 | 0.13 | 0.13 | 0.14 | 0.15 |
| 624.00 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 |
| 639.00 | 0.20 | 0.21 | 0.22 | 0.23 | 0.24 |
| 654.00 | 0.25 | 0.26 | 0.27 | 0.28 | 0.29 |
| 669.00 | 0.31 | 0.32 | 0.34 | 0.36 | 0.38 |
| 684.00 | 0.41 | 0.44 | 0.47 | 0.50 | 0.55 |
| 699.00 | 0.61 | 0.70 | 0.82 | 0.97 | 1.17 |
| 714.00 | 1.42 | 1.75 | 2.19 | 2.76 | 3.44 |
| 729.00 | 4.14 | 4.76 | 5.17 | 5.32 | 5.22 |
| 744.00 | 4.95 | 4.59 | 4.19 | 3.77 | 3.37 |
| 759.00 | 2.98 | 2.62 | 2.30 | 2.03 | 1.81 |
| 774.00 | 1.63 | 1.48 | 1.36 | 1.25 | 1.16 |
| 789.00 | 1.09 | 1.02 | 0.97 | 0.92 | 0.88 |
| 804.00 | 0.85 | 0.82 | 0.80 | 0.78 | 0.76 |
| 819.00 | 0.74 | 0.73 | 0.71 | 0.70 | 0.68 |
| 834.00 | 0.67 | 0.66 | 0.65 | 0.63 | 0.62 |
| 849.00 | 0.61 | 0.60 | 0.59 | 0.58 | 0.57 |
| 864.00 | 0.56 | 0.55 | 0.54 | 0.54 | 0.53 |
| 879.00 | 0.52 | 0.52 | 0.51 | 0.50 | 0.50 |
| 894.00 | 0.49 | 0.48 | 0.48 | 0.47 | 0.46 |
| 909.00 | 0.46 | 0.45 | 0.45 | 0.44 | 0.43 |
| 924.00 | 0.43 | 0.42 | 0.41 | 0.41 | 0.40 |
| 939.00 | 0.39 | 0.39 | 0.38 | 0.38 | 0.37 |
| 954.00 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 969.00 | 0.33 | 0.32 | 0.32 | 0.31 | 0.31 |
| 984.00 | 0.31 | 0.30 | 0.30 | 0.29 | 0.29 |
| 999.00 | 0.29 | 0.29 | 0.28 | 0.28 | 0.28 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1A (Pre-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,014.00 | 0.27 | 0.27 | 0.27 | 0.26 | 0.26 |
| 1,029.00 | 0.26 | 0.26 | 0.25 | 0.25 | 0.25 |
| 1,044.00 | 0.24 | 0.24 | 0.24 | 0.24 | 0.23 |
| 1,059.00 | 0.23 | 0.23 | 0.22 | 0.22 | 0.22 |
| 1,074.00 | 0.22 | 0.21 | 0.21 | 0.21 | 0.20 |
| 1,089.00 | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 |
| 1,104.00 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| 1,119.00 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,134.00 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,149.00 | 0.18 | 0.18 | 0.17 | 0.17 | 0.17 |
| 1,164.00 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| 1,179.00 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 |
| 1,194.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,209.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,224.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,239.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,254.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,269.00 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,284.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,299.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,314.00 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 |
| 1,329.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,344.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,359.00 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 |
| 1,374.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,389.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,404.00 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 |
| 1,419.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,434.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.10 |
| 1,449.00 | 0.09 | 0.08 | 0.07 | 0.05 | 0.04 |
| 1,464.00 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 |
| 1,479.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,494.00 | 0.00 | 0.00 | 0.00 | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

| | |
|---|---|
| Computational Time Increment | 3.37 min |
| Time to Peak (Computed) | 738.18 min |
| Flow (Peak, Computed) | 11.02 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 738.00 min |
| Flow (Peak Interpolated Output) | 11.01 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 77.0 |
| Area (User Defined) | 2.88 acres |
| Maximum Retention (Pervious) | 3.0 in |
| Maximum Retention (Pervious, 20 percent) | 0.6 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 5.5 in |
| Runoff Volume (Pervious) | 57,061.491 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 57,074.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 25.28 min |
| Computational Time Increment | 3.37 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 7.74 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 16.85 min |
| Unit receding limb, Tr | 67.41 min |
| Total unit time, Tb | 84.27 min |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 25.28 min |
| Area (User Defined) | 2.88 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 375.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 390.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 405.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 420.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 |
| 435.00 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 |
| 450.00 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 |
| 465.00 | 0.07 | 0.08 | 0.08 | 0.08 | 0.09 |
| 480.00 | 0.09 | 0.10 | 0.10 | 0.10 | 0.11 |
| 495.00 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 |
| 510.00 | 0.14 | 0.15 | 0.15 | 0.16 | 0.17 |
| 525.00 | 0.18 | 0.18 | 0.19 | 0.20 | 0.21 |
| 540.00 | 0.21 | 0.22 | 0.23 | 0.24 | 0.25 |
| 555.00 | 0.26 | 0.27 | 0.28 | 0.29 | 0.30 |
| 570.00 | 0.31 | 0.32 | 0.33 | 0.34 | 0.35 |
| 585.00 | 0.36 | 0.37 | 0.38 | 0.39 | 0.40 |
| 600.00 | 0.42 | 0.43 | 0.44 | 0.45 | 0.47 |
| 615.00 | 0.48 | 0.50 | 0.51 | 0.53 | 0.55 |
| 630.00 | 0.57 | 0.59 | 0.61 | 0.63 | 0.65 |
| 645.00 | 0.67 | 0.69 | 0.72 | 0.74 | 0.76 |
| 660.00 | 0.79 | 0.81 | 0.84 | 0.87 | 0.90 |
| 675.00 | 0.94 | 0.99 | 1.04 | 1.10 | 1.16 |
| 690.00 | 1.23 | 1.31 | 1.42 | 1.56 | 1.76 |
| 705.00 | 2.03 | 2.38 | 2.83 | 3.38 | 4.08 |
| 720.00 | 4.99 | 6.16 | 7.53 | 8.91 | 10.08 |
| 735.00 | 10.82 | 11.01 | 10.69 | 10.06 | 9.26 |
| 750.00 | 8.38 | 7.50 | 6.66 | 5.86 | 5.13 |
| 765.00 | 4.49 | 3.95 | 3.51 | 3.15 | 2.85 |
| 780.00 | 2.60 | 2.40 | 2.22 | 2.07 | 1.94 |
| 795.00 | 1.83 | 1.74 | 1.66 | 1.60 | 1.54 |
| 810.00 | 1.50 | 1.46 | 1.43 | 1.39 | 1.36 |
| 825.00 | 1.34 | 1.31 | 1.28 | 1.26 | 1.23 |
| 840.00 | 1.21 | 1.18 | 1.16 | 1.13 | 1.11 |
| 855.00 | 1.09 | 1.07 | 1.05 | 1.04 | 1.02 |
| 870.00 | 1.01 | 0.99 | 0.98 | 0.97 | 0.96 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1A (Pre-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 885.00 | 0.94 | 0.93 | 0.92 | 0.91 | 0.89 |
| 900.00 | 0.88 | 0.87 | 0.86 | 0.85 | 0.83 |
| 915.00 | 0.82 | 0.81 | 0.80 | 0.79 | 0.77 |
| 930.00 | 0.76 | 0.75 | 0.74 | 0.73 | 0.71 |
| 945.00 | 0.70 | 0.69 | 0.68 | 0.67 | 0.65 |
| 960.00 | 0.64 | 0.63 | 0.62 | 0.61 | 0.60 |
| 975.00 | 0.59 | 0.58 | 0.57 | 0.56 | 0.55 |
| 990.00 | 0.55 | 0.54 | 0.53 | 0.53 | 0.52 |
| 1,005.00 | 0.52 | 0.51 | 0.51 | 0.50 | 0.50 |
| 1,020.00 | 0.49 | 0.48 | 0.48 | 0.47 | 0.47 |
| 1,035.00 | 0.46 | 0.46 | 0.45 | 0.45 | 0.44 |
| 1,050.00 | 0.44 | 0.43 | 0.43 | 0.42 | 0.41 |
| 1,065.00 | 0.41 | 0.40 | 0.40 | 0.39 | 0.39 |
| 1,080.00 | 0.38 | 0.38 | 0.37 | 0.37 | 0.36 |
| 1,095.00 | 0.36 | 0.35 | 0.35 | 0.35 | 0.35 |
| 1,110.00 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| 1,125.00 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| 1,140.00 | 0.33 | 0.32 | 0.32 | 0.32 | 0.32 |
| 1,155.00 | 0.32 | 0.32 | 0.31 | 0.31 | 0.31 |
| 1,170.00 | 0.31 | 0.31 | 0.31 | 0.31 | 0.30 |
| 1,185.00 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| 1,200.00 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 |
| 1,215.00 | 0.29 | 0.28 | 0.28 | 0.28 | 0.28 |
| 1,230.00 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 |
| 1,245.00 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| 1,260.00 | 0.27 | 0.27 | 0.26 | 0.26 | 0.26 |
| 1,275.00 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| 1,290.00 | 0.26 | 0.25 | 0.25 | 0.25 | 0.25 |
| 1,305.00 | 0.25 | 0.25 | 0.25 | 0.25 | 0.24 |
| 1,320.00 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 |
| 1,335.00 | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 |
| 1,350.00 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| 1,365.00 | 0.23 | 0.22 | 0.22 | 0.22 | 0.22 |
| 1,380.00 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 |
| 1,395.00 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| 1,410.00 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 |
| 1,425.00 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| 1,440.00 | 0.19 | 0.19 | 0.18 | 0.17 | 0.15 |
| 1,455.00 | 0.12 | 0.10 | 0.07 | 0.05 | 0.04 |
| 1,470.00 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 |
| 1,485.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

