WQMP
PRELIMINARY
REPORT

TT No. 20527

City of Victorville, CA

August 25, 2022

Prepared by:

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MOJAVE RIVER WATERSHED
Water Quality Management Plan

For:

TENTATIVE TRACT MAP NO. 20527

APN 0396-341-04,07

Prepared for:

SHERR DEVELOPMENT CORPORATION

31300 ORCHARD LAKE ROAD, SUITE 200

FARMINGTON HILLS, MI 48334

Phone: (248) 626-9099

Prepared by:

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Submittal Date: August 26, 2022

Revision No. and Date: Insert No and Current
Revision No. and Date: Insert No and Current
Revision No. and Date: Insert No and Current

Final Approval Date:_____

Project Owner's Certification

This Mojave River Watershed Water Quality Management Plan (WQMP) has been prepared for Insert Owner/Developer Name by Ludwig Engineering Associates, Inc. The WQMP is intended to comply with the requirements of the County of San Bernardino and the Phase II Small MS4 General Permit for the Mojave River Watershed. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the Phase II Small MS4 Permit and the intent of San Bernardino County (unincorporated areas of Phelan, Oak Hills, Spring Valley Lake and Victorville) and the incorporated cities of Hesperia and Victorville and the Town of Apple Valley. Once the undersigned transfers its interest in the property, its successors in interest and the city/county/town shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

Project Data			
Permit/ Application Number(s):	TBD	Grading Permit Number(s):	TBD
Tract/Parcel Map Number(s):	20527	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 0396-341-04, 0396-341-07

Owner's Signature		
Owner Name: Roger Sherr		
Title	Representative	
Company	Sherr Development Corporation	
Address	31300 Orchard Lake Road, Suite 200, Farmington Hills, MI 48334	
Email	rsherr@sherrdev.com	
Telephone #	(248) 626-9099	
Signature	Date	

Preparer's Certification

Project Data			
Permit/ Application	PRJ13-0069 PSUB21-00107	Grading Permit Number(s):	TBD
Number(s): Tract/Parcel Map Number(s):	Tract No. 20527	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN 0396-341-04, 0396-341-09

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of the California State Water Resources Control Board Order No. 2013-0001-DWQ.

Engineer: Jeffrey Martin Ashbaker		PE Stamp Below
Title	Vice President	
Company	Ludwig Engineering Associates, Inc.	
Address	109 East Third Street, San Bernardino, CA 92410	
Email	jashbaker@ludwigeng.com	
Telephone #	(909) 884-8217	
Signature		
Date		



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SECTION 1

Section I – Introduction

This WQMP template has been prepared specifically for the Phase II Small MS4 General Permit in the Mojave River Watershed.
This location is within the jurisdiction of the Lahontan Regional Water Quality Control Board (LRWQCB). This document should not be confused with the WQMP template for the Santa Ana Phase I area of San Bernardino County.

WQMP preparers must refer to the MS4 Permit for the Mojave Watershed WQMP template and Technical Guidance (TGD) document found at: http://cms.sbcounty.gov/dpw/Land/NPDES.aspx to find pertinent arid region and Mojave River Watershed specific references and requirements.

Section 1 Discretionary Permit(s)

Form 1-1 Project Information					
Project Name	Tract Map No. 20527				
Project Owner Contact Name:	Roger Sherr				
Mailing Address:	31300 Orchard Lake Road, Suite 200, Farmington Hills, MI 48334	E-mail Address:	rsherr@sherrdev.com	Telephone:	(248) 626-9099
Permit/Application Number(s):	PRJ13-0069 PSUB21-00107		Tract/Parcel Map Number(s):	APN 0396-341-04, APN 0396-341-09	
Additional Information/ Comments:	Half of the entire tract will be draining easterly and westerly direction to the water quality basin to store 2yr-24hr storm event, and mitigate the difference between the Pre and Post 10yr volume runoff. The proposed subdivision site lies within the south Lahontan Hydrological basin planning area (SL) Region 6 and Mojave Hydrologic Unit 628.20, Upper Mojave HA.				
Description of Project:	In the proposed development of Tract 20527 there will be the construction of 53 single-family dwelling units and 10 lettered lots on an approximate area of 15 acres. The site is divided into eight drainage areas, "DA1", "DA2"," DA3","DA4","DA5","DA6","DA7 and "DA8", as shown on the map. Drainage area "DA1" has an area of 1.97 acres and produces a 100-year storm runoff of 6.6cfs. Drainage area "DA2" has an area of 2.1 acres and produces a 100-yearstorm runoff of 7.1cfs. Drainage area "DA3" has an area of 2.32 acres and produces a 100-yearstorm runoff of 7.1cfs. Drainage area "DA4" has an area of 2.87 acres and produces a 100-yearstorm runoff of 8.0cfs. This flow will be conveyed to the proposed Facility A-01 per the Baldy Mesa Master Plan of Drainage (BMPD) through a proposed underground drainage system at the westerly corner of cul-de-sac of each onsite street from east to west and then running between drainage easement lots 49 and 50, lots 38 and 39, lots 25 and 26, lots 9 and 10. Details of the proposed drainage system are shown on the grading plans and drainage map; calculations of the proposed catch basin and storm drain pipe are in section 3 of this report. Drainage area "DA5" has an area of 0.92 acres and produces a 100-year storm runoff of 3.4cfs. Drainage area "DA6" has an area of 1.19 acres and produces a 100-year storm runoff of 4.0cfs. Drainage area "DA7" has an area of 1.16 acres and produces a 100-year storm runoff of 3.9cfs. Drainage area "DA8" has an area of 2.35 acres and produces a 100-year storm runoff of 4.6cfs. This flow will be conveyed to the Fremontia Road through a proposed Infiltration Trenches drainage system at the easterly property line with a width of 7 ft. draining from south to north and discharge to easterly of Luna Road. This runoff represents less than of 14% compared to the existing condition; per City Engineering Staff a retention basin is required for WQMP DCV. This flow will be conveyed to the proposed Facility A-01 per the Baldy Mesa MPD Regional Facility Line A-01. In the existing condition the site is also divided into two drainage areas, "AA1" thru "AA8", as shown on the pre-developed map. In order to compare with the proposed condition in producing 100-year storm runoff we used the same drainage boundary; therefore, the total area of the site is also aprrox. 15 acres. Drainage area "AA1" has an area of 1.47 acres and produces a 100-yearstorm runoff of 2.9cfs. Drainage area "AA2" has an area of 2.13 acres				

	and produces a 100-yearstorm runoff of 4.3cfs. Drainage area "AA3" has an area of 3.08 acres and produces a 100-yearstorm runoff of 5.9cfs. Drainage area "AA4" has an area of 3.48 acres and produces a 100-yearstorm runoff of 6.2cfs. This flow will be conveyed to the proposed Facility A-01 per the MPD. Drainage area "AA5" has an area of 1.42 acres and produces a 100-year storm runoff of 2.6cfs. Drainage area "AA6" has an area of 1.18 acres and produces a 100-year storm runoff of 2.5cfs. Drainage area "AA7" has an area of 0.58 acres and produces a 100-year storm runoff of 1.1cfs. Drainage area "AA8" has an area of 1.71 acres and produces a 100-year storm runoff of 3.3cfs.
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	

SECTION 2

Section 2 Project Description

2.1 Project Information

The WQMP shall provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

2.1.1 Project Sizing Categorization

If the Project is greater than 5,000 square feet, and not on the excluded list as found on Section 1.4 of the TGD, the Project is a Regulated Development Project.

If the Project is creating and/or replacing greater than 2,500 square feet but less than 5,000 square feet of impervious surface area, then it is considered a Site Design Only project. This criterion is applicable to all development types including detached single family homes that create and/or replace greater than 2,500 square feet of impervious area and are not part of a larger plan of development.

Form 2.1-1 Description of Proposed Project

1 Regulated Development Project Category (Select all that apply):

☒ #1 New development involving the creation of 5,000 ft^2 or more of impervious surface collectively over entire site	☐ #2 Significant re-development involving the addition or replacement of 5,000 ft^2 or more of impervious surface on an already developed site	☒ #3 Road Project – any road, sidewalk, or bicycle lane project that creates greater than 5,000 square feet of contiguous impervious surface	☐ #4 LUPs – linear underground/overhead projects that has a discrete location with 5,000 sq. ft. or more new constructed impervious surface

☐ Site Design Only (Project Total Square Feet > 2,500 but < 5,000 sq.ft.) *Will require source control Site Design Measures. Use the "PCMP" Template. Do not use this WQMP Template.*

2 Project Area (ft2):	648,171.60	**3** Number of Dwelling Units:	53	**4** SIC Code:	1521

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

Presently the Developer will be responsible for all BMP's Operation & Maintenance and as specified in Section 5 of this report. Afterwards no homeowners or property owners will be formed. Each individual homeowner will be responsible for management and maintenance of down-spouts, drainage swales, and all storm drain features within the property. The City of Victorville will be responsible for the water quality Basin operation and maintenance.
The owner listed below will be responsible for long-term maintenance of WQMP stormwater facilities.

Roger Sherr
31300 Orchard Lake Road, Suite 200, Farmington Hills,
MI 48334
TEL. # (248) 626-9099

2.3 Potential Stormwater Pollutants

Best Management Practices (BMP) measures for pollutant generating activities and sources shall be designed consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment (or an equivalent manual). Pollutant generating activities must be considered when determining the overall pollutants of concern for the Project as presented in Form 2.3-1.

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-2 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern

Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Urban Runoff, Storm Sewers. Receiving waters: No drainage facilities located within 2 miles of site. Mojave River
Nutrients - Phosphorous	E ☒	N ☐	Landscaping activities. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Nutrients - Nitrogen	E ☒	N ☐	Landscaping activities. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Noxious Aquatic Plants	E ☐	N ☒	Only on landscaping areas. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Sediment	E ☒	N ☐	During construction and grading. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Metals	E ☒	N ☐	Road Improvements, Break/Tire wear
Oil and Grease	E ☒	N ☐	Vehicular traffic on public streets. Receiving waters; No drainage facilities located within 2 miles of site. Mojave Rive
Trash/Debris	E ☒	N ☐	Residents and public use. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Pesticides / Herbicides	E ☒	N ☐	Landscape activities. Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Organic Compounds	E ☒	N ☐	Only on Landscaped Areas Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Other: Oxygen Demanding Compound	E ☒	N ☐	Only on Landscaped Areas Receiving waters; No drainage facilities located within 2 miles of site. Mojave River
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

SECTION 3

Section 3 Site and Watershed Description

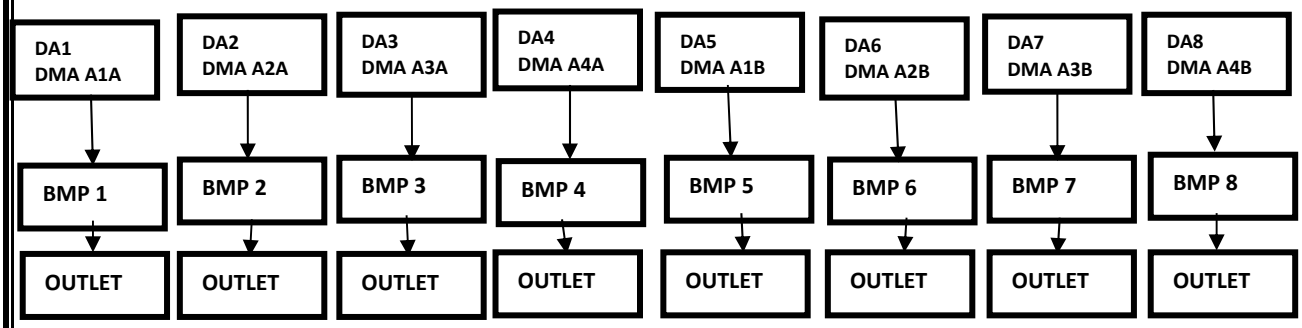
Describe the project site conditions that will facilitate the selection of BMPs through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed Drainage Management Areas (DMAs)) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet. A map presenting the DMAs must be included as an appendix to the WQMP document.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34°29'26.52"N	Longitude -117°24'49.32"W	Thomas Bros Map page 4385

1 San Bernardino County climatic region: ☒ Desert

2 Does the site have more than one drainage area (DA): ☒ Yes ☐ No *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*



Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA1 DMA C Flows to DA1	*Ex. Bioretention overflow to vegetated bioswale with 4' bottom width, 5:1 side slopes and bed slope of 0.01. Conveys runoff for 1000' through DMA 1 to existing catch basin on SE corner of property*
DMA A DA1 DMA A1A to Outlet 1	All Runoff is conveys through DMA A to the street, and street flow to a catch basin in the cul-de-sac westerly corner which drains to a proposed 2-36" dia. Perforated Underground storage in between Lot 49 & 50 Drainage Easement.
DA2 DMA A2A to Outlet 2	All Runoff is conveys through DMA A to the street, and street flow to a catch basin in the cul-de-sac westerly corner which drains to a proposed 2-36" dia. Perforated Underground storage in between Lot 38 & 39 Drainage Easement
DA3 DMA A3A to Outlet 3	All Runoff is conveys through DMA A to the street, and street flow to a catch basin in the cul-de-sac westerly corner which drains to a proposed 2-36" dia. Perforated Underground storage in between Lot 25 & 26 Drainage Easement
DA4 DMA A4A to Outlet 4	All Runoff is conveys through DMA A to the street, and street flow to a catch basin in the cul-de-sac westerly corner which drains to a proposed 2-36" dia. Perforated Underground storage in between Lot 9 & 10 Drainage Easement
DA5 DMA A1B to Outlet 5	All Runoff is conveys through DMA A to the street, and street flow easterly to under parkway drain which DCV will be stored to a 4.5'width x 2.5'depth X 230LF infiltration trench located easterly side of the Lot 53 & Lot 45 Property Line respectively. All excess overflow will discharge to Fremontia Road.
DA6 DMA A2B to Outlet 6	All Runoff is conveys through DMA A to the street, and street flow easterly to under parkway drain which DCV will be stored to a 4.5'width x 2.5'depth X 220LF infiltration trench located easterly side of the Lot 44 & Lot 33 Property Line respectively. All excess overflow will discharge to Fremontia Road.

DA7 DMA A3B to Outlet 7	All Runoff is conveys through DMA A to the street, and street flow easterly to under parkway drain which DCV will be stored to a 4.5'width x 2.5'depth X 200LF infiltration trench located easterly side of the Lot 18 & Lot 19 Property Line respectively. All excess overflow will discharge to Fremontia Road.
DA8 DMA A4B to Outlet 8	All Runoff is conveys through DMA A to the street, and street flow easterly to under parkway drain which DCV will be stored to a 7'width x 4'depth X 100' & 96' infiltration trench located easterly side of the Lot 1 & Northerly Parkway along Luna Road. All excess overflow will discharge to Fremontia Road & Luna Road.

Form 3-2 Existing Hydrologic Characteristics (DA 1)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA5)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	61,855.2			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	369			
6 Longest flowpath slope (ft/ft)	0.0100			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 2)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA6)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	51,400.8			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	355			
6 Longest flowpath slope (ft/ft)	**0.0255**			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 3)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA7)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	25,264.8			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	323			
6 Longest flowpath slope (ft/ft)	0.0133			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 4)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA8)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	74,487.6			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	388			
6 Longest flowpath slope (ft/ft)	0.0167			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 5)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA1)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	64,033.2			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	356			
6 Longest flowpath slope (ft/ft)	0.0168			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 6)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA2)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	92,782.8			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	326			
6 Longest flowpath slope (ft/ft)	0.0153			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 7)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA3)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	134,164.8			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	323			
6 Longest flowpath slope (ft/ft)	0.0105			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics (DA 8)

For Drainage Area 's sub-watershed DMA, provide the following characteristics	DMA A (AA4)	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	150,282			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use* *http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3			
4 Hydrologic soil group *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	A			
5 Longest flowpath length (ft)	518			
6 Longest flowpath slope (ft/ft)	0.0108			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Natural Fair Open Brush			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1 (use only as needed for additional DMA w/in DA 1)

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA E	DMA F	DMA G	DMA H
1 DMA drainage area (ft^2)				
2 Existing site impervious area (ft^2)				
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/2 0100412_map.pdf*				
4 Hydrologic soil group *County Hydrology Manual Addendum for Arid Regions – http://www.sbcounty.gov/dpw/floodcontrol/ pdf/2 0100412_addendum.pdf*				
5 Longest flowpath length (ft)				
6 Longest flowpath slope (ft/ft)				
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*				
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*				

Form 3-3 Watershed Description for Drainage Area

Receiving waters Refer to SWRCB site: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	No drainage facilities located within 2 miles, Mojave River.
Applicable TMDLs *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	None, No drainage facilities located within 2 miles of site.
303(d) listed impairments *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	None, No drainage facilities located within 2 miles of site.
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	Desert Tortoise Habitat Cat 2
Hydromodification Assessment	☒ Yes *Complete Hydromodification Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-9 in submittal* ☐ No



WQMP Project Report

County of San Bernardino Stormwater Program

Santa Ana River Watershed Geodatabase

Monday, January 10, 2022

Note: The information provided in this report and on the Stormwater Geodatabase for the County of San Bernardino Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s): Project	309634104, 309634107 18.6
Site Acreage:	No
HCOC Exempt Area:	**System Number** - See Note
Closest Receiving Waters: (Applicant to verify based on local drainage facilities and topography.)	**Facility Name** - See Note
	Owner - See Note
Closest channel segment's susceptibility to Hydromodification:	See Note
Highest downstream hydromodification susceptibility: Is this	See Note
drainage segment subject to TMDLs?	See Note
Are there downstream drainage segments subject to TMDLs? See Note **Is this drainage segment a 303d listed stream?**	See Note
Are there 303d listed streams downstream?	See Note
Are there unlined downstream waterbodies?	See Note
Project Site Onsite Soil Group(s):	A
Environmentally Sensitive Areas within 200': Groundwater Depth	DESERT TORTOISE HABITAT CAT 2
(FT):	No data available
Parcels with potential septic tanks within 1000':	No
Known Groundwater Contamination Plumes within 1000': Studies	No
and Reports Related to Project Site:	

Note: No drainage facilities located within 2 miles of site.

SECTION 4

Section 4 Best Management Practices (BMP)

4.1 Source Control BMPs and Site Design BMP Measures

The information and data in this section are required for both Regulated Development and Site Design Only Projects. Source Control BMPs and Site Design BMP Measures are the basis of site-specific pollution management.

4.1.1 Source Control BMPs

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

The identified list of source control BMPs correspond to the CASQA Stormwater BMP Handbook for New Development and Redevelopment.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater	☒	☐	Upon final walk through of new homes with homeowners, the developer will provide educational pamphlets published by California regional water Quality Control Board - Santa Ana Region, or other appropriate sources.
N2	BMPs Activity Restrictions	☒	☐	The types of activities allowed within the Project will be limited to those allowed by the City of Victorville codes, regulations, and zoning ordinances.
N3	Landscape Management BMPs	☒	☐	Landscape plans will be consistent with the City of Victorville requirements for water conservation vegetation. Utilizing programmable irrigation systems, and/or rain shut off sensors.
N4	BMP Maintenance	☒	☐	Maintenance of BMPs implemented at the project shall be performed at the frequency prescribed in this WQMP Form 5-1. Records of inspections and maintenance shall be maintained by the Owner and documented with the WQMP, and shall be available for review upon request.
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	No hazardous materials to be allowed for this project
N6	Local Water Quality Ordinances	☒	☐	Home owners to abide by the State, County and Local Water Ordinances, provide with educational material and pamphlets
N7	Spill Contingency Plan	☐	☒	No hazardous materials will be stored or handle on this site.
N8	Underground Storage Tank Compliance	☐	☒	No storage tanks to be allowed for this project
N9	Hazardous Materials Disclosure Compliance	☐	☒	No hazardous materials to be allowed for this project

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	As Required per City of Victorville Fire Department
N11	Litter/Debris Control Program	☒	☐	Private waste receptacles will be place at the curb collection per local waste collection service provider. Educational material also will be provided for home owners.
N12	Employee Training	☐	☒	No employees, private residence
N13	Housekeeping of Loading Docks	☐	☒	Project does not feature any loading docks
N14	Catch Basin Inspection Program	☒	☐	Catch basins will be maintained by the property owner.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☐	☒	There are no private streets
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	N/A
N17	Comply with all other applicable NPDES permits	☒	☐	There are no other NPDES permits applicable to this project.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	SD Stenciling (4" circular Plastic "No Dumping, Drains to the River" marker, with adhesive installation) will be provided by the developer and maintained by the County of San Bernardino.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	No outdoor material storage proposed. Private waste receptacles will be place at the curb collection by local waste collection service provider.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☐	☒	Homeowners to use covered bins
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Per educational material pamphlets provided
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☐	☒	To Maximum Extent Practicable
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	See SD-10 per educational material pamphlets provided (Vegetated Swales, ground cover at slopes Rock at Trenches etc.)
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	Project does not Feature any Dock Areas
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	Not Feature per this project
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Not Feature per this project
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	Not Feature per this project

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	The Project does not feature any wash areas
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	The Project does not feature any fueling areas
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	No hillside landscaping per this project
S14	Wash water control for food preparation areas	☐	☒	The Project does not feature any food preparation areas
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	The Project does not feature any community car wash racks

4.1.2 Site Design BMPs

As part of the planning phase of a project, the site design practices associated with new LID requirements in the Phase II Small MS4 Permit must be considered. Site design BMP measures can result in smaller Design Capture Volume (DCV) to be managed by both LID and hydromodification control BMPs by reducing runoff generation.

As is stated in the Permit, it is necessary to evaluate site conditions such as soil type(s), existing vegetation and flow paths will influence the overall site design.

Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: Site contain landscape areas at 57%. An infiltration trench basin & underground storage pipe BMP's are proposed to minimize impervious area and by landscaping as much as possible, along walkways, driveways and property boundary to serve Permeable areas
Maximize natural infiltration capacity; Including improvement and maintenance of soil: Yes ☒ No ☐ Explanation: Propose infiltration trench basin, underground storage BMP's and by landscaping as much area as possible and provide homeowners with education material for installation of pervious driveways and walkways.
Preserve existing drainage patterns and time of concentration: Yes ☐ No ☒ Explanation: The project retains stormwater on-site and releases less than the predevelopment flows into the same historic drainage pattern.
Disconnect impervious areas. Including rerouting of rooftop drainage pipes to drain stormwater to storage or infiltration BMPs instead of to storm drain: Yes ☐ No ☒ Explanation: Direct roof and walkways storm flows to adjacent landscaped areas, and or drainage swales to MEP
Use of Porous Pavement.: Yes ☐ No ☒ Explanation: Not cost effective, also prone to failure to clogging from desert sand.
Protect existing vegetation and sensitive areas: Yes ☐ No ☒ Explanation: There is no existing vegetation, sensitive areas to be taken care in approval process
Re-vegetate disturbed areas. Including planting and preservation of drought tolerant vegetation: Yes ☒ No ☐ Explanation: MEP

Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☐ No ☒ Explanation: No compaction for basin, scarify surface
Utilize naturalized/rock-lined drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation: To the MEP
Stake off areas that will be used for landscaping to minimize compaction during construction: Yes ☐ No ☒ Explanation: To the MEP
Use of Rain Barrels and Cisterns, Including the use of on-site water collection systems.: Yes ☐ No ☒ Explanation: To the MEP
Stream Setbacks. Includes a specified distance from an adjacent steam: : Yes ☒ No ☐ Explanation: Per Drainage Plan

It is noted that, in the Phase II Small MS4 Permit, site design elements for green roofs and vegetative swales are required. Due to the local climatology in the Mojave River Watershed, proactive measures are taken to maximize the amount of drought tolerant vegetation. It is not practical in this region to have green roofs or vegetative swales. As part of site design the project proponent should utilize locally recommended vegetation types for landscaping. Typical landscaping recommendations are found in following local references:

San Bernardino County Special Districts:

Guide to High Desert Landscaping -
http://www.specialdistricts.org/Modules/ShowDocument.aspx?documentid=795

Recommended High-Desert Plants -
http://www.specialdistricts.org/modules/showdocument.aspx?documentid=553

Mojave Water Agency:

Desert Ranch: http://www.mojavewater.org/files/desertranchgardenprototype.pdf

Summertree: http://www.mojavewater.org/files/Summertree-Native-Plant-Brochure.pdf

Thornless Garden: http://www.mojavewater.org/files/thornlessgardenprototype.pdf

Mediterranean Garden: http://www.mojavewater.org/files/mediterraneangardenprototype.pdf

Lush and Efficient Garden: http://www.mojavewater.org/files/lushandefficientgardenprototype.pdf

Alliance for Water Awareness and Conservation (AWAC) outdoor tips – http://hdawac.org/save-outdoors.html

4.2 Treatment BMPs

After implementation and design of both Source Control BMPs and Site Design BMP measures, any remaining runoff from impervious DMAs must be directed to one or more on-site, treatment BMPs (LID or biotreatment) designed to infiltrate, evaportranspire, and/or bioretain the amount of runoff specified in Permit Section E.12.e (ii)(c) Numeric Sizing Criteria for Storm Water Retention and Treatment.

4.2.1 Project Specific Hydrology Characterization

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in Section E.12.e.ii.c and Section E.12.f of the Phase II Small MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection from hydromodification.

If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.

It is noted that in the Phase II Small MS4 Permit jurisdictions, the LID BMP Design Capture Volume criteria is based on the 2-year rain event. The hydromodification performance criterion is based on the 10-year rain event.

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), San Bernardino County requires use of the P_6 method (Form 4.2-1) For pre- and post-development hydrologic calculation, San Bernardino County requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for hydromodification performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

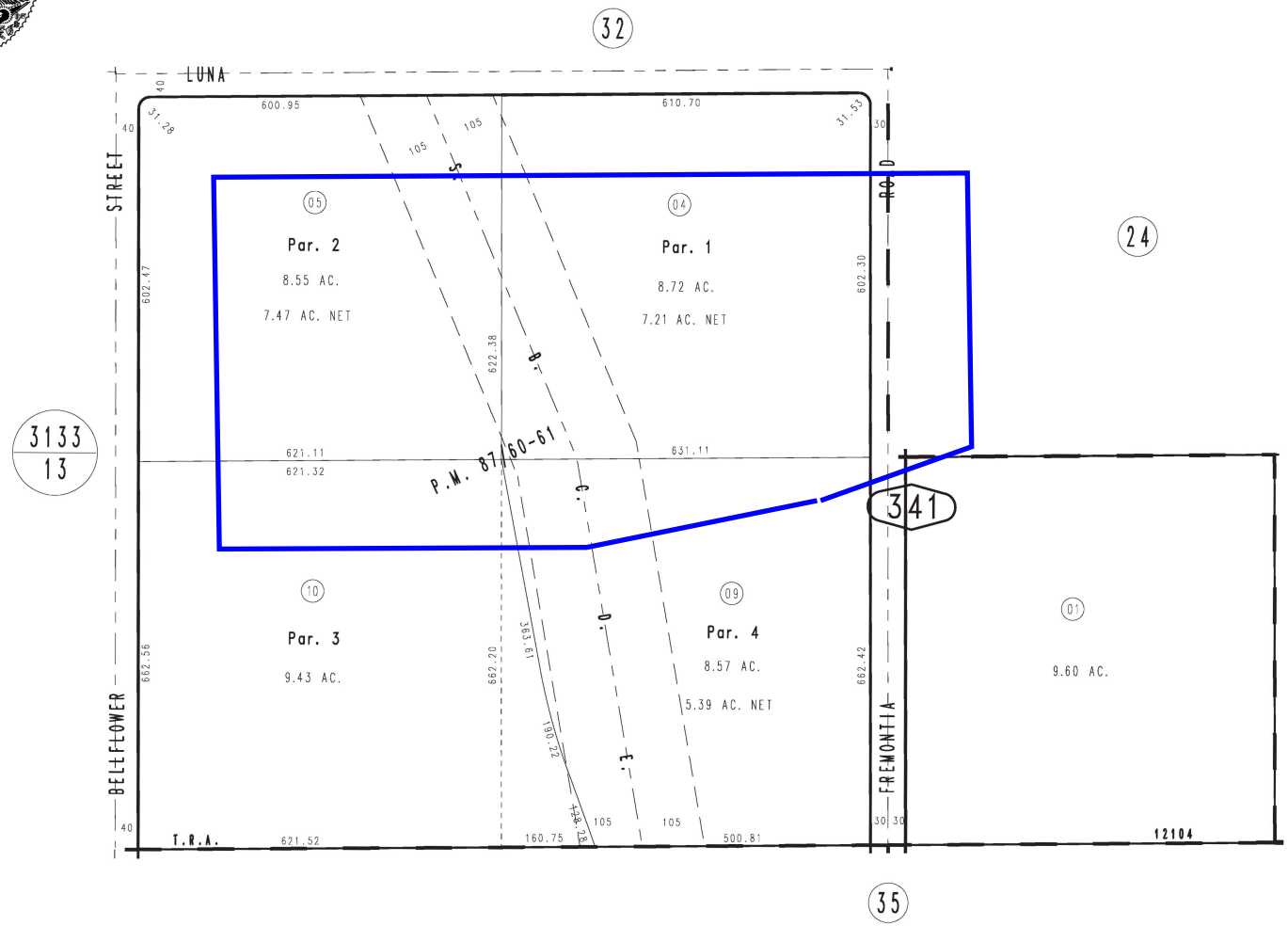
THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY.

N. 1/2, S.W.1/4, Sec. 28, T.5N., R.5W., S.B.M.

City of Victorville
Tax Rate Area
12104

3096 – 34

1"=200'



DEC. 1991

Parcel Map No. 8362, P.M. 87/60-61

Assessor's Map
Book 3096 Page 34
San Bernardino County

REVISED
04/14/15 KC
04/15/15 KC

NOAA Atlas 14, Volume 6, Version 2
Location name: Victorville, California, USA*
Latitude: 34.4907°, Longitude: -117.4137°
Elevation: 3230.88 ft**
* source: ESRI Maps
** source: USGS

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 Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.078 (0.064-0.095)	0.112 (0.093-0.137)	0.157 (0.130-0.193)	0.194 (0.159-0.240)	0.245 (0.194-0.313)	0.284 (0.220-0.371)	0.324 (0.245-0.434)	0.366 (0.269-0.503)	0.422 (0.297-0.606)	0.466 (0.317-0.692)
10-min	0.112 (0.092-0.137)	0.161 (0.133-0.197)	0.226 (0.186-0.277)	0.278 (0.227-0.344)	0.351 (0.277-0.449)	0.407 (0.315-0.532)	0.465 (0.351-0.622)	0.524 (0.385-0.722)	0.605 (0.426-0.868)	0.668 (0.455-0.992)
15-min	0.135 (0.112-0.165)	0.195 (0.161-0.238)	0.273 (0.225-0.335)	0.337 (0.275-0.417)	0.425 (0.335-0.543)	0.493 (0.381-0.643)	0.562 (0.424-0.752)	0.634 (0.465-0.873)	0.732 (0.516-1.05)	0.808 (0.550-1.20)
30-min	0.202 (0.167-0.247)	0.291 (0.240-0.356)	0.408 (0.336-0.501)	0.504 (0.412-0.624)	0.636 (0.502-0.813)	0.737 (0.570-0.963)	0.841 (0.635-1.13)	0.949 (0.697-1.31)	1.10 (0.772-1.57)	1.21 (0.823-1.80)
60-min	0.272 (0.225-0.333)	0.392 (0.323-0.479)	0.549 (0.452-0.673)	0.678 (0.554-0.838)	0.855 (0.675-1.09)	0.991 (0.767-1.30)	1.13 (0.854-1.51)	1.28 (0.937-1.76)	1.47 (1.04-2.11)	1.63 (1.11-2.42)
2-hr	0.382 (0.316-0.467)	0.520 (0.429-0.636)	0.707 (0.582-0.867)	0.864 (0.706-1.07)	1.09 (0.859-1.39)	1.26 (0.978-1.65)	1.45 (1.10-1.94)	1.65 (1.21-2.27)	1.92 (1.35-2.76)	2.14 (1.46-3.18)
3-hr	0.480 (0.397-0.586)	0.641 (0.529-0.784)	0.864 (0.711-1.06)	1.05 (0.861-1.30)	1.33 (1.05-1.70)	1.55 (1.20-2.02)	1.78 (1.34-2.38)	2.03 (1.49-2.79)	2.39 (1.68-3.42)	2.68 (1.82-3.97)
6-hr	0.658 (0.544-0.804)	0.871 (0.719-1.07)	1.17 (0.964-1.44)	1.43 (1.17-1.77)	1.81 (1.43-2.31)	2.12 (1.64-2.77)	2.46 (1.86-3.29)	2.82 (2.07-3.88)	3.35 (2.36-4.81)	3.79 (2.58-5.63)
12-hr	0.823 (0.680-1.01)	1.13 (0.934-1.38)	1.56 (1.29-1.92)	1.94 (1.58-2.40)	2.49 (1.96-3.18)	2.94 (2.27-3.83)	3.42 (2.58-4.58)	3.95 (2.90-5.44)	4.72 (3.32-6.77)	5.36 (3.65-7.95)
24-hr	1.12 (0.997-1.29)	1.61 (1.43-1.86)	2.29 (2.02-2.65)	2.88 (2.52-3.35)	3.73 (3.16-4.49)	4.43 (3.68-5.45)	5.19 (4.20-6.53)	6.01 (4.73-7.78)	7.20 (5.44-9.72)	8.19 (5.98-11.4)
2-day	1.21 (1.08-1.40)	1.73 (1.53-2.00)	2.46 (2.17-2.85)	3.10 (2.71-3.61)	4.03 (3.41-4.85)	4.80 (3.98-5.90)	5.63 (4.56-7.09)	6.54 (5.15-8.47)	7.87 (5.95-10.6)	8.98 (6.56-12.6)
3-day	1.30 (1.15-1.49)	1.84 (1.63-2.12)	2.60 (2.30-3.01)	3.27 (2.87-3.81)	4.26 (3.61-5.12)	5.07 (4.21-6.23)	5.95 (4.82-7.50)	6.93 (5.46-8.97)	8.35 (6.31-11.3)	9.54 (6.97-13.3)
4-day	1.39 (1.23-1.60)	1.97 (1.74-2.27)	2.78 (2.46-3.22)	3.50 (3.06-4.07)	4.54 (3.85-5.47)	5.41 (4.49-6.65)	6.35 (5.14-7.99)	7.38 (5.81-9.56)	8.89 (6.72-12.0)	10.2 (7.42-14.2)
7-day	1.51 (1.34-1.74)	2.12 (1.87-2.44)	2.98 (2.63-3.44)	3.72 (3.26-4.34)	4.81 (4.08-5.79)	5.71 (4.74-7.02)	6.67 (5.41-8.41)	7.73 (6.09-10.0)	9.26 (7.00-12.5)	10.5 (7.69-14.7)
10-day	1.61 (1.43-1.86)	2.25 (1.99-2.59)	3.15 (2.78-3.64)	3.93 (3.45-4.58)	5.07 (4.30-6.11)	6.00 (4.98-7.38)	7.01 (5.67-8.82)	8.09 (6.38-10.5)	9.67 (7.31-13.1)	11.0 (8.01-15.3)
20-day	1.94 (1.72-2.24)	2.70 (2.39-3.11)	3.77 (3.33-4.35)	4.69 (4.11-5.47)	6.04 (5.12-7.28)	7.15 (5.93-8.79)	8.33 (6.75-10.5)	9.61 (7.57-12.4)	11.4 (8.65-15.4)	12.9 (9.46-18.1)
30-day	2.27 (2.01-2.61)	3.13 (2.77-3.60)	4.35 (3.84-5.03)	5.41 (4.74-6.30)	6.96 (5.90-8.38)	8.23 (6.83-10.1)	9.59 (7.77-12.1)	11.1 (8.71-14.3)	13.1 (9.94-17.7)	14.9 (10.8-20.8)
45-day	2.66 (2.36-3.06)	3.63 (3.21-4.18)	5.01 (4.42-5.79)	6.21 (5.44-7.24)	7.98 (6.77-9.61)	9.44 (7.83-11.6)	11.0 (8.90-13.8)	12.7 (9.98-16.4)	15.1 (11.4-20.3)	17.0 (12.4-23.7)
60-day	2.99 (2.65-3.44)	4.03 (3.57-4.64)	5.52 (4.87-6.37)	6.82 (5.98-7.95)	8.74 (7.40-10.5)	10.3 (8.57-12.7)	12.0 (9.73-15.1)	13.8 (10.9-17.9)	16.5 (12.4-22.2)	18.6 (13.6-25.9)

[1] 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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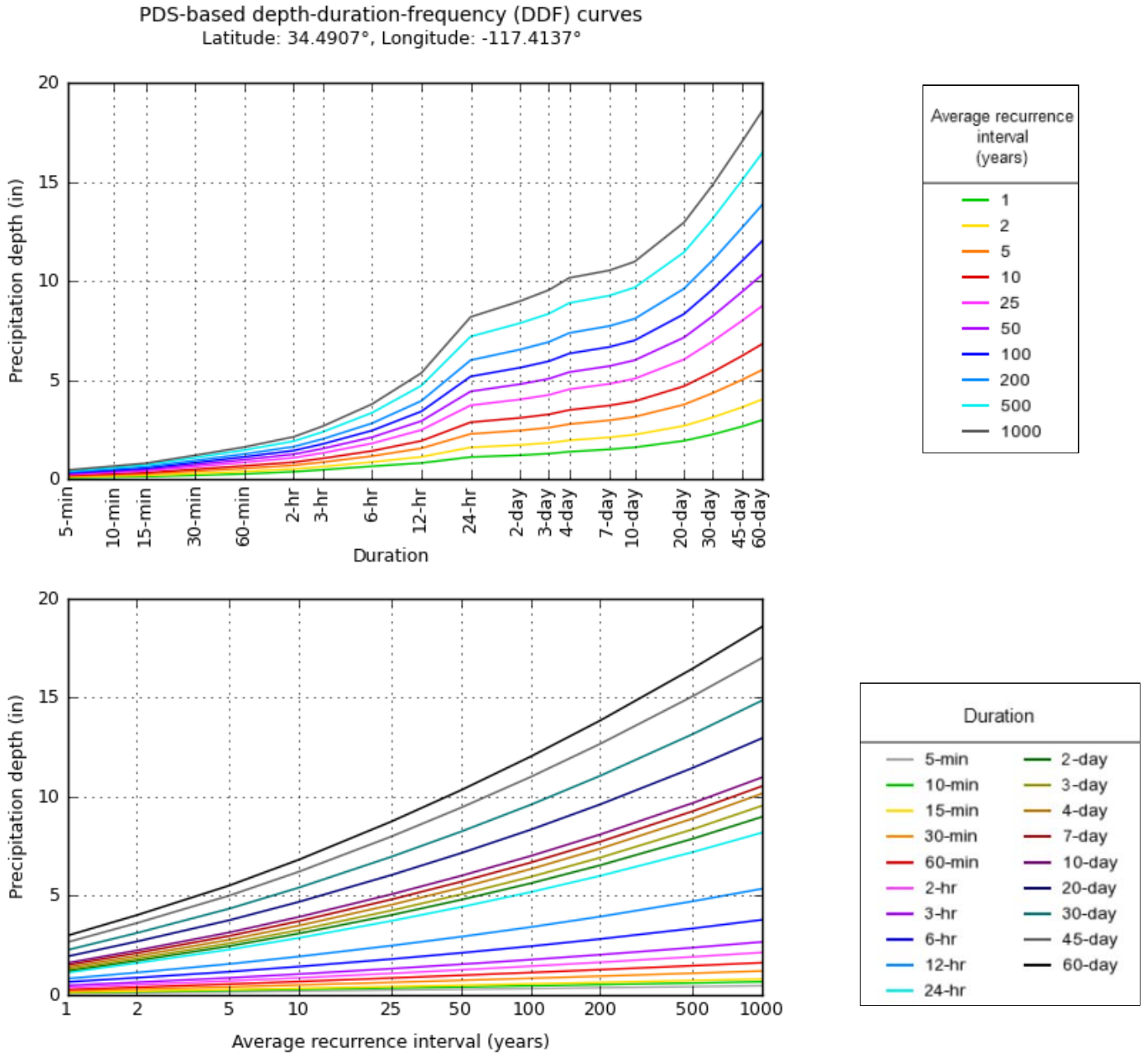
PF graphical



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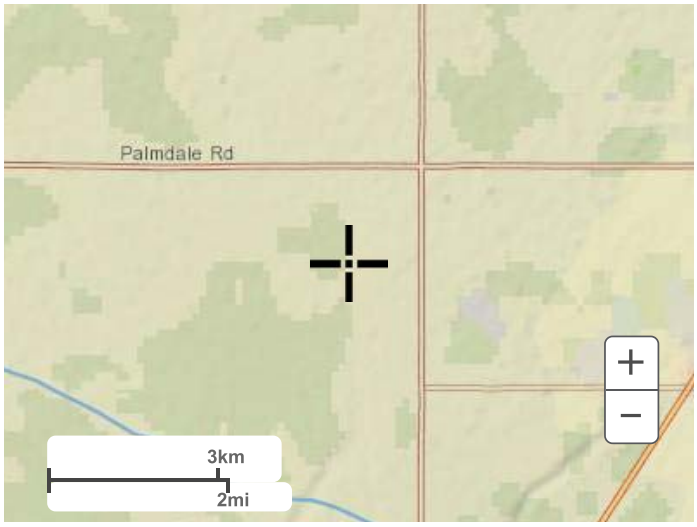
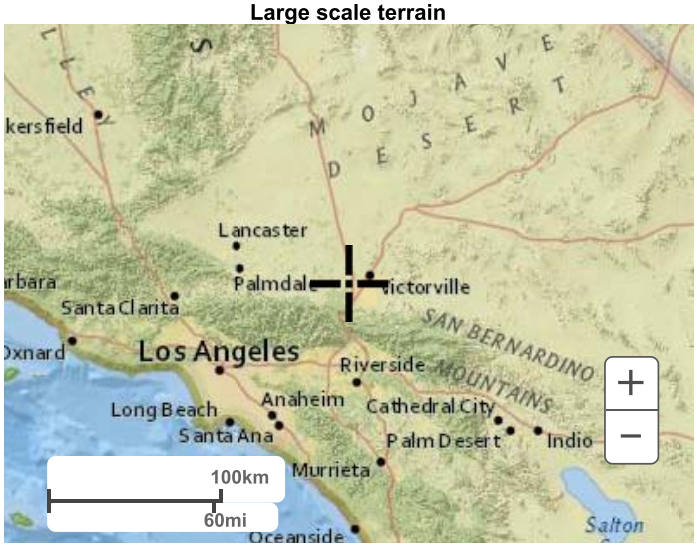
Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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National Weather Service
National Water Center
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Silver Spring, MD 20910
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Disclaimer

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)		
1 Project area DA 1 (ft^2): 85,813.20	**2** Imperviousness after applying preventative site design practices (Imp%): 33.4	**3** Runoff Coefficient (Rc): _0.243 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 1,655.58 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 1** (ft^2):	85,813.20	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.334	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.243	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	1,655.58	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)		
1 Project area DA 1 (ft^2): 91,476	**2** Imperviousness after applying preventative site design practices (Imp%): 33.88	**3** Runoff Coefficient (Rc): _0.246 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 1,785.62 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 2** (ft^2):	91,476.00	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.339	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.246	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	1,785.62	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 3)		
1 Project area DA 1 (ft^2): 101,059.2	**2** Imperviousness after applying preventative site design practices (Imp%): 37.5	**3** Runoff Coefficient (Rc): _0.266 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 2,129.63 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 3** (ft^2):	101,059.20	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.375	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.266	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	2,129.63	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 4)		
1 Project area DA 1 (ft^2): 125,017	**2** Imperviousness after applying preventative site design practices (Imp%): 40.5	**3** Runoff Coefficient (Rc): _0.283 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 2,802.51 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 4** (ft^2):	125,017.00	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.405	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.283	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	2,802.51	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 5)		
1 Project area DA 1 (ft^2): 40,075.20	**2** Imperviousness after applying preventative site design practices (Imp%): 47.30	**3** Runoff Coefficient (Rc): _0.322 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 1,024.91 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 5** (ft^2): (East)	40,075.20	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.473	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.322	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	1,024.91	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 6)		
1 Project area DA 1 (ft^2): 51,836.4	**2** Imperviousness after applying preventative site design practices (Imp%): 50.0	**3** Runoff Coefficient (Rc): _0.339 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 1,395.03 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 6 - B** (ft^2): (East)	51,836.40	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.500	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{3} - 0.78(Imp\%)^{2} + 0.774(Imp\%) + 0.04$	0.339	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1* *(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	1,395.03	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 7)		
1 Project area DA 1 (ft^2): 50,529.6	**2** Imperviousness after applying preventative site design practices (Imp%): 51.4	**3** Runoff Coefficient (Rc): _0.348 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 1,396.05 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 7 - B** (ft^2): (East)	50,529.60	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.514	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.348	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	1,396.05	ft^3

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 8)		
1 Project area DA 1 (ft^2): 102,386	**2** Imperviousness after applying preventative site design practices (Imp%): 52.3	**3** Runoff Coefficient (Rc): _0.354 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.392 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.485 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 2,876.8 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume

	User Input
	User to Verify
	Results

TT-20527 Victorville CA

1	Project area **DA 8 - B** (ft^2): (East)	102,386.00	ft^2
2	Imperviousness after applying preventative site design practices (Imp%):	0.523	Decimal %
3	Runoff Coefficient (Rc): $R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$	0.354	
4	Determine 1-hour rainfall depth for a 2-year return period P2yr-1hr (in):	0.392	in
5	Compute P6, Mean 6-hr Precipitation (inches): *P6 = Item 4 *C1, where C1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*	0.485	(**Note:** Change the equation to use the correct value
6	Drawdown Rate	48	hrs
7	Compute design capture volume, DCV (ft3): *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C2], where C2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963) Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	2,876.79	ft^3

Form 4.2-2 Summary of Hydromodification Assessment (DA 1)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 81.6 *Form 4.2-3 Item 12*	**2** 18.85 *Form 4.2-4 Item 13*	**3** 1.27 *Form 4.2-5 Item 10*
Post-developed	**4** 2,678.1 *Form 4.2-3 Item 13*	**5** 9.14 *Form 4.2-4 Item 14*	**6** 3.65 *Form 4.2-5 Item 14*
Difference	**7** *2,596.5* *Item 4 – Item 1*	**8** *9.71* *Item 2 – Item 5*	**9** *2.38* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *3181.9%* *Item 7 / Item 1*	**11** *51.51%* *Item 8 / Item 2*	**12** *187.40%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 2)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 67.8 *Form 4.2-3 Item 12*	**2** 15.71 *Form 4.2-4 Item 13*	**3** 1.30 *Form 4.2-5 Item 10*
Post-developed	**4** 2,854.9 *Form 4.2-3 Item 13*	**5** 9.16 *Form 4.2-4 Item 14*	**6** 3.89 *Form 4.2-5 Item 14*
Difference	**7** *2,787.1* *Item 4 – Item 1*	**8** *6.55* *Item 2 – Item 5*	**9** *2.59* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *4110.8%* *Item 7 / Item 1*	**11** *41.69%* *Item 8 / Item 2*	**12** *199.23%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 3)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 33.3 *Form 4.2-3 Item 12*	**2** 16.89 *Form 4.2-4 Item 13*	**3** 0.58 *Form 4.2-5 Item 10*
Post-developed	**4** 3,153.9 *Form 4.2-3 Item 13*	**5** 10.37 *Form 4.2-4 Item 14*	**6** 3.85 *Form 4.2-5 Item 14*
Difference	**7** *3,120.7* *Item 4 – Item 1*	**8** *6.52* *Item 2 – Item 5*	**9** *3.27* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *9,371.3%* *Item 7 / Item 1*	**11** *38.60%* *Item 8 / Item 2*	**12** *563.79%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 4)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 98.24 *Form 4.2-3 Item 12*	**2** 17.36 *Form 4.2-4 Item 13*	**3** 1.67 *Form 4.2-5 Item 10*
Post-developed	**4** 3,901.7 *Form 4.2-3 Item 13*	**5** 11.53 *Form 4.2-4 Item 14*	**6** 4.34 *Form 4.2-5 Item 14*
Difference	**7** *3,803.4* *Item 4 – Item 1*	**8** *5.83* *Item 2 – Item 5*	**9** *2.67* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *3871.6%* *Item 7 / Item 1*	**11** *33.58%* *Item 8 / Item 2*	**12** *159.9%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 5)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 84.40 *Form 4.2-3 Item 12*	**2** 16.75 *Form 4.2-4 Item 13*	**3** 1.49 *Form 4.2-5 Item 10*
Post-developed	**4** 1,250.7 *Form 4.2-3 Item 13*	**5** 8.12 *Form 4.2-4 Item 14*	**6** 1.89 *Form 4.2-5 Item 14*
Difference	**7** *1,166.3* *Item 4 – Item 1*	**8** *8.63* *Item 2 – Item 5*	**9** *0.40* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *1,381.9%* *Item 7 / Item 1*	**11** *51.52%* *Item 8 / Item 2*	**12** *26.84%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 6)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 122.4 *Form 4.2-3 Item 12*	**2** 16.57 *Form 4.2-4 Item 13*	**3** 2.18 *Form 4.2-5 Item 10*
Post-developed	**4** 1,617.8 *Form 4.2-3 Item 13*	**5** 9.29 *Form 4.2-4 Item 14*	**6** 2.18 *Form 4.2-5 Item 14*
Difference	**7** *1,495.4* *Item 4 – Item 1*	**8** *7.28* *Item 2 – Item 5*	**9** *0.0* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** 1,221.7 *%* *Item 7 / Item 1*	**11** *43.93%* *Item 8 / Item 2*	**12** *0.0%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 7)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 176.9 *Form 4.2-3 Item 12*	**2** 17.57 *Form 4.2-4 Item 13*	**3** 2.96 *Form 4.2-5 Item 10*
Post-developed	**4** 1,577 *Form 4.2-3 Item 13*	**5** 9.23 *Form 4.2-4 Item 14*	**6** 2.13 *Form 4.2-5 Item 14*
Difference	**7** *1,400.1* *Item 4 – Item 1*	**8** *8.34* *Item 2 – Item 5*	**9** *-0.83* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *791.5%* *Item 7 / Item 1*	**11** *47.47%* *Item 8 / Item 2*	**12** *-28.04%* *Item 9 / Item 3*

Form 4.2-2 Summary of Hydromodification Assessment (DA 8)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for **10yr storm event** using Forms 4.2-3 through 4.2-5 and insert results below *(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 891.4 *Form 4.2-3 Item 12*	**2** 19.12 *Form 4.2-4 Item 13*	**3** 3.06 *Form 4.2-5 Item 10*
Post-developed	**4** 3,195.4 *Form 4.2-3 Item 13*	**5** 17.93 *Form 4.2-4 Item 14*	**6** 2.34 *Form 4.2-5 Item 14*
Difference	**7** *2,304* *Item 4 – Item 1*	**8** *1.19* *Item 2 – Item 5*	**9** *-0.72* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *258.5%* *Item 7 / Item 1*	**11** *6.22%* *Item 8 / Item 2*	**12** *-23.53%* *Item 9 / Item 3*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	61,855							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	85,813							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 81.58
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 2,678.14
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 2,544.23
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 2)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	51,401							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	91,476							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 67.8
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 2,854.88
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 2,712.13
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 3)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	25,265							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	101,059.2							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 33.3
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 3,153.96
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 2,996.26
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 4)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	74,488							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	125,017.2							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 98.24
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 3,901.67
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 3,706.58
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 5)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	64,033							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	40,075.2							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 84.45
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 1,250.71
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 1,188.17
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 6)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	92,783							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	51,836.4							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 122.37
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 1,617.76
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 1,539.88
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 7)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	134,165							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	50,529.60							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 176.95
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 1,576.98
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 1,498.13
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-3 Hydromodification Assessment for Runoff Volume (DA 8)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Natural Fair Open Brush							
2a Hydrologic Soil Group (HSG)	A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	151,589							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	50							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	2-3 UPA							
2b Hydrologic Soil Group (HSG)	A							
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	102,386							
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	32							

5 Pre-Developed area-weighted CN: 50	**7** Pre-developed soil storage capacity, S (in): 10 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 2.0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 32	**8** Post-developed soil storage capacity, S (in): 21.25 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 4.25 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 1.61
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 891.38
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 3,195.37
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet hydromodification requirement, (ft^3): 3,035.6
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	369				261			
2 Change in elevation (ft)	3.70				3.3			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.010				.0095			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	18.85				9.14			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.86			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	3.12				3.41			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	18.85				9.14			

13 Pre-developed time of concentration (min): 18.85 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 9.14 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 8.77 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 2)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	355				279			
2 Change in elevation (ft)	8.00				4.28			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.225				0.0153			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	15.71				9.16			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	4.65				4.33			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	15.71				9.16			

13 Pre-developed time of concentration (min): 15.71 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 9.16 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 5.76 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 3)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	323				346			
2 Change in elevation (ft)	4.30				4.1			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.0133				0.0118			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	16.89				10.37			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	3.60				3.80			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	16.89				10.37			

13 Pre-developed time of concentration (min): 16.89 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 10.37 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 5.68 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 4)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	388				406			
2 Change in elevation (ft)	6.50				3.90			
3 Slope (ft/ft), *S_o = Item 2 / Item 1*	0.0167				0.0096			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	17.36				11.53			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) *V_{fps} = (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	4.03				3.43			
11 Travel time to outlet (min) *T_t = Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) *T_c = Item 5 + Item 11*	17.36				11.53			

13 Pre-developed time of concentration (min): 17.36 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 11.53 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 4.96 *$T_{C\text{-}Hydro}$ = (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 5)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	356				231			
2 Change in elevation (ft)	6.00				4.15			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.0168				0.018			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	16.75				8.12			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	4.05				4.69			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	16.75				8.12			

13 Pre-developed time of concentration (min): 16.75 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 8.12 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 7.79 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 6)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	326				292			
2 Change in elevation (ft)	5.00				4.28			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.0153				0.0146			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	16.57				9.29			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	3.86				4.23			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	16.57				9.29			

13 Pre-developed time of concentration (min): 16.57 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 9.29 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 6.45 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 7)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	308				291			
2 Change in elevation (ft)	3.40				4.37			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.0110				0.0150			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	17.57				9.23			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	3.27				3.74			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	17.57				9.23			

13 Pre-developed time of concentration (min): 17.57 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 9.23 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 7.46 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-4 Hydromodification Assessment for Time of Concentration (DA 8)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	458				1000			
2 Change in elevation (ft)	6.60				8.40			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.0144				0.0084			
4 Land cover	Natural Fair Open Brush				Res. 2-3 UPA			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	19.12				17.93			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0.0				0.0			
7 Cross-sectional area of channel (ft^2)	10				8.61			
8 Wetted perimeter of channel (ft)	20				40.87			
9 Manning's roughness of channel (n)	0.03				0.015			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	3.21				3.78			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0.0				0.0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	19.12				17.93			

13 Pre-developed time of concentration (min): 19.12 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 17.93 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 0.23 $T_{C\text{-}Hydro}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 2)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 3)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 4)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 5)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 6)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 7)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

Form 4.2-5 Hydromodification Assessment for Peak Runoff (DA 8)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.7 LOG Form 4.2-4 Item 5 /60)*							
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*							
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*							
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*							
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): $Q_{p\text{-}hydro}$ *= (Item 14 * 0.95) – Item 10*		

RATIONAL METHOD

ONSITE PRE-DEVELOPED CONDITION

10-YEAR STORM EVENTS

DRAINAGE AREA DA1 TO DA8

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/30/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 1 AREA AA5
FILE: 18345ONSITEPREAA510.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   369.000(Ft.)
Top (of initial area) elevation =  3238.600(Ft.)
Bottom (of initial area) elevation =  3234.900(Ft.)
Difference in elevation =     3.700(Ft.)
Slope =    0.01003  s(%)=       1.00
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.853 min.
Rainfall intensity =      1.525(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.586
Subarea runoff =      1.268(CFS)
Total initial stream area =        1.420(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            1.42 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/30/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 2 AREA AA6
FILE: 18345ONSITEPREAA610.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   355.000(Ft.)
Top (of initial area) elevation =  3238.200(Ft.)
Bottom (of initial area) elevation =  3230.000(Ft.)
Difference in elevation =     8.200(Ft.)
Slope =    0.02310  s(%)=       2.31
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.710 min.
Rainfall intensity =      1.732(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.623
Subarea runoff =      1.274(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            1.18 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 3 AREA AA7
FILE: 18345ONSITEPREAA710.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   323.000(Ft.)
Top (of initial area) elevation =  3232.800(Ft.)
Bottom (of initial area) elevation =  3228.500(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.01331  s(%)=       1.33
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.890 min.
Rainfall intensity =      1.647(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.609
Subarea runoff =      0.582(CFS)
Total initial stream area =        0.580(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            0.58 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 4 AREA AA8
FILE: 18345ONSITEPREAA810.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      112.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   388.000(Ft.)
Top (of initial area) elevation =  3228.500(Ft.)
Bottom (of initial area) elevation =  3222.000(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01675  s(%)=       1.68
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.359 min.
Rainfall intensity =      1.615(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.603
Subarea runoff =      1.667(CFS)
Total initial stream area =        1.710(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            1.71 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 5 AREA AA1
FILE: 18345ONSITEPREAA110.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   356.000(Ft.)
Top (of initial area) elevation =  3242.000(Ft.)
Bottom (of initial area) elevation =  3236.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01685  s(%)=       1.69
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.751 min.
Rainfall intensity =      1.656(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.611
Subarea runoff =      1.487(CFS)
Total initial stream area =        1.470(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            1.47 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 6 AREA AA2
FILE: 18345ONSITEPREAA210.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   329.000(Ft.)
Top (of initial area) elevation =  3236.000(Ft.)
Bottom (of initial area) elevation =  3231.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.01520  s(%)=       1.52
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.570 min.
Rainfall intensity =      1.669(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.613
Subarea runoff =      2.178(CFS)
Total initial stream area =        2.130(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            2.13 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 7 AREA AA3
FILE: 18345ONSITEPREAA310.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** INITIAL AREA EVALUATION ****
```

```
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   319.000(Ft.)
Top (of initial area) elevation =  3231.000(Ft.)
Bottom (of initial area) elevation =  3227.600(Ft.)
Difference in elevation =     3.400(Ft.)
Slope =    0.01066  s(%)=       1.07
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.570 min.
Rainfall intensity =      1.602(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.601
Subarea runoff =      2.964(CFS)
Total initial stream area =        3.080(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            3.08 (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) = 1.000
Area averaged SCS curve number =  50.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/11/22

10-YR, 1-HR RATIONAL METHOD ONSITE PRE-DEVELOPED CONDITION
TR. 20527, CITY OF VICTORVILLE
DA 8 AREA AA4
FILE: 18345ONSITEPREAA410.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
```

