

# Preliminary Hydrology Study & Drainage Analysis

## Fisher Construction GTS Cold Storage

Apple Valley, CA 92307  
APN: 0463-231-06

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## Attachments

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## A. Introduction

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### 1.1 Purpose and Scope

The following Hydrology and Hydraulics Report has been prepared for the development of the GTS Cold Storage project located at the intersection of Navajo Rd and Lafayette Street in the Town of Apple Valley. The site pertains to the San Bernardino County. This report has been prepared to satisfy the San Bernardino County Department of Public Works hydrology study requirements.

**The scope of this report is as follows:**

- Identification of tributary flow impacting the project site.
- Identification of existing conditions, on-site drainage areas, and calculation of peak flow for these areas.
- Identification of developed conditions, on-site drainage areas and calculation of peak flow for these areas.
- Comparison of existing vs. developed peak flow rates and discussion of mitigation measures used to attenuate increases (if any) in peak flows.
- Identification of floodplain(s) impacting the site.
- Summary of findings and conclusion.

### 1.2 Project Overview

The proposed project entails the development of a cold storage facility on approximately 18.75 acres. The site is currently vacant. The project site is about 1.41 miles north of the Apple Valley Airport and approximately 5 miles east of the 15-Freeway (Mojave).



Site Location

### 1.3 Existing Conditions Off-Site Areas

The site is impacted by a significant off-site tributary to the northeast of the project site. The general area surrounding the site consist of typical poorly covered desert terrain sloping to the southwest. Offsite flows originate in the hills to the northeast of the side flowing in a southwesterly direction across native desert with no clearly defined flow path.

### 1.4 Existing Conditions On-Site Areas

The existing on-site project area is generally flat, consist of typical poorly covered desert terrain, sloping to the southwest. The is aerial evidence of flows crossing the site in a southerly direction. However, it is hard to define on the ground, with no clearly defined flow paths.

### 1.5 References

Relevant portions of following documents have been made part of this study by reference:

- 1.) San Bernardino County Department of Public Works Hydrology Manual (August 1986).
- 2.) Topography by Aerotech Mapping, Inc dated May 25, 2022.
- 3.) Site plans by Joseph E. Bonadiman & Associated, Inc dated June 2022.
- 4.) County of San Bernardino Hydrology Manual Addendum for Arid Regions, April 6, 2010.
- 5.) The National Oceanic and Atmospheric Administration Atlas 14, Volume 6, Version 2, January 2014.
- 6.) United States Department of Agriculture – Natural Resources Conservation Service – Conservation Engineering Division Technical Release 55 Manual, June 1986

## B. Methodology

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### 1.1 General Methodology

The requirements and recommendations found in the San Bernardino County Hydrology Manual (August 1986) provided by the San Bernardino County Department of Public Works was used as the basis for the methodology and calculations found in this report. On-site calculations were performed using the rational and unit hydrograph methods per the county requirements.

The San Bernardino County-approved software applications provided by CivilDesign® Corporation were used for all study calculations.

### 1.2 Sources of Topography

- 1.) Mapping and topographic contours was provided by Aerotech Mapping, Inc dated May 25, 2022.

### 1.3 FEMA Floodplain Identification and Considerations

Per FEMA Flood Map Service, the site is in an unmapped panel.

Refer to Exhibit “C” for the FIRMette used in this report.

### 1.4 Watershed Precipitation

Precipitation values used in this report were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 included in the table below. The slope of intensity duration curve value of 0.70 (desert areas) was used per the County Hydrology Manual.

**Table 1 – Watershed Precipitation**

| STORM             | PRECIPITATION |
|-------------------|---------------|
| 10-YEAR, 1-HOUR   | 0.599         |
| 100-YEAR, 1-HOUR  | 1.07          |
| 2-YEAR, 6-HOUR    | 0.753         |
| 100-YEAR, 6-HOUR  | 1.99          |
| 2-YEAR, 24-HOUR   | 1.30          |
| 100-YEAR, 24-HOUR | 3.39          |

Refer to Exhibit “D” for the NOAA Atlas 14 rainfall data.

## 1.5 Watershed Losses

Soil types and SCS Curve Number (AMC II) used in this report were obtained from the Runoff Curve Numbers Table 2-2, included in the Technical Release 55 manual, and are tabulated below.

Type “A”, “B”, “C” & “D” soils with some rock outcroppings is shown for the off-site area, per Custom Soil Resource Report Soil Map of United States Department of Agriculture Natural Resources Conservation Service. The existing conditions off-site are generally 100% undeveloped, consisting of typical poorly covered desert terrain. Per TR-55 Table 2-2d and NRCS report page 11 SCS numbers were proportions resulting in a combined SCS number of 81 for the off-site area.

Type “B” soils is shown for the on-site area, per Custom Soil Resource Report Soil Map of United States Department of Agriculture Natural Resources Conservation Service. The existing conditions on-site consist of 100% undeveloped land, consisting of typical poorly covered desert terrain. Per TR-55 Table 2-2d an SCS number of 77 (“Desert Shrub”) was used for the on-site existing condition. An SCS number of 77 (“Western Desert Urban Areas”) was also used for the on-site developed conditions. Per the San Bernardino County Hydrology Manual Figure C-3 & page C-5, an SCS Curve Number of 98 (“Impervious Areas”) is used for the parking lots, roofs, driveways, etc.

**Table 2 – Developed Condition Soil Loss Rates**

| COVER TYPE                 | SOIL TYPE | QUALITY OF COVER | SCS CURVE NO. (AMC II) |
|----------------------------|-----------|------------------|------------------------|
| Desert Shrub               | A         | Poor             | 63                     |
| Desert Shrub               | B         | Poor             | 77                     |
| Desert Shrub               | C         | Poor             | 85                     |
| Desert Shrub               | D         | Poor             | 88                     |
| Rock & Impervious Area     | ~         | ~                | 98                     |
| Off-site Composite SCS     | ~         | ~                | 81                     |
| Western Desert Urban Areas | B         | ~                | 77                     |

Refer to Exhibit “E” for the NRCS Custom Soil Resource Report, TR-55 Table 2-2d, the San Bernardino County Hydrology Manual Figure C-3 and page C-5 used in this report.

## **1.6 Rational and Unit Hydrology Method Calculations**

The San Bernardino County Rational and Unit Hydrology Method (CIVILD) software application provided by CivilDesign® Corporation was used for the rational and unit method calculations included in this report.

## C. Existing Off-site Conditions Hydrology Calculations

### 1.1. Existing Conditions Off-site Unit Hydrograph Method Calculations

Based on the output data from the Rational Method above the 100-year TC value was used. Input values for the developed conditions unit hydrograph method calculations prepared for this report are tabulated as follows:

**Table 3 – Existing Off-site Conditions Unit Hydrograph Method Input Values**

| DRAINAGE AREA | SIZE (AC) | SCS | PERVIOUS RATIO | FLOW LENGTH (FT) | CENTRIOD LENGTH (FT) | Δ ELEV. (FT) | BASIN FACTOR |
|---------------|-----------|-----|----------------|------------------|----------------------|--------------|--------------|
| O             | 1,626     | 81  | 1.00           | 24,695           | 9,182                | 1026.8       | 0.40         |

Output for the existing conditions unit hydrograph method calculations are tabulated as follows:

**Table 4 – Existing Off-site Conditions Unit Hydrograph Method Output Calculations**

| DRAINAGE AREA | SIZE (AC) | Q <sub>100</sub> (CFS) | LAG <sub>100</sub> (HR) |
|---------------|-----------|------------------------|-------------------------|
| O             | 1,626     | 1,313                  | 0.764                   |

| DRAINAGE AREA | SIZE (AC) | VOL <sub>100</sub> (AF) | LAG <sub>100</sub> (HR) |
|---------------|-----------|-------------------------|-------------------------|
| O             | 1,626     | 253                     | 0.764                   |

Refer to Attachment No. 1 for printouts of the Existing Conditions Unit Hydrograph Calculations.  
Refer to Exhibit “F” for the Existing Off-Site Hydrologic Conditions Study Map.

## D. Existing On-site Conditions Hydrology Calculations

### 1.1 Existing Conditions Rational Method Calculations

Input values for the existing conditions rational method calculations prepared for this report are tabulated below:

**Table 5– Existing Conditions Rational Method Input Values**

| DRAINAGE AREA  | SIZE (AC) | TYPE   | COVER | SOIL | SCS (AMC II) | PERVIOUS FRACTION | U.S. ELEV. (FT) | D.S. ELEV. (FT) | LENGTH (FT) |
|----------------|-----------|--------|-------|------|--------------|-------------------|-----------------|-----------------|-------------|
| A1<br>NODE 0-1 | 10.00     | DESERT | POOR  | B    | 77           | 1.00              | 3070.20         | 3059.00         | 703.34      |
| A2<br>NODE 1-2 | 7.68      | DESERT | POOR  | B    | 77           | 1.00              | 3059.00         | 3052.50         | 464.12      |

Output for the existing conditions rational method calculations are tabulated as follows:

**Table 6– Existing Conditions Rational Method Output Calculations**

| AREA                    | NODE | Q <sub>10</sub> (CFS) | Q <sub>100</sub> (CFS) |
|-------------------------|------|-----------------------|------------------------|
| A<br>NODE 0-2           | 0-2  | 10.17                 | 25.06                  |
| TC <sub>100</sub> (MIN) |      | 26.64                 |                        |

Refer to Attachment No. 2 for printouts of the Existing Conditions Rational Method Calculations.  
Refer to Exhibit “G” for the Existing On-Site Hydrologic Conditions Study Map.

## 1.2. Existing Conditions Unit Hydrograph Method Calculations

Based on the output data from the Rational Method above the 100-year TC value was used. Input values for the developed conditions unit hydrograph method calculations prepared for this report are tabulated as follows:

**Table 7 – Existing Conditions Unit Hydrograph Method Input Values**

| DRAINAGE AREA | SIZE (AC) | SCS | PERVIOUS FRACTION | T.C. (HOUR) |
|---------------|-----------|-----|-------------------|-------------|
| A<br>NODE 0-2 | 17.68     | 77  | 1.00              | 0.444       |

Output for the existing conditions unit hydrograph method calculations are tabulated as follows:

**Table 8 – Existing Conditions Unit Hydrograph Method Output Calculations**

| DRAINAGE AREA | SIZE (AC) | Q <sub>2</sub> (CFS) | Q <sub>5</sub> (CFS) | Q <sub>10</sub> (CFS) | Q <sub>25</sub> (CFS) | Q <sub>100</sub> (CFS) | LAG <sub>100</sub> (HR) |
|---------------|-----------|----------------------|----------------------|-----------------------|-----------------------|------------------------|-------------------------|
| A<br>NODE 0-2 | 17.68     | 3.10                 | 7.06                 | 12.86                 | 18.14                 | 26.36                  | 0.355                   |

| DRAINAGE AREA | SIZE (AC) | VOL <sub>2</sub> (AF) | VOL <sub>5</sub> (AF) | VOL <sub>10</sub> (AF) | VOL <sub>25</sub> (AF) | VOL <sub>100</sub> (AF) | LAG <sub>100</sub> (HR) |
|---------------|-----------|-----------------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|
| A<br>NODE 0-2 | 17.68     | 0.10                  | 0.27                  | 1.07                   | 1.60                   | 2.46                    | 0.355                   |

Refer to Attachment No. 3 for printouts of the Existing Conditions Unit Hydrograph Calculations.

Refer to Exhibit “G” for the Existing On-Site Hydrologic Conditions Study Map.

## E. Developed Conditions Hydrology Calculations

### 1.1 Developed Conditions Rational Method Calculations

Input values for the developed conditions rational method calculations were adjusted accordingly and are tabulated below:

**Table 9 – Developed Conditions Rational Method Input Values**

| DRAINAGE AREA                            | SIZE (AC) | TYPE         | COVER | SOIL | SCS (AMC II) | PERVIOUS FRACTION | U.S. ELEV. (FT) | D.S. ELEV. (FT) | LENGTH (FT) |
|------------------------------------------|-----------|--------------|-------|------|--------------|-------------------|-----------------|-----------------|-------------|
| A1<br>NODE 0-1                           | 3.05      | DESERT URBAN | GOOD  | B    | 77           | 0.16              | 3068.49         | 3057.57         | 859.03      |
| PIPE<br>NODE 1-2                         | 24"       | ~            | ~     | ~    | ~            | ~                 | 3054.07         | 3052.13         | 326.00      |
| A2<br>NODE 2                             | 1.23      | DESERT URBAN | GOOD  | B    | 77           | 0.04              | ~               | ~               | ~           |
| PIPE<br>NODE 2-3                         | 24"       | ~            | ~     | ~    | ~            | ~                 | 3052.13         | 3050.85         | 254.00      |
| A3<br>NODE 3                             | 1.32      | DESERT URBAN | GOOD  | B    | 77           | 0.04              | ~               | ~               | ~           |
| PIPE<br>NODE 3-4                         | 24"       | ~            | ~     | ~    | ~            | ~                 | 3050.85         | 3049.62         | 244.00      |
| A4<br>NODE 4                             | 1.62      | DESERT URBAN | GOOD  | B    | 77           | 0.04              | ~               | ~               | ~           |
| PIPE<br>NODE 4-5                         | 30"       | ~            | ~     | ~    | ~            | ~                 | 3049.62         | 3049.08         | 175.82      |
| A5<br>NODE 5                             | 0.66      | DESERT URBAN | GOOD  | B    | 77           | 0.84              | ~               | ~               | ~           |
| PIPE<br>NODE 5-6                         | 30"       | ~            | ~     | ~    | ~            | ~                 | 3049.08         | 3047.60         | 495.62      |
| CONFLUENCE MINOR STREAM 1 OF 4 AT NODE 6 |           |              |       |      |              |                   |                 |                 |             |
| A6<br>NODE 7-8                           | 0.65      | DESERT URBAN | GOOD  | B    | 77           | 0.25              | 3062.20         | 3056.31         | 144.77      |
| PIPE<br>NODE 8-6                         | 12"       | ~            | ~     | ~    | ~            | ~                 | 3052.31         | 3050.10         | 94.50       |
| CONFLUENCE MINOR STREAM 2 OF 4 AT NODE 6 |           |              |       |      |              |                   |                 |                 |             |
| A7<br>NODE 9-10                          | 4.55      | DESERT URBAN | GOOD  | B    | 77           | 0.07              | 3058.60         | 3056.73         | 349.44      |
| PIPE<br>NODE 10-6                        | 18"       | ~            | ~     | ~    | ~            | ~                 | 3052.73         | 3050.25         | 24.48       |
| CONFLUENCE MINOR STREAM 3 OF 4 AT NODE 6 |           |              |       |      |              |                   |                 |                 |             |
| A8<br>NODE 11-12                         | 4.60      | DESERT URBAN | GOOD  | B    | 77           | 0.07              | 3060.73         | 3057.05         | 362.80      |
| PIPE<br>NODE 12-6                        | 18"       | ~            | ~     | ~    | ~            | ~                 | 3053.05         | 3050.25         | 24.46       |
| CONFLUENCE MINOR STREAM 4 OF 4 AT NODE 6 |           |              |       |      |              |                   |                 |                 |             |

Output for the developed conditions rational method calculations are tabulated as follows:

**Table 10** – Developed Conditions Rational Method Output Calculations

| AREA           | Q <sub>10</sub><br>(CFS) | Q <sub>100</sub><br>(CFS) | TC <sub>100</sub> (MIN) |
|----------------|--------------------------|---------------------------|-------------------------|
| A<br>NODE 0-12 | 29.75                    | 54.07                     | 7.74                    |

Refer to Attachment No. 4 for printouts of the Developed On-site Conditions Rational Method Calculations.  
Refer to Exhibit “H” for the Developed On-Site Hydrologic Conditions Study Map.

## 1.2 Developed Conditions Unit Hydrograph Method Calculations

Based on the output data from the Rational Method above the 100-year TC value was used. Input values for the existing conditions unit hydrograph method calculations prepared for this report are tabulated as follows:

**Table 11 – Developed Conditions Unit Hydrograph Method Input Values**

| DRAINAGE AREA  | SIZE (AC) | SCS | PERVIOUS FRACTION | T.C. (HRS) |
|----------------|-----------|-----|-------------------|------------|
| A<br>NODE 0-12 | 17.68     | 77  | 0.11              | 0.129      |

Output for the existing conditions unit hydrograph method calculations are tabulated as follows:

**Table 12 – Developed Conditions Unit Hydrograph Method Output Calculations**

| DRAINAGE AREA  | SIZE (AC) | Q <sub>2</sub> (CFS) | Q <sub>10</sub> (CFS) | Q <sub>25</sub> (CFS) | Q <sub>100</sub> (CFS) | LAG (HR) |
|----------------|-----------|----------------------|-----------------------|-----------------------|------------------------|----------|
| A<br>NODE 0-12 | 17.68     | 14.00                | 32.89                 | 43.43                 | 59.38                  | 0.103    |

| DRAINAGE AREA  | SIZE (AC) | VOL <sub>2</sub> (AF) | VOL <sub>10</sub> (AF) | VOL <sub>25</sub> (AF) | VOL <sub>100</sub> (AF) | LAG (HR) |
|----------------|-----------|-----------------------|------------------------|------------------------|-------------------------|----------|
| A<br>NODE 0-12 | 17.68     | 1.46                  | 2.71                   | 3.42                   | 4.49                    | 0.103    |

Refer to Attachment No. 5 for printouts of the Developed On-site Conditions Unit Method Calculations.  
Refer to Exhibit “H” for the Developed On-Site Hydrologic Conditions Study Map.

## F. Underground Infiltration System Calculations

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### 1.1 Underground Infiltration System Analysis

An underground infiltration system is proposed to attenuate storm flows and for WQMP volume retention and infiltration. Input values of the depth vs. volume for routing calculations prepared for this report are tabulated as follows:

**Table 13** – Detention Basins A, System Depth vs. Volume

| ELEVATION<br>(FT)           | DEPTH<br>(FT) | TOTAL<br>VOLUME<br>(CF) | DETENTION<br>VOLUME<br>(AF) |
|-----------------------------|---------------|-------------------------|-----------------------------|
| 3047.10                     | 0             | 0                       | 0                           |
| 3047.60                     | 0.5           | 5,040                   | 0.1157                      |
| 3048.60                     | 1.5           | 20,149                  | 0.4626                      |
| 3049.60                     | 2.5           | 38,595                  | 0.8860                      |
| 3050.60                     | 3.5           | 58,233                  | 1.3368                      |
| <b>3051.10<br/>15" PIPE</b> | <b>4.0</b>    | <b>68,121</b>           | <b>1.5638</b>               |
| 3051.60                     | 4.5           | 77,871                  | 1.7877                      |
| 3052.60                     | 5.5           | 96,317                  | 2.2111                      |
| 3053.60                     | 6.5           | 111,426                 | 2.5580                      |
| 3054.60                     | 8.0           | 126,546                 | 2.9051                      |

Output for the detention basin routing calculations are tabulated as follows:

**Table 14 – Detention Basins Output Calculations**

| BASIN AREA | STORM EVENT | OUTLET (IN)     | OUTLET LENGTH (FT) | DIFFERENCE IN ELEVATION (FT) | OUTFLOW PEAK Q (CFS) | BASIN WATER DEPTH (FT) |
|------------|-------------|-----------------|--------------------|------------------------------|----------------------|------------------------|
| A          | 2           | 15" PIPE OUTLET | 20.0               | 0.2                          | 0.00                 | 3.18                   |
|            | 10          |                 |                    |                              | 3.15                 | 5.00                   |
|            | 25          |                 |                    |                              | 6.54                 | 5.99                   |
|            | 100         |                 |                    |                              | 11.35                | 7.70                   |

Refer to Attachment No. 6 for a printout of the routing calculations for the proposed basin system.

## G. Summary and Conclusion

### 1.1 Summary

A summary of the results of the off-site unit hydrograph calculations are tabulated below:

**Table 16–Off-Unit Hydrograph Calculations Summary**

| AREA | STORM EVENT | EXISTING CONDITIONS PEAK Q (CFS) |
|------|-------------|----------------------------------|
| A    | 100         | 1,313                            |

A summary of the results of the on-site rational and unit hydrograph calculations are tabulated below:

**Table 15–On-Site Rational Method Calculations Summary**

| AREA | STORM EVENT | EXISTING CONDITION PEAK Q (CFS) | PROPOSED CONDITION PEAK Q (CFS) | INCREASE (CFS) |
|------|-------------|---------------------------------|---------------------------------|----------------|
| A    | 10          | 10.17                           | <b>29.75</b>                    | <b>19.58</b>   |
|      | 100         | 25.06                           | <b>54.07</b>                    | <b>29.01</b>   |

A summary of the results of the unit hydrograph calculations are tabulated below:

**Table 16–Unit Hydrograph Calculations Summary**

| AREA | STORM EVENT | EXISTING CONDITIONS PEAK Q (CFS) | DEVELOPED CONDITIONS PEAK Q (CFS) | INCREASE (CFS)* | EXISTING CONDITIONS VOLUME (AF) | DEVELOPED CONDITIONS VOLUME (AF) | INCREASE (AF)* |
|------|-------------|----------------------------------|-----------------------------------|-----------------|---------------------------------|----------------------------------|----------------|
| A    | 2           | 3.10                             | 14.00                             | <b>10.90</b>    | 0.10                            | 1.46                             | <b>1.36</b>    |
|      | 10          | 12.86                            | 32.89                             | <b>20.03</b>    | 1.07                            | 2.17                             | <b>1.10</b>    |
|      | 25          | 18.14                            | 43.43                             | <b>25.29</b>    | 1.60                            | 3.42                             | <b>1.82</b>    |
|      | 100         | 26.36                            | 59.38                             | <b>33.02</b>    | 2.46                            | 4.49                             | <b>2.03</b>    |

\* Above listed values are results prior to basin routing & WQMP storage and not reflective of actual site discharge.

As indicated above, an increase in peak flow and runoff volume is expected from Area “A” as a result of the proposed development. The increase in flow rates shall be mitigated onsite as to reduce the discharge from Area “A” to 90% of the pre-development conditions per the San Bernardino County Hydrology Manual.

Per “San Bernardino County Detention Basin Design Criteria” post-development peak flow rates generated by the site shall be less than or equal to 90% of the pre-development peak flow rate based on shifting the rainfall values for the 10-year, 25-year and 100-years storms, providing a least a 50% confidence level that the detention basin outflow will not adversely impact downstream properties. A summary of the maximum allowable peak flow rates are tabulated below:

**Table 17 – Area “A” Outlet Requirements**

| EXISTING AREA | STORM EVENT | EXISTING CONDITIONS PEAK Q (CFS) | ADJUSTED PEAK Q (CFS) | MAXIMUM ALLOWABLE DISCHARGE 90% OF ADJUSTED PEAK Q (CFS) |
|---------------|-------------|----------------------------------|-----------------------|----------------------------------------------------------|
| A             | 2           | 3.10                             | $Q_2=3.10$            | <b>2.79</b>                                              |
|               | 10          | 12.86                            | $Q_5=7.06$            | <b>6.35</b>                                              |
|               | 25          | 18.14                            | $Q_{10}=12.86$        | <b>11.57</b>                                             |
|               | 100         | 26.36                            | $Q_{25}=18.14$        | <b>16.33</b>                                             |

A summary of the results of the routing calculations are tabulated below:

**Table 18 – Routing Summary**

| AREA | STORM EVENT | MAXIMUM BASIN DISCHARGE 90% OF ADJUSTED PEAK Q (CFS) | AREA “A””” OUTFLOW PEAK Q (CFS) | TOTAL BASIN WATER DEPTH (ft) | INCREASED DISCHARGE VOLUME (AF)* |
|------|-------------|------------------------------------------------------|---------------------------------|------------------------------|----------------------------------|
| A    | 2           | 2.79                                                 | 0.00                            | 3.18                         | 1.46                             |
|      | 10          | 6.35                                                 | 3.15                            | 5.00                         | 2.17                             |
|      | 25          | 11.57                                                | 6.54                            | 5.99                         | 3.42                             |
|      | 100         | 16.33                                                | 11.35                           | 7.70                         | 4.49                             |

\* Above listed values do not reflect WQMP storage volume.

## 1.2 Conclusion

As indicated in Tables 15, development of the site results in an increase in peak flow and runoff volume as a result of the proposed development and therefore requires mitigation.

Per the San Bernardino County Hydrology Manual, developed sites shall not increase flow rate exiting the site over the existing conditions. In order to meet mitigation requirements per “San Bernardino County Detention Basin Design Criteria” post-development peak flow rates generated by the site shall be less than or equal to 90% of the pre-development peak flow rate based on shifting the rainfall values for the 10-year, 25-year and 100-years storms, providing a least a 50% confidence level that the detention basin outflow will not adversely impact downstream properties. This can be achieved with the use of an underground storm water chamber system with a minimum capacity of 2.9051AF as shown in Table 13. This can be achieved with the use of 2706 linear feet of 6 ft diameter corrugated steel pipe in a gravel bed measuring 900 ft by 28 ft and 8 ft of depth. Pipe shall be placed on a bed of 6” of gravel with 3 ft spacing between pipe side walls and 2 ft of gravel around the perimeter of the system. Out flow from the system shall be controlled with a 15” pipe and may be connected directly to the chamber system or any part of the on-site storm drain piping that is larger than 15”, as long as the invert remains 4 ft above the bottom of the chamber system. Total water depth is estimated to be at 7.70 ft from the bottom of the chamber system. Resulting in a peak out flow of the 100-year storm event is estimated to be 11.35 cfs as shown in Table 18. Discharge from the site to the street shall be routed through a 6 ft wide parkway located along Lafayette Street near the southwest corner of the site.

With the above mitigation measure the development of the GTS Cold Storage project located at the intersection of Navajo Rd and Lafayette Street in the Town of Apple Valley will not have a negative impact on downstream properties or facilities. Refer to project specific WQMP for additional requirements.

**(END)**

# **EXHIBIT “A”**

Project Watershed  
Aerial Photo



APPLE VALLEY, CA 92307  
SAN BERNARDINO COUNTY

**BONADIMAN**  
JOHN F. BONADIMAN & ASSOCIATES, INC.  
ENGINEERS • ARCHITECTS • INTERIORS • PLANNING

RESUME 1-771

|    |      |          |             |                                                                                                                                                                            |                     |
|----|------|----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|    |      |          |             | PREPARED FOR:                                                                                                                                                              | FISHER CONSTRUCTION |
|    |      |          |             | JOB NO:                                                                                                                                                                    | 224986              |
|    |      |          |             | PREPARED BY:                                                                                                                                                               | CR                  |
|    |      |          |             | CHECKED BY:                                                                                                                                                                | JTS                 |
|    |      |          |             | NOTE: JOSEPH E. BORDANMAN & ASSOCIATES, INC. DOES NOT WARRANT THE ACCURACY OF THE G.L.S. DATA PRESENTED IN THIS EXHIBIT. THIS EXHIBIT MAY CONTAIN INFORMATION COPYRIGHTED. |                     |
| BY | MARK | REVISION | DESCRIPTION | DATE                                                                                                                                                                       |                     |

APN 0463-231-06  
APPLE VALLEY, CA 92307

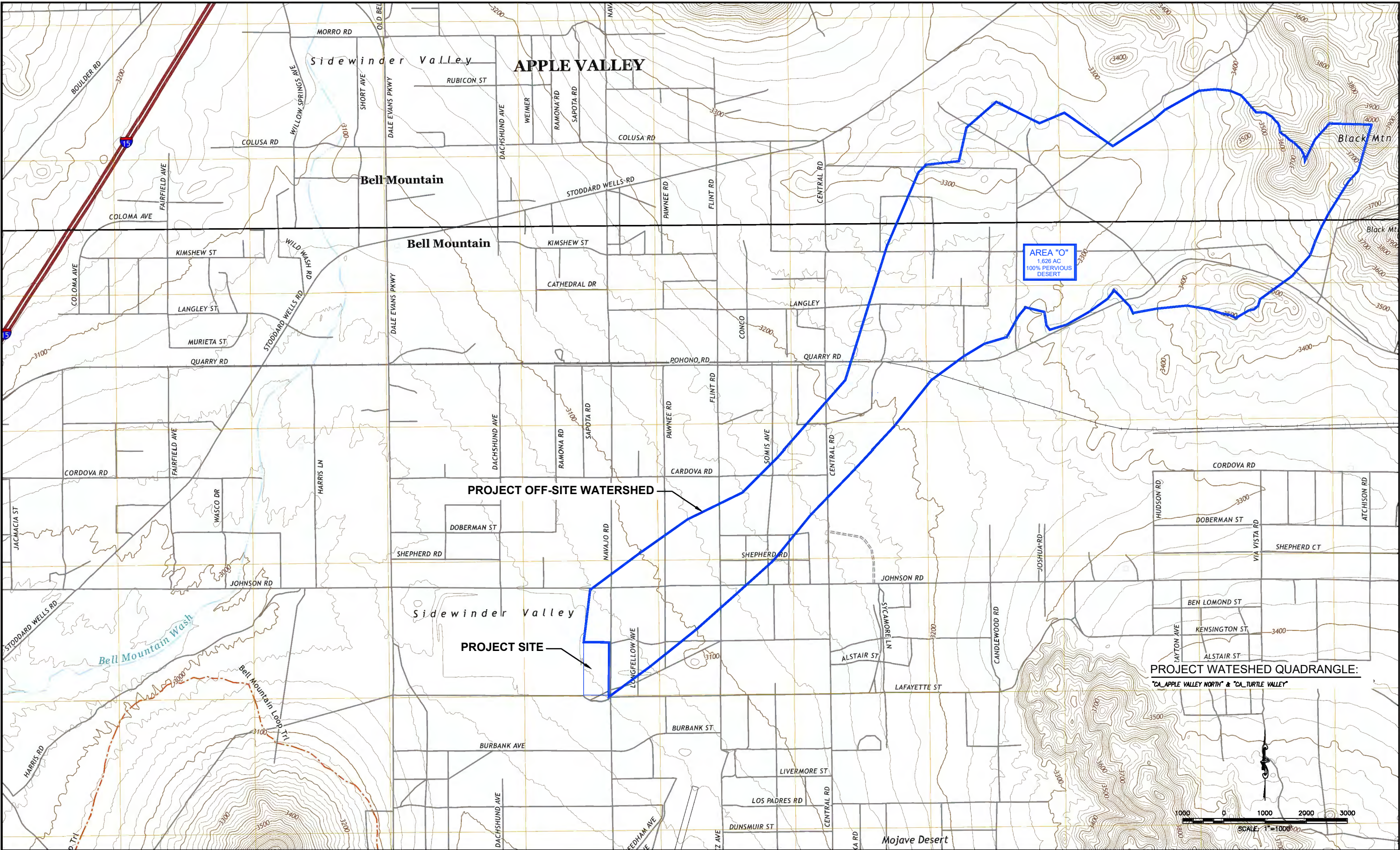
|         |                                                    |                                                                                       |
|---------|----------------------------------------------------|---------------------------------------------------------------------------------------|
| E<br>AY | DISREGARD PRINTS BEARING<br>EARLIER REVISION DATES |  |
|---------|----------------------------------------------------|---------------------------------------------------------------------------------------|

06-23-22

SHEET 1 OF 1

# **EXHIBIT “B”**

Project Watershed  
USGS Quadrangle



**USGS QUADRANGLE**  
FISHER CONSTRUCTION GTS COLD STORAGE  
APN 0463-231-06  
APPLE VALLEY, CA 92307  
SAN BERNARDINO COUNTY

PREPARED BY:  
**BONADIMAN**  
TEL. (909) 885-3886  
10000 BURNING WOODS AVE  
SAN BERNARDINO, CA 92408  
FAX (909) 881-1776  
www.bonadiman.com

| PREPARED FOR:                                                                                                                                                              |      |                      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------|------|
| FISHER CONSTRUCTION                                                                                                                                                        |      |                      |      |
| JOB NO: 224986                                                                                                                                                             |      |                      |      |
| PREPARED BY: CR                                                                                                                                                            |      |                      |      |
| CHECKED BY: JTS                                                                                                                                                            |      |                      |      |
| NOTE: JOSEPH E. BONADIMAN & ASSOCIATES, INC. DOES NOT WARRANT THE ACCURACY OF THE G.I.S. DATA PRESENTED IN THIS EXHIBIT. THIS EXHIBIT MAY CONTAIN INFORMATION COPYRIGHTED. |      |                      |      |
| BY                                                                                                                                                                         | MARK | REVISION DESCRIPTION | DATE |
|                                                                                                                                                                            |      |                      |      |

PREPARED FOR: FISHER CONSTRUCTION  
JOB NO: 224986  
PREPARED BY: CR  
CHECKED BY: JTS  
NOTE: JOSEPH E. BONADIMAN & ASSOCIATES, INC. DOES NOT WARRANT THE ACCURACY OF THE G.I.S. DATA PRESENTED IN THIS EXHIBIT. THIS EXHIBIT MAY CONTAIN INFORMATION COPYRIGHTED.

**USGS QUADRANGLE**  
APN 0463-231-06  
APPLE VALLEY, CA 92307  
**B**  
DISREGARD PRINTS BEARING  
EARLIER REVISION DATES  
06-23-22  
SHEET 1 OF 1

# **EXHIBIT “C”**

## **FEMA FIRMette**

# National Flood Hazard Layer FIRMMette



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

### SPECIAL FLOOD HAZARD AREAS

|  |                                                      |
|--|------------------------------------------------------|
|  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99 |
|  | With BFE or Depth Zone AE, AO, AH, VE, AR            |
|  | Regulatory Floodway                                  |

### OTHER AREAS OF FLOOD HAZARD

|  |                                                                                                                                                                   |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
|  | Future Conditions 1% Annual Chance Flood Hazard Zone X                                                                                                            |
|  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X                                                                                                      |
|  | Area with Flood Risk due to Levee Zone D                                                                                                                          |

### OTHER AREAS

|  |                                          |
|--|------------------------------------------|
|  | Area of Minimal Flood Hazard Zone X      |
|  | Effective LOMRs                          |
|  | Area of Undetermined Flood Hazard Zone D |

### GENERAL STRUCTURES

|  |                                  |
|--|----------------------------------|
|  | Channel, Culvert, or Storm Sewer |
|  | Levee, Dike, or Floodwall        |

### OTHER FEATURES

|  |                                                                   |
|--|-------------------------------------------------------------------|
|  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
|  | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation |
|  | Coastal Transect                                                  |
|  | Base Flood Elevation Line (BFE)                                   |
|  | Limit of Study                                                    |
|  | Jurisdiction Boundary                                             |
|  | Coastal Transect Baseline                                         |
|  | Profile Baseline                                                  |
|  | Hydrographic Feature                                              |

### MAP PANELS

|  |                           |
|--|---------------------------|
|  | Digital Data Available    |
|  | No Digital Data Available |
|  | Unmapped                  |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/30/2020 at 2:39:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



34°26'23.60"N

117°24'2.74"W

T04N R05W S16

T04N R05W S15

AREA OF MINIMAL FLOOD HAZARD

Zone X

City of Hesperia

060723

06071 C6475H

8/28/2008

Not Printed

USGS The National Map: Orthoimagery, Data refreshed April, 2019.

Feet 1:6,000

34°25'53.92"N

0 250 500 1,000 1,500 2,000

117°23'25.29"W

# **EXHIBIT “D”**

NOAA ATLA 14  
Point Precipitation



## POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnlin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps & aeriels](#)

### PF tabular

| PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup> |                                     |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|----------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Duration                                                                                                 | Average recurrence interval (years) |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|                                                                                                          | 1                                   | 2                      | 5                      | 10                     | 25                     | 50                     | 100                    | 200                    | 500                    | 1000                   |
| 5-min                                                                                                    | 0.082<br>(0.067-0.100)              | 0.115<br>(0.095-0.141) | 0.162<br>(0.133-0.199) | 0.203<br>(0.165-0.251) | 0.261<br>(0.206-0.335) | 0.309<br>(0.239-0.405) | 0.361<br>(0.272-0.484) | 0.417<br>(0.306-0.575) | 0.498<br>(0.351-0.715) | 0.565<br>(0.385-0.839) |
| 10-min                                                                                                   | 0.117<br>(0.096-0.143)              | 0.165<br>(0.136-0.203) | 0.232<br>(0.191-0.286) | 0.290<br>(0.236-0.360) | 0.374<br>(0.295-0.480) | 0.443<br>(0.342-0.580) | 0.517<br>(0.390-0.693) | 0.598<br>(0.438-0.823) | 0.714<br>(0.503-1.02)  | 0.810<br>(0.551-1.20)  |
| 15-min                                                                                                   | 0.141<br>(0.116-0.173)              | 0.200<br>(0.164-0.245) | 0.281<br>(0.230-0.346) | 0.351<br>(0.286-0.436) | 0.453<br>(0.357-0.580) | 0.536<br>(0.414-0.702) | 0.626<br>(0.471-0.838) | 0.723<br>(0.530-0.996) | 0.864<br>(0.608-1.24)  | 0.980<br>(0.667-1.45)  |
| 30-min                                                                                                   | 0.193<br>(0.159-0.236)              | 0.272<br>(0.224-0.334) | 0.383<br>(0.314-0.471) | 0.479<br>(0.390-0.594) | 0.618<br>(0.487-0.792) | 0.731<br>(0.565-0.957) | 0.853<br>(0.643-1.14)  | 0.986<br>(0.723-1.36)  | 1.18<br>(0.829-1.69)   | 1.34<br>(0.909-1.98)   |
| 60-min                                                                                                   | 0.241<br>(0.199-0.296)              | 0.341<br>(0.280-0.418) | 0.480<br>(0.394-0.590) | 0.779<br>(0.488-0.744) | 0.773<br>(0.609-0.991) | 0.916<br>(0.707-1.20)  | 1.24<br>(0.805-1.43)   | 1.24<br>(0.905-1.70)   | 1.48<br>(1.04-2.12)    | 1.67<br>(1.14-2.48)    |
| 2-hr                                                                                                     | 0.343<br>(0.283-0.421)              | 0.465<br>(0.383-0.571) | 0.634<br>(0.521-0.781) | 0.779<br>(0.634-0.966) | 0.986<br>(0.777-1.26)  | 1.15<br>(0.891-1.51)   | 1.33<br>(1.00-1.79)    | 1.53<br>(1.12-2.10)    | 1.80<br>(1.27-2.58)    | 2.02<br>(1.38-3.01)    |
| 3-hr                                                                                                     | 0.417<br>(0.344-0.511)              | 0.558<br>(0.459-0.685) | 0.751<br>(0.616-0.924) | 0.915<br>(0.745-1.14)  | 1.15<br>(0.906-1.47)   | 1.34<br>(1.03-1.75)    | 1.54<br>(1.16-2.06)    | 1.75<br>(1.29-2.42)    | 2.06<br>(1.45-2.95)    | 2.30<br>(1.57-3.42)    |
| 6-hr                                                                                                     | 0.570<br>(0.470-0.699)              | 1.00<br>(0.620-0.924)  | 1.00<br>(0.822-1.23)   | 1.21<br>(0.987-1.50)   | 1.51<br>(1.19-1.93)    | 1.74<br>(1.35-2.28)    | 2.26<br>(1.50-2.67)    | 2.26<br>(1.65-3.11)    | 2.62<br>(1.85-3.77)    | 2.92<br>(1.99-4.34)    |
| 12-hr                                                                                                    | 0.735<br>(0.606-0.901)              | 0.974<br>(0.801-1.20)  | 1.30<br>(1.06-1.59)    | 1.56<br>(1.27-1.94)    | 1.94<br>(1.53-2.48)    | 2.23<br>(1.72-2.92)    | 2.54<br>(1.91-3.40)    | 2.86<br>(2.10-3.94)    | 3.31<br>(2.33-4.75)    | 3.66<br>(2.49-5.44)    |
| 24-hr                                                                                                    | 0.968<br>(0.858-1.11)               | 1.73<br>(1.15-1.49)    | 1.73<br>(1.53-2.00)    | 2.10<br>(1.84-2.44)    | 2.59<br>(2.20-3.12)    | 2.99<br>(2.48-3.67)    | 3.81<br>(2.74-4.26)    | 3.81<br>(3.00-4.93)    | 4.39<br>(3.32-5.92)    | 4.84<br>(3.54-6.76)    |
| 2-day                                                                                                    | 1.15<br>(1.02-1.32)                 | 1.57<br>(1.39-1.81)    | 2.12<br>(1.87-2.45)    | 2.57<br>(2.26-3.00)    | 3.19<br>(2.71-3.84)    | 3.67<br>(3.05-4.51)    | 4.17<br>(3.38-5.25)    | 4.68<br>(3.69-6.06)    | 5.38<br>(4.06-7.26)    | 5.92<br>(4.33-8.27)    |
| 3-day                                                                                                    | 1.25<br>(1.11-1.44)                 | 1.73<br>(1.53-1.99)    | 2.35<br>(2.07-2.71)    | 2.86<br>(2.50-3.33)    | 3.55<br>(3.01-4.28)    | 4.09<br>(3.40-5.03)    | 4.64<br>(3.76-5.84)    | 5.21<br>(4.10-6.74)    | 5.98<br>(4.52-8.08)    | 6.59<br>(4.81-9.21)    |
| 4-day                                                                                                    | 1.33<br>(1.18-1.53)                 | 1.84<br>(1.63-2.11)    | 2.50<br>(2.21-2.89)    | 3.05<br>(2.67-3.55)    | 3.79<br>(3.22-4.57)    | 4.37<br>(3.62-5.37)    | 4.95<br>(4.01-6.24)    | 5.56<br>(4.38-7.20)    | 6.38<br>(4.83-8.62)    | 7.03<br>(5.13-9.82)    |
| 7-day                                                                                                    | 1.45<br>(1.28-1.66)                 | 1.98<br>(1.76-2.28)    | 2.70<br>(2.38-3.11)    | 3.28<br>(2.87-3.82)    | 4.08<br>(3.46-4.91)    | 4.70<br>(3.90-5.78)    | 5.34<br>(4.32-6.72)    | 6.00<br>(4.72-7.77)    | 6.90<br>(5.22-9.31)    | 7.61<br>(5.56-10.6)    |
| 10-day                                                                                                   | 1.53<br>(1.36-1.76)                 | 2.09<br>(1.85-2.40)    | 2.83<br>(2.50-3.27)    | 3.44<br>(3.02-4.01)    | 4.29<br>(3.64-5.17)    | 4.95<br>(4.11-6.08)    | 5.63<br>(4.56-7.09)    | 6.33<br>(4.99-8.20)    | 7.30<br>(5.52-9.86)    | 8.06<br>(5.89-11.3)    |
| 20-day                                                                                                   | 1.75<br>(1.55-2.01)                 | 2.39<br>(2.12-2.76)    | 3.26<br>(2.88-3.77)    | 3.98<br>(3.49-4.64)    | 4.99<br>(4.23-6.01)    | 5.78<br>(4.80-7.11)    | 6.60<br>(5.35-8.31)    | 7.46<br>(5.88-9.66)    | 8.65<br>(6.54-11.7)    | 9.58<br>(7.00-13.4)    |
| 30-day                                                                                                   | 1.97<br>(1.75-2.27)                 | 2.71<br>(2.40-3.12)    | 3.71<br>(3.28-4.28)    | 4.55<br>(3.99-5.30)    | 5.73<br>(4.85-6.89)    | 6.66<br>(5.53-8.18)    | 7.63<br>(6.18-9.60)    | 8.65<br>(6.81-11.2)    | 10.1<br>(7.61-13.6)    | 11.2<br>(8.17-15.6)    |
| 45-day                                                                                                   | 2.33<br>(2.06-2.68)                 | 3.20<br>(2.84-3.69)    | 4.40<br>(3.89-5.09)    | 5.42<br>(4.75-6.31)    | 6.87<br>(5.82-8.26)    | 8.02<br>(6.66-9.86)    | 9.23<br>(7.48-11.6)    | 10.5<br>(8.28-13.6)    | 12.3<br>(9.30-16.6)    | 13.7<br>(10.0-19.2)    |
| 60-day                                                                                                   | 2.54<br>(2.26-2.93)                 | 3.49<br>(3.09-4.02)    | 4.81<br>(4.24-5.55)    | 5.93<br>(5.19-6.90)    | 7.53<br>(6.38-9.06)    | 8.82<br>(7.32-10.8)    | 10.2<br>(8.25-12.8)    | 11.6<br>(9.17-15.1)    | 13.7<br>(10.4-18.5)    | 15.4<br>(11.2-21.5)    |

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

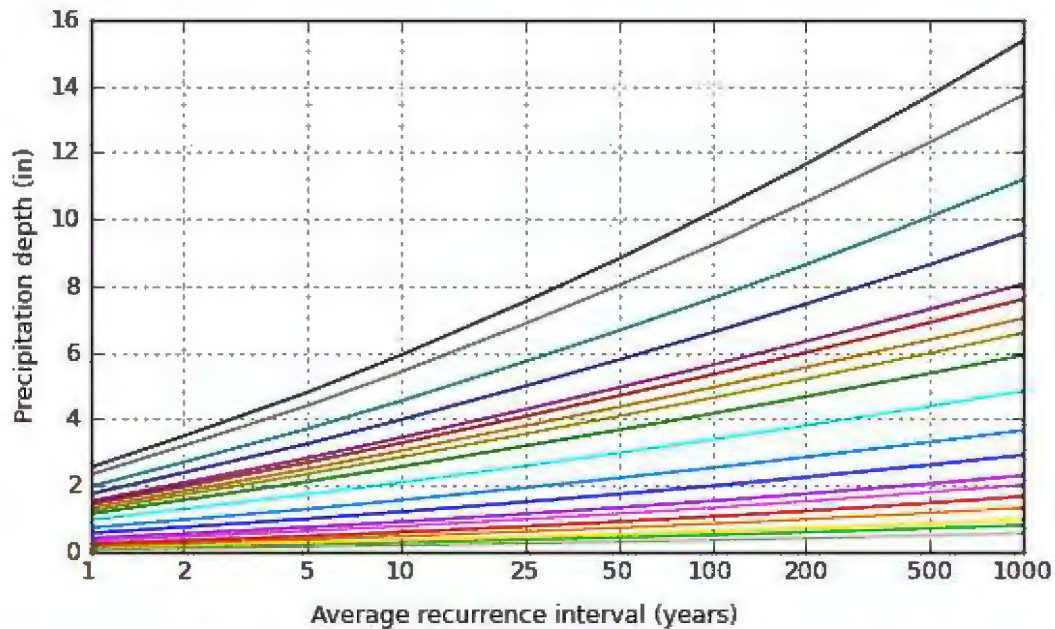
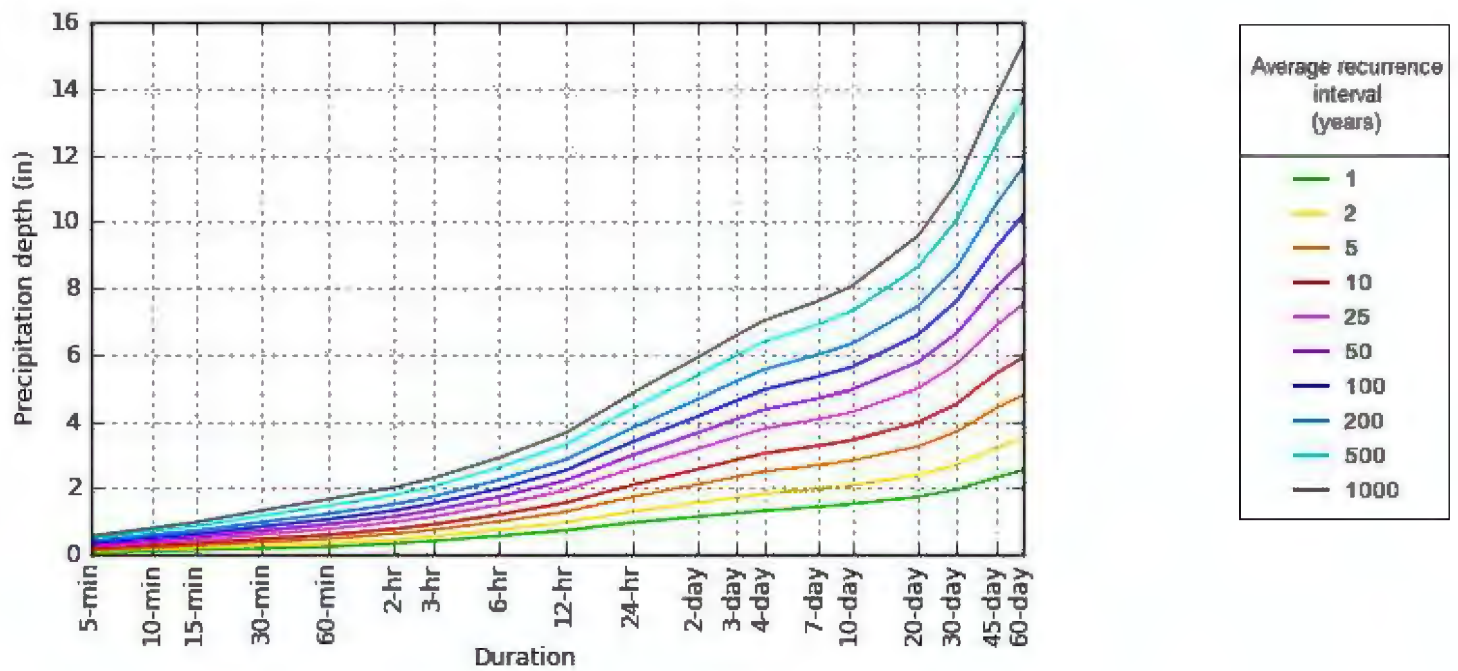
Please refer to NOAA Atlas 14 document for more information.

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### PF graphical

# PDS-based depth-duration-frequency (DDF) curves

Latitude: 34.5952°, Longitude: -117.1903°



## Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

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# **EXHIBIT “E”**

## **NRCS Soils Data**



United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for San Bernardino County, California, Mojave River Area



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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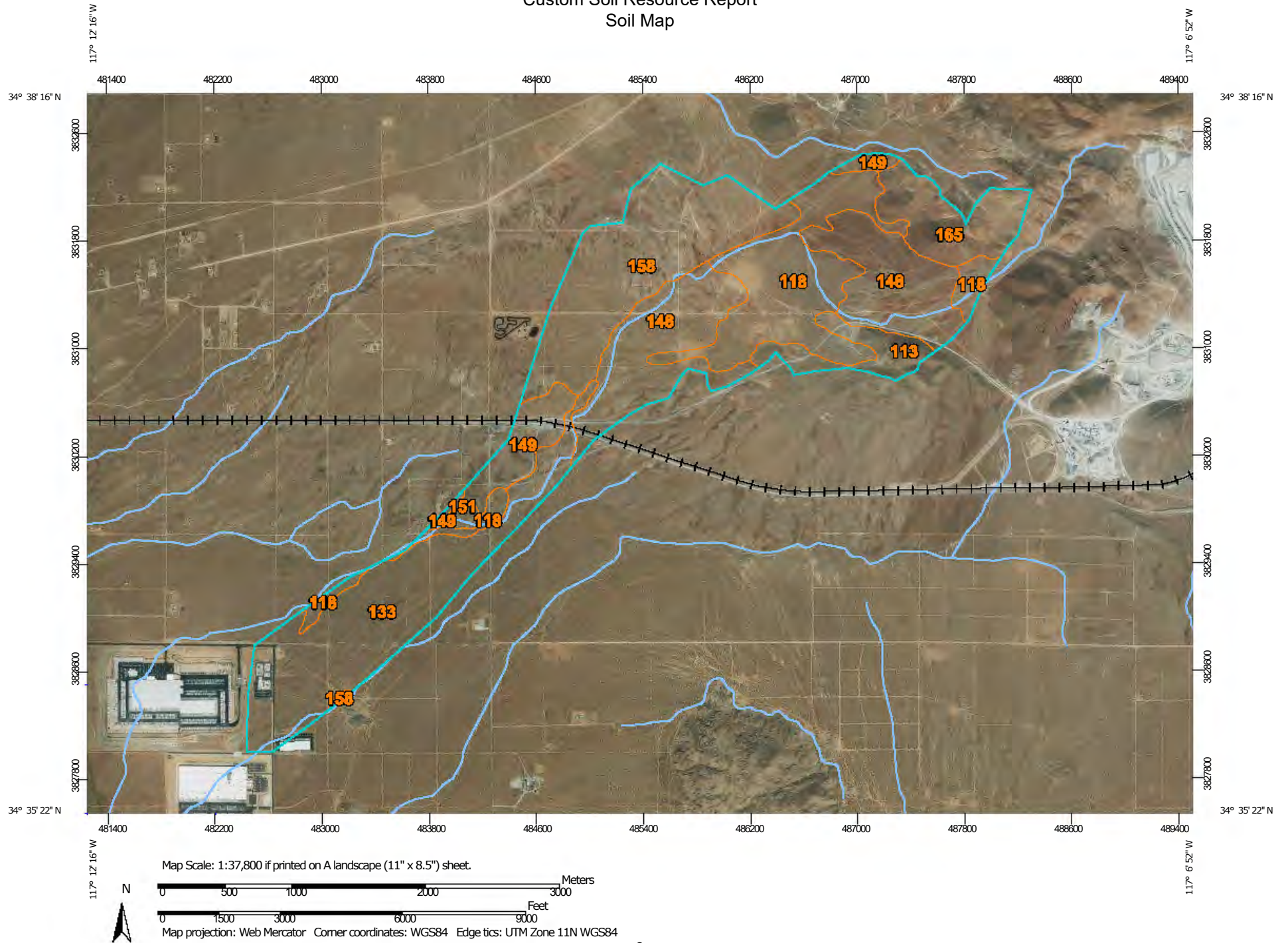
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



## Custom Soil Resource Report

### 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.

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: San Bernardino County, California, Mojave River Area

Survey Area Data: Version 13, Sep 13, 2021

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

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

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 |
|------------------------------------|------------------------------------------------------------------------------|----------------|----------------|
| 113                                | CAJON SAND, 2 TO 9<br>PERCENT SLOPES                                         | 67.6           | 4.1%           |
| 118                                | CAJON-ARIZO COMPLEX, 2<br>TO 15 PERCENT SLOPES*                              | 302.8          | 18.4%          |
| 133                                | HELENDALE-BRYMAN<br>LOAMY SANDS, 2 TO 5<br>PERCENT SLOPES*                   | 360.1          | 21.9%          |
| 148                                | MIRAGE SANDY LOAM, 2 TO<br>5 PERCENT SLOPES*                                 | 360.5          | 21.9%          |
| 149                                | MIRAGE-JOSHUA COMPLEX,<br>2 TO 5 PERCENT SLOPES*                             | 87.2           | 5.3%           |
| 151                                | NEBONA-CUDDEBACK<br>COMPLEX, 2 TO 9<br>PERCENT SLOPES*                       | 10.8           | 0.7%           |
| 158                                | ROCK OUTCROP-LITHIC<br>TORRIORTHENTS<br>COMPLEX, 15 TO 50<br>PERCENT SLOPES* | 330.7          | 20.1%          |
| 165                                | TRIGGER-SPARKHULE-ROCK<br>OUTCROP ASSOCIATION,<br>STEEP*                     | 125.1          | 7.6%           |
| <b>Totals for Area of Interest</b> |                                                                              | <b>1,644.8</b> | <b>100.0%</b>  |

## 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.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

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Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## San Bernardino County, California, Mojave River Area

### 113—CAJON SAND, 2 TO 9 PERCENT SLOPES

#### Map Unit Setting

*National map unit symbol:* hkrk

*Elevation:* 1,800 to 3,500 feet

*Mean annual precipitation:* 3 to 6 inches

*Mean annual air temperature:* 59 to 68 degrees F

*Frost-free period:* 180 to 290 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Cajon and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Cajon

##### Setting

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from mixed sources

##### Typical profile

*A - 0 to 6 inches:* sand

*C1 - 6 to 25 inches:* sand

*C2 - 25 to 60 inches:* gravelly sand

##### Properties and qualities

*Slope:* 0 to 4 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat excessively drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 1 percent

*Available water supply, 0 to 60 inches:* Very low (about 3.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 4e

*Land capability classification (nonirrigated):* 6e

*Ecological site:* R030XF012CA - Sandy

*Hydric soil rating:* No

#### Minor Components

##### Cajon, gravelly surface

*Percent of map unit:* 5 percent

## Custom Soil Resource Report

*Landform:* Alluvial fans

### **Helendale**

*Percent of map unit:* 5 percent

*Landform:* Alluvial fans

*Hydric soil rating:* No

### **Kimberlina**

*Percent of map unit:* 5 percent

*Landform:* Alluvial fans

*Hydric soil rating:* No

## **118—CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES\***

### **Map Unit Setting**

*National map unit symbol:* hkrq

*Elevation:* 2,800 to 3,300 feet

*Mean annual precipitation:* 3 to 6 inches

*Mean annual air temperature:* 59 to 66 degrees F

*Frost-free period:* 180 to 290 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Cajon, gravelly surface, and similar soils:* 55 percent

*Arizo and similar soils:* 30 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Cajon, Gravelly Surface**

#### **Setting**

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from granite sources

#### **Typical profile**

*H1 - 0 to 6 inches:* gravelly sand

*H2 - 6 to 60 inches:* gravelly sand

#### **Properties and qualities**

*Slope:* 2 to 15 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None

## Custom Soil Resource Report

*Calcium carbonate, maximum content:* 1 percent

*Available water supply, 0 to 60 inches:* Very low (about 3.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* 4s

*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XF028CA - COBBLY SANDY

*Hydric soil rating:* No

### Description of Arizo

#### Setting

*Landform:* Alluvial fans

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from granite sources

#### Typical profile

*H1 - 0 to 6 inches:* gravelly loamy sand

*H2 - 6 to 60 inches:* extremely gravelly loamy coarse sand

#### Properties and qualities

*Slope:* 2 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* NoneOccasional

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 15 percent

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7w

*Ecological site:* R030XF025CA - GRAVELLY COARSE LOAMY

*Hydric soil rating:* No

### Minor Components

#### Helendale

*Percent of map unit:* 4 percent

*Hydric soil rating:* No

#### Bryman

*Percent of map unit:* 4 percent

*Hydric soil rating:* No

#### Joshua

*Percent of map unit:* 4 percent

*Hydric soil rating:* No

**Cajon, clayey substratum**

*Percent of map unit: 3 percent*

**133—HELENDALE-BRYMAN LOAMY SANDS, 2 TO 5 PERCENT SLOPES\***

**Map Unit Setting**

*National map unit symbol: hks6*

*Elevation: 2,500 to 4,000 feet*

*Mean annual precipitation: 3 to 6 inches*

*Mean annual air temperature: 59 to 63 degrees F*

*Frost-free period: 180 to 280 days*

*Farmland classification: Prime farmland if irrigated*

**Map Unit Composition**

*Helendale and similar soils: 50 percent*

*Bryman and similar soils: 35 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Helendale**

**Setting**

*Landform: Fan remnants*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Alluvium derived from granite sources*

**Typical profile**

*H1 - 0 to 6 inches: loamy sand*

*H2 - 6 to 30 inches: sandy loam*

*H3 - 30 to 66 inches: sandy loam*

*H4 - 66 to 99 inches: loamy sand*

**Properties and qualities**

*Slope: 2 to 5 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Calcium carbonate, maximum content: 5 percent*

*Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)*

*Available water supply, 0 to 60 inches: Low (about 5.8 inches)*

**Interpretive groups**

*Land capability classification (irrigated): 2e*  
*Land capability classification (nonirrigated): 7e*

*Ecological site: R030XF012CA - Sandy*  
*Hydric soil rating: No*

**Description of Bryman**

**Setting**

*Landform: Fan remnants*  
*Landform position (two-dimensional): Backslope*  
*Landform position (three-dimensional): Side slope*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Parent material: Alluvium derived from granite sources*

**Typical profile**

*H1 - 0 to 8 inches: loamy sand*  
*H2 - 8 to 12 inches: sandy loam*  
*H3 - 12 to 44 inches: sandy clay loam*  
*H4 - 44 to 60 inches: loamy sand*

**Properties and qualities**

*Slope: 2 to 5 percent*  
*Depth to restrictive feature: More than 80 inches*  
*Drainage class: Well drained*  
*Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)*  
*Depth to water table: More than 80 inches*  
*Frequency of flooding: None*  
*Frequency of ponding: None*  
*Calcium carbonate, maximum content: 5 percent*  
*Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)*  
*Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)*

**Interpretive groups**

*Land capability classification (irrigated): 2e*  
*Land capability classification (nonirrigated): 7e*

*Ecological site: R030XF012CA - Sandy*  
*Hydric soil rating: No*

**Minor Components**

**Cajon**

*Percent of map unit: 5 percent*  
*Hydric soil rating: No*

**Mohave variant**

*Percent of map unit: 5 percent*  
*Hydric soil rating: No*

**Unnamed soils**

*Percent of map unit: 5 percent*  
*Hydric soil rating: No*

## 148—MIRAGE SANDY LOAM, 2 TO 5 PERCENT SLOPES\*

### Map Unit Setting

*National map unit symbol:* hksp  
*Elevation:* 2,600 to 3,400 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 63 to 66 degrees F  
*Frost-free period:* 200 to 290 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Mirage and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Mirage

#### Setting

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from granite sources

#### Typical profile

*H1 - 0 to 5 inches:* sandy loam  
*H2 - 5 to 21 inches:* gravelly sandy clay loam  
*H3 - 21 to 39 inches:* gravelly sandy loam  
*H4 - 39 to 60 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 2 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Strongly saline (16.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XG024CA - DESERT PAVEMENT

*Hydric soil rating:* No

**Minor Components**

**Nebona**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Cuddeback**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Mirage**

*Percent of map unit:* 4 percent

*Hydric soil rating:* No

**Unnamed soils**

*Percent of map unit:* 1 percent

*Hydric soil rating:* No

**149—MIRAGE-JOSHUA COMPLEX, 2 TO 5 PERCENT SLOPES\***

**Map Unit Setting**

*National map unit symbol:* hksq

*Elevation:* 2,600 to 3,400 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 63 to 66 degrees F

*Frost-free period:* 200 to 290 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Mirage and similar soils:* 50 percent

*Joshua and similar soils:* 30 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Mirage**

**Setting**

*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from granite sources

**Typical profile**

*H1 - 0 to 5 inches:* sandy loam

*H2 - 5 to 21 inches:* gravelly sandy clay loam

*H3 - 21 to 39 inches:* gravelly sandy loam

*H4 - 39 to 60 inches:* gravelly loamy sand

**Properties and qualities**

*Slope:* 2 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Strongly saline (16.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
[REDACTED]  
*Ecological site:* R030XG024CA - DESERT PAVEMENT  
*Hydric soil rating:* No

**Description of Joshua**

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from mixed sources

**Typical profile**

*H1 - 0 to 3 inches:* loam  
*H2 - 3 to 20 inches:* gravelly sandy clay loam  
*H3 - 20 to 55 inches:* very gravelly loamy coarse sand

**Properties and qualities**

*Slope:* 2 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 3.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
[REDACTED]  
*Ecological site:* R030XG024CA - DESERT PAVEMENT  
*Hydric soil rating:* No

**Minor Components**

**Unnamed soils**

*Percent of map unit:* 10 percent  
*Hydric soil rating:* No

**Nebona**

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

**Cuddeback**

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

**151—NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES\***

**Map Unit Setting**

*National map unit symbol:* hkss  
*Elevation:* 1,800 to 3,400 feet  
*Mean annual precipitation:* 3 to 5 inches  
*Mean annual air temperature:* 63 to 66 degrees F  
*Frost-free period:* 200 to 290 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Nebona and similar soils:* 60 percent  
*Cuddeback and similar soils:* 20 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Nebona**

**Setting**

*Landform:* Fan remnants  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from mixed sources

**Typical profile**

*H1 - 0 to 2 inches:* sandy loam  
*H2 - 2 to 8 inches:* fine sandy loam  
*H3 - 8 to 12 inches:* indurated  
*H4 - 12 to 65 inches:* stratified gravelly sand to loam

**Properties and qualities**

*Slope:* 2 to 9 percent  
*Depth to restrictive feature:* 6 to 14 inches to duripan  
*Drainage class:* Well drained

## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Maximum salinity:* Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 0.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XF030CA - DESERT PAVEMENT

*Hydric soil rating:* No

### Description of Cuddeback

#### Setting

*Landform:* Inset fans

*Landform position (two-dimensional):* Backslope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from mixed sources

#### Typical profile

*H1 - 0 to 3 inches:* sandy loam

*H2 - 3 to 6 inches:* sandy loam

*H3 - 6 to 17 inches:* gravelly sandy clay loam

*H4 - 17 to 34 inches:* gravelly sandy loam

*H5 - 34 to 38 inches:* indurated

#### Properties and qualities

*Slope:* 2 to 9 percent

*Depth to restrictive feature:* 20 to 40 inches to duripan

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 10 percent

*Maximum salinity:* Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XG024CA - DESERT PAVEMENT

*Hydric soil rating:* No

### Minor Components

#### Unnamed soils

*Percent of map unit:* 19 percent

*Hydric soil rating:* No

**Unnamed**

*Percent of map unit:* 1 percent

*Landform:* Playas

*Hydric soil rating:* Yes

**158—ROCK OUTCROP-LITHIC TORRIORTHENTS COMPLEX, 15 TO 50 PERCENT SLOPES\***

**Map Unit Setting**

*National map unit symbol:* hkt0

*Elevation:* 650 to 9,000 feet

*Mean annual precipitation:* 3 to 5 inches

*Mean annual air temperature:* 63 to 66 degrees F

*Frost-free period:* 200 to 290 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Rock outcrop:* 60 percent

*Lithic torriorthents and similar soils:* 30 percent

*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Rock Outcrop**

**Setting**

*Landform:* Mountains

*Landform position (two-dimensional):* Backslope, summit

*Landform position (three-dimensional):* Mountainflank

*Down-slope shape:* Concave

*Across-slope shape:* Concave

**Typical profile**

*H1 - 0 to 10 inches:* unweathered bedrock

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* No

**Description of Lithic Torriorthents**

**Setting**

*Landform:* Mountains, hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountainflank, side slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Residuum weathered from granite

**Typical profile**

*H1 - 0 to 15 inches: variable*  
*H2 - 15 to 29 inches: bedrock*

**Properties and qualities**

*Slope: 15 to 50 percent*  
*Depth to restrictive feature: 8 to 20 inches to lithic bedrock*  
*Drainage class: Excessively drained*  
*Depth to water table: More than 80 inches*  
*Frequency of flooding: None*  
*Frequency of ponding: None*  
*Available water supply, 0 to 60 inches: Very low (about 0.0 inches)*

**Interpretive groups**

*Land capability classification (irrigated): None specified*  
*Land capability classification (nonirrigated): 7e*  
*Hydric soil rating: No*

**Minor Components**

**Sparkhule**

*Percent of map unit: 4 percent*  
*Hydric soil rating: No*

**Trigger**

*Percent of map unit: 3 percent*  
*Hydric soil rating: No*

**Rock outcrop**

*Percent of map unit: 3 percent*  
*Hydric soil rating: No*

**165—TRIGGER-SPARKHULE-ROCK OUTCROP ASSOCIATION, STEEP\***

**Map Unit Setting**

*National map unit symbol: hkt7*  
*Elevation: 650 to 4,500 feet*  
*Mean annual precipitation: 3 to 5 inches*  
*Mean annual air temperature: 59 to 66 degrees F*  
*Frost-free period: 180 to 290 days*  
*Farmland classification: Not prime farmland*

**Map Unit Composition**

*Trigger and similar soils: 40 percent*  
*Sparkhule and similar soils: 30 percent*  
*Rock outcrop: 30 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Trigger

### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Residuum weathered from calcareous conglomerate

### Typical profile

*H1 - 0 to 12 inches:* gravelly sandy loam

*H2 - 12 to 22 inches:* unweathered bedrock

### Properties and qualities

*Slope:* 30 to 40 percent

*Depth to restrictive feature:* 10 to 18 inches to lithic bedrock

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 1.2 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XF033CA - GRAVELLY LOAM

*Hydric soil rating:* No

## Description of Sparkhule

### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Colluvium derived from and/or residuum weathered from dacite

### Typical profile

*H1 - 0 to 2 inches:* gravelly sandy loam

*H2 - 2 to 18 inches:* gravelly sandy clay loam

*H3 - 18 to 28 inches:* unweathered bedrock

### Properties and qualities

*Slope:* 20 to 30 percent

*Depth to restrictive feature:* 14 to 20 inches to lithic bedrock

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

## Custom Soil Resource Report

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7e

*Ecological site:* R030XF033CA - GRAVELLY LOAM

*Hydric soil rating:* No

### Description of Rock Outcrop

#### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

#### Typical profile

*H1 - 0 to 60 inches:* unweathered bedrock

#### Properties and qualities

*Slope:* 20 to 40 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

*Available water supply, 0 to 60 inches:* Very low (about 0.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* No

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## Custom Soil Resource Report

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United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

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**Table 2-2a** Runoff curve numbers for urban areas <sup>1/</sup>

| Cover description                                                                                                                    |                                               | Curve numbers for hydrologic soil group |                                                                                       |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------|----|----|
| Cover type and hydrologic condition                                                                                                  | Average percent impervious area <sup>2/</sup> | A                                       | B                                                                                     | C  | D  |
| <i>Fully developed urban areas (vegetation established)</i>                                                                          |                                               |                                         |                                                                                       |    |    |
| Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :                                                            |                                               |                                         |                                                                                       |    |    |
| Poor condition (grass cover < 50%) .....                                                                                             |                                               | 68                                      | 79                                                                                    | 86 | 89 |
| Fair condition (grass cover 50% to 75%) .....                                                                                        |                                               | 49                                      | 69                                                                                    | 79 | 84 |
| Good condition (grass cover > 75%) .....                                                                                             |                                               | 39                                      | 61                                                                                    | 74 | 80 |
| Impervious areas:                                                                                                                    |                                               |                                         |                                                                                       |    |    |
| Paved parking lots, roofs, driveways, etc. (excluding right-of-way) .....                                                            |                                               | 98                                      | 98                                                                                    | 98 | 98 |
| Streets and roads:                                                                                                                   |                                               |                                         |                                                                                       |    |    |
| Paved; curbs and storm sewers (excluding right-of-way) .....                                                                         |                                               | 98                                      | 98                                                                                    | 98 | 98 |
| Paved; open ditches (including right-of-way) .....                                                                                   |                                               | 83                                      | 89                                                                                    | 92 | 93 |
| Gravel (including right-of-way) .....                                                                                                |                                               | 76                                      | 85                                                                                    | 89 | 91 |
| Dirt (including right-of-way) .....                                                                                                  |                                               | 72                                      | 82                                                                                    | 87 | 89 |
|  <sup>4/</sup> .....                               |                                               | 63                                      |  | 85 | 88 |
| Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) ..... |                                               | 96                                      | 96                                                                                    | 96 | 96 |
| Urban districts:                                                                                                                     |                                               |                                         |                                                                                       |    |    |
| Commercial and business .....                                                                                                        | 85                                            | 89                                      | 92                                                                                    | 94 | 95 |
| Industrial .....                                                                                                                     | 72                                            | 81                                      | 88                                                                                    | 91 | 93 |
| Residential districts by average lot size:                                                                                           |                                               |                                         |                                                                                       |    |    |
| 1/8 acre or less (town houses) .....                                                                                                 | 65                                            | 77                                      | 85                                                                                    | 90 | 92 |
| 1/4 acre .....                                                                                                                       | 38                                            | 61                                      | 75                                                                                    | 83 | 87 |
| 1/3 acre .....                                                                                                                       | 30                                            | 57                                      | 72                                                                                    | 81 | 86 |
| 1/2 acre .....                                                                                                                       | 25                                            | 54                                      | 70                                                                                    | 80 | 85 |
| 1 acre .....                                                                                                                         | 20                                            | 51                                      | 68                                                                                    | 79 | 84 |
| 2 acres .....                                                                                                                        | 12                                            | 46                                      | 65                                                                                    | 77 | 82 |
| <i>Developing urban areas</i>                                                                                                        |                                               |                                         |                                                                                       |    |    |
| Newly graded areas                                                                                                                   |                                               |                                         |                                                                                       |    |    |
| (pervious areas only, no vegetation) <sup>5/</sup> .....                                                                             |                                               | 77                                      | 86                                                                                    | 91 | 94 |
| Idle lands (CN's are determined using cover types similar to those in table 2-2c).                                                   |                                               |                                         |                                                                                       |    |    |

<sup>1/</sup> Average runoff condition, and  $I_a = 0.2S$ .<sup>2/</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.<sup>3/</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.<sup>4/</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.<sup>5/</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**Table 2-2d** Runoff curve numbers for arid and semiarid rangelands <sup>1/</sup>

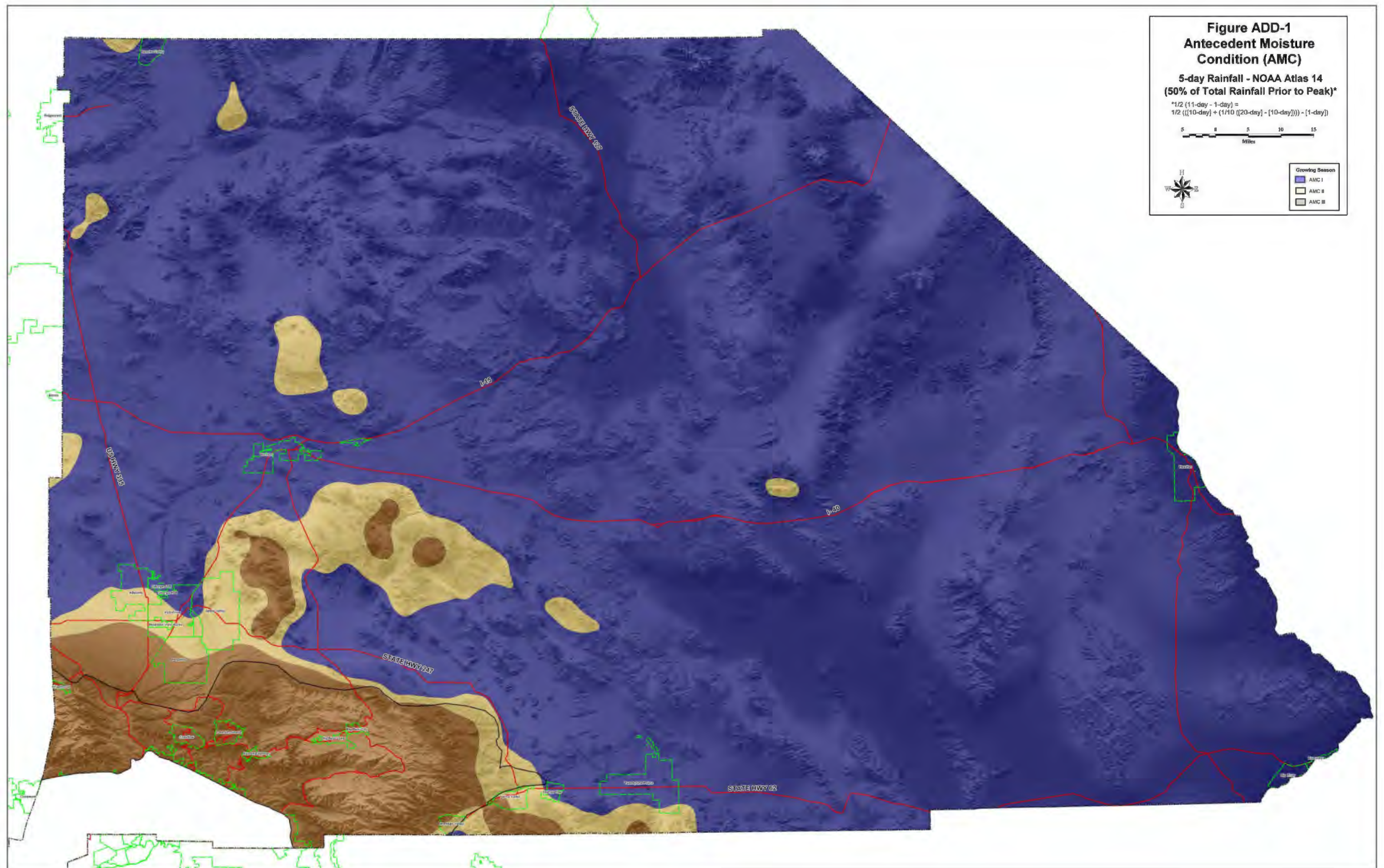
| Cover description                                                                                              |                                    | Curve numbers for hydrologic soil group |    |    |    |
|----------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------|----|----|----|
| Cover type                                                                                                     | Hydrologic condition <sup>2/</sup> | A <sup>3/</sup>                         | B  | C  | D  |
| Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.                       | Poor                               |                                         | 80 | 87 | 93 |
|                                                                                                                | Fair                               |                                         | 71 | 81 | 89 |
|                                                                                                                | Good                               |                                         | 62 | 74 | 85 |
| Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush. | Poor                               |                                         | 66 | 74 | 79 |
|                                                                                                                | Fair                               |                                         | 48 | 57 | 63 |
|                                                                                                                | Good                               |                                         | 30 | 41 | 48 |
| Pinyon-juniper—pinyon, juniper, or both; grass understory.                                                     | Poor                               |                                         | 75 | 85 | 89 |
|                                                                                                                | Fair                               |                                         | 58 | 73 | 80 |
|                                                                                                                | Good                               |                                         | 41 | 61 | 71 |
| Sagebrush with grass understory.                                                                               | Poor                               |                                         | 67 | 80 | 85 |
|                                                                                                                | Fair                               |                                         | 51 | 63 | 70 |
|                                                                                                                | Good                               |                                         | 35 | 47 | 55 |
| greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.                               | Fair                               | 55                                      | 72 | 81 | 86 |
|                                                                                                                | Good                               | 49                                      | 68 | 79 | 84 |

<sup>1</sup> Average runoff condition, and  $I_{a_s} = 0.2S$ . For range in humid regions, use table 2-2c.<sup>2</sup> Poor: <30% ground cover (litter, grass, and brush overstory).

Fair: 30 to 70% ground cover.

Good: &gt; 70% ground cover.

<sup>3</sup> Curve numbers for group A have been developed only for desert shrub.



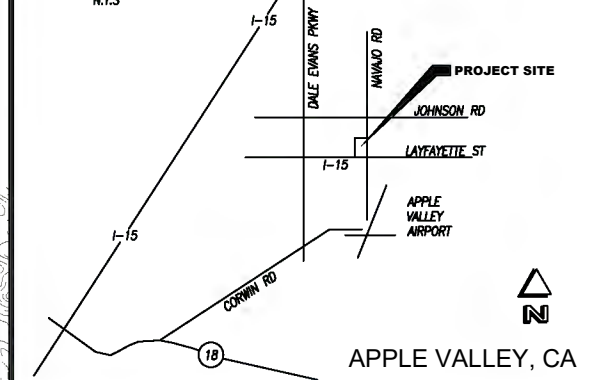
# **EXHIBIT “F”**

## **Existing Off-Site Hydrologic Conditions Study Map**

# EXHIBIT "F" EXISTING OFF-SITE HYDROLOGIC CONDITIONS

FISHER CONSTRUCTION GTS COLD STORAGE  
APPLE VALLEY, CA 92307  
APN 0463-231-06

## VICINITY MAP



## MAP LEGEND

DRAINAGE AREA LIMITS

FLOW PATHS

DRAINAGE AREA CENTROIDS

DRAINAGE AREA,  
SIZE, % IMPERVIOUS,  
& CLOSEST APPROXIMATED  
CLASSIFICATION

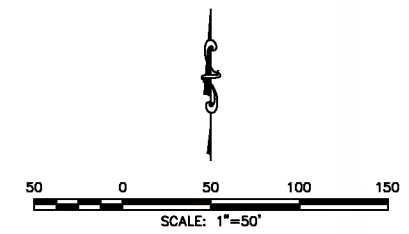
AREA "A"  
1.00 AC  
20% IMPERVIOUS  
1 AC LOTS

RATIONAL METHOD  
NODE LOCATION,  
ELEVATION, & TOTAL  
PEAK  $Q_{100}$

ELEV = 100.00  
1.1  
 $Q_{100} = 1.0$  CFS

UNIT HYDROGRAPH METHOD  
TOTAL PEAK  $Q_{100}$

$Q_{100} = 1$  CFS  
 $V_{100} = 1$  AF



EXISTING ON-SITE HYDROLOGIC CONDITIONS  
FISHER CONSTRUCTION GTS COLD STORAGE  
APN 0463-231-06  
APPLE VALLEY, CA 92307  
SAN BERNARDINO COUNTY

PREPARED BY:  
**BONADIMAN**  
JOSEPH E. BONADIMAN & ASSOCIATES, INC.  
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PREPARED FOR:

PREPARED FOR: FISHER CONSTRUCTION  
JOB NO: 224986  
PREPARED BY: CR  
CHECKED BY: JTS

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| BY | MARK | REVISION DESCRIPTION | DATE |
|----|------|----------------------|------|
|    |      |                      |      |
|    |      |                      |      |
|    |      |                      |      |

| EXISTING OFF-SITE                                  | F            |
|----------------------------------------------------|--------------|
| APN 0463-231-06<br>APPLE VALLEY, CA 92307          |              |
| DISREGARD PRINTS BEARING<br>EARLIER REVISION DATES |              |
| 06-23-22                                           | SHEET 1 OF 1 |

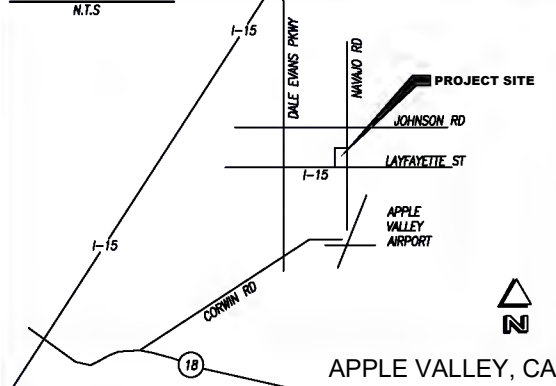
# **EXHIBIT “G”**

## **Existing On-Site Hydrologic Conditions Study Map**

EXHIBIT "G"  
EXISTING ON-SITE  
HYDROLOGIC CONDITIONS

FISHER CONSTRUCTION GTS COLD STORAGE  
APPLE VALLEY, CA 92307  
APN 0463-231-06

VICINITY MAP



MAP LEGEND

DRAINAGE AREA LIMITS

FLOW PATHS

DRAINAGE AREA,  
SIZE, % IMPERVIOUS,  
& CLOSEST APPROXIMATED  
CLASSIFICATION

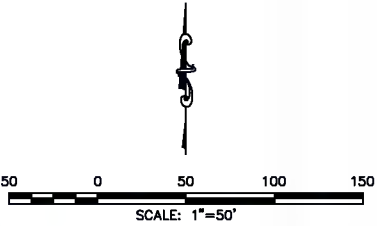
AREA "A"  
1.00 AC  
20% PERVIOUS  
1 AC LOTS

RATIONAL METHOD  
NODE LOCATION,  
ELEVATION, & TOTAL  
PEAK  $Q_{100}$

AREA "A"  
ELEV = 100.00  
 $Q_{100} = 1.0$  CFS

UNIT HYDROGRAPH METHOD  
TOTAL PEAK  $Q_{100-24}$

AREA "A"  
 $Q_{100-24} = 1$  CFS  
 $V_{100-24} = 1$  AF



EXISTING ON-SITE HYDROLOGIC CONDITIONS  
FISHER CONSTRUCTION GTS COLD STORAGE

APN 0463-231-06  
APPLE VALLEY, CA 92307  
SAN BERNARDINO COUNTY

PREPARED BY:



TEL (909) 885-3808  
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COUNTY OF SAN BERNARDINO  
PLANNING & DESIGN  
FAC 909 885-3808  
WWW.BENADIMAN.COM

PREPARED FOR:

PREPARED FOR: FISHER CONSTRUCTION  
JOB NO: 224986  
PREPARED BY: CR  
CHECKED BY: JTS

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EXISTING ON-SITE  
APN 0463-231-06  
APPLE VALLEY, CA 92307

DISPERSED PRINTS BEARING  
EARLIER REVISION DATES

06-23-22

G

SHEET 1 OF 1

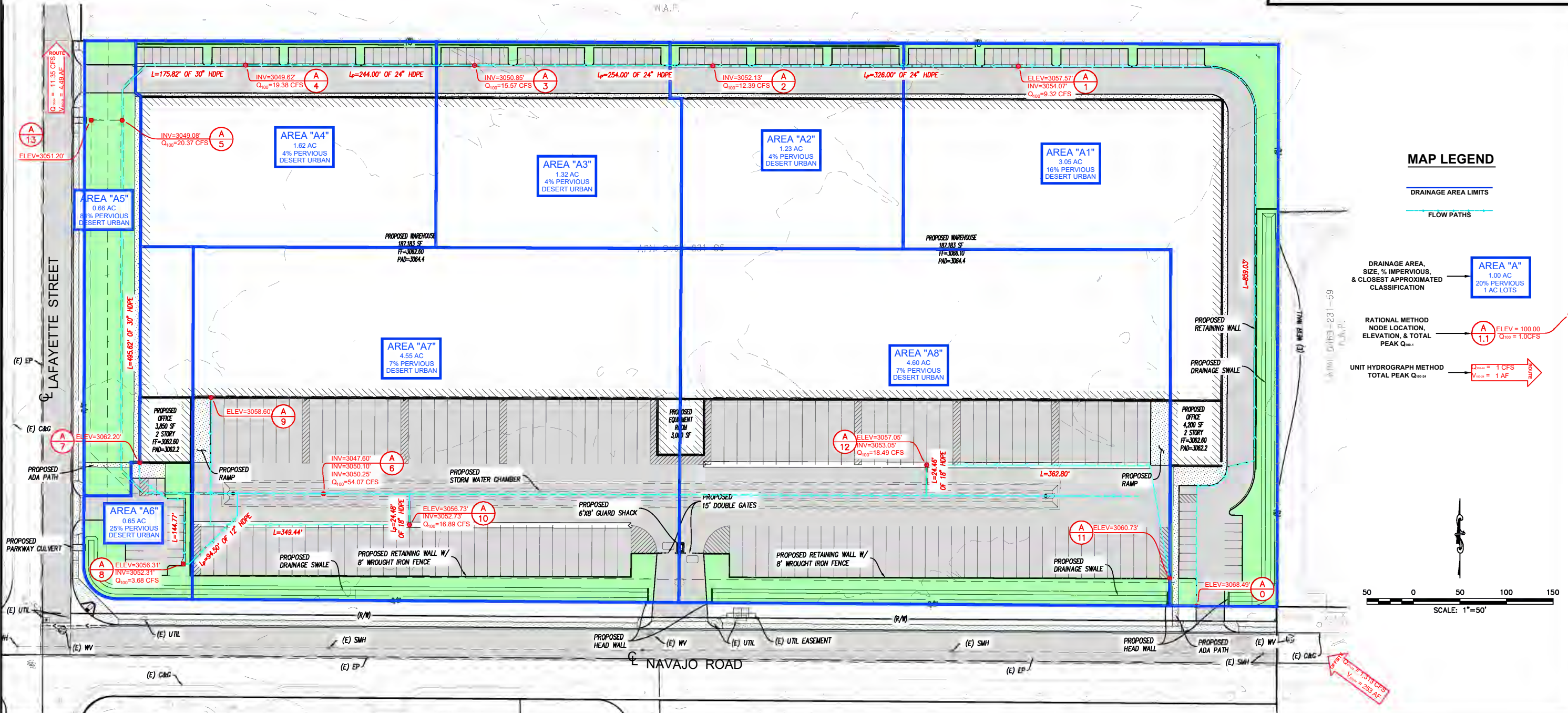
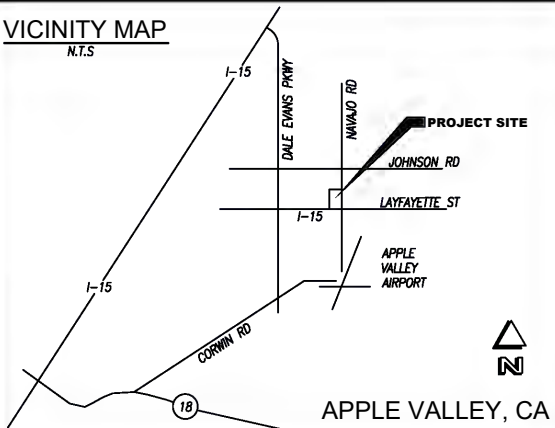
# **EXHIBIT “H”**

Developed On-Site  
Hydrologic Conditions  
Study Map

EXHIBIT "H"  
DEVELOPED ON-SITE  
HYDROLOGIC CONDITIONS

FISHER CONSTRUCTION GTS COLD STORAGE  
APPLE VALLEY, CA 92307  
APN 0463-231-06

VICINITY MAP  
N.T.S.



MAP LEGEND

DRAINAGE AREA LIMITS

FLOW PATHS

DRAINAGE AREA,  
SIZE, % IMPERVIOUS,  
& CLOSEST APPROXIMATED  
CLASSIFICATION

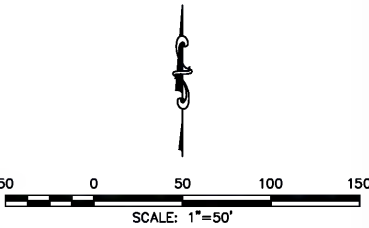
AREA "A"  
1.00 AC  
20% PERVIOUS  
1 AC LOTS

RATIONAL METHOD  
NODE LOCATION,  
ELEVATION, & TOTAL  
PEAK  $Q_{100}$

A  
ELEV = 100.00  
 $Q_{100} = 1.0$  CFS

UNIT HYDROGRAPH METHOD  
TOTAL PEAK  $Q_{100-24}$

$Q_{100-24} = 1$  CFS  
 $V_{100-24} = 1$  AF



DEVELOPED ON-SITE HYDROLOGIC CONDITIONS  
FISHER CONSTRUCTION GTS COLD STORAGE  
APN 0463-231-06  
APPLE VALLEY, CA 92307  
SAN BERNARDINO COUNTY

PREPARED BY:  
**BONADIMAN**  
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PREPARED FOR:

PREPARED FOR: FISHER CONSTRUCTION  
JOB NO: 224986  
PREPARED BY: CR  
CHECKED BY: JTS

NOTE: JOSEPH E. BONADIMAN & ASSOCIATES, INC. DOES NOT WARRANT THE  
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DEVELOPED ON-SITE  
APN 0463-231-06  
APPLE VALLEY, CA 92307

H

DISREGARD PRINTS BEARING  
EARLIER REVISION DATES

06-23-22

SHEET 1 OF 1

# **ATTACHMENT 1**

Existing Off-site Conditions  
Unit Method Calculations

# Unit Hydrograph Analysis

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Study date 06/22/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - OFFSITE  
100-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-22-22  
-----

Storm Event Year =       

Antecedent Moisture Condition =   

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 1626.00                    | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 1626.00                    | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 1626.00                    | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 1626.00                    | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 1626.00                    | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 1626.00                    | 24                  | 3.39              |

+++++

\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 81.0                     | 81.0                     | 1626.00       | 1.000            | 0.353                 | 1.000        | 0.353         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.353

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 1626.00       | 1.000         | 81.0             | 81.0             | 2.35 | 0.478                |

Area-averaged catchment yield fraction, Y = 0.478

Area-averaged low loss fraction, Yb = 0.522

+++++

Watercourse length = 24695.00(Ft.)

Length from concentration point to centroid = 9182.00(Ft.)

Elevation difference along watercourse = 1026.80(Ft.)

Mannings friction factor along watercourse = 0.040  
 watershed area = 1626.00(Ac.)  
 Catchment Lag time =            hours  
 Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 10.9026  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.353(In/Hr)  
 Average low loss rate fraction (Yb) = 0.522 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.508(In)  
 Computed peak 30-minute rainfall = 0.869(In)  
 Specified peak 1-hour rainfall = 1.070(In)  
 Computed peak 3-hour rainfall = 1.565(In)  
 Specified peak 6-hour rainfall = 1.990(In)  
 Specified peak 24-hour rainfall = 3.390(In)

Rainfall depth area reduction factors:  
 Using a total area of 1626.00(Ac.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.924  | Adjusted rainfall = 0.469(In) |
| 30-minute factor = 0.924 | Adjusted rainfall = 0.803(In) |
| 1-hour factor = 0.924    | Adjusted rainfall = 0.988(In) |
| 3-hour factor = 0.990    | Adjusted rainfall = 1.550(In) |
| 6-hour factor = 0.995    | Adjusted rainfall = 1.980(In) |
| 24-hour factor = 0.998   | Adjusted rainfall = 3.383(In) |

| Unit Hydrograph |                      |                 |
|-----------------|----------------------|-----------------|
| Interval        | 'S' Graph            | Unit Hydrograph |
| Number          | Mean values          | ((CFS))         |
| -----           |                      |                 |
|                 | (K = 19664.44 (CFS)) |                 |
| 1               | 0.480                | 94.333          |
| 2               | 1.757                | 251.134         |
| 3               | 3.797                | 401.200         |
| 4               | 6.614                | 553.960         |
| 5               | 10.469               | 757.967         |
| 6               | 17.027               | 1289.614        |
| 7               | 27.054               | 1971.829        |
| 8               | 37.094               | 1974.384        |
| 9               | 45.309               | 1615.377        |
| 10              | 51.839               | 1284.108        |
| 11              | 57.184               | 1050.979        |
| 12              | 61.333               | 815.998         |
| 13              | 64.781               | 677.850         |
| 14              | 67.749               | 583.747         |
| 15              | 70.439               | 528.945         |
| 16              | 72.798               | 463.885         |
| 17              | 74.861               | 405.629         |
| 18              | 76.752               | 371.880         |
| 19              | 78.501               | 343.924         |
| 20              | 79.963               | 287.573         |
| 21              | 81.385               | 279.615         |
| 22              | 82.616               | 241.995         |
| 23              | 83.793               | 231.482         |
| 24              | 84.896               | 216.952         |
| 25              | 85.943               | 205.817         |
| 26              | 86.937               | 195.473         |
| 27              | 87.813               | 172.370         |
| 28              | 88.660               | 166.501         |
| 29              | 89.343               | 134.354         |
| 30              | 89.997               | 128.480         |
| 31              | 90.622               | 122.870         |
| 32              | 91.232               | 120.060         |
| 33              | 91.808               | 113.153         |
| 34              | 92.331               | 102.999         |
| 35              | 92.847               | 101.342         |
| 36              | 93.330               | 95.004          |
| 37              | 93.804               | 93.293          |
| 38              | 94.201               | 77.977          |
| 39              | 94.571               | 72.894          |
| 40              | 94.942               | 72.894          |
| 41              | 95.313               | 72.894          |
| 42              | 95.661               | 68.382          |
| 43              | 95.947               | 56.389          |
| 44              | 96.231               | 55.742          |
| 45              | 96.514               | 55.742          |
| 46              | 96.797               | 55.576          |

|    |         |        |
|----|---------|--------|
| 47 | 97.025  | 44.945 |
| 48 | 97.222  | 38.591 |
| 49 | 97.418  | 38.591 |
| 50 | 97.614  | 38.591 |
| 51 | 97.797  | 35.967 |
| 52 | 97.915  | 23.152 |
| 53 | 98.024  | 21.439 |
| 54 | 98.133  | 21.439 |
| 55 | 98.242  | 21.439 |
| 56 | 98.361  | 23.444 |
| 57 | 98.492  | 25.725 |
| 58 | 98.623  | 25.727 |
| 59 | 98.754  | 25.727 |
| 60 | 98.884  | 25.727 |
| 61 | 99.015  | 25.727 |
| 62 | 99.146  | 25.727 |
| 63 | 99.277  | 25.727 |
| 64 | 99.408  | 25.727 |
| 65 | 99.519  | 21.832 |
| 66 | 99.588  | 13.659 |
| 67 | 99.656  | 13.400 |
| 68 | 99.725  | 13.400 |
| 69 | 99.793  | 13.400 |
| 70 | 99.861  | 13.400 |
| 71 | 99.929  | 13.400 |
| 72 | 100.000 | 6.700  |

| Peak Unit<br>Number | Adjusted mass<br>rainfall<br>(In) | Unit rainfall<br>(In) |
|---------------------|-----------------------------------|-----------------------|
| 1                   | 0.4690                            | 0.4690                |
| 2                   | 0.5774                            | 0.1084                |
| 3                   | 0.6521                            | 0.0747                |
| 4                   | 0.7109                            | 0.0588                |
| 5                   | 0.7601                            | 0.0492                |
| 6                   | 0.8029                            | 0.0427                |
| 7                   | 0.8409                            | 0.0380                |
| 8                   | 0.8752                            | 0.0344                |
| 9                   | 0.9067                            | 0.0315                |
| 10                  | 0.9358                            | 0.0291                |
| 11                  | 0.9630                            | 0.0271                |
| 12                  | 0.9884                            | 0.0255                |
| 13                  | 1.0214                            | 0.0329                |
| 14                  | 1.0529                            | 0.0315                |
| 15                  | 1.0831                            | 0.0302                |
| 16                  | 1.1121                            | 0.0290                |
| 17                  | 1.1400                            | 0.0280                |
| 18                  | 1.1670                            | 0.0270                |
| 19                  | 1.1932                            | 0.0261                |
| 20                  | 1.2185                            | 0.0253                |
| 21                  | 1.2431                            | 0.0246                |
| 22                  | 1.2670                            | 0.0239                |
| 23                  | 1.2903                            | 0.0233                |
| 24                  | 1.3130                            | 0.0227                |
| 25                  | 1.3351                            | 0.0221                |
| 26                  | 1.3568                            | 0.0216                |
| 27                  | 1.3779                            | 0.0211                |
| 28                  | 1.3986                            | 0.0207                |
| 29                  | 1.4188                            | 0.0202                |
| 30                  | 1.4387                            | 0.0198                |
| 31                  | 1.4581                            | 0.0195                |
| 32                  | 1.4772                            | 0.0191                |
| 33                  | 1.4959                            | 0.0187                |
| 34                  | 1.5144                            | 0.0184                |
| 35                  | 1.5324                            | 0.0181                |
| 36                  | 1.5502                            | 0.0178                |
| 37                  | 1.5653                            | 0.0151                |
| 38                  | 1.5801                            | 0.0148                |
| 39                  | 1.5946                            | 0.0146                |
| 40                  | 1.6090                            | 0.0143                |
| 41                  | 1.6230                            | 0.0141                |
| 42                  | 1.6369                            | 0.0139                |
| 43                  | 1.6506                            | 0.0137                |
| 44                  | 1.6640                            | 0.0134                |
| 45                  | 1.6773                            | 0.0133                |
| 46                  | 1.6903                            | 0.0131                |
| 47                  | 1.7032                            | 0.0129                |
| 48                  | 1.7159                            | 0.0127                |
| 49                  | 1.7284                            | 0.0125                |
| 50                  | 1.7408                            | 0.0124                |
| 51                  | 1.7530                            | 0.0122                |
| 52                  | 1.7651                            | 0.0121                |

|     |        |        |
|-----|--------|--------|
| 53  | 1.7770 | 0.0119 |
| 54  | 1.7887 | 0.0118 |
| 55  | 1.8004 | 0.0116 |
| 56  | 1.8118 | 0.0115 |
| 57  | 1.8232 | 0.0114 |
| 58  | 1.8344 | 0.0112 |
| 59  | 1.8455 | 0.0111 |
| 60  | 1.8565 | 0.0110 |
| 61  | 1.8674 | 0.0109 |
| 62  | 1.8781 | 0.0107 |
| 63  | 1.8887 | 0.0106 |
| 64  | 1.8993 | 0.0105 |
| 65  | 1.9097 | 0.0104 |
| 66  | 1.9200 | 0.0103 |
| 67  | 1.9302 | 0.0102 |
| 68  | 1.9403 | 0.0101 |
| 69  | 1.9504 | 0.0100 |
| 70  | 1.9603 | 0.0099 |
| 71  | 1.9701 | 0.0098 |
| 72  | 1.9799 | 0.0097 |
| 73  | 1.9905 | 0.0106 |
| 74  | 2.0010 | 0.0105 |
| 75  | 2.0114 | 0.0104 |
| 76  | 2.0217 | 0.0103 |
| 77  | 2.0319 | 0.0102 |
| 78  | 2.0421 | 0.0102 |
| 79  | 2.0522 | 0.0101 |
| 80  | 2.0622 | 0.0100 |
| 81  | 2.0721 | 0.0099 |
| 82  | 2.0819 | 0.0098 |
| 83  | 2.0917 | 0.0098 |
| 84  | 2.1014 | 0.0097 |
| 85  | 2.1111 | 0.0096 |
| 86  | 2.1206 | 0.0096 |
| 87  | 2.1301 | 0.0095 |
| 88  | 2.1395 | 0.0094 |
| 89  | 2.1489 | 0.0094 |
| 90  | 2.1582 | 0.0093 |
| 91  | 2.1674 | 0.0092 |
| 92  | 2.1766 | 0.0092 |
| 93  | 2.1857 | 0.0091 |
| 94  | 2.1948 | 0.0091 |
| 95  | 2.2038 | 0.0090 |
| 96  | 2.2127 | 0.0089 |
| 97  | 2.2216 | 0.0089 |
| 98  | 2.2304 | 0.0088 |
| 99  | 2.2392 | 0.0088 |
| 100 | 2.2479 | 0.0087 |
| 101 | 2.2566 | 0.0087 |
| 102 | 2.2652 | 0.0086 |
| 103 | 2.2737 | 0.0086 |
| 104 | 2.2822 | 0.0085 |
| 105 | 2.2907 | 0.0085 |
| 106 | 2.2991 | 0.0084 |
| 107 | 2.3075 | 0.0084 |
| 108 | 2.3158 | 0.0083 |
| 109 | 2.3240 | 0.0083 |
| 110 | 2.3322 | 0.0082 |
| 111 | 2.3404 | 0.0082 |
| 112 | 2.3485 | 0.0081 |
| 113 | 2.3566 | 0.0081 |
| 114 | 2.3647 | 0.0080 |
| 115 | 2.3727 | 0.0080 |
| 116 | 2.3806 | 0.0080 |
| 117 | 2.3885 | 0.0079 |
| 118 | 2.3964 | 0.0079 |
| 119 | 2.4042 | 0.0078 |
| 120 | 2.4120 | 0.0078 |
| 121 | 2.4197 | 0.0077 |
| 122 | 2.4275 | 0.0077 |
| 123 | 2.4351 | 0.0077 |
| 124 | 2.4428 | 0.0076 |
| 125 | 2.4504 | 0.0076 |
| 126 | 2.4579 | 0.0076 |
| 127 | 2.4654 | 0.0075 |
| 128 | 2.4729 | 0.0075 |
| 129 | 2.4804 | 0.0074 |
| 130 | 2.4878 | 0.0074 |
| 131 | 2.4952 | 0.0074 |
| 132 | 2.5025 | 0.0073 |
| 133 | 2.5098 | 0.0073 |

|     |        |        |
|-----|--------|--------|
| 134 | 2.5171 | 0.0073 |
| 135 | 2.5243 | 0.0072 |
| 136 | 2.5315 | 0.0072 |
| 137 | 2.5387 | 0.0072 |
| 138 | 2.5459 | 0.0071 |
| 139 | 2.5530 | 0.0071 |
| 140 | 2.5601 | 0.0071 |
| 141 | 2.5671 | 0.0071 |
| 142 | 2.5741 | 0.0070 |
| 143 | 2.5811 | 0.0070 |
| 144 | 2.5881 | 0.0070 |
| 145 | 2.5950 | 0.0069 |
| 146 | 2.6019 | 0.0069 |
| 147 | 2.6088 | 0.0069 |
| 148 | 2.6156 | 0.0068 |
| 149 | 2.6225 | 0.0068 |
| 150 | 2.6292 | 0.0068 |
| 151 | 2.6360 | 0.0068 |
| 152 | 2.6427 | 0.0067 |
| 153 | 2.6494 | 0.0067 |
| 154 | 2.6561 | 0.0067 |
| 155 | 2.6628 | 0.0067 |
| 156 | 2.6694 | 0.0066 |
| 157 | 2.6760 | 0.0066 |
| 158 | 2.6826 | 0.0066 |
| 159 | 2.6891 | 0.0065 |
| 160 | 2.6956 | 0.0065 |
| 161 | 2.7021 | 0.0065 |
| 162 | 2.7086 | 0.0065 |
| 163 | 2.7151 | 0.0064 |
| 164 | 2.7215 | 0.0064 |
| 165 | 2.7279 | 0.0064 |
| 166 | 2.7343 | 0.0064 |
| 167 | 2.7406 | 0.0064 |
| 168 | 2.7470 | 0.0063 |
| 169 | 2.7533 | 0.0063 |
| 170 | 2.7595 | 0.0063 |
| 171 | 2.7658 | 0.0063 |
| 172 | 2.7720 | 0.0062 |
| 173 | 2.7783 | 0.0062 |
| 174 | 2.7845 | 0.0062 |
| 175 | 2.7906 | 0.0062 |
| 176 | 2.7968 | 0.0062 |
| 177 | 2.8029 | 0.0061 |
| 178 | 2.8090 | 0.0061 |
| 179 | 2.8151 | 0.0061 |
| 180 | 2.8212 | 0.0061 |
| 181 | 2.8272 | 0.0060 |
| 182 | 2.8333 | 0.0060 |
| 183 | 2.8393 | 0.0060 |
| 184 | 2.8452 | 0.0060 |
| 185 | 2.8512 | 0.0060 |
| 186 | 2.8572 | 0.0059 |
| 187 | 2.8631 | 0.0059 |
| 188 | 2.8690 | 0.0059 |
| 189 | 2.8749 | 0.0059 |
| 190 | 2.8807 | 0.0059 |
| 191 | 2.8866 | 0.0059 |
| 192 | 2.8924 | 0.0058 |
| 193 | 2.8982 | 0.0058 |
| 194 | 2.9040 | 0.0058 |
| 195 | 2.9098 | 0.0058 |
| 196 | 2.9156 | 0.0058 |
| 197 | 2.9213 | 0.0057 |
| 198 | 2.9270 | 0.0057 |
| 199 | 2.9327 | 0.0057 |
| 200 | 2.9384 | 0.0057 |
| 201 | 2.9441 | 0.0057 |
| 202 | 2.9497 | 0.0057 |
| 203 | 2.9554 | 0.0056 |
| 204 | 2.9610 | 0.0056 |
| 205 | 2.9666 | 0.0056 |
| 206 | 2.9722 | 0.0056 |
| 207 | 2.9778 | 0.0056 |
| 208 | 2.9833 | 0.0056 |
| 209 | 2.9888 | 0.0055 |
| 210 | 2.9944 | 0.0055 |
| 211 | 2.9999 | 0.0055 |
| 212 | 3.0053 | 0.0055 |
| 213 | 3.0108 | 0.0055 |
| 214 | 3.0163 | 0.0055 |