| | |
|---|---|
| Computational Time Increment | 3.15 min |
| Time to Peak (Computed) | 81.85 min |
| Flow (Peak, Computed) | 0.11 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 81.00 min |
| Flow (Peak Interpolated Output) | 0.11 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.8 |
| Area (User Defined) | 0.38 acres |
| Maximum Retention (Pervious) | 2.4 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 0.2 in |
| Runoff Volume (Pervious) | 262.766 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 262.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 23.61 min |
| Computational Time Increment | 3.15 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 1.09 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 15.74 min |
| Unit receding limb, Tr | 62.96 min |
| Total unit time, Tb | 78.70 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Area 1B (Pre-Developed) Storm Event: WQDS
Scenario: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 57.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.04 |
| 72.00 | 0.06 | 0.09 | 0.10 | 0.11 | 0.11 |
| 87.00 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 |
| 102.00 | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 |
| 117.00 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 |
| 132.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| 147.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 162.00 | 0.00 | (N/A) | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

| | |
|---|---|
| Computational Time Increment | 3.15 min |
| Time to Peak (Computed) | 736.63 min |
| Flow (Peak, Computed) | 0.42 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 738.00 min |
| Flow (Peak Interpolated Output) | 0.42 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.8 |
| Area (User Defined) | 0.38 acres |
| Maximum Retention (Pervious) | 2.4 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 1.5 in |
| Runoff Volume (Pervious) | 2,116.240 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 2,115.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 23.61 min |
| Computational Time Increment | 3.15 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 1.09 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 15.74 min |
| Unit receding limb, Tr | 62.96 min |
| Total unit time, Tb | 78.70 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1B (Pre-Developed) Storm Event: 2-Year
Scenario: 2-Year

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 564.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 579.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 594.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 609.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 624.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 639.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 654.00 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 |
| 669.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| 684.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 |
| 699.00 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 |
| 714.00 | 0.11 | 0.13 | 0.17 | 0.22 | 0.28 |
| 729.00 | 0.33 | 0.38 | 0.41 | 0.42 | 0.41 |
| 744.00 | 0.38 | 0.35 | 0.32 | 0.29 | 0.25 |
| 759.00 | 0.22 | 0.20 | 0.17 | 0.15 | 0.13 |
| 774.00 | 0.12 | 0.11 | 0.10 | 0.10 | 0.09 |
| 789.00 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 |
| 804.00 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| 819.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.05 |
| 834.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 849.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 864.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 879.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 894.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 909.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 |
| 924.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 939.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 954.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 969.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 984.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 999.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,014.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,029.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,044.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,059.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1B (Pre-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,074.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,089.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,104.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,119.00 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 |
| 1,134.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,149.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,164.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,179.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,194.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,209.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,224.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,239.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,254.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,269.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,284.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,299.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,314.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,329.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,344.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,359.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,374.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,389.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,404.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,419.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,434.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,449.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 1,464.00 | 0.00 | 0.00 | 0.00 | 0.00 | (N/A) |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

| | |
|---|---|
| Computational Time Increment | 3.15 min |
| Time to Peak (Computed) | 736.63 min |
| Flow (Peak, Computed) | 0.82 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 738.00 min |
| Flow (Peak Interpolated Output) | 0.81 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.8 |
| Area (User Defined) | 0.38 acres |
| Maximum Retention (Pervious) | 2.4 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 3.0 in |
| Runoff Volume (Pervious) | 4,092.309 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 4,091.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 23.61 min |
| Computational Time Increment | 3.15 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 1.09 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 15.74 min |
| Unit receding limb, Tr | 62.96 min |
| Total unit time, Tb | 78.70 min |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 465.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 480.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 495.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 510.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 525.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 540.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 555.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 570.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 585.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 600.00 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 |
| 615.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 630.00 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 |
| 645.00 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 |
| 660.00 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 |
| 675.00 | 0.06 | 0.06 | 0.07 | 0.07 | 0.08 |
| 690.00 | 0.08 | 0.09 | 0.09 | 0.10 | 0.12 |
| 705.00 | 0.14 | 0.17 | 0.20 | 0.24 | 0.30 |
| 720.00 | 0.37 | 0.46 | 0.57 | 0.67 | 0.76 |
| 735.00 | 0.81 | 0.81 | 0.78 | 0.73 | 0.66 |
| 750.00 | 0.60 | 0.53 | 0.47 | 0.41 | 0.36 |
| 765.00 | 0.31 | 0.27 | 0.24 | 0.22 | 0.20 |
| 780.00 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 |
| 795.00 | 0.13 | 0.13 | 0.12 | 0.12 | 0.11 |
| 810.00 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 |
| 825.00 | 0.10 | 0.10 | 0.10 | 0.09 | 0.09 |
| 840.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.08 |
| 855.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 870.00 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 |
| 885.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 900.00 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 |
| 915.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 930.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.05 |
| 945.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 960.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1B (Pre-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 975.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 990.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,005.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,020.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,035.00 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,050.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,065.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,080.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,095.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,110.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,125.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,140.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,155.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,170.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,185.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,200.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,215.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,230.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,245.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,260.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,275.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,290.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,305.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,320.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,335.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,350.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,365.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,380.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,395.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,410.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,425.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,440.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,455.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,470.00 | 0.00 | 0.00 | 0.00 | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

| | |
|---|---|
| Computational Time Increment | 3.15 min |
| Time to Peak (Computed) | 736.63 min |
| Flow (Peak, Computed) | 1.60 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 1.59 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.8 |
| Area (User Defined) | 0.38 acres |
| Maximum Retention (Pervious) | 2.4 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 5.9 in |
| Runoff Volume (Pervious) | 8,148.833 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 8,145.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 23.61 min |
| Computational Time Increment | 3.15 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 1.09 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 15.74 min |
| Unit receding limb, Tr | 62.96 min |
| Total unit time, Tb | 78.70 min |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 23.61 min |
| Area (User Defined) | 0.38 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 333.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 348.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 363.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 378.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| 393.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 408.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 423.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 438.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 453.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 468.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 483.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 498.00 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 |
| 513.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 528.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 543.00 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 |
| 558.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 573.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 588.00 | 0.06 | 0.07 | 0.07 | 0.07 | 0.07 |
| 603.00 | 0.07 | 0.07 | 0.08 | 0.08 | 0.08 |
| 618.00 | 0.08 | 0.08 | 0.09 | 0.09 | 0.09 |
| 633.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.11 |
| 648.00 | 0.11 | 0.11 | 0.12 | 0.12 | 0.12 |
| 663.00 | 0.13 | 0.13 | 0.14 | 0.14 | 0.15 |
| 678.00 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 |
| 693.00 | 0.20 | 0.22 | 0.24 | 0.27 | 0.31 |
| 708.00 | 0.37 | 0.44 | 0.53 | 0.63 | 0.77 |
| 723.00 | 0.95 | 1.16 | 1.36 | 1.51 | 1.59 |
| 738.00 | 1.58 | 1.51 | 1.39 | 1.26 | 1.13 |
| 753.00 | 1.00 | 0.88 | 0.77 | 0.67 | 0.58 |
| 768.00 | 0.51 | 0.45 | 0.41 | 0.37 | 0.34 |
| 783.00 | 0.31 | 0.29 | 0.27 | 0.26 | 0.24 |
| 798.00 | 0.23 | 0.22 | 0.21 | 0.21 | 0.20 |
| 813.00 | 0.20 | 0.19 | 0.19 | 0.18 | 0.18 |
| 828.00 | 0.18 | 0.17 | 0.17 | 0.17 | 0.16 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1B (Pre-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 843.00 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 |
| 858.00 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 |
| 873.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 888.00 | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 |
| 903.00 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 |
| 918.00 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 |
| 933.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.09 |
| 948.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 963.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 978.00 | 0.08 | 0.08 | 0.08 | 0.07 | 0.07 |
| 993.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,008.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,023.00 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,038.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,053.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,068.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,083.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,098.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,113.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,128.00 | 0.05 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,143.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,158.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,173.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,188.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,203.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,218.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,233.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,248.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,263.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,278.00 | 0.04 | 0.04 | 0.03 | 0.03 | 0.03 |
| 1,293.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,308.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,323.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,338.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,353.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,368.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,383.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,398.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,413.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,428.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,443.00 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,458.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 1,473.00 | 0.00 | 0.00 | 0.00 | 0.00 | (N/A) |

# Appendix D

## Post-Developed Hydrographs

Subsection: Unit Hydrograph Summary
Label: Area 1A Imervious (Post-Developed)
Scenario: WQDS