```
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   458.000(Ft.)
Top (of initial area) elevation =  3227.600(Ft.)
Bottom (of initial area) elevation =  3221.000(Ft.)
Difference in elevation =     6.600(Ft.)
Slope =    0.01441  s(%)=       1.44
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.117 min.
Rainfall intensity =      1.510(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.583
Subarea runoff =      3.061(CFS)
Total initial stream area =        3.480(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
End of computations, Total Study Area =            3.48 (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) = 1.000
Area averaged SCS curve number =  50.0
```

UNIT HYDROGRAPH

ONSITE PRE-DEVELOPED CONDITION

10-YEAR STORM EVENTS

DRAINAGE AREA DA1 *to* DA8

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 07/11/22

++

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA1 TRIBUTARY AREA AA5
FILE: 18345HYDROAA5PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.42	1	0.68
Rainfall data for year 10		
1.42	6	1.43
Rainfall data for year 10		
1.42	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	1.42	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.42	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.314 (hours)
++
Watershed area = 1.42(Ac.)
Catchment Lag time = 0.251 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 33.1530
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.42(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 17.17 (CFS))		
1	2.054	0.353
2	11.737	1.663
3	37.390	4.405
4	57.445	3.444

5	68.172	1.842
6	75.245	1.215
7	80.327	0.873
8	84.112	0.650
9	87.221	0.534
10	89.594	0.407
11	91.468	0.322
12	93.069	0.275
13	94.389	0.227
14	95.493	0.190
15	96.399	0.156
16	97.149	0.129
17	97.724	0.099
18	98.102	0.065
19	98.460	0.062
20	98.858	0.068
21	99.256	0.068
22	99.579	0.055
23	99.787	0.036
24	100.000	0.018

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137

32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093

86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073

140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062

194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055

248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012

9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012
11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014

63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014
65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018

117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018
119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029

171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030
173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020

225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019
227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012

279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012
281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 1.39(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

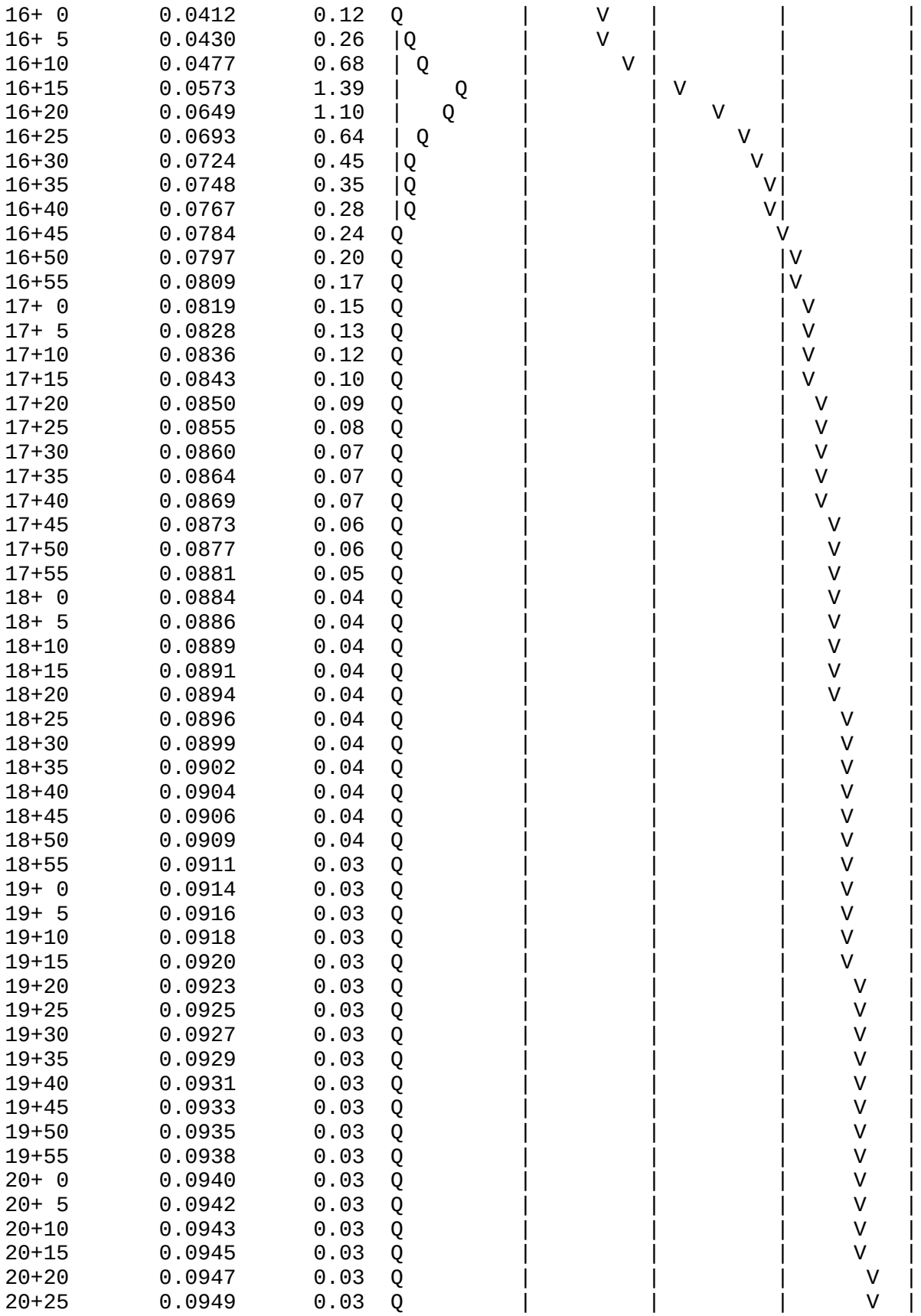
Hydrograph in 5 Minute intervals ((CFS))

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	0.0001	0.01	Q				
0+20	0.0001	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.02	Q				
0+40	0.0006	0.02	Q				
0+45	0.0007	0.02	Q				
0+50	0.0008	0.02	Q				
0+55	0.0009	0.02	Q				
1+ 0	0.0011	0.02	Q				
1+ 5	0.0012	0.02	Q				
1+10	0.0013	0.02	Q				
1+15	0.0015	0.02	Q				
1+20	0.0016	0.02	Q				
1+25	0.0017	0.02	Q				
1+30	0.0019	0.02	Q				
1+35	0.0020	0.02	Q				
1+40	0.0021	0.02	Q				
1+45	0.0023	0.02	Q				
1+50	0.0024	0.02	Q				
1+55	0.0026	0.02	Q				
2+ 0	0.0027	0.02	QV				
2+ 5	0.0028	0.02	QV				
2+10	0.0030	0.02	QV				
2+15	0.0031	0.02	QV				
2+20	0.0033	0.02	QV				
2+25	0.0034	0.02	QV				

2+30	0.0036	0.02	QV	|	|	|	|
2+35	0.0037	0.02	QV	|	|	|	|
2+40	0.0038	0.02	QV	|	|	|	|
2+45	0.0040	0.02	QV	|	|	|	|
2+50	0.0041	0.02	QV	|	|	|	|
2+55	0.0043	0.02	QV	|	|	|	|
3+ 0	0.0044	0.02	QV	|	|	|	|
3+ 5	0.0046	0.02	QV	|	|	|	|
3+10	0.0047	0.02	QV	|	|	|	|
3+15	0.0049	0.02	QV	|	|	|	|
3+20	0.0050	0.02	QV	|	|	|	|
3+25	0.0052	0.02	Q V	|	|	|	|
3+30	0.0053	0.02	Q V	|	|	|	|
3+35	0.0055	0.02	Q V	|	|	|	|
3+40	0.0056	0.02	Q V	|	|	|	|
3+45	0.0058	0.02	Q V	|	|	|	|
3+50	0.0059	0.02	Q V	|	|	|	|
3+55	0.0061	0.02	Q V	|	|	|	|
4+ 0	0.0062	0.02	Q V	|	|	|	|
4+ 5	0.0064	0.02	Q V	|	|	|	|
4+10	0.0065	0.02	Q V	|	|	|	|
4+15	0.0067	0.02	Q V	|	|	|	|
4+20	0.0068	0.02	Q V	|	|	|	|
4+25	0.0070	0.02	Q V	|	|	|	|
4+30	0.0071	0.02	Q V	|	|	|	|
4+35	0.0073	0.02	Q V	|	|	|	|
4+40	0.0075	0.02	Q V	|	|	|	|
4+45	0.0076	0.02	Q V	|	|	|	|
4+50	0.0078	0.02	Q V	|	|	|	|
4+55	0.0079	0.02	Q V	|	|	|	|
5+ 0	0.0081	0.02	Q V	|	|	|	|
5+ 5	0.0082	0.02	Q V	|	|	|	|
5+10	0.0084	0.02	Q V	|	|	|	|
5+15	0.0086	0.02	Q V	|	|	|	|
5+20	0.0087	0.02	Q V	|	|	|	|
5+25	0.0089	0.02	Q V	|	|	|	|
5+30	0.0091	0.02	Q V	|	|	|	|
5+35	0.0092	0.02	Q V	|	|	|	|
5+40	0.0094	0.02	Q V	|	|	|	|
5+45	0.0095	0.02	Q V	|	|	|	|
5+50	0.0097	0.02	Q V	|	|	|	|
5+55	0.0099	0.02	Q V	|	|	|	|
6+ 0	0.0100	0.02	Q V	|	|	|	|
6+ 5	0.0102	0.02	Q V	|	|	|	|
6+10	0.0104	0.02	Q V	|	|	|	|
6+15	0.0105	0.02	Q V	|	|	|	|
6+20	0.0107	0.02	Q V	|	|	|	|
6+25	0.0109	0.02	Q V	|	|	|	|
6+30	0.0111	0.02	Q V	|	|	|	|
6+35	0.0112	0.02	Q V	|	|	|	|
6+40	0.0114	0.02	Q V	|	|	|	|
6+45	0.0116	0.03	Q V	|	|	|	|
6+50	0.0117	0.03	Q V	|	|	|	|
6+55	0.0119	0.03	Q V	|	|	|	|

7+ 0	0.0121	0.03	Q	V				
7+ 5	0.0123	0.03	Q	V				
7+10	0.0124	0.03	Q	V				
7+15	0.0126	0.03	Q	V				
7+20	0.0128	0.03	Q	V				
7+25	0.0130	0.03	Q	V				
7+30	0.0132	0.03	Q	V				
7+35	0.0133	0.03	Q	V				
7+40	0.0135	0.03	Q	V				
7+45	0.0137	0.03	Q	V				
7+50	0.0139	0.03	Q	V				
7+55	0.0141	0.03	Q	V				
8+ 0	0.0142	0.03	Q	V				
8+ 5	0.0144	0.03	Q	V				
8+10	0.0146	0.03	Q	V				
8+15	0.0148	0.03	Q	V				
8+20	0.0150	0.03	Q	V				
8+25	0.0152	0.03	Q	V				
8+30	0.0154	0.03	Q	V				
8+35	0.0156	0.03	Q	V				
8+40	0.0158	0.03	Q	V				
8+45	0.0159	0.03	Q	V				
8+50	0.0161	0.03	Q	V				
8+55	0.0163	0.03	Q	V				
9+ 0	0.0165	0.03	Q	V				
9+ 5	0.0167	0.03	Q	V				
9+10	0.0169	0.03	Q	V				
9+15	0.0171	0.03	Q	V				
9+20	0.0173	0.03	Q	V				
9+25	0.0175	0.03	Q	V				
9+30	0.0177	0.03	Q	V				
9+35	0.0179	0.03	Q	V				
9+40	0.0181	0.03	Q	V				
9+45	0.0184	0.03	Q	V				
9+50	0.0186	0.03	Q	V				
9+55	0.0188	0.03	Q	V				
10+ 0	0.0190	0.03	Q	V				
10+ 5	0.0192	0.03	Q	V				
10+10	0.0194	0.03	Q	V				
10+15	0.0196	0.03	Q	V				
10+20	0.0198	0.03	Q	V				
10+25	0.0201	0.03	Q	V				
10+30	0.0203	0.03	Q	V				
10+35	0.0205	0.03	Q	V				
10+40	0.0207	0.03	Q	V				
10+45	0.0209	0.03	Q	V				
10+50	0.0212	0.03	Q	V				
10+55	0.0214	0.03	Q	V				
11+ 0	0.0216	0.03	Q	V				
11+ 5	0.0219	0.03	Q	V				
11+10	0.0221	0.03	Q	V				
11+15	0.0223	0.03	Q	V				
11+20	0.0226	0.03	Q	V				
11+25	0.0228	0.03	Q	V				

11+30	0.0230	0.03	Q	V|	|	|	|
11+35	0.0233	0.04	Q	V|	|	|	|
11+40	0.0235	0.04	Q	V|	|	|	|
11+45	0.0238	0.04	Q	V|	|	|	|
11+50	0.0240	0.04	Q	V|	|	|	|
11+55	0.0243	0.04	Q	V|	|	|	|
12+ 0	0.0245	0.04	Q	V|	|	|	|
12+ 5	0.0248	0.04	Q	V|	|	|	|
12+10	0.0250	0.04	Q	V|	|	|	|
12+15	0.0253	0.04	Q	V|	|	|	|
12+20	0.0255	0.03	Q	V|	|	|	|
12+25	0.0258	0.03	Q	V	|	|	|
12+30	0.0260	0.03	Q	V	|	|	|
12+35	0.0262	0.03	Q	V	|	|	|
12+40	0.0265	0.03	Q	V	|	|	|
12+45	0.0267	0.03	Q	V	|	|	|
12+50	0.0269	0.03	Q	V	|	|	|
12+55	0.0272	0.04	Q	V	|	|	|
13+ 0	0.0274	0.04	Q	V	|	|	|
13+ 5	0.0277	0.04	Q	V	|	|	|
13+10	0.0279	0.04	Q	V	|	|	|
13+15	0.0282	0.04	Q	|V	|	|	|
13+20	0.0284	0.04	Q	|V	|	|	|
13+25	0.0287	0.04	Q	|V	|	|	|
13+30	0.0290	0.04	Q	|V	|	|	|
13+35	0.0292	0.04	Q	|V	|	|	|
13+40	0.0295	0.04	Q	|V	|	|	|
13+45	0.0298	0.04	Q	|V	|	|	|
13+50	0.0301	0.04	Q	|V	|	|	|
13+55	0.0304	0.04	Q	|V	|	|	|
14+ 0	0.0307	0.04	Q	|V	|	|	|
14+ 5	0.0310	0.04	Q	| V	|	|	|
14+10	0.0313	0.04	Q	| V	|	|	|
14+15	0.0316	0.05	Q	| V	|	|	|
14+20	0.0319	0.05	Q	| V	|	|	|
14+25	0.0322	0.05	Q	| V	|	|	|
14+30	0.0326	0.05	Q	| V	|	|	|
14+35	0.0329	0.05	Q	| V	|	|	|
14+40	0.0333	0.05	Q	| V	|	|	|
14+45	0.0337	0.05	Q	| V	|	|	|
14+50	0.0340	0.06	Q	| V	|	|	|
14+55	0.0344	0.06	Q	| V	|	|	|
15+ 0	0.0348	0.06	Q	| V	|	|	|
15+ 5	0.0353	0.06	Q	| V	|	|	|
15+10	0.0357	0.06	Q	| V	|	|	|
15+15	0.0362	0.07	Q	| V	|	|	|
15+20	0.0366	0.07	Q	| V	|	|	|
15+25	0.0371	0.07	Q	| V	|	|	|
15+30	0.0376	0.07	Q	| V	|	|	|
15+35	0.0381	0.07	Q	| V	|	|	|
15+40	0.0386	0.07	Q	| V	|	|	|
15+45	0.0392	0.08	Q	| V	|	|	|
15+50	0.0398	0.08	Q	| V	|	|	|
15+55	0.0404	0.10	Q	| V	|	|	|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16+15 0.0573 1.39
16+20 0.0649 1.10
16+25 0.0693 0.64
16+30 0.0724 0.45
16+35 0.0748 0.35
16+40 0.0767 0.28
16+45 0.0784 0.24
16+50 0.0797 0.20
16+55 0.0809 0.17
17+ 0 0.0819 0.15
17+ 5 0.0828 0.13
17+10 0.0836 0.12
17+15 0.0843 0.10
17+20 0.0850 0.09
17+25 0.0855 0.08
17+30 0.0860 0.07
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17+40 0.0869 0.07
17+45 0.0873 0.06
17+50 0.0877 0.06
17+55 0.0881 0.05
18+ 0 0.0884 0.04
18+ 5 0.0886 0.04
18+10 0.0889 0.04
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18+35 0.0902 0.04
18+40 0.0904 0.04
18+45 0.0906 0.04
18+50 0.0909 0.04
18+55 0.0911 0.03
19+ 0 0.0914 0.03
19+ 5 0.0916 0.03
19+10 0.0918 0.03
19+15 0.0920 0.03
19+20 0.0923 0.03
19+25 0.0925 0.03
19+30 0.0927 0.03
19+35 0.0929 0.03
19+40 0.0931 0.03
19+45 0.0933 0.03
19+50 0.0935 0.03
19+55 0.0938 0.03
20+ 0 0.0940 0.03
20+ 5 0.0942 0.03
20+10 0.0943 0.03
20+15 0.0945 0.03
20+20 0.0947 0.03
20+25 0.0949 0.03

20+30	0.0951	0.03	Q	|	|	|	V |
20+35	0.0953	0.03	Q	|	|	|	V |
20+40	0.0955	0.03	Q	|	|	|	V |
20+45	0.0957	0.03	Q	|	|	|	V |
20+50	0.0958	0.03	Q	|	|	|	V |
20+55	0.0960	0.03	Q	|	|	|	V |
21+ 0	0.0962	0.03	Q	|	|	|	V |
21+ 5	0.0964	0.03	Q	|	|	|	V |
21+10	0.0966	0.03	Q	|	|	|	V |
21+15	0.0967	0.03	Q	|	|	|	V |
21+20	0.0969	0.02	Q	|	|	|	V |
21+25	0.0971	0.02	Q	|	|	|	V |
21+30	0.0972	0.02	Q	|	|	|	V |
21+35	0.0974	0.02	Q	|	|	|	V |
21+40	0.0976	0.02	Q	|	|	|	V |
21+45	0.0977	0.02	Q	|	|	|	V |
21+50	0.0979	0.02	Q	|	|	|	V |
21+55	0.0981	0.02	Q	|	|	|	V |
22+ 0	0.0982	0.02	Q	|	|	|	V |
22+ 5	0.0984	0.02	Q	|	|	|	V |
22+10	0.0985	0.02	Q	|	|	|	V |
22+15	0.0987	0.02	Q	|	|	|	V |
22+20	0.0989	0.02	Q	|	|	|	V |
22+25	0.0990	0.02	Q	|	|	|	V |
22+30	0.0992	0.02	Q	|	|	|	V |
22+35	0.0993	0.02	Q	|	|	|	V |
22+40	0.0995	0.02	Q	|	|	|	V |
22+45	0.0996	0.02	Q	|	|	|	V |
22+50	0.0998	0.02	Q	|	|	|	V |
22+55	0.0999	0.02	Q	|	|	|	V|
23+ 0	0.1001	0.02	Q	|	|	|	V|
23+ 5	0.1002	0.02	Q	|	|	|	V|
23+10	0.1004	0.02	Q	|	|	|	V|
23+15	0.1005	0.02	Q	|	|	|	V|
23+20	0.1007	0.02	Q	|	|	|	V|
23+25	0.1008	0.02	Q	|	|	|	V|
23+30	0.1009	0.02	Q	|	|	|	V|
23+35	0.1011	0.02	Q	|	|	|	V|
23+40	0.1012	0.02	Q	|	|	|	V|
23+45	0.1014	0.02	Q	|	|	|	V|
23+50	0.1015	0.02	Q	|	|	|	V|
23+55	0.1017	0.02	Q	|	|	|	V|
24+ 0	0.1018	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA6 TRIBUTARY AREA AA6
FILE: 18345HYDROAA6PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.18	1	0.68
Rainfall data for year 10		
1.18	6	1.43
Rainfall data for year 10		
1.18	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	1.18	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.18	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.262 (hours)
++
Watershed area = 1.18(Ac.)
Catchment Lag time = 0.209 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 39.7886
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.18(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 14.27 (CFS))	
1	2.725	0.389
2	18.458	2.245
3	48.845	4.336
4	65.412	2.364

5	74.618	1.314
6	80.729	0.872
7	85.106	0.625
8	88.489	0.483
9	90.931	0.348
10	92.917	0.284
11	94.504	0.226
12	95.782	0.182
13	96.801	0.146
14	97.564	0.109
15	98.069	0.072
16	98.501	0.062
17	98.978	0.068
18	99.437	0.065
19	99.726	0.041
20	100.000	0.039

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127

36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091

90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6881	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072

144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061

198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6542	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054

252	2.6922	0.0054
253	2.6976	0.0054
254	2.7030	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012
11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012

13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014
65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014

67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018
119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018

121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030
173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032

175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019
227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019

229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012
281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012

283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 1.33(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	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0005	0.01	Q				
0+45	0.0006	0.01	Q				
0+50	0.0007	0.02	Q				
0+55	0.0008	0.02	Q				
1+ 0	0.0009	0.02	Q				
1+ 5	0.0011	0.02	Q				
1+10	0.0012	0.02	Q				
1+15	0.0013	0.02	Q				
1+20	0.0014	0.02	Q				
1+25	0.0015	0.02	Q				
1+30	0.0016	0.02	Q				
1+35	0.0017	0.02	Q				
1+40	0.0019	0.02	Q				
1+45	0.0020	0.02	Q				
1+50	0.0021	0.02	Q				
1+55	0.0022	0.02	QV				
2+ 0	0.0023	0.02	QV				
2+ 5	0.0024	0.02	QV				
2+10	0.0026	0.02	QV				
2+15	0.0027	0.02	QV				
2+20	0.0028	0.02	QV				
2+25	0.0029	0.02	QV				
2+30	0.0030	0.02	QV				
2+35	0.0032	0.02	QV				
2+40	0.0033	0.02	QV				
2+45	0.0034	0.02	QV				

2+50	0.0035	0.02	QV	|	|	|	|
2+55	0.0036	0.02	QV	|	|	|	|
3+ 0	0.0038	0.02	QV	|	|	|	|
3+ 5	0.0039	0.02	QV	|	|	|	|
3+10	0.0040	0.02	QV	|	|	|	|
3+15	0.0041	0.02	QV	|	|	|	|
3+20	0.0043	0.02	Q V	|	|	|	|
3+25	0.0044	0.02	Q V	|	|	|	|
3+30	0.0045	0.02	Q V	|	|	|	|
3+35	0.0046	0.02	Q V	|	|	|	|
3+40	0.0048	0.02	Q V	|	|	|	|
3+45	0.0049	0.02	Q V	|	|	|	|
3+50	0.0050	0.02	Q V	|	|	|	|
3+55	0.0051	0.02	Q V	|	|	|	|
4+ 0	0.0053	0.02	Q V	|	|	|	|
4+ 5	0.0054	0.02	Q V	|	|	|	|
4+10	0.0055	0.02	Q V	|	|	|	|
4+15	0.0057	0.02	Q V	|	|	|	|
4+20	0.0058	0.02	Q V	|	|	|	|
4+25	0.0059	0.02	Q V	|	|	|	|
4+30	0.0060	0.02	Q V	|	|	|	|
4+35	0.0062	0.02	Q V	|	|	|	|
4+40	0.0063	0.02	Q V	|	|	|	|
4+45	0.0064	0.02	Q V	|	|	|	|
4+50	0.0066	0.02	Q V	|	|	|	|
4+55	0.0067	0.02	Q V	|	|	|	|
5+ 0	0.0068	0.02	Q V	|	|	|	|
5+ 5	0.0070	0.02	Q V	|	|	|	|
5+10	0.0071	0.02	Q V	|	|	|	|
5+15	0.0072	0.02	Q V	|	|	|	|
5+20	0.0074	0.02	Q V	|	|	|	|
5+25	0.0075	0.02	Q V	|	|	|	|
5+30	0.0076	0.02	Q V	|	|	|	|
5+35	0.0078	0.02	Q V	|	|	|	|
5+40	0.0079	0.02	Q V	|	|	|	|
5+45	0.0080	0.02	Q V	|	|	|	|
5+50	0.0082	0.02	Q V	|	|	|	|
5+55	0.0083	0.02	Q V	|	|	|	|
6+ 0	0.0085	0.02	Q V	|	|	|	|
6+ 5	0.0086	0.02	Q V	|	|	|	|
6+10	0.0087	0.02	Q V	|	|	|	|
6+15	0.0089	0.02	Q V	|	|	|	|
6+20	0.0090	0.02	Q V	|	|	|	|
6+25	0.0092	0.02	Q V	|	|	|	|
6+30	0.0093	0.02	Q V	|	|	|	|
6+35	0.0094	0.02	Q V	|	|	|	|
6+40	0.0096	0.02	Q V	|	|	|	|
6+45	0.0097	0.02	Q V	|	|	|	|
6+50	0.0099	0.02	Q V	|	|	|	|
6+55	0.0100	0.02	Q V	|	|	|	|
7+ 0	0.0102	0.02	Q V	|	|	|	|
7+ 5	0.0103	0.02	Q V	|	|	|	|
7+10	0.0105	0.02	Q V	|	|	|	|
7+15	0.0106	0.02	Q V	|	|	|	|

7+20	0.0107	0.02	Q	V				
7+25	0.0109	0.02	Q	V				
7+30	0.0110	0.02	Q	V				
7+35	0.0112	0.02	Q	V				
7+40	0.0113	0.02	Q	V				
7+45	0.0115	0.02	Q	V				
7+50	0.0117	0.02	Q	V				
7+55	0.0118	0.02	Q	V				
8+ 0	0.0120	0.02	Q	V				
8+ 5	0.0121	0.02	Q	V				
8+10	0.0123	0.02	Q	V				
8+15	0.0124	0.02	Q	V				
8+20	0.0126	0.02	Q	V				
8+25	0.0127	0.02	Q	V				
8+30	0.0129	0.02	Q	V				
8+35	0.0131	0.02	Q	V				
8+40	0.0132	0.02	Q	V				
8+45	0.0134	0.02	Q	V				
8+50	0.0135	0.02	Q	V				
8+55	0.0137	0.02	Q	V				
9+ 0	0.0139	0.02	Q	V				
9+ 5	0.0140	0.02	Q	V				
9+10	0.0142	0.02	Q	V				
9+15	0.0144	0.02	Q	V				
9+20	0.0145	0.02	Q	V				
9+25	0.0147	0.02	Q	V				
9+30	0.0149	0.02	Q	V				
9+35	0.0150	0.02	Q	V				
9+40	0.0152	0.02	Q	V				
9+45	0.0154	0.03	Q	V				
9+50	0.0156	0.03	Q	V				
9+55	0.0157	0.03	Q	V				
10+ 0	0.0159	0.03	Q	V				
10+ 5	0.0161	0.03	Q	V				
10+10	0.0163	0.03	Q	V				
10+15	0.0165	0.03	Q	V				
10+20	0.0166	0.03	Q	V				
10+25	0.0168	0.03	Q	V				
10+30	0.0170	0.03	Q	V				
10+35	0.0172	0.03	Q	V				
10+40	0.0174	0.03	Q	V				
10+45	0.0176	0.03	Q	V				
10+50	0.0177	0.03	Q	V				
10+55	0.0179	0.03	Q	V				
11+ 0	0.0181	0.03	Q	V				
11+ 5	0.0183	0.03	Q	V				
11+10	0.0185	0.03	Q	V				
11+15	0.0187	0.03	Q	V				
11+20	0.0189	0.03	Q	V				
11+25	0.0191	0.03	Q	V				
11+30	0.0193	0.03	Q	V				
11+35	0.0195	0.03	Q	V				
11+40	0.0197	0.03	Q	V				
11+45	0.0199	0.03	Q	V				

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11+50       0.0201      0.03  Q        V|         |         |         |
11+55       0.0203      0.03  Q        V|         |         |         |
12+ 0       0.0206      0.03  Q        V|         |         |         |
12+ 5       0.0208      0.03  Q        V|         |         |         |
12+10       0.0210      0.03  Q        V|         |         |         |
12+15       0.0212      0.03  Q        V|         |         |         |
12+20       0.0214      0.03  Q         V         |         |         |
12+25       0.0216      0.03  Q         V         |         |         |
12+30       0.0218      0.03  Q         V         |         |         |
12+35       0.0220      0.03  Q         V         |         |         |
12+40       0.0222      0.03  Q         V         |         |         |
12+45       0.0224      0.03  Q         V         |         |         |
12+50       0.0226      0.03  Q         V         |         |         |
12+55       0.0228      0.03  Q         V         |         |         |
13+ 0       0.0230      0.03  Q         V         |         |         |
13+ 5       0.0232      0.03  Q         V         |         |         |
13+10       0.0234      0.03  Q         V         |         |         |
13+15       0.0236      0.03  Q         |V        |         |         |
13+20       0.0238      0.03  Q         |V        |         |         |
13+25       0.0240      0.03  Q         |V        |         |         |
13+30       0.0243      0.03  Q         |V        |         |         |
13+35       0.0245      0.03  Q         |V        |         |         |
13+40       0.0247      0.03  Q         |V        |         |         |
13+45       0.0249      0.03  Q         |V        |         |         |
13+50       0.0252      0.03  Q         |V        |         |         |
13+55       0.0254      0.04  Q         |V        |         |         |
14+ 0       0.0257      0.04  Q         | V       |         |         |
14+ 5       0.0259      0.04  Q         | V       |         |         |
14+10       0.0262      0.04  Q         | V       |         |         |
14+15       0.0265      0.04  Q         | V       |         |         |
14+20       0.0267      0.04  Q         | V       |         |         |
14+25       0.0270      0.04  Q         | V       |         |         |
14+30       0.0273      0.04  Q         | V       |         |         |
14+35       0.0276      0.04  Q         | V       |         |         |
14+40       0.0279      0.04  Q         |  V      |         |         |
14+45       0.0282      0.05  Q         |  V      |         |         |
14+50       0.0285      0.05  Q         |  V      |         |         |
14+55       0.0289      0.05  Q         |  V      |         |         |
15+ 0       0.0292      0.05  Q         |  V      |         |         |
15+ 5       0.0296      0.05  Q         |  V      |         |         |
15+10       0.0299      0.05  Q         |   V     |         |         |
15+15       0.0303      0.06  Q         |   V     |         |         |
15+20       0.0307      0.06  Q         |   V     |         |         |
15+25       0.0312      0.06  Q         |   V     |         |         |
15+30       0.0316      0.06  Q         |   V     |         |         |
15+35       0.0320      0.06  Q         |    V    |         |         |
15+40       0.0324      0.06  Q         |    V    |         |         |
15+45       0.0329      0.07  Q         |    V    |         |         |
15+50       0.0334      0.07  Q         |    V    |         |         |
15+55       0.0340      0.08  Q         |    V    |         |         |
16+ 0       0.0347      0.11  Q         |     V   |         |         |
16+ 5       0.0366      0.27  |Q        |      V  |         |         |
16+10       0.0422      0.81  |  Q      |         V|         |         |
16+15       0.0513      1.33  |    Q    |          |   V     |         |
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16+20       0.0567      0.77  |  Q      |          |     V   |          |
16+25       0.0599      0.47  |Q        |          |       V |          |
16+30       0.0622      0.33  |Q        |          |         V|          |
16+35       0.0640      0.26  |Q        |          |          V          |
16+40       0.0655      0.21  Q         |          |          V          |
16+45       0.0666      0.17  Q         |          |          |V         |
16+50       0.0676      0.15  Q         |          |          |V         |
16+55       0.0685      0.12  Q         |          |          | V        |
17+ 0       0.0692      0.11  Q         |          |          | V        |
17+ 5       0.0699      0.09  Q         |          |          | V        |
17+10       0.0704      0.08  Q         |          |          |  V       |
17+15       0.0709      0.07  Q         |          |          |  V       |
17+20       0.0713      0.06  Q         |          |          |  V       |
17+25       0.0717      0.06  Q         |          |          |  V       |
17+30       0.0721      0.06  Q         |          |          |  V       |
17+35       0.0725      0.05  Q         |          |          |   V      |
17+40       0.0728      0.05  Q         |          |          |   V      |
17+45       0.0730      0.03  Q         |          |          |   V      |
17+50       0.0733      0.03  Q         |          |          |   V      |
17+55       0.0735      0.03  Q         |          |          |   V      |
18+ 0       0.0737      0.03  Q         |          |          |   V      |
18+ 5       0.0739      0.03  Q         |          |          |   V      |
18+10       0.0741      0.03  Q         |          |          |   V      |
18+15       0.0743      0.03  Q         |          |          |   V      |
18+20       0.0745      0.03  Q         |          |          |   V      |
18+25       0.0747      0.03  Q         |          |          |    V     |
18+30       0.0749      0.03  Q         |          |          |    V     |
18+35       0.0752      0.03  Q         |          |          |    V     |
18+40       0.0754      0.03  Q         |          |          |    V     |
18+45       0.0756      0.03  Q         |          |          |    V     |
18+50       0.0758      0.03  Q         |          |          |    V     |
18+55       0.0760      0.03  Q         |          |          |    V     |
19+ 0       0.0761      0.03  Q         |          |          |    V     |
19+ 5       0.0763      0.03  Q         |          |          |    V     |
19+10       0.0765      0.03  Q         |          |          |    V     |
19+15       0.0767      0.03  Q         |          |          |     V    |
19+20       0.0769      0.03  Q         |          |          |     V    |
19+25       0.0771      0.03  Q         |          |          |     V    |
19+30       0.0773      0.03  Q         |          |          |     V    |
19+35       0.0774      0.03  Q         |          |          |     V    |
19+40       0.0776      0.03  Q         |          |          |     V    |
19+45       0.0778      0.02  Q         |          |          |     V    |
19+50       0.0779      0.02  Q         |          |          |     V    |
19+55       0.0781      0.02  Q         |          |          |     V    |
20+ 0       0.0783      0.02  Q         |          |          |     V    |
20+ 5       0.0784      0.02  Q         |          |          |     V    |
20+10       0.0786      0.02  Q         |          |          |     V    |
20+15       0.0788      0.02  Q         |          |          |     V    |
20+20       0.0789      0.02  Q         |          |          |      V   |
20+25       0.0791      0.02  Q         |          |          |      V   |
20+30       0.0792      0.02  Q         |          |          |      V   |
20+35       0.0794      0.02  Q         |          |          |      V   |
20+40       0.0795      0.02  Q         |          |          |      V   |
20+45       0.0797      0.02  Q         |          |          |      V   |
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  20+50       0.0798      0.02  Q          |          |          |       V  |
  20+55       0.0800      0.02  Q          |          |          |       V  |
  21+ 0       0.0801      0.02  Q          |          |          |       V  |
  21+ 5       0.0803      0.02  Q          |          |          |       V  |
  21+10       0.0804      0.02  Q          |          |          |       V  |
  21+15       0.0806      0.02  Q          |          |          |       V  |
  21+20       0.0807      0.02  Q          |          |          |       V  |
  21+25       0.0809      0.02  Q          |          |          |       V  |
  21+30       0.0810      0.02  Q          |          |          |        V |
  21+35       0.0811      0.02  Q          |          |          |        V |
  21+40       0.0813      0.02  Q          |          |          |        V |
  21+45       0.0814      0.02  Q          |          |          |        V |
  21+50       0.0815      0.02  Q          |          |          |        V |
  21+55       0.0817      0.02  Q          |          |          |        V |
  22+ 0       0.0818      0.02  Q          |          |          |        V |
  22+ 5       0.0819      0.02  Q          |          |          |        V |
  22+10       0.0821      0.02  Q          |          |          |        V |
  22+15       0.0822      0.02  Q          |          |          |        V |
  22+20       0.0823      0.02  Q          |          |          |        V |
  22+25       0.0825      0.02  Q          |          |          |        V |
  22+30       0.0826      0.02  Q          |          |          |        V |
  22+35       0.0827      0.02  Q          |          |          |        V |
  22+40       0.0828      0.02  Q          |          |          |        V |
  22+45       0.0830      0.02  Q          |          |          |        V |
  22+50       0.0831      0.02  Q          |          |          |         V|
  22+55       0.0832      0.02  Q          |          |          |         V|
  23+ 0       0.0833      0.02  Q          |          |          |         V|
  23+ 5       0.0835      0.02  Q          |          |          |         V|
  23+10       0.0836      0.02  Q          |          |          |         V|
  23+15       0.0837      0.02  Q          |          |          |         V|
  23+20       0.0838      0.02  Q          |          |          |         V|
  23+25       0.0839      0.02  Q          |          |          |         V|
  23+30       0.0841      0.02  Q          |          |          |         V|
  23+35       0.0842      0.02  Q          |          |          |         V|
  23+40       0.0843      0.02  Q          |          |          |         V|
  23+45       0.0844      0.02  Q          |          |          |         V|
  23+50       0.0845      0.02  Q          |          |          |         V|
  23+55       0.0846      0.02  Q          |          |          |         V|
  24+ 0       0.0848      0.02  Q          |          |          |         V|
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA3 **TRIBUTARY AREA AA7**
FILE: 18345HYDROAA7PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
0.58	1	0.68
Rainfall data for year 10		
0.58	6	1.43
Rainfall data for year 10		
0.58	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	0.58	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.58	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.281 (hours)
++
Watershed area = 0.58(Ac.)
Catchment Lag time = 0.225 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 37.0041
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 0.58(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 7.01 (CFS))		
1	2.433	0.171
2	15.405	0.910
3	44.477	2.039
4	62.442	1.260

5	72.157	0.681
6	78.655	0.456
7	83.261	0.323
8	86.847	0.252
9	89.564	0.191
10	91.643	0.146
11	93.388	0.122
12	94.769	0.097
13	95.923	0.081
14	96.853	0.065
15	97.555	0.049
16	98.036	0.034
17	98.429	0.028
18	98.871	0.031
19	99.314	0.031
20	99.635	0.022
21	99.866	0.016
22	100.000	0.009

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5768	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7010	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8560	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9931	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132

34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2783	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3437	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5365	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5643	0.0092
87	1.5734	0.0092

88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6881	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8274	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9496	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072

142	2.0151	0.0072
143	2.0223	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061

196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4495	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5652	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6542	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054

250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7030	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7929	0.0052
272	2.7981	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012

11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014

65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018

119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030

173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019

227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012

281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 0.63(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	0.0001	0.00	Q				
0+25	0.0001	0.01	Q				
0+30	0.0002	0.01	Q				
0+35	0.0002	0.01	Q				
0+40	0.0002	0.01	Q				
0+45	0.0003	0.01	Q				
0+50	0.0003	0.01	Q				
0+55	0.0004	0.01	Q				
1+ 0	0.0005	0.01	Q				
1+ 5	0.0005	0.01	Q				
1+10	0.0006	0.01	Q				
1+15	0.0006	0.01	Q				
1+20	0.0007	0.01	Q				
1+25	0.0007	0.01	Q				
1+30	0.0008	0.01	Q				
1+35	0.0008	0.01	Q				
1+40	0.0009	0.01	Q				
1+45	0.0010	0.01	Q				
1+50	0.0010	0.01	Q				
1+55	0.0011	0.01	QV				
2+ 0	0.0011	0.01	QV				
2+ 5	0.0012	0.01	QV				
2+10	0.0012	0.01	QV				
2+15	0.0013	0.01	QV				
2+20	0.0014	0.01	QV				
2+25	0.0014	0.01	QV				
2+30	0.0015	0.01	QV				
2+35	0.0015	0.01	QV				

2+40	0.0016	0.01	QV	|	|	|	|
2+45	0.0017	0.01	QV	|	|	|	|
2+50	0.0017	0.01	QV	|	|	|	|
2+55	0.0018	0.01	QV	|	|	|	|
3+ 0	0.0018	0.01	QV	|	|	|	|
3+ 5	0.0019	0.01	QV	|	|	|	|
3+10	0.0020	0.01	QV	|	|	|	|
3+15	0.0020	0.01	QV	|	|	|	|
3+20	0.0021	0.01	QV	|	|	|	|
3+25	0.0021	0.01	Q V	|	|	|	|
3+30	0.0022	0.01	Q V	|	|	|	|
3+35	0.0023	0.01	Q V	|	|	|	|
3+40	0.0023	0.01	Q V	|	|	|	|
3+45	0.0024	0.01	Q V	|	|	|	|
3+50	0.0024	0.01	Q V	|	|	|	|
3+55	0.0025	0.01	Q V	|	|	|	|
4+ 0	0.0026	0.01	Q V	|	|	|	|
4+ 5	0.0026	0.01	Q V	|	|	|	|
4+10	0.0027	0.01	Q V	|	|	|	|
4+15	0.0028	0.01	Q V	|	|	|	|
4+20	0.0028	0.01	Q V	|	|	|	|
4+25	0.0029	0.01	Q V	|	|	|	|
4+30	0.0030	0.01	Q V	|	|	|	|
4+35	0.0030	0.01	Q V	|	|	|	|
4+40	0.0031	0.01	Q V	|	|	|	|
4+45	0.0031	0.01	Q V	|	|	|	|
4+50	0.0032	0.01	Q V	|	|	|	|
4+55	0.0033	0.01	Q V	|	|	|	|
5+ 0	0.0033	0.01	Q V	|	|	|	|
5+ 5	0.0034	0.01	Q V	|	|	|	|
5+10	0.0035	0.01	Q V	|	|	|	|
5+15	0.0035	0.01	Q V	|	|	|	|
5+20	0.0036	0.01	Q V	|	|	|	|
5+25	0.0037	0.01	Q V	|	|	|	|
5+30	0.0037	0.01	Q V	|	|	|	|
5+35	0.0038	0.01	Q V	|	|	|	|
5+40	0.0039	0.01	Q V	|	|	|	|
5+45	0.0039	0.01	Q V	|	|	|	|
5+50	0.0040	0.01	Q V	|	|	|	|
5+55	0.0041	0.01	Q V	|	|	|	|
6+ 0	0.0041	0.01	Q V	|	|	|	|
6+ 5	0.0042	0.01	Q V	|	|	|	|
6+10	0.0043	0.01	Q V	|	|	|	|
6+15	0.0043	0.01	Q V	|	|	|	|
6+20	0.0044	0.01	Q V	|	|	|	|
6+25	0.0045	0.01	Q V	|	|	|	|
6+30	0.0045	0.01	Q V	|	|	|	|
6+35	0.0046	0.01	Q V	|	|	|	|
6+40	0.0047	0.01	Q V	|	|	|	|
6+45	0.0048	0.01	Q V	|	|	|	|
6+50	0.0048	0.01	Q V	|	|	|	|
6+55	0.0049	0.01	Q V	|	|	|	|
7+ 0	0.0050	0.01	Q V	|	|	|	|
7+ 5	0.0050	0.01	Q V	|	|	|	|

7+10	0.0051	0.01	Q	V	|	|	|	|
7+15	0.0052	0.01	Q	V	|	|	|	|
7+20	0.0053	0.01	Q	V	|	|	|	|
7+25	0.0053	0.01	Q	V	|	|	|	|
7+30	0.0054	0.01	Q	V	|	|	|	|
7+35	0.0055	0.01	Q	V	|	|	|	|
7+40	0.0056	0.01	Q	V	|	|	|	|
7+45	0.0056	0.01	Q	V	|	|	|	|
7+50	0.0057	0.01	Q	V	|	|	|	|
7+55	0.0058	0.01	Q	V	|	|	|	|
8+ 0	0.0059	0.01	Q	V	|	|	|	|
8+ 5	0.0059	0.01	Q	V	|	|	|	|
8+10	0.0060	0.01	Q	V	|	|	|	|
8+15	0.0061	0.01	Q	V	|	|	|	|
8+20	0.0062	0.01	Q	V	|	|	|	|
8+25	0.0062	0.01	Q	V	|	|	|	|
8+30	0.0063	0.01	Q	V	|	|	|	|
8+35	0.0064	0.01	Q	V	|	|	|	|
8+40	0.0065	0.01	Q	V	|	|	|	|
8+45	0.0066	0.01	Q	V	|	|	|	|
8+50	0.0066	0.01	Q	V	|	|	|	|
8+55	0.0067	0.01	Q	V	|	|	|	|
9+ 0	0.0068	0.01	Q	V	|	|	|	|
9+ 5	0.0069	0.01	Q	V	|	|	|	|
9+10	0.0070	0.01	Q	V	|	|	|	|
9+15	0.0070	0.01	Q	V	|	|	|	|
9+20	0.0071	0.01	Q	V	|	|	|	|
9+25	0.0072	0.01	Q	V	|	|	|	|
9+30	0.0073	0.01	Q	V	|	|	|	|
9+35	0.0074	0.01	Q	V	|	|	|	|
9+40	0.0075	0.01	Q	V	|	|	|	|
9+45	0.0075	0.01	Q	V	|	|	|	|
9+50	0.0076	0.01	Q	V	|	|	|	|
9+55	0.0077	0.01	Q	V	|	|	|	|
10+ 0	0.0078	0.01	Q	V	|	|	|	|
10+ 5	0.0079	0.01	Q	V	|	|	|	|
10+10	0.0080	0.01	Q	V	|	|	|	|
10+15	0.0081	0.01	Q	V	|	|	|	|
10+20	0.0082	0.01	Q	V	|	|	|	|
10+25	0.0082	0.01	Q	V	|	|	|	|
10+30	0.0083	0.01	Q	V	|	|	|	|
10+35	0.0084	0.01	Q	V	|	|	|	|
10+40	0.0085	0.01	Q	V	|	|	|	|
10+45	0.0086	0.01	Q	V	|	|	|	|
10+50	0.0087	0.01	Q	V	|	|	|	|
10+55	0.0088	0.01	Q	V	|	|	|	|
11+ 0	0.0089	0.01	Q	V	|	|	|	|
11+ 5	0.0090	0.01	Q	V	|	|	|	|
11+10	0.0091	0.01	Q	V	|	|	|	|
11+15	0.0092	0.01	Q	V	|	|	|	|
11+20	0.0093	0.01	Q	V	|	|	|	|
11+25	0.0094	0.01	Q	V	|	|	|	|
11+30	0.0095	0.01	Q	V	|	|	|	|
11+35	0.0096	0.01	Q	V	|	|	|	|

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11+40       0.0097      0.01  Q        V|          |          |          |
11+45       0.0098      0.01  Q        V|          |          |          |
11+50       0.0099      0.01  Q        V|          |          |          |
11+55       0.0100      0.01  Q        V|          |          |          |
12+ 0       0.0101      0.02  Q        V|          |          |          |
12+ 5       0.0102      0.02  Q        V|          |          |          |
12+10       0.0103      0.01  Q        V|          |          |          |
12+15       0.0104      0.01  Q        V|          |          |          |
12+20       0.0105      0.01  Q         V          |          |          |
12+25       0.0106      0.01  Q         V          |          |          |
12+30       0.0107      0.01  Q         V          |          |          |
12+35       0.0108      0.01  Q         V          |          |          |
12+40       0.0109      0.01  Q         V          |          |          |
12+45       0.0110      0.01  Q         V          |          |          |
12+50       0.0111      0.01  Q         V          |          |          |
12+55       0.0112      0.01  Q         V          |          |          |
13+ 0       0.0113      0.01  Q         V          |          |          |
13+ 5       0.0114      0.01  Q         V          |          |          |
13+10       0.0115      0.01  Q         V          |          |          |
13+15       0.0116      0.02  Q         |V         |          |          |
13+20       0.0117      0.02  Q         |V         |          |          |
13+25       0.0118      0.02  Q         |V         |          |          |
13+30       0.0119      0.02  Q         |V         |          |          |
13+35       0.0120      0.02  Q         |V         |          |          |
13+40       0.0121      0.02  Q         |V         |          |          |
13+45       0.0122      0.02  Q         |V         |          |          |
13+50       0.0123      0.02  Q         |V         |          |          |
13+55       0.0125      0.02  Q         |V         |          |          |
14+ 0       0.0126      0.02  Q         | V        |          |          |
14+ 5       0.0127      0.02  Q         | V        |          |          |
14+10       0.0128      0.02  Q         | V        |          |          |
14+15       0.0130      0.02  Q         | V        |          |          |
14+20       0.0131      0.02  Q         | V        |          |          |
14+25       0.0132      0.02  Q         | V        |          |          |
14+30       0.0134      0.02  Q         | V        |          |          |
14+35       0.0135      0.02  Q         | V        |          |          |
14+40       0.0137      0.02  Q         |  V       |          |          |
14+45       0.0138      0.02  Q         |  V       |          |          |
14+50       0.0140      0.02  Q         |  V       |          |          |
14+55       0.0141      0.02  Q         |  V       |          |          |
15+ 0       0.0143      0.02  Q         |  V       |          |          |
15+ 5       0.0145      0.03  Q         |  V       |          |          |
15+10       0.0147      0.03  Q         |   V      |          |          |
15+15       0.0149      0.03  Q         |   V      |          |          |
15+20       0.0151      0.03  Q         |   V      |          |          |
15+25       0.0153      0.03  Q         |   V      |          |          |
15+30       0.0155      0.03  Q         |   V      |          |          |
15+35       0.0157      0.03  Q         |   V      |          |          |
15+40       0.0159      0.03  Q         |    V     |          |          |
15+45       0.0161      0.03  Q         |    V     |          |          |
15+50       0.0164      0.04  Q         |    V     |          |          |
15+55       0.0166      0.04  Q         |    V     |          |          |
16+ 0       0.0170      0.05  Q         |     V    |          |          |
16+ 5       0.0178      0.12  Q         |      V   |          |          |
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16+10       0.0202      0.34  |Q        |        V|         |         |
16+15       0.0245      0.63  | Q       |         |  V      |         |
16+20       0.0274      0.41  |Q        |         |     V   |         |
16+25       0.0290      0.24  Q         |         |      V  |         |
16+30       0.0302      0.17  Q         |         |       V |         |
16+35       0.0311      0.13  Q         |         |        V|         |
16+40       0.0319      0.11  Q         |         |         V         |
16+45       0.0325      0.09  Q         |         |          |V        |
16+50       0.0330      0.07  Q         |         |          |V        |
16+55       0.0334      0.06  Q         |         |          |V        |
17+ 0       0.0338      0.06  Q         |         |          | V       |
17+ 5       0.0342      0.05  Q         |         |          | V       |
17+10       0.0345      0.04  Q         |         |          | V       |
17+15       0.0347      0.04  Q         |         |          |  V      |
17+20       0.0349      0.03  Q         |         |          |  V      |
17+25       0.0351      0.03  Q         |         |          |  V      |
17+30       0.0353      0.03  Q         |         |          |  V      |
17+35       0.0355      0.03  Q         |         |          |  V      |
17+40       0.0357      0.02  Q         |         |          |   V     |
17+45       0.0358      0.02  Q         |         |          |   V     |
17+50       0.0360      0.02  Q         |         |          |   V     |
17+55       0.0361      0.02  Q         |         |          |   V     |
18+ 0       0.0362      0.02  Q         |         |          |   V     |
18+ 5       0.0363      0.01  Q         |         |          |   V     |
18+10       0.0364      0.01  Q         |         |          |   V     |
18+15       0.0365      0.02  Q         |         |          |   V     |
18+20       0.0366      0.02  Q         |         |          |   V     |
18+25       0.0367      0.02  Q         |         |          |    V    |
18+30       0.0368      0.02  Q         |         |          |    V    |
18+35       0.0369      0.01  Q         |         |          |    V    |
18+40       0.0370      0.01  Q         |         |          |    V    |
18+45       0.0371      0.01  Q         |         |          |    V    |
18+50       0.0372      0.01  Q         |         |          |    V    |
18+55       0.0373      0.01  Q         |         |          |    V    |
19+ 0       0.0374      0.01  Q         |         |          |    V    |
19+ 5       0.0375      0.01  Q         |         |          |    V    |
19+10       0.0376      0.01  Q         |         |          |    V    |
19+15       0.0377      0.01  Q         |         |          |    V    |
19+20       0.0378      0.01  Q         |         |          |     V   |
19+25       0.0379      0.01  Q         |         |          |     V   |
19+30       0.0379      0.01  Q         |         |          |     V   |
19+35       0.0380      0.01  Q         |         |          |     V   |
19+40       0.0381      0.01  Q         |         |          |     V   |
19+45       0.0382      0.01  Q         |         |          |     V   |
19+50       0.0383      0.01  Q         |         |          |     V   |
19+55       0.0384      0.01  Q         |         |          |     V   |
20+ 0       0.0385      0.01  Q         |         |          |     V   |
20+ 5       0.0385      0.01  Q         |         |          |     V   |
20+10       0.0386      0.01  Q         |         |          |     V   |
20+15       0.0387      0.01  Q         |         |          |     V   |
20+20       0.0388      0.01  Q         |         |          |      V  |
20+25       0.0389      0.01  Q         |         |          |      V  |
20+30       0.0389      0.01  Q         |         |          |      V  |
20+35       0.0390      0.01  Q         |         |          |      V  |
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  20+40       0.0391      0.01  Q          |          |          |       V  |
  20+45       0.0392      0.01  Q          |          |          |       V  |
  20+50       0.0392      0.01  Q          |          |          |       V  |
  20+55       0.0393      0.01  Q          |          |          |       V  |
  21+ 0       0.0394      0.01  Q          |          |          |       V  |
  21+ 5       0.0394      0.01  Q          |          |          |       V  |
  21+10       0.0395      0.01  Q          |          |          |       V  |
  21+15       0.0396      0.01  Q          |          |          |       V  |
  21+20       0.0397      0.01  Q          |          |          |       V  |
  21+25       0.0397      0.01  Q          |          |          |       V  |
  21+30       0.0398      0.01  Q          |          |          |        V |
  21+35       0.0399      0.01  Q          |          |          |        V |
  21+40       0.0399      0.01  Q          |          |          |        V |
  21+45       0.0400      0.01  Q          |          |          |        V |
  21+50       0.0401      0.01  Q          |          |          |        V |
  21+55       0.0401      0.01  Q          |          |          |        V |
  22+ 0       0.0402      0.01  Q          |          |          |        V |
  22+ 5       0.0403      0.01  Q          |          |          |        V |
  22+10       0.0403      0.01  Q          |          |          |        V |
  22+15       0.0404      0.01  Q          |          |          |        V |
  22+20       0.0405      0.01  Q          |          |          |        V |
  22+25       0.0405      0.01  Q          |          |          |        V |
  22+30       0.0406      0.01  Q          |          |          |        V |
  22+35       0.0406      0.01  Q          |          |          |        V |
  22+40       0.0407      0.01  Q          |          |          |        V |
  22+45       0.0408      0.01  Q          |          |          |        V |
  22+50       0.0408      0.01  Q          |          |          |         V|
  22+55       0.0409      0.01  Q          |          |          |         V|
  23+ 0       0.0409      0.01  Q          |          |          |         V|
  23+ 5       0.0410      0.01  Q          |          |          |         V|
  23+10       0.0411      0.01  Q          |          |          |         V|
  23+15       0.0411      0.01  Q          |          |          |         V|
  23+20       0.0412      0.01  Q          |          |          |         V|
  23+25       0.0412      0.01  Q          |          |          |         V|
  23+30       0.0413      0.01  Q          |          |          |         V|
  23+35       0.0414      0.01  Q          |          |          |         V|
  23+40       0.0414      0.01  Q          |          |          |         V|
  23+45       0.0415      0.01  Q          |          |          |         V|
  23+50       0.0415      0.01  Q          |          |          |         V|
  23+55       0.0416      0.01  Q          |          |          |         V|
  24+ 0       0.0416      0.01  Q          |          |          |         V|
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA4 TRIBUTARY AREA AA8
FILE: 18345HYDROAA8PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.71	1	0.68
Rainfall data for year 10		
1.71	6	1.43
Rainfall data for year 10		
1.71	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	1.71	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.71	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.289 (hours)
++
Watershed area = 1.71(Ac.)
Catchment Lag time = 0.231 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 36.0065
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.71(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 20.68 (CFS))		
1	2.333	0.482
2	14.378	2.491
3	42.763	5.870
4	61.264	3.826

5	71.196	2.054
6	77.835	1.373
7	82.549	0.975
8	86.187	0.752
9	89.024	0.587
10	91.144	0.439
11	92.923	0.368
12	94.376	0.301
13	95.566	0.246
14	96.536	0.201
15	97.298	0.157
16	97.870	0.118
17	98.245	0.078
18	98.661	0.086
19	99.093	0.089
20	99.493	0.083
21	99.738	0.051
22	100.000	0.025

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132

34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092

88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072

142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0716	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061

196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054

250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012

11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014

65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018

119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030

173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019

227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012

281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 1.82(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

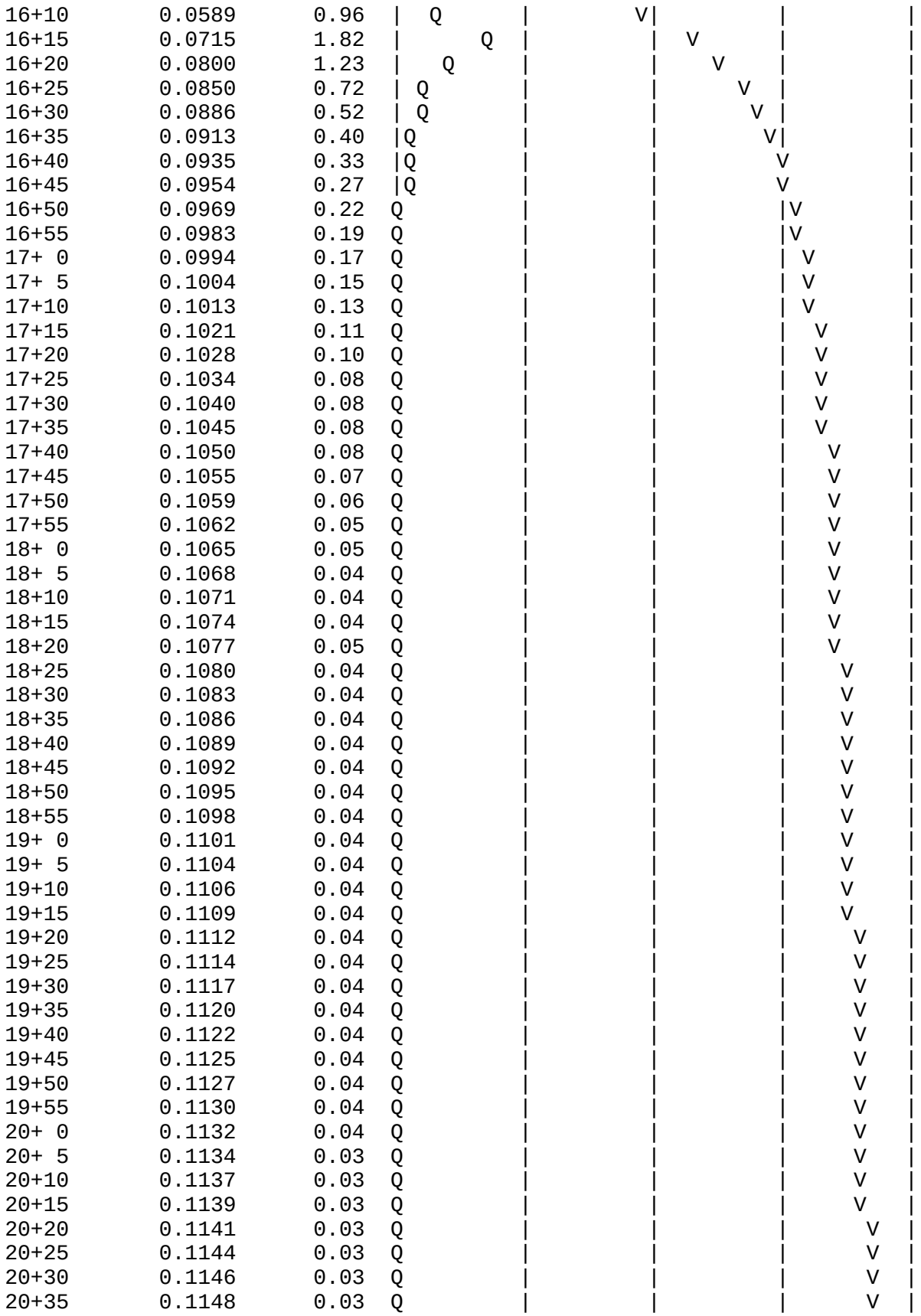
Hydrograph in 5 Minute intervals ((CFS))

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	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.02	Q				
0+30	0.0004	0.02	Q				
0+35	0.0006	0.02	Q				
0+40	0.0007	0.02	Q				
0+45	0.0009	0.02	Q				
0+50	0.0010	0.02	Q				
0+55	0.0012	0.02	Q				
1+ 0	0.0013	0.02	Q				
1+ 5	0.0015	0.02	Q				
1+10	0.0016	0.02	Q				
1+15	0.0018	0.02	Q				
1+20	0.0020	0.02	Q				
1+25	0.0021	0.02	Q				
1+30	0.0023	0.02	Q				
1+35	0.0025	0.02	Q				
1+40	0.0026	0.02	Q				
1+45	0.0028	0.02	Q				
1+50	0.0030	0.02	Q				
1+55	0.0031	0.02	QV				
2+ 0	0.0033	0.02	QV				
2+ 5	0.0035	0.02	QV				
2+10	0.0037	0.02	QV				
2+15	0.0038	0.02	QV				
2+20	0.0040	0.03	QV				
2+25	0.0042	0.03	QV				
2+30	0.0043	0.03	QV				
2+35	0.0045	0.03	QV				

2+40	0.0047	0.03	QV	|	|	|	|
2+45	0.0049	0.03	QV	|	|	|	|
2+50	0.0050	0.03	QV	|	|	|	|
2+55	0.0052	0.03	QV	|	|	|	|
3+ 0	0.0054	0.03	QV	|	|	|	|
3+ 5	0.0056	0.03	QV	|	|	|	|
3+10	0.0057	0.03	QV	|	|	|	|
3+15	0.0059	0.03	QV	|	|	|	|
3+20	0.0061	0.03	QV	|	|	|	|
3+25	0.0063	0.03	Q V	|	|	|	|
3+30	0.0065	0.03	Q V	|	|	|	|
3+35	0.0066	0.03	Q V	|	|	|	|
3+40	0.0068	0.03	Q V	|	|	|	|
3+45	0.0070	0.03	Q V	|	|	|	|
3+50	0.0072	0.03	Q V	|	|	|	|
3+55	0.0074	0.03	Q V	|	|	|	|
4+ 0	0.0076	0.03	Q V	|	|	|	|
4+ 5	0.0077	0.03	Q V	|	|	|	|
4+10	0.0079	0.03	Q V	|	|	|	|
4+15	0.0081	0.03	Q V	|	|	|	|
4+20	0.0083	0.03	Q V	|	|	|	|
4+25	0.0085	0.03	Q V	|	|	|	|
4+30	0.0087	0.03	Q V	|	|	|	|
4+35	0.0089	0.03	Q V	|	|	|	|
4+40	0.0090	0.03	Q V	|	|	|	|
4+45	0.0092	0.03	Q V	|	|	|	|
4+50	0.0094	0.03	Q V	|	|	|	|
4+55	0.0096	0.03	Q V	|	|	|	|
5+ 0	0.0098	0.03	Q V	|	|	|	|
5+ 5	0.0100	0.03	Q V	|	|	|	|
5+10	0.0102	0.03	Q V	|	|	|	|
5+15	0.0104	0.03	Q V	|	|	|	|
5+20	0.0106	0.03	Q V	|	|	|	|
5+25	0.0108	0.03	Q V	|	|	|	|
5+30	0.0110	0.03	Q V	|	|	|	|
5+35	0.0112	0.03	Q V	|	|	|	|
5+40	0.0114	0.03	Q V	|	|	|	|
5+45	0.0116	0.03	Q V	|	|	|	|
5+50	0.0118	0.03	Q V	|	|	|	|
5+55	0.0120	0.03	Q V	|	|	|	|
6+ 0	0.0122	0.03	Q V	|	|	|	|
6+ 5	0.0124	0.03	Q V	|	|	|	|
6+10	0.0126	0.03	Q V	|	|	|	|
6+15	0.0128	0.03	Q V	|	|	|	|
6+20	0.0130	0.03	Q V	|	|	|	|
6+25	0.0132	0.03	Q V	|	|	|	|
6+30	0.0134	0.03	Q V	|	|	|	|
6+35	0.0136	0.03	Q V	|	|	|	|
6+40	0.0138	0.03	Q V	|	|	|	|
6+45	0.0140	0.03	Q V	|	|	|	|
6+50	0.0142	0.03	Q V	|	|	|	|
6+55	0.0144	0.03	Q V	|	|	|	|
7+ 0	0.0146	0.03	Q V	|	|	|	|
7+ 5	0.0148	0.03	Q V	|	|	|	|

7+10	0.0151	0.03	Q	V	|	|	|	|
7+15	0.0153	0.03	Q	V	|	|	|	|
7+20	0.0155	0.03	Q	V	|	|	|	|
7+25	0.0157	0.03	Q	V	|	|	|	|
7+30	0.0159	0.03	Q	V	|	|	|	|
7+35	0.0161	0.03	Q	V	|	|	|	|
7+40	0.0163	0.03	Q	V	|	|	|	|
7+45	0.0166	0.03	Q	V	|	|	|	|
7+50	0.0168	0.03	Q	V	|	|	|	|
7+55	0.0170	0.03	Q	V	|	|	|	|
8+ 0	0.0172	0.03	Q	V	|	|	|	|
8+ 5	0.0175	0.03	Q	V	|	|	|	|
8+10	0.0177	0.03	Q	V	|	|	|	|
8+15	0.0179	0.03	Q	V	|	|	|	|
8+20	0.0181	0.03	Q	V	|	|	|	|
8+25	0.0184	0.03	Q	V	|	|	|	|
8+30	0.0186	0.03	Q	V	|	|	|	|
8+35	0.0188	0.03	Q	V	|	|	|	|
8+40	0.0190	0.03	Q	V	|	|	|	|
8+45	0.0193	0.03	Q	V	|	|	|	|
8+50	0.0195	0.03	Q	V	|	|	|	|
8+55	0.0198	0.03	Q	V	|	|	|	|
9+ 0	0.0200	0.03	Q	V	|	|	|	|
9+ 5	0.0202	0.03	Q	V	|	|	|	|
9+10	0.0205	0.03	Q	V	|	|	|	|
9+15	0.0207	0.03	Q	V	|	|	|	|
9+20	0.0210	0.04	Q	V	|	|	|	|
9+25	0.0212	0.04	Q	V	|	|	|	|
9+30	0.0214	0.04	Q	V	|	|	|	|
9+35	0.0217	0.04	Q	V	|	|	|	|
9+40	0.0219	0.04	Q	V	|	|	|	|
9+45	0.0222	0.04	Q	V	|	|	|	|
9+50	0.0224	0.04	Q	V	|	|	|	|
9+55	0.0227	0.04	Q	V	|	|	|	|
10+ 0	0.0229	0.04	Q	V	|	|	|	|
10+ 5	0.0232	0.04	Q	V	|	|	|	|
10+10	0.0235	0.04	Q	V	|	|	|	|
10+15	0.0237	0.04	Q	V	|	|	|	|
10+20	0.0240	0.04	Q	V	|	|	|	|
10+25	0.0242	0.04	Q	V	|	|	|	|
10+30	0.0245	0.04	Q	V	|	|	|	|
10+35	0.0248	0.04	Q	V	|	|	|	|
10+40	0.0250	0.04	Q	V	|	|	|	|
10+45	0.0253	0.04	Q	V	|	|	|	|
10+50	0.0256	0.04	Q	V	|	|	|	|
10+55	0.0259	0.04	Q	V	|	|	|	|
11+ 0	0.0261	0.04	Q	V	|	|	|	|
11+ 5	0.0264	0.04	Q	V	|	|	|	|
11+10	0.0267	0.04	Q	V	|	|	|	|
11+15	0.0270	0.04	Q	V	|	|	|	|
11+20	0.0273	0.04	Q	V	|	|	|	|
11+25	0.0276	0.04	Q	V	|	|	|	|
11+30	0.0278	0.04	Q	V	|	|	|	|
11+35	0.0281	0.04	Q	V	|	|	|	|

11+40	0.0284	0.04	Q	V|	|	|	|
11+45	0.0287	0.04	Q	V|	|	|	|
11+50	0.0290	0.04	Q	V|	|	|	|
11+55	0.0293	0.04	Q	V|	|	|	|
12+ 0	0.0296	0.04	Q	V|	|	|	|
12+ 5	0.0300	0.04	Q	V|	|	|	|
12+10	0.0303	0.04	Q	V|	|	|	|
12+15	0.0305	0.04	Q	V|	|	|	|
12+20	0.0308	0.04	Q	V	|	|	|
12+25	0.0311	0.04	Q	V	|	|	|
12+30	0.0314	0.04	Q	V	|	|	|
12+35	0.0317	0.04	Q	V	|	|	|
12+40	0.0320	0.04	Q	V	|	|	|
12+45	0.0322	0.04	Q	V	|	|	|
12+50	0.0325	0.04	Q	V	|	|	|
12+55	0.0328	0.04	Q	V	|	|	|
13+ 0	0.0331	0.04	Q	V	|	|	|
13+ 5	0.0334	0.04	Q	V	|	|	|
13+10	0.0337	0.04	Q	V	|	|	|
13+15	0.0340	0.04	Q	|V	|	|	|
13+20	0.0343	0.05	Q	|V	|	|	|
13+25	0.0347	0.05	Q	|V	|	|	|
13+30	0.0350	0.05	Q	|V	|	|	|
13+35	0.0353	0.05	Q	|V	|	|	|
13+40	0.0356	0.05	Q	|V	|	|	|
13+45	0.0360	0.05	Q	|V	|	|	|
13+50	0.0363	0.05	Q	|V	|	|	|
13+55	0.0367	0.05	Q	|V	|	|	|
14+ 0	0.0370	0.05	Q	| V	|	|	|
14+ 5	0.0374	0.05	Q	| V	|	|	|
14+10	0.0378	0.05	Q	| V	|	|	|
14+15	0.0382	0.06	Q	| V	|	|	|
14+20	0.0385	0.06	Q	| V	|	|	|
14+25	0.0389	0.06	Q	| V	|	|	|
14+30	0.0394	0.06	Q	| V	|	|	|
14+35	0.0398	0.06	Q	| V	|	|	|
14+40	0.0402	0.06	Q	| V	|	|	|
14+45	0.0407	0.07	Q	| V	|	|	|
14+50	0.0411	0.07	Q	| V	|	|	|
14+55	0.0416	0.07	Q	| V	|	|	|
15+ 0	0.0421	0.07	Q	| V	|	|	|
15+ 5	0.0426	0.07	Q	| V	|	|	|
15+10	0.0431	0.08	Q	| V	|	|	|
15+15	0.0437	0.08	Q	| V	|	|	|
15+20	0.0443	0.08	Q	| V	|	|	|
15+25	0.0449	0.09	Q	| V	|	|	|
15+30	0.0455	0.09	Q	| V	|	|	|
15+35	0.0461	0.09	Q	| V	|	|	|
15+40	0.0467	0.09	Q	| V	|	|	|
15+45	0.0474	0.09	Q	| V	|	|	|
15+50	0.0481	0.10	Q	| V	|	|	|
15+55	0.0489	0.12	Q	| V	|	|	|
16+ 0	0.0499	0.15	Q	| V	|	|	|
16+ 5	0.0523	0.35	|Q	| V	|	|	|


16+10 0.0589 0.96
16+15 0.0715 1.82
16+20 0.0800 1.23
16+25 0.0850 0.72
16+30 0.0886 0.52
16+35 0.0913 0.40
16+40 0.0935 0.33
16+45 0.0954 0.27
16+50 0.0969 0.22
16+55 0.0983 0.19
17+ 0 0.0994 0.17
17+ 5 0.1004 0.15
17+10 0.1013 0.13
17+15 0.1021 0.11
17+20 0.1028 0.10
17+25 0.1034 0.08
17+30 0.1040 0.08
17+35 0.1045 0.08
17+40 0.1050 0.08
17+45 0.1055 0.07
17+50 0.1059 0.06
17+55 0.1062 0.05
18+ 0 0.1065 0.05
18+ 5 0.1068 0.04
18+10 0.1071 0.04
18+15 0.1074 0.04
18+20 0.1077 0.05
18+25 0.1080 0.04
18+30 0.1083 0.04
18+35 0.1086 0.04
18+40 0.1089 0.04
18+45 0.1092 0.04
18+50 0.1095 0.04
18+55 0.1098 0.04
19+ 0 0.1101 0.04
19+ 5 0.1104 0.04
19+10 0.1106 0.04
19+15 0.1109 0.04
19+20 0.1112 0.04
19+25 0.1114 0.04
19+30 0.1117 0.04
19+35 0.1120 0.04
19+40 0.1122 0.04
19+45 0.1125 0.04
19+50 0.1127 0.04
19+55 0.1130 0.04
20+ 0 0.1132 0.04
20+ 5 0.1134 0.03
20+10 0.1137 0.03
20+15 0.1139 0.03
20+20 0.1141 0.03
20+25 0.1144 0.03
20+30 0.1146 0.03
20+35 0.1148 0.03

20+40	0.1150	0.03	Q	|	|	|	V |
20+45	0.1153	0.03	Q	|	|	|	V |
20+50	0.1155	0.03	Q	|	|	|	V |
20+55	0.1157	0.03	Q	|	|	|	V |
21+ 0	0.1159	0.03	Q	|	|	|	V |
21+ 5	0.1161	0.03	Q	|	|	|	V |
21+10	0.1163	0.03	Q	|	|	|	V |
21+15	0.1165	0.03	Q	|	|	|	V |
21+20	0.1167	0.03	Q	|	|	|	V |
21+25	0.1169	0.03	Q	|	|	|	V |
21+30	0.1171	0.03	Q	|	|	|	V |
21+35	0.1173	0.03	Q	|	|	|	V |
21+40	0.1175	0.03	Q	|	|	|	V |
21+45	0.1177	0.03	Q	|	|	|	V |
21+50	0.1179	0.03	Q	|	|	|	V |
21+55	0.1181	0.03	Q	|	|	|	V |
22+ 0	0.1183	0.03	Q	|	|	|	V |
22+ 5	0.1185	0.03	Q	|	|	|	V |
22+10	0.1187	0.03	Q	|	|	|	V |
22+15	0.1189	0.03	Q	|	|	|	V |
22+20	0.1191	0.03	Q	|	|	|	V |
22+25	0.1193	0.03	Q	|	|	|	V |
22+30	0.1195	0.03	Q	|	|	|	V |
22+35	0.1196	0.03	Q	|	|	|	V |
22+40	0.1198	0.03	Q	|	|	|	V |
22+45	0.1200	0.03	Q	|	|	|	V |
22+50	0.1202	0.03	Q	|	|	|	V |
22+55	0.1204	0.03	Q	|	|	|	V|
23+ 0	0.1205	0.03	Q	|	|	|	V|
23+ 5	0.1207	0.03	Q	|	|	|	V|
23+10	0.1209	0.03	Q	|	|	|	V|
23+15	0.1211	0.03	Q	|	|	|	V|
23+20	0.1212	0.03	Q	|	|	|	V|
23+25	0.1214	0.03	Q	|	|	|	V|
23+30	0.1216	0.02	Q	|	|	|	V|
23+35	0.1218	0.02	Q	|	|	|	V|
23+40	0.1219	0.02	Q	|	|	|	V|
23+45	0.1221	0.02	Q	|	|	|	V|
23+50	0.1223	0.02	Q	|	|	|	V|
23+55	0.1224	0.02	Q	|	|	|	V|
24+ 0	0.1226	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA5 TRIBUTARY AREA AA1
FILE: 18345HYDROAA1PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.47	1	0.68
Rainfall data for year 10		
1.47	6	1.43
Rainfall data for year 10		
1.47	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	1.47	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.47	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.279 (hours)
++
Watershed area = 1.47(Ac.)
Catchment Lag time = 0.223 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 37.3090
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.47(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 17.78 (CFS))	
1	2.464	0.438
2	15.729	2.358
3	44.985	5.201
4	62.787	3.165

5	72.441	1.716
6	78.899	1.148
7	83.470	0.813
8	87.044	0.635
9	89.721	0.476
10	91.791	0.368
11	93.522	0.308
12	94.888	0.243
13	96.025	0.202
14	96.942	0.163
15	97.628	0.122
16	98.083	0.081
17	98.487	0.072
18	98.935	0.080
19	99.377	0.079
20	99.672	0.053
21	100.000	0.026

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129

35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091

89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072

143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061

197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054

251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012
11	0.0052	0.0040	0.0012

12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014
65	0.0062	0.0048	0.0014

66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018
119	0.0081	0.0063	0.0018

120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030
173	0.0139	0.0108	0.0031

174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019
227	0.0084	0.0065	0.0019

228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012
281	0.0053	0.0041	0.0012

282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 1.61(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	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.01	Q				
0+30	0.0004	0.02	Q				
0+35	0.0005	0.02	Q				
0+40	0.0006	0.02	Q				
0+45	0.0008	0.02	Q				
0+50	0.0009	0.02	Q				
0+55	0.0010	0.02	Q				
1+ 0	0.0012	0.02	Q				
1+ 5	0.0013	0.02	Q				
1+10	0.0014	0.02	Q				
1+15	0.0016	0.02	Q				
1+20	0.0017	0.02	Q				
1+25	0.0018	0.02	Q				
1+30	0.0020	0.02	Q				
1+35	0.0021	0.02	Q				
1+40	0.0023	0.02	Q				
1+45	0.0024	0.02	Q				
1+50	0.0026	0.02	Q				
1+55	0.0027	0.02	QV				
2+ 0	0.0029	0.02	QV				
2+ 5	0.0030	0.02	QV				
2+10	0.0032	0.02	QV				
2+15	0.0033	0.02	QV				
2+20	0.0035	0.02	QV				
2+25	0.0036	0.02	QV				
2+30	0.0038	0.02	QV				
2+35	0.0039	0.02	QV				
2+40	0.0041	0.02	QV				

2+45	0.0042	0.02	QV	|	|	|	|
2+50	0.0044	0.02	QV	|	|	|	|
2+55	0.0045	0.02	QV	|	|	|	|
3+ 0	0.0047	0.02	QV	|	|	|	|
3+ 5	0.0048	0.02	QV	|	|	|	|
3+10	0.0050	0.02	QV	|	|	|	|
3+15	0.0051	0.02	QV	|	|	|	|
3+20	0.0053	0.02	QV	|	|	|	|
3+25	0.0054	0.02	Q V	|	|	|	|
3+30	0.0056	0.02	Q V	|	|	|	|
3+35	0.0057	0.02	Q V	|	|	|	|
3+40	0.0059	0.02	Q V	|	|	|	|
3+45	0.0060	0.02	Q V	|	|	|	|
3+50	0.0062	0.02	Q V	|	|	|	|
3+55	0.0064	0.02	Q V	|	|	|	|
4+ 0	0.0065	0.02	Q V	|	|	|	|
4+ 5	0.0067	0.02	Q V	|	|	|	|
4+10	0.0068	0.02	Q V	|	|	|	|
4+15	0.0070	0.02	Q V	|	|	|	|
4+20	0.0072	0.02	Q V	|	|	|	|
4+25	0.0073	0.02	Q V	|	|	|	|
4+30	0.0075	0.02	Q V	|	|	|	|
4+35	0.0076	0.02	Q V	|	|	|	|
4+40	0.0078	0.02	Q V	|	|	|	|
4+45	0.0080	0.02	Q V	|	|	|	|
4+50	0.0081	0.02	Q V	|	|	|	|
4+55	0.0083	0.02	Q V	|	|	|	|
5+ 0	0.0085	0.02	Q V	|	|	|	|
5+ 5	0.0086	0.02	Q V	|	|	|	|
5+10	0.0088	0.02	Q V	|	|	|	|
5+15	0.0089	0.02	Q V	|	|	|	|
5+20	0.0091	0.02	Q V	|	|	|	|
5+25	0.0093	0.02	Q V	|	|	|	|
5+30	0.0095	0.02	Q V	|	|	|	|
5+35	0.0096	0.02	Q V	|	|	|	|
5+40	0.0098	0.02	Q V	|	|	|	|
5+45	0.0100	0.02	Q V	|	|	|	|
5+50	0.0101	0.02	Q V	|	|	|	|
5+55	0.0103	0.02	Q V	|	|	|	|
6+ 0	0.0105	0.02	Q V	|	|	|	|
6+ 5	0.0106	0.03	Q V	|	|	|	|
6+10	0.0108	0.03	Q V	|	|	|	|
6+15	0.0110	0.03	Q V	|	|	|	|
6+20	0.0112	0.03	Q V	|	|	|	|
6+25	0.0113	0.03	Q V	|	|	|	|
6+30	0.0115	0.03	Q V	|	|	|	|
6+35	0.0117	0.03	Q V	|	|	|	|
6+40	0.0119	0.03	Q V	|	|	|	|
6+45	0.0121	0.03	Q V	|	|	|	|
6+50	0.0122	0.03	Q V	|	|	|	|
6+55	0.0124	0.03	Q V	|	|	|	|
7+ 0	0.0126	0.03	Q V	|	|	|	|
7+ 5	0.0128	0.03	Q V	|	|	|	|
7+10	0.0130	0.03	Q V	|	|	|	|

7+15	0.0131	0.03	Q	V	|	|	|	|
7+20	0.0133	0.03	Q	V	|	|	|	|
7+25	0.0135	0.03	Q	V	|	|	|	|
7+30	0.0137	0.03	Q	V	|	|	|	|
7+35	0.0139	0.03	Q	V	|	|	|	|
7+40	0.0141	0.03	Q	V	|	|	|	|
7+45	0.0143	0.03	Q	V	|	|	|	|
7+50	0.0145	0.03	Q	V	|	|	|	|
7+55	0.0146	0.03	Q	V	|	|	|	|
8+ 0	0.0148	0.03	Q	V	|	|	|	|
8+ 5	0.0150	0.03	Q	V	|	|	|	|
8+10	0.0152	0.03	Q	V	|	|	|	|
8+15	0.0154	0.03	Q	V	|	|	|	|
8+20	0.0156	0.03	Q	V	|	|	|	|
8+25	0.0158	0.03	Q	V	|	|	|	|
8+30	0.0160	0.03	Q	V	|	|	|	|
8+35	0.0162	0.03	Q	V	|	|	|	|
8+40	0.0164	0.03	Q	V	|	|	|	|
8+45	0.0166	0.03	Q	V	|	|	|	|
8+50	0.0168	0.03	Q	V	|	|	|	|
8+55	0.0170	0.03	Q	V	|	|	|	|
9+ 0	0.0172	0.03	Q	V	|	|	|	|
9+ 5	0.0174	0.03	Q	V	|	|	|	|
9+10	0.0176	0.03	Q	V	|	|	|	|
9+15	0.0178	0.03	Q	V	|	|	|	|
9+20	0.0180	0.03	Q	V	|	|	|	|
9+25	0.0182	0.03	Q	V	|	|	|	|
9+30	0.0185	0.03	Q	V	|	|	|	|
9+35	0.0187	0.03	Q	V	|	|	|	|
9+40	0.0189	0.03	Q	V	|	|	|	|
9+45	0.0191	0.03	Q	V	|	|	|	|
9+50	0.0193	0.03	Q	V	|	|	|	|
9+55	0.0195	0.03	Q	V	|	|	|	|
10+ 0	0.0197	0.03	Q	V	|	|	|	|
10+ 5	0.0200	0.03	Q	V	|	|	|	|
10+10	0.0202	0.03	Q	V	|	|	|	|
10+15	0.0204	0.03	Q	V	|	|	|	|
10+20	0.0206	0.03	Q	V	|	|	|	|
10+25	0.0209	0.03	Q	V	|	|	|	|
10+30	0.0211	0.03	Q	V	|	|	|	|
10+35	0.0213	0.03	Q	V	|	|	|	|
10+40	0.0216	0.03	Q	V	|	|	|	|
10+45	0.0218	0.03	Q	V	|	|	|	|
10+50	0.0220	0.03	Q	V	|	|	|	|
10+55	0.0223	0.03	Q	V	|	|	|	|
11+ 0	0.0225	0.03	Q	V	|	|	|	|
11+ 5	0.0227	0.03	Q	V	|	|	|	|
11+10	0.0230	0.04	Q	V	|	|	|	|
11+15	0.0232	0.04	Q	V	|	|	|	|
11+20	0.0235	0.04	Q	V	|	|	|	|
11+25	0.0237	0.04	Q	V	|	|	|	|
11+30	0.0240	0.04	Q	V	|	|	|	|
11+35	0.0242	0.04	Q	V	|	|	|	|
11+40	0.0245	0.04	Q	V	|	|	|	|

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11+45       0.0247      0.04  Q        V|          |          |          |
11+50       0.0250      0.04  Q        V|          |          |          |
11+55       0.0252      0.04  Q        V|          |          |          |
12+ 0       0.0255      0.04  Q        V|          |          |          |
12+ 5       0.0258      0.04  Q        V|          |          |          |
12+10       0.0260      0.04  Q        V|          |          |          |
12+15       0.0263      0.04  Q        V|          |          |          |
12+20       0.0265      0.04  Q         V          |          |          |
12+25       0.0268      0.04  Q         V          |          |          |
12+30       0.0270      0.04  Q         V          |          |          |
12+35       0.0273      0.04  Q         V          |          |          |
12+40       0.0275      0.04  Q         V          |          |          |
12+45       0.0277      0.04  Q         V          |          |          |
12+50       0.0280      0.04  Q         V          |          |          |
12+55       0.0282      0.04  Q         V          |          |          |
13+ 0       0.0285      0.04  Q         V          |          |          |
13+ 5       0.0288      0.04  Q         V          |          |          |
13+10       0.0290      0.04  Q         V          |          |          |
13+15       0.0293      0.04  Q         |V         |          |          |
13+20       0.0295      0.04  Q         |V         |          |          |
13+25       0.0298      0.04  Q         |V         |          |          |
13+30       0.0301      0.04  Q         |V         |          |          |
13+35       0.0304      0.04  Q         |V         |          |          |
13+40       0.0307      0.04  Q         |V         |          |          |
13+45       0.0310      0.04  Q         |V         |          |          |
13+50       0.0313      0.04  Q         |V         |          |          |
13+55       0.0316      0.04  Q         |V         |          |          |
14+ 0       0.0319      0.04  Q         | V        |          |          |
14+ 5       0.0322      0.05  Q         | V        |          |          |
14+10       0.0325      0.05  Q         | V        |          |          |
14+15       0.0328      0.05  Q         | V        |          |          |
14+20       0.0332      0.05  Q         | V        |          |          |
14+25       0.0335      0.05  Q         | V        |          |          |
14+30       0.0339      0.05  Q         | V        |          |          |
14+35       0.0342      0.05  Q         | V        |          |          |
14+40       0.0346      0.05  Q         |  V       |          |          |
14+45       0.0350      0.06  Q         |  V       |          |          |
14+50       0.0354      0.06  Q         |  V       |          |          |
14+55       0.0358      0.06  Q         |  V       |          |          |
15+ 0       0.0362      0.06  Q         |  V       |          |          |
15+ 5       0.0367      0.06  Q         |  V       |          |          |
15+10       0.0371      0.07  Q         |   V      |          |          |
15+15       0.0376      0.07  Q         |   V      |          |          |
15+20       0.0381      0.07  Q         |   V      |          |          |
15+25       0.0387      0.08  Q         |   V      |          |          |
15+30       0.0392      0.08  Q         |   V      |          |          |
15+35       0.0397      0.08  Q         |   V      |          |          |
15+40       0.0402      0.08  Q         |    V     |          |          |
15+45       0.0408      0.08  Q         |    V     |          |          |
15+50       0.0414      0.09  Q         |    V     |          |          |
15+55       0.0421      0.10  Q         |    V     |          |          |
16+ 0       0.0430      0.13  Q         |     V    |          |          |
16+ 5       0.0452      0.31  |Q        |      V   |          |          |
16+10       0.0513      0.89  |  Q      |         V|          |          |
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16+15       0.0623      1.61  |     Q   |          |  V       |          |
16+20       0.0694      1.03  |    Q    |          |     V    |          |
16+25       0.0736      0.61  | Q       |          |      V   |          |
16+30       0.0766      0.43  |Q        |          |       V  |          |
16+35       0.0789      0.33  |Q        |          |        V |          |
16+40       0.0808      0.28  |Q        |          |         V|          |
16+45       0.0823      0.22  Q         |          |          V          |
16+50       0.0836      0.19  Q         |          |          |V         |
16+55       0.0848      0.16  Q         |          |          | V        |
17+ 0       0.0857      0.14  Q         |          |          | V        |
17+ 5       0.0866      0.12  Q         |          |          | V        |
17+10       0.0873      0.11  Q         |          |          | V        |
17+15       0.0880      0.09  Q         |          |          |  V       |
17+20       0.0885      0.08  Q         |          |          |  V       |
17+25       0.0890      0.07  Q         |          |          |  V       |
17+30       0.0895      0.07  Q         |          |          |  V       |
17+35       0.0900      0.07  Q         |          |          |  V       |
17+40       0.0904      0.06  Q         |          |          |   V      |
17+45       0.0907      0.05  Q         |          |          |   V      |
17+50       0.0910      0.04  Q         |          |          |   V      |
17+55       0.0913      0.04  Q         |          |          |   V      |
18+ 0       0.0916      0.04  Q         |          |          |   V      |
18+ 5       0.0918      0.04  Q         |          |          |   V      |
18+10       0.0921      0.04  Q         |          |          |   V      |
18+15       0.0923      0.04  Q         |          |          |   V      |
18+20       0.0926      0.04  Q         |          |          |   V      |
18+25       0.0929      0.04  Q         |          |          |    V     |
18+30       0.0931      0.04  Q         |          |          |    V     |
18+35       0.0934      0.04  Q         |          |          |    V     |
18+40       0.0937      0.04  Q         |          |          |    V     |
18+45       0.0939      0.04  Q         |          |          |    V     |
18+50       0.0942      0.04  Q         |          |          |    V     |
18+55       0.0944      0.04  Q         |          |          |    V     |
19+ 0       0.0946      0.04  Q         |          |          |    V     |
19+ 5       0.0949      0.03  Q         |          |          |    V     |
19+10       0.0951      0.03  Q         |          |          |    V     |
19+15       0.0953      0.03  Q         |          |          |     V    |
19+20       0.0956      0.03  Q         |          |          |     V    |
19+25       0.0958      0.03  Q         |          |          |     V    |
19+30       0.0960      0.03  Q         |          |          |     V    |
19+35       0.0962      0.03  Q         |          |          |     V    |
19+40       0.0965      0.03  Q         |          |          |     V    |
19+45       0.0967      0.03  Q         |          |          |     V    |
19+50       0.0969      0.03  Q         |          |          |     V    |
19+55       0.0971      0.03  Q         |          |          |     V    |
20+ 0       0.0973      0.03  Q         |          |          |     V    |
20+ 5       0.0975      0.03  Q         |          |          |     V    |
20+10       0.0977      0.03  Q         |          |          |     V    |
20+15       0.0979      0.03  Q         |          |          |     V    |
20+20       0.0981      0.03  Q         |          |          |      V   |
20+25       0.0983      0.03  Q         |          |          |      V   |
20+30       0.0985      0.03  Q         |          |          |      V   |
20+35       0.0987      0.03  Q         |          |          |      V   |
20+40       0.0989      0.03  Q         |          |          |      V   |
```