| 215                        | 3.0217                   | 0.0054                    |                               |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 216                        | 3.0271                   | 0.0054                    |                               |
| 217                        | 3.0325                   | 0.0054                    |                               |
| 218                        | 3.0379                   | 0.0054                    |                               |
| 219                        | 3.0433                   | 0.0054                    |                               |
| 220                        | 3.0487                   | 0.0054                    |                               |
| 221                        | 3.0540                   | 0.0053                    |                               |
| 222                        | 3.0594                   | 0.0053                    |                               |
| 223                        | 3.0647                   | 0.0053                    |                               |
| 224                        | 3.0700                   | 0.0053                    |                               |
| 225                        | 3.0753                   | 0.0053                    |                               |
| 226                        | 3.0805                   | 0.0053                    |                               |
| 227                        | 3.0858                   | 0.0053                    |                               |
| 228                        | 3.0911                   | 0.0052                    |                               |
| 229                        | 3.0963                   | 0.0052                    |                               |
| 230                        | 3.1015                   | 0.0052                    |                               |
| 231                        | 3.1067                   | 0.0052                    |                               |
| 232                        | 3.1119                   | 0.0052                    |                               |
| 233                        | 3.1171                   | 0.0052                    |                               |
| 234                        | 3.1222                   | 0.0052                    |                               |
| 235                        | 3.1274                   | 0.0051                    |                               |
| 236                        | 3.1325                   | 0.0051                    |                               |
| 237                        | 3.1376                   | 0.0051                    |                               |
| 238                        | 3.1428                   | 0.0051                    |                               |
| 239                        | 3.1479                   | 0.0051                    |                               |
| 240                        | 3.1529                   | 0.0051                    |                               |
| 241                        | 3.1580                   | 0.0051                    |                               |
| 242                        | 3.1631                   | 0.0051                    |                               |
| 243                        | 3.1681                   | 0.0050                    |                               |
| 244                        | 3.1731                   | 0.0050                    |                               |
| 245                        | 3.1782                   | 0.0050                    |                               |
| 246                        | 3.1832                   | 0.0050                    |                               |
| 247                        | 3.1882                   | 0.0050                    |                               |
| 248                        | 3.1931                   | 0.0050                    |                               |
| 249                        | 3.1981                   | 0.0050                    |                               |
| 250                        | 3.2031                   | 0.0050                    |                               |
| 251                        | 3.2080                   | 0.0049                    |                               |
| 252                        | 3.2130                   | 0.0049                    |                               |
| 253                        | 3.2179                   | 0.0049                    |                               |
| 254                        | 3.2228                   | 0.0049                    |                               |
| 255                        | 3.2277                   | 0.0049                    |                               |
| 256                        | 3.2326                   | 0.0049                    |                               |
| 257                        | 3.2374                   | 0.0049                    |                               |
| 258                        | 3.2423                   | 0.0049                    |                               |
| 259                        | 3.2472                   | 0.0049                    |                               |
| 260                        | 3.2520                   | 0.0048                    |                               |
| 261                        | 3.2568                   | 0.0048                    |                               |
| 262                        | 3.2616                   | 0.0048                    |                               |
| 263                        | 3.2664                   | 0.0048                    |                               |
| 264                        | 3.2712                   | 0.0048                    |                               |
| 265                        | 3.2760                   | 0.0048                    |                               |
| 266                        | 3.2808                   | 0.0048                    |                               |
| 267                        | 3.2856                   | 0.0048                    |                               |
| 268                        | 3.2903                   | 0.0048                    |                               |
| 269                        | 3.2950                   | 0.0047                    |                               |
| 270                        | 3.2998                   | 0.0047                    |                               |
| 271                        | 3.3045                   | 0.0047                    |                               |
| 272                        | 3.3092                   | 0.0047                    |                               |
| 273                        | 3.3139                   | 0.0047                    |                               |
| 274                        | 3.3186                   | 0.0047                    |                               |
| 275                        | 3.3233                   | 0.0047                    |                               |
| 276                        | 3.3279                   | 0.0047                    |                               |
| 277                        | 3.3326                   | 0.0047                    |                               |
| 278                        | 3.3372                   | 0.0046                    |                               |
| 279                        | 3.3419                   | 0.0046                    |                               |
| 280                        | 3.3465                   | 0.0046                    |                               |
| 281                        | 3.3511                   | 0.0046                    |                               |
| 282                        | 3.3557                   | 0.0046                    |                               |
| 283                        | 3.3603                   | 0.0046                    |                               |
| 284                        | 3.3649                   | 0.0046                    |                               |
| 285                        | 3.3694                   | 0.0046                    |                               |
| 286                        | 3.3740                   | 0.0046                    |                               |
| 287                        | 3.3786                   | 0.0046                    |                               |
| 288                        | 3.3831                   | 0.0045                    |                               |
| <hr/>                      |                          |                           |                               |
| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
| <hr/>                      |                          |                           |                               |
| 1                          | 0.0045                   | 0.0024                    | 0.0022                        |
| 2                          | 0.0046                   | 0.0024                    | 0.0022                        |

|    |        |        |        |
|----|--------|--------|--------|
| 3  | 0.0046 | 0.0024 | 0.0022 |
| 4  | 0.0046 | 0.0024 | 0.0022 |
| 5  | 0.0046 | 0.0024 | 0.0022 |
| 6  | 0.0046 | 0.0024 | 0.0022 |
| 7  | 0.0046 | 0.0024 | 0.0022 |
| 8  | 0.0046 | 0.0024 | 0.0022 |
| 9  | 0.0047 | 0.0024 | 0.0022 |
| 10 | 0.0047 | 0.0024 | 0.0022 |
| 11 | 0.0047 | 0.0025 | 0.0022 |
| 12 | 0.0047 | 0.0025 | 0.0022 |
| 13 | 0.0047 | 0.0025 | 0.0023 |
| 14 | 0.0047 | 0.0025 | 0.0023 |
| 15 | 0.0048 | 0.0025 | 0.0023 |
| 16 | 0.0048 | 0.0025 | 0.0023 |
| 17 | 0.0048 | 0.0025 | 0.0023 |
| 18 | 0.0048 | 0.0025 | 0.0023 |
| 19 | 0.0048 | 0.0025 | 0.0023 |
| 20 | 0.0048 | 0.0025 | 0.0023 |
| 21 | 0.0049 | 0.0025 | 0.0023 |
| 22 | 0.0049 | 0.0025 | 0.0023 |
| 23 | 0.0049 | 0.0026 | 0.0023 |
| 24 | 0.0049 | 0.0026 | 0.0023 |
| 25 | 0.0049 | 0.0026 | 0.0024 |
| 26 | 0.0049 | 0.0026 | 0.0024 |
| 27 | 0.0050 | 0.0026 | 0.0024 |
| 28 | 0.0050 | 0.0026 | 0.0024 |
| 29 | 0.0050 | 0.0026 | 0.0024 |
| 30 | 0.0050 | 0.0026 | 0.0024 |
| 31 | 0.0050 | 0.0026 | 0.0024 |
| 32 | 0.0051 | 0.0026 | 0.0024 |
| 33 | 0.0051 | 0.0027 | 0.0024 |
| 34 | 0.0051 | 0.0027 | 0.0024 |
| 35 | 0.0051 | 0.0027 | 0.0024 |
| 36 | 0.0051 | 0.0027 | 0.0025 |
| 37 | 0.0052 | 0.0027 | 0.0025 |
| 38 | 0.0052 | 0.0027 | 0.0025 |
| 39 | 0.0052 | 0.0027 | 0.0025 |
| 40 | 0.0052 | 0.0027 | 0.0025 |
| 41 | 0.0052 | 0.0027 | 0.0025 |
| 42 | 0.0053 | 0.0027 | 0.0025 |
| 43 | 0.0053 | 0.0028 | 0.0025 |
| 44 | 0.0053 | 0.0028 | 0.0025 |
| 45 | 0.0053 | 0.0028 | 0.0025 |
| 46 | 0.0053 | 0.0028 | 0.0026 |
| 47 | 0.0054 | 0.0028 | 0.0026 |
| 48 | 0.0054 | 0.0028 | 0.0026 |
| 49 | 0.0054 | 0.0028 | 0.0026 |
| 50 | 0.0054 | 0.0028 | 0.0026 |
| 51 | 0.0055 | 0.0029 | 0.0026 |
| 52 | 0.0055 | 0.0029 | 0.0026 |
| 53 | 0.0055 | 0.0029 | 0.0026 |
| 54 | 0.0055 | 0.0029 | 0.0026 |
| 55 | 0.0056 | 0.0029 | 0.0027 |
| 56 | 0.0056 | 0.0029 | 0.0027 |
| 57 | 0.0056 | 0.0029 | 0.0027 |
| 58 | 0.0056 | 0.0029 | 0.0027 |
| 59 | 0.0057 | 0.0030 | 0.0027 |
| 60 | 0.0057 | 0.0030 | 0.0027 |
| 61 | 0.0057 | 0.0030 | 0.0027 |
| 62 | 0.0057 | 0.0030 | 0.0027 |
| 63 | 0.0058 | 0.0030 | 0.0028 |
| 64 | 0.0058 | 0.0030 | 0.0028 |
| 65 | 0.0058 | 0.0030 | 0.0028 |
| 66 | 0.0059 | 0.0031 | 0.0028 |
| 67 | 0.0059 | 0.0031 | 0.0028 |
| 68 | 0.0059 | 0.0031 | 0.0028 |
| 69 | 0.0059 | 0.0031 | 0.0028 |
| 70 | 0.0060 | 0.0031 | 0.0029 |
| 71 | 0.0060 | 0.0031 | 0.0029 |
| 72 | 0.0060 | 0.0031 | 0.0029 |
| 73 | 0.0061 | 0.0032 | 0.0029 |
| 74 | 0.0061 | 0.0032 | 0.0029 |
| 75 | 0.0061 | 0.0032 | 0.0029 |
| 76 | 0.0062 | 0.0032 | 0.0029 |
| 77 | 0.0062 | 0.0032 | 0.0030 |
| 78 | 0.0062 | 0.0032 | 0.0030 |
| 79 | 0.0063 | 0.0033 | 0.0030 |
| 80 | 0.0063 | 0.0033 | 0.0030 |
| 81 | 0.0063 | 0.0033 | 0.0030 |
| 82 | 0.0064 | 0.0033 | 0.0030 |
| 83 | 0.0064 | 0.0033 | 0.0031 |

|     |        |        |        |
|-----|--------|--------|--------|
| 84  | 0.0064 | 0.0034 | 0.0031 |
| 85  | 0.0065 | 0.0034 | 0.0031 |
| 86  | 0.0065 | 0.0034 | 0.0031 |
| 87  | 0.0065 | 0.0034 | 0.0031 |
| 88  | 0.0066 | 0.0034 | 0.0031 |
| 89  | 0.0066 | 0.0035 | 0.0032 |
| 90  | 0.0067 | 0.0035 | 0.0032 |
| 91  | 0.0067 | 0.0035 | 0.0032 |
| 92  | 0.0067 | 0.0035 | 0.0032 |
| 93  | 0.0068 | 0.0035 | 0.0032 |
| 94  | 0.0068 | 0.0036 | 0.0033 |
| 95  | 0.0069 | 0.0036 | 0.0033 |
| 96  | 0.0069 | 0.0036 | 0.0033 |
| 97  | 0.0070 | 0.0036 | 0.0033 |
| 98  | 0.0070 | 0.0037 | 0.0033 |
| 99  | 0.0071 | 0.0037 | 0.0034 |
| 100 | 0.0071 | 0.0037 | 0.0034 |
| 101 | 0.0071 | 0.0037 | 0.0034 |
| 102 | 0.0072 | 0.0037 | 0.0034 |
| 103 | 0.0072 | 0.0038 | 0.0035 |
| 104 | 0.0073 | 0.0038 | 0.0035 |
| 105 | 0.0073 | 0.0038 | 0.0035 |
| 106 | 0.0074 | 0.0039 | 0.0035 |
| 107 | 0.0074 | 0.0039 | 0.0036 |
| 108 | 0.0075 | 0.0039 | 0.0036 |
| 109 | 0.0076 | 0.0039 | 0.0036 |
| 110 | 0.0076 | 0.0040 | 0.0036 |
| 111 | 0.0077 | 0.0040 | 0.0037 |
| 112 | 0.0077 | 0.0040 | 0.0037 |
| 113 | 0.0078 | 0.0041 | 0.0037 |
| 114 | 0.0078 | 0.0041 | 0.0037 |
| 115 | 0.0079 | 0.0041 | 0.0038 |
| 116 | 0.0080 | 0.0042 | 0.0038 |
| 117 | 0.0080 | 0.0042 | 0.0038 |
| 118 | 0.0081 | 0.0042 | 0.0039 |
| 119 | 0.0082 | 0.0043 | 0.0039 |
| 120 | 0.0082 | 0.0043 | 0.0039 |
| 121 | 0.0083 | 0.0043 | 0.0040 |
| 122 | 0.0084 | 0.0044 | 0.0040 |
| 123 | 0.0085 | 0.0044 | 0.0040 |
| 124 | 0.0085 | 0.0044 | 0.0041 |
| 125 | 0.0086 | 0.0045 | 0.0041 |
| 126 | 0.0087 | 0.0045 | 0.0041 |
| 127 | 0.0088 | 0.0046 | 0.0042 |
| 128 | 0.0088 | 0.0046 | 0.0042 |
| 129 | 0.0089 | 0.0047 | 0.0043 |
| 130 | 0.0090 | 0.0047 | 0.0043 |
| 131 | 0.0091 | 0.0048 | 0.0044 |
| 132 | 0.0092 | 0.0048 | 0.0044 |
| 133 | 0.0093 | 0.0049 | 0.0044 |
| 134 | 0.0094 | 0.0049 | 0.0045 |
| 135 | 0.0095 | 0.0050 | 0.0045 |
| 136 | 0.0096 | 0.0050 | 0.0046 |
| 137 | 0.0097 | 0.0051 | 0.0046 |
| 138 | 0.0098 | 0.0051 | 0.0047 |
| 139 | 0.0099 | 0.0052 | 0.0047 |
| 140 | 0.0100 | 0.0052 | 0.0048 |
| 141 | 0.0102 | 0.0053 | 0.0049 |
| 142 | 0.0102 | 0.0053 | 0.0049 |
| 143 | 0.0104 | 0.0054 | 0.0050 |
| 144 | 0.0105 | 0.0055 | 0.0050 |
| 145 | 0.0097 | 0.0051 | 0.0047 |
| 146 | 0.0098 | 0.0051 | 0.0047 |
| 147 | 0.0100 | 0.0052 | 0.0048 |
| 148 | 0.0101 | 0.0053 | 0.0048 |
| 149 | 0.0103 | 0.0054 | 0.0049 |
| 150 | 0.0104 | 0.0054 | 0.0050 |
| 151 | 0.0106 | 0.0056 | 0.0051 |
| 152 | 0.0107 | 0.0056 | 0.0051 |
| 153 | 0.0110 | 0.0057 | 0.0052 |
| 154 | 0.0111 | 0.0058 | 0.0053 |
| 155 | 0.0114 | 0.0059 | 0.0054 |
| 156 | 0.0115 | 0.0060 | 0.0055 |
| 157 | 0.0118 | 0.0061 | 0.0056 |
| 158 | 0.0119 | 0.0062 | 0.0057 |
| 159 | 0.0122 | 0.0064 | 0.0058 |
| 160 | 0.0124 | 0.0065 | 0.0059 |
| 161 | 0.0127 | 0.0066 | 0.0061 |
| 162 | 0.0129 | 0.0067 | 0.0062 |
| 163 | 0.0133 | 0.0069 | 0.0063 |
| 164 | 0.0134 | 0.0070 | 0.0064 |

|     |        |        |        |
|-----|--------|--------|--------|
| 165 | 0.0139 | 0.0072 | 0.0066 |
| 166 | 0.0141 | 0.0074 | 0.0067 |
| 167 | 0.0146 | 0.0076 | 0.0070 |
| 168 | 0.0148 | 0.0077 | 0.0071 |
| 169 | 0.0178 | 0.0093 | 0.0085 |
| 170 | 0.0181 | 0.0094 | 0.0086 |
| 171 | 0.0187 | 0.0098 | 0.0090 |
| 172 | 0.0191 | 0.0100 | 0.0091 |
| 173 | 0.0198 | 0.0104 | 0.0095 |
| 174 | 0.0202 | 0.0106 | 0.0097 |
| 175 | 0.0211 | 0.0110 | 0.0101 |
| 176 | 0.0216 | 0.0113 | 0.0103 |
| 177 | 0.0227 | 0.0118 | 0.0108 |
| 178 | 0.0233 | 0.0122 | 0.0111 |
| 179 | 0.0246 | 0.0128 | 0.0118 |
| 180 | 0.0253 | 0.0132 | 0.0121 |
| 181 | 0.0270 | 0.0141 | 0.0129 |
| 182 | 0.0280 | 0.0146 | 0.0134 |
| 183 | 0.0302 | 0.0158 | 0.0144 |
| 184 | 0.0315 | 0.0164 | 0.0150 |
| 185 | 0.0255 | 0.0133 | 0.0122 |
| 186 | 0.0271 | 0.0142 | 0.0130 |
| 187 | 0.0315 | 0.0164 | 0.0150 |
| 188 | 0.0344 | 0.0179 | 0.0164 |
| 189 | 0.0427 | 0.0223 | 0.0204 |
| 190 | 0.0492 | 0.0257 | 0.0235 |
| 191 | 0.0747 | 0.0294 | 0.0453 |
| 192 | 0.1084 | 0.0294 | 0.0790 |
| 193 | 0.4690 | 0.0294 | 0.4396 |
| 194 | 0.0588 | 0.0294 | 0.0294 |
| 195 | 0.0380 | 0.0198 | 0.0182 |
| 196 | 0.0291 | 0.0152 | 0.0139 |
| 197 | 0.0329 | 0.0172 | 0.0157 |
| 198 | 0.0290 | 0.0151 | 0.0139 |
| 199 | 0.0261 | 0.0136 | 0.0125 |
| 200 | 0.0239 | 0.0125 | 0.0114 |
| 201 | 0.0221 | 0.0116 | 0.0106 |
| 202 | 0.0207 | 0.0108 | 0.0099 |
| 203 | 0.0195 | 0.0102 | 0.0093 |
| 204 | 0.0184 | 0.0096 | 0.0088 |
| 205 | 0.0151 | 0.0079 | 0.0072 |
| 206 | 0.0143 | 0.0075 | 0.0068 |
| 207 | 0.0137 | 0.0071 | 0.0065 |
| 208 | 0.0131 | 0.0068 | 0.0062 |
| 209 | 0.0125 | 0.0065 | 0.0060 |
| 210 | 0.0121 | 0.0063 | 0.0058 |
| 211 | 0.0116 | 0.0061 | 0.0056 |
| 212 | 0.0112 | 0.0059 | 0.0054 |
| 213 | 0.0109 | 0.0057 | 0.0052 |
| 214 | 0.0105 | 0.0055 | 0.0050 |
| 215 | 0.0102 | 0.0053 | 0.0049 |
| 216 | 0.0099 | 0.0052 | 0.0047 |
| 217 | 0.0106 | 0.0055 | 0.0051 |
| 218 | 0.0103 | 0.0054 | 0.0049 |
| 219 | 0.0101 | 0.0053 | 0.0048 |
| 220 | 0.0098 | 0.0051 | 0.0047 |
| 221 | 0.0096 | 0.0050 | 0.0046 |
| 222 | 0.0094 | 0.0049 | 0.0045 |
| 223 | 0.0092 | 0.0048 | 0.0044 |
| 224 | 0.0091 | 0.0047 | 0.0043 |
| 225 | 0.0089 | 0.0046 | 0.0042 |
| 226 | 0.0087 | 0.0046 | 0.0042 |
| 227 | 0.0086 | 0.0045 | 0.0041 |
| 228 | 0.0084 | 0.0044 | 0.0040 |
| 229 | 0.0083 | 0.0043 | 0.0039 |
| 230 | 0.0081 | 0.0042 | 0.0039 |
| 231 | 0.0080 | 0.0042 | 0.0038 |
| 232 | 0.0079 | 0.0041 | 0.0038 |
| 233 | 0.0077 | 0.0040 | 0.0037 |
| 234 | 0.0076 | 0.0040 | 0.0036 |
| 235 | 0.0075 | 0.0039 | 0.0036 |
| 236 | 0.0074 | 0.0039 | 0.0035 |
| 237 | 0.0073 | 0.0038 | 0.0035 |
| 238 | 0.0072 | 0.0038 | 0.0034 |
| 239 | 0.0071 | 0.0037 | 0.0034 |
| 240 | 0.0070 | 0.0037 | 0.0034 |
| 241 | 0.0069 | 0.0036 | 0.0033 |
| 242 | 0.0068 | 0.0036 | 0.0033 |
| 243 | 0.0068 | 0.0035 | 0.0032 |
| 244 | 0.0067 | 0.0035 | 0.0032 |
| 245 | 0.0066 | 0.0034 | 0.0032 |

|     |        |        |        |
|-----|--------|--------|--------|
| 246 | 0.0065 | 0.0034 | 0.0031 |
| 247 | 0.0064 | 0.0034 | 0.0031 |
| 248 | 0.0064 | 0.0033 | 0.0030 |
| 249 | 0.0063 | 0.0033 | 0.0030 |
| 250 | 0.0062 | 0.0033 | 0.0030 |
| 251 | 0.0062 | 0.0032 | 0.0030 |
| 252 | 0.0061 | 0.0032 | 0.0029 |
| 253 | 0.0060 | 0.0032 | 0.0029 |
| 254 | 0.0060 | 0.0031 | 0.0029 |
| 255 | 0.0059 | 0.0031 | 0.0028 |
| 256 | 0.0059 | 0.0031 | 0.0028 |
| 257 | 0.0058 | 0.0030 | 0.0028 |
| 258 | 0.0058 | 0.0030 | 0.0028 |
| 259 | 0.0057 | 0.0030 | 0.0027 |
| 260 | 0.0057 | 0.0030 | 0.0027 |
| 261 | 0.0056 | 0.0029 | 0.0027 |
| 262 | 0.0056 | 0.0029 | 0.0027 |
| 263 | 0.0055 | 0.0029 | 0.0026 |
| 264 | 0.0055 | 0.0028 | 0.0026 |
| 265 | 0.0054 | 0.0028 | 0.0026 |
| 266 | 0.0054 | 0.0028 | 0.0026 |
| 267 | 0.0053 | 0.0028 | 0.0025 |
| 268 | 0.0053 | 0.0028 | 0.0025 |
| 269 | 0.0052 | 0.0027 | 0.0025 |
| 270 | 0.0052 | 0.0027 | 0.0025 |
| 271 | 0.0051 | 0.0027 | 0.0025 |
| 272 | 0.0051 | 0.0027 | 0.0024 |
| 273 | 0.0051 | 0.0026 | 0.0024 |
| 274 | 0.0050 | 0.0026 | 0.0024 |
| 275 | 0.0050 | 0.0026 | 0.0024 |
| 276 | 0.0050 | 0.0026 | 0.0024 |
| 277 | 0.0049 | 0.0026 | 0.0024 |
| 278 | 0.0049 | 0.0026 | 0.0023 |
| 279 | 0.0049 | 0.0025 | 0.0023 |
| 280 | 0.0048 | 0.0025 | 0.0023 |
| 281 | 0.0048 | 0.0025 | 0.0023 |
| 282 | 0.0048 | 0.0025 | 0.0023 |
| 283 | 0.0047 | 0.0025 | 0.0023 |
| 284 | 0.0047 | 0.0024 | 0.0022 |
| 285 | 0.0047 | 0.0024 | 0.0022 |
| 286 | 0.0046 | 0.0024 | 0.0022 |
| 287 | 0.0046 | 0.0024 | 0.0022 |
| 288 | 0.0046 | 0.0024 | 0.0022 |

-----  
Total soil rain loss = 1.51(In)  
Total effective rainfall = 1.87(In)  
Peak flow rate in flood hydrograph = (CFS)  
-----

+++++  
24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h  
-----  
Hydrograph in 5 Minute intervals ((CFS))  
-----

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0  | 350.0 | 700.0 | 1050.0 | 1400.0 |
|-----------|--------------|--------|----|-------|-------|--------|--------|
| 0+ 5      | 0.0014       | 0.20   | Q  |       |       |        |        |
| 0+10      | 0.0066       | 0.75   | Q  |       |       |        |        |
| 0+15      | 0.0178       | 1.62   | Q  |       |       |        |        |
| 0+20      | 0.0373       | 2.83   | Q  |       |       |        |        |
| 0+25      | 0.0682       | 4.49   | Q  |       |       |        |        |
| 0+30      | 0.1184       | 7.30   | Q  |       |       |        |        |
| 0+35      | 0.1984       | 11.60  | Q  |       |       |        |        |
| 0+40      | 0.3080       | 15.93  | Q  |       |       |        |        |
| 0+45      | 0.4422       | 19.48  | Q  |       |       |        |        |
| 0+50      | 0.5961       | 22.33  | Q  |       |       |        |        |
| 0+55      | 0.7661       | 24.69  | Q  |       |       |        |        |
| 1+ 0      | 0.9489       | 26.54  | Q  |       |       |        |        |
| 1+ 5      | 1.1424       | 28.10  | Q  |       |       |        |        |
| 1+10      | 1.3453       | 29.46  | Q  |       |       |        |        |
| 1+15      | 1.5567       | 30.70  | Q  |       |       |        |        |
| 1+20      | 1.7758       | 31.81  | Q  |       |       |        |        |
| 1+25      | 2.0017       | 32.80  | Q  |       |       |        |        |
| 1+30      | 2.2339       | 33.72  | Q  |       |       |        |        |
| 1+35      | 2.4721       | 34.58  | Q  |       |       |        |        |
| 1+40      | 2.7153       | 35.32  | VQ |       |       |        |        |
| 1+45      | 2.9636       | 36.05  | VQ |       |       |        |        |
| 1+50      | 3.2163       | 36.69  | VQ |       |       |        |        |
| 1+55      | 3.4733       | 37.32  | VQ |       |       |        |        |

|      |         |       |     |
|------|---------|-------|-----|
| 2+ 0 | 3.7345  | 37.92 | VQ  |
| 2+ 5 | 3.9996  | 38.50 | VQ  |
| 2+10 | 4.2686  | 39.06 | VQ  |
| 2+15 | 4.5411  | 39.57 | VQ  |
| 2+20 | 4.8171  | 40.07 | VQ  |
| 2+25 | 5.0960  | 40.50 | VQ  |
| 2+30 | 5.3778  | 40.92 | VQ  |
| 2+35 | 5.6625  | 41.34 | VQ  |
| 2+40 | 5.9500  | 41.75 | VQ  |
| 2+45 | 6.2403  | 42.14 | VQ  |
| 2+50 | 6.5331  | 42.52 | Q   |
| 2+55 | 6.8285  | 42.89 | Q   |
| 3+ 0 | 7.1264  | 43.26 | Q   |
| 3+ 5 | 7.4268  | 43.62 | Q   |
| 3+10 | 7.7295  | 43.95 | Q   |
| 3+15 | 8.0343  | 44.27 | Q   |
| 3+20 | 8.3415  | 44.59 | Q   |
| 3+25 | 8.6508  | 44.92 | Q   |
| 3+30 | 8.9624  | 45.24 | Q   |
| 3+35 | 9.2760  | 45.53 | Q   |
| 3+40 | 9.5916  | 45.83 | Q   |
| 3+45 | 9.9093  | 46.13 | Q   |
| 3+50 | 10.2290 | 46.42 | Q   |
| 3+55 | 10.5506 | 46.70 | Q   |
| 4+ 0 | 10.8741 | 46.97 | Q   |
| 4+ 5 | 11.1995 | 47.24 | Q   |
| 4+10 | 11.5267 | 47.51 | Q   |
| 4+15 | 11.8557 | 47.78 | Q   |
| 4+20 | 12.1864 | 48.02 | Q   |
| 4+25 | 12.5188 | 48.26 | Q   |
| 4+30 | 12.8528 | 48.50 | QV  |
| 4+35 | 13.1886 | 48.75 | QV  |
| 4+40 | 13.5261 | 49.00 | QV  |
| 4+45 | 13.8653 | 49.26 | QV  |
| 4+50 | 14.2064 | 49.52 | QV  |
| 4+55 | 14.5493 | 49.79 | QV  |
| 5+ 0 | 14.8940 | 50.05 | QV  |
| 5+ 5 | 15.2405 | 50.32 | QV  |
| 5+10 | 15.5890 | 50.59 | QV  |
| 5+15 | 15.9393 | 50.87 | QV  |
| 5+20 | 16.2915 | 51.14 | QV  |
| 5+25 | 16.6456 | 51.42 | QV  |
| 5+30 | 17.0015 | 51.67 | QV  |
| 5+35 | 17.3592 | 51.93 | QV  |
| 5+40 | 17.7186 | 52.19 | QV  |
| 5+45 | 18.0799 | 52.46 | QV  |
| 5+50 | 18.4430 | 52.72 | QV  |
| 5+55 | 18.8080 | 52.99 | QV  |
| 6+ 0 | 19.1747 | 53.25 | Q V |
| 6+ 5 | 19.5432 | 53.50 | Q V |
| 6+10 | 19.9134 | 53.75 | Q V |
| 6+15 | 20.2853 | 54.00 | Q V |
| 6+20 | 20.6590 | 54.26 | Q V |
| 6+25 | 21.0345 | 54.52 | Q V |
| 6+30 | 21.4118 | 54.78 | Q V |
| 6+35 | 21.7909 | 55.05 | Q V |
| 6+40 | 22.1719 | 55.32 | Q V |
| 6+45 | 22.5547 | 55.59 | Q V |
| 6+50 | 22.9395 | 55.87 | Q V |
| 6+55 | 23.3262 | 56.15 | Q V |
| 7+ 0 | 23.7149 | 56.43 | Q V |
| 7+ 5 | 24.1055 | 56.72 | Q V |
| 7+10 | 24.4982 | 57.01 | Q V |
| 7+15 | 24.8929 | 57.31 | Q V |
| 7+20 | 25.2897 | 57.61 | Q V |
| 7+25 | 25.6885 | 57.92 | Q V |
| 7+30 | 26.0895 | 58.22 | Q V |
| 7+35 | 26.4927 | 58.54 | Q V |
| 7+40 | 26.8980 | 58.86 | Q V |
| 7+45 | 27.3056 | 59.18 | Q V |
| 7+50 | 27.7154 | 59.50 | Q V |
| 7+55 | 28.1275 | 59.84 | Q V |
| 8+ 0 | 28.5419 | 60.17 | Q V |
| 8+ 5 | 28.9587 | 60.52 | Q V |
| 8+10 | 29.3779 | 60.86 | Q V |
| 8+15 | 29.7995 | 61.22 | Q V |
| 8+20 | 30.2235 | 61.57 | Q V |
| 8+25 | 30.6501 | 61.94 | Q V |
| 8+30 | 31.0792 | 62.31 | Q V |
| 8+35 | 31.5109 | 62.68 | Q V |
| 8+40 | 31.9452 | 63.06 | Q V |

|       |         |        |   |   |  |  |  |  |
|-------|---------|--------|---|---|--|--|--|--|
| 8+45  | 32.3822 | 63.45  | Q | V |  |  |  |  |
| 8+50  | 32.8219 | 63.84  | Q | V |  |  |  |  |
| 8+55  | 33.2643 | 64.24  | Q | V |  |  |  |  |
| 9+ 0  | 33.7096 | 64.65  | Q | V |  |  |  |  |
| 9+ 5  | 34.1577 | 65.07  | Q | V |  |  |  |  |
| 9+10  | 34.6087 | 65.49  | Q | V |  |  |  |  |
| 9+15  | 35.0627 | 65.92  | Q | V |  |  |  |  |
| 9+20  | 35.5196 | 66.35  | Q | V |  |  |  |  |
| 9+25  | 35.9797 | 66.79  | Q | V |  |  |  |  |
| 9+30  | 36.4428 | 67.25  | Q | V |  |  |  |  |
| 9+35  | 36.9091 | 67.71  | Q | V |  |  |  |  |
| 9+40  | 37.3786 | 68.17  | Q | V |  |  |  |  |
| 9+45  | 37.8514 | 68.65  | Q | V |  |  |  |  |
| 9+50  | 38.3275 | 69.14  | Q | V |  |  |  |  |
| 9+55  | 38.8071 | 69.63  | Q | V |  |  |  |  |
| 10+ 0 | 39.2901 | 70.14  | Q | V |  |  |  |  |
| 10+ 5 | 39.7767 | 70.65  | Q | V |  |  |  |  |
| 10+10 | 40.2669 | 71.18  | Q | V |  |  |  |  |
| 10+15 | 40.7608 | 71.71  | Q | V |  |  |  |  |
| 10+20 | 41.2585 | 72.26  | Q | V |  |  |  |  |
| 10+25 | 41.7599 | 72.82  | Q | V |  |  |  |  |
| 10+30 | 42.2653 | 73.38  | Q | V |  |  |  |  |
| 10+35 | 42.7747 | 73.97  | Q | V |  |  |  |  |
| 10+40 | 43.2882 | 74.56  | Q | V |  |  |  |  |
| 10+45 | 43.8059 | 75.17  | Q | V |  |  |  |  |
| 10+50 | 44.3278 | 75.78  | Q | V |  |  |  |  |
| 10+55 | 44.8541 | 76.42  | Q | V |  |  |  |  |
| 11+ 0 | 45.3849 | 77.06  | Q | V |  |  |  |  |
| 11+ 5 | 45.9202 | 77.73  | Q | V |  |  |  |  |
| 11+10 | 46.4601 | 78.40  | Q | V |  |  |  |  |
| 11+15 | 47.0049 | 79.10  | Q | V |  |  |  |  |
| 11+20 | 47.5546 | 79.81  | Q | V |  |  |  |  |
| 11+25 | 48.1092 | 80.54  | Q | V |  |  |  |  |
| 11+30 | 48.6690 | 81.28  | Q | V |  |  |  |  |
| 11+35 | 49.2341 | 82.05  | Q | V |  |  |  |  |
| 11+40 | 49.8046 | 82.83  | Q | V |  |  |  |  |
| 11+45 | 50.3806 | 83.64  | Q | V |  |  |  |  |
| 11+50 | 50.9623 | 84.46  | Q | V |  |  |  |  |
| 11+55 | 51.5498 | 85.31  | Q | V |  |  |  |  |
| 12+ 0 | 52.1433 | 86.18  | Q | V |  |  |  |  |
| 12+ 5 | 52.7427 | 87.04  | Q | V |  |  |  |  |
| 12+10 | 53.3477 | 87.84  | Q | V |  |  |  |  |
| 12+15 | 53.9580 | 88.61  | Q | V |  |  |  |  |
| 12+20 | 54.5733 | 89.34  | Q | V |  |  |  |  |
| 12+25 | 55.1932 | 90.01  | Q | V |  |  |  |  |
| 12+30 | 55.8163 | 90.47  | Q | V |  |  |  |  |
| 12+35 | 56.4407 | 90.66  | Q | V |  |  |  |  |
| 12+40 | 57.0665 | 90.88  | Q | V |  |  |  |  |
| 12+45 | 57.6952 | 91.28  | Q | V |  |  |  |  |
| 12+50 | 58.3279 | 91.87  | Q | V |  |  |  |  |
| 12+55 | 58.9656 | 92.60  | Q | V |  |  |  |  |
| 13+ 0 | 59.6093 | 93.46  | Q | V |  |  |  |  |
| 13+ 5 | 60.2597 | 94.44  | Q | V |  |  |  |  |
| 13+10 | 60.9174 | 95.49  | Q | V |  |  |  |  |
| 13+15 | 61.5828 | 96.63  | Q | V |  |  |  |  |
| 13+20 | 62.2566 | 97.83  | Q | V |  |  |  |  |
| 13+25 | 62.9393 | 99.13  | Q | V |  |  |  |  |
| 13+30 | 63.6314 | 100.49 | Q | V |  |  |  |  |
| 13+35 | 64.3334 | 101.93 | Q | V |  |  |  |  |
| 13+40 | 65.0460 | 103.46 | Q | V |  |  |  |  |
| 13+45 | 65.7697 | 105.08 | Q | V |  |  |  |  |
| 13+50 | 66.5051 | 106.78 | Q | V |  |  |  |  |
| 13+55 | 67.2529 | 108.58 | Q | V |  |  |  |  |
| 14+ 0 | 68.0137 | 110.47 | Q | V |  |  |  |  |
| 14+ 5 | 68.7890 | 112.58 | Q | V |  |  |  |  |
| 14+10 | 69.5809 | 114.98 | Q | V |  |  |  |  |
| 14+15 | 70.3916 | 117.70 | Q | V |  |  |  |  |
| 14+20 | 71.2230 | 120.72 | Q | V |  |  |  |  |
| 14+25 | 72.0780 | 124.16 | Q | V |  |  |  |  |
| 14+30 | 72.9621 | 128.37 | Q | V |  |  |  |  |
| 14+35 | 73.8821 | 133.58 | Q | V |  |  |  |  |
| 14+40 | 74.8393 | 138.99 | Q | V |  |  |  |  |
| 14+45 | 75.8328 | 144.25 | Q | V |  |  |  |  |
| 14+50 | 76.8614 | 149.36 | Q | V |  |  |  |  |
| 14+55 | 77.9255 | 154.51 | Q | V |  |  |  |  |
| 15+ 0 | 79.0253 | 159.68 | Q | V |  |  |  |  |
| 15+ 5 | 80.1622 | 165.08 | Q | V |  |  |  |  |
| 15+10 | 81.3383 | 170.77 | Q | V |  |  |  |  |
| 15+15 | 82.5565 | 176.89 | Q | V |  |  |  |  |
| 15+20 | 83.8201 | 183.47 | Q | V |  |  |  |  |
| 15+25 | 85.1305 | 190.26 | Q | V |  |  |  |  |

|       |          |         |  |  |  |  |
|-------|----------|---------|--|--|--|--|
| 15+30 | 86.4878  | 197.08  |  |  |  |  |
| 15+35 | 87.8941  | 204.20  |  |  |  |  |
| 15+40 | 89.3520  | 211.69  |  |  |  |  |
| 15+45 | 90.8661  | 219.85  |  |  |  |  |
| 15+50 | 92.4336  | 227.60  |  |  |  |  |
| 15+55 | 94.0626  | 236.54  |  |  |  |  |
| 16+ 0 | 95.8116  | 253.95  |  |  |  |  |
| 16+ 5 | 97.9984  | 317.52  |  |  |  |  |
| 16+10 | 100.8288 | 410.99  |  |  |  |  |
| 16+15 | 104.3155 | 506.26  |  |  |  |  |
| 16+20 | 108.5331 | 612.40  |  |  |  |  |
| 16+25 | 113.7504 | 757.55  |  |  |  |  |
| 16+30 | 120.8316 | 1028.19 |  |  |  |  |
| 16+35 | 129.8758 |         |  |  |  |  |
| 16+40 | 138.7647 | 1290.68 |  |  |  |  |
| 16+45 | 146.4062 | 1109.54 |  |  |  |  |
| 16+50 | 152.8745 | 939.19  |  |  |  |  |
| 16+55 | 158.4701 | 812.49  |  |  |  |  |
| 17+ 0 | 163.2363 | 692.06  |  |  |  |  |
| 17+ 5 | 167.4680 | 614.44  |  |  |  |  |
| 17+10 | 171.3094 | 557.76  |  |  |  |  |
| 17+15 | 174.8756 | 517.82  |  |  |  |  |
| 17+20 | 178.1467 | 474.97  |  |  |  |  |
| 17+25 | 181.1546 | 436.74  |  |  |  |  |
| 17+30 | 183.9682 | 408.53  |  |  |  |  |
| 17+35 | 186.6017 | 382.39  |  |  |  |  |
| 17+40 | 188.9925 | 347.14  |  |  |  |  |
| 17+45 | 191.2778 | 331.82  |  |  |  |  |
| 17+50 | 193.3914 | 306.90  |  |  |  |  |
| 17+55 | 195.4138 | 293.64  |  |  |  |  |
| 18+ 0 | 197.3398 | 279.66  |  |  |  |  |
| 18+ 5 | 199.1817 | 267.45  |  |  |  |  |
| 18+10 | 200.9425 | 255.66  |  |  |  |  |
| 18+15 | 202.5913 | 239.42  |  |  |  |  |
| 18+20 | 204.1739 | 229.78  |  |  |  |  |
| 18+25 | 205.6288 | 211.25  |  |  |  |  |
| 18+30 | 207.0345 | 204.12  |  |  |  |  |
| 18+35 | 208.3977 | 197.93  |  |  |  |  |
| 18+40 | 209.7266 | 192.95  |  |  |  |  |
| 18+45 | 211.0092 | 186.23  |  |  |  |  |
| 18+50 | 212.2389 | 178.55  |  |  |  |  |
| 18+55 | 213.4394 | 174.31  |  |  |  |  |
| 19+ 0 | 214.5979 | 168.23  |  |  |  |  |
| 19+ 5 | 215.7246 | 163.59  |  |  |  |  |
| 19+10 | 216.7856 | 154.06  |  |  |  |  |
| 19+15 | 217.8127 | 149.12  |  |  |  |  |
| 19+20 | 218.8208 | 146.38  |  |  |  |  |
| 19+25 | 219.8086 | 143.43  |  |  |  |  |
| 19+30 | 220.7622 | 138.46  |  |  |  |  |
| 19+35 | 221.6646 | 131.03  |  |  |  |  |
| 19+40 | 222.5489 | 128.40  |  |  |  |  |
| 19+45 | 223.4167 | 126.01  |  |  |  |  |
| 19+50 | 224.2648 | 123.15  |  |  |  |  |
| 19+55 | 225.0660 | 116.33  |  |  |  |  |
| 20+ 0 | 225.8346 | 111.60  |  |  |  |  |
| 20+ 5 | 226.5890 | 109.54  |  |  |  |  |
| 20+10 | 227.3281 | 107.31  |  |  |  |  |
| 20+15 | 228.0424 | 103.72  |  |  |  |  |
| 20+20 | 228.7076 | 96.59   |  |  |  |  |
| 20+25 | 229.3564 | 94.20   |  |  |  |  |
| 20+30 | 229.9953 | 92.77   |  |  |  |  |
| 20+35 | 230.6259 | 91.57   |  |  |  |  |
| 20+40 | 231.2541 | 91.20   |  |  |  |  |
| 20+45 | 231.8801 | 90.90   |  |  |  |  |
| 20+50 | 232.4979 | 89.71   |  |  |  |  |
| 20+55 | 233.1077 | 88.54   |  |  |  |  |
| 21+ 0 | 233.7095 | 87.38   |  |  |  |  |
| 21+ 5 | 234.3033 | 86.22   |  |  |  |  |
| 21+10 | 234.8889 | 85.04   |  |  |  |  |
| 21+15 | 235.4658 | 83.76   |  |  |  |  |
| 21+20 | 236.0322 | 82.24   |  |  |  |  |
| 21+25 | 236.5767 | 79.06   |  |  |  |  |
| 21+30 | 237.0901 | 74.54   |  |  |  |  |
| 21+35 | 237.5950 | 73.31   |  |  |  |  |
| 21+40 | 238.0927 | 72.28   |  |  |  |  |
| 21+45 | 238.5834 | 71.25   |  |  |  |  |
| 21+50 | 239.0660 | 70.07   |  |  |  |  |
| 21+55 | 239.5381 | 68.54   |  |  |  |  |
| 22+ 0 | 239.9817 | 64.41   |  |  |  |  |
| 22+ 5 | 240.3993 | 60.64   |  |  |  |  |
| 22+10 | 240.8106 | 59.72   |  |  |  |  |

|       |          |       |   |  |  |  |   |
|-------|----------|-------|---|--|--|--|---|
| 22+15 | 241.2164 | 58.92 | Q |  |  |  | V |
| 22+20 | 241.6169 | 58.16 | Q |  |  |  | V |
| 22+25 | 242.0123 | 57.41 | Q |  |  |  | V |
| 22+30 | 242.4029 | 56.72 | Q |  |  |  | V |
| 22+35 | 242.7891 | 56.06 | Q |  |  |  | V |
| 22+40 | 243.1708 | 55.43 | Q |  |  |  | V |
| 22+45 | 243.5485 | 54.83 | Q |  |  |  | V |
| 22+50 | 243.9221 | 54.25 | Q |  |  |  | V |
| 22+55 | 244.2918 | 53.69 | Q |  |  |  | V |
| 23+ 0 | 244.6579 | 53.15 | Q |  |  |  | V |
| 23+ 5 | 245.0205 | 52.65 | Q |  |  |  | V |
| 23+10 | 245.3797 | 52.15 | Q |  |  |  | V |
| 23+15 | 245.7355 | 51.67 | Q |  |  |  | V |
| 23+20 | 246.0882 | 51.21 | Q |  |  |  | V |
| 23+25 | 246.4377 | 50.75 | Q |  |  |  | V |
| 23+30 | 246.7842 | 50.31 | Q |  |  |  | V |
| 23+35 | 247.1277 | 49.87 | Q |  |  |  | V |
| 23+40 | 247.4683 | 49.45 | Q |  |  |  | V |
| 23+45 | 247.8060 | 49.04 | Q |  |  |  | V |
| 23+50 | 248.1410 | 48.64 | Q |  |  |  | V |
| 23+55 | 248.4733 | 48.25 | Q |  |  |  | V |
| 24+ 0 | 248.8029 | 47.86 | Q |  |  |  | V |
| 24+ 5 | 249.1285 | 47.27 | Q |  |  |  | V |
| 24+10 | 249.4478 | 46.36 | Q |  |  |  | V |
| 24+15 | 249.7586 | 45.13 | Q |  |  |  | V |
| 24+20 | 250.0588 | 43.59 | Q |  |  |  | V |
| 24+25 | 250.3453 | 41.61 | Q |  |  |  | V |
| 24+30 | 250.6105 | 38.50 | Q |  |  |  | V |
| 24+35 | 250.8443 | 33.94 | Q |  |  |  | V |
| 24+40 | 251.0468 | 29.41 | Q |  |  |  | V |
| 24+45 | 251.2237 | 25.68 | Q |  |  |  | V |
| 24+50 | 251.3800 | 22.70 | Q |  |  |  | V |
| 24+55 | 251.5195 | 20.25 | Q |  |  |  | V |
| 25+ 0 | 251.6457 | 18.32 | Q |  |  |  | V |
| 25+ 5 | 251.7608 | 16.71 | Q |  |  |  | V |
| 25+10 | 251.8663 | 15.32 | Q |  |  |  | V |
| 25+15 | 251.9631 | 14.05 | Q |  |  |  | V |
| 25+20 | 252.0522 | 12.94 | Q |  |  |  | V |
| 25+25 | 252.1346 | 11.96 | Q |  |  |  | V |
| 25+30 | 252.2107 | 11.06 | Q |  |  |  | V |
| 25+35 | 252.2812 | 10.23 | Q |  |  |  | V |
| 25+40 | 252.3467 | 9.52  | Q |  |  |  | V |
| 25+45 | 252.4077 | 8.84  | Q |  |  |  | V |
| 25+50 | 252.4645 | 8.25  | Q |  |  |  | V |
| 25+55 | 252.5174 | 7.69  | Q |  |  |  | V |
| 26+ 0 | 252.5667 | 7.16  | Q |  |  |  | V |
| 26+ 5 | 252.6125 | 6.66  | Q |  |  |  | V |
| 26+10 | 252.6551 | 6.18  | Q |  |  |  | V |
| 26+15 | 252.6948 | 5.76  | Q |  |  |  | V |
| 26+20 | 252.7316 | 5.35  | Q |  |  |  | V |
| 26+25 | 252.7662 | 5.02  | Q |  |  |  | V |
| 26+30 | 252.7986 | 4.71  | Q |  |  |  | V |
| 26+35 | 252.8290 | 4.40  | Q |  |  |  | V |
| 26+40 | 252.8573 | 4.11  | Q |  |  |  | V |
| 26+45 | 252.8837 | 3.83  | Q |  |  |  | V |
| 26+50 | 252.9083 | 3.58  | Q |  |  |  | V |
| 26+55 | 252.9313 | 3.34  | Q |  |  |  | V |
| 27+ 0 | 252.9527 | 3.10  | Q |  |  |  | V |
| 27+ 5 | 252.9725 | 2.88  | Q |  |  |  | V |
| 27+10 | 252.9910 | 2.69  | Q |  |  |  | V |
| 27+15 | 253.0083 | 2.51  | Q |  |  |  | V |
| 27+20 | 253.0244 | 2.33  | Q |  |  |  | V |
| 27+25 | 253.0393 | 2.16  | Q |  |  |  | V |
| 27+30 | 253.0530 | 2.00  | Q |  |  |  | V |
| 27+35 | 253.0658 | 1.86  | Q |  |  |  | V |
| 27+40 | 253.0777 | 1.72  | Q |  |  |  | V |
| 27+45 | 253.0886 | 1.59  | Q |  |  |  | V |
| 27+50 | 253.0987 | 1.46  | Q |  |  |  | V |
| 27+55 | 253.1080 | 1.35  | Q |  |  |  | V |
| 28+ 0 | 253.1167 | 1.26  | Q |  |  |  | V |
| 28+ 5 | 253.1247 | 1.16  | Q |  |  |  | V |
| 28+10 | 253.1321 | 1.07  | Q |  |  |  | V |
| 28+15 | 253.1389 | 0.99  | Q |  |  |  | V |
| 28+20 | 253.1453 | 0.93  | Q |  |  |  | V |
| 28+25 | 253.1513 | 0.88  | Q |  |  |  | V |
| 28+30 | 253.1570 | 0.82  | Q |  |  |  | V |
| 28+35 | 253.1623 | 0.77  | Q |  |  |  | V |
| 28+40 | 253.1673 | 0.72  | Q |  |  |  | V |
| 28+45 | 253.1718 | 0.66  | Q |  |  |  | V |
| 28+50 | 253.1759 | 0.60  | Q |  |  |  | V |
| 28+55 | 253.1796 | 0.54  | Q |  |  |  | V |

|       |          |      |   |  |  |  |   |
|-------|----------|------|---|--|--|--|---|
| 29+ 0 | 253.1828 | 0.48 | Q |  |  |  | v |
| 29+ 5 | 253.1857 | 0.42 | Q |  |  |  | v |
| 29+10 | 253.1882 | 0.36 | Q |  |  |  | v |
| 29+15 | 253.1903 | 0.30 | Q |  |  |  | v |
| 29+20 | 253.1919 | 0.24 | Q |  |  |  | v |
| 29+25 | 253.1933 | 0.19 | Q |  |  |  | v |
| 29+30 | 253.1944 | 0.16 | Q |  |  |  | v |
| 29+35 | 253.1953 | 0.13 | Q |  |  |  | v |
| 29+40 | 253.1960 | 0.10 | Q |  |  |  | v |
| 29+45 | 253.1965 | 0.07 | Q |  |  |  | v |
| 29+50 | 253.1968 | 0.04 | Q |  |  |  | v |
| 29+55 |          | 0.01 | Q |  |  |  | v |

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# **ATTACHMENT 2**

Existing On-site Conditions  
Rational Method Calculations

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1  
Rational Hydrology Study Date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
10-YEAR, 1-HOUR STORM  
BY: JTS DATE: 06-23-22  
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Program License Serial Number 6320

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\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*

-----  
Rational hydrology study storm event year is         
Computed rainfall intensity:  
Storm year = 10.00 1 hour rainfall = 0.599 (In.)  
Slope used for rainfall intensity curve b = 0.7000  
Soil antecedent moisture condition (AMC) =       

-----  
+++++  
Process from Point/Station 0.000 to Point/Station 1.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

-----  
Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.420(In/Hr)  
Initial subarea data:  
Initial area flow distance = 703.340(Ft.)  
Top (of initial area) elevation = 3070.200(Ft.)  
Bottom (of initial area) elevation = 3059.000(Ft.)  
Difference in elevation = 11.200(Ft.)  
Slope = 0.01592 s(%)= 1.59  
TC =  $k(0.628)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 19.801 min.  
Rainfall intensity = 1.302(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.609  
Subarea runoff = 7.933(CFS)  
Total initial stream area = 10.000(Ac.)  
Pervious area fraction = 1.000  
Initial area Fm value = 0.420(In/Hr)

+++++  
Process from Point/Station 1.000 to Point/Station 2.000  
\*\*\*\* IMPROVED CHANNEL TRAVEL TIME \*\*\*\*

-----  
Upstream point elevation = 3059.000(Ft.)  
Downstream point elevation = 3052.500(Ft.)  
Channel length thru subarea = 464.120(Ft.)  
Channel base width = 60.000(Ft.)  
Slope or 'Z' of left channel bank = 0.000  
Slope or 'Z' of right channel bank = 0.000  
Estimated mean flow rate at midpoint of channel = 9.091(CFS)  
Manning's 'N' = 0.040  
Maximum depth of channel = 1.000(Ft.)  
Flow(q) thru subarea = 9.091(CFS)  
Depth of flow = 0.133(Ft.), Average velocity = 1.141(Ft/s)  
Channel flow top width = 60.000(Ft.)  
Flow Velocity = 1.14(Ft/s)  
Travel time = 6.78 min.  
Time of concentration = 26.58 min.  
Critical depth = 0.090(Ft.)  
Adding area flow to channel  
Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.420(In/Hr)  
Rainfall intensity = 1.059(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method)(Q=KCIA) is C = 0.543  
Subarea runoff = 2.235(CFS) for 7.680(Ac.)

Total runoff = (CFS)  
Effective area this stream = 17.68(Ac.)  
Total Study Area (Main Stream No. 1) = 17.68(Ac.)  
Area averaged Fm value = 0.420(In/Hr)  
Depth of flow = 0.142(Ft.), Average velocity = 1.193(Ft/s)  
Critical depth = 0.096(Ft.)  
End of computations, Total Study Area = 17.68 (Ac.)  
The following figures may  
be used for a unit hydrograph study of the same area.  
Note: These figures do not consider reduced effective area  
effects caused by confluences in the rational equation.  
Area averaged pervious area fraction( $A_p$ ) = 1.000  
Area averaged SCS curve number = 77.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1  
Rational Hydrology Study Date: 06/23/22

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
100-YEAR, 1-HOUR STORM  
BY: JTS DATE: 06-23-22  
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Program License Serial Number 6320

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\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*  
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Rational hydrology study storm event year is [REDACTED]  
10 Year storm 1 hour rainfall = 0.599(In.)  
100 Year storm 1 hour rainfall = 1.070(In.)  
Computed rainfall intensity:  
Storm year = 100.00 1 hour rainfall = 1.070 (In.)  
Slope used for rainfall intensity curve b = 0.7000  
Soil antecedent moisture condition (AMC) = [REDACTED]

+++++  
Process from Point/Station 0.000 to Point/Station 1.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.420(In/Hr)  
Initial subarea data:  
Initial area flow distance = 703.340(Ft.)  
Top (of initial area) elevation = 3070.200(Ft.)  
Bottom (of initial area) elevation = 3059.000(Ft.)  
Difference in elevation = 11.200(Ft.)  
Slope = 0.01592 s(%)= 1.59  
TC =  $k(0.628)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 19.801 min.  
Rainfall intensity = 2.325(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.737  
Subarea runoff = [REDACTED] (CFS)  
Total initial stream area = 10.000(Ac.)  
Pervious area fraction = 1.000  
Initial area Fm value = 0.420(In/Hr)

+++++  
Process from Point/Station 1.000 to Point/Station 2.000  
\*\*\*\* IMPROVED CHANNEL TRAVEL TIME \*\*\*\*

Upstream point elevation = 3059.000(Ft.)  
Downstream point elevation = 3052.500(Ft.)  
Channel length thru subarea = 464.120(Ft.)  
Channel base width = 60.000(Ft.)  
Slope or 'Z' of left channel bank = 0.000  
Slope or 'Z' of right channel bank = 0.000  
Estimated mean flow rate at midpoint of channel = 21.150(CFS)  
Manning's 'N' = 0.040  
Maximum depth of channel = 1.000(Ft.)  
Flow(q) thru subarea = 21.150(CFS)  
Depth of flow = 0.221(Ft.), Average velocity = 1.598(Ft/s)  
Channel flow top width = 60.000(Ft.)  
Flow velocity = 1.60(Ft/s)  
Travel time = 4.84 min.  
Time of concentration = [REDACTED] min.  
Critical depth = 0.156(Ft.)  
Adding area flow to channel  
Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.420(In/Hr)  
Rainfall intensity = 1.995(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method)(Q=KCIA) is C = 0.710  
Subarea runoff = 7.913(CFS) for 7.680(Ac.)  
Total runoff = [REDACTED] (CFS)  
Effective area this stream = 17.68(Ac.)  
Total Study Area (Main Stream No. 1) = 17.68(Ac.)  
Area averaged Fm value = 0.420(In/Hr)  
Depth of flow = 0.244(Ft.), Average velocity = 1.709(Ft/s)

Critical depth = 0.176(Ft.)  
End of computations, Total Study Area = 17.68 (Ac.)  
The following figures may  
be used for a unit hydrograph study of the same area.  
Note: These figures do not consider reduced effective area  
effects caused by confluences in the rational equation.

Area averaged pervious area fraction( $A_p$ ) = 1.000  
Area averaged SCS curve number = 77.0

# **ATTACHMENT 3**

Existing On-site Conditions  
Unit Method Calculations

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
2-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
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Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC I) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 59.4                     | 17.68         | 1.000            | 0.688                 | 1.000        | 0.688         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.688

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC1) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 17.68         | 1.000         | 77.0             | 59.4             | 6.50 | 0.000                |

Area-averaged catchment yield fraction, Y = 0.000

Area-averaged low loss fraction, Yb = 1.000

User entry of time of concentration = 0.444 (hours)

+++++

watershed area = 17.68(Ac.)

Catchment Lag time = 0.355 hours

Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 23.4610  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.688(In/Hr)  
 Average low loss rate fraction (Yb) = 1.000 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.128(In)  
 Computed peak 30-minute rainfall = 0.219(In)  
 Specified peak 1-hour rainfall = 0.270(In)  
 Computed peak 3-hour rainfall = 0.506(In)  
 Specified peak 6-hour rainfall = 0.753(In)  
 Specified peak 24-hour rainfall = 1.300(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(AC.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.128(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.219(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.270(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 0.506(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 0.753(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 1.300(In) |

| Unit Hydrograph |                    |                 |
|-----------------|--------------------|-----------------|
| Interval        | 'S' Graph          | Unit Hydrograph |
| Number          | Mean values        | ((CFS))         |
| -----           |                    |                 |
|                 | (K = 213.82 (CFS)) |                 |
| 1               | 1.237              | 2.645           |
| 2               | 5.898              | 9.966           |
| 3               | 16.607             | 22.899          |
| 4               | 37.127             | 43.875          |
| 5               | 52.735             | 33.371          |
| 6               | 62.457             | 20.788          |
| 7               | 69.053             | 14.103          |
| 8               | 74.109             | 10.811          |
| 9               | 78.107             | 8.548           |
| 10              | 81.273             | 6.769           |
| 11              | 83.888             | 5.592           |
| 12              | 86.186             | 4.914           |
| 13              | 88.150             | 4.199           |
| 14              | 89.702             | 3.319           |
| 15              | 91.050             | 2.881           |
| 16              | 92.255             | 2.577           |
| 17              | 93.333             | 2.304           |
| 18              | 94.259             | 1.981           |
| 19              | 95.057             | 1.706           |
| 20              | 95.792             | 1.571           |
| 21              | 96.405             | 1.311           |
| 22              | 96.970             | 1.209           |
| 23              | 97.402             | 0.922           |
| 24              | 97.795             | 0.841           |
| 25              | 98.048             | 0.541           |
| 26              | 98.287             | 0.511           |
| 27              | 98.561             | 0.585           |
| 28              | 98.842             | 0.602           |
| 29              | 99.124             | 0.602           |
| 30              | 99.403             | 0.598           |
| 31              | 99.597             | 0.415           |
| 32              | 99.744             | 0.314           |
| 33              | 99.891             | 0.314           |
| 34              | 100.000            | 0.234           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.1279                 | 0.1279        |
| 2         | 0.1575                 | 0.0296        |
| 3         | 0.1778                 | 0.0204        |
| 4         | 0.1939                 | 0.0160        |
| 5         | 0.2073                 | 0.0134        |
| 6         | 0.2190                 | 0.0117        |
| 7         | 0.2293                 | 0.0104        |
| 8         | 0.2387                 | 0.0094        |
| 9         | 0.2473                 | 0.0086        |
| 10        | 0.2552                 | 0.0079        |
| 11        | 0.2626                 | 0.0074        |
| 12        | 0.2696                 | 0.0069        |

|    |        |        |
|----|--------|--------|
| 13 | 0.2822 | 0.0127 |
| 14 | 0.2945 | 0.0123 |
| 15 | 0.3064 | 0.0119 |
| 16 | 0.3179 | 0.0116 |
| 17 | 0.3292 | 0.0112 |
| 18 | 0.3401 | 0.0110 |
| 19 | 0.3508 | 0.0107 |
| 20 | 0.3613 | 0.0105 |
| 21 | 0.3716 | 0.0103 |
| 22 | 0.3816 | 0.0100 |
| 23 | 0.3915 | 0.0099 |
| 24 | 0.4011 | 0.0097 |
| 25 | 0.4107 | 0.0095 |
| 26 | 0.4200 | 0.0093 |
| 27 | 0.4292 | 0.0092 |
| 28 | 0.4382 | 0.0090 |
| 29 | 0.4471 | 0.0089 |
| 30 | 0.4559 | 0.0088 |
| 31 | 0.4646 | 0.0087 |
| 32 | 0.4731 | 0.0085 |
| 33 | 0.4815 | 0.0084 |
| 34 | 0.4898 | 0.0083 |
| 35 | 0.4981 | 0.0082 |
| 36 | 0.5062 | 0.0081 |
| 37 | 0.5142 | 0.0080 |
| 38 | 0.5221 | 0.0079 |
| 39 | 0.5299 | 0.0078 |
| 40 | 0.5377 | 0.0077 |
| 41 | 0.5453 | 0.0077 |
| 42 | 0.5529 | 0.0076 |
| 43 | 0.5604 | 0.0075 |
| 44 | 0.5678 | 0.0074 |
| 45 | 0.5752 | 0.0074 |
| 46 | 0.5825 | 0.0073 |
| 47 | 0.5897 | 0.0072 |
| 48 | 0.5969 | 0.0072 |
| 49 | 0.6040 | 0.0071 |
| 50 | 0.6110 | 0.0070 |
| 51 | 0.6180 | 0.0070 |
| 52 | 0.6249 | 0.0069 |
| 53 | 0.6317 | 0.0069 |
| 54 | 0.6385 | 0.0068 |
| 55 | 0.6453 | 0.0067 |
| 56 | 0.6520 | 0.0067 |
| 57 | 0.6586 | 0.0066 |
| 58 | 0.6652 | 0.0066 |
| 59 | 0.6718 | 0.0065 |
| 60 | 0.6783 | 0.0065 |
| 61 | 0.6847 | 0.0065 |
| 62 | 0.6911 | 0.0064 |
| 63 | 0.6975 | 0.0064 |
| 64 | 0.7038 | 0.0063 |
| 65 | 0.7101 | 0.0063 |
| 66 | 0.7163 | 0.0062 |
| 67 | 0.7225 | 0.0062 |
| 68 | 0.7287 | 0.0062 |
| 69 | 0.7348 | 0.0061 |
| 70 | 0.7409 | 0.0061 |
| 71 | 0.7469 | 0.0060 |
| 72 | 0.7530 | 0.0060 |
| 73 | 0.7571 | 0.0041 |
| 74 | 0.7611 | 0.0041 |
| 75 | 0.7652 | 0.0040 |
| 76 | 0.7692 | 0.0040 |
| 77 | 0.7731 | 0.0040 |
| 78 | 0.7771 | 0.0039 |
| 79 | 0.7810 | 0.0039 |
| 80 | 0.7849 | 0.0039 |
| 81 | 0.7887 | 0.0039 |
| 82 | 0.7925 | 0.0038 |
| 83 | 0.7963 | 0.0038 |
| 84 | 0.8001 | 0.0038 |
| 85 | 0.8038 | 0.0037 |
| 86 | 0.8075 | 0.0037 |
| 87 | 0.8112 | 0.0037 |
| 88 | 0.8149 | 0.0037 |
| 89 | 0.8185 | 0.0036 |
| 90 | 0.8221 | 0.0036 |
| 91 | 0.8257 | 0.0036 |
| 92 | 0.8293 | 0.0036 |
| 93 | 0.8328 | 0.0035 |

|     |        |        |
|-----|--------|--------|
| 94  | 0.8363 | 0.0035 |
| 95  | 0.8398 | 0.0035 |
| 96  | 0.8433 | 0.0035 |
| 97  | 0.8468 | 0.0034 |
| 98  | 0.8502 | 0.0034 |
| 99  | 0.8536 | 0.0034 |
| 100 | 0.8570 | 0.0034 |
| 101 | 0.8603 | 0.0034 |
| 102 | 0.8637 | 0.0033 |
| 103 | 0.8670 | 0.0033 |
| 104 | 0.8703 | 0.0033 |
| 105 | 0.8736 | 0.0033 |
| 106 | 0.8769 | 0.0033 |
| 107 | 0.8801 | 0.0032 |
| 108 | 0.8834 | 0.0032 |
| 109 | 0.8866 | 0.0032 |
| 110 | 0.8898 | 0.0032 |
| 111 | 0.8929 | 0.0032 |
| 112 | 0.8961 | 0.0032 |
| 113 | 0.8992 | 0.0031 |
| 114 | 0.9024 | 0.0031 |
| 115 | 0.9055 | 0.0031 |
| 116 | 0.9086 | 0.0031 |
| 117 | 0.9117 | 0.0031 |
| 118 | 0.9147 | 0.0031 |
| 119 | 0.9178 | 0.0030 |
| 120 | 0.9208 | 0.0030 |
| 121 | 0.9238 | 0.0030 |
| 122 | 0.9268 | 0.0030 |
| 123 | 0.9298 | 0.0030 |
| 124 | 0.9328 | 0.0030 |
| 125 | 0.9357 | 0.0030 |
| 126 | 0.9387 | 0.0029 |
| 127 | 0.9416 | 0.0029 |
| 128 | 0.9445 | 0.0029 |
| 129 | 0.9474 | 0.0029 |
| 130 | 0.9503 | 0.0029 |
| 131 | 0.9532 | 0.0029 |
| 132 | 0.9560 | 0.0029 |
| 133 | 0.9589 | 0.0028 |
| 134 | 0.9617 | 0.0028 |
| 135 | 0.9645 | 0.0028 |
| 136 | 0.9673 | 0.0028 |
| 137 | 0.9701 | 0.0028 |
| 138 | 0.9729 | 0.0028 |
| 139 | 0.9757 | 0.0028 |
| 140 | 0.9784 | 0.0028 |
| 141 | 0.9812 | 0.0027 |
| 142 | 0.9839 | 0.0027 |
| 143 | 0.9866 | 0.0027 |
| 144 | 0.9894 | 0.0027 |
| 145 | 0.9921 | 0.0027 |
| 146 | 0.9947 | 0.0027 |
| 147 | 0.9974 | 0.0027 |
| 148 | 1.0001 | 0.0027 |
| 149 | 1.0027 | 0.0027 |
| 150 | 1.0054 | 0.0026 |
| 151 | 1.0080 | 0.0026 |
| 152 | 1.0107 | 0.0026 |
| 153 | 1.0133 | 0.0026 |
| 154 | 1.0159 | 0.0026 |
| 155 | 1.0185 | 0.0026 |
| 156 | 1.0210 | 0.0026 |
| 157 | 1.0236 | 0.0026 |
| 158 | 1.0262 | 0.0026 |
| 159 | 1.0287 | 0.0026 |
| 160 | 1.0313 | 0.0025 |
| 161 | 1.0338 | 0.0025 |
| 162 | 1.0363 | 0.0025 |
| 163 | 1.0389 | 0.0025 |
| 164 | 1.0414 | 0.0025 |
| 165 | 1.0439 | 0.0025 |
| 166 | 1.0463 | 0.0025 |
| 167 | 1.0488 | 0.0025 |
| 168 | 1.0513 | 0.0025 |
| 169 | 1.0538 | 0.0025 |
| 170 | 1.0562 | 0.0025 |
| 171 | 1.0586 | 0.0024 |
| 172 | 1.0611 | 0.0024 |
| 173 | 1.0635 | 0.0024 |
| 174 | 1.0659 | 0.0024 |

|     |        |        |
|-----|--------|--------|
| 175 | 1.0683 | 0.0024 |
| 176 | 1.0707 | 0.0024 |
| 177 | 1.0731 | 0.0024 |
| 178 | 1.0755 | 0.0024 |
| 179 | 1.0779 | 0.0024 |
| 180 | 1.0803 | 0.0024 |
| 181 | 1.0826 | 0.0024 |
| 182 | 1.0850 | 0.0024 |
| 183 | 1.0873 | 0.0023 |
| 184 | 1.0897 | 0.0023 |
| 185 | 1.0920 | 0.0023 |
| 186 | 1.0943 | 0.0023 |
| 187 | 1.0966 | 0.0023 |
| 188 | 1.0989 | 0.0023 |
| 189 | 1.1012 | 0.0023 |
| 190 | 1.1035 | 0.0023 |
| 191 | 1.1058 | 0.0023 |
| 192 | 1.1081 | 0.0023 |
| 193 | 1.1103 | 0.0023 |
| 194 | 1.1126 | 0.0023 |
| 195 | 1.1149 | 0.0023 |
| 196 | 1.1171 | 0.0022 |
| 197 | 1.1194 | 0.0022 |
| 198 | 1.1216 | 0.0022 |
| 199 | 1.1238 | 0.0022 |
| 200 | 1.1260 | 0.0022 |
| 201 | 1.1282 | 0.0022 |
| 202 | 1.1305 | 0.0022 |
| 203 | 1.1327 | 0.0022 |
| 204 | 1.1349 | 0.0022 |
| 205 | 1.1370 | 0.0022 |
| 206 | 1.1392 | 0.0022 |
| 207 | 1.1414 | 0.0022 |
| 208 | 1.1436 | 0.0022 |
| 209 | 1.1457 | 0.0022 |
| 210 | 1.1479 | 0.0022 |
| 211 | 1.1500 | 0.0022 |
| 212 | 1.1522 | 0.0021 |
| 213 | 1.1543 | 0.0021 |
| 214 | 1.1564 | 0.0021 |
| 215 | 1.1586 | 0.0021 |
| 216 | 1.1607 | 0.0021 |
| 217 | 1.1628 | 0.0021 |
| 218 | 1.1649 | 0.0021 |
| 219 | 1.1670 | 0.0021 |
| 220 | 1.1691 | 0.0021 |
| 221 | 1.1712 | 0.0021 |
| 222 | 1.1733 | 0.0021 |
| 223 | 1.1754 | 0.0021 |
| 224 | 1.1774 | 0.0021 |
| 225 | 1.1795 | 0.0021 |
| 226 | 1.1816 | 0.0021 |
| 227 | 1.1836 | 0.0021 |
| 228 | 1.1857 | 0.0021 |
| 229 | 1.1877 | 0.0020 |
| 230 | 1.1898 | 0.0020 |
| 231 | 1.1918 | 0.0020 |
| 232 | 1.1938 | 0.0020 |
| 233 | 1.1959 | 0.0020 |
| 234 | 1.1979 | 0.0020 |
| 235 | 1.1999 | 0.0020 |
| 236 | 1.2019 | 0.0020 |
| 237 | 1.2039 | 0.0020 |
| 238 | 1.2059 | 0.0020 |
| 239 | 1.2079 | 0.0020 |
| 240 | 1.2099 | 0.0020 |
| 241 | 1.2119 | 0.0020 |
| 242 | 1.2138 | 0.0020 |
| 243 | 1.2158 | 0.0020 |
| 244 | 1.2178 | 0.0020 |
| 245 | 1.2197 | 0.0020 |
| 246 | 1.2217 | 0.0020 |
| 247 | 1.2237 | 0.0020 |
| 248 | 1.2256 | 0.0019 |
| 249 | 1.2276 | 0.0019 |
| 250 | 1.2295 | 0.0019 |
| 251 | 1.2314 | 0.0019 |
| 252 | 1.2334 | 0.0019 |
| 253 | 1.2353 | 0.0019 |
| 254 | 1.2372 | 0.0019 |
| 255 | 1.2391 | 0.0019 |

|     |        |        |
|-----|--------|--------|
| 256 | 1.2410 | 0.0019 |
| 257 | 1.2429 | 0.0019 |
| 258 | 1.2448 | 0.0019 |
| 259 | 1.2467 | 0.0019 |
| 260 | 1.2486 | 0.0019 |
| 261 | 1.2505 | 0.0019 |
| 262 | 1.2524 | 0.0019 |
| 263 | 1.2543 | 0.0019 |
| 264 | 1.2562 | 0.0019 |
| 265 | 1.2580 | 0.0019 |
| 266 | 1.2599 | 0.0019 |
| 267 | 1.2618 | 0.0019 |
| 268 | 1.2636 | 0.0019 |
| 269 | 1.2655 | 0.0019 |
| 270 | 1.2673 | 0.0019 |
| 271 | 1.2692 | 0.0018 |
| 272 | 1.2710 | 0.0018 |
| 273 | 1.2729 | 0.0018 |
| 274 | 1.2747 | 0.0018 |
| 275 | 1.2765 | 0.0018 |
| 276 | 1.2784 | 0.0018 |
| 277 | 1.2802 | 0.0018 |
| 278 | 1.2820 | 0.0018 |
| 279 | 1.2838 | 0.0018 |
| 280 | 1.2856 | 0.0018 |
| 281 | 1.2874 | 0.0018 |
| 282 | 1.2892 | 0.0018 |
| 283 | 1.2910 | 0.0018 |
| 284 | 1.2928 | 0.0018 |
| 285 | 1.2946 | 0.0018 |
| 286 | 1.2964 | 0.0018 |
| 287 | 1.2982 | 0.0018 |
| 288 | 1.3000 | 0.0018 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 2                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 3                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 4                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 5                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 6                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 7                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 8                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 9                          | 0.0018                   | 0.0018                    | 0.0000                        |
| 10                         | 0.0018                   | 0.0018                    | 0.0000                        |
| 11                         | 0.0018                   | 0.0018                    | 0.0000                        |
| 12                         | 0.0018                   | 0.0018                    | 0.0000                        |
| 13                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 14                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 15                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 16                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 17                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 18                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 19                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 20                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 21                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 22                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 23                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 24                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 25                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 26                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 27                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 28                         | 0.0019                   | 0.0019                    | 0.0000                        |
| 29                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 30                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 31                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 32                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 33                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 34                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 35                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 36                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 37                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 38                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 39                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 40                         | 0.0020                   | 0.0020                    | 0.0000                        |
| 41                         | 0.0021                   | 0.0021                    | 0.0000                        |
| 42                         | 0.0021                   | 0.0021                    | 0.0000                        |
| 43                         | 0.0021                   | 0.0021                    | 0.0000                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 44  | 0.0021 | 0.0021 | 0.0000 |
| 45  | 0.0021 | 0.0021 | 0.0000 |
| 46  | 0.0021 | 0.0021 | 0.0000 |
| 47  | 0.0021 | 0.0021 | 0.0000 |
| 48  | 0.0021 | 0.0021 | 0.0000 |
| 49  | 0.0021 | 0.0021 | 0.0000 |
| 50  | 0.0021 | 0.0021 | 0.0000 |
| 51  | 0.0021 | 0.0021 | 0.0000 |
| 52  | 0.0021 | 0.0021 | 0.0000 |
| 53  | 0.0022 | 0.0022 | 0.0000 |
| 54  | 0.0022 | 0.0022 | 0.0000 |
| 55  | 0.0022 | 0.0022 | 0.0000 |
| 56  | 0.0022 | 0.0022 | 0.0000 |
| 57  | 0.0022 | 0.0022 | 0.0000 |
| 58  | 0.0022 | 0.0022 | 0.0000 |
| 59  | 0.0022 | 0.0022 | 0.0000 |
| 60  | 0.0022 | 0.0022 | 0.0000 |
| 61  | 0.0022 | 0.0022 | 0.0000 |
| 62  | 0.0022 | 0.0022 | 0.0000 |
| 63  | 0.0023 | 0.0023 | 0.0000 |
| 64  | 0.0023 | 0.0023 | 0.0000 |
| 65  | 0.0023 | 0.0023 | 0.0000 |
| 66  | 0.0023 | 0.0023 | 0.0000 |
| 67  | 0.0023 | 0.0023 | 0.0000 |
| 68  | 0.0023 | 0.0023 | 0.0000 |
| 69  | 0.0023 | 0.0023 | 0.0000 |
| 70  | 0.0023 | 0.0023 | 0.0000 |
| 71  | 0.0023 | 0.0023 | 0.0000 |
| 72  | 0.0024 | 0.0024 | 0.0000 |
| 73  | 0.0024 | 0.0024 | 0.0000 |
| 74  | 0.0024 | 0.0024 | 0.0000 |
| 75  | 0.0024 | 0.0024 | 0.0000 |
| 76  | 0.0024 | 0.0024 | 0.0000 |
| 77  | 0.0024 | 0.0024 | 0.0000 |
| 78  | 0.0024 | 0.0024 | 0.0000 |
| 79  | 0.0024 | 0.0024 | 0.0000 |
| 80  | 0.0025 | 0.0025 | 0.0000 |
| 81  | 0.0025 | 0.0025 | 0.0000 |
| 82  | 0.0025 | 0.0025 | 0.0000 |
| 83  | 0.0025 | 0.0025 | 0.0000 |
| 84  | 0.0025 | 0.0025 | 0.0000 |
| 85  | 0.0025 | 0.0025 | 0.0000 |
| 86  | 0.0025 | 0.0025 | 0.0000 |
| 87  | 0.0026 | 0.0026 | 0.0000 |
| 88  | 0.0026 | 0.0026 | 0.0000 |
| 89  | 0.0026 | 0.0026 | 0.0000 |
| 90  | 0.0026 | 0.0026 | 0.0000 |
| 91  | 0.0026 | 0.0026 | 0.0000 |
| 92  | 0.0026 | 0.0026 | 0.0000 |
| 93  | 0.0026 | 0.0026 | 0.0000 |
| 94  | 0.0027 | 0.0027 | 0.0000 |
| 95  | 0.0027 | 0.0027 | 0.0000 |
| 96  | 0.0027 | 0.0027 | 0.0000 |
| 97  | 0.0027 | 0.0027 | 0.0000 |
| 98  | 0.0027 | 0.0027 | 0.0000 |
| 99  | 0.0027 | 0.0027 | 0.0000 |
| 100 | 0.0028 | 0.0028 | 0.0000 |
| 101 | 0.0028 | 0.0028 | 0.0000 |
| 102 | 0.0028 | 0.0028 | 0.0000 |
| 103 | 0.0028 | 0.0028 | 0.0000 |
| 104 | 0.0028 | 0.0028 | 0.0000 |
| 105 | 0.0029 | 0.0029 | 0.0000 |
| 106 | 0.0029 | 0.0029 | 0.0000 |
| 107 | 0.0029 | 0.0029 | 0.0000 |
| 108 | 0.0029 | 0.0029 | 0.0000 |
| 109 | 0.0029 | 0.0029 | 0.0000 |
| 110 | 0.0030 | 0.0030 | 0.0000 |
| 111 | 0.0030 | 0.0030 | 0.0000 |
| 112 | 0.0030 | 0.0030 | 0.0000 |
| 113 | 0.0030 | 0.0030 | 0.0000 |
| 114 | 0.0030 | 0.0030 | 0.0000 |
| 115 | 0.0031 | 0.0031 | 0.0000 |
| 116 | 0.0031 | 0.0031 | 0.0000 |
| 117 | 0.0031 | 0.0031 | 0.0000 |
| 118 | 0.0031 | 0.0031 | 0.0000 |
| 119 | 0.0032 | 0.0032 | 0.0000 |
| 120 | 0.0032 | 0.0032 | 0.0000 |
| 121 | 0.0032 | 0.0032 | 0.0000 |
| 122 | 0.0032 | 0.0032 | 0.0000 |
| 123 | 0.0033 | 0.0033 | 0.0000 |
| 124 | 0.0033 | 0.0033 | 0.0000 |

|     |        |        |        |
|-----|--------|--------|--------|
| 125 | 0.0033 | 0.0033 | 0.0000 |
| 126 | 0.0034 | 0.0034 | 0.0000 |
| 127 | 0.0034 | 0.0034 | 0.0000 |
| 128 | 0.0034 | 0.0034 | 0.0000 |
| 129 | 0.0035 | 0.0035 | 0.0000 |
| 130 | 0.0035 | 0.0035 | 0.0000 |
| 131 | 0.0035 | 0.0035 | 0.0000 |
| 132 | 0.0036 | 0.0036 | 0.0000 |
| 133 | 0.0036 | 0.0036 | 0.0000 |
| 134 | 0.0036 | 0.0036 | 0.0000 |
| 135 | 0.0037 | 0.0037 | 0.0000 |
| 136 | 0.0037 | 0.0037 | 0.0000 |
| 137 | 0.0038 | 0.0038 | 0.0000 |
| 138 | 0.0038 | 0.0038 | 0.0000 |
| 139 | 0.0039 | 0.0039 | 0.0000 |
| 140 | 0.0039 | 0.0039 | 0.0000 |
| 141 | 0.0039 | 0.0039 | 0.0000 |
| 142 | 0.0040 | 0.0040 | 0.0000 |
| 143 | 0.0040 | 0.0040 | 0.0000 |
| 144 | 0.0041 | 0.0041 | 0.0000 |
| 145 | 0.0060 | 0.0060 | 0.0000 |
| 146 | 0.0060 | 0.0060 | 0.0000 |
| 147 | 0.0061 | 0.0061 | 0.0000 |
| 148 | 0.0062 | 0.0062 | 0.0000 |
| 149 | 0.0062 | 0.0062 | 0.0000 |
| 150 | 0.0063 | 0.0063 | 0.0000 |
| 151 | 0.0064 | 0.0064 | 0.0000 |
| 152 | 0.0064 | 0.0064 | 0.0000 |
| 153 | 0.0065 | 0.0065 | 0.0000 |
| 154 | 0.0065 | 0.0065 | 0.0000 |
| 155 | 0.0066 | 0.0066 | 0.0000 |
| 156 | 0.0067 | 0.0067 | 0.0000 |
| 157 | 0.0068 | 0.0068 | 0.0000 |
| 158 | 0.0069 | 0.0069 | 0.0000 |
| 159 | 0.0070 | 0.0070 | 0.0000 |
| 160 | 0.0070 | 0.0070 | 0.0000 |
| 161 | 0.0072 | 0.0072 | 0.0000 |
| 162 | 0.0072 | 0.0072 | 0.0000 |
| 163 | 0.0074 | 0.0074 | 0.0000 |
| 164 | 0.0074 | 0.0074 | 0.0000 |
| 165 | 0.0076 | 0.0076 | 0.0000 |
| 166 | 0.0077 | 0.0077 | 0.0000 |
| 167 | 0.0078 | 0.0078 | 0.0000 |
| 168 | 0.0079 | 0.0079 | 0.0000 |
| 169 | 0.0081 | 0.0081 | 0.0000 |
| 170 | 0.0082 | 0.0082 | 0.0000 |
| 171 | 0.0084 | 0.0084 | 0.0000 |
| 172 | 0.0085 | 0.0085 | 0.0000 |
| 173 | 0.0088 | 0.0088 | 0.0000 |
| 174 | 0.0089 | 0.0089 | 0.0000 |
| 175 | 0.0092 | 0.0092 | 0.0000 |
| 176 | 0.0093 | 0.0093 | 0.0000 |
| 177 | 0.0097 | 0.0097 | 0.0000 |
| 178 | 0.0099 | 0.0099 | 0.0000 |
| 179 | 0.0103 | 0.0103 | 0.0000 |
| 180 | 0.0105 | 0.0105 | 0.0000 |
| 181 | 0.0110 | 0.0110 | 0.0000 |
| 182 | 0.0112 | 0.0112 | 0.0000 |
| 183 | 0.0119 | 0.0119 | 0.0000 |
| 184 | 0.0123 | 0.0123 | 0.0000 |
| 185 | 0.0069 | 0.0069 | 0.0000 |
| 186 | 0.0074 | 0.0074 | 0.0000 |
| 187 | 0.0086 | 0.0086 | 0.0000 |
| 188 | 0.0094 | 0.0094 | 0.0000 |
| 189 | 0.0117 | 0.0117 | 0.0000 |
| 190 | 0.0134 | 0.0134 | 0.0000 |
| 191 | 0.0204 | 0.0204 | 0.0000 |
| 192 | 0.0296 | 0.0296 | 0.0000 |
| 193 | 0.1279 | 0.0573 | 0.0706 |
| 194 | 0.0160 | 0.0160 | 0.0000 |
| 195 | 0.0104 | 0.0104 | 0.0000 |
| 196 | 0.0079 | 0.0079 | 0.0000 |
| 197 | 0.0127 | 0.0127 | 0.0000 |
| 198 | 0.0116 | 0.0116 | 0.0000 |
| 199 | 0.0107 | 0.0107 | 0.0000 |
| 200 | 0.0100 | 0.0100 | 0.0000 |
| 201 | 0.0095 | 0.0095 | 0.0000 |
| 202 | 0.0090 | 0.0090 | 0.0000 |
| 203 | 0.0087 | 0.0087 | 0.0000 |
| 204 | 0.0083 | 0.0083 | 0.0000 |
| 205 | 0.0080 | 0.0080 | 0.0000 |

|     |        |        |        |
|-----|--------|--------|--------|
| 206 | 0.0077 | 0.0077 | 0.0000 |
| 207 | 0.0075 | 0.0075 | 0.0000 |
| 208 | 0.0073 | 0.0073 | 0.0000 |
| 209 | 0.0071 | 0.0071 | 0.0000 |
| 210 | 0.0069 | 0.0069 | 0.0000 |
| 211 | 0.0067 | 0.0067 | 0.0000 |
| 212 | 0.0066 | 0.0066 | 0.0000 |
| 213 | 0.0065 | 0.0065 | 0.0000 |
| 214 | 0.0063 | 0.0063 | 0.0000 |
| 215 | 0.0062 | 0.0062 | 0.0000 |
| 216 | 0.0061 | 0.0061 | 0.0000 |
| 217 | 0.0041 | 0.0041 | 0.0000 |
| 218 | 0.0040 | 0.0040 | 0.0000 |
| 219 | 0.0039 | 0.0039 | 0.0000 |
| 220 | 0.0038 | 0.0038 | 0.0000 |
| 221 | 0.0037 | 0.0037 | 0.0000 |
| 222 | 0.0037 | 0.0037 | 0.0000 |
| 223 | 0.0036 | 0.0036 | 0.0000 |
| 224 | 0.0035 | 0.0035 | 0.0000 |
| 225 | 0.0034 | 0.0034 | 0.0000 |
| 226 | 0.0034 | 0.0034 | 0.0000 |
| 227 | 0.0033 | 0.0033 | 0.0000 |
| 228 | 0.0033 | 0.0033 | 0.0000 |
| 229 | 0.0032 | 0.0032 | 0.0000 |
| 230 | 0.0032 | 0.0032 | 0.0000 |
| 231 | 0.0031 | 0.0031 | 0.0000 |
| 232 | 0.0031 | 0.0031 | 0.0000 |
| 233 | 0.0030 | 0.0030 | 0.0000 |
| 234 | 0.0030 | 0.0030 | 0.0000 |
| 235 | 0.0029 | 0.0029 | 0.0000 |
| 236 | 0.0029 | 0.0029 | 0.0000 |
| 237 | 0.0028 | 0.0028 | 0.0000 |
| 238 | 0.0028 | 0.0028 | 0.0000 |
| 239 | 0.0028 | 0.0028 | 0.0000 |
| 240 | 0.0027 | 0.0027 | 0.0000 |
| 241 | 0.0027 | 0.0027 | 0.0000 |
| 242 | 0.0027 | 0.0027 | 0.0000 |
| 243 | 0.0026 | 0.0026 | 0.0000 |
| 244 | 0.0026 | 0.0026 | 0.0000 |
| 245 | 0.0026 | 0.0026 | 0.0000 |
| 246 | 0.0025 | 0.0025 | 0.0000 |
| 247 | 0.0025 | 0.0025 | 0.0000 |
| 248 | 0.0025 | 0.0025 | 0.0000 |
| 249 | 0.0025 | 0.0025 | 0.0000 |
| 250 | 0.0024 | 0.0024 | 0.0000 |
| 251 | 0.0024 | 0.0024 | 0.0000 |
| 252 | 0.0024 | 0.0024 | 0.0000 |
| 253 | 0.0024 | 0.0024 | 0.0000 |
| 254 | 0.0023 | 0.0023 | 0.0000 |
| 255 | 0.0023 | 0.0023 | 0.0000 |
| 256 | 0.0023 | 0.0023 | 0.0000 |
| 257 | 0.0023 | 0.0023 | 0.0000 |
| 258 | 0.0022 | 0.0022 | 0.0000 |
| 259 | 0.0022 | 0.0022 | 0.0000 |
| 260 | 0.0022 | 0.0022 | 0.0000 |
| 261 | 0.0022 | 0.0022 | 0.0000 |
| 262 | 0.0022 | 0.0022 | 0.0000 |
| 263 | 0.0022 | 0.0022 | 0.0000 |
| 264 | 0.0021 | 0.0021 | 0.0000 |
| 265 | 0.0021 | 0.0021 | 0.0000 |
| 266 | 0.0021 | 0.0021 | 0.0000 |
| 267 | 0.0021 | 0.0021 | 0.0000 |
| 268 | 0.0021 | 0.0021 | 0.0000 |
| 269 | 0.0020 | 0.0020 | 0.0000 |
| 270 | 0.0020 | 0.0020 | 0.0000 |
| 271 | 0.0020 | 0.0020 | 0.0000 |
| 272 | 0.0020 | 0.0020 | 0.0000 |
| 273 | 0.0020 | 0.0020 | 0.0000 |
| 274 | 0.0020 | 0.0020 | 0.0000 |
| 275 | 0.0020 | 0.0020 | 0.0000 |
| 276 | 0.0019 | 0.0019 | 0.0000 |
| 277 | 0.0019 | 0.0019 | 0.0000 |
| 278 | 0.0019 | 0.0019 | 0.0000 |
| 279 | 0.0019 | 0.0019 | 0.0000 |
| 280 | 0.0019 | 0.0019 | 0.0000 |
| 281 | 0.0019 | 0.0019 | 0.0000 |
| 282 | 0.0019 | 0.0019 | 0.0000 |
| 283 | 0.0018 | 0.0018 | 0.0000 |
| 284 | 0.0018 | 0.0018 | 0.0000 |
| 285 | 0.0018 | 0.0018 | 0.0000 |
| 286 | 0.0018 | 0.0018 | 0.0000 |

|     |        |        |        |
|-----|--------|--------|--------|
| 287 | 0.0018 | 0.0018 | 0.0000 |
| 288 | 0.0018 | 0.0018 | 0.0000 |

Total soil rain loss = 1.23(In)  
 Total effective rainfall = 0.07(In)  
 Peak flow rate in flood hydrograph = (CFS)

++++++  
 24 - H O U R S T O R M  
 R u n o f f H y d r o g r a p h  
 -----  
 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|-----------|--------|-------|--------|---|-----|-----|-----|------|
| 0+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+25      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+30      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+35      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+40      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+45      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+50      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 0+55      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+ 0      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+25      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+30      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+35      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+40      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+45      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+50      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 1+55      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+ 0      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+25      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+30      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+35      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+40      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+45      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+50      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 2+55      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+ 0      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+25      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+30      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+35      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+40      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+45      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+50      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 3+55      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+ 0      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+25      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+30      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+35      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+40      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+45      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+50      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 4+55      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 5+ 0      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 5+ 5      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 5+10      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 5+15      | 0.0000 | 0.00  | Q      |   |     |     |     |      |
| 5+20      | 0.0000 | 0.00  | Q      |   |     |     |     |      |

|       |        |      |   |
|-------|--------|------|---|
| 5+25  | 0.0000 | 0.00 | Q |
| 5+30  | 0.0000 | 0.00 | Q |
| 5+35  | 0.0000 | 0.00 | Q |
| 5+40  | 0.0000 | 0.00 | Q |
| 5+45  | 0.0000 | 0.00 | Q |
| 5+50  | 0.0000 | 0.00 | Q |
| 5+55  | 0.0000 | 0.00 | Q |
| 6+ 0  | 0.0000 | 0.00 | Q |
| 6+ 5  | 0.0000 | 0.00 | Q |
| 6+10  | 0.0000 | 0.00 | Q |
| 6+15  | 0.0000 | 0.00 | Q |
| 6+20  | 0.0000 | 0.00 | Q |
| 6+25  | 0.0000 | 0.00 | Q |
| 6+30  | 0.0000 | 0.00 | Q |
| 6+35  | 0.0000 | 0.00 | Q |
| 6+40  | 0.0000 | 0.00 | Q |
| 6+45  | 0.0000 | 0.00 | Q |
| 6+50  | 0.0000 | 0.00 | Q |
| 6+55  | 0.0000 | 0.00 | Q |
| 7+ 0  | 0.0000 | 0.00 | Q |
| 7+ 5  | 0.0000 | 0.00 | Q |
| 7+10  | 0.0000 | 0.00 | Q |
| 7+15  | 0.0000 | 0.00 | Q |
| 7+20  | 0.0000 | 0.00 | Q |
| 7+25  | 0.0000 | 0.00 | Q |
| 7+30  | 0.0000 | 0.00 | Q |
| 7+35  | 0.0000 | 0.00 | Q |
| 7+40  | 0.0000 | 0.00 | Q |
| 7+45  | 0.0000 | 0.00 | Q |
| 7+50  | 0.0000 | 0.00 | Q |
| 7+55  | 0.0000 | 0.00 | Q |
| 8+ 0  | 0.0000 | 0.00 | Q |
| 8+ 5  | 0.0000 | 0.00 | Q |
| 8+10  | 0.0000 | 0.00 | Q |
| 8+15  | 0.0000 | 0.00 | Q |
| 8+20  | 0.0000 | 0.00 | Q |
| 8+25  | 0.0000 | 0.00 | Q |
| 8+30  | 0.0000 | 0.00 | Q |
| 8+35  | 0.0000 | 0.00 | Q |
| 8+40  | 0.0000 | 0.00 | Q |
| 8+45  | 0.0000 | 0.00 | Q |
| 8+50  | 0.0000 | 0.00 | Q |
| 8+55  | 0.0000 | 0.00 | Q |
| 9+ 0  | 0.0000 | 0.00 | Q |
| 9+ 5  | 0.0000 | 0.00 | Q |
| 9+10  | 0.0000 | 0.00 | Q |
| 9+15  | 0.0000 | 0.00 | Q |
| 9+20  | 0.0000 | 0.00 | Q |
| 9+25  | 0.0000 | 0.00 | Q |
| 9+30  | 0.0000 | 0.00 | Q |
| 9+35  | 0.0000 | 0.00 | Q |
| 9+40  | 0.0000 | 0.00 | Q |
| 9+45  | 0.0000 | 0.00 | Q |
| 9+50  | 0.0000 | 0.00 | Q |
| 9+55  | 0.0000 | 0.00 | Q |
| 10+ 0 | 0.0000 | 0.00 | Q |
| 10+ 5 | 0.0000 | 0.00 | Q |
| 10+10 | 0.0000 | 0.00 | Q |
| 10+15 | 0.0000 | 0.00 | Q |
| 10+20 | 0.0000 | 0.00 | Q |
| 10+25 | 0.0000 | 0.00 | Q |
| 10+30 | 0.0000 | 0.00 | Q |
| 10+35 | 0.0000 | 0.00 | Q |
| 10+40 | 0.0000 | 0.00 | Q |
| 10+45 | 0.0000 | 0.00 | Q |
| 10+50 | 0.0000 | 0.00 | Q |
| 10+55 | 0.0000 | 0.00 | Q |
| 11+ 0 | 0.0000 | 0.00 | Q |
| 11+ 5 | 0.0000 | 0.00 | Q |
| 11+10 | 0.0000 | 0.00 | Q |
| 11+15 | 0.0000 | 0.00 | Q |
| 11+20 | 0.0000 | 0.00 | Q |
| 11+25 | 0.0000 | 0.00 | Q |
| 11+30 | 0.0000 | 0.00 | Q |
| 11+35 | 0.0000 | 0.00 | Q |
| 11+40 | 0.0000 | 0.00 | Q |
| 11+45 | 0.0000 | 0.00 | Q |
| 11+50 | 0.0000 | 0.00 | Q |
| 11+55 | 0.0000 | 0.00 | Q |
| 12+ 0 | 0.0000 | 0.00 | Q |
| 12+ 5 | 0.0000 | 0.00 | Q |

|       |        |      |   |   |   |   |  |
|-------|--------|------|---|---|---|---|--|
| 12+10 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+15 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+20 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+25 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+30 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+35 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+40 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+45 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+50 | 0.0000 | 0.00 | Q |   |   |   |  |
| 12+55 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+ 0 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+ 5 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+10 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+15 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+20 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+25 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+30 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+35 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+40 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+45 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+50 | 0.0000 | 0.00 | Q |   |   |   |  |
| 13+55 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+ 0 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+ 5 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+10 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+15 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+20 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+25 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+30 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+35 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+40 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+45 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+50 | 0.0000 | 0.00 | Q |   |   |   |  |
| 14+55 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+ 0 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+ 5 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+10 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+15 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+20 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+25 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+30 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+35 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+40 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+45 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+50 | 0.0000 | 0.00 | Q |   |   |   |  |
| 15+55 | 0.0000 | 0.00 | Q |   |   |   |  |
| 16+ 0 | 0.0000 | 0.00 | Q |   |   |   |  |
| 16+ 5 | 0.0013 | 0.19 | Q |   |   |   |  |
| 16+10 | 0.0061 | 0.70 | Q |   |   |   |  |
| 16+15 | 0.0173 | 1.62 | Q |   |   |   |  |
| 16+20 | 0.0386 |      |   | Q | Q | V |  |
| 16+25 | 0.0548 | 2.36 |   |   |   | V |  |
| 16+30 | 0.0649 | 1.47 |   |   | V |   |  |
| 16+35 | 0.0718 | 1.00 |   |   | V |   |  |
| 16+40 | 0.0770 | 0.76 |   |   | V |   |  |
| 16+45 | 0.0812 | 0.60 |   |   | V |   |  |
| 16+50 | 0.0845 | 0.48 |   |   | V |   |  |
| 16+55 | 0.0872 | 0.39 |   |   | V |   |  |
| 17+ 0 | 0.0896 | 0.35 |   |   | V |   |  |
| 17+ 5 | 0.0916 | 0.30 |   |   | V |   |  |
| 17+10 | 0.0932 | 0.23 |   |   | V |   |  |
| 17+15 | 0.0946 | 0.20 |   |   | V |   |  |
| 17+20 | 0.0959 | 0.18 |   |   | V |   |  |
| 17+25 | 0.0970 | 0.16 |   |   | V |   |  |
| 17+30 | 0.0980 | 0.14 |   |   | V |   |  |
| 17+35 | 0.0988 | 0.12 |   |   | V |   |  |
| 17+40 | 0.0995 | 0.11 |   |   | V |   |  |
| 17+45 | 0.1002 | 0.09 |   |   | V |   |  |
| 17+50 | 0.1008 | 0.09 |   |   | V |   |  |
| 17+55 | 0.1012 | 0.07 |   |   | V |   |  |
| 18+ 0 | 0.1016 | 0.06 |   |   | V |   |  |
| 18+ 5 | 0.1019 | 0.04 |   |   | V |   |  |
| 18+10 | 0.1021 | 0.04 |   |   | V |   |  |
| 18+15 | 0.1024 | 0.04 |   |   | V |   |  |
| 18+20 | 0.1027 | 0.04 |   |   | V |   |  |
| 18+25 | 0.1030 | 0.04 |   |   | V |   |  |
| 18+30 | 0.1033 | 0.04 |   |   | V |   |  |
| 18+35 | 0.1035 | 0.03 |   |   | V |   |  |
| 18+40 | 0.1037 | 0.02 |   |   | V |   |  |
| 18+45 | 0.1038 | 0.02 |   |   | V |   |  |
| 18+50 | 0.1039 | 0.02 |   |   | V |   |  |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 18+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 19+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 20+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 21+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 22+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 23+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 24+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+35 | 0.1039 | 0.00 | Q |  |  |  | V |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 25+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+45 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+50 | 0.1039 | 0.00 | Q |  |  |  | V |
| 25+55 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+ 0 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+ 5 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+10 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+15 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+20 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+25 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+30 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+35 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+40 | 0.1039 | 0.00 | Q |  |  |  | V |
| 26+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
5-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = ■

Antecedent Moisture Condition = ■

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC I) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 59.4                     | 17.68         | 1.000            | 0.688                 | 1.000        | 0.688         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.688

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC1) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 17.68         | 1.000         | 77.0             | 59.4             | 6.84 | 0.014                |

Area-averaged catchment yield fraction, Y = 0.014

Area-averaged low loss fraction, Yb = 0.986

User entry of time of concentration = 0.444 (hours)

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watershed area = 17.68(Ac.)