Return Event: 1 years
Storm Event: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 73.53 min |
| Flow (Peak, Computed) | 2.20 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 75.00 min |
| Flow (Peak Interpolated Output) | 2.17 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 98.0 |
| Area (User Defined) | 1.18 acres |
| Maximum Retention (Pervious) | 0.2 in |
| Maximum Retention (Pervious, 20 percent) | 0.0 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 1.0 in |
| Runoff Volume (Pervious) | 4,431.487 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 4,425.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 3.78 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Area 1A Imervious (Post-Developed) Storm Event: WQDS
Scenario: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 21.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.04 |
| 36.00 | 0.06 | 0.09 | 0.12 | 0.16 | 0.20 |
| 51.00 | 0.25 | 0.32 | 0.45 | 0.68 | 1.03 |
| 66.00 | 1.46 | 1.87 | 2.12 | 2.17 | 2.03 |
| 81.00 | 1.78 | 1.49 | 1.22 | 1.01 | 0.85 |
| 96.00 | 0.73 | 0.64 | 0.56 | 0.50 | 0.46 |
| 111.00 | 0.41 | 0.36 | 0.31 | 0.26 | 0.22 |
| 126.00 | 0.18 | 0.14 | 0.11 | 0.08 | 0.06 |
| 141.00 | 0.04 | 0.03 | 0.02 | 0.01 | 0.01 |
| 156.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 171.00 | 0.00 | (N/A) | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 2.45 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 2.45 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 98.0 |
| Area (User Defined) | 1.18 acres |
| Maximum Retention (Pervious) | 0.2 in |
| Maximum Retention (Pervious, 20 percent) | 0.0 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 3.1 in |
| Runoff Volume (Pervious) | 13,137.736 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 13,142.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 3.78 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 93.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 108.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 123.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 138.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 153.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 168.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 183.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 198.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 213.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 228.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| 243.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 258.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 273.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 288.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 |
| 303.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 318.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 333.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 348.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 363.00 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 |
| 378.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 393.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 |
| 408.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 423.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 |
| 438.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 453.00 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 468.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 483.00 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| 498.00 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 |
| 513.00 | 0.10 | 0.10 | 0.10 | 0.11 | 0.11 |
| 528.00 | 0.11 | 0.11 | 0.12 | 0.12 | 0.12 |
| 543.00 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 |
| 558.00 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 |
| 573.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 588.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.17 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 603.00 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 |
| 618.00 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 |
| 633.00 | 0.21 | 0.21 | 0.21 | 0.22 | 0.22 |
| 648.00 | 0.23 | 0.23 | 0.24 | 0.24 | 0.25 |
| 663.00 | 0.25 | 0.26 | 0.27 | 0.27 | 0.28 |
| 678.00 | 0.30 | 0.31 | 0.32 | 0.34 | 0.36 |
| 693.00 | 0.37 | 0.40 | 0.44 | 0.50 | 0.58 |
| 708.00 | 0.68 | 0.80 | 0.94 | 1.12 | 1.34 |
| 723.00 | 1.63 | 1.95 | 2.24 | 2.42 | 2.45 |
| 738.00 | 2.35 | 2.16 | 1.94 | 1.71 | 1.51 |
| 753.00 | 1.32 | 1.14 | 0.98 | 0.84 | 0.73 |
| 768.00 | 0.64 | 0.57 | 0.51 | 0.47 | 0.43 |
| 783.00 | 0.40 | 0.37 | 0.35 | 0.33 | 0.31 |
| 798.00 | 0.30 | 0.29 | 0.28 | 0.27 | 0.27 |
| 813.00 | 0.26 | 0.26 | 0.25 | 0.25 | 0.24 |
| 828.00 | 0.24 | 0.23 | 0.23 | 0.22 | 0.22 |
| 843.00 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 |
| 858.00 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 |
| 873.00 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 |
| 888.00 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 |
| 903.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 918.00 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 |
| 933.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 948.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.11 |
| 963.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.10 |
| 978.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 993.00 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 |
| 1,008.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,023.00 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 |
| 1,038.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,053.00 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 |
| 1,068.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,083.00 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 |
| 1,098.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,113.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,128.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,143.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,158.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,173.00 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,188.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,203.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,218.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,233.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,248.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,263.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,278.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,293.00 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 |
| 1,308.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,323.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,338.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,353.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,368.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,383.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,398.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,413.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,428.00 | 0.04 | 0.04 | 0.03 | 0.03 | 0.03 |
| 1,443.00 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 |
| 1,458.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 1,473.00 | 0.00 | 0.00 | 0.00 | 0.00 | (N/A) |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 3.74 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 3.74 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 98.0 |
| Area (User Defined) | 1.18 acres |
| Maximum Retention (Pervious) | 0.2 in |
| Maximum Retention (Pervious, 20 percent) | 0.0 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 4.8 in |
| Runoff Volume (Pervious) | 20,402.556 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 20,410.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 3.78 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 63.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 78.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 93.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 108.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 123.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 138.00 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 |
| 153.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 168.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 |
| 183.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 198.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 213.00 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 |
| 228.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 243.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 258.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 273.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 288.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 303.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 318.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 333.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 348.00 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 |
| 363.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 378.00 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| 393.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 408.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 423.00 | 0.10 | 0.11 | 0.11 | 0.11 | 0.11 |
| 438.00 | 0.11 | 0.11 | 0.11 | 0.12 | 0.12 |
| 453.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.13 |
| 468.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 483.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 498.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.16 |
| 513.00 | 0.16 | 0.16 | 0.17 | 0.17 | 0.17 |
| 528.00 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 |
| 543.00 | 0.20 | 0.20 | 0.20 | 0.21 | 0.21 |
| 558.00 | 0.21 | 0.22 | 0.22 | 0.22 | 0.23 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 573.00 | 0.23 | 0.23 | 0.24 | 0.24 | 0.24 |
| 588.00 | 0.25 | 0.25 | 0.25 | 0.26 | 0.26 |
| 603.00 | 0.27 | 0.27 | 0.27 | 0.28 | 0.28 |
| 618.00 | 0.29 | 0.29 | 0.30 | 0.31 | 0.31 |
| 633.00 | 0.32 | 0.33 | 0.33 | 0.34 | 0.35 |
| 648.00 | 0.36 | 0.36 | 0.37 | 0.38 | 0.38 |
| 663.00 | 0.39 | 0.40 | 0.41 | 0.42 | 0.44 |
| 678.00 | 0.46 | 0.48 | 0.50 | 0.52 | 0.55 |
| 693.00 | 0.58 | 0.62 | 0.68 | 0.77 | 0.89 |
| 708.00 | 1.05 | 1.24 | 1.45 | 1.71 | 2.06 |
| 723.00 | 2.50 | 2.99 | 3.42 | 3.69 | 3.74 |
| 738.00 | 3.58 | 3.29 | 2.95 | 2.61 | 2.30 |
| 753.00 | 2.01 | 1.74 | 1.49 | 1.28 | 1.11 |
| 768.00 | 0.97 | 0.86 | 0.78 | 0.71 | 0.65 |
| 783.00 | 0.61 | 0.56 | 0.53 | 0.50 | 0.48 |
| 798.00 | 0.46 | 0.44 | 0.43 | 0.42 | 0.41 |
| 813.00 | 0.40 | 0.39 | 0.38 | 0.37 | 0.37 |
| 828.00 | 0.36 | 0.35 | 0.35 | 0.34 | 0.33 |
| 843.00 | 0.32 | 0.32 | 0.31 | 0.30 | 0.30 |
| 858.00 | 0.29 | 0.29 | 0.28 | 0.28 | 0.28 |
| 873.00 | 0.27 | 0.27 | 0.27 | 0.26 | 0.26 |
| 888.00 | 0.26 | 0.25 | 0.25 | 0.25 | 0.24 |
| 903.00 | 0.24 | 0.23 | 0.23 | 0.23 | 0.22 |
| 918.00 | 0.22 | 0.22 | 0.21 | 0.21 | 0.21 |
| 933.00 | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 |
| 948.00 | 0.19 | 0.18 | 0.18 | 0.18 | 0.17 |
| 963.00 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 |
| 978.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 993.00 | 0.15 | 0.15 | 0.14 | 0.14 | 0.14 |
| 1,008.00 | 0.14 | 0.14 | 0.14 | 0.13 | 0.13 |
| 1,023.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,038.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,053.00 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 |
| 1,068.00 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 |
| 1,083.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,098.00 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 |
| 1,113.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,128.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,143.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,158.00 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 |
| 1,173.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,188.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,203.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,218.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,233.00 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 |
| 1,248.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,263.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,278.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,293.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,308.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,323.00 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 |
| 1,338.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,353.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,368.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,383.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,398.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,413.00 | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 |
| 1,428.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,443.00 | 0.05 | 0.05 | 0.04 | 0.03 | 0.03 |
| 1,458.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 |
| 1,473.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 6.16 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 6.16 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 98.0 |
| Area (User Defined) | 1.18 acres |
| Maximum Retention (Pervious) | 0.2 in |
| Maximum Retention (Pervious, 20 percent) | 0.0 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 8.0 in |
| Runoff Volume (Pervious) | 34,096.216 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 34,108.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 3.78 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.18 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 39.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 54.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| 69.00 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 |
| 84.00 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 |
| 99.00 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 |
| 114.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 |
| 129.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 144.00 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 |
| 159.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 174.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 189.00 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| 204.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 219.00 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 |
| 234.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 249.00 | 0.10 | 0.11 | 0.11 | 0.11 | 0.11 |
| 264.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 279.00 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 |
| 294.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 309.00 | 0.12 | 0.13 | 0.13 | 0.13 | 0.13 |
| 324.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 339.00 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 |
| 354.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 369.00 | 0.14 | 0.14 | 0.15 | 0.15 | 0.15 |
| 384.00 | 0.15 | 0.15 | 0.16 | 0.16 | 0.16 |
| 399.00 | 0.16 | 0.17 | 0.17 | 0.17 | 0.17 |
| 414.00 | 0.18 | 0.18 | 0.18 | 0.18 | 0.19 |
| 429.00 | 0.19 | 0.19 | 0.19 | 0.20 | 0.20 |
| 444.00 | 0.20 | 0.20 | 0.21 | 0.21 | 0.21 |
| 459.00 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 |
| 474.00 | 0.23 | 0.23 | 0.23 | 0.23 | 0.24 |
| 489.00 | 0.24 | 0.24 | 0.25 | 0.25 | 0.25 |
| 504.00 | 0.26 | 0.27 | 0.27 | 0.28 | 0.28 |
| 519.00 | 0.29 | 0.29 | 0.30 | 0.30 | 0.31 |
| 534.00 | 0.31 | 0.32 | 0.33 | 0.33 | 0.34 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 549.00 | 0.34 | 0.35 | 0.35 | 0.36 | 0.37 |
| 564.00 | 0.37 | 0.38 | 0.38 | 0.39 | 0.39 |
| 579.00 | 0.40 | 0.41 | 0.41 | 0.42 | 0.42 |
| 594.00 | 0.43 | 0.43 | 0.44 | 0.45 | 0.45 |
| 609.00 | 0.46 | 0.47 | 0.47 | 0.48 | 0.49 |
| 624.00 | 0.50 | 0.51 | 0.52 | 0.54 | 0.55 |
| 639.00 | 0.56 | 0.57 | 0.58 | 0.59 | 0.60 |
| 654.00 | 0.62 | 0.63 | 0.64 | 0.65 | 0.67 |
| 669.00 | 0.68 | 0.70 | 0.73 | 0.76 | 0.79 |
| 684.00 | 0.83 | 0.87 | 0.91 | 0.96 | 1.02 |
| 699.00 | 1.13 | 1.27 | 1.48 | 1.74 | 2.04 |
| 714.00 | 2.40 | 2.83 | 3.40 | 4.12 | 4.92 |
| 729.00 | 5.63 | 6.08 | 6.16 | 5.89 | 5.41 |
| 744.00 | 4.86 | 4.30 | 3.78 | 3.30 | 2.85 |
| 759.00 | 2.45 | 2.10 | 1.82 | 1.59 | 1.42 |
| 774.00 | 1.28 | 1.17 | 1.07 | 1.00 | 0.93 |
| 789.00 | 0.87 | 0.82 | 0.78 | 0.75 | 0.73 |
| 804.00 | 0.70 | 0.69 | 0.67 | 0.65 | 0.64 |
| 819.00 | 0.63 | 0.62 | 0.60 | 0.59 | 0.58 |
| 834.00 | 0.57 | 0.56 | 0.54 | 0.53 | 0.52 |
| 849.00 | 0.51 | 0.50 | 0.49 | 0.48 | 0.47 |
| 864.00 | 0.47 | 0.46 | 0.45 | 0.45 | 0.44 |
| 879.00 | 0.44 | 0.43 | 0.43 | 0.42 | 0.41 |
| 894.00 | 0.41 | 0.40 | 0.40 | 0.39 | 0.39 |
| 909.00 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 |
| 924.00 | 0.35 | 0.35 | 0.34 | 0.34 | 0.33 |
| 939.00 | 0.32 | 0.32 | 0.31 | 0.31 | 0.30 |
| 954.00 | 0.30 | 0.29 | 0.28 | 0.28 | 0.27 |
| 969.00 | 0.27 | 0.26 | 0.26 | 0.26 | 0.25 |
| 984.00 | 0.25 | 0.25 | 0.24 | 0.24 | 0.24 |
| 999.00 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 |
| 1,014.00 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 |
| 1,029.00 | 0.21 | 0.21 | 0.21 | 0.20 | 0.20 |
| 1,044.00 | 0.20 | 0.20 | 0.19 | 0.19 | 0.19 |
| 1,059.00 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,074.00 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 |
| 1,089.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,104.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,119.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,134.00 | 0.15 | 0.15 | 0.15 | 0.14 | 0.14 |
| 1,149.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,164.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,179.00 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1A Imervious (Post-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,194.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,209.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,224.00 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 |
| 1,239.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,254.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,269.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,284.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,299.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,314.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,329.00 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 |
| 1,344.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,359.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,374.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,389.00 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,404.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,419.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,434.00 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 |
| 1,449.00 | 0.07 | 0.06 | 0.04 | 0.03 | 0.02 |
| 1,464.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 |
| 1,479.00 | 0.00 | 0.00 | 0.00 | 0.00 | (N/A) |