20+45	0.0991	0.03	Q	|	|	|	V |
20+50	0.0993	0.03	Q	|	|	|	V |
20+55	0.0994	0.03	Q	|	|	|	V |
21+ 0	0.0996	0.03	Q	|	|	|	V |
21+ 5	0.0998	0.03	Q	|	|	|	V |
21+10	0.1000	0.03	Q	|	|	|	V |
21+15	0.1002	0.03	Q	|	|	|	V |
21+20	0.1003	0.03	Q	|	|	|	V |
21+25	0.1005	0.03	Q	|	|	|	V |
21+30	0.1007	0.03	Q	|	|	|	V |
21+35	0.1009	0.03	Q	|	|	|	V |
21+40	0.1010	0.02	Q	|	|	|	V |
21+45	0.1012	0.02	Q	|	|	|	V |
21+50	0.1014	0.02	Q	|	|	|	V |
21+55	0.1015	0.02	Q	|	|	|	V |
22+ 0	0.1017	0.02	Q	|	|	|	V |
22+ 5	0.1019	0.02	Q	|	|	|	V |
22+10	0.1020	0.02	Q	|	|	|	V |
22+15	0.1022	0.02	Q	|	|	|	V |
22+20	0.1024	0.02	Q	|	|	|	V |
22+25	0.1025	0.02	Q	|	|	|	V |
22+30	0.1027	0.02	Q	|	|	|	V |
22+35	0.1028	0.02	Q	|	|	|	V |
22+40	0.1030	0.02	Q	|	|	|	V |
22+45	0.1031	0.02	Q	|	|	|	V |
22+50	0.1033	0.02	Q	|	|	|	V|
22+55	0.1035	0.02	Q	|	|	|	V|
23+ 0	0.1036	0.02	Q	|	|	|	V|
23+ 5	0.1038	0.02	Q	|	|	|	V|
23+10	0.1039	0.02	Q	|	|	|	V|
23+15	0.1041	0.02	Q	|	|	|	V|
23+20	0.1042	0.02	Q	|	|	|	V|
23+25	0.1044	0.02	Q	|	|	|	V|
23+30	0.1045	0.02	Q	|	|	|	V|
23+35	0.1046	0.02	Q	|	|	|	V|
23+40	0.1048	0.02	Q	|	|	|	V|
23+45	0.1049	0.02	Q	|	|	|	V|
23+50	0.1051	0.02	Q	|	|	|	V|
23+55	0.1052	0.02	Q	|	|	|	V|
24+ 0	0.1054	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA6 TRIBUTARY AREA AA2
FILE: 18345HYDROAA2PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
2.13	1	0.68
Rainfall data for year 10		
2.13	6	1.43
Rainfall data for year 10		
2.13	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	2.13	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
2.13	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.276 (hours)
++
Watershed area = 2.13(Ac.)
Catchment Lag time = 0.221 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 37.7142
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 2.13(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 25.76 (CFS))	
1	2.505	0.645
2	16.164	3.519
3	45.650	7.595
4	63.236	4.530

5	72.812	2.467
6	79.218	1.650
7	83.744	1.166
8	87.302	0.916
9	89.923	0.675
10	91.986	0.531
11	93.695	0.440
12	95.046	0.348
13	96.157	0.286
14	97.055	0.231
15	97.717	0.171
16	98.146	0.110
17	98.567	0.109
18	99.020	0.117
19	99.452	0.111
20	99.721	0.069
21	100.000	0.035

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6418	0.0200
11	0.6605	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129

35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091

89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072

143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0716	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061

197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5079	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054

251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012
11	0.0052	0.0040	0.0012

12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014
65	0.0062	0.0048	0.0014

66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018
119	0.0081	0.0063	0.0018

120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030
173	0.0139	0.0108	0.0031

174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0167	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019
227	0.0084	0.0065	0.0019

228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012
281	0.0053	0.0041	0.0012

282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 2.35(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	0.0001	0.01	Q				
0+20	0.0003	0.02	Q				
0+25	0.0004	0.02	Q				
0+30	0.0006	0.02	Q				
0+35	0.0007	0.02	Q				
0+40	0.0009	0.03	Q				
0+45	0.0011	0.03	Q				
0+50	0.0013	0.03	Q				
0+55	0.0015	0.03	Q				
1+ 0	0.0017	0.03	Q				
1+ 5	0.0019	0.03	Q				
1+10	0.0021	0.03	Q				
1+15	0.0023	0.03	Q				
1+20	0.0025	0.03	Q				
1+25	0.0027	0.03	Q				
1+30	0.0029	0.03	Q				
1+35	0.0031	0.03	Q				
1+40	0.0033	0.03	Q				
1+45	0.0035	0.03	Q				
1+50	0.0037	0.03	Q				
1+55	0.0039	0.03	QV				
2+ 0	0.0042	0.03	QV				
2+ 5	0.0044	0.03	QV				
2+10	0.0046	0.03	QV				
2+15	0.0048	0.03	QV				
2+20	0.0050	0.03	QV				
2+25	0.0052	0.03	QV				
2+30	0.0054	0.03	QV				
2+35	0.0057	0.03	QV				
2+40	0.0059	0.03	QV				

2+45	0.0061	0.03	QV	|	|	|	|
2+50	0.0063	0.03	QV	|	|	|	|
2+55	0.0065	0.03	QV	|	|	|	|
3+ 0	0.0068	0.03	QV	|	|	|	|
3+ 5	0.0070	0.03	QV	|	|	|	|
3+10	0.0072	0.03	QV	|	|	|	|
3+15	0.0074	0.03	QV	|	|	|	|
3+20	0.0076	0.03	QV	|	|	|	|
3+25	0.0079	0.03	Q V	|	|	|	|
3+30	0.0081	0.03	Q V	|	|	|	|
3+35	0.0083	0.03	Q V	|	|	|	|
3+40	0.0085	0.03	Q V	|	|	|	|
3+45	0.0088	0.03	Q V	|	|	|	|
3+50	0.0090	0.03	Q V	|	|	|	|
3+55	0.0092	0.03	Q V	|	|	|	|
4+ 0	0.0095	0.03	Q V	|	|	|	|
4+ 5	0.0097	0.03	Q V	|	|	|	|
4+10	0.0099	0.03	Q V	|	|	|	|
4+15	0.0101	0.03	Q V	|	|	|	|
4+20	0.0104	0.03	Q V	|	|	|	|
4+25	0.0106	0.03	Q V	|	|	|	|
4+30	0.0108	0.03	Q V	|	|	|	|
4+35	0.0111	0.03	Q V	|	|	|	|
4+40	0.0113	0.03	Q V	|	|	|	|
4+45	0.0115	0.03	Q V	|	|	|	|
4+50	0.0118	0.03	Q V	|	|	|	|
4+55	0.0120	0.03	Q V	|	|	|	|
5+ 0	0.0123	0.03	Q V	|	|	|	|
5+ 5	0.0125	0.03	Q V	|	|	|	|
5+10	0.0127	0.03	Q V	|	|	|	|
5+15	0.0130	0.04	Q V	|	|	|	|
5+20	0.0132	0.04	Q V	|	|	|	|
5+25	0.0135	0.04	Q V	|	|	|	|
5+30	0.0137	0.04	Q V	|	|	|	|
5+35	0.0140	0.04	Q V	|	|	|	|
5+40	0.0142	0.04	Q V	|	|	|	|
5+45	0.0144	0.04	Q V	|	|	|	|
5+50	0.0147	0.04	Q V	|	|	|	|
5+55	0.0149	0.04	Q V	|	|	|	|
6+ 0	0.0152	0.04	Q V	|	|	|	|
6+ 5	0.0154	0.04	Q V	|	|	|	|
6+10	0.0157	0.04	Q V	|	|	|	|
6+15	0.0159	0.04	Q V	|	|	|	|
6+20	0.0162	0.04	Q V	|	|	|	|
6+25	0.0165	0.04	Q V	|	|	|	|
6+30	0.0167	0.04	Q V	|	|	|	|
6+35	0.0170	0.04	Q V	|	|	|	|
6+40	0.0172	0.04	Q V	|	|	|	|
6+45	0.0175	0.04	Q V	|	|	|	|
6+50	0.0177	0.04	Q V	|	|	|	|
6+55	0.0180	0.04	Q V	|	|	|	|
7+ 0	0.0183	0.04	Q V	|	|	|	|
7+ 5	0.0185	0.04	Q V	|	|	|	|
7+10	0.0188	0.04	Q V	|	|	|	|

7+15	0.0191	0.04	Q	V	|	|	|	|
7+20	0.0193	0.04	Q	V	|	|	|	|
7+25	0.0196	0.04	Q	V	|	|	|	|
7+30	0.0199	0.04	Q	V	|	|	|	|
7+35	0.0201	0.04	Q	V	|	|	|	|
7+40	0.0204	0.04	Q	V	|	|	|	|
7+45	0.0207	0.04	Q	V	|	|	|	|
7+50	0.0210	0.04	Q	V	|	|	|	|
7+55	0.0212	0.04	Q	V	|	|	|	|
8+ 0	0.0215	0.04	Q	V	|	|	|	|
8+ 5	0.0218	0.04	Q	V	|	|	|	|
8+10	0.0221	0.04	Q	V	|	|	|	|
8+15	0.0224	0.04	Q	V	|	|	|	|
8+20	0.0226	0.04	Q	V	|	|	|	|
8+25	0.0229	0.04	Q	V	|	|	|	|
8+30	0.0232	0.04	Q	V	|	|	|	|
8+35	0.0235	0.04	Q	V	|	|	|	|
8+40	0.0238	0.04	Q	V	|	|	|	|
8+45	0.0241	0.04	Q	V	|	|	|	|
8+50	0.0244	0.04	Q	V	|	|	|	|
8+55	0.0247	0.04	Q	V	|	|	|	|
9+ 0	0.0250	0.04	Q	V	|	|	|	|
9+ 5	0.0252	0.04	Q	V	|	|	|	|
9+10	0.0255	0.04	Q	V	|	|	|	|
9+15	0.0258	0.04	Q	V	|	|	|	|
9+20	0.0262	0.04	Q	V	|	|	|	|
9+25	0.0265	0.04	Q	V	|	|	|	|
9+30	0.0268	0.04	Q	V	|	|	|	|
9+35	0.0271	0.04	Q	V	|	|	|	|
9+40	0.0274	0.04	Q	V	|	|	|	|
9+45	0.0277	0.05	Q	V	|	|	|	|
9+50	0.0280	0.05	Q	V	|	|	|	|
9+55	0.0283	0.05	Q	V	|	|	|	|
10+ 0	0.0286	0.05	Q	V	|	|	|	|
10+ 5	0.0290	0.05	Q	V	|	|	|	|
10+10	0.0293	0.05	Q	V	|	|	|	|
10+15	0.0296	0.05	Q	V	|	|	|	|
10+20	0.0299	0.05	Q	V	|	|	|	|
10+25	0.0303	0.05	Q	V	|	|	|	|
10+30	0.0306	0.05	Q	V	|	|	|	|
10+35	0.0309	0.05	Q	V	|	|	|	|
10+40	0.0313	0.05	Q	V	|	|	|	|
10+45	0.0316	0.05	Q	V	|	|	|	|
10+50	0.0319	0.05	Q	V	|	|	|	|
10+55	0.0323	0.05	Q	V	|	|	|	|
11+ 0	0.0326	0.05	Q	V	|	|	|	|
11+ 5	0.0330	0.05	Q	V	|	|	|	|
11+10	0.0333	0.05	Q	V	|	|	|	|
11+15	0.0337	0.05	Q	V	|	|	|	|
11+20	0.0340	0.05	Q	V	|	|	|	|
11+25	0.0344	0.05	Q	V	|	|	|	|
11+30	0.0348	0.05	Q	V	|	|	|	|
11+35	0.0351	0.05	Q	V	|	|	|	|
11+40	0.0355	0.05	Q	V	|	|	|	|

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11+45       0.0359      0.05  Q        V|          |          |          |
11+50       0.0362      0.05  Q        V|          |          |          |
11+55       0.0366      0.06  Q        V|          |          |          |
12+ 0       0.0370      0.06  Q        V|          |          |          |
12+ 5       0.0374      0.06  Q        V|          |          |          |
12+10       0.0378      0.05  Q        V|          |          |          |
12+15       0.0381      0.05  Q        V|          |          |          |
12+20       0.0385      0.05  Q         V          |          |          |
12+25       0.0388      0.05  Q         V          |          |          |
12+30       0.0392      0.05  Q         V          |          |          |
12+35       0.0395      0.05  Q         V          |          |          |
12+40       0.0399      0.05  Q         V          |          |          |
12+45       0.0402      0.05  Q         V          |          |          |
12+50       0.0406      0.05  Q         V          |          |          |
12+55       0.0410      0.05  Q         V          |          |          |
13+ 0       0.0413      0.05  Q         V          |          |          |
13+ 5       0.0417      0.05  Q         V          |          |          |
13+10       0.0421      0.05  Q         V          |          |          |
13+15       0.0425      0.06  Q         |V         |          |          |
13+20       0.0428      0.06  Q         |V         |          |          |
13+25       0.0432      0.06  Q         |V         |          |          |
13+30       0.0436      0.06  Q         |V         |          |          |
13+35       0.0440      0.06  Q         |V         |          |          |
13+40       0.0445      0.06  Q         |V         |          |          |
13+45       0.0449      0.06  Q         |V         |          |          |
13+50       0.0453      0.06  Q         |V         |          |          |
13+55       0.0458      0.06  Q         |V         |          |          |
14+ 0       0.0462      0.06  Q         | V        |          |          |
14+ 5       0.0467      0.07  Q         | V        |          |          |
14+10       0.0471      0.07  Q         | V        |          |          |
14+15       0.0476      0.07  Q         | V        |          |          |
14+20       0.0481      0.07  Q         | V        |          |          |
14+25       0.0486      0.07  Q         | V        |          |          |
14+30       0.0491      0.07  Q         | V        |          |          |
14+35       0.0496      0.08  Q         | V        |          |          |
14+40       0.0502      0.08  Q         |  V       |          |          |
14+45       0.0507      0.08  Q         |  V       |          |          |
14+50       0.0513      0.08  Q         |  V       |          |          |
14+55       0.0519      0.09  Q         |  V       |          |          |
15+ 0       0.0525      0.09  Q         |  V       |          |          |
15+ 5       0.0532      0.09  Q         |  V       |          |          |
15+10       0.0539      0.10  Q         |   V      |          |          |
15+15       0.0546      0.10  Q         |   V      |          |          |
15+20       0.0553      0.11  Q         |   V      |          |          |
15+25       0.0561      0.11  Q         |   V      |          |          |
15+30       0.0568      0.11  Q         |   V      |          |          |
15+35       0.0576      0.11  Q         |    V     |          |          |
15+40       0.0583      0.11  Q         |    V     |          |          |
15+45       0.0592      0.12  Q         |    V     |          |          |
15+50       0.0601      0.13  Q         |    V     |          |          |
15+55       0.0611      0.15  Q         |    V     |          |          |
16+ 0       0.0624      0.19  Q         |     V    |          |          |
16+ 5       0.0655      0.45  |Q        |      V   |          |          |
16+10       0.0746      1.32  |    Q    |         V|          |          |
```

16+15	0.0907	2.35	| Q|	| V |		
16+20	0.1009	1.47	| Q |	| V |		
16+25	0.1069	0.88	| Q |	| V |		
16+30	0.1112	0.63	| Q |	| V |		
16+35	0.1145	0.48	|Q |	| V|		
16+40	0.1173	0.40	|Q |	| V |		
16+45	0.1195	0.32	|Q |	| |V |		
16+50	0.1213	0.27	|Q |	| |V |		
16+55	0.1229	0.24	Q |	| | V |		
17+ 0	0.1243	0.20	Q |	| | V |		
17+ 5	0.1256	0.18	Q |	| | V |		
17+10	0.1266	0.16	Q |	| | V |		
17+15	0.1275	0.13	Q |	| | | V |		
17+20	0.1283	0.11	Q |	| | | V |		
17+25	0.1290	0.11	Q |	| | | V |		
17+30	0.1298	0.11	Q |	| | | V |		
17+35	0.1305	0.10	Q |	| | | V |		
17+40	0.1311	0.08	Q |	| | | V |		
17+45	0.1315	0.07	Q |	| | | V |		
17+50	0.1320	0.06	Q |	| | | V |		
17+55	0.1324	0.06	Q |	| | | V |		
18+ 0	0.1327	0.06	Q |	| | | V |		
18+ 5	0.1331	0.05	Q |	| | | V |		
18+10	0.1335	0.05	Q |	| | | V |		
18+15	0.1339	0.06	Q |	| | | V |		
18+20	0.1343	0.06	Q |	| | | V |		
18+25	0.1346	0.06	Q |	| | | V |		
18+30	0.1350	0.06	Q |	| | | V |		
18+35	0.1354	0.05	Q |	| | | V |		
18+40	0.1358	0.05	Q |	| | | V |		
18+45	0.1361	0.05	Q |	| | | V |		
18+50	0.1365	0.05	Q |	| | | V |		
18+55	0.1368	0.05	Q |	| | | V |		
19+ 0	0.1372	0.05	Q |	| | | V |		
19+ 5	0.1375	0.05	Q |	| | | V |		
19+10	0.1379	0.05	Q |	| | | V |		
19+15	0.1382	0.05	Q |	| | | V |		
19+20	0.1385	0.05	Q |	| | | V |		
19+25	0.1389	0.05	Q |	| | | V |		
19+30	0.1392	0.05	Q |	| | | V |		
19+35	0.1395	0.05	Q |	| | | V |		
19+40	0.1398	0.05	Q |	| | | V |		
19+45	0.1401	0.05	Q |	| | | V |		
19+50	0.1404	0.04	Q |	| | | V |		
19+55	0.1407	0.04	Q |	| | | V |		
20+ 0	0.1410	0.04	Q |	| | | V |		
20+ 5	0.1413	0.04	Q |	| | | V |		
20+10	0.1416	0.04	Q |	| | | V |		
20+15	0.1419	0.04	Q |	| | | V |		
20+20	0.1422	0.04	Q |	| | | V |		
20+25	0.1425	0.04	Q |	| | | V |		
20+30	0.1428	0.04	Q |	| | | V |		
20+35	0.1431	0.04	Q |	| | | V |		
20+40	0.1433	0.04	Q |	| | | V |		

20+45	0.1436	0.04	Q	|	|	|	V |
20+50	0.1439	0.04	Q	|	|	|	V |
20+55	0.1441	0.04	Q	|	|	|	V |
21+ 0	0.1444	0.04	Q	|	|	|	V |
21+ 5	0.1447	0.04	Q	|	|	|	V |
21+10	0.1449	0.04	Q	|	|	|	V |
21+15	0.1452	0.04	Q	|	|	|	V |
21+20	0.1454	0.04	Q	|	|	|	V |
21+25	0.1457	0.04	Q	|	|	|	V |
21+30	0.1460	0.04	Q	|	|	|	V |
21+35	0.1462	0.04	Q	|	|	|	V |
21+40	0.1464	0.04	Q	|	|	|	V |
21+45	0.1467	0.04	Q	|	|	|	V |
21+50	0.1469	0.04	Q	|	|	|	V |
21+55	0.1472	0.04	Q	|	|	|	V |
22+ 0	0.1474	0.03	Q	|	|	|	V |
22+ 5	0.1477	0.03	Q	|	|	|	V |
22+10	0.1479	0.03	Q	|	|	|	V |
22+15	0.1481	0.03	Q	|	|	|	V |
22+20	0.1484	0.03	Q	|	|	|	V |
22+25	0.1486	0.03	Q	|	|	|	V |
22+30	0.1488	0.03	Q	|	|	|	V |
22+35	0.1491	0.03	Q	|	|	|	V |
22+40	0.1493	0.03	Q	|	|	|	V |
22+45	0.1495	0.03	Q	|	|	|	V |
22+50	0.1497	0.03	Q	|	|	|	V|
22+55	0.1500	0.03	Q	|	|	|	V|
23+ 0	0.1502	0.03	Q	|	|	|	V|
23+ 5	0.1504	0.03	Q	|	|	|	V|
23+10	0.1506	0.03	Q	|	|	|	V|
23+15	0.1508	0.03	Q	|	|	|	V|
23+20	0.1511	0.03	Q	|	|	|	V|
23+25	0.1513	0.03	Q	|	|	|	V|
23+30	0.1515	0.03	Q	|	|	|	V|
23+35	0.1517	0.03	Q	|	|	|	V|
23+40	0.1519	0.03	Q	|	|	|	V|
23+45	0.1521	0.03	Q	|	|	|	V|
23+50	0.1523	0.03	Q	|	|	|	V|
23+55	0.1525	0.03	Q	|	|	|	V|
24+ 0	0.1527	0.03	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA7 **TRIBUTARY AREA AA3**
FILE: 18345HYDROAA3PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
3.08	1	0.68
Rainfall data for year 10		
3.08	6	1.43
Rainfall data for year 10		
3.08	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	3.08	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
3.08	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.293 (hours)
++
Watershed area = 3.08(Ac.)
Catchment Lag time = 0.234 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 35.5760
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 3.08(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 37.25 (CFS))	
1	2.290	0.853
2	13.950	4.343
3	41.999	10.448
4	60.732	6.978

5	70.766	3.738
6	77.470	2.497
7	82.229	1.773
8	85.894	1.365
9	88.777	1.074
10	90.921	0.799
11	92.715	0.668
12	94.200	0.553
13	95.402	0.448
14	96.387	0.367
15	97.185	0.297
16	97.784	0.223
17	98.171	0.144
18	98.571	0.149
19	98.998	0.159
20	99.414	0.155
21	99.683	0.100
22	100.000	0.050

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4472	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5506	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6218	0.0216
10	0.6418	0.0200
11	0.6604	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7439	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8209	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8726	0.0168
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9355	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0332	0.0132

34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3703	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092

88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6965	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8430	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072

142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0576	0.0070
149	2.0647	0.0070
150	2.0716	0.0070
151	2.0786	0.0070
152	2.0855	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1537	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061

196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5079	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6044	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6266	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054

250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8187	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012
9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012

11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014
63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014

65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018
117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018

119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029
171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030

173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0168	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020
225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019

227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012
279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012

281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 3.25(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

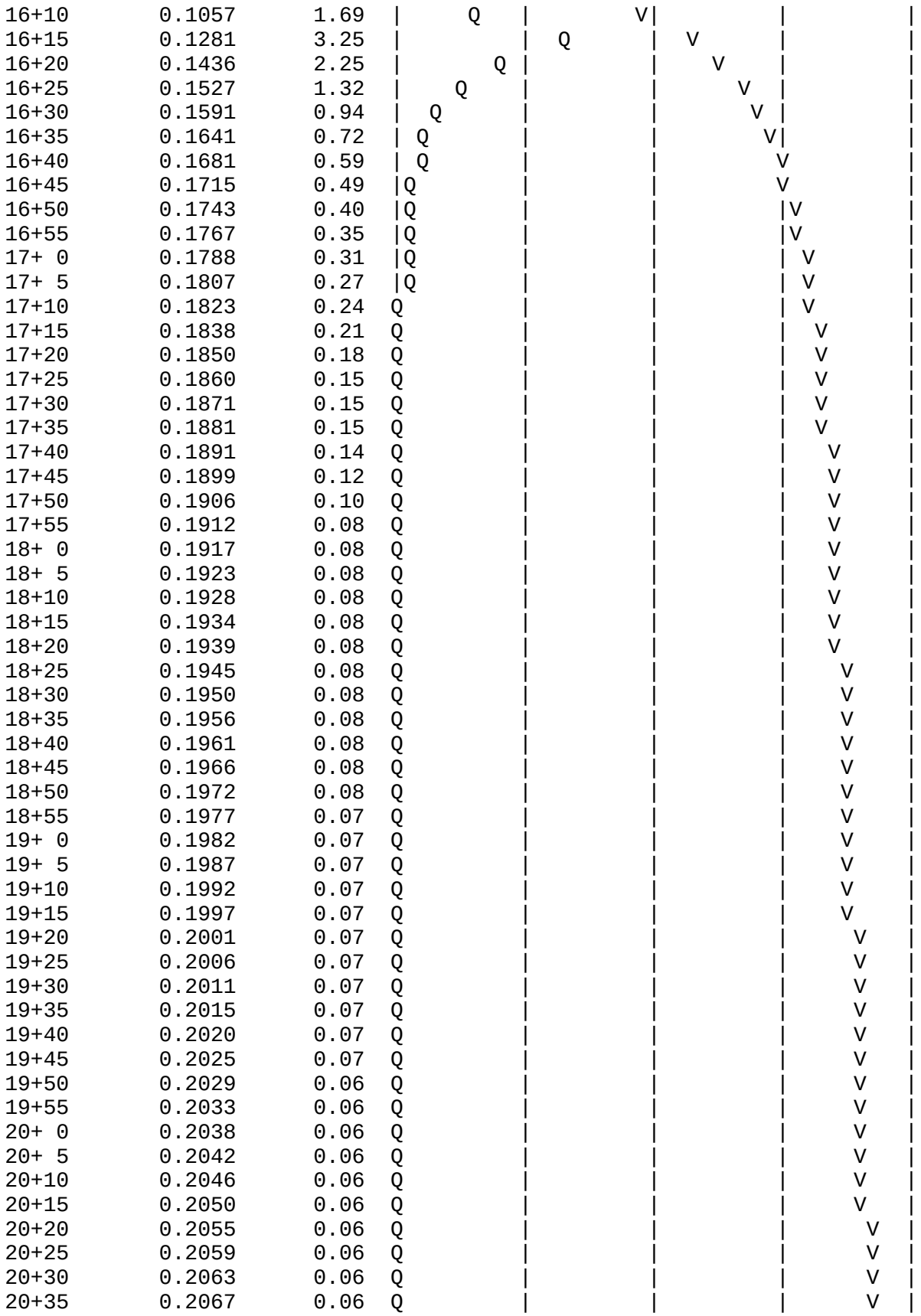
Hydrograph in 5 Minute intervals ((CFS))

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	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.03	Q				
0+25	0.0006	0.03	Q				
0+30	0.0008	0.03	Q				
0+35	0.0010	0.04	Q				
0+40	0.0013	0.04	Q				
0+45	0.0015	0.04	Q				
0+50	0.0018	0.04	Q				
0+55	0.0021	0.04	Q				
1+ 0	0.0024	0.04	Q				
1+ 5	0.0027	0.04	Q				
1+10	0.0029	0.04	Q				
1+15	0.0032	0.04	Q				
1+20	0.0035	0.04	Q				
1+25	0.0038	0.04	Q				
1+30	0.0041	0.04	Q				
1+35	0.0044	0.04	Q				
1+40	0.0047	0.04	Q				
1+45	0.0050	0.04	Q				
1+50	0.0053	0.04	Q				
1+55	0.0056	0.04	QV				
2+ 0	0.0059	0.04	QV				
2+ 5	0.0063	0.04	QV				
2+10	0.0066	0.04	QV				
2+15	0.0069	0.04	QV				
2+20	0.0072	0.05	QV				
2+25	0.0075	0.05	QV				
2+30	0.0078	0.05	QV				
2+35	0.0081	0.05	QV				

2+40	0.0084	0.05	QV	|	|	|	|
2+45	0.0087	0.05	QV	|	|	|	|
2+50	0.0091	0.05	QV	|	|	|	|
2+55	0.0094	0.05	QV	|	|	|	|
3+ 0	0.0097	0.05	QV	|	|	|	|
3+ 5	0.0100	0.05	QV	|	|	|	|
3+10	0.0103	0.05	QV	|	|	|	|
3+15	0.0107	0.05	QV	|	|	|	|
3+20	0.0110	0.05	QV	|	|	|	|
3+25	0.0113	0.05	Q V	|	|	|	|
3+30	0.0116	0.05	Q V	|	|	|	|
3+35	0.0119	0.05	Q V	|	|	|	|
3+40	0.0123	0.05	Q V	|	|	|	|
3+45	0.0126	0.05	Q V	|	|	|	|
3+50	0.0129	0.05	Q V	|	|	|	|
3+55	0.0133	0.05	Q V	|	|	|	|
4+ 0	0.0136	0.05	Q V	|	|	|	|
4+ 5	0.0139	0.05	Q V	|	|	|	|
4+10	0.0143	0.05	Q V	|	|	|	|
4+15	0.0146	0.05	Q V	|	|	|	|
4+20	0.0149	0.05	Q V	|	|	|	|
4+25	0.0153	0.05	Q V	|	|	|	|
4+30	0.0156	0.05	Q V	|	|	|	|
4+35	0.0159	0.05	Q V	|	|	|	|
4+40	0.0163	0.05	Q V	|	|	|	|
4+45	0.0166	0.05	Q V	|	|	|	|
4+50	0.0170	0.05	Q V	|	|	|	|
4+55	0.0173	0.05	Q V	|	|	|	|
5+ 0	0.0176	0.05	Q V	|	|	|	|
5+ 5	0.0180	0.05	Q V	|	|	|	|
5+10	0.0183	0.05	Q V	|	|	|	|
5+15	0.0187	0.05	Q V	|	|	|	|
5+20	0.0190	0.05	Q V	|	|	|	|
5+25	0.0194	0.05	Q V	|	|	|	|
5+30	0.0197	0.05	Q V	|	|	|	|
5+35	0.0201	0.05	Q V	|	|	|	|
5+40	0.0204	0.05	Q V	|	|	|	|
5+45	0.0208	0.05	Q V	|	|	|	|
5+50	0.0212	0.05	Q V	|	|	|	|
5+55	0.0215	0.05	Q V	|	|	|	|
6+ 0	0.0219	0.05	Q V	|	|	|	|
6+ 5	0.0222	0.05	Q V	|	|	|	|
6+10	0.0226	0.05	Q V	|	|	|	|
6+15	0.0230	0.05	Q V	|	|	|	|
6+20	0.0233	0.05	Q V	|	|	|	|
6+25	0.0237	0.05	Q V	|	|	|	|
6+30	0.0241	0.05	Q V	|	|	|	|
6+35	0.0244	0.05	Q V	|	|	|	|
6+40	0.0248	0.05	Q V	|	|	|	|
6+45	0.0252	0.05	Q V	|	|	|	|
6+50	0.0256	0.05	Q V	|	|	|	|
6+55	0.0259	0.05	Q V	|	|	|	|
7+ 0	0.0263	0.06	Q V	|	|	|	|
7+ 5	0.0267	0.06	Q V	|	|	|	|

7+10	0.0271	0.06	Q	V	|	|	|	|
7+15	0.0275	0.06	Q	V	|	|	|	|
7+20	0.0278	0.06	Q	V	|	|	|	|
7+25	0.0282	0.06	Q	V	|	|	|	|
7+30	0.0286	0.06	Q	V	|	|	|	|
7+35	0.0290	0.06	Q	V	|	|	|	|
7+40	0.0294	0.06	Q	V	|	|	|	|
7+45	0.0298	0.06	Q	V	|	|	|	|
7+50	0.0302	0.06	Q	V	|	|	|	|
7+55	0.0306	0.06	Q	V	|	|	|	|
8+ 0	0.0310	0.06	Q	V	|	|	|	|
8+ 5	0.0314	0.06	Q	V	|	|	|	|
8+10	0.0318	0.06	Q	V	|	|	|	|
8+15	0.0322	0.06	Q	V	|	|	|	|
8+20	0.0326	0.06	Q	V	|	|	|	|
8+25	0.0330	0.06	Q	V	|	|	|	|
8+30	0.0334	0.06	Q	V	|	|	|	|
8+35	0.0339	0.06	Q	V	|	|	|	|
8+40	0.0343	0.06	Q	V	|	|	|	|
8+45	0.0347	0.06	Q	V	|	|	|	|
8+50	0.0351	0.06	Q	V	|	|	|	|
8+55	0.0355	0.06	Q	V	|	|	|	|
9+ 0	0.0360	0.06	Q	V	|	|	|	|
9+ 5	0.0364	0.06	Q	V	|	|	|	|
9+10	0.0368	0.06	Q	V	|	|	|	|
9+15	0.0373	0.06	Q	V	|	|	|	|
9+20	0.0377	0.06	Q	V	|	|	|	|
9+25	0.0381	0.06	Q	V	|	|	|	|
9+30	0.0386	0.06	Q	V	|	|	|	|
9+35	0.0390	0.06	Q	V	|	|	|	|
9+40	0.0395	0.06	Q	V	|	|	|	|
9+45	0.0399	0.07	Q	V	|	|	|	|
9+50	0.0404	0.07	Q	V	|	|	|	|
9+55	0.0408	0.07	Q	V	|	|	|	|
10+ 0	0.0413	0.07	Q	V	|	|	|	|
10+ 5	0.0417	0.07	Q	V	|	|	|	|
10+10	0.0422	0.07	Q	V	|	|	|	|
10+15	0.0427	0.07	Q	V	|	|	|	|
10+20	0.0432	0.07	Q	V	|	|	|	|
10+25	0.0436	0.07	Q	V	|	|	|	|
10+30	0.0441	0.07	Q	V	|	|	|	|
10+35	0.0446	0.07	Q	V	|	|	|	|
10+40	0.0451	0.07	Q	V	|	|	|	|
10+45	0.0456	0.07	Q	V	|	|	|	|
10+50	0.0460	0.07	Q	V	|	|	|	|
10+55	0.0465	0.07	Q	V	|	|	|	|
11+ 0	0.0470	0.07	Q	V	|	|	|	|
11+ 5	0.0475	0.07	Q	V	|	|	|	|
11+10	0.0480	0.07	Q	V	|	|	|	|
11+15	0.0486	0.07	Q	V	|	|	|	|
11+20	0.0491	0.07	Q	V	|	|	|	|
11+25	0.0496	0.08	Q	V	|	|	|	|
11+30	0.0501	0.08	Q	V	|	|	|	|
11+35	0.0506	0.08	Q	V	|	|	|	|

```
11+40       0.0512      0.08  Q        V|          |          |          |
11+45       0.0517      0.08  Q        V|          |          |          |
11+50       0.0523      0.08  Q        V|          |          |          |
11+55       0.0528      0.08  Q        V|          |          |          |
12+ 0       0.0534      0.08  Q        V|          |          |          |
12+ 5       0.0539      0.08  Q        V|          |          |          |
12+10       0.0545      0.08  Q        V|          |          |          |
12+15       0.0550      0.08  Q        V|          |          |          |
12+20       0.0555      0.07  Q         V          |          |          |
12+25       0.0560      0.07  Q         V          |          |          |
12+30       0.0565      0.07  Q         V          |          |          |
12+35       0.0570      0.07  Q         V          |          |          |
12+40       0.0575      0.07  Q         V          |          |          |
12+45       0.0580      0.07  Q         V          |          |          |
12+50       0.0586      0.08  Q         V          |          |          |
12+55       0.0591      0.08  Q         V          |          |          |
13+ 0       0.0596      0.08  Q         V          |          |          |
13+ 5       0.0602      0.08  Q         V          |          |          |
13+10       0.0607      0.08  Q         V          |          |          |
13+15       0.0612      0.08  Q         |V         |          |          |
13+20       0.0618      0.08  Q         |V         |          |          |
13+25       0.0624      0.08  Q         |V         |          |          |
13+30       0.0630      0.08  Q         |V         |          |          |
13+35       0.0635      0.09  Q         |V         |          |          |
13+40       0.0641      0.09  Q         |V         |          |          |
13+45       0.0647      0.09  Q         |V         |          |          |
13+50       0.0654      0.09  Q         |V         |          |          |
13+55       0.0660      0.09  Q         |V         |          |          |
14+ 0       0.0666      0.09  Q         | V        |          |          |
14+ 5       0.0673      0.10  Q         | V        |          |          |
14+10       0.0680      0.10  Q         | V        |          |          |
14+15       0.0687      0.10  Q         | V        |          |          |
14+20       0.0694      0.10  Q         | V        |          |          |
14+25       0.0701      0.10  Q         | V        |          |          |
14+30       0.0708      0.11  Q         | V        |          |          |
14+35       0.0716      0.11  Q         | V        |          |          |
14+40       0.0724      0.11  Q         |  V       |          |          |
14+45       0.0732      0.12  Q         |  V       |          |          |
14+50       0.0740      0.12  Q         |  V       |          |          |
14+55       0.0749      0.12  Q         |  V       |          |          |
15+ 0       0.0758      0.13  Q         |  V       |          |          |
15+ 5       0.0767      0.13  Q         |  V       |          |          |
15+10       0.0776      0.14  Q         |  V       |          |          |
15+15       0.0786      0.15  Q         |   V      |          |          |
15+20       0.0797      0.15  Q         |   V      |          |          |
15+25       0.0808      0.16  Q         |   V      |          |          |
15+30       0.0819      0.16  Q         |   V      |          |          |
15+35       0.0830      0.16  Q         |   V      |          |          |
15+40       0.0841      0.16  Q         |    V     |          |          |
15+45       0.0853      0.17  Q         |    V     |          |          |
15+50       0.0865      0.19  Q         |    V     |          |          |
15+55       0.0880      0.21  Q         |    V     |          |          |
16+ 0       0.0898      0.27  |Q        |     V    |          |          |
16+ 5       0.0941      0.61  | Q       |     V    |          |          |
```


16+10 0.1057 1.69
16+15 0.1281 3.25
16+20 0.1436 2.25
16+25 0.1527 1.32
16+30 0.1591 0.94
16+35 0.1641 0.72
16+40 0.1681 0.59
16+45 0.1715 0.49
16+50 0.1743 0.40
16+55 0.1767 0.35
17+ 0 0.1788 0.31
17+ 5 0.1807 0.27
17+10 0.1823 0.24
17+15 0.1838 0.21
17+20 0.1850 0.18
17+25 0.1860 0.15
17+30 0.1871 0.15
17+35 0.1881 0.15
17+40 0.1891 0.14
17+45 0.1899 0.12
17+50 0.1906 0.10
17+55 0.1912 0.08
18+ 0 0.1917 0.08
18+ 5 0.1923 0.08
18+10 0.1928 0.08
18+15 0.1934 0.08
18+20 0.1939 0.08
18+25 0.1945 0.08
18+30 0.1950 0.08
18+35 0.1956 0.08
18+40 0.1961 0.08
18+45 0.1966 0.08
18+50 0.1972 0.08
18+55 0.1977 0.07
19+ 0 0.1982 0.07
19+ 5 0.1987 0.07
19+10 0.1992 0.07
19+15 0.1997 0.07
19+20 0.2001 0.07
19+25 0.2006 0.07
19+30 0.2011 0.07
19+35 0.2015 0.07
19+40 0.2020 0.07
19+45 0.2025 0.07
19+50 0.2029 0.06
19+55 0.2033 0.06
20+ 0 0.2038 0.06
20+ 5 0.2042 0.06
20+10 0.2046 0.06
20+15 0.2050 0.06
20+20 0.2055 0.06
20+25 0.2059 0.06
20+30 0.2063 0.06
20+35 0.2067 0.06

```
  20+40       0.2071      0.06  Q          |          |          |       V  |
  20+45       0.2075      0.06  Q          |          |          |       V  |
  20+50       0.2079      0.06  Q          |          |          |       V  |
  20+55       0.2083      0.06  Q          |          |          |       V  |
  21+ 0       0.2086      0.06  Q          |          |          |       V  |
  21+ 5       0.2090      0.06  Q          |          |          |       V  |
  21+10       0.2094      0.05  Q          |          |          |       V  |
  21+15       0.2098      0.05  Q          |          |          |       V  |
  21+20       0.2101      0.05  Q          |          |          |       V  |
  21+25       0.2105      0.05  Q          |          |          |       V  |
  21+30       0.2109      0.05  Q          |          |          |        V |
  21+35       0.2112      0.05  Q          |          |          |        V |
  21+40       0.2116      0.05  Q          |          |          |        V |
  21+45       0.2120      0.05  Q          |          |          |        V |
  21+50       0.2123      0.05  Q          |          |          |        V |
  21+55       0.2127      0.05  Q          |          |          |        V |
  22+ 0       0.2130      0.05  Q          |          |          |        V |
  22+ 5       0.2134      0.05  Q          |          |          |        V |
  22+10       0.2137      0.05  Q          |          |          |        V |
  22+15       0.2140      0.05  Q          |          |          |        V |
  22+20       0.2144      0.05  Q          |          |          |        V |
  22+25       0.2147      0.05  Q          |          |          |        V |
  22+30       0.2150      0.05  Q          |          |          |        V |
  22+35       0.2154      0.05  Q          |          |          |        V |
  22+40       0.2157      0.05  Q          |          |          |        V |
  22+45       0.2160      0.05  Q          |          |          |        V |
  22+50       0.2164      0.05  Q          |          |          |        V |
  22+55       0.2167      0.05  Q          |          |          |         V|
  23+ 0       0.2170      0.05  Q          |          |          |         V|
  23+ 5       0.2173      0.05  Q          |          |          |         V|
  23+10       0.2176      0.05  Q          |          |          |         V|
  23+15       0.2180      0.05  Q          |          |          |         V|
  23+20       0.2183      0.05  Q          |          |          |         V|
  23+25       0.2186      0.05  Q          |          |          |         V|
  23+30       0.2189      0.04  Q          |          |          |         V|
  23+35       0.2192      0.04  Q          |          |          |         V|
  23+40       0.2195      0.04  Q          |          |          |         V|
  23+45       0.2198      0.04  Q          |          |          |         V|
  23+50       0.2201      0.04  Q          |          |          |         V|
  23+55       0.2204      0.04  Q          |          |          |         V|
  24+ 0       0.2207      0.04  Q          |          |          |         V|
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 07/11/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM PRE-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA8 **TRIBUTARY AREA AA4**
FILE: 18345HYDROAA4PRE10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
3.48	1	0.68
Rainfall data for year 10		
3.48	6	1.43
Rainfall data for year 10		
3.48	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
50.0	70.0	3.48	1.000	0.532	1.000	0.532

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
3.48	1.000	50.0	70.0	4.29	0.225

Area-averaged catchment yield fraction, Y = 0.225
Area-averaged low loss fraction, Yb = 0.775
User entry of time of concentration = 0.319 (hours)
++
Watershed area = 3.48(Ac.)
Catchment Lag time = 0.255 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 32.6951
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.775 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 3.48(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 42.09 (CFS))		
1	2.010	0.846
2	11.360	3.935
3	36.460	10.564
4	56.767	8.546

5	67.641	4.577
6	74.791	3.009
7	79.939	2.167
8	83.759	1.608
9	86.888	1.317
10	89.326	1.026
11	91.213	0.794
12	92.829	0.680
13	94.186	0.571
14	95.300	0.469
15	96.226	0.390
16	97.011	0.330
17	97.606	0.251
18	98.022	0.175
19	98.362	0.143
20	98.751	0.163
21	99.143	0.165
22	99.503	0.151
23	99.723	0.093
24	100.000	0.046

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4472	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5506	0.0293
7	0.5767	0.0261
8	0.6002	0.0236
9	0.6218	0.0216
10	0.6418	0.0200
11	0.6604	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7439	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8026	0.0189
19	0.8209	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8726	0.0168
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9355	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137

32	1.0201	0.0134
33	1.0332	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1194	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3703	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093

86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6965	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8430	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073

140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0576	0.0070
149	2.0647	0.0070
150	2.0716	0.0070
151	2.0786	0.0070
152	2.0855	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
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161	2.1470	0.0067
162	2.1537	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062

194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
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205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5079	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
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226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
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234	2.5933	0.0056
235	2.5989	0.0056
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241	2.6322	0.0055
242	2.6377	0.0055
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248	2.6705	0.0054
249	2.6759	0.0054
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254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
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262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8187	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0039	0.0011
2	0.0051	0.0039	0.0011
3	0.0051	0.0039	0.0011
4	0.0051	0.0039	0.0011
5	0.0051	0.0040	0.0012
6	0.0051	0.0040	0.0012
7	0.0051	0.0040	0.0012
8	0.0051	0.0040	0.0012

9	0.0052	0.0040	0.0012
10	0.0052	0.0040	0.0012
11	0.0052	0.0040	0.0012
12	0.0052	0.0040	0.0012
13	0.0052	0.0040	0.0012
14	0.0052	0.0041	0.0012
15	0.0052	0.0041	0.0012
16	0.0053	0.0041	0.0012
17	0.0053	0.0041	0.0012
18	0.0053	0.0041	0.0012
19	0.0053	0.0041	0.0012
20	0.0053	0.0041	0.0012
21	0.0053	0.0041	0.0012
22	0.0053	0.0041	0.0012
23	0.0054	0.0042	0.0012
24	0.0054	0.0042	0.0012
25	0.0054	0.0042	0.0012
26	0.0054	0.0042	0.0012
27	0.0054	0.0042	0.0012
28	0.0054	0.0042	0.0012
29	0.0055	0.0042	0.0012
30	0.0055	0.0042	0.0012
31	0.0055	0.0043	0.0012
32	0.0055	0.0043	0.0012
33	0.0055	0.0043	0.0012
34	0.0055	0.0043	0.0012
35	0.0056	0.0043	0.0013
36	0.0056	0.0043	0.0013
37	0.0056	0.0043	0.0013
38	0.0056	0.0044	0.0013
39	0.0056	0.0044	0.0013
40	0.0057	0.0044	0.0013
41	0.0057	0.0044	0.0013
42	0.0057	0.0044	0.0013
43	0.0057	0.0044	0.0013
44	0.0057	0.0044	0.0013
45	0.0058	0.0045	0.0013
46	0.0058	0.0045	0.0013
47	0.0058	0.0045	0.0013
48	0.0058	0.0045	0.0013
49	0.0058	0.0045	0.0013
50	0.0058	0.0045	0.0013
51	0.0059	0.0045	0.0013
52	0.0059	0.0046	0.0013
53	0.0059	0.0046	0.0013
54	0.0059	0.0046	0.0013
55	0.0060	0.0046	0.0013
56	0.0060	0.0046	0.0013
57	0.0060	0.0046	0.0014
58	0.0060	0.0047	0.0014
59	0.0060	0.0047	0.0014
60	0.0061	0.0047	0.0014
61	0.0061	0.0047	0.0014
62	0.0061	0.0047	0.0014

63	0.0061	0.0048	0.0014
64	0.0061	0.0048	0.0014
65	0.0062	0.0048	0.0014
66	0.0062	0.0048	0.0014
67	0.0062	0.0048	0.0014
68	0.0062	0.0048	0.0014
69	0.0063	0.0049	0.0014
70	0.0063	0.0049	0.0014
71	0.0063	0.0049	0.0014
72	0.0063	0.0049	0.0014
73	0.0064	0.0049	0.0014
74	0.0064	0.0050	0.0014
75	0.0064	0.0050	0.0014
76	0.0065	0.0050	0.0015
77	0.0065	0.0050	0.0015
78	0.0065	0.0050	0.0015
79	0.0065	0.0051	0.0015
80	0.0066	0.0051	0.0015
81	0.0066	0.0051	0.0015
82	0.0066	0.0051	0.0015
83	0.0067	0.0052	0.0015
84	0.0067	0.0052	0.0015
85	0.0067	0.0052	0.0015
86	0.0067	0.0052	0.0015
87	0.0068	0.0053	0.0015
88	0.0068	0.0053	0.0015
89	0.0069	0.0053	0.0015
90	0.0069	0.0053	0.0015
91	0.0069	0.0054	0.0016
92	0.0069	0.0054	0.0016
93	0.0070	0.0054	0.0016
94	0.0070	0.0054	0.0016
95	0.0071	0.0055	0.0016
96	0.0071	0.0055	0.0016
97	0.0071	0.0055	0.0016
98	0.0072	0.0055	0.0016
99	0.0072	0.0056	0.0016
100	0.0072	0.0056	0.0016
101	0.0073	0.0056	0.0016
102	0.0073	0.0057	0.0016
103	0.0074	0.0057	0.0017
104	0.0074	0.0057	0.0017
105	0.0074	0.0058	0.0017
106	0.0075	0.0058	0.0017
107	0.0075	0.0058	0.0017
108	0.0076	0.0059	0.0017
109	0.0076	0.0059	0.0017
110	0.0076	0.0059	0.0017
111	0.0077	0.0060	0.0017
112	0.0077	0.0060	0.0017
113	0.0078	0.0060	0.0018
114	0.0078	0.0061	0.0018
115	0.0079	0.0061	0.0018
116	0.0079	0.0062	0.0018

117	0.0080	0.0062	0.0018
118	0.0080	0.0062	0.0018
119	0.0081	0.0063	0.0018
120	0.0082	0.0063	0.0018
121	0.0082	0.0064	0.0019
122	0.0083	0.0064	0.0019
123	0.0083	0.0065	0.0019
124	0.0084	0.0065	0.0019
125	0.0085	0.0066	0.0019
126	0.0085	0.0066	0.0019
127	0.0086	0.0067	0.0019
128	0.0086	0.0067	0.0019
129	0.0087	0.0068	0.0020
130	0.0088	0.0068	0.0020
131	0.0089	0.0069	0.0020
132	0.0089	0.0069	0.0020
133	0.0090	0.0070	0.0020
134	0.0091	0.0070	0.0020
135	0.0092	0.0071	0.0021
136	0.0092	0.0071	0.0021
137	0.0093	0.0072	0.0021
138	0.0094	0.0073	0.0021
139	0.0095	0.0074	0.0021
140	0.0096	0.0074	0.0022
141	0.0097	0.0075	0.0022
142	0.0097	0.0075	0.0022
143	0.0099	0.0076	0.0022
144	0.0099	0.0077	0.0022
145	0.0083	0.0064	0.0019
146	0.0084	0.0065	0.0019
147	0.0085	0.0066	0.0019
148	0.0086	0.0067	0.0019
149	0.0087	0.0068	0.0020
150	0.0088	0.0068	0.0020
151	0.0090	0.0070	0.0020
152	0.0091	0.0070	0.0020
153	0.0092	0.0072	0.0021
154	0.0093	0.0072	0.0021
155	0.0095	0.0074	0.0021
156	0.0096	0.0075	0.0022
157	0.0098	0.0076	0.0022
158	0.0099	0.0077	0.0022
159	0.0102	0.0079	0.0023
160	0.0103	0.0080	0.0023
161	0.0105	0.0082	0.0024
162	0.0107	0.0083	0.0024
163	0.0110	0.0085	0.0025
164	0.0111	0.0086	0.0025
165	0.0114	0.0088	0.0026
166	0.0116	0.0090	0.0026
167	0.0119	0.0092	0.0027
168	0.0121	0.0094	0.0027
169	0.0125	0.0097	0.0028
170	0.0127	0.0098	0.0029

171	0.0132	0.0102	0.0030
172	0.0134	0.0104	0.0030
173	0.0139	0.0108	0.0031
174	0.0142	0.0110	0.0032
175	0.0148	0.0115	0.0033
176	0.0152	0.0117	0.0034
177	0.0159	0.0123	0.0036
178	0.0163	0.0126	0.0037
179	0.0172	0.0133	0.0039
180	0.0177	0.0137	0.0040
181	0.0189	0.0146	0.0043
182	0.0195	0.0151	0.0044
183	0.0211	0.0163	0.0047
184	0.0220	0.0170	0.0049
185	0.0175	0.0135	0.0039
186	0.0186	0.0144	0.0042
187	0.0216	0.0167	0.0049
188	0.0236	0.0183	0.0053
189	0.0293	0.0227	0.0066
190	0.0338	0.0262	0.0076
191	0.0512	0.0397	0.0115
192	0.0744	0.0444	0.0300
193	0.3217	0.0444	0.2773
194	0.0403	0.0312	0.0091
195	0.0261	0.0202	0.0059
196	0.0200	0.0155	0.0045
197	0.0230	0.0178	0.0052
198	0.0203	0.0157	0.0046
199	0.0183	0.0142	0.0041
200	0.0168	0.0130	0.0038
201	0.0155	0.0120	0.0035
202	0.0145	0.0112	0.0033
203	0.0137	0.0106	0.0031
204	0.0129	0.0100	0.0029
205	0.0123	0.0095	0.0028
206	0.0117	0.0091	0.0026
207	0.0113	0.0087	0.0025
208	0.0108	0.0084	0.0024
209	0.0104	0.0081	0.0023
210	0.0101	0.0078	0.0023
211	0.0097	0.0075	0.0022
212	0.0094	0.0073	0.0021
213	0.0092	0.0071	0.0021
214	0.0089	0.0069	0.0020
215	0.0087	0.0067	0.0020
216	0.0084	0.0065	0.0019
217	0.0100	0.0077	0.0023
218	0.0098	0.0076	0.0022
219	0.0096	0.0074	0.0022
220	0.0094	0.0073	0.0021
221	0.0093	0.0072	0.0021
222	0.0091	0.0071	0.0021
223	0.0090	0.0069	0.0020
224	0.0088	0.0068	0.0020

225	0.0087	0.0067	0.0020
226	0.0085	0.0066	0.0019
227	0.0084	0.0065	0.0019
228	0.0083	0.0064	0.0019
229	0.0082	0.0063	0.0018
230	0.0081	0.0063	0.0018
231	0.0080	0.0062	0.0018
232	0.0079	0.0061	0.0018
233	0.0078	0.0060	0.0018
234	0.0077	0.0059	0.0017
235	0.0076	0.0059	0.0017
236	0.0075	0.0058	0.0017
237	0.0074	0.0057	0.0017
238	0.0073	0.0057	0.0017
239	0.0073	0.0056	0.0016
240	0.0072	0.0056	0.0016
241	0.0071	0.0055	0.0016
242	0.0070	0.0054	0.0016
243	0.0070	0.0054	0.0016
244	0.0069	0.0053	0.0016
245	0.0068	0.0053	0.0015
246	0.0068	0.0052	0.0015
247	0.0067	0.0052	0.0015
248	0.0066	0.0051	0.0015
249	0.0066	0.0051	0.0015
250	0.0065	0.0051	0.0015
251	0.0065	0.0050	0.0015
252	0.0064	0.0050	0.0014
253	0.0064	0.0049	0.0014
254	0.0063	0.0049	0.0014
255	0.0063	0.0049	0.0014
256	0.0062	0.0048	0.0014
257	0.0062	0.0048	0.0014
258	0.0061	0.0047	0.0014
259	0.0061	0.0047	0.0014
260	0.0060	0.0047	0.0014
261	0.0060	0.0046	0.0013
262	0.0059	0.0046	0.0013
263	0.0059	0.0046	0.0013
264	0.0059	0.0045	0.0013
265	0.0058	0.0045	0.0013
266	0.0058	0.0045	0.0013
267	0.0057	0.0044	0.0013
268	0.0057	0.0044	0.0013
269	0.0057	0.0044	0.0013
270	0.0056	0.0044	0.0013
271	0.0056	0.0043	0.0013
272	0.0056	0.0043	0.0013
273	0.0055	0.0043	0.0012
274	0.0055	0.0043	0.0012
275	0.0055	0.0042	0.0012
276	0.0054	0.0042	0.0012
277	0.0054	0.0042	0.0012
278	0.0054	0.0042	0.0012

279	0.0053	0.0041	0.0012
280	0.0053	0.0041	0.0012
281	0.0053	0.0041	0.0012
282	0.0052	0.0041	0.0012
283	0.0052	0.0040	0.0012
284	0.0052	0.0040	0.0012
285	0.0052	0.0040	0.0012
286	0.0051	0.0040	0.0012
287	0.0051	0.0040	0.0011
288	0.0051	0.0039	0.0011

Total soil rain loss = 2.01(In)
Total effective rainfall = 0.87(In)
Peak flow rate in flood hydrograph = 3.35(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

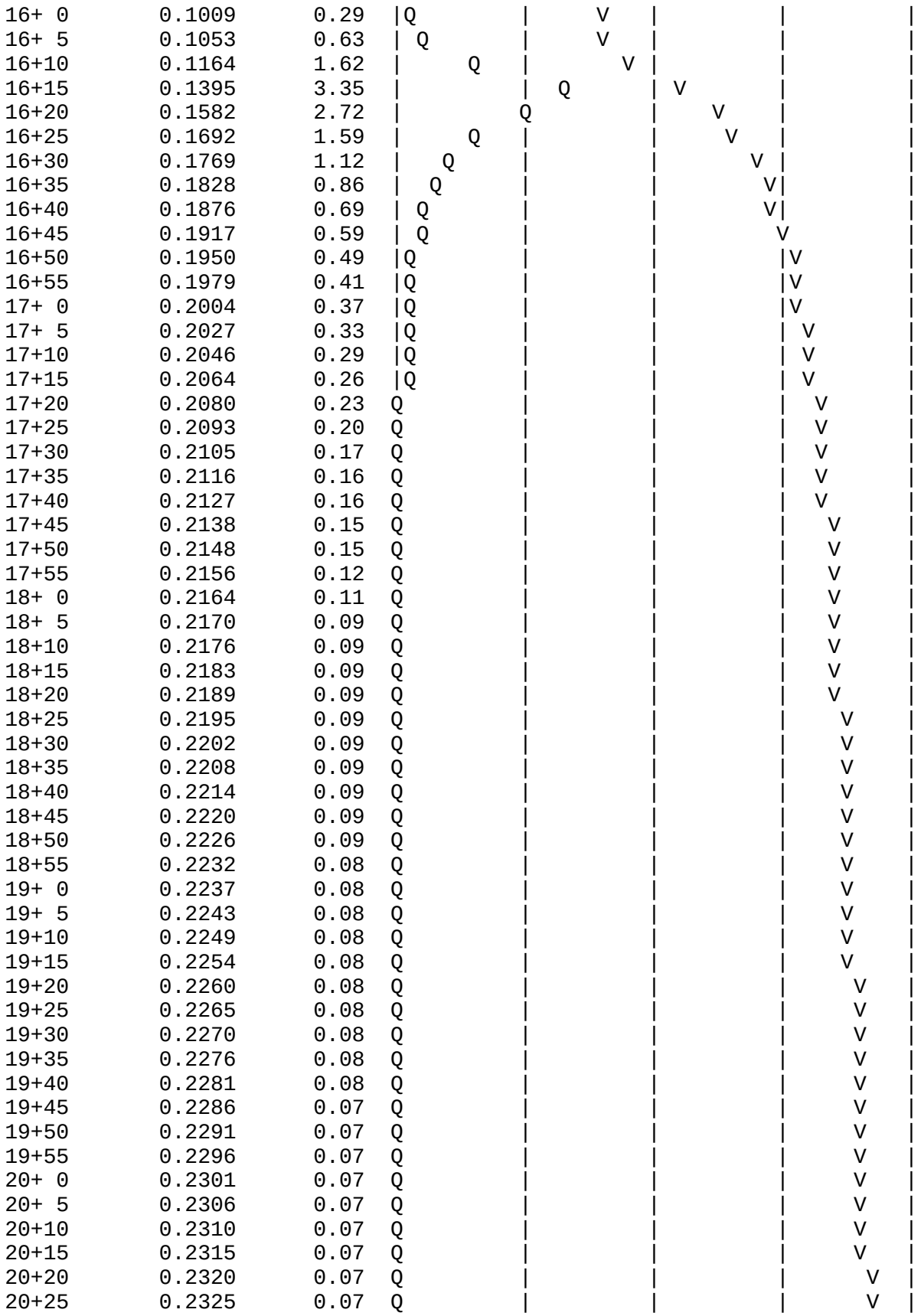
Hydrograph in 5 Minute intervals ((CFS))

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	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0004	0.03	Q				
0+25	0.0006	0.03	Q				
0+30	0.0008	0.04	Q				
0+35	0.0011	0.04	Q				
0+40	0.0014	0.04	Q				
0+45	0.0017	0.04	Q				
0+50	0.0020	0.04	Q				
0+55	0.0023	0.04	Q				
1+ 0	0.0026	0.05	Q				
1+ 5	0.0029	0.05	Q				
1+10	0.0032	0.05	Q				
1+15	0.0035	0.05	Q				
1+20	0.0039	0.05	Q				
1+25	0.0042	0.05	Q				
1+30	0.0045	0.05	Q				
1+35	0.0049	0.05	Q				
1+40	0.0052	0.05	Q				
1+45	0.0056	0.05	Q				
1+50	0.0059	0.05	Q				
1+55	0.0062	0.05	Q				
2+ 0	0.0066	0.05	QV				
2+ 5	0.0069	0.05	QV				
2+10	0.0073	0.05	QV				
2+15	0.0076	0.05	QV				
2+20	0.0080	0.05	QV				
2+25	0.0083	0.05	QV				

2+30	0.0087	0.05	QV	|	|	|	|
2+35	0.0090	0.05	QV	|	|	|	|
2+40	0.0094	0.05	QV	|	|	|	|
2+45	0.0098	0.05	QV	|	|	|	|
2+50	0.0101	0.05	QV	|	|	|	|
2+55	0.0105	0.05	QV	|	|	|	|
3+ 0	0.0108	0.05	QV	|	|	|	|
3+ 5	0.0112	0.05	QV	|	|	|	|
3+10	0.0115	0.05	QV	|	|	|	|
3+15	0.0119	0.05	QV	|	|	|	|
3+20	0.0123	0.05	QV	|	|	|	|
3+25	0.0126	0.05	Q V	|	|	|	|
3+30	0.0130	0.05	Q V	|	|	|	|
3+35	0.0134	0.05	Q V	|	|	|	|
3+40	0.0137	0.05	Q V	|	|	|	|
3+45	0.0141	0.05	Q V	|	|	|	|
3+50	0.0145	0.05	Q V	|	|	|	|
3+55	0.0148	0.05	Q V	|	|	|	|
4+ 0	0.0152	0.05	Q V	|	|	|	|
4+ 5	0.0156	0.05	Q V	|	|	|	|
4+10	0.0160	0.05	Q V	|	|	|	|
4+15	0.0163	0.05	Q V	|	|	|	|
4+20	0.0167	0.05	Q V	|	|	|	|
4+25	0.0171	0.06	Q V	|	|	|	|
4+30	0.0175	0.06	Q V	|	|	|	|
4+35	0.0179	0.06	Q V	|	|	|	|
4+40	0.0182	0.06	Q V	|	|	|	|
4+45	0.0186	0.06	Q V	|	|	|	|
4+50	0.0190	0.06	Q V	|	|	|	|
4+55	0.0194	0.06	Q V	|	|	|	|
5+ 0	0.0198	0.06	Q V	|	|	|	|
5+ 5	0.0202	0.06	Q V	|	|	|	|
5+10	0.0206	0.06	Q V	|	|	|	|
5+15	0.0210	0.06	Q V	|	|	|	|
5+20	0.0214	0.06	Q V	|	|	|	|
5+25	0.0218	0.06	Q V	|	|	|	|
5+30	0.0222	0.06	Q V	|	|	|	|
5+35	0.0226	0.06	Q V	|	|	|	|
5+40	0.0230	0.06	Q V	|	|	|	|
5+45	0.0234	0.06	Q V	|	|	|	|
5+50	0.0238	0.06	Q V	|	|	|	|
5+55	0.0242	0.06	Q V	|	|	|	|
6+ 0	0.0246	0.06	Q V	|	|	|	|
6+ 5	0.0250	0.06	Q V	|	|	|	|
6+10	0.0254	0.06	Q V	|	|	|	|
6+15	0.0258	0.06	Q V	|	|	|	|
6+20	0.0262	0.06	Q V	|	|	|	|
6+25	0.0266	0.06	Q V	|	|	|	|
6+30	0.0270	0.06	Q V	|	|	|	|
6+35	0.0275	0.06	Q V	|	|	|	|
6+40	0.0279	0.06	Q V	|	|	|	|
6+45	0.0283	0.06	Q V	|	|	|	|
6+50	0.0287	0.06	Q V	|	|	|	|
6+55	0.0292	0.06	Q V	|	|	|	|

7+ 0	0.0296	0.06	Q	V	|	|	|	|
7+ 5	0.0300	0.06	Q	V	|	|	|	|
7+10	0.0304	0.06	Q	V	|	|	|	|
7+15	0.0309	0.06	Q	V	|	|	|	|
7+20	0.0313	0.06	Q	V	|	|	|	|
7+25	0.0318	0.06	Q	V	|	|	|	|
7+30	0.0322	0.06	Q	V	|	|	|	|
7+35	0.0326	0.06	Q	V	|	|	|	|
7+40	0.0331	0.06	Q	V	|	|	|	|
7+45	0.0335	0.06	Q	V	|	|	|	|
7+50	0.0340	0.06	Q	V	|	|	|	|
7+55	0.0344	0.07	Q	V	|	|	|	|
8+ 0	0.0349	0.07	Q	V	|	|	|	|
8+ 5	0.0353	0.07	Q	V	|	|	|	|
8+10	0.0358	0.07	Q	V	|	|	|	|
8+15	0.0362	0.07	Q	V	|	|	|	|
8+20	0.0367	0.07	Q	V	|	|	|	|
8+25	0.0372	0.07	Q	V	|	|	|	|
8+30	0.0376	0.07	Q	V	|	|	|	|
8+35	0.0381	0.07	Q	V	|	|	|	|
8+40	0.0386	0.07	Q	V	|	|	|	|
8+45	0.0390	0.07	Q	V	|	|	|	|
8+50	0.0395	0.07	Q	V	|	|	|	|
8+55	0.0400	0.07	Q	V	|	|	|	|
9+ 0	0.0405	0.07	Q	V	|	|	|	|
9+ 5	0.0410	0.07	Q	V	|	|	|	|
9+10	0.0414	0.07	Q	V	|	|	|	|
9+15	0.0419	0.07	Q	V	|	|	|	|
9+20	0.0424	0.07	Q	V	|	|	|	|
9+25	0.0429	0.07	Q	V	|	|	|	|
9+30	0.0434	0.07	Q	V	|	|	|	|
9+35	0.0439	0.07	Q	V	|	|	|	|
9+40	0.0444	0.07	Q	V	|	|	|	|
9+45	0.0449	0.07	Q	V	|	|	|	|
9+50	0.0454	0.07	Q	V	|	|	|	|
9+55	0.0460	0.07	Q	V	|	|	|	|
10+ 0	0.0465	0.08	Q	V	|	|	|	|
10+ 5	0.0470	0.08	Q	V	|	|	|	|
10+10	0.0475	0.08	Q	V	|	|	|	|
10+15	0.0480	0.08	Q	V	|	|	|	|
10+20	0.0486	0.08	Q	V	|	|	|	|
10+25	0.0491	0.08	Q	V	|	|	|	|
10+30	0.0496	0.08	Q	V	|	|	|	|
10+35	0.0502	0.08	Q	V	|	|	|	|
10+40	0.0507	0.08	Q	V	|	|	|	|
10+45	0.0513	0.08	Q	V	|	|	|	|
10+50	0.0518	0.08	Q	V	|	|	|	|
10+55	0.0524	0.08	Q	V	|	|	|	|
11+ 0	0.0530	0.08	Q	V	|	|	|	|
11+ 5	0.0535	0.08	Q	V	|	|	|	|
11+10	0.0541	0.08	Q	V	|	|	|	|
11+15	0.0547	0.08	Q	V	|	|	|	|
11+20	0.0552	0.08	Q	V	|	|	|	|
11+25	0.0558	0.08	Q	V	|	|	|	|

```
11+30       0.0564      0.09  Q       V |          |          |          |
11+35       0.0570      0.09  Q        V|          |          |          |
11+40       0.0576      0.09  Q        V|          |          |          |
11+45       0.0582      0.09  Q        V|          |          |          |
11+50       0.0588      0.09  Q        V|          |          |          |
11+55       0.0594      0.09  Q        V|          |          |          |
12+ 0       0.0601      0.09  Q        V|          |          |          |
12+ 5       0.0607      0.09  Q        V|          |          |          |
12+10       0.0613      0.09  Q        V|          |          |          |
12+15       0.0619      0.09  Q        V|          |          |          |
12+20       0.0625      0.08  Q        V|          |          |          |
12+25       0.0631      0.08  Q         V          |          |          |
12+30       0.0636      0.08  Q         V          |          |          |
12+35       0.0642      0.08  Q         V          |          |          |
12+40       0.0648      0.08  Q         V          |          |          |
12+45       0.0654      0.08  Q         V          |          |          |
12+50       0.0660      0.09  Q         V          |          |          |
12+55       0.0665      0.09  Q         V          |          |          |
13+ 0       0.0671      0.09  Q         V          |          |          |
13+ 5       0.0678      0.09  Q         V          |          |          |
13+10       0.0684      0.09  Q         V          |          |          |
13+15       0.0690      0.09  Q         |V         |          |          |
13+20       0.0696      0.09  Q         |V         |          |          |
13+25       0.0703      0.09  Q         |V         |          |          |
13+30       0.0709      0.09  Q         |V         |          |          |
13+35       0.0716      0.10  Q         |V         |          |          |
13+40       0.0722      0.10  Q         |V         |          |          |
13+45       0.0729      0.10  Q         |V         |          |          |
13+50       0.0736      0.10  Q         |V         |          |          |
13+55       0.0743      0.10  Q         |V         |          |          |
14+ 0       0.0751      0.11  Q         |V         |          |          |
14+ 5       0.0758      0.11  Q         | V        |          |          |
14+10       0.0765      0.11  Q         | V        |          |          |
14+15       0.0773      0.11  Q         | V        |          |          |
14+20       0.0781      0.11  Q         | V        |          |          |
14+25       0.0789      0.12  Q         | V        |          |          |
14+30       0.0797      0.12  Q         | V        |          |          |
14+35       0.0806      0.12  Q         | V        |          |          |
14+40       0.0815      0.13  Q         | V        |          |          |
14+45       0.0824      0.13  Q         |  V       |          |          |
14+50       0.0833      0.14  Q         |  V       |          |          |
14+55       0.0843      0.14  Q         |  V       |          |          |
15+ 0       0.0853      0.14  Q         |  V       |          |          |
15+ 5       0.0863      0.15  Q         |  V       |          |          |
15+10       0.0874      0.16  Q         |  V       |          |          |
15+15       0.0885      0.16  Q         |   V      |          |          |
15+20       0.0897      0.17  Q         |   V      |          |          |
15+25       0.0909      0.18  Q         |   V      |          |          |
15+30       0.0921      0.18  Q         |   V      |          |          |
15+35       0.0934      0.18  Q         |   V      |          |          |
15+40       0.0946      0.18  Q         |    V     |          |          |
15+45       0.0959      0.19  Q         |    V     |          |          |
15+50       0.0973      0.21  Q         |    V     |          |          |
15+55       0.0989      0.23  Q         |    V     |          |          |
```