Catchment Lag time = 0.355 hours

Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 23.4610  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.688(In/Hr)  
 Average low loss rate fraction (Yb) = 0.986 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.217(In)  
 Computed peak 30-minute rainfall = 0.371(In)  
 Specified peak 1-hour rainfall = 0.457(In)  
 Computed peak 3-hour rainfall = 0.758(In)  
 Specified peak 6-hour rainfall = 1.043(In)  
 Specified peak 24-hour rainfall = 1.790(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(AC.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.217(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.371(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.457(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 0.758(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.043(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 1.789(In) |

| Unit Hydrograph |                    |                 |
|-----------------|--------------------|-----------------|
| Interval        | 'S' Graph          | Unit Hydrograph |
| Number          | Mean values        | ((CFS))         |
| -----           |                    |                 |
|                 | (K = 213.82 (CFS)) |                 |
| 1               | 1.237              | 2.645           |
| 2               | 5.898              | 9.966           |
| 3               | 16.607             | 22.899          |
| 4               | 37.127             | 43.875          |
| 5               | 52.735             | 33.371          |
| 6               | 62.457             | 20.788          |
| 7               | 69.053             | 14.103          |
| 8               | 74.109             | 10.811          |
| 9               | 78.107             | 8.548           |
| 10              | 81.273             | 6.769           |
| 11              | 83.888             | 5.592           |
| 12              | 86.186             | 4.914           |
| 13              | 88.150             | 4.199           |
| 14              | 89.702             | 3.319           |
| 15              | 91.050             | 2.881           |
| 16              | 92.255             | 2.577           |
| 17              | 93.333             | 2.304           |
| 18              | 94.259             | 1.981           |
| 19              | 95.057             | 1.706           |
| 20              | 95.792             | 1.571           |
| 21              | 96.405             | 1.311           |
| 22              | 96.970             | 1.209           |
| 23              | 97.402             | 0.922           |
| 24              | 97.795             | 0.841           |
| 25              | 98.048             | 0.541           |
| 26              | 98.287             | 0.511           |
| 27              | 98.561             | 0.585           |
| 28              | 98.842             | 0.602           |
| 29              | 99.124             | 0.602           |
| 30              | 99.403             | 0.598           |
| 31              | 99.597             | 0.415           |
| 32              | 99.744             | 0.314           |
| 33              | 99.891             | 0.314           |
| 34              | 100.000            | 0.234           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.2168                 | 0.2168        |
| 2         | 0.2669                 | 0.0501        |
| 3         | 0.3014                 | 0.0345        |
| 4         | 0.3286                 | 0.0272        |
| 5         | 0.3513                 | 0.0227        |
| 6         | 0.3711                 | 0.0198        |
| 7         | 0.3886                 | 0.0176        |
| 8         | 0.4045                 | 0.0159        |
| 9         | 0.4191                 | 0.0145        |
| 10        | 0.4325                 | 0.0135        |
| 11        | 0.4451                 | 0.0125        |
| 12        | 0.4568                 | 0.0118        |

|    |        |        |
|----|--------|--------|
| 13 | 0.4740 | 0.0172 |
| 14 | 0.4905 | 0.0165 |
| 15 | 0.5063 | 0.0158 |
| 16 | 0.5216 | 0.0153 |
| 17 | 0.5364 | 0.0148 |
| 18 | 0.5507 | 0.0143 |
| 19 | 0.5646 | 0.0139 |
| 20 | 0.5781 | 0.0135 |
| 21 | 0.5912 | 0.0131 |
| 22 | 0.6040 | 0.0128 |
| 23 | 0.6165 | 0.0125 |
| 24 | 0.6287 | 0.0122 |
| 25 | 0.6407 | 0.0119 |
| 26 | 0.6524 | 0.0117 |
| 27 | 0.6638 | 0.0114 |
| 28 | 0.6750 | 0.0112 |
| 29 | 0.6860 | 0.0110 |
| 30 | 0.6968 | 0.0108 |
| 31 | 0.7074 | 0.0106 |
| 32 | 0.7179 | 0.0104 |
| 33 | 0.7281 | 0.0103 |
| 34 | 0.7382 | 0.0101 |
| 35 | 0.7481 | 0.0099 |
| 36 | 0.7579 | 0.0098 |
| 37 | 0.7675 | 0.0096 |
| 38 | 0.7770 | 0.0095 |
| 39 | 0.7863 | 0.0093 |
| 40 | 0.7956 | 0.0092 |
| 41 | 0.8047 | 0.0091 |
| 42 | 0.8136 | 0.0090 |
| 43 | 0.8225 | 0.0089 |
| 44 | 0.8312 | 0.0087 |
| 45 | 0.8399 | 0.0086 |
| 46 | 0.8484 | 0.0085 |
| 47 | 0.8568 | 0.0084 |
| 48 | 0.8652 | 0.0083 |
| 49 | 0.8734 | 0.0082 |
| 50 | 0.8816 | 0.0082 |
| 51 | 0.8897 | 0.0081 |
| 52 | 0.8977 | 0.0080 |
| 53 | 0.9056 | 0.0079 |
| 54 | 0.9134 | 0.0078 |
| 55 | 0.9211 | 0.0077 |
| 56 | 0.9288 | 0.0077 |
| 57 | 0.9364 | 0.0076 |
| 58 | 0.9439 | 0.0075 |
| 59 | 0.9514 | 0.0075 |
| 60 | 0.9588 | 0.0074 |
| 61 | 0.9661 | 0.0073 |
| 62 | 0.9733 | 0.0073 |
| 63 | 0.9805 | 0.0072 |
| 64 | 0.9877 | 0.0071 |
| 65 | 0.9947 | 0.0071 |
| 66 | 1.0018 | 0.0070 |
| 67 | 1.0087 | 0.0070 |
| 68 | 1.0156 | 0.0069 |
| 69 | 1.0225 | 0.0068 |
| 70 | 1.0292 | 0.0068 |
| 71 | 1.0360 | 0.0067 |
| 72 | 1.0427 | 0.0067 |
| 73 | 1.0483 | 0.0056 |
| 74 | 1.0539 | 0.0056 |
| 75 | 1.0594 | 0.0055 |
| 76 | 1.0649 | 0.0055 |
| 77 | 1.0703 | 0.0054 |
| 78 | 1.0757 | 0.0054 |
| 79 | 1.0811 | 0.0054 |
| 80 | 1.0864 | 0.0053 |
| 81 | 1.0916 | 0.0053 |
| 82 | 1.0969 | 0.0052 |
| 83 | 1.1021 | 0.0052 |
| 84 | 1.1072 | 0.0052 |
| 85 | 1.1123 | 0.0051 |
| 86 | 1.1174 | 0.0051 |
| 87 | 1.1225 | 0.0050 |
| 88 | 1.1275 | 0.0050 |
| 89 | 1.1324 | 0.0050 |
| 90 | 1.1374 | 0.0049 |
| 91 | 1.1423 | 0.0049 |
| 92 | 1.1472 | 0.0049 |
| 93 | 1.1520 | 0.0048 |

|     |        |        |
|-----|--------|--------|
| 94  | 1.1568 | 0.0048 |
| 95  | 1.1616 | 0.0048 |
| 96  | 1.1664 | 0.0047 |
| 97  | 1.1711 | 0.0047 |
| 98  | 1.1758 | 0.0047 |
| 99  | 1.1804 | 0.0047 |
| 100 | 1.1851 | 0.0046 |
| 101 | 1.1897 | 0.0046 |
| 102 | 1.1942 | 0.0046 |
| 103 | 1.1988 | 0.0045 |
| 104 | 1.2033 | 0.0045 |
| 105 | 1.2078 | 0.0045 |
| 106 | 1.2123 | 0.0045 |
| 107 | 1.2167 | 0.0044 |
| 108 | 1.2211 | 0.0044 |
| 109 | 1.2255 | 0.0044 |
| 110 | 1.2299 | 0.0044 |
| 111 | 1.2342 | 0.0043 |
| 112 | 1.2386 | 0.0043 |
| 113 | 1.2428 | 0.0043 |
| 114 | 1.2471 | 0.0043 |
| 115 | 1.2514 | 0.0043 |
| 116 | 1.2556 | 0.0042 |
| 117 | 1.2598 | 0.0042 |
| 118 | 1.2640 | 0.0042 |
| 119 | 1.2682 | 0.0042 |
| 120 | 1.2723 | 0.0041 |
| 121 | 1.2764 | 0.0041 |
| 122 | 1.2805 | 0.0041 |
| 123 | 1.2846 | 0.0041 |
| 124 | 1.2887 | 0.0041 |
| 125 | 1.2927 | 0.0040 |
| 126 | 1.2967 | 0.0040 |
| 127 | 1.3007 | 0.0040 |
| 128 | 1.3047 | 0.0040 |
| 129 | 1.3087 | 0.0040 |
| 130 | 1.3126 | 0.0039 |
| 131 | 1.3165 | 0.0039 |
| 132 | 1.3204 | 0.0039 |
| 133 | 1.3243 | 0.0039 |
| 134 | 1.3282 | 0.0039 |
| 135 | 1.3320 | 0.0039 |
| 136 | 1.3359 | 0.0038 |
| 137 | 1.3397 | 0.0038 |
| 138 | 1.3435 | 0.0038 |
| 139 | 1.3473 | 0.0038 |
| 140 | 1.3511 | 0.0038 |
| 141 | 1.3548 | 0.0038 |
| 142 | 1.3585 | 0.0037 |
| 143 | 1.3623 | 0.0037 |
| 144 | 1.3660 | 0.0037 |
| 145 | 1.3697 | 0.0037 |
| 146 | 1.3733 | 0.0037 |
| 147 | 1.3770 | 0.0037 |
| 148 | 1.3806 | 0.0036 |
| 149 | 1.3843 | 0.0036 |
| 150 | 1.3879 | 0.0036 |
| 151 | 1.3915 | 0.0036 |
| 152 | 1.3950 | 0.0036 |
| 153 | 1.3986 | 0.0036 |
| 154 | 1.4022 | 0.0036 |
| 155 | 1.4057 | 0.0035 |
| 156 | 1.4092 | 0.0035 |
| 157 | 1.4127 | 0.0035 |
| 158 | 1.4162 | 0.0035 |
| 159 | 1.4197 | 0.0035 |
| 160 | 1.4232 | 0.0035 |
| 161 | 1.4267 | 0.0035 |
| 162 | 1.4301 | 0.0034 |
| 163 | 1.4335 | 0.0034 |
| 164 | 1.4370 | 0.0034 |
| 165 | 1.4404 | 0.0034 |
| 166 | 1.4438 | 0.0034 |
| 167 | 1.4472 | 0.0034 |
| 168 | 1.4505 | 0.0034 |
| 169 | 1.4539 | 0.0034 |
| 170 | 1.4572 | 0.0033 |
| 171 | 1.4606 | 0.0033 |
| 172 | 1.4639 | 0.0033 |
| 173 | 1.4672 | 0.0033 |
| 174 | 1.4705 | 0.0033 |

|     |        |        |
|-----|--------|--------|
| 175 | 1.4738 | 0.0033 |
| 176 | 1.4771 | 0.0033 |
| 177 | 1.4803 | 0.0033 |
| 178 | 1.4836 | 0.0033 |
| 179 | 1.4868 | 0.0032 |
| 180 | 1.4900 | 0.0032 |
| 181 | 1.4933 | 0.0032 |
| 182 | 1.4965 | 0.0032 |
| 183 | 1.4997 | 0.0032 |
| 184 | 1.5029 | 0.0032 |
| 185 | 1.5060 | 0.0032 |
| 186 | 1.5092 | 0.0032 |
| 187 | 1.5124 | 0.0032 |
| 188 | 1.5155 | 0.0031 |
| 189 | 1.5186 | 0.0031 |
| 190 | 1.5218 | 0.0031 |
| 191 | 1.5249 | 0.0031 |
| 192 | 1.5280 | 0.0031 |
| 193 | 1.5311 | 0.0031 |
| 194 | 1.5342 | 0.0031 |
| 195 | 1.5372 | 0.0031 |
| 196 | 1.5403 | 0.0031 |
| 197 | 1.5434 | 0.0031 |
| 198 | 1.5464 | 0.0030 |
| 199 | 1.5495 | 0.0030 |
| 200 | 1.5525 | 0.0030 |
| 201 | 1.5555 | 0.0030 |
| 202 | 1.5585 | 0.0030 |
| 203 | 1.5615 | 0.0030 |
| 204 | 1.5645 | 0.0030 |
| 205 | 1.5675 | 0.0030 |
| 206 | 1.5705 | 0.0030 |
| 207 | 1.5734 | 0.0030 |
| 208 | 1.5764 | 0.0030 |
| 209 | 1.5793 | 0.0029 |
| 210 | 1.5823 | 0.0029 |
| 211 | 1.5852 | 0.0029 |
| 212 | 1.5881 | 0.0029 |
| 213 | 1.5910 | 0.0029 |
| 214 | 1.5940 | 0.0029 |
| 215 | 1.5969 | 0.0029 |
| 216 | 1.5997 | 0.0029 |
| 217 | 1.6026 | 0.0029 |
| 218 | 1.6055 | 0.0029 |
| 219 | 1.6084 | 0.0029 |
| 220 | 1.6112 | 0.0029 |
| 221 | 1.6141 | 0.0028 |
| 222 | 1.6169 | 0.0028 |
| 223 | 1.6197 | 0.0028 |
| 224 | 1.6226 | 0.0028 |
| 225 | 1.6254 | 0.0028 |
| 226 | 1.6282 | 0.0028 |
| 227 | 1.6310 | 0.0028 |
| 228 | 1.6338 | 0.0028 |
| 229 | 1.6366 | 0.0028 |
| 230 | 1.6394 | 0.0028 |
| 231 | 1.6421 | 0.0028 |
| 232 | 1.6449 | 0.0028 |
| 233 | 1.6477 | 0.0028 |
| 234 | 1.6504 | 0.0028 |
| 235 | 1.6532 | 0.0027 |
| 236 | 1.6559 | 0.0027 |
| 237 | 1.6586 | 0.0027 |
| 238 | 1.6614 | 0.0027 |
| 239 | 1.6641 | 0.0027 |
| 240 | 1.6668 | 0.0027 |
| 241 | 1.6695 | 0.0027 |
| 242 | 1.6722 | 0.0027 |
| 243 | 1.6749 | 0.0027 |
| 244 | 1.6775 | 0.0027 |
| 245 | 1.6802 | 0.0027 |
| 246 | 1.6829 | 0.0027 |
| 247 | 1.6856 | 0.0027 |
| 248 | 1.6882 | 0.0027 |
| 249 | 1.6909 | 0.0026 |
| 250 | 1.6935 | 0.0026 |
| 251 | 1.6961 | 0.0026 |
| 252 | 1.6988 | 0.0026 |
| 253 | 1.7014 | 0.0026 |
| 254 | 1.7040 | 0.0026 |
| 255 | 1.7066 | 0.0026 |

|     |        |        |
|-----|--------|--------|
| 256 | 1.7092 | 0.0026 |
| 257 | 1.7118 | 0.0026 |
| 258 | 1.7144 | 0.0026 |
| 259 | 1.7170 | 0.0026 |
| 260 | 1.7196 | 0.0026 |
| 261 | 1.7222 | 0.0026 |
| 262 | 1.7247 | 0.0026 |
| 263 | 1.7273 | 0.0026 |
| 264 | 1.7298 | 0.0026 |
| 265 | 1.7324 | 0.0026 |
| 266 | 1.7349 | 0.0025 |
| 267 | 1.7375 | 0.0025 |
| 268 | 1.7400 | 0.0025 |
| 269 | 1.7425 | 0.0025 |
| 270 | 1.7451 | 0.0025 |
| 271 | 1.7476 | 0.0025 |
| 272 | 1.7501 | 0.0025 |
| 273 | 1.7526 | 0.0025 |
| 274 | 1.7551 | 0.0025 |
| 275 | 1.7576 | 0.0025 |
| 276 | 1.7601 | 0.0025 |
| 277 | 1.7625 | 0.0025 |
| 278 | 1.7650 | 0.0025 |
| 279 | 1.7675 | 0.0025 |
| 280 | 1.7700 | 0.0025 |
| 281 | 1.7724 | 0.0025 |
| 282 | 1.7749 | 0.0025 |
| 283 | 1.7773 | 0.0024 |
| 284 | 1.7798 | 0.0024 |
| 285 | 1.7822 | 0.0024 |
| 286 | 1.7846 | 0.0024 |
| 287 | 1.7871 | 0.0024 |
| 288 | 1.7895 | 0.0024 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0024                   | 0.0024                    | 0.0000                        |
| 2                          | 0.0024                   | 0.0024                    | 0.0000                        |
| 3                          | 0.0024                   | 0.0024                    | 0.0000                        |
| 4                          | 0.0024                   | 0.0024                    | 0.0000                        |
| 5                          | 0.0025                   | 0.0024                    | 0.0000                        |
| 6                          | 0.0025                   | 0.0024                    | 0.0000                        |
| 7                          | 0.0025                   | 0.0024                    | 0.0000                        |
| 8                          | 0.0025                   | 0.0024                    | 0.0000                        |
| 9                          | 0.0025                   | 0.0025                    | 0.0000                        |
| 10                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 11                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 12                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 13                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 14                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 15                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 16                         | 0.0025                   | 0.0025                    | 0.0000                        |
| 17                         | 0.0026                   | 0.0025                    | 0.0000                        |
| 18                         | 0.0026                   | 0.0025                    | 0.0000                        |
| 19                         | 0.0026                   | 0.0025                    | 0.0000                        |
| 20                         | 0.0026                   | 0.0025                    | 0.0000                        |
| 21                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 22                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 23                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 24                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 25                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 26                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 27                         | 0.0026                   | 0.0026                    | 0.0000                        |
| 28                         | 0.0027                   | 0.0026                    | 0.0000                        |
| 29                         | 0.0027                   | 0.0026                    | 0.0000                        |
| 30                         | 0.0027                   | 0.0026                    | 0.0000                        |
| 31                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 32                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 33                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 34                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 35                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 36                         | 0.0027                   | 0.0027                    | 0.0000                        |
| 37                         | 0.0028                   | 0.0027                    | 0.0000                        |
| 38                         | 0.0028                   | 0.0027                    | 0.0000                        |
| 39                         | 0.0028                   | 0.0027                    | 0.0000                        |
| 40                         | 0.0028                   | 0.0027                    | 0.0000                        |
| 41                         | 0.0028                   | 0.0028                    | 0.0000                        |
| 42                         | 0.0028                   | 0.0028                    | 0.0000                        |
| 43                         | 0.0028                   | 0.0028                    | 0.0000                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 44  | 0.0028 | 0.0028 | 0.0000 |
| 45  | 0.0028 | 0.0028 | 0.0000 |
| 46  | 0.0028 | 0.0028 | 0.0000 |
| 47  | 0.0029 | 0.0028 | 0.0000 |
| 48  | 0.0029 | 0.0028 | 0.0000 |
| 49  | 0.0029 | 0.0029 | 0.0000 |
| 50  | 0.0029 | 0.0029 | 0.0000 |
| 51  | 0.0029 | 0.0029 | 0.0000 |
| 52  | 0.0029 | 0.0029 | 0.0000 |
| 53  | 0.0029 | 0.0029 | 0.0000 |
| 54  | 0.0029 | 0.0029 | 0.0000 |
| 55  | 0.0030 | 0.0029 | 0.0000 |
| 56  | 0.0030 | 0.0029 | 0.0000 |
| 57  | 0.0030 | 0.0030 | 0.0000 |
| 58  | 0.0030 | 0.0030 | 0.0000 |
| 59  | 0.0030 | 0.0030 | 0.0000 |
| 60  | 0.0030 | 0.0030 | 0.0000 |
| 61  | 0.0030 | 0.0030 | 0.0000 |
| 62  | 0.0031 | 0.0030 | 0.0000 |
| 63  | 0.0031 | 0.0030 | 0.0000 |
| 64  | 0.0031 | 0.0030 | 0.0000 |
| 65  | 0.0031 | 0.0031 | 0.0000 |
| 66  | 0.0031 | 0.0031 | 0.0000 |
| 67  | 0.0031 | 0.0031 | 0.0000 |
| 68  | 0.0031 | 0.0031 | 0.0000 |
| 69  | 0.0032 | 0.0031 | 0.0000 |
| 70  | 0.0032 | 0.0031 | 0.0000 |
| 71  | 0.0032 | 0.0032 | 0.0000 |
| 72  | 0.0032 | 0.0032 | 0.0000 |
| 73  | 0.0032 | 0.0032 | 0.0000 |
| 74  | 0.0032 | 0.0032 | 0.0000 |
| 75  | 0.0033 | 0.0032 | 0.0000 |
| 76  | 0.0033 | 0.0032 | 0.0000 |
| 77  | 0.0033 | 0.0033 | 0.0000 |
| 78  | 0.0033 | 0.0033 | 0.0000 |
| 79  | 0.0033 | 0.0033 | 0.0000 |
| 80  | 0.0033 | 0.0033 | 0.0000 |
| 81  | 0.0034 | 0.0033 | 0.0000 |
| 82  | 0.0034 | 0.0033 | 0.0000 |
| 83  | 0.0034 | 0.0034 | 0.0000 |
| 84  | 0.0034 | 0.0034 | 0.0000 |
| 85  | 0.0034 | 0.0034 | 0.0000 |
| 86  | 0.0035 | 0.0034 | 0.0000 |
| 87  | 0.0035 | 0.0034 | 0.0000 |
| 88  | 0.0035 | 0.0035 | 0.0000 |
| 89  | 0.0035 | 0.0035 | 0.0000 |
| 90  | 0.0035 | 0.0035 | 0.0000 |
| 91  | 0.0036 | 0.0035 | 0.0000 |
| 92  | 0.0036 | 0.0035 | 0.0000 |
| 93  | 0.0036 | 0.0036 | 0.0000 |
| 94  | 0.0036 | 0.0036 | 0.0000 |
| 95  | 0.0037 | 0.0036 | 0.0001 |
| 96  | 0.0037 | 0.0036 | 0.0001 |
| 97  | 0.0037 | 0.0037 | 0.0001 |
| 98  | 0.0037 | 0.0037 | 0.0001 |
| 99  | 0.0038 | 0.0037 | 0.0001 |
| 100 | 0.0038 | 0.0037 | 0.0001 |
| 101 | 0.0038 | 0.0037 | 0.0001 |
| 102 | 0.0038 | 0.0038 | 0.0001 |
| 103 | 0.0039 | 0.0038 | 0.0001 |
| 104 | 0.0039 | 0.0038 | 0.0001 |
| 105 | 0.0039 | 0.0039 | 0.0001 |
| 106 | 0.0039 | 0.0039 | 0.0001 |
| 107 | 0.0040 | 0.0039 | 0.0001 |
| 108 | 0.0040 | 0.0039 | 0.0001 |
| 109 | 0.0040 | 0.0040 | 0.0001 |
| 110 | 0.0040 | 0.0040 | 0.0001 |
| 111 | 0.0041 | 0.0040 | 0.0001 |
| 112 | 0.0041 | 0.0040 | 0.0001 |
| 113 | 0.0041 | 0.0041 | 0.0001 |
| 114 | 0.0042 | 0.0041 | 0.0001 |
| 115 | 0.0042 | 0.0041 | 0.0001 |
| 116 | 0.0042 | 0.0042 | 0.0001 |
| 117 | 0.0043 | 0.0042 | 0.0001 |
| 118 | 0.0043 | 0.0042 | 0.0001 |
| 119 | 0.0043 | 0.0043 | 0.0001 |
| 120 | 0.0044 | 0.0043 | 0.0001 |
| 121 | 0.0044 | 0.0044 | 0.0001 |
| 122 | 0.0044 | 0.0044 | 0.0001 |
| 123 | 0.0045 | 0.0044 | 0.0001 |
| 124 | 0.0045 | 0.0045 | 0.0001 |

|     |        |        |        |
|-----|--------|--------|--------|
| 125 | 0.0046 | 0.0045 | 0.0001 |
| 126 | 0.0046 | 0.0045 | 0.0001 |
| 127 | 0.0047 | 0.0046 | 0.0001 |
| 128 | 0.0047 | 0.0046 | 0.0001 |
| 129 | 0.0047 | 0.0047 | 0.0001 |
| 130 | 0.0048 | 0.0047 | 0.0001 |
| 131 | 0.0048 | 0.0048 | 0.0001 |
| 132 | 0.0049 | 0.0048 | 0.0001 |
| 133 | 0.0049 | 0.0049 | 0.0001 |
| 134 | 0.0050 | 0.0049 | 0.0001 |
| 135 | 0.0050 | 0.0050 | 0.0001 |
| 136 | 0.0051 | 0.0050 | 0.0001 |
| 137 | 0.0052 | 0.0051 | 0.0001 |
| 138 | 0.0052 | 0.0051 | 0.0001 |
| 139 | 0.0053 | 0.0052 | 0.0001 |
| 140 | 0.0053 | 0.0052 | 0.0001 |
| 141 | 0.0054 | 0.0053 | 0.0001 |
| 142 | 0.0054 | 0.0054 | 0.0001 |
| 143 | 0.0055 | 0.0055 | 0.0001 |
| 144 | 0.0056 | 0.0055 | 0.0001 |
| 145 | 0.0067 | 0.0066 | 0.0001 |
| 146 | 0.0067 | 0.0066 | 0.0001 |
| 147 | 0.0068 | 0.0068 | 0.0001 |
| 148 | 0.0069 | 0.0068 | 0.0001 |
| 149 | 0.0070 | 0.0069 | 0.0001 |
| 150 | 0.0071 | 0.0070 | 0.0001 |
| 151 | 0.0072 | 0.0071 | 0.0001 |
| 152 | 0.0073 | 0.0072 | 0.0001 |
| 153 | 0.0074 | 0.0073 | 0.0001 |
| 154 | 0.0075 | 0.0074 | 0.0001 |
| 155 | 0.0076 | 0.0075 | 0.0001 |
| 156 | 0.0077 | 0.0076 | 0.0001 |
| 157 | 0.0078 | 0.0077 | 0.0001 |
| 158 | 0.0079 | 0.0078 | 0.0001 |
| 159 | 0.0081 | 0.0080 | 0.0001 |
| 160 | 0.0082 | 0.0080 | 0.0001 |
| 161 | 0.0083 | 0.0082 | 0.0001 |
| 162 | 0.0084 | 0.0083 | 0.0001 |
| 163 | 0.0086 | 0.0085 | 0.0001 |
| 164 | 0.0087 | 0.0086 | 0.0001 |
| 165 | 0.0090 | 0.0088 | 0.0001 |
| 166 | 0.0091 | 0.0090 | 0.0001 |
| 167 | 0.0093 | 0.0092 | 0.0001 |
| 168 | 0.0095 | 0.0093 | 0.0001 |
| 169 | 0.0098 | 0.0096 | 0.0001 |
| 170 | 0.0099 | 0.0098 | 0.0001 |
| 171 | 0.0103 | 0.0101 | 0.0001 |
| 172 | 0.0104 | 0.0103 | 0.0001 |
| 173 | 0.0108 | 0.0107 | 0.0001 |
| 174 | 0.0110 | 0.0109 | 0.0002 |
| 175 | 0.0114 | 0.0113 | 0.0002 |
| 176 | 0.0117 | 0.0115 | 0.0002 |
| 177 | 0.0122 | 0.0120 | 0.0002 |
| 178 | 0.0125 | 0.0123 | 0.0002 |
| 179 | 0.0131 | 0.0130 | 0.0002 |
| 180 | 0.0135 | 0.0133 | 0.0002 |
| 181 | 0.0143 | 0.0141 | 0.0002 |
| 182 | 0.0148 | 0.0146 | 0.0002 |
| 183 | 0.0158 | 0.0156 | 0.0002 |
| 184 | 0.0165 | 0.0162 | 0.0002 |
| 185 | 0.0118 | 0.0116 | 0.0002 |
| 186 | 0.0125 | 0.0124 | 0.0002 |
| 187 | 0.0145 | 0.0143 | 0.0002 |
| 188 | 0.0159 | 0.0157 | 0.0002 |
| 189 | 0.0198 | 0.0195 | 0.0003 |
| 190 | 0.0227 | 0.0224 | 0.0003 |
| 191 | 0.0345 | 0.0340 | 0.0005 |
| 192 | 0.0501 | 0.0494 | 0.0007 |
| 193 | 0.2168 | 0.0573 | 0.1594 |
| 194 | 0.0272 | 0.0268 | 0.0004 |
| 195 | 0.0176 | 0.0173 | 0.0002 |
| 196 | 0.0135 | 0.0133 | 0.0002 |
| 197 | 0.0172 | 0.0169 | 0.0002 |
| 198 | 0.0153 | 0.0151 | 0.0002 |
| 199 | 0.0139 | 0.0137 | 0.0002 |
| 200 | 0.0128 | 0.0126 | 0.0002 |
| 201 | 0.0119 | 0.0118 | 0.0002 |
| 202 | 0.0112 | 0.0111 | 0.0002 |
| 203 | 0.0106 | 0.0105 | 0.0001 |
| 204 | 0.0101 | 0.0099 | 0.0001 |
| 205 | 0.0096 | 0.0095 | 0.0001 |

|     |        |        |        |
|-----|--------|--------|--------|
| 206 | 0.0092 | 0.0091 | 0.0001 |
| 207 | 0.0089 | 0.0087 | 0.0001 |
| 208 | 0.0085 | 0.0084 | 0.0001 |
| 209 | 0.0082 | 0.0081 | 0.0001 |
| 210 | 0.0080 | 0.0079 | 0.0001 |
| 211 | 0.0077 | 0.0076 | 0.0001 |
| 212 | 0.0075 | 0.0074 | 0.0001 |
| 213 | 0.0073 | 0.0072 | 0.0001 |
| 214 | 0.0071 | 0.0070 | 0.0001 |
| 215 | 0.0070 | 0.0069 | 0.0001 |
| 216 | 0.0068 | 0.0067 | 0.0001 |
| 217 | 0.0056 | 0.0055 | 0.0001 |
| 218 | 0.0055 | 0.0054 | 0.0001 |
| 219 | 0.0054 | 0.0053 | 0.0001 |
| 220 | 0.0052 | 0.0052 | 0.0001 |
| 221 | 0.0051 | 0.0050 | 0.0001 |
| 222 | 0.0050 | 0.0049 | 0.0001 |
| 223 | 0.0049 | 0.0048 | 0.0001 |
| 224 | 0.0048 | 0.0047 | 0.0001 |
| 225 | 0.0047 | 0.0047 | 0.0001 |
| 226 | 0.0046 | 0.0046 | 0.0001 |
| 227 | 0.0045 | 0.0045 | 0.0001 |
| 228 | 0.0045 | 0.0044 | 0.0001 |
| 229 | 0.0044 | 0.0043 | 0.0001 |
| 230 | 0.0043 | 0.0043 | 0.0001 |
| 231 | 0.0043 | 0.0042 | 0.0001 |
| 232 | 0.0042 | 0.0041 | 0.0001 |
| 233 | 0.0041 | 0.0041 | 0.0001 |
| 234 | 0.0041 | 0.0040 | 0.0001 |
| 235 | 0.0040 | 0.0039 | 0.0001 |
| 236 | 0.0039 | 0.0039 | 0.0001 |
| 237 | 0.0039 | 0.0038 | 0.0001 |
| 238 | 0.0038 | 0.0038 | 0.0001 |
| 239 | 0.0038 | 0.0037 | 0.0001 |
| 240 | 0.0037 | 0.0037 | 0.0001 |
| 241 | 0.0037 | 0.0036 | 0.0001 |
| 242 | 0.0036 | 0.0036 | 0.0001 |
| 243 | 0.0036 | 0.0035 | 0.0000 |
| 244 | 0.0036 | 0.0035 | 0.0000 |
| 245 | 0.0035 | 0.0035 | 0.0000 |
| 246 | 0.0035 | 0.0034 | 0.0000 |
| 247 | 0.0034 | 0.0034 | 0.0000 |
| 248 | 0.0034 | 0.0033 | 0.0000 |
| 249 | 0.0034 | 0.0033 | 0.0000 |
| 250 | 0.0033 | 0.0033 | 0.0000 |
| 251 | 0.0033 | 0.0032 | 0.0000 |
| 252 | 0.0033 | 0.0032 | 0.0000 |
| 253 | 0.0032 | 0.0032 | 0.0000 |
| 254 | 0.0032 | 0.0031 | 0.0000 |
| 255 | 0.0032 | 0.0031 | 0.0000 |
| 256 | 0.0031 | 0.0031 | 0.0000 |
| 257 | 0.0031 | 0.0031 | 0.0000 |
| 258 | 0.0031 | 0.0030 | 0.0000 |
| 259 | 0.0030 | 0.0030 | 0.0000 |
| 260 | 0.0030 | 0.0030 | 0.0000 |
| 261 | 0.0030 | 0.0029 | 0.0000 |
| 262 | 0.0030 | 0.0029 | 0.0000 |
| 263 | 0.0029 | 0.0029 | 0.0000 |
| 264 | 0.0029 | 0.0029 | 0.0000 |
| 265 | 0.0029 | 0.0028 | 0.0000 |
| 266 | 0.0029 | 0.0028 | 0.0000 |
| 267 | 0.0028 | 0.0028 | 0.0000 |
| 268 | 0.0028 | 0.0028 | 0.0000 |
| 269 | 0.0028 | 0.0027 | 0.0000 |
| 270 | 0.0028 | 0.0027 | 0.0000 |
| 271 | 0.0027 | 0.0027 | 0.0000 |
| 272 | 0.0027 | 0.0027 | 0.0000 |
| 273 | 0.0027 | 0.0027 | 0.0000 |
| 274 | 0.0027 | 0.0026 | 0.0000 |
| 275 | 0.0027 | 0.0026 | 0.0000 |
| 276 | 0.0026 | 0.0026 | 0.0000 |
| 277 | 0.0026 | 0.0026 | 0.0000 |
| 278 | 0.0026 | 0.0026 | 0.0000 |
| 279 | 0.0026 | 0.0026 | 0.0000 |
| 280 | 0.0026 | 0.0025 | 0.0000 |
| 281 | 0.0026 | 0.0025 | 0.0000 |
| 282 | 0.0025 | 0.0025 | 0.0000 |
| 283 | 0.0025 | 0.0025 | 0.0000 |
| 284 | 0.0025 | 0.0025 | 0.0000 |
| 285 | 0.0025 | 0.0024 | 0.0000 |
| 286 | 0.0025 | 0.0024 | 0.0000 |

|     |        |        |        |
|-----|--------|--------|--------|
| 287 | 0.0024 | 0.0024 | 0.0000 |
| 288 | 0.0024 | 0.0024 | 0.0000 |

Total soil rain loss = 1.61(In)  
 Total effective rainfall = 0.18(In)  
 Peak flow rate in flood hydrograph = (CFS)

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 24 - H O U R S T O R M  
 R u n o f f H y d r o g r a p h  
 -----  
 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|-----------|--------|-------|--------|---|-----|-----|-----|------|
| 0+ 5      | 0.0000 |       | 0.00 Q |   |     |     |     |      |
| 0+10      | 0.0000 |       | 0.00 Q |   |     |     |     |      |
| 0+15      | 0.0000 |       | 0.00 Q |   |     |     |     |      |
| 0+20      | 0.0000 |       | 0.00 Q |   |     |     |     |      |
| 0+25      | 0.0001 |       | 0.00 Q |   |     |     |     |      |
| 0+30      | 0.0001 |       | 0.00 Q |   |     |     |     |      |
| 0+35      | 0.0001 |       | 0.00 Q |   |     |     |     |      |
| 0+40      | 0.0002 |       | 0.01 Q |   |     |     |     |      |
| 0+45      | 0.0002 |       | 0.01 Q |   |     |     |     |      |
| 0+50      | 0.0002 |       | 0.01 Q |   |     |     |     |      |
| 0+55      | 0.0003 |       | 0.01 Q |   |     |     |     |      |
| 1+ 0      | 0.0003 |       | 0.01 Q |   |     |     |     |      |
| 1+ 5      | 0.0004 |       | 0.01 Q |   |     |     |     |      |
| 1+10      | 0.0004 |       | 0.01 Q |   |     |     |     |      |
| 1+15      | 0.0005 |       | 0.01 Q |   |     |     |     |      |
| 1+20      | 0.0005 |       | 0.01 Q |   |     |     |     |      |
| 1+25      | 0.0006 |       | 0.01 Q |   |     |     |     |      |
| 1+30      | 0.0006 |       | 0.01 Q |   |     |     |     |      |
| 1+35      | 0.0006 |       | 0.01 Q |   |     |     |     |      |
| 1+40      | 0.0007 |       | 0.01 Q |   |     |     |     |      |
| 1+45      | 0.0007 |       | 0.01 Q |   |     |     |     |      |
| 1+50      | 0.0008 |       | 0.01 Q |   |     |     |     |      |
| 1+55      | 0.0008 |       | 0.01 Q |   |     |     |     |      |
| 2+ 0      | 0.0009 |       | 0.01 Q |   |     |     |     |      |
| 2+ 5      | 0.0009 |       | 0.01 Q |   |     |     |     |      |
| 2+10      | 0.0010 |       | 0.01 Q |   |     |     |     |      |
| 2+15      | 0.0011 |       | 0.01 Q |   |     |     |     |      |
| 2+20      | 0.0011 |       | 0.01 Q |   |     |     |     |      |
| 2+25      | 0.0012 |       | 0.01 Q |   |     |     |     |      |
| 2+30      | 0.0012 |       | 0.01 Q |   |     |     |     |      |
| 2+35      | 0.0013 |       | 0.01 Q |   |     |     |     |      |
| 2+40      | 0.0013 |       | 0.01 Q |   |     |     |     |      |
| 2+45      | 0.0014 |       | 0.01 Q |   |     |     |     |      |
| 2+50      | 0.0014 |       | 0.01 Q |   |     |     |     |      |
| 2+55      | 0.0015 |       | 0.01 Q |   |     |     |     |      |
| 3+ 0      | 0.0015 |       | 0.01 Q |   |     |     |     |      |
| 3+ 5      | 0.0016 |       | 0.01 Q |   |     |     |     |      |
| 3+10      | 0.0016 |       | 0.01 Q |   |     |     |     |      |
| 3+15      | 0.0017 |       | 0.01 Q |   |     |     |     |      |
| 3+20      | 0.0017 |       | 0.01 Q |   |     |     |     |      |
| 3+25      | 0.0018 |       | 0.01 Q |   |     |     |     |      |
| 3+30      | 0.0019 |       | 0.01 Q |   |     |     |     |      |
| 3+35      | 0.0019 |       | 0.01 Q |   |     |     |     |      |
| 3+40      | 0.0020 |       | 0.01 Q |   |     |     |     |      |
| 3+45      | 0.0020 |       | 0.01 Q |   |     |     |     |      |
| 3+50      | 0.0021 |       | 0.01 Q |   |     |     |     |      |
| 3+55      | 0.0021 |       | 0.01 Q |   |     |     |     |      |
| 4+ 0      | 0.0022 |       | 0.01 Q |   |     |     |     |      |
| 4+ 5      | 0.0023 |       | 0.01 Q |   |     |     |     |      |
| 4+10      | 0.0023 |       | 0.01 Q |   |     |     |     |      |
| 4+15      | 0.0024 |       | 0.01 Q |   |     |     |     |      |
| 4+20      | 0.0024 |       | 0.01 Q |   |     |     |     |      |
| 4+25      | 0.0025 |       | 0.01 Q |   |     |     |     |      |
| 4+30      | 0.0025 |       | 0.01 Q |   |     |     |     |      |
| 4+35      | 0.0026 |       | 0.01 Q |   |     |     |     |      |
| 4+40      | 0.0027 |       | 0.01 Q |   |     |     |     |      |
| 4+45      | 0.0027 |       | 0.01 Q |   |     |     |     |      |
| 4+50      | 0.0028 |       | 0.01 Q |   |     |     |     |      |
| 4+55      | 0.0028 |       | 0.01 Q |   |     |     |     |      |
| 5+ 0      | 0.0029 |       | 0.01 Q |   |     |     |     |      |
| 5+ 5      | 0.0030 |       | 0.01 Q |   |     |     |     |      |
| 5+10      | 0.0030 |       | 0.01 Q |   |     |     |     |      |
| 5+15      | 0.0031 |       | 0.01 Q |   |     |     |     |      |
| 5+20      | 0.0031 |       | 0.01 Q |   |     |     |     |      |

|       |        |      |    |
|-------|--------|------|----|
| 5+25  | 0.0032 | 0.01 | Q  |
| 5+30  | 0.0033 | 0.01 | Q  |
| 5+35  | 0.0033 | 0.01 | Q  |
| 5+40  | 0.0034 | 0.01 | Q  |
| 5+45  | 0.0034 | 0.01 | Q  |
| 5+50  | 0.0035 | 0.01 | Q  |
| 5+55  | 0.0036 | 0.01 | Q  |
| 6+ 0  | 0.0036 | 0.01 | Q  |
| 6+ 5  | 0.0037 | 0.01 | Q  |
| 6+10  | 0.0038 | 0.01 | Q  |
| 6+15  | 0.0038 | 0.01 | Q  |
| 6+20  | 0.0039 | 0.01 | Q  |
| 6+25  | 0.0040 | 0.01 | Q  |
| 6+30  | 0.0040 | 0.01 | Q  |
| 6+35  | 0.0041 | 0.01 | Q  |
| 6+40  | 0.0042 | 0.01 | Q  |
| 6+45  | 0.0042 | 0.01 | Q  |
| 6+50  | 0.0043 | 0.01 | Q  |
| 6+55  | 0.0043 | 0.01 | Q  |
| 7+ 0  | 0.0044 | 0.01 | Q  |
| 7+ 5  | 0.0045 | 0.01 | Q  |
| 7+10  | 0.0046 | 0.01 | Q  |
| 7+15  | 0.0046 | 0.01 | Q  |
| 7+20  | 0.0047 | 0.01 | Q  |
| 7+25  | 0.0048 | 0.01 | Q  |
| 7+30  | 0.0048 | 0.01 | Q  |
| 7+35  | 0.0049 | 0.01 | Q  |
| 7+40  | 0.0050 | 0.01 | Q  |
| 7+45  | 0.0050 | 0.01 | Q  |
| 7+50  | 0.0051 | 0.01 | Q  |
| 7+55  | 0.0052 | 0.01 | Q  |
| 8+ 0  | 0.0053 | 0.01 | Q  |
| 8+ 5  | 0.0053 | 0.01 | Q  |
| 8+10  | 0.0054 | 0.01 | Q  |
| 8+15  | 0.0055 | 0.01 | Q  |
| 8+20  | 0.0055 | 0.01 | Q  |
| 8+25  | 0.0056 | 0.01 | Q  |
| 8+30  | 0.0057 | 0.01 | Q  |
| 8+35  | 0.0058 | 0.01 | Q  |
| 8+40  | 0.0058 | 0.01 | Q  |
| 8+45  | 0.0059 | 0.01 | Q  |
| 8+50  | 0.0060 | 0.01 | Q  |
| 8+55  | 0.0061 | 0.01 | Q  |
| 9+ 0  | 0.0061 | 0.01 | Q  |
| 9+ 5  | 0.0062 | 0.01 | Q  |
| 9+10  | 0.0063 | 0.01 | Q  |
| 9+15  | 0.0064 | 0.01 | Q  |
| 9+20  | 0.0065 | 0.01 | Q  |
| 9+25  | 0.0065 | 0.01 | Q  |
| 9+30  | 0.0066 | 0.01 | Q  |
| 9+35  | 0.0067 | 0.01 | QV |
| 9+40  | 0.0068 | 0.01 | QV |
| 9+45  | 0.0069 | 0.01 | QV |
| 9+50  | 0.0070 | 0.01 | QV |
| 9+55  | 0.0070 | 0.01 | QV |
| 10+ 0 | 0.0071 | 0.01 | QV |
| 10+ 5 | 0.0072 | 0.01 | QV |
| 10+10 | 0.0073 | 0.01 | QV |
| 10+15 | 0.0074 | 0.01 | QV |
| 10+20 | 0.0075 | 0.01 | QV |
| 10+25 | 0.0076 | 0.01 | QV |
| 10+30 | 0.0076 | 0.01 | QV |
| 10+35 | 0.0077 | 0.01 | QV |
| 10+40 | 0.0078 | 0.01 | QV |
| 10+45 | 0.0079 | 0.01 | QV |
| 10+50 | 0.0080 | 0.01 | QV |
| 10+55 | 0.0081 | 0.01 | QV |
| 11+ 0 | 0.0082 | 0.01 | QV |
| 11+ 5 | 0.0083 | 0.01 | QV |
| 11+10 | 0.0084 | 0.01 | QV |
| 11+15 | 0.0085 | 0.01 | QV |
| 11+20 | 0.0086 | 0.01 | QV |
| 11+25 | 0.0087 | 0.01 | QV |
| 11+30 | 0.0088 | 0.01 | QV |
| 11+35 | 0.0089 | 0.01 | QV |
| 11+40 | 0.0090 | 0.01 | QV |
| 11+45 | 0.0091 | 0.01 | QV |
| 11+50 | 0.0092 | 0.01 | QV |
| 11+55 | 0.0093 | 0.02 | QV |
| 12+ 0 | 0.0094 | 0.02 | QV |
| 12+ 5 | 0.0095 | 0.02 | QV |

|       |        |      |       |   |   |   |  |
|-------|--------|------|-------|---|---|---|--|
| 12+10 | 0.0096 | 0.02 | QV    |   |   |   |  |
| 12+15 | 0.0097 | 0.02 | QV    |   |   |   |  |
| 12+20 | 0.0098 | 0.02 | QV    |   |   |   |  |
| 12+25 | 0.0100 | 0.02 | QV    |   |   |   |  |
| 12+30 | 0.0101 | 0.02 | QV    |   |   |   |  |
| 12+35 | 0.0102 | 0.02 | QV    |   |   |   |  |
| 12+40 | 0.0103 | 0.02 | QV    |   |   |   |  |
| 12+45 | 0.0105 | 0.02 | QV    |   |   |   |  |
| 12+50 | 0.0106 | 0.02 | QV    |   |   |   |  |
| 12+55 | 0.0107 | 0.02 | QV    |   |   |   |  |
| 13+ 0 | 0.0109 | 0.02 | QV    |   |   |   |  |
| 13+ 5 | 0.0110 | 0.02 | QV    |   |   |   |  |
| 13+10 | 0.0112 | 0.02 | QV    |   |   |   |  |
| 13+15 | 0.0113 | 0.02 | QV    |   |   |   |  |
| 13+20 | 0.0115 | 0.02 | QV    |   |   |   |  |
| 13+25 | 0.0116 | 0.02 | QV    |   |   |   |  |
| 13+30 | 0.0118 | 0.02 | QV    |   |   |   |  |
| 13+35 | 0.0119 | 0.02 | QV    |   |   |   |  |
| 13+40 | 0.0121 | 0.02 | QV    |   |   |   |  |
| 13+45 | 0.0123 | 0.02 | QV    |   |   |   |  |
| 13+50 | 0.0124 | 0.02 | QV    |   |   |   |  |
| 13+55 | 0.0126 | 0.02 | QV    |   |   |   |  |
| 14+ 0 | 0.0128 | 0.02 | QV    |   |   |   |  |
| 14+ 5 | 0.0129 | 0.03 | QV    |   |   |   |  |
| 14+10 | 0.0131 | 0.03 | QV    |   |   |   |  |
| 14+15 | 0.0133 | 0.03 | QV    |   |   |   |  |
| 14+20 | 0.0135 | 0.03 | Q V   |   |   |   |  |
| 14+25 | 0.0137 | 0.03 | Q V   |   |   |   |  |
| 14+30 | 0.0139 | 0.03 | Q V   |   |   |   |  |
| 14+35 | 0.0141 | 0.03 | Q V   |   |   |   |  |
| 14+40 | 0.0143 | 0.03 | Q V   |   |   |   |  |
| 14+45 | 0.0145 | 0.03 | Q V   |   |   |   |  |
| 14+50 | 0.0147 | 0.03 | Q V   |   |   |   |  |
| 14+55 | 0.0149 | 0.03 | Q V   |   |   |   |  |
| 15+ 0 | 0.0151 | 0.03 | Q V   |   |   |   |  |
| 15+ 5 | 0.0154 | 0.03 | Q V   |   |   |   |  |
| 15+10 | 0.0156 | 0.04 | Q V   |   |   |   |  |
| 15+15 | 0.0159 | 0.04 | Q V   |   |   |   |  |
| 15+20 | 0.0161 | 0.04 | Q V   |   |   |   |  |
| 15+25 | 0.0164 | 0.04 | Q V   |   |   |   |  |
| 15+30 | 0.0167 | 0.04 | Q V   |   |   |   |  |
| 15+35 | 0.0170 | 0.04 | Q V   |   |   |   |  |
| 15+40 | 0.0172 | 0.04 | Q V   |   |   |   |  |
| 15+45 | 0.0175 | 0.04 | Q V   |   |   |   |  |
| 15+50 | 0.0178 | 0.04 | Q V   |   |   |   |  |
| 15+55 | 0.0181 | 0.04 | Q V   |   |   |   |  |
| 16+ 0 | 0.0185 | 0.05 | Q V   |   |   |   |  |
| 16+ 5 | 0.0218 | 0.48 | Q V   |   |   |   |  |
| 16+10 | 0.0332 | 1.66 | V Q V |   |   |   |  |
| 16+15 | 0.0588 | 3.72 | Q V   |   |   |   |  |
| 16+20 | 0.1074 |      |       | Q |   | Q |  |
| 16+25 | 0.1445 | 5.38 |       |   | Q |   |  |
| 16+30 | 0.1677 | 3.37 |       | Q |   | V |  |
| 16+35 | 0.1836 | 2.30 |       |   | V |   |  |
| 16+40 | 0.1958 | 1.78 |       |   | V |   |  |
| 16+45 | 0.2055 | 1.41 |       |   | V |   |  |
| 16+50 | 0.2133 | 1.13 |       |   | V |   |  |
| 16+55 | 0.2197 | 0.94 |       |   | V |   |  |
| 17+ 0 | 0.2254 | 0.83 |       |   | V |   |  |
| 17+ 5 | 0.2303 | 0.71 |       |   | V |   |  |
| 17+10 | 0.2342 | 0.57 |       |   | V |   |  |
| 17+15 | 0.2376 | 0.50 |       |   | V |   |  |
| 17+20 | 0.2407 | 0.45 |       |   | V |   |  |
| 17+25 | 0.2435 | 0.40 |       |   | V |   |  |
| 17+30 | 0.2459 | 0.35 |       |   | V |   |  |
| 17+35 | 0.2479 | 0.30 |       |   | V |   |  |
| 17+40 | 0.2499 | 0.28 |       |   | V |   |  |
| 17+45 | 0.2515 | 0.24 |       |   | V |   |  |
| 17+50 | 0.2530 | 0.22 |       |   | V |   |  |
| 17+55 | 0.2542 | 0.17 |       |   | V |   |  |
| 18+ 0 | 0.2553 | 0.16 |       |   | V |   |  |
| 18+ 5 | 0.2561 | 0.11 |       |   | V |   |  |
| 18+10 | 0.2568 | 0.11 |       |   | V |   |  |
| 18+15 | 0.2576 | 0.12 |       |   | V |   |  |
| 18+20 | 0.2584 | 0.12 |       |   | V |   |  |
| 18+25 | 0.2592 | 0.12 |       |   | V |   |  |
| 18+30 | 0.2600 | 0.11 |       |   | V |   |  |
| 18+35 | 0.2606 | 0.08 |       |   | V |   |  |
| 18+40 | 0.2610 | 0.07 |       |   | V |   |  |
| 18+45 | 0.2615 | 0.07 |       |   | V |   |  |
| 18+50 | 0.2619 | 0.05 |       |   | V |   |  |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 18+55 | 0.2620 | 0.02 | Q |  |  |  | V |
| 19+ 0 | 0.2621 | 0.02 | Q |  |  |  | V |
| 19+ 5 | 0.2622 | 0.02 | Q |  |  |  | V |
| 19+10 | 0.2623 | 0.01 | Q |  |  |  | V |
| 19+15 | 0.2624 | 0.01 | Q |  |  |  | V |
| 19+20 | 0.2625 | 0.01 | Q |  |  |  | V |
| 19+25 | 0.2626 | 0.01 | Q |  |  |  | V |
| 19+30 | 0.2627 | 0.01 | Q |  |  |  | V |
| 19+35 | 0.2628 | 0.01 | Q |  |  |  | V |
| 19+40 | 0.2629 | 0.01 | Q |  |  |  | V |
| 19+45 | 0.2630 | 0.01 | Q |  |  |  | V |
| 19+50 | 0.2631 | 0.01 | Q |  |  |  | V |
| 19+55 | 0.2631 | 0.01 | Q |  |  |  | V |
| 20+ 0 | 0.2632 | 0.01 | Q |  |  |  | V |
| 20+ 5 | 0.2633 | 0.01 | Q |  |  |  | V |
| 20+10 | 0.2634 | 0.01 | Q |  |  |  | V |
| 20+15 | 0.2635 | 0.01 | Q |  |  |  | V |
| 20+20 | 0.2636 | 0.01 | Q |  |  |  | V |
| 20+25 | 0.2636 | 0.01 | Q |  |  |  | V |
| 20+30 | 0.2637 | 0.01 | Q |  |  |  | V |
| 20+35 | 0.2638 | 0.01 | Q |  |  |  | V |
| 20+40 | 0.2639 | 0.01 | Q |  |  |  | V |
| 20+45 | 0.2639 | 0.01 | Q |  |  |  | V |
| 20+50 | 0.2640 | 0.01 | Q |  |  |  | V |
| 20+55 | 0.2641 | 0.01 | Q |  |  |  | V |
| 21+ 0 | 0.2641 | 0.01 | Q |  |  |  | V |
| 21+ 5 | 0.2642 | 0.01 | Q |  |  |  | V |
| 21+10 | 0.2643 | 0.01 | Q |  |  |  | V |
| 21+15 | 0.2644 | 0.01 | Q |  |  |  | V |
| 21+20 | 0.2644 | 0.01 | Q |  |  |  | V |
| 21+25 | 0.2645 | 0.01 | Q |  |  |  | V |
| 21+30 | 0.2646 | 0.01 | Q |  |  |  | V |
| 21+35 | 0.2646 | 0.01 | Q |  |  |  | V |
| 21+40 | 0.2647 | 0.01 | Q |  |  |  | V |
| 21+45 | 0.2648 | 0.01 | Q |  |  |  | V |
| 21+50 | 0.2648 | 0.01 | Q |  |  |  | V |
| 21+55 | 0.2649 | 0.01 | Q |  |  |  | V |
| 22+ 0 | 0.2649 | 0.01 | Q |  |  |  | V |
| 22+ 5 | 0.2650 | 0.01 | Q |  |  |  | V |
| 22+10 | 0.2651 | 0.01 | Q |  |  |  | V |
| 22+15 | 0.2651 | 0.01 | Q |  |  |  | V |
| 22+20 | 0.2652 | 0.01 | Q |  |  |  | V |
| 22+25 | 0.2652 | 0.01 | Q |  |  |  | V |
| 22+30 | 0.2653 | 0.01 | Q |  |  |  | V |
| 22+35 | 0.2654 | 0.01 | Q |  |  |  | V |
| 22+40 | 0.2654 | 0.01 | Q |  |  |  | V |
| 22+45 | 0.2655 | 0.01 | Q |  |  |  | V |
| 22+50 | 0.2655 | 0.01 | Q |  |  |  | V |
| 22+55 | 0.2656 | 0.01 | Q |  |  |  | V |
| 23+ 0 | 0.2657 | 0.01 | Q |  |  |  | V |
| 23+ 5 | 0.2657 | 0.01 | Q |  |  |  | V |
| 23+10 | 0.2658 | 0.01 | Q |  |  |  | V |
| 23+15 | 0.2658 | 0.01 | Q |  |  |  | V |
| 23+20 | 0.2659 | 0.01 | Q |  |  |  | V |
| 23+25 | 0.2659 | 0.01 | Q |  |  |  | V |
| 23+30 | 0.2660 | 0.01 | Q |  |  |  | V |
| 23+35 | 0.2660 | 0.01 | Q |  |  |  | V |
| 23+40 | 0.2661 | 0.01 | Q |  |  |  | V |
| 23+45 | 0.2661 | 0.01 | Q |  |  |  | V |
| 23+50 | 0.2662 | 0.01 | Q |  |  |  | V |
| 23+55 | 0.2662 | 0.01 | Q |  |  |  | V |
| 24+ 0 | 0.2663 | 0.01 | Q |  |  |  | V |
| 24+ 5 | 0.2663 | 0.01 | Q |  |  |  | V |
| 24+10 | 0.2664 | 0.01 | Q |  |  |  | V |
| 24+15 | 0.2664 | 0.01 | Q |  |  |  | V |
| 24+20 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+25 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+30 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+35 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+40 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+45 | 0.2665 | 0.00 | Q |  |  |  | V |
| 24+50 | 0.2666 | 0.00 | Q |  |  |  | V |
| 24+55 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+ 0 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+ 5 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+10 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+15 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+20 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+25 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+30 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+35 | 0.2666 | 0.00 | Q |  |  |  | V |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 25+40 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+45 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+50 | 0.2666 | 0.00 | Q |  |  |  | V |
| 25+55 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+ 0 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+ 5 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+10 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+15 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+20 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+25 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+30 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+35 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+40 | 0.2666 | 0.00 | Q |  |  |  | V |
| 26+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
10-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 1.000        | 0.420         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.420

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 17.68         | 1.000         | 77.0             | 77.0             | 2.99 | 0.248                |

Area-averaged catchment yield fraction, Y = 0.248

Area-averaged low loss fraction, Yb = 0.752

User entry of time of concentration = 0.444 (hours)

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watershed area = 17.68(Ac.)  
Catchment Lag time = 0.355 hours

Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 23.4610  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.420(In/Hr)  
 Average low loss rate fraction (Yb) = 0.752 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.284(In)  
 Computed peak 30-minute rainfall = 0.487(In)  
 Specified peak 1-hour rainfall = 0.599(In)  
 Computed peak 3-hour rainfall = 0.946(In)  
 Specified peak 6-hour rainfall = 1.262(In)  
 Specified peak 24-hour rainfall = 2.160(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(AC.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.284(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.486(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.599(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 0.946(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.262(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 2.160(In) |

| Unit Hydrograph |                    |                 |
|-----------------|--------------------|-----------------|
| Interval        | 'S' Graph          | Unit Hydrograph |
| Number          | Mean values        | ((CFS))         |
| -----           |                    |                 |
|                 | (K = 213.82 (CFS)) |                 |
| 1               | 1.237              | 2.645           |
| 2               | 5.898              | 9.966           |
| 3               | 16.607             | 22.899          |
| 4               | 37.127             | 43.875          |
| 5               | 52.735             | 33.371          |
| 6               | 62.457             | 20.788          |
| 7               | 69.053             | 14.103          |
| 8               | 74.109             | 10.811          |
| 9               | 78.107             | 8.548           |
| 10              | 81.273             | 6.769           |
| 11              | 83.888             | 5.592           |
| 12              | 86.186             | 4.914           |
| 13              | 88.150             | 4.199           |
| 14              | 89.702             | 3.319           |
| 15              | 91.050             | 2.881           |
| 16              | 92.255             | 2.577           |
| 17              | 93.333             | 2.304           |
| 18              | 94.259             | 1.981           |
| 19              | 95.057             | 1.706           |
| 20              | 95.792             | 1.571           |
| 21              | 96.405             | 1.311           |
| 22              | 96.970             | 1.209           |
| 23              | 97.402             | 0.922           |
| 24              | 97.795             | 0.841           |
| 25              | 98.048             | 0.541           |
| 26              | 98.287             | 0.511           |
| 27              | 98.561             | 0.585           |
| 28              | 98.842             | 0.602           |
| 29              | 99.124             | 0.602           |
| 30              | 99.403             | 0.598           |
| 31              | 99.597             | 0.415           |
| 32              | 99.744             | 0.314           |
| 33              | 99.891             | 0.314           |
| 34              | 100.000            | 0.234           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.2840                 | 0.2840        |
| 2         | 0.3496                 | 0.0656        |
| 3         | 0.3949                 | 0.0452        |
| 4         | 0.4305                 | 0.0356        |
| 5         | 0.4603                 | 0.0298        |
| 6         | 0.4861                 | 0.0259        |
| 7         | 0.5091                 | 0.0230        |
| 8         | 0.5300                 | 0.0208        |
| 9         | 0.5490                 | 0.0191        |
| 10        | 0.5666                 | 0.0176        |
| 11        | 0.5831                 | 0.0164        |
| 12        | 0.5985                 | 0.0154        |

|    |        |        |
|----|--------|--------|
| 13 | 0.6188 | 0.0203 |
| 14 | 0.6382 | 0.0194 |
| 15 | 0.6568 | 0.0186 |
| 16 | 0.6747 | 0.0179 |
| 17 | 0.6919 | 0.0173 |
| 18 | 0.7086 | 0.0167 |
| 19 | 0.7248 | 0.0161 |
| 20 | 0.7404 | 0.0157 |
| 21 | 0.7556 | 0.0152 |
| 22 | 0.7704 | 0.0148 |
| 23 | 0.7848 | 0.0144 |
| 24 | 0.7988 | 0.0140 |
| 25 | 0.8125 | 0.0137 |
| 26 | 0.8259 | 0.0134 |
| 27 | 0.8390 | 0.0131 |
| 28 | 0.8518 | 0.0128 |
| 29 | 0.8643 | 0.0125 |
| 30 | 0.8766 | 0.0123 |
| 31 | 0.8887 | 0.0121 |
| 32 | 0.9005 | 0.0118 |
| 33 | 0.9121 | 0.0116 |
| 34 | 0.9235 | 0.0114 |
| 35 | 0.9348 | 0.0112 |
| 36 | 0.9458 | 0.0110 |
| 37 | 0.9566 | 0.0108 |
| 38 | 0.9673 | 0.0107 |
| 39 | 0.9778 | 0.0105 |
| 40 | 0.9882 | 0.0104 |
| 41 | 0.9984 | 0.0102 |
| 42 | 1.0084 | 0.0101 |
| 43 | 1.0183 | 0.0099 |
| 44 | 1.0281 | 0.0098 |
| 45 | 1.0378 | 0.0097 |
| 46 | 1.0473 | 0.0095 |
| 47 | 1.0567 | 0.0094 |
| 48 | 1.0660 | 0.0093 |
| 49 | 1.0752 | 0.0092 |
| 50 | 1.0843 | 0.0091 |
| 51 | 1.0932 | 0.0090 |
| 52 | 1.1021 | 0.0089 |
| 53 | 1.1109 | 0.0088 |
| 54 | 1.1195 | 0.0087 |
| 55 | 1.1281 | 0.0086 |
| 56 | 1.1366 | 0.0085 |
| 57 | 1.1450 | 0.0084 |
| 58 | 1.1533 | 0.0083 |
| 59 | 1.1615 | 0.0082 |
| 60 | 1.1697 | 0.0081 |
| 61 | 1.1778 | 0.0081 |
| 62 | 1.1858 | 0.0080 |
| 63 | 1.1937 | 0.0079 |
| 64 | 1.2015 | 0.0078 |
| 65 | 1.2093 | 0.0078 |
| 66 | 1.2170 | 0.0077 |
| 67 | 1.2246 | 0.0076 |
| 68 | 1.2322 | 0.0076 |
| 69 | 1.2397 | 0.0075 |
| 70 | 1.2471 | 0.0074 |
| 71 | 1.2545 | 0.0074 |
| 72 | 1.2618 | 0.0073 |
| 73 | 1.2686 | 0.0068 |
| 74 | 1.2753 | 0.0067 |
| 75 | 1.2820 | 0.0067 |
| 76 | 1.2886 | 0.0066 |
| 77 | 1.2951 | 0.0065 |
| 78 | 1.3016 | 0.0065 |
| 79 | 1.3081 | 0.0064 |
| 80 | 1.3145 | 0.0064 |
| 81 | 1.3208 | 0.0063 |
| 82 | 1.3271 | 0.0063 |
| 83 | 1.3333 | 0.0063 |
| 84 | 1.3396 | 0.0062 |
| 85 | 1.3457 | 0.0062 |
| 86 | 1.3518 | 0.0061 |
| 87 | 1.3579 | 0.0061 |
| 88 | 1.3639 | 0.0060 |
| 89 | 1.3699 | 0.0060 |
| 90 | 1.3759 | 0.0059 |
| 91 | 1.3818 | 0.0059 |
| 92 | 1.3876 | 0.0059 |
| 93 | 1.3935 | 0.0058 |

|     |        |        |
|-----|--------|--------|
| 94  | 1.3993 | 0.0058 |
| 95  | 1.4050 | 0.0058 |
| 96  | 1.4107 | 0.0057 |
| 97  | 1.4164 | 0.0057 |
| 98  | 1.4220 | 0.0056 |
| 99  | 1.4277 | 0.0056 |
| 100 | 1.4332 | 0.0056 |
| 101 | 1.4388 | 0.0055 |
| 102 | 1.4443 | 0.0055 |
| 103 | 1.4497 | 0.0055 |
| 104 | 1.4552 | 0.0054 |
| 105 | 1.4606 | 0.0054 |
| 106 | 1.4660 | 0.0054 |
| 107 | 1.4713 | 0.0053 |
| 108 | 1.4766 | 0.0053 |
| 109 | 1.4819 | 0.0053 |
| 110 | 1.4872 | 0.0053 |
| 111 | 1.4924 | 0.0052 |
| 112 | 1.4976 | 0.0052 |
| 113 | 1.5028 | 0.0052 |
| 114 | 1.5079 | 0.0051 |
| 115 | 1.5130 | 0.0051 |
| 116 | 1.5181 | 0.0051 |
| 117 | 1.5232 | 0.0051 |
| 118 | 1.5282 | 0.0050 |
| 119 | 1.5332 | 0.0050 |
| 120 | 1.5382 | 0.0050 |
| 121 | 1.5432 | 0.0050 |
| 122 | 1.5481 | 0.0049 |
| 123 | 1.5530 | 0.0049 |
| 124 | 1.5579 | 0.0049 |
| 125 | 1.5627 | 0.0049 |
| 126 | 1.5676 | 0.0048 |
| 127 | 1.5724 | 0.0048 |
| 128 | 1.5772 | 0.0048 |
| 129 | 1.5819 | 0.0048 |
| 130 | 1.5867 | 0.0047 |
| 131 | 1.5914 | 0.0047 |
| 132 | 1.5961 | 0.0047 |
| 133 | 1.6008 | 0.0047 |
| 134 | 1.6054 | 0.0047 |
| 135 | 1.6101 | 0.0046 |
| 136 | 1.6147 | 0.0046 |
| 137 | 1.6193 | 0.0046 |
| 138 | 1.6238 | 0.0046 |
| 139 | 1.6284 | 0.0046 |
| 140 | 1.6329 | 0.0045 |
| 141 | 1.6374 | 0.0045 |
| 142 | 1.6419 | 0.0045 |
| 143 | 1.6464 | 0.0045 |
| 144 | 1.6509 | 0.0045 |
| 145 | 1.6553 | 0.0044 |
| 146 | 1.6597 | 0.0044 |
| 147 | 1.6641 | 0.0044 |
| 148 | 1.6685 | 0.0044 |
| 149 | 1.6728 | 0.0044 |
| 150 | 1.6772 | 0.0043 |
| 151 | 1.6815 | 0.0043 |
| 152 | 1.6858 | 0.0043 |
| 153 | 1.6901 | 0.0043 |
| 154 | 1.6944 | 0.0043 |
| 155 | 1.6986 | 0.0043 |
| 156 | 1.7029 | 0.0042 |
| 157 | 1.7071 | 0.0042 |
| 158 | 1.7113 | 0.0042 |
| 159 | 1.7155 | 0.0042 |
| 160 | 1.7197 | 0.0042 |
| 161 | 1.7238 | 0.0042 |
| 162 | 1.7280 | 0.0041 |
| 163 | 1.7321 | 0.0041 |
| 164 | 1.7362 | 0.0041 |
| 165 | 1.7403 | 0.0041 |
| 166 | 1.7444 | 0.0041 |
| 167 | 1.7485 | 0.0041 |
| 168 | 1.7525 | 0.0041 |
| 169 | 1.7566 | 0.0040 |
| 170 | 1.7606 | 0.0040 |
| 171 | 1.7646 | 0.0040 |
| 172 | 1.7686 | 0.0040 |
| 173 | 1.7726 | 0.0040 |
| 174 | 1.7765 | 0.0040 |

|     |        |        |
|-----|--------|--------|
| 175 | 1.7805 | 0.0040 |
| 176 | 1.7844 | 0.0039 |
| 177 | 1.7883 | 0.0039 |
| 178 | 1.7922 | 0.0039 |
| 179 | 1.7961 | 0.0039 |
| 180 | 1.8000 | 0.0039 |
| 181 | 1.8039 | 0.0039 |
| 182 | 1.8078 | 0.0039 |
| 183 | 1.8116 | 0.0038 |
| 184 | 1.8154 | 0.0038 |
| 185 | 1.8192 | 0.0038 |
| 186 | 1.8231 | 0.0038 |
| 187 | 1.8268 | 0.0038 |
| 188 | 1.8306 | 0.0038 |
| 189 | 1.8344 | 0.0038 |
| 190 | 1.8382 | 0.0038 |
| 191 | 1.8419 | 0.0037 |
| 192 | 1.8456 | 0.0037 |
| 193 | 1.8494 | 0.0037 |
| 194 | 1.8531 | 0.0037 |
| 195 | 1.8568 | 0.0037 |
| 196 | 1.8604 | 0.0037 |
| 197 | 1.8641 | 0.0037 |
| 198 | 1.8678 | 0.0037 |
| 199 | 1.8714 | 0.0037 |
| 200 | 1.8751 | 0.0036 |
| 201 | 1.8787 | 0.0036 |
| 202 | 1.8823 | 0.0036 |
| 203 | 1.8859 | 0.0036 |
| 204 | 1.8895 | 0.0036 |
| 205 | 1.8931 | 0.0036 |
| 206 | 1.8967 | 0.0036 |
| 207 | 1.9002 | 0.0036 |
| 208 | 1.9038 | 0.0036 |
| 209 | 1.9073 | 0.0035 |
| 210 | 1.9109 | 0.0035 |
| 211 | 1.9144 | 0.0035 |
| 212 | 1.9179 | 0.0035 |
| 213 | 1.9214 | 0.0035 |
| 214 | 1.9249 | 0.0035 |
| 215 | 1.9284 | 0.0035 |
| 216 | 1.9319 | 0.0035 |
| 217 | 1.9353 | 0.0035 |
| 218 | 1.9388 | 0.0035 |
| 219 | 1.9422 | 0.0034 |
| 220 | 1.9457 | 0.0034 |
| 221 | 1.9491 | 0.0034 |
| 222 | 1.9525 | 0.0034 |
| 223 | 1.9559 | 0.0034 |
| 224 | 1.9593 | 0.0034 |
| 225 | 1.9627 | 0.0034 |
| 226 | 1.9661 | 0.0034 |
| 227 | 1.9694 | 0.0034 |
| 228 | 1.9728 | 0.0034 |
| 229 | 1.9761 | 0.0033 |
| 230 | 1.9795 | 0.0033 |
| 231 | 1.9828 | 0.0033 |
| 232 | 1.9861 | 0.0033 |
| 233 | 1.9894 | 0.0033 |
| 234 | 1.9927 | 0.0033 |
| 235 | 1.9960 | 0.0033 |
| 236 | 1.9993 | 0.0033 |
| 237 | 2.0026 | 0.0033 |
| 238 | 2.0059 | 0.0033 |
| 239 | 2.0092 | 0.0033 |
| 240 | 2.0124 | 0.0033 |
| 241 | 2.0157 | 0.0032 |
| 242 | 2.0189 | 0.0032 |
| 243 | 2.0221 | 0.0032 |
| 244 | 2.0253 | 0.0032 |
| 245 | 2.0286 | 0.0032 |
| 246 | 2.0318 | 0.0032 |
| 247 | 2.0350 | 0.0032 |
| 248 | 2.0382 | 0.0032 |
| 249 | 2.0413 | 0.0032 |
| 250 | 2.0445 | 0.0032 |
| 251 | 2.0477 | 0.0032 |
| 252 | 2.0508 | 0.0032 |
| 253 | 2.0540 | 0.0032 |
| 254 | 2.0571 | 0.0031 |
| 255 | 2.0603 | 0.0031 |

|     |        |        |
|-----|--------|--------|
| 256 | 2.0634 | 0.0031 |
| 257 | 2.0665 | 0.0031 |
| 258 | 2.0696 | 0.0031 |
| 259 | 2.0727 | 0.0031 |
| 260 | 2.0758 | 0.0031 |
| 261 | 2.0789 | 0.0031 |
| 262 | 2.0820 | 0.0031 |
| 263 | 2.0851 | 0.0031 |
| 264 | 2.0882 | 0.0031 |
| 265 | 2.0912 | 0.0031 |
| 266 | 2.0943 | 0.0031 |
| 267 | 2.0973 | 0.0030 |
| 268 | 2.1004 | 0.0030 |
| 269 | 2.1034 | 0.0030 |
| 270 | 2.1064 | 0.0030 |
| 271 | 2.1094 | 0.0030 |
| 272 | 2.1125 | 0.0030 |
| 273 | 2.1155 | 0.0030 |
| 274 | 2.1185 | 0.0030 |
| 275 | 2.1215 | 0.0030 |
| 276 | 2.1245 | 0.0030 |
| 277 | 2.1274 | 0.0030 |
| 278 | 2.1304 | 0.0030 |
| 279 | 2.1334 | 0.0030 |
| 280 | 2.1363 | 0.0030 |
| 281 | 2.1393 | 0.0030 |
| 282 | 2.1422 | 0.0029 |
| 283 | 2.1452 | 0.0029 |
| 284 | 2.1481 | 0.0029 |
| 285 | 2.1510 | 0.0029 |
| 286 | 2.1540 | 0.0029 |
| 287 | 2.1569 | 0.0029 |
| 288 | 2.1598 | 0.0029 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0029                   | 0.0022                    | 0.0007                        |
| 2                          | 0.0029                   | 0.0022                    | 0.0007                        |
| 3                          | 0.0029                   | 0.0022                    | 0.0007                        |
| 4                          | 0.0029                   | 0.0022                    | 0.0007                        |
| 5                          | 0.0029                   | 0.0022                    | 0.0007                        |
| 6                          | 0.0030                   | 0.0022                    | 0.0007                        |
| 7                          | 0.0030                   | 0.0022                    | 0.0007                        |
| 8                          | 0.0030                   | 0.0022                    | 0.0007                        |
| 9                          | 0.0030                   | 0.0022                    | 0.0007                        |
| 10                         | 0.0030                   | 0.0023                    | 0.0007                        |
| 11                         | 0.0030                   | 0.0023                    | 0.0007                        |
| 12                         | 0.0030                   | 0.0023                    | 0.0007                        |
| 13                         | 0.0030                   | 0.0023                    | 0.0008                        |
| 14                         | 0.0030                   | 0.0023                    | 0.0008                        |
| 15                         | 0.0030                   | 0.0023                    | 0.0008                        |
| 16                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 17                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 18                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 19                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 20                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 21                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 22                         | 0.0031                   | 0.0023                    | 0.0008                        |
| 23                         | 0.0031                   | 0.0024                    | 0.0008                        |
| 24                         | 0.0031                   | 0.0024                    | 0.0008                        |
| 25                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 26                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 27                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 28                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 29                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 30                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 31                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 32                         | 0.0032                   | 0.0024                    | 0.0008                        |
| 33                         | 0.0033                   | 0.0024                    | 0.0008                        |
| 34                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 35                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 36                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 37                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 38                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 39                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 40                         | 0.0033                   | 0.0025                    | 0.0008                        |
| 41                         | 0.0034                   | 0.0025                    | 0.0008                        |
| 42                         | 0.0034                   | 0.0025                    | 0.0008                        |
| 43                         | 0.0034                   | 0.0025                    | 0.0008                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 44  | 0.0034 | 0.0026 | 0.0008 |
| 45  | 0.0034 | 0.0026 | 0.0008 |
| 46  | 0.0034 | 0.0026 | 0.0009 |
| 47  | 0.0034 | 0.0026 | 0.0009 |
| 48  | 0.0035 | 0.0026 | 0.0009 |
| 49  | 0.0035 | 0.0026 | 0.0009 |
| 50  | 0.0035 | 0.0026 | 0.0009 |
| 51  | 0.0035 | 0.0026 | 0.0009 |
| 52  | 0.0035 | 0.0026 | 0.0009 |
| 53  | 0.0035 | 0.0027 | 0.0009 |
| 54  | 0.0035 | 0.0027 | 0.0009 |
| 55  | 0.0036 | 0.0027 | 0.0009 |
| 56  | 0.0036 | 0.0027 | 0.0009 |
| 57  | 0.0036 | 0.0027 | 0.0009 |
| 58  | 0.0036 | 0.0027 | 0.0009 |
| 59  | 0.0036 | 0.0027 | 0.0009 |
| 60  | 0.0036 | 0.0027 | 0.0009 |
| 61  | 0.0037 | 0.0028 | 0.0009 |
| 62  | 0.0037 | 0.0028 | 0.0009 |
| 63  | 0.0037 | 0.0028 | 0.0009 |
| 64  | 0.0037 | 0.0028 | 0.0009 |
| 65  | 0.0037 | 0.0028 | 0.0009 |
| 66  | 0.0037 | 0.0028 | 0.0009 |
| 67  | 0.0038 | 0.0028 | 0.0009 |
| 68  | 0.0038 | 0.0028 | 0.0009 |
| 69  | 0.0038 | 0.0029 | 0.0009 |
| 70  | 0.0038 | 0.0029 | 0.0009 |
| 71  | 0.0038 | 0.0029 | 0.0010 |
| 72  | 0.0039 | 0.0029 | 0.0010 |
| 73  | 0.0039 | 0.0029 | 0.0010 |
| 74  | 0.0039 | 0.0029 | 0.0010 |
| 75  | 0.0039 | 0.0029 | 0.0010 |
| 76  | 0.0039 | 0.0030 | 0.0010 |
| 77  | 0.0040 | 0.0030 | 0.0010 |
| 78  | 0.0040 | 0.0030 | 0.0010 |
| 79  | 0.0040 | 0.0030 | 0.0010 |
| 80  | 0.0040 | 0.0030 | 0.0010 |
| 81  | 0.0041 | 0.0030 | 0.0010 |
| 82  | 0.0041 | 0.0031 | 0.0010 |
| 83  | 0.0041 | 0.0031 | 0.0010 |
| 84  | 0.0041 | 0.0031 | 0.0010 |
| 85  | 0.0041 | 0.0031 | 0.0010 |
| 86  | 0.0042 | 0.0031 | 0.0010 |
| 87  | 0.0042 | 0.0031 | 0.0010 |
| 88  | 0.0042 | 0.0032 | 0.0010 |
| 89  | 0.0042 | 0.0032 | 0.0011 |
| 90  | 0.0043 | 0.0032 | 0.0011 |
| 91  | 0.0043 | 0.0032 | 0.0011 |
| 92  | 0.0043 | 0.0032 | 0.0011 |
| 93  | 0.0043 | 0.0033 | 0.0011 |
| 94  | 0.0044 | 0.0033 | 0.0011 |
| 95  | 0.0044 | 0.0033 | 0.0011 |
| 96  | 0.0044 | 0.0033 | 0.0011 |
| 97  | 0.0045 | 0.0033 | 0.0011 |
| 98  | 0.0045 | 0.0034 | 0.0011 |
| 99  | 0.0045 | 0.0034 | 0.0011 |
| 100 | 0.0045 | 0.0034 | 0.0011 |
| 101 | 0.0046 | 0.0034 | 0.0011 |
| 102 | 0.0046 | 0.0035 | 0.0011 |
| 103 | 0.0046 | 0.0035 | 0.0012 |
| 104 | 0.0047 | 0.0035 | 0.0012 |
| 105 | 0.0047 | 0.0035 | 0.0012 |
| 106 | 0.0047 | 0.0035 | 0.0012 |
| 107 | 0.0048 | 0.0036 | 0.0012 |
| 108 | 0.0048 | 0.0036 | 0.0012 |
| 109 | 0.0048 | 0.0036 | 0.0012 |
| 110 | 0.0049 | 0.0037 | 0.0012 |
| 111 | 0.0049 | 0.0037 | 0.0012 |
| 112 | 0.0049 | 0.0037 | 0.0012 |
| 113 | 0.0050 | 0.0037 | 0.0012 |
| 114 | 0.0050 | 0.0038 | 0.0012 |
| 115 | 0.0051 | 0.0038 | 0.0013 |
| 116 | 0.0051 | 0.0038 | 0.0013 |
| 117 | 0.0051 | 0.0039 | 0.0013 |
| 118 | 0.0052 | 0.0039 | 0.0013 |
| 119 | 0.0052 | 0.0039 | 0.0013 |
| 120 | 0.0053 | 0.0040 | 0.0013 |
| 121 | 0.0053 | 0.0040 | 0.0013 |
| 122 | 0.0053 | 0.0040 | 0.0013 |
| 123 | 0.0054 | 0.0041 | 0.0013 |
| 124 | 0.0054 | 0.0041 | 0.0014 |

|     |        |        |        |
|-----|--------|--------|--------|
| 125 | 0.0055 | 0.0041 | 0.0014 |
| 126 | 0.0055 | 0.0042 | 0.0014 |
| 127 | 0.0056 | 0.0042 | 0.0014 |
| 128 | 0.0056 | 0.0042 | 0.0014 |
| 129 | 0.0057 | 0.0043 | 0.0014 |
| 130 | 0.0058 | 0.0043 | 0.0014 |
| 131 | 0.0058 | 0.0044 | 0.0014 |
| 132 | 0.0059 | 0.0044 | 0.0015 |
| 133 | 0.0059 | 0.0045 | 0.0015 |
| 134 | 0.0060 | 0.0045 | 0.0015 |
| 135 | 0.0061 | 0.0046 | 0.0015 |
| 136 | 0.0061 | 0.0046 | 0.0015 |
| 137 | 0.0062 | 0.0047 | 0.0015 |
| 138 | 0.0063 | 0.0047 | 0.0016 |
| 139 | 0.0063 | 0.0048 | 0.0016 |
| 140 | 0.0064 | 0.0048 | 0.0016 |
| 141 | 0.0065 | 0.0049 | 0.0016 |
| 142 | 0.0065 | 0.0049 | 0.0016 |
| 143 | 0.0067 | 0.0050 | 0.0017 |
| 144 | 0.0067 | 0.0050 | 0.0017 |
| 145 | 0.0073 | 0.0055 | 0.0018 |
| 146 | 0.0074 | 0.0055 | 0.0018 |
| 147 | 0.0075 | 0.0056 | 0.0019 |
| 148 | 0.0076 | 0.0057 | 0.0019 |
| 149 | 0.0077 | 0.0058 | 0.0019 |
| 150 | 0.0078 | 0.0058 | 0.0019 |
| 151 | 0.0079 | 0.0060 | 0.0020 |
| 152 | 0.0080 | 0.0060 | 0.0020 |
| 153 | 0.0081 | 0.0061 | 0.0020 |
| 154 | 0.0082 | 0.0062 | 0.0020 |
| 155 | 0.0084 | 0.0063 | 0.0021 |
| 156 | 0.0085 | 0.0064 | 0.0021 |
| 157 | 0.0087 | 0.0065 | 0.0022 |
| 158 | 0.0088 | 0.0066 | 0.0022 |
| 159 | 0.0090 | 0.0067 | 0.0022 |
| 160 | 0.0091 | 0.0068 | 0.0023 |
| 161 | 0.0093 | 0.0070 | 0.0023 |
| 162 | 0.0094 | 0.0071 | 0.0023 |
| 163 | 0.0097 | 0.0073 | 0.0024 |
| 164 | 0.0098 | 0.0074 | 0.0024 |
| 165 | 0.0101 | 0.0076 | 0.0025 |
| 166 | 0.0102 | 0.0077 | 0.0025 |
| 167 | 0.0105 | 0.0079 | 0.0026 |
| 168 | 0.0107 | 0.0080 | 0.0027 |
| 169 | 0.0110 | 0.0083 | 0.0027 |
| 170 | 0.0112 | 0.0084 | 0.0028 |
| 171 | 0.0116 | 0.0087 | 0.0029 |
| 172 | 0.0118 | 0.0089 | 0.0029 |
| 173 | 0.0123 | 0.0092 | 0.0031 |
| 174 | 0.0125 | 0.0094 | 0.0031 |
| 175 | 0.0131 | 0.0098 | 0.0033 |
| 176 | 0.0134 | 0.0101 | 0.0033 |
| 177 | 0.0140 | 0.0105 | 0.0035 |
| 178 | 0.0144 | 0.0108 | 0.0036 |
| 179 | 0.0152 | 0.0114 | 0.0038 |
| 180 | 0.0157 | 0.0118 | 0.0039 |
| 181 | 0.0167 | 0.0125 | 0.0041 |
| 182 | 0.0173 | 0.0130 | 0.0043 |
| 183 | 0.0186 | 0.0140 | 0.0046 |
| 184 | 0.0194 | 0.0146 | 0.0048 |
| 185 | 0.0154 | 0.0116 | 0.0038 |
| 186 | 0.0164 | 0.0124 | 0.0041 |
| 187 | 0.0191 | 0.0143 | 0.0047 |
| 188 | 0.0208 | 0.0156 | 0.0052 |
| 189 | 0.0259 | 0.0194 | 0.0064 |
| 190 | 0.0298 | 0.0224 | 0.0074 |
| 191 | 0.0452 | 0.0340 | 0.0112 |
| 192 | 0.0656 | 0.0350 | 0.0306 |
| 193 | 0.2840 | 0.0350 | 0.2490 |
| 194 | 0.0356 | 0.0267 | 0.0088 |
| 195 | 0.0230 | 0.0173 | 0.0057 |
| 196 | 0.0176 | 0.0133 | 0.0044 |
| 197 | 0.0203 | 0.0152 | 0.0050 |
| 198 | 0.0179 | 0.0134 | 0.0044 |
| 199 | 0.0161 | 0.0121 | 0.0040 |
| 200 | 0.0148 | 0.0111 | 0.0037 |
| 201 | 0.0137 | 0.0103 | 0.0034 |
| 202 | 0.0128 | 0.0096 | 0.0032 |
| 203 | 0.0121 | 0.0091 | 0.0030 |
| 204 | 0.0114 | 0.0086 | 0.0028 |
| 205 | 0.0108 | 0.0081 | 0.0027 |

|     |        |        |        |
|-----|--------|--------|--------|
| 206 | 0.0104 | 0.0078 | 0.0026 |
| 207 | 0.0099 | 0.0075 | 0.0025 |
| 208 | 0.0095 | 0.0072 | 0.0024 |
| 209 | 0.0092 | 0.0069 | 0.0023 |
| 210 | 0.0089 | 0.0067 | 0.0022 |
| 211 | 0.0086 | 0.0064 | 0.0021 |
| 212 | 0.0083 | 0.0062 | 0.0021 |
| 213 | 0.0081 | 0.0061 | 0.0020 |
| 214 | 0.0078 | 0.0059 | 0.0019 |
| 215 | 0.0076 | 0.0057 | 0.0019 |
| 216 | 0.0074 | 0.0056 | 0.0018 |
| 217 | 0.0068 | 0.0051 | 0.0017 |
| 218 | 0.0066 | 0.0050 | 0.0016 |
| 219 | 0.0064 | 0.0048 | 0.0016 |
| 220 | 0.0063 | 0.0047 | 0.0016 |
| 221 | 0.0062 | 0.0046 | 0.0015 |
| 222 | 0.0060 | 0.0045 | 0.0015 |
| 223 | 0.0059 | 0.0044 | 0.0015 |
| 224 | 0.0058 | 0.0044 | 0.0014 |
| 225 | 0.0057 | 0.0043 | 0.0014 |
| 226 | 0.0056 | 0.0042 | 0.0014 |
| 227 | 0.0055 | 0.0041 | 0.0014 |
| 228 | 0.0054 | 0.0040 | 0.0013 |
| 229 | 0.0053 | 0.0040 | 0.0013 |
| 230 | 0.0052 | 0.0039 | 0.0013 |
| 231 | 0.0051 | 0.0038 | 0.0013 |
| 232 | 0.0050 | 0.0038 | 0.0013 |
| 233 | 0.0050 | 0.0037 | 0.0012 |
| 234 | 0.0049 | 0.0037 | 0.0012 |
| 235 | 0.0048 | 0.0036 | 0.0012 |
| 236 | 0.0047 | 0.0036 | 0.0012 |
| 237 | 0.0047 | 0.0035 | 0.0012 |
| 238 | 0.0046 | 0.0035 | 0.0011 |
| 239 | 0.0046 | 0.0034 | 0.0011 |
| 240 | 0.0045 | 0.0034 | 0.0011 |
| 241 | 0.0044 | 0.0033 | 0.0011 |
| 242 | 0.0044 | 0.0033 | 0.0011 |
| 243 | 0.0043 | 0.0033 | 0.0011 |
| 244 | 0.0043 | 0.0032 | 0.0011 |
| 245 | 0.0042 | 0.0032 | 0.0010 |
| 246 | 0.0042 | 0.0031 | 0.0010 |
| 247 | 0.0041 | 0.0031 | 0.0010 |
| 248 | 0.0041 | 0.0031 | 0.0010 |
| 249 | 0.0040 | 0.0030 | 0.0010 |
| 250 | 0.0040 | 0.0030 | 0.0010 |
| 251 | 0.0040 | 0.0030 | 0.0010 |
| 252 | 0.0039 | 0.0029 | 0.0010 |
| 253 | 0.0039 | 0.0029 | 0.0010 |
| 254 | 0.0038 | 0.0029 | 0.0010 |
| 255 | 0.0038 | 0.0029 | 0.0009 |
| 256 | 0.0038 | 0.0028 | 0.0009 |
| 257 | 0.0037 | 0.0028 | 0.0009 |
| 258 | 0.0037 | 0.0028 | 0.0009 |
| 259 | 0.0037 | 0.0027 | 0.0009 |
| 260 | 0.0036 | 0.0027 | 0.0009 |
| 261 | 0.0036 | 0.0027 | 0.0009 |
| 262 | 0.0036 | 0.0027 | 0.0009 |
| 263 | 0.0035 | 0.0026 | 0.0009 |
| 264 | 0.0035 | 0.0026 | 0.0009 |
| 265 | 0.0035 | 0.0026 | 0.0009 |
| 266 | 0.0034 | 0.0026 | 0.0009 |
| 267 | 0.0034 | 0.0026 | 0.0008 |
| 268 | 0.0034 | 0.0025 | 0.0008 |
| 269 | 0.0033 | 0.0025 | 0.0008 |
| 270 | 0.0033 | 0.0025 | 0.0008 |
| 271 | 0.0033 | 0.0025 | 0.0008 |
| 272 | 0.0033 | 0.0025 | 0.0008 |
| 273 | 0.0032 | 0.0024 | 0.0008 |
| 274 | 0.0032 | 0.0024 | 0.0008 |
| 275 | 0.0032 | 0.0024 | 0.0008 |
| 276 | 0.0032 | 0.0024 | 0.0008 |
| 277 | 0.0032 | 0.0024 | 0.0008 |
| 278 | 0.0031 | 0.0024 | 0.0008 |
| 279 | 0.0031 | 0.0023 | 0.0008 |
| 280 | 0.0031 | 0.0023 | 0.0008 |
| 281 | 0.0031 | 0.0023 | 0.0008 |
| 282 | 0.0030 | 0.0023 | 0.0008 |
| 283 | 0.0030 | 0.0023 | 0.0008 |
| 284 | 0.0030 | 0.0023 | 0.0007 |
| 285 | 0.0030 | 0.0022 | 0.0007 |
| 286 | 0.0030 | 0.0022 | 0.0007 |

|     |        |        |        |
|-----|--------|--------|--------|
| 287 | 0.0029 | 0.0022 | 0.0007 |
| 288 | 0.0029 | 0.0022 | 0.0007 |

Total soil rain loss = 1.43(In)  
 Total effective rainfall = 0.73(In)  
 Peak flow rate in flood hydrograph = (CFS)

++++++  
 24 - H O U R S T O R M  
 R u n o f f H y d r o g r a p h  
 -----  
 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|-----------|--------|-------|--------|---|-----|------|------|------|
| 0+ 5      | 0.0000 | 0.00  | Q      |   |     |      |      |      |
| 0+10      | 0.0001 | 0.01  | Q      |   |     |      |      |      |
| 0+15      | 0.0003 | 0.03  | Q      |   |     |      |      |      |
| 0+20      | 0.0006 | 0.06  | Q      |   |     |      |      |      |
| 0+25      | 0.0012 | 0.08  | Q      |   |     |      |      |      |
| 0+30      | 0.0019 | 0.10  | Q      |   |     |      |      |      |
| 0+35      | 0.0026 | 0.11  | Q      |   |     |      |      |      |
| 0+40      | 0.0034 | 0.12  | Q      |   |     |      |      |      |
| 0+45      | 0.0043 | 0.12  | Q      |   |     |      |      |      |
| 0+50      | 0.0051 | 0.13  | Q      |   |     |      |      |      |
| 0+55      | 0.0060 | 0.13  | Q      |   |     |      |      |      |
| 1+ 0      | 0.0070 | 0.14  | Q      |   |     |      |      |      |
| 1+ 5      | 0.0079 | 0.14  | Q      |   |     |      |      |      |
| 1+10      | 0.0089 | 0.14  | Q      |   |     |      |      |      |
| 1+15      | 0.0099 | 0.14  | Q      |   |     |      |      |      |
| 1+20      | 0.0109 | 0.15  | Q      |   |     |      |      |      |
| 1+25      | 0.0120 | 0.15  | Q      |   |     |      |      |      |
| 1+30      | 0.0130 | 0.15  | Q      |   |     |      |      |      |
| 1+35      | 0.0141 | 0.15  | Q      |   |     |      |      |      |
| 1+40      | 0.0151 | 0.15  | Q      |   |     |      |      |      |
| 1+45      | 0.0162 | 0.16  | Q      |   |     |      |      |      |
| 1+50      | 0.0173 | 0.16  | Q      |   |     |      |      |      |
| 1+55      | 0.0184 | 0.16  | Q      |   |     |      |      |      |
| 2+ 0      | 0.0195 | 0.16  | Q      |   |     |      |      |      |
| 2+ 5      | 0.0206 | 0.16  | Q      |   |     |      |      |      |
| 2+10      | 0.0217 | 0.16  | Q      |   |     |      |      |      |
| 2+15      | 0.0228 | 0.16  | Q      |   |     |      |      |      |
| 2+20      | 0.0240 | 0.16  | Q      |   |     |      |      |      |
| 2+25      | 0.0251 | 0.17  | Q      |   |     |      |      |      |
| 2+30      | 0.0263 | 0.17  | Q      |   |     |      |      |      |
| 2+35      | 0.0274 | 0.17  | QV     |   |     |      |      |      |
| 2+40      | 0.0286 | 0.17  | QV     |   |     |      |      |      |
| 2+45      | 0.0297 | 0.17  | QV     |   |     |      |      |      |
| 2+50      | 0.0309 | 0.17  | QV     |   |     |      |      |      |
| 2+55      | 0.0321 | 0.17  | QV     |   |     |      |      |      |
| 3+ 0      | 0.0332 | 0.17  | QV     |   |     |      |      |      |
| 3+ 5      | 0.0344 | 0.17  | QV     |   |     |      |      |      |
| 3+10      | 0.0356 | 0.17  | QV     |   |     |      |      |      |
| 3+15      | 0.0368 | 0.17  | QV     |   |     |      |      |      |
| 3+20      | 0.0380 | 0.17  | QV     |   |     |      |      |      |
| 3+25      | 0.0392 | 0.17  | QV     |   |     |      |      |      |
| 3+30      | 0.0404 | 0.17  | QV     |   |     |      |      |      |
| 3+35      | 0.0416 | 0.18  | QV     |   |     |      |      |      |
| 3+40      | 0.0428 | 0.18  | QV     |   |     |      |      |      |
| 3+45      | 0.0440 | 0.18  | QV     |   |     |      |      |      |
| 3+50      | 0.0452 | 0.18  | QV     |   |     |      |      |      |
| 3+55      | 0.0465 | 0.18  | QV     |   |     |      |      |      |
| 4+ 0      | 0.0477 | 0.18  | QV     |   |     |      |      |      |
| 4+ 5      | 0.0489 | 0.18  | QV     |   |     |      |      |      |
| 4+10      | 0.0502 | 0.18  | QV     |   |     |      |      |      |
| 4+15      | 0.0514 | 0.18  | QV     |   |     |      |      |      |
| 4+20      | 0.0527 | 0.18  | QV     |   |     |      |      |      |
| 4+25      | 0.0539 | 0.18  | Q V    |   |     |      |      |      |
| 4+30      | 0.0552 | 0.18  | Q V    |   |     |      |      |      |
| 4+35      | 0.0565 | 0.18  | Q V    |   |     |      |      |      |
| 4+40      | 0.0577 | 0.18  | Q V    |   |     |      |      |      |
| 4+45      | 0.0590 | 0.19  | Q V    |   |     |      |      |      |
| 4+50      | 0.0603 | 0.19  | Q V    |   |     |      |      |      |
| 4+55      | 0.0616 | 0.19  | Q V    |   |     |      |      |      |
| 5+ 0      | 0.0629 | 0.19  | Q V    |   |     |      |      |      |
| 5+ 5      | 0.0642 | 0.19  | Q V    |   |     |      |      |      |
| 5+10      | 0.0655 | 0.19  | Q V    |   |     |      |      |      |
| 5+15      | 0.0668 | 0.19  | Q V    |   |     |      |      |      |
| 5+20      | 0.0681 | 0.19  | Q V    |   |     |      |      |      |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 5+25  | 0.0695 | 0.19 | Q | V |  |  |  |  |
| 5+30  | 0.0708 | 0.19 | Q | V |  |  |  |  |
| 5+35  | 0.0721 | 0.19 | Q | V |  |  |  |  |
| 5+40  | 0.0735 | 0.20 | Q | V |  |  |  |  |
| 5+45  | 0.0748 | 0.20 | Q | V |  |  |  |  |
| 5+50  | 0.0762 | 0.20 | Q | V |  |  |  |  |
| 5+55  | 0.0776 | 0.20 | Q | V |  |  |  |  |
| 6+ 0  | 0.0789 | 0.20 | Q | V |  |  |  |  |
| 6+ 5  | 0.0803 | 0.20 | Q | V |  |  |  |  |
| 6+10  | 0.0817 | 0.20 | Q | V |  |  |  |  |
| 6+15  | 0.0831 | 0.20 | Q | V |  |  |  |  |
| 6+20  | 0.0845 | 0.20 | Q | V |  |  |  |  |
| 6+25  | 0.0859 | 0.20 | Q | V |  |  |  |  |
| 6+30  | 0.0873 | 0.20 | Q | V |  |  |  |  |
| 6+35  | 0.0887 | 0.21 | Q | V |  |  |  |  |
| 6+40  | 0.0901 | 0.21 | Q | V |  |  |  |  |
| 6+45  | 0.0916 | 0.21 | Q | V |  |  |  |  |
| 6+50  | 0.0930 | 0.21 | Q | V |  |  |  |  |
| 6+55  | 0.0945 | 0.21 | Q | V |  |  |  |  |
| 7+ 0  | 0.0959 | 0.21 | Q | V |  |  |  |  |
| 7+ 5  | 0.0974 | 0.21 | Q | V |  |  |  |  |
| 7+10  | 0.0988 | 0.21 | Q | V |  |  |  |  |
| 7+15  | 0.1003 | 0.21 | Q | V |  |  |  |  |
| 7+20  | 0.1018 | 0.22 | Q | V |  |  |  |  |
| 7+25  | 0.1033 | 0.22 | Q | V |  |  |  |  |
| 7+30  | 0.1048 | 0.22 | Q | V |  |  |  |  |
| 7+35  | 0.1063 | 0.22 | Q | V |  |  |  |  |
| 7+40  | 0.1079 | 0.22 | Q | V |  |  |  |  |
| 7+45  | 0.1094 | 0.22 | Q | V |  |  |  |  |
| 7+50  | 0.1109 | 0.22 | Q | V |  |  |  |  |
| 7+55  | 0.1125 | 0.22 | Q | V |  |  |  |  |
| 8+ 0  | 0.1140 | 0.23 | Q | V |  |  |  |  |
| 8+ 5  | 0.1156 | 0.23 | Q | V |  |  |  |  |
| 8+10  | 0.1172 | 0.23 | Q | V |  |  |  |  |
| 8+15  | 0.1188 | 0.23 | Q | V |  |  |  |  |
| 8+20  | 0.1204 | 0.23 | Q | V |  |  |  |  |
| 8+25  | 0.1220 | 0.23 | Q | V |  |  |  |  |
| 8+30  | 0.1236 | 0.23 | Q | V |  |  |  |  |
| 8+35  | 0.1252 | 0.24 | Q | V |  |  |  |  |
| 8+40  | 0.1268 | 0.24 | Q | V |  |  |  |  |
| 8+45  | 0.1285 | 0.24 | Q | V |  |  |  |  |
| 8+50  | 0.1301 | 0.24 | Q | V |  |  |  |  |
| 8+55  | 0.1318 | 0.24 | Q | V |  |  |  |  |
| 9+ 0  | 0.1335 | 0.24 | Q | V |  |  |  |  |
| 9+ 5  | 0.1352 | 0.25 | Q | V |  |  |  |  |
| 9+10  | 0.1369 | 0.25 | Q | V |  |  |  |  |
| 9+15  | 0.1386 | 0.25 | Q | V |  |  |  |  |
| 9+20  | 0.1403 | 0.25 | Q | V |  |  |  |  |
| 9+25  | 0.1421 | 0.25 | Q | V |  |  |  |  |
| 9+30  | 0.1438 | 0.25 | Q | V |  |  |  |  |
| 9+35  | 0.1456 | 0.26 | Q | V |  |  |  |  |
| 9+40  | 0.1474 | 0.26 | Q | V |  |  |  |  |
| 9+45  | 0.1492 | 0.26 | Q | V |  |  |  |  |
| 9+50  | 0.1510 | 0.26 | Q | V |  |  |  |  |
| 9+55  | 0.1528 | 0.26 | Q | V |  |  |  |  |
| 10+ 0 | 0.1546 | 0.27 | Q | V |  |  |  |  |
| 10+ 5 | 0.1565 | 0.27 | Q | V |  |  |  |  |
| 10+10 | 0.1583 | 0.27 | Q | V |  |  |  |  |
| 10+15 | 0.1602 | 0.27 | Q | V |  |  |  |  |
| 10+20 | 0.1621 | 0.27 | Q | V |  |  |  |  |
| 10+25 | 0.1640 | 0.28 | Q | V |  |  |  |  |
| 10+30 | 0.1660 | 0.28 | Q | V |  |  |  |  |
| 10+35 | 0.1679 | 0.28 | Q | V |  |  |  |  |
| 10+40 | 0.1699 | 0.28 | Q | V |  |  |  |  |
| 10+45 | 0.1718 | 0.29 | Q | V |  |  |  |  |
| 10+50 | 0.1738 | 0.29 | Q | V |  |  |  |  |
| 10+55 | 0.1758 | 0.29 | Q | V |  |  |  |  |
| 11+ 0 | 0.1779 | 0.29 | Q | V |  |  |  |  |
| 11+ 5 | 0.1799 | 0.30 | Q | V |  |  |  |  |
| 11+10 | 0.1820 | 0.30 | Q | V |  |  |  |  |
| 11+15 | 0.1841 | 0.30 | Q | V |  |  |  |  |
| 11+20 | 0.1862 | 0.31 | Q | V |  |  |  |  |
| 11+25 | 0.1883 | 0.31 | Q | V |  |  |  |  |
| 11+30 | 0.1905 | 0.31 | Q | V |  |  |  |  |
| 11+35 | 0.1926 | 0.32 | Q | V |  |  |  |  |
| 11+40 | 0.1948 | 0.32 | Q | V |  |  |  |  |
| 11+45 | 0.1970 | 0.32 | Q | V |  |  |  |  |
| 11+50 | 0.1993 | 0.33 | Q | V |  |  |  |  |
| 11+55 | 0.2016 | 0.33 | Q | V |  |  |  |  |
| 12+ 0 | 0.2038 | 0.33 | Q | V |  |  |  |  |
| 12+ 5 | 0.2062 | 0.34 | Q | V |  |  |  |  |

|       |        |       |   |   |   |  |  |   |
|-------|--------|-------|---|---|---|--|--|---|
| 12+10 | 0.2085 | 0.34  | Q | V |   |  |  |   |
| 12+15 | 0.2109 | 0.35  | Q | V |   |  |  |   |
| 12+20 | 0.2134 | 0.36  | Q | V |   |  |  |   |
| 12+25 | 0.2159 | 0.37  | Q | V |   |  |  |   |
| 12+30 | 0.2185 | 0.37  | Q | V |   |  |  |   |
| 12+35 | 0.2211 | 0.38  | Q | V |   |  |  |   |
| 12+40 | 0.2238 | 0.39  | Q | V |   |  |  |   |
| 12+45 | 0.2265 | 0.39  | Q | V |   |  |  |   |
| 12+50 | 0.2292 | 0.40  | Q | V |   |  |  |   |
| 12+55 | 0.2320 | 0.40  | Q | V |   |  |  |   |
| 13+ 0 | 0.2349 | 0.41  | Q | V |   |  |  |   |
| 13+ 5 | 0.2377 | 0.42  | Q | V |   |  |  |   |
| 13+10 | 0.2407 | 0.42  | Q | V |   |  |  |   |
| 13+15 | 0.2436 | 0.43  | Q | V |   |  |  |   |
| 13+20 | 0.2466 | 0.44  | Q | V |   |  |  |   |
| 13+25 | 0.2497 | 0.44  | Q | V |   |  |  |   |
| 13+30 | 0.2528 | 0.45  | Q | V |   |  |  |   |
| 13+35 | 0.2560 | 0.46  | Q | V |   |  |  |   |
| 13+40 | 0.2592 | 0.47  | Q | V |   |  |  |   |
| 13+45 | 0.2625 | 0.48  | Q | V |   |  |  |   |
| 13+50 | 0.2658 | 0.49  | Q | V |   |  |  |   |
| 13+55 | 0.2692 | 0.49  | Q | V |   |  |  |   |
| 14+ 0 | 0.2727 | 0.50  | Q | V |   |  |  |   |
| 14+ 5 | 0.2762 | 0.51  | Q | V |   |  |  |   |
| 14+10 | 0.2798 | 0.52  | Q | V |   |  |  |   |
| 14+15 | 0.2835 | 0.54  | Q | V |   |  |  |   |
| 14+20 | 0.2873 | 0.55  | Q | V |   |  |  |   |
| 14+25 | 0.2912 | 0.56  | Q | V |   |  |  |   |
| 14+30 | 0.2951 | 0.58  | Q | V |   |  |  |   |
| 14+35 | 0.2992 | 0.59  | Q | V |   |  |  |   |
| 14+40 | 0.3034 | 0.61  | Q | V |   |  |  |   |
| 14+45 | 0.3077 | 0.62  | Q | V |   |  |  |   |
| 14+50 | 0.3121 | 0.64  | Q | V |   |  |  |   |
| 14+55 | 0.3166 | 0.66  | Q | V |   |  |  |   |
| 15+ 0 | 0.3213 | 0.68  | Q | V |   |  |  |   |
| 15+ 5 | 0.3262 | 0.71  | Q | V |   |  |  |   |
| 15+10 | 0.3312 | 0.73  | Q | V |   |  |  |   |
| 15+15 | 0.3365 | 0.76  | Q | V |   |  |  |   |
| 15+20 | 0.3419 | 0.79  | Q | V |   |  |  |   |
| 15+25 | 0.3476 | 0.83  | Q | V |   |  |  |   |
| 15+30 | 0.3535 | 0.86  | Q | V |   |  |  |   |
| 15+35 | 0.3595 | 0.87  | Q | V |   |  |  |   |
| 15+40 | 0.3655 | 0.87  | Q | V |   |  |  |   |
| 15+45 | 0.3716 | 0.88  | Q | V |   |  |  |   |
| 15+50 | 0.3781 | 0.94  | Q | V |   |  |  |   |
| 15+55 | 0.3852 | 1.03  | Q | V |   |  |  |   |
| 16+ 0 | 0.3936 | 1.23  | Q | V |   |  |  |   |
| 16+ 5 | 0.4087 | 2.19  | Q | V |   |  |  |   |
| 16+10 | 0.4391 | 4.42  | Q | V |   |  |  |   |
| 16+15 | 0.4945 | 8.05  |   | Q | V |  |  |   |
| 16+20 | 0.5831 |       |   | Q | V |  |  |   |
| 16+25 | 0.6520 | 10.01 |   | Q | V |  |  |   |
| 16+30 | 0.6982 | 6.71  |   | Q | V |  |  |   |
| 16+35 | 0.7320 | 4.91  |   | Q | V |  |  |   |
| 16+40 | 0.7595 | 3.99  |   | Q | V |  |  |   |
| 16+45 | 0.7824 | 3.34  |   | Q | V |  |  |   |
| 16+50 | 0.8018 | 2.81  |   | Q | V |  |  |   |
| 16+55 | 0.8186 | 2.45  |   | Q | V |  |  |   |
| 17+ 0 | 0.8338 | 2.21  |   | Q | V |  |  |   |
| 17+ 5 | 0.8473 | 1.96  |   | Q | V |  |  |   |
| 17+10 | 0.8590 | 1.69  |   | Q | V |  |  |   |
| 17+15 | 0.8695 | 1.53  |   | Q | V |  |  |   |
| 17+20 | 0.8792 | 1.41  |   | Q | V |  |  |   |
| 17+25 | 0.8882 | 1.30  |   | Q | V |  |  |   |
| 17+30 | 0.8964 | 1.19  |   | Q | V |  |  |   |
| 17+35 | 0.9039 | 1.09  |   | Q | V |  |  |   |
| 17+40 | 0.9109 | 1.02  |   | Q | V |  |  |   |
| 17+45 | 0.9173 | 0.93  |   | Q | V |  |  |   |
| 17+50 | 0.9233 | 0.87  |   | Q | V |  |  |   |
| 17+55 | 0.9287 | 0.78  |   | Q | V |  |  |   |
| 18+ 0 | 0.9338 | 0.73  |   | Q | V |  |  |   |
| 18+ 5 | 0.9382 | 0.64  |   | Q | V |  |  |   |
| 18+10 | 0.9425 | 0.62  |   | Q | V |  |  |   |
| 18+15 | 0.9467 | 0.62  |   | Q | V |  |  |   |
| 18+20 | 0.9509 | 0.60  |   | Q | V |  |  |   |
| 18+25 | 0.9549 | 0.59  |   | Q | V |  |  |   |
| 18+30 | 0.9588 | 0.56  |   | Q | V |  |  |   |
| 18+35 | 0.9623 | 0.50  |   | Q | V |  |  |   |
| 18+40 | 0.9655 | 0.47  | Q |   |   |  |  | V |
| 18+45 | 0.9686 | 0.45  | Q |   |   |  |  | V |
| 18+50 | 0.9715 | 0.42  | Q |   |   |  |  | V |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 18+55 | 0.9739 | 0.35 | Q |  |  |  | V |
| 19+ 0 | 0.9762 | 0.34 | Q |  |  |  | V |
| 19+ 5 | 0.9785 | 0.33 | Q |  |  |  | V |
| 19+10 | 0.9807 | 0.32 | Q |  |  |  | V |
| 19+15 | 0.9828 | 0.31 | Q |  |  |  | V |
| 19+20 | 0.9849 | 0.31 | Q |  |  |  | V |
| 19+25 | 0.9870 | 0.30 | Q |  |  |  | V |
| 19+30 | 0.9890 | 0.29 | Q |  |  |  | V |
| 19+35 | 0.9910 | 0.29 | Q |  |  |  | V |
| 19+40 | 0.9930 | 0.28 | Q |  |  |  | V |
| 19+45 | 0.9949 | 0.28 | Q |  |  |  | V |
| 19+50 | 0.9968 | 0.27 | Q |  |  |  | V |
| 19+55 | 0.9986 | 0.27 | Q |  |  |  | V |
| 20+ 0 | 1.0005 | 0.26 | Q |  |  |  | V |
| 20+ 5 | 1.0023 | 0.26 | Q |  |  |  | V |
| 20+10 | 1.0040 | 0.26 | Q |  |  |  | V |
| 20+15 | 1.0058 | 0.25 | Q |  |  |  | V |
| 20+20 | 1.0075 | 0.25 | Q |  |  |  | V |
| 20+25 | 1.0092 | 0.25 | Q |  |  |  | V |
| 20+30 | 1.0108 | 0.24 | Q |  |  |  | V |
| 20+35 | 1.0125 | 0.24 | Q |  |  |  | V |
| 20+40 | 1.0141 | 0.24 | Q |  |  |  | V |
| 20+45 | 1.0157 | 0.23 | Q |  |  |  | V |
| 20+50 | 1.0173 | 0.23 | Q |  |  |  | V |
| 20+55 | 1.0189 | 0.23 | Q |  |  |  | V |
| 21+ 0 | 1.0204 | 0.22 | Q |  |  |  | V |
| 21+ 5 | 1.0219 | 0.22 | Q |  |  |  | V |
| 21+10 | 1.0234 | 0.22 | Q |  |  |  | V |
| 21+15 | 1.0249 | 0.22 | Q |  |  |  | V |
| 21+20 | 1.0264 | 0.21 | Q |  |  |  | V |
| 21+25 | 1.0279 | 0.21 | Q |  |  |  | V |
| 21+30 | 1.0293 | 0.21 | Q |  |  |  | V |
| 21+35 | 1.0307 | 0.21 | Q |  |  |  | V |
| 21+40 | 1.0321 | 0.21 | Q |  |  |  | V |
| 21+45 | 1.0335 | 0.20 | Q |  |  |  | V |
| 21+50 | 1.0349 | 0.20 | Q |  |  |  | V |
| 21+55 | 1.0363 | 0.20 | Q |  |  |  | V |
| 22+ 0 | 1.0377 | 0.20 | Q |  |  |  | V |
| 22+ 5 | 1.0390 | 0.20 | Q |  |  |  | V |
| 22+10 | 1.0403 | 0.19 | Q |  |  |  | V |
| 22+15 | 1.0417 | 0.19 | Q |  |  |  | V |
| 22+20 | 1.0430 | 0.19 | Q |  |  |  | V |
| 22+25 | 1.0443 | 0.19 | Q |  |  |  | V |
| 22+30 | 1.0455 | 0.19 | Q |  |  |  | V |
| 22+35 | 1.0468 | 0.19 | Q |  |  |  | V |
| 22+40 | 1.0481 | 0.18 | Q |  |  |  | V |
| 22+45 | 1.0493 | 0.18 | Q |  |  |  | V |
| 22+50 | 1.0506 | 0.18 | Q |  |  |  | V |
| 22+55 | 1.0518 | 0.18 | Q |  |  |  | V |
| 23+ 0 | 1.0530 | 0.18 | Q |  |  |  | V |
| 23+ 5 | 1.0542 | 0.18 | Q |  |  |  | V |
| 23+10 | 1.0554 | 0.17 | Q |  |  |  | V |
| 23+15 | 1.0566 | 0.17 | Q |  |  |  | V |
| 23+20 | 1.0578 | 0.17 | Q |  |  |  | V |
| 23+25 | 1.0590 | 0.17 | Q |  |  |  | V |
| 23+30 | 1.0602 | 0.17 | Q |  |  |  | V |
| 23+35 | 1.0613 | 0.17 | Q |  |  |  | V |
| 23+40 | 1.0625 | 0.17 | Q |  |  |  | V |
| 23+45 | 1.0636 | 0.17 | Q |  |  |  | V |
| 23+50 | 1.0648 | 0.16 | Q |  |  |  | V |
| 23+55 | 1.0659 | 0.16 | Q |  |  |  | V |
| 24+ 0 | 1.0670 | 0.16 | Q |  |  |  | V |
| 24+ 5 | 1.0681 | 0.16 | Q |  |  |  | V |
| 24+10 | 1.0691 | 0.15 | Q |  |  |  | V |
| 24+15 | 1.0701 | 0.13 | Q |  |  |  | V |
| 24+20 | 1.0707 | 0.10 | Q |  |  |  | V |
| 24+25 | 1.0713 | 0.08 | Q |  |  |  | V |
| 24+30 | 1.0717 | 0.06 | Q |  |  |  | V |
| 24+35 | 1.0720 | 0.05 | Q |  |  |  | V |
| 24+40 | 1.0723 | 0.04 | Q |  |  |  | V |
| 24+45 | 1.0726 | 0.04 | Q |  |  |  | V |
| 24+50 | 1.0728 | 0.03 | Q |  |  |  | V |
| 24+55 | 1.0730 | 0.03 | Q |  |  |  | V |
| 25+ 0 | 1.0731 | 0.02 | Q |  |  |  | V |
| 25+ 5 | 1.0732 | 0.02 | Q |  |  |  | V |
| 25+10 | 1.0734 | 0.02 | Q |  |  |  | V |
| 25+15 | 1.0735 | 0.01 | Q |  |  |  | V |
| 25+20 | 1.0735 | 0.01 | Q |  |  |  | V |
| 25+25 | 1.0736 | 0.01 | Q |  |  |  | V |
| 25+30 | 1.0737 | 0.01 | Q |  |  |  | V |
| 25+35 | 1.0737 | 0.01 | Q |  |  |  | V |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 25+40 | 1.0738 | 0.01 | Q |  |  |  | V |
| 25+45 | 1.0738 | 0.01 | Q |  |  |  | V |
| 25+50 | 1.0739 | 0.00 | Q |  |  |  | V |
| 25+55 | 1.0739 | 0.00 | Q |  |  |  | V |
| 26+ 0 | 1.0739 | 0.00 | Q |  |  |  | V |
| 26+ 5 | 1.0739 | 0.00 | Q |  |  |  | V |
| 26+10 | 1.0739 | 0.00 | Q |  |  |  | V |
| 26+15 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+20 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+25 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+30 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+35 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+40 | 1.0740 | 0.00 | Q |  |  |  | V |
| 26+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
25-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>NO. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 1.000        | 0.420         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.420

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 17.68         | 1.000         | 77.0             | 77.0             | 2.99 | 0.315                |

Area-averaged catchment yield fraction, Y = 0.315

Area-averaged low loss fraction, Yb = 0.685

User entry of time of concentration = 0.444 (hours)