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 79.18 min |
| Flow (Peak, Computed) | 0.48 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 81.00 min |
| Flow (Peak Interpolated Output) | 0.48 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 79.8 |
| Area (User Defined) | 1.82 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 0.2 in |
| Runoff Volume (Pervious) | 1,115.945 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 1,115.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 5.83 ft³/s |

Subsection: Unit Hydrograph Summary
Label: Area 1A Pervious (Post-Developed)
Scenario: WQDS

Return Event: 1 years
Storm Event: WQDS

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Area 1A Pervious (Post-Developed) Storm Event: WQDS
Scenario: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 57.00 | 0.00 | 0.00 | 0.03 | 0.09 | 0.19 |
| 72.00 | 0.32 | 0.41 | 0.47 | 0.48 | 0.45 |
| 87.00 | 0.41 | 0.37 | 0.33 | 0.31 | 0.29 |
| 102.00 | 0.27 | 0.25 | 0.24 | 0.22 | 0.20 |
| 117.00 | 0.18 | 0.15 | 0.13 | 0.11 | 0.09 |
| 132.00 | 0.07 | 0.05 | 0.04 | 0.03 | 0.02 |
| 147.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 162.00 | 0.00 | 0.00 | 0.00 | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 1.99 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 1.99 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 79.8 |
| Area (User Defined) | 1.82 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 1.5 in |
| Runoff Volume (Pervious) | 9,683.711 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 9,689.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 5.83 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 564.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 579.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 594.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| 609.00 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 |
| 624.00 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 |
| 639.00 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 |
| 654.00 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 |
| 669.00 | 0.08 | 0.09 | 0.10 | 0.10 | 0.11 |
| 684.00 | 0.12 | 0.13 | 0.14 | 0.15 | 0.17 |
| 699.00 | 0.19 | 0.23 | 0.28 | 0.34 | 0.43 |
| 714.00 | 0.53 | 0.66 | 0.84 | 1.09 | 1.39 |
| 729.00 | 1.67 | 1.89 | 1.99 | 1.96 | 1.86 |
| 744.00 | 1.71 | 1.55 | 1.39 | 1.23 | 1.08 |
| 759.00 | 0.94 | 0.82 | 0.72 | 0.63 | 0.57 |
| 774.00 | 0.52 | 0.48 | 0.44 | 0.41 | 0.39 |
| 789.00 | 0.36 | 0.35 | 0.33 | 0.32 | 0.31 |
| 804.00 | 0.30 | 0.29 | 0.29 | 0.28 | 0.28 |
| 819.00 | 0.27 | 0.27 | 0.26 | 0.26 | 0.25 |
| 834.00 | 0.25 | 0.24 | 0.24 | 0.23 | 0.23 |
| 849.00 | 0.22 | 0.22 | 0.22 | 0.21 | 0.21 |
| 864.00 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 |
| 879.00 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| 894.00 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 |
| 909.00 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 |
| 924.00 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 |
| 939.00 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 |
| 954.00 | 0.14 | 0.13 | 0.13 | 0.13 | 0.13 |
| 969.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 984.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 999.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.10 |
| 1,014.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,029.00 | 0.10 | 0.10 | 0.10 | 0.09 | 0.09 |
| 1,044.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,059.00 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1A Pervious (Post-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,074.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,089.00 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 |
| 1,104.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,119.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,134.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,149.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,164.00 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 |
| 1,179.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,194.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,209.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,224.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,239.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,254.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 1,269.00 | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 |
| 1,284.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,299.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,314.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,329.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,344.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,359.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,374.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,389.00 | 0.05 | 0.05 | 0.05 | 0.04 | 0.04 |
| 1,404.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,419.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,434.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,449.00 | 0.03 | 0.03 | 0.02 | 0.02 | 0.01 |
| 1,464.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,479.00 | 0.00 | 0.00 | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 3.96 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 3.95 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 79.8 |
| Area (User Defined) | 1.82 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 2.9 in |
| Runoff Volume (Pervious) | 18,991.321 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 19,000.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 5.83 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 462.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 477.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| 492.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 507.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 522.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 537.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 |
| 552.00 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 |
| 567.00 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 |
| 582.00 | 0.08 | 0.08 | 0.09 | 0.09 | 0.09 |
| 597.00 | 0.10 | 0.10 | 0.10 | 0.11 | 0.11 |
| 612.00 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 |
| 627.00 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 |
| 642.00 | 0.18 | 0.18 | 0.19 | 0.20 | 0.21 |
| 657.00 | 0.22 | 0.22 | 0.23 | 0.24 | 0.25 |
| 672.00 | 0.26 | 0.28 | 0.29 | 0.31 | 0.33 |
| 687.00 | 0.36 | 0.38 | 0.41 | 0.44 | 0.50 |
| 702.00 | 0.58 | 0.69 | 0.83 | 1.00 | 1.21 |
| 717.00 | 1.48 | 1.85 | 2.34 | 2.90 | 3.43 |
| 732.00 | 3.81 | 3.95 | 3.85 | 3.61 | 3.29 |
| 747.00 | 2.95 | 2.63 | 2.32 | 2.02 | 1.75 |
| 762.00 | 1.52 | 1.32 | 1.16 | 1.04 | 0.94 |
| 777.00 | 0.87 | 0.80 | 0.75 | 0.70 | 0.66 |
| 792.00 | 0.62 | 0.59 | 0.57 | 0.55 | 0.54 |
| 807.00 | 0.52 | 0.51 | 0.50 | 0.49 | 0.48 |
| 822.00 | 0.47 | 0.46 | 0.46 | 0.45 | 0.44 |
| 837.00 | 0.43 | 0.42 | 0.41 | 0.40 | 0.40 |
| 852.00 | 0.39 | 0.38 | 0.38 | 0.37 | 0.36 |
| 867.00 | 0.36 | 0.35 | 0.35 | 0.35 | 0.34 |
| 882.00 | 0.34 | 0.33 | 0.33 | 0.32 | 0.32 |
| 897.00 | 0.32 | 0.31 | 0.31 | 0.30 | 0.30 |
| 912.00 | 0.30 | 0.29 | 0.29 | 0.28 | 0.28 |
| 927.00 | 0.27 | 0.27 | 0.27 | 0.26 | 0.26 |
| 942.00 | 0.25 | 0.25 | 0.24 | 0.24 | 0.24 |
| 957.00 | 0.23 | 0.23 | 0.22 | 0.22 | 0.21 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1A Pervious (Post-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 972.00 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 |
| 987.00 | 0.20 | 0.19 | 0.19 | 0.19 | 0.19 |
| 1,002.00 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,017.00 | 0.18 | 0.17 | 0.17 | 0.17 | 0.17 |
| 1,032.00 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 |
| 1,047.00 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 |
| 1,062.00 | 0.15 | 0.15 | 0.14 | 0.14 | 0.14 |
| 1,077.00 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 |
| 1,092.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.12 |
| 1,107.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,122.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,137.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 1,152.00 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,167.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,182.00 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 1,197.00 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 |
| 1,212.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,227.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,242.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,257.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 1,272.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,287.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,302.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,317.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| 1,332.00 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 |
| 1,347.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,362.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,377.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,392.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 1,407.00 | 0.08 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,422.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 1,437.00 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 |
| 1,452.00 | 0.05 | 0.04 | 0.03 | 0.02 | 0.01 |
| 1,467.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1,482.00 | 0.00 | 0.00 | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