16+ 0 0.1009 0.29
16+ 5 0.1053 0.63
16+10 0.1164 1.62
16+15 0.1395 3.35
16+20 0.1582 2.72
16+25 0.1692 1.59
16+30 0.1769 1.12
16+35 0.1828 0.86
16+40 0.1876 0.69
16+45 0.1917 0.59
16+50 0.1950 0.49
16+55 0.1979 0.41
17+ 0 0.2004 0.37
17+ 5 0.2027 0.33
17+10 0.2046 0.29
17+15 0.2064 0.26
17+20 0.2080 0.23
17+25 0.2093 0.20
17+30 0.2105 0.17
17+35 0.2116 0.16
17+40 0.2127 0.16
17+45 0.2138 0.15
17+50 0.2148 0.15
17+55 0.2156 0.12
18+ 0 0.2164 0.11
18+ 5 0.2170 0.09
18+10 0.2176 0.09
18+15 0.2183 0.09
18+20 0.2189 0.09
18+25 0.2195 0.09
18+30 0.2202 0.09
18+35 0.2208 0.09
18+40 0.2214 0.09
18+45 0.2220 0.09
18+50 0.2226 0.09
18+55 0.2232 0.08
19+ 0 0.2237 0.08
19+ 5 0.2243 0.08
19+10 0.2249 0.08
19+15 0.2254 0.08
19+20 0.2260 0.08
19+25 0.2265 0.08
19+30 0.2270 0.08
19+35 0.2276 0.08
19+40 0.2281 0.08
19+45 0.2286 0.07
19+50 0.2291 0.07
19+55 0.2296 0.07
20+ 0 0.2301 0.07
20+ 5 0.2306 0.07
20+10 0.2310 0.07
20+15 0.2315 0.07
20+20 0.2320 0.07
20+25 0.2325 0.07

```
  20+30       0.2329      0.07  Q          |          |          |       V  |
  20+35       0.2334      0.07  Q          |          |          |       V  |
  20+40       0.2338      0.07  Q          |          |          |       V  |
  20+45       0.2343      0.07  Q          |          |          |       V  |
  20+50       0.2347      0.06  Q          |          |          |       V  |
  20+55       0.2352      0.06  Q          |          |          |       V  |
  21+ 0       0.2356      0.06  Q          |          |          |       V  |
  21+ 5       0.2360      0.06  Q          |          |          |       V  |
  21+10       0.2365      0.06  Q          |          |          |       V  |
  21+15       0.2369      0.06  Q          |          |          |       V  |
  21+20       0.2373      0.06  Q          |          |          |       V  |
  21+25       0.2377      0.06  Q          |          |          |       V  |
  21+30       0.2381      0.06  Q          |          |          |       V  |
  21+35       0.2386      0.06  Q          |          |          |        V |
  21+40       0.2390      0.06  Q          |          |          |        V |
  21+45       0.2394      0.06  Q          |          |          |        V |
  21+50       0.2398      0.06  Q          |          |          |        V |
  21+55       0.2402      0.06  Q          |          |          |        V |
  22+ 0       0.2406      0.06  Q          |          |          |        V |
  22+ 5       0.2409      0.06  Q          |          |          |        V |
  22+10       0.2413      0.06  Q          |          |          |        V |
  22+15       0.2417      0.06  Q          |          |          |        V |
  22+20       0.2421      0.06  Q          |          |          |        V |
  22+25       0.2425      0.06  Q          |          |          |        V |
  22+30       0.2429      0.05  Q          |          |          |        V |
  22+35       0.2432      0.05  Q          |          |          |        V |
  22+40       0.2436      0.05  Q          |          |          |        V |
  22+45       0.2440      0.05  Q          |          |          |        V |
  22+50       0.2444      0.05  Q          |          |          |        V |
  22+55       0.2447      0.05  Q          |          |          |         V|
  23+ 0       0.2451      0.05  Q          |          |          |         V|
  23+ 5       0.2454      0.05  Q          |          |          |         V|
  23+10       0.2458      0.05  Q          |          |          |         V|
  23+15       0.2462      0.05  Q          |          |          |         V|
  23+20       0.2465      0.05  Q          |          |          |         V|
  23+25       0.2469      0.05  Q          |          |          |         V|
  23+30       0.2472      0.05  Q          |          |          |         V|
  23+35       0.2476      0.05  Q          |          |          |         V|
  23+40       0.2479      0.05  Q          |          |          |         V|
  23+45       0.2483      0.05  Q          |          |          |         V|
  23+50       0.2486      0.05  Q          |          |          |         V|
  23+55       0.2489      0.05  Q          |          |          |         V|
  24+ 0       0.2493      0.05  Q          |          |          |         V|
-------------------------------------------------------------------------
```

RATIONAL METHOD

ONSITE POST DEVELOPED CONDITION

10-YEAR STORM EVENTS

DRAINAGE AREA DA1 TO DA8

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA1 AREA A1-A (WEST)
FILE: 18345ONSITEPOSTA1A10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   261.000(Ft.)
Top (of initial area) elevation =  3240.800(Ft.)
Bottom (of initial area) elevation =  3237.500(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01264  s(%)=       1.26
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.145 min.
Rainfall intensity =      2.530(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.732
Subarea runoff =      3.650(CFS)
Total initial stream area =        1.970(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            1.97 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA5 AREA A1-B (EAST)
FILE: 18345ONSITEPOSTA1B10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        3.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   231.000(Ft.)
Top (of initial area) elevation =  3240.800(Ft.)
Bottom (of initial area) elevation =  3236.650(Ft.)
Difference in elevation =     4.150(Ft.)
Slope =    0.01797  s(%)=       1.80
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.118 min.
Rainfall intensity =      2.750(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.746
Subarea runoff =      1.887(CFS)
Total initial stream area =        0.920(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            0.92 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA2 AREA A2-A (WEST)
FILE: 18345ONSITEPOSTA2A10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   279.000(Ft.)
Top (of initial area) elevation =  3236.500(Ft.)
Bottom (of initial area) elevation =  3232.500(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.01434  s(%)=       1.43
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.159 min.
Rainfall intensity =      2.527(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.732
Subarea runoff =      3.886(CFS)
Total initial stream area =        2.100(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            2.10 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA6 **AREA A2-B (EAST)**
FILE: 18345ONSITEPOSTA2B10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   292.000(Ft.)
Top (of initial area) elevation =  3236.500(Ft.)
Bottom (of initial area) elevation =  3232.220(Ft.)
Difference in elevation =     4.280(Ft.)
Slope =    0.01466  s(%)=       1.47
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.286 min.
Rainfall intensity =      2.503(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.731
Subarea runoff =      2.176(CFS)
Total initial stream area =        1.190(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            1.19 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA3 AREA A3-A (WEST)
FILE: 18345ONSITEPOSTA3A10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   346.000(Ft.)
Top (of initial area) elevation =  3232.700(Ft.)
Bottom (of initial area) elevation =  3228.600(Ft.)
Difference in elevation =     4.100(Ft.)
Slope =    0.01185  s(%)=       1.18
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.370 min.
Rainfall intensity =      2.317(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.717
Subarea runoff =      3.854(CFS)
Total initial stream area =        2.320(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            2.32 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA7 AREA A3-B (EAST)
FILE: 18345ONSITEPOSTA3B10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        9.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   291.000(Ft.)
Top (of initial area) elevation =  3232.700(Ft.)
Bottom (of initial area) elevation =  3228.330(Ft.)
Difference in elevation =     4.370(Ft.)
Slope =    0.01502  s(%)=       1.50
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.229 min.
Rainfall intensity =      2.514(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.731
Subarea runoff =      2.133(CFS)
Total initial stream area =        1.160(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            1.16 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA4 AREA A4-A (WEST)
FILE: 18345ONSITEPOSTA4A10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   406.000(Ft.)
Top (of initial area) elevation =  3229.400(Ft.)
Bottom (of initial area) elevation =  3225.500(Ft.)
Difference in elevation =     3.900(Ft.)
Slope =    0.00961  s(%)=       0.96
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.529 min.
Rainfall intensity =      2.151(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.703
Subarea runoff =      4.340(CFS)
Total initial stream area =        2.870(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            2.87 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 06/29/22

10-YR, 1-HR STORM RATIONAL METHOD ONSITE POST DEVELOPED
TR 20527, CITY OF VICTORVILLE
DA8 AREA A4-B (EAST)
FILE: 18345ONSITEPOSTA4B10.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       12.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  3229.400(Ft.)
Bottom (of initial area) elevation =  3223.000(Ft.)
Difference in elevation =     6.400(Ft.)
Slope =    0.00640  s(%)=       0.64
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.933 min.
Rainfall intensity =      1.579(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.631
Subarea runoff =      2.343(CFS)
Total initial stream area =        2.350(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
End of computations, Total Study Area =            2.35 (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) = 0.600
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/05/22

10-YR, 1-HR STORM RATIONAL METHOD OFFSITE PRE-DEV/ONSITE POST DEV.
TR 20527, CITY OF VICTORVILLE
OFFSITE AREA A6, A6.1 & ONSITE FLOW THRU FREMONTIA RD AND LUNA RD.
FILE: 18345FREMONTIARD10YR.OUT

Program License Serial Number 4070

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.678 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        6.100
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   767.000(Ft.)
Top (of initial area) elevation =  3263.000(Ft.)
Bottom (of initial area) elevation =  3252.000(Ft.)
Difference in elevation =    11.000(Ft.)
Slope =    0.01434  s(%)=       1.43
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   23.518 min.
Rainfall intensity =      1.306(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.533
Subarea runoff =      6.962(CFS)
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.100 to Point/Station        7.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.715(Ft.), Average velocity =   2.028(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              1.20
      2             10.00              0.00
      3             20.00              1.20
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      8.649(CFS)
  '     '    flow top width =     11.922(Ft.)
  '     '     velocity=    2.028(Ft/s)
  '     '    area =      4.264(Sq.Ft)
  '     '    Froude number =     0.598

Upstream point elevation =  3252.000(Ft.)
Downstream point elevation =  3241.000(Ft.)
Flow length =  1212.000(Ft.)
Travel time  =    9.96 min.
Time of concentration =   33.48 min.
Depth of flow =   0.715(Ft.)
Average velocity =   2.028(Ft/s)
Total irregular channel flow =     8.648(CFS)
Irregular channel normal depth above invert elev. =   0.715(Ft.)
Average velocity of channel(s) =   2.028(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Rainfall intensity =      1.020(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.430
Subarea runoff =      3.306(CFS) for   13.400(Ac.)
Total runoff =     10.268(CFS)
Effective area this stream =       23.40(Ac.)
Total Study Area (Main Stream No. 1) =       23.40(Ac.)
Area averaged Fm value =    0.532(In/Hr)
Depth of flow =   0.763(Ft.), Average velocity =   2.117(Ft/s)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  3239.800(Ft.)
End of street segment elevation =  3236.650(Ft.)
Length of street segment  =   213.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.416(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     10.268(CFS)
Depth of flow =   0.342(Ft.), Average velocity =   3.067(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  12.680(Ft.)
Flow velocity =   3.07(Ft/s)
Travel time =    1.16 min.     TC =   34.63  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      0.996(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.419
Subarea runoff =      0.000(CFS) for    0.000(Ac.)
Total runoff =     10.268(CFS)
Effective area this stream =       23.40(Ac.)
Total Study Area (Main Stream No. 1) =       23.40(Ac.)
Area averaged Fm value =    0.532(In/Hr)
Street flow at end of street =     10.268(CFS)
Half street flow at end of street =      5.134(CFS)
Depth of flow =   0.342(Ft.), Average velocity =   3.067(Ft/s)
Flow width (from curb towards crown)=  12.680(Ft.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        3.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     23.400(Ac.)
Runoff from this stream =     10.268(CFS)
Time of concentration =   34.63 min.
Rainfall intensity =     0.996(In/Hr)
Area averaged loss rate (Fm) =    0.5325(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
------------------------------------------------------------------------
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.749(In/Hr) for a    10.0 year storm
User specified values are as follows:
TC =   8.12 min.  Rain intensity =       2.75(In/Hr)
Total area this stream =         0.52(Ac.)
Total Study Area (Main Stream No. 1) =       23.92(Ac.)
Total runoff =      0.53(CFS)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.520(Ac.)
Runoff from this stream =      0.530(CFS)
Time of concentration =    8.12 min.
Rainfall intensity =     2.749(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     10.27    23.400     34.63    0.532      0.996
2      0.53     0.520      8.12    0.471      2.749
Qmax(1) =
         1.000 *    1.000 *    10.268) +
         0.230 *    1.000 *     0.530) + =      10.390
Qmax(2) =
         4.782 *    0.234 *    10.268) +
         1.000 *    1.000 *     0.530) + =      12.043

Total of 2 streams to confluence:
Flow rates before confluence point:
      10.268       0.530
Maximum flow rates at confluence using above data:
       10.390       12.043
Area of streams before confluence:
       23.400        0.520
Effective area values after confluence:
       23.920        6.006
Results of confluence:
Total flow rate =     12.043(CFS)
Time of concentration =     8.120 min.
Effective stream area after confluence =      6.006(Ac.)
Study area average Pervious fraction(Ap) =  0.991
Study area average soil loss rate(Fm) =    0.531(In/Hr)
Study area total (this main stream) =      23.92(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        6.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  3236.650(Ft.)
End of street segment elevation =  3232.220(Ft.)
Length of street segment  =   330.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.416(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     12.043(CFS)
Depth of flow =   0.363(Ft.), Average velocity =   3.075(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.757(Ft.)
Flow velocity =   3.07(Ft/s)
Travel time =    1.79 min.     TC =    9.91  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.392(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.700
Subarea runoff =      0.000(CFS) for    0.000(Ac.)
Total runoff =     12.043(CFS)
Effective area this stream =        6.01(Ac.)
Total Study Area (Main Stream No. 1) =       23.92(Ac.)
Area averaged Fm value =    0.531(In/Hr)
Street flow at end of street =     12.043(CFS)
Half street flow at end of street =      6.021(CFS)
Depth of flow =   0.363(Ft.), Average velocity =   3.075(Ft/s)
Flow width (from curb towards crown)=  13.757(Ft.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        6.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      6.006(Ac.)
Runoff from this stream =     12.043(CFS)
Time of concentration =    9.91 min.
Rainfall intensity =     2.392(In/Hr)
Area averaged loss rate (Fm) =    0.5311(In/Hr)
Area averaged Pervious ratio (Ap) = 0.9913
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.00
Adjusted SCS curve number for AMC 3 = 70.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.532(In/Hr)
Initial subarea data:
Initial area flow distance =   975.000(Ft.)
Top (of initial area) elevation =  3245.000(Ft.)
Bottom (of initial area) elevation =  3231.000(Ft.)
Difference in elevation =    14.000(Ft.)
Slope =    0.01436  s(%)=       1.44
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   25.881 min.
Rainfall intensity =      1.221(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.508
Subarea runoff =      5.580(CFS)
Total initial stream area =        9.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.532(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      9.000(Ac.)
Runoff from this stream =      5.580(CFS)
Time of concentration =   25.88 min.
Rainfall intensity =     1.221(In/Hr)
Area averaged loss rate (Fm) =    0.5325(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        6.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
_____________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.502(In/Hr) for a    10.0 year storm
User specified values are as follows:
TC =   9.29 min.  Rain intensity =       2.50(In/Hr)
Total area this stream =         0.82(Ac.)
Total Study Area (Main Stream No. 1) =       33.74(Ac.)
Total runoff =      0.88(CFS)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        6.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.820(Ac.)
Runoff from this stream =      0.880(CFS)
Time of concentration =    9.29 min.
Rainfall intensity =     2.502(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     12.04     6.006      9.91    0.531      2.392
2      5.58     9.000     25.88    0.532      1.221
3      0.88     0.820      9.29    0.471      2.502
Qmax(1) =
         1.000 *    1.000 *    12.043) +
         2.699 *    0.383 *     5.580) +
         0.946 *    1.000 *     0.880) + =      18.641
Qmax(2) =
         0.371 *    1.000 *    12.043) +
         1.000 *    1.000 *     5.580) +
         0.369 *    1.000 *     0.880) + =      10.373
Qmax(3) =
         1.059 *    0.938 *    12.043) +
         2.859 *    0.359 *     5.580) +
         1.000 *    1.000 *     0.880) + =      18.568

Total of 3 streams to confluence:
Flow rates before confluence point:
      12.043       5.580       0.880
Maximum flow rates at confluence using above data:
       18.641       10.373       18.568
Area of streams before confluence:
        6.006        9.000        0.820
Effective area values after confluence:
       10.272       15.826        9.682
Results of confluence:
Total flow rate =     18.641(CFS)
Time of concentration =     9.909 min.
Effective stream area after confluence =     10.272(Ac.)
Study area average Pervious fraction(Ap) =  0.976
Study area average soil loss rate(Fm) =    0.529(In/Hr)
Study area total (this main stream) =      15.83(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________________
Top of street segment elevation =  3232.220(Ft.)
End of street segment elevation =  3228.330(Ft.)
Length of street segment  =   320.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.142(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     18.641(CFS)
Depth of flow =   0.399(Ft.), Average velocity =   3.294(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.674(Ft.)
Flow velocity =   3.29(Ft/s)
Travel time =    1.62 min.     TC =   11.53  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.151(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.679
Subarea runoff =      0.000(CFS) for    0.000(Ac.)
Total runoff =     18.641(CFS)
Effective area this stream =       10.27(Ac.)
Total Study Area (Main Stream No. 1) =       33.74(Ac.)
Area averaged Fm value =    0.529(In/Hr)
Street flow at end of street =     18.641(CFS)
Half street flow at end of street =      9.320(CFS)
Depth of flow =   0.399(Ft.), Average velocity =   3.294(Ft/s)
Flow width (from curb towards crown)=  16.674(Ft.)
```

++
Process from Point/Station 6.000 to Point/Station 9.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 10.272(Ac.)
Runoff from this stream = 18.641(CFS)
Time of concentration = 11.53 min.
Rainfall intensity = 2.151(In/Hr)
Area averaged loss rate (Fm) = 0.5288(In/Hr)
Area averaged Pervious ratio (Ap) = 0.9760

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        9.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.514(In/Hr) for a    10.0 year storm
User specified values are as follows:
TC =   9.23 min.  Rain intensity =       2.51(In/Hr)
Total area this stream =         0.80(Ac.)
Total Study Area (Main Stream No. 1) =       34.54(Ac.)
Total runoff =      0.95(CFS)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        9.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.800(Ac.)
Runoff from this stream =      0.950(CFS)
Time of concentration =    9.23 min.
Rainfall intensity =     2.514(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     18.64    10.272     11.53    0.529      2.151
2      0.95     0.800      9.23    0.471      2.514
Qmax(1) =
         1.000 *    1.000 *    18.641) +
         0.823 *    1.000 *     0.950) + =      19.422
Qmax(2) =
         1.223 *    0.801 *    18.641) +
         1.000 *    1.000 *     0.950) + =      19.207

Total of 2 streams to confluence:
Flow rates before confluence point:
      18.641       0.950
Maximum flow rates at confluence using above data:
       19.422       19.207
Area of streams before confluence:
       10.272        0.800
Effective area values after confluence:
       11.072        9.024
Results of confluence:
Total flow rate =     19.422(CFS)
Time of concentration =    11.528 min.
Effective stream area after confluence =     11.072(Ac.)
Study area average Pervious fraction(Ap) =  0.949
Study area average soil loss rate(Fm) =    0.525(In/Hr)
Study area total (this main stream) =      11.07(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        9.100
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________________
Top of street segment elevation =  3228.330(Ft.)
End of street segment elevation =  3222.890(Ft.)
Length of street segment  =   441.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  20.000(Ft.)
Distance from crown to crossfall grade break  =  18.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.416(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     19.480(CFS)
Depth of flow =   0.425(Ft.), Average velocity =   3.352(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.852(Ft.)
Flow velocity =   3.35(Ft/s)
Travel time =    2.19 min.     TC =   13.72  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =     16.459(CFS)
therefore the upstream flow rate of Q =     19.422(CFS) is being used
Rainfall intensity =      1.904(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.656
Subarea runoff =      0.000(CFS) for    2.100(Ac.)
Total runoff =     19.422(CFS)
Effective area this stream =       13.17(Ac.)
Total Study Area (Main Stream No. 1) =       36.64(Ac.)
Area averaged Fm value =    0.516(In/Hr)
Street flow at end of street =     19.422(CFS)
Half street flow at end of street =      9.711(CFS)
Depth of flow =   0.425(Ft.), Average velocity =   3.349(Ft/s)
Flow width (from curb towards crown)=  16.833(Ft.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        9.100
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.172(Ac.)
Runoff from this stream =     19.422(CFS)
Time of concentration =   13.72 min.
Rainfall intensity =     1.904(In/Hr)
Area averaged loss rate (Fm) =    0.5161(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8932
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.100 to Point/Station        9.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
------------------------------------------------------------------------------
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      1.579(In/Hr) for a    10.0 year storm
User specified values are as follows:
TC =  17.93 min.  Rain intensity =       1.58(In/Hr)
Total area this stream =         1.29(Ac.)
Total Study Area (Main Stream No. 2) =       37.93(Ac.)
Total runoff =      1.65(CFS)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.100 to Point/Station        9.100
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.290(Ac.)
Runoff from this stream =      1.650(CFS)
Time of concentration =   17.93 min.
Rainfall intensity =     1.579(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Program is now starting with Main Stream No. 3
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       22.000 to Point/Station        9.100
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  3229.900(Ft.)
Bottom (of initial area) elevation =  3222.890(Ft.)
Difference in elevation =     7.010(Ft.)
Slope =    0.00701  s(%)=       0.70
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.610 min.
Rainfall intensity =      1.599(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.635
Subarea runoff =      5.889(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       22.000 to Point/Station        9.100
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.800(Ac.)
Runoff from this stream =      5.889(CFS)
Time of concentration =   17.61 min.
Rainfall intensity =     1.599(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     19.42    13.172     13.72    0.516      1.904
2      1.65     1.290     17.93    0.471      1.579
3      5.89     5.800     17.61    0.471      1.599
Qmax(1) =
         1.000 *    1.000 *    19.422) +
         1.294 *    0.765 *     1.650) +
         1.271 *    0.779 *     5.889) + =      26.885
Qmax(2) =
         0.766 *    1.000 *    19.422) +
         1.000 *    1.000 *     1.650) +
         0.982 *    1.000 *     5.889) + =      22.306
Qmax(3) =
         0.780 *    1.000 *    19.422) +
         1.018 *    0.982 *     1.650) +
         1.000 *    1.000 *     5.889) + =      22.691

Total of 3 main streams to confluence:
Flow rates before confluence point:
      20.422       2.650       6.889
Maximum flow rates at confluence using above data:
       26.885       22.306       22.691
Area of streams before confluence:
       13.172        1.290        5.800
Effective area values after confluence:
       18.678       20.262       20.239


Results of confluence:
Total flow rate =     26.885(CFS)
Time of concentration =    13.721 min.
Effective stream area after confluence  =     18.678(Ac.)
Study area average Pervious fraction(Ap) =  0.791
Study area average soil loss rate(Fm) =    0.500(In/Hr)
Study area total =      20.26(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.100 to Point/Station       12.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  3222.890(Ft.)
End of street segment elevation =  3219.640(Ft.)
Length of street segment  =   650.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  24.000(Ft.)
Distance from crown to crossfall grade break  =  22.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.416(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     26.885(CFS)
Depth of flow =   0.549(Ft.), Average velocity =   2.468(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    2.46(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  23.064(Ft.)
Flow velocity =   2.47(Ft/s)
Travel time =    4.39 min.     TC =   18.11  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      1.568(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.613
Subarea runoff =      0.000(CFS) for    0.000(Ac.)
Total runoff =     26.885(CFS)
Effective area this stream =       18.68(Ac.)
Total Study Area (Main Stream No. 1) =       43.73(Ac.)
Area averaged Fm value =    0.500(In/Hr)
Street flow at end of street =     26.885(CFS)
Half street flow at end of street =     13.443(CFS)
Depth of flow =   0.549(Ft.), Average velocity =   2.468(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    2.46(Ft.)
Flow width (from curb towards crown)=  23.064(Ft.)
End of computations, Total Study Area =          43.73 (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) = 0.896
Area averaged SCS curve number = 45.3

UNIT HYDROGRAPH

ONSITE POST DEVELOPED CONDITION

10-YEAR STORM EVENTS

DRAINAGE AREA DA1 TO DA8

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 07/08/22

++

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA1 TRIBUTARY AREA A1-A
FILE: 18345HYDROA1APOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.97	1	0.68
Rainfall data for year 10		
1.97	6	1.43
Rainfall data for year 10		
1.97	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.97	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.18	0.600	32.0	52.0	9.23	0.036
0.79	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.152 (hours)
++
Watershed area = 1.97(Ac.)
Catchment Lag time = 0.122 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 68.3957
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.97(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 23.82 (CFS))		
1	7.402	1.763
2	49.183	9.954
3	72.789	5.624

4	83.036	2.441
5	89.056	1.434
6	92.808	0.894
7	95.367	0.610
8	97.107	0.415
9	98.117	0.241
10	98.897	0.186
11	99.603	0.168
12	100.000	0.095

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114

43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087

97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0716	0.0070

151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060

205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053

259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020
17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021

20	0.0053	0.0032	0.0021
21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025
71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025

74	0.0064	0.0039	0.0025
75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033
125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033

128	0.0086	0.0053	0.0034
129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0090	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064
179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074

182	0.0195	0.0119	0.0076
183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031
233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030

236	0.0075	0.0046	0.0029
237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020
287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 3.13(CFS)

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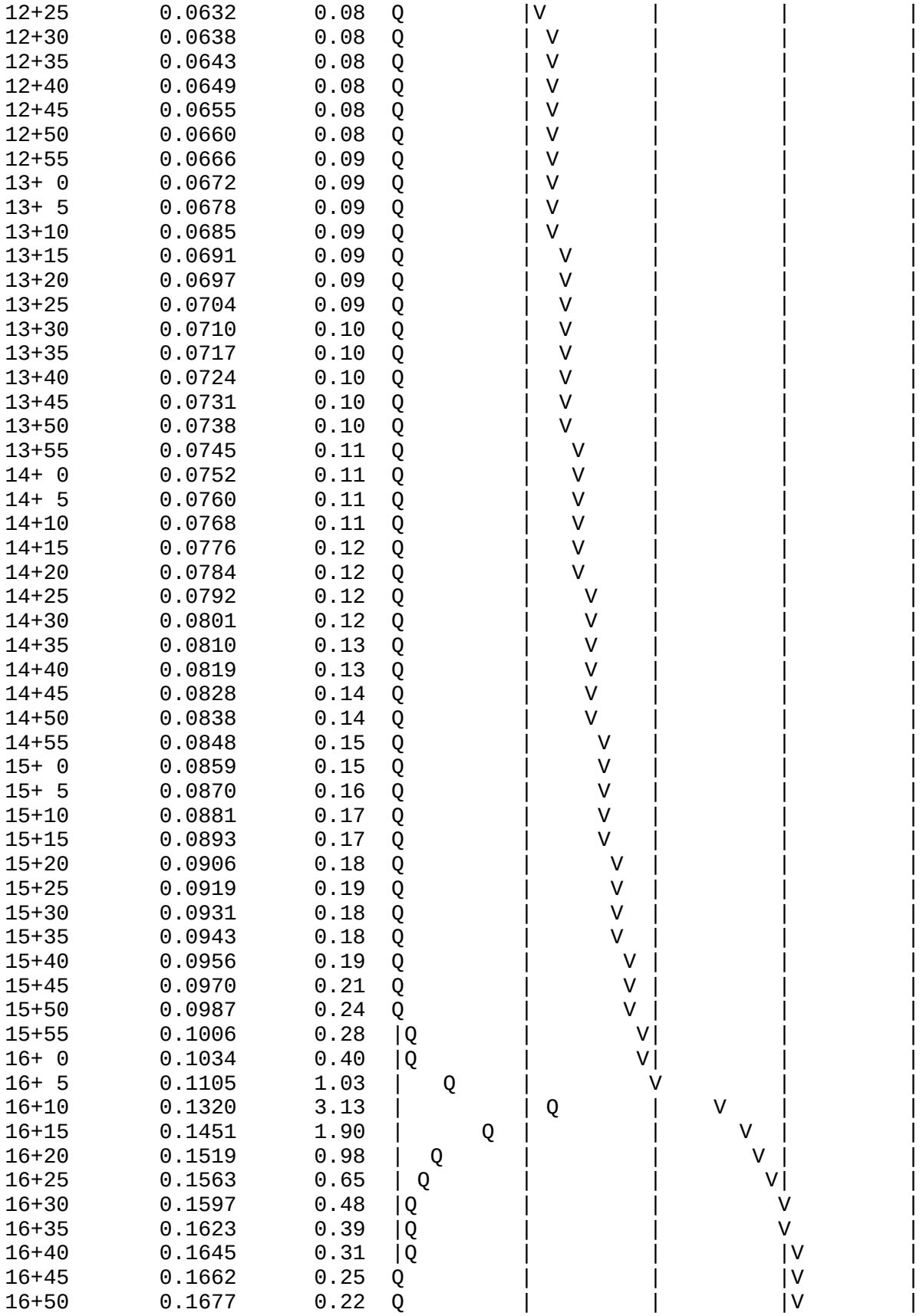
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0002	0.02	Q				
0+15	0.0004	0.03	Q				
0+20	0.0007	0.04	Q				
0+25	0.0010	0.04	Q				
0+30	0.0013	0.04	Q				
0+35	0.0016	0.05	Q				
0+40	0.0019	0.05	Q				
0+45	0.0022	0.05	Q				
0+50	0.0026	0.05	Q				
0+55	0.0029	0.05	Q				
1+ 0	0.0032	0.05	Q				
1+ 5	0.0035	0.05	Q				
1+10	0.0039	0.05	Q				
1+15	0.0042	0.05	Q				
1+20	0.0045	0.05	Q				
1+25	0.0049	0.05	Q				
1+30	0.0052	0.05	Q				
1+35	0.0056	0.05	QV				
1+40	0.0059	0.05	QV				
1+45	0.0062	0.05	QV				
1+50	0.0066	0.05	QV				
1+55	0.0069	0.05	QV				
2+ 0	0.0073	0.05	QV				
2+ 5	0.0076	0.05	QV				
2+10	0.0079	0.05	QV				
2+15	0.0083	0.05	QV				
2+20	0.0086	0.05	QV				
2+25	0.0090	0.05	QV				
2+30	0.0093	0.05	QV				
2+35	0.0097	0.05	QV				
2+40	0.0100	0.05	QV				
2+45	0.0104	0.05	QV				
2+50	0.0107	0.05	Q V				
2+55	0.0111	0.05	Q V				
3+ 0	0.0114	0.05	Q V				
3+ 5	0.0118	0.05	Q V				
3+10	0.0121	0.05	Q V				
3+15	0.0125	0.05	Q V				
3+20	0.0129	0.05	Q V				

3+25	0.0132	0.05	Q V	|	|	|	|
3+30	0.0136	0.05	Q V	|	|	|	|
3+35	0.0139	0.05	Q V	|	|	|	|
3+40	0.0143	0.05	Q V	|	|	|	|
3+45	0.0147	0.05	Q V	|	|	|	|
3+50	0.0150	0.05	Q V	|	|	|	|
3+55	0.0154	0.05	Q V	|	|	|	|
4+ 0	0.0158	0.05	Q V	|	|	|	|
4+ 5	0.0161	0.05	Q V	|	|	|	|
4+10	0.0165	0.05	Q V	|	|	|	|
4+15	0.0169	0.05	Q V	|	|	|	|
4+20	0.0173	0.05	Q V	|	|	|	|
4+25	0.0176	0.05	Q V	|	|	|	|
4+30	0.0180	0.05	Q V	|	|	|	|
4+35	0.0184	0.05	Q V	|	|	|	|
4+40	0.0188	0.06	Q V	|	|	|	|
4+45	0.0192	0.06	Q V	|	|	|	|
4+50	0.0195	0.06	Q V	|	|	|	|
4+55	0.0199	0.06	Q V	|	|	|	|
5+ 0	0.0203	0.06	Q V	|	|	|	|
5+ 5	0.0207	0.06	Q V	|	|	|	|
5+10	0.0211	0.06	Q V	|	|	|	|
5+15	0.0215	0.06	Q V	|	|	|	|
5+20	0.0219	0.06	Q V	|	|	|	|
5+25	0.0222	0.06	Q V	|	|	|	|
5+30	0.0226	0.06	Q V	|	|	|	|
5+35	0.0230	0.06	Q V	|	|	|	|
5+40	0.0234	0.06	Q V	|	|	|	|
5+45	0.0238	0.06	Q V	|	|	|	|
5+50	0.0242	0.06	Q V	|	|	|	|
5+55	0.0246	0.06	Q V	|	|	|	|
6+ 0	0.0250	0.06	Q V	|	|	|	|
6+ 5	0.0254	0.06	Q V	|	|	|	|
6+10	0.0258	0.06	Q V	|	|	|	|
6+15	0.0262	0.06	Q V	|	|	|	|
6+20	0.0267	0.06	Q V	|	|	|	|
6+25	0.0271	0.06	Q V	|	|	|	|
6+30	0.0275	0.06	Q V	|	|	|	|
6+35	0.0279	0.06	Q V	|	|	|	|
6+40	0.0283	0.06	Q V	|	|	|	|
6+45	0.0287	0.06	Q V	|	|	|	|
6+50	0.0291	0.06	Q V	|	|	|	|
6+55	0.0296	0.06	Q V	|	|	|	|
7+ 0	0.0300	0.06	Q V	|	|	|	|
7+ 5	0.0304	0.06	Q V	|	|	|	|
7+10	0.0308	0.06	Q V	|	|	|	|
7+15	0.0313	0.06	Q V	|	|	|	|
7+20	0.0317	0.06	Q V	|	|	|	|
7+25	0.0321	0.06	Q V	|	|	|	|
7+30	0.0326	0.06	Q V	|	|	|	|
7+35	0.0330	0.06	Q V	|	|	|	|
7+40	0.0335	0.06	Q V	|	|	|	|
7+45	0.0339	0.06	Q V	|	|	|	|
7+50	0.0343	0.06	Q V	|	|	|	|

7+55	0.0348	0.06	Q	V	|	|	|	|
8+ 0	0.0352	0.07	Q	V	|	|	|	|
8+ 5	0.0357	0.07	Q	V	|	|	|	|
8+10	0.0361	0.07	Q	V	|	|	|	|
8+15	0.0366	0.07	Q	V	|	|	|	|
8+20	0.0370	0.07	Q	V	|	|	|	|
8+25	0.0375	0.07	Q	V	|	|	|	|
8+30	0.0380	0.07	Q	V	|	|	|	|
8+35	0.0384	0.07	Q	V	|	|	|	|
8+40	0.0389	0.07	Q	V	|	|	|	|
8+45	0.0394	0.07	Q	V	|	|	|	|
8+50	0.0398	0.07	Q	V	|	|	|	|
8+55	0.0403	0.07	Q	V	|	|	|	|
9+ 0	0.0408	0.07	Q	V	|	|	|	|
9+ 5	0.0413	0.07	Q	V	|	|	|	|
9+10	0.0418	0.07	Q	V	|	|	|	|
9+15	0.0422	0.07	Q	V	|	|	|	|
9+20	0.0427	0.07	Q	V	|	|	|	|
9+25	0.0432	0.07	Q	V	|	|	|	|
9+30	0.0437	0.07	Q	V	|	|	|	|
9+35	0.0442	0.07	Q	V	|	|	|	|
9+40	0.0447	0.07	Q	V	|	|	|	|
9+45	0.0452	0.07	Q	V	|	|	|	|
9+50	0.0457	0.07	Q	V	|	|	|	|
9+55	0.0462	0.07	Q	V	|	|	|	|
10+ 0	0.0468	0.07	Q	V	|	|	|	|
10+ 5	0.0473	0.08	Q	V	|	|	|	|
10+10	0.0478	0.08	Q	V	|	|	|	|
10+15	0.0483	0.08	Q	V	|	|	|	|
10+20	0.0488	0.08	Q	V	|	|	|	|
10+25	0.0494	0.08	Q	V	|	|	|	|
10+30	0.0499	0.08	Q	V	|	|	|	|
10+35	0.0505	0.08	Q	V	|	|	|	|
10+40	0.0510	0.08	Q	V	|	|	|	|
10+45	0.0515	0.08	Q	V	|	|	|	|
10+50	0.0521	0.08	Q	V	|	|	|	|
10+55	0.0527	0.08	Q	V	|	|	|	|
11+ 0	0.0532	0.08	Q	V	|	|	|	|
11+ 5	0.0538	0.08	Q	V	|	|	|	|
11+10	0.0544	0.08	Q	V	|	|	|	|
11+15	0.0549	0.08	Q	V	|	|	|	|
11+20	0.0555	0.08	Q	V	|	|	|	|
11+25	0.0561	0.08	Q	V	|	|	|	|
11+30	0.0567	0.09	Q	V	|	|	|	|
11+35	0.0573	0.09	Q	V	|	|	|	|
11+40	0.0579	0.09	Q	V	|	|	|	|
11+45	0.0585	0.09	Q	|	V	|	|	|
11+50	0.0591	0.09	Q	|	V	|	|	|
11+55	0.0597	0.09	Q	|	V	|	|	|
12+ 0	0.0603	0.09	Q	|	V	|	|	|
12+ 5	0.0609	0.09	Q	|	V	|	|	|
12+10	0.0615	0.08	Q	|	V	|	|	|
12+15	0.0621	0.08	Q	|	V	|	|	|
12+20	0.0626	0.08	Q	|	V	|	|	|


12+25 0.0632 0.08
12+30 0.0638 0.08
12+35 0.0643 0.08
12+40 0.0649 0.08
12+45 0.0655 0.08
12+50 0.0660 0.08
12+55 0.0666 0.09
13+ 0 0.0672 0.09
13+ 5 0.0678 0.09
13+10 0.0685 0.09
13+15 0.0691 0.09
13+20 0.0697 0.09
13+25 0.0704 0.09
13+30 0.0710 0.10
13+35 0.0717 0.10
13+40 0.0724 0.10
13+45 0.0731 0.10
13+50 0.0738 0.10
13+55 0.0745 0.11
14+ 0 0.0752 0.11
14+ 5 0.0760 0.11
14+10 0.0768 0.11
14+15 0.0776 0.12
14+20 0.0784 0.12
14+25 0.0792 0.12
14+30 0.0801 0.12
14+35 0.0810 0.13
14+40 0.0819 0.13
14+45 0.0828 0.14
14+50 0.0838 0.14
14+55 0.0848 0.15
15+ 0 0.0859 0.15
15+ 5 0.0870 0.16
15+10 0.0881 0.17
15+15 0.0893 0.17
15+20 0.0906 0.18
15+25 0.0919 0.19
15+30 0.0931 0.18
15+35 0.0943 0.18
15+40 0.0956 0.19
15+45 0.0970 0.21
15+50 0.0987 0.24
15+55 0.1006 0.28
16+ 0 0.1034 0.40
16+ 5 0.1105 1.03
16+10 0.1320 3.13
16+15 0.1451 1.90
16+20 0.1519 0.98
16+25 0.1563 0.65
16+30 0.1597 0.48
16+35 0.1623 0.39
16+40 0.1645 0.31
16+45 0.1662 0.25
16+50 0.1677 0.22

16+55	0.1690	0.20	Q	|	|	| V	|
17+ 0	0.1702	0.17	Q	|	|	| V	|
17+ 5	0.1711	0.13	Q	|	|	| V	|
17+10	0.1719	0.12	Q	|	|	| V	|
17+15	0.1727	0.12	Q	|	|	| V	|
17+20	0.1735	0.11	Q	|	|	| V	|
17+25	0.1742	0.11	Q	|	|	| V	|
17+30	0.1749	0.10	Q	|	|	| V	|
17+35	0.1756	0.10	Q	|	|	| V	|
17+40	0.1763	0.09	Q	|	|	| V	|
17+45	0.1769	0.09	Q	|	|	| V	|
17+50	0.1775	0.09	Q	|	|	| V	|
17+55	0.1781	0.09	Q	|	|	| V	|
18+ 0	0.1787	0.08	Q	|	|	| V	|
18+ 5	0.1792	0.08	Q	|	|	| V	|
18+10	0.1798	0.09	Q	|	|	| V	|
18+15	0.1804	0.09	Q	|	|	| V	|
18+20	0.1811	0.09	Q	|	|	| V	|
18+25	0.1817	0.09	Q	|	|	| V	|
18+30	0.1823	0.09	Q	|	|	| V	|
18+35	0.1828	0.09	Q	|	|	| V	|
18+40	0.1834	0.08	Q	|	|	| V	|
18+45	0.1840	0.08	Q	|	|	| V	|
18+50	0.1846	0.08	Q	|	|	| V	|
18+55	0.1851	0.08	Q	|	|	| V	|
19+ 0	0.1857	0.08	Q	|	|	| V	|
19+ 5	0.1862	0.08	Q	|	|	| V	|
19+10	0.1867	0.08	Q	|	|	| V	|
19+15	0.1873	0.08	Q	|	|	| V	|
19+20	0.1878	0.08	Q	|	|	| V	|
19+25	0.1883	0.07	Q	|	|	| V	|
19+30	0.1888	0.07	Q	|	|	| V	|
19+35	0.1893	0.07	Q	|	|	| V	|
19+40	0.1898	0.07	Q	|	|	| V	|
19+45	0.1903	0.07	Q	|	|	| V	|
19+50	0.1908	0.07	Q	|	|	| V	|
19+55	0.1912	0.07	Q	|	|	| V	|
20+ 0	0.1917	0.07	Q	|	|	| V	|
20+ 5	0.1922	0.07	Q	|	|	| V	|
20+10	0.1926	0.07	Q	|	|	| V	|
20+15	0.1931	0.07	Q	|	|	| V	|
20+20	0.1935	0.07	Q	|	|	| V	|
20+25	0.1940	0.06	Q	|	|	| V	|
20+30	0.1944	0.06	Q	|	|	| V	|
20+35	0.1949	0.06	Q	|	|	| V	|
20+40	0.1953	0.06	Q	|	|	| V	|
20+45	0.1957	0.06	Q	|	|	| V	|
20+50	0.1961	0.06	Q	|	|	| V	|
20+55	0.1966	0.06	Q	|	|	| V	|
21+ 0	0.1970	0.06	Q	|	|	| V	|
21+ 5	0.1974	0.06	Q	|	|	| V	|
21+10	0.1978	0.06	Q	|	|	| V	|
21+15	0.1982	0.06	Q	|	|	| V	|
21+20	0.1986	0.06	Q	|	|	| V	|

21+25	0.1990	0.06	Q	|	|	|	V |
21+30	0.1994	0.06	Q	|	|	|	V |
21+35	0.1998	0.06	Q	|	|	|	V |
21+40	0.2002	0.06	Q	|	|	|	V |
21+45	0.2006	0.06	Q	|	|	|	V |
21+50	0.2010	0.06	Q	|	|	|	V |
21+55	0.2014	0.06	Q	|	|	|	V |
22+ 0	0.2017	0.06	Q	|	|	|	V |
22+ 5	0.2021	0.05	Q	|	|	|	V |
22+10	0.2025	0.05	Q	|	|	|	V |
22+15	0.2029	0.05	Q	|	|	|	V |
22+20	0.2032	0.05	Q	|	|	|	V |
22+25	0.2036	0.05	Q	|	|	|	V |
22+30	0.2040	0.05	Q	|	|	|	V |
22+35	0.2043	0.05	Q	|	|	|	V |
22+40	0.2047	0.05	Q	|	|	|	V |
22+45	0.2051	0.05	Q	|	|	|	V |
22+50	0.2054	0.05	Q	|	|	|	V |
22+55	0.2058	0.05	Q	|	|	|	V|
23+ 0	0.2061	0.05	Q	|	|	|	V|
23+ 5	0.2065	0.05	Q	|	|	|	V|
23+10	0.2068	0.05	Q	|	|	|	V|
23+15	0.2072	0.05	Q	|	|	|	V|
23+20	0.2075	0.05	Q	|	|	|	V|
23+25	0.2078	0.05	Q	|	|	|	V|
23+30	0.2082	0.05	Q	|	|	|	V|
23+35	0.2085	0.05	Q	|	|	|	V|
23+40	0.2089	0.05	Q	|	|	|	V|
23+45	0.2092	0.05	Q	|	|	|	V|
23+50	0.2095	0.05	Q	|	|	|	V|
23+55	0.2098	0.05	Q	|	|	|	V|
24+ 0	0.2102	0.05	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/05/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA5 TRIBUTARY AREA A1-B
FILE: 18345HYDROA1BPOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
0.92	1	0.68
Rainfall data for year 10		
0.92	6	1.43
Rainfall data for year 10		
0.92	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	0.92	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.55	0.600	32.0	52.0	9.23	0.036
0.37	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.135 (hours)
++
Watershed area = 0.92(Ac.)
Catchment Lag time = 0.108 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 76.9723
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 0.92(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 11.13 (CFS))		
1	9.796	1.090
2	55.474	5.082
3	76.653	2.356

4	86.014	1.042
5	91.324	0.591
6	94.672	0.372
7	96.830	0.240
8	98.070	0.138
9	98.951	0.098
10	99.693	0.083
11	100.000	0.034

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7010	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113

44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3437	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087

98	1.6709	0.0086
99	1.6795	0.0086
100	1.6881	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9496	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0223	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070
151	2.0786	0.0070

152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060

206	2.4316	0.0060
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208	2.4435	0.0059
209	2.4495	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5652	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6542	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7030	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053

260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020
17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021
20	0.0053	0.0032	0.0021

21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025
71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025
74	0.0064	0.0039	0.0025

75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033
125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033
128	0.0086	0.0053	0.0034

129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0090	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064
179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074
182	0.0195	0.0119	0.0076

183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031
233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030
236	0.0075	0.0046	0.0029

237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020
287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 1.57(CFS)

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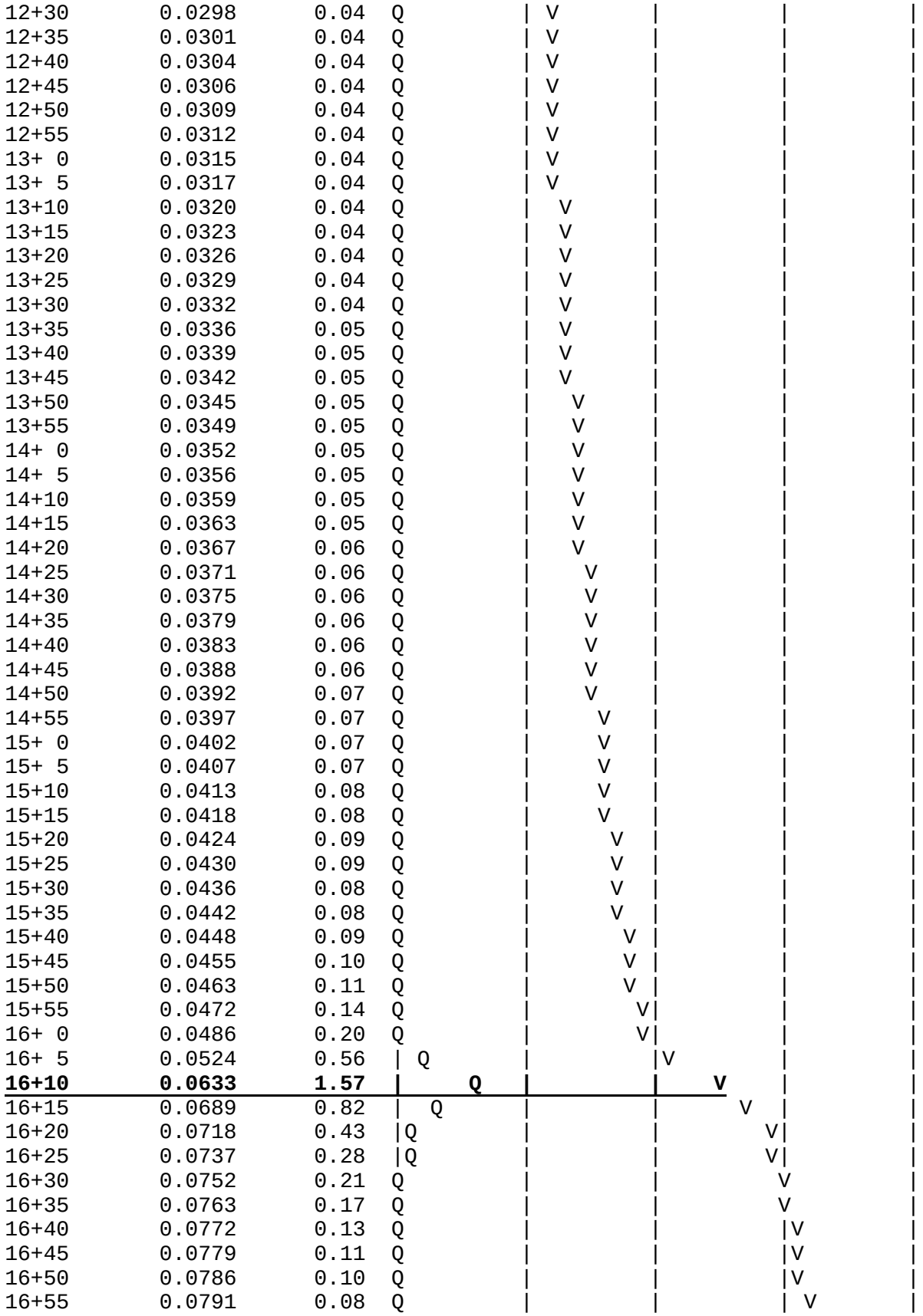
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.02	Q				
0+25	0.0005	0.02	Q				
0+30	0.0006	0.02	Q				
0+35	0.0008	0.02	Q				
0+40	0.0009	0.02	Q				
0+45	0.0011	0.02	Q				
0+50	0.0012	0.02	Q				
0+55	0.0014	0.02	Q				
1+ 0	0.0015	0.02	Q				
1+ 5	0.0017	0.02	Q				
1+10	0.0018	0.02	Q				
1+15	0.0020	0.02	Q				
1+20	0.0022	0.02	Q				
1+25	0.0023	0.02	Q				
1+30	0.0025	0.02	QV				
1+35	0.0026	0.02	QV				
1+40	0.0028	0.02	QV				
1+45	0.0029	0.02	QV				
1+50	0.0031	0.02	QV				
1+55	0.0033	0.02	QV				
2+ 0	0.0034	0.02	QV				
2+ 5	0.0036	0.02	QV				
2+10	0.0037	0.02	QV				
2+15	0.0039	0.02	QV				
2+20	0.0041	0.02	QV				
2+25	0.0042	0.02	QV				
2+30	0.0044	0.02	QV				
2+35	0.0046	0.02	QV				
2+40	0.0047	0.02	QV				
2+45	0.0049	0.02	QV				
2+50	0.0051	0.02	Q V				
2+55	0.0052	0.02	Q V				
3+ 0	0.0054	0.02	Q V				
3+ 5	0.0055	0.02	Q V				
3+10	0.0057	0.02	Q V				
3+15	0.0059	0.02	Q V				
3+20	0.0060	0.02	Q V				
3+25	0.0062	0.02	Q V				

3+30	0.0064	0.02	Q V	|	|	|	|
3+35	0.0066	0.02	Q V	|	|	|	|
3+40	0.0067	0.02	Q V	|	|	|	|
3+45	0.0069	0.02	Q V	|	|	|	|
3+50	0.0071	0.02	Q V	|	|	|	|
3+55	0.0072	0.02	Q V	|	|	|	|
4+ 0	0.0074	0.03	Q V	|	|	|	|
4+ 5	0.0076	0.03	Q V	|	|	|	|
4+10	0.0078	0.03	Q V	|	|	|	|
4+15	0.0079	0.03	Q V	|	|	|	|
4+20	0.0081	0.03	Q V	|	|	|	|
4+25	0.0083	0.03	Q V	|	|	|	|
4+30	0.0085	0.03	Q V	|	|	|	|
4+35	0.0086	0.03	Q V	|	|	|	|
4+40	0.0088	0.03	Q V	|	|	|	|
4+45	0.0090	0.03	Q V	|	|	|	|
4+50	0.0092	0.03	Q V	|	|	|	|
4+55	0.0093	0.03	Q V	|	|	|	|
5+ 0	0.0095	0.03	Q V	|	|	|	|
5+ 5	0.0097	0.03	Q V	|	|	|	|
5+10	0.0099	0.03	Q V	|	|	|	|
5+15	0.0101	0.03	Q V	|	|	|	|
5+20	0.0103	0.03	Q V	|	|	|	|
5+25	0.0104	0.03	Q V	|	|	|	|
5+30	0.0106	0.03	Q V	|	|	|	|
5+35	0.0108	0.03	Q V	|	|	|	|
5+40	0.0110	0.03	Q V	|	|	|	|
5+45	0.0112	0.03	Q V	|	|	|	|
5+50	0.0114	0.03	Q V	|	|	|	|
5+55	0.0115	0.03	Q V	|	|	|	|
6+ 0	0.0117	0.03	Q V	|	|	|	|
6+ 5	0.0119	0.03	Q V	|	|	|	|
6+10	0.0121	0.03	Q V	|	|	|	|
6+15	0.0123	0.03	Q V	|	|	|	|
6+20	0.0125	0.03	Q V	|	|	|	|
6+25	0.0127	0.03	Q V	|	|	|	|
6+30	0.0129	0.03	Q V	|	|	|	|
6+35	0.0131	0.03	Q V	|	|	|	|
6+40	0.0133	0.03	Q V	|	|	|	|
6+45	0.0135	0.03	Q V	|	|	|	|
6+50	0.0137	0.03	Q V	|	|	|	|
6+55	0.0139	0.03	Q V	|	|	|	|
7+ 0	0.0141	0.03	Q V	|	|	|	|
7+ 5	0.0143	0.03	Q V	|	|	|	|
7+10	0.0145	0.03	Q V	|	|	|	|
7+15	0.0147	0.03	Q V	|	|	|	|
7+20	0.0149	0.03	Q V	|	|	|	|
7+25	0.0151	0.03	Q V	|	|	|	|
7+30	0.0153	0.03	Q V	|	|	|	|
7+35	0.0155	0.03	Q V	|	|	|	|
7+40	0.0157	0.03	Q V	|	|	|	|
7+45	0.0159	0.03	Q V	|	|	|	|
7+50	0.0161	0.03	Q V	|	|	|	|
7+55	0.0163	0.03	Q V	|	|	|	|

8+ 0	0.0165	0.03	Q	V	|	|	|	|
8+ 5	0.0167	0.03	Q	V	|	|	|	|
8+10	0.0169	0.03	Q	V	|	|	|	|
8+15	0.0171	0.03	Q	V	|	|	|	|
8+20	0.0174	0.03	Q	V	|	|	|	|
8+25	0.0176	0.03	Q	V	|	|	|	|
8+30	0.0178	0.03	Q	V	|	|	|	|
8+35	0.0180	0.03	Q	V	|	|	|	|
8+40	0.0182	0.03	Q	V	|	|	|	|
8+45	0.0184	0.03	Q	V	|	|	|	|
8+50	0.0187	0.03	Q	V	|	|	|	|
8+55	0.0189	0.03	Q	V	|	|	|	|
9+ 0	0.0191	0.03	Q	V	|	|	|	|
9+ 5	0.0193	0.03	Q	V	|	|	|	|
9+10	0.0196	0.03	Q	V	|	|	|	|
9+15	0.0198	0.03	Q	V	|	|	|	|
9+20	0.0200	0.03	Q	V	|	|	|	|
9+25	0.0202	0.03	Q	V	|	|	|	|
9+30	0.0205	0.03	Q	V	|	|	|	|
9+35	0.0207	0.03	Q	V	|	|	|	|
9+40	0.0209	0.03	Q	V	|	|	|	|
9+45	0.0212	0.03	Q	V	|	|	|	|
9+50	0.0214	0.03	Q	V	|	|	|	|
9+55	0.0217	0.03	Q	V	|	|	|	|
10+ 0	0.0219	0.03	Q	V	|	|	|	|
10+ 5	0.0221	0.04	Q	V	|	|	|	|
10+10	0.0224	0.04	Q	V	|	|	|	|
10+15	0.0226	0.04	Q	V	|	|	|	|
10+20	0.0229	0.04	Q	V	|	|	|	|
10+25	0.0231	0.04	Q	V	|	|	|	|
10+30	0.0234	0.04	Q	V	|	|	|	|
10+35	0.0236	0.04	Q	V	|	|	|	|
10+40	0.0239	0.04	Q	V	|	|	|	|
10+45	0.0241	0.04	Q	V	|	|	|	|
10+50	0.0244	0.04	Q	V	|	|	|	|
10+55	0.0247	0.04	Q	V	|	|	|	|
11+ 0	0.0249	0.04	Q	V	|	|	|	|
11+ 5	0.0252	0.04	Q	V	|	|	|	|
11+10	0.0254	0.04	Q	V	|	|	|	|
11+15	0.0257	0.04	Q	V	|	|	|	|
11+20	0.0260	0.04	Q	V	|	|	|	|
11+25	0.0263	0.04	Q	V	|	|	|	|
11+30	0.0265	0.04	Q	V	|	|	|	|
11+35	0.0268	0.04	Q	V	|	|	|	|
11+40	0.0271	0.04	Q	|	V	|	|	|
11+45	0.0274	0.04	Q	|	V	|	|	|
11+50	0.0277	0.04	Q	|	V	|	|	|
11+55	0.0280	0.04	Q	|	V	|	|	|
12+ 0	0.0282	0.04	Q	|	V	|	|	|
12+ 5	0.0285	0.04	Q	|	V	|	|	|
12+10	0.0288	0.04	Q	|	V	|	|	|
12+15	0.0291	0.04	Q	|	V	|	|	|
12+20	0.0293	0.04	Q	|	V	|	|	|
12+25	0.0296	0.04	Q	|	|	V	|	|


12+30 0.0298 0.04
12+35 0.0301 0.04
12+40 0.0304 0.04
12+45 0.0306 0.04
12+50 0.0309 0.04
12+55 0.0312 0.04
13+ 0 0.0315 0.04
13+ 5 0.0317 0.04
13+10 0.0320 0.04
13+15 0.0323 0.04
13+20 0.0326 0.04
13+25 0.0329 0.04
13+30 0.0332 0.04
13+35 0.0336 0.05
13+40 0.0339 0.05
13+45 0.0342 0.05
13+50 0.0345 0.05
13+55 0.0349 0.05
14+ 0 0.0352 0.05
14+ 5 0.0356 0.05
14+10 0.0359 0.05
14+15 0.0363 0.05
14+20 0.0367 0.06
14+25 0.0371 0.06
14+30 0.0375 0.06
14+35 0.0379 0.06
14+40 0.0383 0.06
14+45 0.0388 0.06
14+50 0.0392 0.07
14+55 0.0397 0.07
15+ 0 0.0402 0.07
15+ 5 0.0407 0.07
15+10 0.0413 0.08
15+15 0.0418 0.08
15+20 0.0424 0.09
15+25 0.0430 0.09
15+30 0.0436 0.08
15+35 0.0442 0.08
15+40 0.0448 0.09
15+45 0.0455 0.10
15+50 0.0463 0.11
15+55 0.0472 0.14
16+ 0 0.0486 0.20
16+ 5 0.0524 0.56
16+10 0.0633 1.57
16+15 0.0689 0.82
16+20 0.0718 0.43
16+25 0.0737 0.28
16+30 0.0752 0.21
16+35 0.0763 0.17
16+40 0.0772 0.13
16+45 0.0779 0.11
16+50 0.0786 0.10
16+55 0.0791 0.08

17+ 0	0.0796	0.06	Q	|	|	| V	|
17+ 5	0.0800	0.06	Q	|	|	| V	|
17+10	0.0804	0.06	Q	|	|	| V	|
17+15	0.0808	0.05	Q	|	|	| V	|
17+20	0.0811	0.05	Q	|	|	| V	|
17+25	0.0815	0.05	Q	|	|	| V	|
17+30	0.0818	0.05	Q	|	|	| V	|
17+35	0.0821	0.05	Q	|	|	| V	|
17+40	0.0824	0.04	Q	|	|	| V	|
17+45	0.0827	0.04	Q	|	|	| V	|
17+50	0.0830	0.04	Q	|	|	| V	|
17+55	0.0832	0.04	Q	|	|	| V	|
18+ 0	0.0835	0.04	Q	|	|	| V	|
18+ 5	0.0838	0.04	Q	|	|	| V	|
18+10	0.0840	0.04	Q	|	|	| V	|
18+15	0.0843	0.04	Q	|	|	| V	|
18+20	0.0846	0.04	Q	|	|	| V	|
18+25	0.0849	0.04	Q	|	|	| V	|
18+30	0.0852	0.04	Q	|	|	| V	|
18+35	0.0855	0.04	Q	|	|	| V	|
18+40	0.0857	0.04	Q	|	|	| V	|
18+45	0.0860	0.04	Q	|	|	| V	|
18+50	0.0863	0.04	Q	|	|	| V	|
18+55	0.0865	0.04	Q	|	|	| V	|
19+ 0	0.0868	0.04	Q	|	|	| V	|
19+ 5	0.0870	0.04	Q	|	|	| V	|
19+10	0.0873	0.04	Q	|	|	| V	|
19+15	0.0875	0.04	Q	|	|	| V	|
19+20	0.0878	0.04	Q	|	|	| V	|
19+25	0.0880	0.03	Q	|	|	| V	|
19+30	0.0882	0.03	Q	|	|	| V	|
19+35	0.0885	0.03	Q	|	|	| V	|
19+40	0.0887	0.03	Q	|	|	| V	|
19+45	0.0889	0.03	Q	|	|	| V	|
19+50	0.0891	0.03	Q	|	|	| V	|
19+55	0.0894	0.03	Q	|	|	| V	|
20+ 0	0.0896	0.03	Q	|	|	| V	|
20+ 5	0.0898	0.03	Q	|	|	| V	|
20+10	0.0900	0.03	Q	|	|	| V	|
20+15	0.0902	0.03	Q	|	|	| V	|
20+20	0.0904	0.03	Q	|	|	| V	|
20+25	0.0906	0.03	Q	|	|	| V	|
20+30	0.0908	0.03	Q	|	|	| V	|
20+35	0.0911	0.03	Q	|	|	| V	|
20+40	0.0913	0.03	Q	|	|	| V	|
20+45	0.0915	0.03	Q	|	|	| V	|
20+50	0.0917	0.03	Q	|	|	| V	|
20+55	0.0918	0.03	Q	|	|	| V	|
21+ 0	0.0920	0.03	Q	|	|	| V	|
21+ 5	0.0922	0.03	Q	|	|	| V	|
21+10	0.0924	0.03	Q	|	|	| V	|
21+15	0.0926	0.03	Q	|	|	| V	|
21+20	0.0928	0.03	Q	|	|	| V	|
21+25	0.0930	0.03	Q	|	|	| V	|

21+30	0.0932	0.03	Q	|	|	|	V |
21+35	0.0934	0.03	Q	|	|	|	V |
21+40	0.0935	0.03	Q	|	|	|	V |
21+45	0.0937	0.03	Q	|	|	|	V |
21+50	0.0939	0.03	Q	|	|	|	V |
21+55	0.0941	0.03	Q	|	|	|	V |
22+ 0	0.0943	0.03	Q	|	|	|	V |
22+ 5	0.0944	0.03	Q	|	|	|	V |
22+10	0.0946	0.03	Q	|	|	|	V |
22+15	0.0948	0.03	Q	|	|	|	V |
22+20	0.0950	0.03	Q	|	|	|	V |
22+25	0.0951	0.02	Q	|	|	|	V |
22+30	0.0953	0.02	Q	|	|	|	V |
22+35	0.0955	0.02	Q	|	|	|	V |
22+40	0.0956	0.02	Q	|	|	|	V |
22+45	0.0958	0.02	Q	|	|	|	V |
22+50	0.0960	0.02	Q	|	|	|	V |
22+55	0.0961	0.02	Q	|	|	|	V|
23+ 0	0.0963	0.02	Q	|	|	|	V|
23+ 5	0.0965	0.02	Q	|	|	|	V|
23+10	0.0966	0.02	Q	|	|	|	V|
23+15	0.0968	0.02	Q	|	|	|	V|
23+20	0.0969	0.02	Q	|	|	|	V|
23+25	0.0971	0.02	Q	|	|	|	V|
23+30	0.0973	0.02	Q	|	|	|	V|
23+35	0.0974	0.02	Q	|	|	|	V|
23+40	0.0976	0.02	Q	|	|	|	V|
23+45	0.0977	0.02	Q	|	|	|	V|
23+50	0.0979	0.02	Q	|	|	|	V|
23+55	0.0980	0.02	Q	|	|	|	V|
24+ 0	0.0982	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/08/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA2
TR 20527, CITY OF VICTORVILLE
DA2 **TRIBUTARY AREA A2-A**
FILE: 18345HYDROA2APOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
2.10	1	0.68
Rainfall data for year 10		
2.10	6	1.43
Rainfall data for year 10		
2.10	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.10	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.26	0.600	32.0	52.0	9.23	0.036
0.84	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.153 (hours)
++
Watershed area = 2.10(Ac.)
Catchment Lag time = 0.122 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 68.2300
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 2.10(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 25.40 (CFS))		
1	7.360	1.869
2	49.046	10.587
3	72.705	6.009

4	82.972	2.607
5	89.006	1.533
6	92.767	0.955
7	95.334	0.652
8	97.082	0.444
9	98.101	0.259
10	98.878	0.197
11	99.589	0.181
12	100.000	0.104

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6418	0.0200
11	0.6605	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114

43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087

97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0716	0.0070

151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060

205	2.4257	0.0060
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208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
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253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053

259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020
17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021

20	0.0053	0.0032	0.0021
21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025
71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025

74	0.0064	0.0039	0.0025
75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033
125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033

128	0.0086	0.0053	0.0034
129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0090	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064
179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074

182	0.0195	0.0119	0.0076
183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031
233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030

236	0.0075	0.0046	0.0029
237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020
287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 3.33(CFS)

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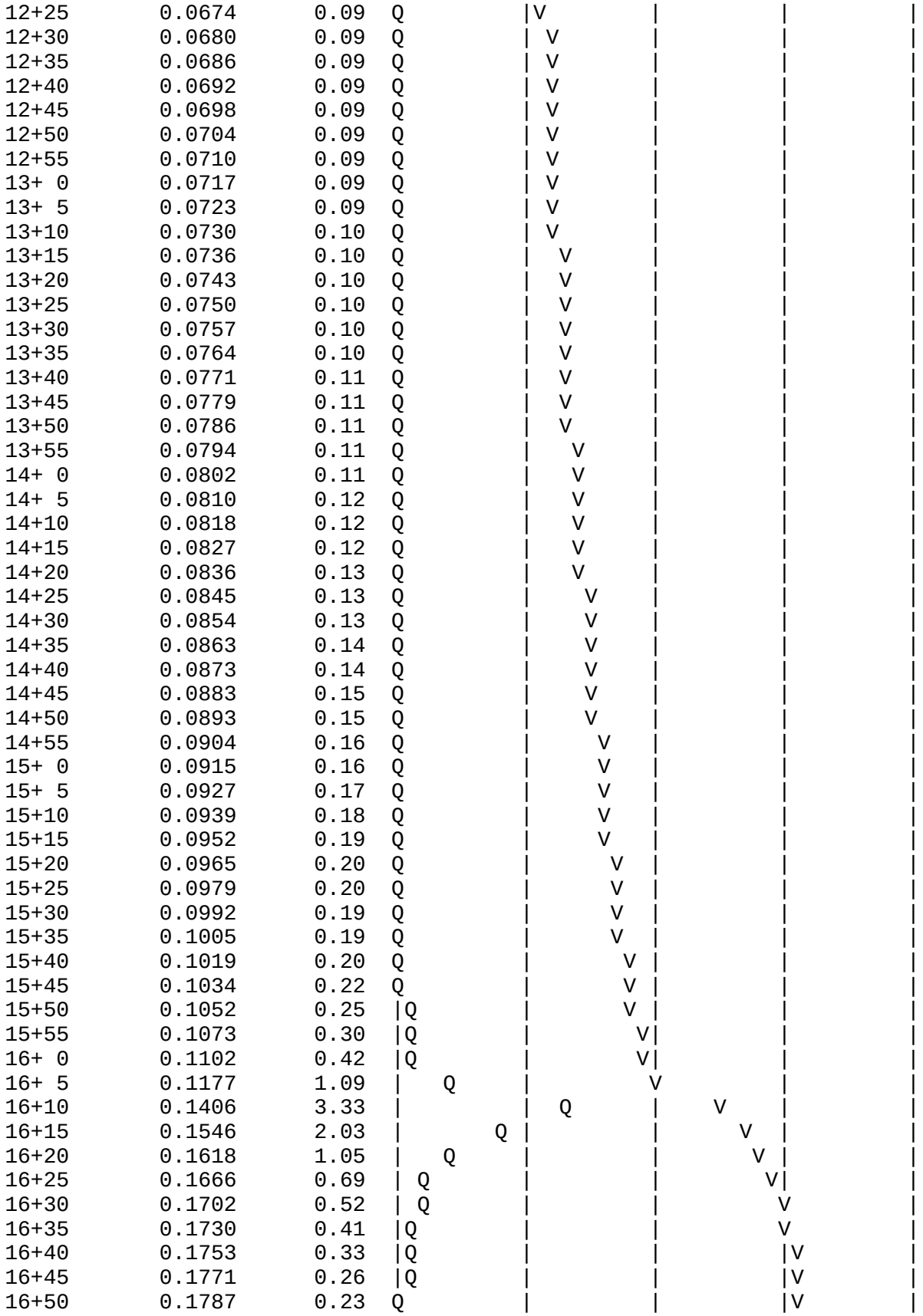
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0002	0.02	Q				
0+15	0.0004	0.04	Q				
0+20	0.0007	0.04	Q				
0+25	0.0010	0.04	Q				
0+30	0.0014	0.05	Q				
0+35	0.0017	0.05	Q				
0+40	0.0020	0.05	Q				
0+45	0.0024	0.05	Q				
0+50	0.0027	0.05	Q				
0+55	0.0031	0.05	Q				
1+ 0	0.0034	0.05	Q				
1+ 5	0.0038	0.05	Q				
1+10	0.0041	0.05	Q				
1+15	0.0045	0.05	Q				
1+20	0.0048	0.05	Q				
1+25	0.0052	0.05	Q				
1+30	0.0056	0.05	Q				
1+35	0.0059	0.05	QV				
1+40	0.0063	0.05	QV				
1+45	0.0066	0.05	QV				
1+50	0.0070	0.05	QV				
1+55	0.0074	0.05	QV				
2+ 0	0.0077	0.05	QV				
2+ 5	0.0081	0.05	QV				
2+10	0.0085	0.05	QV				
2+15	0.0088	0.05	QV				
2+20	0.0092	0.05	QV				
2+25	0.0096	0.05	QV				
2+30	0.0099	0.05	QV				
2+35	0.0103	0.05	QV				
2+40	0.0107	0.05	QV				
2+45	0.0111	0.05	QV				
2+50	0.0114	0.05	Q V				
2+55	0.0118	0.05	Q V				
3+ 0	0.0122	0.05	Q V				
3+ 5	0.0126	0.06	Q V				
3+10	0.0129	0.06	Q V				
3+15	0.0133	0.06	Q V				
3+20	0.0137	0.06	Q V				

3+25	0.0141	0.06	Q V	|	|	|	|
3+30	0.0145	0.06	Q V	|	|	|	|
3+35	0.0149	0.06	Q V	|	|	|	|
3+40	0.0153	0.06	Q V	|	|	|	|
3+45	0.0156	0.06	Q V	|	|	|	|
3+50	0.0160	0.06	Q V	|	|	|	|
3+55	0.0164	0.06	Q V	|	|	|	|
4+ 0	0.0168	0.06	Q V	|	|	|	|
4+ 5	0.0172	0.06	Q V	|	|	|	|
4+10	0.0176	0.06	Q V	|	|	|	|
4+15	0.0180	0.06	Q V	|	|	|	|
4+20	0.0184	0.06	Q V	|	|	|	|
4+25	0.0188	0.06	Q V	|	|	|	|
4+30	0.0192	0.06	Q V	|	|	|	|
4+35	0.0196	0.06	Q V	|	|	|	|
4+40	0.0200	0.06	Q V	|	|	|	|
4+45	0.0204	0.06	Q V	|	|	|	|
4+50	0.0208	0.06	Q V	|	|	|	|
4+55	0.0212	0.06	Q V	|	|	|	|
5+ 0	0.0216	0.06	Q V	|	|	|	|
5+ 5	0.0221	0.06	Q V	|	|	|	|
5+10	0.0225	0.06	Q V	|	|	|	|
5+15	0.0229	0.06	Q V	|	|	|	|
5+20	0.0233	0.06	Q V	|	|	|	|
5+25	0.0237	0.06	Q V	|	|	|	|
5+30	0.0241	0.06	Q V	|	|	|	|
5+35	0.0246	0.06	Q V	|	|	|	|
5+40	0.0250	0.06	Q V	|	|	|	|
5+45	0.0254	0.06	Q V	|	|	|	|
5+50	0.0258	0.06	Q V	|	|	|	|
5+55	0.0263	0.06	Q V	|	|	|	|
6+ 0	0.0267	0.06	Q V	|	|	|	|
6+ 5	0.0271	0.06	Q V	|	|	|	|
6+10	0.0275	0.06	Q V	|	|	|	|
6+15	0.0280	0.06	Q V	|	|	|	|
6+20	0.0284	0.06	Q V	|	|	|	|
6+25	0.0289	0.06	Q V	|	|	|	|
6+30	0.0293	0.06	Q V	|	|	|	|
6+35	0.0297	0.06	Q V	|	|	|	|
6+40	0.0302	0.06	Q V	|	|	|	|
6+45	0.0306	0.06	Q V	|	|	|	|
6+50	0.0311	0.06	Q V	|	|	|	|
6+55	0.0315	0.07	Q V	|	|	|	|
7+ 0	0.0320	0.07	Q V	|	|	|	|
7+ 5	0.0324	0.07	Q V	|	|	|	|
7+10	0.0329	0.07	Q V	|	|	|	|
7+15	0.0333	0.07	Q V	|	|	|	|
7+20	0.0338	0.07	Q V	|	|	|	|
7+25	0.0343	0.07	Q V	|	|	|	|
7+30	0.0347	0.07	Q V	|	|	|	|
7+35	0.0352	0.07	Q V	|	|	|	|
7+40	0.0357	0.07	Q V	|	|	|	|
7+45	0.0361	0.07	Q V	|	|	|	|
7+50	0.0366	0.07	Q V	|	|	|	|

7+55	0.0371	0.07	Q	V	|	|	|	|
8+ 0	0.0376	0.07	Q	V	|	|	|	|
8+ 5	0.0380	0.07	Q	V	|	|	|	|
8+10	0.0385	0.07	Q	V	|	|	|	|
8+15	0.0390	0.07	Q	V	|	|	|	|
8+20	0.0395	0.07	Q	V	|	|	|	|
8+25	0.0400	0.07	Q	V	|	|	|	|
8+30	0.0405	0.07	Q	V	|	|	|	|
8+35	0.0410	0.07	Q	V	|	|	|	|
8+40	0.0415	0.07	Q	V	|	|	|	|
8+45	0.0420	0.07	Q	V	|	|	|	|
8+50	0.0425	0.07	Q	V	|	|	|	|
8+55	0.0430	0.07	Q	V	|	|	|	|
9+ 0	0.0435	0.07	Q	V	|	|	|	|
9+ 5	0.0440	0.07	Q	V	|	|	|	|
9+10	0.0445	0.07	Q	V	|	|	|	|
9+15	0.0450	0.08	Q	V	|	|	|	|
9+20	0.0456	0.08	Q	V	|	|	|	|
9+25	0.0461	0.08	Q	V	|	|	|	|
9+30	0.0466	0.08	Q	V	|	|	|	|
9+35	0.0471	0.08	Q	V	|	|	|	|
9+40	0.0477	0.08	Q	V	|	|	|	|
9+45	0.0482	0.08	Q	V	|	|	|	|
9+50	0.0487	0.08	Q	V	|	|	|	|
9+55	0.0493	0.08	Q	V	|	|	|	|
10+ 0	0.0498	0.08	Q	V	|	|	|	|
10+ 5	0.0504	0.08	Q	V	|	|	|	|
10+10	0.0509	0.08	Q	V	|	|	|	|
10+15	0.0515	0.08	Q	V	|	|	|	|
10+20	0.0521	0.08	Q	V	|	|	|	|
10+25	0.0526	0.08	Q	V	|	|	|	|
10+30	0.0532	0.08	Q	V	|	|	|	|
10+35	0.0538	0.08	Q	V	|	|	|	|
10+40	0.0544	0.08	Q	V	|	|	|	|
10+45	0.0549	0.08	Q	V	|	|	|	|
10+50	0.0555	0.09	Q	V	|	|	|	|
10+55	0.0561	0.09	Q	V	|	|	|	|
11+ 0	0.0567	0.09	Q	V	|	|	|	|
11+ 5	0.0573	0.09	Q	V	|	|	|	|
11+10	0.0579	0.09	Q	V	|	|	|	|
11+15	0.0585	0.09	Q	V	|	|	|	|
11+20	0.0592	0.09	Q	V	|	|	|	|
11+25	0.0598	0.09	Q	V	|	|	|	|
11+30	0.0604	0.09	Q	V	|	|	|	|
11+35	0.0610	0.09	Q	V	|	|	|	|
11+40	0.0617	0.09	Q	V	|	|	|	|
11+45	0.0623	0.09	Q	|	V	|	|	|
11+50	0.0630	0.09	Q	|	V	|	|	|
11+55	0.0636	0.10	Q	|	V	|	|	|
12+ 0	0.0643	0.10	Q	|	V	|	|	|
12+ 5	0.0650	0.10	Q	|	V	|	|	|
12+10	0.0656	0.09	Q	|	V	|	|	|
12+15	0.0662	0.09	Q	|	V	|	|	|
12+20	0.0668	0.09	Q	|	V	|	|	|


12+25 0.0674 0.09
12+30 0.0680 0.09
12+35 0.0686 0.09
12+40 0.0692 0.09
12+45 0.0698 0.09
12+50 0.0704 0.09
12+55 0.0710 0.09
13+ 0 0.0717 0.09
13+ 5 0.0723 0.09
13+10 0.0730 0.10
13+15 0.0736 0.10
13+20 0.0743 0.10
13+25 0.0750 0.10
13+30 0.0757 0.10
13+35 0.0764 0.10
13+40 0.0771 0.11
13+45 0.0779 0.11
13+50 0.0786 0.11
13+55 0.0794 0.11
14+ 0 0.0802 0.11
14+ 5 0.0810 0.12
14+10 0.0818 0.12
14+15 0.0827 0.12
14+20 0.0836 0.13
14+25 0.0845 0.13
14+30 0.0854 0.13
14+35 0.0863 0.14
14+40 0.0873 0.14
14+45 0.0883 0.15
14+50 0.0893 0.15
14+55 0.0904 0.16
15+ 0 0.0915 0.16
15+ 5 0.0927 0.17
15+10 0.0939 0.18
15+15 0.0952 0.19
15+20 0.0965 0.20
15+25 0.0979 0.20
15+30 0.0992 0.19
15+35 0.1005 0.19
15+40 0.1019 0.20
15+45 0.1034 0.22
15+50 0.1052 0.25
15+55 0.1073 0.30
16+ 0 0.1102 0.42
16+ 5 0.1177 1.09
16+10 0.1406 3.33
16+15 0.1546 2.03
16+20 0.1618 1.05
16+25 0.1666 0.69
16+30 0.1702 0.52
16+35 0.1730 0.41
16+40 0.1753 0.33
16+45 0.1771 0.26
16+50 0.1787 0.23

16+55	0.1802	0.21	Q	|	|	| V	|
17+ 0	0.1814	0.18	Q	|	|	| V	|
17+ 5	0.1824	0.14	Q	|	|	| V	|
17+10	0.1833	0.13	Q	|	|	| V	|
17+15	0.1841	0.12	Q	|	|	| V	|
17+20	0.1849	0.12	Q	|	|	| V	|
17+25	0.1857	0.11	Q	|	|	| V	|
17+30	0.1865	0.11	Q	|	|	| V	|
17+35	0.1872	0.10	Q	|	|	| V	|
17+40	0.1879	0.10	Q	|	|	| V	|
17+45	0.1886	0.10	Q	|	|	| V	|
17+50	0.1892	0.09	Q	|	|	| V	|
17+55	0.1898	0.09	Q	|	|	| V	|
18+ 0	0.1904	0.09	Q	|	|	| V	|
18+ 5	0.1911	0.09	Q	|	|	| V	|
18+10	0.1917	0.09	Q	|	|	| V	|
18+15	0.1923	0.09	Q	|	|	| V	|
18+20	0.1930	0.09	Q	|	|	| V	|
18+25	0.1936	0.09	Q	|	|	| V	|
18+30	0.1943	0.09	Q	|	|	| V	|
18+35	0.1949	0.09	Q	|	|	| V	|
18+40	0.1955	0.09	Q	|	|	| V	|
18+45	0.1961	0.09	Q	|	|	| V	|
18+50	0.1967	0.09	Q	|	|	| V	|
18+55	0.1973	0.09	Q	|	|	| V	|
19+ 0	0.1979	0.08	Q	|	|	| V	|
19+ 5	0.1985	0.08	Q	|	|	| V	|
19+10	0.1991	0.08	Q	|	|	| V	|
19+15	0.1996	0.08	Q	|	|	| V	|
19+20	0.2002	0.08	Q	|	|	| V	|
19+25	0.2007	0.08	Q	|	|	| V	|
19+30	0.2013	0.08	Q	|	|	| V	|
19+35	0.2018	0.08	Q	|	|	| V	|
19+40	0.2023	0.08	Q	|	|	| V	|
19+45	0.2028	0.08	Q	|	|	| V	|
19+50	0.2033	0.07	Q	|	|	| V	|
19+55	0.2038	0.07	Q	|	|	| V	|
20+ 0	0.2044	0.07	Q	|	|	| V	|
20+ 5	0.2048	0.07	Q	|	|	| V	|
20+10	0.2053	0.07	Q	|	|	| V	|
20+15	0.2058	0.07	Q	|	|	| V	|
20+20	0.2063	0.07	Q	|	|	| V	|
20+25	0.2068	0.07	Q	|	|	| V	|
20+30	0.2072	0.07	Q	|	|	| V	|
20+35	0.2077	0.07	Q	|	|	| V	|
20+40	0.2082	0.07	Q	|	|	| V	|
20+45	0.2086	0.07	Q	|	|	| V	|
20+50	0.2091	0.07	Q	|	|	| V	|
20+55	0.2095	0.07	Q	|	|	| V	|
21+ 0	0.2100	0.06	Q	|	|	| V	|
21+ 5	0.2104	0.06	Q	|	|	| V	|
21+10	0.2109	0.06	Q	|	|	| V	|
21+15	0.2113	0.06	Q	|	|	| V	|
21+20	0.2117	0.06	Q	|	|	| V	|

21+25	0.2122	0.06	Q	|	|	|	V |
21+30	0.2126	0.06	Q	|	|	|	V |
21+35	0.2130	0.06	Q	|	|	|	V |
21+40	0.2134	0.06	Q	|	|	|	V |
21+45	0.2138	0.06	Q	|	|	|	V |
21+50	0.2142	0.06	Q	|	|	|	V |
21+55	0.2147	0.06	Q	|	|	|	V |
22+ 0	0.2151	0.06	Q	|	|	|	V |
22+ 5	0.2155	0.06	Q	|	|	|	V |
22+10	0.2159	0.06	Q	|	|	|	V |
22+15	0.2163	0.06	Q	|	|	|	V |
22+20	0.2167	0.06	Q	|	|	|	V |
22+25	0.2170	0.06	Q	|	|	|	V |
22+30	0.2174	0.06	Q	|	|	|	V |
22+35	0.2178	0.06	Q	|	|	|	V |
22+40	0.2182	0.06	Q	|	|	|	V |
22+45	0.2186	0.06	Q	|	|	|	V |
22+50	0.2190	0.06	Q	|	|	|	V |
22+55	0.2193	0.05	Q	|	|	|	V|
23+ 0	0.2197	0.05	Q	|	|	|	V|
23+ 5	0.2201	0.05	Q	|	|	|	V|
23+10	0.2205	0.05	Q	|	|	|	V|
23+15	0.2208	0.05	Q	|	|	|	V|
23+20	0.2212	0.05	Q	|	|	|	V|
23+25	0.2216	0.05	Q	|	|	|	V|
23+30	0.2219	0.05	Q	|	|	|	V|
23+35	0.2223	0.05	Q	|	|	|	V|
23+40	0.2226	0.05	Q	|	|	|	V|
23+45	0.2230	0.05	Q	|	|	|	V|
23+50	0.2233	0.05	Q	|	|	|	V|
23+55	0.2237	0.05	Q	|	|	|	V|
24+ 0	0.2240	0.05	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/05/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA6 TRIBUTARY AREA A2-B
FILE: 18345HYDROA2BPOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.19	1	0.68
Rainfall data for year 10		
1.19	6	1.43
Rainfall data for year 10		
1.19	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.19	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.71	0.600	32.0	52.0	9.23	0.036
0.48	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.155 (hours)
++
Watershed area = 1.19(Ac.)
Catchment Lag time = 0.124 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 67.2781
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.19(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 14.39 (CFS))		
1	7.127	1.026
2	48.251	5.918
3	72.220	3.450

4	82.603	1.494
5	88.715	0.880
6	92.525	0.548
7	95.142	0.377
8	96.932	0.258
9	98.011	0.155
10	98.770	0.109
11	99.508	0.106
12	100.000	0.071

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114

43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087

97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6881	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070

151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
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204	2.4197	0.0060

205	2.4257	0.0060
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211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
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236	2.6045	0.0056
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244	2.6487	0.0055
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247	2.6651	0.0055
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249	2.6759	0.0054
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254	2.7030	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053

259	2.7297	0.0053
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262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
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274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020
17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021

20	0.0053	0.0032	0.0021
21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025
71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025

74	0.0064	0.0039	0.0025
75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033
125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033

128	0.0086	0.0053	0.0034
129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0090	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064
179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074

182	0.0195	0.0119	0.0076
183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031
233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030

236	0.0075	0.0046	0.0029
237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020
287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 1.87(CFS)

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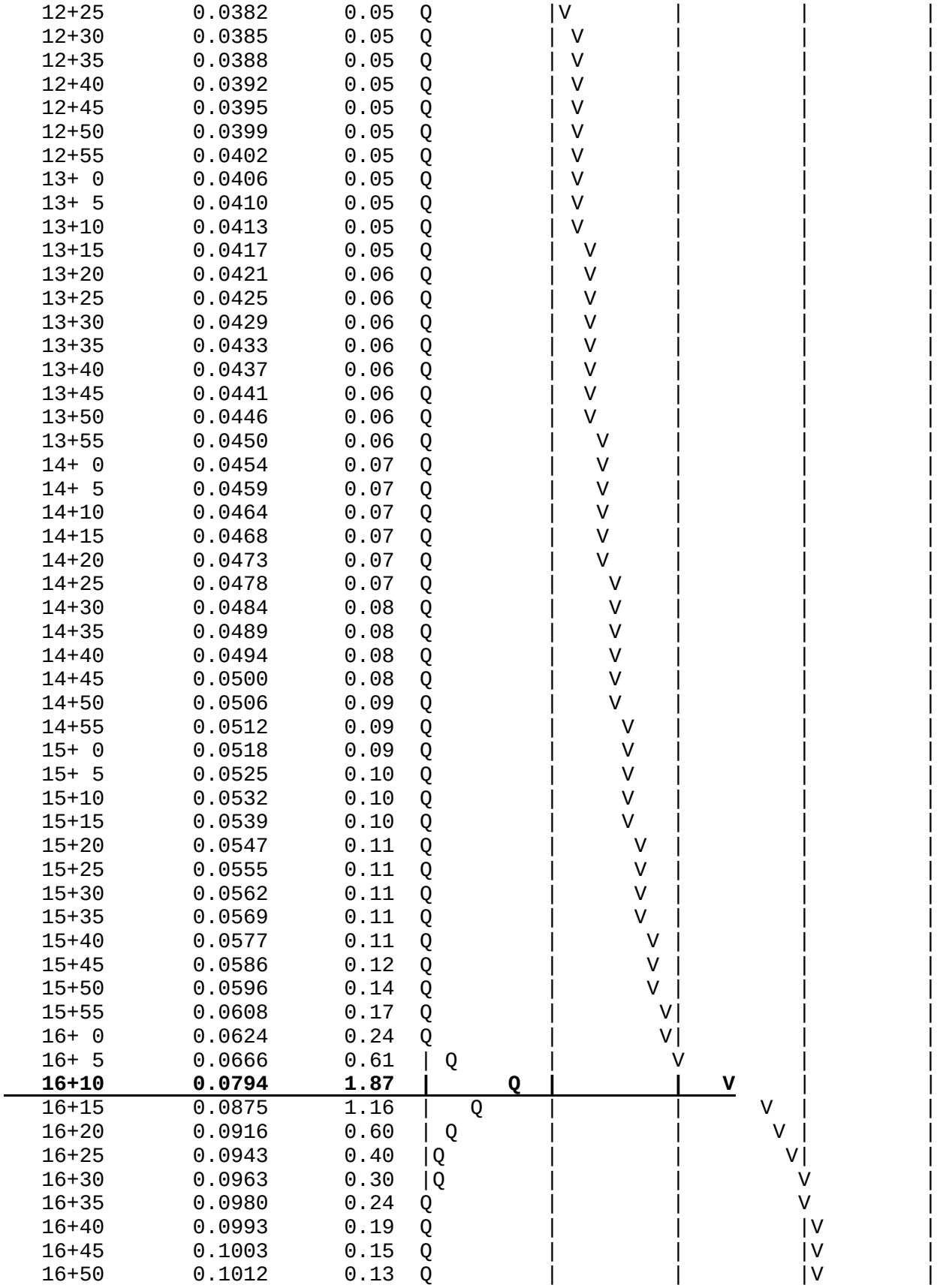
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0004	0.02	Q				
0+25	0.0006	0.03	Q				
0+30	0.0008	0.03	Q				
0+35	0.0010	0.03	Q				
0+40	0.0011	0.03	Q				
0+45	0.0013	0.03	Q				
0+50	0.0015	0.03	Q				
0+55	0.0017	0.03	Q				
1+ 0	0.0019	0.03	Q				
1+ 5	0.0021	0.03	Q				
1+10	0.0023	0.03	Q				
1+15	0.0025	0.03	Q				
1+20	0.0027	0.03	Q				
1+25	0.0029	0.03	Q				
1+30	0.0031	0.03	Q				
1+35	0.0033	0.03	QV				
1+40	0.0036	0.03	QV				
1+45	0.0038	0.03	QV				
1+50	0.0040	0.03	QV				
1+55	0.0042	0.03	QV				
2+ 0	0.0044	0.03	QV				
2+ 5	0.0046	0.03	QV				
2+10	0.0048	0.03	QV				
2+15	0.0050	0.03	QV				
2+20	0.0052	0.03	QV				
2+25	0.0054	0.03	QV				
2+30	0.0056	0.03	QV				
2+35	0.0058	0.03	QV				
2+40	0.0060	0.03	QV				
2+45	0.0063	0.03	QV				
2+50	0.0065	0.03	Q V				
2+55	0.0067	0.03	Q V				
3+ 0	0.0069	0.03	Q V				
3+ 5	0.0071	0.03	Q V				
3+10	0.0073	0.03	Q V				
3+15	0.0075	0.03	Q V				
3+20	0.0078	0.03	Q V				

3+25	0.0080	0.03	Q V	|	|	|	|
3+30	0.0082	0.03	Q V	|	|	|	|
3+35	0.0084	0.03	Q V	|	|	|	|
3+40	0.0086	0.03	Q V	|	|	|	|
3+45	0.0089	0.03	Q V	|	|	|	|
3+50	0.0091	0.03	Q V	|	|	|	|
3+55	0.0093	0.03	Q V	|	|	|	|
4+ 0	0.0095	0.03	Q V	|	|	|	|
4+ 5	0.0097	0.03	Q V	|	|	|	|
4+10	0.0100	0.03	Q V	|	|	|	|
4+15	0.0102	0.03	Q V	|	|	|	|
4+20	0.0104	0.03	Q V	|	|	|	|
4+25	0.0106	0.03	Q V	|	|	|	|
4+30	0.0109	0.03	Q V	|	|	|	|
4+35	0.0111	0.03	Q V	|	|	|	|
4+40	0.0113	0.03	Q V	|	|	|	|
4+45	0.0116	0.03	Q V	|	|	|	|
4+50	0.0118	0.03	Q V	|	|	|	|
4+55	0.0120	0.03	Q V	|	|	|	|
5+ 0	0.0123	0.03	Q V	|	|	|	|
5+ 5	0.0125	0.03	Q V	|	|	|	|
5+10	0.0127	0.03	Q V	|	|	|	|
5+15	0.0130	0.03	Q V	|	|	|	|
5+20	0.0132	0.03	Q V	|	|	|	|
5+25	0.0134	0.03	Q V	|	|	|	|
5+30	0.0137	0.03	Q V	|	|	|	|
5+35	0.0139	0.03	Q V	|	|	|	|
5+40	0.0141	0.03	Q V	|	|	|	|
5+45	0.0144	0.03	Q V	|	|	|	|
5+50	0.0146	0.04	Q V	|	|	|	|
5+55	0.0149	0.04	Q V	|	|	|	|
6+ 0	0.0151	0.04	Q V	|	|	|	|
6+ 5	0.0154	0.04	Q V	|	|	|	|
6+10	0.0156	0.04	Q V	|	|	|	|
6+15	0.0158	0.04	Q V	|	|	|	|
6+20	0.0161	0.04	Q V	|	|	|	|
6+25	0.0163	0.04	Q V	|	|	|	|
6+30	0.0166	0.04	Q V	|	|	|	|
6+35	0.0168	0.04	Q V	|	|	|	|
6+40	0.0171	0.04	Q V	|	|	|	|
6+45	0.0173	0.04	Q V	|	|	|	|
6+50	0.0176	0.04	Q V	|	|	|	|
6+55	0.0179	0.04	Q V	|	|	|	|
7+ 0	0.0181	0.04	Q V	|	|	|	|
7+ 5	0.0184	0.04	Q V	|	|	|	|
7+10	0.0186	0.04	Q V	|	|	|	|
7+15	0.0189	0.04	Q V	|	|	|	|
7+20	0.0191	0.04	Q V	|	|	|	|
7+25	0.0194	0.04	Q V	|	|	|	|
7+30	0.0197	0.04	Q V	|	|	|	|
7+35	0.0199	0.04	Q V	|	|	|	|
7+40	0.0202	0.04	Q V	|	|	|	|
7+45	0.0205	0.04	Q V	|	|	|	|
7+50	0.0207	0.04	Q V	|	|	|	|

7+55	0.0210	0.04	Q	V	|	|	|	|
8+ 0	0.0213	0.04	Q	V	|	|	|	|
8+ 5	0.0215	0.04	Q	V	|	|	|	|
8+10	0.0218	0.04	Q	V	|	|	|	|
8+15	0.0221	0.04	Q	V	|	|	|	|
8+20	0.0224	0.04	Q	V	|	|	|	|
8+25	0.0226	0.04	Q	V	|	|	|	|
8+30	0.0229	0.04	Q	V	|	|	|	|
8+35	0.0232	0.04	Q	V	|	|	|	|
8+40	0.0235	0.04	Q	V	|	|	|	|
8+45	0.0238	0.04	Q	V	|	|	|	|
8+50	0.0241	0.04	Q	V	|	|	|	|
8+55	0.0243	0.04	Q	V	|	|	|	|
9+ 0	0.0246	0.04	Q	V	|	|	|	|
9+ 5	0.0249	0.04	Q	V	|	|	|	|
9+10	0.0252	0.04	Q	V	|	|	|	|
9+15	0.0255	0.04	Q	V	|	|	|	|
9+20	0.0258	0.04	Q	V	|	|	|	|
9+25	0.0261	0.04	Q	V	|	|	|	|
9+30	0.0264	0.04	Q	V	|	|	|	|
9+35	0.0267	0.04	Q	V	|	|	|	|
9+40	0.0270	0.04	Q	V	|	|	|	|
9+45	0.0273	0.04	Q	V	|	|	|	|
9+50	0.0276	0.04	Q	V	|	|	|	|
9+55	0.0279	0.04	Q	V	|	|	|	|
10+ 0	0.0282	0.05	Q	V	|	|	|	|
10+ 5	0.0285	0.05	Q	V	|	|	|	|
10+10	0.0289	0.05	Q	V	|	|	|	|
10+15	0.0292	0.05	Q	V	|	|	|	|
10+20	0.0295	0.05	Q	V	|	|	|	|
10+25	0.0298	0.05	Q	V	|	|	|	|
10+30	0.0301	0.05	Q	V	|	|	|	|
10+35	0.0305	0.05	Q	V	|	|	|	|
10+40	0.0308	0.05	Q	V	|	|	|	|
10+45	0.0311	0.05	Q	V	|	|	|	|
10+50	0.0315	0.05	Q	V	|	|	|	|
10+55	0.0318	0.05	Q	V	|	|	|	|
11+ 0	0.0321	0.05	Q	V	|	|	|	|
11+ 5	0.0325	0.05	Q	V	|	|	|	|
11+10	0.0328	0.05	Q	V	|	|	|	|
11+15	0.0332	0.05	Q	V	|	|	|	|
11+20	0.0335	0.05	Q	V	|	|	|	|
11+25	0.0339	0.05	Q	V	|	|	|	|
11+30	0.0342	0.05	Q	V	|	|	|	|
11+35	0.0346	0.05	Q	V	|	|	|	|
11+40	0.0349	0.05	Q	V	|	|	|	|
11+45	0.0353	0.05	Q	|	V	|	|	|
11+50	0.0357	0.05	Q	|	V	|	|	|
11+55	0.0361	0.05	Q	|	V	|	|	|
12+ 0	0.0364	0.05	Q	|	V	|	|	|
12+ 5	0.0368	0.05	Q	|	V	|	|	|
12+10	0.0372	0.05	Q	|	V	|	|	|
12+15	0.0375	0.05	Q	|	V	|	|	|
12+20	0.0378	0.05	Q	|	V	|	|	|



16+55	0.1021	0.12	Q	|	|	| V	|
17+ 0	0.1028	0.10	Q	|	|	| V	|
17+ 5	0.1033	0.08	Q	|	|	| V	|
17+10	0.1038	0.07	Q	|	|	| V	|
17+15	0.1043	0.07	Q	|	|	| V	|
17+20	0.1048	0.07	Q	|	|	| V	|
17+25	0.1052	0.06	Q	|	|	| V	|
17+30	0.1057	0.06	Q	|	|	| V	|
17+35	0.1061	0.06	Q	|	|	| V	|
17+40	0.1065	0.06	Q	|	|	| V	|
17+45	0.1068	0.06	Q	|	|	| V	|
17+50	0.1072	0.05	Q	|	|	| V	|
17+55	0.1076	0.05	Q	|	|	| V	|
18+ 0	0.1079	0.05	Q	|	|	| V	|
18+ 5	0.1083	0.05	Q	|	|	| V	|
18+10	0.1086	0.05	Q	|	|	| V	|
18+15	0.1090	0.05	Q	|	|	| V	|
18+20	0.1094	0.05	Q	|	|	| V	|
18+25	0.1097	0.05	Q	|	|	| V	|
18+30	0.1101	0.05	Q	|	|	| V	|
18+35	0.1104	0.05	Q	|	|	| V	|
18+40	0.1108	0.05	Q	|	|	| V	|
18+45	0.1111	0.05	Q	|	|	| V	|
18+50	0.1115	0.05	Q	|	|	| V	|
18+55	0.1118	0.05	Q	|	|	| V	|
19+ 0	0.1121	0.05	Q	|	|	| V	|
19+ 5	0.1125	0.05	Q	|	|	| V	|
19+10	0.1128	0.05	Q	|	|	| V	|
19+15	0.1131	0.05	Q	|	|	| V	|
19+20	0.1134	0.05	Q	|	|	| V	|
19+25	0.1137	0.04	Q	|	|	| V	|
19+30	0.1140	0.04	Q	|	|	| V	|
19+35	0.1143	0.04	Q	|	|	| V	|
19+40	0.1146	0.04	Q	|	|	| V	|
19+45	0.1149	0.04	Q	|	|	| V	|
19+50	0.1152	0.04	Q	|	|	| V	|
19+55	0.1155	0.04	Q	|	|	| V	|
20+ 0	0.1158	0.04	Q	|	|	| V	|
20+ 5	0.1161	0.04	Q	|	|	| V	|
20+10	0.1164	0.04	Q	|	|	| V	|
20+15	0.1166	0.04	Q	|	|	| V	|
20+20	0.1169	0.04	Q	|	|	| V	|
20+25	0.1172	0.04	Q	|	|	| V	|
20+30	0.1174	0.04	Q	|	|	| V	|
20+35	0.1177	0.04	Q	|	|	| V	|
20+40	0.1180	0.04	Q	|	|	| V	|
20+45	0.1182	0.04	Q	|	|	| V	|
20+50	0.1185	0.04	Q	|	|	| V	|
20+55	0.1187	0.04	Q	|	|	| V	|
21+ 0	0.1190	0.04	Q	|	|	| V	|
21+ 5	0.1192	0.04	Q	|	|	| V	|
21+10	0.1195	0.04	Q	|	|	| V	|
21+15	0.1197	0.04	Q	|	|	| V	|
21+20	0.1200	0.04	Q	|	|	| V	|

21+25	0.1202	0.04	Q	|	|	|	V |
21+30	0.1205	0.03	Q	|	|	|	V |
21+35	0.1207	0.03	Q	|	|	|	V |
21+40	0.1209	0.03	Q	|	|	|	V |
21+45	0.1212	0.03	Q	|	|	|	V |
21+50	0.1214	0.03	Q	|	|	|	V |
21+55	0.1216	0.03	Q	|	|	|	V |
22+ 0	0.1219	0.03	Q	|	|	|	V |
22+ 5	0.1221	0.03	Q	|	|	|	V |
22+10	0.1223	0.03	Q	|	|	|	V |
22+15	0.1225	0.03	Q	|	|	|	V |
22+20	0.1228	0.03	Q	|	|	|	V |
22+25	0.1230	0.03	Q	|	|	|	V |
22+30	0.1232	0.03	Q	|	|	|	V |
22+35	0.1234	0.03	Q	|	|	|	V |
22+40	0.1236	0.03	Q	|	|	|	V |
22+45	0.1239	0.03	Q	|	|	|	V |
22+50	0.1241	0.03	Q	|	|	|	V |
22+55	0.1243	0.03	Q	|	|	|	V|
23+ 0	0.1245	0.03	Q	|	|	|	V|
23+ 5	0.1247	0.03	Q	|	|	|	V|
23+10	0.1249	0.03	Q	|	|	|	V|
23+15	0.1251	0.03	Q	|	|	|	V|
23+20	0.1253	0.03	Q	|	|	|	V|
23+25	0.1255	0.03	Q	|	|	|	V|
23+30	0.1257	0.03	Q	|	|	|	V|
23+35	0.1260	0.03	Q	|	|	|	V|
23+40	0.1262	0.03	Q	|	|	|	V|
23+45	0.1264	0.03	Q	|	|	|	V|
23+50	0.1266	0.03	Q	|	|	|	V|
23+55	0.1268	0.03	Q	|	|	|	V|
24+ 0	0.1270	0.03	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/08/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA3
TR 20527, CITY OF VICTORVILLE
DA3 TRIBUTARY AREA A3-A
FILE: 18345HYDROA3APOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
2.32	1	0.68
Rainfall data for year 10		
2.32	6	1.43
Rainfall data for year 10		
2.32	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
24.0	43.8	2.32	1.000	0.879	0.600	0.528

Area-averaged adjusted loss rate Fm (In/Hr) = 0.528

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.39	0.600	24.0	43.8	12.83	0.003
0.93	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.369
Area-averaged low loss fraction, Yb = 0.631
User entry of time of concentration = 0.173 (hours)
++
Watershed area = 2.32(Ac.)
Catchment Lag time = 0.138 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 60.2816
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.528(In/Hr)
Average low loss rate fraction (Yb) = 0.631 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 2.32(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 28.06 (CFS))		
1	5.639	1.582
2	41.763	10.135
3	68.252	7.432

4	79.586	3.180
5	86.241	1.867
6	90.539	1.206
7	93.495	0.829
8	95.603	0.591
9	97.102	0.421
10	98.023	0.258
11	98.695	0.189
12	99.393	0.196
13	100.000	0.170

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5506	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6418	0.0200
11	0.6605	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116

42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088

96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070

150	2.0716	0.0070
151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060

204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5079	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6044	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053

258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8187	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0032	0.0019
2	0.0051	0.0032	0.0019
3	0.0051	0.0032	0.0019
4	0.0051	0.0032	0.0019
5	0.0051	0.0032	0.0019
6	0.0051	0.0032	0.0019
7	0.0051	0.0032	0.0019
8	0.0051	0.0032	0.0019
9	0.0052	0.0033	0.0019
10	0.0052	0.0033	0.0019
11	0.0052	0.0033	0.0019
12	0.0052	0.0033	0.0019
13	0.0052	0.0033	0.0019
14	0.0052	0.0033	0.0019
15	0.0052	0.0033	0.0019
16	0.0053	0.0033	0.0019
17	0.0053	0.0033	0.0019
18	0.0053	0.0033	0.0020

19	0.0053	0.0033	0.0020
20	0.0053	0.0034	0.0020
21	0.0053	0.0034	0.0020
22	0.0053	0.0034	0.0020
23	0.0054	0.0034	0.0020
24	0.0054	0.0034	0.0020
25	0.0054	0.0034	0.0020
26	0.0054	0.0034	0.0020
27	0.0054	0.0034	0.0020
28	0.0054	0.0034	0.0020
29	0.0055	0.0034	0.0020
30	0.0055	0.0035	0.0020
31	0.0055	0.0035	0.0020
32	0.0055	0.0035	0.0020
33	0.0055	0.0035	0.0020
34	0.0055	0.0035	0.0020
35	0.0056	0.0035	0.0021
36	0.0056	0.0035	0.0021
37	0.0056	0.0035	0.0021
38	0.0056	0.0035	0.0021
39	0.0056	0.0036	0.0021
40	0.0057	0.0036	0.0021
41	0.0057	0.0036	0.0021
42	0.0057	0.0036	0.0021
43	0.0057	0.0036	0.0021
44	0.0057	0.0036	0.0021
45	0.0058	0.0036	0.0021
46	0.0058	0.0036	0.0021
47	0.0058	0.0037	0.0021
48	0.0058	0.0037	0.0021
49	0.0058	0.0037	0.0022
50	0.0058	0.0037	0.0022
51	0.0059	0.0037	0.0022
52	0.0059	0.0037	0.0022
53	0.0059	0.0037	0.0022
54	0.0059	0.0037	0.0022
55	0.0060	0.0038	0.0022
56	0.0060	0.0038	0.0022
57	0.0060	0.0038	0.0022
58	0.0060	0.0038	0.0022
59	0.0060	0.0038	0.0022
60	0.0061	0.0038	0.0022
61	0.0061	0.0038	0.0022
62	0.0061	0.0038	0.0023
63	0.0061	0.0039	0.0023
64	0.0061	0.0039	0.0023
65	0.0062	0.0039	0.0023
66	0.0062	0.0039	0.0023
67	0.0062	0.0039	0.0023
68	0.0062	0.0039	0.0023
69	0.0063	0.0040	0.0023
70	0.0063	0.0040	0.0023
71	0.0063	0.0040	0.0023
72	0.0063	0.0040	0.0023

73	0.0064	0.0040	0.0024
74	0.0064	0.0040	0.0024
75	0.0064	0.0041	0.0024
76	0.0065	0.0041	0.0024
77	0.0065	0.0041	0.0024
78	0.0065	0.0041	0.0024
79	0.0065	0.0041	0.0024
80	0.0066	0.0041	0.0024
81	0.0066	0.0042	0.0024
82	0.0066	0.0042	0.0024
83	0.0067	0.0042	0.0025
84	0.0067	0.0042	0.0025
85	0.0067	0.0042	0.0025
86	0.0067	0.0043	0.0025
87	0.0068	0.0043	0.0025
88	0.0068	0.0043	0.0025
89	0.0069	0.0043	0.0025
90	0.0069	0.0043	0.0025
91	0.0069	0.0044	0.0026
92	0.0069	0.0044	0.0026
93	0.0070	0.0044	0.0026
94	0.0070	0.0044	0.0026
95	0.0071	0.0044	0.0026
96	0.0071	0.0045	0.0026
97	0.0071	0.0045	0.0026
98	0.0072	0.0045	0.0026
99	0.0072	0.0045	0.0027
100	0.0072	0.0046	0.0027
101	0.0073	0.0046	0.0027
102	0.0073	0.0046	0.0027
103	0.0074	0.0046	0.0027
104	0.0074	0.0047	0.0027
105	0.0074	0.0047	0.0028
106	0.0075	0.0047	0.0028
107	0.0075	0.0047	0.0028
108	0.0076	0.0048	0.0028
109	0.0076	0.0048	0.0028
110	0.0076	0.0048	0.0028
111	0.0077	0.0049	0.0028
112	0.0077	0.0049	0.0029
113	0.0078	0.0049	0.0029
114	0.0078	0.0049	0.0029
115	0.0079	0.0050	0.0029
116	0.0079	0.0050	0.0029
117	0.0080	0.0050	0.0030
118	0.0080	0.0051	0.0030
119	0.0081	0.0051	0.0030
120	0.0082	0.0051	0.0030
121	0.0082	0.0052	0.0030
122	0.0083	0.0052	0.0031
123	0.0083	0.0053	0.0031
124	0.0084	0.0053	0.0031
125	0.0085	0.0053	0.0031
126	0.0085	0.0054	0.0031

127	0.0086	0.0054	0.0032
128	0.0086	0.0054	0.0032
129	0.0087	0.0055	0.0032
130	0.0088	0.0055	0.0032
131	0.0089	0.0056	0.0033
132	0.0089	0.0056	0.0033
133	0.0090	0.0057	0.0033
134	0.0091	0.0057	0.0033
135	0.0092	0.0058	0.0034
136	0.0092	0.0058	0.0034
137	0.0093	0.0059	0.0034
138	0.0094	0.0059	0.0035
139	0.0095	0.0060	0.0035
140	0.0096	0.0060	0.0035
141	0.0097	0.0061	0.0036
142	0.0097	0.0061	0.0036
143	0.0099	0.0062	0.0036
144	0.0099	0.0063	0.0037
145	0.0083	0.0052	0.0031
146	0.0084	0.0053	0.0031
147	0.0085	0.0054	0.0031
148	0.0086	0.0054	0.0032
149	0.0087	0.0055	0.0032
150	0.0088	0.0056	0.0033
151	0.0090	0.0057	0.0033
152	0.0091	0.0057	0.0034
153	0.0092	0.0058	0.0034
154	0.0093	0.0059	0.0034
155	0.0095	0.0060	0.0035
156	0.0096	0.0061	0.0036
157	0.0098	0.0062	0.0036
158	0.0099	0.0063	0.0037
159	0.0102	0.0064	0.0038
160	0.0103	0.0065	0.0038
161	0.0105	0.0066	0.0039
162	0.0107	0.0067	0.0039
163	0.0110	0.0069	0.0040
164	0.0111	0.0070	0.0041
165	0.0114	0.0072	0.0042
166	0.0116	0.0073	0.0043
167	0.0119	0.0075	0.0044
168	0.0121	0.0076	0.0045
169	0.0125	0.0079	0.0046
170	0.0127	0.0080	0.0047
171	0.0132	0.0083	0.0049
172	0.0134	0.0085	0.0050
173	0.0139	0.0088	0.0051
174	0.0142	0.0090	0.0052
175	0.0148	0.0093	0.0055
176	0.0152	0.0096	0.0056
177	0.0159	0.0100	0.0059
178	0.0163	0.0103	0.0060
179	0.0172	0.0109	0.0064
180	0.0177	0.0112	0.0066

181	0.0189	0.0119	0.0070
182	0.0195	0.0123	0.0072
183	0.0211	0.0133	0.0078
184	0.0220	0.0139	0.0081
185	0.0175	0.0110	0.0065
186	0.0186	0.0117	0.0069
187	0.0216	0.0136	0.0080
188	0.0236	0.0149	0.0087
189	0.0293	0.0185	0.0108
190	0.0338	0.0213	0.0125
191	0.0512	0.0323	0.0189
192	0.0744	0.0440	0.0304
193	0.3217	0.0440	0.2777
194	0.0403	0.0254	0.0149
195	0.0261	0.0164	0.0096
196	0.0200	0.0126	0.0074
197	0.0230	0.0145	0.0085
198	0.0203	0.0128	0.0075
199	0.0183	0.0115	0.0068
200	0.0167	0.0106	0.0062
201	0.0155	0.0098	0.0057
202	0.0145	0.0091	0.0054
203	0.0137	0.0086	0.0050
204	0.0129	0.0082	0.0048
205	0.0123	0.0078	0.0045
206	0.0117	0.0074	0.0043
207	0.0113	0.0071	0.0042
208	0.0108	0.0068	0.0040
209	0.0104	0.0066	0.0038
210	0.0101	0.0063	0.0037
211	0.0097	0.0061	0.0036
212	0.0094	0.0059	0.0035
213	0.0092	0.0058	0.0034
214	0.0089	0.0056	0.0033
215	0.0087	0.0055	0.0032
216	0.0084	0.0053	0.0031
217	0.0100	0.0063	0.0037
218	0.0098	0.0062	0.0036
219	0.0096	0.0061	0.0036
220	0.0094	0.0059	0.0035
221	0.0093	0.0058	0.0034
222	0.0091	0.0057	0.0034
223	0.0090	0.0056	0.0033
224	0.0088	0.0056	0.0033
225	0.0087	0.0055	0.0032
226	0.0085	0.0054	0.0032
227	0.0084	0.0053	0.0031
228	0.0083	0.0052	0.0031
229	0.0082	0.0052	0.0030
230	0.0081	0.0051	0.0030
231	0.0080	0.0050	0.0029
232	0.0079	0.0050	0.0029
233	0.0078	0.0049	0.0029
234	0.0077	0.0048	0.0028

235	0.0076	0.0048	0.0028
236	0.0075	0.0047	0.0028
237	0.0074	0.0047	0.0027
238	0.0073	0.0046	0.0027
239	0.0073	0.0046	0.0027
240	0.0072	0.0045	0.0027
241	0.0071	0.0045	0.0026
242	0.0070	0.0044	0.0026
243	0.0070	0.0044	0.0026
244	0.0069	0.0043	0.0025
245	0.0068	0.0043	0.0025
246	0.0068	0.0043	0.0025
247	0.0067	0.0042	0.0025
248	0.0066	0.0042	0.0025
249	0.0066	0.0042	0.0024
250	0.0065	0.0041	0.0024
251	0.0065	0.0041	0.0024
252	0.0064	0.0040	0.0024
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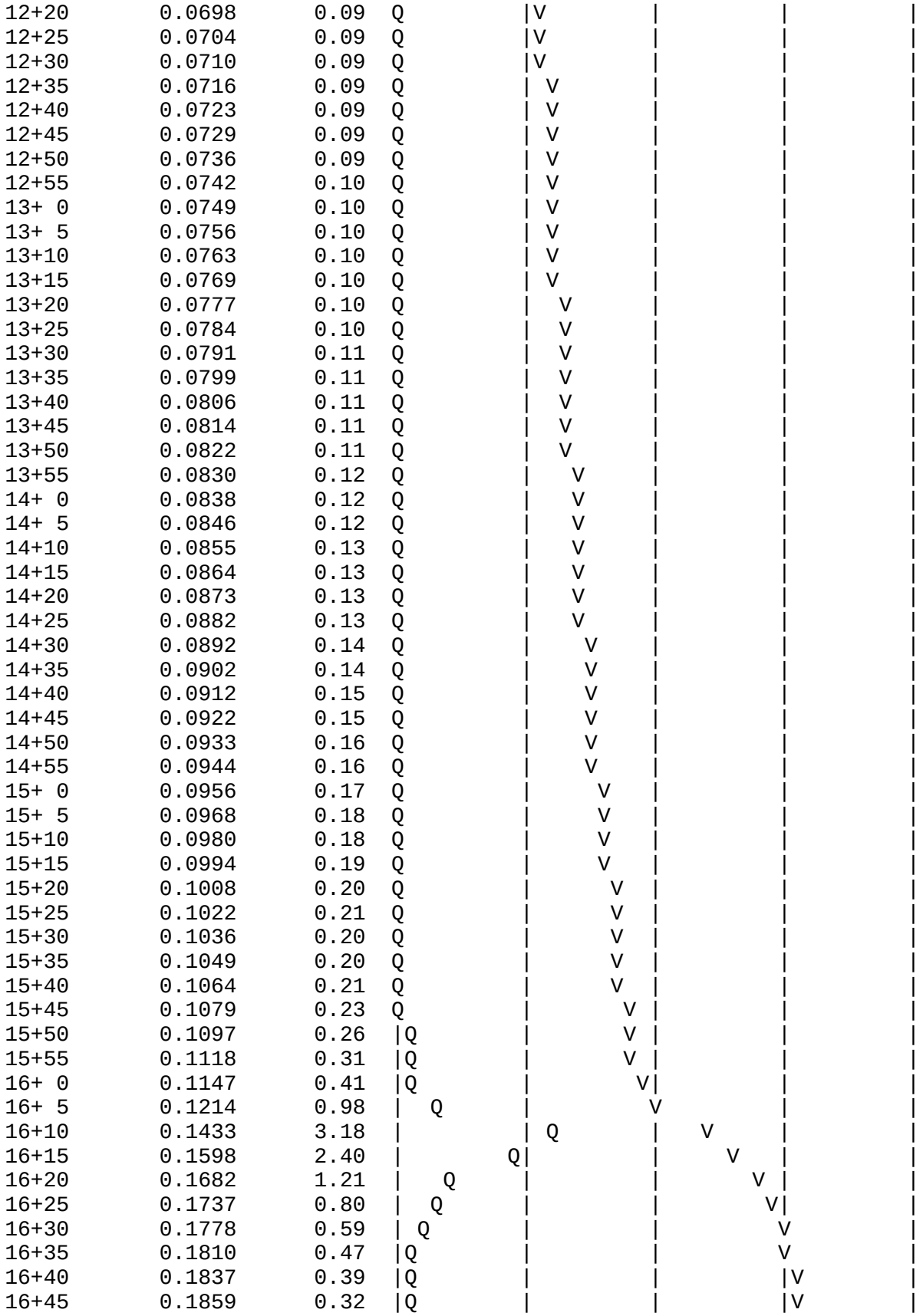
260	0.0060	0.0038	0.0022
261	0.0060	0.0038	0.0022
262	0.0059	0.0037	0.0022
263	0.0059	0.0037	0.0022
264	0.0059	0.0037	0.0022
265	0.0058	0.0037	0.0021
266	0.0058	0.0036	0.0021
267	0.0057	0.0036	0.0021
268	0.0057	0.0036	0.0021
269	0.0057	0.0036	0.0021
270	0.0056	0.0035	0.0021
271	0.0056	0.0035	0.0021
272	0.0056	0.0035	0.0021
273	0.0055	0.0035	0.0020
274	0.0055	0.0035	0.0020
275	0.0055	0.0034	0.0020
276	0.0054	0.0034	0.0020
277	0.0054	0.0034	0.0020
278	0.0054	0.0034	0.0020
279	0.0053	0.0034	0.0020
280	0.0053	0.0033	0.0020
281	0.0053	0.0033	0.0019
282	0.0052	0.0033	0.0019
283	0.0052	0.0033	0.0019
284	0.0052	0.0033	0.0019
285	0.0052	0.0032	0.0019
286	0.0051	0.0032	0.0019
287	0.0051	0.0032	0.0019
288	0.0051	0.0032	0.0019