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watershed area = 17.68(Ac.)  
Catchment Lag time = 0.355 hours

Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 23.4610  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.420(In/Hr)  
 Average low loss rate fraction (Yb) = 0.685 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.373(In)  
 Computed peak 30-minute rainfall = 0.639(In)  
 Specified peak 1-hour rainfall = 0.786(In)  
 Computed peak 3-hour rainfall = 1.193(In)  
 Specified peak 6-hour rainfall = 1.552(In)  
 Specified peak 24-hour rainfall = 2.649(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(AC.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.373(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.638(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.786(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 1.193(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.552(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 2.649(In) |

| Unit Hydrograph |                    |                 |
|-----------------|--------------------|-----------------|
| Interval        | 'S' Graph          | Unit Hydrograph |
| Number          | Mean values        | ((CFS))         |
| -----           |                    |                 |
|                 | (K = 213.82 (CFS)) |                 |
| 1               | 1.237              | 2.645           |
| 2               | 5.898              | 9.966           |
| 3               | 16.607             | 22.899          |
| 4               | 37.127             | 43.875          |
| 5               | 52.735             | 33.371          |
| 6               | 62.457             | 20.788          |
| 7               | 69.053             | 14.103          |
| 8               | 74.109             | 10.811          |
| 9               | 78.107             | 8.548           |
| 10              | 81.273             | 6.769           |
| 11              | 83.888             | 5.592           |
| 12              | 86.186             | 4.914           |
| 13              | 88.150             | 4.199           |
| 14              | 89.702             | 3.319           |
| 15              | 91.050             | 2.881           |
| 16              | 92.255             | 2.577           |
| 17              | 93.333             | 2.304           |
| 18              | 94.259             | 1.981           |
| 19              | 95.057             | 1.706           |
| 20              | 95.792             | 1.571           |
| 21              | 96.405             | 1.311           |
| 22              | 96.970             | 1.209           |
| 23              | 97.402             | 0.922           |
| 24              | 97.795             | 0.841           |
| 25              | 98.048             | 0.541           |
| 26              | 98.287             | 0.511           |
| 27              | 98.561             | 0.585           |
| 28              | 98.842             | 0.602           |
| 29              | 99.124             | 0.602           |
| 30              | 99.403             | 0.598           |
| 31              | 99.597             | 0.415           |
| 32              | 99.744             | 0.314           |
| 33              | 99.891             | 0.314           |
| 34              | 100.000            | 0.234           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.3729                 | 0.3729        |
| 2         | 0.4590                 | 0.0862        |
| 3         | 0.5184                 | 0.0594        |
| 4         | 0.5651                 | 0.0467        |
| 5         | 0.6043                 | 0.0391        |
| 6         | 0.6383                 | 0.0340        |
| 7         | 0.6685                 | 0.0302        |
| 8         | 0.6958                 | 0.0273        |
| 9         | 0.7208                 | 0.0250        |
| 10        | 0.7440                 | 0.0231        |
| 11        | 0.7655                 | 0.0216        |
| 12        | 0.7858                 | 0.0202        |

|    |        |        |
|----|--------|--------|
| 13 | 0.8100 | 0.0243 |
| 14 | 0.8332 | 0.0231 |
| 15 | 0.8553 | 0.0221 |
| 16 | 0.8765 | 0.0212 |
| 17 | 0.8970 | 0.0204 |
| 18 | 0.9166 | 0.0197 |
| 19 | 0.9357 | 0.0190 |
| 20 | 0.9541 | 0.0184 |
| 21 | 0.9719 | 0.0179 |
| 22 | 0.9893 | 0.0173 |
| 23 | 1.0061 | 0.0168 |
| 24 | 1.0225 | 0.0164 |
| 25 | 1.0385 | 0.0160 |
| 26 | 1.0541 | 0.0156 |
| 27 | 1.0693 | 0.0152 |
| 28 | 1.0842 | 0.0149 |
| 29 | 1.0987 | 0.0146 |
| 30 | 1.1130 | 0.0142 |
| 31 | 1.1269 | 0.0140 |
| 32 | 1.1406 | 0.0137 |
| 33 | 1.1540 | 0.0134 |
| 34 | 1.1672 | 0.0132 |
| 35 | 1.1801 | 0.0129 |
| 36 | 1.1928 | 0.0127 |
| 37 | 1.2053 | 0.0125 |
| 38 | 1.2175 | 0.0123 |
| 39 | 1.2296 | 0.0121 |
| 40 | 1.2415 | 0.0119 |
| 41 | 1.2531 | 0.0117 |
| 42 | 1.2647 | 0.0115 |
| 43 | 1.2760 | 0.0113 |
| 44 | 1.2872 | 0.0112 |
| 45 | 1.2982 | 0.0110 |
| 46 | 1.3091 | 0.0109 |
| 47 | 1.3198 | 0.0107 |
| 48 | 1.3304 | 0.0106 |
| 49 | 1.3408 | 0.0104 |
| 50 | 1.3511 | 0.0103 |
| 51 | 1.3613 | 0.0102 |
| 52 | 1.3714 | 0.0101 |
| 53 | 1.3813 | 0.0099 |
| 54 | 1.3911 | 0.0098 |
| 55 | 1.4009 | 0.0097 |
| 56 | 1.4105 | 0.0096 |
| 57 | 1.4200 | 0.0095 |
| 58 | 1.4294 | 0.0094 |
| 59 | 1.4387 | 0.0093 |
| 60 | 1.4479 | 0.0092 |
| 61 | 1.4570 | 0.0091 |
| 62 | 1.4660 | 0.0090 |
| 63 | 1.4749 | 0.0089 |
| 64 | 1.4838 | 0.0088 |
| 65 | 1.4925 | 0.0088 |
| 66 | 1.5012 | 0.0087 |
| 67 | 1.5098 | 0.0086 |
| 68 | 1.5183 | 0.0085 |
| 69 | 1.5267 | 0.0084 |
| 70 | 1.5351 | 0.0084 |
| 71 | 1.5434 | 0.0083 |
| 72 | 1.5516 | 0.0082 |
| 73 | 1.5598 | 0.0083 |
| 74 | 1.5681 | 0.0082 |
| 75 | 1.5762 | 0.0081 |
| 76 | 1.5843 | 0.0081 |
| 77 | 1.5923 | 0.0080 |
| 78 | 1.6002 | 0.0079 |
| 79 | 1.6081 | 0.0079 |
| 80 | 1.6160 | 0.0078 |
| 81 | 1.6237 | 0.0078 |
| 82 | 1.6314 | 0.0077 |
| 83 | 1.6391 | 0.0077 |
| 84 | 1.6467 | 0.0076 |
| 85 | 1.6542 | 0.0075 |
| 86 | 1.6617 | 0.0075 |
| 87 | 1.6691 | 0.0074 |
| 88 | 1.6765 | 0.0074 |
| 89 | 1.6838 | 0.0073 |
| 90 | 1.6911 | 0.0073 |
| 91 | 1.6983 | 0.0072 |
| 92 | 1.7055 | 0.0072 |
| 93 | 1.7126 | 0.0071 |

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|-----|--------|--------|
| 94  | 1.7197 | 0.0071 |
| 95  | 1.7268 | 0.0070 |
| 96  | 1.7338 | 0.0070 |
| 97  | 1.7407 | 0.0069 |
| 98  | 1.7476 | 0.0069 |
| 99  | 1.7545 | 0.0069 |
| 100 | 1.7613 | 0.0068 |
| 101 | 1.7681 | 0.0068 |
| 102 | 1.7748 | 0.0067 |
| 103 | 1.7815 | 0.0067 |
| 104 | 1.7882 | 0.0067 |
| 105 | 1.7948 | 0.0066 |
| 106 | 1.8013 | 0.0066 |
| 107 | 1.8079 | 0.0065 |
| 108 | 1.8144 | 0.0065 |
| 109 | 1.8209 | 0.0065 |
| 110 | 1.8273 | 0.0064 |
| 111 | 1.8337 | 0.0064 |
| 112 | 1.8400 | 0.0064 |
| 113 | 1.8464 | 0.0063 |
| 114 | 1.8527 | 0.0063 |
| 115 | 1.8589 | 0.0063 |
| 116 | 1.8651 | 0.0062 |
| 117 | 1.8713 | 0.0062 |
| 118 | 1.8775 | 0.0062 |
| 119 | 1.8836 | 0.0061 |
| 120 | 1.8897 | 0.0061 |
| 121 | 1.8958 | 0.0061 |
| 122 | 1.9018 | 0.0060 |
| 123 | 1.9078 | 0.0060 |
| 124 | 1.9138 | 0.0060 |
| 125 | 1.9197 | 0.0059 |
| 126 | 1.9256 | 0.0059 |
| 127 | 1.9315 | 0.0059 |
| 128 | 1.9374 | 0.0059 |
| 129 | 1.9432 | 0.0058 |
| 130 | 1.9490 | 0.0058 |
| 131 | 1.9548 | 0.0058 |
| 132 | 1.9605 | 0.0057 |
| 133 | 1.9662 | 0.0057 |
| 134 | 1.9719 | 0.0057 |
| 135 | 1.9776 | 0.0057 |
| 136 | 1.9832 | 0.0056 |
| 137 | 1.9888 | 0.0056 |
| 138 | 1.9944 | 0.0056 |
| 139 | 2.0000 | 0.0056 |
| 140 | 2.0055 | 0.0055 |
| 141 | 2.0110 | 0.0055 |
| 142 | 2.0165 | 0.0055 |
| 143 | 2.0220 | 0.0055 |
| 144 | 2.0275 | 0.0054 |
| 145 | 2.0329 | 0.0054 |
| 146 | 2.0383 | 0.0054 |
| 147 | 2.0437 | 0.0054 |
| 148 | 2.0490 | 0.0054 |
| 149 | 2.0543 | 0.0053 |
| 150 | 2.0597 | 0.0053 |
| 151 | 2.0649 | 0.0053 |
| 152 | 2.0702 | 0.0053 |
| 153 | 2.0755 | 0.0052 |
| 154 | 2.0807 | 0.0052 |
| 155 | 2.0859 | 0.0052 |
| 156 | 2.0911 | 0.0052 |
| 157 | 2.0962 | 0.0052 |
| 158 | 2.1014 | 0.0051 |
| 159 | 2.1065 | 0.0051 |
| 160 | 2.1116 | 0.0051 |
| 161 | 2.1167 | 0.0051 |
| 162 | 2.1217 | 0.0051 |
| 163 | 2.1268 | 0.0050 |
| 164 | 2.1318 | 0.0050 |
| 165 | 2.1368 | 0.0050 |
| 166 | 2.1418 | 0.0050 |
| 167 | 2.1468 | 0.0050 |
| 168 | 2.1517 | 0.0050 |
| 169 | 2.1567 | 0.0049 |
| 170 | 2.1616 | 0.0049 |
| 171 | 2.1665 | 0.0049 |
| 172 | 2.1714 | 0.0049 |
| 173 | 2.1762 | 0.0049 |
| 174 | 2.1811 | 0.0048 |

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|-----|--------|--------|
| 175 | 2.1859 | 0.0048 |
| 176 | 2.1907 | 0.0048 |
| 177 | 2.1955 | 0.0048 |
| 178 | 2.2003 | 0.0048 |
| 179 | 2.2051 | 0.0048 |
| 180 | 2.2098 | 0.0047 |
| 181 | 2.2145 | 0.0047 |
| 182 | 2.2192 | 0.0047 |
| 183 | 2.2239 | 0.0047 |
| 184 | 2.2286 | 0.0047 |
| 185 | 2.2333 | 0.0047 |
| 186 | 2.2379 | 0.0047 |
| 187 | 2.2426 | 0.0046 |
| 188 | 2.2472 | 0.0046 |
| 189 | 2.2518 | 0.0046 |
| 190 | 2.2564 | 0.0046 |
| 191 | 2.2610 | 0.0046 |
| 192 | 2.2655 | 0.0046 |
| 193 | 2.2701 | 0.0045 |
| 194 | 2.2746 | 0.0045 |
| 195 | 2.2791 | 0.0045 |
| 196 | 2.2836 | 0.0045 |
| 197 | 2.2881 | 0.0045 |
| 198 | 2.2926 | 0.0045 |
| 199 | 2.2971 | 0.0045 |
| 200 | 2.3015 | 0.0044 |
| 201 | 2.3059 | 0.0044 |
| 202 | 2.3104 | 0.0044 |
| 203 | 2.3148 | 0.0044 |
| 204 | 2.3192 | 0.0044 |
| 205 | 2.3236 | 0.0044 |
| 206 | 2.3279 | 0.0044 |
| 207 | 2.3323 | 0.0044 |
| 208 | 2.3366 | 0.0043 |
| 209 | 2.3409 | 0.0043 |
| 210 | 2.3453 | 0.0043 |
| 211 | 2.3496 | 0.0043 |
| 212 | 2.3539 | 0.0043 |
| 213 | 2.3581 | 0.0043 |
| 214 | 2.3624 | 0.0043 |
| 215 | 2.3667 | 0.0043 |
| 216 | 2.3709 | 0.0042 |
| 217 | 2.3751 | 0.0042 |
| 218 | 2.3793 | 0.0042 |
| 219 | 2.3836 | 0.0042 |
| 220 | 2.3878 | 0.0042 |
| 221 | 2.3919 | 0.0042 |
| 222 | 2.3961 | 0.0042 |
| 223 | 2.4003 | 0.0042 |
| 224 | 2.4044 | 0.0041 |
| 225 | 2.4086 | 0.0041 |
| 226 | 2.4127 | 0.0041 |
| 227 | 2.4168 | 0.0041 |
| 228 | 2.4209 | 0.0041 |
| 229 | 2.4250 | 0.0041 |
| 230 | 2.4291 | 0.0041 |
| 231 | 2.4331 | 0.0041 |
| 232 | 2.4372 | 0.0041 |
| 233 | 2.4412 | 0.0040 |
| 234 | 2.4453 | 0.0040 |
| 235 | 2.4493 | 0.0040 |
| 236 | 2.4533 | 0.0040 |
| 237 | 2.4573 | 0.0040 |
| 238 | 2.4613 | 0.0040 |
| 239 | 2.4653 | 0.0040 |
| 240 | 2.4693 | 0.0040 |
| 241 | 2.4733 | 0.0040 |
| 242 | 2.4772 | 0.0040 |
| 243 | 2.4812 | 0.0039 |
| 244 | 2.4851 | 0.0039 |
| 245 | 2.4890 | 0.0039 |
| 246 | 2.4929 | 0.0039 |
| 247 | 2.4968 | 0.0039 |
| 248 | 2.5007 | 0.0039 |
| 249 | 2.5046 | 0.0039 |
| 250 | 2.5085 | 0.0039 |
| 251 | 2.5124 | 0.0039 |
| 252 | 2.5162 | 0.0039 |
| 253 | 2.5201 | 0.0038 |
| 254 | 2.5239 | 0.0038 |
| 255 | 2.5278 | 0.0038 |

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|-----|--------|--------|
| 256 | 2.5316 | 0.0038 |
| 257 | 2.5354 | 0.0038 |
| 258 | 2.5392 | 0.0038 |
| 259 | 2.5430 | 0.0038 |
| 260 | 2.5468 | 0.0038 |
| 261 | 2.5505 | 0.0038 |
| 262 | 2.5543 | 0.0038 |
| 263 | 2.5581 | 0.0038 |
| 264 | 2.5618 | 0.0037 |
| 265 | 2.5656 | 0.0037 |
| 266 | 2.5693 | 0.0037 |
| 267 | 2.5730 | 0.0037 |
| 268 | 2.5767 | 0.0037 |
| 269 | 2.5804 | 0.0037 |
| 270 | 2.5841 | 0.0037 |
| 271 | 2.5878 | 0.0037 |
| 272 | 2.5915 | 0.0037 |
| 273 | 2.5952 | 0.0037 |
| 274 | 2.5988 | 0.0037 |
| 275 | 2.6025 | 0.0037 |
| 276 | 2.6062 | 0.0036 |
| 277 | 2.6098 | 0.0036 |
| 278 | 2.6134 | 0.0036 |
| 279 | 2.6170 | 0.0036 |
| 280 | 2.6207 | 0.0036 |
| 281 | 2.6243 | 0.0036 |
| 282 | 2.6279 | 0.0036 |
| 283 | 2.6315 | 0.0036 |
| 284 | 2.6351 | 0.0036 |
| 285 | 2.6386 | 0.0036 |
| 286 | 2.6422 | 0.0036 |
| 287 | 2.6458 | 0.0036 |
| 288 | 2.6493 | 0.0036 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0036                   | 0.0024                    | 0.0011                        |
| 2                          | 0.0036                   | 0.0024                    | 0.0011                        |
| 3                          | 0.0036                   | 0.0024                    | 0.0011                        |
| 4                          | 0.0036                   | 0.0025                    | 0.0011                        |
| 5                          | 0.0036                   | 0.0025                    | 0.0011                        |
| 6                          | 0.0036                   | 0.0025                    | 0.0011                        |
| 7                          | 0.0036                   | 0.0025                    | 0.0011                        |
| 8                          | 0.0036                   | 0.0025                    | 0.0011                        |
| 9                          | 0.0036                   | 0.0025                    | 0.0012                        |
| 10                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 11                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 12                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 13                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 14                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 15                         | 0.0037                   | 0.0025                    | 0.0012                        |
| 16                         | 0.0037                   | 0.0026                    | 0.0012                        |
| 17                         | 0.0037                   | 0.0026                    | 0.0012                        |
| 18                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 19                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 20                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 21                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 22                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 23                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 24                         | 0.0038                   | 0.0026                    | 0.0012                        |
| 25                         | 0.0039                   | 0.0026                    | 0.0012                        |
| 26                         | 0.0039                   | 0.0026                    | 0.0012                        |
| 27                         | 0.0039                   | 0.0027                    | 0.0012                        |
| 28                         | 0.0039                   | 0.0027                    | 0.0012                        |
| 29                         | 0.0039                   | 0.0027                    | 0.0012                        |
| 30                         | 0.0039                   | 0.0027                    | 0.0012                        |
| 31                         | 0.0039                   | 0.0027                    | 0.0012                        |
| 32                         | 0.0040                   | 0.0027                    | 0.0012                        |
| 33                         | 0.0040                   | 0.0027                    | 0.0013                        |
| 34                         | 0.0040                   | 0.0027                    | 0.0013                        |
| 35                         | 0.0040                   | 0.0027                    | 0.0013                        |
| 36                         | 0.0040                   | 0.0028                    | 0.0013                        |
| 37                         | 0.0040                   | 0.0028                    | 0.0013                        |
| 38                         | 0.0040                   | 0.0028                    | 0.0013                        |
| 39                         | 0.0041                   | 0.0028                    | 0.0013                        |
| 40                         | 0.0041                   | 0.0028                    | 0.0013                        |
| 41                         | 0.0041                   | 0.0028                    | 0.0013                        |
| 42                         | 0.0041                   | 0.0028                    | 0.0013                        |
| 43                         | 0.0041                   | 0.0028                    | 0.0013                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 44  | 0.0041 | 0.0028 | 0.0013 |
| 45  | 0.0042 | 0.0029 | 0.0013 |
| 46  | 0.0042 | 0.0029 | 0.0013 |
| 47  | 0.0042 | 0.0029 | 0.0013 |
| 48  | 0.0042 | 0.0029 | 0.0013 |
| 49  | 0.0042 | 0.0029 | 0.0013 |
| 50  | 0.0043 | 0.0029 | 0.0013 |
| 51  | 0.0043 | 0.0029 | 0.0013 |
| 52  | 0.0043 | 0.0029 | 0.0014 |
| 53  | 0.0043 | 0.0030 | 0.0014 |
| 54  | 0.0043 | 0.0030 | 0.0014 |
| 55  | 0.0044 | 0.0030 | 0.0014 |
| 56  | 0.0044 | 0.0030 | 0.0014 |
| 57  | 0.0044 | 0.0030 | 0.0014 |
| 58  | 0.0044 | 0.0030 | 0.0014 |
| 59  | 0.0044 | 0.0030 | 0.0014 |
| 60  | 0.0044 | 0.0030 | 0.0014 |
| 61  | 0.0045 | 0.0031 | 0.0014 |
| 62  | 0.0045 | 0.0031 | 0.0014 |
| 63  | 0.0045 | 0.0031 | 0.0014 |
| 64  | 0.0045 | 0.0031 | 0.0014 |
| 65  | 0.0046 | 0.0031 | 0.0014 |
| 66  | 0.0046 | 0.0031 | 0.0014 |
| 67  | 0.0046 | 0.0032 | 0.0015 |
| 68  | 0.0046 | 0.0032 | 0.0015 |
| 69  | 0.0047 | 0.0032 | 0.0015 |
| 70  | 0.0047 | 0.0032 | 0.0015 |
| 71  | 0.0047 | 0.0032 | 0.0015 |
| 72  | 0.0047 | 0.0032 | 0.0015 |
| 73  | 0.0047 | 0.0032 | 0.0015 |
| 74  | 0.0048 | 0.0033 | 0.0015 |
| 75  | 0.0048 | 0.0033 | 0.0015 |
| 76  | 0.0048 | 0.0033 | 0.0015 |
| 77  | 0.0048 | 0.0033 | 0.0015 |
| 78  | 0.0049 | 0.0033 | 0.0015 |
| 79  | 0.0049 | 0.0034 | 0.0015 |
| 80  | 0.0049 | 0.0034 | 0.0016 |
| 81  | 0.0050 | 0.0034 | 0.0016 |
| 82  | 0.0050 | 0.0034 | 0.0016 |
| 83  | 0.0050 | 0.0034 | 0.0016 |
| 84  | 0.0050 | 0.0034 | 0.0016 |
| 85  | 0.0051 | 0.0035 | 0.0016 |
| 86  | 0.0051 | 0.0035 | 0.0016 |
| 87  | 0.0051 | 0.0035 | 0.0016 |
| 88  | 0.0051 | 0.0035 | 0.0016 |
| 89  | 0.0052 | 0.0035 | 0.0016 |
| 90  | 0.0052 | 0.0036 | 0.0016 |
| 91  | 0.0052 | 0.0036 | 0.0017 |
| 92  | 0.0053 | 0.0036 | 0.0017 |
| 93  | 0.0053 | 0.0036 | 0.0017 |
| 94  | 0.0053 | 0.0037 | 0.0017 |
| 95  | 0.0054 | 0.0037 | 0.0017 |
| 96  | 0.0054 | 0.0037 | 0.0017 |
| 97  | 0.0054 | 0.0037 | 0.0017 |
| 98  | 0.0055 | 0.0037 | 0.0017 |
| 99  | 0.0055 | 0.0038 | 0.0017 |
| 100 | 0.0055 | 0.0038 | 0.0017 |
| 101 | 0.0056 | 0.0038 | 0.0018 |
| 102 | 0.0056 | 0.0038 | 0.0018 |
| 103 | 0.0057 | 0.0039 | 0.0018 |
| 104 | 0.0057 | 0.0039 | 0.0018 |
| 105 | 0.0057 | 0.0039 | 0.0018 |
| 106 | 0.0058 | 0.0040 | 0.0018 |
| 107 | 0.0058 | 0.0040 | 0.0018 |
| 108 | 0.0059 | 0.0040 | 0.0018 |
| 109 | 0.0059 | 0.0040 | 0.0019 |
| 110 | 0.0059 | 0.0041 | 0.0019 |
| 111 | 0.0060 | 0.0041 | 0.0019 |
| 112 | 0.0060 | 0.0041 | 0.0019 |
| 113 | 0.0061 | 0.0042 | 0.0019 |
| 114 | 0.0061 | 0.0042 | 0.0019 |
| 115 | 0.0062 | 0.0042 | 0.0020 |
| 116 | 0.0062 | 0.0043 | 0.0020 |
| 117 | 0.0063 | 0.0043 | 0.0020 |
| 118 | 0.0063 | 0.0043 | 0.0020 |
| 119 | 0.0064 | 0.0044 | 0.0020 |
| 120 | 0.0064 | 0.0044 | 0.0020 |
| 121 | 0.0065 | 0.0045 | 0.0021 |
| 122 | 0.0065 | 0.0045 | 0.0021 |
| 123 | 0.0066 | 0.0045 | 0.0021 |
| 124 | 0.0067 | 0.0046 | 0.0021 |

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|-----|--------|--------|--------|
| 125 | 0.0067 | 0.0046 | 0.0021 |
| 126 | 0.0068 | 0.0046 | 0.0021 |
| 127 | 0.0069 | 0.0047 | 0.0022 |
| 128 | 0.0069 | 0.0047 | 0.0022 |
| 129 | 0.0070 | 0.0048 | 0.0022 |
| 130 | 0.0070 | 0.0048 | 0.0022 |
| 131 | 0.0071 | 0.0049 | 0.0022 |
| 132 | 0.0072 | 0.0049 | 0.0023 |
| 133 | 0.0073 | 0.0050 | 0.0023 |
| 134 | 0.0073 | 0.0050 | 0.0023 |
| 135 | 0.0074 | 0.0051 | 0.0023 |
| 136 | 0.0075 | 0.0051 | 0.0024 |
| 137 | 0.0076 | 0.0052 | 0.0024 |
| 138 | 0.0077 | 0.0052 | 0.0024 |
| 139 | 0.0078 | 0.0053 | 0.0024 |
| 140 | 0.0078 | 0.0054 | 0.0025 |
| 141 | 0.0079 | 0.0054 | 0.0025 |
| 142 | 0.0080 | 0.0055 | 0.0025 |
| 143 | 0.0081 | 0.0056 | 0.0026 |
| 144 | 0.0082 | 0.0056 | 0.0026 |
| 145 | 0.0082 | 0.0056 | 0.0026 |
| 146 | 0.0083 | 0.0057 | 0.0026 |
| 147 | 0.0084 | 0.0058 | 0.0027 |
| 148 | 0.0085 | 0.0058 | 0.0027 |
| 149 | 0.0087 | 0.0059 | 0.0027 |
| 150 | 0.0088 | 0.0060 | 0.0028 |
| 151 | 0.0089 | 0.0061 | 0.0028 |
| 152 | 0.0090 | 0.0062 | 0.0028 |
| 153 | 0.0092 | 0.0063 | 0.0029 |
| 154 | 0.0093 | 0.0064 | 0.0029 |
| 155 | 0.0095 | 0.0065 | 0.0030 |
| 156 | 0.0096 | 0.0066 | 0.0030 |
| 157 | 0.0098 | 0.0067 | 0.0031 |
| 158 | 0.0099 | 0.0068 | 0.0031 |
| 159 | 0.0102 | 0.0070 | 0.0032 |
| 160 | 0.0103 | 0.0071 | 0.0033 |
| 161 | 0.0106 | 0.0072 | 0.0033 |
| 162 | 0.0107 | 0.0073 | 0.0034 |
| 163 | 0.0110 | 0.0075 | 0.0035 |
| 164 | 0.0112 | 0.0077 | 0.0035 |
| 165 | 0.0115 | 0.0079 | 0.0036 |
| 166 | 0.0117 | 0.0080 | 0.0037 |
| 167 | 0.0121 | 0.0083 | 0.0038 |
| 168 | 0.0123 | 0.0084 | 0.0039 |
| 169 | 0.0127 | 0.0087 | 0.0040 |
| 170 | 0.0129 | 0.0088 | 0.0041 |
| 171 | 0.0134 | 0.0092 | 0.0042 |
| 172 | 0.0137 | 0.0094 | 0.0043 |
| 173 | 0.0142 | 0.0098 | 0.0045 |
| 174 | 0.0146 | 0.0100 | 0.0046 |
| 175 | 0.0152 | 0.0104 | 0.0048 |
| 176 | 0.0156 | 0.0107 | 0.0049 |
| 177 | 0.0164 | 0.0112 | 0.0052 |
| 178 | 0.0168 | 0.0115 | 0.0053 |
| 179 | 0.0179 | 0.0122 | 0.0056 |
| 180 | 0.0184 | 0.0126 | 0.0058 |
| 181 | 0.0197 | 0.0135 | 0.0062 |
| 182 | 0.0204 | 0.0140 | 0.0064 |
| 183 | 0.0221 | 0.0151 | 0.0070 |
| 184 | 0.0231 | 0.0158 | 0.0073 |
| 185 | 0.0202 | 0.0139 | 0.0064 |
| 186 | 0.0216 | 0.0148 | 0.0068 |
| 187 | 0.0250 | 0.0171 | 0.0079 |
| 188 | 0.0273 | 0.0187 | 0.0086 |
| 189 | 0.0340 | 0.0233 | 0.0107 |
| 190 | 0.0391 | 0.0268 | 0.0123 |
| 191 | 0.0594 | 0.0350 | 0.0244 |
| 192 | 0.0862 | 0.0350 | 0.0512 |
| 193 | 0.3729 | 0.0350 | 0.3378 |
| 194 | 0.0467 | 0.0320 | 0.0147 |
| 195 | 0.0302 | 0.0207 | 0.0095 |
| 196 | 0.0231 | 0.0158 | 0.0073 |
| 197 | 0.0243 | 0.0166 | 0.0077 |
| 198 | 0.0212 | 0.0145 | 0.0067 |
| 199 | 0.0190 | 0.0130 | 0.0060 |
| 200 | 0.0173 | 0.0119 | 0.0055 |
| 201 | 0.0160 | 0.0109 | 0.0050 |
| 202 | 0.0149 | 0.0102 | 0.0047 |
| 203 | 0.0140 | 0.0096 | 0.0044 |
| 204 | 0.0132 | 0.0090 | 0.0042 |
| 205 | 0.0125 | 0.0085 | 0.0039 |

|     |        |        |        |
|-----|--------|--------|--------|
| 206 | 0.0119 | 0.0081 | 0.0037 |
| 207 | 0.0113 | 0.0078 | 0.0036 |
| 208 | 0.0109 | 0.0074 | 0.0034 |
| 209 | 0.0104 | 0.0072 | 0.0033 |
| 210 | 0.0101 | 0.0069 | 0.0032 |
| 211 | 0.0097 | 0.0067 | 0.0031 |
| 212 | 0.0094 | 0.0064 | 0.0030 |
| 213 | 0.0091 | 0.0062 | 0.0029 |
| 214 | 0.0088 | 0.0061 | 0.0028 |
| 215 | 0.0086 | 0.0059 | 0.0027 |
| 216 | 0.0084 | 0.0057 | 0.0026 |
| 217 | 0.0083 | 0.0057 | 0.0026 |
| 218 | 0.0081 | 0.0055 | 0.0025 |
| 219 | 0.0079 | 0.0054 | 0.0025 |
| 220 | 0.0077 | 0.0053 | 0.0024 |
| 221 | 0.0075 | 0.0052 | 0.0024 |
| 222 | 0.0074 | 0.0051 | 0.0023 |
| 223 | 0.0072 | 0.0049 | 0.0023 |
| 224 | 0.0071 | 0.0048 | 0.0022 |
| 225 | 0.0069 | 0.0048 | 0.0022 |
| 226 | 0.0068 | 0.0047 | 0.0022 |
| 227 | 0.0067 | 0.0046 | 0.0021 |
| 228 | 0.0066 | 0.0045 | 0.0021 |
| 229 | 0.0065 | 0.0044 | 0.0020 |
| 230 | 0.0064 | 0.0044 | 0.0020 |
| 231 | 0.0063 | 0.0043 | 0.0020 |
| 232 | 0.0062 | 0.0042 | 0.0019 |
| 233 | 0.0061 | 0.0042 | 0.0019 |
| 234 | 0.0060 | 0.0041 | 0.0019 |
| 235 | 0.0059 | 0.0040 | 0.0019 |
| 236 | 0.0058 | 0.0040 | 0.0018 |
| 237 | 0.0057 | 0.0039 | 0.0018 |
| 238 | 0.0056 | 0.0039 | 0.0018 |
| 239 | 0.0056 | 0.0038 | 0.0018 |
| 240 | 0.0055 | 0.0038 | 0.0017 |
| 241 | 0.0054 | 0.0037 | 0.0017 |
| 242 | 0.0054 | 0.0037 | 0.0017 |
| 243 | 0.0053 | 0.0036 | 0.0017 |
| 244 | 0.0052 | 0.0036 | 0.0016 |
| 245 | 0.0052 | 0.0035 | 0.0016 |
| 246 | 0.0051 | 0.0035 | 0.0016 |
| 247 | 0.0050 | 0.0035 | 0.0016 |
| 248 | 0.0050 | 0.0034 | 0.0016 |
| 249 | 0.0049 | 0.0034 | 0.0016 |
| 250 | 0.0049 | 0.0033 | 0.0015 |
| 251 | 0.0048 | 0.0033 | 0.0015 |
| 252 | 0.0048 | 0.0033 | 0.0015 |
| 253 | 0.0047 | 0.0032 | 0.0015 |
| 254 | 0.0047 | 0.0032 | 0.0015 |
| 255 | 0.0046 | 0.0032 | 0.0015 |
| 256 | 0.0046 | 0.0031 | 0.0014 |
| 257 | 0.0045 | 0.0031 | 0.0014 |
| 258 | 0.0045 | 0.0031 | 0.0014 |
| 259 | 0.0045 | 0.0031 | 0.0014 |
| 260 | 0.0044 | 0.0030 | 0.0014 |
| 261 | 0.0044 | 0.0030 | 0.0014 |
| 262 | 0.0043 | 0.0030 | 0.0014 |
| 263 | 0.0043 | 0.0029 | 0.0014 |
| 264 | 0.0043 | 0.0029 | 0.0013 |
| 265 | 0.0042 | 0.0029 | 0.0013 |
| 266 | 0.0042 | 0.0029 | 0.0013 |
| 267 | 0.0042 | 0.0028 | 0.0013 |
| 268 | 0.0041 | 0.0028 | 0.0013 |
| 269 | 0.0041 | 0.0028 | 0.0013 |
| 270 | 0.0041 | 0.0028 | 0.0013 |
| 271 | 0.0040 | 0.0028 | 0.0013 |
| 272 | 0.0040 | 0.0027 | 0.0013 |
| 273 | 0.0040 | 0.0027 | 0.0013 |
| 274 | 0.0039 | 0.0027 | 0.0012 |
| 275 | 0.0039 | 0.0027 | 0.0012 |
| 276 | 0.0039 | 0.0027 | 0.0012 |
| 277 | 0.0038 | 0.0026 | 0.0012 |
| 278 | 0.0038 | 0.0026 | 0.0012 |
| 279 | 0.0038 | 0.0026 | 0.0012 |
| 280 | 0.0038 | 0.0026 | 0.0012 |
| 281 | 0.0037 | 0.0026 | 0.0012 |
| 282 | 0.0037 | 0.0025 | 0.0012 |
| 283 | 0.0037 | 0.0025 | 0.0012 |
| 284 | 0.0037 | 0.0025 | 0.0012 |
| 285 | 0.0036 | 0.0025 | 0.0011 |
| 286 | 0.0036 | 0.0025 | 0.0011 |

|     |        |        |        |
|-----|--------|--------|--------|
| 287 | 0.0036 | 0.0025 | 0.0011 |
| 288 | 0.0036 | 0.0024 | 0.0011 |

Total soil rain loss = 1.56(In)  
 Total effective rainfall = 1.09(In)  
 Peak flow rate in flood hydrograph = (CFS)

++++++  
 24 - H O U R S T O R M  
 R u n o f f H y d r o g r a p h  
 -----  
 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|-----------|--------|-------|--------|---|-----|------|------|------|
| 0+ 5      | 0.0000 | 0.00  | Q      |   |     |      |      |      |
| 0+10      | 0.0001 | 0.01  | Q      |   |     |      |      |      |
| 0+15      | 0.0004 | 0.04  | Q      |   |     |      |      |      |
| 0+20      | 0.0010 | 0.09  | Q      |   |     |      |      |      |
| 0+25      | 0.0019 | 0.13  | Q      |   |     |      |      |      |
| 0+30      | 0.0029 | 0.15  | Q      |   |     |      |      |      |
| 0+35      | 0.0041 | 0.17  | Q      |   |     |      |      |      |
| 0+40      | 0.0053 | 0.18  | Q      |   |     |      |      |      |
| 0+45      | 0.0066 | 0.19  | Q      |   |     |      |      |      |
| 0+50      | 0.0080 | 0.20  | Q      |   |     |      |      |      |
| 0+55      | 0.0094 | 0.20  | Q      |   |     |      |      |      |
| 1+ 0      | 0.0108 | 0.21  | Q      |   |     |      |      |      |
| 1+ 5      | 0.0123 | 0.22  | Q      |   |     |      |      |      |
| 1+10      | 0.0138 | 0.22  | Q      |   |     |      |      |      |
| 1+15      | 0.0154 | 0.22  | Q      |   |     |      |      |      |
| 1+20      | 0.0170 | 0.23  | Q      |   |     |      |      |      |
| 1+25      | 0.0186 | 0.23  | Q      |   |     |      |      |      |
| 1+30      | 0.0202 | 0.23  | Q      |   |     |      |      |      |
| 1+35      | 0.0218 | 0.24  | Q      |   |     |      |      |      |
| 1+40      | 0.0235 | 0.24  | Q      |   |     |      |      |      |
| 1+45      | 0.0251 | 0.24  | Q      |   |     |      |      |      |
| 1+50      | 0.0268 | 0.24  | Q      |   |     |      |      |      |
| 1+55      | 0.0285 | 0.25  | Q      |   |     |      |      |      |
| 2+ 0      | 0.0302 | 0.25  | Q      |   |     |      |      |      |
| 2+ 5      | 0.0319 | 0.25  | Q      |   |     |      |      |      |
| 2+10      | 0.0337 | 0.25  | Q      |   |     |      |      |      |
| 2+15      | 0.0354 | 0.25  | Q      |   |     |      |      |      |
| 2+20      | 0.0372 | 0.25  | Q      |   |     |      |      |      |
| 2+25      | 0.0389 | 0.26  | Q      |   |     |      |      |      |
| 2+30      | 0.0407 | 0.26  | QV     |   |     |      |      |      |
| 2+35      | 0.0425 | 0.26  | QV     |   |     |      |      |      |
| 2+40      | 0.0443 | 0.26  | QV     |   |     |      |      |      |
| 2+45      | 0.0461 | 0.26  | QV     |   |     |      |      |      |
| 2+50      | 0.0479 | 0.26  | QV     |   |     |      |      |      |
| 2+55      | 0.0497 | 0.26  | QV     |   |     |      |      |      |
| 3+ 0      | 0.0515 | 0.26  | QV     |   |     |      |      |      |
| 3+ 5      | 0.0534 | 0.27  | QV     |   |     |      |      |      |
| 3+10      | 0.0552 | 0.27  | QV     |   |     |      |      |      |
| 3+15      | 0.0570 | 0.27  | QV     |   |     |      |      |      |
| 3+20      | 0.0589 | 0.27  | QV     |   |     |      |      |      |
| 3+25      | 0.0607 | 0.27  | QV     |   |     |      |      |      |
| 3+30      | 0.0626 | 0.27  | QV     |   |     |      |      |      |
| 3+35      | 0.0645 | 0.27  | QV     |   |     |      |      |      |
| 3+40      | 0.0664 | 0.27  | QV     |   |     |      |      |      |
| 3+45      | 0.0683 | 0.27  | QV     |   |     |      |      |      |
| 3+50      | 0.0702 | 0.28  | QV     |   |     |      |      |      |
| 3+55      | 0.0721 | 0.28  | QV     |   |     |      |      |      |
| 4+ 0      | 0.0740 | 0.28  | QV     |   |     |      |      |      |
| 4+ 5      | 0.0759 | 0.28  | QV     |   |     |      |      |      |
| 4+10      | 0.0778 | 0.28  | QV     |   |     |      |      |      |
| 4+15      | 0.0797 | 0.28  | QV     |   |     |      |      |      |
| 4+20      | 0.0817 | 0.28  | Q V    |   |     |      |      |      |
| 4+25      | 0.0836 | 0.28  | Q V    |   |     |      |      |      |
| 4+30      | 0.0856 | 0.28  | Q V    |   |     |      |      |      |
| 4+35      | 0.0876 | 0.29  | Q V    |   |     |      |      |      |
| 4+40      | 0.0895 | 0.29  | Q V    |   |     |      |      |      |
| 4+45      | 0.0915 | 0.29  | Q V    |   |     |      |      |      |
| 4+50      | 0.0935 | 0.29  | Q V    |   |     |      |      |      |
| 4+55      | 0.0955 | 0.29  | Q V    |   |     |      |      |      |
| 5+ 0      | 0.0975 | 0.29  | Q V    |   |     |      |      |      |
| 5+ 5      | 0.0996 | 0.29  | Q V    |   |     |      |      |      |
| 5+10      | 0.1016 | 0.29  | Q V    |   |     |      |      |      |
| 5+15      | 0.1036 | 0.30  | Q V    |   |     |      |      |      |
| 5+20      | 0.1057 | 0.30  | Q V    |   |     |      |      |      |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 5+25  | 0.1077 | 0.30 | Q | V |  |  |  |  |
| 5+30  | 0.1098 | 0.30 | Q | V |  |  |  |  |
| 5+35  | 0.1119 | 0.30 | Q | V |  |  |  |  |
| 5+40  | 0.1140 | 0.30 | Q | V |  |  |  |  |
| 5+45  | 0.1160 | 0.30 | Q | V |  |  |  |  |
| 5+50  | 0.1182 | 0.31 | Q | V |  |  |  |  |
| 5+55  | 0.1203 | 0.31 | Q | V |  |  |  |  |
| 6+ 0  | 0.1224 | 0.31 | Q | V |  |  |  |  |
| 6+ 5  | 0.1245 | 0.31 | Q | V |  |  |  |  |
| 6+10  | 0.1267 | 0.31 | Q | V |  |  |  |  |
| 6+15  | 0.1288 | 0.31 | Q | V |  |  |  |  |
| 6+20  | 0.1310 | 0.31 | Q | V |  |  |  |  |
| 6+25  | 0.1332 | 0.32 | Q | V |  |  |  |  |
| 6+30  | 0.1354 | 0.32 | Q | V |  |  |  |  |
| 6+35  | 0.1376 | 0.32 | Q | V |  |  |  |  |
| 6+40  | 0.1398 | 0.32 | Q | V |  |  |  |  |
| 6+45  | 0.1420 | 0.32 | Q | V |  |  |  |  |
| 6+50  | 0.1442 | 0.32 | Q | V |  |  |  |  |
| 6+55  | 0.1465 | 0.33 | Q | V |  |  |  |  |
| 7+ 0  | 0.1488 | 0.33 | Q | V |  |  |  |  |
| 7+ 5  | 0.1510 | 0.33 | Q | V |  |  |  |  |
| 7+10  | 0.1533 | 0.33 | Q | V |  |  |  |  |
| 7+15  | 0.1556 | 0.33 | Q | V |  |  |  |  |
| 7+20  | 0.1579 | 0.34 | Q | V |  |  |  |  |
| 7+25  | 0.1602 | 0.34 | Q | V |  |  |  |  |
| 7+30  | 0.1626 | 0.34 | Q | V |  |  |  |  |
| 7+35  | 0.1649 | 0.34 | Q | V |  |  |  |  |
| 7+40  | 0.1673 | 0.34 | Q | V |  |  |  |  |
| 7+45  | 0.1697 | 0.34 | Q | V |  |  |  |  |
| 7+50  | 0.1720 | 0.35 | Q | V |  |  |  |  |
| 7+55  | 0.1744 | 0.35 | Q | V |  |  |  |  |
| 8+ 0  | 0.1769 | 0.35 | Q | V |  |  |  |  |
| 8+ 5  | 0.1793 | 0.35 | Q | V |  |  |  |  |
| 8+10  | 0.1817 | 0.36 | Q | V |  |  |  |  |
| 8+15  | 0.1842 | 0.36 | Q | V |  |  |  |  |
| 8+20  | 0.1867 | 0.36 | Q | V |  |  |  |  |
| 8+25  | 0.1892 | 0.36 | Q | V |  |  |  |  |
| 8+30  | 0.1917 | 0.36 | Q | V |  |  |  |  |
| 8+35  | 0.1942 | 0.37 | Q | V |  |  |  |  |
| 8+40  | 0.1968 | 0.37 | Q | V |  |  |  |  |
| 8+45  | 0.1993 | 0.37 | Q | V |  |  |  |  |
| 8+50  | 0.2019 | 0.37 | Q | V |  |  |  |  |
| 8+55  | 0.2045 | 0.38 | Q | V |  |  |  |  |
| 9+ 0  | 0.2071 | 0.38 | Q | V |  |  |  |  |
| 9+ 5  | 0.2097 | 0.38 | Q | V |  |  |  |  |
| 9+10  | 0.2124 | 0.38 | Q | V |  |  |  |  |
| 9+15  | 0.2150 | 0.39 | Q | V |  |  |  |  |
| 9+20  | 0.2177 | 0.39 | Q | V |  |  |  |  |
| 9+25  | 0.2204 | 0.39 | Q | V |  |  |  |  |
| 9+30  | 0.2231 | 0.40 | Q | V |  |  |  |  |
| 9+35  | 0.2259 | 0.40 | Q | V |  |  |  |  |
| 9+40  | 0.2286 | 0.40 | Q | V |  |  |  |  |
| 9+45  | 0.2314 | 0.40 | Q | V |  |  |  |  |
| 9+50  | 0.2342 | 0.41 | Q | V |  |  |  |  |
| 9+55  | 0.2371 | 0.41 | Q | V |  |  |  |  |
| 10+ 0 | 0.2399 | 0.41 | Q | V |  |  |  |  |
| 10+ 5 | 0.2428 | 0.42 | Q | V |  |  |  |  |
| 10+10 | 0.2457 | 0.42 | Q | V |  |  |  |  |
| 10+15 | 0.2486 | 0.42 | Q | V |  |  |  |  |
| 10+20 | 0.2515 | 0.43 | Q | V |  |  |  |  |
| 10+25 | 0.2545 | 0.43 | Q | V |  |  |  |  |
| 10+30 | 0.2575 | 0.43 | Q | V |  |  |  |  |
| 10+35 | 0.2605 | 0.44 | Q | V |  |  |  |  |
| 10+40 | 0.2635 | 0.44 | Q | V |  |  |  |  |
| 10+45 | 0.2666 | 0.45 | Q | V |  |  |  |  |
| 10+50 | 0.2697 | 0.45 | Q | V |  |  |  |  |
| 10+55 | 0.2728 | 0.45 | Q | V |  |  |  |  |
| 11+ 0 | 0.2760 | 0.46 | Q | V |  |  |  |  |
| 11+ 5 | 0.2792 | 0.46 | Q | V |  |  |  |  |
| 11+10 | 0.2824 | 0.47 | Q | V |  |  |  |  |
| 11+15 | 0.2856 | 0.47 | Q | V |  |  |  |  |
| 11+20 | 0.2889 | 0.48 | Q | V |  |  |  |  |
| 11+25 | 0.2922 | 0.48 | Q | V |  |  |  |  |
| 11+30 | 0.2955 | 0.49 | Q | V |  |  |  |  |
| 11+35 | 0.2989 | 0.49 | Q | V |  |  |  |  |
| 11+40 | 0.3023 | 0.50 | Q | V |  |  |  |  |
| 11+45 | 0.3058 | 0.50 | Q | V |  |  |  |  |
| 11+50 | 0.3092 | 0.51 | Q | V |  |  |  |  |
| 11+55 | 0.3128 | 0.51 | Q | V |  |  |  |  |
| 12+ 0 | 0.3163 | 0.52 | Q | V |  |  |  |  |
| 12+ 5 | 0.3199 | 0.52 | Q | V |  |  |  |  |

|       |        |       |   |   |  |  |  |  |
|-------|--------|-------|---|---|--|--|--|--|
| 12+10 | 0.3236 | 0.53  | Q | V |  |  |  |  |
| 12+15 | 0.3273 | 0.53  | Q | V |  |  |  |  |
| 12+20 | 0.3310 | 0.54  | Q | V |  |  |  |  |
| 12+25 | 0.3347 | 0.54  | Q | V |  |  |  |  |
| 12+30 | 0.3385 | 0.55  | Q | V |  |  |  |  |
| 12+35 | 0.3423 | 0.56  | Q | V |  |  |  |  |
| 12+40 | 0.3462 | 0.56  | Q | V |  |  |  |  |
| 12+45 | 0.3501 | 0.57  | Q | V |  |  |  |  |
| 12+50 | 0.3541 | 0.58  | Q | V |  |  |  |  |
| 12+55 | 0.3581 | 0.59  | Q | V |  |  |  |  |
| 13+ 0 | 0.3622 | 0.59  | Q | V |  |  |  |  |
| 13+ 5 | 0.3664 | 0.60  | Q | V |  |  |  |  |
| 13+10 | 0.3706 | 0.61  | Q | V |  |  |  |  |
| 13+15 | 0.3749 | 0.62  | Q | V |  |  |  |  |
| 13+20 | 0.3792 | 0.63  | Q | V |  |  |  |  |
| 13+25 | 0.3837 | 0.64  | Q | V |  |  |  |  |
| 13+30 | 0.3882 | 0.65  | Q | V |  |  |  |  |
| 13+35 | 0.3927 | 0.66  | Q | V |  |  |  |  |
| 13+40 | 0.3974 | 0.68  | Q | V |  |  |  |  |
| 13+45 | 0.4021 | 0.69  | Q | V |  |  |  |  |
| 13+50 | 0.4070 | 0.70  | Q | V |  |  |  |  |
| 13+55 | 0.4119 | 0.72  | Q | V |  |  |  |  |
| 14+ 0 | 0.4169 | 0.73  | Q | V |  |  |  |  |
| 14+ 5 | 0.4221 | 0.75  | Q | V |  |  |  |  |
| 14+10 | 0.4273 | 0.76  | Q | V |  |  |  |  |
| 14+15 | 0.4327 | 0.78  | Q | V |  |  |  |  |
| 14+20 | 0.4382 | 0.80  | Q | V |  |  |  |  |
| 14+25 | 0.4438 | 0.82  | Q | V |  |  |  |  |
| 14+30 | 0.4496 | 0.84  | Q | V |  |  |  |  |
| 14+35 | 0.4555 | 0.86  | Q | V |  |  |  |  |
| 14+40 | 0.4617 | 0.89  | Q | V |  |  |  |  |
| 14+45 | 0.4679 | 0.91  | Q | V |  |  |  |  |
| 14+50 | 0.4744 | 0.94  | Q | V |  |  |  |  |
| 14+55 | 0.4811 | 0.97  | Q | V |  |  |  |  |
| 15+ 0 | 0.4881 | 1.01  | Q | V |  |  |  |  |
| 15+ 5 | 0.4953 | 1.04  | Q | V |  |  |  |  |
| 15+10 | 0.5027 | 1.09  | Q | V |  |  |  |  |
| 15+15 | 0.5105 | 1.13  | Q | V |  |  |  |  |
| 15+20 | 0.5187 | 1.18  | Q | V |  |  |  |  |
| 15+25 | 0.5272 | 1.24  | Q | V |  |  |  |  |
| 15+30 | 0.5361 | 1.29  | Q | V |  |  |  |  |
| 15+35 | 0.5453 | 1.33  | Q | V |  |  |  |  |
| 15+40 | 0.5546 | 1.35  | Q | V |  |  |  |  |
| 15+45 | 0.5643 | 1.40  | Q | V |  |  |  |  |
| 15+50 | 0.5747 | 1.51  | Q | V |  |  |  |  |
| 15+55 | 0.5863 | 1.69  | Q | V |  |  |  |  |
| 16+ 0 | 0.6005 | 2.07  | Q | V |  |  |  |  |
| 16+ 5 | 0.6250 | 3.55  | Q | V |  |  |  |  |
| 16+10 | 0.6719 | 6.82  | Q | V |  |  |  |  |
| 16+15 | 0.7533 | 11.81 | Q | V |  |  |  |  |
| 16+20 | 0.8782 |       | Q | V |  |  |  |  |
| 16+25 | 0.9758 | 14.17 | Q | V |  |  |  |  |
| 16+30 | 1.0421 | 9.62  | Q | V |  |  |  |  |
| 16+35 | 1.0910 | 7.10  | Q | V |  |  |  |  |
| 16+40 | 1.1308 | 5.78  | Q | V |  |  |  |  |
| 16+45 | 1.1642 | 4.84  | Q | V |  |  |  |  |
| 16+50 | 1.1923 | 4.09  | Q | V |  |  |  |  |
| 16+55 | 1.2169 | 3.56  | Q | V |  |  |  |  |
| 17+ 0 | 1.2390 | 3.21  | Q | V |  |  |  |  |
| 17+ 5 | 1.2586 | 2.85  | Q | V |  |  |  |  |
| 17+10 | 1.2755 | 2.46  | Q | V |  |  |  |  |
| 17+15 | 1.2909 | 2.23  | Q | V |  |  |  |  |
| 17+20 | 1.3051 | 2.06  | Q | V |  |  |  |  |
| 17+25 | 1.3181 | 1.90  | Q | V |  |  |  |  |
| 17+30 | 1.3300 | 1.73  | Q | V |  |  |  |  |
| 17+35 | 1.3409 | 1.58  | Q | V |  |  |  |  |
| 17+40 | 1.3511 | 1.48  | Q | V |  |  |  |  |
| 17+45 | 1.3603 | 1.35  | Q | V |  |  |  |  |
| 17+50 | 1.3690 | 1.26  | Q | V |  |  |  |  |
| 17+55 | 1.3768 | 1.13  | Q | V |  |  |  |  |
| 18+ 0 | 1.3841 | 1.06  | Q | V |  |  |  |  |
| 18+ 5 | 1.3905 | 0.93  | Q | V |  |  |  |  |
| 18+10 | 1.3967 | 0.90  | Q | V |  |  |  |  |
| 18+15 | 1.4029 | 0.90  | Q | V |  |  |  |  |
| 18+20 | 1.4090 | 0.89  | Q | V |  |  |  |  |
| 18+25 | 1.4150 | 0.86  | Q | V |  |  |  |  |
| 18+30 | 1.4207 | 0.84  | Q | V |  |  |  |  |
| 18+35 | 1.4259 | 0.75  | Q | V |  |  |  |  |
| 18+40 | 1.4307 | 0.70  | Q | V |  |  |  |  |
| 18+45 | 1.4354 | 0.68  | Q | V |  |  |  |  |
| 18+50 | 1.4397 | 0.62  | Q | V |  |  |  |  |

|       |        |      |   |  |  |  |   |  |
|-------|--------|------|---|--|--|--|---|--|
| 18+55 | 1.4433 | 0.53 | Q |  |  |  | V |  |
| 19+ 0 | 1.4469 | 0.52 | Q |  |  |  | V |  |
| 19+ 5 | 1.4504 | 0.51 | Q |  |  |  | V |  |
| 19+10 | 1.4538 | 0.49 | Q |  |  |  | V |  |
| 19+15 | 1.4571 | 0.48 | Q |  |  |  | V |  |
| 19+20 | 1.4604 | 0.47 | Q |  |  |  | V |  |
| 19+25 | 1.4636 | 0.46 | Q |  |  |  | V |  |
| 19+30 | 1.4667 | 0.45 | Q |  |  |  | V |  |
| 19+35 | 1.4698 | 0.45 | Q |  |  |  | V |  |
| 19+40 | 1.4728 | 0.44 | Q |  |  |  | V |  |
| 19+45 | 1.4758 | 0.43 | Q |  |  |  | V |  |
| 19+50 | 1.4787 | 0.42 | Q |  |  |  | V |  |
| 19+55 | 1.4816 | 0.42 | Q |  |  |  | V |  |
| 20+ 0 | 1.4844 | 0.41 | Q |  |  |  | V |  |
| 20+ 5 | 1.4872 | 0.40 | Q |  |  |  | V |  |
| 20+10 | 1.4899 | 0.40 | Q |  |  |  | V |  |
| 20+15 | 1.4926 | 0.39 | Q |  |  |  | V |  |
| 20+20 | 1.4952 | 0.39 | Q |  |  |  | V |  |
| 20+25 | 1.4979 | 0.38 | Q |  |  |  | V |  |
| 20+30 | 1.5004 | 0.38 | Q |  |  |  | V |  |
| 20+35 | 1.5030 | 0.37 | Q |  |  |  | V |  |
| 20+40 | 1.5055 | 0.37 | Q |  |  |  | V |  |
| 20+45 | 1.5080 | 0.36 | Q |  |  |  | V |  |
| 20+50 | 1.5105 | 0.36 | Q |  |  |  | V |  |
| 20+55 | 1.5129 | 0.35 | Q |  |  |  | V |  |
| 21+ 0 | 1.5153 | 0.35 | Q |  |  |  | V |  |
| 21+ 5 | 1.5176 | 0.34 | Q |  |  |  | V |  |
| 21+10 | 1.5200 | 0.34 | Q |  |  |  | V |  |
| 21+15 | 1.5223 | 0.34 | Q |  |  |  | V |  |
| 21+20 | 1.5246 | 0.33 | Q |  |  |  | V |  |
| 21+25 | 1.5268 | 0.33 | Q |  |  |  | V |  |
| 21+30 | 1.5291 | 0.33 | Q |  |  |  | V |  |
| 21+35 | 1.5313 | 0.32 | Q |  |  |  | V |  |
| 21+40 | 1.5335 | 0.32 | Q |  |  |  | V |  |
| 21+45 | 1.5357 | 0.32 | Q |  |  |  | V |  |
| 21+50 | 1.5378 | 0.31 | Q |  |  |  | V |  |
| 21+55 | 1.5399 | 0.31 | Q |  |  |  | V |  |
| 22+ 0 | 1.5421 | 0.31 | Q |  |  |  | V |  |
| 22+ 5 | 1.5441 | 0.30 | Q |  |  |  | V |  |
| 22+10 | 1.5462 | 0.30 | Q |  |  |  | V |  |
| 22+15 | 1.5483 | 0.30 | Q |  |  |  | V |  |
| 22+20 | 1.5503 | 0.29 | Q |  |  |  | V |  |
| 22+25 | 1.5523 | 0.29 | Q |  |  |  | V |  |
| 22+30 | 1.5543 | 0.29 | Q |  |  |  | V |  |
| 22+35 | 1.5563 | 0.29 | Q |  |  |  | V |  |
| 22+40 | 1.5582 | 0.28 | Q |  |  |  | V |  |
| 22+45 | 1.5602 | 0.28 | Q |  |  |  | V |  |
| 22+50 | 1.5621 | 0.28 | Q |  |  |  | V |  |
| 22+55 | 1.5640 | 0.28 | Q |  |  |  | V |  |
| 23+ 0 | 1.5659 | 0.28 | Q |  |  |  | V |  |
| 23+ 5 | 1.5678 | 0.27 | Q |  |  |  | V |  |
| 23+10 | 1.5697 | 0.27 | Q |  |  |  | V |  |
| 23+15 | 1.5715 | 0.27 | Q |  |  |  | V |  |
| 23+20 | 1.5733 | 0.27 | Q |  |  |  | V |  |
| 23+25 | 1.5752 | 0.26 | Q |  |  |  | V |  |
| 23+30 | 1.5770 | 0.26 | Q |  |  |  | V |  |
| 23+35 | 1.5788 | 0.26 | Q |  |  |  | V |  |
| 23+40 | 1.5806 | 0.26 | Q |  |  |  | V |  |
| 23+45 | 1.5823 | 0.26 | Q |  |  |  | V |  |
| 23+50 | 1.5841 | 0.26 | Q |  |  |  | V |  |
| 23+55 | 1.5858 | 0.25 | Q |  |  |  | V |  |
| 24+ 0 | 1.5876 | 0.25 | Q |  |  |  | V |  |
| 24+ 5 | 1.5893 | 0.25 | Q |  |  |  | V |  |
| 24+10 | 1.5909 | 0.23 | Q |  |  |  | V |  |
| 24+15 | 1.5923 | 0.21 | Q |  |  |  | V |  |
| 24+20 | 1.5934 | 0.16 | Q |  |  |  | V |  |
| 24+25 | 1.5942 | 0.12 | Q |  |  |  | V |  |
| 24+30 | 1.5948 | 0.09 | Q |  |  |  | V |  |
| 24+35 | 1.5954 | 0.08 | Q |  |  |  | V |  |
| 24+40 | 1.5958 | 0.06 | Q |  |  |  | V |  |
| 24+45 | 1.5962 | 0.05 | Q |  |  |  | V |  |
| 24+50 | 1.5965 | 0.05 | Q |  |  |  | V |  |
| 24+55 | 1.5968 | 0.04 | Q |  |  |  | V |  |
| 25+ 0 | 1.5970 | 0.03 | Q |  |  |  | V |  |
| 25+ 5 | 1.5972 | 0.03 | Q |  |  |  | V |  |
| 25+10 | 1.5974 | 0.03 | Q |  |  |  | V |  |
| 25+15 | 1.5976 | 0.02 | Q |  |  |  | V |  |
| 25+20 | 1.5977 | 0.02 | Q |  |  |  | V |  |
| 25+25 | 1.5978 | 0.02 | Q |  |  |  | V |  |
| 25+30 | 1.5979 | 0.01 | Q |  |  |  | V |  |
| 25+35 | 1.5980 | 0.01 | Q |  |  |  | V |  |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 25+40 | 1.5981 | 0.01 | Q |  |  |  | V |
| 25+45 | 1.5981 | 0.01 | Q |  |  |  | V |
| 25+50 | 1.5982 | 0.01 | Q |  |  |  | V |
| 25+55 | 1.5982 | 0.01 | Q |  |  |  | V |
| 26+ 0 | 1.5983 | 0.01 | Q |  |  |  | V |
| 26+ 5 | 1.5983 | 0.00 | Q |  |  |  | V |
| 26+10 | 1.5983 | 0.00 | Q |  |  |  | V |
| 26+15 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+20 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+25 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+30 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+35 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+40 | 1.5984 | 0.00 | Q |  |  |  | V |
| 26+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
EXISTING CONDITION - ON-SITE  
100-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year =

Antecedent Moisture Condition =

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

+++++

\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 1.000        | 0.420         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.420

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 17.68         | 1.000         | 77.0             | 77.0             | 2.99 | 0.398                |

Area-averaged catchment yield fraction, Y = 0.398

Area-averaged low loss fraction, Yb = 0.602

User entry of time of concentration = 0.444 (hours)

+++++

watershed area = 17.68(Ac.)

Catchment Lag time = 0.355 hours

Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 23.4610  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.420(In/Hr)  
 Average low loss rate fraction (Yb) = 0.602 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.508(In)  
 Computed peak 30-minute rainfall = 0.869(In)  
 Specified peak 1-hour rainfall = 1.070(In)  
 Computed peak 3-hour rainfall = 1.565(In)  
 Specified peak 6-hour rainfall = 1.990(In)  
 Specified peak 24-hour rainfall = 3.390(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(AC.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.507(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.868(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 1.069(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 1.565(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.990(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 3.390(In) |

| Unit Hydrograph |                    |                 |
|-----------------|--------------------|-----------------|
| Interval        | 'S' Graph          | Unit Hydrograph |
| Number          | Mean values        | ((CFS))         |
| -----           |                    |                 |
|                 | (K = 213.82 (CFS)) |                 |
| 1               | 1.237              | 2.645           |
| 2               | 5.898              | 9.966           |
| 3               | 16.607             | 22.899          |
| 4               | 37.127             | 43.875          |
| 5               | 52.735             | 33.371          |
| 6               | 62.457             | 20.788          |
| 7               | 69.053             | 14.103          |
| 8               | 74.109             | 10.811          |
| 9               | 78.107             | 8.548           |
| 10              | 81.273             | 6.769           |
| 11              | 83.888             | 5.592           |
| 12              | 86.186             | 4.914           |
| 13              | 88.150             | 4.199           |
| 14              | 89.702             | 3.319           |
| 15              | 91.050             | 2.881           |
| 16              | 92.255             | 2.577           |
| 17              | 93.333             | 2.304           |
| 18              | 94.259             | 1.981           |
| 19              | 95.057             | 1.706           |
| 20              | 95.792             | 1.571           |
| 21              | 96.405             | 1.311           |
| 22              | 96.970             | 1.209           |
| 23              | 97.402             | 0.922           |
| 24              | 97.795             | 0.841           |
| 25              | 98.048             | 0.541           |
| 26              | 98.287             | 0.511           |
| 27              | 98.561             | 0.585           |
| 28              | 98.842             | 0.602           |
| 29              | 99.124             | 0.602           |
| 30              | 99.403             | 0.598           |
| 31              | 99.597             | 0.415           |
| 32              | 99.744             | 0.314           |
| 33              | 99.891             | 0.314           |
| 34              | 100.000            | 0.234           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.5073                 | 0.5073        |
| 2         | 0.6246                 | 0.1173        |
| 3         | 0.7054                 | 0.0808        |
| 4         | 0.7689                 | 0.0636        |
| 5         | 0.8222                 | 0.0532        |
| 6         | 0.8684                 | 0.0462        |
| 7         | 0.9095                 | 0.0411        |
| 8         | 0.9467                 | 0.0372        |
| 9         | 0.9807                 | 0.0340        |
| 10        | 1.0122                 | 0.0315        |
| 11        | 1.0416                 | 0.0294        |
| 12        | 1.0691                 | 0.0275        |

|    |        |        |
|----|--------|--------|
| 13 | 1.0992 | 0.0301 |
| 14 | 1.1278 | 0.0286 |
| 15 | 1.1552 | 0.0273 |
| 16 | 1.1813 | 0.0262 |
| 17 | 1.2064 | 0.0251 |
| 18 | 1.2306 | 0.0242 |
| 19 | 1.2539 | 0.0233 |
| 20 | 1.2764 | 0.0225 |
| 21 | 1.2982 | 0.0218 |
| 22 | 1.3193 | 0.0211 |
| 23 | 1.3398 | 0.0205 |
| 24 | 1.3598 | 0.0199 |
| 25 | 1.3792 | 0.0194 |
| 26 | 1.3981 | 0.0189 |
| 27 | 1.4165 | 0.0184 |
| 28 | 1.4345 | 0.0180 |
| 29 | 1.4521 | 0.0176 |
| 30 | 1.4692 | 0.0172 |
| 31 | 1.4860 | 0.0168 |
| 32 | 1.5025 | 0.0165 |
| 33 | 1.5186 | 0.0161 |
| 34 | 1.5344 | 0.0158 |
| 35 | 1.5500 | 0.0155 |
| 36 | 1.5652 | 0.0152 |
| 37 | 1.5801 | 0.0149 |
| 38 | 1.5948 | 0.0147 |
| 39 | 1.6092 | 0.0144 |
| 40 | 1.6233 | 0.0142 |
| 41 | 1.6373 | 0.0139 |
| 42 | 1.6510 | 0.0137 |
| 43 | 1.6645 | 0.0135 |
| 44 | 1.6778 | 0.0133 |
| 45 | 1.6909 | 0.0131 |
| 46 | 1.7039 | 0.0129 |
| 47 | 1.7166 | 0.0127 |
| 48 | 1.7292 | 0.0126 |
| 49 | 1.7416 | 0.0124 |
| 50 | 1.7538 | 0.0122 |
| 51 | 1.7659 | 0.0121 |
| 52 | 1.7778 | 0.0119 |
| 53 | 1.7895 | 0.0118 |
| 54 | 1.8012 | 0.0116 |
| 55 | 1.8127 | 0.0115 |
| 56 | 1.8240 | 0.0113 |
| 57 | 1.8352 | 0.0112 |
| 58 | 1.8463 | 0.0111 |
| 59 | 1.8573 | 0.0110 |
| 60 | 1.8681 | 0.0108 |
| 61 | 1.8788 | 0.0107 |
| 62 | 1.8895 | 0.0106 |
| 63 | 1.9000 | 0.0105 |
| 64 | 1.9103 | 0.0104 |
| 65 | 1.9206 | 0.0103 |
| 66 | 1.9308 | 0.0102 |
| 67 | 1.9409 | 0.0101 |
| 68 | 1.9509 | 0.0100 |
| 69 | 1.9608 | 0.0099 |
| 70 | 1.9706 | 0.0098 |
| 71 | 1.9803 | 0.0097 |
| 72 | 1.9899 | 0.0096 |
| 73 | 2.0005 | 0.0106 |
| 74 | 2.0110 | 0.0105 |
| 75 | 2.0214 | 0.0104 |
| 76 | 2.0317 | 0.0103 |
| 77 | 2.0419 | 0.0102 |
| 78 | 2.0520 | 0.0101 |
| 79 | 2.0621 | 0.0101 |
| 80 | 2.0721 | 0.0100 |
| 81 | 2.0820 | 0.0099 |
| 82 | 2.0919 | 0.0098 |
| 83 | 2.1016 | 0.0098 |
| 84 | 2.1113 | 0.0097 |
| 85 | 2.1210 | 0.0096 |
| 86 | 2.1305 | 0.0096 |
| 87 | 2.1400 | 0.0095 |
| 88 | 2.1494 | 0.0094 |
| 89 | 2.1588 | 0.0094 |
| 90 | 2.1681 | 0.0093 |
| 91 | 2.1773 | 0.0092 |
| 92 | 2.1864 | 0.0092 |
| 93 | 2.1955 | 0.0091 |

|     |        |        |
|-----|--------|--------|
| 94  | 2.2046 | 0.0090 |
| 95  | 2.2136 | 0.0090 |
| 96  | 2.2225 | 0.0089 |
| 97  | 2.2314 | 0.0089 |
| 98  | 2.2402 | 0.0088 |
| 99  | 2.2489 | 0.0088 |
| 100 | 2.2576 | 0.0087 |
| 101 | 2.2663 | 0.0086 |
| 102 | 2.2749 | 0.0086 |
| 103 | 2.2834 | 0.0085 |
| 104 | 2.2919 | 0.0085 |
| 105 | 2.3004 | 0.0084 |
| 106 | 2.3088 | 0.0084 |
| 107 | 2.3171 | 0.0083 |
| 108 | 2.3254 | 0.0083 |
| 109 | 2.3337 | 0.0083 |
| 110 | 2.3419 | 0.0082 |
| 111 | 2.3500 | 0.0082 |
| 112 | 2.3581 | 0.0081 |
| 113 | 2.3662 | 0.0081 |
| 114 | 2.3742 | 0.0080 |
| 115 | 2.3822 | 0.0080 |
| 116 | 2.3901 | 0.0079 |
| 117 | 2.3980 | 0.0079 |
| 118 | 2.4059 | 0.0079 |
| 119 | 2.4137 | 0.0078 |
| 120 | 2.4215 | 0.0078 |
| 121 | 2.4292 | 0.0077 |
| 122 | 2.4369 | 0.0077 |
| 123 | 2.4446 | 0.0077 |
| 124 | 2.4522 | 0.0076 |
| 125 | 2.4598 | 0.0076 |
| 126 | 2.4673 | 0.0075 |
| 127 | 2.4748 | 0.0075 |
| 128 | 2.4823 | 0.0075 |
| 129 | 2.4897 | 0.0074 |
| 130 | 2.4971 | 0.0074 |
| 131 | 2.5045 | 0.0074 |
| 132 | 2.5118 | 0.0073 |
| 133 | 2.5191 | 0.0073 |
| 134 | 2.5264 | 0.0073 |
| 135 | 2.5336 | 0.0072 |
| 136 | 2.5408 | 0.0072 |
| 137 | 2.5480 | 0.0072 |
| 138 | 2.5551 | 0.0071 |
| 139 | 2.5622 | 0.0071 |
| 140 | 2.5693 | 0.0071 |
| 141 | 2.5763 | 0.0070 |
| 142 | 2.5833 | 0.0070 |
| 143 | 2.5903 | 0.0070 |
| 144 | 2.5972 | 0.0069 |
| 145 | 2.6041 | 0.0069 |
| 146 | 2.6110 | 0.0069 |
| 147 | 2.6179 | 0.0069 |
| 148 | 2.6247 | 0.0068 |
| 149 | 2.6315 | 0.0068 |
| 150 | 2.6383 | 0.0068 |
| 151 | 2.6450 | 0.0067 |
| 152 | 2.6518 | 0.0067 |
| 153 | 2.6584 | 0.0067 |
| 154 | 2.6651 | 0.0067 |
| 155 | 2.6717 | 0.0066 |
| 156 | 2.6784 | 0.0066 |
| 157 | 2.6849 | 0.0066 |
| 158 | 2.6915 | 0.0066 |
| 159 | 2.6980 | 0.0065 |
| 160 | 2.7045 | 0.0065 |
| 161 | 2.7110 | 0.0065 |
| 162 | 2.7175 | 0.0065 |
| 163 | 2.7239 | 0.0064 |
| 164 | 2.7303 | 0.0064 |
| 165 | 2.7367 | 0.0064 |
| 166 | 2.7431 | 0.0064 |
| 167 | 2.7494 | 0.0063 |
| 168 | 2.7557 | 0.0063 |
| 169 | 2.7620 | 0.0063 |
| 170 | 2.7683 | 0.0063 |
| 171 | 2.7745 | 0.0062 |
| 172 | 2.7808 | 0.0062 |
| 173 | 2.7870 | 0.0062 |
| 174 | 2.7931 | 0.0062 |

|     |        |        |
|-----|--------|--------|
| 175 | 2.7993 | 0.0062 |
| 176 | 2.8054 | 0.0061 |
| 177 | 2.8115 | 0.0061 |
| 178 | 2.8176 | 0.0061 |
| 179 | 2.8237 | 0.0061 |
| 180 | 2.8298 | 0.0061 |
| 181 | 2.8358 | 0.0060 |
| 182 | 2.8418 | 0.0060 |
| 183 | 2.8478 | 0.0060 |
| 184 | 2.8538 | 0.0060 |
| 185 | 2.8597 | 0.0060 |
| 186 | 2.8656 | 0.0059 |
| 187 | 2.8716 | 0.0059 |
| 188 | 2.8774 | 0.0059 |
| 189 | 2.8833 | 0.0059 |
| 190 | 2.8892 | 0.0059 |
| 191 | 2.8950 | 0.0058 |
| 192 | 2.9008 | 0.0058 |
| 193 | 2.9066 | 0.0058 |
| 194 | 2.9124 | 0.0058 |
| 195 | 2.9182 | 0.0058 |
| 196 | 2.9239 | 0.0057 |
| 197 | 2.9296 | 0.0057 |
| 198 | 2.9353 | 0.0057 |
| 199 | 2.9410 | 0.0057 |
| 200 | 2.9467 | 0.0057 |
| 201 | 2.9523 | 0.0057 |
| 202 | 2.9580 | 0.0056 |
| 203 | 2.9636 | 0.0056 |
| 204 | 2.9692 | 0.0056 |
| 205 | 2.9748 | 0.0056 |
| 206 | 2.9804 | 0.0056 |
| 207 | 2.9859 | 0.0056 |
| 208 | 2.9914 | 0.0055 |
| 209 | 2.9970 | 0.0055 |
| 210 | 3.0025 | 0.0055 |
| 211 | 3.0079 | 0.0055 |
| 212 | 3.0134 | 0.0055 |
| 213 | 3.0189 | 0.0055 |
| 214 | 3.0243 | 0.0054 |
| 215 | 3.0297 | 0.0054 |
| 216 | 3.0351 | 0.0054 |
| 217 | 3.0405 | 0.0054 |
| 218 | 3.0459 | 0.0054 |
| 219 | 3.0513 | 0.0054 |
| 220 | 3.0566 | 0.0053 |
| 221 | 3.0619 | 0.0053 |
| 222 | 3.0673 | 0.0053 |
| 223 | 3.0726 | 0.0053 |
| 224 | 3.0779 | 0.0053 |
| 225 | 3.0831 | 0.0053 |
| 226 | 3.0884 | 0.0053 |
| 227 | 3.0936 | 0.0052 |
| 228 | 3.0989 | 0.0052 |
| 229 | 3.1041 | 0.0052 |
| 230 | 3.1093 | 0.0052 |
| 231 | 3.1145 | 0.0052 |
| 232 | 3.1196 | 0.0052 |
| 233 | 3.1248 | 0.0052 |
| 234 | 3.1299 | 0.0051 |
| 235 | 3.1351 | 0.0051 |
| 236 | 3.1402 | 0.0051 |
| 237 | 3.1453 | 0.0051 |
| 238 | 3.1504 | 0.0051 |
| 239 | 3.1555 | 0.0051 |
| 240 | 3.1605 | 0.0051 |
| 241 | 3.1656 | 0.0051 |
| 242 | 3.1706 | 0.0050 |
| 243 | 3.1757 | 0.0050 |
| 244 | 3.1807 | 0.0050 |
| 245 | 3.1857 | 0.0050 |
| 246 | 3.1907 | 0.0050 |
| 247 | 3.1957 | 0.0050 |
| 248 | 3.2006 | 0.0050 |
| 249 | 3.2056 | 0.0050 |
| 250 | 3.2105 | 0.0049 |
| 251 | 3.2154 | 0.0049 |
| 252 | 3.2204 | 0.0049 |
| 253 | 3.2253 | 0.0049 |
| 254 | 3.2302 | 0.0049 |
| 255 | 3.2350 | 0.0049 |

|     |        |        |
|-----|--------|--------|
| 256 | 3.2399 | 0.0049 |
| 257 | 3.2448 | 0.0049 |
| 258 | 3.2496 | 0.0048 |
| 259 | 3.2544 | 0.0048 |
| 260 | 3.2593 | 0.0048 |
| 261 | 3.2641 | 0.0048 |
| 262 | 3.2689 | 0.0048 |
| 263 | 3.2737 | 0.0048 |
| 264 | 3.2785 | 0.0048 |
| 265 | 3.2832 | 0.0048 |
| 266 | 3.2880 | 0.0048 |
| 267 | 3.2927 | 0.0047 |
| 268 | 3.2975 | 0.0047 |
| 269 | 3.3022 | 0.0047 |
| 270 | 3.3069 | 0.0047 |
| 271 | 3.3116 | 0.0047 |
| 272 | 3.3163 | 0.0047 |
| 273 | 3.3210 | 0.0047 |
| 274 | 3.3256 | 0.0047 |
| 275 | 3.3303 | 0.0047 |
| 276 | 3.3349 | 0.0046 |
| 277 | 3.3396 | 0.0046 |
| 278 | 3.3442 | 0.0046 |
| 279 | 3.3488 | 0.0046 |
| 280 | 3.3534 | 0.0046 |
| 281 | 3.3580 | 0.0046 |
| 282 | 3.3626 | 0.0046 |
| 283 | 3.3672 | 0.0046 |
| 284 | 3.3718 | 0.0046 |
| 285 | 3.3763 | 0.0046 |
| 286 | 3.3809 | 0.0045 |
| 287 | 3.3854 | 0.0045 |
| 288 | 3.3899 | 0.0045 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0045                   | 0.0027                    | 0.0018                        |
| 2                          | 0.0045                   | 0.0027                    | 0.0018                        |
| 3                          | 0.0046                   | 0.0027                    | 0.0018                        |
| 4                          | 0.0046                   | 0.0027                    | 0.0018                        |
| 5                          | 0.0046                   | 0.0028                    | 0.0018                        |
| 6                          | 0.0046                   | 0.0028                    | 0.0018                        |
| 7                          | 0.0046                   | 0.0028                    | 0.0018                        |
| 8                          | 0.0046                   | 0.0028                    | 0.0018                        |
| 9                          | 0.0046                   | 0.0028                    | 0.0019                        |
| 10                         | 0.0047                   | 0.0028                    | 0.0019                        |
| 11                         | 0.0047                   | 0.0028                    | 0.0019                        |
| 12                         | 0.0047                   | 0.0028                    | 0.0019                        |
| 13                         | 0.0047                   | 0.0028                    | 0.0019                        |
| 14                         | 0.0047                   | 0.0028                    | 0.0019                        |
| 15                         | 0.0047                   | 0.0029                    | 0.0019                        |
| 16                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 17                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 18                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 19                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 20                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 21                         | 0.0048                   | 0.0029                    | 0.0019                        |
| 22                         | 0.0049                   | 0.0029                    | 0.0019                        |
| 23                         | 0.0049                   | 0.0029                    | 0.0019                        |
| 24                         | 0.0049                   | 0.0029                    | 0.0019                        |
| 25                         | 0.0049                   | 0.0030                    | 0.0020                        |
| 26                         | 0.0049                   | 0.0030                    | 0.0020                        |
| 27                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 28                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 29                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 30                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 31                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 32                         | 0.0050                   | 0.0030                    | 0.0020                        |
| 33                         | 0.0051                   | 0.0031                    | 0.0020                        |
| 34                         | 0.0051                   | 0.0031                    | 0.0020                        |
| 35                         | 0.0051                   | 0.0031                    | 0.0020                        |
| 36                         | 0.0051                   | 0.0031                    | 0.0020                        |
| 37                         | 0.0051                   | 0.0031                    | 0.0020                        |
| 38                         | 0.0052                   | 0.0031                    | 0.0021                        |
| 39                         | 0.0052                   | 0.0031                    | 0.0021                        |
| 40                         | 0.0052                   | 0.0031                    | 0.0021                        |
| 41                         | 0.0052                   | 0.0031                    | 0.0021                        |
| 42                         | 0.0052                   | 0.0032                    | 0.0021                        |
| 43                         | 0.0053                   | 0.0032                    | 0.0021                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 44  | 0.0053 | 0.0032 | 0.0021 |
| 45  | 0.0053 | 0.0032 | 0.0021 |
| 46  | 0.0053 | 0.0032 | 0.0021 |
| 47  | 0.0054 | 0.0032 | 0.0021 |
| 48  | 0.0054 | 0.0032 | 0.0021 |
| 49  | 0.0054 | 0.0033 | 0.0022 |
| 50  | 0.0054 | 0.0033 | 0.0022 |
| 51  | 0.0055 | 0.0033 | 0.0022 |
| 52  | 0.0055 | 0.0033 | 0.0022 |
| 53  | 0.0055 | 0.0033 | 0.0022 |
| 54  | 0.0055 | 0.0033 | 0.0022 |
| 55  | 0.0056 | 0.0033 | 0.0022 |
| 56  | 0.0056 | 0.0034 | 0.0022 |
| 57  | 0.0056 | 0.0034 | 0.0022 |
| 58  | 0.0056 | 0.0034 | 0.0022 |
| 59  | 0.0057 | 0.0034 | 0.0023 |
| 60  | 0.0057 | 0.0034 | 0.0023 |
| 61  | 0.0057 | 0.0034 | 0.0023 |
| 62  | 0.0057 | 0.0034 | 0.0023 |
| 63  | 0.0058 | 0.0035 | 0.0023 |
| 64  | 0.0058 | 0.0035 | 0.0023 |
| 65  | 0.0058 | 0.0035 | 0.0023 |
| 66  | 0.0058 | 0.0035 | 0.0023 |
| 67  | 0.0059 | 0.0035 | 0.0023 |
| 68  | 0.0059 | 0.0035 | 0.0023 |
| 69  | 0.0059 | 0.0036 | 0.0024 |
| 70  | 0.0060 | 0.0036 | 0.0024 |
| 71  | 0.0060 | 0.0036 | 0.0024 |
| 72  | 0.0060 | 0.0036 | 0.0024 |
| 73  | 0.0061 | 0.0036 | 0.0024 |
| 74  | 0.0061 | 0.0037 | 0.0024 |
| 75  | 0.0061 | 0.0037 | 0.0024 |
| 76  | 0.0061 | 0.0037 | 0.0024 |
| 77  | 0.0062 | 0.0037 | 0.0025 |
| 78  | 0.0062 | 0.0037 | 0.0025 |
| 79  | 0.0062 | 0.0038 | 0.0025 |
| 80  | 0.0063 | 0.0038 | 0.0025 |
| 81  | 0.0063 | 0.0038 | 0.0025 |
| 82  | 0.0063 | 0.0038 | 0.0025 |
| 83  | 0.0064 | 0.0038 | 0.0025 |
| 84  | 0.0064 | 0.0039 | 0.0026 |
| 85  | 0.0065 | 0.0039 | 0.0026 |
| 86  | 0.0065 | 0.0039 | 0.0026 |
| 87  | 0.0065 | 0.0039 | 0.0026 |
| 88  | 0.0066 | 0.0039 | 0.0026 |
| 89  | 0.0066 | 0.0040 | 0.0026 |
| 90  | 0.0066 | 0.0040 | 0.0026 |
| 91  | 0.0067 | 0.0040 | 0.0027 |
| 92  | 0.0067 | 0.0040 | 0.0027 |
| 93  | 0.0068 | 0.0041 | 0.0027 |
| 94  | 0.0068 | 0.0041 | 0.0027 |
| 95  | 0.0069 | 0.0041 | 0.0027 |
| 96  | 0.0069 | 0.0041 | 0.0027 |
| 97  | 0.0069 | 0.0042 | 0.0028 |
| 98  | 0.0070 | 0.0042 | 0.0028 |
| 99  | 0.0070 | 0.0042 | 0.0028 |
| 100 | 0.0071 | 0.0043 | 0.0028 |
| 101 | 0.0071 | 0.0043 | 0.0028 |
| 102 | 0.0072 | 0.0043 | 0.0029 |
| 103 | 0.0072 | 0.0044 | 0.0029 |
| 104 | 0.0073 | 0.0044 | 0.0029 |
| 105 | 0.0073 | 0.0044 | 0.0029 |
| 106 | 0.0074 | 0.0044 | 0.0029 |
| 107 | 0.0074 | 0.0045 | 0.0030 |
| 108 | 0.0075 | 0.0045 | 0.0030 |
| 109 | 0.0075 | 0.0045 | 0.0030 |
| 110 | 0.0076 | 0.0046 | 0.0030 |
| 111 | 0.0077 | 0.0046 | 0.0030 |
| 112 | 0.0077 | 0.0046 | 0.0031 |
| 113 | 0.0078 | 0.0047 | 0.0031 |
| 114 | 0.0078 | 0.0047 | 0.0031 |
| 115 | 0.0079 | 0.0048 | 0.0031 |
| 116 | 0.0079 | 0.0048 | 0.0032 |
| 117 | 0.0080 | 0.0048 | 0.0032 |
| 118 | 0.0081 | 0.0049 | 0.0032 |
| 119 | 0.0082 | 0.0049 | 0.0032 |
| 120 | 0.0082 | 0.0049 | 0.0033 |
| 121 | 0.0083 | 0.0050 | 0.0033 |
| 122 | 0.0083 | 0.0050 | 0.0033 |
| 123 | 0.0084 | 0.0051 | 0.0034 |
| 124 | 0.0085 | 0.0051 | 0.0034 |

|     |        |        |        |
|-----|--------|--------|--------|
| 125 | 0.0086 | 0.0052 | 0.0034 |
| 126 | 0.0086 | 0.0052 | 0.0034 |
| 127 | 0.0088 | 0.0053 | 0.0035 |
| 128 | 0.0088 | 0.0053 | 0.0035 |
| 129 | 0.0089 | 0.0054 | 0.0036 |
| 130 | 0.0090 | 0.0054 | 0.0036 |
| 131 | 0.0091 | 0.0055 | 0.0036 |
| 132 | 0.0092 | 0.0055 | 0.0036 |
| 133 | 0.0093 | 0.0056 | 0.0037 |
| 134 | 0.0094 | 0.0056 | 0.0037 |
| 135 | 0.0095 | 0.0057 | 0.0038 |
| 136 | 0.0096 | 0.0058 | 0.0038 |
| 137 | 0.0097 | 0.0058 | 0.0039 |
| 138 | 0.0098 | 0.0059 | 0.0039 |
| 139 | 0.0099 | 0.0060 | 0.0039 |
| 140 | 0.0100 | 0.0060 | 0.0040 |
| 141 | 0.0101 | 0.0061 | 0.0040 |
| 142 | 0.0102 | 0.0062 | 0.0041 |
| 143 | 0.0104 | 0.0063 | 0.0041 |
| 144 | 0.0105 | 0.0063 | 0.0042 |
| 145 | 0.0096 | 0.0058 | 0.0038 |
| 146 | 0.0097 | 0.0058 | 0.0039 |
| 147 | 0.0099 | 0.0060 | 0.0039 |
| 148 | 0.0100 | 0.0060 | 0.0040 |
| 149 | 0.0102 | 0.0061 | 0.0041 |
| 150 | 0.0103 | 0.0062 | 0.0041 |
| 151 | 0.0105 | 0.0063 | 0.0042 |
| 152 | 0.0106 | 0.0064 | 0.0042 |
| 153 | 0.0108 | 0.0065 | 0.0043 |
| 154 | 0.0110 | 0.0066 | 0.0044 |
| 155 | 0.0112 | 0.0068 | 0.0045 |
| 156 | 0.0113 | 0.0068 | 0.0045 |
| 157 | 0.0116 | 0.0070 | 0.0046 |
| 158 | 0.0118 | 0.0071 | 0.0047 |
| 159 | 0.0121 | 0.0073 | 0.0048 |
| 160 | 0.0122 | 0.0074 | 0.0049 |
| 161 | 0.0126 | 0.0076 | 0.0050 |
| 162 | 0.0127 | 0.0077 | 0.0051 |
| 163 | 0.0131 | 0.0079 | 0.0052 |
| 164 | 0.0133 | 0.0080 | 0.0053 |
| 165 | 0.0137 | 0.0083 | 0.0055 |
| 166 | 0.0139 | 0.0084 | 0.0055 |
| 167 | 0.0144 | 0.0087 | 0.0057 |
| 168 | 0.0147 | 0.0088 | 0.0058 |
| 169 | 0.0152 | 0.0092 | 0.0061 |
| 170 | 0.0155 | 0.0093 | 0.0062 |
| 171 | 0.0161 | 0.0097 | 0.0064 |
| 172 | 0.0165 | 0.0099 | 0.0066 |
| 173 | 0.0172 | 0.0103 | 0.0068 |
| 174 | 0.0176 | 0.0106 | 0.0070 |
| 175 | 0.0184 | 0.0111 | 0.0073 |
| 176 | 0.0189 | 0.0114 | 0.0075 |
| 177 | 0.0199 | 0.0120 | 0.0079 |
| 178 | 0.0205 | 0.0123 | 0.0082 |
| 179 | 0.0218 | 0.0131 | 0.0087 |
| 180 | 0.0225 | 0.0136 | 0.0090 |
| 181 | 0.0242 | 0.0145 | 0.0096 |
| 182 | 0.0251 | 0.0151 | 0.0100 |
| 183 | 0.0273 | 0.0164 | 0.0109 |
| 184 | 0.0286 | 0.0172 | 0.0114 |
| 185 | 0.0275 | 0.0166 | 0.0110 |
| 186 | 0.0294 | 0.0177 | 0.0117 |
| 187 | 0.0340 | 0.0205 | 0.0136 |
| 188 | 0.0372 | 0.0224 | 0.0148 |
| 189 | 0.0462 | 0.0278 | 0.0184 |
| 190 | 0.0532 | 0.0320 | 0.0212 |
| 191 | 0.0808 | 0.0350 | 0.0458 |
| 192 | 0.1173 | 0.0350 | 0.0822 |
| 193 | 0.5073 | 0.0350 | 0.4723 |
| 194 | 0.0636 | 0.0350 | 0.0286 |
| 195 | 0.0411 | 0.0247 | 0.0164 |
| 196 | 0.0315 | 0.0190 | 0.0125 |
| 197 | 0.0301 | 0.0181 | 0.0120 |
| 198 | 0.0262 | 0.0157 | 0.0104 |
| 199 | 0.0233 | 0.0140 | 0.0093 |
| 200 | 0.0211 | 0.0127 | 0.0084 |
| 201 | 0.0194 | 0.0117 | 0.0077 |
| 202 | 0.0180 | 0.0108 | 0.0072 |
| 203 | 0.0168 | 0.0101 | 0.0067 |
| 204 | 0.0158 | 0.0095 | 0.0063 |
| 205 | 0.0149 | 0.0090 | 0.0059 |

|     |        |        |        |
|-----|--------|--------|--------|
| 206 | 0.0142 | 0.0085 | 0.0056 |
| 207 | 0.0135 | 0.0081 | 0.0054 |
| 208 | 0.0129 | 0.0078 | 0.0051 |
| 209 | 0.0124 | 0.0075 | 0.0049 |
| 210 | 0.0119 | 0.0072 | 0.0047 |
| 211 | 0.0115 | 0.0069 | 0.0046 |
| 212 | 0.0111 | 0.0067 | 0.0044 |
| 213 | 0.0107 | 0.0065 | 0.0043 |
| 214 | 0.0104 | 0.0063 | 0.0041 |
| 215 | 0.0101 | 0.0061 | 0.0040 |
| 216 | 0.0098 | 0.0059 | 0.0039 |
| 217 | 0.0106 | 0.0064 | 0.0042 |
| 218 | 0.0103 | 0.0062 | 0.0041 |
| 219 | 0.0101 | 0.0061 | 0.0040 |
| 220 | 0.0098 | 0.0059 | 0.0039 |
| 221 | 0.0096 | 0.0058 | 0.0038 |
| 222 | 0.0094 | 0.0057 | 0.0037 |
| 223 | 0.0092 | 0.0056 | 0.0037 |
| 224 | 0.0090 | 0.0054 | 0.0036 |
| 225 | 0.0089 | 0.0053 | 0.0035 |
| 226 | 0.0087 | 0.0052 | 0.0035 |
| 227 | 0.0085 | 0.0051 | 0.0034 |
| 228 | 0.0084 | 0.0051 | 0.0033 |
| 229 | 0.0083 | 0.0050 | 0.0033 |
| 230 | 0.0081 | 0.0049 | 0.0032 |
| 231 | 0.0080 | 0.0048 | 0.0032 |
| 232 | 0.0079 | 0.0047 | 0.0031 |
| 233 | 0.0077 | 0.0047 | 0.0031 |
| 234 | 0.0076 | 0.0046 | 0.0030 |
| 235 | 0.0075 | 0.0045 | 0.0030 |
| 236 | 0.0074 | 0.0045 | 0.0029 |
| 237 | 0.0073 | 0.0044 | 0.0029 |
| 238 | 0.0072 | 0.0043 | 0.0029 |
| 239 | 0.0071 | 0.0043 | 0.0028 |
| 240 | 0.0070 | 0.0042 | 0.0028 |
| 241 | 0.0069 | 0.0042 | 0.0028 |
| 242 | 0.0068 | 0.0041 | 0.0027 |
| 243 | 0.0067 | 0.0041 | 0.0027 |
| 244 | 0.0067 | 0.0040 | 0.0027 |
| 245 | 0.0066 | 0.0040 | 0.0026 |
| 246 | 0.0065 | 0.0039 | 0.0026 |
| 247 | 0.0064 | 0.0039 | 0.0026 |
| 248 | 0.0064 | 0.0038 | 0.0025 |
| 249 | 0.0063 | 0.0038 | 0.0025 |
| 250 | 0.0062 | 0.0037 | 0.0025 |
| 251 | 0.0062 | 0.0037 | 0.0025 |
| 252 | 0.0061 | 0.0037 | 0.0024 |
| 253 | 0.0060 | 0.0036 | 0.0024 |
| 254 | 0.0060 | 0.0036 | 0.0024 |
| 255 | 0.0059 | 0.0036 | 0.0024 |
| 256 | 0.0059 | 0.0035 | 0.0023 |
| 257 | 0.0058 | 0.0035 | 0.0023 |
| 258 | 0.0057 | 0.0035 | 0.0023 |
| 259 | 0.0057 | 0.0034 | 0.0023 |
| 260 | 0.0056 | 0.0034 | 0.0022 |
| 261 | 0.0056 | 0.0034 | 0.0022 |
| 262 | 0.0055 | 0.0033 | 0.0022 |
| 263 | 0.0055 | 0.0033 | 0.0022 |
| 264 | 0.0054 | 0.0033 | 0.0022 |
| 265 | 0.0054 | 0.0032 | 0.0021 |
| 266 | 0.0053 | 0.0032 | 0.0021 |
| 267 | 0.0053 | 0.0032 | 0.0021 |
| 268 | 0.0053 | 0.0032 | 0.0021 |
| 269 | 0.0052 | 0.0031 | 0.0021 |
| 270 | 0.0052 | 0.0031 | 0.0021 |
| 271 | 0.0051 | 0.0031 | 0.0020 |
| 272 | 0.0051 | 0.0031 | 0.0020 |
| 273 | 0.0051 | 0.0030 | 0.0020 |
| 274 | 0.0050 | 0.0030 | 0.0020 |
| 275 | 0.0050 | 0.0030 | 0.0020 |
| 276 | 0.0049 | 0.0030 | 0.0020 |
| 277 | 0.0049 | 0.0030 | 0.0020 |
| 278 | 0.0049 | 0.0029 | 0.0019 |
| 279 | 0.0048 | 0.0029 | 0.0019 |
| 280 | 0.0048 | 0.0029 | 0.0019 |
| 281 | 0.0048 | 0.0029 | 0.0019 |
| 282 | 0.0047 | 0.0028 | 0.0019 |
| 283 | 0.0047 | 0.0028 | 0.0019 |
| 284 | 0.0047 | 0.0028 | 0.0019 |
| 285 | 0.0046 | 0.0028 | 0.0018 |
| 286 | 0.0046 | 0.0028 | 0.0018 |

|     |        |        |        |
|-----|--------|--------|--------|
| 287 | 0.0046 | 0.0028 | 0.0018 |
| 288 | 0.0045 | 0.0027 | 0.0018 |

Total soil rain loss = 1.72(In)  
 Total effective rainfall = 1.67(In)  
 Peak flow rate in flood hydrograph = (CFS)