| | |
|---|---|
| Computational Time Increment | 2.83 min |
| Time to Peak (Computed) | 735.28 min |
| Flow (Peak, Computed) | 7.85 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 7.84 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 79.8 |
| Area (User Defined) | 1.82 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 5.8 in |
| Runoff Volume (Pervious) | 38,246.750 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 38,263.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 21.21 min |
| Computational Time Increment | 2.83 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 5.83 ft³/s |

Subsection: Unit Hydrograph Summary
Label: Area 1A Pervious (Post-Developed)
Scenario: 100-Year

Return Event: 100 years
Storm Event: 100-Year

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 14.14 min |
| Unit receding limb, Tr | 56.56 min |
| Total unit time, Tb | 70.70 min |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 21.21 min |
| Area (User Defined) | 1.82 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 333.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 348.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| 363.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 378.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 393.00 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 |
| 408.00 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 |
| 423.00 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 |
| 438.00 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 |
| 453.00 | 0.06 | 0.07 | 0.07 | 0.07 | 0.07 |
| 468.00 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| 483.00 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 |
| 498.00 | 0.11 | 0.11 | 0.12 | 0.12 | 0.13 |
| 513.00 | 0.13 | 0.14 | 0.14 | 0.15 | 0.15 |
| 528.00 | 0.16 | 0.16 | 0.17 | 0.17 | 0.18 |
| 543.00 | 0.19 | 0.19 | 0.20 | 0.21 | 0.21 |
| 558.00 | 0.22 | 0.23 | 0.23 | 0.24 | 0.25 |
| 573.00 | 0.25 | 0.26 | 0.27 | 0.28 | 0.28 |
| 588.00 | 0.29 | 0.30 | 0.31 | 0.31 | 0.32 |
| 603.00 | 0.33 | 0.34 | 0.35 | 0.36 | 0.37 |
| 618.00 | 0.38 | 0.39 | 0.40 | 0.42 | 0.43 |
| 633.00 | 0.44 | 0.46 | 0.47 | 0.49 | 0.50 |
| 648.00 | 0.52 | 0.53 | 0.55 | 0.57 | 0.58 |
| 663.00 | 0.60 | 0.62 | 0.64 | 0.66 | 0.70 |
| 678.00 | 0.73 | 0.77 | 0.81 | 0.86 | 0.91 |
| 693.00 | 0.97 | 1.05 | 1.17 | 1.34 | 1.57 |
| 708.00 | 1.88 | 2.25 | 2.68 | 3.22 | 3.95 |
| 723.00 | 4.90 | 5.98 | 6.97 | 7.65 | 7.84 |
| 738.00 | 7.58 | 7.04 | 6.37 | 5.68 | 5.03 |
| 753.00 | 4.42 | 3.84 | 3.31 | 2.85 | 2.48 |
| 768.00 | 2.18 | 1.94 | 1.76 | 1.61 | 1.48 |
| 783.00 | 1.38 | 1.29 | 1.21 | 1.14 | 1.09 |
| 798.00 | 1.05 | 1.01 | 0.98 | 0.96 | 0.94 |
| 813.00 | 0.92 | 0.90 | 0.88 | 0.86 | 0.85 |
| 828.00 | 0.83 | 0.81 | 0.80 | 0.78 | 0.77 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1A Pervious (Post-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 843.00 | 0.75 | 0.73 | 0.72 | 0.70 | 0.69 |
| 858.00 | 0.68 | 0.67 | 0.66 | 0.65 | 0.64 |
| 873.00 | 0.63 | 0.63 | 0.62 | 0.61 | 0.60 |
| 888.00 | 0.60 | 0.59 | 0.58 | 0.57 | 0.56 |
| 903.00 | 0.56 | 0.55 | 0.54 | 0.53 | 0.52 |
| 918.00 | 0.52 | 0.51 | 0.50 | 0.49 | 0.49 |
| 933.00 | 0.48 | 0.47 | 0.46 | 0.45 | 0.45 |
| 948.00 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 |
| 963.00 | 0.40 | 0.39 | 0.38 | 0.38 | 0.37 |
| 978.00 | 0.37 | 0.36 | 0.36 | 0.35 | 0.35 |
| 993.00 | 0.34 | 0.34 | 0.34 | 0.33 | 0.33 |
| 1,008.00 | 0.33 | 0.32 | 0.32 | 0.32 | 0.31 |
| 1,023.00 | 0.31 | 0.31 | 0.30 | 0.30 | 0.30 |
| 1,038.00 | 0.29 | 0.29 | 0.29 | 0.28 | 0.28 |
| 1,053.00 | 0.27 | 0.27 | 0.27 | 0.26 | 0.26 |
| 1,068.00 | 0.26 | 0.25 | 0.25 | 0.25 | 0.24 |
| 1,083.00 | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 |
| 1,098.00 | 0.23 | 0.22 | 0.22 | 0.22 | 0.22 |
| 1,113.00 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 |
| 1,128.00 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| 1,143.00 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 |
| 1,158.00 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| 1,173.00 | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 |
| 1,188.00 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| 1,203.00 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 |
| 1,218.00 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,233.00 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| 1,248.00 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| 1,263.00 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| 1,278.00 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 |
| 1,293.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,308.00 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| 1,323.00 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,338.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 1,353.00 | 0.15 | 0.15 | 0.15 | 0.15 | 0.14 |
| 1,368.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,383.00 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 1,398.00 | 0.14 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,413.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 1,428.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.12 |
| 1,443.00 | 0.12 | 0.11 | 0.10 | 0.08 | 0.06 |
| 1,458.00 | 0.05 | 0.03 | 0.02 | 0.02 | 0.01 |
| 1,473.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1A Pervious (Post-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,488.00 | 0.00 | 0.00 | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

| | |
|---|---|
| Computational Time Increment | 2.55 min |
| Time to Peak (Computed) | 79.11 min |
| Flow (Peak, Computed) | 0.07 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 78.00 min |
| Flow (Peak Interpolated Output) | 0.07 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.0 |
| Area (User Defined) | 0.26 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 0.2 in |
| Runoff Volume (Pervious) | 163.350 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 163.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 19.14 min |
| Computational Time Increment | 2.55 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 0.92 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 12.76 min |
| Unit receding limb, Tr | 51.04 min |
| Total unit time, Tb | 63.80 min |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Area 1B (Post-Developed) Storm Event: WQDS
Scenario: WQDS

| | |
|---|---|
| Storm Event | WQDS |
| Return Event | 1 years |
| Duration | 4,320.00 min |
| Depth | 1.3 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 60.00 | 0.00 | 0.00 | 0.02 | 0.03 | 0.06 |
| 75.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.06 |
| 90.00 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 |
| 105.00 | 0.04 | 0.03 | 0.03 | 0.03 | 0.02 |
| 120.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 |
| 135.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 150.00 | 0.00 | (N/A) | (N/A) | (N/A) | (N/A) |