```
    ------------------------------------------------------------------------
    ------------------------------------------------------------------------
    Total soil rain loss =      1.65(In)
    Total effective rainfall =      1.23(In)
    Peak flow rate in flood hydrograph =      3.18(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       0.0002      0.02  Q          |         |         |         |
  0+15       0.0004      0.04  Q          |         |         |         |
  0+20       0.0007      0.04  Q          |         |         |         |
  0+25       0.0010      0.05  Q          |         |         |         |
  0+30       0.0013      0.05  Q          |         |         |         |
  0+35       0.0017      0.05  Q          |         |         |         |
  0+40       0.0020      0.05  Q          |         |         |         |
  0+45       0.0024      0.05  Q          |         |         |         |
  0+50       0.0028      0.05  Q          |         |         |         |
  0+55       0.0031      0.05  Q          |         |         |         |
  1+ 0       0.0035      0.05  Q          |         |         |         |
  1+ 5       0.0039      0.05  Q          |         |         |         |
  1+10       0.0042      0.05  Q          |         |         |         |
  1+15       0.0046      0.05  Q          |         |         |         |
  1+20       0.0050      0.05  Q          |         |         |         |
  1+25       0.0053      0.05  Q          |         |         |         |
  1+30       0.0057      0.05  Q          |         |         |         |
  1+35       0.0061      0.05  QV         |         |         |         |
  1+40       0.0065      0.05  QV         |         |         |         |
  1+45       0.0068      0.05  QV         |         |         |         |
  1+50       0.0072      0.06  QV         |         |         |         |
  1+55       0.0076      0.06  QV         |         |         |         |
  2+ 0       0.0080      0.06  QV         |         |         |         |
  2+ 5       0.0084      0.06  QV         |         |         |         |
  2+10       0.0088      0.06  QV         |         |         |         |
  2+15       0.0091      0.06  QV         |         |         |         |
  2+20       0.0095      0.06  QV         |         |         |         |
  2+25       0.0099      0.06  QV         |         |         |         |
  2+30       0.0103      0.06  QV         |         |         |         |
  2+35       0.0107      0.06  QV         |         |         |         |
  2+40       0.0111      0.06  QV         |         |         |         |
  2+45       0.0115      0.06  QV         |         |         |         |
  2+50       0.0119      0.06  Q V        |         |         |         |
  2+55       0.0123      0.06  Q V        |         |         |         |
  3+ 0       0.0127      0.06  Q V        |         |         |         |
  3+ 5       0.0131      0.06  Q V        |         |         |         |
  3+10       0.0135      0.06  Q V        |         |         |         |
  3+15       0.0139      0.06  Q V        |         |         |         |
```

3+20	0.0143	0.06	Q V	|	|	|	|
3+25	0.0147	0.06	Q V	|	|	|	|
3+30	0.0151	0.06	Q V	|	|	|	|
3+35	0.0155	0.06	Q V	|	|	|	|
3+40	0.0159	0.06	Q V	|	|	|	|
3+45	0.0163	0.06	Q V	|	|	|	|
3+50	0.0167	0.06	Q V	|	|	|	|
3+55	0.0171	0.06	Q V	|	|	|	|
4+ 0	0.0175	0.06	Q V	|	|	|	|
4+ 5	0.0179	0.06	Q V	|	|	|	|
4+10	0.0183	0.06	Q V	|	|	|	|
4+15	0.0187	0.06	Q V	|	|	|	|
4+20	0.0192	0.06	Q V	|	|	|	|
4+25	0.0196	0.06	Q V	|	|	|	|
4+30	0.0200	0.06	Q V	|	|	|	|
4+35	0.0204	0.06	Q V	|	|	|	|
4+40	0.0208	0.06	Q V	|	|	|	|
4+45	0.0213	0.06	Q V	|	|	|	|
4+50	0.0217	0.06	Q V	|	|	|	|
4+55	0.0221	0.06	Q V	|	|	|	|
5+ 0	0.0226	0.06	Q V	|	|	|	|
5+ 5	0.0230	0.06	Q V	|	|	|	|
5+10	0.0234	0.06	Q V	|	|	|	|
5+15	0.0238	0.06	Q V	|	|	|	|
5+20	0.0243	0.06	Q V	|	|	|	|
5+25	0.0247	0.06	Q V	|	|	|	|
5+30	0.0252	0.06	Q V	|	|	|	|
5+35	0.0256	0.06	Q V	|	|	|	|
5+40	0.0260	0.06	Q V	|	|	|	|
5+45	0.0265	0.06	Q V	|	|	|	|
5+50	0.0269	0.06	Q V	|	|	|	|
5+55	0.0274	0.06	Q V	|	|	|	|
6+ 0	0.0278	0.07	Q V	|	|	|	|
6+ 5	0.0283	0.07	Q V	|	|	|	|
6+10	0.0287	0.07	Q V	|	|	|	|
6+15	0.0292	0.07	Q V	|	|	|	|
6+20	0.0296	0.07	Q V	|	|	|	|
6+25	0.0301	0.07	Q V	|	|	|	|
6+30	0.0306	0.07	Q V	|	|	|	|
6+35	0.0310	0.07	Q V	|	|	|	|
6+40	0.0315	0.07	Q V	|	|	|	|
6+45	0.0319	0.07	Q V	|	|	|	|
6+50	0.0324	0.07	Q V	|	|	|	|
6+55	0.0329	0.07	Q V	|	|	|	|
7+ 0	0.0334	0.07	Q V	|	|	|	|
7+ 5	0.0338	0.07	Q V	|	|	|	|
7+10	0.0343	0.07	Q V	|	|	|	|
7+15	0.0348	0.07	Q V	|	|	|	|
7+20	0.0353	0.07	Q V	|	|	|	|
7+25	0.0358	0.07	Q V	|	|	|	|
7+30	0.0362	0.07	Q V	|	|	|	|
7+35	0.0367	0.07	Q V	|	|	|	|
7+40	0.0372	0.07	Q V	|	|	|	|
7+45	0.0377	0.07	Q V	|	|	|	|

7+50	0.0382	0.07	Q	V	|	|	|	|
7+55	0.0387	0.07	Q	V	|	|	|	|
8+ 0	0.0392	0.07	Q	V	|	|	|	|
8+ 5	0.0397	0.07	Q	V	|	|	|	|
8+10	0.0402	0.07	Q	V	|	|	|	|
8+15	0.0407	0.07	Q	V	|	|	|	|
8+20	0.0412	0.07	Q	V	|	|	|	|
8+25	0.0417	0.07	Q	V	|	|	|	|
8+30	0.0423	0.07	Q	V	|	|	|	|
8+35	0.0428	0.08	Q	V	|	|	|	|
8+40	0.0433	0.08	Q	V	|	|	|	|
8+45	0.0438	0.08	Q	V	|	|	|	|
8+50	0.0443	0.08	Q	V	|	|	|	|
8+55	0.0449	0.08	Q	V	|	|	|	|
9+ 0	0.0454	0.08	Q	V	|	|	|	|
9+ 5	0.0459	0.08	Q	V	|	|	|	|
9+10	0.0465	0.08	Q	V	|	|	|	|
9+15	0.0470	0.08	Q	V	|	|	|	|
9+20	0.0476	0.08	Q	V	|	|	|	|
9+25	0.0481	0.08	Q	V	|	|	|	|
9+30	0.0487	0.08	Q	V	|	|	|	|
9+35	0.0492	0.08	Q	V	|	|	|	|
9+40	0.0498	0.08	Q	V	|	|	|	|
9+45	0.0503	0.08	Q	V	|	|	|	|
9+50	0.0509	0.08	Q	V	|	|	|	|
9+55	0.0515	0.08	Q	V	|	|	|	|
10+ 0	0.0521	0.08	Q	V	|	|	|	|
10+ 5	0.0526	0.08	Q	V	|	|	|	|
10+10	0.0532	0.08	Q	V	|	|	|	|
10+15	0.0538	0.08	Q	V	|	|	|	|
10+20	0.0544	0.09	Q	V	|	|	|	|
10+25	0.0550	0.09	Q	V	|	|	|	|
10+30	0.0556	0.09	Q	V	|	|	|	|
10+35	0.0562	0.09	Q	V	|	|	|	|
10+40	0.0568	0.09	Q	V	|	|	|	|
10+45	0.0574	0.09	Q	V	|	|	|	|
10+50	0.0580	0.09	Q	V	|	|	|	|
10+55	0.0586	0.09	Q	V	|	|	|	|
11+ 0	0.0593	0.09	Q	V	|	|	|	|
11+ 5	0.0599	0.09	Q	V	|	|	|	|
11+10	0.0605	0.09	Q	V	|	|	|	|
11+15	0.0612	0.09	Q	V	|	|	|	|
11+20	0.0618	0.09	Q	V	|	|	|	|
11+25	0.0625	0.09	Q	V	|	|	|	|
11+30	0.0631	0.10	Q	V	|	|	|	|
11+35	0.0638	0.10	Q	V	|	|	|	|
11+40	0.0644	0.10	Q	V	|	|	|	|
11+45	0.0651	0.10	Q	V	|	|	|	|
11+50	0.0658	0.10	Q	|	V	|	|	|
11+55	0.0665	0.10	Q	|	V	|	|	|
12+ 0	0.0672	0.10	Q	|	V	|	|	|
12+ 5	0.0679	0.10	Q	|	V	|	|	|
12+10	0.0685	0.10	Q	|	V	|	|	|
12+15	0.0692	0.09	Q	|	V	|	|	|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12+25 0.0704 0.09
12+30 0.0710 0.09
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12+40 0.0723 0.09
12+45 0.0729 0.09
12+50 0.0736 0.09
12+55 0.0742 0.10
13+ 0 0.0749 0.10
13+ 5 0.0756 0.10
13+10 0.0763 0.10
13+15 0.0769 0.10
13+20 0.0777 0.10
13+25 0.0784 0.10
13+30 0.0791 0.11
13+35 0.0799 0.11
13+40 0.0806 0.11
13+45 0.0814 0.11
13+50 0.0822 0.11
13+55 0.0830 0.12
14+ 0 0.0838 0.12
14+ 5 0.0846 0.12
14+10 0.0855 0.13
14+15 0.0864 0.13
14+20 0.0873 0.13
14+25 0.0882 0.13
14+30 0.0892 0.14
14+35 0.0902 0.14
14+40 0.0912 0.15
14+45 0.0922 0.15
14+50 0.0933 0.16
14+55 0.0944 0.16
15+ 0 0.0956 0.17
15+ 5 0.0968 0.18
15+10 0.0980 0.18
15+15 0.0994 0.19
15+20 0.1008 0.20
15+25 0.1022 0.21
15+30 0.1036 0.20
15+35 0.1049 0.20
15+40 0.1064 0.21
15+45 0.1079 0.23
15+50 0.1097 0.26
15+55 0.1118 0.31
16+ 0 0.1147 0.41
16+ 5 0.1214 0.98
16+10 0.1433 3.18
16+15 0.1598 2.40
16+20 0.1682 1.21
16+25 0.1737 0.80
16+30 0.1778 0.59
16+35 0.1810 0.47
16+40 0.1837 0.39
16+45 0.1859 0.32