++++++  
 24 - H O U R S T O R M  
 R u n o f f H y d r o g r a p h  
 -----  
 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 7.5 | 15.0 | 22.5 | 30.0 |
|-----------|--------|-------|--------|---|-----|------|------|------|
| 0+ 5      | 0.0000 | 0.00  | Q      |   |     |      |      |      |
| 0+10      | 0.0002 | 0.02  | Q      |   |     |      |      |      |
| 0+15      | 0.0006 | 0.06  | Q      |   |     |      |      |      |
| 0+20      | 0.0016 | 0.14  | Q      |   |     |      |      |      |
| 0+25      | 0.0030 | 0.20  | Q      |   |     |      |      |      |
| 0+30      | 0.0047 | 0.24  | Q      |   |     |      |      |      |
| 0+35      | 0.0065 | 0.27  | Q      |   |     |      |      |      |
| 0+40      | 0.0085 | 0.29  | Q      |   |     |      |      |      |
| 0+45      | 0.0106 | 0.30  | Q      |   |     |      |      |      |
| 0+50      | 0.0128 | 0.32  | Q      |   |     |      |      |      |
| 0+55      | 0.0151 | 0.33  | Q      |   |     |      |      |      |
| 1+ 0      | 0.0174 | 0.34  | Q      |   |     |      |      |      |
| 1+ 5      | 0.0198 | 0.35  | Q      |   |     |      |      |      |
| 1+10      | 0.0223 | 0.35  | Q      |   |     |      |      |      |
| 1+15      | 0.0247 | 0.36  | Q      |   |     |      |      |      |
| 1+20      | 0.0273 | 0.37  | Q      |   |     |      |      |      |
| 1+25      | 0.0298 | 0.37  | Q      |   |     |      |      |      |
| 1+30      | 0.0324 | 0.38  | Q      |   |     |      |      |      |
| 1+35      | 0.0351 | 0.38  | Q      |   |     |      |      |      |
| 1+40      | 0.0377 | 0.39  | Q      |   |     |      |      |      |
| 1+45      | 0.0404 | 0.39  | Q      |   |     |      |      |      |
| 1+50      | 0.0431 | 0.39  | Q      |   |     |      |      |      |
| 1+55      | 0.0458 | 0.40  | Q      |   |     |      |      |      |
| 2+ 0      | 0.0486 | 0.40  | Q      |   |     |      |      |      |
| 2+ 5      | 0.0514 | 0.40  | Q      |   |     |      |      |      |
| 2+10      | 0.0541 | 0.40  | Q      |   |     |      |      |      |
| 2+15      | 0.0569 | 0.41  | Q      |   |     |      |      |      |
| 2+20      | 0.0598 | 0.41  | Q      |   |     |      |      |      |
| 2+25      | 0.0626 | 0.41  | QV     |   |     |      |      |      |
| 2+30      | 0.0654 | 0.41  | QV     |   |     |      |      |      |
| 2+35      | 0.0683 | 0.42  | QV     |   |     |      |      |      |
| 2+40      | 0.0712 | 0.42  | QV     |   |     |      |      |      |
| 2+45      | 0.0741 | 0.42  | QV     |   |     |      |      |      |
| 2+50      | 0.0770 | 0.42  | QV     |   |     |      |      |      |
| 2+55      | 0.0799 | 0.42  | QV     |   |     |      |      |      |
| 3+ 0      | 0.0829 | 0.43  | QV     |   |     |      |      |      |
| 3+ 5      | 0.0858 | 0.43  | QV     |   |     |      |      |      |
| 3+10      | 0.0888 | 0.43  | QV     |   |     |      |      |      |
| 3+15      | 0.0917 | 0.43  | QV     |   |     |      |      |      |
| 3+20      | 0.0947 | 0.43  | QV     |   |     |      |      |      |
| 3+25      | 0.0977 | 0.43  | QV     |   |     |      |      |      |
| 3+30      | 0.1007 | 0.44  | QV     |   |     |      |      |      |
| 3+35      | 0.1037 | 0.44  | QV     |   |     |      |      |      |
| 3+40      | 0.1067 | 0.44  | QV     |   |     |      |      |      |
| 3+45      | 0.1098 | 0.44  | QV     |   |     |      |      |      |
| 3+50      | 0.1128 | 0.44  | QV     |   |     |      |      |      |
| 3+55      | 0.1159 | 0.44  | QV     |   |     |      |      |      |
| 4+ 0      | 0.1189 | 0.45  | QV     |   |     |      |      |      |
| 4+ 5      | 0.1220 | 0.45  | QV     |   |     |      |      |      |
| 4+10      | 0.1251 | 0.45  | Q V    |   |     |      |      |      |
| 4+15      | 0.1282 | 0.45  | Q V    |   |     |      |      |      |
| 4+20      | 0.1314 | 0.45  | Q V    |   |     |      |      |      |
| 4+25      | 0.1345 | 0.46  | Q V    |   |     |      |      |      |
| 4+30      | 0.1377 | 0.46  | Q V    |   |     |      |      |      |
| 4+35      | 0.1408 | 0.46  | Q V    |   |     |      |      |      |
| 4+40      | 0.1440 | 0.46  | Q V    |   |     |      |      |      |
| 4+45      | 0.1472 | 0.46  | Q V    |   |     |      |      |      |
| 4+50      | 0.1504 | 0.47  | Q V    |   |     |      |      |      |
| 4+55      | 0.1536 | 0.47  | Q V    |   |     |      |      |      |
| 5+ 0      | 0.1569 | 0.47  | Q V    |   |     |      |      |      |
| 5+ 5      | 0.1601 | 0.47  | Q V    |   |     |      |      |      |
| 5+10      | 0.1634 | 0.47  | Q V    |   |     |      |      |      |
| 5+15      | 0.1667 | 0.48  | Q V    |   |     |      |      |      |
| 5+20      | 0.1699 | 0.48  | Q V    |   |     |      |      |      |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 5+25  | 0.1733 | 0.48 | Q | V |  |  |  |  |
| 5+30  | 0.1766 | 0.48 | Q | V |  |  |  |  |
| 5+35  | 0.1799 | 0.48 | Q | V |  |  |  |  |
| 5+40  | 0.1833 | 0.49 | Q | V |  |  |  |  |
| 5+45  | 0.1866 | 0.49 | Q | V |  |  |  |  |
| 5+50  | 0.1900 | 0.49 | Q | V |  |  |  |  |
| 5+55  | 0.1934 | 0.49 | Q | V |  |  |  |  |
| 6+ 0  | 0.1969 | 0.50 | Q | V |  |  |  |  |
| 6+ 5  | 0.2003 | 0.50 | Q | V |  |  |  |  |
| 6+10  | 0.2037 | 0.50 | Q | V |  |  |  |  |
| 6+15  | 0.2072 | 0.50 | Q | V |  |  |  |  |
| 6+20  | 0.2107 | 0.51 | Q | V |  |  |  |  |
| 6+25  | 0.2142 | 0.51 | Q | V |  |  |  |  |
| 6+30  | 0.2177 | 0.51 | Q | V |  |  |  |  |
| 6+35  | 0.2213 | 0.51 | Q | V |  |  |  |  |
| 6+40  | 0.2248 | 0.52 | Q | V |  |  |  |  |
| 6+45  | 0.2284 | 0.52 | Q | V |  |  |  |  |
| 6+50  | 0.2320 | 0.52 | Q | V |  |  |  |  |
| 6+55  | 0.2356 | 0.53 | Q | V |  |  |  |  |
| 7+ 0  | 0.2393 | 0.53 | Q | V |  |  |  |  |
| 7+ 5  | 0.2429 | 0.53 | Q | V |  |  |  |  |
| 7+10  | 0.2466 | 0.53 | Q | V |  |  |  |  |
| 7+15  | 0.2503 | 0.54 | Q | V |  |  |  |  |
| 7+20  | 0.2540 | 0.54 | Q | V |  |  |  |  |
| 7+25  | 0.2577 | 0.54 | Q | V |  |  |  |  |
| 7+30  | 0.2615 | 0.55 | Q | V |  |  |  |  |
| 7+35  | 0.2653 | 0.55 | Q | V |  |  |  |  |
| 7+40  | 0.2691 | 0.55 | Q | V |  |  |  |  |
| 7+45  | 0.2729 | 0.56 | Q | V |  |  |  |  |
| 7+50  | 0.2768 | 0.56 | Q | V |  |  |  |  |
| 7+55  | 0.2806 | 0.56 | Q | V |  |  |  |  |
| 8+ 0  | 0.2845 | 0.57 | Q | V |  |  |  |  |
| 8+ 5  | 0.2884 | 0.57 | Q | V |  |  |  |  |
| 8+10  | 0.2924 | 0.57 | Q | V |  |  |  |  |
| 8+15  | 0.2963 | 0.58 | Q | V |  |  |  |  |
| 8+20  | 0.3003 | 0.58 | Q | V |  |  |  |  |
| 8+25  | 0.3043 | 0.58 | Q | V |  |  |  |  |
| 8+30  | 0.3084 | 0.59 | Q | V |  |  |  |  |
| 8+35  | 0.3124 | 0.59 | Q | V |  |  |  |  |
| 8+40  | 0.3165 | 0.59 | Q | V |  |  |  |  |
| 8+45  | 0.3206 | 0.60 | Q | V |  |  |  |  |
| 8+50  | 0.3248 | 0.60 | Q | V |  |  |  |  |
| 8+55  | 0.3290 | 0.61 | Q | V |  |  |  |  |
| 9+ 0  | 0.3332 | 0.61 | Q | V |  |  |  |  |
| 9+ 5  | 0.3374 | 0.61 | Q | V |  |  |  |  |
| 9+10  | 0.3417 | 0.62 | Q | V |  |  |  |  |
| 9+15  | 0.3459 | 0.62 | Q | V |  |  |  |  |
| 9+20  | 0.3503 | 0.63 | Q | V |  |  |  |  |
| 9+25  | 0.3546 | 0.63 | Q | V |  |  |  |  |
| 9+30  | 0.3590 | 0.64 | Q | V |  |  |  |  |
| 9+35  | 0.3634 | 0.64 | Q | V |  |  |  |  |
| 9+40  | 0.3679 | 0.65 | Q | V |  |  |  |  |
| 9+45  | 0.3723 | 0.65 | Q | V |  |  |  |  |
| 9+50  | 0.3769 | 0.66 | Q | V |  |  |  |  |
| 9+55  | 0.3814 | 0.66 | Q | V |  |  |  |  |
| 10+ 0 | 0.3860 | 0.67 | Q | V |  |  |  |  |
| 10+ 5 | 0.3906 | 0.67 | Q | V |  |  |  |  |
| 10+10 | 0.3953 | 0.68 | Q | V |  |  |  |  |
| 10+15 | 0.4000 | 0.68 | Q | V |  |  |  |  |
| 10+20 | 0.4047 | 0.69 | Q | V |  |  |  |  |
| 10+25 | 0.4095 | 0.69 | Q | V |  |  |  |  |
| 10+30 | 0.4143 | 0.70 | Q | V |  |  |  |  |
| 10+35 | 0.4191 | 0.71 | Q | V |  |  |  |  |
| 10+40 | 0.4240 | 0.71 | Q | V |  |  |  |  |
| 10+45 | 0.4290 | 0.72 | Q | V |  |  |  |  |
| 10+50 | 0.4340 | 0.72 | Q | V |  |  |  |  |
| 10+55 | 0.4390 | 0.73 | Q | V |  |  |  |  |
| 11+ 0 | 0.4441 | 0.74 | Q | V |  |  |  |  |
| 11+ 5 | 0.4492 | 0.74 | Q | V |  |  |  |  |
| 11+10 | 0.4544 | 0.75 | Q | V |  |  |  |  |
| 11+15 | 0.4596 | 0.76 | Q | V |  |  |  |  |
| 11+20 | 0.4649 | 0.77 | Q | V |  |  |  |  |
| 11+25 | 0.4702 | 0.77 | Q | V |  |  |  |  |
| 11+30 | 0.4756 | 0.78 | Q | V |  |  |  |  |
| 11+35 | 0.4810 | 0.79 | Q | V |  |  |  |  |
| 11+40 | 0.4865 | 0.80 | Q | V |  |  |  |  |
| 11+45 | 0.4921 | 0.81 | Q | V |  |  |  |  |
| 11+50 | 0.4977 | 0.82 | Q | V |  |  |  |  |
| 11+55 | 0.5034 | 0.82 | Q | V |  |  |  |  |
| 12+ 0 | 0.5091 | 0.83 | Q | V |  |  |  |  |
| 12+ 5 | 0.5149 | 0.84 | Q | V |  |  |  |  |

|       |        |       |   |   |  |  |  |  |
|-------|--------|-------|---|---|--|--|--|--|
| 12+10 | 0.5207 | 0.85  | Q | V |  |  |  |  |
| 12+15 | 0.5266 | 0.85  | Q | V |  |  |  |  |
| 12+20 | 0.5324 | 0.84  | Q | V |  |  |  |  |
| 12+25 | 0.5381 | 0.84  | Q | V |  |  |  |  |
| 12+30 | 0.5439 | 0.84  | Q | V |  |  |  |  |
| 12+35 | 0.5497 | 0.84  | Q | V |  |  |  |  |
| 12+40 | 0.5556 | 0.85  | Q | V |  |  |  |  |
| 12+45 | 0.5615 | 0.86  | Q | V |  |  |  |  |
| 12+50 | 0.5675 | 0.87  | Q | V |  |  |  |  |
| 12+55 | 0.5736 | 0.88  | Q | V |  |  |  |  |
| 13+ 0 | 0.5797 | 0.89  | Q | V |  |  |  |  |
| 13+ 5 | 0.5859 | 0.90  | Q | V |  |  |  |  |
| 13+10 | 0.5923 | 0.92  | Q | V |  |  |  |  |
| 13+15 | 0.5987 | 0.93  | Q | V |  |  |  |  |
| 13+20 | 0.6052 | 0.95  | Q | V |  |  |  |  |
| 13+25 | 0.6118 | 0.96  | Q | V |  |  |  |  |
| 13+30 | 0.6185 | 0.98  | Q | V |  |  |  |  |
| 13+35 | 0.6254 | 0.99  | Q | V |  |  |  |  |
| 13+40 | 0.6324 | 1.01  | Q | V |  |  |  |  |
| 13+45 | 0.6395 | 1.03  | Q | V |  |  |  |  |
| 13+50 | 0.6467 | 1.05  | Q | V |  |  |  |  |
| 13+55 | 0.6541 | 1.07  | Q | V |  |  |  |  |
| 14+ 0 | 0.6617 | 1.10  | Q | V |  |  |  |  |
| 14+ 5 | 0.6694 | 1.12  | Q | V |  |  |  |  |
| 14+10 | 0.6773 | 1.15  | Q | V |  |  |  |  |
| 14+15 | 0.6854 | 1.18  | Q | V |  |  |  |  |
| 14+20 | 0.6937 | 1.21  | Q | V |  |  |  |  |
| 14+25 | 0.7022 | 1.24  | Q | V |  |  |  |  |
| 14+30 | 0.7110 | 1.27  | Q | V |  |  |  |  |
| 14+35 | 0.7200 | 1.31  | Q | V |  |  |  |  |
| 14+40 | 0.7292 | 1.35  | Q | V |  |  |  |  |
| 14+45 | 0.7388 | 1.39  | Q | V |  |  |  |  |
| 14+50 | 0.7487 | 1.43  | Q | V |  |  |  |  |
| 14+55 | 0.7589 | 1.48  | Q | V |  |  |  |  |
| 15+ 0 | 0.7695 | 1.54  | Q | V |  |  |  |  |
| 15+ 5 | 0.7805 | 1.60  | Q | V |  |  |  |  |
| 15+10 | 0.7919 | 1.67  | Q | V |  |  |  |  |
| 15+15 | 0.8039 | 1.74  | Q | V |  |  |  |  |
| 15+20 | 0.8165 | 1.82  | Q | V |  |  |  |  |
| 15+25 | 0.8297 | 1.92  | Q | V |  |  |  |  |
| 15+30 | 0.8435 | 2.01  | Q | V |  |  |  |  |
| 15+35 | 0.8580 | 2.10  | Q | V |  |  |  |  |
| 15+40 | 0.8730 | 2.18  | Q | V |  |  |  |  |
| 15+45 | 0.8890 | 2.31  | Q | V |  |  |  |  |
| 15+50 | 0.9063 | 2.51  | Q | V |  |  |  |  |
| 15+55 | 0.9259 | 2.84  | Q | V |  |  |  |  |
| 16+ 0 | 0.9501 | 3.52  | Q | V |  |  |  |  |
| 16+ 5 | 0.9900 | 5.79  | Q | V |  |  |  |  |
| 16+10 | 1.0633 | 10.65 | Q | V |  |  |  |  |
| 16+15 | 1.1852 | 17.70 | Q | V |  |  |  |  |
| 16+20 | 1.3668 |       | Q | V |  |  |  |  |
| 16+25 | 1.5099 | 20.79 | Q | V |  |  |  |  |
| 16+30 | 1.6085 | 14.31 | Q | V |  |  |  |  |
| 16+35 | 1.6819 | 10.65 | Q | V |  |  |  |  |
| 16+40 | 1.7417 | 8.68  | Q | V |  |  |  |  |
| 16+45 | 1.7918 | 7.28  | Q | V |  |  |  |  |
| 16+50 | 1.8342 | 6.16  | Q | V |  |  |  |  |
| 16+55 | 1.8712 | 5.37  | Q | V |  |  |  |  |
| 17+ 0 | 1.9044 | 4.82  | Q | V |  |  |  |  |
| 17+ 5 | 1.9338 | 4.28  | Q | V |  |  |  |  |
| 17+10 | 1.9594 | 3.71  | Q | V |  |  |  |  |
| 17+15 | 1.9826 | 3.36  | Q | V |  |  |  |  |
| 17+20 | 2.0039 | 3.09  | Q | V |  |  |  |  |
| 17+25 | 2.0235 | 2.85  | Q | V |  |  |  |  |
| 17+30 | 2.0413 | 2.59  | Q | V |  |  |  |  |
| 17+35 | 2.0577 | 2.37  | Q | V |  |  |  |  |
| 17+40 | 2.0729 | 2.22  | Q | V |  |  |  |  |
| 17+45 | 2.0869 | 2.02  | Q | V |  |  |  |  |
| 17+50 | 2.0999 | 1.89  | Q | V |  |  |  |  |
| 17+55 | 2.1115 | 1.69  | Q | V |  |  |  |  |
| 18+ 0 | 2.1224 | 1.58  | Q | V |  |  |  |  |
| 18+ 5 | 2.1321 | 1.40  | Q | V |  |  |  |  |
| 18+10 | 2.1414 | 1.35  | Q | V |  |  |  |  |
| 18+15 | 2.1507 | 1.36  | Q | V |  |  |  |  |
| 18+20 | 2.1600 | 1.35  | Q | V |  |  |  |  |
| 18+25 | 2.1691 | 1.32  | Q | V |  |  |  |  |
| 18+30 | 2.1779 | 1.28  | Q | V |  |  |  |  |
| 18+35 | 2.1859 | 1.17  | Q | V |  |  |  |  |
| 18+40 | 2.1934 | 1.09  | Q | V |  |  |  |  |
| 18+45 | 2.2007 | 1.05  | Q | V |  |  |  |  |
| 18+50 | 2.2074 | 0.98  | Q | V |  |  |  |  |

|       |        |      |   |  |  |  |   |  |
|-------|--------|------|---|--|--|--|---|--|
| 18+55 | 2.2133 | 0.85 | Q |  |  |  | V |  |
| 19+ 0 | 2.2189 | 0.83 | Q |  |  |  | V |  |
| 19+ 5 | 2.2245 | 0.81 | Q |  |  |  | V |  |
| 19+10 | 2.2299 | 0.79 | Q |  |  |  | V |  |
| 19+15 | 2.2352 | 0.77 | Q |  |  |  | V |  |
| 19+20 | 2.2404 | 0.76 | Q |  |  |  | V |  |
| 19+25 | 2.2455 | 0.74 | Q |  |  |  | V |  |
| 19+30 | 2.2506 | 0.73 | Q |  |  |  | V |  |
| 19+35 | 2.2555 | 0.71 | Q |  |  |  | V |  |
| 19+40 | 2.2603 | 0.70 | Q |  |  |  | V |  |
| 19+45 | 2.2651 | 0.69 | Q |  |  |  | V |  |
| 19+50 | 2.2697 | 0.68 | Q |  |  |  | V |  |
| 19+55 | 2.2743 | 0.67 | Q |  |  |  | V |  |
| 20+ 0 | 2.2789 | 0.66 | Q |  |  |  | V |  |
| 20+ 5 | 2.2833 | 0.65 | Q |  |  |  | V |  |
| 20+10 | 2.2877 | 0.64 | Q |  |  |  | V |  |
| 20+15 | 2.2921 | 0.63 | Q |  |  |  | V |  |
| 20+20 | 2.2963 | 0.62 | Q |  |  |  | V |  |
| 20+25 | 2.3006 | 0.61 | Q |  |  |  | V |  |
| 20+30 | 2.3047 | 0.60 | Q |  |  |  | V |  |
| 20+35 | 2.3088 | 0.60 | Q |  |  |  | V |  |
| 20+40 | 2.3129 | 0.59 | Q |  |  |  | V |  |
| 20+45 | 2.3169 | 0.58 | Q |  |  |  | V |  |
| 20+50 | 2.3208 | 0.57 | Q |  |  |  | V |  |
| 20+55 | 2.3247 | 0.57 | Q |  |  |  | V |  |
| 21+ 0 | 2.3286 | 0.56 | Q |  |  |  | V |  |
| 21+ 5 | 2.3324 | 0.55 | Q |  |  |  | V |  |
| 21+10 | 2.3362 | 0.55 | Q |  |  |  | V |  |
| 21+15 | 2.3399 | 0.54 | Q |  |  |  | V |  |
| 21+20 | 2.3436 | 0.53 | Q |  |  |  | V |  |
| 21+25 | 2.3472 | 0.53 | Q |  |  |  | V |  |
| 21+30 | 2.3508 | 0.52 | Q |  |  |  | V |  |
| 21+35 | 2.3544 | 0.52 | Q |  |  |  | V |  |
| 21+40 | 2.3579 | 0.51 | Q |  |  |  | V |  |
| 21+45 | 2.3614 | 0.51 | Q |  |  |  | V |  |
| 21+50 | 2.3649 | 0.50 | Q |  |  |  | V |  |
| 21+55 | 2.3683 | 0.50 | Q |  |  |  | V |  |
| 22+ 0 | 2.3717 | 0.49 | Q |  |  |  | V |  |
| 22+ 5 | 2.3750 | 0.49 | Q |  |  |  | V |  |
| 22+10 | 2.3784 | 0.48 | Q |  |  |  | V |  |
| 22+15 | 2.3816 | 0.48 | Q |  |  |  | V |  |
| 22+20 | 2.3849 | 0.47 | Q |  |  |  | V |  |
| 22+25 | 2.3882 | 0.47 | Q |  |  |  | V |  |
| 22+30 | 2.3914 | 0.47 | Q |  |  |  | V |  |
| 22+35 | 2.3945 | 0.46 | Q |  |  |  | V |  |
| 22+40 | 2.3977 | 0.46 | Q |  |  |  | V |  |
| 22+45 | 2.4008 | 0.45 | Q |  |  |  | V |  |
| 22+50 | 2.4039 | 0.45 | Q |  |  |  | V |  |
| 22+55 | 2.4070 | 0.45 | Q |  |  |  | V |  |
| 23+ 0 | 2.4100 | 0.44 | Q |  |  |  | V |  |
| 23+ 5 | 2.4131 | 0.44 | Q |  |  |  | V |  |
| 23+10 | 2.4161 | 0.44 | Q |  |  |  | V |  |
| 23+15 | 2.4190 | 0.43 | Q |  |  |  | V |  |
| 23+20 | 2.4220 | 0.43 | Q |  |  |  | V |  |
| 23+25 | 2.4249 | 0.43 | Q |  |  |  | V |  |
| 23+30 | 2.4278 | 0.42 | Q |  |  |  | V |  |
| 23+35 | 2.4307 | 0.42 | Q |  |  |  | V |  |
| 23+40 | 2.4336 | 0.42 | Q |  |  |  | V |  |
| 23+45 | 2.4364 | 0.41 | Q |  |  |  | V |  |
| 23+50 | 2.4393 | 0.41 | Q |  |  |  | V |  |
| 23+55 | 2.4421 | 0.41 | Q |  |  |  | V |  |
| 24+ 0 | 2.4449 | 0.40 | Q |  |  |  | V |  |
| 24+ 5 | 2.4476 | 0.40 | Q |  |  |  | V |  |
| 24+10 | 2.4502 | 0.38 | Q |  |  |  | V |  |
| 24+15 | 2.4525 | 0.33 | Q |  |  |  | V |  |
| 24+20 | 2.4542 | 0.25 | Q |  |  |  | V |  |
| 24+25 | 2.4555 | 0.19 | Q |  |  |  | V |  |
| 24+30 | 2.4566 | 0.15 | Q |  |  |  | V |  |
| 24+35 | 2.4574 | 0.12 | Q |  |  |  | V |  |
| 24+40 | 2.4581 | 0.10 | Q |  |  |  | V |  |
| 24+45 | 2.4588 | 0.09 | Q |  |  |  | V |  |
| 24+50 | 2.4593 | 0.08 | Q |  |  |  | V |  |
| 24+55 | 2.4597 | 0.06 | Q |  |  |  | V |  |
| 25+ 0 | 2.4601 | 0.06 | Q |  |  |  | V |  |
| 25+ 5 | 2.4604 | 0.05 | Q |  |  |  | V |  |
| 25+10 | 2.4607 | 0.04 | Q |  |  |  | V |  |
| 25+15 | 2.4610 | 0.04 | Q |  |  |  | V |  |
| 25+20 | 2.4612 | 0.03 | Q |  |  |  | V |  |
| 25+25 | 2.4614 | 0.03 | Q |  |  |  | V |  |
| 25+30 | 2.4615 | 0.02 | Q |  |  |  | V |  |
| 25+35 | 2.4617 | 0.02 | Q |  |  |  | V |  |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 25+40 | 2.4618 | 0.02 | Q |  |  |  | V |
| 25+45 | 2.4619 | 0.01 | Q |  |  |  | V |
| 25+50 | 2.4620 | 0.01 | Q |  |  |  | V |
| 25+55 | 2.4620 | 0.01 | Q |  |  |  | V |
| 26+ 0 | 2.4621 | 0.01 | Q |  |  |  | V |
| 26+ 5 | 2.4621 | 0.01 | Q |  |  |  | V |
| 26+10 | 2.4622 | 0.01 | Q |  |  |  | V |
| 26+15 | 2.4622 | 0.01 | Q |  |  |  | V |
| 26+20 | 2.4623 | 0.00 | Q |  |  |  | V |
| 26+25 | 2.4623 | 0.00 | Q |  |  |  | V |
| 26+30 | 2.4623 | 0.00 | Q |  |  |  | V |
| 26+35 | 2.4623 | 0.00 | Q |  |  |  | V |
| 26+40 | 2.4623 | 0.00 | Q |  |  |  | V |
| 26+45 |        | 0.00 | Q |  |  |  | V |

# **ATTACHMENT 4**

Developed On-Site Conditions  
Rational Method Calculations

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1  
Rational Hydrology Study Date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ON-SITE  
10-YEAR, 1-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

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\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*

-----  
Rational hydrology study storm event year is         
Computed rainfall intensity:  
Storm year = 10.00 1 hour rainfall = 0.599 (In.)  
Slope used for rainfall intensity curve b = 0.7000  
Soil antecedent moisture condition (AMC) =    

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+++++  
Process from Point/Station 0.000 to Point/Station 1.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

-----  
Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.1600 Max loss rate(Fm)= 0.067(In/Hr)  
Initial subarea data:  
Initial area flow distance = 859.030(Ft.)  
Top (of initial area) elevation = 3068.490(Ft.)  
Bottom (of initial area) elevation = 3057.570(Ft.)  
Difference in elevation = 10.920(Ft.)  
Slope = 0.01271 s(%)= 1.27  
TC =  $k(0.314)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 11.211 min.  
Rainfall intensity = 1.938(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.869  
Subarea runoff = 5.136(CFS)  
Total initial stream area = 3.050(Ac.)  
Pervious area fraction = 0.160  
Initial area Fm value = 0.067(In/Hr)

+++++  
Process from Point/Station 1.000 to Point/Station 2.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

-----  
Upstream point/station elevation = 3054.070(Ft.)  
Downstream point/station elevation = 3052.130(Ft.)  
Pipe length = 326.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 5.136(CFS)  
Given pipe size = 24.00(In.)  
Calculated individual pipe flow = 5.136(CFS)  
Normal flow depth in pipe = 8.92(In.)  
Flow top width inside pipe = 23.19(In.)  
Critical Depth = 9.58(In.)  
Pipe flow velocity = 4.83(Ft/s)  
Travel time through pipe = 1.13 min.  
Time of concentration (TC) = 12.34 min.

+++++  
Process from Point/Station 2.000 to Point/Station 2.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

-----  
Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 12.34 min.  
Rainfall intensity = 1.813(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area,(total area with modified

rational method)(Q=KCIA) is C = 0.874  
Subarea runoff = 1.644(CFS) for 1.230(Ac.)  
Total runoff = 6.779(CFS)  
Effective area this stream = 4.28(Ac.)  
Total Study Area (Main Stream No. 1) = 4.28(Ac.)  
Area averaged Fm value = 0.053(In/Hr)

+++++  
Process from Point/Station 2.000 to Point/Station 3.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

---

Upstream point/station elevation = 3052.130(Ft.)  
Downstream point/station elevation = 3050.850(Ft.)  
Pipe length = 254.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 6.779(CFS)  
Given pipe size = 24.00(In.)  
Calculated individual pipe flow = 6.779(CFS)  
Normal flow depth in pipe = 10.89(In.)  
Flow top width inside pipe = 23.90(In.)  
Critical Depth = 11.08(In.)  
Pipe flow velocity = 4.90(Ft/s)  
Travel time through pipe = 0.86 min.  
Time of concentration (TC) = 13.20 min.

+++++  
Process from Point/Station 3.000 to Point/Station 3.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 13.20 min.  
Rainfall intensity = 1.729(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area,(total area with modified  
rational method)(Q=KCIA) is C = 0.877  
Subarea runoff = 1.710(CFS) for 1.320(Ac.)  
Total runoff = 8.490(CFS)  
Effective area this stream = 5.60(Ac.)  
Total Study Area (Main Stream No. 1) = 5.60(Ac.)  
Area averaged Fm value = 0.044(In/Hr)

+++++  
Process from Point/Station 3.000 to Point/Station 4.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

---

Upstream point/station elevation = 3050.850(Ft.)  
Downstream point/station elevation = 3049.620(Ft.)  
Pipe length = 244.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 8.490(CFS)  
Given pipe size = 24.00(In.)  
Calculated individual pipe flow = 8.490(CFS)  
Normal flow depth in pipe = 12.40(In.)  
Flow top width inside pipe = 23.99(In.)  
Critical Depth = 12.47(In.)  
Pipe flow velocity = 5.18(Ft/s)  
Travel time through pipe = 0.78 min.  
Time of concentration (TC) = 13.98 min.

+++++  
Process from Point/Station 4.000 to Point/Station 4.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

---

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 13.98 min.  
Rainfall intensity = 1.660(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area,(total area with modified  
rational method)(Q=KCIA) is C = 0.879  
Subarea runoff = 2.051(CFS) for 1.620(Ac.)  
Total runoff = 10.541(CFS)  
Effective area this stream = 7.22(Ac.)  
Total Study Area (Main Stream No. 1) = 7.22(Ac.)  
Area averaged Fm value = 0.038(In/Hr)

\*\*\*\*\*  
Process from Point/Station 4.000 to Point/Station 5.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3049.620(Ft.)  
Downstream point/station elevation = 3049.080(Ft.)  
Pipe length = 175.82(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 10.541(CFS)  
Given pipe size = 30.00(In.)  
Calculated individual pipe flow = 10.541(CFS)  
Normal flow depth in pipe = 14.36(In.)  
Flow top width inside pipe = 29.97(In.)  
Critical Depth = 13.03(In.)  
Pipe flow velocity = 4.54(Ft/s)  
Travel time through pipe = 0.64 min.  
Time of concentration (TC) = 14.63 min.

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 5.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.8400 Max loss rate(Fm)= 0.353(In/Hr)  
Time of concentration = 14.63 min.  
Rainfall intensity = 1.609(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area,(total area with modified  
rational method)(Q=KCIA) is C = 0.864  
Subarea runoff = 0.411(CFS) for 0.660(Ac.)  
Total runoff = 10.951(CFS)  
Effective area this stream = 7.88(Ac.)  
Total Study Area (Main Stream No. 1) = 7.88(Ac.)  
Area averaged Fm value = 0.064(In/Hr)

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 6.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3049.080(Ft.)  
Downstream point/station elevation = 3047.600(Ft.)  
Pipe length = 495.62(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 10.951(CFS)  
Given pipe size = 30.00(In.)  
Calculated individual pipe flow = 10.951(CFS)  
Normal flow depth in pipe = 14.80(In.)  
Flow top width inside pipe = 30.00(In.)  
Critical Depth = 13.29(In.)  
Pipe flow velocity = 4.54(Ft/s)  
Travel time through pipe = 1.82 min.  
Time of concentration (TC) = 16.45 min.

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 6.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 1  
Stream flow area = 7.880(Ac.)  
Runoff from this stream = 10.951(CFS)  
Time of concentration = 16.45 min.  
Rainfall intensity = 1.482(In/Hr)  
Area averaged loss rate (Fm) = 0.0645(In/Hr)  
Area averaged Pervious ratio (Ap) = 0.1535

\*\*\*\*\*  
Process from Point/Station 7.000 to Point/Station 8.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.2500 Max loss rate(Fm)= 0.105(In/Hr)  
Initial subarea data:  
Initial area flow distance = 144.770(Ft.)  
Top (of initial area) elevation = 3062.200(Ft.)  
Bottom (of initial area) elevation = 3056.310(Ft.)

Difference in elevation = 5.890(Ft.)  
 Slope = 0.04069 s(%) = 4.07  
 $TC = k(0.336)*[(length^3)/(elevation\ change)]^{0.2}$   
 Initial area time of concentration = 4.666 min.  
 Rainfall intensity = 3.580(In/Hr) for a 10.0 year storm  
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.874  
 Subarea runoff = 2.033(CFS)  
 Total initial stream area = 0.650(Ac.)  
 Pervious area fraction = 0.250  
 Initial area Fm value = 0.105(In/Hr)

++++++  
 Process from Point/Station 8.000 to Point/Station 6.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3052.310(Ft.)  
 Downstream point/station elevation = 3050.100(Ft.)  
 Pipe length = 94.50(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 2.033(CFS)  
 Given pipe size = 12.00(In.)  
 Calculated individual pipe flow = 2.033(CFS)  
 Normal flow depth in pipe = 5.07(In.)  
 Flow top width inside pipe = 11.86(In.)  
 Critical depth = 7.30(In.)  
 Pipe flow velocity = 6.43(Ft/s)  
 Travel time through pipe = 0.24 min.  
 Time of concentration (TC) = 4.91 min.

++++++  
 Process from Point/Station 8.000 to Point/Station 6.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 2  
 Stream flow area = 0.650(Ac.)  
 Runoff from this stream = 2.033(CFS)  
 Time of concentration = 4.91 min.  
 Rainfall intensity = 3.454(In/Hr)  
 Area averaged loss rate (Fm) = 0.1050(In/Hr)  
 Area averaged Pervious ratio (Ap) = 0.2500

++++++  
 Process from Point/Station 9.000 to Point/Station 10.000  
 \*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
 USER INPUT of soil data for subarea  
 SCS curve number for soil(AMC 2) = 77.00  
 Pervious ratio(Ap) = 0.0700 Max loss rate(Fm)= 0.029(In/Hr)  
 Initial subarea data:  
 Initial area flow distance = 349.440(Ft.)  
 Top (of initial area) elevation = 3058.600(Ft.)  
 Bottom (of initial area) elevation = 3056.730(Ft.)  
 Difference in elevation = 1.870(Ft.)  
 Slope = 0.00535 s(%) = 0.54  
 $TC = k(0.292)*[(length^3)/(elevation\ change)]^{0.2}$   
 Initial area time of concentration = 8.643 min.  
 Rainfall intensity = 2.325(In/Hr) for a 10.0 year storm  
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.889  
 Subarea runoff = 9.401(CFS)  
 Total initial stream area = 4.550(Ac.)  
 Pervious area fraction = 0.070  
 Initial area Fm value = 0.029(In/Hr)

++++++  
 Process from Point/Station 10.000 to Point/Station 6.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3052.730(Ft.)  
 Downstream point/station elevation = 3050.250(Ft.)  
 Pipe length = 24.48(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 9.401(CFS)  
 Given pipe size = 18.00(In.)  
 Calculated individual pipe flow = 9.401(CFS)  
 Normal flow depth in pipe = 6.53(In.)  
 Flow top width inside pipe = 17.31(In.)  
 Critical depth = 14.22(In.)  
 Pipe flow velocity = 16.24(Ft/s)

Travel time through pipe = 0.03 min.  
Time of concentration (TC) = 8.67 min.

\*\*\*\*\*  
Process from Point/Station 10.000 to Point/Station 6.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 3  
Stream flow area = 4.550(Ac.)  
Runoff from this stream = 9.401(CFS)  
Time of concentration = 8.67 min.  
Rainfall intensity = 2.320(In/Hr)  
Area averaged loss rate (Fm) = 0.0294(In/Hr)  
Area averaged Pervious ratio (Ap) = 0.0700

\*\*\*\*\*  
Process from Point/Station 11.000 to Point/Station 12.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0700 Max loss rate(Fm)= 0.029(In/Hr)  
Initial subarea data:  
Initial area flow distance = 362.800(Ft.)  
Top (of initial area) elevation = 3060.730(Ft.)  
Bottom (of initial area) elevation = 3057.050(Ft.)  
Difference in elevation = 3.680(Ft.)  
Slope = 0.01014 s(%) = 1.01  
TC =  $k(0.292)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 7.721 min.  
Rainfall intensity = 2.516(In/Hr) for a 10.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.889  
Subarea runoff = 10.296(CFS)  
Total initial stream area = 4.600(Ac.)  
Pervious area fraction = 0.070  
Initial area Fm value = 0.029(In/Hr)

\*\*\*\*\*  
Process from Point/Station 12.000 to Point/Station 6.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3053.050(Ft.)  
Downstream point/station elevation = 3050.250(Ft.)  
Pipe length = 24.46(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 10.296(CFS)  
Given pipe size = 18.00(In.)  
Calculated individual pipe flow = 10.296(CFS)  
Normal flow depth in pipe = 6.63(In.)  
Flow top width inside pipe = 17.37(In.)  
Critical Depth = 14.81(In.)  
Pipe flow velocity = 17.41(Ft/s)  
Travel time through pipe = 0.02 min.  
Time of concentration (TC) = 7.74 min.

\*\*\*\*\*  
Process from Point/Station 12.000 to Point/Station 6.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 4  
Stream flow area = 4.600(Ac.)  
Runoff from this stream = 10.296(CFS)  
Time of concentration = 7.74 min.  
Rainfall intensity = 2.511(In/Hr)  
Area averaged loss rate (Fm) = 0.0294(In/Hr)  
Area averaged Pervious ratio (Ap) = 0.0700  
Summary of stream data:

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|------------|-----------------|------------|----------|------------|----------------------------|
| 1          | 10.95           | 7.880      | 16.45    | 0.064      | 1.482                      |
| 2          | 2.03            | 0.650      | 4.91     | 0.105      | 3.454                      |
| 3          | 9.40            | 4.550      | 8.67     | 0.029      | 2.320                      |
| 4          | 10.30           | 4.600      | 7.74     | 0.029      | 2.511                      |

Qmax(1) =

|           |         |         |         |   |          |
|-----------|---------|---------|---------|---|----------|
|           | 1.000 * | 1.000 * | 10.951) | + |          |
|           | 0.411 * | 1.000 * | 2.033)  | + |          |
|           | 0.634 * | 1.000 * | 9.401)  | + |          |
| Qmax(2) = | 0.585 * | 1.000 * | 10.296) | + | = 23.774 |
|           | 2.391 * | 0.299 * | 10.951) | + |          |
|           | 1.000 * | 1.000 * | 2.033)  | + |          |
|           | 1.495 * | 0.566 * | 9.401)  | + |          |
| Qmax(3) = | 1.380 * | 0.634 * | 10.296) | + | = 26.822 |
|           | 1.592 * | 0.527 * | 10.951) | + |          |
|           | 0.662 * | 1.000 * | 2.033)  | + |          |
|           | 1.000 * | 1.000 * | 9.401)  | + |          |
| Qmax(4) = | 0.923 * | 1.000 * | 10.296) | + | = 29.436 |
|           | 1.726 * | 0.471 * | 10.951) | + |          |
|           | 0.718 * | 1.000 * | 2.033)  | + |          |
|           | 1.083 * | 0.893 * | 9.401)  | + |          |
|           | 1.000 * | 1.000 * | 10.296) | + | = 29.753 |

Total of 4 streams to confluence:

Flow rates before confluence point:

|                                                    |        |        |        |
|----------------------------------------------------|--------|--------|--------|
| 10.951                                             | 2.033  | 9.401  | 10.296 |
| Maximum flow rates at confluence using above data: |        |        |        |
| 23.774                                             | 26.822 | 29.436 | 29.753 |

Area of streams before confluence:

|       |       |       |       |
|-------|-------|-------|-------|
| 7.880 | 0.650 | 4.550 | 4.600 |
|-------|-------|-------|-------|

Effective area values after confluence:

|        |       |        |        |
|--------|-------|--------|--------|
| 17.680 | 8.497 | 13.953 | 13.025 |
|--------|-------|--------|--------|

Results of confluence:

Total flow rate = (CFS)

Time of concentration = 7.744 min.

Effective stream area after confluence = 13.025(Ac.)

Study area average Pervious fraction(Ap) = 0.114

Study area average soil loss rate(Fm) = 0.048(In/Hr)

Study area total (this main stream) = 17.68(Ac.)

End of computations, Total Study Area = 17.68 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.114

Area averaged SCS curve number = 77.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1  
Rational Hydrology Study Date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ON-SITE  
100-YEAR, 1-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

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\*\*\*\*\* Hydrology Study Control Information \*\*\*\*\*  
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Rational hydrology study storm event year is [REDACTED]  
10 Year storm 1 hour rainfall = 0.599(In.)  
100 Year storm 1 hour rainfall = 1.070(In.)  
Computed rainfall intensity:  
Storm year = 100.00 1 hour rainfall = 1.070 (In.)  
Slope used for rainfall intensity curve b = 0.7000  
Soil antecedent moisture condition (AMC) = [REDACTED]

+++++  
Process from Point/Station 0.000 to Point/Station 1.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.1600 Max loss rate(Fm)= 0.067(In/Hr)  
Initial subarea data:  
Initial area flow distance = 859.030(Ft.)  
Top (of initial area) elevation = 3068.490(Ft.)  
Bottom (of initial area) elevation = 3057.570(Ft.)  
Difference in elevation = 10.920(Ft.)  
Slope = 0.01271 s(%)= 1.27  
TC =  $k(0.314)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 11.211 min.  
Rainfall intensity = 3.462(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883  
Subarea runoff = [REDACTED] (CFS)  
Total initial stream area = 3.050(Ac.)  
Pervious area fraction = 0.160  
Initial area Fm value = 0.067(In/Hr)

+++++  
Process from Point/Station 1.000 to Point/Station 2.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3054.070(Ft.)  
Downstream point/station elevation = 3052.130(Ft.)  
Pipe length = 326.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 9.319(CFS)  
Given pipe size = [REDACTED] (In.)  
Calculated individual pipe flow = 9.319(CFS)  
Normal flow depth in pipe = 12.48(In.)  
Flow top width inside pipe = 23.98(In.)  
Critical Depth = 13.09(In.)  
Pipe flow velocity = 5.65(Ft/s)  
Travel time through pipe = 0.96 min.  
Time of concentration (TC) = 12.17 min.

+++++  
Process from Point/Station 2.000 to Point/Station 2.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 12.17 min.

Rainfall intensity = 3.268(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method) (Q=KCIA) is C = 0.885  
Subarea runoff = 3.067(CFS) for 1.230(Ac.)  
Total runoff = (CFS)  
Effective area this stream = 4.28(Ac.)  
Total Study Area (Main Stream No. 1) = 4.28(Ac.)  
Area averaged Fm value = 0.053(In/Hr)

\*\*\*\*\*  
Process from Point/Station 2.000 to Point/Station 3.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3052.130(Ft.)  
Downstream point/station elevation = 3050.850(Ft.)  
Pipe length = 254.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 12.386(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 12.386(CFS)  
Normal flow depth in pipe = 15.82(In.)  
Flow top width inside pipe = 22.75(In.)  
Critical Depth = 15.17(In.)  
Pipe flow velocity = 5.64(Ft/s)  
Travel time through pipe = 0.75 min.  
Time of concentration (TC) = 12.92 min.

\*\*\*\*\*  
Process from Point/Station 3.000 to Point/Station 3.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 12.92 min.  
Rainfall intensity = 3.134(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method) (Q=KCIA) is C = 0.887  
Subarea runoff = 3.187(CFS) for 1.320(Ac.)  
Total runoff = (CFS)  
Effective area this stream = 5.60(Ac.)  
Total Study Area (Main Stream No. 1) = 5.60(Ac.)  
Area averaged Fm value = 0.044(In/Hr)

\*\*\*\*\*  
Process from Point/Station 3.000 to Point/Station 4.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3050.850(Ft.)  
Downstream point/station elevation = 3049.620(Ft.)  
Pipe length = 244.00(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 15.573(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 15.573(CFS)  
Normal flow depth in pipe = 19.03(In.)  
Flow top width inside pipe = 19.45(In.)  
Critical Depth = 17.08(In.)  
Pipe flow velocity = 5.83(Ft/s)  
Travel time through pipe = 0.70 min.  
Time of concentration (TC) = 13.62 min.

\*\*\*\*\*  
Process from Point/Station 4.000 to Point/Station 4.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0400 Max loss rate(Fm)= 0.017(In/Hr)  
Time of concentration = 13.62 min.  
Rainfall intensity = 3.021(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method) (Q=KCIA) is C = 0.889  
Subarea runoff = 3.809(CFS) for 1.620(Ac.)  
Total runoff = (CFS)  
Effective area this stream = 7.22(Ac.)  
Total Study Area (Main Stream No. 1) = 7.22(Ac.)

Area averaged Fm value = 0.038(In/Hr)

\*\*\*\*\*  
Process from Point/Station 4.000 to Point/Station 5.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3049.620(Ft.)  
Downstream point/station elevation = 3049.080(Ft.)  
Pipe length = 175.82(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 19.382(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 19.382(CFS)  
Normal flow depth in pipe = 21.30(In.)  
Flow top width inside pipe = 27.22(In.)  
Critical depth = 17.93(In.)  
Pipe flow velocity = 5.20(Ft/s)  
Travel time through pipe = 0.56 min.  
Time of concentration (TC) = 14.18 min.

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 5.000  
\*\*\*\* SUBAREA FLOW ADDITION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.8400 Max loss rate(Fm)= 0.353(In/Hr)  
Time of concentration = 14.18 min.  
Rainfall intensity = 2.936(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area, (total area with modified  
rational method)(Q=KCIA) is C = 0.880  
Subarea runoff = 0.985(CFS) for 0.660(Ac.)  
Total runoff = (CFS)  
Effective area this stream = 7.88(Ac.)  
Total Study Area (Main Stream No. 1) = 7.88(Ac.)  
Area averaged Fm value = 0.064(In/Hr)

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 6.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3049.080(Ft.)  
Downstream point/station elevation = 3047.600(Ft.)  
Pipe length = 495.62(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 20.368(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 20.368(CFS)  
Normal flow depth in pipe = 22.43(In.)  
Flow top width inside pipe = 26.06(In.)  
Critical depth = 18.40(In.)  
Pipe flow velocity = 5.17(Ft/s)  
Travel time through pipe = 1.60 min.  
Time of concentration (TC) = 15.78 min.

\*\*\*\*\*  
Process from Point/Station 5.000 to Point/Station 6.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 1  
Stream flow area = 7.880(Ac.)  
Runoff from this stream = 20.368(CFS)  
Time of concentration = 15.78 min.  
Rainfall intensity = 2.725(In/Hr)  
Area averaged loss rate (Fm) = 0.0645(In/Hr)  
Area averaged Pervious ratio (Ap) = 0.1535

\*\*\*\*\*  
Process from Point/Station 7.000 to Point/Station 8.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.2500 Max loss rate(Fm)= 0.105(In/Hr)  
Initial subarea data:  
Initial area flow distance = 144.770(Ft.)

Top (of initial area) elevation = 3062.200(Ft.)  
Bottom (of initial area) elevation = 3056.310(Ft.)  
Difference in elevation = 5.890(Ft.)  
Slope = 0.04069 s(%) = 4.07  
 $TC = k(0.336)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 4.666 min.  
Rainfall intensity = 6.395(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885  
Subarea runoff = (CFS)  
Total initial stream area = 0.650(Ac.)  
Pervious area fraction = 0.250  
Initial area Fm value = 0.105(In/Hr)

\*\*\*\*\*  
Process from Point/Station 8.000 to Point/Station 6.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

---

Upstream point/station elevation = 3052.310(Ft.)  
Downstream point/station elevation = 3050.100(Ft.)  
Pipe length = 94.50(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 3.680(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 3.680(CFS)  
Normal flow depth in pipe = 7.22(In.)  
Flow top width inside pipe = 11.75(In.)  
Critical Depth = 9.82(In.)  
Pipe flow velocity = 7.45(Ft/s)  
Travel time through pipe = 0.21 min.  
Time of concentration (TC) = 4.88 min.

\*\*\*\*\*  
Process from Point/Station 8.000 to Point/Station 6.000  
\*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

---

Along Main Stream number: 1 in normal stream number 2  
Stream flow area = 0.650(Ac.)  
Runoff from this stream = 3.680(CFS)  
Time of concentration = 4.88 min.  
Rainfall intensity = 6.200(In/Hr)  
Area averaged loss rate (Fm) = 0.1050(In/Hr)  
Area averaged Pervious ratio (Ap) = 0.2500

\*\*\*\*\*  
Process from Point/Station 9.000 to Point/Station 10.000  
\*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

---

Soil classification AP and SCS values input by user  
USER INPUT of soil data for subarea  
SCS curve number for soil(AMC 2) = 77.00  
Pervious ratio(Ap) = 0.0700 Max loss rate(Fm)= 0.029(In/Hr)  
Initial subarea data:  
Initial area flow distance = 349.440(Ft.)  
Top (of initial area) elevation = 3058.600(Ft.)  
Bottom (of initial area) elevation = 3056.730(Ft.)  
Difference in elevation = 1.870(Ft.)  
Slope = 0.00535 s(%) = 0.54  
 $TC = k(0.292)*[(length^3)/(elevation\ change)]^{0.2}$   
Initial area time of concentration = 8.643 min.  
Rainfall intensity = 4.153(In/Hr) for a 100.0 year storm  
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894  
Subarea runoff = (CFS)  
Total initial stream area = 4.550(Ac.)  
Pervious area fraction = 0.070  
Initial area Fm value = 0.029(In/Hr)

\*\*\*\*\*  
Process from Point/Station 10.000 to Point/Station 6.000  
\*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

---

Upstream point/station elevation = 3052.730(Ft.)  
Downstream point/station elevation = 3050.250(Ft.)  
Pipe length = 24.48(Ft.) Manning's N = 0.013  
No. of pipes = 1 Required pipe flow = 16.888(CFS)  
Given pipe size = (In.)  
Calculated individual pipe flow = 16.888(CFS)  
Normal flow depth in pipe = 9.06(In.)  
Flow top width inside pipe = 18.00(In.)

Critical depth could not be calculated.  
 Pipe flow velocity = 18.97(Ft/s)  
 Travel time through pipe = 0.02 min.  
 Time of concentration (TC) = 8.66 min.

\*\*\*\*\*  
 Process from Point/Station 10.000 to Point/Station 6.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 3  
 Stream flow area = 4.550(Ac.)  
 Runoff from this stream = 16.888(CFS)  
 Time of concentration = 8.66 min.  
 Rainfall intensity = 4.146(In/Hr)  
 Area averaged loss rate (Fm) = 0.0294(In/Hr)  
 Area averaged Pervious ratio (Ap) = 0.0700

\*\*\*\*\*  
 Process from Point/Station 11.000 to Point/Station 12.000  
 \*\*\*\* INITIAL AREA EVALUATION \*\*\*\*

Soil classification AP and SCS values input by user  
 USER INPUT of soil data for subarea  
 SCS curve number for soil(AMC 2) = 77.00  
 Pervious ratio(Ap) = 0.0700 Max loss rate(Fm)= 0.029(In/Hr)  
 Initial subarea data:  
 Initial area flow distance = 362.800(Ft.)  
 Top (of initial area) elevation = 3060.730(Ft.)  
 Bottom (of initial area) elevation = 3057.050(Ft.)  
 Difference in elevation = 3.680(Ft.)  
 Slope = 0.01014 s(%)= 1.01  
 $TC = k(0.292)*[(length^3)/(elevation\ change)]^{0.2}$   
 Initial area time of concentration = 7.721 min.  
 Rainfall intensity = 4.495(In/Hr) for a 100.0 year storm  
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.894  
 Subarea runoff = (CFS)  
 Total initial stream area = 4.600(Ac.)  
 Pervious area fraction = 0.070  
 Initial area Fm value = 0.029(In/Hr)

\*\*\*\*\*  
 Process from Point/Station 12.000 to Point/Station 6.000  
 \*\*\*\* PIPEFLOW TRAVEL TIME (User specified size) \*\*\*\*

Upstream point/station elevation = 3053.050(Ft.)  
 Downstream point/station elevation = 3050.250(Ft.)  
 Pipe length = 24.46(Ft.) Manning's N = 0.013  
 No. of pipes = 1 Required pipe flow = 18.487(CFS)  
 Given pipe size = (In.)  
 Calculated individual pipe flow = 18.487(CFS)  
 Normal flow depth in pipe = 9.21(In.)  
 Flow top width inside pipe = 18.00(In.)  
 Critical depth could not be calculated.  
 Pipe flow velocity = 20.31(Ft/s)  
 Travel time through pipe = 0.02 min.  
 Time of concentration (TC) = 7.74 min.

\*\*\*\*\*  
 Process from Point/Station 12.000 to Point/Station 6.000  
 \*\*\*\* CONFLUENCE OF MINOR STREAMS \*\*\*\*

Along Main Stream number: 1 in normal stream number 4  
 Stream flow area = 4.600(Ac.)  
 Runoff from this stream = 18.487(CFS)  
 Time of concentration = 7.74 min.  
 Rainfall intensity = 4.487(In/Hr)  
 Area averaged loss rate (Fm) = 0.0294(In/Hr)  
 Area averaged Pervious ratio (Ap) = 0.0700  
 Summary of stream data:

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|------------|-----------------|------------|----------|------------|----------------------------|
| 1          | 20.37           | 7.880      | 15.78    | 0.064      | 2.725                      |
| 2          | 3.68            | 0.650      | 4.88     | 0.105      | 6.200                      |
| 3          | 16.89           | 4.550      | 8.66     | 0.029      | 4.146                      |

|           |         |         |         |       |        |
|-----------|---------|---------|---------|-------|--------|
| 4         | 18.49   | 4.600   | 7.74    | 0.029 | 4.487  |
| Qmax(1) = | 1.000 * | 1.000 * | 20.368) | +     |        |
|           | 0.430 * | 1.000 * | 3.680)  | +     |        |
|           | 0.655 * | 1.000 * | 16.888) | +     |        |
|           | 0.605 * | 1.000 * | 18.487) | +     | 44.188 |
| Qmax(2) = | 2.306 * | 0.309 * | 20.368) | +     |        |
|           | 1.000 * | 1.000 * | 3.680)  | +     |        |
|           | 1.499 * | 0.563 * | 16.888) | +     |        |
|           | 1.384 * | 0.630 * | 18.487) | +     | 48.566 |
| Qmax(3) = | 1.534 * | 0.549 * | 20.368) | +     |        |
|           | 0.663 * | 1.000 * | 3.680)  | +     |        |
|           | 1.000 * | 1.000 * | 16.888) | +     |        |
|           | 0.924 * | 1.000 * | 18.487) | +     | 53.559 |
| Qmax(4) = | 1.662 * | 0.490 * | 20.368) | +     |        |
|           | 0.719 * | 1.000 * | 3.680)  | +     |        |
|           | 1.083 * | 0.893 * | 16.888) | +     |        |
|           | 1.000 * | 1.000 * | 18.487) | +     | 54.073 |

Total of 4 streams to confluence:  
Flow rates before confluence point:  
20.368      3.680      16.888      18.487  
Maximum flow rates at confluence using above data:  
44.188      48.566      53.559      54.073  
Area of streams before confluence:  
7.880      0.650      4.550      4.600  
Effective area values after confluence:  
17.680      8.545      14.127      13.180  
Results of confluence:  
Total flow rate =      (CFS)  
Time of concentration =      min.  
Effective stream area after confluence =      13.180(Ac.)  
Study area average Pervious fraction(Ap) = 0.114  
Study area average soil loss rate(Fm) = 0.048(In/Hr)  
Study area total (this main stream) = 17.68(Ac.)  
End of computations, Total Study Area = 17.68 (Ac.)  
The following figures may  
be used for a unit hydrograph study of the same area.  
Note: These figures do not consider reduced effective area  
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.114  
Area averaged SCS curve number = 77.0

# **ATTACHMENT 5**

Developed On-site Conditions  
Unit Method Calculations

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ON-SITE  
2-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

+++++

\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC I) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 59.4                     | 17.68         | 1.000            | 0.688                 | 0.110        | 0.076         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.076

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC1) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 1.94          | 0.110         | 77.0             | 59.4             | 6.50 | 0.000                |
| 15.74         | 0.890         | 98.0             | 98.0             | 0.20 | 0.834                |

Area-averaged catchment yield fraction, Y = 0.742

Area-averaged low loss fraction, Yb = 0.258

User entry of time of concentration = 0.129 (hours)

+++++  
Watershed area = 17.68(Ac.)

Catchment Lag time = 0.103 hours  
 Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 80.7494  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.076(In/Hr)  
 Average low loss rate fraction (Yb) = 0.258 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.128(In)  
 Computed peak 30-minute rainfall = 0.219(In)  
 Specified peak 1-hour rainfall = 0.270(In)  
 Computed peak 3-hour rainfall = 0.506(In)  
 Specified peak 6-hour rainfall = 0.753(In)  
 Specified peak 24-hour rainfall = 1.300(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(Ac.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.128(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.219(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.270(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 0.506(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 0.753(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 1.300(In) |

| U n i t H y d r o g r a p h |                    |                 |
|-----------------------------|--------------------|-----------------|
| Interval                    | 'S' Graph          | Unit Hydrograph |
| Number                      | Mean values        | ((CFS))         |
| -----                       |                    |                 |
|                             | (K = 213.82 (CFS)) |                 |
| 1                           | 10.956             | 23.427          |
| 2                           | 57.842             | 100.249         |
| 3                           | 78.112             | 43.341          |
| 4                           | 87.134             | 19.290          |
| 5                           | 92.184             | 10.799          |
| 6                           | 95.341             | 6.750           |
| 7                           | 97.324             | 4.240           |
| 8                           | 98.382             | 2.263           |
| 9                           | 99.311             | 1.985           |
| 10                          | 100.000            | 1.473           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.1279                 | 0.1279        |
| 2         | 0.1575                 | 0.0296        |
| 3         | 0.1778                 | 0.0204        |
| 4         | 0.1939                 | 0.0160        |
| 5         | 0.2073                 | 0.0134        |
| 6         | 0.2190                 | 0.0117        |
| 7         | 0.2293                 | 0.0104        |
| 8         | 0.2387                 | 0.0094        |
| 9         | 0.2473                 | 0.0086        |
| 10        | 0.2552                 | 0.0079        |
| 11        | 0.2626                 | 0.0074        |
| 12        | 0.2696                 | 0.0069        |
| 13        | 0.2822                 | 0.0127        |
| 14        | 0.2945                 | 0.0123        |
| 15        | 0.3064                 | 0.0119        |
| 16        | 0.3179                 | 0.0116        |
| 17        | 0.3292                 | 0.0112        |
| 18        | 0.3401                 | 0.0110        |
| 19        | 0.3508                 | 0.0107        |
| 20        | 0.3613                 | 0.0105        |
| 21        | 0.3716                 | 0.0103        |
| 22        | 0.3816                 | 0.0100        |
| 23        | 0.3915                 | 0.0099        |
| 24        | 0.4011                 | 0.0097        |
| 25        | 0.4107                 | 0.0095        |
| 26        | 0.4200                 | 0.0093        |
| 27        | 0.4292                 | 0.0092        |
| 28        | 0.4382                 | 0.0090        |
| 29        | 0.4471                 | 0.0089        |
| 30        | 0.4559                 | 0.0088        |
| 31        | 0.4646                 | 0.0087        |
| 32        | 0.4731                 | 0.0085        |
| 33        | 0.4815                 | 0.0084        |
| 34        | 0.4898                 | 0.0083        |
| 35        | 0.4981                 | 0.0082        |

|     |        |        |
|-----|--------|--------|
| 36  | 0.5062 | 0.0081 |
| 37  | 0.5142 | 0.0080 |
| 38  | 0.5221 | 0.0079 |
| 39  | 0.5299 | 0.0078 |
| 40  | 0.5377 | 0.0077 |
| 41  | 0.5453 | 0.0077 |
| 42  | 0.5529 | 0.0076 |
| 43  | 0.5604 | 0.0075 |
| 44  | 0.5678 | 0.0074 |
| 45  | 0.5752 | 0.0074 |
| 46  | 0.5825 | 0.0073 |
| 47  | 0.5897 | 0.0072 |
| 48  | 0.5969 | 0.0072 |
| 49  | 0.6040 | 0.0071 |
| 50  | 0.6110 | 0.0070 |
| 51  | 0.6180 | 0.0070 |
| 52  | 0.6249 | 0.0069 |
| 53  | 0.6317 | 0.0069 |
| 54  | 0.6385 | 0.0068 |
| 55  | 0.6453 | 0.0067 |
| 56  | 0.6520 | 0.0067 |
| 57  | 0.6586 | 0.0066 |
| 58  | 0.6652 | 0.0066 |
| 59  | 0.6718 | 0.0065 |
| 60  | 0.6783 | 0.0065 |
| 61  | 0.6847 | 0.0065 |
| 62  | 0.6911 | 0.0064 |
| 63  | 0.6975 | 0.0064 |
| 64  | 0.7038 | 0.0063 |
| 65  | 0.7101 | 0.0063 |
| 66  | 0.7163 | 0.0062 |
| 67  | 0.7225 | 0.0062 |
| 68  | 0.7287 | 0.0062 |
| 69  | 0.7348 | 0.0061 |
| 70  | 0.7409 | 0.0061 |
| 71  | 0.7469 | 0.0060 |
| 72  | 0.7530 | 0.0060 |
| 73  | 0.7571 | 0.0041 |
| 74  | 0.7611 | 0.0041 |
| 75  | 0.7652 | 0.0040 |
| 76  | 0.7692 | 0.0040 |
| 77  | 0.7731 | 0.0040 |
| 78  | 0.7771 | 0.0039 |
| 79  | 0.7810 | 0.0039 |
| 80  | 0.7849 | 0.0039 |
| 81  | 0.7887 | 0.0039 |
| 82  | 0.7925 | 0.0038 |
| 83  | 0.7963 | 0.0038 |
| 84  | 0.8001 | 0.0038 |
| 85  | 0.8038 | 0.0037 |
| 86  | 0.8075 | 0.0037 |
| 87  | 0.8112 | 0.0037 |
| 88  | 0.8149 | 0.0037 |
| 89  | 0.8185 | 0.0036 |
| 90  | 0.8221 | 0.0036 |
| 91  | 0.8257 | 0.0036 |
| 92  | 0.8293 | 0.0036 |
| 93  | 0.8328 | 0.0035 |
| 94  | 0.8363 | 0.0035 |
| 95  | 0.8398 | 0.0035 |
| 96  | 0.8433 | 0.0035 |
| 97  | 0.8468 | 0.0034 |
| 98  | 0.8502 | 0.0034 |
| 99  | 0.8536 | 0.0034 |
| 100 | 0.8570 | 0.0034 |
| 101 | 0.8603 | 0.0034 |
| 102 | 0.8637 | 0.0033 |
| 103 | 0.8670 | 0.0033 |
| 104 | 0.8703 | 0.0033 |
| 105 | 0.8736 | 0.0033 |
| 106 | 0.8769 | 0.0033 |
| 107 | 0.8801 | 0.0032 |
| 108 | 0.8834 | 0.0032 |
| 109 | 0.8866 | 0.0032 |
| 110 | 0.8898 | 0.0032 |
| 111 | 0.8929 | 0.0032 |
| 112 | 0.8961 | 0.0032 |
| 113 | 0.8992 | 0.0031 |
| 114 | 0.9024 | 0.0031 |
| 115 | 0.9055 | 0.0031 |
| 116 | 0.9086 | 0.0031 |

|     |        |        |
|-----|--------|--------|
| 117 | 0.9117 | 0.0031 |
| 118 | 0.9147 | 0.0031 |
| 119 | 0.9178 | 0.0030 |
| 120 | 0.9208 | 0.0030 |
| 121 | 0.9238 | 0.0030 |
| 122 | 0.9268 | 0.0030 |
| 123 | 0.9298 | 0.0030 |
| 124 | 0.9328 | 0.0030 |
| 125 | 0.9357 | 0.0030 |
| 126 | 0.9387 | 0.0029 |
| 127 | 0.9416 | 0.0029 |
| 128 | 0.9445 | 0.0029 |
| 129 | 0.9474 | 0.0029 |
| 130 | 0.9503 | 0.0029 |
| 131 | 0.9532 | 0.0029 |
| 132 | 0.9560 | 0.0029 |
| 133 | 0.9589 | 0.0028 |
| 134 | 0.9617 | 0.0028 |
| 135 | 0.9645 | 0.0028 |
| 136 | 0.9673 | 0.0028 |
| 137 | 0.9701 | 0.0028 |
| 138 | 0.9729 | 0.0028 |
| 139 | 0.9757 | 0.0028 |
| 140 | 0.9784 | 0.0028 |
| 141 | 0.9812 | 0.0027 |
| 142 | 0.9839 | 0.0027 |
| 143 | 0.9866 | 0.0027 |
| 144 | 0.9894 | 0.0027 |
| 145 | 0.9921 | 0.0027 |
| 146 | 0.9947 | 0.0027 |
| 147 | 0.9974 | 0.0027 |
| 148 | 1.0001 | 0.0027 |
| 149 | 1.0027 | 0.0027 |
| 150 | 1.0054 | 0.0026 |
| 151 | 1.0080 | 0.0026 |
| 152 | 1.0107 | 0.0026 |
| 153 | 1.0133 | 0.0026 |
| 154 | 1.0159 | 0.0026 |
| 155 | 1.0185 | 0.0026 |
| 156 | 1.0210 | 0.0026 |
| 157 | 1.0236 | 0.0026 |
| 158 | 1.0262 | 0.0026 |
| 159 | 1.0287 | 0.0026 |
| 160 | 1.0313 | 0.0025 |
| 161 | 1.0338 | 0.0025 |
| 162 | 1.0363 | 0.0025 |
| 163 | 1.0389 | 0.0025 |
| 164 | 1.0414 | 0.0025 |
| 165 | 1.0439 | 0.0025 |
| 166 | 1.0463 | 0.0025 |
| 167 | 1.0488 | 0.0025 |
| 168 | 1.0513 | 0.0025 |
| 169 | 1.0538 | 0.0025 |
| 170 | 1.0562 | 0.0025 |
| 171 | 1.0586 | 0.0024 |
| 172 | 1.0611 | 0.0024 |
| 173 | 1.0635 | 0.0024 |
| 174 | 1.0659 | 0.0024 |
| 175 | 1.0683 | 0.0024 |
| 176 | 1.0707 | 0.0024 |
| 177 | 1.0731 | 0.0024 |
| 178 | 1.0755 | 0.0024 |
| 179 | 1.0779 | 0.0024 |
| 180 | 1.0803 | 0.0024 |
| 181 | 1.0826 | 0.0024 |
| 182 | 1.0850 | 0.0024 |
| 183 | 1.0873 | 0.0023 |
| 184 | 1.0897 | 0.0023 |
| 185 | 1.0920 | 0.0023 |
| 186 | 1.0943 | 0.0023 |
| 187 | 1.0966 | 0.0023 |
| 188 | 1.0989 | 0.0023 |
| 189 | 1.1012 | 0.0023 |
| 190 | 1.1035 | 0.0023 |
| 191 | 1.1058 | 0.0023 |
| 192 | 1.1081 | 0.0023 |
| 193 | 1.1103 | 0.0023 |
| 194 | 1.1126 | 0.0023 |
| 195 | 1.1149 | 0.0023 |
| 196 | 1.1171 | 0.0022 |
| 197 | 1.1194 | 0.0022 |

|     |        |        |
|-----|--------|--------|
| 198 | 1.1216 | 0.0022 |
| 199 | 1.1238 | 0.0022 |
| 200 | 1.1260 | 0.0022 |
| 201 | 1.1282 | 0.0022 |
| 202 | 1.1305 | 0.0022 |
| 203 | 1.1327 | 0.0022 |
| 204 | 1.1349 | 0.0022 |
| 205 | 1.1370 | 0.0022 |
| 206 | 1.1392 | 0.0022 |
| 207 | 1.1414 | 0.0022 |
| 208 | 1.1436 | 0.0022 |
| 209 | 1.1457 | 0.0022 |
| 210 | 1.1479 | 0.0022 |
| 211 | 1.1500 | 0.0022 |
| 212 | 1.1522 | 0.0021 |
| 213 | 1.1543 | 0.0021 |
| 214 | 1.1564 | 0.0021 |
| 215 | 1.1586 | 0.0021 |
| 216 | 1.1607 | 0.0021 |
| 217 | 1.1628 | 0.0021 |
| 218 | 1.1649 | 0.0021 |
| 219 | 1.1670 | 0.0021 |
| 220 | 1.1691 | 0.0021 |
| 221 | 1.1712 | 0.0021 |
| 222 | 1.1733 | 0.0021 |
| 223 | 1.1754 | 0.0021 |
| 224 | 1.1774 | 0.0021 |
| 225 | 1.1795 | 0.0021 |
| 226 | 1.1816 | 0.0021 |
| 227 | 1.1836 | 0.0021 |
| 228 | 1.1857 | 0.0021 |
| 229 | 1.1877 | 0.0020 |
| 230 | 1.1898 | 0.0020 |
| 231 | 1.1918 | 0.0020 |
| 232 | 1.1938 | 0.0020 |
| 233 | 1.1959 | 0.0020 |
| 234 | 1.1979 | 0.0020 |
| 235 | 1.1999 | 0.0020 |
| 236 | 1.2019 | 0.0020 |
| 237 | 1.2039 | 0.0020 |
| 238 | 1.2059 | 0.0020 |
| 239 | 1.2079 | 0.0020 |
| 240 | 1.2099 | 0.0020 |
| 241 | 1.2119 | 0.0020 |
| 242 | 1.2138 | 0.0020 |
| 243 | 1.2158 | 0.0020 |
| 244 | 1.2178 | 0.0020 |
| 245 | 1.2197 | 0.0020 |
| 246 | 1.2217 | 0.0020 |
| 247 | 1.2237 | 0.0020 |
| 248 | 1.2256 | 0.0019 |
| 249 | 1.2276 | 0.0019 |
| 250 | 1.2295 | 0.0019 |
| 251 | 1.2314 | 0.0019 |
| 252 | 1.2334 | 0.0019 |
| 253 | 1.2353 | 0.0019 |
| 254 | 1.2372 | 0.0019 |
| 255 | 1.2391 | 0.0019 |
| 256 | 1.2410 | 0.0019 |
| 257 | 1.2429 | 0.0019 |
| 258 | 1.2448 | 0.0019 |
| 259 | 1.2467 | 0.0019 |
| 260 | 1.2486 | 0.0019 |
| 261 | 1.2505 | 0.0019 |
| 262 | 1.2524 | 0.0019 |
| 263 | 1.2543 | 0.0019 |
| 264 | 1.2562 | 0.0019 |
| 265 | 1.2580 | 0.0019 |
| 266 | 1.2599 | 0.0019 |
| 267 | 1.2618 | 0.0019 |
| 268 | 1.2636 | 0.0019 |
| 269 | 1.2655 | 0.0019 |
| 270 | 1.2673 | 0.0019 |
| 271 | 1.2692 | 0.0018 |
| 272 | 1.2710 | 0.0018 |
| 273 | 1.2729 | 0.0018 |
| 274 | 1.2747 | 0.0018 |
| 275 | 1.2765 | 0.0018 |
| 276 | 1.2784 | 0.0018 |
| 277 | 1.2802 | 0.0018 |
| 278 | 1.2820 | 0.0018 |

|     |        |        |
|-----|--------|--------|
| 279 | 1.2838 | 0.0018 |
| 280 | 1.2856 | 0.0018 |
| 281 | 1.2874 | 0.0018 |
| 282 | 1.2892 | 0.0018 |
| 283 | 1.2910 | 0.0018 |
| 284 | 1.2928 | 0.0018 |
| 285 | 1.2946 | 0.0018 |
| 286 | 1.2964 | 0.0018 |
| 287 | 1.2982 | 0.0018 |
| 288 | 1.3000 | 0.0018 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 2                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 3                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 4                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 5                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 6                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 7                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 8                          | 0.0018                   | 0.0005                    | 0.0013                        |
| 9                          | 0.0018                   | 0.0005                    | 0.0014                        |
| 10                         | 0.0018                   | 0.0005                    | 0.0014                        |
| 11                         | 0.0018                   | 0.0005                    | 0.0014                        |
| 12                         | 0.0018                   | 0.0005                    | 0.0014                        |
| 13                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 14                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 15                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 16                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 17                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 18                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 19                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 20                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 21                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 22                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 23                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 24                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 25                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 26                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 27                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 28                         | 0.0019                   | 0.0005                    | 0.0014                        |
| 29                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 30                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 31                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 32                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 33                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 34                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 35                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 36                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 37                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 38                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 39                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 40                         | 0.0020                   | 0.0005                    | 0.0015                        |
| 41                         | 0.0021                   | 0.0005                    | 0.0015                        |
| 42                         | 0.0021                   | 0.0005                    | 0.0015                        |
| 43                         | 0.0021                   | 0.0005                    | 0.0015                        |
| 44                         | 0.0021                   | 0.0005                    | 0.0015                        |
| 45                         | 0.0021                   | 0.0005                    | 0.0015                        |
| 46                         | 0.0021                   | 0.0005                    | 0.0016                        |
| 47                         | 0.0021                   | 0.0005                    | 0.0016                        |
| 48                         | 0.0021                   | 0.0005                    | 0.0016                        |
| 49                         | 0.0021                   | 0.0005                    | 0.0016                        |
| 50                         | 0.0021                   | 0.0005                    | 0.0016                        |
| 51                         | 0.0021                   | 0.0006                    | 0.0016                        |
| 52                         | 0.0021                   | 0.0006                    | 0.0016                        |
| 53                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 54                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 55                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 56                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 57                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 58                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 59                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 60                         | 0.0022                   | 0.0006                    | 0.0016                        |
| 61                         | 0.0022                   | 0.0006                    | 0.0017                        |
| 62                         | 0.0022                   | 0.0006                    | 0.0017                        |
| 63                         | 0.0023                   | 0.0006                    | 0.0017                        |
| 64                         | 0.0023                   | 0.0006                    | 0.0017                        |
| 65                         | 0.0023                   | 0.0006                    | 0.0017                        |
| 66                         | 0.0023                   | 0.0006                    | 0.0017                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 67  | 0.0023 | 0.0006 | 0.0017 |
| 68  | 0.0023 | 0.0006 | 0.0017 |
| 69  | 0.0023 | 0.0006 | 0.0017 |
| 70  | 0.0023 | 0.0006 | 0.0017 |
| 71  | 0.0023 | 0.0006 | 0.0017 |
| 72  | 0.0024 | 0.0006 | 0.0017 |
| 73  | 0.0024 | 0.0006 | 0.0018 |
| 74  | 0.0024 | 0.0006 | 0.0018 |
| 75  | 0.0024 | 0.0006 | 0.0018 |
| 76  | 0.0024 | 0.0006 | 0.0018 |
| 77  | 0.0024 | 0.0006 | 0.0018 |
| 78  | 0.0024 | 0.0006 | 0.0018 |
| 79  | 0.0024 | 0.0006 | 0.0018 |
| 80  | 0.0025 | 0.0006 | 0.0018 |
| 81  | 0.0025 | 0.0006 | 0.0018 |
| 82  | 0.0025 | 0.0006 | 0.0018 |
| 83  | 0.0025 | 0.0006 | 0.0019 |
| 84  | 0.0025 | 0.0006 | 0.0019 |
| 85  | 0.0025 | 0.0007 | 0.0019 |
| 86  | 0.0025 | 0.0007 | 0.0019 |
| 87  | 0.0026 | 0.0007 | 0.0019 |
| 88  | 0.0026 | 0.0007 | 0.0019 |
| 89  | 0.0026 | 0.0007 | 0.0019 |
| 90  | 0.0026 | 0.0007 | 0.0019 |
| 91  | 0.0026 | 0.0007 | 0.0019 |
| 92  | 0.0026 | 0.0007 | 0.0019 |
| 93  | 0.0026 | 0.0007 | 0.0020 |
| 94  | 0.0027 | 0.0007 | 0.0020 |
| 95  | 0.0027 | 0.0007 | 0.0020 |
| 96  | 0.0027 | 0.0007 | 0.0020 |
| 97  | 0.0027 | 0.0007 | 0.0020 |
| 98  | 0.0027 | 0.0007 | 0.0020 |
| 99  | 0.0027 | 0.0007 | 0.0020 |
| 100 | 0.0028 | 0.0007 | 0.0020 |
| 101 | 0.0028 | 0.0007 | 0.0021 |
| 102 | 0.0028 | 0.0007 | 0.0021 |
| 103 | 0.0028 | 0.0007 | 0.0021 |
| 104 | 0.0028 | 0.0007 | 0.0021 |
| 105 | 0.0029 | 0.0007 | 0.0021 |
| 106 | 0.0029 | 0.0007 | 0.0021 |
| 107 | 0.0029 | 0.0007 | 0.0022 |
| 108 | 0.0029 | 0.0008 | 0.0022 |
| 109 | 0.0029 | 0.0008 | 0.0022 |
| 110 | 0.0030 | 0.0008 | 0.0022 |
| 111 | 0.0030 | 0.0008 | 0.0022 |
| 112 | 0.0030 | 0.0008 | 0.0022 |
| 113 | 0.0030 | 0.0008 | 0.0022 |
| 114 | 0.0030 | 0.0008 | 0.0023 |
| 115 | 0.0031 | 0.0008 | 0.0023 |
| 116 | 0.0031 | 0.0008 | 0.0023 |
| 117 | 0.0031 | 0.0008 | 0.0023 |
| 118 | 0.0031 | 0.0008 | 0.0023 |
| 119 | 0.0032 | 0.0008 | 0.0024 |
| 120 | 0.0032 | 0.0008 | 0.0024 |
| 121 | 0.0032 | 0.0008 | 0.0024 |
| 122 | 0.0032 | 0.0008 | 0.0024 |
| 123 | 0.0033 | 0.0008 | 0.0024 |
| 124 | 0.0033 | 0.0009 | 0.0025 |
| 125 | 0.0033 | 0.0009 | 0.0025 |
| 126 | 0.0034 | 0.0009 | 0.0025 |
| 127 | 0.0034 | 0.0009 | 0.0025 |
| 128 | 0.0034 | 0.0009 | 0.0025 |
| 129 | 0.0035 | 0.0009 | 0.0026 |
| 130 | 0.0035 | 0.0009 | 0.0026 |
| 131 | 0.0035 | 0.0009 | 0.0026 |
| 132 | 0.0036 | 0.0009 | 0.0026 |
| 133 | 0.0036 | 0.0009 | 0.0027 |
| 134 | 0.0036 | 0.0009 | 0.0027 |
| 135 | 0.0037 | 0.0010 | 0.0027 |
| 136 | 0.0037 | 0.0010 | 0.0028 |
| 137 | 0.0038 | 0.0010 | 0.0028 |
| 138 | 0.0038 | 0.0010 | 0.0028 |
| 139 | 0.0039 | 0.0010 | 0.0029 |
| 140 | 0.0039 | 0.0010 | 0.0029 |
| 141 | 0.0039 | 0.0010 | 0.0029 |
| 142 | 0.0040 | 0.0010 | 0.0029 |
| 143 | 0.0040 | 0.0010 | 0.0030 |
| 144 | 0.0041 | 0.0011 | 0.0030 |
| 145 | 0.0060 | 0.0016 | 0.0045 |
| 146 | 0.0060 | 0.0016 | 0.0045 |
| 147 | 0.0061 | 0.0016 | 0.0045 |

|     |        |        |        |
|-----|--------|--------|--------|
| 148 | 0.0062 | 0.0016 | 0.0046 |
| 149 | 0.0062 | 0.0016 | 0.0046 |
| 150 | 0.0063 | 0.0016 | 0.0047 |
| 151 | 0.0064 | 0.0016 | 0.0047 |
| 152 | 0.0064 | 0.0017 | 0.0048 |
| 153 | 0.0065 | 0.0017 | 0.0048 |
| 154 | 0.0065 | 0.0017 | 0.0049 |
| 155 | 0.0066 | 0.0017 | 0.0049 |
| 156 | 0.0067 | 0.0017 | 0.0050 |
| 157 | 0.0068 | 0.0018 | 0.0050 |
| 158 | 0.0069 | 0.0018 | 0.0051 |
| 159 | 0.0070 | 0.0018 | 0.0052 |
| 160 | 0.0070 | 0.0018 | 0.0052 |
| 161 | 0.0072 | 0.0018 | 0.0053 |
| 162 | 0.0072 | 0.0019 | 0.0054 |
| 163 | 0.0074 | 0.0019 | 0.0055 |
| 164 | 0.0074 | 0.0019 | 0.0055 |
| 165 | 0.0076 | 0.0020 | 0.0056 |
| 166 | 0.0077 | 0.0020 | 0.0057 |
| 167 | 0.0078 | 0.0020 | 0.0058 |
| 168 | 0.0079 | 0.0020 | 0.0059 |
| 169 | 0.0081 | 0.0021 | 0.0060 |
| 170 | 0.0082 | 0.0021 | 0.0061 |
| 171 | 0.0084 | 0.0022 | 0.0062 |
| 172 | 0.0085 | 0.0022 | 0.0063 |
| 173 | 0.0088 | 0.0023 | 0.0065 |
| 174 | 0.0089 | 0.0023 | 0.0066 |
| 175 | 0.0092 | 0.0024 | 0.0068 |
| 176 | 0.0093 | 0.0024 | 0.0069 |
| 177 | 0.0097 | 0.0025 | 0.0072 |
| 178 | 0.0099 | 0.0025 | 0.0073 |
| 179 | 0.0103 | 0.0026 | 0.0076 |
| 180 | 0.0105 | 0.0027 | 0.0078 |
| 181 | 0.0110 | 0.0028 | 0.0081 |
| 182 | 0.0112 | 0.0029 | 0.0083 |
| 183 | 0.0119 | 0.0031 | 0.0088 |
| 184 | 0.0123 | 0.0032 | 0.0091 |
| 185 | 0.0069 | 0.0018 | 0.0052 |
| 186 | 0.0074 | 0.0019 | 0.0055 |
| 187 | 0.0086 | 0.0022 | 0.0064 |
| 188 | 0.0094 | 0.0024 | 0.0070 |
| 189 | 0.0117 | 0.0030 | 0.0086 |
| 190 | 0.0134 | 0.0035 | 0.0100 |
| 191 | 0.0204 | 0.0053 | 0.0151 |
| 192 | 0.0296 | 0.0063 | 0.0233 |
| 193 | 0.1279 | 0.0063 | 0.1216 |
| 194 | 0.0160 | 0.0041 | 0.0119 |
| 195 | 0.0104 | 0.0027 | 0.0077 |
| 196 | 0.0079 | 0.0021 | 0.0059 |
| 197 | 0.0127 | 0.0033 | 0.0094 |
| 198 | 0.0116 | 0.0030 | 0.0086 |
| 199 | 0.0107 | 0.0028 | 0.0079 |
| 200 | 0.0100 | 0.0026 | 0.0075 |
| 201 | 0.0095 | 0.0025 | 0.0070 |
| 202 | 0.0090 | 0.0023 | 0.0067 |
| 203 | 0.0087 | 0.0022 | 0.0064 |
| 204 | 0.0083 | 0.0021 | 0.0062 |
| 205 | 0.0080 | 0.0021 | 0.0059 |
| 206 | 0.0077 | 0.0020 | 0.0057 |
| 207 | 0.0075 | 0.0019 | 0.0056 |
| 208 | 0.0073 | 0.0019 | 0.0054 |
| 209 | 0.0071 | 0.0018 | 0.0053 |
| 210 | 0.0069 | 0.0018 | 0.0051 |
| 211 | 0.0067 | 0.0017 | 0.0050 |
| 212 | 0.0066 | 0.0017 | 0.0049 |
| 213 | 0.0065 | 0.0017 | 0.0048 |
| 214 | 0.0063 | 0.0016 | 0.0047 |
| 215 | 0.0062 | 0.0016 | 0.0046 |
| 216 | 0.0061 | 0.0016 | 0.0045 |
| 217 | 0.0041 | 0.0011 | 0.0030 |
| 218 | 0.0040 | 0.0010 | 0.0030 |
| 219 | 0.0039 | 0.0010 | 0.0029 |
| 220 | 0.0038 | 0.0010 | 0.0028 |
| 221 | 0.0037 | 0.0010 | 0.0028 |
| 222 | 0.0037 | 0.0009 | 0.0027 |
| 223 | 0.0036 | 0.0009 | 0.0027 |
| 224 | 0.0035 | 0.0009 | 0.0026 |
| 225 | 0.0034 | 0.0009 | 0.0026 |
| 226 | 0.0034 | 0.0009 | 0.0025 |
| 227 | 0.0033 | 0.0009 | 0.0025 |
| 228 | 0.0033 | 0.0008 | 0.0024 |

|     |        |        |        |
|-----|--------|--------|--------|
| 229 | 0.0032 | 0.0008 | 0.0024 |
| 230 | 0.0032 | 0.0008 | 0.0023 |
| 231 | 0.0031 | 0.0008 | 0.0023 |
| 232 | 0.0031 | 0.0008 | 0.0023 |
| 233 | 0.0030 | 0.0008 | 0.0022 |
| 234 | 0.0030 | 0.0008 | 0.0022 |
| 235 | 0.0029 | 0.0008 | 0.0022 |
| 236 | 0.0029 | 0.0007 | 0.0021 |
| 237 | 0.0028 | 0.0007 | 0.0021 |
| 238 | 0.0028 | 0.0007 | 0.0021 |
| 239 | 0.0028 | 0.0007 | 0.0021 |
| 240 | 0.0027 | 0.0007 | 0.0020 |
| 241 | 0.0027 | 0.0007 | 0.0020 |
| 242 | 0.0027 | 0.0007 | 0.0020 |
| 243 | 0.0026 | 0.0007 | 0.0020 |
| 244 | 0.0026 | 0.0007 | 0.0019 |
| 245 | 0.0026 | 0.0007 | 0.0019 |
| 246 | 0.0025 | 0.0007 | 0.0019 |
| 247 | 0.0025 | 0.0006 | 0.0019 |
| 248 | 0.0025 | 0.0006 | 0.0018 |
| 249 | 0.0025 | 0.0006 | 0.0018 |
| 250 | 0.0024 | 0.0006 | 0.0018 |
| 251 | 0.0024 | 0.0006 | 0.0018 |
| 252 | 0.0024 | 0.0006 | 0.0018 |
| 253 | 0.0024 | 0.0006 | 0.0018 |
| 254 | 0.0023 | 0.0006 | 0.0017 |
| 255 | 0.0023 | 0.0006 | 0.0017 |
| 256 | 0.0023 | 0.0006 | 0.0017 |
| 257 | 0.0023 | 0.0006 | 0.0017 |
| 258 | 0.0022 | 0.0006 | 0.0017 |
| 259 | 0.0022 | 0.0006 | 0.0017 |
| 260 | 0.0022 | 0.0006 | 0.0016 |
| 261 | 0.0022 | 0.0006 | 0.0016 |
| 262 | 0.0022 | 0.0006 | 0.0016 |
| 263 | 0.0022 | 0.0006 | 0.0016 |
| 264 | 0.0021 | 0.0006 | 0.0016 |
| 265 | 0.0021 | 0.0005 | 0.0016 |
| 266 | 0.0021 | 0.0005 | 0.0016 |
| 267 | 0.0021 | 0.0005 | 0.0015 |
| 268 | 0.0021 | 0.0005 | 0.0015 |
| 269 | 0.0020 | 0.0005 | 0.0015 |
| 270 | 0.0020 | 0.0005 | 0.0015 |
| 271 | 0.0020 | 0.0005 | 0.0015 |
| 272 | 0.0020 | 0.0005 | 0.0015 |
| 273 | 0.0020 | 0.0005 | 0.0015 |
| 274 | 0.0020 | 0.0005 | 0.0015 |
| 275 | 0.0020 | 0.0005 | 0.0014 |
| 276 | 0.0019 | 0.0005 | 0.0014 |
| 277 | 0.0019 | 0.0005 | 0.0014 |
| 278 | 0.0019 | 0.0005 | 0.0014 |
| 279 | 0.0019 | 0.0005 | 0.0014 |
| 280 | 0.0019 | 0.0005 | 0.0014 |
| 281 | 0.0019 | 0.0005 | 0.0014 |
| 282 | 0.0019 | 0.0005 | 0.0014 |
| 283 | 0.0018 | 0.0005 | 0.0014 |
| 284 | 0.0018 | 0.0005 | 0.0014 |
| 285 | 0.0018 | 0.0005 | 0.0014 |
| 286 | 0.0018 | 0.0005 | 0.0013 |
| 287 | 0.0018 | 0.0005 | 0.0013 |
| 288 | 0.0018 | 0.0005 | 0.0013 |

-----  
Total soil rain loss = 0.31(In)  
Total effective rainfall = 0.99(In)  
Peak flow rate in flood hydrograph = (CFS)  
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+++++  
24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h  
-----

Hydrograph in 5 Minute intervals ((CFS))  
-----

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|-----------|--------------|--------|---|-----|------|------|------|
| 0+ 5      | 0.0002       | 0.03   | Q |     |      |      |      |
| 0+10      | 0.0013       | 0.16   | Q |     |      |      |      |
| 0+15      | 0.0029       | 0.22   | Q |     |      |      |      |
| 0+20      | 0.0046       | 0.25   | Q |     |      |      |      |
| 0+25      | 0.0064       | 0.26   | Q |     |      |      |      |
| 0+30      | 0.0082       | 0.27   | Q |     |      |      |      |

|      |        |      |     |
|------|--------|------|-----|
| 0+35 | 0.0102 | 0.28 | Q   |
| 0+40 | 0.0121 | 0.28 | Q   |
| 0+45 | 0.0141 | 0.29 | Q   |
| 0+50 | 0.0161 | 0.29 | Q   |
| 0+55 | 0.0181 | 0.29 | Q   |
| 1+ 0 | 0.0201 | 0.29 | Q   |
| 1+ 5 | 0.0221 | 0.29 | Q   |
| 1+10 | 0.0241 | 0.29 | Q   |
| 1+15 | 0.0261 | 0.29 | Q   |
| 1+20 | 0.0281 | 0.29 | Q   |
| 1+25 | 0.0302 | 0.30 | Q   |
| 1+30 | 0.0322 | 0.30 | Q   |
| 1+35 | 0.0343 | 0.30 | Q   |
| 1+40 | 0.0363 | 0.30 | Q   |
| 1+45 | 0.0384 | 0.30 | QV  |
| 1+50 | 0.0405 | 0.30 | QV  |
| 1+55 | 0.0425 | 0.30 | QV  |
| 2+ 0 | 0.0446 | 0.30 | QV  |
| 2+ 5 | 0.0467 | 0.30 | QV  |
| 2+10 | 0.0488 | 0.31 | QV  |
| 2+15 | 0.0509 | 0.31 | QV  |
| 2+20 | 0.0530 | 0.31 | QV  |
| 2+25 | 0.0552 | 0.31 | QV  |
| 2+30 | 0.0573 | 0.31 | QV  |
| 2+35 | 0.0594 | 0.31 | QV  |
| 2+40 | 0.0616 | 0.31 | QV  |
| 2+45 | 0.0637 | 0.31 | QV  |
| 2+50 | 0.0659 | 0.31 | QV  |
| 2+55 | 0.0681 | 0.32 | QV  |
| 3+ 0 | 0.0703 | 0.32 | QV  |
| 3+ 5 | 0.0724 | 0.32 | QV  |
| 3+10 | 0.0746 | 0.32 | Q V |
| 3+15 | 0.0768 | 0.32 | Q V |
| 3+20 | 0.0791 | 0.32 | Q V |
| 3+25 | 0.0813 | 0.32 | Q V |
| 3+30 | 0.0835 | 0.32 | Q V |
| 3+35 | 0.0858 | 0.33 | Q V |
| 3+40 | 0.0880 | 0.33 | Q V |
| 3+45 | 0.0903 | 0.33 | Q V |
| 3+50 | 0.0925 | 0.33 | Q V |
| 3+55 | 0.0948 | 0.33 | Q V |
| 4+ 0 | 0.0971 | 0.33 | Q V |
| 4+ 5 | 0.0994 | 0.33 | Q V |
| 4+10 | 0.1017 | 0.33 | Q V |
| 4+15 | 0.1040 | 0.34 | Q V |
| 4+20 | 0.1063 | 0.34 | Q V |
| 4+25 | 0.1087 | 0.34 | Q V |
| 4+30 | 0.1110 | 0.34 | Q V |
| 4+35 | 0.1134 | 0.34 | Q V |
| 4+40 | 0.1157 | 0.34 | Q V |
| 4+45 | 0.1181 | 0.34 | Q V |
| 4+50 | 0.1205 | 0.35 | Q V |
| 4+55 | 0.1229 | 0.35 | Q V |
| 5+ 0 | 0.1253 | 0.35 | Q V |
| 5+ 5 | 0.1277 | 0.35 | Q V |
| 5+10 | 0.1302 | 0.35 | Q V |
| 5+15 | 0.1326 | 0.35 | Q V |
| 5+20 | 0.1351 | 0.36 | Q V |
| 5+25 | 0.1375 | 0.36 | Q V |
| 5+30 | 0.1400 | 0.36 | Q V |
| 5+35 | 0.1425 | 0.36 | Q V |
| 5+40 | 0.1450 | 0.36 | Q V |
| 5+45 | 0.1475 | 0.36 | Q V |
| 5+50 | 0.1500 | 0.37 | Q V |
| 5+55 | 0.1526 | 0.37 | Q V |
| 6+ 0 | 0.1551 | 0.37 | Q V |
| 6+ 5 | 0.1577 | 0.37 | Q V |
| 6+10 | 0.1602 | 0.37 | Q V |
| 6+15 | 0.1628 | 0.38 | Q V |
| 6+20 | 0.1654 | 0.38 | Q V |
| 6+25 | 0.1680 | 0.38 | Q V |
| 6+30 | 0.1707 | 0.38 | Q V |
| 6+35 | 0.1733 | 0.38 | Q V |
| 6+40 | 0.1760 | 0.39 | Q V |
| 6+45 | 0.1786 | 0.39 | Q V |
| 6+50 | 0.1813 | 0.39 | Q V |
| 6+55 | 0.1840 | 0.39 | Q V |
| 7+ 0 | 0.1867 | 0.39 | Q V |
| 7+ 5 | 0.1895 | 0.40 | Q V |
| 7+10 | 0.1922 | 0.40 | Q V |
| 7+15 | 0.1950 | 0.40 | Q V |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 7+20  | 0.1977 | 0.40 | Q | V |  |  |  |  |
| 7+25  | 0.2005 | 0.40 | Q | V |  |  |  |  |
| 7+30  | 0.2033 | 0.41 | Q | V |  |  |  |  |
| 7+35  | 0.2061 | 0.41 | Q | V |  |  |  |  |
| 7+40  | 0.2090 | 0.41 | Q | V |  |  |  |  |
| 7+45  | 0.2118 | 0.41 | Q | V |  |  |  |  |
| 7+50  | 0.2147 | 0.42 | Q | V |  |  |  |  |
| 7+55  | 0.2176 | 0.42 | Q | V |  |  |  |  |
| 8+ 0  | 0.2205 | 0.42 | Q | V |  |  |  |  |
| 8+ 5  | 0.2234 | 0.42 | Q | V |  |  |  |  |
| 8+10  | 0.2264 | 0.43 | Q | V |  |  |  |  |
| 8+15  | 0.2293 | 0.43 | Q | V |  |  |  |  |
| 8+20  | 0.2323 | 0.43 | Q | V |  |  |  |  |
| 8+25  | 0.2353 | 0.44 | Q | V |  |  |  |  |
| 8+30  | 0.2384 | 0.44 | Q | V |  |  |  |  |
| 8+35  | 0.2414 | 0.44 | Q | V |  |  |  |  |
| 8+40  | 0.2445 | 0.44 | Q | V |  |  |  |  |
| 8+45  | 0.2475 | 0.45 | Q | V |  |  |  |  |
| 8+50  | 0.2506 | 0.45 | Q | V |  |  |  |  |
| 8+55  | 0.2538 | 0.45 | Q | V |  |  |  |  |
| 9+ 0  | 0.2569 | 0.46 | Q | V |  |  |  |  |
| 9+ 5  | 0.2601 | 0.46 | Q | V |  |  |  |  |
| 9+10  | 0.2633 | 0.46 | Q | V |  |  |  |  |
| 9+15  | 0.2665 | 0.47 | Q | V |  |  |  |  |
| 9+20  | 0.2697 | 0.47 | Q | V |  |  |  |  |
| 9+25  | 0.2730 | 0.47 | Q | V |  |  |  |  |
| 9+30  | 0.2763 | 0.48 | Q | V |  |  |  |  |
| 9+35  | 0.2796 | 0.48 | Q | V |  |  |  |  |
| 9+40  | 0.2829 | 0.48 | Q | V |  |  |  |  |
| 9+45  | 0.2863 | 0.49 | Q | V |  |  |  |  |
| 9+50  | 0.2897 | 0.49 | Q | V |  |  |  |  |
| 9+55  | 0.2931 | 0.50 | Q | V |  |  |  |  |
| 10+ 0 | 0.2965 | 0.50 | Q | V |  |  |  |  |
| 10+ 5 | 0.3000 | 0.50 | Q | V |  |  |  |  |
| 10+10 | 0.3035 | 0.51 | Q | V |  |  |  |  |
| 10+15 | 0.3070 | 0.51 | Q | V |  |  |  |  |
| 10+20 | 0.3106 | 0.52 | Q | V |  |  |  |  |
| 10+25 | 0.3142 | 0.52 | Q | V |  |  |  |  |
| 10+30 | 0.3178 | 0.53 | Q | V |  |  |  |  |
| 10+35 | 0.3215 | 0.53 | Q | V |  |  |  |  |
| 10+40 | 0.3252 | 0.54 | Q | V |  |  |  |  |
| 10+45 | 0.3289 | 0.54 | Q | V |  |  |  |  |
| 10+50 | 0.3326 | 0.55 | Q | V |  |  |  |  |
| 10+55 | 0.3364 | 0.55 | Q | V |  |  |  |  |
| 11+ 0 | 0.3403 | 0.56 | Q | V |  |  |  |  |
| 11+ 5 | 0.3441 | 0.56 | Q | V |  |  |  |  |
| 11+10 | 0.3480 | 0.57 | Q | V |  |  |  |  |
| 11+15 | 0.3520 | 0.57 | Q | V |  |  |  |  |
| 11+20 | 0.3560 | 0.58 | Q | V |  |  |  |  |
| 11+25 | 0.3600 | 0.58 | Q | V |  |  |  |  |
| 11+30 | 0.3641 | 0.59 | Q | V |  |  |  |  |
| 11+35 | 0.3682 | 0.60 | Q | V |  |  |  |  |
| 11+40 | 0.3723 | 0.60 | Q | V |  |  |  |  |
| 11+45 | 0.3765 | 0.61 | Q | V |  |  |  |  |
| 11+50 | 0.3808 | 0.62 | Q | V |  |  |  |  |
| 11+55 | 0.3851 | 0.62 | Q | V |  |  |  |  |
| 12+ 0 | 0.3895 | 0.63 | Q | V |  |  |  |  |
| 12+ 5 | 0.3941 | 0.67 | Q | V |  |  |  |  |
| 12+10 | 0.3997 | 0.82 | Q | V |  |  |  |  |
| 12+15 | 0.4059 | 0.89 | Q | V |  |  |  |  |
| 12+20 | 0.4122 | 0.92 | Q | V |  |  |  |  |
| 12+25 | 0.4188 | 0.95 | Q | V |  |  |  |  |
| 12+30 | 0.4254 | 0.97 | Q | V |  |  |  |  |
| 12+35 | 0.4322 | 0.98 | Q | V |  |  |  |  |
| 12+40 | 0.4390 | 1.00 | Q | V |  |  |  |  |
| 12+45 | 0.4460 | 1.01 | Q | V |  |  |  |  |
| 12+50 | 0.4530 | 1.02 | Q | V |  |  |  |  |
| 12+55 | 0.4601 | 1.03 | Q | V |  |  |  |  |
| 13+ 0 | 0.4673 | 1.04 | Q | V |  |  |  |  |
| 13+ 5 | 0.4745 | 1.05 | Q | V |  |  |  |  |
| 13+10 | 0.4819 | 1.07 | Q | V |  |  |  |  |
| 13+15 | 0.4893 | 1.08 | Q | V |  |  |  |  |
| 13+20 | 0.4969 | 1.09 | Q | V |  |  |  |  |
| 13+25 | 0.5045 | 1.11 | Q | V |  |  |  |  |
| 13+30 | 0.5122 | 1.12 | Q | V |  |  |  |  |
| 13+35 | 0.5200 | 1.14 | Q | V |  |  |  |  |
| 13+40 | 0.5280 | 1.15 | Q | V |  |  |  |  |
| 13+45 | 0.5360 | 1.17 | Q | V |  |  |  |  |
| 13+50 | 0.5442 | 1.19 | Q | V |  |  |  |  |
| 13+55 | 0.5525 | 1.20 | Q | V |  |  |  |  |
| 14+ 0 | 0.5609 | 1.22 | Q | V |  |  |  |  |

|       |        |      |   |   |    |  |  |
|-------|--------|------|---|---|----|--|--|
| 14+ 5 | 0.5694 | 1.24 | Q |   | V  |  |  |
| 14+10 | 0.5782 | 1.27 | Q |   | V  |  |  |
| 14+15 | 0.5870 | 1.29 | Q |   | V  |  |  |
| 14+20 | 0.5961 | 1.31 | Q |   | V  |  |  |
| 14+25 | 0.6053 | 1.34 | Q |   | V  |  |  |
| 14+30 | 0.6147 | 1.37 | Q |   | V  |  |  |
| 14+35 | 0.6243 | 1.39 | Q |   | V  |  |  |
| 14+40 | 0.6341 | 1.43 | Q |   | V  |  |  |
| 14+45 | 0.6442 | 1.46 | Q |   | V  |  |  |
| 14+50 | 0.6545 | 1.50 | Q |   | V  |  |  |
| 14+55 | 0.6651 | 1.54 | Q |   | V  |  |  |
| 15+ 0 | 0.6760 | 1.59 | Q |   | V  |  |  |
| 15+ 5 | 0.6872 | 1.63 | Q |   | V  |  |  |
| 15+10 | 0.6989 | 1.69 | Q |   | V  |  |  |
| 15+15 | 0.7109 | 1.75 | Q |   | V  |  |  |
| 15+20 | 0.7235 | 1.82 | Q |   | V  |  |  |
| 15+25 | 0.7358 | 1.79 | Q |   | V  |  |  |
| 15+30 | 0.7456 | 1.43 | Q |   | V  |  |  |
| 15+35 | 0.7548 | 1.33 | Q |   | V  |  |  |
| 15+40 | 0.7642 | 1.38 | Q |   | V  |  |  |
| 15+45 | 0.7745 | 1.48 | Q |   | V  |  |  |
| 15+50 | 0.7862 | 1.71 | Q |   | V  |  |  |
| 15+55 | 0.8002 | 2.04 | Q |   | V  |  |  |
| 16+ 0 | 0.8198 | 2.84 | Q |   | V  |  |  |
| 16+ 5 | 0.8627 | 6.23 |   | Q | V  |  |  |
| 16+10 | 0.9591 |      |   | Q | VQ |  |  |
| 16+15 | 1.0101 | 7.39 |   | Q | V  |  |  |
| 16+20 | 1.0390 | 4.21 |   |   | V  |  |  |
| 16+25 | 1.0594 | 2.96 | Q |   | V  |  |  |
| 16+30 | 1.0777 | 2.66 | Q |   | V  |  |  |
| 16+35 | 1.0939 | 2.34 | Q |   | V  |  |  |
| 16+40 | 1.1079 | 2.03 | Q |   | V  |  |  |
| 16+45 | 1.1209 | 1.90 | Q |   | V  |  |  |
| 16+50 | 1.1329 | 1.74 | Q |   | V  |  |  |
| 16+55 | 1.1433 | 1.50 | Q |   | V  |  |  |
| 17+ 0 | 1.1531 | 1.43 | Q |   | V  |  |  |
| 17+ 5 | 1.1626 | 1.37 | Q |   | V  |  |  |
| 17+10 | 1.1717 | 1.32 | Q |   | V  |  |  |
| 17+15 | 1.1804 | 1.27 | Q |   | V  |  |  |
| 17+20 | 1.1889 | 1.23 | Q |   | V  |  |  |
| 17+25 | 1.1971 | 1.19 | Q |   | V  |  |  |
| 17+30 | 1.2051 | 1.16 | Q |   | V  |  |  |
| 17+35 | 1.2128 | 1.12 | Q |   | V  |  |  |
| 17+40 | 1.2204 | 1.10 | Q |   | V  |  |  |
| 17+45 | 1.2277 | 1.07 | Q |   | V  |  |  |
| 17+50 | 1.2349 | 1.05 | Q |   | V  |  |  |
| 17+55 | 1.2420 | 1.02 | Q |   | V  |  |  |
| 18+ 0 | 1.2489 | 1.00 | Q |   | V  |  |  |
| 18+ 5 | 1.2554 | 0.95 | Q |   | V  |  |  |
| 18+10 | 1.2608 | 0.79 | Q |   | V  |  |  |
| 18+15 | 1.2658 | 0.71 | Q |   | V  |  |  |
| 18+20 | 1.2704 | 0.67 | Q |   | V  |  |  |
| 18+25 | 1.2748 | 0.64 | Q |   | V  |  |  |
| 18+30 | 1.2791 | 0.62 | Q |   | V  |  |  |
| 18+35 | 1.2832 | 0.60 | Q |   | V  |  |  |
| 18+40 | 1.2872 | 0.58 | Q |   | V  |  |  |
| 18+45 | 1.2912 | 0.57 | Q |   | V  |  |  |
| 18+50 | 1.2950 | 0.56 | Q |   | V  |  |  |
| 18+55 | 1.2988 | 0.55 | Q |   | V  |  |  |
| 19+ 0 | 1.3025 | 0.54 | Q |   | V  |  |  |
| 19+ 5 | 1.3061 | 0.53 | Q |   | V  |  |  |
| 19+10 | 1.3096 | 0.52 | Q |   | V  |  |  |
| 19+15 | 1.3131 | 0.51 | Q |   | V  |  |  |
| 19+20 | 1.3166 | 0.50 | Q |   | V  |  |  |
| 19+25 | 1.3200 | 0.49 | Q |   | V  |  |  |
| 19+30 | 1.3233 | 0.48 | Q |   | V  |  |  |
| 19+35 | 1.3266 | 0.48 | Q |   | V  |  |  |
| 19+40 | 1.3299 | 0.47 | Q |   | V  |  |  |
| 19+45 | 1.3330 | 0.46 | Q |   | V  |  |  |
| 19+50 | 1.3362 | 0.46 | Q |   | V  |  |  |
| 19+55 | 1.3393 | 0.45 | Q |   | V  |  |  |
| 20+ 0 | 1.3424 | 0.44 | Q |   | V  |  |  |
| 20+ 5 | 1.3454 | 0.44 | Q |   | V  |  |  |
| 20+10 | 1.3484 | 0.43 | Q |   | V  |  |  |
| 20+15 | 1.3513 | 0.43 | Q |   | V  |  |  |
| 20+20 | 1.3542 | 0.42 | Q |   | V  |  |  |
| 20+25 | 1.3571 | 0.42 | Q |   | V  |  |  |
| 20+30 | 1.3599 | 0.41 | Q |   | V  |  |  |
| 20+35 | 1.3627 | 0.41 | Q |   | V  |  |  |
| 20+40 | 1.3655 | 0.40 | Q |   | V  |  |  |
| 20+45 | 1.3683 | 0.40 | Q |   | V  |  |  |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 20+50 | 1.3710 | 0.39 | Q |  |  |  | V |
| 20+55 | 1.3737 | 0.39 | Q |  |  |  | V |
| 21+ 0 | 1.3763 | 0.39 | Q |  |  |  | V |
| 21+ 5 | 1.3789 | 0.38 | Q |  |  |  | V |
| 21+10 | 1.3815 | 0.38 | Q |  |  |  | V |
| 21+15 | 1.3841 | 0.37 | Q |  |  |  | V |
| 21+20 | 1.3867 | 0.37 | Q |  |  |  | V |
| 21+25 | 1.3892 | 0.37 | Q |  |  |  | V |
| 21+30 | 1.3917 | 0.36 | Q |  |  |  | V |
| 21+35 | 1.3942 | 0.36 | Q |  |  |  | V |
| 21+40 | 1.3966 | 0.36 | Q |  |  |  | V |
| 21+45 | 1.3991 | 0.35 | Q |  |  |  | V |
| 21+50 | 1.4015 | 0.35 | Q |  |  |  | V |
| 21+55 | 1.4039 | 0.35 | Q |  |  |  | V |
| 22+ 0 | 1.4062 | 0.34 | Q |  |  |  | V |
| 22+ 5 | 1.4086 | 0.34 | Q |  |  |  | V |
| 22+10 | 1.4109 | 0.34 | Q |  |  |  | V |
| 22+15 | 1.4132 | 0.33 | Q |  |  |  | V |
| 22+20 | 1.4155 | 0.33 | Q |  |  |  | V |
| 22+25 | 1.4178 | 0.33 | Q |  |  |  | V |
| 22+30 | 1.4200 | 0.33 | Q |  |  |  | V |
| 22+35 | 1.4222 | 0.32 | Q |  |  |  | V |
| 22+40 | 1.4245 | 0.32 | Q |  |  |  | V |
| 22+45 | 1.4266 | 0.32 | Q |  |  |  | V |
| 22+50 | 1.4288 | 0.32 | Q |  |  |  | V |
| 22+55 | 1.4310 | 0.31 | Q |  |  |  | V |
| 23+ 0 | 1.4331 | 0.31 | Q |  |  |  | V |
| 23+ 5 | 1.4353 | 0.31 | Q |  |  |  | V |
| 23+10 | 1.4374 | 0.31 | Q |  |  |  | V |
| 23+15 | 1.4395 | 0.31 | Q |  |  |  | V |
| 23+20 | 1.4416 | 0.30 | Q |  |  |  | V |
| 23+25 | 1.4436 | 0.30 | Q |  |  |  | V |
| 23+30 | 1.4457 | 0.30 | Q |  |  |  | V |
| 23+35 | 1.4478 | 0.30 | Q |  |  |  | V |
| 23+40 | 1.4498 | 0.29 | Q |  |  |  | V |
| 23+45 | 1.4518 | 0.29 | Q |  |  |  | V |
| 23+50 | 1.4538 | 0.29 | Q |  |  |  | V |
| 23+55 | 1.4558 | 0.29 | Q |  |  |  | V |
| 24+ 0 | 1.4578 | 0.29 | Q |  |  |  | V |
| 24+ 5 | 1.4595 | 0.25 | Q |  |  |  | V |
| 24+10 | 1.4603 | 0.12 | Q |  |  |  | V |
| 24+15 | 1.4608 | 0.06 | Q |  |  |  | V |
| 24+20 | 1.4610 | 0.04 | Q |  |  |  | V |
| 24+25 | 1.4612 | 0.02 | Q |  |  |  | V |
| 24+30 | 1.4613 | 0.01 | Q |  |  |  | V |
| 24+35 | 1.4613 | 0.01 | Q |  |  |  | V |
| 24+40 | 1.4614 | 0.00 | Q |  |  |  | V |
| 24+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ON-SITE  
10-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>No. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 0.110        | 0.046         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.046

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 1.94          | 0.110         | 77.0             | 77.0             | 2.99 | 0.248                |
| 15.74         | 0.890         | 98.0             | 98.0             | 0.20 | 0.895                |

Area-averaged catchment yield fraction, Y = 0.824

Area-averaged low loss fraction, Yb = 0.176

User entry of time of concentration = 0.129 (hours)

+++++  
Watershed area = 17.68(Ac.)