Subsection: Unit Hydrograph Summary
Label: Area 1B (Post-Developed)
Scenario: 2-Year

Return Event: 2 years
Storm Event: 2-Year

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

| | |
|---|---|
| Computational Time Increment | 2.55 min |
| Time to Peak (Computed) | 734.98 min |
| Flow (Peak, Computed) | 0.30 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 0.30 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.0 |
| Area (User Defined) | 0.26 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 1.5 in |
| Runoff Volume (Pervious) | 1,396.112 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 1,396.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 19.14 min |
| Computational Time Increment | 2.55 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 0.92 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 12.76 min |
| Unit receding limb, Tr | 51.04 min |
| Total unit time, Tb | 63.80 min |

| | |
|---|---|
| Storm Event | 2-Year |
| Return Event | 2 years |
| Duration | 4,320.00 min |
| Depth | 3.3 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 579.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 594.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 609.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 624.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 639.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 654.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 669.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 684.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| 699.00 | 0.03 | 0.04 | 0.04 | 0.05 | 0.07 |
| 714.00 | 0.08 | 0.10 | 0.13 | 0.17 | 0.22 |
| 729.00 | 0.26 | 0.29 | 0.30 | 0.29 | 0.26 |
| 744.00 | 0.24 | 0.21 | 0.19 | 0.17 | 0.14 |
| 759.00 | 0.13 | 0.11 | 0.09 | 0.08 | 0.08 |
| 774.00 | 0.07 | 0.06 | 0.06 | 0.06 | 0.05 |
| 789.00 | 0.05 | 0.05 | 0.05 | 0.04 | 0.04 |
| 804.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 819.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 834.00 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 |
| 849.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 864.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 879.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 894.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |
| 909.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 924.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 939.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 954.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 969.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 984.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 999.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 |
| 1,014.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,029.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,044.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,059.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,074.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Area 1B (Post-Developed) Storm Event: 2-Year
Scenario: 2-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 1,089.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,104.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,119.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,134.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,149.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,164.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,179.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,194.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,209.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,224.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,239.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,254.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,269.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,284.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,299.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,314.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,329.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,344.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,359.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,374.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,389.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,404.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,419.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,434.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,449.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,464.00 | 0.00 | (N/A) | (N/A) | (N/A) | (N/A) |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

| | |
|---|---|
| Computational Time Increment | 2.55 min |
| Time to Peak (Computed) | 732.42 min |
| Flow (Peak, Computed) | 0.59 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 735.00 min |
| Flow (Peak Interpolated Output) | 0.59 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.0 |
| Area (User Defined) | 0.26 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 2.9 in |
| Runoff Volume (Pervious) | 2,730.278 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 2,730.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 19.14 min |
| Computational Time Increment | 2.55 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 0.92 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 12.76 min |
| Unit receding limb, Tr | 51.04 min |
| Total unit time, Tb | 63.80 min |

| | |
|---|---|
| Storm Event | 10-Year |
| Return Event | 10 years |
| Duration | 4,320.00 min |
| Depth | 5.0 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 480.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 495.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 510.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 525.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| 540.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 555.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 570.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 585.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 600.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 615.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 630.00 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 |
| 645.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 660.00 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 |
| 675.00 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 |
| 690.00 | 0.06 | 0.06 | 0.07 | 0.08 | 0.09 |
| 705.00 | 0.11 | 0.13 | 0.16 | 0.19 | 0.23 |
| 720.00 | 0.29 | 0.37 | 0.46 | 0.53 | 0.58 |
| 735.00 | 0.59 | 0.55 | 0.51 | 0.45 | 0.40 |
| 750.00 | 0.36 | 0.31 | 0.27 | 0.23 | 0.20 |
| 765.00 | 0.17 | 0.15 | 0.14 | 0.13 | 0.12 |
| 780.00 | 0.11 | 0.10 | 0.10 | 0.09 | 0.09 |
| 795.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.07 |
| 810.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 825.00 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| 840.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 855.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 870.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 885.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 900.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 915.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 930.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 945.00 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 |
| 960.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 975.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Area 1B (Post-Developed) Storm Event: 10-Year
Scenario: 10-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 990.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,005.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,020.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,035.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,050.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,065.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,080.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,095.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,110.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,125.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,140.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,155.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,170.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,185.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,200.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 |
| 1,215.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,230.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,245.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,260.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,275.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,290.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,305.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,320.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,335.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,350.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,365.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,380.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,395.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,410.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,425.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,440.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,455.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

| | |
|---|---|
| Computational Time Increment | 2.55 min |
| Time to Peak (Computed) | 732.42 min |
| Flow (Peak, Computed) | 1.17 ft³/s |
| Output Increment | 3.00 min |
| Time to Flow (Peak Interpolated Output) | 732.00 min |
| Flow (Peak Interpolated Output) | 1.16 ft³/s |

| Drainage Area | |
|---|---|
| SCS CN (Composite) | 80.0 |
| Area (User Defined) | 0.26 acres |
| Maximum Retention (Pervious) | 2.5 in |
| Maximum Retention (Pervious, 20 percent) | 0.5 in |

| Cumulative Runoff | |
|---|---|
| Cumulative Runoff Depth (Pervious) | 5.8 in |
| Runoff Volume (Pervious) | 5,486.069 ft³ |

| Hydrograph Volume (Area under Hydrograph curve) | |
|---|---|
| Volume | 5,486.000 ft³ |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Time of Concentration (Composite) | 19.14 min |
| Computational Time Increment | 2.55 min |
| Unit Hydrograph Shape Factor | 483.4 |
| K Factor | 0.7 |
| Receding/Rising, Tr/Tp | 1.670 |
| Unit peak, qp | 0.92 ft³/s |

| SCS Unit Hydrograph Parameters | |
|---|---|
| Unit peak time, Tp | 12.76 min |
| Unit receding limb, Tr | 51.04 min |
| Total unit time, Tb | 63.80 min |

| | |
|---|---|
| Storm Event | 100-Year |
| Return Event | 100 years |
| Duration | 4,320.00 min |
| Depth | 8.2 in |
| Time of Concentration (Composite) | 19.14 min |
| Area (User Defined) | 0.26 acres |

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 351.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 366.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 381.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 396.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 411.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 426.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 441.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 456.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 471.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 486.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| 501.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 516.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 531.00 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 |
| 546.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 561.00 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 |
| 576.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 591.00 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 |
| 606.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 |
| 621.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 |
| 636.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 |
| 651.00 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| 666.00 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 |
| 681.00 | 0.11 | 0.12 | 0.13 | 0.14 | 0.14 |
| 696.00 | 0.16 | 0.18 | 0.20 | 0.24 | 0.29 |
| 711.00 | 0.35 | 0.41 | 0.49 | 0.61 | 0.77 |
| 726.00 | 0.93 | 1.08 | 1.16 | 1.16 | 1.08 |
| 741.00 | 0.98 | 0.87 | 0.77 | 0.68 | 0.59 |
| 756.00 | 0.51 | 0.43 | 0.37 | 0.32 | 0.28 |
| 771.00 | 0.25 | 0.23 | 0.21 | 0.20 | 0.19 |
| 786.00 | 0.17 | 0.17 | 0.16 | 0.15 | 0.15 |
| 801.00 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 |
| 816.00 | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 |
| 831.00 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 |
| 846.00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Area 1B (Post-Developed) Storm Event: 100-Year
Scenario: 100-Year

**HYDROGRAPH ORDINATES (ft³/s)**
**Output Time Increment = 3.00 min**
**Time on left represents time for first value in each row.**

| Time (min) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) | Flow (ft³/s) |
|---|---|---|---|---|---|
| 861.00 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 |
| 876.00 | 0.09 | 0.09 | 0.09 | 0.09 | 0.08 |
| 891.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 906.00 | 0.08 | 0.08 | 0.08 | 0.07 | 0.07 |
| 921.00 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 936.00 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 |
| 951.00 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| 966.00 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 |
| 981.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 996.00 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 1,011.00 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 |
| 1,026.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,041.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,056.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| 1,071.00 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 |
| 1,086.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,101.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,116.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,131.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,146.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,161.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,176.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,191.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,206.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,221.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| 1,236.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |
| 1,251.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,266.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,281.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,296.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,311.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,326.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,341.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,356.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,371.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,386.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,401.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,416.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,431.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 1,446.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,461.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# Appendix E

## Soil Data

## Soil Logs and Testing Bl 286, L 14.02 Franklin Twp, 11/06/17 to 11/08/17

**Soil Log #1 (Basin - Basin Flood Log 1)**

0-9" 5YR 4/3 Loam Topsoil; Granular, Friable
9-26" 5YR 4/3 Highly Fractured Platy Shale w 15% Loam;
26-105" 5YR 4/4 Fractured Shale; 5% Loam,
Machine Refusal
No Water
5YR 6/2 Mottles @ 26-40”

**Basin Flood**

| Depth: 72” | Date | Time | Depth to Water |
|---|---|---|---|
| | 11/07/17 | 12:00pm | 60” (12” water added) |
| | 11/07/17 | 2:00pm | 66” (6” water left in hole) |
| | 11/08/17 | 7:45am | 72” (dry) |
| | 11/08/17 | 8:00am | 60” (12” water added) |
| | 11/08/17 | 1:05pm | 72” (dry) **PASS** |