```
16+50       0.1877      0.26  |Q        |          |          |V         |
16+55       0.1892      0.23  Q        |          |          |V         |
17+ 0       0.1907      0.22  Q        |          |          | V        |
17+ 5       0.1921      0.20  Q        |          |          | V        |
17+10       0.1930      0.14  Q        |          |          | V        |
17+15       0.1940      0.13  Q        |          |          | V        |
17+20       0.1948      0.13  Q        |          |          | V        |
17+25       0.1957      0.12  Q        |          |          |  V       |
17+30       0.1965      0.12  Q        |          |          |  V       |
17+35       0.1972      0.11  Q        |          |          |  V       |
17+40       0.1980      0.11  Q        |          |          |  V       |
17+45       0.1987      0.10  Q        |          |          |  V       |
17+50       0.1994      0.10  Q        |          |          |  V       |
17+55       0.2000      0.10  Q        |          |          |  V       |
18+ 0       0.2007      0.09  Q        |          |          |  V       |
18+ 5       0.2013      0.09  Q        |          |          |  V       |
18+10       0.2020      0.10  Q        |          |          |   V      |
18+15       0.2027      0.10  Q        |          |          |   V      |
18+20       0.2034      0.10  Q        |          |          |   V      |
18+25       0.2040      0.10  Q        |          |          |   V      |
18+30       0.2047      0.10  Q        |          |          |   V      |
18+35       0.2054      0.10  Q        |          |          |   V      |
18+40       0.2060      0.09  Q        |          |          |   V      |
18+45       0.2067      0.09  Q        |          |          |   V      |
18+50       0.2073      0.09  Q        |          |          |    V     |
18+55       0.2079      0.09  Q        |          |          |    V     |
19+ 0       0.2085      0.09  Q        |          |          |    V     |
19+ 5       0.2091      0.09  Q        |          |          |    V     |
19+10       0.2097      0.09  Q        |          |          |    V     |
19+15       0.2103      0.09  Q        |          |          |    V     |
19+20       0.2109      0.08  Q        |          |          |    V     |
19+25       0.2115      0.08  Q        |          |          |    V     |
19+30       0.2120      0.08  Q        |          |          |    V     |
19+35       0.2126      0.08  Q        |          |          |    V     |
19+40       0.2131      0.08  Q        |          |          |    V     |
19+45       0.2137      0.08  Q        |          |          |     V    |
19+50       0.2142      0.08  Q        |          |          |     V    |
19+55       0.2148      0.08  Q        |          |          |     V    |
20+ 0       0.2153      0.08  Q        |          |          |     V    |
20+ 5       0.2158      0.08  Q        |          |          |     V    |
20+10       0.2163      0.07  Q        |          |          |     V    |
20+15       0.2168      0.07  Q        |          |          |     V    |
20+20       0.2173      0.07  Q        |          |          |     V    |
20+25       0.2178      0.07  Q        |          |          |     V    |
20+30       0.2183      0.07  Q        |          |          |     V    |
20+35       0.2188      0.07  Q        |          |          |     V    |
20+40       0.2193      0.07  Q        |          |          |      V   |
20+45       0.2198      0.07  Q        |          |          |      V   |
20+50       0.2203      0.07  Q        |          |          |      V   |
20+55       0.2207      0.07  Q        |          |          |      V   |
21+ 0       0.2212      0.07  Q        |          |          |      V   |
21+ 5       0.2217      0.07  Q        |          |          |      V   |
21+10       0.2221      0.07  Q        |          |          |      V   |
21+15       0.2226      0.07  Q        |          |          |      V   |
```

21+20	0.2230	0.07	Q	|	|	|	V |
21+25	0.2235	0.07	Q	|	|	|	V |
21+30	0.2239	0.06	Q	|	|	|	V |
21+35	0.2244	0.06	Q	|	|	|	V |
21+40	0.2248	0.06	Q	|	|	|	V |
21+45	0.2253	0.06	Q	|	|	|	V |
21+50	0.2257	0.06	Q	|	|	|	V |
21+55	0.2261	0.06	Q	|	|	|	V |
22+ 0	0.2265	0.06	Q	|	|	|	V |
22+ 5	0.2270	0.06	Q	|	|	|	V |
22+10	0.2274	0.06	Q	|	|	|	V |
22+15	0.2278	0.06	Q	|	|	|	V |
22+20	0.2282	0.06	Q	|	|	|	V |
22+25	0.2286	0.06	Q	|	|	|	V |
22+30	0.2290	0.06	Q	|	|	|	V |
22+35	0.2294	0.06	Q	|	|	|	V |
22+40	0.2298	0.06	Q	|	|	|	V |
22+45	0.2302	0.06	Q	|	|	|	V |
22+50	0.2306	0.06	Q	|	|	|	V |
22+55	0.2310	0.06	Q	|	|	|	V|
23+ 0	0.2314	0.06	Q	|	|	|	V|
23+ 5	0.2318	0.06	Q	|	|	|	V|
23+10	0.2322	0.06	Q	|	|	|	V|
23+15	0.2326	0.06	Q	|	|	|	V|
23+20	0.2330	0.06	Q	|	|	|	V|
23+25	0.2334	0.06	Q	|	|	|	V|
23+30	0.2337	0.06	Q	|	|	|	V|
23+35	0.2341	0.05	Q	|	|	|	V|
23+40	0.2345	0.05	Q	|	|	|	V|
23+45	0.2349	0.05	Q	|	|	|	V|
23+50	0.2352	0.05	Q	|	|	|	V|
23+55	0.2356	0.05	Q	|	|	|	V|
24+ 0	0.2360	0.05	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/05/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA7 **TRIBUTARY AREA A3-B**
FILE: 18345HYDROA3BPOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
1.16	1	0.68
Rainfall data for year 10		
1.16	6	1.43
Rainfall data for year 10		
1.16	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.16	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.70	0.600	32.0	52.0	9.23	0.036
0.46	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.154 (hours)
++
Watershed area = 1.16(Ac.)
Catchment Lag time = 0.123 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 67.7287
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 1.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 14.03 (CFS))	
1	7.236	1.015
2	48.630	5.807
3	72.451	3.342

4	82.778	1.449
5	88.854	0.852
6	92.641	0.531
7	95.234	0.364
8	97.004	0.248
9	98.054	0.147
10	98.821	0.108
11	99.548	0.102
12	100.000	0.063

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3961	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5214	0.0338
6	0.5507	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6419	0.0200
11	0.6605	0.0186
12	0.6780	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7643	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8210	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0333	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119
40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114

43	1.1537	0.0113
44	1.1648	0.0111
45	1.1758	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3704	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3964	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089
94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087

97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6881	0.0085
101	1.6966	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7550	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071
148	2.0577	0.0070
149	2.0647	0.0070
150	2.0717	0.0070

151	2.0786	0.0070
152	2.0856	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1538	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1805	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3157	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060
202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060

205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5080	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6045	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6267	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6542	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7030	0.0054
255	2.7083	0.0054
256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053

259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7720	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8188	0.0052
277	2.8239	0.0052
278	2.8291	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020
17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021

20	0.0053	0.0032	0.0021
21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025
71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025

74	0.0064	0.0039	0.0025
75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033
125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033

128	0.0086	0.0053	0.0034
129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0090	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064
179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074

182	0.0195	0.0119	0.0076
183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031
233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030

236	0.0075	0.0046	0.0029
237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020
287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 1.83(CFS)

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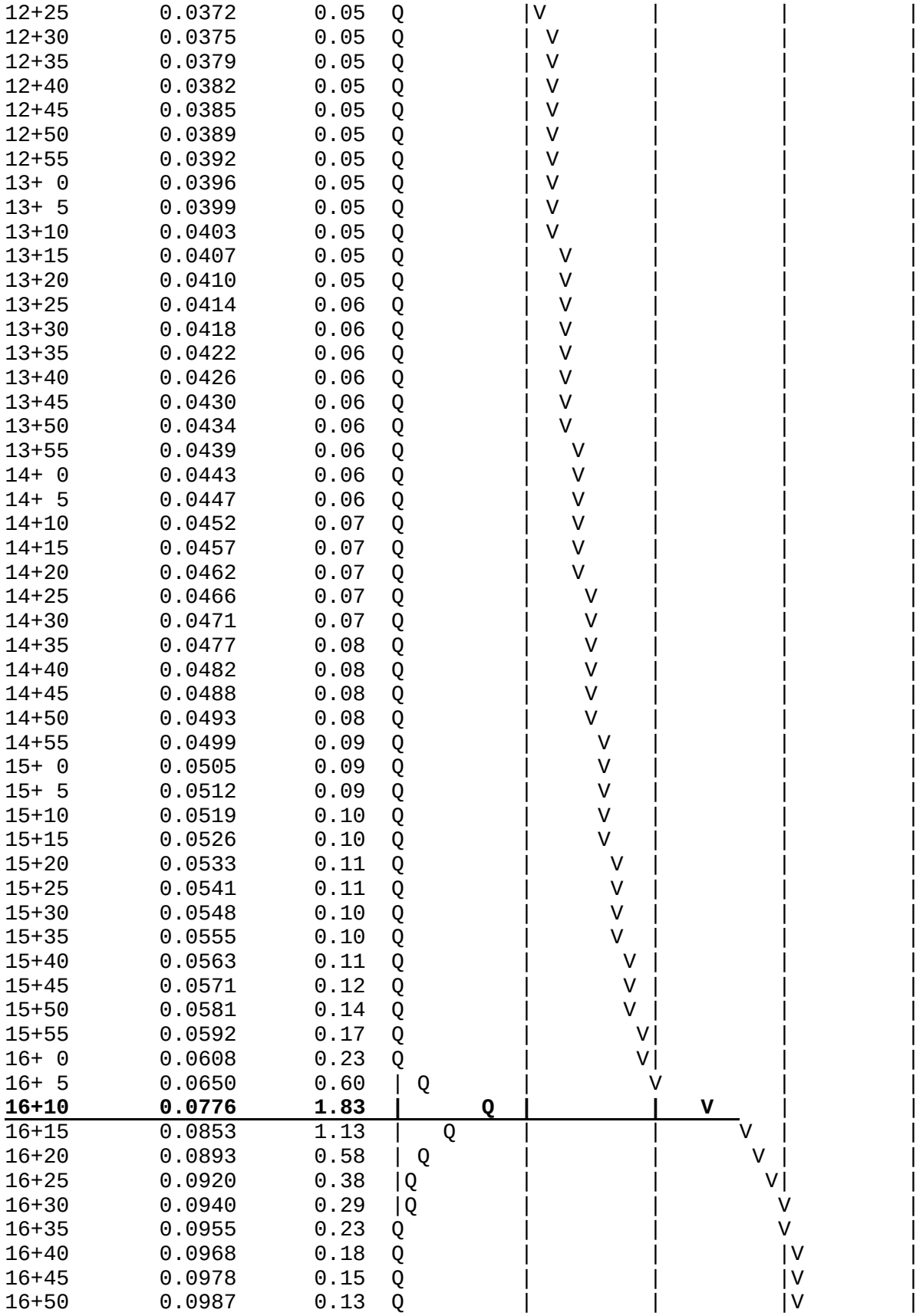
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0004	0.02	Q				
0+25	0.0006	0.02	Q				
0+30	0.0008	0.03	Q				
0+35	0.0009	0.03	Q				
0+40	0.0011	0.03	Q				
0+45	0.0013	0.03	Q				
0+50	0.0015	0.03	Q				
0+55	0.0017	0.03	Q				
1+ 0	0.0019	0.03	Q				
1+ 5	0.0021	0.03	Q				
1+10	0.0023	0.03	Q				
1+15	0.0025	0.03	Q				
1+20	0.0027	0.03	Q				
1+25	0.0029	0.03	Q				
1+30	0.0031	0.03	Q				
1+35	0.0033	0.03	QV				
1+40	0.0035	0.03	QV				
1+45	0.0037	0.03	QV				
1+50	0.0039	0.03	QV				
1+55	0.0041	0.03	QV				
2+ 0	0.0043	0.03	QV				
2+ 5	0.0045	0.03	QV				
2+10	0.0047	0.03	QV				
2+15	0.0049	0.03	QV				
2+20	0.0051	0.03	QV				
2+25	0.0053	0.03	QV				
2+30	0.0055	0.03	QV				
2+35	0.0057	0.03	QV				
2+40	0.0059	0.03	QV				
2+45	0.0061	0.03	QV				
2+50	0.0063	0.03	Q V				
2+55	0.0065	0.03	Q V				
3+ 0	0.0067	0.03	Q V				
3+ 5	0.0069	0.03	Q V				
3+10	0.0071	0.03	Q V				
3+15	0.0074	0.03	Q V				
3+20	0.0076	0.03	Q V				

3+25	0.0078	0.03	Q V	|	|	|	|
3+30	0.0080	0.03	Q V	|	|	|	|
3+35	0.0082	0.03	Q V	|	|	|	|
3+40	0.0084	0.03	Q V	|	|	|	|
3+45	0.0086	0.03	Q V	|	|	|	|
3+50	0.0089	0.03	Q V	|	|	|	|
3+55	0.0091	0.03	Q V	|	|	|	|
4+ 0	0.0093	0.03	Q V	|	|	|	|
4+ 5	0.0095	0.03	Q V	|	|	|	|
4+10	0.0097	0.03	Q V	|	|	|	|
4+15	0.0099	0.03	Q V	|	|	|	|
4+20	0.0102	0.03	Q V	|	|	|	|
4+25	0.0104	0.03	Q V	|	|	|	|
4+30	0.0106	0.03	Q V	|	|	|	|
4+35	0.0108	0.03	Q V	|	|	|	|
4+40	0.0110	0.03	Q V	|	|	|	|
4+45	0.0113	0.03	Q V	|	|	|	|
4+50	0.0115	0.03	Q V	|	|	|	|
4+55	0.0117	0.03	Q V	|	|	|	|
5+ 0	0.0120	0.03	Q V	|	|	|	|
5+ 5	0.0122	0.03	Q V	|	|	|	|
5+10	0.0124	0.03	Q V	|	|	|	|
5+15	0.0126	0.03	Q V	|	|	|	|
5+20	0.0129	0.03	Q V	|	|	|	|
5+25	0.0131	0.03	Q V	|	|	|	|
5+30	0.0133	0.03	Q V	|	|	|	|
5+35	0.0136	0.03	Q V	|	|	|	|
5+40	0.0138	0.03	Q V	|	|	|	|
5+45	0.0140	0.03	Q V	|	|	|	|
5+50	0.0143	0.03	Q V	|	|	|	|
5+55	0.0145	0.03	Q V	|	|	|	|
6+ 0	0.0147	0.03	Q V	|	|	|	|
6+ 5	0.0150	0.03	Q V	|	|	|	|
6+10	0.0152	0.03	Q V	|	|	|	|
6+15	0.0155	0.03	Q V	|	|	|	|
6+20	0.0157	0.03	Q V	|	|	|	|
6+25	0.0159	0.04	Q V	|	|	|	|
6+30	0.0162	0.04	Q V	|	|	|	|
6+35	0.0164	0.04	Q V	|	|	|	|
6+40	0.0167	0.04	Q V	|	|	|	|
6+45	0.0169	0.04	Q V	|	|	|	|
6+50	0.0172	0.04	Q V	|	|	|	|
6+55	0.0174	0.04	Q V	|	|	|	|
7+ 0	0.0177	0.04	Q V	|	|	|	|
7+ 5	0.0179	0.04	Q V	|	|	|	|
7+10	0.0182	0.04	Q V	|	|	|	|
7+15	0.0184	0.04	Q V	|	|	|	|
7+20	0.0187	0.04	Q V	|	|	|	|
7+25	0.0189	0.04	Q V	|	|	|	|
7+30	0.0192	0.04	Q V	|	|	|	|
7+35	0.0194	0.04	Q V	|	|	|	|
7+40	0.0197	0.04	Q V	|	|	|	|
7+45	0.0200	0.04	Q V	|	|	|	|
7+50	0.0202	0.04	Q V	|	|	|	|

7+55	0.0205	0.04	Q	V	|	|	|	|
8+ 0	0.0207	0.04	Q	V	|	|	|	|
8+ 5	0.0210	0.04	Q	V	|	|	|	|
8+10	0.0213	0.04	Q	V	|	|	|	|
8+15	0.0215	0.04	Q	V	|	|	|	|
8+20	0.0218	0.04	Q	V	|	|	|	|
8+25	0.0221	0.04	Q	V	|	|	|	|
8+30	0.0224	0.04	Q	V	|	|	|	|
8+35	0.0226	0.04	Q	V	|	|	|	|
8+40	0.0229	0.04	Q	V	|	|	|	|
8+45	0.0232	0.04	Q	V	|	|	|	|
8+50	0.0235	0.04	Q	V	|	|	|	|
8+55	0.0237	0.04	Q	V	|	|	|	|
9+ 0	0.0240	0.04	Q	V	|	|	|	|
9+ 5	0.0243	0.04	Q	V	|	|	|	|
9+10	0.0246	0.04	Q	V	|	|	|	|
9+15	0.0249	0.04	Q	V	|	|	|	|
9+20	0.0252	0.04	Q	V	|	|	|	|
9+25	0.0254	0.04	Q	V	|	|	|	|
9+30	0.0257	0.04	Q	V	|	|	|	|
9+35	0.0260	0.04	Q	V	|	|	|	|
9+40	0.0263	0.04	Q	V	|	|	|	|
9+45	0.0266	0.04	Q	V	|	|	|	|
9+50	0.0269	0.04	Q	V	|	|	|	|
9+55	0.0272	0.04	Q	V	|	|	|	|
10+ 0	0.0275	0.04	Q	V	|	|	|	|
10+ 5	0.0278	0.04	Q	V	|	|	|	|
10+10	0.0281	0.04	Q	V	|	|	|	|
10+15	0.0284	0.04	Q	V	|	|	|	|
10+20	0.0288	0.05	Q	V	|	|	|	|
10+25	0.0291	0.05	Q	V	|	|	|	|
10+30	0.0294	0.05	Q	V	|	|	|	|
10+35	0.0297	0.05	Q	V	|	|	|	|
10+40	0.0300	0.05	Q	V	|	|	|	|
10+45	0.0303	0.05	Q	V	|	|	|	|
10+50	0.0307	0.05	Q	V	|	|	|	|
10+55	0.0310	0.05	Q	V	|	|	|	|
11+ 0	0.0313	0.05	Q	V	|	|	|	|
11+ 5	0.0317	0.05	Q	V	|	|	|	|
11+10	0.0320	0.05	Q	V	|	|	|	|
11+15	0.0323	0.05	Q	V	|	|	|	|
11+20	0.0327	0.05	Q	V	|	|	|	|
11+25	0.0330	0.05	Q	V	|	|	|	|
11+30	0.0334	0.05	Q	V	|	|	|	|
11+35	0.0337	0.05	Q	V	|	|	|	|
11+40	0.0341	0.05	Q	V	|	|	|	|
11+45	0.0344	0.05	Q	V	|	|	|	|
11+50	0.0348	0.05	Q	V	|	|	|	|
11+55	0.0351	0.05	Q	V	|	|	|	|
12+ 0	0.0355	0.05	Q	V	|	|	|	|
12+ 5	0.0359	0.05	Q	V	|	|	|	|
12+10	0.0362	0.05	Q	V	|	|	|	|
12+15	0.0366	0.05	Q	V	|	|	|	|
12+20	0.0369	0.05	Q	V	|	|	|	|



16+55	0.0995	0.12	Q	|	|	| V	|
17+ 0	0.1002	0.10	Q	|	|	| V	|
17+ 5	0.1007	0.08	Q	|	|	| V	|
17+10	0.1012	0.07	Q	|	|	| V	|
17+15	0.1017	0.07	Q	|	|	| V	|
17+20	0.1021	0.07	Q	|	|	| V	|
17+25	0.1026	0.06	Q	|	|	| V	|
17+30	0.1030	0.06	Q	|	|	| V	|
17+35	0.1034	0.06	Q	|	|	| V	|
17+40	0.1038	0.06	Q	|	|	| V	|
17+45	0.1041	0.05	Q	|	|	| V	|
17+50	0.1045	0.05	Q	|	|	| V	|
17+55	0.1049	0.05	Q	|	|	| V	|
18+ 0	0.1052	0.05	Q	|	|	| V	|
18+ 5	0.1055	0.05	Q	|	|	| V	|
18+10	0.1059	0.05	Q	|	|	| V	|
18+15	0.1062	0.05	Q	|	|	| V	|
18+20	0.1066	0.05	Q	|	|	| V	|
18+25	0.1070	0.05	Q	|	|	| V	|
18+30	0.1073	0.05	Q	|	|	| V	|
18+35	0.1077	0.05	Q	|	|	| V	|
18+40	0.1080	0.05	Q	|	|	| V	|
18+45	0.1083	0.05	Q	|	|	| V	|
18+50	0.1087	0.05	Q	|	|	| V	|
18+55	0.1090	0.05	Q	|	|	| V	|
19+ 0	0.1093	0.05	Q	|	|	| V	|
19+ 5	0.1096	0.05	Q	|	|	| V	|
19+10	0.1100	0.05	Q	|	|	| V	|
19+15	0.1103	0.04	Q	|	|	| V	|
19+20	0.1106	0.04	Q	|	|	| V	|
19+25	0.1109	0.04	Q	|	|	| V	|
19+30	0.1112	0.04	Q	|	|	| V	|
19+35	0.1115	0.04	Q	|	|	| V	|
19+40	0.1117	0.04	Q	|	|	| V	|
19+45	0.1120	0.04	Q	|	|	| V	|
19+50	0.1123	0.04	Q	|	|	| V	|
19+55	0.1126	0.04	Q	|	|	| V	|
20+ 0	0.1129	0.04	Q	|	|	| V	|
20+ 5	0.1132	0.04	Q	|	|	| V	|
20+10	0.1134	0.04	Q	|	|	| V	|
20+15	0.1137	0.04	Q	|	|	| V	|
20+20	0.1140	0.04	Q	|	|	| V	|
20+25	0.1142	0.04	Q	|	|	| V	|
20+30	0.1145	0.04	Q	|	|	| V	|
20+35	0.1147	0.04	Q	|	|	| V	|
20+40	0.1150	0.04	Q	|	|	| V	|
20+45	0.1152	0.04	Q	|	|	| V	|
20+50	0.1155	0.04	Q	|	|	| V	|
20+55	0.1157	0.04	Q	|	|	| V	|
21+ 0	0.1160	0.04	Q	|	|	| V	|
21+ 5	0.1162	0.04	Q	|	|	| V	|
21+10	0.1165	0.04	Q	|	|	| V	|
21+15	0.1167	0.03	Q	|	|	| V	|
21+20	0.1170	0.03	Q	|	|	| V	|

21+25	0.1172	0.03	Q	|	|	|	V |
21+30	0.1174	0.03	Q	|	|	|	V |
21+35	0.1177	0.03	Q	|	|	|	V |
21+40	0.1179	0.03	Q	|	|	|	V |
21+45	0.1181	0.03	Q	|	|	|	V |
21+50	0.1183	0.03	Q	|	|	|	V |
21+55	0.1186	0.03	Q	|	|	|	V |
22+ 0	0.1188	0.03	Q	|	|	|	V |
22+ 5	0.1190	0.03	Q	|	|	|	V |
22+10	0.1192	0.03	Q	|	|	|	V |
22+15	0.1195	0.03	Q	|	|	|	V |
22+20	0.1197	0.03	Q	|	|	|	V |
22+25	0.1199	0.03	Q	|	|	|	V |
22+30	0.1201	0.03	Q	|	|	|	V |
22+35	0.1203	0.03	Q	|	|	|	V |
22+40	0.1205	0.03	Q	|	|	|	V |
22+45	0.1207	0.03	Q	|	|	|	V |
22+50	0.1209	0.03	Q	|	|	|	V |
22+55	0.1212	0.03	Q	|	|	|	V|
23+ 0	0.1214	0.03	Q	|	|	|	V|
23+ 5	0.1216	0.03	Q	|	|	|	V|
23+10	0.1218	0.03	Q	|	|	|	V|
23+15	0.1220	0.03	Q	|	|	|	V|
23+20	0.1222	0.03	Q	|	|	|	V|
23+25	0.1224	0.03	Q	|	|	|	V|
23+30	0.1226	0.03	Q	|	|	|	V|
23+35	0.1228	0.03	Q	|	|	|	V|
23+40	0.1230	0.03	Q	|	|	|	V|
23+45	0.1232	0.03	Q	|	|	|	V|
23+50	0.1234	0.03	Q	|	|	|	V|
23+55	0.1236	0.03	Q	|	|	|	V|
24+ 0	0.1238	0.03	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/08/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION
TR 20527, CITY OF VICTORVILLE
DA4 **TRIBUTARY AREA A4-A**
FILE: 18345HYDROA4APOST10.OUT

Storm Event Year = 10

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
2.87	1	0.68
Rainfall data for year 10		
2.87	6	1.43
Rainfall data for year 10		
2.87	24	2.88

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.87	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.72	0.600	32.0	52.0	9.23	0.036
1.15	0.400	98.0	98.0	0.20	0.920

Area-averaged catchment yield fraction, Y = 0.390
Area-averaged low loss fraction, Yb = 0.610
User entry of time of concentration = 0.192 (hours)
++
Watershed area = 2.87(Ac.)
Catchment Lag time = 0.154 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 54.1970
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.610 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.322(In)
Computed peak 30-minute rainfall = 0.551(In)
Specified peak 1-hour rainfall = 0.678(In)
Computed peak 3-hour rainfall = 1.071(In)
Specified peak 6-hour rainfall = 1.430(In)
Specified peak 24-hour rainfall = 2.880(In)

Rainfall depth area reduction factors:
Using a total area of 2.87(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.322(In)
30-minute factor = 1.000 Adjusted rainfall = 0.551(In)
1-hour factor = 1.000 Adjusted rainfall = 0.678(In)
3-hour factor = 1.000 Adjusted rainfall = 1.071(In)
6-hour factor = 1.000 Adjusted rainfall = 1.430(In)
24-hour factor = 1.000 Adjusted rainfall = 2.880(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 34.71 (CFS))		
1	4.573	1.587
2	35.315	10.670
3	64.055	9.976

4	76.394	4.283
5	83.576	2.493
6	88.427	1.684
7	91.663	1.123
8	94.081	0.839
9	95.858	0.617
10	97.157	0.451
11	97.986	0.288
12	98.579	0.206
13	99.228	0.225
14	99.698	0.163
15	100.000	0.105

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3217	0.3217
2	0.3960	0.0744
3	0.4473	0.0512
4	0.4876	0.0403
5	0.5213	0.0338
6	0.5506	0.0293
7	0.5767	0.0261
8	0.6003	0.0236
9	0.6219	0.0216
10	0.6418	0.0200
11	0.6604	0.0186
12	0.6779	0.0175
13	0.7009	0.0230
14	0.7229	0.0220
15	0.7440	0.0211
16	0.7642	0.0203
17	0.7838	0.0195
18	0.8027	0.0189
19	0.8209	0.0183
20	0.8387	0.0177
21	0.8559	0.0172
22	0.8727	0.0167
23	0.8890	0.0163
24	0.9049	0.0159
25	0.9204	0.0155
26	0.9356	0.0152
27	0.9504	0.0148
28	0.9649	0.0145
29	0.9791	0.0142
30	0.9930	0.0139
31	1.0067	0.0137
32	1.0201	0.0134
33	1.0332	0.0132
34	1.0462	0.0129
35	1.0589	0.0127
36	1.0714	0.0125
37	1.0837	0.0123
38	1.0958	0.0121
39	1.1077	0.0119

40	1.1195	0.0117
41	1.1310	0.0116
42	1.1424	0.0114
43	1.1537	0.0113
44	1.1648	0.0111
45	1.1757	0.0110
46	1.1866	0.0108
47	1.1972	0.0107
48	1.2078	0.0105
49	1.2182	0.0104
50	1.2285	0.0103
51	1.2387	0.0102
52	1.2487	0.0101
53	1.2587	0.0099
54	1.2685	0.0098
55	1.2782	0.0097
56	1.2879	0.0096
57	1.2974	0.0095
58	1.3068	0.0094
59	1.3162	0.0093
60	1.3254	0.0092
61	1.3346	0.0092
62	1.3436	0.0091
63	1.3526	0.0090
64	1.3615	0.0089
65	1.3703	0.0088
66	1.3791	0.0087
67	1.3878	0.0087
68	1.3963	0.0086
69	1.4049	0.0085
70	1.4133	0.0084
71	1.4217	0.0084
72	1.4300	0.0083
73	1.4400	0.0100
74	1.4499	0.0099
75	1.4598	0.0099
76	1.4696	0.0098
77	1.4793	0.0097
78	1.4890	0.0097
79	1.4986	0.0096
80	1.5081	0.0096
81	1.5176	0.0095
82	1.5271	0.0094
83	1.5364	0.0094
84	1.5458	0.0093
85	1.5550	0.0093
86	1.5642	0.0092
87	1.5734	0.0092
88	1.5825	0.0091
89	1.5916	0.0091
90	1.6006	0.0090
91	1.6095	0.0090
92	1.6184	0.0089
93	1.6273	0.0089

94	1.6361	0.0088
95	1.6449	0.0088
96	1.6536	0.0087
97	1.6623	0.0087
98	1.6709	0.0086
99	1.6795	0.0086
100	1.6880	0.0085
101	1.6965	0.0085
102	1.7050	0.0085
103	1.7134	0.0084
104	1.7218	0.0084
105	1.7302	0.0083
106	1.7385	0.0083
107	1.7467	0.0083
108	1.7549	0.0082
109	1.7631	0.0082
110	1.7713	0.0082
111	1.7794	0.0081
112	1.7875	0.0081
113	1.7955	0.0080
114	1.8035	0.0080
115	1.8115	0.0080
116	1.8194	0.0079
117	1.8273	0.0079
118	1.8352	0.0079
119	1.8431	0.0078
120	1.8509	0.0078
121	1.8586	0.0078
122	1.8664	0.0077
123	1.8741	0.0077
124	1.8818	0.0077
125	1.8894	0.0076
126	1.8970	0.0076
127	1.9046	0.0076
128	1.9122	0.0076
129	1.9197	0.0075
130	1.9272	0.0075
131	1.9347	0.0075
132	1.9421	0.0074
133	1.9495	0.0074
134	1.9569	0.0074
135	1.9643	0.0074
136	1.9716	0.0073
137	1.9789	0.0073
138	1.9862	0.0073
139	1.9935	0.0073
140	2.0007	0.0072
141	2.0079	0.0072
142	2.0151	0.0072
143	2.0222	0.0072
144	2.0294	0.0071
145	2.0365	0.0071
146	2.0436	0.0071
147	2.0506	0.0071

148	2.0576	0.0070
149	2.0647	0.0070
150	2.0716	0.0070
151	2.0786	0.0070
152	2.0855	0.0069
153	2.0925	0.0069
154	2.0994	0.0069
155	2.1062	0.0069
156	2.1131	0.0069
157	2.1199	0.0068
158	2.1267	0.0068
159	2.1335	0.0068
160	2.1403	0.0068
161	2.1470	0.0067
162	2.1537	0.0067
163	2.1605	0.0067
164	2.1671	0.0067
165	2.1738	0.0067
166	2.1804	0.0066
167	2.1871	0.0066
168	2.1937	0.0066
169	2.2003	0.0066
170	2.2068	0.0066
171	2.2134	0.0065
172	2.2199	0.0065
173	2.2264	0.0065
174	2.2329	0.0065
175	2.2394	0.0065
176	2.2458	0.0065
177	2.2523	0.0064
178	2.2587	0.0064
179	2.2651	0.0064
180	2.2715	0.0064
181	2.2778	0.0064
182	2.2842	0.0063
183	2.2905	0.0063
184	2.2968	0.0063
185	2.3031	0.0063
186	2.3094	0.0063
187	2.3156	0.0063
188	2.3219	0.0062
189	2.3281	0.0062
190	2.3343	0.0062
191	2.3405	0.0062
192	2.3467	0.0062
193	2.3529	0.0062
194	2.3590	0.0061
195	2.3652	0.0061
196	2.3713	0.0061
197	2.3774	0.0061
198	2.3835	0.0061
199	2.3895	0.0061
200	2.3956	0.0061
201	2.4016	0.0060

202	2.4077	0.0060
203	2.4137	0.0060
204	2.4197	0.0060
205	2.4257	0.0060
206	2.4316	0.0060
207	2.4376	0.0060
208	2.4435	0.0059
209	2.4494	0.0059
210	2.4554	0.0059
211	2.4613	0.0059
212	2.4671	0.0059
213	2.4730	0.0059
214	2.4789	0.0059
215	2.4847	0.0058
216	2.4905	0.0058
217	2.4964	0.0058
218	2.5022	0.0058
219	2.5079	0.0058
220	2.5137	0.0058
221	2.5195	0.0058
222	2.5252	0.0058
223	2.5310	0.0057
224	2.5367	0.0057
225	2.5424	0.0057
226	2.5481	0.0057
227	2.5538	0.0057
228	2.5595	0.0057
229	2.5651	0.0057
230	2.5708	0.0057
231	2.5764	0.0056
232	2.5821	0.0056
233	2.5877	0.0056
234	2.5933	0.0056
235	2.5989	0.0056
236	2.6044	0.0056
237	2.6100	0.0056
238	2.6156	0.0056
239	2.6211	0.0055
240	2.6266	0.0055
241	2.6322	0.0055
242	2.6377	0.0055
243	2.6432	0.0055
244	2.6487	0.0055
245	2.6541	0.0055
246	2.6596	0.0055
247	2.6651	0.0055
248	2.6705	0.0054
249	2.6759	0.0054
250	2.6814	0.0054
251	2.6868	0.0054
252	2.6922	0.0054
253	2.6976	0.0054
254	2.7029	0.0054
255	2.7083	0.0054

256	2.7137	0.0054
257	2.7190	0.0053
258	2.7244	0.0053
259	2.7297	0.0053
260	2.7350	0.0053
261	2.7403	0.0053
262	2.7456	0.0053
263	2.7509	0.0053
264	2.7562	0.0053
265	2.7614	0.0053
266	2.7667	0.0053
267	2.7719	0.0052
268	2.7772	0.0052
269	2.7824	0.0052
270	2.7876	0.0052
271	2.7928	0.0052
272	2.7980	0.0052
273	2.8032	0.0052
274	2.8084	0.0052
275	2.8136	0.0052
276	2.8187	0.0052
277	2.8239	0.0052
278	2.8290	0.0051
279	2.8342	0.0051
280	2.8393	0.0051
281	2.8444	0.0051
282	2.8495	0.0051
283	2.8546	0.0051
284	2.8597	0.0051
285	2.8648	0.0051
286	2.8699	0.0051
287	2.8749	0.0051
288	2.8800	0.0051

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0051	0.0031	0.0020
2	0.0051	0.0031	0.0020
3	0.0051	0.0031	0.0020
4	0.0051	0.0031	0.0020
5	0.0051	0.0031	0.0020
6	0.0051	0.0031	0.0020
7	0.0051	0.0031	0.0020
8	0.0051	0.0031	0.0020
9	0.0052	0.0032	0.0020
10	0.0052	0.0032	0.0020
11	0.0052	0.0032	0.0020
12	0.0052	0.0032	0.0020
13	0.0052	0.0032	0.0020
14	0.0052	0.0032	0.0020
15	0.0052	0.0032	0.0020
16	0.0053	0.0032	0.0020

17	0.0053	0.0032	0.0021
18	0.0053	0.0032	0.0021
19	0.0053	0.0032	0.0021
20	0.0053	0.0032	0.0021
21	0.0053	0.0033	0.0021
22	0.0053	0.0033	0.0021
23	0.0054	0.0033	0.0021
24	0.0054	0.0033	0.0021
25	0.0054	0.0033	0.0021
26	0.0054	0.0033	0.0021
27	0.0054	0.0033	0.0021
28	0.0054	0.0033	0.0021
29	0.0055	0.0033	0.0021
30	0.0055	0.0033	0.0021
31	0.0055	0.0034	0.0021
32	0.0055	0.0034	0.0021
33	0.0055	0.0034	0.0022
34	0.0055	0.0034	0.0022
35	0.0056	0.0034	0.0022
36	0.0056	0.0034	0.0022
37	0.0056	0.0034	0.0022
38	0.0056	0.0034	0.0022
39	0.0056	0.0034	0.0022
40	0.0057	0.0034	0.0022
41	0.0057	0.0035	0.0022
42	0.0057	0.0035	0.0022
43	0.0057	0.0035	0.0022
44	0.0057	0.0035	0.0022
45	0.0058	0.0035	0.0022
46	0.0058	0.0035	0.0022
47	0.0058	0.0035	0.0023
48	0.0058	0.0035	0.0023
49	0.0058	0.0036	0.0023
50	0.0058	0.0036	0.0023
51	0.0059	0.0036	0.0023
52	0.0059	0.0036	0.0023
53	0.0059	0.0036	0.0023
54	0.0059	0.0036	0.0023
55	0.0060	0.0036	0.0023
56	0.0060	0.0036	0.0023
57	0.0060	0.0037	0.0023
58	0.0060	0.0037	0.0023
59	0.0060	0.0037	0.0024
60	0.0061	0.0037	0.0024
61	0.0061	0.0037	0.0024
62	0.0061	0.0037	0.0024
63	0.0061	0.0037	0.0024
64	0.0061	0.0038	0.0024
65	0.0062	0.0038	0.0024
66	0.0062	0.0038	0.0024
67	0.0062	0.0038	0.0024
68	0.0062	0.0038	0.0024
69	0.0063	0.0038	0.0024
70	0.0063	0.0038	0.0025

71	0.0063	0.0039	0.0025
72	0.0063	0.0039	0.0025
73	0.0064	0.0039	0.0025
74	0.0064	0.0039	0.0025
75	0.0064	0.0039	0.0025
76	0.0065	0.0039	0.0025
77	0.0065	0.0040	0.0025
78	0.0065	0.0040	0.0025
79	0.0065	0.0040	0.0026
80	0.0066	0.0040	0.0026
81	0.0066	0.0040	0.0026
82	0.0066	0.0040	0.0026
83	0.0067	0.0041	0.0026
84	0.0067	0.0041	0.0026
85	0.0067	0.0041	0.0026
86	0.0067	0.0041	0.0026
87	0.0068	0.0041	0.0026
88	0.0068	0.0042	0.0027
89	0.0069	0.0042	0.0027
90	0.0069	0.0042	0.0027
91	0.0069	0.0042	0.0027
92	0.0069	0.0042	0.0027
93	0.0070	0.0043	0.0027
94	0.0070	0.0043	0.0027
95	0.0071	0.0043	0.0027
96	0.0071	0.0043	0.0028
97	0.0071	0.0044	0.0028
98	0.0072	0.0044	0.0028
99	0.0072	0.0044	0.0028
100	0.0072	0.0044	0.0028
101	0.0073	0.0044	0.0028
102	0.0073	0.0045	0.0028
103	0.0074	0.0045	0.0029
104	0.0074	0.0045	0.0029
105	0.0074	0.0045	0.0029
106	0.0075	0.0046	0.0029
107	0.0075	0.0046	0.0029
108	0.0076	0.0046	0.0029
109	0.0076	0.0047	0.0030
110	0.0076	0.0047	0.0030
111	0.0077	0.0047	0.0030
112	0.0077	0.0047	0.0030
113	0.0078	0.0048	0.0030
114	0.0078	0.0048	0.0031
115	0.0079	0.0048	0.0031
116	0.0079	0.0048	0.0031
117	0.0080	0.0049	0.0031
118	0.0080	0.0049	0.0031
119	0.0081	0.0050	0.0032
120	0.0082	0.0050	0.0032
121	0.0082	0.0050	0.0032
122	0.0083	0.0050	0.0032
123	0.0083	0.0051	0.0032
124	0.0084	0.0051	0.0033

125	0.0085	0.0052	0.0033
126	0.0085	0.0052	0.0033
127	0.0086	0.0052	0.0033
128	0.0086	0.0053	0.0034
129	0.0087	0.0053	0.0034
130	0.0088	0.0054	0.0034
131	0.0089	0.0054	0.0035
132	0.0089	0.0054	0.0035
133	0.0090	0.0055	0.0035
134	0.0091	0.0055	0.0035
135	0.0092	0.0056	0.0036
136	0.0092	0.0056	0.0036
137	0.0093	0.0057	0.0036
138	0.0094	0.0057	0.0037
139	0.0095	0.0058	0.0037
140	0.0096	0.0058	0.0037
141	0.0097	0.0059	0.0038
142	0.0097	0.0059	0.0038
143	0.0099	0.0060	0.0038
144	0.0099	0.0061	0.0039
145	0.0083	0.0051	0.0032
146	0.0084	0.0051	0.0033
147	0.0085	0.0052	0.0033
148	0.0086	0.0052	0.0033
149	0.0087	0.0053	0.0034
150	0.0088	0.0054	0.0034
151	0.0090	0.0055	0.0035
152	0.0091	0.0055	0.0035
153	0.0092	0.0056	0.0036
154	0.0093	0.0057	0.0036
155	0.0095	0.0058	0.0037
156	0.0096	0.0059	0.0038
157	0.0098	0.0060	0.0038
158	0.0099	0.0061	0.0039
159	0.0102	0.0062	0.0040
160	0.0103	0.0063	0.0040
161	0.0105	0.0064	0.0041
162	0.0107	0.0065	0.0042
163	0.0110	0.0067	0.0043
164	0.0111	0.0068	0.0043
165	0.0114	0.0070	0.0044
166	0.0116	0.0071	0.0045
167	0.0119	0.0073	0.0046
168	0.0121	0.0074	0.0047
169	0.0125	0.0076	0.0049
170	0.0127	0.0078	0.0050
171	0.0132	0.0080	0.0051
172	0.0134	0.0082	0.0052
173	0.0139	0.0085	0.0054
174	0.0142	0.0087	0.0055
175	0.0148	0.0091	0.0058
176	0.0152	0.0093	0.0059
177	0.0159	0.0097	0.0062
178	0.0163	0.0100	0.0064

179	0.0172	0.0105	0.0067
180	0.0177	0.0108	0.0069
181	0.0189	0.0115	0.0074
182	0.0195	0.0119	0.0076
183	0.0211	0.0129	0.0082
184	0.0220	0.0134	0.0086
185	0.0175	0.0107	0.0068
186	0.0186	0.0114	0.0073
187	0.0216	0.0132	0.0084
188	0.0236	0.0144	0.0092
189	0.0293	0.0179	0.0114
190	0.0338	0.0206	0.0132
191	0.0512	0.0313	0.0200
192	0.0744	0.0393	0.0351
193	0.3217	0.0393	0.2824
194	0.0403	0.0246	0.0157
195	0.0261	0.0159	0.0102
196	0.0200	0.0122	0.0078
197	0.0230	0.0140	0.0090
198	0.0203	0.0124	0.0079
199	0.0183	0.0112	0.0071
200	0.0167	0.0102	0.0065
201	0.0155	0.0095	0.0060
202	0.0145	0.0089	0.0057
203	0.0137	0.0083	0.0053
204	0.0129	0.0079	0.0050
205	0.0123	0.0075	0.0048
206	0.0117	0.0072	0.0046
207	0.0113	0.0069	0.0044
208	0.0108	0.0066	0.0042
209	0.0104	0.0064	0.0041
210	0.0101	0.0061	0.0039
211	0.0097	0.0059	0.0038
212	0.0094	0.0058	0.0037
213	0.0092	0.0056	0.0036
214	0.0089	0.0054	0.0035
215	0.0087	0.0053	0.0034
216	0.0084	0.0052	0.0033
217	0.0100	0.0061	0.0039
218	0.0098	0.0060	0.0038
219	0.0096	0.0059	0.0037
220	0.0094	0.0058	0.0037
221	0.0093	0.0057	0.0036
222	0.0091	0.0056	0.0035
223	0.0090	0.0055	0.0035
224	0.0088	0.0054	0.0034
225	0.0087	0.0053	0.0034
226	0.0085	0.0052	0.0033
227	0.0084	0.0051	0.0033
228	0.0083	0.0051	0.0032
229	0.0082	0.0050	0.0032
230	0.0081	0.0049	0.0031
231	0.0080	0.0049	0.0031
232	0.0079	0.0048	0.0031

233	0.0078	0.0047	0.0030
234	0.0077	0.0047	0.0030
235	0.0076	0.0046	0.0030
236	0.0075	0.0046	0.0029
237	0.0074	0.0045	0.0029
238	0.0073	0.0045	0.0029
239	0.0073	0.0044	0.0028
240	0.0072	0.0044	0.0028
241	0.0071	0.0043	0.0028
242	0.0070	0.0043	0.0027
243	0.0070	0.0043	0.0027
244	0.0069	0.0042	0.0027
245	0.0068	0.0042	0.0027
246	0.0068	0.0041	0.0026
247	0.0067	0.0041	0.0026
248	0.0066	0.0041	0.0026
249	0.0066	0.0040	0.0026
250	0.0065	0.0040	0.0025
251	0.0065	0.0040	0.0025
252	0.0064	0.0039	0.0025
253	0.0064	0.0039	0.0025
254	0.0063	0.0039	0.0025
255	0.0063	0.0038	0.0024
256	0.0062	0.0038	0.0024
257	0.0062	0.0038	0.0024
258	0.0061	0.0037	0.0024
259	0.0061	0.0037	0.0024
260	0.0060	0.0037	0.0023
261	0.0060	0.0037	0.0023
262	0.0059	0.0036	0.0023
263	0.0059	0.0036	0.0023
264	0.0059	0.0036	0.0023
265	0.0058	0.0036	0.0023
266	0.0058	0.0035	0.0023
267	0.0057	0.0035	0.0022
268	0.0057	0.0035	0.0022
269	0.0057	0.0035	0.0022
270	0.0056	0.0034	0.0022
271	0.0056	0.0034	0.0022
272	0.0056	0.0034	0.0022
273	0.0055	0.0034	0.0022
274	0.0055	0.0033	0.0021
275	0.0055	0.0033	0.0021
276	0.0054	0.0033	0.0021
277	0.0054	0.0033	0.0021
278	0.0054	0.0033	0.0021
279	0.0053	0.0033	0.0021
280	0.0053	0.0032	0.0021
281	0.0053	0.0032	0.0021
282	0.0052	0.0032	0.0020
283	0.0052	0.0032	0.0020
284	0.0052	0.0032	0.0020
285	0.0052	0.0031	0.0020
286	0.0051	0.0031	0.0020

287	0.0051	0.0031	0.0020
288	0.0051	0.0031	0.0020

Total soil rain loss = 1.59(In)
Total effective rainfall = 1.29(In)
Peak flow rate in flood hydrograph = 3.56(CFS)

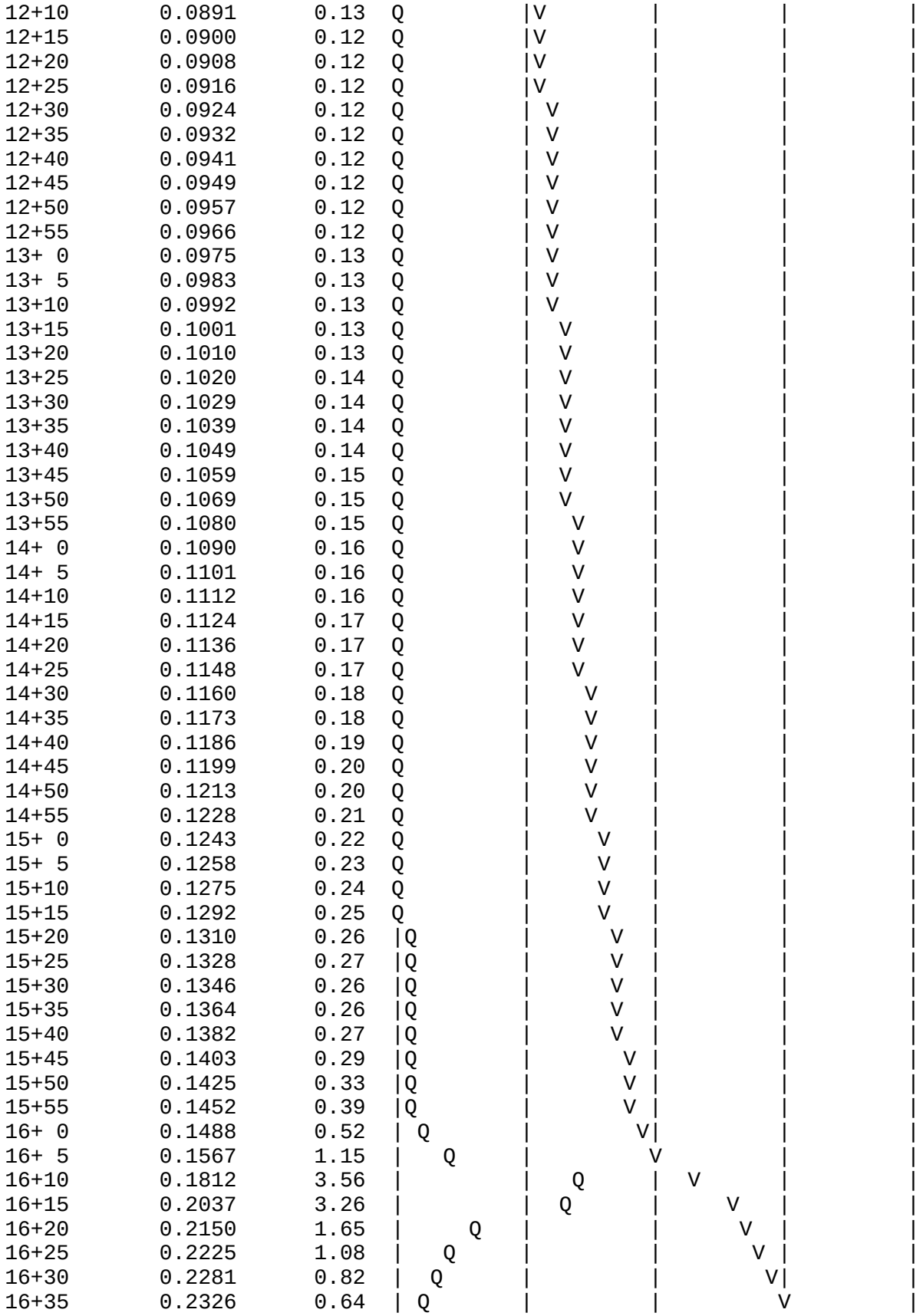
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0002	0.02	Q				
0+15	0.0005	0.04	Q				
0+20	0.0009	0.05	Q				
0+25	0.0012	0.06	Q				
0+30	0.0017	0.06	Q				
0+35	0.0021	0.06	Q				
0+40	0.0025	0.07	Q				
0+45	0.0030	0.07	Q				
0+50	0.0035	0.07	Q				
0+55	0.0039	0.07	Q				
1+ 0	0.0044	0.07	Q				
1+ 5	0.0049	0.07	Q				
1+10	0.0054	0.07	Q				
1+15	0.0059	0.07	Q				
1+20	0.0063	0.07	Q				
1+25	0.0068	0.07	Q				
1+30	0.0073	0.07	Q				
1+35	0.0078	0.07	QV				
1+40	0.0083	0.07	QV				
1+45	0.0088	0.07	QV				
1+50	0.0093	0.07	QV				
1+55	0.0098	0.07	QV				
2+ 0	0.0103	0.07	QV				
2+ 5	0.0108	0.07	QV				
2+10	0.0113	0.07	QV				
2+15	0.0118	0.07	QV				
2+20	0.0123	0.07	QV				
2+25	0.0128	0.07	QV				
2+30	0.0133	0.07	QV				
2+35	0.0138	0.07	QV				
2+40	0.0143	0.07	QV				
2+45	0.0148	0.07	QV				
2+50	0.0153	0.07	QV				
2+55	0.0159	0.07	Q V				
3+ 0	0.0164	0.07	Q V				
3+ 5	0.0169	0.08	Q V				

3+10	0.0174	0.08	Q V	|	|	|	|
3+15	0.0179	0.08	Q V	|	|	|	|
3+20	0.0184	0.08	Q V	|	|	|	|
3+25	0.0190	0.08	Q V	|	|	|	|
3+30	0.0195	0.08	Q V	|	|	|	|
3+35	0.0200	0.08	Q V	|	|	|	|
3+40	0.0206	0.08	Q V	|	|	|	|
3+45	0.0211	0.08	Q V	|	|	|	|
3+50	0.0216	0.08	Q V	|	|	|	|
3+55	0.0222	0.08	Q V	|	|	|	|
4+ 0	0.0227	0.08	Q V	|	|	|	|
4+ 5	0.0232	0.08	Q V	|	|	|	|
4+10	0.0238	0.08	Q V	|	|	|	|
4+15	0.0243	0.08	Q V	|	|	|	|
4+20	0.0248	0.08	Q V	|	|	|	|
4+25	0.0254	0.08	Q V	|	|	|	|
4+30	0.0259	0.08	Q V	|	|	|	|
4+35	0.0265	0.08	Q V	|	|	|	|
4+40	0.0270	0.08	Q V	|	|	|	|
4+45	0.0276	0.08	Q V	|	|	|	|
4+50	0.0281	0.08	Q V	|	|	|	|
4+55	0.0287	0.08	Q V	|	|	|	|
5+ 0	0.0293	0.08	Q V	|	|	|	|
5+ 5	0.0298	0.08	Q V	|	|	|	|
5+10	0.0304	0.08	Q V	|	|	|	|
5+15	0.0310	0.08	Q V	|	|	|	|
5+20	0.0315	0.08	Q V	|	|	|	|
5+25	0.0321	0.08	Q V	|	|	|	|
5+30	0.0327	0.08	Q V	|	|	|	|
5+35	0.0332	0.08	Q V	|	|	|	|
5+40	0.0338	0.08	Q V	|	|	|	|
5+45	0.0344	0.08	Q V	|	|	|	|
5+50	0.0350	0.08	Q V	|	|	|	|
5+55	0.0355	0.08	Q V	|	|	|	|
6+ 0	0.0361	0.08	Q V	|	|	|	|
6+ 5	0.0367	0.09	Q V	|	|	|	|
6+10	0.0373	0.09	Q V	|	|	|	|
6+15	0.0379	0.09	Q V	|	|	|	|
6+20	0.0385	0.09	Q V	|	|	|	|
6+25	0.0391	0.09	Q V	|	|	|	|
6+30	0.0397	0.09	Q V	|	|	|	|
6+35	0.0403	0.09	Q V	|	|	|	|
6+40	0.0409	0.09	Q V	|	|	|	|
6+45	0.0415	0.09	Q V	|	|	|	|
6+50	0.0421	0.09	Q V	|	|	|	|
6+55	0.0427	0.09	Q V	|	|	|	|
7+ 0	0.0433	0.09	Q V	|	|	|	|
7+ 5	0.0440	0.09	Q V	|	|	|	|
7+10	0.0446	0.09	Q V	|	|	|	|
7+15	0.0452	0.09	Q V	|	|	|	|
7+20	0.0458	0.09	Q V	|	|	|	|
7+25	0.0465	0.09	Q V	|	|	|	|
7+30	0.0471	0.09	Q V	|	|	|	|
7+35	0.0477	0.09	Q V	|	|	|	|

7+40	0.0484	0.09	Q	V	|	|	|	|
7+45	0.0490	0.09	Q	V	|	|	|	|
7+50	0.0497	0.09	Q	V	|	|	|	|
7+55	0.0503	0.09	Q	V	|	|	|	|
8+ 0	0.0510	0.09	Q	V	|	|	|	|
8+ 5	0.0516	0.10	Q	V	|	|	|	|
8+10	0.0523	0.10	Q	V	|	|	|	|
8+15	0.0529	0.10	Q	V	|	|	|	|
8+20	0.0536	0.10	Q	V	|	|	|	|
8+25	0.0543	0.10	Q	V	|	|	|	|
8+30	0.0549	0.10	Q	V	|	|	|	|
8+35	0.0556	0.10	Q	V	|	|	|	|
8+40	0.0563	0.10	Q	V	|	|	|	|
8+45	0.0570	0.10	Q	V	|	|	|	|
8+50	0.0577	0.10	Q	V	|	|	|	|
8+55	0.0583	0.10	Q	V	|	|	|	|
9+ 0	0.0590	0.10	Q	V	|	|	|	|
9+ 5	0.0597	0.10	Q	V	|	|	|	|
9+10	0.0604	0.10	Q	V	|	|	|	|
9+15	0.0611	0.10	Q	V	|	|	|	|
9+20	0.0619	0.10	Q	V	|	|	|	|
9+25	0.0626	0.10	Q	V	|	|	|	|
9+30	0.0633	0.10	Q	V	|	|	|	|
9+35	0.0640	0.10	Q	V	|	|	|	|
9+40	0.0647	0.11	Q	V	|	|	|	|
9+45	0.0655	0.11	Q	V	|	|	|	|
9+50	0.0662	0.11	Q	V	|	|	|	|
9+55	0.0670	0.11	Q	V	|	|	|	|
10+ 0	0.0677	0.11	Q	V	|	|	|	|
10+ 5	0.0684	0.11	Q	V	|	|	|	|
10+10	0.0692	0.11	Q	V	|	|	|	|
10+15	0.0700	0.11	Q	V	|	|	|	|
10+20	0.0707	0.11	Q	V	|	|	|	|
10+25	0.0715	0.11	Q	V	|	|	|	|
10+30	0.0723	0.11	Q	V	|	|	|	|
10+35	0.0731	0.11	Q	V	|	|	|	|
10+40	0.0739	0.11	Q	V	|	|	|	|
10+45	0.0747	0.12	Q	V	|	|	|	|
10+50	0.0755	0.12	Q	V	|	|	|	|
10+55	0.0763	0.12	Q	V	|	|	|	|
11+ 0	0.0771	0.12	Q	V	|	|	|	|
11+ 5	0.0779	0.12	Q	V	|	|	|	|
11+10	0.0787	0.12	Q	V	|	|	|	|
11+15	0.0796	0.12	Q	V	|	|	|	|
11+20	0.0804	0.12	Q	V	|	|	|	|
11+25	0.0812	0.12	Q	V	|	|	|	|
11+30	0.0821	0.12	Q	V	|	|	|	|
11+35	0.0830	0.13	Q	V	|	|	|	|
11+40	0.0838	0.13	Q	V	|	|	|	|
11+45	0.0847	0.13	Q	V	|	|	|	|
11+50	0.0856	0.13	Q	V	|	|	|	|
11+55	0.0865	0.13	Q	V	|	|	|	|
12+ 0	0.0874	0.13	Q	V	|	|	|	|
12+ 5	0.0883	0.13	Q	V	|	|	|	|



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16+40       0.2362      0.54  | Q       |          |          V          |
16+45       0.2393      0.45  |Q        |          |          |V         |
16+50       0.2419      0.38  |Q        |          |          |V         |
16+55       0.2441      0.31  |Q        |          |          |V         |
17+ 0       0.2460      0.28  |Q        |          |          | V        |
17+ 5       0.2478      0.27  |Q        |          |          | V        |
17+10       0.2495      0.24  Q         |          |          | V        |
17+15       0.2509      0.21  Q         |          |          | V        |
17+20       0.2520      0.17  Q         |          |          | V        |
17+25       0.2531      0.16  Q         |          |          | V        |
17+30       0.2542      0.15  Q         |          |          |  V       |
17+35       0.2552      0.15  Q         |          |          |  V       |
17+40       0.2562      0.14  Q         |          |          |  V       |
17+45       0.2571      0.14  Q         |          |          |  V       |
17+50       0.2580      0.13  Q         |          |          |  V       |
17+55       0.2589      0.13  Q         |          |          |  V       |
18+ 0       0.2598      0.12  Q         |          |          |  V       |
18+ 5       0.2606      0.12  Q         |          |          |  V       |
18+10       0.2615      0.13  Q         |          |          |   V      |
18+15       0.2624      0.13  Q         |          |          |   V      |
18+20       0.2633      0.13  Q         |          |          |   V      |
18+25       0.2641      0.13  Q         |          |          |   V      |
18+30       0.2650      0.13  Q         |          |          |   V      |
18+35       0.2659      0.13  Q         |          |          |   V      |
18+40       0.2667      0.12  Q         |          |          |   V      |
18+45       0.2676      0.12  Q         |          |          |   V      |
18+50       0.2684      0.12  Q         |          |          |   V      |
18+55       0.2692      0.12  Q         |          |          |    V     |
19+ 0       0.2700      0.12  Q         |          |          |    V     |
19+ 5       0.2708      0.12  Q         |          |          |    V     |
19+10       0.2716      0.11  Q         |          |          |    V     |
19+15       0.2724      0.11  Q         |          |          |    V     |
19+20       0.2731      0.11  Q         |          |          |    V     |
19+25       0.2739      0.11  Q         |          |          |    V     |
19+30       0.2746      0.11  Q         |          |          |    V     |
19+35       0.2754      0.11  Q         |          |          |    V     |
19+40       0.2761      0.10  Q         |          |          |    V     |
19+45       0.2768      0.10  Q         |          |          |     V    |
19+50       0.2775      0.10  Q         |          |          |     V    |
19+55       0.2782      0.10  Q         |          |          |     V    |
20+ 0       0.2789      0.10  Q         |          |          |     V    |
20+ 5       0.2796      0.10  Q         |          |          |     V    |
20+10       0.2802      0.10  Q         |          |          |     V    |
20+15       0.2809      0.10  Q         |          |          |     V    |
20+20       0.2816      0.10  Q         |          |          |     V    |
20+25       0.2822      0.09  Q         |          |          |     V    |
20+30       0.2829      0.09  Q         |          |          |     V    |
20+35       0.2835      0.09  Q         |          |          |     V    |
20+40       0.2841      0.09  Q         |          |          |     V    |
20+45       0.2848      0.09  Q         |          |          |      V   |
20+50       0.2854      0.09  Q         |          |          |      V   |
20+55       0.2860      0.09  Q         |          |          |      V   |
21+ 0       0.2866      0.09  Q         |          |          |      V   |
21+ 5       0.2872      0.09  Q         |          |          |      V   |
```

21+10	0.2878	0.09	Q	|	|	|	V |
21+15	0.2884	0.09	Q	|	|	|	V |
21+20	0.2890	0.09	Q	|	|	|	V |
21+25	0.2896	0.09	Q	|	|	|	V |
21+30	0.2902	0.08	Q	|	|	|	V |
21+35	0.2908	0.08	Q	|	|	|	V |
21+40	0.2913	0.08	Q	|	|	|	V |
21+45	0.2919	0.08	Q	|	|	|	V |
21+50	0.2925	0.08	Q	|	|	|	V |
21+55	0.2930	0.08	Q	|	|	|	V |
22+ 0	0.2936	0.08	Q	|	|	|	V |
22+ 5	0.2941	0.08	Q	|	|	|	V |
22+10	0.2947	0.08	Q	|	|	|	V |
22+15	0.2952	0.08	Q	|	|	|	V |
22+20	0.2958	0.08	Q	|	|	|	V |
22+25	0.2963	0.08	Q	|	|	|	V |
22+30	0.2969	0.08	Q	|	|	|	V |
22+35	0.2974	0.08	Q	|	|	|	V |
22+40	0.2979	0.08	Q	|	|	|	V |
22+45	0.2984	0.08	Q	|	|	|	V |
22+50	0.2990	0.08	Q	|	|	|	V |
22+55	0.2995	0.08	Q	|	|	|	V |
23+ 0	0.3000	0.07	Q	|	|	|	V|
23+ 5	0.3005	0.07	Q	|	|	|	V|
23+10	0.3010	0.07	Q	|	|	|	V|
23+15	0.3015	0.07	Q	|	|	|	V|
23+20	0.3020	0.07	Q	|	|	|	V|
23+25	0.3025	0.07	Q	|	|	|	V|
23+30	0.3030	0.07	Q	|	|	|	V|
23+35	0.3035	0.07	Q	|	|	|	V|
23+40	0.3040	0.07	Q	|	|	|	V|
23+45	0.3045	0.07	Q	|	|	|	V|
23+50	0.3050	0.07	Q	|	|	|	V|
23+55	0.3054	0.07	Q	|	|	|	V|
24+ 0	0.3059	0.07	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/05/22

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

Program License Serial Number 4070

10-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA8
TR 20527, CITY OF VICTORVILLE
DA8 **TRIBUTARY AREA A4-B**
FILE: 18345HYDROA4BPOST10.OUT

Storm Event Year = 100

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
1.87	1	1.13
Rainfall data for year 100		
1.87	6	2.46
Rainfall data for year 100		
1.87	24	5.19

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.87	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.12	0.600	32.0	52.0	9.23	0.171
0.75	0.400	98.0	98.0	0.20	0.954

Area-averaged catchment yield fraction, Y = 0.485
Area-averaged low loss fraction, Yb = 0.515
User entry of time of concentration = 0.299 (hours)
++
Watershed area = 1.87(Ac.)
Catchment Lag time = 0.239 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.8617
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.515 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.536(In)
Computed peak 30-minute rainfall = 0.918(In)
Specified peak 1-hour rainfall = 1.130(In)
Computed peak 3-hour rainfall = 1.821(In)
Specified peak 6-hour rainfall = 2.460(In)
Specified peak 24-hour rainfall = 5.190(In)

Rainfall depth area reduction factors:
Using a total area of 1.87(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.536(In)
30-minute factor = 1.000 Adjusted rainfall = 0.918(In)
1-hour factor = 1.000 Adjusted rainfall = 1.130(In)
3-hour factor = 1.000 Adjusted rainfall = 1.821(In)
6-hour factor = 1.000 Adjusted rainfall = 2.460(In)
24-hour factor = 1.000 Adjusted rainfall = 5.190(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 22.62 (CFS))	
1	2.219	0.502
2	13.263	2.497
3	40.696	6.204

4	59.814	4.323
5	70.032	2.311
6	76.849	1.542
7	81.687	1.094
8	85.391	0.838
9	88.352	0.670
10	90.539	0.495
11	92.366	0.413
12	93.892	0.345
13	95.115	0.277
14	96.136	0.231
15	96.983	0.191
16	97.619	0.144
17	98.052	0.098
18	98.423	0.084
19	98.839	0.094
20	99.258	0.095
21	99.591	0.075
22	99.810	0.049
23	100.000	0.043

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5361	0.5361
2	0.6601	0.1239
3	0.7455	0.0854
4	0.8127	0.0672
5	0.8689	0.0563
6	0.9178	0.0489
7	0.9612	0.0434
8	1.0005	0.0393
9	1.0365	0.0360
10	1.0698	0.0333
11	1.1008	0.0310
12	1.1299	0.0291
13	1.1699	0.0400
14	1.2081	0.0383
15	1.2449	0.0367
16	1.2803	0.0354
17	1.3144	0.0342
18	1.3474	0.0330
19	1.3794	0.0320
20	1.4105	0.0311
21	1.4407	0.0302
22	1.4701	0.0294
23	1.4988	0.0287
24	1.5267	0.0280
25	1.5540	0.0273
26	1.5807	0.0267
27	1.6068	0.0261
28	1.6324	0.0256
29	1.6575	0.0251
30	1.6821	0.0246
31	1.7062	0.0241

32	1.7299	0.0237
33	1.7532	0.0233
34	1.7760	0.0229
35	1.7985	0.0225
36	1.8207	0.0221
37	1.8425	0.0218
38	1.8639	0.0215
39	1.8850	0.0211
40	1.9059	0.0208
41	1.9264	0.0205
42	1.9467	0.0203
43	1.9667	0.0200
44	1.9864	0.0197
45	2.0059	0.0195
46	2.0251	0.0192
47	2.0441	0.0190
48	2.0629	0.0188
49	2.0814	0.0186
50	2.0998	0.0183
51	2.1179	0.0181
52	2.1358	0.0179
53	2.1536	0.0177
54	2.1711	0.0175
55	2.1885	0.0174
56	2.2057	0.0172
57	2.2227	0.0170
58	2.2395	0.0168
59	2.2562	0.0167
60	2.2728	0.0165
61	2.2891	0.0164
62	2.3053	0.0162
63	2.3214	0.0161
64	2.3373	0.0159
65	2.3531	0.0158
66	2.3688	0.0157
67	2.3843	0.0155
68	2.3997	0.0154
69	2.4149	0.0153
70	2.4301	0.0151
71	2.4451	0.0150
72	2.4600	0.0149
73	2.4783	0.0183
74	2.4966	0.0182
75	2.5147	0.0181
76	2.5327	0.0180
77	2.5506	0.0179
78	2.5683	0.0178
79	2.5860	0.0177
80	2.6036	0.0176
81	2.6211	0.0175
82	2.6385	0.0174
83	2.6557	0.0173
84	2.6729	0.0172
85	2.6900	0.0171

86	2.7070	0.0170
87	2.7239	0.0169
88	2.7407	0.0168
89	2.7575	0.0167
90	2.7741	0.0166
91	2.7907	0.0166
92	2.8071	0.0165
93	2.8235	0.0164
94	2.8398	0.0163
95	2.8561	0.0162
96	2.8722	0.0162
97	2.8883	0.0161
98	2.9043	0.0160
99	2.9202	0.0159
100	2.9361	0.0158
101	2.9518	0.0158
102	2.9675	0.0157
103	2.9832	0.0156
104	2.9987	0.0156
105	3.0142	0.0155
106	3.0297	0.0154
107	3.0450	0.0154
108	3.0603	0.0153
109	3.0755	0.0152
110	3.0907	0.0152
111	3.1058	0.0151
112	3.1208	0.0150
113	3.1358	0.0150
114	3.1507	0.0149
115	3.1656	0.0149
116	3.1804	0.0148
117	3.1951	0.0147
118	3.2098	0.0147
119	3.2244	0.0146
120	3.2390	0.0146
121	3.2535	0.0145
122	3.2679	0.0145
123	3.2823	0.0144
124	3.2967	0.0143
125	3.3110	0.0143
126	3.3252	0.0142
127	3.3394	0.0142
128	3.3535	0.0141
129	3.3676	0.0141
130	3.3816	0.0140
131	3.3956	0.0140
132	3.4096	0.0139
133	3.4234	0.0139
134	3.4373	0.0138
135	3.4511	0.0138
136	3.4648	0.0137
137	3.4785	0.0137
138	3.4922	0.0137
139	3.5058	0.0136

140	3.5193	0.0136
141	3.5329	0.0135
142	3.5463	0.0135
143	3.5598	0.0134
144	3.5731	0.0134
145	3.5865	0.0133
146	3.5998	0.0133
147	3.6130	0.0133
148	3.6262	0.0132
149	3.6394	0.0132
150	3.6526	0.0131
151	3.6657	0.0131
152	3.6787	0.0131
153	3.6917	0.0130
154	3.7047	0.0130
155	3.7176	0.0129
156	3.7305	0.0129
157	3.7434	0.0129
158	3.7562	0.0128
159	3.7690	0.0128
160	3.7817	0.0127
161	3.7945	0.0127
162	3.8071	0.0127
163	3.8198	0.0126
164	3.8324	0.0126
165	3.8449	0.0126
166	3.8575	0.0125
167	3.8700	0.0125
168	3.8824	0.0125
169	3.8949	0.0124
170	3.9072	0.0124
171	3.9196	0.0124
172	3.9319	0.0123
173	3.9442	0.0123
174	3.9565	0.0123
175	3.9687	0.0122
176	3.9809	0.0122
177	3.9931	0.0122
178	4.0052	0.0121
179	4.0173	0.0121
180	4.0294	0.0121
181	4.0414	0.0120
182	4.0534	0.0120
183	4.0654	0.0120
184	4.0774	0.0119
185	4.0893	0.0119
186	4.1012	0.0119
187	4.1130	0.0119
188	4.1249	0.0118
189	4.1367	0.0118
190	4.1484	0.0118
191	4.1602	0.0117
192	4.1719	0.0117
193	4.1836	0.0117

194	4.1952	0.0117
195	4.2069	0.0116
196	4.2185	0.0116
197	4.2301	0.0116
198	4.2416	0.0116
199	4.2531	0.0115
200	4.2646	0.0115
201	4.2761	0.0115
202	4.2875	0.0114
203	4.2990	0.0114
204	4.3104	0.0114
205	4.3217	0.0114
206	4.3331	0.0113
207	4.3444	0.0113
208	4.3557	0.0113
209	4.3669	0.0113
210	4.3782	0.0112
211	4.3894	0.0112
212	4.4006	0.0112
213	4.4117	0.0112
214	4.4229	0.0111
215	4.4340	0.0111
216	4.4451	0.0111
217	4.4562	0.0111
218	4.4672	0.0110
219	4.4782	0.0110
220	4.4892	0.0110
221	4.5002	0.0110
222	4.5112	0.0110
223	4.5221	0.0109
224	4.5330	0.0109
225	4.5439	0.0109
226	4.5548	0.0109
227	4.5656	0.0108
228	4.5764	0.0108
229	4.5872	0.0108
230	4.5980	0.0108
231	4.6088	0.0108
232	4.6195	0.0107
233	4.6302	0.0107
234	4.6409	0.0107
235	4.6516	0.0107
236	4.6622	0.0106
237	4.6729	0.0106
238	4.6835	0.0106
239	4.6940	0.0106
240	4.7046	0.0106
241	4.7152	0.0105
242	4.7257	0.0105
243	4.7362	0.0105
244	4.7467	0.0105
245	4.7571	0.0105
246	4.7676	0.0104
247	4.7780	0.0104

248	4.7884	0.0104
249	4.7988	0.0104
250	4.8092	0.0104
251	4.8195	0.0104
252	4.8299	0.0103
253	4.8402	0.0103
254	4.8505	0.0103
255	4.8607	0.0103
256	4.8710	0.0103
257	4.8812	0.0102
258	4.8915	0.0102
259	4.9017	0.0102
260	4.9118	0.0102
261	4.9220	0.0102
262	4.9322	0.0101
263	4.9423	0.0101
264	4.9524	0.0101
265	4.9625	0.0101
266	4.9726	0.0101
267	4.9826	0.0101
268	4.9927	0.0100
269	5.0027	0.0100
270	5.0127	0.0100
271	5.0227	0.0100
272	5.0327	0.0100
273	5.0426	0.0100
274	5.0526	0.0099
275	5.0625	0.0099
276	5.0724	0.0099
277	5.0823	0.0099
278	5.0921	0.0099
279	5.1020	0.0099
280	5.1118	0.0098
281	5.1217	0.0098
282	5.1315	0.0098
283	5.1413	0.0098
284	5.1510	0.0098
285	5.1608	0.0098
286	5.1705	0.0097
287	5.1803	0.0097
288	5.1900	0.0097

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0097	0.0050	0.0047
2	0.0097	0.0050	0.0047
3	0.0098	0.0050	0.0047
4	0.0098	0.0050	0.0047
5	0.0098	0.0051	0.0048
6	0.0098	0.0051	0.0048
7	0.0099	0.0051	0.0048
8	0.0099	0.0051	0.0048

9	0.0099	0.0051	0.0048
10	0.0099	0.0051	0.0048
11	0.0100	0.0051	0.0048
12	0.0100	0.0051	0.0048
13	0.0100	0.0052	0.0048
14	0.0100	0.0052	0.0049
15	0.0101	0.0052	0.0049
16	0.0101	0.0052	0.0049
17	0.0101	0.0052	0.0049
18	0.0101	0.0052	0.0049
19	0.0102	0.0052	0.0049
20	0.0102	0.0052	0.0049
21	0.0102	0.0053	0.0050
22	0.0102	0.0053	0.0050
23	0.0103	0.0053	0.0050
24	0.0103	0.0053	0.0050
25	0.0103	0.0053	0.0050
26	0.0104	0.0053	0.0050
27	0.0104	0.0054	0.0050
28	0.0104	0.0054	0.0050
29	0.0104	0.0054	0.0051
30	0.0105	0.0054	0.0051
31	0.0105	0.0054	0.0051
32	0.0105	0.0054	0.0051
33	0.0106	0.0054	0.0051
34	0.0106	0.0055	0.0051
35	0.0106	0.0055	0.0051
36	0.0106	0.0055	0.0052
37	0.0107	0.0055	0.0052
38	0.0107	0.0055	0.0052
39	0.0108	0.0055	0.0052
40	0.0108	0.0056	0.0052
41	0.0108	0.0056	0.0052
42	0.0108	0.0056	0.0053
43	0.0109	0.0056	0.0053
44	0.0109	0.0056	0.0053
45	0.0110	0.0056	0.0053
46	0.0110	0.0057	0.0053
47	0.0110	0.0057	0.0053
48	0.0110	0.0057	0.0054
49	0.0111	0.0057	0.0054
50	0.0111	0.0057	0.0054
51	0.0112	0.0058	0.0054
52	0.0112	0.0058	0.0054
53	0.0112	0.0058	0.0054
54	0.0113	0.0058	0.0055
55	0.0113	0.0058	0.0055
56	0.0113	0.0058	0.0055
57	0.0114	0.0059	0.0055
58	0.0114	0.0059	0.0055
59	0.0115	0.0059	0.0056
60	0.0115	0.0059	0.0056
61	0.0116	0.0060	0.0056
62	0.0116	0.0060	0.0056

63	0.0116	0.0060	0.0056
64	0.0117	0.0060	0.0056
65	0.0117	0.0060	0.0057
66	0.0117	0.0061	0.0057
67	0.0118	0.0061	0.0057
68	0.0118	0.0061	0.0057
69	0.0119	0.0061	0.0058
70	0.0119	0.0061	0.0058
71	0.0120	0.0062	0.0058
72	0.0120	0.0062	0.0058
73	0.0121	0.0062	0.0058
74	0.0121	0.0062	0.0059
75	0.0122	0.0063	0.0059
76	0.0122	0.0063	0.0059
77	0.0123	0.0063	0.0059
78	0.0123	0.0063	0.0060
79	0.0124	0.0064	0.0060
80	0.0124	0.0064	0.0060
81	0.0125	0.0064	0.0060
82	0.0125	0.0064	0.0061
83	0.0126	0.0065	0.0061
84	0.0126	0.0065	0.0061
85	0.0127	0.0065	0.0061
86	0.0127	0.0066	0.0062
87	0.0128	0.0066	0.0062
88	0.0128	0.0066	0.0062
89	0.0129	0.0066	0.0062
90	0.0129	0.0067	0.0063
91	0.0130	0.0067	0.0063
92	0.0131	0.0067	0.0063
93	0.0131	0.0068	0.0064
94	0.0132	0.0068	0.0064
95	0.0133	0.0068	0.0064
96	0.0133	0.0069	0.0064
97	0.0134	0.0069	0.0065
98	0.0134	0.0069	0.0065
99	0.0135	0.0070	0.0065
100	0.0136	0.0070	0.0066
101	0.0137	0.0070	0.0066
102	0.0137	0.0071	0.0066
103	0.0138	0.0071	0.0067
104	0.0138	0.0071	0.0067
105	0.0139	0.0072	0.0068
106	0.0140	0.0072	0.0068
107	0.0141	0.0073	0.0068
108	0.0141	0.0073	0.0068
109	0.0142	0.0073	0.0069
110	0.0143	0.0074	0.0069
111	0.0144	0.0074	0.0070
112	0.0145	0.0075	0.0070
113	0.0146	0.0075	0.0071
114	0.0146	0.0075	0.0071
115	0.0147	0.0076	0.0071
116	0.0148	0.0076	0.0072

117	0.0149	0.0077	0.0072
118	0.0150	0.0077	0.0073
119	0.0151	0.0078	0.0073
120	0.0152	0.0078	0.0073
121	0.0153	0.0079	0.0074
122	0.0154	0.0079	0.0074
123	0.0155	0.0080	0.0075
124	0.0156	0.0080	0.0075
125	0.0157	0.0081	0.0076
126	0.0158	0.0081	0.0076
127	0.0159	0.0082	0.0077
128	0.0160	0.0082	0.0078
129	0.0162	0.0083	0.0078
130	0.0162	0.0084	0.0079
131	0.0164	0.0084	0.0079
132	0.0165	0.0085	0.0080
133	0.0166	0.0086	0.0081
134	0.0167	0.0086	0.0081
135	0.0169	0.0087	0.0082
136	0.0170	0.0088	0.0082
137	0.0172	0.0089	0.0083
138	0.0173	0.0089	0.0084
139	0.0175	0.0090	0.0085
140	0.0176	0.0091	0.0085
141	0.0178	0.0092	0.0086
142	0.0179	0.0092	0.0087
143	0.0181	0.0093	0.0088
144	0.0182	0.0094	0.0088
145	0.0149	0.0077	0.0072
146	0.0150	0.0077	0.0073
147	0.0153	0.0079	0.0074
148	0.0154	0.0079	0.0075
149	0.0157	0.0081	0.0076
150	0.0158	0.0081	0.0076
151	0.0161	0.0083	0.0078
152	0.0162	0.0084	0.0079
153	0.0165	0.0085	0.0080
154	0.0167	0.0086	0.0081
155	0.0170	0.0088	0.0082
156	0.0172	0.0089	0.0083
157	0.0175	0.0090	0.0085
158	0.0177	0.0091	0.0086
159	0.0181	0.0093	0.0088
160	0.0183	0.0095	0.0089
161	0.0188	0.0097	0.0091
162	0.0190	0.0098	0.0092
163	0.0195	0.0100	0.0094
164	0.0197	0.0102	0.0096
165	0.0203	0.0104	0.0098
166	0.0205	0.0106	0.0100
167	0.0211	0.0109	0.0102
168	0.0215	0.0111	0.0104
169	0.0221	0.0114	0.0107
170	0.0225	0.0116	0.0109

171	0.0233	0.0120	0.0113
172	0.0237	0.0122	0.0115
173	0.0246	0.0127	0.0119
174	0.0251	0.0129	0.0121
175	0.0261	0.0135	0.0127
176	0.0267	0.0138	0.0129
177	0.0280	0.0144	0.0135
178	0.0287	0.0148	0.0139
179	0.0302	0.0156	0.0146
180	0.0311	0.0160	0.0151
181	0.0330	0.0170	0.0160
182	0.0342	0.0176	0.0165
183	0.0367	0.0189	0.0178
184	0.0383	0.0197	0.0185
185	0.0291	0.0150	0.0141
186	0.0310	0.0160	0.0150
187	0.0360	0.0185	0.0174
188	0.0393	0.0203	0.0190
189	0.0489	0.0252	0.0237
190	0.0563	0.0290	0.0273
191	0.0854	0.0393	0.0461
192	0.1239	0.0393	0.0847
193	0.5361	0.0393	0.4969
194	0.0672	0.0346	0.0326
195	0.0434	0.0224	0.0210
196	0.0333	0.0172	0.0161
197	0.0400	0.0206	0.0194
198	0.0354	0.0182	0.0171
199	0.0320	0.0165	0.0155
200	0.0294	0.0152	0.0142
201	0.0273	0.0141	0.0132
202	0.0256	0.0132	0.0124
203	0.0241	0.0124	0.0117
204	0.0229	0.0118	0.0111
205	0.0218	0.0112	0.0106
206	0.0208	0.0107	0.0101
207	0.0200	0.0103	0.0097
208	0.0192	0.0099	0.0093
209	0.0186	0.0096	0.0090
210	0.0179	0.0092	0.0087
211	0.0174	0.0090	0.0084
212	0.0168	0.0087	0.0082
213	0.0164	0.0084	0.0079
214	0.0159	0.0082	0.0077
215	0.0155	0.0080	0.0075
216	0.0151	0.0078	0.0073
217	0.0183	0.0095	0.0089
218	0.0180	0.0093	0.0087
219	0.0177	0.0091	0.0086
220	0.0174	0.0090	0.0084
221	0.0171	0.0088	0.0083
222	0.0168	0.0087	0.0081
223	0.0166	0.0085	0.0080
224	0.0163	0.0084	0.0079

225	0.0161	0.0083	0.0078
226	0.0158	0.0082	0.0077
227	0.0156	0.0081	0.0076
228	0.0154	0.0080	0.0075
229	0.0152	0.0078	0.0074
230	0.0150	0.0078	0.0073
231	0.0149	0.0077	0.0072
232	0.0147	0.0076	0.0071
233	0.0145	0.0075	0.0070
234	0.0143	0.0074	0.0070
235	0.0142	0.0073	0.0069
236	0.0140	0.0072	0.0068
237	0.0139	0.0072	0.0067
238	0.0137	0.0071	0.0067
239	0.0136	0.0070	0.0066
240	0.0135	0.0069	0.0065
241	0.0133	0.0069	0.0065
242	0.0132	0.0068	0.0064
243	0.0131	0.0067	0.0063
244	0.0130	0.0067	0.0063
245	0.0129	0.0066	0.0062
246	0.0127	0.0066	0.0062
247	0.0126	0.0065	0.0061
248	0.0125	0.0065	0.0061
249	0.0124	0.0064	0.0060
250	0.0123	0.0064	0.0060
251	0.0122	0.0063	0.0059
252	0.0121	0.0063	0.0059
253	0.0120	0.0062	0.0058
254	0.0119	0.0062	0.0058
255	0.0119	0.0061	0.0057
256	0.0118	0.0061	0.0057
257	0.0117	0.0060	0.0057
258	0.0116	0.0060	0.0056
259	0.0115	0.0059	0.0056
260	0.0114	0.0059	0.0055
261	0.0114	0.0059	0.0055
262	0.0113	0.0058	0.0055
263	0.0112	0.0058	0.0054
264	0.0111	0.0057	0.0054
265	0.0111	0.0057	0.0054
266	0.0110	0.0057	0.0053
267	0.0109	0.0056	0.0053
268	0.0109	0.0056	0.0053
269	0.0108	0.0056	0.0052
270	0.0107	0.0055	0.0052
271	0.0107	0.0055	0.0052
272	0.0106	0.0055	0.0051
273	0.0105	0.0054	0.0051
274	0.0105	0.0054	0.0051
275	0.0104	0.0054	0.0051
276	0.0104	0.0053	0.0050
277	0.0103	0.0053	0.0050
278	0.0103	0.0053	0.0050

279	0.0102	0.0053	0.0049
280	0.0101	0.0052	0.0049
281	0.0101	0.0052	0.0049
282	0.0100	0.0052	0.0049
283	0.0100	0.0051	0.0048
284	0.0099	0.0051	0.0048
285	0.0099	0.0051	0.0048
286	0.0098	0.0051	0.0048
287	0.0098	0.0050	0.0047
288	0.0097	0.0050	0.0047

Total soil rain loss = 2.41(In)
Total effective rainfall = 2.78(In)
Peak flow rate in flood hydrograph = 3.78(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	0.0001	0.01	Q				
0+15	0.0004	0.04	Q				
0+20	0.0009	0.06	Q				
0+25	0.0014	0.07	Q				
0+30	0.0019	0.08	Q				
0+35	0.0025	0.09	Q				
0+40	0.0032	0.09	Q				
0+45	0.0038	0.10	Q				
0+50	0.0045	0.10	Q				
0+55	0.0052	0.10	Q				
1+ 0	0.0059	0.10	Q				
1+ 5	0.0066	0.10	Q				
1+10	0.0073	0.10	Q				
1+15	0.0080	0.11	Q				
1+20	0.0088	0.11	Q				
1+25	0.0095	0.11	Q				
1+30	0.0103	0.11	Q				
1+35	0.0110	0.11	QV				
1+40	0.0118	0.11	QV				
1+45	0.0125	0.11	QV				
1+50	0.0133	0.11	QV				
1+55	0.0141	0.11	QV				
2+ 0	0.0148	0.11	QV				
2+ 5	0.0156	0.11	QV				
2+10	0.0164	0.11	QV				
2+15	0.0171	0.11	QV				
2+20	0.0179	0.11	QV				
2+25	0.0187	0.11	QV				