Catchment Lag time = 0.103 hours  
 Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 80.7494  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.046(In/Hr)  
 Average low loss rate fraction (Yb) = 0.176 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.284(In)  
 Computed peak 30-minute rainfall = 0.487(In)  
 Specified peak 1-hour rainfall = 0.599(In)  
 Computed peak 3-hour rainfall = 0.946(In)  
 Specified peak 6-hour rainfall = 1.262(In)  
 Specified peak 24-hour rainfall = 2.160(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(Ac.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.284(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.486(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.599(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 0.946(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.262(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 2.160(In) |

| U n i t H y d r o g r a p h |             |                 |
|-----------------------------|-------------|-----------------|
| Interval                    | 'S' Graph   | Unit Hydrograph |
| Number                      | Mean values | ((CFS))         |
| (K = 213.82 (CFS))          |             |                 |
| 1                           | 10.956      | 23.427          |
| 2                           | 57.842      | 100.249         |
| 3                           | 78.112      | 43.341          |
| 4                           | 87.134      | 19.290          |
| 5                           | 92.184      | 10.799          |
| 6                           | 95.341      | 6.750           |
| 7                           | 97.324      | 4.240           |
| 8                           | 98.382      | 2.263           |
| 9                           | 99.311      | 1.985           |
| 10                          | 100.000     | 1.473           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.2840                 | 0.2840        |
| 2         | 0.3496                 | 0.0656        |
| 3         | 0.3949                 | 0.0452        |
| 4         | 0.4305                 | 0.0356        |
| 5         | 0.4603                 | 0.0298        |
| 6         | 0.4861                 | 0.0259        |
| 7         | 0.5091                 | 0.0230        |
| 8         | 0.5300                 | 0.0208        |
| 9         | 0.5490                 | 0.0191        |
| 10        | 0.5666                 | 0.0176        |
| 11        | 0.5831                 | 0.0164        |
| 12        | 0.5985                 | 0.0154        |
| 13        | 0.6188                 | 0.0203        |
| 14        | 0.6382                 | 0.0194        |
| 15        | 0.6568                 | 0.0186        |
| 16        | 0.6747                 | 0.0179        |
| 17        | 0.6919                 | 0.0173        |
| 18        | 0.7086                 | 0.0167        |
| 19        | 0.7248                 | 0.0161        |
| 20        | 0.7404                 | 0.0157        |
| 21        | 0.7556                 | 0.0152        |
| 22        | 0.7704                 | 0.0148        |
| 23        | 0.7848                 | 0.0144        |
| 24        | 0.7988                 | 0.0140        |
| 25        | 0.8125                 | 0.0137        |
| 26        | 0.8259                 | 0.0134        |
| 27        | 0.8390                 | 0.0131        |
| 28        | 0.8518                 | 0.0128        |
| 29        | 0.8643                 | 0.0125        |
| 30        | 0.8766                 | 0.0123        |
| 31        | 0.8887                 | 0.0121        |
| 32        | 0.9005                 | 0.0118        |
| 33        | 0.9121                 | 0.0116        |
| 34        | 0.9235                 | 0.0114        |
| 35        | 0.9348                 | 0.0112        |

|     |        |        |
|-----|--------|--------|
| 36  | 0.9458 | 0.0110 |
| 37  | 0.9566 | 0.0108 |
| 38  | 0.9673 | 0.0107 |
| 39  | 0.9778 | 0.0105 |
| 40  | 0.9882 | 0.0104 |
| 41  | 0.9984 | 0.0102 |
| 42  | 1.0084 | 0.0101 |
| 43  | 1.0183 | 0.0099 |
| 44  | 1.0281 | 0.0098 |
| 45  | 1.0378 | 0.0097 |
| 46  | 1.0473 | 0.0095 |
| 47  | 1.0567 | 0.0094 |
| 48  | 1.0660 | 0.0093 |
| 49  | 1.0752 | 0.0092 |
| 50  | 1.0843 | 0.0091 |
| 51  | 1.0932 | 0.0090 |
| 52  | 1.1021 | 0.0089 |
| 53  | 1.1109 | 0.0088 |
| 54  | 1.1195 | 0.0087 |
| 55  | 1.1281 | 0.0086 |
| 56  | 1.1366 | 0.0085 |
| 57  | 1.1450 | 0.0084 |
| 58  | 1.1533 | 0.0083 |
| 59  | 1.1615 | 0.0082 |
| 60  | 1.1697 | 0.0081 |
| 61  | 1.1778 | 0.0081 |
| 62  | 1.1858 | 0.0080 |
| 63  | 1.1937 | 0.0079 |
| 64  | 1.2015 | 0.0078 |
| 65  | 1.2093 | 0.0078 |
| 66  | 1.2170 | 0.0077 |
| 67  | 1.2246 | 0.0076 |
| 68  | 1.2322 | 0.0076 |
| 69  | 1.2397 | 0.0075 |
| 70  | 1.2471 | 0.0074 |
| 71  | 1.2545 | 0.0074 |
| 72  | 1.2618 | 0.0073 |
| 73  | 1.2686 | 0.0068 |
| 74  | 1.2753 | 0.0067 |
| 75  | 1.2820 | 0.0067 |
| 76  | 1.2886 | 0.0066 |
| 77  | 1.2951 | 0.0065 |
| 78  | 1.3016 | 0.0065 |
| 79  | 1.3081 | 0.0064 |
| 80  | 1.3145 | 0.0064 |
| 81  | 1.3208 | 0.0063 |
| 82  | 1.3271 | 0.0063 |
| 83  | 1.3333 | 0.0063 |
| 84  | 1.3396 | 0.0062 |
| 85  | 1.3457 | 0.0062 |
| 86  | 1.3518 | 0.0061 |
| 87  | 1.3579 | 0.0061 |
| 88  | 1.3639 | 0.0060 |
| 89  | 1.3699 | 0.0060 |
| 90  | 1.3759 | 0.0059 |
| 91  | 1.3818 | 0.0059 |
| 92  | 1.3876 | 0.0059 |
| 93  | 1.3935 | 0.0058 |
| 94  | 1.3993 | 0.0058 |
| 95  | 1.4050 | 0.0058 |
| 96  | 1.4107 | 0.0057 |
| 97  | 1.4164 | 0.0057 |
| 98  | 1.4220 | 0.0056 |
| 99  | 1.4277 | 0.0056 |
| 100 | 1.4332 | 0.0056 |
| 101 | 1.4388 | 0.0055 |
| 102 | 1.4443 | 0.0055 |
| 103 | 1.4497 | 0.0055 |
| 104 | 1.4552 | 0.0054 |
| 105 | 1.4606 | 0.0054 |
| 106 | 1.4660 | 0.0054 |
| 107 | 1.4713 | 0.0053 |
| 108 | 1.4766 | 0.0053 |
| 109 | 1.4819 | 0.0053 |
| 110 | 1.4872 | 0.0053 |
| 111 | 1.4924 | 0.0052 |
| 112 | 1.4976 | 0.0052 |
| 113 | 1.5028 | 0.0052 |
| 114 | 1.5079 | 0.0051 |
| 115 | 1.5130 | 0.0051 |
| 116 | 1.5181 | 0.0051 |

|     |        |        |
|-----|--------|--------|
| 117 | 1.5232 | 0.0051 |
| 118 | 1.5282 | 0.0050 |
| 119 | 1.5332 | 0.0050 |
| 120 | 1.5382 | 0.0050 |
| 121 | 1.5432 | 0.0050 |
| 122 | 1.5481 | 0.0049 |
| 123 | 1.5530 | 0.0049 |
| 124 | 1.5579 | 0.0049 |
| 125 | 1.5627 | 0.0049 |
| 126 | 1.5676 | 0.0048 |
| 127 | 1.5724 | 0.0048 |
| 128 | 1.5772 | 0.0048 |
| 129 | 1.5819 | 0.0048 |
| 130 | 1.5867 | 0.0047 |
| 131 | 1.5914 | 0.0047 |
| 132 | 1.5961 | 0.0047 |
| 133 | 1.6008 | 0.0047 |
| 134 | 1.6054 | 0.0047 |
| 135 | 1.6101 | 0.0046 |
| 136 | 1.6147 | 0.0046 |
| 137 | 1.6193 | 0.0046 |
| 138 | 1.6238 | 0.0046 |
| 139 | 1.6284 | 0.0046 |
| 140 | 1.6329 | 0.0045 |
| 141 | 1.6374 | 0.0045 |
| 142 | 1.6419 | 0.0045 |
| 143 | 1.6464 | 0.0045 |
| 144 | 1.6509 | 0.0045 |
| 145 | 1.6553 | 0.0044 |
| 146 | 1.6597 | 0.0044 |
| 147 | 1.6641 | 0.0044 |
| 148 | 1.6685 | 0.0044 |
| 149 | 1.6728 | 0.0044 |
| 150 | 1.6772 | 0.0043 |
| 151 | 1.6815 | 0.0043 |
| 152 | 1.6858 | 0.0043 |
| 153 | 1.6901 | 0.0043 |
| 154 | 1.6944 | 0.0043 |
| 155 | 1.6986 | 0.0043 |
| 156 | 1.7029 | 0.0042 |
| 157 | 1.7071 | 0.0042 |
| 158 | 1.7113 | 0.0042 |
| 159 | 1.7155 | 0.0042 |
| 160 | 1.7197 | 0.0042 |
| 161 | 1.7238 | 0.0042 |
| 162 | 1.7280 | 0.0041 |
| 163 | 1.7321 | 0.0041 |
| 164 | 1.7362 | 0.0041 |
| 165 | 1.7403 | 0.0041 |
| 166 | 1.7444 | 0.0041 |
| 167 | 1.7485 | 0.0041 |
| 168 | 1.7525 | 0.0041 |
| 169 | 1.7566 | 0.0040 |
| 170 | 1.7606 | 0.0040 |
| 171 | 1.7646 | 0.0040 |
| 172 | 1.7686 | 0.0040 |
| 173 | 1.7726 | 0.0040 |
| 174 | 1.7765 | 0.0040 |
| 175 | 1.7805 | 0.0040 |
| 176 | 1.7844 | 0.0039 |
| 177 | 1.7883 | 0.0039 |
| 178 | 1.7922 | 0.0039 |
| 179 | 1.7961 | 0.0039 |
| 180 | 1.8000 | 0.0039 |
| 181 | 1.8039 | 0.0039 |
| 182 | 1.8078 | 0.0039 |
| 183 | 1.8116 | 0.0038 |
| 184 | 1.8154 | 0.0038 |
| 185 | 1.8192 | 0.0038 |
| 186 | 1.8231 | 0.0038 |
| 187 | 1.8268 | 0.0038 |
| 188 | 1.8306 | 0.0038 |
| 189 | 1.8344 | 0.0038 |
| 190 | 1.8382 | 0.0038 |
| 191 | 1.8419 | 0.0037 |
| 192 | 1.8456 | 0.0037 |
| 193 | 1.8494 | 0.0037 |
| 194 | 1.8531 | 0.0037 |
| 195 | 1.8568 | 0.0037 |
| 196 | 1.8604 | 0.0037 |
| 197 | 1.8641 | 0.0037 |

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|-----|--------|--------|
| 198 | 1.8678 | 0.0037 |
| 199 | 1.8714 | 0.0037 |
| 200 | 1.8751 | 0.0036 |
| 201 | 1.8787 | 0.0036 |
| 202 | 1.8823 | 0.0036 |
| 203 | 1.8859 | 0.0036 |
| 204 | 1.8895 | 0.0036 |
| 205 | 1.8931 | 0.0036 |
| 206 | 1.8967 | 0.0036 |
| 207 | 1.9002 | 0.0036 |
| 208 | 1.9038 | 0.0036 |
| 209 | 1.9073 | 0.0035 |
| 210 | 1.9109 | 0.0035 |
| 211 | 1.9144 | 0.0035 |
| 212 | 1.9179 | 0.0035 |
| 213 | 1.9214 | 0.0035 |
| 214 | 1.9249 | 0.0035 |
| 215 | 1.9284 | 0.0035 |
| 216 | 1.9319 | 0.0035 |
| 217 | 1.9353 | 0.0035 |
| 218 | 1.9388 | 0.0035 |
| 219 | 1.9422 | 0.0034 |
| 220 | 1.9457 | 0.0034 |
| 221 | 1.9491 | 0.0034 |
| 222 | 1.9525 | 0.0034 |
| 223 | 1.9559 | 0.0034 |
| 224 | 1.9593 | 0.0034 |
| 225 | 1.9627 | 0.0034 |
| 226 | 1.9661 | 0.0034 |
| 227 | 1.9694 | 0.0034 |
| 228 | 1.9728 | 0.0034 |
| 229 | 1.9761 | 0.0033 |
| 230 | 1.9795 | 0.0033 |
| 231 | 1.9828 | 0.0033 |
| 232 | 1.9861 | 0.0033 |
| 233 | 1.9894 | 0.0033 |
| 234 | 1.9927 | 0.0033 |
| 235 | 1.9960 | 0.0033 |
| 236 | 1.9993 | 0.0033 |
| 237 | 2.0026 | 0.0033 |
| 238 | 2.0059 | 0.0033 |
| 239 | 2.0092 | 0.0033 |
| 240 | 2.0124 | 0.0033 |
| 241 | 2.0157 | 0.0032 |
| 242 | 2.0189 | 0.0032 |
| 243 | 2.0221 | 0.0032 |
| 244 | 2.0253 | 0.0032 |
| 245 | 2.0286 | 0.0032 |
| 246 | 2.0318 | 0.0032 |
| 247 | 2.0350 | 0.0032 |
| 248 | 2.0382 | 0.0032 |
| 249 | 2.0413 | 0.0032 |
| 250 | 2.0445 | 0.0032 |
| 251 | 2.0477 | 0.0032 |
| 252 | 2.0508 | 0.0032 |
| 253 | 2.0540 | 0.0032 |
| 254 | 2.0571 | 0.0031 |
| 255 | 2.0603 | 0.0031 |
| 256 | 2.0634 | 0.0031 |
| 257 | 2.0665 | 0.0031 |
| 258 | 2.0696 | 0.0031 |
| 259 | 2.0727 | 0.0031 |
| 260 | 2.0758 | 0.0031 |
| 261 | 2.0789 | 0.0031 |
| 262 | 2.0820 | 0.0031 |
| 263 | 2.0851 | 0.0031 |
| 264 | 2.0882 | 0.0031 |
| 265 | 2.0912 | 0.0031 |
| 266 | 2.0943 | 0.0031 |
| 267 | 2.0973 | 0.0030 |
| 268 | 2.1004 | 0.0030 |
| 269 | 2.1034 | 0.0030 |
| 270 | 2.1064 | 0.0030 |
| 271 | 2.1094 | 0.0030 |
| 272 | 2.1125 | 0.0030 |
| 273 | 2.1155 | 0.0030 |
| 274 | 2.1185 | 0.0030 |
| 275 | 2.1215 | 0.0030 |
| 276 | 2.1245 | 0.0030 |
| 277 | 2.1274 | 0.0030 |
| 278 | 2.1304 | 0.0030 |

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|-----|--------|--------|
| 279 | 2.1334 | 0.0030 |
| 280 | 2.1363 | 0.0030 |
| 281 | 2.1393 | 0.0030 |
| 282 | 2.1422 | 0.0029 |
| 283 | 2.1452 | 0.0029 |
| 284 | 2.1481 | 0.0029 |
| 285 | 2.1510 | 0.0029 |
| 286 | 2.1540 | 0.0029 |
| 287 | 2.1569 | 0.0029 |
| 288 | 2.1598 | 0.0029 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0029                   | 0.0005                    | 0.0024                        |
| 2                          | 0.0029                   | 0.0005                    | 0.0024                        |
| 3                          | 0.0029                   | 0.0005                    | 0.0024                        |
| 4                          | 0.0029                   | 0.0005                    | 0.0024                        |
| 5                          | 0.0029                   | 0.0005                    | 0.0024                        |
| 6                          | 0.0030                   | 0.0005                    | 0.0024                        |
| 7                          | 0.0030                   | 0.0005                    | 0.0024                        |
| 8                          | 0.0030                   | 0.0005                    | 0.0025                        |
| 9                          | 0.0030                   | 0.0005                    | 0.0025                        |
| 10                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 11                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 12                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 13                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 14                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 15                         | 0.0030                   | 0.0005                    | 0.0025                        |
| 16                         | 0.0031                   | 0.0005                    | 0.0025                        |
| 17                         | 0.0031                   | 0.0005                    | 0.0025                        |
| 18                         | 0.0031                   | 0.0005                    | 0.0025                        |
| 19                         | 0.0031                   | 0.0005                    | 0.0025                        |
| 20                         | 0.0031                   | 0.0005                    | 0.0026                        |
| 21                         | 0.0031                   | 0.0005                    | 0.0026                        |
| 22                         | 0.0031                   | 0.0005                    | 0.0026                        |
| 23                         | 0.0031                   | 0.0006                    | 0.0026                        |
| 24                         | 0.0031                   | 0.0006                    | 0.0026                        |
| 25                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 26                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 27                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 28                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 29                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 30                         | 0.0032                   | 0.0006                    | 0.0026                        |
| 31                         | 0.0032                   | 0.0006                    | 0.0027                        |
| 32                         | 0.0032                   | 0.0006                    | 0.0027                        |
| 33                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 34                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 35                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 36                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 37                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 38                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 39                         | 0.0033                   | 0.0006                    | 0.0027                        |
| 40                         | 0.0033                   | 0.0006                    | 0.0028                        |
| 41                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 42                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 43                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 44                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 45                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 46                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 47                         | 0.0034                   | 0.0006                    | 0.0028                        |
| 48                         | 0.0035                   | 0.0006                    | 0.0028                        |
| 49                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 50                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 51                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 52                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 53                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 54                         | 0.0035                   | 0.0006                    | 0.0029                        |
| 55                         | 0.0036                   | 0.0006                    | 0.0029                        |
| 56                         | 0.0036                   | 0.0006                    | 0.0029                        |
| 57                         | 0.0036                   | 0.0006                    | 0.0030                        |
| 58                         | 0.0036                   | 0.0006                    | 0.0030                        |
| 59                         | 0.0036                   | 0.0006                    | 0.0030                        |
| 60                         | 0.0036                   | 0.0006                    | 0.0030                        |
| 61                         | 0.0037                   | 0.0006                    | 0.0030                        |
| 62                         | 0.0037                   | 0.0006                    | 0.0030                        |
| 63                         | 0.0037                   | 0.0007                    | 0.0030                        |
| 64                         | 0.0037                   | 0.0007                    | 0.0031                        |
| 65                         | 0.0037                   | 0.0007                    | 0.0031                        |
| 66                         | 0.0037                   | 0.0007                    | 0.0031                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 67  | 0.0038 | 0.0007 | 0.0031 |
| 68  | 0.0038 | 0.0007 | 0.0031 |
| 69  | 0.0038 | 0.0007 | 0.0031 |
| 70  | 0.0038 | 0.0007 | 0.0031 |
| 71  | 0.0038 | 0.0007 | 0.0032 |
| 72  | 0.0039 | 0.0007 | 0.0032 |
| 73  | 0.0039 | 0.0007 | 0.0032 |
| 74  | 0.0039 | 0.0007 | 0.0032 |
| 75  | 0.0039 | 0.0007 | 0.0032 |
| 76  | 0.0039 | 0.0007 | 0.0032 |
| 77  | 0.0040 | 0.0007 | 0.0033 |
| 78  | 0.0040 | 0.0007 | 0.0033 |
| 79  | 0.0040 | 0.0007 | 0.0033 |
| 80  | 0.0040 | 0.0007 | 0.0033 |
| 81  | 0.0041 | 0.0007 | 0.0033 |
| 82  | 0.0041 | 0.0007 | 0.0033 |
| 83  | 0.0041 | 0.0007 | 0.0034 |
| 84  | 0.0041 | 0.0007 | 0.0034 |
| 85  | 0.0041 | 0.0007 | 0.0034 |
| 86  | 0.0042 | 0.0007 | 0.0034 |
| 87  | 0.0042 | 0.0007 | 0.0035 |
| 88  | 0.0042 | 0.0007 | 0.0035 |
| 89  | 0.0042 | 0.0007 | 0.0035 |
| 90  | 0.0043 | 0.0008 | 0.0035 |
| 91  | 0.0043 | 0.0008 | 0.0035 |
| 92  | 0.0043 | 0.0008 | 0.0035 |
| 93  | 0.0043 | 0.0008 | 0.0036 |
| 94  | 0.0044 | 0.0008 | 0.0036 |
| 95  | 0.0044 | 0.0008 | 0.0036 |
| 96  | 0.0044 | 0.0008 | 0.0036 |
| 97  | 0.0045 | 0.0008 | 0.0037 |
| 98  | 0.0045 | 0.0008 | 0.0037 |
| 99  | 0.0045 | 0.0008 | 0.0037 |
| 100 | 0.0045 | 0.0008 | 0.0037 |
| 101 | 0.0046 | 0.0008 | 0.0038 |
| 102 | 0.0046 | 0.0008 | 0.0038 |
| 103 | 0.0046 | 0.0008 | 0.0038 |
| 104 | 0.0047 | 0.0008 | 0.0038 |
| 105 | 0.0047 | 0.0008 | 0.0039 |
| 106 | 0.0047 | 0.0008 | 0.0039 |
| 107 | 0.0048 | 0.0008 | 0.0039 |
| 108 | 0.0048 | 0.0008 | 0.0039 |
| 109 | 0.0048 | 0.0009 | 0.0040 |
| 110 | 0.0049 | 0.0009 | 0.0040 |
| 111 | 0.0049 | 0.0009 | 0.0040 |
| 112 | 0.0049 | 0.0009 | 0.0041 |
| 113 | 0.0050 | 0.0009 | 0.0041 |
| 114 | 0.0050 | 0.0009 | 0.0041 |
| 115 | 0.0051 | 0.0009 | 0.0042 |
| 116 | 0.0051 | 0.0009 | 0.0042 |
| 117 | 0.0051 | 0.0009 | 0.0042 |
| 118 | 0.0052 | 0.0009 | 0.0043 |
| 119 | 0.0052 | 0.0009 | 0.0043 |
| 120 | 0.0053 | 0.0009 | 0.0043 |
| 121 | 0.0053 | 0.0009 | 0.0044 |
| 122 | 0.0053 | 0.0009 | 0.0044 |
| 123 | 0.0054 | 0.0010 | 0.0045 |
| 124 | 0.0054 | 0.0010 | 0.0045 |
| 125 | 0.0055 | 0.0010 | 0.0045 |
| 126 | 0.0055 | 0.0010 | 0.0046 |
| 127 | 0.0056 | 0.0010 | 0.0046 |
| 128 | 0.0056 | 0.0010 | 0.0046 |
| 129 | 0.0057 | 0.0010 | 0.0047 |
| 130 | 0.0058 | 0.0010 | 0.0047 |
| 131 | 0.0058 | 0.0010 | 0.0048 |
| 132 | 0.0059 | 0.0010 | 0.0048 |
| 133 | 0.0059 | 0.0010 | 0.0049 |
| 134 | 0.0060 | 0.0011 | 0.0049 |
| 135 | 0.0061 | 0.0011 | 0.0050 |
| 136 | 0.0061 | 0.0011 | 0.0050 |
| 137 | 0.0062 | 0.0011 | 0.0051 |
| 138 | 0.0063 | 0.0011 | 0.0051 |
| 139 | 0.0063 | 0.0011 | 0.0052 |
| 140 | 0.0064 | 0.0011 | 0.0053 |
| 141 | 0.0065 | 0.0011 | 0.0054 |
| 142 | 0.0065 | 0.0012 | 0.0054 |
| 143 | 0.0067 | 0.0012 | 0.0055 |
| 144 | 0.0067 | 0.0012 | 0.0055 |
| 145 | 0.0073 | 0.0013 | 0.0060 |
| 146 | 0.0074 | 0.0013 | 0.0061 |
| 147 | 0.0075 | 0.0013 | 0.0062 |

|     |        |        |        |
|-----|--------|--------|--------|
| 148 | 0.0076 | 0.0013 | 0.0062 |
| 149 | 0.0077 | 0.0014 | 0.0063 |
| 150 | 0.0078 | 0.0014 | 0.0064 |
| 151 | 0.0079 | 0.0014 | 0.0065 |
| 152 | 0.0080 | 0.0014 | 0.0066 |
| 153 | 0.0081 | 0.0014 | 0.0067 |
| 154 | 0.0082 | 0.0015 | 0.0068 |
| 155 | 0.0084 | 0.0015 | 0.0069 |
| 156 | 0.0085 | 0.0015 | 0.0070 |
| 157 | 0.0087 | 0.0015 | 0.0071 |
| 158 | 0.0088 | 0.0015 | 0.0072 |
| 159 | 0.0090 | 0.0016 | 0.0074 |
| 160 | 0.0091 | 0.0016 | 0.0075 |
| 161 | 0.0093 | 0.0016 | 0.0077 |
| 162 | 0.0094 | 0.0017 | 0.0078 |
| 163 | 0.0097 | 0.0017 | 0.0080 |
| 164 | 0.0098 | 0.0017 | 0.0081 |
| 165 | 0.0101 | 0.0018 | 0.0083 |
| 166 | 0.0102 | 0.0018 | 0.0084 |
| 167 | 0.0105 | 0.0019 | 0.0087 |
| 168 | 0.0107 | 0.0019 | 0.0088 |
| 169 | 0.0110 | 0.0019 | 0.0091 |
| 170 | 0.0112 | 0.0020 | 0.0092 |
| 171 | 0.0116 | 0.0020 | 0.0096 |
| 172 | 0.0118 | 0.0021 | 0.0097 |
| 173 | 0.0123 | 0.0022 | 0.0101 |
| 174 | 0.0125 | 0.0022 | 0.0103 |
| 175 | 0.0131 | 0.0023 | 0.0108 |
| 176 | 0.0134 | 0.0024 | 0.0110 |
| 177 | 0.0140 | 0.0025 | 0.0116 |
| 178 | 0.0144 | 0.0025 | 0.0119 |
| 179 | 0.0152 | 0.0027 | 0.0125 |
| 180 | 0.0157 | 0.0028 | 0.0129 |
| 181 | 0.0167 | 0.0029 | 0.0137 |
| 182 | 0.0173 | 0.0030 | 0.0142 |
| 183 | 0.0186 | 0.0033 | 0.0153 |
| 184 | 0.0194 | 0.0034 | 0.0160 |
| 185 | 0.0154 | 0.0027 | 0.0127 |
| 186 | 0.0164 | 0.0029 | 0.0135 |
| 187 | 0.0191 | 0.0034 | 0.0157 |
| 188 | 0.0208 | 0.0037 | 0.0171 |
| 189 | 0.0259 | 0.0039 | 0.0220 |
| 190 | 0.0298 | 0.0039 | 0.0260 |
| 191 | 0.0452 | 0.0039 | 0.0414 |
| 192 | 0.0656 | 0.0039 | 0.0618 |
| 193 | 0.2840 | 0.0039 | 0.2801 |
| 194 | 0.0356 | 0.0039 | 0.0317 |
| 195 | 0.0230 | 0.0039 | 0.0192 |
| 196 | 0.0176 | 0.0031 | 0.0145 |
| 197 | 0.0203 | 0.0036 | 0.0167 |
| 198 | 0.0179 | 0.0032 | 0.0147 |
| 199 | 0.0161 | 0.0028 | 0.0133 |
| 200 | 0.0148 | 0.0026 | 0.0122 |
| 201 | 0.0137 | 0.0024 | 0.0113 |
| 202 | 0.0128 | 0.0023 | 0.0105 |
| 203 | 0.0121 | 0.0021 | 0.0099 |
| 204 | 0.0114 | 0.0020 | 0.0094 |
| 205 | 0.0108 | 0.0019 | 0.0089 |
| 206 | 0.0104 | 0.0018 | 0.0085 |
| 207 | 0.0099 | 0.0017 | 0.0082 |
| 208 | 0.0095 | 0.0017 | 0.0079 |
| 209 | 0.0092 | 0.0016 | 0.0076 |
| 210 | 0.0089 | 0.0016 | 0.0073 |
| 211 | 0.0086 | 0.0015 | 0.0071 |
| 212 | 0.0083 | 0.0015 | 0.0068 |
| 213 | 0.0081 | 0.0014 | 0.0066 |
| 214 | 0.0078 | 0.0014 | 0.0065 |
| 215 | 0.0076 | 0.0013 | 0.0063 |
| 216 | 0.0074 | 0.0013 | 0.0061 |
| 217 | 0.0068 | 0.0012 | 0.0056 |
| 218 | 0.0066 | 0.0012 | 0.0054 |
| 219 | 0.0064 | 0.0011 | 0.0053 |
| 220 | 0.0063 | 0.0011 | 0.0052 |
| 221 | 0.0062 | 0.0011 | 0.0051 |
| 222 | 0.0060 | 0.0011 | 0.0050 |
| 223 | 0.0059 | 0.0010 | 0.0049 |
| 224 | 0.0058 | 0.0010 | 0.0048 |
| 225 | 0.0057 | 0.0010 | 0.0047 |
| 226 | 0.0056 | 0.0010 | 0.0046 |
| 227 | 0.0055 | 0.0010 | 0.0045 |
| 228 | 0.0054 | 0.0009 | 0.0044 |

|     |        |        |        |
|-----|--------|--------|--------|
| 229 | 0.0053 | 0.0009 | 0.0044 |
| 230 | 0.0052 | 0.0009 | 0.0043 |
| 231 | 0.0051 | 0.0009 | 0.0042 |
| 232 | 0.0050 | 0.0009 | 0.0041 |
| 233 | 0.0050 | 0.0009 | 0.0041 |
| 234 | 0.0049 | 0.0009 | 0.0040 |
| 235 | 0.0048 | 0.0008 | 0.0040 |
| 236 | 0.0047 | 0.0008 | 0.0039 |
| 237 | 0.0047 | 0.0008 | 0.0039 |
| 238 | 0.0046 | 0.0008 | 0.0038 |
| 239 | 0.0046 | 0.0008 | 0.0037 |
| 240 | 0.0045 | 0.0008 | 0.0037 |
| 241 | 0.0044 | 0.0008 | 0.0037 |
| 242 | 0.0044 | 0.0008 | 0.0036 |
| 243 | 0.0043 | 0.0008 | 0.0036 |
| 244 | 0.0043 | 0.0008 | 0.0035 |
| 245 | 0.0042 | 0.0007 | 0.0035 |
| 246 | 0.0042 | 0.0007 | 0.0034 |
| 247 | 0.0041 | 0.0007 | 0.0034 |
| 248 | 0.0041 | 0.0007 | 0.0034 |
| 249 | 0.0040 | 0.0007 | 0.0033 |
| 250 | 0.0040 | 0.0007 | 0.0033 |
| 251 | 0.0040 | 0.0007 | 0.0033 |
| 252 | 0.0039 | 0.0007 | 0.0032 |
| 253 | 0.0039 | 0.0007 | 0.0032 |
| 254 | 0.0038 | 0.0007 | 0.0032 |
| 255 | 0.0038 | 0.0007 | 0.0031 |
| 256 | 0.0038 | 0.0007 | 0.0031 |
| 257 | 0.0037 | 0.0007 | 0.0031 |
| 258 | 0.0037 | 0.0006 | 0.0030 |
| 259 | 0.0037 | 0.0006 | 0.0030 |
| 260 | 0.0036 | 0.0006 | 0.0030 |
| 261 | 0.0036 | 0.0006 | 0.0030 |
| 262 | 0.0036 | 0.0006 | 0.0029 |
| 263 | 0.0035 | 0.0006 | 0.0029 |
| 264 | 0.0035 | 0.0006 | 0.0029 |
| 265 | 0.0035 | 0.0006 | 0.0029 |
| 266 | 0.0034 | 0.0006 | 0.0028 |
| 267 | 0.0034 | 0.0006 | 0.0028 |
| 268 | 0.0034 | 0.0006 | 0.0028 |
| 269 | 0.0033 | 0.0006 | 0.0028 |
| 270 | 0.0033 | 0.0006 | 0.0027 |
| 271 | 0.0033 | 0.0006 | 0.0027 |
| 272 | 0.0033 | 0.0006 | 0.0027 |
| 273 | 0.0032 | 0.0006 | 0.0027 |
| 274 | 0.0032 | 0.0006 | 0.0027 |
| 275 | 0.0032 | 0.0006 | 0.0026 |
| 276 | 0.0032 | 0.0006 | 0.0026 |
| 277 | 0.0032 | 0.0006 | 0.0026 |
| 278 | 0.0031 | 0.0006 | 0.0026 |
| 279 | 0.0031 | 0.0005 | 0.0026 |
| 280 | 0.0031 | 0.0005 | 0.0025 |
| 281 | 0.0031 | 0.0005 | 0.0025 |
| 282 | 0.0030 | 0.0005 | 0.0025 |
| 283 | 0.0030 | 0.0005 | 0.0025 |
| 284 | 0.0030 | 0.0005 | 0.0025 |
| 285 | 0.0030 | 0.0005 | 0.0025 |
| 286 | 0.0030 | 0.0005 | 0.0024 |
| 287 | 0.0029 | 0.0005 | 0.0024 |
| 288 | 0.0029 | 0.0005 | 0.0024 |

-----  
Total soil rain loss = 0.32(In)  
Total effective rainfall = 1.84(In)  
Peak flow rate in flood hydrograph = (CFS)  
-----

+++++  
24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h  
-----

Hydrograph in 5 Minute intervals ((CFS))  
-----

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 10.0 | 20.0 | 30.0 | 40.0 |
|-----------|--------------|--------|---|------|------|------|------|
| 0+ 5      | 0.0004       | 0.06   | Q |      |      |      |      |
| 0+10      | 0.0024       | 0.30   | Q |      |      |      |      |
| 0+15      | 0.0052       | 0.40   | Q |      |      |      |      |
| 0+20      | 0.0083       | 0.45   | Q |      |      |      |      |
| 0+25      | 0.0116       | 0.48   | Q |      |      |      |      |
| 0+30      | 0.0150       | 0.49   | Q |      |      |      |      |

|      |        |      |     |
|------|--------|------|-----|
| 0+35 | 0.0184 | 0.51 | Q   |
| 0+40 | 0.0220 | 0.51 | Q   |
| 0+45 | 0.0256 | 0.52 | Q   |
| 0+50 | 0.0292 | 0.52 | Q   |
| 0+55 | 0.0328 | 0.53 | Q   |
| 1+ 0 | 0.0364 | 0.53 | Q   |
| 1+ 5 | 0.0401 | 0.53 | Q   |
| 1+10 | 0.0437 | 0.53 | Q   |
| 1+15 | 0.0474 | 0.53 | Q   |
| 1+20 | 0.0511 | 0.54 | Q   |
| 1+25 | 0.0548 | 0.54 | Q   |
| 1+30 | 0.0585 | 0.54 | Q   |
| 1+35 | 0.0622 | 0.54 | Q   |
| 1+40 | 0.0660 | 0.54 | Q   |
| 1+45 | 0.0697 | 0.54 | QV  |
| 1+50 | 0.0735 | 0.55 | QV  |
| 1+55 | 0.0773 | 0.55 | QV  |
| 2+ 0 | 0.0811 | 0.55 | QV  |
| 2+ 5 | 0.0849 | 0.55 | QV  |
| 2+10 | 0.0887 | 0.55 | QV  |
| 2+15 | 0.0925 | 0.56 | QV  |
| 2+20 | 0.0964 | 0.56 | QV  |
| 2+25 | 0.1002 | 0.56 | QV  |
| 2+30 | 0.1041 | 0.56 | QV  |
| 2+35 | 0.1080 | 0.56 | QV  |
| 2+40 | 0.1119 | 0.57 | QV  |
| 2+45 | 0.1158 | 0.57 | QV  |
| 2+50 | 0.1197 | 0.57 | QV  |
| 2+55 | 0.1237 | 0.57 | QV  |
| 3+ 0 | 0.1276 | 0.58 | QV  |
| 3+ 5 | 0.1316 | 0.58 | QV  |
| 3+10 | 0.1356 | 0.58 | QV  |
| 3+15 | 0.1396 | 0.58 | Q V |
| 3+20 | 0.1437 | 0.58 | Q V |
| 3+25 | 0.1477 | 0.59 | Q V |
| 3+30 | 0.1518 | 0.59 | Q V |
| 3+35 | 0.1558 | 0.59 | Q V |
| 3+40 | 0.1599 | 0.59 | Q V |
| 3+45 | 0.1640 | 0.60 | Q V |
| 3+50 | 0.1682 | 0.60 | Q V |
| 3+55 | 0.1723 | 0.60 | Q V |
| 4+ 0 | 0.1765 | 0.60 | Q V |
| 4+ 5 | 0.1806 | 0.61 | Q V |
| 4+10 | 0.1848 | 0.61 | Q V |
| 4+15 | 0.1890 | 0.61 | Q V |
| 4+20 | 0.1933 | 0.61 | Q V |
| 4+25 | 0.1975 | 0.62 | Q V |
| 4+30 | 0.2018 | 0.62 | Q V |
| 4+35 | 0.2061 | 0.62 | Q V |
| 4+40 | 0.2104 | 0.63 | Q V |
| 4+45 | 0.2147 | 0.63 | Q V |
| 4+50 | 0.2191 | 0.63 | Q V |
| 4+55 | 0.2234 | 0.63 | Q V |
| 5+ 0 | 0.2278 | 0.64 | Q V |
| 5+ 5 | 0.2322 | 0.64 | Q V |
| 5+10 | 0.2366 | 0.64 | Q V |
| 5+15 | 0.2411 | 0.65 | Q V |
| 5+20 | 0.2455 | 0.65 | Q V |
| 5+25 | 0.2500 | 0.65 | Q V |
| 5+30 | 0.2545 | 0.65 | Q V |
| 5+35 | 0.2591 | 0.66 | Q V |
| 5+40 | 0.2636 | 0.66 | Q V |
| 5+45 | 0.2682 | 0.66 | Q V |
| 5+50 | 0.2728 | 0.67 | Q V |
| 5+55 | 0.2774 | 0.67 | Q V |
| 6+ 0 | 0.2820 | 0.67 | Q V |
| 6+ 5 | 0.2867 | 0.68 | Q V |
| 6+10 | 0.2914 | 0.68 | Q V |
| 6+15 | 0.2961 | 0.68 | Q V |
| 6+20 | 0.3008 | 0.69 | Q V |
| 6+25 | 0.3056 | 0.69 | Q V |
| 6+30 | 0.3104 | 0.69 | Q V |
| 6+35 | 0.3152 | 0.70 | Q V |
| 6+40 | 0.3200 | 0.70 | Q V |
| 6+45 | 0.3249 | 0.71 | Q V |
| 6+50 | 0.3298 | 0.71 | Q V |
| 6+55 | 0.3347 | 0.71 | Q V |
| 7+ 0 | 0.3396 | 0.72 | Q V |
| 7+ 5 | 0.3446 | 0.72 | Q V |
| 7+10 | 0.3496 | 0.73 | Q V |
| 7+15 | 0.3546 | 0.73 | Q V |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 7+20  | 0.3597 | 0.73 | Q | V |  |  |  |  |
| 7+25  | 0.3648 | 0.74 | Q | V |  |  |  |  |
| 7+30  | 0.3699 | 0.74 | Q | V |  |  |  |  |
| 7+35  | 0.3750 | 0.75 | Q | V |  |  |  |  |
| 7+40  | 0.3802 | 0.75 | Q | V |  |  |  |  |
| 7+45  | 0.3854 | 0.76 | Q | V |  |  |  |  |
| 7+50  | 0.3906 | 0.76 | Q | V |  |  |  |  |
| 7+55  | 0.3959 | 0.77 | Q | V |  |  |  |  |
| 8+ 0  | 0.4012 | 0.77 | Q | V |  |  |  |  |
| 8+ 5  | 0.4065 | 0.77 | Q | V |  |  |  |  |
| 8+10  | 0.4119 | 0.78 | Q | V |  |  |  |  |
| 8+15  | 0.4173 | 0.78 | Q | V |  |  |  |  |
| 8+20  | 0.4228 | 0.79 | Q | V |  |  |  |  |
| 8+25  | 0.4282 | 0.79 | Q | V |  |  |  |  |
| 8+30  | 0.4337 | 0.80 | Q | V |  |  |  |  |
| 8+35  | 0.4393 | 0.81 | Q | V |  |  |  |  |
| 8+40  | 0.4449 | 0.81 | Q | V |  |  |  |  |
| 8+45  | 0.4505 | 0.82 | Q | V |  |  |  |  |
| 8+50  | 0.4562 | 0.82 | Q | V |  |  |  |  |
| 8+55  | 0.4619 | 0.83 | Q | V |  |  |  |  |
| 9+ 0  | 0.4676 | 0.83 | Q | V |  |  |  |  |
| 9+ 5  | 0.4734 | 0.84 | Q | V |  |  |  |  |
| 9+10  | 0.4792 | 0.85 | Q | V |  |  |  |  |
| 9+15  | 0.4851 | 0.85 | Q | V |  |  |  |  |
| 9+20  | 0.4910 | 0.86 | Q | V |  |  |  |  |
| 9+25  | 0.4969 | 0.86 | Q | V |  |  |  |  |
| 9+30  | 0.5029 | 0.87 | Q | V |  |  |  |  |
| 9+35  | 0.5090 | 0.88 | Q | V |  |  |  |  |
| 9+40  | 0.5151 | 0.88 | Q | V |  |  |  |  |
| 9+45  | 0.5212 | 0.89 | Q | V |  |  |  |  |
| 9+50  | 0.5274 | 0.90 | Q | V |  |  |  |  |
| 9+55  | 0.5336 | 0.91 | Q | V |  |  |  |  |
| 10+ 0 | 0.5399 | 0.91 | Q | V |  |  |  |  |
| 10+ 5 | 0.5463 | 0.92 | Q | V |  |  |  |  |
| 10+10 | 0.5527 | 0.93 | Q | V |  |  |  |  |
| 10+15 | 0.5591 | 0.94 | Q | V |  |  |  |  |
| 10+20 | 0.5656 | 0.94 | Q | V |  |  |  |  |
| 10+25 | 0.5722 | 0.95 | Q | V |  |  |  |  |
| 10+30 | 0.5788 | 0.96 | Q | V |  |  |  |  |
| 10+35 | 0.5855 | 0.97 | Q | V |  |  |  |  |
| 10+40 | 0.5922 | 0.98 | Q | V |  |  |  |  |
| 10+45 | 0.5990 | 0.99 | Q | V |  |  |  |  |
| 10+50 | 0.6059 | 1.00 | Q | V |  |  |  |  |
| 10+55 | 0.6128 | 1.01 | Q | V |  |  |  |  |
| 11+ 0 | 0.6199 | 1.02 | Q | V |  |  |  |  |
| 11+ 5 | 0.6269 | 1.03 | Q | V |  |  |  |  |
| 11+10 | 0.6341 | 1.04 | Q | V |  |  |  |  |
| 11+15 | 0.6413 | 1.05 | Q | V |  |  |  |  |
| 11+20 | 0.6486 | 1.06 | Q | V |  |  |  |  |
| 11+25 | 0.6559 | 1.07 | Q | V |  |  |  |  |
| 11+30 | 0.6634 | 1.08 | Q | V |  |  |  |  |
| 11+35 | 0.6709 | 1.09 | Q | V |  |  |  |  |
| 11+40 | 0.6785 | 1.11 | Q | V |  |  |  |  |
| 11+45 | 0.6862 | 1.12 | Q | V |  |  |  |  |
| 11+50 | 0.6940 | 1.13 | Q | V |  |  |  |  |
| 11+55 | 0.7019 | 1.14 | Q | V |  |  |  |  |
| 12+ 0 | 0.7099 | 1.16 | Q | V |  |  |  |  |
| 12+ 5 | 0.7180 | 1.18 | Q | V |  |  |  |  |
| 12+10 | 0.7266 | 1.24 | Q | V |  |  |  |  |
| 12+15 | 0.7353 | 1.27 | Q | V |  |  |  |  |
| 12+20 | 0.7442 | 1.30 | Q | V |  |  |  |  |
| 12+25 | 0.7533 | 1.32 | Q | V |  |  |  |  |
| 12+30 | 0.7625 | 1.34 | Q | V |  |  |  |  |
| 12+35 | 0.7718 | 1.35 | Q | V |  |  |  |  |
| 12+40 | 0.7813 | 1.38 | Q | V |  |  |  |  |
| 12+45 | 0.7909 | 1.39 | Q | V |  |  |  |  |
| 12+50 | 0.8007 | 1.42 | Q | V |  |  |  |  |
| 12+55 | 0.8105 | 1.44 | Q | V |  |  |  |  |
| 13+ 0 | 0.8206 | 1.46 | Q | V |  |  |  |  |
| 13+ 5 | 0.8308 | 1.48 | Q | V |  |  |  |  |
| 13+10 | 0.8411 | 1.50 | Q | V |  |  |  |  |
| 13+15 | 0.8517 | 1.53 | Q | V |  |  |  |  |
| 13+20 | 0.8624 | 1.56 | Q | V |  |  |  |  |
| 13+25 | 0.8733 | 1.58 | Q | V |  |  |  |  |
| 13+30 | 0.8843 | 1.61 | Q | V |  |  |  |  |
| 13+35 | 0.8956 | 1.64 | Q | V |  |  |  |  |
| 13+40 | 0.9071 | 1.67 | Q | V |  |  |  |  |
| 13+45 | 0.9189 | 1.70 | Q | V |  |  |  |  |
| 13+50 | 0.9308 | 1.74 | Q | V |  |  |  |  |
| 13+55 | 0.9430 | 1.77 | Q | V |  |  |  |  |
| 14+ 0 | 0.9555 | 1.81 | Q | V |  |  |  |  |

|       |        |       |   |   |   |   |   |
|-------|--------|-------|---|---|---|---|---|
| 14+ 5 | 0.9683 | 1.85  | Q |   | V |   |   |
| 14+10 | 0.9814 | 1.90  | Q |   | V |   |   |
| 14+15 | 0.9948 | 1.94  | Q |   | V |   |   |
| 14+20 | 1.0086 | 2.00  | Q |   | V |   |   |
| 14+25 | 1.0227 | 2.05  | Q |   | V |   |   |
| 14+30 | 1.0372 | 2.11  | Q |   | V |   |   |
| 14+35 | 1.0521 | 2.17  | Q |   | V |   |   |
| 14+40 | 1.0676 | 2.24  | Q |   | V |   |   |
| 14+45 | 1.0835 | 2.31  | Q |   | V |   |   |
| 14+50 | 1.1000 | 2.40  | Q |   | V |   |   |
| 14+55 | 1.1171 | 2.48  | Q |   | V |   |   |
| 15+ 0 | 1.1349 | 2.59  | Q |   | V |   |   |
| 15+ 5 | 1.1534 | 2.69  | Q |   | V |   |   |
| 15+10 | 1.1729 | 2.82  | Q |   | V |   |   |
| 15+15 | 1.1932 | 2.95  | Q |   | V |   |   |
| 15+20 | 1.2147 | 3.13  | Q |   | V |   |   |
| 15+25 | 1.2367 | 3.19  | Q |   | V |   |   |
| 15+30 | 1.2570 | 2.95  | Q |   | V |   |   |
| 15+35 | 1.2775 | 2.98  | Q |   | V |   |   |
| 15+40 | 1.2997 | 3.22  | Q |   | V |   |   |
| 15+45 | 1.3243 | 3.56  | Q |   | V |   |   |
| 15+50 | 1.3535 | 4.24  | Q |   | V |   |   |
| 15+55 | 1.3897 | 5.26  | Q |   | V |   |   |
| 16+ 0 | 1.4419 | 7.58  | Q |   | V |   |   |
| 16+ 5 | 1.5490 | 15.55 |   | Q | V |   |   |
| 16+10 | 1.7755 |       |   |   |   | V | Q |
| 16+15 | 1.8979 | 17.77 |   | Q |   | V |   |
| 16+20 | 1.9681 | 10.20 |   |   |   | V |   |
| 16+25 | 2.0166 | 7.04  | Q |   |   | V |   |
| 16+30 | 2.0558 | 5.69  | Q |   |   | V |   |
| 16+35 | 2.0879 | 4.66  | Q |   |   | V |   |
| 16+40 | 2.1142 | 3.82  | Q |   |   | V |   |
| 16+45 | 2.1378 | 3.42  | Q |   |   | V |   |
| 16+50 | 2.1586 | 3.02  | Q |   |   | V |   |
| 16+55 | 2.1754 | 2.45  | Q |   |   | V |   |
| 17+ 0 | 2.1910 | 2.27  | Q |   |   | V |   |
| 17+ 5 | 2.2057 | 2.13  | Q |   |   | V |   |
| 17+10 | 2.2196 | 2.02  | Q |   |   | V |   |
| 17+15 | 2.2328 | 1.92  | Q |   |   | V |   |
| 17+20 | 2.2454 | 1.83  | Q |   |   | V |   |
| 17+25 | 2.2575 | 1.75  | Q |   |   | V |   |
| 17+30 | 2.2690 | 1.68  | Q |   |   | V |   |
| 17+35 | 2.2802 | 1.62  | Q |   |   | V |   |
| 17+40 | 2.2909 | 1.56  | Q |   |   | V |   |
| 17+45 | 2.3013 | 1.51  | Q |   |   | V |   |
| 17+50 | 2.3114 | 1.46  | Q |   |   | V |   |
| 17+55 | 2.3212 | 1.42  | Q |   |   | V |   |
| 18+ 0 | 2.3307 | 1.38  | Q |   |   | V |   |
| 18+ 5 | 2.3399 | 1.33  | Q |   |   | V |   |
| 18+10 | 2.3485 | 1.26  | Q |   |   | V |   |
| 18+15 | 2.3569 | 1.21  | Q |   |   | V |   |
| 18+20 | 2.3649 | 1.17  | Q |   |   | V |   |
| 18+25 | 2.3728 | 1.14  | Q |   |   | V |   |
| 18+30 | 2.3804 | 1.11  | Q |   |   | V |   |
| 18+35 | 2.3879 | 1.09  | Q |   |   | V |   |
| 18+40 | 2.3952 | 1.06  | Q |   |   | V |   |
| 18+45 | 2.4024 | 1.04  | Q |   |   | V |   |
| 18+50 | 2.4094 | 1.02  | Q |   |   | V |   |
| 18+55 | 2.4163 | 1.00  | Q |   |   | V |   |
| 19+ 0 | 2.4230 | 0.98  | Q |   |   | V |   |
| 19+ 5 | 2.4297 | 0.96  | Q |   |   | V |   |
| 19+10 | 2.4362 | 0.95  | Q |   |   | V |   |
| 19+15 | 2.4426 | 0.93  | Q |   |   | V |   |
| 19+20 | 2.4489 | 0.91  | Q |   |   | V |   |
| 19+25 | 2.4551 | 0.90  | Q |   |   | V |   |
| 19+30 | 2.4612 | 0.89  | Q |   |   | V |   |
| 19+35 | 2.4672 | 0.87  | Q |   |   | V |   |
| 19+40 | 2.4731 | 0.86  | Q |   |   | V |   |
| 19+45 | 2.4789 | 0.85  | Q |   |   | V |   |
| 19+50 | 2.4846 | 0.83  | Q |   |   | V |   |
| 19+55 | 2.4903 | 0.82  | Q |   |   | V |   |
| 20+ 0 | 2.4959 | 0.81  | Q |   |   | V |   |
| 20+ 5 | 2.5014 | 0.80  | Q |   |   | V |   |
| 20+10 | 2.5068 | 0.79  | Q |   |   | V |   |
| 20+15 | 2.5122 | 0.78  | Q |   |   | V |   |
| 20+20 | 2.5175 | 0.77  | Q |   |   | V |   |
| 20+25 | 2.5228 | 0.76  | Q |   |   | V |   |
| 20+30 | 2.5279 | 0.75  | Q |   |   | V |   |
| 20+35 | 2.5331 | 0.74  | Q |   |   | V |   |
| 20+40 | 2.5381 | 0.73  | Q |   |   | V |   |
| 20+45 | 2.5431 | 0.73  | Q |   |   | V |   |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 20+50 | 2.5481 | 0.72 | Q |  |  |  | V |
| 20+55 | 2.5530 | 0.71 | Q |  |  |  | V |
| 21+ 0 | 2.5578 | 0.70 | Q |  |  |  | V |
| 21+ 5 | 2.5626 | 0.70 | Q |  |  |  | V |
| 21+10 | 2.5673 | 0.69 | Q |  |  |  | V |
| 21+15 | 2.5720 | 0.68 | Q |  |  |  | V |
| 21+20 | 2.5766 | 0.67 | Q |  |  |  | V |
| 21+25 | 2.5812 | 0.67 | Q |  |  |  | V |
| 21+30 | 2.5858 | 0.66 | Q |  |  |  | V |
| 21+35 | 2.5903 | 0.65 | Q |  |  |  | V |
| 21+40 | 2.5948 | 0.65 | Q |  |  |  | V |
| 21+45 | 2.5992 | 0.64 | Q |  |  |  | V |
| 21+50 | 2.6036 | 0.64 | Q |  |  |  | V |
| 21+55 | 2.6079 | 0.63 | Q |  |  |  | V |
| 22+ 0 | 2.6122 | 0.63 | Q |  |  |  | V |
| 22+ 5 | 2.6165 | 0.62 | Q |  |  |  | V |
| 22+10 | 2.6207 | 0.61 | Q |  |  |  | V |
| 22+15 | 2.6249 | 0.61 | Q |  |  |  | V |
| 22+20 | 2.6291 | 0.60 | Q |  |  |  | V |
| 22+25 | 2.6332 | 0.60 | Q |  |  |  | V |
| 22+30 | 2.6373 | 0.59 | Q |  |  |  | V |
| 22+35 | 2.6414 | 0.59 | Q |  |  |  | V |
| 22+40 | 2.6454 | 0.58 | Q |  |  |  | V |
| 22+45 | 2.6494 | 0.58 | Q |  |  |  | V |
| 22+50 | 2.6533 | 0.58 | Q |  |  |  | V |
| 22+55 | 2.6573 | 0.57 | Q |  |  |  | V |
| 23+ 0 | 2.6612 | 0.57 | Q |  |  |  | V |
| 23+ 5 | 2.6651 | 0.56 | Q |  |  |  | V |
| 23+10 | 2.6689 | 0.56 | Q |  |  |  | V |
| 23+15 | 2.6727 | 0.55 | Q |  |  |  | V |
| 23+20 | 2.6765 | 0.55 | Q |  |  |  | V |
| 23+25 | 2.6803 | 0.55 | Q |  |  |  | V |
| 23+30 | 2.6840 | 0.54 | Q |  |  |  | V |
| 23+35 | 2.6877 | 0.54 | Q |  |  |  | V |
| 23+40 | 2.6914 | 0.54 | Q |  |  |  | V |
| 23+45 | 2.6951 | 0.53 | Q |  |  |  | V |
| 23+50 | 2.6987 | 0.53 | Q |  |  |  | V |
| 23+55 | 2.7023 | 0.52 | Q |  |  |  | V |
| 24+ 0 | 2.7059 | 0.52 | Q |  |  |  | V |
| 24+ 5 | 2.7091 | 0.46 | Q |  |  |  | V |
| 24+10 | 2.7106 | 0.22 | Q |  |  |  | V |
| 24+15 | 2.7114 | 0.11 | Q |  |  |  | V |
| 24+20 | 2.7118 | 0.07 | Q |  |  |  | V |
| 24+25 | 2.7121 | 0.04 | Q |  |  |  | V |
| 24+30 | 2.7123 | 0.02 | Q |  |  |  | V |
| 24+35 | 2.7124 | 0.01 | Q |  |  |  | V |
| 24+40 | 2.7124 | 0.01 | Q |  |  |  | V |
| 24+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

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San Bernardino County Synthetic Unit Hydrology Method  
Manual date - August 1986

Program License Serial Number 6320

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224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ON-SITE  
25-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Storm Event Year = 1

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| -----                      |                     |                   |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| -----                      |                     |                   |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |
| -----                      |                     |                   |

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\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>NO. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 0.110        | 0.046         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.046

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 1.94          | 0.110         | 77.0             | 77.0             | 2.99 | 0.315                |
| 15.74         | 0.890         | 98.0             | 98.0             | 0.20 | 0.913                |

Area-averaged catchment yield fraction, Y = 0.847

Area-averaged low loss fraction, Yb = 0.153

User entry of time of concentration = 0.129 (hours)

+++++  
Watershed area = 17.68(Ac.)

Catchment Lag time = 0.103 hours  
 Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 80.7494  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.046(In/Hr)  
 Average low loss rate fraction (Yb) = 0.153 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.373(In)  
 Computed peak 30-minute rainfall = 0.639(In)  
 Specified peak 1-hour rainfall = 0.786(In)  
 Computed peak 3-hour rainfall = 1.193(In)  
 Specified peak 6-hour rainfall = 1.552(In)  
 Specified peak 24-hour rainfall = 2.649(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(Ac.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.373(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.638(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 0.786(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 1.193(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.552(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 2.649(In) |

| U n i t H y d r o g r a p h |             |                 |
|-----------------------------|-------------|-----------------|
| Interval                    | 'S' Graph   | Unit Hydrograph |
| Number                      | Mean values | ((CFS))         |
| (K = 213.82 (CFS))          |             |                 |
| 1                           | 10.956      | 23.427          |
| 2                           | 57.842      | 100.249         |
| 3                           | 78.112      | 43.341          |
| 4                           | 87.134      | 19.290          |
| 5                           | 92.184      | 10.799          |
| 6                           | 95.341      | 6.750           |
| 7                           | 97.324      | 4.240           |
| 8                           | 98.382      | 2.263           |
| 9                           | 99.311      | 1.985           |
| 10                          | 100.000     | 1.473           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.3729                 | 0.3729        |
| 2         | 0.4590                 | 0.0862        |
| 3         | 0.5184                 | 0.0594        |
| 4         | 0.5651                 | 0.0467        |
| 5         | 0.6043                 | 0.0391        |
| 6         | 0.6383                 | 0.0340        |
| 7         | 0.6685                 | 0.0302        |
| 8         | 0.6958                 | 0.0273        |
| 9         | 0.7208                 | 0.0250        |
| 10        | 0.7440                 | 0.0231        |
| 11        | 0.7655                 | 0.0216        |
| 12        | 0.7858                 | 0.0202        |
| 13        | 0.8100                 | 0.0243        |
| 14        | 0.8332                 | 0.0231        |
| 15        | 0.8553                 | 0.0221        |
| 16        | 0.8765                 | 0.0212        |
| 17        | 0.8970                 | 0.0204        |
| 18        | 0.9166                 | 0.0197        |
| 19        | 0.9357                 | 0.0190        |
| 20        | 0.9541                 | 0.0184        |
| 21        | 0.9719                 | 0.0179        |
| 22        | 0.9893                 | 0.0173        |
| 23        | 1.0061                 | 0.0168        |
| 24        | 1.0225                 | 0.0164        |
| 25        | 1.0385                 | 0.0160        |
| 26        | 1.0541                 | 0.0156        |
| 27        | 1.0693                 | 0.0152        |
| 28        | 1.0842                 | 0.0149        |
| 29        | 1.0987                 | 0.0146        |
| 30        | 1.1130                 | 0.0142        |
| 31        | 1.1269                 | 0.0140        |
| 32        | 1.1406                 | 0.0137        |
| 33        | 1.1540                 | 0.0134        |
| 34        | 1.1672                 | 0.0132        |
| 35        | 1.1801                 | 0.0129        |

|     |        |        |
|-----|--------|--------|
| 36  | 1.1928 | 0.0127 |
| 37  | 1.2053 | 0.0125 |
| 38  | 1.2175 | 0.0123 |
| 39  | 1.2296 | 0.0121 |
| 40  | 1.2415 | 0.0119 |
| 41  | 1.2531 | 0.0117 |
| 42  | 1.2647 | 0.0115 |
| 43  | 1.2760 | 0.0113 |
| 44  | 1.2872 | 0.0112 |
| 45  | 1.2982 | 0.0110 |
| 46  | 1.3091 | 0.0109 |
| 47  | 1.3198 | 0.0107 |
| 48  | 1.3304 | 0.0106 |
| 49  | 1.3408 | 0.0104 |
| 50  | 1.3511 | 0.0103 |
| 51  | 1.3613 | 0.0102 |
| 52  | 1.3714 | 0.0101 |
| 53  | 1.3813 | 0.0099 |
| 54  | 1.3911 | 0.0098 |
| 55  | 1.4009 | 0.0097 |
| 56  | 1.4105 | 0.0096 |
| 57  | 1.4200 | 0.0095 |
| 58  | 1.4294 | 0.0094 |
| 59  | 1.4387 | 0.0093 |
| 60  | 1.4479 | 0.0092 |
| 61  | 1.4570 | 0.0091 |
| 62  | 1.4660 | 0.0090 |
| 63  | 1.4749 | 0.0089 |
| 64  | 1.4838 | 0.0088 |
| 65  | 1.4925 | 0.0088 |
| 66  | 1.5012 | 0.0087 |
| 67  | 1.5098 | 0.0086 |
| 68  | 1.5183 | 0.0085 |
| 69  | 1.5267 | 0.0084 |
| 70  | 1.5351 | 0.0084 |
| 71  | 1.5434 | 0.0083 |
| 72  | 1.5516 | 0.0082 |
| 73  | 1.5598 | 0.0083 |
| 74  | 1.5681 | 0.0082 |
| 75  | 1.5762 | 0.0081 |
| 76  | 1.5843 | 0.0081 |
| 77  | 1.5923 | 0.0080 |
| 78  | 1.6002 | 0.0079 |
| 79  | 1.6081 | 0.0079 |
| 80  | 1.6160 | 0.0078 |
| 81  | 1.6237 | 0.0078 |
| 82  | 1.6314 | 0.0077 |
| 83  | 1.6391 | 0.0077 |
| 84  | 1.6467 | 0.0076 |
| 85  | 1.6542 | 0.0075 |
| 86  | 1.6617 | 0.0075 |
| 87  | 1.6691 | 0.0074 |
| 88  | 1.6765 | 0.0074 |
| 89  | 1.6838 | 0.0073 |
| 90  | 1.6911 | 0.0073 |
| 91  | 1.6983 | 0.0072 |
| 92  | 1.7055 | 0.0072 |
| 93  | 1.7126 | 0.0071 |
| 94  | 1.7197 | 0.0071 |
| 95  | 1.7268 | 0.0070 |
| 96  | 1.7338 | 0.0070 |
| 97  | 1.7407 | 0.0069 |
| 98  | 1.7476 | 0.0069 |
| 99  | 1.7545 | 0.0069 |
| 100 | 1.7613 | 0.0068 |
| 101 | 1.7681 | 0.0068 |
| 102 | 1.7748 | 0.0067 |
| 103 | 1.7815 | 0.0067 |
| 104 | 1.7882 | 0.0067 |
| 105 | 1.7948 | 0.0066 |
| 106 | 1.8013 | 0.0066 |
| 107 | 1.8079 | 0.0065 |
| 108 | 1.8144 | 0.0065 |
| 109 | 1.8209 | 0.0065 |
| 110 | 1.8273 | 0.0064 |
| 111 | 1.8337 | 0.0064 |
| 112 | 1.8400 | 0.0064 |
| 113 | 1.8464 | 0.0063 |
| 114 | 1.8527 | 0.0063 |
| 115 | 1.8589 | 0.0063 |
| 116 | 1.8651 | 0.0062 |

|     |        |        |
|-----|--------|--------|
| 117 | 1.8713 | 0.0062 |
| 118 | 1.8775 | 0.0062 |
| 119 | 1.8836 | 0.0061 |
| 120 | 1.8897 | 0.0061 |
| 121 | 1.8958 | 0.0061 |
| 122 | 1.9018 | 0.0060 |
| 123 | 1.9078 | 0.0060 |
| 124 | 1.9138 | 0.0060 |
| 125 | 1.9197 | 0.0059 |
| 126 | 1.9256 | 0.0059 |
| 127 | 1.9315 | 0.0059 |
| 128 | 1.9374 | 0.0059 |
| 129 | 1.9432 | 0.0058 |
| 130 | 1.9490 | 0.0058 |
| 131 | 1.9548 | 0.0058 |
| 132 | 1.9605 | 0.0057 |
| 133 | 1.9662 | 0.0057 |
| 134 | 1.9719 | 0.0057 |
| 135 | 1.9776 | 0.0057 |
| 136 | 1.9832 | 0.0056 |
| 137 | 1.9888 | 0.0056 |
| 138 | 1.9944 | 0.0056 |
| 139 | 2.0000 | 0.0056 |
| 140 | 2.0055 | 0.0055 |
| 141 | 2.0110 | 0.0055 |
| 142 | 2.0165 | 0.0055 |
| 143 | 2.0220 | 0.0055 |
| 144 | 2.0275 | 0.0054 |
| 145 | 2.0329 | 0.0054 |
| 146 | 2.0383 | 0.0054 |
| 147 | 2.0437 | 0.0054 |
| 148 | 2.0490 | 0.0054 |
| 149 | 2.0543 | 0.0053 |
| 150 | 2.0597 | 0.0053 |
| 151 | 2.0649 | 0.0053 |
| 152 | 2.0702 | 0.0053 |
| 153 | 2.0755 | 0.0052 |
| 154 | 2.0807 | 0.0052 |
| 155 | 2.0859 | 0.0052 |
| 156 | 2.0911 | 0.0052 |
| 157 | 2.0962 | 0.0052 |
| 158 | 2.1014 | 0.0051 |
| 159 | 2.1065 | 0.0051 |
| 160 | 2.1116 | 0.0051 |
| 161 | 2.1167 | 0.0051 |
| 162 | 2.1217 | 0.0051 |
| 163 | 2.1268 | 0.0050 |
| 164 | 2.1318 | 0.0050 |
| 165 | 2.1368 | 0.0050 |
| 166 | 2.1418 | 0.0050 |
| 167 | 2.1468 | 0.0050 |
| 168 | 2.1517 | 0.0050 |
| 169 | 2.1567 | 0.0049 |
| 170 | 2.1616 | 0.0049 |
| 171 | 2.1665 | 0.0049 |
| 172 | 2.1714 | 0.0049 |
| 173 | 2.1762 | 0.0049 |
| 174 | 2.1811 | 0.0048 |
| 175 | 2.1859 | 0.0048 |
| 176 | 2.1907 | 0.0048 |
| 177 | 2.1955 | 0.0048 |
| 178 | 2.2003 | 0.0048 |
| 179 | 2.2051 | 0.0048 |
| 180 | 2.2098 | 0.0047 |
| 181 | 2.2145 | 0.0047 |
| 182 | 2.2192 | 0.0047 |
| 183 | 2.2239 | 0.0047 |
| 184 | 2.2286 | 0.0047 |
| 185 | 2.2333 | 0.0047 |
| 186 | 2.2379 | 0.0047 |
| 187 | 2.2426 | 0.0046 |
| 188 | 2.2472 | 0.0046 |
| 189 | 2.2518 | 0.0046 |
| 190 | 2.2564 | 0.0046 |
| 191 | 2.2610 | 0.0046 |
| 192 | 2.2655 | 0.0046 |
| 193 | 2.2701 | 0.0045 |
| 194 | 2.2746 | 0.0045 |
| 195 | 2.2791 | 0.0045 |
| 196 | 2.2836 | 0.0045 |
| 197 | 2.2881 | 0.0045 |

|     |        |        |
|-----|--------|--------|
| 198 | 2.2926 | 0.0045 |
| 199 | 2.2971 | 0.0045 |
| 200 | 2.3015 | 0.0044 |
| 201 | 2.3059 | 0.0044 |
| 202 | 2.3104 | 0.0044 |
| 203 | 2.3148 | 0.0044 |
| 204 | 2.3192 | 0.0044 |
| 205 | 2.3236 | 0.0044 |
| 206 | 2.3279 | 0.0044 |
| 207 | 2.3323 | 0.0044 |
| 208 | 2.3366 | 0.0043 |
| 209 | 2.3409 | 0.0043 |
| 210 | 2.3453 | 0.0043 |
| 211 | 2.3496 | 0.0043 |
| 212 | 2.3539 | 0.0043 |
| 213 | 2.3581 | 0.0043 |
| 214 | 2.3624 | 0.0043 |
| 215 | 2.3667 | 0.0043 |
| 216 | 2.3709 | 0.0042 |
| 217 | 2.3751 | 0.0042 |
| 218 | 2.3793 | 0.0042 |
| 219 | 2.3836 | 0.0042 |
| 220 | 2.3878 | 0.0042 |
| 221 | 2.3919 | 0.0042 |
| 222 | 2.3961 | 0.0042 |
| 223 | 2.4003 | 0.0042 |
| 224 | 2.4044 | 0.0041 |
| 225 | 2.4086 | 0.0041 |
| 226 | 2.4127 | 0.0041 |
| 227 | 2.4168 | 0.0041 |
| 228 | 2.4209 | 0.0041 |
| 229 | 2.4250 | 0.0041 |
| 230 | 2.4291 | 0.0041 |
| 231 | 2.4331 | 0.0041 |
| 232 | 2.4372 | 0.0041 |
| 233 | 2.4412 | 0.0040 |
| 234 | 2.4453 | 0.0040 |
| 235 | 2.4493 | 0.0040 |
| 236 | 2.4533 | 0.0040 |
| 237 | 2.4573 | 0.0040 |
| 238 | 2.4613 | 0.0040 |
| 239 | 2.4653 | 0.0040 |
| 240 | 2.4693 | 0.0040 |
| 241 | 2.4733 | 0.0040 |
| 242 | 2.4772 | 0.0040 |
| 243 | 2.4812 | 0.0039 |
| 244 | 2.4851 | 0.0039 |
| 245 | 2.4890 | 0.0039 |
| 246 | 2.4929 | 0.0039 |
| 247 | 2.4968 | 0.0039 |
| 248 | 2.5007 | 0.0039 |
| 249 | 2.5046 | 0.0039 |
| 250 | 2.5085 | 0.0039 |
| 251 | 2.5124 | 0.0039 |
| 252 | 2.5162 | 0.0039 |
| 253 | 2.5201 | 0.0038 |
| 254 | 2.5239 | 0.0038 |
| 255 | 2.5278 | 0.0038 |
| 256 | 2.5316 | 0.0038 |
| 257 | 2.5354 | 0.0038 |
| 258 | 2.5392 | 0.0038 |
| 259 | 2.5430 | 0.0038 |
| 260 | 2.5468 | 0.0038 |
| 261 | 2.5505 | 0.0038 |
| 262 | 2.5543 | 0.0038 |
| 263 | 2.5581 | 0.0038 |
| 264 | 2.5618 | 0.0037 |
| 265 | 2.5656 | 0.0037 |
| 266 | 2.5693 | 0.0037 |
| 267 | 2.5730 | 0.0037 |
| 268 | 2.5767 | 0.0037 |
| 269 | 2.5804 | 0.0037 |
| 270 | 2.5841 | 0.0037 |
| 271 | 2.5878 | 0.0037 |
| 272 | 2.5915 | 0.0037 |
| 273 | 2.5952 | 0.0037 |
| 274 | 2.5988 | 0.0037 |
| 275 | 2.6025 | 0.0037 |
| 276 | 2.6062 | 0.0036 |
| 277 | 2.6098 | 0.0036 |
| 278 | 2.6134 | 0.0036 |

|     |        |        |
|-----|--------|--------|
| 279 | 2.6170 | 0.0036 |
| 280 | 2.6207 | 0.0036 |
| 281 | 2.6243 | 0.0036 |
| 282 | 2.6279 | 0.0036 |
| 283 | 2.6315 | 0.0036 |
| 284 | 2.6351 | 0.0036 |
| 285 | 2.6386 | 0.0036 |
| 286 | 2.6422 | 0.0036 |
| 287 | 2.6458 | 0.0036 |
| 288 | 2.6493 | 0.0036 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0036                   | 0.0005                    | 0.0030                        |
| 2                          | 0.0036                   | 0.0005                    | 0.0030                        |
| 3                          | 0.0036                   | 0.0005                    | 0.0030                        |
| 4                          | 0.0036                   | 0.0005                    | 0.0030                        |
| 5                          | 0.0036                   | 0.0005                    | 0.0031                        |
| 6                          | 0.0036                   | 0.0006                    | 0.0031                        |
| 7                          | 0.0036                   | 0.0006                    | 0.0031                        |
| 8                          | 0.0036                   | 0.0006                    | 0.0031                        |
| 9                          | 0.0036                   | 0.0006                    | 0.0031                        |
| 10                         | 0.0037                   | 0.0006                    | 0.0031                        |
| 11                         | 0.0037                   | 0.0006                    | 0.0031                        |
| 12                         | 0.0037                   | 0.0006                    | 0.0031                        |
| 13                         | 0.0037                   | 0.0006                    | 0.0031                        |
| 14                         | 0.0037                   | 0.0006                    | 0.0031                        |
| 15                         | 0.0037                   | 0.0006                    | 0.0032                        |
| 16                         | 0.0037                   | 0.0006                    | 0.0032                        |
| 17                         | 0.0037                   | 0.0006                    | 0.0032                        |
| 18                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 19                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 20                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 21                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 22                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 23                         | 0.0038                   | 0.0006                    | 0.0032                        |
| 24                         | 0.0038                   | 0.0006                    | 0.0033                        |
| 25                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 26                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 27                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 28                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 29                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 30                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 31                         | 0.0039                   | 0.0006                    | 0.0033                        |
| 32                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 33                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 34                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 35                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 36                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 37                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 38                         | 0.0040                   | 0.0006                    | 0.0034                        |
| 39                         | 0.0041                   | 0.0006                    | 0.0034                        |
| 40                         | 0.0041                   | 0.0006                    | 0.0035                        |
| 41                         | 0.0041                   | 0.0006                    | 0.0035                        |
| 42                         | 0.0041                   | 0.0006                    | 0.0035                        |
| 43                         | 0.0041                   | 0.0006                    | 0.0035                        |
| 44                         | 0.0041                   | 0.0006                    | 0.0035                        |
| 45                         | 0.0042                   | 0.0006                    | 0.0035                        |
| 46                         | 0.0042                   | 0.0006                    | 0.0035                        |
| 47                         | 0.0042                   | 0.0006                    | 0.0036                        |
| 48                         | 0.0042                   | 0.0006                    | 0.0036                        |
| 49                         | 0.0042                   | 0.0006                    | 0.0036                        |
| 50                         | 0.0043                   | 0.0006                    | 0.0036                        |
| 51                         | 0.0043                   | 0.0007                    | 0.0036                        |
| 52                         | 0.0043                   | 0.0007                    | 0.0036                        |
| 53                         | 0.0043                   | 0.0007                    | 0.0037                        |
| 54                         | 0.0043                   | 0.0007                    | 0.0037                        |
| 55                         | 0.0044                   | 0.0007                    | 0.0037                        |
| 56                         | 0.0044                   | 0.0007                    | 0.0037                        |
| 57                         | 0.0044                   | 0.0007                    | 0.0037                        |
| 58                         | 0.0044                   | 0.0007                    | 0.0037                        |
| 59                         | 0.0044                   | 0.0007                    | 0.0038                        |
| 60                         | 0.0044                   | 0.0007                    | 0.0038                        |
| 61                         | 0.0045                   | 0.0007                    | 0.0038                        |
| 62                         | 0.0045                   | 0.0007                    | 0.0038                        |
| 63                         | 0.0045                   | 0.0007                    | 0.0038                        |
| 64                         | 0.0045                   | 0.0007                    | 0.0038                        |
| 65                         | 0.0046                   | 0.0007                    | 0.0039                        |
| 66                         | 0.0046                   | 0.0007                    | 0.0039                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 67  | 0.0046 | 0.0007 | 0.0039 |
| 68  | 0.0046 | 0.0007 | 0.0039 |
| 69  | 0.0047 | 0.0007 | 0.0039 |
| 70  | 0.0047 | 0.0007 | 0.0040 |
| 71  | 0.0047 | 0.0007 | 0.0040 |
| 72  | 0.0047 | 0.0007 | 0.0040 |
| 73  | 0.0047 | 0.0007 | 0.0040 |
| 74  | 0.0048 | 0.0007 | 0.0040 |
| 75  | 0.0048 | 0.0007 | 0.0041 |
| 76  | 0.0048 | 0.0007 | 0.0041 |
| 77  | 0.0048 | 0.0007 | 0.0041 |
| 78  | 0.0049 | 0.0007 | 0.0041 |
| 79  | 0.0049 | 0.0007 | 0.0042 |
| 80  | 0.0049 | 0.0008 | 0.0042 |
| 81  | 0.0050 | 0.0008 | 0.0042 |
| 82  | 0.0050 | 0.0008 | 0.0042 |
| 83  | 0.0050 | 0.0008 | 0.0042 |
| 84  | 0.0050 | 0.0008 | 0.0043 |
| 85  | 0.0051 | 0.0008 | 0.0043 |
| 86  | 0.0051 | 0.0008 | 0.0043 |
| 87  | 0.0051 | 0.0008 | 0.0043 |
| 88  | 0.0051 | 0.0008 | 0.0044 |
| 89  | 0.0052 | 0.0008 | 0.0044 |
| 90  | 0.0052 | 0.0008 | 0.0044 |
| 91  | 0.0052 | 0.0008 | 0.0044 |
| 92  | 0.0053 | 0.0008 | 0.0045 |
| 93  | 0.0053 | 0.0008 | 0.0045 |
| 94  | 0.0053 | 0.0008 | 0.0045 |
| 95  | 0.0054 | 0.0008 | 0.0046 |
| 96  | 0.0054 | 0.0008 | 0.0046 |
| 97  | 0.0054 | 0.0008 | 0.0046 |
| 98  | 0.0055 | 0.0008 | 0.0046 |
| 99  | 0.0055 | 0.0008 | 0.0047 |
| 100 | 0.0055 | 0.0008 | 0.0047 |
| 101 | 0.0056 | 0.0009 | 0.0047 |
| 102 | 0.0056 | 0.0009 | 0.0048 |
| 103 | 0.0057 | 0.0009 | 0.0048 |
| 104 | 0.0057 | 0.0009 | 0.0048 |
| 105 | 0.0057 | 0.0009 | 0.0049 |
| 106 | 0.0058 | 0.0009 | 0.0049 |
| 107 | 0.0058 | 0.0009 | 0.0049 |
| 108 | 0.0059 | 0.0009 | 0.0050 |
| 109 | 0.0059 | 0.0009 | 0.0050 |
| 110 | 0.0059 | 0.0009 | 0.0050 |
| 111 | 0.0060 | 0.0009 | 0.0051 |
| 112 | 0.0060 | 0.0009 | 0.0051 |
| 113 | 0.0061 | 0.0009 | 0.0052 |
| 114 | 0.0061 | 0.0009 | 0.0052 |
| 115 | 0.0062 | 0.0009 | 0.0052 |
| 116 | 0.0062 | 0.0009 | 0.0053 |
| 117 | 0.0063 | 0.0010 | 0.0053 |
| 118 | 0.0063 | 0.0010 | 0.0054 |
| 119 | 0.0064 | 0.0010 | 0.0054 |
| 120 | 0.0064 | 0.0010 | 0.0054 |
| 121 | 0.0065 | 0.0010 | 0.0055 |
| 122 | 0.0065 | 0.0010 | 0.0055 |
| 123 | 0.0066 | 0.0010 | 0.0056 |
| 124 | 0.0067 | 0.0010 | 0.0056 |
| 125 | 0.0067 | 0.0010 | 0.0057 |
| 126 | 0.0068 | 0.0010 | 0.0057 |
| 127 | 0.0069 | 0.0010 | 0.0058 |
| 128 | 0.0069 | 0.0011 | 0.0059 |
| 129 | 0.0070 | 0.0011 | 0.0059 |
| 130 | 0.0070 | 0.0011 | 0.0060 |
| 131 | 0.0071 | 0.0011 | 0.0060 |
| 132 | 0.0072 | 0.0011 | 0.0061 |
| 133 | 0.0073 | 0.0011 | 0.0062 |
| 134 | 0.0073 | 0.0011 | 0.0062 |
| 135 | 0.0074 | 0.0011 | 0.0063 |
| 136 | 0.0075 | 0.0011 | 0.0063 |
| 137 | 0.0076 | 0.0012 | 0.0064 |
| 138 | 0.0077 | 0.0012 | 0.0065 |
| 139 | 0.0078 | 0.0012 | 0.0066 |
| 140 | 0.0078 | 0.0012 | 0.0066 |
| 141 | 0.0079 | 0.0012 | 0.0067 |
| 142 | 0.0080 | 0.0012 | 0.0068 |
| 143 | 0.0081 | 0.0012 | 0.0069 |
| 144 | 0.0082 | 0.0013 | 0.0070 |
| 145 | 0.0082 | 0.0013 | 0.0070 |
| 146 | 0.0083 | 0.0013 | 0.0070 |
| 147 | 0.0084 | 0.0013 | 0.0071 |

|     |        |        |        |
|-----|--------|--------|--------|
| 148 | 0.0085 | 0.0013 | 0.0072 |
| 149 | 0.0087 | 0.0013 | 0.0073 |
| 150 | 0.0088 | 0.0013 | 0.0074 |
| 151 | 0.0089 | 0.0014 | 0.0076 |
| 152 | 0.0090 | 0.0014 | 0.0076 |
| 153 | 0.0092 | 0.0014 | 0.0078 |
| 154 | 0.0093 | 0.0014 | 0.0079 |
| 155 | 0.0095 | 0.0015 | 0.0081 |
| 156 | 0.0096 | 0.0015 | 0.0081 |
| 157 | 0.0098 | 0.0015 | 0.0083 |
| 158 | 0.0099 | 0.0015 | 0.0084 |
| 159 | 0.0102 | 0.0016 | 0.0086 |
| 160 | 0.0103 | 0.0016 | 0.0087 |
| 161 | 0.0106 | 0.0016 | 0.0090 |
| 162 | 0.0107 | 0.0016 | 0.0091 |
| 163 | 0.0110 | 0.0017 | 0.0093 |
| 164 | 0.0112 | 0.0017 | 0.0095 |
| 165 | 0.0115 | 0.0018 | 0.0098 |
| 166 | 0.0117 | 0.0018 | 0.0099 |
| 167 | 0.0121 | 0.0018 | 0.0102 |
| 168 | 0.0123 | 0.0019 | 0.0104 |
| 169 | 0.0127 | 0.0019 | 0.0108 |
| 170 | 0.0129 | 0.0020 | 0.0110 |
| 171 | 0.0134 | 0.0020 | 0.0114 |
| 172 | 0.0137 | 0.0021 | 0.0116 |
| 173 | 0.0142 | 0.0022 | 0.0121 |
| 174 | 0.0146 | 0.0022 | 0.0123 |
| 175 | 0.0152 | 0.0023 | 0.0129 |
| 176 | 0.0156 | 0.0024 | 0.0132 |
| 177 | 0.0164 | 0.0025 | 0.0139 |
| 178 | 0.0168 | 0.0026 | 0.0143 |
| 179 | 0.0179 | 0.0027 | 0.0151 |
| 180 | 0.0184 | 0.0028 | 0.0156 |
| 181 | 0.0197 | 0.0030 | 0.0167 |
| 182 | 0.0204 | 0.0031 | 0.0173 |
| 183 | 0.0221 | 0.0034 | 0.0188 |
| 184 | 0.0231 | 0.0035 | 0.0196 |
| 185 | 0.0202 | 0.0031 | 0.0172 |
| 186 | 0.0216 | 0.0033 | 0.0183 |
| 187 | 0.0250 | 0.0038 | 0.0212 |
| 188 | 0.0273 | 0.0039 | 0.0235 |
| 189 | 0.0340 | 0.0039 | 0.0301 |
| 190 | 0.0391 | 0.0039 | 0.0353 |
| 191 | 0.0594 | 0.0039 | 0.0555 |
| 192 | 0.0862 | 0.0039 | 0.0823 |
| 193 | 0.3729 | 0.0039 | 0.3690 |
| 194 | 0.0467 | 0.0039 | 0.0429 |
| 195 | 0.0302 | 0.0039 | 0.0264 |
| 196 | 0.0231 | 0.0035 | 0.0196 |
| 197 | 0.0243 | 0.0037 | 0.0206 |
| 198 | 0.0212 | 0.0032 | 0.0180 |
| 199 | 0.0190 | 0.0029 | 0.0161 |
| 200 | 0.0173 | 0.0026 | 0.0147 |
| 201 | 0.0160 | 0.0024 | 0.0135 |
| 202 | 0.0149 | 0.0023 | 0.0126 |
| 203 | 0.0140 | 0.0021 | 0.0118 |
| 204 | 0.0132 | 0.0020 | 0.0112 |
| 205 | 0.0125 | 0.0019 | 0.0106 |
| 206 | 0.0119 | 0.0018 | 0.0101 |
| 207 | 0.0113 | 0.0017 | 0.0096 |
| 208 | 0.0109 | 0.0017 | 0.0092 |
| 209 | 0.0104 | 0.0016 | 0.0089 |
| 210 | 0.0101 | 0.0015 | 0.0085 |
| 211 | 0.0097 | 0.0015 | 0.0082 |
| 212 | 0.0094 | 0.0014 | 0.0080 |
| 213 | 0.0091 | 0.0014 | 0.0077 |
| 214 | 0.0088 | 0.0013 | 0.0075 |
| 215 | 0.0086 | 0.0013 | 0.0073 |
| 216 | 0.0084 | 0.0013 | 0.0071 |
| 217 | 0.0083 | 0.0013 | 0.0070 |
| 218 | 0.0081 | 0.0012 | 0.0068 |
| 219 | 0.0079 | 0.0012 | 0.0067 |
| 220 | 0.0077 | 0.0012 | 0.0065 |
| 221 | 0.0075 | 0.0012 | 0.0064 |
| 222 | 0.0074 | 0.0011 | 0.0063 |
| 223 | 0.0072 | 0.0011 | 0.0061 |
| 224 | 0.0071 | 0.0011 | 0.0060 |
| 225 | 0.0069 | 0.0011 | 0.0059 |
| 226 | 0.0068 | 0.0010 | 0.0058 |
| 227 | 0.0067 | 0.0010 | 0.0057 |
| 228 | 0.0066 | 0.0010 | 0.0056 |

|     |        |        |        |
|-----|--------|--------|--------|
| 229 | 0.0065 | 0.0010 | 0.0055 |
| 230 | 0.0064 | 0.0010 | 0.0054 |
| 231 | 0.0063 | 0.0010 | 0.0053 |
| 232 | 0.0062 | 0.0009 | 0.0052 |
| 233 | 0.0061 | 0.0009 | 0.0051 |
| 234 | 0.0060 | 0.0009 | 0.0051 |
| 235 | 0.0059 | 0.0009 | 0.0050 |
| 236 | 0.0058 | 0.0009 | 0.0049 |
| 237 | 0.0057 | 0.0009 | 0.0048 |
| 238 | 0.0056 | 0.0009 | 0.0048 |
| 239 | 0.0056 | 0.0008 | 0.0047 |
| 240 | 0.0055 | 0.0008 | 0.0047 |
| 241 | 0.0054 | 0.0008 | 0.0046 |
| 242 | 0.0054 | 0.0008 | 0.0045 |
| 243 | 0.0053 | 0.0008 | 0.0045 |
| 244 | 0.0052 | 0.0008 | 0.0044 |
| 245 | 0.0052 | 0.0008 | 0.0044 |
| 246 | 0.0051 | 0.0008 | 0.0043 |
| 247 | 0.0050 | 0.0008 | 0.0043 |
| 248 | 0.0050 | 0.0008 | 0.0042 |
| 249 | 0.0049 | 0.0008 | 0.0042 |
| 250 | 0.0049 | 0.0007 | 0.0041 |
| 251 | 0.0048 | 0.0007 | 0.0041 |
| 252 | 0.0048 | 0.0007 | 0.0040 |
| 253 | 0.0047 | 0.0007 | 0.0040 |
| 254 | 0.0047 | 0.0007 | 0.0040 |
| 255 | 0.0046 | 0.0007 | 0.0039 |
| 256 | 0.0046 | 0.0007 | 0.0039 |
| 257 | 0.0045 | 0.0007 | 0.0039 |
| 258 | 0.0045 | 0.0007 | 0.0038 |
| 259 | 0.0045 | 0.0007 | 0.0038 |
| 260 | 0.0044 | 0.0007 | 0.0037 |
| 261 | 0.0044 | 0.0007 | 0.0037 |
| 262 | 0.0043 | 0.0007 | 0.0037 |
| 263 | 0.0043 | 0.0007 | 0.0036 |
| 264 | 0.0043 | 0.0007 | 0.0036 |
| 265 | 0.0042 | 0.0006 | 0.0036 |
| 266 | 0.0042 | 0.0006 | 0.0036 |
| 267 | 0.0042 | 0.0006 | 0.0035 |
| 268 | 0.0041 | 0.0006 | 0.0035 |
| 269 | 0.0041 | 0.0006 | 0.0035 |
| 270 | 0.0041 | 0.0006 | 0.0034 |
| 271 | 0.0040 | 0.0006 | 0.0034 |
| 272 | 0.0040 | 0.0006 | 0.0034 |
| 273 | 0.0040 | 0.0006 | 0.0034 |
| 274 | 0.0039 | 0.0006 | 0.0033 |
| 275 | 0.0039 | 0.0006 | 0.0033 |
| 276 | 0.0039 | 0.0006 | 0.0033 |
| 277 | 0.0038 | 0.0006 | 0.0033 |
| 278 | 0.0038 | 0.0006 | 0.0032 |
| 279 | 0.0038 | 0.0006 | 0.0032 |
| 280 | 0.0038 | 0.0006 | 0.0032 |
| 281 | 0.0037 | 0.0006 | 0.0032 |
| 282 | 0.0037 | 0.0006 | 0.0031 |
| 283 | 0.0037 | 0.0006 | 0.0031 |
| 284 | 0.0037 | 0.0006 | 0.0031 |
| 285 | 0.0036 | 0.0006 | 0.0031 |
| 286 | 0.0036 | 0.0006 | 0.0031 |
| 287 | 0.0036 | 0.0005 | 0.0030 |
| 288 | 0.0036 | 0.0005 | 0.0030 |

-----  
Total soil rain loss = 0.33(In)  
Total effective rainfall = 2.32(In)  
Peak flow rate in flood hydrograph = (CFS)  
-----

+++++  
24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h  
-----

Hydrograph in 5 Minute intervals ((CFS))  
-----

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 12.5 | 25.0 | 37.5 | 50.0 |
|-----------|--------------|--------|---|------|------|------|------|
| 0+ 5      | 0.0005       | 0.07   | Q |      |      |      |      |
| 0+10      | 0.0031       | 0.37   | Q |      |      |      |      |
| 0+15      | 0.0065       | 0.50   | Q |      |      |      |      |
| 0+20      | 0.0104       | 0.56   | Q |      |      |      |      |
| 0+25      | 0.0145       | 0.60   | Q |      |      |      |      |
| 0+30      | 0.0188       | 0.62   | Q |      |      |      |      |

|      |        |      |     |
|------|--------|------|-----|
| 0+35 | 0.0232 | 0.64 | Q   |
| 0+40 | 0.0276 | 0.64 | Q   |
| 0+45 | 0.0321 | 0.65 | Q   |
| 0+50 | 0.0366 | 0.66 | Q   |
| 0+55 | 0.0412 | 0.66 | Q   |
| 1+ 0 | 0.0458 | 0.66 | Q   |
| 1+ 5 | 0.0503 | 0.67 | Q   |
| 1+10 | 0.0549 | 0.67 | Q   |
| 1+15 | 0.0596 | 0.67 | Q   |
| 1+20 | 0.0642 | 0.67 | Q   |
| 1+25 | 0.0688 | 0.67 | Q   |
| 1+30 | 0.0735 | 0.68 | Q   |
| 1+35 | 0.0782 | 0.68 | Q   |
| 1+40 | 0.0829 | 0.68 | Q   |
| 1+45 | 0.0876 | 0.68 | QV  |
| 1+50 | 0.0923 | 0.69 | QV  |
| 1+55 | 0.0971 | 0.69 | QV  |
| 2+ 0 | 0.1018 | 0.69 | QV  |
| 2+ 5 | 0.1066 | 0.69 | QV  |
| 2+10 | 0.1114 | 0.70 | QV  |
| 2+15 | 0.1162 | 0.70 | QV  |
| 2+20 | 0.1211 | 0.70 | QV  |
| 2+25 | 0.1259 | 0.70 | QV  |
| 2+30 | 0.1308 | 0.71 | QV  |
| 2+35 | 0.1357 | 0.71 | QV  |
| 2+40 | 0.1406 | 0.71 | QV  |
| 2+45 | 0.1455 | 0.71 | QV  |
| 2+50 | 0.1504 | 0.72 | QV  |
| 2+55 | 0.1554 | 0.72 | QV  |
| 3+ 0 | 0.1604 | 0.72 | QV  |
| 3+ 5 | 0.1654 | 0.73 | QV  |
| 3+10 | 0.1704 | 0.73 | QV  |
| 3+15 | 0.1754 | 0.73 | Q V |
| 3+20 | 0.1805 | 0.73 | Q V |
| 3+25 | 0.1856 | 0.74 | Q V |
| 3+30 | 0.1907 | 0.74 | Q V |
| 3+35 | 0.1958 | 0.74 | Q V |
| 3+40 | 0.2009 | 0.75 | Q V |
| 3+45 | 0.2061 | 0.75 | Q V |
| 3+50 | 0.2113 | 0.75 | Q V |
| 3+55 | 0.2165 | 0.76 | Q V |
| 4+ 0 | 0.2217 | 0.76 | Q V |
| 4+ 5 | 0.2270 | 0.76 | Q V |
| 4+10 | 0.2322 | 0.77 | Q V |
| 4+15 | 0.2375 | 0.77 | Q V |
| 4+20 | 0.2428 | 0.77 | Q V |
| 4+25 | 0.2482 | 0.78 | Q V |
| 4+30 | 0.2535 | 0.78 | Q V |
| 4+35 | 0.2589 | 0.78 | Q V |
| 4+40 | 0.2643 | 0.79 | Q V |
| 4+45 | 0.2698 | 0.79 | Q V |
| 4+50 | 0.2752 | 0.79 | Q V |
| 4+55 | 0.2807 | 0.80 | Q V |
| 5+ 0 | 0.2862 | 0.80 | Q V |
| 5+ 5 | 0.2918 | 0.80 | Q V |
| 5+10 | 0.2973 | 0.81 | Q V |
| 5+15 | 0.3029 | 0.81 | Q V |
| 5+20 | 0.3085 | 0.81 | Q V |
| 5+25 | 0.3142 | 0.82 | Q V |
| 5+30 | 0.3198 | 0.82 | Q V |
| 5+35 | 0.3255 | 0.83 | Q V |
| 5+40 | 0.3312 | 0.83 | Q V |
| 5+45 | 0.3370 | 0.83 | Q V |
| 5+50 | 0.3428 | 0.84 | Q V |
| 5+55 | 0.3486 | 0.84 | Q V |
| 6+ 0 | 0.3544 | 0.85 | Q V |
| 6+ 5 | 0.3603 | 0.85 | Q V |
| 6+10 | 0.3662 | 0.86 | Q V |
| 6+15 | 0.3721 | 0.86 | Q V |
| 6+20 | 0.3780 | 0.86 | Q V |
| 6+25 | 0.3840 | 0.87 | Q V |
| 6+30 | 0.3900 | 0.87 | Q V |
| 6+35 | 0.3961 | 0.88 | Q V |
| 6+40 | 0.4022 | 0.88 | Q V |
| 6+45 | 0.4083 | 0.89 | Q V |
| 6+50 | 0.4144 | 0.89 | Q V |
| 6+55 | 0.4206 | 0.90 | Q V |
| 7+ 0 | 0.4268 | 0.90 | Q V |
| 7+ 5 | 0.4331 | 0.91 | Q V |
| 7+10 | 0.4394 | 0.91 | Q V |
| 7+15 | 0.4457 | 0.92 | Q V |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 7+20  | 0.4520 | 0.92 | Q | V |  |  |  |  |
| 7+25  | 0.4584 | 0.93 | Q | V |  |  |  |  |
| 7+30  | 0.4649 | 0.93 | Q | V |  |  |  |  |
| 7+35  | 0.4713 | 0.94 | Q | V |  |  |  |  |
| 7+40  | 0.4778 | 0.95 | Q | V |  |  |  |  |
| 7+45  | 0.4844 | 0.95 | Q | V |  |  |  |  |
| 7+50  | 0.4910 | 0.96 | Q | V |  |  |  |  |
| 7+55  | 0.4976 | 0.96 | Q | V |  |  |  |  |
| 8+ 0  | 0.5043 | 0.97 | Q | V |  |  |  |  |
| 8+ 5  | 0.5110 | 0.97 | Q | V |  |  |  |  |
| 8+10  | 0.5177 | 0.98 | Q | V |  |  |  |  |
| 8+15  | 0.5245 | 0.99 | Q | V |  |  |  |  |
| 8+20  | 0.5314 | 0.99 | Q | V |  |  |  |  |
| 8+25  | 0.5382 | 1.00 | Q | V |  |  |  |  |
| 8+30  | 0.5452 | 1.01 | Q | V |  |  |  |  |
| 8+35  | 0.5522 | 1.01 | Q | V |  |  |  |  |
| 8+40  | 0.5592 | 1.02 | Q | V |  |  |  |  |
| 8+45  | 0.5663 | 1.03 | Q | V |  |  |  |  |
| 8+50  | 0.5734 | 1.03 | Q | V |  |  |  |  |
| 8+55  | 0.5805 | 1.04 | Q | V |  |  |  |  |
| 9+ 0  | 0.5878 | 1.05 | Q | V |  |  |  |  |
| 9+ 5  | 0.5950 | 1.06 | Q | V |  |  |  |  |
| 9+10  | 0.6024 | 1.06 | Q | V |  |  |  |  |
| 9+15  | 0.6097 | 1.07 | Q | V |  |  |  |  |
| 9+20  | 0.6172 | 1.08 | Q | V |  |  |  |  |
| 9+25  | 0.6247 | 1.09 | Q | V |  |  |  |  |
| 9+30  | 0.6322 | 1.10 | Q | V |  |  |  |  |
| 9+35  | 0.6398 | 1.10 | Q | V |  |  |  |  |
| 9+40  | 0.6475 | 1.11 | Q | V |  |  |  |  |
| 9+45  | 0.6552 | 1.12 | Q | V |  |  |  |  |
| 9+50  | 0.6630 | 1.13 | Q | V |  |  |  |  |
| 9+55  | 0.6708 | 1.14 | Q | V |  |  |  |  |
| 10+ 0 | 0.6788 | 1.15 | Q | V |  |  |  |  |
| 10+ 5 | 0.6867 | 1.16 | Q | V |  |  |  |  |
| 10+10 | 0.6948 | 1.17 | Q | V |  |  |  |  |
| 10+15 | 0.7029 | 1.18 | Q | V |  |  |  |  |
| 10+20 | 0.7111 | 1.19 | Q | V |  |  |  |  |
| 10+25 | 0.7193 | 1.20 | Q | V |  |  |  |  |
| 10+30 | 0.7277 | 1.21 | Q | V |  |  |  |  |
| 10+35 | 0.7361 | 1.22 | Q | V |  |  |  |  |
| 10+40 | 0.7446 | 1.23 | Q | V |  |  |  |  |
| 10+45 | 0.7531 | 1.24 | Q | V |  |  |  |  |
| 10+50 | 0.7618 | 1.26 | Q | V |  |  |  |  |
| 10+55 | 0.7705 | 1.27 | Q | V |  |  |  |  |
| 11+ 0 | 0.7793 | 1.28 | Q | V |  |  |  |  |
| 11+ 5 | 0.7882 | 1.29 | Q | V |  |  |  |  |
| 11+10 | 0.7972 | 1.31 | Q | V |  |  |  |  |
| 11+15 | 0.8063 | 1.32 | Q | V |  |  |  |  |
| 11+20 | 0.8155 | 1.33 | Q | V |  |  |  |  |
| 11+25 | 0.8248 | 1.35 | Q | V |  |  |  |  |
| 11+30 | 0.8341 | 1.36 | Q | V |  |  |  |  |
| 11+35 | 0.8436 | 1.38 | Q | V |  |  |  |  |
| 11+40 | 0.8532 | 1.39 | Q | V |  |  |  |  |
| 11+45 | 0.8629 | 1.41 | Q | V |  |  |  |  |
| 11+50 | 0.8727 | 1.42 | Q | V |  |  |  |  |
| 11+55 | 0.8826 | 1.44 | Q | V |  |  |  |  |
| 12+ 0 | 0.8927 | 1.46 | Q | V |  |  |  |  |
| 12+ 5 | 0.9028 | 1.47 | Q | V |  |  |  |  |
| 12+10 | 0.9130 | 1.48 | Q | V |  |  |  |  |
| 12+15 | 0.9233 | 1.49 | Q | V |  |  |  |  |
| 12+20 | 0.9337 | 1.51 | Q | V |  |  |  |  |
| 12+25 | 0.9443 | 1.53 | Q | V |  |  |  |  |
| 12+30 | 0.9549 | 1.55 | Q | V |  |  |  |  |
| 12+35 | 0.9658 | 1.57 | Q | V |  |  |  |  |
| 12+40 | 0.9768 | 1.60 | Q | V |  |  |  |  |
| 12+45 | 0.9879 | 1.62 | Q | V |  |  |  |  |
| 12+50 | 0.9992 | 1.64 | Q | V |  |  |  |  |
| 12+55 | 1.0107 | 1.67 | Q | V |  |  |  |  |
| 13+ 0 | 1.0224 | 1.70 | Q | V |  |  |  |  |
| 13+ 5 | 1.0342 | 1.72 | Q | V |  |  |  |  |
| 13+10 | 1.0463 | 1.75 | Q | V |  |  |  |  |
| 13+15 | 1.0586 | 1.78 | Q | V |  |  |  |  |
| 13+20 | 1.0711 | 1.82 | Q | V |  |  |  |  |
| 13+25 | 1.0838 | 1.85 | Q | V |  |  |  |  |
| 13+30 | 1.0968 | 1.88 | Q | V |  |  |  |  |
| 13+35 | 1.1100 | 1.92 | Q | V |  |  |  |  |
| 13+40 | 1.1235 | 1.96 | Q | V |  |  |  |  |
| 13+45 | 1.1373 | 2.00 | Q | V |  |  |  |  |
| 13+50 | 1.1513 | 2.04 | Q | V |  |  |  |  |
| 13+55 | 1.1657 | 2.09 | Q | V |  |  |  |  |
| 14+ 0 | 1.1805 | 2.14 | Q | V |  |  |  |  |

|       |        |       |   |   |   |   |   |
|-------|--------|-------|---|---|---|---|---|
| 14+ 5 | 1.1955 | 2.19  | Q |   | V |   |   |
| 14+10 | 1.2110 | 2.25  | Q |   | V |   |   |
| 14+15 | 1.2269 | 2.30  | Q |   | V |   |   |
| 14+20 | 1.2432 | 2.37  | Q |   | V |   |   |
| 14+25 | 1.2599 | 2.43  | Q |   | V |   |   |
| 14+30 | 1.2772 | 2.51  | Q |   | V |   |   |
| 14+35 | 1.2951 | 2.59  | Q |   | V |   |   |
| 14+40 | 1.3135 | 2.68  | Q |   | V |   |   |
| 14+45 | 1.3325 | 2.77  | Q |   | V |   |   |
| 14+50 | 1.3524 | 2.88  | Q |   | V |   |   |
| 14+55 | 1.3729 | 2.98  | Q |   | V |   |   |
| 15+ 0 | 1.3944 | 3.12  | Q |   | V |   |   |
| 15+ 5 | 1.4167 | 3.25  | Q |   | V |   |   |
| 15+10 | 1.4403 | 3.42  | Q |   | V |   |   |
| 15+15 | 1.4650 | 3.59  | Q |   | V |   |   |
| 15+20 | 1.4913 | 3.82  | Q |   | V |   |   |
| 15+25 | 1.5185 | 3.94  | Q |   | V |   |   |
| 15+30 | 1.5447 | 3.81  | Q |   | V |   |   |
| 15+35 | 1.5718 | 3.93  | Q |   | V |   |   |
| 15+40 | 1.6014 | 4.30  | Q |   | V |   |   |
| 15+45 | 1.6346 | 4.82  | Q |   | V |   |   |
| 15+50 | 1.6744 | 5.77  | Q |   | V |   |   |
| 15+55 | 1.7234 | 7.13  | Q |   | V |   |   |
| 16+ 0 | 1.7936 | 10.18 | Q |   | V |   |   |
| 16+ 5 | 1.9359 | 20.66 |   | Q | V |   |   |
| 16+10 | 2.2350 |       |   |   | V |   | Q |
| 16+15 | 2.3974 | 23.59 |   | Q |   | V |   |
| 16+20 | 2.4914 | 13.64 |   |   |   | V |   |
| 16+25 | 2.5559 | 9.37  | Q |   |   | V |   |
| 16+30 | 2.6067 | 7.38  | Q |   |   | V |   |
| 16+35 | 2.6476 | 5.94  | Q |   |   | V |   |
| 16+40 | 2.6806 | 4.79  | Q |   |   | V |   |
| 16+45 | 2.7099 | 4.25  | Q |   |   | V |   |
| 16+50 | 2.7354 | 3.71  | Q |   |   | V |   |
| 16+55 | 2.7557 | 2.95  | Q |   |   | V |   |
| 17+ 0 | 2.7745 | 2.72  | Q |   |   | V |   |
| 17+ 5 | 2.7920 | 2.55  | Q |   |   | V |   |
| 17+10 | 2.8085 | 2.40  | Q |   |   | V |   |
| 17+15 | 2.8242 | 2.27  | Q |   |   | V |   |
| 17+20 | 2.8390 | 2.16  | Q |   |   | V |   |
| 17+25 | 2.8532 | 2.06  | Q |   |   | V |   |
| 17+30 | 2.8668 | 1.97  | Q |   |   | V |   |
| 17+35 | 2.8798 | 1.89  | Q |   |   | V |   |
| 17+40 | 2.8923 | 1.82  | Q |   |   | V |   |
| 17+45 | 2.9045 | 1.76  | Q |   |   | V |   |
| 17+50 | 2.9162 | 1.70  | Q |   |   | V |   |
| 17+55 | 2.9275 | 1.65  | Q |   |   | V |   |
| 18+ 0 | 2.9385 | 1.60  | Q |   |   | V |   |
| 18+ 5 | 2.9493 | 1.56  | Q |   |   | V |   |
| 18+10 | 2.9598 | 1.53  | Q |   |   | V |   |
| 18+15 | 2.9701 | 1.49  | Q |   |   | V |   |
| 18+20 | 2.9801 | 1.46  | Q |   |   | V |   |
| 18+25 | 2.9899 | 1.42  | Q |   |   | V |   |
| 18+30 | 2.9995 | 1.39  | Q |   |   | V |   |
| 18+35 | 3.0089 | 1.36  | Q |   |   | V |   |
| 18+40 | 3.0181 | 1.33  | Q |   |   | V |   |
| 18+45 | 3.0271 | 1.31  | Q |   |   | V |   |
| 18+50 | 3.0359 | 1.28  | Q |   |   | V |   |
| 18+55 | 3.0446 | 1.26  | Q |   |   | V |   |
| 19+ 0 | 3.0531 | 1.23  | Q |   |   | V |   |
| 19+ 5 | 3.0614 | 1.21  | Q |   |   | V |   |
| 19+10 | 3.0696 | 1.19  | Q |   |   | V |   |
| 19+15 | 3.0776 | 1.17  | Q |   |   | V |   |
| 19+20 | 3.0856 | 1.15  | Q |   |   | V |   |
| 19+25 | 3.0934 | 1.13  | Q |   |   | V |   |
| 19+30 | 3.1010 | 1.11  | Q |   |   | V |   |
| 19+35 | 3.1086 | 1.10  | Q |   |   | V |   |
| 19+40 | 3.1160 | 1.08  | Q |   |   | V |   |
| 19+45 | 3.1233 | 1.06  | Q |   |   | V |   |
| 19+50 | 3.1306 | 1.05  | Q |   |   | V |   |
| 19+55 | 3.1377 | 1.03  | Q |   |   | V |   |
| 20+ 0 | 3.1447 | 1.02  | Q |   |   | V |   |
| 20+ 5 | 3.1517 | 1.01  | Q |   |   | V |   |
| 20+10 | 3.1585 | 0.99  | Q |   |   | V |   |
| 20+15 | 3.1653 | 0.98  | Q |   |   | V |   |
| 20+20 | 3.1719 | 0.97  | Q |   |   | V |   |
| 20+25 | 3.1785 | 0.96  | Q |   |   | V |   |
| 20+30 | 3.1850 | 0.95  | Q |   |   | V |   |
| 20+35 | 3.1915 | 0.93  | Q |   |   | V |   |
| 20+40 | 3.1978 | 0.92  | Q |   |   | V |   |
| 20+45 | 3.2041 | 0.91  | Q |   |   | V |   |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 20+50 | 3.2103 | 0.90 | Q |  |  |  | V |
| 20+55 | 3.2165 | 0.89 | Q |  |  |  | V |
| 21+ 0 | 3.2226 | 0.88 | Q |  |  |  | V |
| 21+ 5 | 3.2286 | 0.87 | Q |  |  |  | V |
| 21+10 | 3.2345 | 0.86 | Q |  |  |  | V |
| 21+15 | 3.2404 | 0.86 | Q |  |  |  | V |
| 21+20 | 3.2463 | 0.85 | Q |  |  |  | V |
| 21+25 | 3.2520 | 0.84 | Q |  |  |  | V |
| 21+30 | 3.2578 | 0.83 | Q |  |  |  | V |
| 21+35 | 3.2634 | 0.82 | Q |  |  |  | V |
| 21+40 | 3.2690 | 0.82 | Q |  |  |  | V |
| 21+45 | 3.2746 | 0.81 | Q |  |  |  | V |
| 21+50 | 3.2801 | 0.80 | Q |  |  |  | V |
| 21+55 | 3.2856 | 0.79 | Q |  |  |  | V |
| 22+ 0 | 3.2910 | 0.79 | Q |  |  |  | V |
| 22+ 5 | 3.2964 | 0.78 | Q |  |  |  | V |
| 22+10 | 3.3017 | 0.77 | Q |  |  |  | V |
| 22+15 | 3.3069 | 0.77 | Q |  |  |  | V |
| 22+20 | 3.3122 | 0.76 | Q |  |  |  | V |
| 22+25 | 3.3174 | 0.75 | Q |  |  |  | V |
| 22+30 | 3.3225 | 0.75 | Q |  |  |  | V |
| 22+35 | 3.3276 | 0.74 | Q |  |  |  | V |
| 22+40 | 3.3327 | 0.73 | Q |  |  |  | V |
| 22+45 | 3.3377 | 0.73 | Q |  |  |  | V |
| 22+50 | 3.3427 | 0.72 | Q |  |  |  | V |
| 22+55 | 3.3476 | 0.72 | Q |  |  |  | V |
| 23+ 0 | 3.3525 | 0.71 | Q |  |  |  | V |
| 23+ 5 | 3.3574 | 0.71 | Q |  |  |  | V |
| 23+10 | 3.3622 | 0.70 | Q |  |  |  | V |
| 23+15 | 3.3670 | 0.70 | Q |  |  |  | V |
| 23+20 | 3.3718 | 0.69 | Q |  |  |  | V |
| 23+25 | 3.3765 | 0.69 | Q |  |  |  | V |
| 23+30 | 3.3812 | 0.68 | Q |  |  |  | V |
| 23+35 | 3.3859 | 0.68 | Q |  |  |  | V |
| 23+40 | 3.3905 | 0.67 | Q |  |  |  | V |
| 23+45 | 3.3951 | 0.67 | Q |  |  |  | V |
| 23+50 | 3.3997 | 0.66 | Q |  |  |  | V |
| 23+55 | 3.4042 | 0.66 | Q |  |  |  | V |
| 24+ 0 | 3.4087 | 0.65 | Q |  |  |  | V |
| 24+ 5 | 3.4127 | 0.58 | Q |  |  |  | V |
| 24+10 | 3.4146 | 0.27 | Q |  |  |  | V |
| 24+15 | 3.4156 | 0.14 | Q |  |  |  | V |
| 24+20 | 3.4162 | 0.08 | Q |  |  |  | V |
| 24+25 | 3.4165 | 0.05 | Q |  |  |  | V |
| 24+30 | 3.4167 | 0.03 | Q |  |  |  | V |
| 24+35 | 3.4168 | 0.02 | Q |  |  |  | V |
| 24+40 | 3.4169 | 0.01 | Q |  |  |  | V |
| 24+45 |        | 0.00 | Q |  |  |  | V |

# Unit Hydrograph Analysis

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Study date 06/23/22

San Bernardino County Synthetic Unit Hydrology Method

Manual date - August 1986

Program License Serial Number 6320

Storm Event Year =

Antecedent Moisture Condition =

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area<br>(Ac.)          | Duration<br>(hours) | Isohyetal<br>(In) |
|----------------------------|---------------------|-------------------|
| Rainfall data for year 10  |                     |                   |
| 17.68                      | 1                   | 0.60              |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 6                   | 0.75              |
| Rainfall data for year 2   |                     |                   |
| 17.68                      | 24                  | 1.30              |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 1                   | 1.07              |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 6                   | 1.99              |
| Rainfall data for year 100 |                     |                   |
| 17.68                      | 24                  | 3.39              |

\*\*\*\*\* Area-averaged max loss rate, Fm \*\*\*\*\*

| SCS curve<br>No. (AMCII) | SCS curve<br>NO. (AMC 2) | Area<br>(Ac.) | Area<br>Fraction | Fp(Fig C6)<br>(In/Hr) | Ap<br>(dec.) | Fm<br>(In/Hr) |
|--------------------------|--------------------------|---------------|------------------|-----------------------|--------------|---------------|
| 77.0                     | 77.0                     | 17.68         | 1.000            | 0.420                 | 0.110        | 0.046         |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.046

\*\*\*\*\* Area-Averaged low loss rate fraction, Yb \*\*\*\*\*

| Area<br>(Ac.) | Area<br>Fract | SCS CN<br>(AMC2) | SCS CN<br>(AMC2) | S    | Pervious<br>Yield Fr |
|---------------|---------------|------------------|------------------|------|----------------------|
| 1.94          | 0.110         | 77.0             | 77.0             | 2.99 | 0.398                |
| 15.74         | 0.890         | 98.0             | 98.0             | 0.20 | 0.931                |

Area-averaged catchment yield fraction, Y = 0.873

Area-averaged low loss fraction, Yb = 0.127

User entry of time of concentration = 0.129 (hours)

Watershed area = 17.68(Ac.)