**Soil Log #12 (Basin -Basin Flood Log 2)**

0-12" 5YR 4/3 Loam Topsoil; Granular, Friable
12-24" 5YR 4/3 Highly Fractured Platy Shale w 15% Loam;
24-72" 5YR 4/4 Fractured Shale; 5% Loam,
Machine Refusal
No Water
5YR 6/2 Mottles @ 26-40” (Relic)

**Basin Flood**

| Depth: 72” | Date | Time | Depth to Water |
|---|---|---|---|
| | 11/07/17 | 12:20pm | 60” (12” water added) |
| | 11/07/17 | 2:07pm | 64” (8” water left) |
| | 11/08/17 | 7:46am | 72” (dry) |
| | 11/08/17 | 8:10am | 60” (12” water added) |
| | 11/08/17 | 11:00am | 65” (7” water left) |
| | 11/08/17 | 2:00pm | 66” **FAIL** |

Note: Test ran at a passing rate until it hit 65-66” on second run, then failed

# Appendix F

## Pipe Calculations

| Inlet Drainage Area Calculations | | | | | | |
|---|---|---|---|---|---|---|
| Drainage Area | Catch Basin I.D. | Area (Acres) | Impervious C Value | Woods C Value (HSG D) | Open Space C Value (HSG D) | Runoff Coefficient (Rational) |
| | | | 0.99 | 0.59 | 0.65 | |
| DA-5 | CB #5 | 0.10 | 0.06 | 0.00 | 0.04 | 0.85 |
| DA-6 | CB #6 | 0.35 | 0.09 | 0.10 | 0.16 | 0.72 |
| DA-9 | CB #9 | 0.98 | 0.15 | 0.44 | 0.39 | 0.68 |
| DA-101 | CB #101 | 0.39 | 0.21 | 0.00 | 0.18 | 0.83 |
| DA-102 | CB #102 | 0.23 | 0.10 | 0.00 | 0.13 | 0.80 |
| DA-103 | CB #103 | 0.60 | 0.26 | 0.00 | 0.34 | 0.80 |
| DA-105 | CB #105 | 0.29 | 0.05 | 0.00 | 0.24 | 0.71 |
| DA-106 | CB #106 | 0.92 | 0.10 | 0.14 | 0.68 | 0.68 |
| DA-107 | CB #107 | 0.28 | 0.01 | 0.00 | 0.27 | 0.66 |
| DA-201 | CB #201 | 0.05 | 0.02 | 0.00 | 0.03 | 0.79 |
| DA-202 | CB #202 | 0.04 | 0.01 | 0.00 | 0.03 | 0.74 |

# PIPE CAPACITY ANALYSIS

| Start Node | Stop Node | Invert (Start) (ft) | Invert (Stop) (ft) | Length (ft) | System Intensity (in/h) | System CA (acres) | Upstream Inlet Area (acres) | Upstream Inlet C | Slope (%) | Manning's n | Diameter (in) | Flow (cfs) | Capacity (Full Flow) (cfs) | Velocity (ft/s) | HGL (In) (ft) | HGL (Out) (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CB #106 | CB #105 | 98.43 | 97.65 | 156 | 6.60 | 0.63 | 0.92 | 0.68 | 0.50 | 0.013 | 18 | 4.16 | 7.42 | 4.32 | 99.23 | 98.50 |
| CB #105 | STM MH #104 | 97.55 | 97.30 | 50 | 6.48 | 0.83 | 0.29 | 0.71 | 0.50 | 0.013 | 18 | 5.43 | 7.46 | 4.61 | 98.50 | 98.20 |
| STM MH #104 | CB #103 | 97.05 | 96.38 | 134 | 6.44 | 1.02 | (N/A) | (N/A) | 0.50 | 0.013 | 18 | 6.60 | 7.43 | 4.75 | 98.15 | 97.48 |
| CB #107 | STM MH #104 | 97.67 | 97.30 | 73 | 6.60 | 0.18 | 0.28 | 0.66 | 0.50 | 0.013 | 15 | 1.23 | 4.57 | 3.16 | 98.17 | 98.15 |
| CB #202 | CB #201 | 95.55 | 95.30 | 25 | 6.60 | 0.03 | 0.04 | 0.74 | 1.00 | 0.013 | 15 | 0.20 | 6.46 | 2.36 | 95.72 | 95.45 |
| CB #201 | HW #200 | 95.20 | 95.00 | 20 | 6.56 | 0.07 | 0.05 | 0.79 | 1.00 | 0.013 | 15 | 0.46 | 6.46 | 3.04 | 95.46 | 95.23 |
| CB #9 | STM MH#8 | 95.46 | 95.23 | 20 | 6.60 | 0.67 | 0.98 | 0.68 | 1.15 | 0.013 | 18 | 9.09 | 11.26 | 7.09 | 96.63 | 96.28 |
| CB #103 | CB #102 | 96.28 | 95.82 | 46 | 6.35 | 1.50 | 0.60 | 0.80 | 1.00 | 0.013 | 18 | 9.58 | 10.48 | 6.72 | 97.48 | 96.95 |
| CB #102 | CB #101 | 95.32 | 95.20 | 24 | 6.33 | 1.68 | 0.23 | 0.80 | 0.50 | 0.013 | 24 | 10.72 | 16.00 | 5.46 | 96.52 | 96.44 |
| CB #101 | HW#100 | 95.10 | 95.00 | 19 | 6.31 | 2.00 | 0.39 | 0.83 | 0.50 | 0.013 | 24 | 12.75 | 16.04 | 5.67 | 96.44 | 96.29 |
| STM MH#8 | STM MH#7 | 95.13 | 93.74 | 121 | 6.59 | 0.67 | (N/A) | (N/A) | 1.15 | 0.013 | 18 | 9.09 | 11.28 | 7.10 | 96.30 | 94.76 |
| CB #6 | CB #5 | 96.20 | 96.08 | 24 | 6.60 | 0.25 | 0.35 | 0.72 | 0.50 | 0.013 | 15 | 1.68 | 4.57 | 3.44 | 96.72 | 96.60 |
| CB #5 | STM MH#3 | 95.98 | 95.37 | 122 | 6.58 | 0.34 | 0.10 | 0.85 | 0.50 | 0.013 | 15 | 2.23 | 4.57 | 3.70 | 96.60 | 95.97 |
| OCS | CB #9 | 95.85 | 95.56 | 25 | 7.90 | 0.00 | (N/A) | (N/A) | 1.15 | 0.013 | 18 | 4.66 | 11.27 | 6.07 | 96.68 | 96.63 |
| STM MH#3 | HW #300 | 95.27 | 95.00 | 54 | 6.47 | 0.34 | (N/A) | (N/A) | 0.50 | 0.013 | 15 | 2.20 | 4.57 | 3.69 | 95.88 | 95.59 |

# Appendix G

## Soil Erosion and Sediment Control

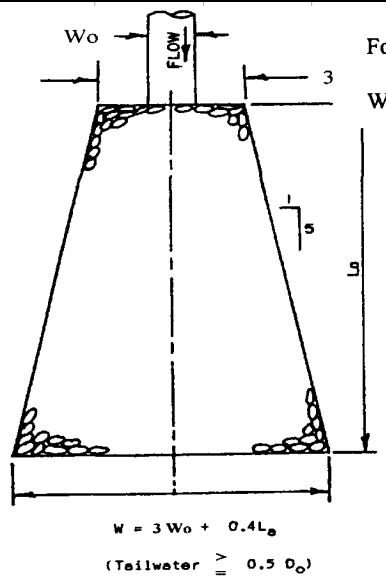
# RIPRAP APRON DATA SHEET

PROJECT NAME: Block 286, Lot 14.02 | Job #: 1509FS

STORM FREQENCIES: 25 Year | DATE: 3/24/2022

BY: KH

| OUTLET STRUCT. | YEAR STORM | Q (cfs) | PIPE HEIGHT (in) | PIPE WIDTH (in) | TAILWATER (ft) | La (ft) | W (beg) (ft) | W (end) (ft) | d50 (in) |
|---|---|---|---|---|---|---|---|---|---|
| HW-100 | 25 | **12.75** | 24 | 24 | 2.40 | **13.5** | **6.0** | **11.4** | **0.9** |
| HW-200 | 25 | **0.46** | 15 | 15 | 2.40 | **1.0** | **3.8** | **4.1** | **0.0** |
| HW-300 | 25 | **2.20** | 15 | 15 | 2.40 | **4.7** | **3.8** | **5.6** | **0.2** |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |




For tailwater elevation greater than or equal to the elevation of the center of the pipe,

$W = 3\ W_o + 0.4\ L_a$

$$L_a = 3\frac{q}{D_o^{1/2}}$$

TW > ½ $D_o$

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

where $q = Q/D_o$

# Appendix H

## Emergency Spillway Design

Subsection: Master Network Summary

## Catchments Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|---|---|---|---|---|---|
| Area 1A (Pre-Developed) | 100-Year | 100 | 57,074.000 | 738.00 | 11.01 |
| Area 1A Imervious (Post-Developed) | 100-Year | 100 | 34,108.000 | 735.00 | 6.16 |
| Area 1A Pervious (Post-Developed) | 100-Year | 100 | 38,263.000 | 735.00 | 7.84 |
| Area 1B (Post-Developed) | 100-Year | 100 | 5,486.000 | 732.00 | 1.16 |
| Area 1B (Pre-Developed) | 100-Year | 100 | 8,145.000 | 735.00 | 1.59 |