2+30	0.0195	0.11	QV	|	|	|	|
2+35	0.0203	0.11	QV	|	|	|	|
2+40	0.0211	0.11	QV	|	|	|	|
2+45	0.0218	0.11	Q V	|	|	|	|
2+50	0.0226	0.11	Q V	|	|	|	|
2+55	0.0234	0.12	Q V	|	|	|	|
3+ 0	0.0242	0.12	Q V	|	|	|	|
3+ 5	0.0250	0.12	Q V	|	|	|	|
3+10	0.0258	0.12	Q V	|	|	|	|
3+15	0.0266	0.12	Q V	|	|	|	|
3+20	0.0274	0.12	Q V	|	|	|	|
3+25	0.0282	0.12	Q V	|	|	|	|
3+30	0.0290	0.12	Q V	|	|	|	|
3+35	0.0298	0.12	Q V	|	|	|	|
3+40	0.0307	0.12	Q V	|	|	|	|
3+45	0.0315	0.12	Q V	|	|	|	|
3+50	0.0323	0.12	Q V	|	|	|	|
3+55	0.0331	0.12	Q V	|	|	|	|
4+ 0	0.0339	0.12	Q V	|	|	|	|
4+ 5	0.0348	0.12	Q V	|	|	|	|
4+10	0.0356	0.12	Q V	|	|	|	|
4+15	0.0364	0.12	Q V	|	|	|	|
4+20	0.0372	0.12	Q V	|	|	|	|
4+25	0.0381	0.12	Q V	|	|	|	|
4+30	0.0389	0.12	Q V	|	|	|	|
4+35	0.0398	0.12	Q V	|	|	|	|
4+40	0.0406	0.12	Q V	|	|	|	|
4+45	0.0415	0.12	Q V	|	|	|	|
4+50	0.0423	0.12	Q V	|	|	|	|
4+55	0.0432	0.12	Q V	|	|	|	|
5+ 0	0.0440	0.12	Q V	|	|	|	|
5+ 5	0.0449	0.12	Q V	|	|	|	|
5+10	0.0457	0.13	Q V	|	|	|	|
5+15	0.0466	0.13	Q V	|	|	|	|
5+20	0.0475	0.13	Q V	|	|	|	|
5+25	0.0483	0.13	Q V	|	|	|	|
5+30	0.0492	0.13	Q V	|	|	|	|
5+35	0.0501	0.13	Q V	|	|	|	|
5+40	0.0510	0.13	Q V	|	|	|	|
5+45	0.0519	0.13	Q V	|	|	|	|
5+50	0.0527	0.13	Q V	|	|	|	|
5+55	0.0536	0.13	Q V	|	|	|	|
6+ 0	0.0545	0.13	Q V	|	|	|	|
6+ 5	0.0554	0.13	Q V	|	|	|	|
6+10	0.0563	0.13	Q V	|	|	|	|
6+15	0.0572	0.13	Q V	|	|	|	|
6+20	0.0581	0.13	Q V	|	|	|	|
6+25	0.0590	0.13	Q V	|	|	|	|
6+30	0.0600	0.13	Q V	|	|	|	|
6+35	0.0609	0.13	Q V	|	|	|	|
6+40	0.0618	0.13	Q V	|	|	|	|
6+45	0.0627	0.13	Q V	|	|	|	|
6+50	0.0636	0.13	Q V	|	|	|	|
6+55	0.0646	0.14	Q V	|	|	|	|

7+ 0	0.0655	0.14	Q	V	|	|	|	|
7+ 5	0.0664	0.14	Q	V	|	|	|	|
7+10	0.0674	0.14	Q	V	|	|	|	|
7+15	0.0683	0.14	Q	V	|	|	|	|
7+20	0.0693	0.14	Q	V	|	|	|	|
7+25	0.0702	0.14	Q	V	|	|	|	|
7+30	0.0712	0.14	Q	V	|	|	|	|
7+35	0.0722	0.14	Q	V	|	|	|	|
7+40	0.0731	0.14	Q	V	|	|	|	|
7+45	0.0741	0.14	Q	V	|	|	|	|
7+50	0.0751	0.14	Q	V	|	|	|	|
7+55	0.0761	0.14	Q	V	|	|	|	|
8+ 0	0.0770	0.14	Q	V	|	|	|	|
8+ 5	0.0780	0.14	Q	V	|	|	|	|
8+10	0.0790	0.14	Q	V	|	|	|	|
8+15	0.0800	0.15	Q	V	|	|	|	|
8+20	0.0810	0.15	Q	V	|	|	|	|
8+25	0.0820	0.15	Q	V	|	|	|	|
8+30	0.0831	0.15	Q	V	|	|	|	|
8+35	0.0841	0.15	Q	V	|	|	|	|
8+40	0.0851	0.15	Q	V	|	|	|	|
8+45	0.0861	0.15	Q	V	|	|	|	|
8+50	0.0872	0.15	Q	V	|	|	|	|
8+55	0.0882	0.15	Q	V	|	|	|	|
9+ 0	0.0892	0.15	Q	V	|	|	|	|
9+ 5	0.0903	0.15	Q	V	|	|	|	|
9+10	0.0913	0.15	Q	V	|	|	|	|
9+15	0.0924	0.15	Q	V	|	|	|	|
9+20	0.0935	0.15	Q	V	|	|	|	|
9+25	0.0945	0.16	Q	V	|	|	|	|
9+30	0.0956	0.16	Q	V	|	|	|	|
9+35	0.0967	0.16	Q	V	|	|	|	|
9+40	0.0978	0.16	Q	V	|	|	|	|
9+45	0.0989	0.16	Q	V	|	|	|	|
9+50	0.1000	0.16	Q	V	|	|	|	|
9+55	0.1011	0.16	Q	V	|	|	|	|
10+ 0	0.1022	0.16	Q	V	|	|	|	|
10+ 5	0.1034	0.16	Q	V	|	|	|	|
10+10	0.1045	0.16	Q	V	|	|	|	|
10+15	0.1056	0.17	Q	V	|	|	|	|
10+20	0.1068	0.17	Q	V	|	|	|	|
10+25	0.1079	0.17	Q	V	|	|	|	|
10+30	0.1091	0.17	Q	V	|	|	|	|
10+35	0.1102	0.17	Q	V	|	|	|	|
10+40	0.1114	0.17	Q	V	|	|	|	|
10+45	0.1126	0.17	Q	V	|	|	|	|
10+50	0.1138	0.17	Q	V	|	|	|	|
10+55	0.1150	0.17	Q	V	|	|	|	|
11+ 0	0.1162	0.18	Q	V	|	|	|	|
11+ 5	0.1174	0.18	Q	V	|	|	|	|
11+10	0.1186	0.18	Q	V	|	|	|	|
11+15	0.1199	0.18	Q	V	|	|	|	|
11+20	0.1211	0.18	Q	V	|	|	|	|
11+25	0.1224	0.18	Q	V	|	|	|	|

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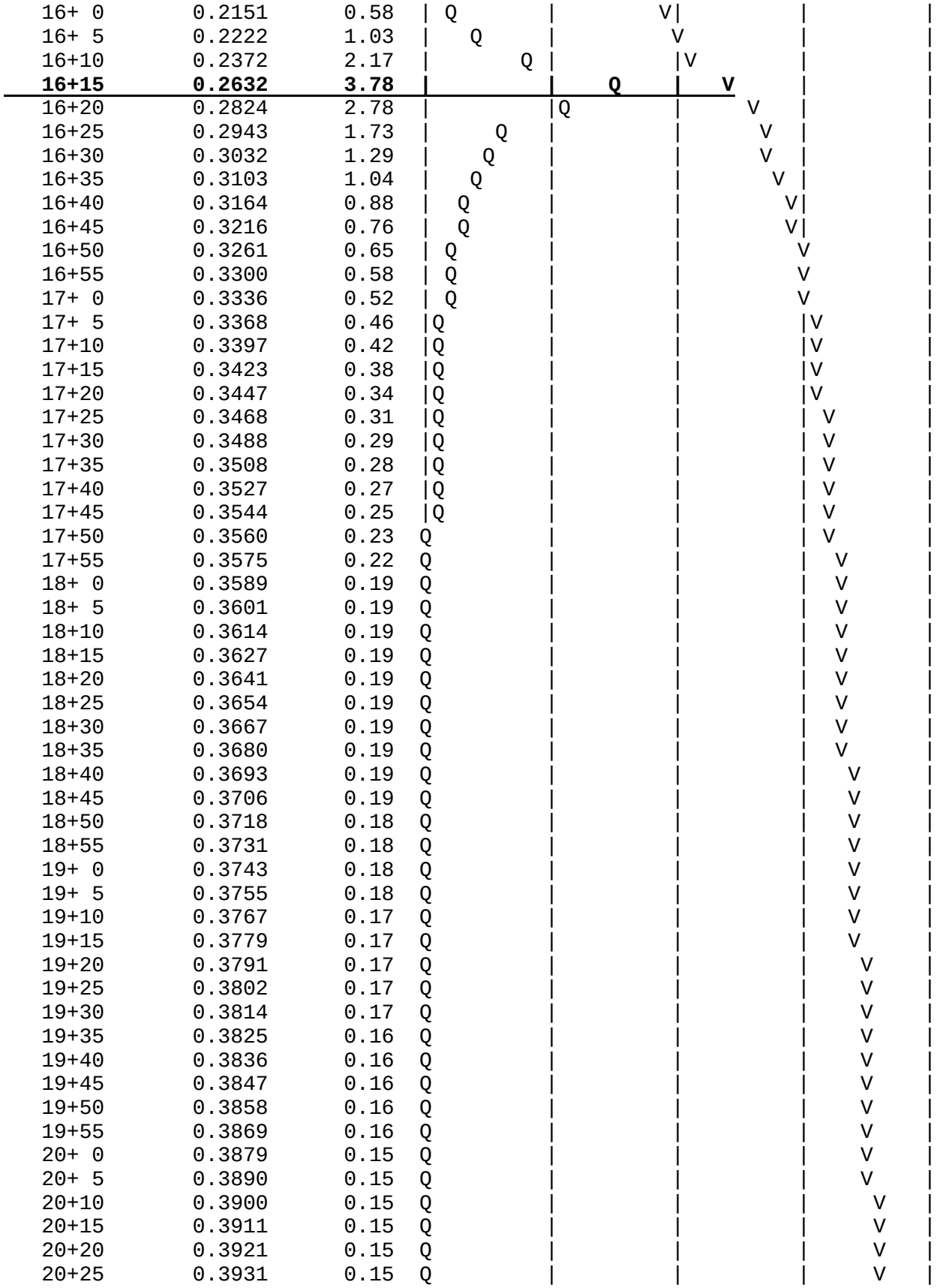
11+30       0.1236      0.18  Q          |V         |          |          |
11+35       0.1249      0.18  Q          |V         |          |          |
11+40       0.1262      0.19  Q          |V         |          |          |
11+45       0.1275      0.19  Q          |V         |          |          |
11+50       0.1288      0.19  Q          |V         |          |          |
11+55       0.1301      0.19  Q          | V        |          |          |
12+ 0       0.1314      0.19  Q          | V        |          |          |
12+ 5       0.1328      0.19  Q          | V        |          |          |
12+10       0.1341      0.19  Q          | V        |          |          |
12+15       0.1353      0.18  Q          | V        |          |          |
12+20       0.1366      0.18  Q          | V        |          |          |
12+25       0.1378      0.17  Q          | V        |          |          |
12+30       0.1390      0.17  Q          | V        |          |          |
12+35       0.1402      0.17  Q          | V        |          |          |
12+40       0.1414      0.17  Q          |  V       |          |          |
12+45       0.1426      0.18  Q          |  V       |          |          |
12+50       0.1438      0.18  Q          |  V       |          |          |
12+55       0.1450      0.18  Q          |  V       |          |          |
13+ 0       0.1463      0.18  Q          |  V       |          |          |
13+ 5       0.1475      0.18  Q          |  V       |          |          |
13+10       0.1488      0.18  Q          |  V       |          |          |
13+15       0.1501      0.19  Q          |  V       |          |          |
13+20       0.1514      0.19  Q          |  V       |          |          |
13+25       0.1527      0.19  Q          |   V      |          |          |
13+30       0.1541      0.20  Q          |   V      |          |          |
13+35       0.1554      0.20  Q          |   V      |          |          |
13+40       0.1568      0.20  Q          |   V      |          |          |
13+45       0.1582      0.21  Q          |   V      |          |          |
13+50       0.1597      0.21  Q          |   V      |          |          |
13+55       0.1611      0.21  Q          |   V      |          |          |
14+ 0       0.1626      0.22  Q          |    V     |          |          |
14+ 5       0.1642      0.22  Q          |    V     |          |          |
14+10       0.1657      0.23  Q          |    V     |          |          |
14+15       0.1673      0.23  Q          |    V     |          |          |
14+20       0.1689      0.24  Q          |    V     |          |          |
14+25       0.1706      0.24  Q          |    V     |          |          |
14+30       0.1723      0.25  Q          |    V     |          |          |
14+35       0.1741      0.25  |Q         |     V    |          |          |
14+40       0.1759      0.26  |Q         |     V    |          |          |
14+45       0.1777      0.27  |Q         |     V    |          |          |
14+50       0.1796      0.28  |Q         |     V    |          |          |
14+55       0.1816      0.29  |Q         |     V    |          |          |
15+ 0       0.1837      0.30  |Q         |     V    |          |          |
15+ 5       0.1858      0.31  |Q         |      V   |          |          |
15+10       0.1880      0.32  |Q         |      V   |          |          |
15+15       0.1903      0.33  |Q         |      V   |          |          |
15+20       0.1927      0.35  |Q         |      V   |          |          |
15+25       0.1952      0.36  |Q         |       V  |          |          |
15+30       0.1977      0.37  |Q         |       V  |          |          |
15+35       0.2001      0.35  |Q         |       V  |          |          |
15+40       0.2026      0.35  |Q         |       V  |          |          |
15+45       0.2051      0.37  |Q         |       V  |          |          |
15+50       0.2079      0.41  |Q         |        V |          |          |
15+55       0.2111      0.46  |Q         |        V |          |          |
```



20+30	0.3941	0.15	Q	|	|	|	V |
20+35	0.3951	0.14	Q	|	|	|	V |
20+40	0.3961	0.14	Q	|	|	|	V |
20+45	0.3970	0.14	Q	|	|	|	V |
20+50	0.3980	0.14	Q	|	|	|	V |
20+55	0.3990	0.14	Q	|	|	|	V |
21+ 0	0.3999	0.14	Q	|	|	|	V |
21+ 5	0.4009	0.14	Q	|	|	|	V |
21+10	0.4018	0.14	Q	|	|	|	V |
21+15	0.4027	0.13	Q	|	|	|	V |
21+20	0.4036	0.13	Q	|	|	|	V |
21+25	0.4045	0.13	Q	|	|	|	V |
21+30	0.4055	0.13	Q	|	|	|	V |
21+35	0.4064	0.13	Q	|	|	|	V |
21+40	0.4072	0.13	Q	|	|	|	V |
21+45	0.4081	0.13	Q	|	|	|	V |
21+50	0.4090	0.13	Q	|	|	|	V |
21+55	0.4099	0.13	Q	|	|	|	V |
22+ 0	0.4107	0.13	Q	|	|	|	V |
22+ 5	0.4116	0.12	Q	|	|	|	V |
22+10	0.4125	0.12	Q	|	|	|	V |
22+15	0.4133	0.12	Q	|	|	|	V |
22+20	0.4142	0.12	Q	|	|	|	V |
22+25	0.4150	0.12	Q	|	|	|	V |
22+30	0.4158	0.12	Q	|	|	|	V |
22+35	0.4166	0.12	Q	|	|	|	V |
22+40	0.4175	0.12	Q	|	|	|	V |
22+45	0.4183	0.12	Q	|	|	|	V |
22+50	0.4191	0.12	Q	|	|	|	V |
22+55	0.4199	0.12	Q	|	|	|	V |
23+ 0	0.4207	0.12	Q	|	|	|	V |
23+ 5	0.4215	0.12	Q	|	|	|	V |
23+10	0.4223	0.12	Q	|	|	|	V |
23+15	0.4231	0.11	Q	|	|	|	V|
23+20	0.4239	0.11	Q	|	|	|	V|
23+25	0.4247	0.11	Q	|	|	|	V|
23+30	0.4254	0.11	Q	|	|	|	V|
23+35	0.4262	0.11	Q	|	|	|	V|
23+40	0.4270	0.11	Q	|	|	|	V|
23+45	0.4277	0.11	Q	|	|	|	V|
23+50	0.4285	0.11	Q	|	|	|	V|
23+55	0.4292	0.11	Q	|	|	|	V|
24+ 0	0.4300	0.11	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/26/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION - DA1
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A1-A
FILE: 18345HYDROA1APOST2DA1.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.97	1	0.39
Rainfall data for year 2		
1.97	6	0.87
Rainfall data for year 2		
1.97	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.97	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.18	0.600	32.0	52.0	8.05	0.000
0.79	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.181 (hours)
++
Watershed area = 1.97(Ac.)
Catchment Lag time = 0.145 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 57.3921
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 1.97(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 23.82 (CFS))	
1	5.109	1.217
2	38.789	8.024
3	66.362	6.569

4	78.150	2.808
5	85.030	1.639
6	89.597	1.088
7	92.679	0.734
8	94.929	0.536
9	96.565	0.390
10	97.674	0.264
11	98.343	0.159
12	99.020	0.161
13	99.602	0.139
14	100.000	0.095

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3334	0.0151
8	0.3471	0.0136
9	0.3596	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4198	0.0136
15	0.4329	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4810	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5896	0.0088
31	0.5983	0.0087
32	0.6069	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076
40	0.6703	0.0075

41	0.6777	0.0074
42	0.6850	0.0073
43	0.6923	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7598	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9424	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9662	0.0047
92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046

95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036
147	1.1951	0.0036
148	1.1987	0.0036

149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2199	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2712	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3358	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030

203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4027	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026

257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5387	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5824	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5975	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009

18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011

72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015

126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037

180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014

234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009

288 0.0025 0.0016 0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 1.34(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	0.0001	0.01	Q				
0+15	0.0002	0.01	Q				
0+20	0.0003	0.02	Q				
0+25	0.0004	0.02	Q				
0+30	0.0005	0.02	Q				
0+35	0.0006	0.02	Q				
0+40	0.0008	0.02	Q				
0+45	0.0009	0.02	Q				
0+50	0.0011	0.02	Q				
0+55	0.0012	0.02	Q				
1+ 0	0.0013	0.02	Q				
1+ 5	0.0015	0.02	Q				
1+10	0.0016	0.02	Q				
1+15	0.0018	0.02	Q				
1+20	0.0019	0.02	Q				
1+25	0.0021	0.02	Q				
1+30	0.0022	0.02	Q				
1+35	0.0024	0.02	Q				
1+40	0.0025	0.02	Q				
1+45	0.0027	0.02	QV				
1+50	0.0028	0.02	QV				
1+55	0.0030	0.02	QV				
2+ 0	0.0031	0.02	QV				
2+ 5	0.0033	0.02	QV				
2+10	0.0034	0.02	QV				
2+15	0.0036	0.02	QV				
2+20	0.0037	0.02	QV				
2+25	0.0039	0.02	QV				
2+30	0.0040	0.02	QV				
2+35	0.0042	0.02	QV				
2+40	0.0043	0.02	QV				
2+45	0.0045	0.02	QV				
2+50	0.0046	0.02	QV				
2+55	0.0048	0.02	QV				
3+ 0	0.0049	0.02	QV				
3+ 5	0.0051	0.02	QV				
3+10	0.0052	0.02	Q V				

3+15	0.0054	0.02	Q V	|	|	|	|
3+20	0.0056	0.02	Q V	|	|	|	|
3+25	0.0057	0.02	Q V	|	|	|	|
3+30	0.0059	0.02	Q V	|	|	|	|
3+35	0.0060	0.02	Q V	|	|	|	|
3+40	0.0062	0.02	Q V	|	|	|	|
3+45	0.0064	0.02	Q V	|	|	|	|
3+50	0.0065	0.02	Q V	|	|	|	|
3+55	0.0067	0.02	Q V	|	|	|	|
4+ 0	0.0068	0.02	Q V	|	|	|	|
4+ 5	0.0070	0.02	Q V	|	|	|	|
4+10	0.0072	0.02	Q V	|	|	|	|
4+15	0.0073	0.02	Q V	|	|	|	|
4+20	0.0075	0.02	Q V	|	|	|	|
4+25	0.0077	0.02	Q V	|	|	|	|
4+30	0.0078	0.02	Q V	|	|	|	|
4+35	0.0080	0.02	Q V	|	|	|	|
4+40	0.0082	0.02	Q V	|	|	|	|
4+45	0.0083	0.02	Q V	|	|	|	|
4+50	0.0085	0.02	Q V	|	|	|	|
4+55	0.0087	0.02	Q V	|	|	|	|
5+ 0	0.0088	0.02	Q V	|	|	|	|
5+ 5	0.0090	0.02	Q V	|	|	|	|
5+10	0.0092	0.02	Q V	|	|	|	|
5+15	0.0094	0.03	Q V	|	|	|	|
5+20	0.0095	0.03	Q V	|	|	|	|
5+25	0.0097	0.03	Q V	|	|	|	|
5+30	0.0099	0.03	Q V	|	|	|	|
5+35	0.0101	0.03	Q V	|	|	|	|
5+40	0.0102	0.03	Q V	|	|	|	|
5+45	0.0104	0.03	Q V	|	|	|	|
5+50	0.0106	0.03	Q V	|	|	|	|
5+55	0.0108	0.03	Q V	|	|	|	|
6+ 0	0.0109	0.03	Q V	|	|	|	|
6+ 5	0.0111	0.03	Q V	|	|	|	|
6+10	0.0113	0.03	Q V	|	|	|	|
6+15	0.0115	0.03	Q V	|	|	|	|
6+20	0.0117	0.03	Q V	|	|	|	|
6+25	0.0119	0.03	Q V	|	|	|	|
6+30	0.0120	0.03	Q V	|	|	|	|
6+35	0.0122	0.03	Q V	|	|	|	|
6+40	0.0124	0.03	Q V	|	|	|	|
6+45	0.0126	0.03	Q V	|	|	|	|
6+50	0.0128	0.03	Q V	|	|	|	|
6+55	0.0130	0.03	Q V	|	|	|	|
7+ 0	0.0132	0.03	Q V	|	|	|	|
7+ 5	0.0134	0.03	Q V	|	|	|	|
7+10	0.0135	0.03	Q V	|	|	|	|
7+15	0.0137	0.03	Q V	|	|	|	|
7+20	0.0139	0.03	Q V	|	|	|	|
7+25	0.0141	0.03	Q V	|	|	|	|
7+30	0.0143	0.03	Q V	|	|	|	|
7+35	0.0145	0.03	Q V	|	|	|	|
7+40	0.0147	0.03	Q V	|	|	|	|

7+45	0.0149	0.03	Q	V	|	|	|	|
7+50	0.0151	0.03	Q	V	|	|	|	|
7+55	0.0153	0.03	Q	V	|	|	|	|
8+ 0	0.0155	0.03	Q	V	|	|	|	|
8+ 5	0.0157	0.03	Q	V	|	|	|	|
8+10	0.0159	0.03	Q	V	|	|	|	|
8+15	0.0161	0.03	Q	V	|	|	|	|
8+20	0.0163	0.03	Q	V	|	|	|	|
8+25	0.0166	0.03	Q	V	|	|	|	|
8+30	0.0168	0.03	Q	V	|	|	|	|
8+35	0.0170	0.03	Q	V	|	|	|	|
8+40	0.0172	0.03	Q	V	|	|	|	|
8+45	0.0174	0.03	Q	V	|	|	|	|
8+50	0.0176	0.03	Q	V	|	|	|	|
8+55	0.0178	0.03	Q	V	|	|	|	|
9+ 0	0.0180	0.03	Q	V	|	|	|	|
9+ 5	0.0183	0.03	Q	V	|	|	|	|
9+10	0.0185	0.03	Q	V	|	|	|	|
9+15	0.0187	0.03	Q	V	|	|	|	|
9+20	0.0189	0.03	Q	V	|	|	|	|
9+25	0.0192	0.03	Q	V	|	|	|	|
9+30	0.0194	0.03	Q	V	|	|	|	|
9+35	0.0196	0.03	Q	V	|	|	|	|
9+40	0.0198	0.03	Q	V	|	|	|	|
9+45	0.0201	0.03	Q	V	|	|	|	|
9+50	0.0203	0.03	Q	V	|	|	|	|
9+55	0.0205	0.03	Q	V	|	|	|	|
10+ 0	0.0208	0.03	Q	V	|	|	|	|
10+ 5	0.0210	0.03	Q	V	|	|	|	|
10+10	0.0212	0.03	Q	V	|	|	|	|
10+15	0.0215	0.04	Q	V	|	|	|	|
10+20	0.0217	0.04	Q	V	|	|	|	|
10+25	0.0220	0.04	Q	V	|	|	|	|
10+30	0.0222	0.04	Q	V	|	|	|	|
10+35	0.0225	0.04	Q	V	|	|	|	|
10+40	0.0227	0.04	Q	V	|	|	|	|
10+45	0.0230	0.04	Q	V	|	|	|	|
10+50	0.0232	0.04	Q	V	|	|	|	|
10+55	0.0235	0.04	Q	V	|	|	|	|
11+ 0	0.0238	0.04	Q	V	|	|	|	|
11+ 5	0.0240	0.04	Q	V	|	|	|	|
11+10	0.0243	0.04	Q	V	|	|	|	|
11+15	0.0245	0.04	Q	V	|	|	|	|
11+20	0.0248	0.04	Q	V	|	|	|	|
11+25	0.0251	0.04	Q	V	|	|	|	|
11+30	0.0254	0.04	Q	V	|	|	|	|
11+35	0.0256	0.04	Q	V	|	|	|	|
11+40	0.0259	0.04	Q	V	|	|	|	|
11+45	0.0262	0.04	Q	V	|	|	|	|
11+50	0.0265	0.04	Q	V	|	|	|	|
11+55	0.0268	0.04	Q	V	|	|	|	|
12+ 0	0.0271	0.04	Q	V	|	|	|	|
12+ 5	0.0274	0.04	Q	V	|	|	|	|
12+10	0.0277	0.04	Q	V	|	|	|	|

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12+15       0.0280      0.04  Q         V         |         |         |
12+20       0.0283      0.04  Q         V         |         |         |
12+25       0.0286      0.05  Q         V         |         |         |
12+30       0.0289      0.05  Q         |V        |         |         |
12+35       0.0292      0.05  Q         |V        |         |         |
12+40       0.0295      0.05  Q         |V        |         |         |
12+45       0.0299      0.05  Q         |V        |         |         |
12+50       0.0302      0.05  Q         |V        |         |         |
12+55       0.0305      0.05  Q         |V        |         |         |
13+ 0       0.0309      0.05  Q         |V        |         |         |
13+ 5       0.0312      0.05  Q         |V        |         |         |
13+10       0.0316      0.05  Q         | V       |         |         |
13+15       0.0319      0.05  Q         | V       |         |         |
13+20       0.0323      0.05  Q         | V       |         |         |
13+25       0.0327      0.05  Q         | V       |         |         |
13+30       0.0330      0.05  Q         | V       |         |         |
13+35       0.0334      0.06  Q         | V       |         |         |
13+40       0.0338      0.06  Q         | V       |         |         |
13+45       0.0342      0.06  Q         |  V      |         |         |
13+50       0.0346      0.06  Q         |  V      |         |         |
13+55       0.0350      0.06  Q         |  V      |         |         |
14+ 0       0.0354      0.06  Q         |  V      |         |         |
14+ 5       0.0359      0.06  Q         |  V      |         |         |
14+10       0.0363      0.06  Q         |  V      |         |         |
14+15       0.0367      0.06  Q         |   V     |         |         |
14+20       0.0372      0.07  Q         |   V     |         |         |
14+25       0.0377      0.07  Q         |   V     |         |         |
14+30       0.0381      0.07  Q         |   V     |         |         |
14+35       0.0386      0.07  Q         |   V     |         |         |
14+40       0.0391      0.07  Q         |   V     |         |         |
14+45       0.0397      0.08  Q         |    V    |         |         |
14+50       0.0402      0.08  Q         |    V    |         |         |
14+55       0.0408      0.08  Q         |    V    |         |         |
15+ 0       0.0413      0.08  Q         |    V    |         |         |
15+ 5       0.0419      0.09  Q         |     V   |         |         |
15+10       0.0426      0.09  Q         |     V   |         |         |
15+15       0.0432      0.09  Q         |     V   |         |         |
15+20       0.0439      0.10  Q         |     V   |         |         |
15+25       0.0446      0.10  Q         |      V  |         |         |
15+30       0.0453      0.10  Q         |      V  |         |         |
15+35       0.0459      0.09  Q         |      V  |         |         |
15+40       0.0466      0.10  Q         |      V  |         |         |
15+45       0.0473      0.10  Q         |       V |         |         |
15+50       0.0481      0.12  Q         |       V |         |         |
15+55       0.0491      0.14  Q         |       V |         |         |
16+ 0       0.0503      0.18  Q         |        V|         |         |
16+ 5       0.0531      0.41  |Q        |         V         |         |
16+10       0.0624      1.34  |    Q    |         |  V      |         |
16+15       0.0700      1.11  |   Q     |         |     V   |         |
16+20       0.0739      0.56  | Q       |         |       V |         |
16+25       0.0764      0.37  |Q        |         |        V|         |
16+30       0.0784      0.28  |Q        |         |        V|         |
16+35       0.0799      0.22  Q         |         |         V         |
16+40       0.0812      0.19  Q         |         |         |V        |
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16+45	0.0823	0.16	Q	|	|	|V	|
16+50	0.0832	0.13	Q	|	|	|V	|
16+55	0.0840	0.11	Q	|	|	| V	|
17+ 0	0.0847	0.10	Q	|	|	| V	|
17+ 5	0.0853	0.10	Q	|	|	| V	|
17+10	0.0859	0.09	Q	|	|	| V	|
17+15	0.0864	0.07	Q	|	|	| V	|
17+20	0.0868	0.06	Q	|	|	| V	|
17+25	0.0873	0.06	Q	|	|	| V	|
17+30	0.0877	0.06	Q	|	|	| V	|
17+35	0.0881	0.06	Q	|	|	| V	|
17+40	0.0884	0.06	Q	|	|	| V	|
17+45	0.0888	0.05	Q	|	|	| V	|
17+50	0.0892	0.05	Q	|	|	| V	|
17+55	0.0895	0.05	Q	|	|	| V	|
18+ 0	0.0898	0.05	Q	|	|	| V	|
18+ 5	0.0902	0.05	Q	|	|	| V	|
18+10	0.0905	0.05	Q	|	|	| V	|
18+15	0.0908	0.04	Q	|	|	| V	|
18+20	0.0911	0.04	Q	|	|	| V	|
18+25	0.0914	0.04	Q	|	|	| V	|
18+30	0.0917	0.04	Q	|	|	| V	|
18+35	0.0920	0.04	Q	|	|	| V	|
18+40	0.0922	0.04	Q	|	|	| V	|
18+45	0.0925	0.04	Q	|	|	| V	|
18+50	0.0928	0.04	Q	|	|	| V	|
18+55	0.0930	0.04	Q	|	|	| V	|
19+ 0	0.0933	0.04	Q	|	|	| V	|
19+ 5	0.0935	0.04	Q	|	|	| V	|
19+10	0.0938	0.04	Q	|	|	| V	|
19+15	0.0940	0.04	Q	|	|	| V	|
19+20	0.0943	0.03	Q	|	|	| V	|
19+25	0.0945	0.03	Q	|	|	| V	|
19+30	0.0947	0.03	Q	|	|	| V	|
19+35	0.0950	0.03	Q	|	|	| V	|
19+40	0.0952	0.03	Q	|	|	| V	|
19+45	0.0954	0.03	Q	|	|	| V	|
19+50	0.0956	0.03	Q	|	|	| V	|
19+55	0.0959	0.03	Q	|	|	| V	|
20+ 0	0.0961	0.03	Q	|	|	| V	|
20+ 5	0.0963	0.03	Q	|	|	| V	|
20+10	0.0965	0.03	Q	|	|	| V	|
20+15	0.0967	0.03	Q	|	|	| V	|
20+20	0.0969	0.03	Q	|	|	| V	|
20+25	0.0971	0.03	Q	|	|	| V	|
20+30	0.0973	0.03	Q	|	|	| V	|
20+35	0.0975	0.03	Q	|	|	| V	|
20+40	0.0977	0.03	Q	|	|	| V	|
20+45	0.0979	0.03	Q	|	|	| V	|
20+50	0.0981	0.03	Q	|	|	| V	|
20+55	0.0983	0.03	Q	|	|	| V	|
21+ 0	0.0985	0.03	Q	|	|	| V	|
21+ 5	0.0987	0.03	Q	|	|	| V	|
21+10	0.0988	0.03	Q	|	|	| V	|

```
  21+15       0.0990      0.03  Q          |           |           |       V  |
  21+20       0.0992      0.03  Q          |           |           |       V  |
  21+25       0.0994      0.03  Q          |           |           |       V  |
  21+30       0.0996      0.03  Q          |           |           |        V |
  21+35       0.0997      0.03  Q          |           |           |        V |
  21+40       0.0999      0.03  Q          |           |           |        V |
  21+45       0.1001      0.03  Q          |           |           |        V |
  21+50       0.1003      0.02  Q          |           |           |        V |
  21+55       0.1004      0.02  Q          |           |           |        V |
  22+ 0       0.1006      0.02  Q          |           |           |        V |
  22+ 5       0.1008      0.02  Q          |           |           |        V |
  22+10       0.1009      0.02  Q          |           |           |        V |
  22+15       0.1011      0.02  Q          |           |           |        V |
  22+20       0.1013      0.02  Q          |           |           |        V |
  22+25       0.1014      0.02  Q          |           |           |        V |
  22+30       0.1016      0.02  Q          |           |           |        V |
  22+35       0.1018      0.02  Q          |           |           |        V |
  22+40       0.1019      0.02  Q          |           |           |        V |
  22+45       0.1021      0.02  Q          |           |           |         V|
  22+50       0.1022      0.02  Q          |           |           |         V|
  22+55       0.1024      0.02  Q          |           |           |         V|
  23+ 0       0.1025      0.02  Q          |           |           |         V|
  23+ 5       0.1027      0.02  Q          |           |           |         V|
  23+10       0.1028      0.02  Q          |           |           |         V|
  23+15       0.1030      0.02  Q          |           |           |         V|
  23+20       0.1031      0.02  Q          |           |           |         V|
  23+25       0.1033      0.02  Q          |           |           |         V|
  23+30       0.1034      0.02  Q          |           |           |         V|
  23+35       0.1036      0.02  Q          |           |           |         V|
  23+40       0.1037      0.02  Q          |           |           |         V|
  23+45       0.1039      0.02  Q          |           |           |         V|
  23+50       0.1040      0.02  Q          |           |           |         V|
  23+55       0.1042      0.02  Q          |           |           |         V|
  24+ 0       0.1043      0.02  Q          |           |           |         V|
-------------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 06/29/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA2
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A2-A
FILE: 18345HYDROA2APOST2.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
2.10	1	0.39
Rainfall data for year 2		
2.10	6	0.87
Rainfall data for year 2		
2.10	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.10	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.26	0.600	32.0	52.0	8.05	0.000
0.84	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.135 (hours)
++
Watershed area = 2.10(Ac.)
Catchment Lag time = 0.108 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 76.9723
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 2.10(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 25.40 (CFS))	
1	9.796	2.488
2	55.474	11.601
3	76.653	5.379

4	86.014	2.377
5	91.324	1.349
6	94.672	0.850
7	96.830	0.548
8	98.070	0.315
9	98.951	0.224
10	99.693	0.188
11	100.000	0.078

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3334	0.0151
8	0.3471	0.0136
9	0.3596	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4198	0.0136
15	0.4329	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4810	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5896	0.0088
31	0.5983	0.0087
32	0.6069	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076
40	0.6703	0.0075
41	0.6777	0.0074
42	0.6850	0.0073
43	0.6923	0.0072

44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7598	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9424	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9662	0.0047
92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046
95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046

98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036
147	1.1951	0.0036
148	1.1987	0.0036
149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036

152	1.2129	0.0035
153	1.2164	0.0035
154	1.2199	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2712	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3358	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030
203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030

206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4026	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026
257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026

260	1.5387	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5824	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5975	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009
18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009

21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011
72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011

75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015
126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016

129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037
180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042

183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014
234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013

237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009
288	0.0025	0.0016	0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 1.85(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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.02	Q				
0+25	0.0005	0.02	Q				
0+30	0.0006	0.02	Q				
0+35	0.0008	0.02	Q				
0+40	0.0009	0.02	Q				
0+45	0.0011	0.02	Q				
0+50	0.0012	0.02	Q				
0+55	0.0014	0.02	Q				
1+ 0	0.0015	0.02	Q				
1+ 5	0.0017	0.02	Q				
1+10	0.0018	0.02	Q				
1+15	0.0020	0.02	Q				
1+20	0.0021	0.02	Q				
1+25	0.0023	0.02	Q				
1+30	0.0025	0.02	Q				
1+35	0.0026	0.02	Q				
1+40	0.0028	0.02	Q				
1+45	0.0029	0.02	QV				
1+50	0.0031	0.02	QV				
1+55	0.0033	0.02	QV				
2+ 0	0.0034	0.02	QV				
2+ 5	0.0036	0.02	QV				
2+10	0.0037	0.02	QV				
2+15	0.0039	0.02	QV				
2+20	0.0041	0.02	QV				
2+25	0.0042	0.02	QV				
2+30	0.0044	0.02	QV				
2+35	0.0045	0.02	QV				
2+40	0.0047	0.02	QV				
2+45	0.0049	0.02	QV				
2+50	0.0050	0.02	QV				
2+55	0.0052	0.02	QV				
3+ 0	0.0054	0.02	QV				
3+ 5	0.0055	0.02	QV				
3+10	0.0057	0.02	Q V				
3+15	0.0059	0.02	Q V				
3+20	0.0060	0.02	Q V				
3+25	0.0062	0.02	Q V				

3+30	0.0064	0.02	Q V	|	|	|	|
3+35	0.0065	0.02	Q V	|	|	|	|
3+40	0.0067	0.02	Q V	|	|	|	|
3+45	0.0069	0.02	Q V	|	|	|	|
3+50	0.0071	0.03	Q V	|	|	|	|
3+55	0.0072	0.03	Q V	|	|	|	|
4+ 0	0.0074	0.03	Q V	|	|	|	|
4+ 5	0.0076	0.03	Q V	|	|	|	|
4+10	0.0078	0.03	Q V	|	|	|	|
4+15	0.0079	0.03	Q V	|	|	|	|
4+20	0.0081	0.03	Q V	|	|	|	|
4+25	0.0083	0.03	Q V	|	|	|	|
4+30	0.0085	0.03	Q V	|	|	|	|
4+35	0.0086	0.03	Q V	|	|	|	|
4+40	0.0088	0.03	Q V	|	|	|	|
4+45	0.0090	0.03	Q V	|	|	|	|
4+50	0.0092	0.03	Q V	|	|	|	|
4+55	0.0094	0.03	Q V	|	|	|	|
5+ 0	0.0095	0.03	Q V	|	|	|	|
5+ 5	0.0097	0.03	Q V	|	|	|	|
5+10	0.0099	0.03	Q V	|	|	|	|
5+15	0.0101	0.03	Q V	|	|	|	|
5+20	0.0103	0.03	Q V	|	|	|	|
5+25	0.0105	0.03	Q V	|	|	|	|
5+30	0.0107	0.03	Q V	|	|	|	|
5+35	0.0108	0.03	Q V	|	|	|	|
5+40	0.0110	0.03	Q V	|	|	|	|
5+45	0.0112	0.03	Q V	|	|	|	|
5+50	0.0114	0.03	Q V	|	|	|	|
5+55	0.0116	0.03	Q V	|	|	|	|
6+ 0	0.0118	0.03	Q V	|	|	|	|
6+ 5	0.0120	0.03	Q V	|	|	|	|
6+10	0.0122	0.03	Q V	|	|	|	|
6+15	0.0124	0.03	Q V	|	|	|	|
6+20	0.0126	0.03	Q V	|	|	|	|
6+25	0.0128	0.03	Q V	|	|	|	|
6+30	0.0130	0.03	Q V	|	|	|	|
6+35	0.0132	0.03	Q V	|	|	|	|
6+40	0.0134	0.03	Q V	|	|	|	|
6+45	0.0136	0.03	Q V	|	|	|	|
6+50	0.0138	0.03	Q V	|	|	|	|
6+55	0.0140	0.03	Q V	|	|	|	|
7+ 0	0.0142	0.03	Q V	|	|	|	|
7+ 5	0.0144	0.03	Q V	|	|	|	|
7+10	0.0146	0.03	Q V	|	|	|	|
7+15	0.0148	0.03	Q V	|	|	|	|
7+20	0.0150	0.03	Q V	|	|	|	|
7+25	0.0152	0.03	Q V	|	|	|	|
7+30	0.0154	0.03	Q V	|	|	|	|
7+35	0.0156	0.03	Q V	|	|	|	|
7+40	0.0158	0.03	Q V	|	|	|	|
7+45	0.0160	0.03	Q V	|	|	|	|
7+50	0.0163	0.03	Q V	|	|	|	|
7+55	0.0165	0.03	Q V	|	|	|	|

8+ 0	0.0167	0.03	Q	V	|	|	|	|
8+ 5	0.0169	0.03	Q	V	|	|	|	|
8+10	0.0171	0.03	Q	V	|	|	|	|
8+15	0.0173	0.03	Q	V	|	|	|	|
8+20	0.0176	0.03	Q	V	|	|	|	|
8+25	0.0178	0.03	Q	V	|	|	|	|
8+30	0.0180	0.03	Q	V	|	|	|	|
8+35	0.0182	0.03	Q	V	|	|	|	|
8+40	0.0185	0.03	Q	V	|	|	|	|
8+45	0.0187	0.03	Q	V	|	|	|	|
8+50	0.0189	0.03	Q	V	|	|	|	|
8+55	0.0192	0.03	Q	V	|	|	|	|
9+ 0	0.0194	0.03	Q	V	|	|	|	|
9+ 5	0.0196	0.03	Q	V	|	|	|	|
9+10	0.0199	0.03	Q	V	|	|	|	|
9+15	0.0201	0.03	Q	V	|	|	|	|
9+20	0.0203	0.03	Q	V	|	|	|	|
9+25	0.0206	0.03	Q	V	|	|	|	|
9+30	0.0208	0.04	Q	V	|	|	|	|
9+35	0.0211	0.04	Q	V	|	|	|	|
9+40	0.0213	0.04	Q	V	|	|	|	|
9+45	0.0216	0.04	Q	V	|	|	|	|
9+50	0.0218	0.04	Q	V	|	|	|	|
9+55	0.0221	0.04	Q	V	|	|	|	|
10+ 0	0.0223	0.04	Q	V	|	|	|	|
10+ 5	0.0226	0.04	Q	V	|	|	|	|
10+10	0.0228	0.04	Q	V	|	|	|	|
10+15	0.0231	0.04	Q	V	|	|	|	|
10+20	0.0233	0.04	Q	V	|	|	|	|
10+25	0.0236	0.04	Q	V	|	|	|	|
10+30	0.0239	0.04	Q	V	|	|	|	|
10+35	0.0241	0.04	Q	V	|	|	|	|
10+40	0.0244	0.04	Q	V	|	|	|	|
10+45	0.0247	0.04	Q	V	|	|	|	|
10+50	0.0249	0.04	Q	V	|	|	|	|
10+55	0.0252	0.04	Q	V	|	|	|	|
11+ 0	0.0255	0.04	Q	V	|	|	|	|
11+ 5	0.0258	0.04	Q	V	|	|	|	|
11+10	0.0261	0.04	Q	V	|	|	|	|
11+15	0.0264	0.04	Q	V	|	|	|	|
11+20	0.0266	0.04	Q	V	|	|	|	|
11+25	0.0269	0.04	Q	V	|	|	|	|
11+30	0.0272	0.04	Q	V	|	|	|	|
11+35	0.0275	0.04	Q	V	|	|	|	|
11+40	0.0278	0.04	Q	V	|	|	|	|
11+45	0.0281	0.04	Q	V	|	|	|	|
11+50	0.0284	0.04	Q	V	|	|	|	|
11+55	0.0287	0.05	Q	V	|	|	|	|
12+ 0	0.0291	0.05	Q	V	|	|	|	|
12+ 5	0.0294	0.05	Q	V	|	|	|	|
12+10	0.0297	0.05	Q	V	|	|	|	|
12+15	0.0300	0.05	Q	V	|	|	|	|
12+20	0.0304	0.05	Q	V	|	|	|	|
12+25	0.0307	0.05	Q	|	V	|	|	|

12+30	0.0310	0.05	Q	V			
12+35	0.0314	0.05	Q	V			
12+40	0.0317	0.05	Q	V			
12+45	0.0321	0.05	Q	V			
12+50	0.0324	0.05	Q	V			
12+55	0.0328	0.05	Q	V			
13+ 0	0.0332	0.05	Q	V			
13+ 5	0.0335	0.05	Q	V			
13+10	0.0339	0.05	Q	V			
13+15	0.0343	0.06	Q	V			
13+20	0.0347	0.06	Q	V			
13+25	0.0351	0.06	Q	V			
13+30	0.0355	0.06	Q	V			
13+35	0.0359	0.06	Q	V			
13+40	0.0363	0.06	Q	V			
13+45	0.0367	0.06	Q	V			
13+50	0.0372	0.06	Q	V			
13+55	0.0376	0.06	Q	V			
14+ 0	0.0381	0.07	Q	V			
14+ 5	0.0385	0.07	Q	V			
14+10	0.0390	0.07	Q	V			
14+15	0.0395	0.07	Q	V			
14+20	0.0400	0.07	Q	V			
14+25	0.0405	0.07	Q	V			
14+30	0.0410	0.08	Q	V			
14+35	0.0415	0.08	Q	V			
14+40	0.0421	0.08	Q	V			
14+45	0.0426	0.08	Q	V			
14+50	0.0432	0.09	Q	V			
14+55	0.0438	0.09	Q	V			
15+ 0	0.0445	0.09	Q	V			
15+ 5	0.0451	0.09	Q	V			
15+10	0.0458	0.10	Q	V			
15+15	0.0465	0.10	Q	V			
15+20	0.0473	0.11	Q	V			
15+25	0.0480	0.11	Q	V			
15+30	0.0487	0.10	Q	V			
15+35	0.0494	0.10	Q	V			
15+40	0.0501	0.11	Q	V			
15+45	0.0509	0.12	Q	V			
15+50	0.0518	0.13	Q	V			
15+55	0.0529	0.16	Q	V			
16+ 0	0.0545	0.22	Q	V			
16+ 5	0.0588	0.63	Q	V			
16+10	**0.0715**	**1.85**	**Q**	**V**			
16+15	0.0781	0.96	Q	V			
16+20	0.0815	0.50	Q	V			
16+25	0.0838	0.33	Q	V			
16+30	0.0855	0.25	Q	V			
16+35	0.0869	0.20	Q	V			
16+40	0.0879	0.16	Q	V			
16+45	0.0889	0.13	Q	V			
16+50	0.0897	0.12	Q	V			
16+55	0.0904	0.10	Q	V			

17+ 0	0.0909	0.08	Q	|	|	| V	|
17+ 5	0.0915	0.08	Q	|	|	| V	|
17+10	0.0920	0.07	Q	|	|	| V	|
17+15	0.0924	0.07	Q	|	|	| V	|
17+20	0.0929	0.07	Q	|	|	| V	|
17+25	0.0933	0.06	Q	|	|	| V	|
17+30	0.0938	0.06	Q	|	|	| V	|
17+35	0.0942	0.06	Q	|	|	| V	|
17+40	0.0946	0.06	Q	|	|	| V	|
17+45	0.0949	0.06	Q	|	|	| V	|
17+50	0.0953	0.05	Q	|	|	| V	|
17+55	0.0957	0.05	Q	|	|	| V	|
18+ 0	0.0960	0.05	Q	|	|	| V	|
18+ 5	0.0964	0.05	Q	|	|	| V	|
18+10	0.0967	0.05	Q	|	|	| V	|
18+15	0.0970	0.05	Q	|	|	| V	|
18+20	0.0973	0.05	Q	|	|	| V	|
18+25	0.0976	0.04	Q	|	|	| V	|
18+30	0.0979	0.04	Q	|	|	| V	|
18+35	0.0982	0.04	Q	|	|	| V	|
18+40	0.0985	0.04	Q	|	|	| V	|
18+45	0.0988	0.04	Q	|	|	| V	|
18+50	0.0991	0.04	Q	|	|	| V	|
18+55	0.0994	0.04	Q	|	|	| V	|
19+ 0	0.0996	0.04	Q	|	|	| V	|
19+ 5	0.0999	0.04	Q	|	|	| V	|
19+10	0.1002	0.04	Q	|	|	| V	|
19+15	0.1004	0.04	Q	|	|	| V	|
19+20	0.1007	0.04	Q	|	|	| V	|
19+25	0.1009	0.04	Q	|	|	| V	|
19+30	0.1012	0.04	Q	|	|	| V	|
19+35	0.1014	0.04	Q	|	|	| V	|
19+40	0.1016	0.03	Q	|	|	| V	|
19+45	0.1019	0.03	Q	|	|	| V	|
19+50	0.1021	0.03	Q	|	|	| V	|
19+55	0.1023	0.03	Q	|	|	| V	|
20+ 0	0.1026	0.03	Q	|	|	| V	|
20+ 5	0.1028	0.03	Q	|	|	| V	|
20+10	0.1030	0.03	Q	|	|	| V	|
20+15	0.1032	0.03	Q	|	|	| V	|
20+20	0.1035	0.03	Q	|	|	| V	|
20+25	0.1037	0.03	Q	|	|	| V	|
20+30	0.1039	0.03	Q	|	|	| V	|
20+35	0.1041	0.03	Q	|	|	| V	|
20+40	0.1043	0.03	Q	|	|	| V	|
20+45	0.1045	0.03	Q	|	|	| V	|
20+50	0.1047	0.03	Q	|	|	| V	|
20+55	0.1049	0.03	Q	|	|	| V	|
21+ 0	0.1051	0.03	Q	|	|	| V	|
21+ 5	0.1053	0.03	Q	|	|	| V	|
21+10	0.1055	0.03	Q	|	|	| V	|
21+15	0.1057	0.03	Q	|	|	| V	|
21+20	0.1059	0.03	Q	|	|	| V	|
21+25	0.1061	0.03	Q	|	|	| V	|

21+30	0.1063	0.03	Q	|	|	|	V |
21+35	0.1065	0.03	Q	|	|	|	V |
21+40	0.1066	0.03	Q	|	|	|	V |
21+45	0.1068	0.03	Q	|	|	|	V |
21+50	0.1070	0.03	Q	|	|	|	V |
21+55	0.1072	0.03	Q	|	|	|	V |
22+ 0	0.1074	0.03	Q	|	|	|	V |
22+ 5	0.1075	0.03	Q	|	|	|	V |
22+10	0.1077	0.03	Q	|	|	|	V |
22+15	0.1079	0.03	Q	|	|	|	V |
22+20	0.1081	0.03	Q	|	|	|	V |
22+25	0.1082	0.03	Q	|	|	|	V |
22+30	0.1084	0.02	Q	|	|	|	V |
22+35	0.1086	0.02	Q	|	|	|	V |
22+40	0.1088	0.02	Q	|	|	|	V |
22+45	0.1089	0.02	Q	|	|	|	V|
22+50	0.1091	0.02	Q	|	|	|	V|
22+55	0.1092	0.02	Q	|	|	|	V|
23+ 0	0.1094	0.02	Q	|	|	|	V|
23+ 5	0.1096	0.02	Q	|	|	|	V|
23+10	0.1097	0.02	Q	|	|	|	V|
23+15	0.1099	0.02	Q	|	|	|	V|
23+20	0.1101	0.02	Q	|	|	|	V|
23+25	0.1102	0.02	Q	|	|	|	V|
23+30	0.1104	0.02	Q	|	|	|	V|
23+35	0.1105	0.02	Q	|	|	|	V|
23+40	0.1107	0.02	Q	|	|	|	V|
23+45	0.1108	0.02	Q	|	|	|	V|
23+50	0.1110	0.02	Q	|	|	|	V|
23+55	0.1111	0.02	Q	|	|	|	V|
24+ 0	0.1113	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/26/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA3
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A3-A
FILE: 18345HYDROA3APOST2DA3.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
2.32	1	0.39
Rainfall data for year 2		
2.32	6	0.87
Rainfall data for year 2		
2.32	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.32	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.39	0.600	32.0	52.0	8.05	0.000
0.93	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.182 (hours)
++
Watershed area = 2.32(Ac.)
Catchment Lag time = 0.146 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 57.2344
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 2.32(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 28.06 (CFS))	
1	5.081	1.426
2	38.622	9.411
3	66.254	7.753

4	78.068	3.315
5	84.961	1.934
6	89.542	1.285
7	92.631	0.867
8	94.890	0.634
9	96.533	0.461
10	97.652	0.314
11	98.325	0.189
12	98.998	0.189
13	99.588	0.165
14	100.000	0.116

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3334	0.0151
8	0.3471	0.0136
9	0.3595	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4198	0.0136
15	0.4329	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4810	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5896	0.0088
31	0.5983	0.0087
32	0.6068	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076
40	0.6703	0.0075

41	0.6777	0.0074
42	0.6850	0.0073
43	0.6922	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7598	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9423	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9662	0.0047
92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046

95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036
147	1.1951	0.0036
148	1.1987	0.0036

149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2199	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2712	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3358	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030

203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4026	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026

257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5386	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5824	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5975	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009

18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011

72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015

126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037

180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014

234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009

288 0.0025 0.0016 0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 1.57(CFS)

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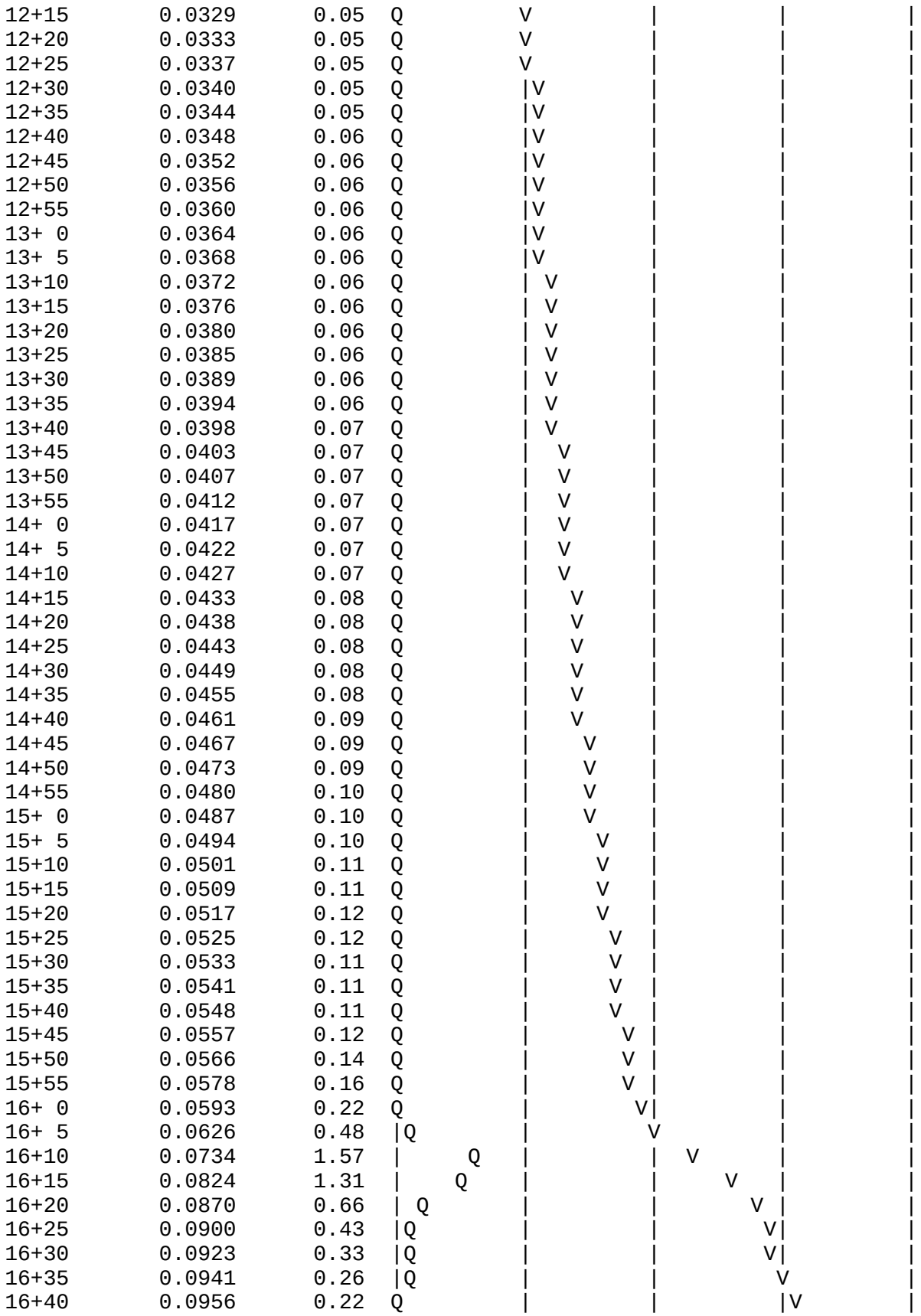
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.02	Q				
0+25	0.0005	0.02	Q				
0+30	0.0006	0.02	Q				
0+35	0.0008	0.02	Q				
0+40	0.0009	0.02	Q				
0+45	0.0011	0.02	Q				
0+50	0.0012	0.02	Q				
0+55	0.0014	0.02	Q				
1+ 0	0.0016	0.02	Q				
1+ 5	0.0017	0.02	Q				
1+10	0.0019	0.02	Q				
1+15	0.0021	0.02	Q				
1+20	0.0023	0.02	Q				
1+25	0.0024	0.02	Q				
1+30	0.0026	0.03	Q				
1+35	0.0028	0.03	Q				
1+40	0.0030	0.03	Q				
1+45	0.0031	0.03	QV				
1+50	0.0033	0.03	QV				
1+55	0.0035	0.03	QV				
2+ 0	0.0037	0.03	QV				
2+ 5	0.0038	0.03	QV				
2+10	0.0040	0.03	QV				
2+15	0.0042	0.03	QV				
2+20	0.0044	0.03	QV				
2+25	0.0045	0.03	QV				
2+30	0.0047	0.03	QV				
2+35	0.0049	0.03	QV				
2+40	0.0051	0.03	QV				
2+45	0.0053	0.03	QV				
2+50	0.0054	0.03	QV				
2+55	0.0056	0.03	QV				
3+ 0	0.0058	0.03	QV				
3+ 5	0.0060	0.03	QV				
3+10	0.0062	0.03	Q V				

3+15	0.0064	0.03	Q V	|	|	|	|
3+20	0.0065	0.03	Q V	|	|	|	|
3+25	0.0067	0.03	Q V	|	|	|	|
3+30	0.0069	0.03	Q V	|	|	|	|
3+35	0.0071	0.03	Q V	|	|	|	|
3+40	0.0073	0.03	Q V	|	|	|	|
3+45	0.0075	0.03	Q V	|	|	|	|
3+50	0.0077	0.03	Q V	|	|	|	|
3+55	0.0079	0.03	Q V	|	|	|	|
4+ 0	0.0081	0.03	Q V	|	|	|	|
4+ 5	0.0083	0.03	Q V	|	|	|	|
4+10	0.0084	0.03	Q V	|	|	|	|
4+15	0.0086	0.03	Q V	|	|	|	|
4+20	0.0088	0.03	Q V	|	|	|	|
4+25	0.0090	0.03	Q V	|	|	|	|
4+30	0.0092	0.03	Q V	|	|	|	|
4+35	0.0094	0.03	Q V	|	|	|	|
4+40	0.0096	0.03	Q V	|	|	|	|
4+45	0.0098	0.03	Q V	|	|	|	|
4+50	0.0100	0.03	Q V	|	|	|	|
4+55	0.0102	0.03	Q V	|	|	|	|
5+ 0	0.0104	0.03	Q V	|	|	|	|
5+ 5	0.0106	0.03	Q V	|	|	|	|
5+10	0.0108	0.03	Q V	|	|	|	|
5+15	0.0110	0.03	Q V	|	|	|	|
5+20	0.0112	0.03	Q V	|	|	|	|
5+25	0.0114	0.03	Q V	|	|	|	|
5+30	0.0116	0.03	Q V	|	|	|	|
5+35	0.0118	0.03	Q V	|	|	|	|
5+40	0.0120	0.03	Q V	|	|	|	|
5+45	0.0123	0.03	Q V	|	|	|	|
5+50	0.0125	0.03	Q V	|	|	|	|
5+55	0.0127	0.03	Q V	|	|	|	|
6+ 0	0.0129	0.03	Q V	|	|	|	|
6+ 5	0.0131	0.03	Q V	|	|	|	|
6+10	0.0133	0.03	Q V	|	|	|	|
6+15	0.0135	0.03	Q V	|	|	|	|
6+20	0.0137	0.03	Q V	|	|	|	|
6+25	0.0140	0.03	Q V	|	|	|	|
6+30	0.0142	0.03	Q V	|	|	|	|
6+35	0.0144	0.03	Q V	|	|	|	|
6+40	0.0146	0.03	Q V	|	|	|	|
6+45	0.0148	0.03	Q V	|	|	|	|
6+50	0.0151	0.03	Q V	|	|	|	|
6+55	0.0153	0.03	Q V	|	|	|	|
7+ 0	0.0155	0.03	Q V	|	|	|	|
7+ 5	0.0157	0.03	Q V	|	|	|	|
7+10	0.0160	0.03	Q V	|	|	|	|
7+15	0.0162	0.03	Q V	|	|	|	|
7+20	0.0164	0.03	Q V	|	|	|	|
7+25	0.0166	0.03	Q V	|	|	|	|
7+30	0.0169	0.03	Q V	|	|	|	|
7+35	0.0171	0.03	Q V	|	|	|	|
7+40	0.0173	0.03	Q V	|	|	|	|

7+45	0.0176	0.03	Q	V	|	|	|	|
7+50	0.0178	0.03	Q	V	|	|	|	|
7+55	0.0180	0.03	Q	V	|	|	|	|
8+ 0	0.0183	0.03	Q	V	|	|	|	|
8+ 5	0.0185	0.03	Q	V	|	|	|	|
8+10	0.0188	0.03	Q	V	|	|	|	|
8+15	0.0190	0.04	Q	V	|	|	|	|
8+20	0.0192	0.04	Q	V	|	|	|	|
8+25	0.0195	0.04	Q	V	|	|	|	|
8+30	0.0197	0.04	Q	V	|	|	|	|
8+35	0.0200	0.04	Q	V	|	|	|	|
8+40	0.0202	0.04	Q	V	|	|	|	|
8+45	0.0205	0.04	Q	V	|	|	|	|
8+50	0.0207	0.04	Q	V	|	|	|	|
8+55	0.0210	0.04	Q	V	|	|	|	|
9+ 0	0.0212	0.04	Q	V	|	|	|	|
9+ 5	0.0215	0.04	Q	V	|	|	|	|
9+10	0.0218	0.04	Q	V	|	|	|	|
9+15	0.0220	0.04	Q	V	|	|	|	|
9+20	0.0223	0.04	Q	V	|	|	|	|
9+25	0.0226	0.04	Q	V	|	|	|	|
9+30	0.0228	0.04	Q	V	|	|	|	|
9+35	0.0231	0.04	Q	V	|	|	|	|
9+40	0.0234	0.04	Q	V	|	|	|	|
9+45	0.0236	0.04	Q	V	|	|	|	|
9+50	0.0239	0.04	Q	V	|	|	|	|
9+55	0.0242	0.04	Q	V	|	|	|	|
10+ 0	0.0245	0.04	Q	V	|	|	|	|
10+ 5	0.0247	0.04	Q	V	|	|	|	|
10+10	0.0250	0.04	Q	V	|	|	|	|
10+15	0.0253	0.04	Q	V	|	|	|	|
10+20	0.0256	0.04	Q	V	|	|	|	|
10+25	0.0259	0.04	Q	V	|	|	|	|
10+30	0.0262	0.04	Q	V	|	|	|	|
10+35	0.0265	0.04	Q	V	|	|	|	|
10+40	0.0268	0.04	Q	V	|	|	|	|
10+45	0.0271	0.04	Q	V	|	|	|	|
10+50	0.0274	0.04	Q	V	|	|	|	|
10+55	0.0277	0.04	Q	V	|	|	|	|
11+ 0	0.0280	0.04	Q	V	|	|	|	|
11+ 5	0.0283	0.04	Q	V	|	|	|	|
11+10	0.0286	0.05	Q	V	|	|	|	|
11+15	0.0289	0.05	Q	V	|	|	|	|
11+20	0.0292	0.05	Q	V	|	|	|	|
11+25	0.0295	0.05	Q	V	|	|	|	|
11+30	0.0299	0.05	Q	V	|	|	|	|
11+35	0.0302	0.05	Q	V	|	|	|	|
11+40	0.0305	0.05	Q	V	|	|	|	|
11+45	0.0309	0.05	Q	V	|	|	|	|
11+50	0.0312	0.05	Q	V	|	|	|	|
11+55	0.0315	0.05	Q	V	|	|	|	|
12+ 0	0.0319	0.05	Q	V	|	|	|	|
12+ 5	0.0322	0.05	Q	V	|	|	|	|
12+10	0.0326	0.05	Q	V	|	|	|	|


12+15 0.0329 0.05
12+20 0.0333 0.05
12+25 0.0337 0.05
12+30 0.0340 0.05
12+35 0.0344 0.05
12+40 0.0348 0.06
12+45 0.0352 0.06
12+50 0.0356 0.06
12+55 0.0360 0.06
13+ 0 0.0364 0.06
13+ 5 0.0368 0.06
13+10 0.0372 0.06
13+15 0.0376 0.06
13+20 0.0380 0.06
13+25 0.0385 0.06
13+30 0.0389 0.06
13+35 0.0394 0.06
13+40 0.0398 0.07
13+45 0.0403 0.07
13+50 0.0407 0.07
13+55 0.0412 0.07
14+ 0 0.0417 0.07
14+ 5 0.0422 0.07
14+10 0.0427 0.07
14+15 0.0433 0.08
14+20 0.0438 0.08
14+25 0.0443 0.08
14+30 0.0449 0.08
14+35 0.0455 0.08
14+40 0.0461 0.09
14+45 0.0467 0.09
14+50 0.0473 0.09
14+55 0.0480 0.10
15+ 0 0.0487 0.10
15+ 5 0.0494 0.10
15+10 0.0501 0.11
15+15 0.0509 0.11
15+20 0.0517 0.12
15+25 0.0525 0.12
15+30 0.0533 0.11
15+35 0.0541 0.11
15+40 0.0548 0.11
15+45 0.0557 0.12
15+50 0.0566 0.14
15+55 0.0578 0.16
16+ 0 0.0593 0.22
16+ 5 0.0626 0.48
16+10 0.0734 1.57
16+15 0.0824 1.31
16+20 0.0870 0.66
16+25 0.0900 0.43
16+30 0.0923 0.33
16+35 0.0941 0.26
16+40 0.0956 0.22

16+45	0.0969	0.19	Q	|	|	|	V |
16+50	0.0980	0.16	Q	|	|	|	V |
16+55	0.0989	0.13	Q	|	|	|	V |
17+ 0	0.0997	0.12	Q	|	|	|	V |
17+ 5	0.1005	0.11	Q	|	|	|	V |
17+10	0.1012	0.10	Q	|	|	|	V |
17+15	0.1017	0.08	Q	|	|	|	V |
17+20	0.1023	0.08	Q	|	|	|	V |
17+25	0.1028	0.07	Q	|	|	|	V |
17+30	0.1032	0.07	Q	|	|	|	V |
17+35	0.1037	0.07	Q	|	|	|	V |
17+40	0.1042	0.06	Q	|	|	|	V |
17+45	0.1046	0.06	Q	|	|	|	V |
17+50	0.1050	0.06	Q	|	|	|	V |
17+55	0.1054	0.06	Q	|	|	|	V |
18+ 0	0.1058	0.06	Q	|	|	|	V |
18+ 5	0.1062	0.06	Q	|	|	|	V |
18+10	0.1066	0.05	Q	|	|	|	V |
18+15	0.1069	0.05	Q	|	|	|	V |
18+20	0.1073	0.05	Q	|	|	|	V |
18+25	0.1076	0.05	Q	|	|	|	V |
18+30	0.1080	0.05	Q	|	|	|	V |
18+35	0.1083	0.05	Q	|	|	|	V |
18+40	0.1086	0.05	Q	|	|	|	V |
18+45	0.1089	0.05	Q	|	|	|	V |
18+50	0.1092	0.05	Q	|	|	|	V |
18+55	0.1096	0.04	Q	|	|	|	V |
19+ 0	0.1099	0.04	Q	|	|	|	V |
19+ 5	0.1102	0.04	Q	|	|	|	V |
19+10	0.1104	0.04	Q	|	|	|	V |
19+15	0.1107	0.04	Q	|	|	|	V |
19+20	0.1110	0.04	Q	|	|	|	V |
19+25	0.1113	0.04	Q	|	|	|	V |
19+30	0.1116	0.04	Q	|	|	|	V |
19+35	0.1118	0.04	Q	|	|	|	V |
19+40	0.1121	0.04	Q	|	|	|	V |
19+45	0.1124	0.04	Q	|	|	|	V |
19+50	0.1126	0.04	Q	|	|	|	V |
19+55	0.1129	0.04	Q	|	|	|	V |
20+ 0	0.1131	0.04	Q	|	|	|	V |
20+ 5	0.1134	0.04	Q	|	|	|	V |
20+10	0.1136	0.04	Q	|	|	|	V |
20+15	0.1139	0.04	Q	|	|	|	V |
20+20	0.1141	0.04	Q	|	|	|	V |
20+25	0.1144	0.03	Q	|	|	|	V |
20+30	0.1146	0.03	Q	|	|	|	V |
20+35	0.1148	0.03	Q	|	|	|	V |
20+40	0.1151	0.03	Q	|	|	|	V |
20+45	0.1153	0.03	Q	|	|	|	V |
20+50	0.1155	0.03	Q	|	|	|	V |
20+55	0.1157	0.03	Q	|	|	|	V |
21+ 0	0.1160	0.03	Q	|	|	|	V |
21+ 5	0.1162	0.03	Q	|	|	|	V |
21+10	0.1164	0.03	Q	|	|	|	V |

21+15	0.1166	0.03	Q	|	|	|	V |
21+20	0.1168	0.03	Q	|	|	|	V |
21+25	0.1170	0.03	Q	|	|	|	V |
21+30	0.1173	0.03	Q	|	|	|	V |
21+35	0.1175	0.03	Q	|	|	|	V |
21+40	0.1177	0.03	Q	|	|	|	V |
21+45	0.1179	0.03	Q	|	|	|	V |
21+50	0.1181	0.03	Q	|	|	|	V |
21+55	0.1183	0.03	Q	|	|	|	V |
22+ 0	0.1185	0.03	Q	|	|	|	V |
22+ 5	0.1187	0.03	Q	|	|	|	V |
22+10	0.1189	0.03	Q	|	|	|	V |
22+15	0.1191	0.03	Q	|	|	|	V |
22+20	0.1193	0.03	Q	|	|	|	V |
22+25	0.1195	0.03	Q	|	|	|	V |
22+30	0.1196	0.03	Q	|	|	|	V |
22+35	0.1198	0.03	Q	|	|	|	V |
22+40	0.1200	0.03	Q	|	|	|	V |
22+45	0.1202	0.03	Q	|	|	|	V|
22+50	0.1204	0.03	Q	|	|	|	V|
22+55	0.1206	0.03	Q	|	|	|	V|
23+ 0	0.1208	0.03	Q	|	|	|	V|
23+ 5	0.1209	0.03	Q	|	|	|	V|
23+10	0.1211	0.03	Q	|	|	|	V|
23+15	0.1213	0.03	Q	|	|	|	V|
23+20	0.1215	0.03	Q	|	|	|	V|
23+25	0.1216	0.03	Q	|	|	|	V|
23+30	0.1218	0.03	Q	|	|	|	V|
23+35	0.1220	0.03	Q	|	|	|	V|
23+40	0.1222	0.03	Q	|	|	|	V|
23+45	0.1223	0.02	Q	|	|	|	V|
23+50	0.1225	0.02	Q	|	|	|	V|
23+55	0.1227	0.02	Q	|	|	|	V|
24+ 0	0.1228	0.02	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 08/25/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA4
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A4-A
FILE: 18345HYDROA4APOST2DA4.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
2.87	1	0.39
Rainfall data for year 2		
2.87	6	0.87
Rainfall data for year 2		
2.87	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.87	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.72	0.600	32.0	52.0	8.05	0.000
1.15	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.214 (hours)
++
Watershed area = 2.87(Ac.)
Catchment Lag time = 0.171 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 48.7443
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 2.87(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
(K = 34.71 (CFS))		
1	3.800	1.319
2	29.029	8.757
3	59.402	10.542