Catchment Lag time =        hours  
 Unit interval = 5.000 minutes  
 Unit interval percentage of lag time = 80.7494  
 Hydrograph baseflow = 0.00(CFS)  
 Average maximum watershed loss rate(Fm) = 0.046(In/Hr)  
 Average low loss rate fraction (Yb) = 0.127 (decimal)  
 DESERT S-Graph Selected  
 Computed peak 5-minute rainfall = 0.508(In)  
 Computed peak 30-minute rainfall = 0.869(In)  
 Specified peak 1-hour rainfall = 1.070(In)  
 Computed peak 3-hour rainfall = 1.565(In)  
 Specified peak 6-hour rainfall = 1.990(In)  
 Specified peak 24-hour rainfall = 3.390(In)

Rainfall depth area reduction factors:  
 Using a total area of 17.68(Ac.) (Ref: fig. E-4)

|                          |                               |
|--------------------------|-------------------------------|
| 5-minute factor = 0.999  | Adjusted rainfall = 0.507(In) |
| 30-minute factor = 0.999 | Adjusted rainfall = 0.868(In) |
| 1-hour factor = 0.999    | Adjusted rainfall = 1.069(In) |
| 3-hour factor = 1.000    | Adjusted rainfall = 1.565(In) |
| 6-hour factor = 1.000    | Adjusted rainfall = 1.990(In) |
| 24-hour factor = 1.000   | Adjusted rainfall = 3.390(In) |

| Unit Hydrograph    |             |                 |
|--------------------|-------------|-----------------|
| Interval           | 'S' Graph   | Unit Hydrograph |
| Number             | Mean values | ((CFS))         |
| (K = 213.82 (CFS)) |             |                 |
| 1                  | 10.956      | 23.427          |
| 2                  | 57.842      | 100.249         |
| 3                  | 78.112      | 43.341          |
| 4                  | 87.134      | 19.290          |
| 5                  | 92.184      | 10.799          |
| 6                  | 95.341      | 6.750           |
| 7                  | 97.324      | 4.240           |
| 8                  | 98.382      | 2.263           |
| 9                  | 99.311      | 1.985           |
| 10                 | 100.000     | 1.473           |

| Peak Unit | Adjusted mass rainfall | Unit rainfall |
|-----------|------------------------|---------------|
| Number    | (In)                   | (In)          |
| 1         | 0.5073                 | 0.5073        |
| 2         | 0.6246                 | 0.1173        |
| 3         | 0.7054                 | 0.0808        |
| 4         | 0.7689                 | 0.0636        |
| 5         | 0.8222                 | 0.0532        |
| 6         | 0.8684                 | 0.0462        |
| 7         | 0.9095                 | 0.0411        |
| 8         | 0.9467                 | 0.0372        |
| 9         | 0.9807                 | 0.0340        |
| 10        | 1.0122                 | 0.0315        |
| 11        | 1.0416                 | 0.0294        |
| 12        | 1.0691                 | 0.0275        |
| 13        | 1.0992                 | 0.0301        |
| 14        | 1.1278                 | 0.0286        |
| 15        | 1.1552                 | 0.0273        |
| 16        | 1.1813                 | 0.0262        |
| 17        | 1.2064                 | 0.0251        |
| 18        | 1.2306                 | 0.0242        |
| 19        | 1.2539                 | 0.0233        |
| 20        | 1.2764                 | 0.0225        |
| 21        | 1.2982                 | 0.0218        |
| 22        | 1.3193                 | 0.0211        |
| 23        | 1.3398                 | 0.0205        |
| 24        | 1.3598                 | 0.0199        |
| 25        | 1.3792                 | 0.0194        |
| 26        | 1.3981                 | 0.0189        |
| 27        | 1.4165                 | 0.0184        |
| 28        | 1.4345                 | 0.0180        |
| 29        | 1.4521                 | 0.0176        |
| 30        | 1.4692                 | 0.0172        |
| 31        | 1.4860                 | 0.0168        |
| 32        | 1.5025                 | 0.0165        |
| 33        | 1.5186                 | 0.0161        |
| 34        | 1.5344                 | 0.0158        |
| 35        | 1.5500                 | 0.0155        |

|     |        |        |
|-----|--------|--------|
| 36  | 1.5652 | 0.0152 |
| 37  | 1.5801 | 0.0149 |
| 38  | 1.5948 | 0.0147 |
| 39  | 1.6092 | 0.0144 |
| 40  | 1.6233 | 0.0142 |
| 41  | 1.6373 | 0.0139 |
| 42  | 1.6510 | 0.0137 |
| 43  | 1.6645 | 0.0135 |
| 44  | 1.6778 | 0.0133 |
| 45  | 1.6909 | 0.0131 |
| 46  | 1.7039 | 0.0129 |
| 47  | 1.7166 | 0.0127 |
| 48  | 1.7292 | 0.0126 |
| 49  | 1.7416 | 0.0124 |
| 50  | 1.7538 | 0.0122 |
| 51  | 1.7659 | 0.0121 |
| 52  | 1.7778 | 0.0119 |
| 53  | 1.7895 | 0.0118 |
| 54  | 1.8012 | 0.0116 |
| 55  | 1.8127 | 0.0115 |
| 56  | 1.8240 | 0.0113 |
| 57  | 1.8352 | 0.0112 |
| 58  | 1.8463 | 0.0111 |
| 59  | 1.8573 | 0.0110 |
| 60  | 1.8681 | 0.0108 |
| 61  | 1.8788 | 0.0107 |
| 62  | 1.8895 | 0.0106 |
| 63  | 1.9000 | 0.0105 |
| 64  | 1.9103 | 0.0104 |
| 65  | 1.9206 | 0.0103 |
| 66  | 1.9308 | 0.0102 |
| 67  | 1.9409 | 0.0101 |
| 68  | 1.9509 | 0.0100 |
| 69  | 1.9608 | 0.0099 |
| 70  | 1.9706 | 0.0098 |
| 71  | 1.9803 | 0.0097 |
| 72  | 1.9899 | 0.0096 |
| 73  | 2.0005 | 0.0106 |
| 74  | 2.0110 | 0.0105 |
| 75  | 2.0214 | 0.0104 |
| 76  | 2.0317 | 0.0103 |
| 77  | 2.0419 | 0.0102 |
| 78  | 2.0520 | 0.0101 |
| 79  | 2.0621 | 0.0101 |
| 80  | 2.0721 | 0.0100 |
| 81  | 2.0820 | 0.0099 |
| 82  | 2.0919 | 0.0098 |
| 83  | 2.1016 | 0.0098 |
| 84  | 2.1113 | 0.0097 |
| 85  | 2.1210 | 0.0096 |
| 86  | 2.1305 | 0.0096 |
| 87  | 2.1400 | 0.0095 |
| 88  | 2.1494 | 0.0094 |
| 89  | 2.1588 | 0.0094 |
| 90  | 2.1681 | 0.0093 |
| 91  | 2.1773 | 0.0092 |
| 92  | 2.1864 | 0.0092 |
| 93  | 2.1955 | 0.0091 |
| 94  | 2.2046 | 0.0090 |
| 95  | 2.2136 | 0.0090 |
| 96  | 2.2225 | 0.0089 |
| 97  | 2.2314 | 0.0089 |
| 98  | 2.2402 | 0.0088 |
| 99  | 2.2489 | 0.0088 |
| 100 | 2.2576 | 0.0087 |
| 101 | 2.2663 | 0.0086 |
| 102 | 2.2749 | 0.0086 |
| 103 | 2.2834 | 0.0085 |
| 104 | 2.2919 | 0.0085 |
| 105 | 2.3004 | 0.0084 |
| 106 | 2.3088 | 0.0084 |
| 107 | 2.3171 | 0.0083 |
| 108 | 2.3254 | 0.0083 |
| 109 | 2.3337 | 0.0083 |
| 110 | 2.3419 | 0.0082 |
| 111 | 2.3500 | 0.0082 |
| 112 | 2.3581 | 0.0081 |
| 113 | 2.3662 | 0.0081 |
| 114 | 2.3742 | 0.0080 |
| 115 | 2.3822 | 0.0080 |
| 116 | 2.3901 | 0.0079 |

|     |        |        |
|-----|--------|--------|
| 117 | 2.3980 | 0.0079 |
| 118 | 2.4059 | 0.0079 |
| 119 | 2.4137 | 0.0078 |
| 120 | 2.4215 | 0.0078 |
| 121 | 2.4292 | 0.0077 |
| 122 | 2.4369 | 0.0077 |
| 123 | 2.4446 | 0.0077 |
| 124 | 2.4522 | 0.0076 |
| 125 | 2.4598 | 0.0076 |
| 126 | 2.4673 | 0.0075 |
| 127 | 2.4748 | 0.0075 |
| 128 | 2.4823 | 0.0075 |
| 129 | 2.4897 | 0.0074 |
| 130 | 2.4971 | 0.0074 |
| 131 | 2.5045 | 0.0074 |
| 132 | 2.5118 | 0.0073 |
| 133 | 2.5191 | 0.0073 |
| 134 | 2.5264 | 0.0073 |
| 135 | 2.5336 | 0.0072 |
| 136 | 2.5408 | 0.0072 |
| 137 | 2.5480 | 0.0072 |
| 138 | 2.5551 | 0.0071 |
| 139 | 2.5622 | 0.0071 |
| 140 | 2.5693 | 0.0071 |
| 141 | 2.5763 | 0.0070 |
| 142 | 2.5833 | 0.0070 |
| 143 | 2.5903 | 0.0070 |
| 144 | 2.5972 | 0.0069 |
| 145 | 2.6041 | 0.0069 |
| 146 | 2.6110 | 0.0069 |
| 147 | 2.6179 | 0.0069 |
| 148 | 2.6247 | 0.0068 |
| 149 | 2.6315 | 0.0068 |
| 150 | 2.6383 | 0.0068 |
| 151 | 2.6450 | 0.0067 |
| 152 | 2.6518 | 0.0067 |
| 153 | 2.6584 | 0.0067 |
| 154 | 2.6651 | 0.0067 |
| 155 | 2.6717 | 0.0066 |
| 156 | 2.6784 | 0.0066 |
| 157 | 2.6849 | 0.0066 |
| 158 | 2.6915 | 0.0066 |
| 159 | 2.6980 | 0.0065 |
| 160 | 2.7045 | 0.0065 |
| 161 | 2.7110 | 0.0065 |
| 162 | 2.7175 | 0.0065 |
| 163 | 2.7239 | 0.0064 |
| 164 | 2.7303 | 0.0064 |
| 165 | 2.7367 | 0.0064 |
| 166 | 2.7431 | 0.0064 |
| 167 | 2.7494 | 0.0063 |
| 168 | 2.7557 | 0.0063 |
| 169 | 2.7620 | 0.0063 |
| 170 | 2.7683 | 0.0063 |
| 171 | 2.7745 | 0.0062 |
| 172 | 2.7808 | 0.0062 |
| 173 | 2.7870 | 0.0062 |
| 174 | 2.7931 | 0.0062 |
| 175 | 2.7993 | 0.0062 |
| 176 | 2.8054 | 0.0061 |
| 177 | 2.8115 | 0.0061 |
| 178 | 2.8176 | 0.0061 |
| 179 | 2.8237 | 0.0061 |
| 180 | 2.8298 | 0.0061 |
| 181 | 2.8358 | 0.0060 |
| 182 | 2.8418 | 0.0060 |
| 183 | 2.8478 | 0.0060 |
| 184 | 2.8538 | 0.0060 |
| 185 | 2.8597 | 0.0060 |
| 186 | 2.8656 | 0.0059 |
| 187 | 2.8716 | 0.0059 |
| 188 | 2.8774 | 0.0059 |
| 189 | 2.8833 | 0.0059 |
| 190 | 2.8892 | 0.0059 |
| 191 | 2.8950 | 0.0058 |
| 192 | 2.9008 | 0.0058 |
| 193 | 2.9066 | 0.0058 |
| 194 | 2.9124 | 0.0058 |
| 195 | 2.9182 | 0.0058 |
| 196 | 2.9239 | 0.0057 |
| 197 | 2.9296 | 0.0057 |

|     |        |        |
|-----|--------|--------|
| 198 | 2.9353 | 0.0057 |
| 199 | 2.9410 | 0.0057 |
| 200 | 2.9467 | 0.0057 |
| 201 | 2.9523 | 0.0057 |
| 202 | 2.9580 | 0.0056 |
| 203 | 2.9636 | 0.0056 |
| 204 | 2.9692 | 0.0056 |
| 205 | 2.9748 | 0.0056 |
| 206 | 2.9804 | 0.0056 |
| 207 | 2.9859 | 0.0056 |
| 208 | 2.9914 | 0.0055 |
| 209 | 2.9970 | 0.0055 |
| 210 | 3.0025 | 0.0055 |
| 211 | 3.0079 | 0.0055 |
| 212 | 3.0134 | 0.0055 |
| 213 | 3.0189 | 0.0055 |
| 214 | 3.0243 | 0.0054 |
| 215 | 3.0297 | 0.0054 |
| 216 | 3.0351 | 0.0054 |
| 217 | 3.0405 | 0.0054 |
| 218 | 3.0459 | 0.0054 |
| 219 | 3.0513 | 0.0054 |
| 220 | 3.0566 | 0.0053 |
| 221 | 3.0619 | 0.0053 |
| 222 | 3.0673 | 0.0053 |
| 223 | 3.0726 | 0.0053 |
| 224 | 3.0779 | 0.0053 |
| 225 | 3.0831 | 0.0053 |
| 226 | 3.0884 | 0.0053 |
| 227 | 3.0936 | 0.0052 |
| 228 | 3.0989 | 0.0052 |
| 229 | 3.1041 | 0.0052 |
| 230 | 3.1093 | 0.0052 |
| 231 | 3.1145 | 0.0052 |
| 232 | 3.1196 | 0.0052 |
| 233 | 3.1248 | 0.0052 |
| 234 | 3.1299 | 0.0051 |
| 235 | 3.1351 | 0.0051 |
| 236 | 3.1402 | 0.0051 |
| 237 | 3.1453 | 0.0051 |
| 238 | 3.1504 | 0.0051 |
| 239 | 3.1555 | 0.0051 |
| 240 | 3.1605 | 0.0051 |
| 241 | 3.1656 | 0.0051 |
| 242 | 3.1706 | 0.0050 |
| 243 | 3.1757 | 0.0050 |
| 244 | 3.1807 | 0.0050 |
| 245 | 3.1857 | 0.0050 |
| 246 | 3.1907 | 0.0050 |
| 247 | 3.1957 | 0.0050 |
| 248 | 3.2006 | 0.0050 |
| 249 | 3.2056 | 0.0050 |
| 250 | 3.2105 | 0.0049 |
| 251 | 3.2154 | 0.0049 |
| 252 | 3.2204 | 0.0049 |
| 253 | 3.2253 | 0.0049 |
| 254 | 3.2302 | 0.0049 |
| 255 | 3.2350 | 0.0049 |
| 256 | 3.2399 | 0.0049 |
| 257 | 3.2448 | 0.0049 |
| 258 | 3.2496 | 0.0048 |
| 259 | 3.2544 | 0.0048 |
| 260 | 3.2593 | 0.0048 |
| 261 | 3.2641 | 0.0048 |
| 262 | 3.2689 | 0.0048 |
| 263 | 3.2737 | 0.0048 |
| 264 | 3.2785 | 0.0048 |
| 265 | 3.2832 | 0.0048 |
| 266 | 3.2880 | 0.0048 |
| 267 | 3.2927 | 0.0047 |
| 268 | 3.2975 | 0.0047 |
| 269 | 3.3022 | 0.0047 |
| 270 | 3.3069 | 0.0047 |
| 271 | 3.3116 | 0.0047 |
| 272 | 3.3163 | 0.0047 |
| 273 | 3.3210 | 0.0047 |
| 274 | 3.3256 | 0.0047 |
| 275 | 3.3303 | 0.0047 |
| 276 | 3.3349 | 0.0046 |
| 277 | 3.3396 | 0.0046 |
| 278 | 3.3442 | 0.0046 |

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|-----|--------|--------|
| 279 | 3.3488 | 0.0046 |
| 280 | 3.3534 | 0.0046 |
| 281 | 3.3580 | 0.0046 |
| 282 | 3.3626 | 0.0046 |
| 283 | 3.3672 | 0.0046 |
| 284 | 3.3718 | 0.0046 |
| 285 | 3.3763 | 0.0046 |
| 286 | 3.3809 | 0.0045 |
| 287 | 3.3854 | 0.0045 |
| 288 | 3.3899 | 0.0045 |

| Unit<br>Period<br>(number) | Unit<br>Rainfall<br>(In) | Unit<br>Soil-Loss<br>(In) | Effective<br>Rainfall<br>(In) |
|----------------------------|--------------------------|---------------------------|-------------------------------|
| 1                          | 0.0045                   | 0.0006                    | 0.0040                        |
| 2                          | 0.0045                   | 0.0006                    | 0.0040                        |
| 3                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 4                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 5                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 6                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 7                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 8                          | 0.0046                   | 0.0006                    | 0.0040                        |
| 9                          | 0.0046                   | 0.0006                    | 0.0041                        |
| 10                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 11                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 12                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 13                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 14                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 15                         | 0.0047                   | 0.0006                    | 0.0041                        |
| 16                         | 0.0048                   | 0.0006                    | 0.0041                        |
| 17                         | 0.0048                   | 0.0006                    | 0.0042                        |
| 18                         | 0.0048                   | 0.0006                    | 0.0042                        |
| 19                         | 0.0048                   | 0.0006                    | 0.0042                        |
| 20                         | 0.0048                   | 0.0006                    | 0.0042                        |
| 21                         | 0.0048                   | 0.0006                    | 0.0042                        |
| 22                         | 0.0049                   | 0.0006                    | 0.0042                        |
| 23                         | 0.0049                   | 0.0006                    | 0.0043                        |
| 24                         | 0.0049                   | 0.0006                    | 0.0043                        |
| 25                         | 0.0049                   | 0.0006                    | 0.0043                        |
| 26                         | 0.0049                   | 0.0006                    | 0.0043                        |
| 27                         | 0.0050                   | 0.0006                    | 0.0043                        |
| 28                         | 0.0050                   | 0.0006                    | 0.0043                        |
| 29                         | 0.0050                   | 0.0006                    | 0.0044                        |
| 30                         | 0.0050                   | 0.0006                    | 0.0044                        |
| 31                         | 0.0050                   | 0.0006                    | 0.0044                        |
| 32                         | 0.0050                   | 0.0006                    | 0.0044                        |
| 33                         | 0.0051                   | 0.0006                    | 0.0044                        |
| 34                         | 0.0051                   | 0.0006                    | 0.0044                        |
| 35                         | 0.0051                   | 0.0007                    | 0.0045                        |
| 36                         | 0.0051                   | 0.0007                    | 0.0045                        |
| 37                         | 0.0051                   | 0.0007                    | 0.0045                        |
| 38                         | 0.0052                   | 0.0007                    | 0.0045                        |
| 39                         | 0.0052                   | 0.0007                    | 0.0045                        |
| 40                         | 0.0052                   | 0.0007                    | 0.0045                        |
| 41                         | 0.0052                   | 0.0007                    | 0.0046                        |
| 42                         | 0.0052                   | 0.0007                    | 0.0046                        |
| 43                         | 0.0053                   | 0.0007                    | 0.0046                        |
| 44                         | 0.0053                   | 0.0007                    | 0.0046                        |
| 45                         | 0.0053                   | 0.0007                    | 0.0046                        |
| 46                         | 0.0053                   | 0.0007                    | 0.0047                        |
| 47                         | 0.0054                   | 0.0007                    | 0.0047                        |
| 48                         | 0.0054                   | 0.0007                    | 0.0047                        |
| 49                         | 0.0054                   | 0.0007                    | 0.0047                        |
| 50                         | 0.0054                   | 0.0007                    | 0.0047                        |
| 51                         | 0.0055                   | 0.0007                    | 0.0048                        |
| 52                         | 0.0055                   | 0.0007                    | 0.0048                        |
| 53                         | 0.0055                   | 0.0007                    | 0.0048                        |
| 54                         | 0.0055                   | 0.0007                    | 0.0048                        |
| 55                         | 0.0056                   | 0.0007                    | 0.0048                        |
| 56                         | 0.0056                   | 0.0007                    | 0.0049                        |
| 57                         | 0.0056                   | 0.0007                    | 0.0049                        |
| 58                         | 0.0056                   | 0.0007                    | 0.0049                        |
| 59                         | 0.0057                   | 0.0007                    | 0.0049                        |
| 60                         | 0.0057                   | 0.0007                    | 0.0049                        |
| 61                         | 0.0057                   | 0.0007                    | 0.0050                        |
| 62                         | 0.0057                   | 0.0007                    | 0.0050                        |
| 63                         | 0.0058                   | 0.0007                    | 0.0050                        |
| 64                         | 0.0058                   | 0.0007                    | 0.0050                        |
| 65                         | 0.0058                   | 0.0007                    | 0.0051                        |
| 66                         | 0.0058                   | 0.0007                    | 0.0051                        |

|     |        |        |        |
|-----|--------|--------|--------|
| 67  | 0.0059 | 0.0007 | 0.0051 |
| 68  | 0.0059 | 0.0008 | 0.0051 |
| 69  | 0.0059 | 0.0008 | 0.0052 |
| 70  | 0.0060 | 0.0008 | 0.0052 |
| 71  | 0.0060 | 0.0008 | 0.0052 |
| 72  | 0.0060 | 0.0008 | 0.0052 |
| 73  | 0.0061 | 0.0008 | 0.0053 |
| 74  | 0.0061 | 0.0008 | 0.0053 |
| 75  | 0.0061 | 0.0008 | 0.0053 |
| 76  | 0.0061 | 0.0008 | 0.0054 |
| 77  | 0.0062 | 0.0008 | 0.0054 |
| 78  | 0.0062 | 0.0008 | 0.0054 |
| 79  | 0.0062 | 0.0008 | 0.0055 |
| 80  | 0.0063 | 0.0008 | 0.0055 |
| 81  | 0.0063 | 0.0008 | 0.0055 |
| 82  | 0.0063 | 0.0008 | 0.0055 |
| 83  | 0.0064 | 0.0008 | 0.0056 |
| 84  | 0.0064 | 0.0008 | 0.0056 |
| 85  | 0.0065 | 0.0008 | 0.0056 |
| 86  | 0.0065 | 0.0008 | 0.0057 |
| 87  | 0.0065 | 0.0008 | 0.0057 |
| 88  | 0.0066 | 0.0008 | 0.0057 |
| 89  | 0.0066 | 0.0008 | 0.0058 |
| 90  | 0.0066 | 0.0008 | 0.0058 |
| 91  | 0.0067 | 0.0009 | 0.0058 |
| 92  | 0.0067 | 0.0009 | 0.0059 |
| 93  | 0.0068 | 0.0009 | 0.0059 |
| 94  | 0.0068 | 0.0009 | 0.0059 |
| 95  | 0.0069 | 0.0009 | 0.0060 |
| 96  | 0.0069 | 0.0009 | 0.0060 |
| 97  | 0.0069 | 0.0009 | 0.0061 |
| 98  | 0.0070 | 0.0009 | 0.0061 |
| 99  | 0.0070 | 0.0009 | 0.0061 |
| 100 | 0.0071 | 0.0009 | 0.0062 |
| 101 | 0.0071 | 0.0009 | 0.0062 |
| 102 | 0.0072 | 0.0009 | 0.0063 |
| 103 | 0.0072 | 0.0009 | 0.0063 |
| 104 | 0.0073 | 0.0009 | 0.0063 |
| 105 | 0.0073 | 0.0009 | 0.0064 |
| 106 | 0.0074 | 0.0009 | 0.0064 |
| 107 | 0.0074 | 0.0009 | 0.0065 |
| 108 | 0.0075 | 0.0010 | 0.0065 |
| 109 | 0.0075 | 0.0010 | 0.0066 |
| 110 | 0.0076 | 0.0010 | 0.0066 |
| 111 | 0.0077 | 0.0010 | 0.0067 |
| 112 | 0.0077 | 0.0010 | 0.0067 |
| 113 | 0.0078 | 0.0010 | 0.0068 |
| 114 | 0.0078 | 0.0010 | 0.0068 |
| 115 | 0.0079 | 0.0010 | 0.0069 |
| 116 | 0.0079 | 0.0010 | 0.0069 |
| 117 | 0.0080 | 0.0010 | 0.0070 |
| 118 | 0.0081 | 0.0010 | 0.0070 |
| 119 | 0.0082 | 0.0010 | 0.0071 |
| 120 | 0.0082 | 0.0010 | 0.0072 |
| 121 | 0.0083 | 0.0011 | 0.0072 |
| 122 | 0.0083 | 0.0011 | 0.0073 |
| 123 | 0.0084 | 0.0011 | 0.0074 |
| 124 | 0.0085 | 0.0011 | 0.0074 |
| 125 | 0.0086 | 0.0011 | 0.0075 |
| 126 | 0.0086 | 0.0011 | 0.0075 |
| 127 | 0.0088 | 0.0011 | 0.0076 |
| 128 | 0.0088 | 0.0011 | 0.0077 |
| 129 | 0.0089 | 0.0011 | 0.0078 |
| 130 | 0.0090 | 0.0011 | 0.0078 |
| 131 | 0.0091 | 0.0012 | 0.0079 |
| 132 | 0.0092 | 0.0012 | 0.0080 |
| 133 | 0.0093 | 0.0012 | 0.0081 |
| 134 | 0.0094 | 0.0012 | 0.0082 |
| 135 | 0.0095 | 0.0012 | 0.0083 |
| 136 | 0.0096 | 0.0012 | 0.0083 |
| 137 | 0.0097 | 0.0012 | 0.0085 |
| 138 | 0.0098 | 0.0012 | 0.0085 |
| 139 | 0.0099 | 0.0013 | 0.0087 |
| 140 | 0.0100 | 0.0013 | 0.0087 |
| 141 | 0.0101 | 0.0013 | 0.0089 |
| 142 | 0.0102 | 0.0013 | 0.0089 |
| 143 | 0.0104 | 0.0013 | 0.0091 |
| 144 | 0.0105 | 0.0013 | 0.0092 |
| 145 | 0.0096 | 0.0012 | 0.0084 |
| 146 | 0.0097 | 0.0012 | 0.0085 |
| 147 | 0.0099 | 0.0013 | 0.0086 |

|     |        |        |        |
|-----|--------|--------|--------|
| 148 | 0.0100 | 0.0013 | 0.0087 |
| 149 | 0.0102 | 0.0013 | 0.0089 |
| 150 | 0.0103 | 0.0013 | 0.0090 |
| 151 | 0.0105 | 0.0013 | 0.0092 |
| 152 | 0.0106 | 0.0014 | 0.0093 |
| 153 | 0.0108 | 0.0014 | 0.0095 |
| 154 | 0.0110 | 0.0014 | 0.0096 |
| 155 | 0.0112 | 0.0014 | 0.0098 |
| 156 | 0.0113 | 0.0014 | 0.0099 |
| 157 | 0.0116 | 0.0015 | 0.0101 |
| 158 | 0.0118 | 0.0015 | 0.0103 |
| 159 | 0.0121 | 0.0015 | 0.0105 |
| 160 | 0.0122 | 0.0016 | 0.0107 |
| 161 | 0.0126 | 0.0016 | 0.0110 |
| 162 | 0.0127 | 0.0016 | 0.0111 |
| 163 | 0.0131 | 0.0017 | 0.0114 |
| 164 | 0.0133 | 0.0017 | 0.0116 |
| 165 | 0.0137 | 0.0017 | 0.0120 |
| 166 | 0.0139 | 0.0018 | 0.0122 |
| 167 | 0.0144 | 0.0018 | 0.0126 |
| 168 | 0.0147 | 0.0019 | 0.0128 |
| 169 | 0.0152 | 0.0019 | 0.0133 |
| 170 | 0.0155 | 0.0020 | 0.0135 |
| 171 | 0.0161 | 0.0021 | 0.0141 |
| 172 | 0.0165 | 0.0021 | 0.0144 |
| 173 | 0.0172 | 0.0022 | 0.0150 |
| 174 | 0.0176 | 0.0022 | 0.0153 |
| 175 | 0.0184 | 0.0023 | 0.0161 |
| 176 | 0.0189 | 0.0024 | 0.0165 |
| 177 | 0.0199 | 0.0025 | 0.0174 |
| 178 | 0.0205 | 0.0026 | 0.0179 |
| 179 | 0.0218 | 0.0028 | 0.0190 |
| 180 | 0.0225 | 0.0029 | 0.0196 |
| 181 | 0.0242 | 0.0031 | 0.0211 |
| 182 | 0.0251 | 0.0032 | 0.0219 |
| 183 | 0.0273 | 0.0035 | 0.0238 |
| 184 | 0.0286 | 0.0036 | 0.0250 |
| 185 | 0.0275 | 0.0035 | 0.0240 |
| 186 | 0.0294 | 0.0037 | 0.0256 |
| 187 | 0.0340 | 0.0039 | 0.0302 |
| 188 | 0.0372 | 0.0039 | 0.0333 |
| 189 | 0.0462 | 0.0039 | 0.0424 |
| 190 | 0.0532 | 0.0039 | 0.0494 |
| 191 | 0.0808 | 0.0039 | 0.0769 |
| 192 | 0.1173 | 0.0039 | 0.1134 |
| 193 | 0.5073 | 0.0039 | 0.5035 |
| 194 | 0.0636 | 0.0039 | 0.0597 |
| 195 | 0.0411 | 0.0039 | 0.0373 |
| 196 | 0.0315 | 0.0039 | 0.0276 |
| 197 | 0.0301 | 0.0038 | 0.0263 |
| 198 | 0.0262 | 0.0033 | 0.0228 |
| 199 | 0.0233 | 0.0030 | 0.0203 |
| 200 | 0.0211 | 0.0027 | 0.0184 |
| 201 | 0.0194 | 0.0025 | 0.0169 |
| 202 | 0.0180 | 0.0023 | 0.0157 |
| 203 | 0.0168 | 0.0021 | 0.0147 |
| 204 | 0.0158 | 0.0020 | 0.0138 |
| 205 | 0.0149 | 0.0019 | 0.0130 |
| 206 | 0.0142 | 0.0018 | 0.0124 |
| 207 | 0.0135 | 0.0017 | 0.0118 |
| 208 | 0.0129 | 0.0016 | 0.0113 |
| 209 | 0.0124 | 0.0016 | 0.0108 |
| 210 | 0.0119 | 0.0015 | 0.0104 |
| 211 | 0.0115 | 0.0015 | 0.0100 |
| 212 | 0.0111 | 0.0014 | 0.0097 |
| 213 | 0.0107 | 0.0014 | 0.0094 |
| 214 | 0.0104 | 0.0013 | 0.0091 |
| 215 | 0.0101 | 0.0013 | 0.0088 |
| 216 | 0.0098 | 0.0012 | 0.0085 |
| 217 | 0.0106 | 0.0013 | 0.0092 |
| 218 | 0.0103 | 0.0013 | 0.0090 |
| 219 | 0.0101 | 0.0013 | 0.0088 |
| 220 | 0.0098 | 0.0013 | 0.0086 |
| 221 | 0.0096 | 0.0012 | 0.0084 |
| 222 | 0.0094 | 0.0012 | 0.0082 |
| 223 | 0.0092 | 0.0012 | 0.0081 |
| 224 | 0.0090 | 0.0012 | 0.0079 |
| 225 | 0.0089 | 0.0011 | 0.0077 |
| 226 | 0.0087 | 0.0011 | 0.0076 |
| 227 | 0.0085 | 0.0011 | 0.0075 |
| 228 | 0.0084 | 0.0011 | 0.0073 |

|     |        |        |        |
|-----|--------|--------|--------|
| 229 | 0.0083 | 0.0011 | 0.0072 |
| 230 | 0.0081 | 0.0010 | 0.0071 |
| 231 | 0.0080 | 0.0010 | 0.0070 |
| 232 | 0.0079 | 0.0010 | 0.0069 |
| 233 | 0.0077 | 0.0010 | 0.0067 |
| 234 | 0.0076 | 0.0010 | 0.0066 |
| 235 | 0.0075 | 0.0010 | 0.0066 |
| 236 | 0.0074 | 0.0009 | 0.0065 |
| 237 | 0.0073 | 0.0009 | 0.0064 |
| 238 | 0.0072 | 0.0009 | 0.0063 |
| 239 | 0.0071 | 0.0009 | 0.0062 |
| 240 | 0.0070 | 0.0009 | 0.0061 |
| 241 | 0.0069 | 0.0009 | 0.0060 |
| 242 | 0.0068 | 0.0009 | 0.0060 |
| 243 | 0.0067 | 0.0009 | 0.0059 |
| 244 | 0.0067 | 0.0008 | 0.0058 |
| 245 | 0.0066 | 0.0008 | 0.0057 |
| 246 | 0.0065 | 0.0008 | 0.0057 |
| 247 | 0.0064 | 0.0008 | 0.0056 |
| 248 | 0.0064 | 0.0008 | 0.0056 |
| 249 | 0.0063 | 0.0008 | 0.0055 |
| 250 | 0.0062 | 0.0008 | 0.0054 |
| 251 | 0.0062 | 0.0008 | 0.0054 |
| 252 | 0.0061 | 0.0008 | 0.0053 |
| 253 | 0.0060 | 0.0008 | 0.0053 |
| 254 | 0.0060 | 0.0008 | 0.0052 |
| 255 | 0.0059 | 0.0008 | 0.0052 |
| 256 | 0.0059 | 0.0007 | 0.0051 |
| 257 | 0.0058 | 0.0007 | 0.0051 |
| 258 | 0.0057 | 0.0007 | 0.0050 |
| 259 | 0.0057 | 0.0007 | 0.0050 |
| 260 | 0.0056 | 0.0007 | 0.0049 |
| 261 | 0.0056 | 0.0007 | 0.0049 |
| 262 | 0.0055 | 0.0007 | 0.0048 |
| 263 | 0.0055 | 0.0007 | 0.0048 |
| 264 | 0.0054 | 0.0007 | 0.0047 |
| 265 | 0.0054 | 0.0007 | 0.0047 |
| 266 | 0.0053 | 0.0007 | 0.0047 |
| 267 | 0.0053 | 0.0007 | 0.0046 |
| 268 | 0.0053 | 0.0007 | 0.0046 |
| 269 | 0.0052 | 0.0007 | 0.0046 |
| 270 | 0.0052 | 0.0007 | 0.0045 |
| 271 | 0.0051 | 0.0007 | 0.0045 |
| 272 | 0.0051 | 0.0006 | 0.0044 |
| 273 | 0.0051 | 0.0006 | 0.0044 |
| 274 | 0.0050 | 0.0006 | 0.0044 |
| 275 | 0.0050 | 0.0006 | 0.0043 |
| 276 | 0.0049 | 0.0006 | 0.0043 |
| 277 | 0.0049 | 0.0006 | 0.0043 |
| 278 | 0.0049 | 0.0006 | 0.0042 |
| 279 | 0.0048 | 0.0006 | 0.0042 |
| 280 | 0.0048 | 0.0006 | 0.0042 |
| 281 | 0.0048 | 0.0006 | 0.0042 |
| 282 | 0.0047 | 0.0006 | 0.0041 |
| 283 | 0.0047 | 0.0006 | 0.0041 |
| 284 | 0.0047 | 0.0006 | 0.0041 |
| 285 | 0.0046 | 0.0006 | 0.0040 |
| 286 | 0.0046 | 0.0006 | 0.0040 |
| 287 | 0.0046 | 0.0006 | 0.0040 |
| 288 | 0.0045 | 0.0006 | 0.0040 |

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Total soil rain loss = 0.34(In)  
Total effective rainfall = 3.05(In)  
Peak flow rate in flood hydrograph = (CFS)  
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+++++  
24 - H O U R S T O R M  
R u n o f f H y d r o g r a p h  
-----

Hydrograph in 5 Minute intervals ((CFS))  
-----

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 15.0 | 30.0 | 45.0 | 60.0 |
|-----------|--------------|--------|---|------|------|------|------|
| 0+ 5      | 0.0006       | 0.09   | Q |      |      |      |      |
| 0+10      | 0.0040       | 0.49   | Q |      |      |      |      |
| 0+15      | 0.0086       | 0.66   | Q |      |      |      |      |
| 0+20      | 0.0137       | 0.74   | Q |      |      |      |      |
| 0+25      | 0.0191       | 0.78   | Q |      |      |      |      |
| 0+30      | 0.0247       | 0.81   | Q |      |      |      |      |

|      |        |      |     |
|------|--------|------|-----|
| 0+35 | 0.0304 | 0.83 | Q   |
| 0+40 | 0.0362 | 0.85 | Q   |
| 0+45 | 0.0421 | 0.86 | Q   |
| 0+50 | 0.0481 | 0.86 | Q   |
| 0+55 | 0.0540 | 0.87 | Q   |
| 1+ 0 | 0.0600 | 0.87 | Q   |
| 1+ 5 | 0.0661 | 0.87 | Q   |
| 1+10 | 0.0721 | 0.88 | Q   |
| 1+15 | 0.0781 | 0.88 | Q   |
| 1+20 | 0.0842 | 0.88 | Q   |
| 1+25 | 0.0903 | 0.89 | Q   |
| 1+30 | 0.0964 | 0.89 | Q   |
| 1+35 | 0.1026 | 0.89 | Q   |
| 1+40 | 0.1087 | 0.89 | Q   |
| 1+45 | 0.1149 | 0.90 | QV  |
| 1+50 | 0.1211 | 0.90 | QV  |
| 1+55 | 0.1273 | 0.90 | QV  |
| 2+ 0 | 0.1336 | 0.91 | QV  |
| 2+ 5 | 0.1399 | 0.91 | QV  |
| 2+10 | 0.1462 | 0.91 | QV  |
| 2+15 | 0.1525 | 0.92 | QV  |
| 2+20 | 0.1588 | 0.92 | QV  |
| 2+25 | 0.1652 | 0.92 | QV  |
| 2+30 | 0.1716 | 0.93 | QV  |
| 2+35 | 0.1780 | 0.93 | QV  |
| 2+40 | 0.1844 | 0.93 | QV  |
| 2+45 | 0.1909 | 0.94 | QV  |
| 2+50 | 0.1974 | 0.94 | QV  |
| 2+55 | 0.2039 | 0.95 | QV  |
| 3+ 0 | 0.2104 | 0.95 | QV  |
| 3+ 5 | 0.2170 | 0.95 | QV  |
| 3+10 | 0.2236 | 0.96 | QV  |
| 3+15 | 0.2302 | 0.96 | Q V |
| 3+20 | 0.2368 | 0.96 | Q V |
| 3+25 | 0.2435 | 0.97 | Q V |
| 3+30 | 0.2502 | 0.97 | Q V |
| 3+35 | 0.2569 | 0.98 | Q V |
| 3+40 | 0.2637 | 0.98 | Q V |
| 3+45 | 0.2704 | 0.98 | Q V |
| 3+50 | 0.2772 | 0.99 | Q V |
| 3+55 | 0.2841 | 0.99 | Q V |
| 4+ 0 | 0.2909 | 1.00 | Q V |
| 4+ 5 | 0.2978 | 1.00 | Q V |
| 4+10 | 0.3047 | 1.00 | Q V |
| 4+15 | 0.3117 | 1.01 | Q V |
| 4+20 | 0.3187 | 1.01 | Q V |
| 4+25 | 0.3257 | 1.02 | Q V |
| 4+30 | 0.3327 | 1.02 | Q V |
| 4+35 | 0.3398 | 1.03 | Q V |
| 4+40 | 0.3469 | 1.03 | Q V |
| 4+45 | 0.3540 | 1.04 | Q V |
| 4+50 | 0.3612 | 1.04 | Q V |
| 4+55 | 0.3684 | 1.04 | Q V |
| 5+ 0 | 0.3756 | 1.05 | Q V |
| 5+ 5 | 0.3829 | 1.05 | Q V |
| 5+10 | 0.3902 | 1.06 | Q V |
| 5+15 | 0.3975 | 1.06 | Q V |
| 5+20 | 0.4049 | 1.07 | Q V |
| 5+25 | 0.4123 | 1.07 | Q V |
| 5+30 | 0.4197 | 1.08 | Q V |
| 5+35 | 0.4272 | 1.08 | Q V |
| 5+40 | 0.4347 | 1.09 | Q V |
| 5+45 | 0.4422 | 1.10 | Q V |
| 5+50 | 0.4498 | 1.10 | Q V |
| 5+55 | 0.4574 | 1.11 | Q V |
| 6+ 0 | 0.4651 | 1.11 | Q V |
| 6+ 5 | 0.4728 | 1.12 | Q V |
| 6+10 | 0.4805 | 1.12 | Q V |
| 6+15 | 0.4883 | 1.13 | Q V |
| 6+20 | 0.4961 | 1.14 | Q V |
| 6+25 | 0.5040 | 1.14 | Q V |
| 6+30 | 0.5119 | 1.15 | Q V |
| 6+35 | 0.5198 | 1.15 | Q V |
| 6+40 | 0.5278 | 1.16 | Q V |
| 6+45 | 0.5358 | 1.17 | Q V |
| 6+50 | 0.5439 | 1.17 | Q V |
| 6+55 | 0.5520 | 1.18 | Q V |
| 7+ 0 | 0.5602 | 1.19 | Q V |
| 7+ 5 | 0.5684 | 1.19 | Q V |
| 7+10 | 0.5766 | 1.20 | Q V |
| 7+15 | 0.5849 | 1.20 | Q V |

|       |        |      |   |   |  |  |  |  |
|-------|--------|------|---|---|--|--|--|--|
| 7+20  | 0.5933 | 1.21 | Q | V |  |  |  |  |
| 7+25  | 0.6017 | 1.22 | Q | V |  |  |  |  |
| 7+30  | 0.6101 | 1.23 | Q | V |  |  |  |  |
| 7+35  | 0.6186 | 1.23 | Q | V |  |  |  |  |
| 7+40  | 0.6272 | 1.24 | Q | V |  |  |  |  |
| 7+45  | 0.6358 | 1.25 | Q | V |  |  |  |  |
| 7+50  | 0.6444 | 1.26 | Q | V |  |  |  |  |
| 7+55  | 0.6531 | 1.26 | Q | V |  |  |  |  |
| 8+ 0  | 0.6619 | 1.27 | Q | V |  |  |  |  |
| 8+ 5  | 0.6707 | 1.28 | Q | V |  |  |  |  |
| 8+10  | 0.6796 | 1.29 | Q | V |  |  |  |  |
| 8+15  | 0.6885 | 1.30 | Q | V |  |  |  |  |
| 8+20  | 0.6975 | 1.30 | Q | V |  |  |  |  |
| 8+25  | 0.7065 | 1.31 | Q | V |  |  |  |  |
| 8+30  | 0.7156 | 1.32 | Q | V |  |  |  |  |
| 8+35  | 0.7248 | 1.33 | Q | V |  |  |  |  |
| 8+40  | 0.7340 | 1.34 | Q | V |  |  |  |  |
| 8+45  | 0.7433 | 1.35 | Q | V |  |  |  |  |
| 8+50  | 0.7526 | 1.36 | Q | V |  |  |  |  |
| 8+55  | 0.7621 | 1.37 | Q | V |  |  |  |  |
| 9+ 0  | 0.7716 | 1.38 | Q | V |  |  |  |  |
| 9+ 5  | 0.7811 | 1.39 | Q | V |  |  |  |  |
| 9+10  | 0.7907 | 1.40 | Q | V |  |  |  |  |
| 9+15  | 0.8004 | 1.41 | Q | V |  |  |  |  |
| 9+20  | 0.8102 | 1.42 | Q | V |  |  |  |  |
| 9+25  | 0.8200 | 1.43 | Q | V |  |  |  |  |
| 9+30  | 0.8299 | 1.44 | Q | V |  |  |  |  |
| 9+35  | 0.8399 | 1.45 | Q | V |  |  |  |  |
| 9+40  | 0.8500 | 1.46 | Q | V |  |  |  |  |
| 9+45  | 0.8602 | 1.47 | Q | V |  |  |  |  |
| 9+50  | 0.8704 | 1.49 | Q | V |  |  |  |  |
| 9+55  | 0.8807 | 1.50 | Q | V |  |  |  |  |
| 10+ 0 | 0.8911 | 1.51 | Q | V |  |  |  |  |
| 10+ 5 | 0.9016 | 1.52 | Q | V |  |  |  |  |
| 10+10 | 0.9122 | 1.54 | Q | V |  |  |  |  |
| 10+15 | 0.9228 | 1.55 | Q | V |  |  |  |  |
| 10+20 | 0.9336 | 1.56 | Q | V |  |  |  |  |
| 10+25 | 0.9444 | 1.58 | Q | V |  |  |  |  |
| 10+30 | 0.9554 | 1.59 | Q | V |  |  |  |  |
| 10+35 | 0.9664 | 1.60 | Q | V |  |  |  |  |
| 10+40 | 0.9776 | 1.62 | Q | V |  |  |  |  |
| 10+45 | 0.9888 | 1.63 | Q | V |  |  |  |  |
| 10+50 | 1.0002 | 1.65 | Q | V |  |  |  |  |
| 10+55 | 1.0117 | 1.67 | Q | V |  |  |  |  |
| 11+ 0 | 1.0233 | 1.68 | Q | V |  |  |  |  |
| 11+ 5 | 1.0350 | 1.70 | Q | V |  |  |  |  |
| 11+10 | 1.0468 | 1.72 | Q | V |  |  |  |  |
| 11+15 | 1.0587 | 1.73 | Q | V |  |  |  |  |
| 11+20 | 1.0708 | 1.75 | Q | V |  |  |  |  |
| 11+25 | 1.0830 | 1.77 | Q | V |  |  |  |  |
| 11+30 | 1.0953 | 1.79 | Q | V |  |  |  |  |
| 11+35 | 1.1078 | 1.81 | Q | V |  |  |  |  |
| 11+40 | 1.1204 | 1.83 | Q | V |  |  |  |  |
| 11+45 | 1.1331 | 1.85 | Q | V |  |  |  |  |
| 11+50 | 1.1460 | 1.87 | Q | V |  |  |  |  |
| 11+55 | 1.1591 | 1.89 | Q | V |  |  |  |  |
| 12+ 0 | 1.1723 | 1.92 | Q | V |  |  |  |  |
| 12+ 5 | 1.1855 | 1.92 | Q | V |  |  |  |  |
| 12+10 | 1.1982 | 1.85 | Q | V |  |  |  |  |
| 12+15 | 1.2109 | 1.84 | Q | V |  |  |  |  |
| 12+20 | 1.2236 | 1.85 | Q | V |  |  |  |  |
| 12+25 | 1.2364 | 1.86 | Q | V |  |  |  |  |
| 12+30 | 1.2494 | 1.88 | Q | V |  |  |  |  |
| 12+35 | 1.2625 | 1.91 | Q | V |  |  |  |  |
| 12+40 | 1.2758 | 1.93 | Q | V |  |  |  |  |
| 12+45 | 1.2893 | 1.96 | Q | V |  |  |  |  |
| 12+50 | 1.3031 | 1.99 | Q | V |  |  |  |  |
| 12+55 | 1.3170 | 2.02 | Q | V |  |  |  |  |
| 13+ 0 | 1.3312 | 2.06 | Q | V |  |  |  |  |
| 13+ 5 | 1.3456 | 2.09 | Q | V |  |  |  |  |
| 13+10 | 1.3603 | 2.13 | Q | V |  |  |  |  |
| 13+15 | 1.3752 | 2.17 | Q | V |  |  |  |  |
| 13+20 | 1.3905 | 2.21 | Q | V |  |  |  |  |
| 13+25 | 1.4060 | 2.25 | Q | V |  |  |  |  |
| 13+30 | 1.4219 | 2.30 | Q | V |  |  |  |  |
| 13+35 | 1.4380 | 2.35 | Q | V |  |  |  |  |
| 13+40 | 1.4545 | 2.40 | Q | V |  |  |  |  |
| 13+45 | 1.4714 | 2.45 | Q | V |  |  |  |  |
| 13+50 | 1.4887 | 2.51 | Q | V |  |  |  |  |
| 13+55 | 1.5063 | 2.56 | Q | V |  |  |  |  |
| 14+ 0 | 1.5244 | 2.63 | Q | V |  |  |  |  |

|       |        |       |   |   |   |   |
|-------|--------|-------|---|---|---|---|
| 14+ 5 | 1.5430 | 2.69  | Q | V |   |   |
| 14+10 | 1.5620 | 2.77  | Q | V |   |   |
| 14+15 | 1.5816 | 2.84  | Q | V |   |   |
| 14+20 | 1.6018 | 2.93  | Q | V |   |   |
| 14+25 | 1.6226 | 3.01  | Q | V |   |   |
| 14+30 | 1.6440 | 3.12  | Q | V |   |   |
| 14+35 | 1.6662 | 3.21  | Q | V |   |   |
| 14+40 | 1.6891 | 3.33  | Q | V |   |   |
| 14+45 | 1.7129 | 3.45  | Q | V |   |   |
| 14+50 | 1.7376 | 3.59  | Q | V |   |   |
| 14+55 | 1.7633 | 3.73  | Q | V |   |   |
| 15+ 0 | 1.7902 | 3.91  | Q | V |   |   |
| 15+ 5 | 1.8184 | 4.09  | Q | V |   |   |
| 15+10 | 1.8481 | 4.31  | Q | V |   |   |
| 15+15 | 1.8794 | 4.54  | Q | V |   |   |
| 15+20 | 1.9127 | 4.84  | Q | V |   |   |
| 15+25 | 1.9476 | 5.06  | Q | V |   |   |
| 15+30 | 1.9829 | 5.12  | Q | V |   |   |
| 15+35 | 2.0201 | 5.40  | Q | V |   |   |
| 15+40 | 2.0615 | 6.02  | Q | V |   |   |
| 15+45 | 2.1083 | 6.79  | Q | V |   |   |
| 15+50 | 2.1641 | 8.10  | Q | V |   |   |
| 15+55 | 2.2327 | 9.97  | Q | V |   |   |
| 16+ 0 | 2.3301 | 14.14 | Q | V |   |   |
| 16+ 5 | 2.5257 | 28.40 |   | Q | V |   |
| 16+10 | 2.9347 |       |   |   | V | Q |
| 16+15 | 3.1577 | 32.39 |   | Q | V |   |
| 16+20 | 3.2875 | 18.84 | Q |   | V |   |
| 16+25 | 3.3765 | 12.93 | Q |   | V |   |
| 16+30 | 3.4450 | 9.94  | Q |   | V |   |
| 16+35 | 3.4991 | 7.86  | Q |   | V |   |
| 16+40 | 3.5422 | 6.25  | Q |   | V |   |
| 16+45 | 3.5800 | 5.50  | Q |   | V |   |
| 16+50 | 3.6127 | 4.74  | Q |   | V |   |
| 16+55 | 3.6383 | 3.72  | Q |   | V |   |
| 17+ 0 | 3.6617 | 3.40  | Q |   | V |   |
| 17+ 5 | 3.6835 | 3.16  | Q |   | V |   |
| 17+10 | 3.7039 | 2.97  | Q |   | V |   |
| 17+15 | 3.7232 | 2.80  | Q |   | V |   |
| 17+20 | 3.7415 | 2.65  | Q |   | V |   |
| 17+25 | 3.7589 | 2.53  | Q |   | V |   |
| 17+30 | 3.7755 | 2.41  | Q |   | V |   |
| 17+35 | 3.7914 | 2.31  | Q |   | V |   |
| 17+40 | 3.8067 | 2.22  | Q |   | V |   |
| 17+45 | 3.8215 | 2.14  | Q |   | V |   |
| 17+50 | 3.8357 | 2.07  | Q |   | V |   |
| 17+55 | 3.8495 | 2.00  | Q |   | V |   |
| 18+ 0 | 3.8628 | 1.94  | Q |   | V |   |
| 18+ 5 | 3.8759 | 1.90  | Q |   | V |   |
| 18+10 | 3.8892 | 1.94  | Q |   | V |   |
| 18+15 | 3.9025 | 1.93  | Q |   | V |   |
| 18+20 | 3.9155 | 1.90  | Q |   | V |   |
| 18+25 | 3.9283 | 1.86  | Q |   | V |   |
| 18+30 | 3.9409 | 1.82  | Q |   | V |   |
| 18+35 | 3.9532 | 1.79  | Q |   | V |   |
| 18+40 | 3.9653 | 1.75  | Q |   | V |   |
| 18+45 | 3.9771 | 1.72  | Q |   | V |   |
| 18+50 | 3.9887 | 1.68  | Q |   | V |   |
| 18+55 | 4.0001 | 1.65  | Q |   | V |   |
| 19+ 0 | 4.0112 | 1.62  | Q |   | V |   |
| 19+ 5 | 4.0222 | 1.59  | Q |   | V |   |
| 19+10 | 4.0330 | 1.56  | Q |   | V |   |
| 19+15 | 4.0435 | 1.54  | Q |   | V |   |
| 19+20 | 4.0540 | 1.51  | Q |   | V |   |
| 19+25 | 4.0642 | 1.49  | Q |   | V |   |
| 19+30 | 4.0743 | 1.46  | Q |   | V |   |
| 19+35 | 4.0842 | 1.44  | Q |   | V |   |
| 19+40 | 4.0940 | 1.42  | Q |   | V |   |
| 19+45 | 4.1036 | 1.40  | Q |   | V |   |
| 19+50 | 4.1131 | 1.38  | Q |   | V |   |
| 19+55 | 4.1224 | 1.36  | Q |   | V |   |
| 20+ 0 | 4.1317 | 1.34  | Q |   | V |   |
| 20+ 5 | 4.1408 | 1.32  | Q |   | V |   |
| 20+10 | 4.1498 | 1.31  | Q |   | V |   |
| 20+15 | 4.1586 | 1.29  | Q |   | V |   |
| 20+20 | 4.1674 | 1.27  | Q |   | V |   |
| 20+25 | 4.1761 | 1.26  | Q |   | V |   |
| 20+30 | 4.1846 | 1.24  | Q |   | V |   |
| 20+35 | 4.1931 | 1.23  | Q |   | V |   |
| 20+40 | 4.2014 | 1.21  | Q |   | V |   |
| 20+45 | 4.2097 | 1.20  | Q |   | V |   |

|       |        |      |   |  |  |  |   |
|-------|--------|------|---|--|--|--|---|
| 20+50 | 4.2178 | 1.19 | Q |  |  |  | V |
| 20+55 | 4.2259 | 1.17 | Q |  |  |  | V |
| 21+ 0 | 4.2339 | 1.16 | Q |  |  |  | V |
| 21+ 5 | 4.2418 | 1.15 | Q |  |  |  | V |
| 21+10 | 4.2496 | 1.14 | Q |  |  |  | V |
| 21+15 | 4.2574 | 1.12 | Q |  |  |  | V |
| 21+20 | 4.2650 | 1.11 | Q |  |  |  | V |
| 21+25 | 4.2726 | 1.10 | Q |  |  |  | V |
| 21+30 | 4.2801 | 1.09 | Q |  |  |  | V |
| 21+35 | 4.2875 | 1.08 | Q |  |  |  | V |
| 21+40 | 4.2949 | 1.07 | Q |  |  |  | V |
| 21+45 | 4.3022 | 1.06 | Q |  |  |  | V |
| 21+50 | 4.3094 | 1.05 | Q |  |  |  | V |
| 21+55 | 4.3166 | 1.04 | Q |  |  |  | V |
| 22+ 0 | 4.3237 | 1.03 | Q |  |  |  | V |
| 22+ 5 | 4.3308 | 1.02 | Q |  |  |  | V |
| 22+10 | 4.3377 | 1.01 | Q |  |  |  | V |
| 22+15 | 4.3447 | 1.00 | Q |  |  |  | V |
| 22+20 | 4.3515 | 1.00 | Q |  |  |  | V |
| 22+25 | 4.3583 | 0.99 | Q |  |  |  | V |
| 22+30 | 4.3651 | 0.98 | Q |  |  |  | V |
| 22+35 | 4.3718 | 0.97 | Q |  |  |  | V |
| 22+40 | 4.3784 | 0.96 | Q |  |  |  | V |
| 22+45 | 4.3850 | 0.96 | Q |  |  |  | V |
| 22+50 | 4.3915 | 0.95 | Q |  |  |  | V |
| 22+55 | 4.3980 | 0.94 | Q |  |  |  | V |
| 23+ 0 | 4.4045 | 0.93 | Q |  |  |  | V |
| 23+ 5 | 4.4109 | 0.93 | Q |  |  |  | V |
| 23+10 | 4.4172 | 0.92 | Q |  |  |  | V |
| 23+15 | 4.4235 | 0.91 | Q |  |  |  | V |
| 23+20 | 4.4297 | 0.91 | Q |  |  |  | V |
| 23+25 | 4.4359 | 0.90 | Q |  |  |  | V |
| 23+30 | 4.4421 | 0.89 | Q |  |  |  | V |
| 23+35 | 4.4482 | 0.89 | Q |  |  |  | V |
| 23+40 | 4.4543 | 0.88 | Q |  |  |  | V |
| 23+45 | 4.4603 | 0.88 | Q |  |  |  | V |
| 23+50 | 4.4663 | 0.87 | Q |  |  |  | V |
| 23+55 | 4.4723 | 0.86 | Q |  |  |  | V |
| 24+ 0 | 4.4782 | 0.86 | Q |  |  |  | V |
| 24+ 5 | 4.4834 | 0.76 | Q |  |  |  | V |
| 24+10 | 4.4859 | 0.36 | Q |  |  |  | V |
| 24+15 | 4.4872 | 0.19 | Q |  |  |  | V |
| 24+20 | 4.4880 | 0.11 | Q |  |  |  | V |
| 24+25 | 4.4884 | 0.07 | Q |  |  |  | V |
| 24+30 | 4.4887 | 0.04 | Q |  |  |  | V |
| 24+35 | 4.4889 | 0.02 | Q |  |  |  | V |
| 24+40 | 4.4890 | 0.01 | Q |  |  |  | V |
| 24+45 |        | 0.01 | Q |  |  |  | V |

# **ATTACHMENT 6**

## Routing Calculations

FLOOD HYDROGRAPH ROUTING PROGRAM  
Copyright (C) CIVILCADD/CIVILDESIGN, 1989 - 2018  
Study date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ROUTE  
2-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

-----  
\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name:                       
\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*  
Number of intervals = 297  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 13.997 (CFS)  
Total volume = 1.461 (Ac.Ft)  
Status of hydrographs being held in storage  
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000  
\*\*\*\*\*

+++++  
Process from Point/Station 6.000 to Point/Station 13.000  
\*\*\*\* RETARDING BASIN ROUTING \*\*\*\*  
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Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH = 0.50(Ft.)  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.50(Ft.)  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.50(Ft.)  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.50(Ft.)  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.00(Ft.)  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.)  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Given pipe size = 15.00(In.)  
Calculated individual pipe flow = 1.593(CFS)  
Normal flow depth in pipe = 5.07(In.)  
Flow top width inside pipe = 14.19(In.)  
Critical depth = 0.50(Ft.)  
Calculated flow rate through pipe(s) = 1.593(CFS)  
Total outflow at this depth = 1.59(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.)  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)

Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 0.450(Ft.)  
 Pipe friction loss = 0.106(Ft.)  
 Minor friction loss = 0.344(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 4.713(CFS)

Total outflow at this depth = 4.71(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 1.450(Ft.)  
 Pipe friction loss = 0.343(Ft.)  
 Minor friction loss = 1.107(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 8.460(CFS)

Total outflow at this depth = 8.46(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.00(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 2.950(Ft.)  
 Pipe friction loss = 0.698(Ft.)  
 Minor friction loss = 2.252(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 12.067(CFS)

Total outflow at this depth = 12.07(CFS)

-----  
 Total number of inflow hydrograph intervals = 297  
 Hydrograph time unit = 5.000 (Min.)  
 Initial depth in storage basin = 0.00(Ft.)  
 -----

-----  
 Initial basin depth = 0.00 (Ft.)  
 Initial basin storage = 0.00 (Ac.Ft)  
 Initial basin outflow = 0.00 (CFS)  
 -----

-----  
 Depth vs. Storage and Depth vs. Discharge data:  

| Basin Depth<br>(Ft.) | Storage<br>(Ac.Ft) | Outflow<br>(CFS) | (S-O*dt/2)<br>(Ac.Ft) | (S+O*dt/2)<br>(Ac.Ft) |
|----------------------|--------------------|------------------|-----------------------|-----------------------|
| 0.000                | 0.000              | 0.000            | 0.000                 | 0.000                 |
| 0.500                | 0.116              | 0.000            | 0.116                 | 0.116                 |
| 1.500                | 0.463              | 0.000            | 0.463                 | 0.463                 |
| 2.500                | 0.886              | 0.000            | 0.886                 | 0.886                 |
| 3.500                | 1.337              | 0.000            | 1.337                 | 1.337                 |
| 4.000                | 1.564              | 0.000            | 1.564                 | 1.564                 |
| 4.500                | 1.788              | 1.593            | 1.783                 | 1.793                 |
| 5.500                | 2.211              | 4.713            | 2.195                 | 2.227                 |
| 6.500                | 2.558              | 8.460            | 2.529                 | 2.587                 |
| 8.000                | 2.905              | 12.067           | 2.863                 | 2.947                 |

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-----  
 Hydrograph Detention Basin Routing  
 -----

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

| Time<br>(Hours) | Inflow<br>(CFS) | Outflow<br>(CFS) | Storage<br>(Ac.Ft) | 0 | 3.5 | 7.00 | 10.50 | 14.00 | Depth<br>(Ft.) |
|-----------------|-----------------|------------------|--------------------|---|-----|------|-------|-------|----------------|
| 0.083           | 0.03            | 0.00             | 0.000              | 0 |     |      |       |       | 0.00           |
| 0.167           | 0.16            | 0.00             | 0.001              | 0 |     |      |       |       | 0.00           |
| 0.250           | 0.22            | 0.00             | 0.002              | 0 |     |      |       |       | 0.01           |
| 0.333           | 0.25            | 0.00             | 0.004              | 0 |     |      |       |       | 0.02           |
| 0.417           | 0.26            | 0.00             | 0.005              | 0 |     |      |       |       | 0.02           |
| 0.500           | 0.27            | 0.00             | 0.007              | 0 |     |      |       |       | 0.03           |
| 0.583           | 0.28            | 0.00             | 0.009              | 0 |     |      |       |       | 0.04           |
| 0.667           | 0.28            | 0.00             | 0.011              | 0 |     |      |       |       | 0.05           |
| 0.750           | 0.29            | 0.00             | 0.013              | 0 |     |      |       |       | 0.06           |

|       |      |      |       |   |  |  |  |  |      |
|-------|------|------|-------|---|--|--|--|--|------|
| 0.833 | 0.29 | 0.00 | 0.015 | 0 |  |  |  |  | 0.06 |
| 0.917 | 0.29 | 0.00 | 0.017 | 0 |  |  |  |  | 0.07 |
| 1.000 | 0.29 | 0.00 | 0.019 | 0 |  |  |  |  | 0.08 |
| 1.083 | 0.29 | 0.00 | 0.021 | 0 |  |  |  |  | 0.09 |
| 1.167 | 0.29 | 0.00 | 0.023 | 0 |  |  |  |  | 0.10 |
| 1.250 | 0.29 | 0.00 | 0.025 | 0 |  |  |  |  | 0.11 |
| 1.333 | 0.29 | 0.00 | 0.027 | 0 |  |  |  |  | 0.12 |
| 1.417 | 0.30 | 0.00 | 0.029 | 0 |  |  |  |  | 0.13 |
| 1.500 | 0.30 | 0.00 | 0.031 | 0 |  |  |  |  | 0.13 |
| 1.583 | 0.30 | 0.00 | 0.033 | 0 |  |  |  |  | 0.14 |
| 1.667 | 0.30 | 0.00 | 0.035 | 0 |  |  |  |  | 0.15 |
| 1.750 | 0.30 | 0.00 | 0.037 | 0 |  |  |  |  | 0.16 |
| 1.833 | 0.30 | 0.00 | 0.039 | 0 |  |  |  |  | 0.17 |
| 1.917 | 0.30 | 0.00 | 0.041 | 0 |  |  |  |  | 0.18 |
| 2.000 | 0.30 | 0.00 | 0.044 | 0 |  |  |  |  | 0.19 |
| 2.083 | 0.30 | 0.00 | 0.046 | 0 |  |  |  |  | 0.20 |
| 2.167 | 0.31 | 0.00 | 0.048 | 0 |  |  |  |  | 0.21 |
| 2.250 | 0.31 | 0.00 | 0.050 | 0 |  |  |  |  | 0.21 |
| 2.333 | 0.31 | 0.00 | 0.052 | 0 |  |  |  |  | 0.22 |
| 2.417 | 0.31 | 0.00 | 0.054 | 0 |  |  |  |  | 0.23 |
| 2.500 | 0.31 | 0.00 | 0.056 | 0 |  |  |  |  | 0.24 |
| 2.583 | 0.31 | 0.00 | 0.058 | 0 |  |  |  |  | 0.25 |
| 2.667 | 0.31 | 0.00 | 0.061 | 0 |  |  |  |  | 0.26 |
| 2.750 | 0.31 | 0.00 | 0.063 | 0 |  |  |  |  | 0.27 |
| 2.833 | 0.31 | 0.00 | 0.065 | 0 |  |  |  |  | 0.28 |
| 2.917 | 0.32 | 0.00 | 0.067 | 0 |  |  |  |  | 0.29 |
| 3.000 | 0.32 | 0.00 | 0.069 | 0 |  |  |  |  | 0.30 |
| 3.083 | 0.32 | 0.00 | 0.071 | 0 |  |  |  |  | 0.31 |
| 3.167 | 0.32 | 0.00 | 0.074 | 0 |  |  |  |  | 0.32 |
| 3.250 | 0.32 | 0.00 | 0.076 | 0 |  |  |  |  | 0.33 |
| 3.333 | 0.32 | 0.00 | 0.078 | 0 |  |  |  |  | 0.34 |
| 3.417 | 0.32 | 0.00 | 0.080 | 0 |  |  |  |  | 0.35 |
| 3.500 | 0.32 | 0.00 | 0.082 | 0 |  |  |  |  | 0.36 |
| 3.583 | 0.33 | 0.00 | 0.085 | 0 |  |  |  |  | 0.36 |
| 3.667 | 0.33 | 0.00 | 0.087 | 0 |  |  |  |  | 0.37 |
| 3.750 | 0.33 | 0.00 | 0.089 | 0 |  |  |  |  | 0.38 |
| 3.833 | 0.33 | 0.00 | 0.091 | 0 |  |  |  |  | 0.39 |
| 3.917 | 0.33 | 0.00 | 0.094 | 0 |  |  |  |  | 0.40 |
| 4.000 | 0.33 | 0.00 | 0.096 | 0 |  |  |  |  | 0.41 |
| 4.083 | 0.33 | 0.00 | 0.098 | 0 |  |  |  |  | 0.42 |
| 4.167 | 0.33 | 0.00 | 0.101 | 0 |  |  |  |  | 0.43 |
| 4.250 | 0.34 | 0.00 | 0.103 | 0 |  |  |  |  | 0.44 |
| 4.333 | 0.34 | 0.00 | 0.105 | 0 |  |  |  |  | 0.45 |
| 4.417 | 0.34 | 0.00 | 0.108 | 0 |  |  |  |  | 0.46 |
| 4.500 | 0.34 | 0.00 | 0.110 | 0 |  |  |  |  | 0.47 |
| 4.583 | 0.34 | 0.00 | 0.112 | 0 |  |  |  |  | 0.48 |
| 4.667 | 0.34 | 0.00 | 0.115 | 0 |  |  |  |  | 0.49 |
| 4.750 | 0.34 | 0.00 | 0.117 | 0 |  |  |  |  | 0.50 |
| 4.833 | 0.35 | 0.00 | 0.119 | 0 |  |  |  |  | 0.51 |
| 4.917 | 0.35 | 0.00 | 0.122 | 0 |  |  |  |  | 0.52 |
| 5.000 | 0.35 | 0.00 | 0.124 | 0 |  |  |  |  | 0.52 |
| 5.083 | 0.35 | 0.00 | 0.127 | 0 |  |  |  |  | 0.53 |
| 5.167 | 0.35 | 0.00 | 0.129 | 0 |  |  |  |  | 0.54 |
| 5.250 | 0.35 | 0.00 | 0.131 | 0 |  |  |  |  | 0.54 |
| 5.333 | 0.36 | 0.00 | 0.134 | 0 |  |  |  |  | 0.55 |
| 5.417 | 0.36 | 0.00 | 0.136 | 0 |  |  |  |  | 0.56 |
| 5.500 | 0.36 | 0.00 | 0.139 | 0 |  |  |  |  | 0.57 |
| 5.583 | 0.36 | 0.00 | 0.141 | 0 |  |  |  |  | 0.57 |
| 5.667 | 0.36 | 0.00 | 0.144 | 0 |  |  |  |  | 0.58 |
| 5.750 | 0.36 | 0.00 | 0.146 | 0 |  |  |  |  | 0.59 |
| 5.833 | 0.37 | 0.00 | 0.149 | 0 |  |  |  |  | 0.59 |
| 5.917 | 0.37 | 0.00 | 0.151 | 0 |  |  |  |  | 0.60 |
| 6.000 | 0.37 | 0.00 | 0.154 | 0 |  |  |  |  | 0.61 |
| 6.083 | 0.37 | 0.00 | 0.156 | 0 |  |  |  |  | 0.62 |
| 6.167 | 0.37 | 0.00 | 0.159 | 0 |  |  |  |  | 0.62 |
| 6.250 | 0.38 | 0.00 | 0.162 | 0 |  |  |  |  | 0.63 |
| 6.333 | 0.38 | 0.00 | 0.164 | 0 |  |  |  |  | 0.64 |
| 6.417 | 0.38 | 0.00 | 0.167 | 0 |  |  |  |  | 0.65 |
| 6.500 | 0.38 | 0.00 | 0.169 | 0 |  |  |  |  | 0.65 |
| 6.583 | 0.38 | 0.00 | 0.172 | 0 |  |  |  |  | 0.66 |
| 6.667 | 0.39 | 0.00 | 0.175 | 0 |  |  |  |  | 0.67 |
| 6.750 | 0.39 | 0.00 | 0.177 | 0 |  |  |  |  | 0.68 |
| 6.833 | 0.39 | 0.00 | 0.180 | 0 |  |  |  |  | 0.68 |
| 6.917 | 0.39 | 0.00 | 0.183 | 0 |  |  |  |  | 0.69 |
| 7.000 | 0.39 | 0.00 | 0.185 | 0 |  |  |  |  | 0.70 |
| 7.083 | 0.40 | 0.00 | 0.188 | 0 |  |  |  |  | 0.71 |
| 7.167 | 0.40 | 0.00 | 0.191 | 0 |  |  |  |  | 0.72 |
| 7.250 | 0.40 | 0.00 | 0.194 | 0 |  |  |  |  | 0.72 |
| 7.333 | 0.40 | 0.00 | 0.196 | 0 |  |  |  |  | 0.73 |
| 7.417 | 0.40 | 0.00 | 0.199 | 0 |  |  |  |  | 0.74 |
| 7.500 | 0.41 | 0.00 | 0.202 | 0 |  |  |  |  | 0.75 |

|        |      |      |       |     |  |  |  |  |      |
|--------|------|------|-------|-----|--|--|--|--|------|
| 7.583  | 0.41 | 0.00 | 0.205 | O   |  |  |  |  | 0.76 |
| 7.667  | 0.41 | 0.00 | 0.208 | O   |  |  |  |  | 0.76 |
| 7.750  | 0.41 | 0.00 | 0.210 | O   |  |  |  |  | 0.77 |
| 7.833  | 0.42 | 0.00 | 0.213 | O   |  |  |  |  | 0.78 |
| 7.917  | 0.42 | 0.00 | 0.216 | O   |  |  |  |  | 0.79 |
| 8.000  | 0.42 | 0.00 | 0.219 | O   |  |  |  |  | 0.80 |
| 8.083  | 0.42 | 0.00 | 0.222 | O   |  |  |  |  | 0.81 |
| 8.167  | 0.43 | 0.00 | 0.225 | O   |  |  |  |  | 0.81 |
| 8.250  | 0.43 | 0.00 | 0.228 | O   |  |  |  |  | 0.82 |
| 8.333  | 0.43 | 0.00 | 0.231 | O   |  |  |  |  | 0.83 |
| 8.417  | 0.44 | 0.00 | 0.234 | O   |  |  |  |  | 0.84 |
| 8.500  | 0.44 | 0.00 | 0.237 | OI  |  |  |  |  | 0.85 |
| 8.583  | 0.44 | 0.00 | 0.240 | OI  |  |  |  |  | 0.86 |
| 8.667  | 0.44 | 0.00 | 0.243 | OI  |  |  |  |  | 0.87 |
| 8.750  | 0.45 | 0.00 | 0.246 | OI  |  |  |  |  | 0.87 |
| 8.833  | 0.45 | 0.00 | 0.249 | OI  |  |  |  |  | 0.88 |
| 8.917  | 0.45 | 0.00 | 0.252 | OI  |  |  |  |  | 0.89 |
| 9.000  | 0.46 | 0.00 | 0.255 | OI  |  |  |  |  | 0.90 |
| 9.083  | 0.46 | 0.00 | 0.258 | OI  |  |  |  |  | 0.91 |
| 9.167  | 0.46 | 0.00 | 0.262 | OI  |  |  |  |  | 0.92 |
| 9.250  | 0.47 | 0.00 | 0.265 | OI  |  |  |  |  | 0.93 |
| 9.333  | 0.47 | 0.00 | 0.268 | OI  |  |  |  |  | 0.94 |
| 9.417  | 0.47 | 0.00 | 0.271 | OI  |  |  |  |  | 0.95 |
| 9.500  | 0.48 | 0.00 | 0.275 | OI  |  |  |  |  | 0.96 |
| 9.583  | 0.48 | 0.00 | 0.278 | OI  |  |  |  |  | 0.97 |
| 9.667  | 0.48 | 0.00 | 0.281 | OI  |  |  |  |  | 0.98 |
| 9.750  | 0.49 | 0.00 | 0.285 | OI  |  |  |  |  | 0.99 |
| 9.833  | 0.49 | 0.00 | 0.288 | OI  |  |  |  |  | 1.00 |
| 9.917  | 0.50 | 0.00 | 0.291 | OI  |  |  |  |  | 1.01 |
| 10.000 | 0.50 | 0.00 | 0.295 | OI  |  |  |  |  | 1.02 |
| 10.083 | 0.50 | 0.00 | 0.298 | OI  |  |  |  |  | 1.03 |
| 10.167 | 0.51 | 0.00 | 0.302 | OI  |  |  |  |  | 1.04 |
| 10.250 | 0.51 | 0.00 | 0.305 | OI  |  |  |  |  | 1.05 |
| 10.333 | 0.52 | 0.00 | 0.309 | OI  |  |  |  |  | 1.06 |
| 10.417 | 0.52 | 0.00 | 0.312 | OI  |  |  |  |  | 1.07 |
| 10.500 | 0.53 | 0.00 | 0.316 | OI  |  |  |  |  | 1.08 |
| 10.583 | 0.53 | 0.00 | 0.320 | OI  |  |  |  |  | 1.09 |
| 10.667 | 0.54 | 0.00 | 0.323 | OI  |  |  |  |  | 1.10 |
| 10.750 | 0.54 | 0.00 | 0.327 | OI  |  |  |  |  | 1.11 |
| 10.833 | 0.55 | 0.00 | 0.331 | OI  |  |  |  |  | 1.12 |
| 10.917 | 0.55 | 0.00 | 0.335 | OI  |  |  |  |  | 1.13 |
| 11.000 | 0.56 | 0.00 | 0.338 | OI  |  |  |  |  | 1.14 |
| 11.083 | 0.56 | 0.00 | 0.342 | OI  |  |  |  |  | 1.15 |
| 11.167 | 0.57 | 0.00 | 0.346 | OI  |  |  |  |  | 1.16 |
| 11.250 | 0.57 | 0.00 | 0.350 | OI  |  |  |  |  | 1.17 |
| 11.333 | 0.58 | 0.00 | 0.354 | OI  |  |  |  |  | 1.19 |
| 11.417 | 0.58 | 0.00 | 0.358 | OI  |  |  |  |  | 1.20 |
| 11.500 | 0.59 | 0.00 | 0.362 | OI  |  |  |  |  | 1.21 |
| 11.583 | 0.60 | 0.00 | 0.366 | OI  |  |  |  |  | 1.22 |
| 11.667 | 0.60 | 0.00 | 0.370 | OI  |  |  |  |  | 1.23 |
| 11.750 | 0.61 | 0.00 | 0.374 | OI  |  |  |  |  | 1.24 |
| 11.833 | 0.62 | 0.00 | 0.379 | OI  |  |  |  |  | 1.26 |
| 11.917 | 0.62 | 0.00 | 0.383 | OI  |  |  |  |  | 1.27 |
| 12.000 | 0.63 | 0.00 | 0.387 | OI  |  |  |  |  | 1.28 |
| 12.083 | 0.67 | 0.00 | 0.392 | OI  |  |  |  |  | 1.29 |
| 12.167 | 0.82 | 0.00 | 0.397 | OI  |  |  |  |  | 1.31 |
| 12.250 | 0.89 | 0.00 | 0.403 | O I |  |  |  |  | 1.33 |
| 12.333 | 0.92 | 0.00 | 0.409 | O I |  |  |  |  | 1.34 |
| 12.417 | 0.95 | 0.00 | 0.415 | O I |  |  |  |  | 1.36 |
| 12.500 | 0.97 | 0.00 | 0.422 | O I |  |  |  |  | 1.38 |
| 12.583 | 0.98 | 0.00 | 0.429 | O I |  |  |  |  | 1.40 |
| 12.667 | 1.00 | 0.00 | 0.436 | O I |  |  |  |  | 1.42 |
| 12.750 | 1.01 | 0.00 | 0.443 | O I |  |  |  |  | 1.44 |
| 12.833 | 1.02 | 0.00 | 0.449 | O I |  |  |  |  | 1.46 |
| 12.917 | 1.03 | 0.00 | 0.457 | O I |  |  |  |  | 1.48 |
| 13.000 | 1.04 | 0.00 | 0.464 | O I |  |  |  |  | 1.50 |
| 13.083 | 1.05 | 0.00 | 0.471 | O I |  |  |  |  | 1.52 |
| 13.167 | 1.07 | 0.00 | 0.478 | O I |  |  |  |  | 1.54 |
| 13.250 | 1.08 | 0.00 | 0.486 | O I |  |  |  |  | 1.55 |
| 13.333 | 1.09 | 0.00 | 0.493 | O I |  |  |  |  | 1.57 |
| 13.417 | 1.11 | 0.00 | 0.501 | O I |  |  |  |  | 1.59 |
| 13.500 | 1.12 | 0.00 | 0.508 | O I |  |  |  |  | 1.61 |
| 13.583 | 1.14 | 0.00 | 0.516 | O I |  |  |  |  | 1.63 |
| 13.667 | 1.15 | 0.00 | 0.524 | O I |  |  |  |  | 1.64 |
| 13.750 | 1.17 | 0.00 | 0.532 | O I |  |  |  |  | 1.66 |
| 13.833 | 1.19 | 0.00 | 0.540 | O I |  |  |  |  | 1.68 |
| 13.917 | 1.20 | 0.00 | 0.548 | O I |  |  |  |  | 1.70 |
| 14.000 | 1.22 | 0.00 | 0.557 | O I |  |  |  |  | 1.72 |
| 14.083 | 1.24 | 0.00 | 0.565 | O I |  |  |  |  | 1.74 |
| 14.167 | 1.27 | 0.00 | 0.574 | O I |  |  |  |  | 1.76 |
| 14.250 | 1.29 | 0.00 | 0.583 | O I |  |  |  |  | 1.78 |

|        |       |      |       |    |   |   |   |   |   |      |
|--------|-------|------|-------|----|---|---|---|---|---|------|
| 14.333 | 1.31  | 0.00 | 0.592 | O  | I |   |   |   |   | 1.80 |
| 14.417 | 1.34  | 0.00 | 0.601 | O  | I |   |   |   |   | 1.83 |
| 14.500 | 1.37  | 0.00 | 0.610 | O  | I |   |   |   |   | 1.85 |
| 14.583 | 1.39  | 0.00 | 0.619 | O  | I |   |   |   |   | 1.87 |
| 14.667 | 1.43  | 0.00 | 0.629 | O  | I |   |   |   |   | 1.89 |
| 14.750 | 1.46  | 0.00 | 0.639 | O  | I |   |   |   |   | 1.92 |
| 14.833 | 1.50  | 0.00 | 0.649 | O  | I |   |   |   |   | 1.94 |
| 14.917 | 1.54  | 0.00 | 0.660 | O  | I |   |   |   |   | 1.97 |
| 15.000 | 1.59  | 0.00 | 0.671 | O  | I |   |   |   |   | 1.99 |
| 15.083 | 1.63  | 0.00 | 0.682 | O  | I |   |   |   |   | 2.02 |
| 15.167 | 1.69  | 0.00 | 0.693 | O  | I |   |   |   |   | 2.04 |
| 15.250 | 1.75  | 0.00 | 0.705 | O  | I |   |   |   |   | 2.07 |
| 15.333 | 1.82  | 0.00 | 0.717 | O  | I |   |   |   |   | 2.10 |
| 15.417 | 1.79  | 0.00 | 0.730 | O  | I |   |   |   |   | 2.13 |
| 15.500 | 1.43  | 0.00 | 0.741 | O  | I |   |   |   |   | 2.16 |
| 15.583 | 1.33  | 0.00 | 0.750 | O  | I |   |   |   |   | 2.18 |
| 15.667 | 1.38  | 0.00 | 0.760 | O  | I |   |   |   |   | 2.20 |
| 15.750 | 1.48  | 0.00 | 0.769 | O  | I |   |   |   |   | 2.22 |
| 15.833 | 1.71  | 0.00 | 0.780 | O  | I |   |   |   |   | 2.25 |
| 15.917 | 2.04  | 0.00 | 0.793 | O  | I |   |   |   |   | 2.28 |
| 16.000 | 2.84  | 0.00 | 0.810 | O  |   | I |   |   |   | 2.32 |
| 16.083 | 6.23  | 0.00 | 0.841 | O  |   |   | I |   |   | 2.39 |
| 16.167 | 14.00 | 0.00 | 0.911 | O  |   |   |   | I |   | 2.56 |
| 16.250 | 7.39  | 0.00 | 0.985 | O  |   |   |   |   | I | 2.72 |
| 16.333 | 4.21  | 0.00 | 1.025 | O  |   | I |   |   |   | 2.81 |
| 16.417 | 2.96  | 0.00 | 1.049 | O  |   |   | I |   |   | 2.86 |
| 16.500 | 2.66  | 0.00 | 1.069 | O  |   |   | I |   |   | 2.90 |
| 16.583 | 2.34  | 0.00 | 1.086 | O  |   |   |   | I |   | 2.94 |
| 16.667 | 2.03  | 0.00 | 1.101 | O  |   | I |   |   |   | 2.98 |
| 16.750 | 1.90  | 0.00 | 1.114 | O  |   | I |   |   |   | 3.01 |
| 16.833 | 1.74  | 0.00 | 1.127 | O  | I |   |   |   |   | 3.03 |
| 16.917 | 1.50  | 0.00 | 1.138 | O  | I |   |   |   |   | 3.06 |
| 17.000 | 1.43  | 0.00 | 1.148 | O  | I |   |   |   |   | 3.08 |
| 17.083 | 1.37  | 0.00 | 1.158 | O  | I |   |   |   |   | 3.10 |
| 17.167 | 1.32  | 0.00 | 1.167 | O  | I |   |   |   |   | 3.12 |
| 17.250 | 1.27  | 0.00 | 1.176 | O  | I |   |   |   |   | 3.14 |
| 17.333 | 1.23  | 0.00 | 1.185 | O  | I |   |   |   |   | 3.16 |
| 17.417 | 1.19  | 0.00 | 1.193 | O  | I |   |   |   |   | 3.18 |
| 17.500 | 1.16  | 0.00 | 1.201 | O  | I |   |   |   |   | 3.20 |
| 17.583 | 1.12  | 0.00 | 1.209 | O  | I |   |   |   |   | 3.22 |
| 17.667 | 1.10  | 0.00 | 1.217 | O  | I |   |   |   |   | 3.23 |
| 17.750 | 1.07  | 0.00 | 1.224 | O  | I |   |   |   |   | 3.25 |
| 17.833 | 1.05  | 0.00 | 1.231 | O  | I |   |   |   |   | 3.27 |
| 17.917 | 1.02  | 0.00 | 1.238 | O  | I |   |   |   |   | 3.28 |
| 18.000 | 1.00  | 0.00 | 1.245 | O  | I |   |   |   |   | 3.30 |
| 18.083 | 0.95  | 0.00 | 1.252 | O  | I |   |   |   |   | 3.31 |
| 18.167 | 0.79  | 0.00 | 1.258 | OI |   |   |   |   |   | 3.33 |
| 18.250 | 0.71  | 0.00 | 1.263 | OI |   |   |   |   |   | 3.34 |
| 18.333 | 0.67  | 0.00 | 1.268 | OI |   |   |   |   |   | 3.35 |
| 18.417 | 0.64  | 0.00 | 1.273 | OI |   |   |   |   |   | 3.36 |
| 18.500 | 0.62  | 0.00 | 1.277 | OI |   |   |   |   |   | 3.37 |
| 18.583 | 0.60  | 0.00 | 1.281 | OI |   |   |   |   |   | 3.38 |
| 18.667 | 0.58  | 0.00 | 1.285 | OI |   |   |   |   |   | 3.39 |
| 18.750 | 0.57  | 0.00 | 1.289 | OI |   |   |   |   |   | 3.39 |
| 18.833 | 0.56  | 0.00 | 1.293 | OI |   |   |   |   |   | 3.40 |
| 18.917 | 0.55  | 0.00 | 1.297 | OI |   |   |   |   |   | 3.41 |
| 19.000 | 0.54  | 0.00 | 1.301 | OI |   |   |   |   |   | 3.42 |
| 19.083 | 0.53  | 0.00 | 1.304 | OI |   |   |   |   |   | 3.43 |
| 19.167 | 0.52  | 0.00 | 1.308 | OI |   |   |   |   |   | 3.44 |
| 19.250 | 0.51  | 0.00 | 1.311 | OI |   |   |   |   |   | 3.44 |
| 19.333 | 0.50  | 0.00 | 1.315 | OI |   |   |   |   |   | 3.45 |
| 19.417 | 0.49  | 0.00 | 1.318 | OI |   |   |   |   |   | 3.46 |
| 19.500 | 0.48  | 0.00 | 1.322 | OI |   |   |   |   |   | 3.47 |
| 19.583 | 0.48  | 0.00 | 1.325 | OI |   |   |   |   |   | 3.47 |
| 19.667 | 0.47  | 0.00 | 1.328 | OI |   |   |   |   |   | 3.48 |
| 19.750 | 0.46  | 0.00 | 1.331 | OI |   |   |   |   |   | 3.49 |
| 19.833 | 0.46  | 0.00 | 1.335 | OI |   |   |   |   |   | 3.49 |
| 19.917 | 0.45  | 0.00 | 1.338 | OI |   |   |   |   |   | 3.50 |
| 20.000 | 0.44  | 0.00 | 1.341 | OI |   |   |   |   |   | 3.51 |
| 20.083 | 0.44  | 0.00 | 1.344 | OI |   |   |   |   |   | 3.52 |
| 20.167 | 0.43  | 0.00 | 1.347 | O  |   |   |   |   |   | 3.52 |
| 20.250 | 0.43  | 0.00 | 1.350 | O  |   |   |   |   |   | 3.53 |
| 20.333 | 0.42  | 0.00 | 1.353 | O  |   |   |   |   |   | 3.53 |
| 20.417 | 0.42  | 0.00 | 1.356 | O  |   |   |   |   |   | 3.54 |
| 20.500 | 0.41  | 0.00 | 1.359 | O  |   |   |   |   |   | 3.55 |
| 20.583 | 0.41  | 0.00 | 1.361 | O  |   |   |   |   |   | 3.55 |
| 20.667 | 0.40  | 0.00 | 1.364 | O  |   |   |   |   |   | 3.56 |
| 20.750 | 0.40  | 0.00 | 1.367 | O  |   |   |   |   |   | 3.57 |
| 20.833 | 0.39  | 0.00 | 1.370 | O  |   |   |   |   |   | 3.57 |
| 20.917 | 0.39  | 0.00 | 1.372 | O  |   |   |   |   |   | 3.58 |
| 21.000 | 0.39  |      | 1.375 | O  |   |   |   |   |   |      |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 21.083 | 0.38 | 0.00 | 1.378 | 0 |  |  |  |  | 3.59 |
| 21.167 | 0.38 | 0.00 | 1.380 | 0 |  |  |  |  | 3.60 |
| 21.250 | 0.37 | 0.00 | 1.383 | 0 |  |  |  |  | 3.60 |
| 21.333 | 0.37 | 0.00 | 1.385 | 0 |  |  |  |  | 3.61 |
| 21.417 | 0.37 | 0.00 | 1.388 | 0 |  |  |  |  | 3.61 |
| 21.500 | 0.36 | 0.00 | 1.390 | 0 |  |  |  |  | 3.62 |
| 21.583 | 0.36 | 0.00 | 1.393 | 0 |  |  |  |  | 3.62 |
| 21.667 | 0.36 | 0.00 | 1.395 | 0 |  |  |  |  | 3.63 |
| 21.750 | 0.35 | 0.00 | 1.398 | 0 |  |  |  |  | 3.63 |
| 21.833 | 0.35 | 0.00 | 1.400 | 0 |  |  |  |  | 3.64 |
| 21.917 | 0.35 | 0.00 | 1.403 | 0 |  |  |  |  | 3.64 |
| 22.000 | 0.34 | 0.00 | 1.405 | 0 |  |  |  |  | 3.65 |
| 22.083 | 0.34 | 0.00 | 1.407 | 0 |  |  |  |  | 3.66 |
| 22.167 | 0.34 | 0.00 | 1.410 | 0 |  |  |  |  | 3.66 |
| 22.250 | 0.33 | 0.00 | 1.412 | 0 |  |  |  |  | 3.67 |
| 22.333 | 0.33 | 0.00 | 1.414 | 0 |  |  |  |  | 3.67 |
| 22.417 | 0.33 | 0.00 | 1.417 | 0 |  |  |  |  | 3.68 |
| 22.500 | 0.33 | 0.00 | 1.419 | 0 |  |  |  |  | 3.68 |
| 22.583 | 0.32 | 0.00 | 1.421 | 0 |  |  |  |  | 3.69 |
| 22.667 | 0.32 | 0.00 | 1.423 | 0 |  |  |  |  | 3.69 |
| 22.750 | 0.32 | 0.00 | 1.426 | 0 |  |  |  |  | 3.70 |
| 22.833 | 0.32 | 0.00 | 1.428 | 0 |  |  |  |  | 3.70 |
| 22.917 | 0.31 | 0.00 | 1.430 | 0 |  |  |  |  | 3.70 |
| 23.000 | 0.31 | 0.00 | 1.432 | 0 |  |  |  |  | 3.71 |
| 23.083 | 0.31 | 0.00 | 1.434 | 0 |  |  |  |  | 3.71 |
| 23.167 | 0.31 | 0.00 | 1.436 | 0 |  |  |  |  | 3.72 |
| 23.250 | 0.31 | 0.00 | 1.438 | 0 |  |  |  |  | 3.72 |
| 23.333 | 0.30 | 0.00 | 1.441 | 0 |  |  |  |  | 3.73 |
| 23.417 | 0.30 | 0.00 | 1.443 | 0 |  |  |  |  | 3.73 |
| 23.500 | 0.30 | 0.00 | 1.445 | 0 |  |  |  |  | 3.74 |
| 23.583 | 0.30 | 0.00 | 1.447 | 0 |  |  |  |  | 3.74 |
| 23.667 | 0.29 | 0.00 | 1.449 | 0 |  |  |  |  | 3.75 |
| 23.750 | 0.29 | 0.00 | 1.451 | 0 |  |  |  |  | 3.75 |
| 23.833 | 0.29 | 0.00 | 1.453 | 0 |  |  |  |  | 3.76 |
| 23.917 | 0.29 | 0.00 | 1.455 | 0 |  |  |  |  | 3.76 |
| 24.000 | 0.29 | 0.00 | 1.457 | 0 |  |  |  |  | 3.76 |
| 24.083 | 0.25 | 0.00 | 1.459 | 0 |  |  |  |  | 3.77 |
| 24.167 | 0.12 | 0.00 | 1.460 | 0 |  |  |  |  | 3.77 |
| 24.250 | 0.06 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.333 | 0.04 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.417 | 0.02 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.500 | 0.01 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.583 | 0.01 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.667 | 0.00 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.750 | 0.00 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |
| 24.833 | 0.00 | 0.00 | 1.461 | 0 |  |  |  |  | 3.77 |

Remaining water in basin = 1.46 (Ac.Ft)

```
*****HYDROGRAPH DATA*****
      Number of intervals = 298
      Time interval = 5.0 (Min.)
      Maximum/Peak flow rate = 0.000 (CFS)
      Total volume = 0.000 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

```
-----
+++++
Process from Point/Station 6.000 to Point/Station 13.000
*** STORE OR DELETE CURRENT HYDROGRAPH ***
```

```
Current stream hydrograph saved in file route.rte
*****HYDROGRAPH DATA*****
      Number of intervals = 0
      Time interval = 0.0 (Min.)
      Maximum/Peak flow rate = 0.000 (CFS)
      Total volume = 0.000 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```



FLOOD HYDROGRAPH ROUTING PROGRAM  
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018  
Study date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ROUTE  
10-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

-----  
\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name: [REDACTED]  
\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*  
Number of intervals = 297  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 32.887 (CFS)  
Total volume = 2.712 (Ac.Ft)  
Status of hydrographs being held in storage  
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000  
\*\*\*\*\*

+++++  
Process from Point/Station 6.000 to Point/Station 13.000  
\*\*\*\* RETARDING BASIN ROUTING \*\*\*\*  
-----

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH = 0.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.00(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Given pipe size = 15.00(In.)  
Calculated individual pipe flow = 1.593(CFS)  
Normal flow depth in pipe = 5.07(In.)  
Flow top width inside pipe = 14.19(In.)  
Critical depth = 0.50(Ft.)  
Calculated flow rate through pipe(s) = 1.593(CFS)  
Total outflow at this depth = 1.59(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)

Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 0.450(Ft.)  
 Pipe friction loss = 0.106(Ft.)  
 Minor friction loss = 0.344(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 4.713(CFS)

Total outflow at this depth = 4.71(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 1.450(Ft.)  
 Pipe friction loss = 0.343(Ft.)  
 Minor friction loss = 1.107(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 8.460(CFS)

Total outflow at this depth = 8.46(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.00(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 2.950(Ft.)  
 Pipe friction loss = 0.698(Ft.)  
 Minor friction loss = 2.252(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 12.067(CFS)

Total outflow at this depth = 12.07(CFS)

-----  
 Total number of inflow hydrograph intervals = 297  
 Hydrograph time unit = 5.000 (Min.)  
 Initial depth in storage basin = 0.00(Ft.)  
 -----

-----  
 Initial basin depth = 0.00 (Ft.)  
 Initial basin storage = 0.00 (Ac.Ft)  
 Initial basin outflow = 0.00 (CFS)  
 -----

-----  
 Depth vs. Storage and Depth vs. Discharge data:  

| Basin Depth<br>(Ft.) | Storage<br>(Ac.Ft) | Outflow<br>(CFS) | (S-O*dt/2)<br>(Ac.Ft) | (S+O*dt/2)<br>(Ac.Ft) |
|----------------------|--------------------|------------------|-----------------------|-----------------------|
| 0.000                | 0.000              | 0.000            | 0.000                 | 0.000                 |
| 0.500                | 0.116              | 0.000            | 0.116                 | 0.116                 |
| 1.500                | 0.463              | 0.000            | 0.463                 | 0.463                 |
| 2.500                | 0.886              | 0.000            | 0.886                 | 0.886                 |
| 3.500                | 1.337              | 0.000            | 1.337                 | 1.337                 |
| 4.000                | 1.564              | 0.000            | 1.564                 | 1.564                 |
| 4.500                | 1.788              | 1.593            | 1.783                 | 1.793                 |
| 5.500                | 2.211              | 4.713            | 2.195                 | 2.227                 |
| 6.500                | 2.558              | 8.460            | 2.529                 | 2.587                 |
| 8.000                | 2.905              | 12.067           | 2.863                 | 2.947                 |