## Node Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) |
|---|---|---|---|---|---|
| POA 1 (Post-Developed) | 100-Year | 100 | 45,811.000 | 744.00 | 12.62 |
| POA 1 (Pre-Developed - Area 1A) | 100-Year | 100 | 57,074.000 | 738.00 | 11.01 |
| POA 1 (Pre-Developed - Area 1B) | 100-Year | 100 | 8,145.000 | 735.00 | 1.59 |

## Pond Summary

| Label | Scenario | Return Event (years) | Hydrograph Volume (ft³) | Time to Peak (min) | Peak Flow (ft³/s) | Maximum Water Surface Elevation (ft) | Maximum Pond Storage (ft³) |
|---|---|---|---|---|---|---|---|
| Infiltration Basin (IN) | 100-Year | 100 | 72,371.000 | 735.00 | 14.00 | (N/A) | (N/A) |
| Infiltration Basin (OUT) | 100-Year | 100 | 40,325.000 | 744.00 | 11.74 | 100.18 | 33,556.000 |

Subsection: Outlet Input Data
Label: Emergency Spillway
Scenario: 100-Year

Return Event: 100 years
Storm Event: 100-Year

| Requested Pond Water Surface Elevations | |
|---|---|
| Minimum (Headwater) | 95.00 ft |
| Increment (Headwater) | 0.50 ft |
| Maximum (Headwater) | 101.00 ft |

## Outlet Connectivity

| Structure Type | Outlet ID | Direction | Outfall | E1 (ft) | E2 (ft) |
|---|---|---|---|---|---|
| Rectangular Weir | 25' Weir | Forward | TW | 99.95 | 101.00 |
| Tailwater Settings | Tailwater | | | (N/A) | (N/A) |

| Structure ID: 25' Weir<br>Structure Type: Rectangular Weir | |
|---|---|
| Number of Openings | 1 |
| Elevation | 99.95 ft |
| Weir Length | 25.00 ft |
| Weir Coefficient | 3.00 (ft^0.5)/s |

| Structure ID: TW<br>Structure Type: TW Setup, DS Channel | |
|---|---|
| Tailwater Type | Free Outfall |

| Convergence Tolerances | |
|---|---|
| Maximum Iterations | 30 |
| Tailwater Tolerance (Minimum) | 0.01 ft |
| Tailwater Tolerance (Maximum) | 0.50 ft |
| Headwater Tolerance (Minimum) | 0.01 ft |
| Headwater Tolerance (Maximum) | 0.50 ft |
| Flow Tolerance (Minimum) | 0.001 ft³/s |
| Flow Tolerance (Maximum) | 10.000 ft³/s |

# Appendix I

## BMP Calculations

# BMP Calculations

## I. Infiltration Basin

### *i. Parameters*

Sand Bed-1:
Sand Bed Depth = 6"
Sand Bed Surface Area = 3,394 $ft^2$
Contributory Drainage Area = 2.18 Acres

Sand Bed-2:
Sand Bed Depth = 6"
Sand Bed Surface Area = 2,547 $ft^2$
Contributory Drainage Area = 0.27 Acre

### *ii. Drain Time*

Per Chapter 9.8 of the NJDEP Stormwater BMP Manual:

$$Drain\ Time = \frac{WQDS\ Runoff\ Volume}{System\ Infiltration\ Area\ x\ Subsoil\ Design\ \ Permeability\ Rate}$$

Subsoil Design Permeability Rate: 0.5 inch/hour
Drain Time = (5,540 $ft^3$)/[(5,941 $ft^2$) x (0.5 in/hr) x (1 ft/12 in)]
= 22.4 hours < 72 hours

# Appendix J

## Groundwater Recharge

New Jersey Groundwater Recharge Spreadsheet
Version 2.0
November 2003

# Annual Groundwater Recharge Analysis (based on GSR-32)

| Select Township ↓ | Average Annual P (in) | Climatic Factor |
|---|---|---|
| SOMERSET CO., FRANKLIN TWP | 45.7 | 1.48 |

| | |
|---|---|
| **Project Name:** | 1509FS |
| **Description:** | Block 286, Lot 14.02 |
| **Analysis Date:** | 03/24/22 |

## Pre-Developed Conditions

| Land Segment | Area (acres) | TR-55 Land Cover | Soil | Annual Recharge (in) | Annual Recharge (cu.ft) |
|---|---|---|---|---|---|
| 1 | 2.88 | Woods | Klinesville | 14.6 | 153,032 |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | 0 | | | | |
| 8 | 0 | | | | |
| 9 | 0 | | | | |
| 10 | 0 | | | | |
| 11 | 0 | | | | |
| 12 | 0 | | | | |
| 13 | 0 | | | | |
| 14 | 0 | | | | |
| 15 | 0 | | | | |
| Total = | 2.9 | | | Total Annual Recharge (in) | Total Annual Recharge (cu-ft) |
| | | | | 14.6 | 153,032 |

## Post-Developed Conditions

| Land Segment | Area (acres) | TR-55 Land Cover | Soil | Annual Recharge (in) | Annual Recharge (cu.ft) |
|---|---|---|---|---|---|
| 1 | 1.14 | Impervious areas | Klinesville | 0.0 | - |
| 2 | 1.74 | Open space | Klinesville | 14.2 | 89,622 |
| 3 | | | | | |
| 4 | | | | | |
| 5 | 0 | | | | |
| 6 | 0 | | | | |
| 7 | 0 | | | | |
| 8 | 0 | | | | |
| 9 | 0 | | | | |
| 10 | 0 | | | | |
| 11 | 0 | | | | |
| 12 | 0 | | | | |
| 13 | 0 | | | | |
| 14 | 0 | | | | |
| 15 | 0 | | | | |
| Total = | 2.9 | | | Total Annual Recharge (in) | Total Annual Recharge (cu.ft) |
| | | | | 8.6 | 89,622 |

## Annual Recharge Requirements Calculation ↓

| | | |
|---|---|---|
| % of Pre-Developed Annual Recharge to Preserve = | 100% | Total Impervious Area (sq.ft) 49,658 |
| ***Post-Development Annual Recharge Deficit=*** | ***63,410*** | (cubic feet) |

## Recharge Efficiency Parameters Calculations (area averages)

| | | | | | |
|---|---|---|---|---|---|
| RWC= | 1.14 | (in) | DRWC= | 1.14 | (in) |
| ERWC = | 0.30 | (in) | EDRWC= | 0.30 | (in) |

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

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

| Project Name | Description | Analysis Date | BMP or LID Type |
|---|---|---|---|
| 1509FS | Block 286, Lot 14.02 | 03/24/22 | |

**Recharge BMP Input Parameters**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| BMP Area | ABMP | 5941.0 | sq.ft |
| BMP Effective Depth, this is the design variable | dBMP | 10.3 | in |
| Upper level of the BMP surface (negative if above ground) | dBMPu | -10.3 | in |
| Depth of lower surface of BMP, must be>=dBMPu | dEXC | 0.0 | in |
| Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined | SegBMP | 2 | unitless |

**Root Zone Water capacity Calculated Parameters**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Empty Portion of RWC under Post-D Natural Recharge | ERWC | 0.30 | in |
| ERWC Modified to consider dEXC | EDRWC | 0.30 | in |
| Empty Portion of RWC under Infilt. BMP | RERWC | 0.23 | in |

**Recharge Design Parameters**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Inches of Runoff to capture | Qdesign | 1.33 | in |
| Inches of Rainfall to capture | Pdesign | 1.55 | in |
| Recharge Provided Avg. over Imp. Area | | 30.2 | in |
| Runoff Captured Avg. over imp. Area | | 32.4 | in |

**BMP Calculated Size Parameters**

| | | | |
|---|---|---|---|
| ABMP/Aimp | Aratio | 0.12 | unitless |
| BMP Volume | VBMP | 5,109 | cu.ft |

**CALCULATION CHECK MESSAGES**

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

**Parameters from Annual Recharge Worksheet**

| | | | |
|---|---|---|---|
| Post-D Deficit Recharge (or desired recharge volume) | Vdef | 63,410 | cu.ft |
| Post-D Impervious Area (or target Impervious Area) | Aimp | 49,658 | sq.ft |
| Root Zone Water Capacity | RWC | 1.14 | in |
| RWC Modified to consider dEXC | DRWC | 1.14 | in |
| Climatic Factor | C-factor | 1.48 | no units |
| Average Annual P | Pavg | 45.7 | in |
| Recharge Requirement over Imp. Area | dr | 15.3 | in |

**System Performance Calculated Parameters**

| | | | |
|---|---|---|---|
| Annual BMP Recharge Volume | | 124,954 | cu.ft |
| Avg BMP Recharge Efficiency | | 93.2% | Represents % Infiltration Recharged |
| %Rainfall became Runoff | | 77.9% | % |
| %Runoff Infiltrated | | 91.0% | % |
| %Runoff Recharged | | 84.8% | % |
| %Rainfall Recharged | | 66.1% | % |

**OTHER NOTES**

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

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

# Appendix K

## Drainage Area Maps & Soil Log Exhibit