 -----

-----  
 Hydrograph Detention Basin Routing  
 -----

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

| Time<br>(Hours) | Inflow<br>(CFS) | Outflow<br>(CFS) | Storage<br>(Ac.Ft) | 0 | 8.2 | 16.44 | 24.67 | 32.89 | Depth<br>(Ft.) |
|-----------------|-----------------|------------------|--------------------|---|-----|-------|-------|-------|----------------|
| 0.083           | 0.06            | 0.00             | 0.000              | 0 |     |       |       |       | 0.00           |
| 0.167           | 0.30            | 0.00             | 0.001              | 0 |     |       |       |       | 0.01           |
| 0.250           | 0.40            | 0.00             | 0.004              | 0 |     |       |       |       | 0.02           |
| 0.333           | 0.45            | 0.00             | 0.007              | 0 |     |       |       |       | 0.03           |
| 0.417           | 0.48            | 0.00             | 0.010              | 0 |     |       |       |       | 0.04           |
| 0.500           | 0.49            | 0.00             | 0.013              | 0 |     |       |       |       | 0.06           |
| 0.583           | 0.51            | 0.00             | 0.017              | 0 |     |       |       |       | 0.07           |
| 0.667           | 0.51            | 0.00             | 0.020              | 0 |     |       |       |       | 0.09           |
| 0.750           | 0.52            | 0.00             | 0.024              | 0 |     |       |       |       | 0.10           |

|       |      |      |       |   |  |  |  |  |      |
|-------|------|------|-------|---|--|--|--|--|------|
| 0.833 | 0.52 | 0.00 | 0.027 | 0 |  |  |  |  | 0.12 |
| 0.917 | 0.53 | 0.00 | 0.031 | 0 |  |  |  |  | 0.13 |
| 1.000 | 0.53 | 0.00 | 0.035 | 0 |  |  |  |  | 0.15 |
| 1.083 | 0.53 | 0.00 | 0.038 | 0 |  |  |  |  | 0.16 |
| 1.167 | 0.53 | 0.00 | 0.042 | 0 |  |  |  |  | 0.18 |
| 1.250 | 0.53 | 0.00 | 0.046 | 0 |  |  |  |  | 0.20 |
| 1.333 | 0.54 | 0.00 | 0.049 | 0 |  |  |  |  | 0.21 |
| 1.417 | 0.54 | 0.00 | 0.053 | 0 |  |  |  |  | 0.23 |
| 1.500 | 0.54 | 0.00 | 0.057 | 0 |  |  |  |  | 0.24 |
| 1.583 | 0.54 | 0.00 | 0.060 | 0 |  |  |  |  | 0.26 |
| 1.667 | 0.54 | 0.00 | 0.064 | 0 |  |  |  |  | 0.28 |
| 1.750 | 0.54 | 0.00 | 0.068 | 0 |  |  |  |  | 0.29 |
| 1.833 | 0.55 | 0.00 | 0.072 | 0 |  |  |  |  | 0.31 |
| 1.917 | 0.55 | 0.00 | 0.075 | 0 |  |  |  |  | 0.32 |
| 2.000 | 0.55 | 0.00 | 0.079 | 0 |  |  |  |  | 0.34 |
| 2.083 | 0.55 | 0.00 | 0.083 | 0 |  |  |  |  | 0.36 |
| 2.167 | 0.55 | 0.00 | 0.087 | 0 |  |  |  |  | 0.37 |
| 2.250 | 0.56 | 0.00 | 0.091 | 0 |  |  |  |  | 0.39 |
| 2.333 | 0.56 | 0.00 | 0.094 | 0 |  |  |  |  | 0.41 |
| 2.417 | 0.56 | 0.00 | 0.098 | 0 |  |  |  |  | 0.42 |
| 2.500 | 0.56 | 0.00 | 0.102 | 0 |  |  |  |  | 0.44 |
| 2.583 | 0.56 | 0.00 | 0.106 | 0 |  |  |  |  | 0.46 |
| 2.667 | 0.57 | 0.00 | 0.110 | 0 |  |  |  |  | 0.47 |
| 2.750 | 0.57 | 0.00 | 0.114 | 0 |  |  |  |  | 0.49 |
| 2.833 | 0.57 | 0.00 | 0.118 | 0 |  |  |  |  | 0.51 |
| 2.917 | 0.57 | 0.00 | 0.122 | 0 |  |  |  |  | 0.52 |
| 3.000 | 0.58 | 0.00 | 0.126 | 0 |  |  |  |  | 0.53 |
| 3.083 | 0.58 | 0.00 | 0.130 | 0 |  |  |  |  | 0.54 |
| 3.167 | 0.58 | 0.00 | 0.134 | 0 |  |  |  |  | 0.55 |
| 3.250 | 0.58 | 0.00 | 0.138 | 0 |  |  |  |  | 0.56 |
| 3.333 | 0.58 | 0.00 | 0.142 | 0 |  |  |  |  | 0.57 |
| 3.417 | 0.59 | 0.00 | 0.146 | 0 |  |  |  |  | 0.59 |
| 3.500 | 0.59 | 0.00 | 0.150 | 0 |  |  |  |  | 0.60 |
| 3.583 | 0.59 | 0.00 | 0.154 | 0 |  |  |  |  | 0.61 |
| 3.667 | 0.59 | 0.00 | 0.158 | 0 |  |  |  |  | 0.62 |
| 3.750 | 0.60 | 0.00 | 0.162 | 0 |  |  |  |  | 0.63 |
| 3.833 | 0.60 | 0.00 | 0.166 | 0 |  |  |  |  | 0.64 |
| 3.917 | 0.60 | 0.00 | 0.170 | 0 |  |  |  |  | 0.66 |
| 4.000 | 0.60 | 0.00 | 0.174 | 0 |  |  |  |  | 0.67 |
| 4.083 | 0.61 | 0.00 | 0.179 | 0 |  |  |  |  | 0.68 |
| 4.167 | 0.61 | 0.00 | 0.183 | 0 |  |  |  |  | 0.69 |
| 4.250 | 0.61 | 0.00 | 0.187 | 0 |  |  |  |  | 0.70 |
| 4.333 | 0.61 | 0.00 | 0.191 | 0 |  |  |  |  | 0.72 |
| 4.417 | 0.62 | 0.00 | 0.195 | 0 |  |  |  |  | 0.73 |
| 4.500 | 0.62 | 0.00 | 0.200 | 0 |  |  |  |  | 0.74 |
| 4.583 | 0.62 | 0.00 | 0.204 | 0 |  |  |  |  | 0.75 |
| 4.667 | 0.63 | 0.00 | 0.208 | 0 |  |  |  |  | 0.77 |
| 4.750 | 0.63 | 0.00 | 0.213 | 0 |  |  |  |  | 0.78 |
| 4.833 | 0.63 | 0.00 | 0.217 | 0 |  |  |  |  | 0.79 |
| 4.917 | 0.63 | 0.00 | 0.221 | 0 |  |  |  |  | 0.80 |
| 5.000 | 0.64 | 0.00 | 0.226 | 0 |  |  |  |  | 0.82 |
| 5.083 | 0.64 | 0.00 | 0.230 | 0 |  |  |  |  | 0.83 |
| 5.167 | 0.64 | 0.00 | 0.234 | 0 |  |  |  |  | 0.84 |
| 5.250 | 0.65 | 0.00 | 0.239 | 0 |  |  |  |  | 0.85 |
| 5.333 | 0.65 | 0.00 | 0.243 | 0 |  |  |  |  | 0.87 |
| 5.417 | 0.65 | 0.00 | 0.248 | 0 |  |  |  |  | 0.88 |
| 5.500 | 0.65 | 0.00 | 0.252 | 0 |  |  |  |  | 0.89 |
| 5.583 | 0.66 | 0.00 | 0.257 | 0 |  |  |  |  | 0.91 |
| 5.667 | 0.66 | 0.00 | 0.261 | 0 |  |  |  |  | 0.92 |
| 5.750 | 0.66 | 0.00 | 0.266 | 0 |  |  |  |  | 0.93 |
| 5.833 | 0.67 | 0.00 | 0.270 | 0 |  |  |  |  | 0.95 |
| 5.917 | 0.67 | 0.00 | 0.275 | 0 |  |  |  |  | 0.96 |
| 6.000 | 0.67 | 0.00 | 0.280 | 0 |  |  |  |  | 0.97 |
| 6.083 | 0.68 | 0.00 | 0.284 | 0 |  |  |  |  | 0.99 |
| 6.167 | 0.68 | 0.00 | 0.289 | 0 |  |  |  |  | 1.00 |
| 6.250 | 0.68 | 0.00 | 0.294 | 0 |  |  |  |  | 1.01 |
| 6.333 | 0.69 | 0.00 | 0.298 | 0 |  |  |  |  | 1.03 |
| 6.417 | 0.69 | 0.00 | 0.303 | 0 |  |  |  |  | 1.04 |
| 6.500 | 0.69 | 0.00 | 0.308 | 0 |  |  |  |  | 1.05 |
| 6.583 | 0.70 | 0.00 | 0.313 | 0 |  |  |  |  | 1.07 |
| 6.667 | 0.70 | 0.00 | 0.318 | 0 |  |  |  |  | 1.08 |
| 6.750 | 0.71 | 0.00 | 0.322 | 0 |  |  |  |  | 1.09 |
| 6.833 | 0.71 | 0.00 | 0.327 | 0 |  |  |  |  | 1.11 |
| 6.917 | 0.71 | 0.00 | 0.332 | 0 |  |  |  |  | 1.12 |
| 7.000 | 0.72 | 0.00 | 0.337 | 0 |  |  |  |  | 1.14 |
| 7.083 | 0.72 | 0.00 | 0.342 | 0 |  |  |  |  | 1.15 |
| 7.167 | 0.73 | 0.00 | 0.347 | 0 |  |  |  |  | 1.17 |
| 7.250 | 0.73 | 0.00 | 0.352 | 0 |  |  |  |  | 1.18 |
| 7.333 | 0.73 | 0.00 | 0.357 | 0 |  |  |  |  | 1.19 |
| 7.417 | 0.74 | 0.00 | 0.362 | 0 |  |  |  |  | 1.21 |
| 7.500 | 0.74 | 0.00 | 0.367 | 0 |  |  |  |  | 1.22 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 7.583  | 0.75 | 0.00 | 0.372 | O  |  |  |  |  | 1.24 |
| 7.667  | 0.75 | 0.00 | 0.378 | O  |  |  |  |  | 1.25 |
| 7.750  | 0.76 | 0.00 | 0.383 | O  |  |  |  |  | 1.27 |
| 7.833  | 0.76 | 0.00 | 0.388 | O  |  |  |  |  | 1.28 |
| 7.917  | 0.77 | 0.00 | 0.393 | O  |  |  |  |  | 1.30 |
| 8.000  | 0.77 | 0.00 | 0.399 | O  |  |  |  |  | 1.31 |
| 8.083  | 0.77 | 0.00 | 0.404 | O  |  |  |  |  | 1.33 |
| 8.167  | 0.78 | 0.00 | 0.409 | O  |  |  |  |  | 1.35 |
| 8.250  | 0.78 | 0.00 | 0.415 | O  |  |  |  |  | 1.36 |
| 8.333  | 0.79 | 0.00 | 0.420 | O  |  |  |  |  | 1.38 |
| 8.417  | 0.79 | 0.00 | 0.425 | O  |  |  |  |  | 1.39 |
| 8.500  | 0.80 | 0.00 | 0.431 | O  |  |  |  |  | 1.41 |
| 8.583  | 0.81 | 0.00 | 0.437 | O  |  |  |  |  | 1.42 |
| 8.667  | 0.81 | 0.00 | 0.442 | O  |  |  |  |  | 1.44 |
| 8.750  | 0.82 | 0.00 | 0.448 | O  |  |  |  |  | 1.46 |
| 8.833  | 0.82 | 0.00 | 0.453 | O  |  |  |  |  | 1.47 |
| 8.917  | 0.83 | 0.00 | 0.459 | O  |  |  |  |  | 1.49 |
| 9.000  | 0.83 | 0.00 | 0.465 | O  |  |  |  |  | 1.50 |
| 9.083  | 0.84 | 0.00 | 0.470 | O  |  |  |  |  | 1.52 |
| 9.167  | 0.85 | 0.00 | 0.476 | O  |  |  |  |  | 1.53 |
| 9.250  | 0.85 | 0.00 | 0.482 | O  |  |  |  |  | 1.55 |
| 9.333  | 0.86 | 0.00 | 0.488 | O  |  |  |  |  | 1.56 |
| 9.417  | 0.86 | 0.00 | 0.494 | O  |  |  |  |  | 1.57 |
| 9.500  | 0.87 | 0.00 | 0.500 | O  |  |  |  |  | 1.59 |
| 9.583  | 0.88 | 0.00 | 0.506 | O  |  |  |  |  | 1.60 |
| 9.667  | 0.88 | 0.00 | 0.512 | O  |  |  |  |  | 1.62 |
| 9.750  | 0.89 | 0.00 | 0.518 | O  |  |  |  |  | 1.63 |
| 9.833  | 0.90 | 0.00 | 0.524 | O  |  |  |  |  | 1.64 |
| 9.917  | 0.91 | 0.00 | 0.531 | O  |  |  |  |  | 1.66 |
| 10.000 | 0.91 | 0.00 | 0.537 | O  |  |  |  |  | 1.67 |
| 10.083 | 0.92 | 0.00 | 0.543 | O  |  |  |  |  | 1.69 |
| 10.167 | 0.93 | 0.00 | 0.549 | O  |  |  |  |  | 1.70 |
| 10.250 | 0.94 | 0.00 | 0.556 | O  |  |  |  |  | 1.72 |
| 10.333 | 0.94 | 0.00 | 0.562 | O  |  |  |  |  | 1.73 |
| 10.417 | 0.95 | 0.00 | 0.569 | O  |  |  |  |  | 1.75 |
| 10.500 | 0.96 | 0.00 | 0.576 | O  |  |  |  |  | 1.77 |
| 10.583 | 0.97 | 0.00 | 0.582 | O  |  |  |  |  | 1.78 |
| 10.667 | 0.98 | 0.00 | 0.589 | O  |  |  |  |  | 1.80 |
| 10.750 | 0.99 | 0.00 | 0.596 | O  |  |  |  |  | 1.81 |
| 10.833 | 1.00 | 0.00 | 0.602 | O  |  |  |  |  | 1.83 |
| 10.917 | 1.01 | 0.00 | 0.609 | O  |  |  |  |  | 1.85 |
| 11.000 | 1.02 | 0.00 | 0.616 | O  |  |  |  |  | 1.86 |
| 11.083 | 1.03 | 0.00 | 0.623 | O  |  |  |  |  | 1.88 |
| 11.167 | 1.04 | 0.00 | 0.630 | OI |  |  |  |  | 1.90 |
| 11.250 | 1.05 | 0.00 | 0.638 | OI |  |  |  |  | 1.91 |
| 11.333 | 1.06 | 0.00 | 0.645 | OI |  |  |  |  | 1.93 |
| 11.417 | 1.07 | 0.00 | 0.652 | OI |  |  |  |  | 1.95 |
| 11.500 | 1.08 | 0.00 | 0.660 | OI |  |  |  |  | 1.96 |
| 11.583 | 1.09 | 0.00 | 0.667 | OI |  |  |  |  | 1.98 |
| 11.667 | 1.11 | 0.00 | 0.675 | OI |  |  |  |  | 2.00 |
| 11.750 | 1.12 | 0.00 | 0.682 | OI |  |  |  |  | 2.02 |
| 11.833 | 1.13 | 0.00 | 0.690 | OI |  |  |  |  | 2.04 |
| 11.917 | 1.14 | 0.00 | 0.698 | OI |  |  |  |  | 2.06 |
| 12.000 | 1.16 | 0.00 | 0.706 | OI |  |  |  |  | 2.07 |
| 12.083 | 1.18 | 0.00 | 0.714 | OI |  |  |  |  | 2.09 |
| 12.167 | 1.24 | 0.00 | 0.722 | OI |  |  |  |  | 2.11 |
| 12.250 | 1.27 | 0.00 | 0.731 | OI |  |  |  |  | 2.13 |
| 12.333 | 1.30 | 0.00 | 0.740 | OI |  |  |  |  | 2.15 |
| 12.417 | 1.32 | 0.00 | 0.749 | OI |  |  |  |  | 2.18 |
| 12.500 | 1.34 | 0.00 | 0.758 | OI |  |  |  |  | 2.20 |
| 12.583 | 1.35 | 0.00 | 0.767 | OI |  |  |  |  | 2.22 |
| 12.667 | 1.38 | 0.00 | 0.777 | OI |  |  |  |  | 2.24 |
| 12.750 | 1.39 | 0.00 | 0.786 | OI |  |  |  |  | 2.26 |
| 12.833 | 1.42 | 0.00 | 0.796 | OI |  |  |  |  | 2.29 |
| 12.917 | 1.44 | 0.00 | 0.806 | OI |  |  |  |  | 2.31 |
| 13.000 | 1.46 | 0.00 | 0.816 | OI |  |  |  |  | 2.33 |
| 13.083 | 1.48 | 0.00 | 0.826 | OI |  |  |  |  | 2.36 |
| 13.167 | 1.50 | 0.00 | 0.836 | OI |  |  |  |  | 2.38 |
| 13.250 | 1.53 | 0.00 | 0.846 | OI |  |  |  |  | 2.41 |
| 13.333 | 1.56 | 0.00 | 0.857 | OI |  |  |  |  | 2.43 |
| 13.417 | 1.58 | 0.00 | 0.868 | OI |  |  |  |  | 2.46 |
| 13.500 | 1.61 | 0.00 | 0.879 | OI |  |  |  |  | 2.48 |
| 13.583 | 1.64 | 0.00 | 0.890 | OI |  |  |  |  | 2.51 |
| 13.667 | 1.67 | 0.00 | 0.901 | OI |  |  |  |  | 2.53 |
| 13.750 | 1.70 | 0.00 | 0.913 | OI |  |  |  |  | 2.56 |
| 13.833 | 1.74 | 0.00 | 0.925 | OI |  |  |  |  | 2.59 |
| 13.917 | 1.77 | 0.00 | 0.937 | OI |  |  |  |  | 2.61 |
| 14.000 | 1.81 | 0.00 | 0.949 | OI |  |  |  |  | 2.64 |
| 14.083 | 1.85 | 0.00 | 0.962 | OI |  |  |  |  | 2.67 |
| 14.167 | 1.90 | 0.00 | 0.975 | OI |  |  |  |  | 2.70 |
| 14.250 | 1.94 | 0.00 | 0.988 | OI |  |  |  |  | 2.73 |

|        |       |      |       |     |  |   |   |  |      |
|--------|-------|------|-------|-----|--|---|---|--|------|
| 14.333 | 2.00  | 0.00 | 1.002 | OI  |  |   |   |  | 2.76 |
| 14.417 | 2.05  | 0.00 | 1.016 | OI  |  |   |   |  | 2.79 |
| 14.500 | 2.11  | 0.00 | 1.030 | O I |  |   |   |  | 2.82 |
| 14.583 | 2.17  | 0.00 | 1.045 | O I |  |   |   |  | 2.85 |
| 14.667 | 2.24  | 0.00 | 1.060 | O I |  |   |   |  | 2.89 |
| 14.750 | 2.31  | 0.00 | 1.076 | O I |  |   |   |  | 2.92 |
| 14.833 | 2.40  | 0.00 | 1.092 | O I |  |   |   |  | 2.96 |
| 14.917 | 2.48  | 0.00 | 1.109 | O I |  |   |   |  | 2.99 |
| 15.000 | 2.59  | 0.00 | 1.126 | O I |  |   |   |  | 3.03 |
| 15.083 | 2.69  | 0.00 | 1.144 | O I |  |   |   |  | 3.07 |
| 15.167 | 2.82  | 0.00 | 1.163 | O I |  |   |   |  | 3.11 |
| 15.250 | 2.95  | 0.00 | 1.183 | O I |  |   |   |  | 3.16 |
| 15.333 | 3.13  | 0.00 | 1.204 | O I |  |   |   |  | 3.21 |
| 15.417 | 3.19  | 0.00 | 1.226 | O I |  |   |   |  | 3.25 |
| 15.500 | 2.95  | 0.00 | 1.247 | O I |  |   |   |  | 3.30 |
| 15.583 | 2.98  | 0.00 | 1.267 | O I |  |   |   |  | 3.35 |
| 15.667 | 3.22  | 0.00 | 1.289 | O I |  |   |   |  | 3.39 |
| 15.750 | 3.56  | 0.00 | 1.312 | O I |  |   |   |  | 3.44 |
| 15.833 | 4.24  | 0.00 | 1.339 | O I |  |   |   |  | 3.50 |
| 15.917 | 5.26  | 0.00 | 1.372 | O I |  |   |   |  | 3.58 |
| 16.000 | 7.58  | 0.00 | 1.416 | O I |  |   |   |  | 3.67 |
| 16.083 | 15.55 | 0.00 | 1.495 | O   |  | I |   |  | 3.85 |
| 16.167 | 32.89 | 0.68 | 1.660 | O   |  |   | I |  | 4.21 |
| 16.250 | 17.77 | 1.87 | 1.826 | O   |  | I |   |  | 4.59 |
| 16.333 | 10.20 | 2.47 | 1.907 | O   |  | I |   |  | 4.78 |
| 16.417 | 7.04  | 2.77 | 1.948 | O I |  |   |   |  | 4.88 |
| 16.500 | 5.69  | 2.95 | 1.972 | O I |  |   |   |  | 4.94 |
| 16.583 | 4.66  | 3.06 | 1.987 | O I |  |   |   |  | 4.97 |
| 16.667 | 3.82  | 3.12 | 1.995 | O   |  |   |   |  | 4.99 |
| 16.750 | 3.42  |      | 1.999 | O   |  |   |   |  |      |
| 16.833 | 3.02  | 3.15 | 1.999 | IO  |  |   |   |  | 5.00 |
| 16.917 | 2.45  | 3.13 | 1.996 | IO  |  |   |   |  | 4.99 |
| 17.000 | 2.27  | 3.09 | 1.991 | IO  |  |   |   |  | 4.98 |
| 17.083 | 2.13  | 3.05 | 1.985 | O   |  |   |   |  | 4.97 |
| 17.167 | 2.02  | 3.00 | 1.979 | IO  |  |   |   |  | 4.95 |
| 17.250 | 1.92  | 2.95 | 1.972 | IO  |  |   |   |  | 4.93 |
| 17.333 | 1.83  | 2.89 | 1.964 | IO  |  |   |   |  | 4.92 |
| 17.417 | 1.75  | 2.84 | 1.957 | IO  |  |   |   |  | 4.90 |
| 17.500 | 1.68  | 2.78 | 1.949 | IO  |  |   |   |  | 4.88 |
| 17.583 | 1.62  | 2.73 | 1.942 | IO  |  |   |   |  | 4.86 |
| 17.667 | 1.56  | 2.67 | 1.934 | IO  |  |   |   |  | 4.85 |
| 17.750 | 1.51  | 2.61 | 1.927 | IO  |  |   |   |  | 4.83 |
| 17.833 | 1.46  | 2.56 | 1.919 | IO  |  |   |   |  | 4.81 |
| 17.917 | 1.42  | 2.50 | 1.911 | IO  |  |   |   |  | 4.79 |
| 18.000 | 1.38  | 2.45 | 1.904 | IO  |  |   |   |  | 4.77 |
| 18.083 | 1.33  | 2.39 | 1.897 | IO  |  |   |   |  | 4.76 |
| 18.167 | 1.26  | 2.34 | 1.889 | IO  |  |   |   |  | 4.74 |
| 18.250 | 1.21  | 2.29 | 1.882 | IO  |  |   |   |  | 4.72 |
| 18.333 | 1.17  | 2.23 | 1.875 | IO  |  |   |   |  | 4.70 |
| 18.417 | 1.14  | 2.18 | 1.867 | IO  |  |   |   |  | 4.69 |
| 18.500 | 1.11  | 2.13 | 1.860 | IO  |  |   |   |  | 4.67 |
| 18.583 | 1.09  | 2.07 | 1.853 | IO  |  |   |   |  | 4.65 |
| 18.667 | 1.06  | 2.03 | 1.847 | O   |  |   |   |  | 4.64 |
| 18.750 | 1.04  | 1.98 | 1.840 | O   |  |   |   |  | 4.62 |
| 18.833 | 1.02  | 1.93 | 1.834 | IO  |  |   |   |  | 4.61 |
| 18.917 | 1.00  | 1.88 | 1.828 | IO  |  |   |   |  | 4.59 |
| 19.000 | 0.98  | 1.84 | 1.822 | IO  |  |   |   |  | 4.58 |
| 19.083 | 0.96  | 1.80 | 1.816 | IO  |  |   |   |  | 4.57 |
| 19.167 | 0.95  | 1.76 | 1.810 | IO  |  |   |   |  | 4.55 |
| 19.250 | 0.93  | 1.71 | 1.805 | IO  |  |   |   |  | 4.54 |
| 19.333 | 0.91  | 1.68 | 1.799 | IO  |  |   |   |  | 4.53 |
| 19.417 | 0.90  | 1.64 | 1.794 | IO  |  |   |   |  | 4.51 |
| 19.500 | 0.89  | 1.60 | 1.789 | IO  |  |   |   |  | 4.50 |
| 19.583 | 0.87  | 1.57 | 1.784 | IO  |  |   |   |  | 4.49 |
| 19.667 | 0.86  | 1.53 | 1.779 | IO  |  |   |   |  | 4.48 |
| 19.750 | 0.85  | 1.50 | 1.775 | IO  |  |   |   |  | 4.47 |
| 19.833 | 0.83  | 1.47 | 1.770 | IO  |  |   |   |  | 4.46 |
| 19.917 | 0.82  | 1.44 | 1.766 | IO  |  |   |   |  | 4.45 |
| 20.000 | 0.81  | 1.41 | 1.762 | IO  |  |   |   |  | 4.44 |
| 20.083 | 0.80  | 1.38 | 1.758 | IO  |  |   |   |  | 4.43 |
| 20.167 | 0.79  | 1.35 | 1.754 | IO  |  |   |   |  | 4.42 |
| 20.250 | 0.78  | 1.32 | 1.750 | IO  |  |   |   |  | 4.42 |
| 20.333 | 0.77  | 1.30 | 1.747 | IO  |  |   |   |  | 4.41 |
| 20.417 | 0.76  | 1.27 | 1.743 | IO  |  |   |   |  | 4.40 |
| 20.500 | 0.75  | 1.25 | 1.739 | IO  |  |   |   |  | 4.39 |
| 20.583 | 0.74  | 1.22 | 1.736 | IO  |  |   |   |  | 4.38 |
| 20.667 | 0.73  | 1.20 | 1.733 | IO  |  |   |   |  | 4.38 |
| 20.750 | 0.73  | 1.18 | 1.730 | IO  |  |   |   |  | 4.37 |
| 20.833 | 0.72  | 1.16 | 1.727 | IO  |  |   |   |  | 4.36 |
| 20.917 | 0.71  | 1.14 | 1.724 | IO  |  |   |   |  | 4.36 |
| 21.000 | 0.70  | 1.11 | 1.721 | IO  |  |   |   |  | 4.35 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 21.083 | 0.70 | 1.09 | 1.718 | IO |  |  |  |  | 4.34 |
| 21.167 | 0.69 | 1.08 | 1.715 | IO |  |  |  |  | 4.34 |
| 21.250 | 0.68 | 1.06 | 1.713 | IO |  |  |  |  | 4.33 |
| 21.333 | 0.67 | 1.04 | 1.710 | IO |  |  |  |  | 4.33 |
| 21.417 | 0.67 | 1.02 | 1.708 | O  |  |  |  |  | 4.32 |
| 21.500 | 0.66 | 1.00 | 1.705 | O  |  |  |  |  | 4.32 |
| 21.583 | 0.65 | 0.99 | 1.703 | O  |  |  |  |  | 4.31 |
| 21.667 | 0.65 | 0.97 | 1.701 | O  |  |  |  |  | 4.30 |
| 21.750 | 0.64 | 0.96 | 1.698 | O  |  |  |  |  | 4.30 |
| 21.833 | 0.64 | 0.94 | 1.696 | O  |  |  |  |  | 4.30 |
| 21.917 | 0.63 | 0.93 | 1.694 | O  |  |  |  |  | 4.29 |
| 22.000 | 0.63 | 0.91 | 1.692 | O  |  |  |  |  | 4.29 |
| 22.083 | 0.62 | 0.90 | 1.690 | O  |  |  |  |  | 4.28 |
| 22.167 | 0.61 | 0.88 | 1.688 | O  |  |  |  |  | 4.28 |
| 22.250 | 0.61 | 0.87 | 1.687 | O  |  |  |  |  | 4.27 |
| 22.333 | 0.60 | 0.86 | 1.685 | O  |  |  |  |  | 4.27 |
| 22.417 | 0.60 | 0.85 | 1.683 | O  |  |  |  |  | 4.27 |
| 22.500 | 0.59 | 0.83 | 1.681 | O  |  |  |  |  | 4.26 |
| 22.583 | 0.59 | 0.82 | 1.680 | O  |  |  |  |  | 4.26 |
| 22.667 | 0.58 | 0.81 | 1.678 | O  |  |  |  |  | 4.25 |
| 22.750 | 0.58 | 0.80 | 1.677 | O  |  |  |  |  | 4.25 |
| 22.833 | 0.58 | 0.79 | 1.675 | O  |  |  |  |  | 4.25 |
| 22.917 | 0.57 | 0.78 | 1.674 | O  |  |  |  |  | 4.24 |
| 23.000 | 0.57 | 0.77 | 1.672 | O  |  |  |  |  | 4.24 |
| 23.083 | 0.56 | 0.76 | 1.671 | O  |  |  |  |  | 4.24 |
| 23.167 | 0.56 | 0.75 | 1.670 | O  |  |  |  |  | 4.24 |
| 23.250 | 0.55 | 0.74 | 1.668 | O  |  |  |  |  | 4.23 |
| 23.333 | 0.55 | 0.73 | 1.667 | O  |  |  |  |  | 4.23 |
| 23.417 | 0.55 | 0.72 | 1.666 | O  |  |  |  |  | 4.23 |
| 23.500 | 0.54 | 0.71 | 1.665 | O  |  |  |  |  | 4.22 |
| 23.583 | 0.54 | 0.71 | 1.663 | O  |  |  |  |  | 4.22 |
| 23.667 | 0.54 | 0.70 | 1.662 | O  |  |  |  |  | 4.22 |
| 23.750 | 0.53 | 0.69 | 1.661 | O  |  |  |  |  | 4.22 |
| 23.833 | 0.53 | 0.68 | 1.660 | O  |  |  |  |  | 4.21 |
| 23.917 | 0.52 | 0.68 | 1.659 | O  |  |  |  |  | 4.21 |
| 24.000 | 0.52 | 0.67 | 1.658 | O  |  |  |  |  | 4.21 |
| 24.083 | 0.46 | 0.66 | 1.657 | O  |  |  |  |  | 4.21 |
| 24.167 | 0.22 | 0.64 | 1.655 | O  |  |  |  |  | 4.20 |
| 24.250 | 0.11 | 0.62 | 1.651 | O  |  |  |  |  | 4.20 |
| 24.333 | 0.07 | 0.60 | 1.648 | O  |  |  |  |  | 4.19 |
| 24.417 | 0.04 | 0.57 | 1.644 | O  |  |  |  |  | 4.18 |
| 24.500 | 0.02 | 0.54 | 1.641 | O  |  |  |  |  | 4.17 |
| 24.583 | 0.01 | 0.52 | 1.637 | O  |  |  |  |  | 4.16 |
| 24.667 | 0.01 | 0.50 | 1.634 | O  |  |  |  |  | 4.16 |
| 24.750 | 0.00 | 0.47 | 1.630 | O  |  |  |  |  | 4.15 |
| 24.833 | 0.00 | 0.45 | 1.627 | O  |  |  |  |  | 4.14 |
| 24.917 | 0.00 | 0.43 | 1.624 | O  |  |  |  |  | 4.13 |
| 25.000 | 0.00 | 0.41 | 1.621 | O  |  |  |  |  | 4.13 |
| 25.083 | 0.00 | 0.39 | 1.619 | O  |  |  |  |  | 4.12 |
| 25.167 | 0.00 | 0.37 | 1.616 | O  |  |  |  |  | 4.12 |
| 25.250 | 0.00 | 0.35 | 1.613 | O  |  |  |  |  | 4.11 |
| 25.333 | 0.00 | 0.33 | 1.611 | O  |  |  |  |  | 4.11 |
| 25.417 | 0.00 | 0.32 | 1.609 | O  |  |  |  |  | 4.10 |
| 25.500 | 0.00 | 0.30 | 1.607 | O  |  |  |  |  | 4.10 |
| 25.583 | 0.00 | 0.29 | 1.605 | O  |  |  |  |  | 4.09 |
| 25.667 | 0.00 | 0.28 | 1.603 | O  |  |  |  |  | 4.09 |
| 25.750 | 0.00 | 0.26 | 1.601 | O  |  |  |  |  | 4.08 |
| 25.833 | 0.00 | 0.25 | 1.599 | O  |  |  |  |  | 4.08 |
| 25.917 | 0.00 | 0.24 | 1.597 | O  |  |  |  |  | 4.07 |
| 26.000 | 0.00 | 0.23 | 1.596 | O  |  |  |  |  | 4.07 |
| 26.083 | 0.00 | 0.22 | 1.594 | O  |  |  |  |  | 4.07 |
| 26.167 | 0.00 | 0.21 | 1.593 | O  |  |  |  |  | 4.06 |
| 26.250 | 0.00 | 0.20 | 1.591 | O  |  |  |  |  | 4.06 |
| 26.333 | 0.00 | 0.19 | 1.590 | O  |  |  |  |  | 4.06 |
| 26.417 | 0.00 | 0.18 | 1.589 | O  |  |  |  |  | 4.06 |
| 26.500 | 0.00 | 0.17 | 1.588 | O  |  |  |  |  | 4.05 |
| 26.583 | 0.00 | 0.16 | 1.587 | O  |  |  |  |  | 4.05 |
| 26.667 | 0.00 | 0.15 | 1.586 | O  |  |  |  |  | 4.05 |
| 26.750 | 0.00 | 0.15 | 1.584 | O  |  |  |  |  | 4.05 |
| 26.833 | 0.00 | 0.14 | 1.584 | O  |  |  |  |  | 4.04 |
| 26.917 | 0.00 | 0.13 | 1.583 | O  |  |  |  |  | 4.04 |
| 27.000 | 0.00 | 0.13 | 1.582 | O  |  |  |  |  | 4.04 |
| 27.083 | 0.00 | 0.12 | 1.581 | O  |  |  |  |  | 4.04 |
| 27.167 | 0.00 | 0.11 | 1.580 | O  |  |  |  |  | 4.04 |
| 27.250 | 0.00 | 0.11 | 1.579 | O  |  |  |  |  | 4.03 |
| 27.333 | 0.00 | 0.10 | 1.579 | O  |  |  |  |  | 4.03 |
| 27.417 | 0.00 | 0.10 | 1.578 | O  |  |  |  |  | 4.03 |
| 27.500 | 0.00 | 0.09 | 1.577 | O  |  |  |  |  | 4.03 |
| 27.583 | 0.00 | 0.09 | 1.577 | O  |  |  |  |  | 4.03 |
| 27.667 | 0.00 | 0.08 | 1.576 | O  |  |  |  |  | 4.03 |
| 27.750 | 0.00 | 0.08 | 1.575 | O  |  |  |  |  | 4.03 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 27.833 | 0.00 | 0.08 | 1.575 | 0 |  |  |  |  | 4.02 |
| 27.917 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 28.000 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 28.083 | 0.00 | 0.07 | 1.573 | 0 |  |  |  |  | 4.02 |
| 28.167 | 0.00 | 0.06 | 1.573 | 0 |  |  |  |  | 4.02 |
| 28.250 | 0.00 | 0.06 | 1.572 | 0 |  |  |  |  | 4.02 |
| 28.333 | 0.00 | 0.06 | 1.572 | 0 |  |  |  |  | 4.02 |
| 28.417 | 0.00 | 0.05 | 1.572 | 0 |  |  |  |  | 4.02 |
| 28.500 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 28.583 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 28.667 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.01 |
| 28.750 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 28.833 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 28.917 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.000 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.083 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.167 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.250 | 0.00 | 0.03 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.333 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.417 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.500 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.583 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.667 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.750 | 0.00 | 0.02 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.833 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 29.917 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.000 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.083 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.167 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.250 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.333 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 30.417 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 30.500 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 30.583 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.00 |
| 30.667 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 30.750 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 30.833 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 30.917 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.000 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.083 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.167 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.250 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.333 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.417 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.500 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.583 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.667 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.750 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.833 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.917 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.000 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.083 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.167 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.250 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.333 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.417 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.500 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.583 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.667 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.750 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.833 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.917 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.000 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 34.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

Remaining water in basin = 1.56 (Ac.Ft)

```
*****HYDROGRAPH DATA*****
      Number of intervals = 423
      Time interval = 5.0 (Min.)
      Maximum/Peak flow rate = 3.150 (CFS)
      Total volume = 1.148 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

-----

```
+++++
Process from Point/Station 6.000 to Point/Station 13.000
*** STORE OR DELETE CURRENT HYDROGRAPH ***
```

Current stream hydrograph saved in file route.rte

```
*****HYDROGRAPH DATA*****
      Number of intervals = 0
      Time interval = 0.0 (Min.)
      Maximum/Peak flow rate = 0.000 (CFS)
      Total volume = 0.000 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

-----

FLOOD HYDROGRAPH ROUTING PROGRAM  
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018  
Study date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ROUTE  
25-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

-----  
\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name: [REDACTED]  
\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*  
Number of intervals = 297  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 43.430 (CFS)  
Total volume = 3.417 (Ac.Ft)  
Status of hydrographs being held in storage  
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000  
\*\*\*\*\*

+++++  
Process from Point/Station 6.000 to Point/Station 13.000  
\*\*\*\* RETARDING BASIN ROUTING \*\*\*\*  
-----

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH = 0.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.00(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Given pipe size = 15.00(In.)  
Calculated individual pipe flow = 1.593(CFS)  
Normal flow depth in pipe = 5.07(In.)  
Flow top width inside pipe = 14.19(In.)  
Critical depth = 0.50(Ft.)  
Calculated flow rate through pipe(s) = 1.593(CFS)  
Total outflow at this depth = 1.59(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)

Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 0.450(Ft.)  
 Pipe friction loss = 0.106(Ft.)  
 Minor friction loss = 0.344(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 4.713(CFS)

Total outflow at this depth = 4.71(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 1.450(Ft.)  
 Pipe friction loss = 0.343(Ft.)  
 Minor friction loss = 1.107(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 8.460(CFS)

Total outflow at this depth = 8.46(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.00(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 2.950(Ft.)  
 Pipe friction loss = 0.698(Ft.)  
 Minor friction loss = 2.252(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 12.067(CFS)

Total outflow at this depth = 12.07(CFS)

-----  
 Total number of inflow hydrograph intervals = 297  
 Hydrograph time unit = 5.000 (Min.)  
 Initial depth in storage basin = 0.00(Ft.)  
 -----

-----  
 Initial basin depth = 0.00 (Ft.)  
 Initial basin storage = 0.00 (Ac.Ft)  
 Initial basin outflow = 0.00 (CFS)  
 -----

-----  
 Depth vs. Storage and Depth vs. Discharge data:  

| Basin Depth<br>(Ft.) | Storage<br>(Ac.Ft) | Outflow<br>(CFS) | (S-O*dt/2)<br>(Ac.Ft) | (S+O*dt/2)<br>(Ac.Ft) |
|----------------------|--------------------|------------------|-----------------------|-----------------------|
| 0.000                | 0.000              | 0.000            | 0.000                 | 0.000                 |
| 0.500                | 0.116              | 0.000            | 0.116                 | 0.116                 |
| 1.500                | 0.463              | 0.000            | 0.463                 | 0.463                 |
| 2.500                | 0.886              | 0.000            | 0.886                 | 0.886                 |
| 3.500                | 1.337              | 0.000            | 1.337                 | 1.337                 |
| 4.000                | 1.564              | 0.000            | 1.564                 | 1.564                 |
| 4.500                | 1.788              | 1.593            | 1.783                 | 1.793                 |
| 5.500                | 2.211              | 4.713            | 2.195                 | 2.227                 |
| 6.500                | 2.558              | 8.460            | 2.529                 | 2.587                 |
| 8.000                | 2.905              | 12.067           | 2.863                 | 2.947                 |

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 Hydrograph Detention Basin Routing  
 -----

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

| Time<br>(Hours) | Inflow<br>(CFS) | Outflow<br>(CFS) | Storage<br>(Ac.Ft) | 0 | 10.9 | 21.71 | 32.57 | 43.43 | Depth<br>(Ft.) |
|-----------------|-----------------|------------------|--------------------|---|------|-------|-------|-------|----------------|
| 0.083           | 0.07            | 0.00             | 0.000              | 0 |      |       |       |       | 0.00           |
| 0.167           | 0.37            | 0.00             | 0.002              | 0 |      |       |       |       | 0.01           |
| 0.250           | 0.50            | 0.00             | 0.005              | 0 |      |       |       |       | 0.02           |
| 0.333           | 0.56            | 0.00             | 0.008              | 0 |      |       |       |       | 0.04           |
| 0.417           | 0.60            | 0.00             | 0.012              | 0 |      |       |       |       | 0.05           |
| 0.500           | 0.62            | 0.00             | 0.017              | 0 |      |       |       |       | 0.07           |
| 0.583           | 0.64            | 0.00             | 0.021              | 0 |      |       |       |       | 0.09           |
| 0.667           | 0.64            | 0.00             | 0.025              | 0 |      |       |       |       | 0.11           |
| 0.750           | 0.65            | 0.00             | 0.030              | 0 |      |       |       |       | 0.13           |

|       |      |      |       |   |  |  |  |  |      |
|-------|------|------|-------|---|--|--|--|--|------|
| 0.833 | 0.66 | 0.00 | 0.034 | 0 |  |  |  |  | 0.15 |
| 0.917 | 0.66 | 0.00 | 0.039 | 0 |  |  |  |  | 0.17 |
| 1.000 | 0.66 | 0.00 | 0.043 | 0 |  |  |  |  | 0.19 |
| 1.083 | 0.67 | 0.00 | 0.048 | 0 |  |  |  |  | 0.21 |
| 1.167 | 0.67 | 0.00 | 0.053 | 0 |  |  |  |  | 0.23 |
| 1.250 | 0.67 | 0.00 | 0.057 | 0 |  |  |  |  | 0.25 |
| 1.333 | 0.67 | 0.00 | 0.062 | 0 |  |  |  |  | 0.27 |
| 1.417 | 0.67 | 0.00 | 0.067 | 0 |  |  |  |  | 0.29 |
| 1.500 | 0.68 | 0.00 | 0.071 | 0 |  |  |  |  | 0.31 |
| 1.583 | 0.68 | 0.00 | 0.076 | 0 |  |  |  |  | 0.33 |
| 1.667 | 0.68 | 0.00 | 0.081 | 0 |  |  |  |  | 0.35 |
| 1.750 | 0.68 | 0.00 | 0.085 | 0 |  |  |  |  | 0.37 |
| 1.833 | 0.69 | 0.00 | 0.090 | 0 |  |  |  |  | 0.39 |
| 1.917 | 0.69 | 0.00 | 0.095 | 0 |  |  |  |  | 0.41 |
| 2.000 | 0.69 | 0.00 | 0.099 | 0 |  |  |  |  | 0.43 |
| 2.083 | 0.69 | 0.00 | 0.104 | 0 |  |  |  |  | 0.45 |
| 2.167 | 0.70 | 0.00 | 0.109 | 0 |  |  |  |  | 0.47 |
| 2.250 | 0.70 | 0.00 | 0.114 | 0 |  |  |  |  | 0.49 |
| 2.333 | 0.70 | 0.00 | 0.119 | 0 |  |  |  |  | 0.51 |
| 2.417 | 0.70 | 0.00 | 0.123 | 0 |  |  |  |  | 0.52 |
| 2.500 | 0.71 | 0.00 | 0.128 | 0 |  |  |  |  | 0.54 |
| 2.583 | 0.71 | 0.00 | 0.133 | 0 |  |  |  |  | 0.55 |
| 2.667 | 0.71 | 0.00 | 0.138 | 0 |  |  |  |  | 0.56 |
| 2.750 | 0.71 | 0.00 | 0.143 | 0 |  |  |  |  | 0.58 |
| 2.833 | 0.72 | 0.00 | 0.148 | 0 |  |  |  |  | 0.59 |
| 2.917 | 0.72 | 0.00 | 0.153 | 0 |  |  |  |  | 0.61 |
| 3.000 | 0.72 | 0.00 | 0.158 | 0 |  |  |  |  | 0.62 |
| 3.083 | 0.73 | 0.00 | 0.163 | 0 |  |  |  |  | 0.64 |
| 3.167 | 0.73 | 0.00 | 0.168 | 0 |  |  |  |  | 0.65 |
| 3.250 | 0.73 | 0.00 | 0.173 | 0 |  |  |  |  | 0.66 |
| 3.333 | 0.73 | 0.00 | 0.178 | 0 |  |  |  |  | 0.68 |
| 3.417 | 0.74 | 0.00 | 0.183 | 0 |  |  |  |  | 0.69 |
| 3.500 | 0.74 | 0.00 | 0.188 | 0 |  |  |  |  | 0.71 |
| 3.583 | 0.74 | 0.00 | 0.193 | 0 |  |  |  |  | 0.72 |
| 3.667 | 0.75 | 0.00 | 0.198 | 0 |  |  |  |  | 0.74 |
| 3.750 | 0.75 | 0.00 | 0.204 | 0 |  |  |  |  | 0.75 |
| 3.833 | 0.75 | 0.00 | 0.209 | 0 |  |  |  |  | 0.77 |
| 3.917 | 0.76 | 0.00 | 0.214 | 0 |  |  |  |  | 0.78 |
| 4.000 | 0.76 | 0.00 | 0.219 | 0 |  |  |  |  | 0.80 |
| 4.083 | 0.76 | 0.00 | 0.224 | 0 |  |  |  |  | 0.81 |
| 4.167 | 0.77 | 0.00 | 0.230 | 0 |  |  |  |  | 0.83 |
| 4.250 | 0.77 | 0.00 | 0.235 | 0 |  |  |  |  | 0.84 |
| 4.333 | 0.77 | 0.00 | 0.240 | 0 |  |  |  |  | 0.86 |
| 4.417 | 0.78 | 0.00 | 0.246 | 0 |  |  |  |  | 0.87 |
| 4.500 | 0.78 | 0.00 | 0.251 | 0 |  |  |  |  | 0.89 |
| 4.583 | 0.78 | 0.00 | 0.256 | 0 |  |  |  |  | 0.90 |
| 4.667 | 0.79 | 0.00 | 0.262 | 0 |  |  |  |  | 0.92 |
| 4.750 | 0.79 | 0.00 | 0.267 | 0 |  |  |  |  | 0.94 |
| 4.833 | 0.79 | 0.00 | 0.273 | 0 |  |  |  |  | 0.95 |
| 4.917 | 0.80 | 0.00 | 0.278 | 0 |  |  |  |  | 0.97 |
| 5.000 | 0.80 | 0.00 | 0.283 | 0 |  |  |  |  | 0.98 |
| 5.083 | 0.80 | 0.00 | 0.289 | 0 |  |  |  |  | 1.00 |
| 5.167 | 0.81 | 0.00 | 0.295 | 0 |  |  |  |  | 1.01 |
| 5.250 | 0.81 | 0.00 | 0.300 | 0 |  |  |  |  | 1.03 |
| 5.333 | 0.81 | 0.00 | 0.306 | 0 |  |  |  |  | 1.05 |
| 5.417 | 0.82 | 0.00 | 0.311 | 0 |  |  |  |  | 1.06 |
| 5.500 | 0.82 | 0.00 | 0.317 | 0 |  |  |  |  | 1.08 |
| 5.583 | 0.83 | 0.00 | 0.323 | 0 |  |  |  |  | 1.10 |
| 5.667 | 0.83 | 0.00 | 0.328 | 0 |  |  |  |  | 1.11 |
| 5.750 | 0.83 | 0.00 | 0.334 | 0 |  |  |  |  | 1.13 |
| 5.833 | 0.84 | 0.00 | 0.340 | 0 |  |  |  |  | 1.15 |
| 5.917 | 0.84 | 0.00 | 0.346 | 0 |  |  |  |  | 1.16 |
| 6.000 | 0.85 | 0.00 | 0.351 | 0 |  |  |  |  | 1.18 |
| 6.083 | 0.85 | 0.00 | 0.357 | 0 |  |  |  |  | 1.20 |
| 6.167 | 0.86 | 0.00 | 0.363 | 0 |  |  |  |  | 1.21 |
| 6.250 | 0.86 | 0.00 | 0.369 | 0 |  |  |  |  | 1.23 |
| 6.333 | 0.86 | 0.00 | 0.375 | 0 |  |  |  |  | 1.25 |
| 6.417 | 0.87 | 0.00 | 0.381 | 0 |  |  |  |  | 1.26 |
| 6.500 | 0.87 | 0.00 | 0.387 | 0 |  |  |  |  | 1.28 |
| 6.583 | 0.88 | 0.00 | 0.393 | 0 |  |  |  |  | 1.30 |
| 6.667 | 0.88 | 0.00 | 0.399 | 0 |  |  |  |  | 1.32 |
| 6.750 | 0.89 | 0.00 | 0.405 | 0 |  |  |  |  | 1.33 |
| 6.833 | 0.89 | 0.00 | 0.411 | 0 |  |  |  |  | 1.35 |
| 6.917 | 0.90 | 0.00 | 0.418 | 0 |  |  |  |  | 1.37 |
| 7.000 | 0.90 | 0.00 | 0.424 | 0 |  |  |  |  | 1.39 |
| 7.083 | 0.91 | 0.00 | 0.430 | 0 |  |  |  |  | 1.40 |
| 7.167 | 0.91 | 0.00 | 0.436 | 0 |  |  |  |  | 1.42 |
| 7.250 | 0.92 | 0.00 | 0.443 | 0 |  |  |  |  | 1.44 |
| 7.333 | 0.92 | 0.00 | 0.449 | 0 |  |  |  |  | 1.46 |
| 7.417 | 0.93 | 0.00 | 0.455 | 0 |  |  |  |  | 1.48 |
| 7.500 | 0.93 | 0.00 | 0.462 | 0 |  |  |  |  | 1.50 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 7.583  | 0.94 | 0.00 | 0.468 | O  |  |  |  |  | 1.51 |
| 7.667  | 0.95 | 0.00 | 0.475 | O  |  |  |  |  | 1.53 |
| 7.750  | 0.95 | 0.00 | 0.481 | O  |  |  |  |  | 1.54 |
| 7.833  | 0.96 | 0.00 | 0.488 | O  |  |  |  |  | 1.56 |
| 7.917  | 0.96 | 0.00 | 0.494 | O  |  |  |  |  | 1.57 |
| 8.000  | 0.97 | 0.00 | 0.501 | O  |  |  |  |  | 1.59 |
| 8.083  | 0.97 | 0.00 | 0.508 | O  |  |  |  |  | 1.61 |
| 8.167  | 0.98 | 0.00 | 0.514 | O  |  |  |  |  | 1.62 |
| 8.250  | 0.99 | 0.00 | 0.521 | O  |  |  |  |  | 1.64 |
| 8.333  | 0.99 | 0.00 | 0.528 | O  |  |  |  |  | 1.65 |
| 8.417  | 1.00 | 0.00 | 0.535 | O  |  |  |  |  | 1.67 |
| 8.500  | 1.01 | 0.00 | 0.542 | O  |  |  |  |  | 1.69 |
| 8.583  | 1.01 | 0.00 | 0.549 | O  |  |  |  |  | 1.70 |
| 8.667  | 1.02 | 0.00 | 0.556 | O  |  |  |  |  | 1.72 |
| 8.750  | 1.03 | 0.00 | 0.563 | O  |  |  |  |  | 1.74 |
| 8.833  | 1.03 | 0.00 | 0.570 | O  |  |  |  |  | 1.75 |
| 8.917  | 1.04 | 0.00 | 0.577 | O  |  |  |  |  | 1.77 |
| 9.000  | 1.05 | 0.00 | 0.584 | O  |  |  |  |  | 1.79 |
| 9.083  | 1.06 | 0.00 | 0.591 | O  |  |  |  |  | 1.80 |
| 9.167  | 1.06 | 0.00 | 0.599 | O  |  |  |  |  | 1.82 |
| 9.250  | 1.07 | 0.00 | 0.606 | O  |  |  |  |  | 1.84 |
| 9.333  | 1.08 | 0.00 | 0.613 | O  |  |  |  |  | 1.86 |
| 9.417  | 1.09 | 0.00 | 0.621 | O  |  |  |  |  | 1.87 |
| 9.500  | 1.10 | 0.00 | 0.628 | O  |  |  |  |  | 1.89 |
| 9.583  | 1.10 | 0.00 | 0.636 | O  |  |  |  |  | 1.91 |
| 9.667  | 1.11 | 0.00 | 0.644 | O  |  |  |  |  | 1.93 |
| 9.750  | 1.12 | 0.00 | 0.651 | O  |  |  |  |  | 1.95 |
| 9.833  | 1.13 | 0.00 | 0.659 | O  |  |  |  |  | 1.96 |
| 9.917  | 1.14 | 0.00 | 0.667 | O  |  |  |  |  | 1.98 |
| 10.000 | 1.15 | 0.00 | 0.675 | O  |  |  |  |  | 2.00 |
| 10.083 | 1.16 | 0.00 | 0.683 | O  |  |  |  |  | 2.02 |
| 10.167 | 1.17 | 0.00 | 0.691 | O  |  |  |  |  | 2.04 |
| 10.250 | 1.18 | 0.00 | 0.699 | O  |  |  |  |  | 2.06 |
| 10.333 | 1.19 | 0.00 | 0.707 | O  |  |  |  |  | 2.08 |
| 10.417 | 1.20 | 0.00 | 0.715 | O  |  |  |  |  | 2.10 |
| 10.500 | 1.21 | 0.00 | 0.724 | O  |  |  |  |  | 2.12 |
| 10.583 | 1.22 | 0.00 | 0.732 | O  |  |  |  |  | 2.14 |
| 10.667 | 1.23 | 0.00 | 0.740 | O  |  |  |  |  | 2.16 |
| 10.750 | 1.24 | 0.00 | 0.749 | O  |  |  |  |  | 2.18 |
| 10.833 | 1.26 | 0.00 | 0.757 | O  |  |  |  |  | 2.20 |
| 10.917 | 1.27 | 0.00 | 0.766 | O  |  |  |  |  | 2.22 |
| 11.000 | 1.28 | 0.00 | 0.775 | O  |  |  |  |  | 2.24 |
| 11.083 | 1.29 | 0.00 | 0.784 | O  |  |  |  |  | 2.26 |
| 11.167 | 1.31 | 0.00 | 0.793 | O  |  |  |  |  | 2.28 |
| 11.250 | 1.32 | 0.00 | 0.802 | O  |  |  |  |  | 2.30 |
| 11.333 | 1.33 | 0.00 | 0.811 | O  |  |  |  |  | 2.32 |
| 11.417 | 1.35 | 0.00 | 0.820 | O  |  |  |  |  | 2.34 |
| 11.500 | 1.36 | 0.00 | 0.829 | OI |  |  |  |  | 2.37 |
| 11.583 | 1.38 | 0.00 | 0.839 | OI |  |  |  |  | 2.39 |
| 11.667 | 1.39 | 0.00 | 0.848 | OI |  |  |  |  | 2.41 |
| 11.750 | 1.41 | 0.00 | 0.858 | OI |  |  |  |  | 2.43 |
| 11.833 | 1.42 | 0.00 | 0.868 | OI |  |  |  |  | 2.46 |
| 11.917 | 1.44 | 0.00 | 0.878 | OI |  |  |  |  | 2.48 |
| 12.000 | 1.46 | 0.00 | 0.888 | OI |  |  |  |  | 2.50 |
| 12.083 | 1.47 | 0.00 | 0.898 | OI |  |  |  |  | 2.53 |
| 12.167 | 1.48 | 0.00 | 0.908 | OI |  |  |  |  | 2.55 |
| 12.250 | 1.49 | 0.00 | 0.918 | OI |  |  |  |  | 2.57 |
| 12.333 | 1.51 | 0.00 | 0.929 | OI |  |  |  |  | 2.59 |
| 12.417 | 1.53 | 0.00 | 0.939 | OI |  |  |  |  | 2.62 |
| 12.500 | 1.55 | 0.00 | 0.950 | OI |  |  |  |  | 2.64 |
| 12.583 | 1.57 | 0.00 | 0.960 | OI |  |  |  |  | 2.66 |
| 12.667 | 1.60 | 0.00 | 0.971 | OI |  |  |  |  | 2.69 |
| 12.750 | 1.62 | 0.00 | 0.982 | OI |  |  |  |  | 2.71 |
| 12.833 | 1.64 | 0.00 | 0.994 | OI |  |  |  |  | 2.74 |
| 12.917 | 1.67 | 0.00 | 1.005 | OI |  |  |  |  | 2.76 |
| 13.000 | 1.70 | 0.00 | 1.017 | OI |  |  |  |  | 2.79 |
| 13.083 | 1.72 | 0.00 | 1.028 | OI |  |  |  |  | 2.82 |
| 13.167 | 1.75 | 0.00 | 1.040 | OI |  |  |  |  | 2.84 |
| 13.250 | 1.78 | 0.00 | 1.052 | OI |  |  |  |  | 2.87 |
| 13.333 | 1.82 | 0.00 | 1.065 | OI |  |  |  |  | 2.90 |
| 13.417 | 1.85 | 0.00 | 1.077 | OI |  |  |  |  | 2.92 |
| 13.500 | 1.88 | 0.00 | 1.090 | OI |  |  |  |  | 2.95 |
| 13.583 | 1.92 | 0.00 | 1.103 | OI |  |  |  |  | 2.98 |
| 13.667 | 1.96 | 0.00 | 1.117 | OI |  |  |  |  | 3.01 |
| 13.750 | 2.00 | 0.00 | 1.130 | OI |  |  |  |  | 3.04 |
| 13.833 | 2.04 | 0.00 | 1.144 | OI |  |  |  |  | 3.07 |
| 13.917 | 2.09 | 0.00 | 1.159 | OI |  |  |  |  | 3.10 |
| 14.000 | 2.14 | 0.00 | 1.173 | OI |  |  |  |  | 3.14 |
| 14.083 | 2.19 | 0.00 | 1.188 | OI |  |  |  |  | 3.17 |
| 14.167 | 2.25 | 0.00 | 1.203 | OI |  |  |  |  | 3.20 |
| 14.250 | 2.30 | 0.00 | 1.219 | OI |  |  |  |  | 3.24 |

|        |       |      |       |     |  |  |  |  |      |
|--------|-------|------|-------|-----|--|--|--|--|------|
| 14.333 | 2.37  | 0.00 | 1.235 | OI  |  |  |  |  | 3.27 |
| 14.417 | 2.43  | 0.00 | 1.252 | OI  |  |  |  |  | 3.31 |
| 14.500 | 2.51  | 0.00 | 1.269 | OI  |  |  |  |  | 3.35 |
| 14.583 | 2.59  | 0.00 | 1.286 | OI  |  |  |  |  | 3.39 |
| 14.667 | 2.68  | 0.00 | 1.304 | OI  |  |  |  |  | 3.43 |
| 14.750 | 2.77  | 0.00 | 1.323 | O I |  |  |  |  | 3.47 |
| 14.833 | 2.88  | 0.00 | 1.342 | O I |  |  |  |  | 3.51 |
| 14.917 | 2.98  | 0.00 | 1.363 | O I |  |  |  |  | 3.56 |
| 15.000 | 3.12  | 0.00 | 1.384 | O I |  |  |  |  | 3.60 |
| 15.083 | 3.25  | 0.00 | 1.406 | O I |  |  |  |  | 3.65 |
| 15.167 | 3.42  | 0.00 | 1.429 | O I |  |  |  |  | 3.70 |
| 15.250 | 3.59  | 0.00 | 1.453 | O I |  |  |  |  | 3.75 |
| 15.333 | 3.82  | 0.00 | 1.478 | O I |  |  |  |  | 3.81 |
| 15.417 | 3.94  | 0.00 | 1.505 | O I |  |  |  |  | 3.87 |
| 15.500 | 3.81  | 0.00 | 1.532 | O I |  |  |  |  | 3.93 |
| 15.583 | 3.93  | 0.00 | 1.558 | O I |  |  |  |  | 3.99 |
| 15.667 | 4.30  | 0.16 | 1.586 | O I |  |  |  |  | 4.05 |
| 15.750 | 4.82  | 0.37 | 1.616 | O I |  |  |  |  | 4.12 |
| 15.833 | 5.77  | 0.60 | 1.649 | O I |  |  |  |  | 4.19 |
| 15.917 | 7.13  | 0.88 | 1.688 | O I |  |  |  |  | 4.28 |
| 16.000 | 10.18 | 1.25 | 1.740 | O I |  |  |  |  | 4.39 |
| 16.083 | 20.66 | 1.94 | 1.836 | O I |  |  |  |  | 4.61 |
| 16.167 | 43.43 | 3.44 | 2.038 | O I |  |  |  |  | 5.09 |
| 16.250 | 23.59 | 5.02 | 2.239 | O I |  |  |  |  | 5.58 |
| 16.333 | 13.64 | 5.99 | 2.330 | O I |  |  |  |  | 5.84 |
| 16.417 | 9.37  | 6.39 | 2.366 | O I |  |  |  |  | 5.95 |
| 16.500 | 7.38  | 6.53 | 2.379 | OI  |  |  |  |  | 5.99 |
| 16.583 | 5.94  |      | 2.380 | O   |  |  |  |  |      |
| 16.667 | 4.79  | 6.46 | 2.372 | IO  |  |  |  |  | 5.97 |
| 16.750 | 4.25  | 6.32 | 2.360 | IO  |  |  |  |  | 5.93 |
| 16.833 | 3.71  | 6.15 | 2.344 | I O |  |  |  |  | 5.88 |
| 16.917 | 2.95  | 5.95 | 2.325 | I O |  |  |  |  | 5.83 |
| 17.000 | 2.72  | 5.72 | 2.305 | I O |  |  |  |  | 5.77 |
| 17.083 | 2.55  | 5.50 | 2.284 | I O |  |  |  |  | 5.71 |
| 17.167 | 2.40  | 5.29 | 2.264 | I O |  |  |  |  | 5.65 |
| 17.250 | 2.27  | 5.07 | 2.244 | I O |  |  |  |  | 5.60 |
| 17.333 | 2.16  | 4.87 | 2.225 | I O |  |  |  |  | 5.54 |
| 17.417 | 2.06  | 4.68 | 2.207 | I O |  |  |  |  | 5.49 |
| 17.500 | 1.97  | 4.55 | 2.189 | I O |  |  |  |  | 5.45 |
| 17.583 | 1.89  | 4.42 | 2.172 | I O |  |  |  |  | 5.41 |
| 17.667 | 1.82  | 4.29 | 2.154 | I O |  |  |  |  | 5.37 |
| 17.750 | 1.76  | 4.17 | 2.137 | I O |  |  |  |  | 5.33 |
| 17.833 | 1.70  | 4.05 | 2.121 | IO  |  |  |  |  | 5.29 |
| 17.917 | 1.65  | 3.93 | 2.105 | IO  |  |  |  |  | 5.25 |
| 18.000 | 1.60  | 3.82 | 2.090 | IO  |  |  |  |  | 5.21 |
| 18.083 | 1.56  | 3.71 | 2.075 | IO  |  |  |  |  | 5.18 |
| 18.167 | 1.53  | 3.60 | 2.060 | IO  |  |  |  |  | 5.14 |
| 18.250 | 1.49  | 3.50 | 2.046 | IO  |  |  |  |  | 5.11 |
| 18.333 | 1.46  | 3.40 | 2.032 | IO  |  |  |  |  | 5.08 |
| 18.417 | 1.42  | 3.30 | 2.019 | IO  |  |  |  |  | 5.05 |
| 18.500 | 1.39  | 3.21 | 2.007 | IO  |  |  |  |  | 5.02 |
| 18.583 | 1.36  | 3.11 | 1.994 | IO  |  |  |  |  | 4.99 |
| 18.667 | 1.33  | 3.03 | 1.982 | I O |  |  |  |  | 4.96 |
| 18.750 | 1.31  | 2.94 | 1.971 | I O |  |  |  |  | 4.93 |
| 18.833 | 1.28  | 2.86 | 1.960 | I O |  |  |  |  | 4.91 |
| 18.917 | 1.26  | 2.78 | 1.949 | I O |  |  |  |  | 4.88 |
| 19.000 | 1.23  | 2.71 | 1.939 | IO  |  |  |  |  | 4.86 |
| 19.083 | 1.21  | 2.63 | 1.929 | IO  |  |  |  |  | 4.83 |
| 19.167 | 1.19  | 2.56 | 1.919 | IO  |  |  |  |  | 4.81 |
| 19.250 | 1.17  | 2.49 | 1.910 | IO  |  |  |  |  | 4.79 |
| 19.333 | 1.15  | 2.43 | 1.901 | IO  |  |  |  |  | 4.77 |
| 19.417 | 1.13  | 2.36 | 1.892 | IO  |  |  |  |  | 4.75 |
| 19.500 | 1.11  | 2.30 | 1.884 | IO  |  |  |  |  | 4.73 |
| 19.583 | 1.10  | 2.24 | 1.876 | IO  |  |  |  |  | 4.71 |
| 19.667 | 1.08  | 2.19 | 1.868 | IO  |  |  |  |  | 4.69 |
| 19.750 | 1.06  | 2.13 | 1.861 | IO  |  |  |  |  | 4.67 |
| 19.833 | 1.05  | 2.08 | 1.854 | IO  |  |  |  |  | 4.66 |
| 19.917 | 1.03  | 2.03 | 1.847 | IO  |  |  |  |  | 4.64 |
| 20.000 | 1.02  | 1.98 | 1.840 | IO  |  |  |  |  | 4.62 |
| 20.083 | 1.01  | 1.93 | 1.834 | IO  |  |  |  |  | 4.61 |
| 20.167 | 0.99  | 1.88 | 1.827 | IO  |  |  |  |  | 4.59 |
| 20.250 | 0.98  | 1.84 | 1.821 | IO  |  |  |  |  | 4.58 |
| 20.333 | 0.97  | 1.80 | 1.815 | IO  |  |  |  |  | 4.56 |
| 20.417 | 0.96  | 1.75 | 1.810 | IO  |  |  |  |  | 4.55 |
| 20.500 | 0.95  | 1.71 | 1.805 | IO  |  |  |  |  | 4.54 |
| 20.583 | 0.93  | 1.68 | 1.799 | IO  |  |  |  |  | 4.53 |
| 20.667 | 0.92  | 1.64 | 1.794 | IO  |  |  |  |  | 4.51 |
| 20.750 | 0.91  | 1.60 | 1.789 | IO  |  |  |  |  | 4.50 |
| 20.833 | 0.90  | 1.57 | 1.785 | IO  |  |  |  |  | 4.49 |
| 20.917 | 0.89  | 1.54 | 1.780 | IO  |  |  |  |  | 4.48 |
| 21.000 | 0.88  | 1.51 | 1.776 | IO  |  |  |  |  | 4.47 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 21.083 | 0.87 | 1.48 | 1.772 | IO |  |  |  |  | 4.46 |
| 21.167 | 0.86 | 1.45 | 1.768 | IO |  |  |  |  | 4.45 |
| 21.250 | 0.86 | 1.42 | 1.764 | IO |  |  |  |  | 4.45 |
| 21.333 | 0.85 | 1.39 | 1.760 | IO |  |  |  |  | 4.44 |
| 21.417 | 0.84 | 1.37 | 1.756 | IO |  |  |  |  | 4.43 |
| 21.500 | 0.83 | 1.34 | 1.753 | O  |  |  |  |  | 4.42 |
| 21.583 | 0.82 | 1.32 | 1.749 | O  |  |  |  |  | 4.41 |
| 21.667 | 0.82 | 1.29 | 1.746 | O  |  |  |  |  | 4.41 |
| 21.750 | 0.81 | 1.27 | 1.743 | O  |  |  |  |  | 4.40 |
| 21.833 | 0.80 | 1.25 | 1.739 | O  |  |  |  |  | 4.39 |
| 21.917 | 0.79 | 1.23 | 1.736 | O  |  |  |  |  | 4.38 |
| 22.000 | 0.79 | 1.20 | 1.733 | O  |  |  |  |  | 4.38 |
| 22.083 | 0.78 | 1.18 | 1.731 | O  |  |  |  |  | 4.37 |
| 22.167 | 0.77 | 1.16 | 1.728 | O  |  |  |  |  | 4.37 |
| 22.250 | 0.77 | 1.15 | 1.725 | O  |  |  |  |  | 4.36 |
| 22.333 | 0.76 | 1.13 | 1.723 | O  |  |  |  |  | 4.35 |
| 22.417 | 0.75 | 1.11 | 1.720 | O  |  |  |  |  | 4.35 |
| 22.500 | 0.75 | 1.09 | 1.718 | O  |  |  |  |  | 4.34 |
| 22.583 | 0.74 | 1.08 | 1.715 | O  |  |  |  |  | 4.34 |
| 22.667 | 0.73 | 1.06 | 1.713 | O  |  |  |  |  | 4.33 |
| 22.750 | 0.73 | 1.04 | 1.711 | O  |  |  |  |  | 4.33 |
| 22.833 | 0.72 | 1.03 | 1.709 | O  |  |  |  |  | 4.32 |
| 22.917 | 0.72 | 1.01 | 1.707 | O  |  |  |  |  | 4.32 |
| 23.000 | 0.71 | 1.00 | 1.705 | O  |  |  |  |  | 4.31 |
| 23.083 | 0.71 | 0.99 | 1.703 | O  |  |  |  |  | 4.31 |
| 23.167 | 0.70 | 0.97 | 1.701 | O  |  |  |  |  | 4.31 |
| 23.250 | 0.70 | 0.96 | 1.699 | O  |  |  |  |  | 4.30 |
| 23.333 | 0.69 | 0.95 | 1.697 | O  |  |  |  |  | 4.30 |
| 23.417 | 0.69 | 0.93 | 1.695 | O  |  |  |  |  | 4.29 |
| 23.500 | 0.68 | 0.92 | 1.694 | O  |  |  |  |  | 4.29 |
| 23.583 | 0.68 | 0.91 | 1.692 | O  |  |  |  |  | 4.29 |
| 23.667 | 0.67 | 0.90 | 1.691 | O  |  |  |  |  | 4.28 |
| 23.750 | 0.67 | 0.89 | 1.689 | O  |  |  |  |  | 4.28 |
| 23.833 | 0.66 | 0.88 | 1.687 | O  |  |  |  |  | 4.28 |
| 23.917 | 0.66 | 0.87 | 1.686 | O  |  |  |  |  | 4.27 |
| 24.000 | 0.65 | 0.86 | 1.685 | O  |  |  |  |  | 4.27 |
| 24.083 | 0.58 | 0.85 | 1.683 | O  |  |  |  |  | 4.27 |
| 24.167 | 0.27 | 0.83 | 1.680 | O  |  |  |  |  | 4.26 |
| 24.250 | 0.14 | 0.80 | 1.676 | O  |  |  |  |  | 4.25 |
| 24.333 | 0.08 | 0.76 | 1.671 | O  |  |  |  |  | 4.24 |
| 24.417 | 0.05 | 0.73 | 1.667 | O  |  |  |  |  | 4.23 |
| 24.500 | 0.03 | 0.70 | 1.662 | O  |  |  |  |  | 4.22 |
| 24.583 | 0.02 | 0.67 | 1.658 | O  |  |  |  |  | 4.21 |
| 24.667 | 0.01 | 0.63 | 1.653 | O  |  |  |  |  | 4.20 |
| 24.750 | 0.00 | 0.60 | 1.649 | O  |  |  |  |  | 4.19 |
| 24.833 | 0.00 | 0.58 | 1.645 | O  |  |  |  |  | 4.18 |
| 24.917 | 0.00 | 0.55 | 1.641 | O  |  |  |  |  | 4.17 |
| 25.000 | 0.00 | 0.52 | 1.637 | O  |  |  |  |  | 4.16 |
| 25.083 | 0.00 | 0.50 | 1.634 | O  |  |  |  |  | 4.16 |
| 25.167 | 0.00 | 0.47 | 1.631 | O  |  |  |  |  | 4.15 |
| 25.250 | 0.00 | 0.45 | 1.627 | O  |  |  |  |  | 4.14 |
| 25.333 | 0.00 | 0.43 | 1.624 | O  |  |  |  |  | 4.13 |
| 25.417 | 0.00 | 0.41 | 1.621 | O  |  |  |  |  | 4.13 |
| 25.500 | 0.00 | 0.39 | 1.619 | O  |  |  |  |  | 4.12 |
| 25.583 | 0.00 | 0.37 | 1.616 | O  |  |  |  |  | 4.12 |
| 25.667 | 0.00 | 0.35 | 1.614 | O  |  |  |  |  | 4.11 |
| 25.750 | 0.00 | 0.34 | 1.611 | O  |  |  |  |  | 4.11 |
| 25.833 | 0.00 | 0.32 | 1.609 | O  |  |  |  |  | 4.10 |
| 25.917 | 0.00 | 0.30 | 1.607 | O  |  |  |  |  | 4.10 |
| 26.000 | 0.00 | 0.29 | 1.605 | O  |  |  |  |  | 4.09 |
| 26.083 | 0.00 | 0.28 | 1.603 | O  |  |  |  |  | 4.09 |
| 26.167 | 0.00 | 0.26 | 1.601 | O  |  |  |  |  | 4.08 |
| 26.250 | 0.00 | 0.25 | 1.599 | O  |  |  |  |  | 4.08 |
| 26.333 | 0.00 | 0.24 | 1.598 | O  |  |  |  |  | 4.07 |
| 26.417 | 0.00 | 0.23 | 1.596 | O  |  |  |  |  | 4.07 |
| 26.500 | 0.00 | 0.22 | 1.594 | O  |  |  |  |  | 4.07 |
| 26.583 | 0.00 | 0.21 | 1.593 | O  |  |  |  |  | 4.06 |
| 26.667 | 0.00 | 0.20 | 1.592 | O  |  |  |  |  | 4.06 |
| 26.750 | 0.00 | 0.19 | 1.590 | O  |  |  |  |  | 4.06 |
| 26.833 | 0.00 | 0.18 | 1.589 | O  |  |  |  |  | 4.06 |
| 26.917 | 0.00 | 0.17 | 1.588 | O  |  |  |  |  | 4.05 |
| 27.000 | 0.00 | 0.16 | 1.587 | O  |  |  |  |  | 4.05 |
| 27.083 | 0.00 | 0.15 | 1.586 | O  |  |  |  |  | 4.05 |
| 27.167 | 0.00 | 0.15 | 1.585 | O  |  |  |  |  | 4.05 |
| 27.250 | 0.00 | 0.14 | 1.584 | O  |  |  |  |  | 4.04 |
| 27.333 | 0.00 | 0.13 | 1.583 | O  |  |  |  |  | 4.04 |
| 27.417 | 0.00 | 0.13 | 1.582 | O  |  |  |  |  | 4.04 |
| 27.500 | 0.00 | 0.12 | 1.581 | O  |  |  |  |  | 4.04 |
| 27.583 | 0.00 | 0.11 | 1.580 | O  |  |  |  |  | 4.04 |
| 27.667 | 0.00 | 0.11 | 1.579 | O  |  |  |  |  | 4.03 |
| 27.750 | 0.00 | 0.10 | 1.579 | O  |  |  |  |  | 4.03 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 27.833 | 0.00 | 0.10 | 1.578 | 0 |  |  |  |  | 4.03 |
| 27.917 | 0.00 | 0.09 | 1.577 | 0 |  |  |  |  | 4.03 |
| 28.000 | 0.00 | 0.09 | 1.577 | 0 |  |  |  |  | 4.03 |
| 28.083 | 0.00 | 0.09 | 1.576 | 0 |  |  |  |  | 4.03 |
| 28.167 | 0.00 | 0.08 | 1.575 | 0 |  |  |  |  | 4.03 |
| 28.250 | 0.00 | 0.08 | 1.575 | 0 |  |  |  |  | 4.02 |
| 28.333 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 28.417 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 28.500 | 0.00 | 0.07 | 1.573 | 0 |  |  |  |  | 4.02 |
| 28.583 | 0.00 | 0.06 | 1.573 | 0 |  |  |  |  | 4.02 |
| 28.667 | 0.00 | 0.06 | 1.573 | 0 |  |  |  |  | 4.02 |
| 28.750 | 0.00 | 0.06 | 1.572 | 0 |  |  |  |  | 4.02 |
| 28.833 | 0.00 | 0.05 | 1.572 | 0 |  |  |  |  | 4.02 |
| 28.917 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 29.000 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 29.083 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.01 |
| 29.167 | 0.00 | 0.05 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.250 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.333 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.417 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.500 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.583 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.667 | 0.00 | 0.03 | 1.569 | 0 |  |  |  |  | 4.01 |
| 29.750 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.833 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 29.917 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.000 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.083 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.167 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.250 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.333 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.417 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.500 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.583 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.667 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.750 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.833 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 30.917 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 31.000 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.083 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.167 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.250 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.333 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.417 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.500 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.583 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.667 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.750 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.833 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 31.917 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.000 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.083 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.167 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.250 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.333 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.417 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.500 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.583 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.667 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.750 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.833 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.917 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.000 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.083 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.167 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.250 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.333 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.417 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 33.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 34.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

Remaining water in basin = 1.56 (Ac.Ft)

```
*****HYDROGRAPH DATA*****
      Number of intervals = 428
      Time interval = 5.0 (Min.)
      Maximum/Peak flow rate = 6.541 (CFS)
      Total volume = 1.853 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

```
+++++
Process from Point/Station 6.000 to Point/Station 13.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
```

```
Current stream hydrograph saved in file route.rte
*****HYDROGRAPH DATA*****
      Number of intervals = 0
      Time interval = 0.0 (Min.)
      Maximum/Peak flow rate = 0.000 (CFS)
      Total volume = 0.000 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

FLOOD HYDROGRAPH ROUTING PROGRAM  
Copyright (C) CIVILCADD/CIVILDESIGN, 1989 - 2018  
Study date: 06/23/22

-----  
224986 FISHER CONSTRUCTION - GTS COLD STORAGE APPLE VALLEY  
DEVELOPED CONDITION - ROUTE  
100-YEAR, 24-HOUR STORM  
BY: JTS DATE: 06-23-22  
-----

Program License Serial Number 6320

-----  
\*\*\*\*\* HYDROGRAPH INFORMATION \*\*\*\*\*

From study/file name: [REDACTED]  
\*\*\*\*\*HYDROGRAPH DATA\*\*\*\*\*  
Number of intervals = 297  
Time interval = 5.0 (Min.)  
Maximum/Peak flow rate = 59.384 (CFS)  
Total volume = 4.489 (Ac.Ft)  
Status of hydrographs being held in storage  
Stream 1 Stream 2 Stream 3 Stream 4 Stream 5  
Peak (CFS) 0.000 0.000 0.000 0.000 0.000  
Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000  
\*\*\*\*\*

+++++  
Process from Point/Station 6.000 to Point/Station 13.000  
\*\*\*\* RETARDING BASIN ROUTING \*\*\*\*  
-----

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH = 0.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.50(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.00(Ft.))  
Total outflow at this depth = 0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
Manning's N = 0.013 No. of pipes = 1  
Given pipe size = 15.00(In.)  
Calculated individual pipe flow = 1.593(CFS)  
Normal flow depth in pipe = 5.07(In.)  
Flow top width inside pipe = 14.19(In.)  
Critical depth = 0.50(Ft.)  
Calculated flow rate through pipe(s) = 1.593(CFS)  
Total outflow at this depth = 1.59(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))  
Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)

Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 0.450(Ft.)  
 Pipe friction loss = 0.106(Ft.)  
 Minor friction loss = 0.344(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 4.713(CFS)

Total outflow at this depth = 4.71(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 1.450(Ft.)  
 Pipe friction loss = 0.343(Ft.)  
 Minor friction loss = 1.107(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 8.460(CFS)

Total outflow at this depth = 8.46(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.00(Ft.)  
 Pipe length = 20.00(Ft.) Elevation difference = 0.20(Ft.)  
 Manning's N = 0.013 No. of pipes = 1  
 Given pipe size = 15.00(In.)  
 NOTE: Assuming outlet depth at soffit of outlet.  
 NOTE: Normal flow is pressure flow.  
 The total friction loss through the pipe is 2.950(Ft.)  
 Pipe friction loss = 0.698(Ft.)  
 Minor friction loss = 2.252(Ft.) K-factor = 1.50  
 Calculated flow rate through pipe(s) = 12.067(CFS)

Total outflow at this depth = 12.07(CFS)

-----  
 Total number of inflow hydrograph intervals = 297  
 Hydrograph time unit = 5.000 (Min.)  
 Initial depth in storage basin = 0.00(Ft.)  
 -----

-----  
 Initial basin depth = 0.00 (Ft.)  
 Initial basin storage = 0.00 (Ac.Ft)  
 Initial basin outflow = 0.00 (CFS)  
 -----

-----  
 Depth vs. Storage and Depth vs. Discharge data:  

| Basin Depth<br>(Ft.) | Storage<br>(Ac.Ft) | Outflow<br>(CFS) | (S-O*dt/2)<br>(Ac.Ft) | (S+O*dt/2)<br>(Ac.Ft) |
|----------------------|--------------------|------------------|-----------------------|-----------------------|
| 0.000                | 0.000              | 0.000            | 0.000                 | 0.000                 |
| 0.500                | 0.116              | 0.000            | 0.116                 | 0.116                 |
| 1.500                | 0.463              | 0.000            | 0.463                 | 0.463                 |
| 2.500                | 0.886              | 0.000            | 0.886                 | 0.886                 |
| 3.500                | 1.337              | 0.000            | 1.337                 | 1.337                 |
| 4.000                | 1.564              | 0.000            | 1.564                 | 1.564                 |
| 4.500                | 1.788              | 1.593            | 1.783                 | 1.793                 |
| 5.500                | 2.211              | 4.713            | 2.195                 | 2.227                 |
| 6.500                | 2.558              | 8.460            | 2.529                 | 2.587                 |
| 8.000                | 2.905              | 12.067           | 2.863                 | 2.947                 |

 -----

-----  
 Hydrograph Detention Basin Routing  
 -----

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

| Time<br>(Hours) | Inflow<br>(CFS) | Outflow<br>(CFS) | Storage<br>(Ac.Ft) | .0 | 14.8 | 29.69 | 44.54 | 59.38 | Depth<br>(Ft.) |
|-----------------|-----------------|------------------|--------------------|----|------|-------|-------|-------|----------------|
| 0.083           | 0.09            | 0.00             | 0.000              | 0  |      |       |       |       | 0.00           |
| 0.167           | 0.49            | 0.00             | 0.002              | 0  |      |       |       |       | 0.01           |
| 0.250           | 0.66            | 0.00             | 0.006              | 0  |      |       |       |       | 0.03           |
| 0.333           | 0.74            | 0.00             | 0.011              | 0  |      |       |       |       | 0.05           |
| 0.417           | 0.78            | 0.00             | 0.016              | 0  |      |       |       |       | 0.07           |
| 0.500           | 0.81            | 0.00             | 0.022              | 0  |      |       |       |       | 0.09           |
| 0.583           | 0.83            | 0.00             | 0.028              | 0  |      |       |       |       | 0.12           |
| 0.667           | 0.85            | 0.00             | 0.033              | 0  |      |       |       |       | 0.14           |
| 0.750           | 0.86            | 0.00             | 0.039              | 0  |      |       |       |       | 0.17           |

|       |      |      |       |   |  |  |  |  |      |
|-------|------|------|-------|---|--|--|--|--|------|
| 0.833 | 0.86 | 0.00 | 0.045 | 0 |  |  |  |  | 0.19 |
| 0.917 | 0.87 | 0.00 | 0.051 | 0 |  |  |  |  | 0.22 |
| 1.000 | 0.87 | 0.00 | 0.057 | 0 |  |  |  |  | 0.25 |
| 1.083 | 0.87 | 0.00 | 0.063 | 0 |  |  |  |  | 0.27 |
| 1.167 | 0.88 | 0.00 | 0.069 | 0 |  |  |  |  | 0.30 |
| 1.250 | 0.88 | 0.00 | 0.075 | 0 |  |  |  |  | 0.32 |
| 1.333 | 0.88 | 0.00 | 0.081 | 0 |  |  |  |  | 0.35 |
| 1.417 | 0.89 | 0.00 | 0.087 | 0 |  |  |  |  | 0.38 |
| 1.500 | 0.89 | 0.00 | 0.093 | 0 |  |  |  |  | 0.40 |
| 1.583 | 0.89 | 0.00 | 0.100 | 0 |  |  |  |  | 0.43 |
| 1.667 | 0.89 | 0.00 | 0.106 | 0 |  |  |  |  | 0.46 |
| 1.750 | 0.90 | 0.00 | 0.112 | 0 |  |  |  |  | 0.48 |
| 1.833 | 0.90 | 0.00 | 0.118 | 0 |  |  |  |  | 0.51 |
| 1.917 | 0.90 | 0.00 | 0.124 | 0 |  |  |  |  | 0.52 |
| 2.000 | 0.91 | 0.00 | 0.130 | 0 |  |  |  |  | 0.54 |
| 2.083 | 0.91 | 0.00 | 0.137 | 0 |  |  |  |  | 0.56 |
| 2.167 | 0.91 | 0.00 | 0.143 | 0 |  |  |  |  | 0.58 |
| 2.250 | 0.92 | 0.00 | 0.149 | 0 |  |  |  |  | 0.60 |
| 2.333 | 0.92 | 0.00 | 0.156 | 0 |  |  |  |  | 0.61 |
| 2.417 | 0.92 | 0.00 | 0.162 | 0 |  |  |  |  | 0.63 |
| 2.500 | 0.93 | 0.00 | 0.168 | 0 |  |  |  |  | 0.65 |
| 2.583 | 0.93 | 0.00 | 0.175 | 0 |  |  |  |  | 0.67 |
| 2.667 | 0.93 | 0.00 | 0.181 | 0 |  |  |  |  | 0.69 |
| 2.750 | 0.94 | 0.00 | 0.188 | 0 |  |  |  |  | 0.71 |
| 2.833 | 0.94 | 0.00 | 0.194 | 0 |  |  |  |  | 0.73 |
| 2.917 | 0.95 | 0.00 | 0.201 | 0 |  |  |  |  | 0.74 |
| 3.000 | 0.95 | 0.00 | 0.207 | 0 |  |  |  |  | 0.76 |
| 3.083 | 0.95 | 0.00 | 0.214 | 0 |  |  |  |  | 0.78 |
| 3.167 | 0.96 | 0.00 | 0.220 | 0 |  |  |  |  | 0.80 |
| 3.250 | 0.96 | 0.00 | 0.227 | 0 |  |  |  |  | 0.82 |
| 3.333 | 0.96 | 0.00 | 0.234 | 0 |  |  |  |  | 0.84 |
| 3.417 | 0.97 | 0.00 | 0.240 | 0 |  |  |  |  | 0.86 |
| 3.500 | 0.97 | 0.00 | 0.247 | 0 |  |  |  |  | 0.88 |
| 3.583 | 0.98 | 0.00 | 0.254 | 0 |  |  |  |  | 0.90 |
| 3.667 | 0.98 | 0.00 | 0.260 | 0 |  |  |  |  | 0.92 |
| 3.750 | 0.98 | 0.00 | 0.267 | 0 |  |  |  |  | 0.94 |
| 3.833 | 0.99 | 0.00 | 0.274 | 0 |  |  |  |  | 0.95 |
| 3.917 | 0.99 | 0.00 | 0.281 | 0 |  |  |  |  | 0.97 |
| 4.000 | 1.00 | 0.00 | 0.287 | 0 |  |  |  |  | 0.99 |
| 4.083 | 1.00 | 0.00 | 0.294 | 0 |  |  |  |  | 1.01 |
| 4.167 | 1.00 | 0.00 | 0.301 | 0 |  |  |  |  | 1.03 |
| 4.250 | 1.01 | 0.00 | 0.308 | 0 |  |  |  |  | 1.05 |
| 4.333 | 1.01 | 0.00 | 0.315 | 0 |  |  |  |  | 1.07 |
| 4.417 | 1.02 | 0.00 | 0.322 | 0 |  |  |  |  | 1.09 |
| 4.500 | 1.02 | 0.00 | 0.329 | 0 |  |  |  |  | 1.11 |
| 4.583 | 1.03 | 0.00 | 0.336 | 0 |  |  |  |  | 1.13 |
| 4.667 | 1.03 | 0.00 | 0.343 | 0 |  |  |  |  | 1.16 |
| 4.750 | 1.04 | 0.00 | 0.350 | 0 |  |  |  |  | 1.18 |
| 4.833 | 1.04 | 0.00 | 0.358 | 0 |  |  |  |  | 1.20 |
| 4.917 | 1.04 | 0.00 | 0.365 | 0 |  |  |  |  | 1.22 |
| 5.000 | 1.05 | 0.00 | 0.372 | 0 |  |  |  |  | 1.24 |
| 5.083 | 1.05 | 0.00 | 0.379 | 0 |  |  |  |  | 1.26 |
| 5.167 | 1.06 | 0.00 | 0.387 | 0 |  |  |  |  | 1.28 |
| 5.250 | 1.06 | 0.00 | 0.394 | 0 |  |  |  |  | 1.30 |
| 5.333 | 1.07 | 0.00 | 0.401 | 0 |  |  |  |  | 1.32 |
| 5.417 | 1.07 | 0.00 | 0.409 | 0 |  |  |  |  | 1.34 |
| 5.500 | 1.08 | 0.00 | 0.416 | 0 |  |  |  |  | 1.36 |
| 5.583 | 1.08 | 0.00 | 0.423 | 0 |  |  |  |  | 1.39 |
| 5.667 | 1.09 | 0.00 | 0.431 | 0 |  |  |  |  | 1.41 |
| 5.750 | 1.10 | 0.00 | 0.438 | 0 |  |  |  |  | 1.43 |
| 5.833 | 1.10 | 0.00 | 0.446 | 0 |  |  |  |  | 1.45 |
| 5.917 | 1.11 | 0.00 | 0.454 | 0 |  |  |  |  | 1.47 |
| 6.000 | 1.11 | 0.00 | 0.461 | 0 |  |  |  |  | 1.50 |
| 6.083 | 1.12 | 0.00 | 0.469 | 0 |  |  |  |  | 1.51 |
| 6.167 | 1.12 | 0.00 | 0.477 | 0 |  |  |  |  | 1.53 |
| 6.250 | 1.13 | 0.00 | 0.484 | 0 |  |  |  |  | 1.55 |
| 6.333 | 1.14 | 0.00 | 0.492 | 0 |  |  |  |  | 1.57 |
| 6.417 | 1.14 | 0.00 | 0.500 | 0 |  |  |  |  | 1.59 |
| 6.500 | 1.15 | 0.00 | 0.508 | 0 |  |  |  |  | 1.61 |
| 6.583 | 1.15 | 0.00 | 0.516 | 0 |  |  |  |  | 1.62 |
| 6.667 | 1.16 | 0.00 | 0.524 | 0 |  |  |  |  | 1.64 |
| 6.750 | 1.17 | 0.00 | 0.532 | 0 |  |  |  |  | 1.66 |
| 6.833 | 1.17 | 0.00 | 0.540 | 0 |  |  |  |  | 1.68 |
| 6.917 | 1.18 | 0.00 | 0.548 | 0 |  |  |  |  | 1.70 |
| 7.000 | 1.19 | 0.00 | 0.556 | 0 |  |  |  |  | 1.72 |
| 7.083 | 1.19 | 0.00 | 0.564 | 0 |  |  |  |  | 1.74 |
| 7.167 | 1.20 | 0.00 | 0.573 | 0 |  |  |  |  | 1.76 |
| 7.250 | 1.20 | 0.00 | 0.581 | 0 |  |  |  |  | 1.78 |
| 7.333 | 1.21 | 0.00 | 0.589 | 0 |  |  |  |  | 1.80 |
| 7.417 | 1.22 | 0.00 | 0.597 | 0 |  |  |  |  | 1.82 |
| 7.500 | 1.23 | 0.00 | 0.606 | 0 |  |  |  |  | 1.84 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 7.583  | 1.23 | 0.00 | 0.614 | O  |  |  |  |  | 1.86 |
| 7.667  | 1.24 | 0.00 | 0.623 | O  |  |  |  |  | 1.88 |
| 7.750  | 1.25 | 0.00 | 0.631 | O  |  |  |  |  | 1.90 |
| 7.833  | 1.26 | 0.00 | 0.640 | O  |  |  |  |  | 1.92 |
| 7.917  | 1.26 | 0.00 | 0.649 | O  |  |  |  |  | 1.94 |
| 8.000  | 1.27 | 0.00 | 0.657 | O  |  |  |  |  | 1.96 |
| 8.083  | 1.28 | 0.00 | 0.666 | O  |  |  |  |  | 1.98 |
| 8.167  | 1.29 | 0.00 | 0.675 | O  |  |  |  |  | 2.00 |
| 8.250  | 1.30 | 0.00 | 0.684 | O  |  |  |  |  | 2.02 |
| 8.333  | 1.30 | 0.00 | 0.693 | O  |  |  |  |  | 2.04 |
| 8.417  | 1.31 | 0.00 | 0.702 | O  |  |  |  |  | 2.06 |
| 8.500  | 1.32 | 0.00 | 0.711 | O  |  |  |  |  | 2.09 |
| 8.583  | 1.33 | 0.00 | 0.720 | O  |  |  |  |  | 2.11 |
| 8.667  | 1.34 | 0.00 | 0.729 | O  |  |  |  |  | 2.13 |
| 8.750  | 1.35 | 0.00 | 0.739 | O  |  |  |  |  | 2.15 |
| 8.833  | 1.36 | 0.00 | 0.748 | O  |  |  |  |  | 2.17 |
| 8.917  | 1.37 | 0.00 | 0.757 | O  |  |  |  |  | 2.20 |
| 9.000  | 1.38 | 0.00 | 0.767 | O  |  |  |  |  | 2.22 |
| 9.083  | 1.39 | 0.00 | 0.776 | O  |  |  |  |  | 2.24 |
| 9.167  | 1.40 | 0.00 | 0.786 | O  |  |  |  |  | 2.26 |
| 9.250  | 1.41 | 0.00 | 0.796 | O  |  |  |  |  | 2.29 |
| 9.333  | 1.42 | 0.00 | 0.805 | O  |  |  |  |  | 2.31 |
| 9.417  | 1.43 | 0.00 | 0.815 | O  |  |  |  |  | 2.33 |
| 9.500  | 1.44 | 0.00 | 0.825 | O  |  |  |  |  | 2.36 |
| 9.583  | 1.45 | 0.00 | 0.835 | O  |  |  |  |  | 2.38 |
| 9.667  | 1.46 | 0.00 | 0.845 | O  |  |  |  |  | 2.40 |
| 9.750  | 1.47 | 0.00 | 0.855 | O  |  |  |  |  | 2.43 |
| 9.833  | 1.49 | 0.00 | 0.865 | O  |  |  |  |  | 2.45 |
| 9.917  | 1.50 | 0.00 | 0.876 | O  |  |  |  |  | 2.48 |
| 10.000 | 1.51 | 0.00 | 0.886 | O  |  |  |  |  | 2.50 |
| 10.083 | 1.52 | 0.00 | 0.896 | O  |  |  |  |  | 2.52 |
| 10.167 | 1.54 | 0.00 | 0.907 | O  |  |  |  |  | 2.55 |
| 10.250 | 1.55 | 0.00 | 0.917 | O  |  |  |  |  | 2.57 |
| 10.333 | 1.56 | 0.00 | 0.928 | O  |  |  |  |  | 2.59 |
| 10.417 | 1.58 | 0.00 | 0.939 | O  |  |  |  |  | 2.62 |
| 10.500 | 1.59 | 0.00 | 0.950 | O  |  |  |  |  | 2.64 |
| 10.583 | 1.60 | 0.00 | 0.961 | O  |  |  |  |  | 2.67 |
| 10.667 | 1.62 | 0.00 | 0.972 | O  |  |  |  |  | 2.69 |
| 10.750 | 1.63 | 0.00 | 0.983 | O  |  |  |  |  | 2.72 |
| 10.833 | 1.65 | 0.00 | 0.995 | O  |  |  |  |  | 2.74 |
| 10.917 | 1.67 | 0.00 | 1.006 | O  |  |  |  |  | 2.77 |
| 11.000 | 1.68 | 0.00 | 1.017 | O  |  |  |  |  | 2.79 |
| 11.083 | 1.70 | 0.00 | 1.029 | O  |  |  |  |  | 2.82 |
| 11.167 | 1.72 | 0.00 | 1.041 | O  |  |  |  |  | 2.84 |
| 11.250 | 1.73 | 0.00 | 1.053 | O  |  |  |  |  | 2.87 |
| 11.333 | 1.75 | 0.00 | 1.065 | O  |  |  |  |  | 2.90 |
| 11.417 | 1.77 | 0.00 | 1.077 | O  |  |  |  |  | 2.92 |
| 11.500 | 1.79 | 0.00 | 1.089 | O  |  |  |  |  | 2.95 |
| 11.583 | 1.81 | 0.00 | 1.102 | O  |  |  |  |  | 2.98 |
| 11.667 | 1.83 | 0.00 | 1.114 | O  |  |  |  |  | 3.01 |
| 11.750 | 1.85 | 0.00 | 1.127 | O  |  |  |  |  | 3.03 |
| 11.833 | 1.87 | 0.00 | 1.140 | OI |  |  |  |  | 3.06 |
| 11.917 | 1.89 | 0.00 | 1.153 | OI |  |  |  |  | 3.09 |
| 12.000 | 1.92 | 0.00 | 1.166 | OI |  |  |  |  | 3.12 |
| 12.083 | 1.92 | 0.00 | 1.179 | OI |  |  |  |  | 3.15 |
| 12.167 | 1.85 | 0.00 | 1.192 | O  |  |  |  |  | 3.18 |
| 12.250 | 1.84 | 0.00 | 1.205 | O  |  |  |  |  | 3.21 |
| 12.333 | 1.85 | 0.00 | 1.217 | O  |  |  |  |  | 3.23 |
| 12.417 | 1.86 | 0.00 | 1.230 | OI |  |  |  |  | 3.26 |
| 12.500 | 1.88 | 0.00 | 1.243 | OI |  |  |  |  | 3.29 |
| 12.583 | 1.91 | 0.00 | 1.256 | OI |  |  |  |  | 3.32 |
| 12.667 | 1.93 | 0.00 | 1.269 | OI |  |  |  |  | 3.35 |
| 12.750 | 1.96 | 0.00 | 1.283 | OI |  |  |  |  | 3.38 |
| 12.833 | 1.99 | 0.00 | 1.296 | OI |  |  |  |  | 3.41 |
| 12.917 | 2.02 | 0.00 | 1.310 | OI |  |  |  |  | 3.44 |
| 13.000 | 2.06 | 0.00 | 1.324 | OI |  |  |  |  | 3.47 |
| 13.083 | 2.09 | 0.00 | 1.338 | OI |  |  |  |  | 3.50 |
| 13.167 | 2.13 | 0.00 | 1.353 | OI |  |  |  |  | 3.54 |
| 13.250 | 2.17 | 0.00 | 1.368 | OI |  |  |  |  | 3.57 |
| 13.333 | 2.21 | 0.00 | 1.383 | OI |  |  |  |  | 3.60 |
| 13.417 | 2.25 | 0.00 | 1.398 | OI |  |  |  |  | 3.63 |
| 13.500 | 2.30 | 0.00 | 1.414 | OI |  |  |  |  | 3.67 |
| 13.583 | 2.35 | 0.00 | 1.430 | OI |  |  |  |  | 3.70 |
| 13.667 | 2.40 | 0.00 | 1.446 | OI |  |  |  |  | 3.74 |
| 13.750 | 2.45 | 0.00 | 1.463 | OI |  |  |  |  | 3.78 |
| 13.833 | 2.51 | 0.00 | 1.480 | OI |  |  |  |  | 3.82 |
| 13.917 | 2.56 | 0.00 | 1.497 | OI |  |  |  |  | 3.85 |
| 14.000 | 2.63 | 0.00 | 1.515 | OI |  |  |  |  | 3.89 |
| 14.083 | 2.69 | 0.00 | 1.534 | OI |  |  |  |  | 3.93 |
| 14.167 | 2.77 | 0.00 | 1.553 | OI |  |  |  |  | 3.97 |
| 14.250 | 2.84 | 0.05 | 1.572 | OI |  |  |  |  | 4.02 |

|        |       |       |       |     |   |   |   |  |      |
|--------|-------|-------|-------|-----|---|---|---|--|------|
| 14.333 | 2.93  | 0.19  | 1.591 | OI  |   |   |   |  | 4.06 |
| 14.417 | 3.01  | 0.32  | 1.609 | OI  |   |   |   |  | 4.10 |
| 14.500 | 3.12  | 0.45  | 1.628 | OI  |   |   |   |  | 4.14 |
| 14.583 | 3.21  | 0.58  | 1.646 | OI  |   |   |   |  | 4.18 |
| 14.667 | 3.33  | 0.71  | 1.664 | OI  |   |   |   |  | 4.22 |
| 14.750 | 3.45  | 0.84  | 1.682 | OI  |   |   |   |  | 4.26 |
| 14.833 | 3.59  | 0.97  | 1.700 | OI  |   |   |   |  | 4.30 |
| 14.917 | 3.73  | 1.10  | 1.718 | O I |   |   |   |  | 4.34 |
| 15.000 | 3.91  | 1.23  | 1.737 | O I |   |   |   |  | 4.39 |
| 15.083 | 4.09  | 1.36  | 1.755 | O I |   |   |   |  | 4.43 |
| 15.167 | 4.31  | 1.50  | 1.774 | O I |   |   |   |  | 4.47 |
| 15.250 | 4.54  | 1.64  | 1.794 | O I |   |   |   |  | 4.51 |
| 15.333 | 4.84  | 1.79  | 1.815 | O I |   |   |   |  | 4.56 |
| 15.417 | 5.06  | 1.95  | 1.836 | OI  |   |   |   |  | 4.61 |
| 15.500 | 5.12  | 2.10  | 1.857 | OI  |   |   |   |  | 4.66 |
| 15.583 | 5.40  | 2.26  | 1.878 | OI  |   |   |   |  | 4.71 |
| 15.667 | 6.02  | 2.43  | 1.901 | O I |   |   |   |  | 4.77 |
| 15.750 | 6.79  | 2.63  | 1.928 | O I |   |   |   |  | 4.83 |
| 15.833 | 8.10  | 2.86  | 1.960 | O I |   |   |   |  | 4.91 |
| 15.917 | 9.97  | 3.17  | 2.002 | O I |   |   |   |  | 5.01 |
| 16.000 | 14.14 | 3.61  | 2.062 | O I |   |   |   |  | 5.15 |
| 16.083 | 28.40 | 4.49  | 2.180 | O   |   | I |   |  | 5.43 |
| 16.167 | 59.38 | 7.21  | 2.442 | O   |   |   | I |  | 6.17 |
| 16.250 | 32.39 | 9.93  | 2.699 | O   |   | I |   |  | 7.11 |
| 16.333 | 18.84 | 11.01 | 2.803 | O   | I |   |   |  | 7.56 |
| 16.417 | 12.93 |       | 2.836 | O   |   |   |   |  |      |
| 16.500 | 9.94  | 11.35 | 2.836 | O   |   |   |   |  | 7.70 |
| 16.583 | 7.86  | 11.18 | 2.820 | O   |   |   |   |  | 7.63 |
| 16.667 | 6.25  | 10.90 | 2.793 | O   |   |   |   |  | 7.51 |
| 16.750 | 5.50  | 10.55 | 2.759 | O   |   |   |   |  | 7.37 |
| 16.833 | 4.74  | 10.18 | 2.723 | O   |   |   |   |  | 7.21 |
| 16.917 | 3.72  | 9.77  | 2.684 | O   |   |   |   |  | 7.04 |
| 17.000 | 3.40  | 9.34  | 2.642 | O   |   |   |   |  | 6.86 |
| 17.083 | 3.16  | 8.92  | 2.602 | O   |   |   |   |  | 6.69 |
| 17.167 | 2.97  | 8.51  | 2.563 | O   |   |   |   |  | 6.52 |
| 17.250 | 2.80  | 8.11  | 2.526 | O   |   |   |   |  | 6.41 |
| 17.333 | 2.65  | 7.73  | 2.490 | O   |   |   |   |  | 6.30 |
| 17.417 | 2.53  | 7.36  | 2.456 | O   |   |   |   |  | 6.21 |
| 17.500 | 2.41  | 7.01  | 2.423 | O   |   |   |   |  | 6.11 |
| 17.583 | 2.31  | 6.67  | 2.393 | O   |   |   |   |  | 6.02 |
| 17.667 | 2.22  | 6.36  | 2.363 | O   |   |   |   |  | 5.94 |
| 17.750 | 2.14  | 6.06  | 2.336 | O   |   |   |   |  | 5.86 |
| 17.833 | 2.07  | 5.77  | 2.309 | O   |   |   |   |  | 5.78 |
| 17.917 | 2.00  | 5.51  | 2.284 | O   |   |   |   |  | 5.71 |
| 18.000 | 1.94  | 5.25  | 2.261 | O   |   |   |   |  | 5.64 |
| 18.083 | 1.90  | 5.01  | 2.239 | O   |   |   |   |  | 5.58 |
| 18.167 | 1.94  | 4.79  | 2.218 | O   |   |   |   |  | 5.52 |
| 18.250 | 1.93  | 4.63  | 2.199 | O   |   |   |   |  | 5.47 |
| 18.333 | 1.90  | 4.49  | 2.181 | O   |   |   |   |  | 5.43 |
| 18.417 | 1.86  | 4.36  | 2.163 | O   |   |   |   |  | 5.39 |
| 18.500 | 1.82  | 4.24  | 2.146 | O   |   |   |   |  | 5.35 |
| 18.583 | 1.79  | 4.12  | 2.130 | O   |   |   |   |  | 5.31 |
| 18.667 | 1.75  | 4.00  | 2.114 | O   |   |   |   |  | 5.27 |
| 18.750 | 1.72  | 3.89  | 2.099 | O   |   |   |   |  | 5.24 |
| 18.833 | 1.68  | 3.78  | 2.084 | O   |   |   |   |  | 5.20 |
| 18.917 | 1.65  | 3.67  | 2.070 | O   |   |   |   |  | 5.17 |
| 19.000 | 1.62  | 3.57  | 2.057 | O   |   |   |   |  | 5.13 |
| 19.083 | 1.59  | 3.48  | 2.043 | O   |   |   |   |  | 5.10 |
| 19.167 | 1.56  | 3.38  | 2.031 | O   |   |   |   |  | 5.07 |
| 19.250 | 1.54  | 3.29  | 2.018 | O   |   |   |   |  | 5.04 |
| 19.333 | 1.51  | 3.20  | 2.006 | O   |   |   |   |  | 5.02 |
| 19.417 | 1.49  | 3.12  | 1.995 | O   |   |   |   |  | 4.99 |
| 19.500 | 1.46  | 3.04  | 1.984 | O   |   |   |   |  | 4.96 |
| 19.583 | 1.44  | 2.96  | 1.973 | O   |   |   |   |  | 4.94 |
| 19.667 | 1.42  | 2.88  | 1.963 | O   |   |   |   |  | 4.91 |
| 19.750 | 1.40  | 2.81  | 1.953 | O   |   |   |   |  | 4.89 |
| 19.833 | 1.38  | 2.74  | 1.944 | O   |   |   |   |  | 4.87 |
| 19.917 | 1.36  | 2.67  | 1.934 | O   |   |   |   |  | 4.85 |
| 20.000 | 1.34  | 2.61  | 1.925 | O   |   |   |   |  | 4.82 |
| 20.083 | 1.32  | 2.54  | 1.917 | O   |   |   |   |  | 4.80 |
| 20.167 | 1.31  | 2.48  | 1.909 | O   |   |   |   |  | 4.79 |
| 20.250 | 1.29  | 2.42  | 1.901 | O   |   |   |   |  | 4.77 |
| 20.333 | 1.27  | 2.37  | 1.893 | O   |   |   |   |  | 4.75 |
| 20.417 | 1.26  | 2.31  | 1.886 | O   |   |   |   |  | 4.73 |
| 20.500 | 1.24  | 2.26  | 1.878 | O   |   |   |   |  | 4.71 |
| 20.583 | 1.23  | 2.21  | 1.872 | O   |   |   |   |  | 4.70 |
| 20.667 | 1.21  | 2.16  | 1.865 | O   |   |   |   |  | 4.68 |
| 20.750 | 1.20  | 2.11  | 1.858 | O   |   |   |   |  | 4.67 |
| 20.833 | 1.19  | 2.07  | 1.852 | O   |   |   |   |  | 4.65 |
| 20.917 | 1.17  | 2.02  | 1.846 | O   |   |   |   |  | 4.64 |
| 21.000 | 1.16  | 1.98  | 1.841 | O   |   |   |   |  | 4.62 |

|        |      |      |       |    |  |  |  |  |      |
|--------|------|------|-------|----|--|--|--|--|------|
| 21.083 | 1.15 | 1.94 | 1.835 | IO |  |  |  |  | 4.61 |
| 21.167 | 1.14 | 1.90 | 1.830 | IO |  |  |  |  | 4.60 |
| 21.250 | 1.12 | 1.86 | 1.824 | IO |  |  |  |  | 4.59 |
| 21.333 | 1.11 | 1.83 | 1.819 | O  |  |  |  |  | 4.57 |
| 21.417 | 1.10 | 1.79 | 1.815 | O  |  |  |  |  | 4.56 |
| 21.500 | 1.09 | 1.76 | 1.810 | O  |  |  |  |  | 4.55 |
| 21.583 | 1.08 | 1.72 | 1.806 | O  |  |  |  |  | 4.54 |
| 21.667 | 1.07 | 1.69 | 1.801 | O  |  |  |  |  | 4.53 |
| 21.750 | 1.06 | 1.66 | 1.797 | O  |  |  |  |  | 4.52 |
| 21.833 | 1.05 | 1.63 | 1.793 | O  |  |  |  |  | 4.51 |
| 21.917 | 1.04 | 1.60 | 1.789 | O  |  |  |  |  | 4.50 |
| 22.000 | 1.03 | 1.57 | 1.785 | O  |  |  |  |  | 4.49 |
| 22.083 | 1.02 | 1.55 | 1.782 | O  |  |  |  |  | 4.49 |
| 22.167 | 1.01 | 1.52 | 1.778 | O  |  |  |  |  | 4.48 |
| 22.250 | 1.00 | 1.50 | 1.775 | O  |  |  |  |  | 4.47 |
| 22.333 | 1.00 | 1.47 | 1.771 | O  |  |  |  |  | 4.46 |
| 22.417 | 0.99 | 1.45 | 1.768 | O  |  |  |  |  | 4.46 |
| 22.500 | 0.98 | 1.43 | 1.765 | O  |  |  |  |  | 4.45 |
| 22.583 | 0.97 | 1.41 | 1.762 | O  |  |  |  |  | 4.44 |
| 22.667 | 0.96 | 1.39 | 1.759 | O  |  |  |  |  | 4.43 |
| 22.750 | 0.96 | 1.37 | 1.756 | O  |  |  |  |  | 4.43 |
| 22.833 | 0.95 | 1.35 | 1.753 | O  |  |  |  |  | 4.42 |
| 22.917 | 0.94 | 1.33 | 1.751 | O  |  |  |  |  | 4.42 |
| 23.000 | 0.93 | 1.31 | 1.748 | O  |  |  |  |  | 4.41 |
| 23.083 | 0.93 | 1.29 | 1.745 | O  |  |  |  |  | 4.40 |
| 23.167 | 0.92 | 1.27 | 1.743 | O  |  |  |  |  | 4.40 |
| 23.250 | 0.91 | 1.26 | 1.741 | O  |  |  |  |  | 4.39 |
| 23.333 | 0.91 | 1.24 | 1.738 | O  |  |  |  |  | 4.39 |
| 23.417 | 0.90 | 1.22 | 1.736 | O  |  |  |  |  | 4.38 |
| 23.500 | 0.89 | 1.21 | 1.734 | O  |  |  |  |  | 4.38 |
| 23.583 | 0.89 | 1.19 | 1.732 | O  |  |  |  |  | 4.37 |
| 23.667 | 0.88 | 1.18 | 1.730 | O  |  |  |  |  | 4.37 |
| 23.750 | 0.88 | 1.16 | 1.728 | O  |  |  |  |  | 4.37 |
| 23.833 | 0.87 | 1.15 | 1.726 | O  |  |  |  |  | 4.36 |
| 23.917 | 0.86 | 1.14 | 1.724 | O  |  |  |  |  | 4.36 |
| 24.000 | 0.86 | 1.12 | 1.722 | O  |  |  |  |  | 4.35 |
| 24.083 | 0.76 | 1.11 | 1.720 | O  |  |  |  |  | 4.35 |
| 24.167 | 0.36 | 1.08 | 1.716 | O  |  |  |  |  | 4.34 |
| 24.250 | 0.19 | 1.04 | 1.711 | O  |  |  |  |  | 4.33 |
| 24.333 | 0.11 | 1.00 | 1.705 | O  |  |  |  |  | 4.31 |
| 24.417 | 0.07 | 0.96 | 1.699 | O  |  |  |  |  | 4.30 |
| 24.500 | 0.04 | 0.91 | 1.692 | O  |  |  |  |  | 4.29 |
| 24.583 | 0.02 | 0.87 | 1.687 | O  |  |  |  |  | 4.27 |
| 24.667 | 0.01 | 0.83 | 1.681 | O  |  |  |  |  | 4.26 |
| 24.750 | 0.01 | 0.79 | 1.675 | O  |  |  |  |  | 4.25 |
| 24.833 | 0.00 | 0.75 | 1.670 | O  |  |  |  |  | 4.24 |
| 24.917 | 0.00 | 0.72 | 1.665 | O  |  |  |  |  | 4.23 |
| 25.000 | 0.00 | 0.68 | 1.660 | O  |  |  |  |  | 4.21 |
| 25.083 | 0.00 | 0.65 | 1.656 | O  |  |  |  |  | 4.20 |
| 25.167 | 0.00 | 0.62 | 1.651 | O  |  |  |  |  | 4.19 |
| 25.250 | 0.00 | 0.59 | 1.647 | O  |  |  |  |  | 4.19 |
| 25.333 | 0.00 | 0.56 | 1.643 | O  |  |  |  |  | 4.18 |
| 25.417 | 0.00 | 0.53 | 1.639 | O  |  |  |  |  | 4.17 |
| 25.500 | 0.00 | 0.51 | 1.636 | O  |  |  |  |  | 4.16 |
| 25.583 | 0.00 | 0.49 | 1.632 | O  |  |  |  |  | 4.15 |
| 25.667 | 0.00 | 0.46 | 1.629 | O  |  |  |  |  | 4.14 |
| 25.750 | 0.00 | 0.44 | 1.626 | O  |  |  |  |  | 4.14 |
| 25.833 | 0.00 | 0.42 | 1.623 | O  |  |  |  |  | 4.13 |
| 25.917 | 0.00 | 0.40 | 1.620 | O  |  |  |  |  | 4.13 |
| 26.000 | 0.00 | 0.38 | 1.617 | O  |  |  |  |  | 4.12 |
| 26.083 | 0.00 | 0.36 | 1.615 | O  |  |  |  |  | 4.11 |
| 26.167 | 0.00 | 0.34 | 1.612 | O  |  |  |  |  | 4.11 |
| 26.250 | 0.00 | 0.33 | 1.610 | O  |  |  |  |  | 4.10 |
| 26.333 | 0.00 | 0.31 | 1.608 | O  |  |  |  |  | 4.10 |
| 26.417 | 0.00 | 0.30 | 1.606 | O  |  |  |  |  | 4.09 |
| 26.500 | 0.00 | 0.28 | 1.604 | O  |  |  |  |  | 4.09 |
| 26.583 | 0.00 | 0.27 | 1.602 | O  |  |  |  |  | 4.08 |
| 26.667 | 0.00 | 0.26 | 1.600 | O  |  |  |  |  | 4.08 |
| 26.750 | 0.00 | 0.24 | 1.598 | O  |  |  |  |  | 4.08 |
| 26.833 | 0.00 | 0.23 | 1.597 | O  |  |  |  |  | 4.07 |
| 26.917 | 0.00 | 0.22 | 1.595 | O  |  |  |  |  | 4.07 |
| 27.000 | 0.00 | 0.21 | 1.594 | O  |  |  |  |  | 4.07 |
| 27.083 | 0.00 | 0.20 | 1.592 | O  |  |  |  |  | 4.06 |
| 27.167 | 0.00 | 0.19 | 1.591 | O  |  |  |  |  | 4.06 |
| 27.250 | 0.00 | 0.18 | 1.590 | O  |  |  |  |  | 4.06 |
| 27.333 | 0.00 | 0.17 | 1.588 | O  |  |  |  |  | 4.05 |
| 27.417 | 0.00 | 0.17 | 1.587 | O  |  |  |  |  | 4.05 |
| 27.500 | 0.00 | 0.16 | 1.586 | O  |  |  |  |  | 4.05 |
| 27.583 | 0.00 | 0.15 | 1.585 | O  |  |  |  |  | 4.05 |
| 27.667 | 0.00 | 0.14 | 1.584 | O  |  |  |  |  | 4.04 |
| 27.750 | 0.00 | 0.14 | 1.583 | O  |  |  |  |  | 4.04 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 27.833 | 0.00 | 0.13 | 1.582 | 0 |  |  |  |  | 4.04 |
| 27.917 | 0.00 | 0.12 | 1.581 | 0 |  |  |  |  | 4.04 |
| 28.000 | 0.00 | 0.12 | 1.580 | 0 |  |  |  |  | 4.04 |
| 28.083 | 0.00 | 0.11 | 1.580 | 0 |  |  |  |  | 4.04 |
| 28.167 | 0.00 | 0.11 | 1.579 | 0 |  |  |  |  | 4.03 |
| 28.250 | 0.00 | 0.10 | 1.578 | 0 |  |  |  |  | 4.03 |
| 28.333 | 0.00 | 0.10 | 1.578 | 0 |  |  |  |  | 4.03 |
| 28.417 | 0.00 | 0.09 | 1.577 | 0 |  |  |  |  | 4.03 |
| 28.500 | 0.00 | 0.09 | 1.576 | 0 |  |  |  |  | 4.03 |
| 28.583 | 0.00 | 0.08 | 1.576 | 0 |  |  |  |  | 4.03 |
| 28.667 | 0.00 | 0.08 | 1.575 | 0 |  |  |  |  | 4.02 |
| 28.750 | 0.00 | 0.08 | 1.575 | 0 |  |  |  |  | 4.02 |
| 28.833 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 28.917 | 0.00 | 0.07 | 1.574 | 0 |  |  |  |  | 4.02 |
| 29.000 | 0.00 | 0.07 | 1.573 | 0 |  |  |  |  | 4.02 |
| 29.083 | 0.00 | 0.06 | 1.573 | 0 |  |  |  |  | 4.02 |
| 29.167 | 0.00 | 0.06 | 1.572 | 0 |  |  |  |  | 4.02 |
| 29.250 | 0.00 | 0.06 | 1.572 | 0 |  |  |  |  | 4.02 |
| 29.333 | 0.00 | 0.05 | 1.572 | 0 |  |  |  |  | 4.02 |
| 29.417 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 29.500 | 0.00 | 0.05 | 1.571 | 0 |  |  |  |  | 4.02 |
| 29.583 | 0.00 | 0.05 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.667 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.750 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.833 | 0.00 | 0.04 | 1.570 | 0 |  |  |  |  | 4.01 |
| 29.917 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 30.000 | 0.00 | 0.04 | 1.569 | 0 |  |  |  |  | 4.01 |
| 30.083 | 0.00 | 0.03 | 1.569 | 0 |  |  |  |  | 4.01 |
| 30.167 | 0.00 | 0.03 | 1.569 | 0 |  |  |  |  | 4.01 |
| 30.250 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.333 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.417 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.500 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.583 | 0.00 | 0.03 | 1.568 | 0 |  |  |  |  | 4.01 |
| 30.667 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.750 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.833 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 30.917 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 31.000 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 31.083 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 31.167 | 0.00 | 0.02 | 1.567 | 0 |  |  |  |  | 4.01 |
| 31.250 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 31.333 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.01 |
| 31.417 | 0.00 | 0.02 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.500 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.583 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.667 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.750 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.833 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 31.917 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 32.000 | 0.00 | 0.01 | 1.566 | 0 |  |  |  |  | 4.00 |
| 32.083 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.167 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.250 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.333 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.417 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.500 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.583 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.667 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.750 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.833 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 32.917 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.000 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.083 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.167 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.250 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.333 | 0.00 | 0.01 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.417 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.500 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.583 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.667 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.750 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.833 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 33.917 | 0.00 | 0.00 | 1.565 | 0 |  |  |  |  | 4.00 |
| 34.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

|        |      |      |       |   |  |  |  |  |      |
|--------|------|------|-------|---|--|--|--|--|------|
| 34.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 34.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.250 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.333 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.417 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.500 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.583 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.667 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.750 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.833 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 35.917 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 36.000 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 36.083 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |
| 36.167 | 0.00 | 0.00 | 1.564 | 0 |  |  |  |  | 4.00 |

Remaining water in basin = 1.56 (Ac.Ft)

```
*****HYDROGRAPH DATA*****
      Number of intervals = 434
      Time interval = 5.0 (Min.)
      Maximum/Peak flow rate = 11.354 (CFS)
      Total volume = 2.925 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```

```
+++++
Process from Point/Station 6.000 to Point/Station 13.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
```

```
Current stream hydrograph saved in file route.rte
*****HYDROGRAPH DATA*****
      Number of intervals = 0
      Time interval = 0.0 (Min.)
      Maximum/Peak flow rate = 0.000 (CFS)
      Total volume = 0.000 (Ac.Ft)
      Status of hydrographs being held in storage
      Stream 1 Stream 2 Stream 3 Stream 4 Stream 5
      Peak (CFS) 0.000 0.000 0.000 0.000 0.000
      Vol (Ac.Ft) 0.000 0.000 0.000 0.000 0.000
*****
```