4	72.906	4.687
5	80.759	2.725
6	85.982	1.813
7	89.688	1.286
8	92.332	0.918
9	94.377	0.710
10	95.929	0.539
11	97.100	0.406
12	97.890	0.274
13	98.416	0.183
14	98.997	0.201
15	99.524	0.183
16	99.847	0.112
17	100.000	0.053

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3334	0.0151
8	0.3471	0.0136
9	0.3595	0.0125
10	0.3711	0.0115
11	0.3818	0.0108
12	0.3919	0.0101
13	0.4062	0.0142
14	0.4198	0.0136
15	0.4329	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4810	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5896	0.0088
31	0.5983	0.0087
32	0.6068	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079

38	0.6551	0.0077
39	0.6628	0.0076
40	0.6703	0.0075
41	0.6777	0.0074
42	0.6850	0.0073
43	0.6922	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7598	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8148	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9423	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9662	0.0047

92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046
95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036

146	1.1914	0.0036
147	1.1951	0.0036
148	1.1987	0.0036
149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2199	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2712	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3040	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3358	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3575	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030

200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030
203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4026	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027

254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026
257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5386	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5824	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5975	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009

15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009
18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011

69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011
72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015

123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015
126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033

177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037
180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014

231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014
234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009

285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009
288	0.0025	0.0016	0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 1.76(CFS)

++

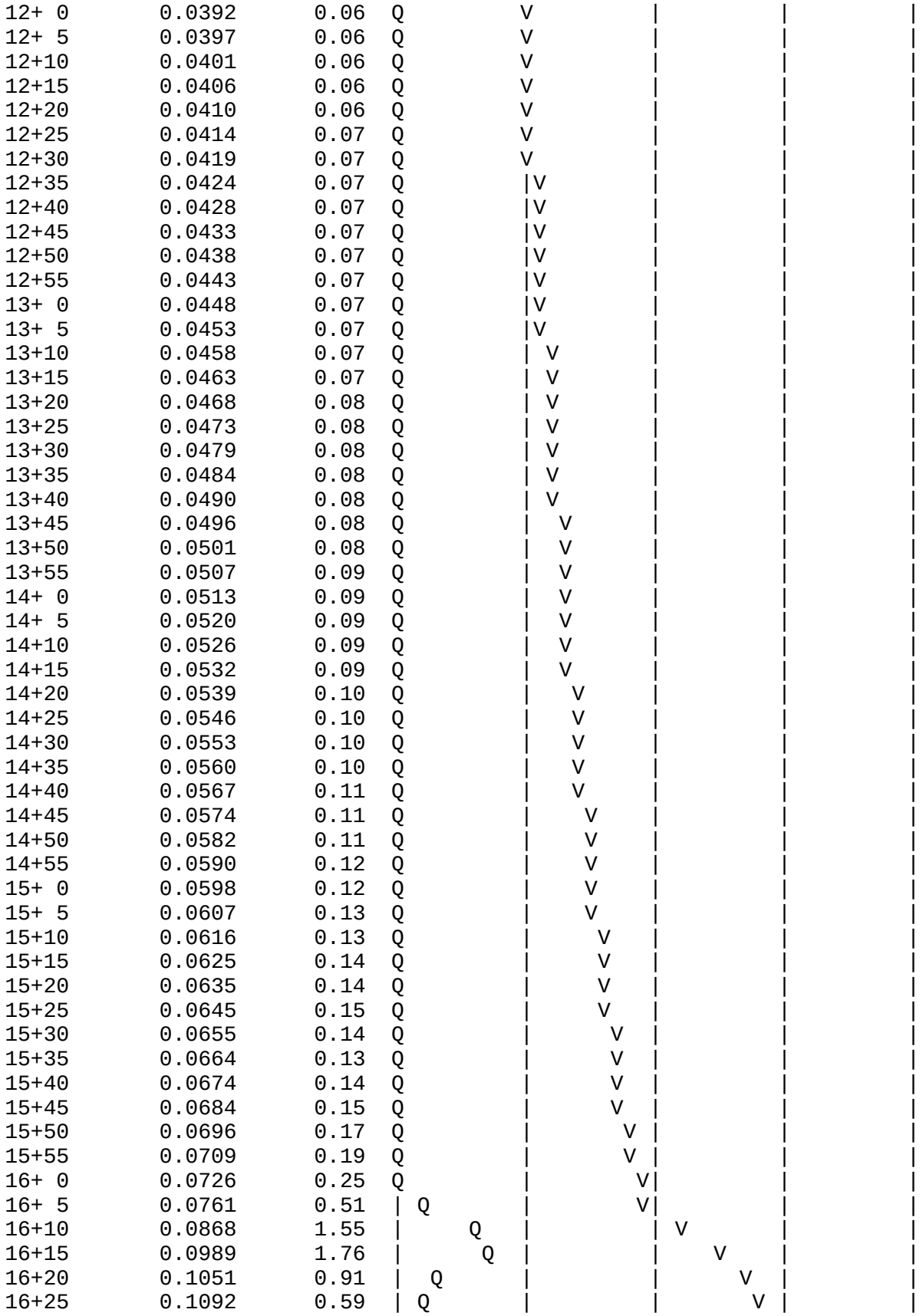
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.02	Q				
0+25	0.0005	0.02	Q				
0+30	0.0007	0.03	Q				
0+35	0.0009	0.03	Q				
0+40	0.0011	0.03	Q				
0+45	0.0013	0.03	Q				
0+50	0.0015	0.03	Q				
0+55	0.0017	0.03	Q				
1+ 0	0.0019	0.03	Q				
1+ 5	0.0021	0.03	Q				
1+10	0.0023	0.03	Q				
1+15	0.0025	0.03	Q				
1+20	0.0027	0.03	Q				
1+25	0.0029	0.03	Q				
1+30	0.0031	0.03	Q				
1+35	0.0033	0.03	Q				
1+40	0.0036	0.03	Q				
1+45	0.0038	0.03	Q				
1+50	0.0040	0.03	QV				
1+55	0.0042	0.03	QV				
2+ 0	0.0044	0.03	QV				
2+ 5	0.0046	0.03	QV				
2+10	0.0049	0.03	QV				
2+15	0.0051	0.03	QV				
2+20	0.0053	0.03	QV				
2+25	0.0055	0.03	QV				
2+30	0.0057	0.03	QV				
2+35	0.0060	0.03	QV				
2+40	0.0062	0.03	QV				
2+45	0.0064	0.03	QV				
2+50	0.0066	0.03	QV				
2+55	0.0069	0.03	QV				

3+ 0	0.0071	0.03	QV	|	|	|	|
3+ 5	0.0073	0.03	QV	|	|	|	|
3+10	0.0075	0.03	QV	|	|	|	|
3+15	0.0078	0.03	Q V	|	|	|	|
3+20	0.0080	0.03	Q V	|	|	|	|
3+25	0.0082	0.03	Q V	|	|	|	|
3+30	0.0085	0.03	Q V	|	|	|	|
3+35	0.0087	0.03	Q V	|	|	|	|
3+40	0.0089	0.03	Q V	|	|	|	|
3+45	0.0092	0.03	Q V	|	|	|	|
3+50	0.0094	0.03	Q V	|	|	|	|
3+55	0.0096	0.03	Q V	|	|	|	|
4+ 0	0.0099	0.03	Q V	|	|	|	|
4+ 5	0.0101	0.03	Q V	|	|	|	|
4+10	0.0103	0.03	Q V	|	|	|	|
4+15	0.0106	0.03	Q V	|	|	|	|
4+20	0.0108	0.03	Q V	|	|	|	|
4+25	0.0111	0.03	Q V	|	|	|	|
4+30	0.0113	0.04	Q V	|	|	|	|
4+35	0.0115	0.04	Q V	|	|	|	|
4+40	0.0118	0.04	Q V	|	|	|	|
4+45	0.0120	0.04	Q V	|	|	|	|
4+50	0.0123	0.04	Q V	|	|	|	|
4+55	0.0125	0.04	Q V	|	|	|	|
5+ 0	0.0128	0.04	Q V	|	|	|	|
5+ 5	0.0130	0.04	Q V	|	|	|	|
5+10	0.0133	0.04	Q V	|	|	|	|
5+15	0.0135	0.04	Q V	|	|	|	|
5+20	0.0138	0.04	Q V	|	|	|	|
5+25	0.0140	0.04	Q V	|	|	|	|
5+30	0.0143	0.04	Q V	|	|	|	|
5+35	0.0145	0.04	Q V	|	|	|	|
5+40	0.0148	0.04	Q V	|	|	|	|
5+45	0.0150	0.04	Q V	|	|	|	|
5+50	0.0153	0.04	Q V	|	|	|	|
5+55	0.0156	0.04	Q V	|	|	|	|
6+ 0	0.0158	0.04	Q V	|	|	|	|
6+ 5	0.0161	0.04	Q V	|	|	|	|
6+10	0.0164	0.04	Q V	|	|	|	|
6+15	0.0166	0.04	Q V	|	|	|	|
6+20	0.0169	0.04	Q V	|	|	|	|
6+25	0.0171	0.04	Q V	|	|	|	|
6+30	0.0174	0.04	Q V	|	|	|	|
6+35	0.0177	0.04	Q V	|	|	|	|
6+40	0.0180	0.04	Q V	|	|	|	|
6+45	0.0182	0.04	Q V	|	|	|	|
6+50	0.0185	0.04	Q V	|	|	|	|
6+55	0.0188	0.04	Q V	|	|	|	|
7+ 0	0.0191	0.04	Q V	|	|	|	|
7+ 5	0.0193	0.04	Q V	|	|	|	|
7+10	0.0196	0.04	Q V	|	|	|	|
7+15	0.0199	0.04	Q V	|	|	|	|
7+20	0.0202	0.04	Q V	|	|	|	|
7+25	0.0205	0.04	Q V	|	|	|	|

7+30	0.0207	0.04	Q	V	|	|	|	|
7+35	0.0210	0.04	Q	V	|	|	|	|
7+40	0.0213	0.04	Q	V	|	|	|	|
7+45	0.0216	0.04	Q	V	|	|	|	|
7+50	0.0219	0.04	Q	V	|	|	|	|
7+55	0.0222	0.04	Q	V	|	|	|	|
8+ 0	0.0225	0.04	Q	V	|	|	|	|
8+ 5	0.0228	0.04	Q	V	|	|	|	|
8+10	0.0231	0.04	Q	V	|	|	|	|
8+15	0.0234	0.04	Q	V	|	|	|	|
8+20	0.0237	0.04	Q	V	|	|	|	|
8+25	0.0240	0.04	Q	V	|	|	|	|
8+30	0.0243	0.04	Q	V	|	|	|	|
8+35	0.0246	0.04	Q	V	|	|	|	|
8+40	0.0249	0.04	Q	V	|	|	|	|
8+45	0.0252	0.05	Q	V	|	|	|	|
8+50	0.0255	0.05	Q	V	|	|	|	|
8+55	0.0258	0.05	Q	V	|	|	|	|
9+ 0	0.0261	0.05	Q	V	|	|	|	|
9+ 5	0.0265	0.05	Q	V	|	|	|	|
9+10	0.0268	0.05	Q	V	|	|	|	|
9+15	0.0271	0.05	Q	V	|	|	|	|
9+20	0.0274	0.05	Q	V	|	|	|	|
9+25	0.0278	0.05	Q	V	|	|	|	|
9+30	0.0281	0.05	Q	V	|	|	|	|
9+35	0.0284	0.05	Q	V	|	|	|	|
9+40	0.0287	0.05	Q	V	|	|	|	|
9+45	0.0291	0.05	Q	V	|	|	|	|
9+50	0.0294	0.05	Q	V	|	|	|	|
9+55	0.0298	0.05	Q	V	|	|	|	|
10+ 0	0.0301	0.05	Q	V	|	|	|	|
10+ 5	0.0305	0.05	Q	V	|	|	|	|
10+10	0.0308	0.05	Q	V	|	|	|	|
10+15	0.0311	0.05	Q	V	|	|	|	|
10+20	0.0315	0.05	Q	V	|	|	|	|
10+25	0.0319	0.05	Q	V	|	|	|	|
10+30	0.0322	0.05	Q	V	|	|	|	|
10+35	0.0326	0.05	Q	V	|	|	|	|
10+40	0.0329	0.05	Q	V	|	|	|	|
10+45	0.0333	0.05	Q	V	|	|	|	|
10+50	0.0337	0.05	Q	V	|	|	|	|
10+55	0.0341	0.05	Q	V	|	|	|	|
11+ 0	0.0344	0.05	Q	V	|	|	|	|
11+ 5	0.0348	0.06	Q	V	|	|	|	|
11+10	0.0352	0.06	Q	V	|	|	|	|
11+15	0.0356	0.06	Q	V	|	|	|	|
11+20	0.0360	0.06	Q	V	|	|	|	|
11+25	0.0364	0.06	Q	V	|	|	|	|
11+30	0.0368	0.06	Q	V	|	|	|	|
11+35	0.0372	0.06	Q	V	|	|	|	|
11+40	0.0376	0.06	Q	V	|	|	|	|
11+45	0.0380	0.06	Q	V	|	|	|	|
11+50	0.0384	0.06	Q	V	|	|	|	|
11+55	0.0388	0.06	Q	V	|	|	|	|


12+ 0 0.0392 0.06
12+ 5 0.0397 0.06
12+10 0.0401 0.06
12+15 0.0406 0.06
12+20 0.0410 0.06
12+25 0.0414 0.07
12+30 0.0419 0.07
12+35 0.0424 0.07
12+40 0.0428 0.07
12+45 0.0433 0.07
12+50 0.0438 0.07
12+55 0.0443 0.07
13+ 0 0.0448 0.07
13+ 5 0.0453 0.07
13+10 0.0458 0.07
13+15 0.0463 0.07
13+20 0.0468 0.08
13+25 0.0473 0.08
13+30 0.0479 0.08
13+35 0.0484 0.08
13+40 0.0490 0.08
13+45 0.0496 0.08
13+50 0.0501 0.08
13+55 0.0507 0.09
14+ 0 0.0513 0.09
14+ 5 0.0520 0.09
14+10 0.0526 0.09
14+15 0.0532 0.09
14+20 0.0539 0.10
14+25 0.0546 0.10
14+30 0.0553 0.10
14+35 0.0560 0.10
14+40 0.0567 0.11
14+45 0.0574 0.11
14+50 0.0582 0.11
14+55 0.0590 0.12
15+ 0 0.0598 0.12
15+ 5 0.0607 0.13
15+10 0.0616 0.13
15+15 0.0625 0.14
15+20 0.0635 0.14
15+25 0.0645 0.15
15+30 0.0655 0.14
15+35 0.0664 0.13
15+40 0.0674 0.14
15+45 0.0684 0.15
15+50 0.0696 0.17
15+55 0.0709 0.19
16+ 0 0.0726 0.25
16+ 5 0.0761 0.51
16+10 0.0868 1.55
16+15 0.0989 1.76
16+20 0.1051 0.91
16+25 0.1092 0.59

```
16+30       0.1123      0.45  |Q        |         |        V|         |
16+35       0.1148      0.36  |Q        |         |         V         |
16+40       0.1168      0.30  |Q        |         |         V         |
16+45       0.1186      0.25  |Q        |         |          |V        |
16+50       0.1201      0.22  Q         |         |          |V        |
16+55       0.1214      0.19  Q         |         |          |V        |
17+ 0       0.1225      0.16  Q         |         |          | V       |
17+ 5       0.1235      0.14  Q         |         |          | V       |
17+10       0.1244      0.14  Q         |         |          | V       |
17+15       0.1253      0.13  Q         |         |          | V       |
17+20       0.1261      0.11  Q         |         |          |  V      |
17+25       0.1268      0.10  Q         |         |          |  V      |
17+30       0.1274      0.09  Q         |         |          |  V      |
17+35       0.1280      0.09  Q         |         |          |  V      |
17+40       0.1286      0.08  Q         |         |          |  V      |
17+45       0.1291      0.08  Q         |         |          |  V      |
17+50       0.1296      0.08  Q         |         |          |   V     |
17+55       0.1301      0.07  Q         |         |          |   V     |
18+ 0       0.1306      0.07  Q         |         |          |   V     |
18+ 5       0.1311      0.07  Q         |         |          |   V     |
18+10       0.1316      0.07  Q         |         |          |   V     |
18+15       0.1321      0.07  Q         |         |          |   V     |
18+20       0.1325      0.06  Q         |         |          |   V     |
18+25       0.1329      0.06  Q         |         |          |   V     |
18+30       0.1334      0.06  Q         |         |          |   V     |
18+35       0.1338      0.06  Q         |         |          |    V    |
18+40       0.1342      0.06  Q         |         |          |    V    |
18+45       0.1346      0.06  Q         |         |          |    V    |
18+50       0.1350      0.06  Q         |         |          |    V    |
18+55       0.1354      0.06  Q         |         |          |    V    |
19+ 0       0.1357      0.05  Q         |         |          |    V    |
19+ 5       0.1361      0.05  Q         |         |          |    V    |
19+10       0.1365      0.05  Q         |         |          |    V    |
19+15       0.1368      0.05  Q         |         |          |    V    |
19+20       0.1372      0.05  Q         |         |          |    V    |
19+25       0.1375      0.05  Q         |         |          |     V   |
19+30       0.1379      0.05  Q         |         |          |     V   |
19+35       0.1382      0.05  Q         |         |          |     V   |
19+40       0.1385      0.05  Q         |         |          |     V   |
19+45       0.1389      0.05  Q         |         |          |     V   |
19+50       0.1392      0.05  Q         |         |          |     V   |
19+55       0.1395      0.05  Q         |         |          |     V   |
20+ 0       0.1398      0.05  Q         |         |          |     V   |
20+ 5       0.1401      0.05  Q         |         |          |     V   |
20+10       0.1404      0.04  Q         |         |          |     V   |
20+15       0.1407      0.04  Q         |         |          |     V   |
20+20       0.1410      0.04  Q         |         |          |     V   |
20+25       0.1413      0.04  Q         |         |          |      V  |
20+30       0.1416      0.04  Q         |         |          |      V  |
20+35       0.1419      0.04  Q         |         |          |      V  |
20+40       0.1422      0.04  Q         |         |          |      V  |
20+45       0.1425      0.04  Q         |         |          |      V  |
20+50       0.1428      0.04  Q         |         |          |      V  |
20+55       0.1431      0.04  Q         |         |          |      V  |
```

21+ 0	0.1433	0.04	Q	|	|	|	V |
21+ 5	0.1436	0.04	Q	|	|	|	V |
21+10	0.1439	0.04	Q	|	|	|	V |
21+15	0.1441	0.04	Q	|	|	|	V |
21+20	0.1444	0.04	Q	|	|	|	V |
21+25	0.1447	0.04	Q	|	|	|	V |
21+30	0.1449	0.04	Q	|	|	|	V |
21+35	0.1452	0.04	Q	|	|	|	V |
21+40	0.1454	0.04	Q	|	|	|	V |
21+45	0.1457	0.04	Q	|	|	|	V |
21+50	0.1460	0.04	Q	|	|	|	V |
21+55	0.1462	0.04	Q	|	|	|	V |
22+ 0	0.1465	0.04	Q	|	|	|	V |
22+ 5	0.1467	0.04	Q	|	|	|	V |
22+10	0.1469	0.04	Q	|	|	|	V |
22+15	0.1472	0.04	Q	|	|	|	V |
22+20	0.1474	0.03	Q	|	|	|	V |
22+25	0.1477	0.03	Q	|	|	|	V |
22+30	0.1479	0.03	Q	|	|	|	V |
22+35	0.1481	0.03	Q	|	|	|	V |
22+40	0.1484	0.03	Q	|	|	|	V |
22+45	0.1486	0.03	Q	|	|	|	V |
22+50	0.1488	0.03	Q	|	|	|	V|
22+55	0.1491	0.03	Q	|	|	|	V|
23+ 0	0.1493	0.03	Q	|	|	|	V|
23+ 5	0.1495	0.03	Q	|	|	|	V|
23+10	0.1497	0.03	Q	|	|	|	V|
23+15	0.1499	0.03	Q	|	|	|	V|
23+20	0.1502	0.03	Q	|	|	|	V|
23+25	0.1504	0.03	Q	|	|	|	V|
23+30	0.1506	0.03	Q	|	|	|	V|
23+35	0.1508	0.03	Q	|	|	|	V|
23+40	0.1510	0.03	Q	|	|	|	V|
23+45	0.1512	0.03	Q	|	|	|	V|
23+50	0.1515	0.03	Q	|	|	|	V|
23+55	0.1517	0.03	Q	|	|	|	V|
24+ 0	0.1519	0.03	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/26/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA5
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A1-B
FILE: 18345HYDROA1BPOST2DA5.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
0.92	1	0.39
Rainfall data for year 2		
0.92	6	0.87
Rainfall data for year 2		
0.92	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	0.92	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.55	0.600	32.0	52.0	8.05	0.000
0.37	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.171 (hours)
++
Watershed area = 0.92(Ac.)
Catchment Lag time = 0.137 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 60.9875
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 0.92(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 11.13 (CFS))	
1	5.774	0.642
2	42.465	4.082
3	68.688	2.918

4	79.919	1.250
5	86.521	0.735
6	90.754	0.471
7	93.680	0.326
8	95.758	0.231
9	97.221	0.163
10	98.095	0.097
11	98.784	0.077
12	99.468	0.076
13	100.000	0.059

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3335	0.0151
8	0.3471	0.0136
9	0.3596	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4199	0.0136
15	0.4330	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4811	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5897	0.0088
31	0.5983	0.0087
32	0.6069	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076
40	0.6703	0.0075
41	0.6777	0.0074

42	0.6850	0.0073
43	0.6923	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7599	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9424	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9663	0.0047
92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046
95	0.9848	0.0046

96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1915	0.0036
147	1.1951	0.0036
148	1.1987	0.0036
149	1.2022	0.0036

150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2200	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2713	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3359	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030
203	1.3788	0.0030

204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4027	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026
257	1.5308	0.0026

258	1.5334	0.0026
259	1.5360	0.0026
260	1.5387	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5825	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5976	0.0025
284	1.6001	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009
18	0.0026	0.0017	0.0009

19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011
72	0.0032	0.0021	0.0011

73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015
126	0.0045	0.0029	0.0015

127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037
180	0.0111	0.0073	0.0038

181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014
234	0.0040	0.0026	0.0014

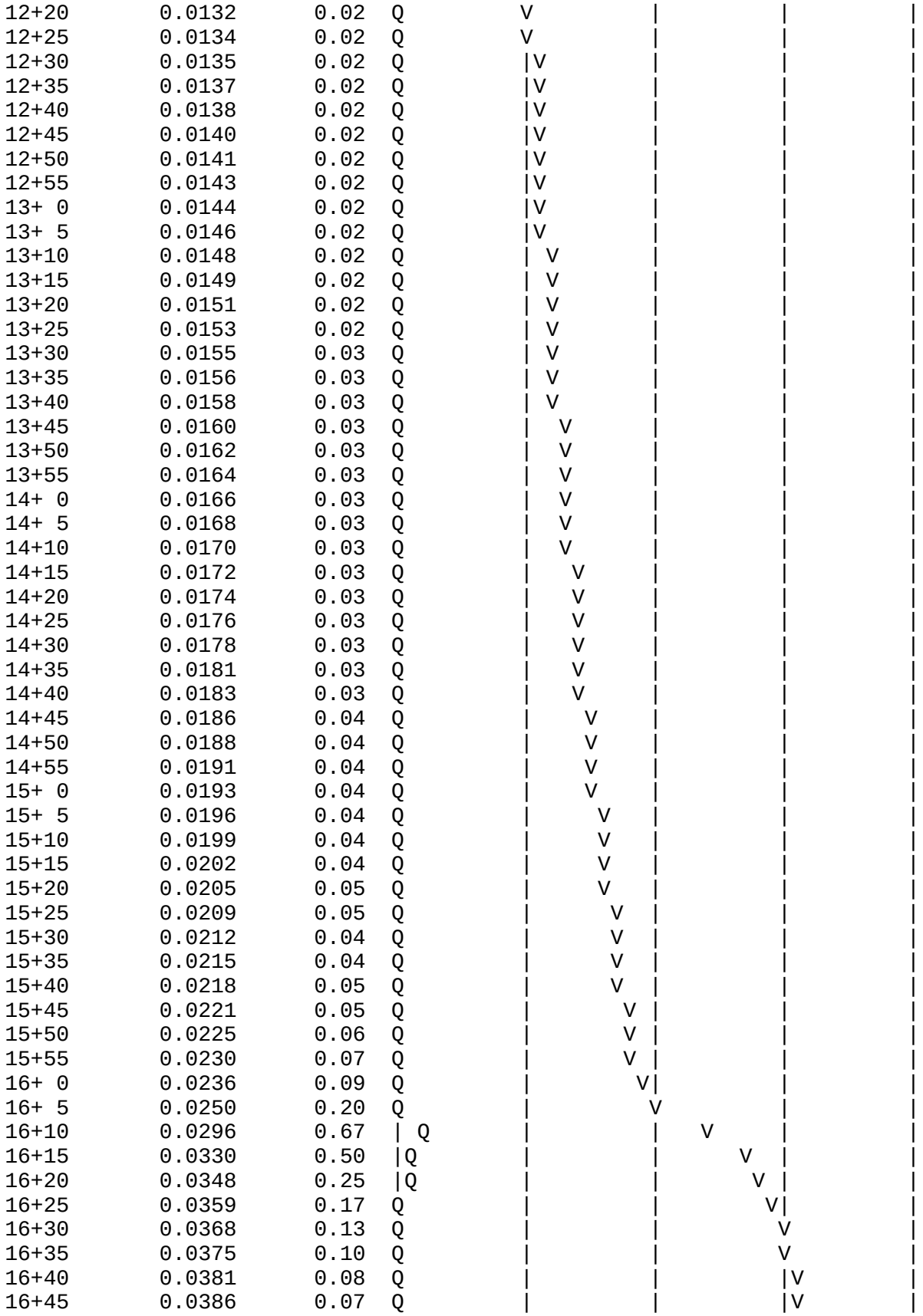
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009
288	0.0025	0.0016	0.0009

```
    ------------------------------------------------------------------------
    ------------------------------------------------------------------------
    Total soil rain loss =      0.97(In)
    Total effective rainfall =      0.64(In)
    Peak flow rate in flood hydrograph =      0.67(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       0.0001      0.01  Q          |         |         |         |
  0+20       0.0001      0.01  Q          |         |         |         |
  0+25       0.0002      0.01  Q          |         |         |         |
  0+30       0.0002      0.01  Q          |         |         |         |
  0+35       0.0003      0.01  Q          |         |         |         |
  0+40       0.0004      0.01  Q          |         |         |         |
  0+45       0.0004      0.01  Q          |         |         |         |
  0+50       0.0005      0.01  Q          |         |         |         |
  0+55       0.0006      0.01  Q          |         |         |         |
  1+ 0       0.0006      0.01  Q          |         |         |         |
  1+ 5       0.0007      0.01  Q          |         |         |         |
  1+10       0.0008      0.01  Q          |         |         |         |
  1+15       0.0008      0.01  Q          |         |         |         |
  1+20       0.0009      0.01  Q          |         |         |         |
  1+25       0.0010      0.01  Q          |         |         |         |
  1+30       0.0010      0.01  Q          |         |         |         |
  1+35       0.0011      0.01  Q          |         |         |         |
  1+40       0.0012      0.01  Q          |         |         |         |
  1+45       0.0013      0.01  QV         |         |         |         |
  1+50       0.0013      0.01  QV         |         |         |         |
  1+55       0.0014      0.01  QV         |         |         |         |
  2+ 0       0.0015      0.01  QV         |         |         |         |
  2+ 5       0.0015      0.01  QV         |         |         |         |
  2+10       0.0016      0.01  QV         |         |         |         |
  2+15       0.0017      0.01  QV         |         |         |         |
  2+20       0.0017      0.01  QV         |         |         |         |
  2+25       0.0018      0.01  QV         |         |         |         |
  2+30       0.0019      0.01  QV         |         |         |         |
  2+35       0.0020      0.01  QV         |         |         |         |
  2+40       0.0020      0.01  QV         |         |         |         |
  2+45       0.0021      0.01  QV         |         |         |         |
  2+50       0.0022      0.01  QV         |         |         |         |
  2+55       0.0022      0.01  QV         |         |         |         |
  3+ 0       0.0023      0.01  QV         |         |         |         |
  3+ 5       0.0024      0.01  QV         |         |         |         |
  3+10       0.0025      0.01  Q V        |         |         |         |
  3+15       0.0025      0.01  Q V        |         |         |         |
```

3+20	0.0026	0.01	Q V	|	|	|	|
3+25	0.0027	0.01	Q V	|	|	|	|
3+30	0.0028	0.01	Q V	|	|	|	|
3+35	0.0028	0.01	Q V	|	|	|	|
3+40	0.0029	0.01	Q V	|	|	|	|
3+45	0.0030	0.01	Q V	|	|	|	|
3+50	0.0031	0.01	Q V	|	|	|	|
3+55	0.0031	0.01	Q V	|	|	|	|
4+ 0	0.0032	0.01	Q V	|	|	|	|
4+ 5	0.0033	0.01	Q V	|	|	|	|
4+10	0.0034	0.01	Q V	|	|	|	|
4+15	0.0034	0.01	Q V	|	|	|	|
4+20	0.0035	0.01	Q V	|	|	|	|
4+25	0.0036	0.01	Q V	|	|	|	|
4+30	0.0037	0.01	Q V	|	|	|	|
4+35	0.0037	0.01	Q V	|	|	|	|
4+40	0.0038	0.01	Q V	|	|	|	|
4+45	0.0039	0.01	Q V	|	|	|	|
4+50	0.0040	0.01	Q V	|	|	|	|
4+55	0.0041	0.01	Q V	|	|	|	|
5+ 0	0.0041	0.01	Q V	|	|	|	|
5+ 5	0.0042	0.01	Q V	|	|	|	|
5+10	0.0043	0.01	Q V	|	|	|	|
5+15	0.0044	0.01	Q V	|	|	|	|
5+20	0.0045	0.01	Q V	|	|	|	|
5+25	0.0045	0.01	Q V	|	|	|	|
5+30	0.0046	0.01	Q V	|	|	|	|
5+35	0.0047	0.01	Q V	|	|	|	|
5+40	0.0048	0.01	Q V	|	|	|	|
5+45	0.0049	0.01	Q V	|	|	|	|
5+50	0.0050	0.01	Q V	|	|	|	|
5+55	0.0050	0.01	Q V	|	|	|	|
6+ 0	0.0051	0.01	Q V	|	|	|	|
6+ 5	0.0052	0.01	Q V	|	|	|	|
6+10	0.0053	0.01	Q V	|	|	|	|
6+15	0.0054	0.01	Q V	|	|	|	|
6+20	0.0055	0.01	Q V	|	|	|	|
6+25	0.0055	0.01	Q V	|	|	|	|
6+30	0.0056	0.01	Q V	|	|	|	|
6+35	0.0057	0.01	Q V	|	|	|	|
6+40	0.0058	0.01	Q V	|	|	|	|
6+45	0.0059	0.01	Q V	|	|	|	|
6+50	0.0060	0.01	Q V	|	|	|	|
6+55	0.0061	0.01	Q V	|	|	|	|
7+ 0	0.0062	0.01	Q V	|	|	|	|
7+ 5	0.0063	0.01	Q V	|	|	|	|
7+10	0.0063	0.01	Q V	|	|	|	|
7+15	0.0064	0.01	Q V	|	|	|	|
7+20	0.0065	0.01	Q V	|	|	|	|
7+25	0.0066	0.01	Q V	|	|	|	|
7+30	0.0067	0.01	Q V	|	|	|	|
7+35	0.0068	0.01	Q V	|	|	|	|
7+40	0.0069	0.01	Q V	|	|	|	|
7+45	0.0070	0.01	Q V	|	|	|	|

7+50	0.0071	0.01	Q	V	|	|	|	|
7+55	0.0072	0.01	Q	V	|	|	|	|
8+ 0	0.0073	0.01	Q	V	|	|	|	|
8+ 5	0.0074	0.01	Q	V	|	|	|	|
8+10	0.0075	0.01	Q	V	|	|	|	|
8+15	0.0076	0.01	Q	V	|	|	|	|
8+20	0.0076	0.01	Q	V	|	|	|	|
8+25	0.0077	0.01	Q	V	|	|	|	|
8+30	0.0078	0.01	Q	V	|	|	|	|
8+35	0.0079	0.01	Q	V	|	|	|	|
8+40	0.0080	0.01	Q	V	|	|	|	|
8+45	0.0081	0.01	Q	V	|	|	|	|
8+50	0.0082	0.01	Q	V	|	|	|	|
8+55	0.0083	0.01	Q	V	|	|	|	|
9+ 0	0.0084	0.01	Q	V	|	|	|	|
9+ 5	0.0085	0.01	Q	V	|	|	|	|
9+10	0.0086	0.01	Q	V	|	|	|	|
9+15	0.0088	0.02	Q	V	|	|	|	|
9+20	0.0089	0.02	Q	V	|	|	|	|
9+25	0.0090	0.02	Q	V	|	|	|	|
9+30	0.0091	0.02	Q	V	|	|	|	|
9+35	0.0092	0.02	Q	V	|	|	|	|
9+40	0.0093	0.02	Q	V	|	|	|	|
9+45	0.0094	0.02	Q	V	|	|	|	|
9+50	0.0095	0.02	Q	V	|	|	|	|
9+55	0.0096	0.02	Q	V	|	|	|	|
10+ 0	0.0097	0.02	Q	V	|	|	|	|
10+ 5	0.0098	0.02	Q	V	|	|	|	|
10+10	0.0099	0.02	Q	V	|	|	|	|
10+15	0.0101	0.02	Q	V	|	|	|	|
10+20	0.0102	0.02	Q	V	|	|	|	|
10+25	0.0103	0.02	Q	V	|	|	|	|
10+30	0.0104	0.02	Q	V	|	|	|	|
10+35	0.0105	0.02	Q	V	|	|	|	|
10+40	0.0106	0.02	Q	V	|	|	|	|
10+45	0.0107	0.02	Q	V	|	|	|	|
10+50	0.0109	0.02	Q	V	|	|	|	|
10+55	0.0110	0.02	Q	V	|	|	|	|
11+ 0	0.0111	0.02	Q	V	|	|	|	|
11+ 5	0.0112	0.02	Q	V	|	|	|	|
11+10	0.0114	0.02	Q	V	|	|	|	|
11+15	0.0115	0.02	Q	V	|	|	|	|
11+20	0.0116	0.02	Q	V	|	|	|	|
11+25	0.0117	0.02	Q	V	|	|	|	|
11+30	0.0119	0.02	Q	V	|	|	|	|
11+35	0.0120	0.02	Q	V	|	|	|	|
11+40	0.0121	0.02	Q	V	|	|	|	|
11+45	0.0123	0.02	Q	V	|	|	|	|
11+50	0.0124	0.02	Q	V	|	|	|	|
11+55	0.0125	0.02	Q	V	|	|	|	|
12+ 0	0.0127	0.02	Q	V	|	|	|	|
12+ 5	0.0128	0.02	Q	V	|	|	|	|
12+10	0.0129	0.02	Q	V	|	|	|	|
12+15	0.0131	0.02	Q	V	|	|	|	|



16+50	0.0390	0.06	Q	|	|	|V	|
16+55	0.0393	0.05	Q	|	|	| V	|
17+ 0	0.0396	0.05	Q	|	|	| V	|
17+ 5	0.0399	0.04	Q	|	|	| V	|
17+10	0.0402	0.03	Q	|	|	| V	|
17+15	0.0404	0.03	Q	|	|	| V	|
17+20	0.0406	0.03	Q	|	|	| V	|
17+25	0.0408	0.03	Q	|	|	| V	|
17+30	0.0410	0.03	Q	|	|	| V	|
17+35	0.0412	0.03	Q	|	|	| V	|
17+40	0.0413	0.03	Q	|	|	| V	|
17+45	0.0415	0.02	Q	|	|	| V	|
17+50	0.0417	0.02	Q	|	|	| V	|
17+55	0.0418	0.02	Q	|	|	| V	|
18+ 0	0.0420	0.02	Q	|	|	| V	|
18+ 5	0.0421	0.02	Q	|	|	| V	|
18+10	0.0423	0.02	Q	|	|	| V	|
18+15	0.0424	0.02	Q	|	|	| V	|
18+20	0.0426	0.02	Q	|	|	| V	|
18+25	0.0427	0.02	Q	|	|	| V	|
18+30	0.0428	0.02	Q	|	|	| V	|
18+35	0.0430	0.02	Q	|	|	| V	|
18+40	0.0431	0.02	Q	|	|	| V	|
18+45	0.0432	0.02	Q	|	|	| V	|
18+50	0.0433	0.02	Q	|	|	| V	|
18+55	0.0435	0.02	Q	|	|	| V	|
19+ 0	0.0436	0.02	Q	|	|	| V	|
19+ 5	0.0437	0.02	Q	|	|	| V	|
19+10	0.0438	0.02	Q	|	|	| V	|
19+15	0.0439	0.02	Q	|	|	| V	|
19+20	0.0440	0.02	Q	|	|	| V	|
19+25	0.0442	0.02	Q	|	|	| V	|
19+30	0.0443	0.02	Q	|	|	| V	|
19+35	0.0444	0.02	Q	|	|	| V	|
19+40	0.0445	0.02	Q	|	|	| V	|
19+45	0.0446	0.02	Q	|	|	| V	|
19+50	0.0447	0.01	Q	|	|	| V	|
19+55	0.0448	0.01	Q	|	|	| V	|
20+ 0	0.0449	0.01	Q	|	|	| V	|
20+ 5	0.0450	0.01	Q	|	|	| V	|
20+10	0.0451	0.01	Q	|	|	| V	|
20+15	0.0452	0.01	Q	|	|	| V	|
20+20	0.0453	0.01	Q	|	|	| V	|
20+25	0.0454	0.01	Q	|	|	| V	|
20+30	0.0455	0.01	Q	|	|	| V	|
20+35	0.0456	0.01	Q	|	|	| V	|
20+40	0.0456	0.01	Q	|	|	| V	|
20+45	0.0457	0.01	Q	|	|	| V	|
20+50	0.0458	0.01	Q	|	|	| V	|
20+55	0.0459	0.01	Q	|	|	| V	|
21+ 0	0.0460	0.01	Q	|	|	| V	|
21+ 5	0.0461	0.01	Q	|	|	| V	|
21+10	0.0462	0.01	Q	|	|	| V	|
21+15	0.0463	0.01	Q	|	|	| V	|

21+20	0.0463	0.01	Q	|	|	|	V |
21+25	0.0464	0.01	Q	|	|	|	V |
21+30	0.0465	0.01	Q	|	|	|	V |
21+35	0.0466	0.01	Q	|	|	|	V |
21+40	0.0467	0.01	Q	|	|	|	V |
21+45	0.0468	0.01	Q	|	|	|	V |
21+50	0.0468	0.01	Q	|	|	|	V |
21+55	0.0469	0.01	Q	|	|	|	V |
22+ 0	0.0470	0.01	Q	|	|	|	V |
22+ 5	0.0471	0.01	Q	|	|	|	V |
22+10	0.0472	0.01	Q	|	|	|	V |
22+15	0.0472	0.01	Q	|	|	|	V |
22+20	0.0473	0.01	Q	|	|	|	V |
22+25	0.0474	0.01	Q	|	|	|	V |
22+30	0.0475	0.01	Q	|	|	|	V |
22+35	0.0475	0.01	Q	|	|	|	V |
22+40	0.0476	0.01	Q	|	|	|	V |
22+45	0.0477	0.01	Q	|	|	|	V|
22+50	0.0478	0.01	Q	|	|	|	V|
22+55	0.0478	0.01	Q	|	|	|	V|
23+ 0	0.0479	0.01	Q	|	|	|	V|
23+ 5	0.0480	0.01	Q	|	|	|	V|
23+10	0.0480	0.01	Q	|	|	|	V|
23+15	0.0481	0.01	Q	|	|	|	V|
23+20	0.0482	0.01	Q	|	|	|	V|
23+25	0.0483	0.01	Q	|	|	|	V|
23+30	0.0483	0.01	Q	|	|	|	V|
23+35	0.0484	0.01	Q	|	|	|	V|
23+40	0.0485	0.01	Q	|	|	|	V|
23+45	0.0485	0.01	Q	|	|	|	V|
23+50	0.0486	0.01	Q	|	|	|	V|
23+55	0.0487	0.01	Q	|	|	|	V|
24+ 0	0.0487	0.01	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/26/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA6
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A2-B
FILE: 18345HYDROA2BPOST2DA6.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.19	1	0.39
Rainfall data for year 2		
1.19	6	0.87
Rainfall data for year 2		
1.19	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.19	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.71	0.600	32.0	52.0	8.05	0.000
0.48	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.178 (hours)
++
Watershed area = 1.19(Ac.)
Catchment Lag time = 0.142 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 58.5206
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 1.19(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 14.39 (CFS))	
1	5.311	0.764
2	39.970	4.988
3	67.121	3.907

4	78.726	1.670
5	85.513	0.977
6	89.979	0.643
7	93.009	0.436
8	95.200	0.315
9	96.784	0.228
10	97.822	0.149
11	98.477	0.094
12	99.176	0.100
13	99.697	0.075
14	100.000	0.044

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3335	0.0151
8	0.3471	0.0136
9	0.3596	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4199	0.0136
15	0.4330	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4811	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5897	0.0088
31	0.5983	0.0087
32	0.6069	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076
40	0.6703	0.0075

41	0.6777	0.0074
42	0.6850	0.0073
43	0.6923	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7599	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9424	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9663	0.0047
92	0.9709	0.0047
93	0.9756	0.0047
94	0.9802	0.0046

95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036
147	1.1951	0.0036
148	1.1987	0.0036

149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2200	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2713	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3359	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030
202	1.3758	0.0030

203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4027	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027
256	1.5281	0.0026

257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5387	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5825	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5976	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009

18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011

72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015

126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037

180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014

234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009

288 0.0025 0.0016 0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 0.83(CFS)

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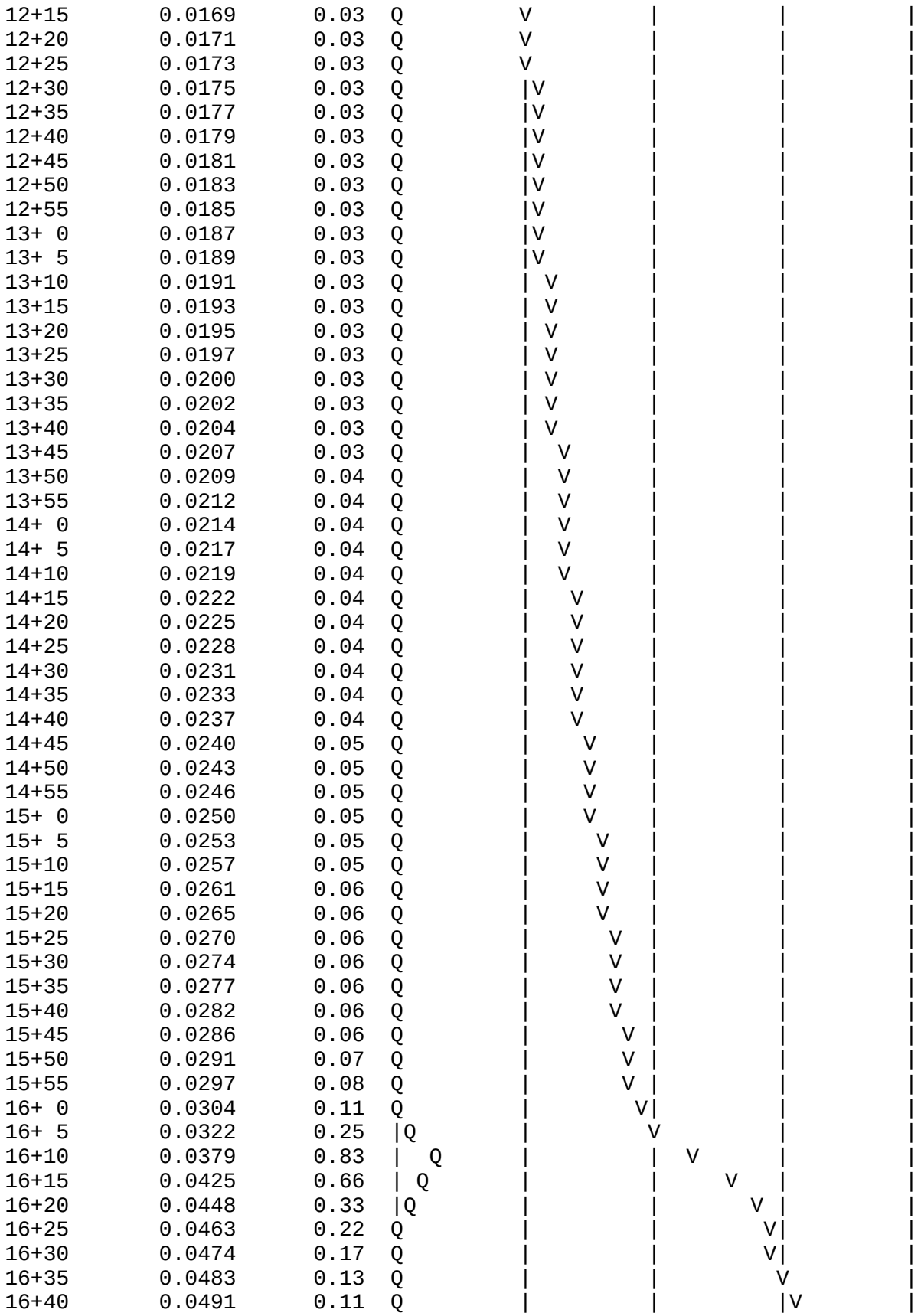
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0005	0.01	Q				
0+45	0.0006	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0007	0.01	Q				
1+ 0	0.0008	0.01	Q				
1+ 5	0.0009	0.01	Q				
1+10	0.0010	0.01	Q				
1+15	0.0011	0.01	Q				
1+20	0.0012	0.01	Q				
1+25	0.0013	0.01	Q				
1+30	0.0013	0.01	Q				
1+35	0.0014	0.01	Q				
1+40	0.0015	0.01	Q				
1+45	0.0016	0.01	QV				
1+50	0.0017	0.01	QV				
1+55	0.0018	0.01	QV				
2+ 0	0.0019	0.01	QV				
2+ 5	0.0020	0.01	QV				
2+10	0.0021	0.01	QV				
2+15	0.0022	0.01	QV				
2+20	0.0022	0.01	QV				
2+25	0.0023	0.01	QV				
2+30	0.0024	0.01	QV				
2+35	0.0025	0.01	QV				
2+40	0.0026	0.01	QV				
2+45	0.0027	0.01	QV				
2+50	0.0028	0.01	QV				
2+55	0.0029	0.01	QV				
3+ 0	0.0030	0.01	QV				
3+ 5	0.0031	0.01	QV				
3+10	0.0032	0.01	Q V				

3+15	0.0033	0.01	Q V	|	|	|	|
3+20	0.0034	0.01	Q V	|	|	|	|
3+25	0.0035	0.01	Q V	|	|	|	|
3+30	0.0036	0.01	Q V	|	|	|	|
3+35	0.0037	0.01	Q V	|	|	|	|
3+40	0.0037	0.01	Q V	|	|	|	|
3+45	0.0038	0.01	Q V	|	|	|	|
3+50	0.0039	0.01	Q V	|	|	|	|
3+55	0.0040	0.01	Q V	|	|	|	|
4+ 0	0.0041	0.01	Q V	|	|	|	|
4+ 5	0.0042	0.01	Q V	|	|	|	|
4+10	0.0043	0.01	Q V	|	|	|	|
4+15	0.0044	0.01	Q V	|	|	|	|
4+20	0.0045	0.01	Q V	|	|	|	|
4+25	0.0046	0.01	Q V	|	|	|	|
4+30	0.0047	0.01	Q V	|	|	|	|
4+35	0.0048	0.01	Q V	|	|	|	|
4+40	0.0049	0.01	Q V	|	|	|	|
4+45	0.0050	0.01	Q V	|	|	|	|
4+50	0.0051	0.01	Q V	|	|	|	|
4+55	0.0052	0.01	Q V	|	|	|	|
5+ 0	0.0053	0.01	Q V	|	|	|	|
5+ 5	0.0055	0.02	Q V	|	|	|	|
5+10	0.0056	0.02	Q V	|	|	|	|
5+15	0.0057	0.02	Q V	|	|	|	|
5+20	0.0058	0.02	Q V	|	|	|	|
5+25	0.0059	0.02	Q V	|	|	|	|
5+30	0.0060	0.02	Q V	|	|	|	|
5+35	0.0061	0.02	Q V	|	|	|	|
5+40	0.0062	0.02	Q V	|	|	|	|
5+45	0.0063	0.02	Q V	|	|	|	|
5+50	0.0064	0.02	Q V	|	|	|	|
5+55	0.0065	0.02	Q V	|	|	|	|
6+ 0	0.0066	0.02	Q V	|	|	|	|
6+ 5	0.0067	0.02	Q V	|	|	|	|
6+10	0.0068	0.02	Q V	|	|	|	|
6+15	0.0069	0.02	Q V	|	|	|	|
6+20	0.0071	0.02	Q V	|	|	|	|
6+25	0.0072	0.02	Q V	|	|	|	|
6+30	0.0073	0.02	Q V	|	|	|	|
6+35	0.0074	0.02	Q V	|	|	|	|
6+40	0.0075	0.02	Q V	|	|	|	|
6+45	0.0076	0.02	Q V	|	|	|	|
6+50	0.0077	0.02	Q V	|	|	|	|
6+55	0.0078	0.02	Q V	|	|	|	|
7+ 0	0.0080	0.02	Q V	|	|	|	|
7+ 5	0.0081	0.02	Q V	|	|	|	|
7+10	0.0082	0.02	Q V	|	|	|	|
7+15	0.0083	0.02	Q V	|	|	|	|
7+20	0.0084	0.02	Q V	|	|	|	|
7+25	0.0085	0.02	Q V	|	|	|	|
7+30	0.0087	0.02	Q V	|	|	|	|
7+35	0.0088	0.02	Q V	|	|	|	|
7+40	0.0089	0.02	Q V	|	|	|	|

7+45	0.0090	0.02	Q	V	|	|	|	|
7+50	0.0091	0.02	Q	V	|	|	|	|
7+55	0.0093	0.02	Q	V	|	|	|	|
8+ 0	0.0094	0.02	Q	V	|	|	|	|
8+ 5	0.0095	0.02	Q	V	|	|	|	|
8+10	0.0096	0.02	Q	V	|	|	|	|
8+15	0.0098	0.02	Q	V	|	|	|	|
8+20	0.0099	0.02	Q	V	|	|	|	|
8+25	0.0100	0.02	Q	V	|	|	|	|
8+30	0.0101	0.02	Q	V	|	|	|	|
8+35	0.0103	0.02	Q	V	|	|	|	|
8+40	0.0104	0.02	Q	V	|	|	|	|
8+45	0.0105	0.02	Q	V	|	|	|	|
8+50	0.0106	0.02	Q	V	|	|	|	|
8+55	0.0108	0.02	Q	V	|	|	|	|
9+ 0	0.0109	0.02	Q	V	|	|	|	|
9+ 5	0.0110	0.02	Q	V	|	|	|	|
9+10	0.0112	0.02	Q	V	|	|	|	|
9+15	0.0113	0.02	Q	V	|	|	|	|
9+20	0.0114	0.02	Q	V	|	|	|	|
9+25	0.0116	0.02	Q	V	|	|	|	|
9+30	0.0117	0.02	Q	V	|	|	|	|
9+35	0.0119	0.02	Q	V	|	|	|	|
9+40	0.0120	0.02	Q	V	|	|	|	|
9+45	0.0121	0.02	Q	V	|	|	|	|
9+50	0.0123	0.02	Q	V	|	|	|	|
9+55	0.0124	0.02	Q	V	|	|	|	|
10+ 0	0.0126	0.02	Q	V	|	|	|	|
10+ 5	0.0127	0.02	Q	V	|	|	|	|
10+10	0.0128	0.02	Q	V	|	|	|	|
10+15	0.0130	0.02	Q	V	|	|	|	|
10+20	0.0131	0.02	Q	V	|	|	|	|
10+25	0.0133	0.02	Q	V	|	|	|	|
10+30	0.0134	0.02	Q	V	|	|	|	|
10+35	0.0136	0.02	Q	V	|	|	|	|
10+40	0.0137	0.02	Q	V	|	|	|	|
10+45	0.0139	0.02	Q	V	|	|	|	|
10+50	0.0140	0.02	Q	V	|	|	|	|
10+55	0.0142	0.02	Q	V	|	|	|	|
11+ 0	0.0144	0.02	Q	V	|	|	|	|
11+ 5	0.0145	0.02	Q	V	|	|	|	|
11+10	0.0147	0.02	Q	V	|	|	|	|
11+15	0.0148	0.02	Q	V	|	|	|	|
11+20	0.0150	0.02	Q	V	|	|	|	|
11+25	0.0152	0.02	Q	V	|	|	|	|
11+30	0.0153	0.02	Q	V	|	|	|	|
11+35	0.0155	0.02	Q	V	|	|	|	|
11+40	0.0157	0.02	Q	V	|	|	|	|
11+45	0.0158	0.02	Q	V	|	|	|	|
11+50	0.0160	0.03	Q	V	|	|	|	|
11+55	0.0162	0.03	Q	V	|	|	|	|
12+ 0	0.0164	0.03	Q	V	|	|	|	|
12+ 5	0.0165	0.03	Q	V	|	|	|	|
12+10	0.0167	0.03	Q	V	|	|	|	|



16+45	0.0498	0.09	Q	|	|	|V	|
16+50	0.0503	0.08	Q	|	|	|V	|
16+55	0.0508	0.07	Q	|	|	| V	|
17+ 0	0.0512	0.06	Q	|	|	| V	|
17+ 5	0.0516	0.06	Q	|	|	| V	|
17+10	0.0519	0.05	Q	|	|	| V	|
17+15	0.0522	0.04	Q	|	|	| V	|
17+20	0.0525	0.04	Q	|	|	| V	|
17+25	0.0527	0.04	Q	|	|	| V	|
17+30	0.0530	0.04	Q	|	|	| V	|
17+35	0.0532	0.03	Q	|	|	| V	|
17+40	0.0534	0.03	Q	|	|	| V	|
17+45	0.0537	0.03	Q	|	|	| V	|
17+50	0.0539	0.03	Q	|	|	| V	|
17+55	0.0541	0.03	Q	|	|	| V	|
18+ 0	0.0543	0.03	Q	|	|	| V	|
18+ 5	0.0545	0.03	Q	|	|	| V	|
18+10	0.0547	0.03	Q	|	|	| V	|
18+15	0.0549	0.03	Q	|	|	| V	|
18+20	0.0550	0.03	Q	|	|	| V	|
18+25	0.0552	0.03	Q	|	|	| V	|
18+30	0.0554	0.03	Q	|	|	| V	|
18+35	0.0556	0.02	Q	|	|	| V	|
18+40	0.0557	0.02	Q	|	|	| V	|
18+45	0.0559	0.02	Q	|	|	| V	|
18+50	0.0560	0.02	Q	|	|	| V	|
18+55	0.0562	0.02	Q	|	|	| V	|
19+ 0	0.0564	0.02	Q	|	|	| V	|
19+ 5	0.0565	0.02	Q	|	|	| V	|
19+10	0.0567	0.02	Q	|	|	| V	|
19+15	0.0568	0.02	Q	|	|	| V	|
19+20	0.0570	0.02	Q	|	|	| V	|
19+25	0.0571	0.02	Q	|	|	| V	|
19+30	0.0572	0.02	Q	|	|	| V	|
19+35	0.0574	0.02	Q	|	|	| V	|
19+40	0.0575	0.02	Q	|	|	| V	|
19+45	0.0576	0.02	Q	|	|	| V	|
19+50	0.0578	0.02	Q	|	|	| V	|
19+55	0.0579	0.02	Q	|	|	| V	|
20+ 0	0.0580	0.02	Q	|	|	| V	|
20+ 5	0.0582	0.02	Q	|	|	| V	|
20+10	0.0583	0.02	Q	|	|	| V	|
20+15	0.0584	0.02	Q	|	|	| V	|
20+20	0.0585	0.02	Q	|	|	| V	|
20+25	0.0587	0.02	Q	|	|	| V	|
20+30	0.0588	0.02	Q	|	|	| V	|
20+35	0.0589	0.02	Q	|	|	| V	|
20+40	0.0590	0.02	Q	|	|	| V	|
20+45	0.0591	0.02	Q	|	|	| V	|
20+50	0.0593	0.02	Q	|	|	| V	|
20+55	0.0594	0.02	Q	|	|	| V	|
21+ 0	0.0595	0.02	Q	|	|	| V	|
21+ 5	0.0596	0.02	Q	|	|	| V	|
21+10	0.0597	0.02	Q	|	|	| V	|

21+15	0.0598	0.02	Q	|	|	|	V |
21+20	0.0599	0.02	Q	|	|	|	V |
21+25	0.0600	0.02	Q	|	|	|	V |
21+30	0.0602	0.02	Q	|	|	|	V |
21+35	0.0603	0.02	Q	|	|	|	V |
21+40	0.0604	0.02	Q	|	|	|	V |
21+45	0.0605	0.02	Q	|	|	|	V |
21+50	0.0606	0.02	Q	|	|	|	V |
21+55	0.0607	0.01	Q	|	|	|	V |
22+ 0	0.0608	0.01	Q	|	|	|	V |
22+ 5	0.0609	0.01	Q	|	|	|	V |
22+10	0.0610	0.01	Q	|	|	|	V |
22+15	0.0611	0.01	Q	|	|	|	V |
22+20	0.0612	0.01	Q	|	|	|	V |
22+25	0.0613	0.01	Q	|	|	|	V |
22+30	0.0614	0.01	Q	|	|	|	V |
22+35	0.0615	0.01	Q	|	|	|	V |
22+40	0.0616	0.01	Q	|	|	|	V |
22+45	0.0617	0.01	Q	|	|	|	V|
22+50	0.0618	0.01	Q	|	|	|	V|
22+55	0.0619	0.01	Q	|	|	|	V|
23+ 0	0.0619	0.01	Q	|	|	|	V|
23+ 5	0.0620	0.01	Q	|	|	|	V|
23+10	0.0621	0.01	Q	|	|	|	V|
23+15	0.0622	0.01	Q	|	|	|	V|
23+20	0.0623	0.01	Q	|	|	|	V|
23+25	0.0624	0.01	Q	|	|	|	V|
23+30	0.0625	0.01	Q	|	|	|	V|
23+35	0.0626	0.01	Q	|	|	|	V|
23+40	0.0627	0.01	Q	|	|	|	V|
23+45	0.0628	0.01	Q	|	|	|	V|
23+50	0.0628	0.01	Q	|	|	|	V|
23+55	0.0629	0.01	Q	|	|	|	V|
24+ 0	0.0630	0.01	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 08/25/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA7
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A3-B
FILE: 18345HYDROA3BPOST2DA7.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
1.16	1	0.39
Rainfall data for year 2		
1.16	6	0.87
Rainfall data for year 2		
1.16	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	1.16	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.70	0.600	32.0	52.0	8.05	0.000
0.46	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.188 (hours)
++
Watershed area = 1.16(Ac.)
Catchment Lag time = 0.150 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 55.4964
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 1.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 14.03 (CFS))	
1	4.784	0.671
2	36.747	4.484
3	65.029	3.968

4	77.128	1.697
5	84.187	0.990
6	88.920	0.664
7	92.087	0.444
8	94.440	0.330
9	96.162	0.242
10	97.388	0.172
11	98.129	0.104
12	98.758	0.088
13	99.401	0.090
14	99.808	0.057
15	100.000	0.027

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3335	0.0151
8	0.3471	0.0136
9	0.3596	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4199	0.0136
15	0.4330	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4811	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5897	0.0088
31	0.5983	0.0087
32	0.6069	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077
39	0.6628	0.0076

40	0.6703	0.0075
41	0.6777	0.0074
42	0.6850	0.0073
43	0.6923	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7599	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9424	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9663	0.0047
92	0.9709	0.0047
93	0.9756	0.0047

94	0.9802	0.0046
95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036
147	1.1951	0.0036

148	1.1987	0.0036
149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2200	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2713	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3359	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030
201	1.3728	0.0030

202	1.3758	0.0030
203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4027	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027
255	1.5255	0.0027

256	1.5281	0.0026
257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5387	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5825	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5976	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009
16	0.0026	0.0017	0.0009

17	0.0026	0.0017	0.0009
18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011
70	0.0032	0.0021	0.0011

71	0.0032	0.0021	0.0011
72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015
124	0.0044	0.0029	0.0015

125	0.0044	0.0029	0.0015
126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035
178	0.0103	0.0067	0.0035

179	0.0108	0.0071	0.0037
180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014
232	0.0041	0.0027	0.0014

233	0.0040	0.0026	0.0014
234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009
286	0.0025	0.0017	0.0009

287	0.0025	0.0016	0.0009
288	0.0025	0.0016	0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 0.76(CFS)

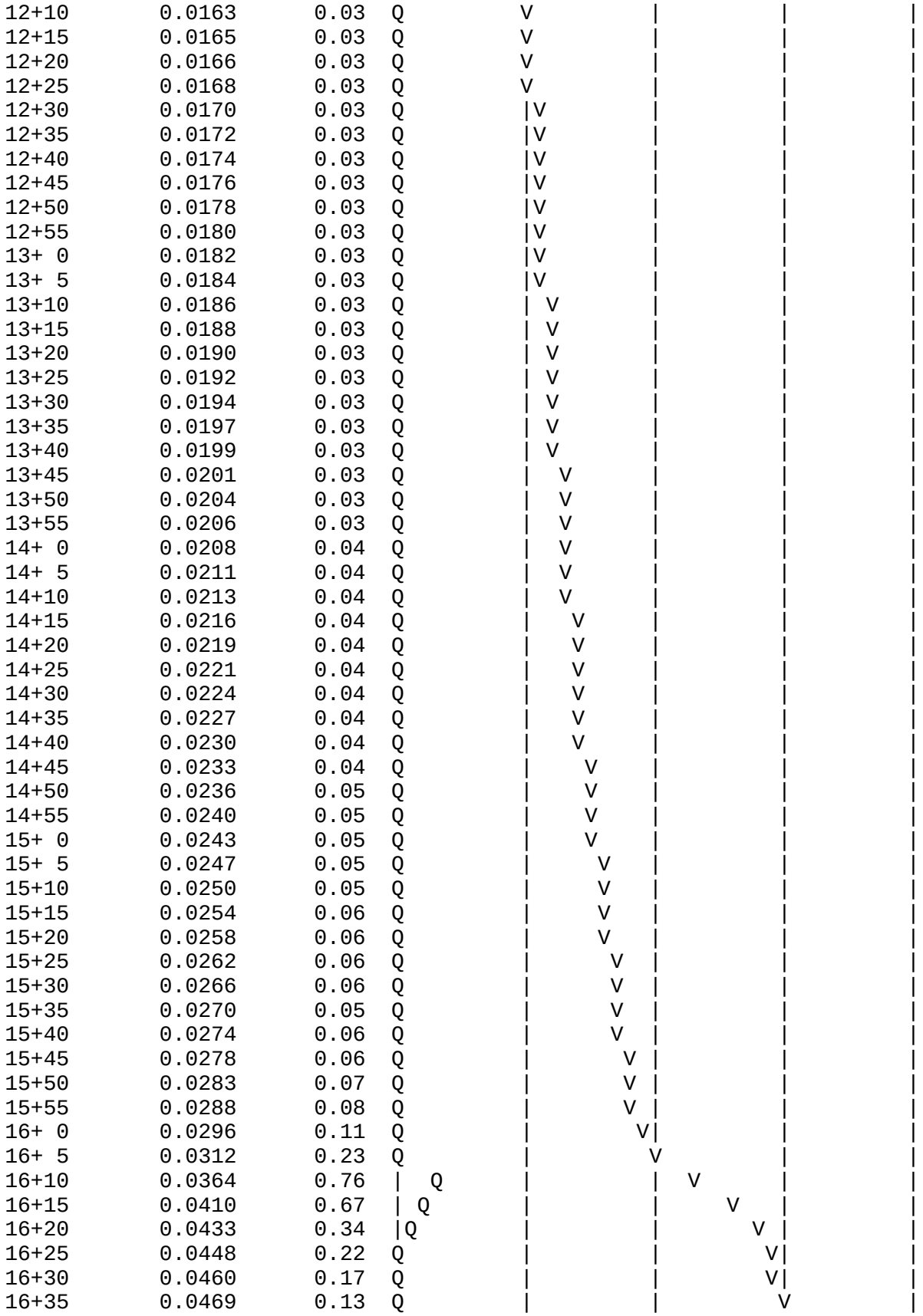
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0005	0.01	Q				
0+45	0.0005	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0007	0.01	Q				
1+ 0	0.0008	0.01	Q				
1+ 5	0.0009	0.01	Q				
1+10	0.0010	0.01	Q				
1+15	0.0010	0.01	Q				
1+20	0.0011	0.01	Q				
1+25	0.0012	0.01	Q				
1+30	0.0013	0.01	Q				
1+35	0.0014	0.01	Q				
1+40	0.0015	0.01	Q				
1+45	0.0016	0.01	QV				
1+50	0.0016	0.01	QV				
1+55	0.0017	0.01	QV				
2+ 0	0.0018	0.01	QV				
2+ 5	0.0019	0.01	QV				
2+10	0.0020	0.01	QV				
2+15	0.0021	0.01	QV				
2+20	0.0022	0.01	QV				
2+25	0.0023	0.01	QV				
2+30	0.0024	0.01	QV				
2+35	0.0024	0.01	QV				
2+40	0.0025	0.01	QV				
2+45	0.0026	0.01	QV				
2+50	0.0027	0.01	QV				
2+55	0.0028	0.01	QV				
3+ 0	0.0029	0.01	QV				
3+ 5	0.0030	0.01	QV				

3+10	0.0031	0.01	QV	|	|	|	|
3+15	0.0032	0.01	Q V	|	|	|	|
3+20	0.0033	0.01	Q V	|	|	|	|
3+25	0.0034	0.01	Q V	|	|	|	|
3+30	0.0035	0.01	Q V	|	|	|	|
3+35	0.0035	0.01	Q V	|	|	|	|
3+40	0.0036	0.01	Q V	|	|	|	|
3+45	0.0037	0.01	Q V	|	|	|	|
3+50	0.0038	0.01	Q V	|	|	|	|
3+55	0.0039	0.01	Q V	|	|	|	|
4+ 0	0.0040	0.01	Q V	|	|	|	|
4+ 5	0.0041	0.01	Q V	|	|	|	|
4+10	0.0042	0.01	Q V	|	|	|	|
4+15	0.0043	0.01	Q V	|	|	|	|
4+20	0.0044	0.01	Q V	|	|	|	|
4+25	0.0045	0.01	Q V	|	|	|	|
4+30	0.0046	0.01	Q V	|	|	|	|
4+35	0.0047	0.01	Q V	|	|	|	|
4+40	0.0048	0.01	Q V	|	|	|	|
4+45	0.0049	0.01	Q V	|	|	|	|
4+50	0.0050	0.01	Q V	|	|	|	|
4+55	0.0051	0.01	Q V	|	|	|	|
5+ 0	0.0052	0.01	Q V	|	|	|	|
5+ 5	0.0053	0.01	Q V	|	|	|	|
5+10	0.0054	0.01	Q V	|	|	|	|
5+15	0.0055	0.01	Q V	|	|	|	|
5+20	0.0056	0.01	Q V	|	|	|	|
5+25	0.0057	0.01	Q V	|	|	|	|
5+30	0.0058	0.01	Q V	|	|	|	|
5+35	0.0059	0.01	Q V	|	|	|	|
5+40	0.0060	0.02	Q V	|	|	|	|
5+45	0.0061	0.02	Q V	|	|	|	|
5+50	0.0062	0.02	Q V	|	|	|	|
5+55	0.0063	0.02	Q V	|	|	|	|
6+ 0	0.0064	0.02	Q V	|	|	|	|
6+ 5	0.0065	0.02	Q V	|	|	|	|
6+10	0.0066	0.02	Q V	|	|	|	|
6+15	0.0068	0.02	Q V	|	|	|	|
6+20	0.0069	0.02	Q V	|	|	|	|
6+25	0.0070	0.02	Q V	|	|	|	|
6+30	0.0071	0.02	Q V	|	|	|	|
6+35	0.0072	0.02	Q V	|	|	|	|
6+40	0.0073	0.02	Q V	|	|	|	|
6+45	0.0074	0.02	Q V	|	|	|	|
6+50	0.0075	0.02	Q V	|	|	|	|
6+55	0.0076	0.02	Q V	|	|	|	|
7+ 0	0.0077	0.02	Q V	|	|	|	|
7+ 5	0.0079	0.02	Q V	|	|	|	|
7+10	0.0080	0.02	Q V	|	|	|	|
7+15	0.0081	0.02	Q V	|	|	|	|
7+20	0.0082	0.02	Q V	|	|	|	|
7+25	0.0083	0.02	Q V	|	|	|	|
7+30	0.0084	0.02	Q V	|	|	|	|
7+35	0.0085	0.02	Q V	|	|	|	|

7+40	0.0087	0.02	Q	V				
7+45	0.0088	0.02	Q	V				
7+50	0.0089	0.02	Q	V				
7+55	0.0090	0.02	Q	V				
8+ 0	0.0091	0.02	Q	V				
8+ 5	0.0092	0.02	Q	V				
8+10	0.0094	0.02	Q	V				
8+15	0.0095	0.02	Q	V				
8+20	0.0096	0.02	Q	V				
8+25	0.0097	0.02	Q	V				
8+30	0.0099	0.02	Q	V				
8+35	0.0100	0.02	Q	V				
8+40	0.0101	0.02	Q	V				
8+45	0.0102	0.02	Q	V				
8+50	0.0104	0.02	Q	V				
8+55	0.0105	0.02	Q	V				
9+ 0	0.0106	0.02	Q	V				
9+ 5	0.0107	0.02	Q	V				
9+10	0.0109	0.02	Q	V				
9+15	0.0110	0.02	Q	V				
9+20	0.0111	0.02	Q	V				
9+25	0.0113	0.02	Q	V				
9+30	0.0114	0.02	Q	V				
9+35	0.0115	0.02	Q	V				
9+40	0.0117	0.02	Q	V				
9+45	0.0118	0.02	Q	V				
9+50	0.0119	0.02	Q	V				
9+55	0.0121	0.02	Q	V				
10+ 0	0.0122	0.02	Q	V				
10+ 5	0.0124	0.02	Q	V				
10+10	0.0125	0.02	Q	V				
10+15	0.0126	0.02	Q	V				
10+20	0.0128	0.02	Q	V				
10+25	0.0129	0.02	Q	V				
10+30	0.0131	0.02	Q	V				
10+35	0.0132	0.02	Q	V				
10+40	0.0134	0.02	Q	V				
10+45	0.0135	0.02	Q	V				
10+50	0.0137	0.02	Q	V				
10+55	0.0138	0.02	Q	V				
11+ 0	0.0140	0.02	Q	V				
11+ 5	0.0141	0.02	Q	V				
11+10	0.0143	0.02	Q	V				
11+15	0.0144	0.02	Q	V				
11+20	0.0146	0.02	Q	V				
11+25	0.0148	0.02	Q	V				
11+30	0.0149	0.02	Q	V				
11+35	0.0151	0.02	Q	V				
11+40	0.0152	0.02	Q	V				
11+45	0.0154	0.02	Q	V				
11+50	0.0156	0.02	Q	V				
11+55	0.0158	0.02	Q	V				
12+ 0	0.0159	0.02	Q	V				
12+ 5	0.0161	0.03	Q	V				



16+40	0.0477	0.11	Q	|	|	V	|
16+45	0.0484	0.09	Q	|	|	|V	|
16+50	0.0489	0.08	Q	|	|	|V	|
16+55	0.0494	0.07	Q	|	|	| V	|
17+ 0	0.0498	0.06	Q	|	|	| V	|
17+ 5	0.0502	0.06	Q	|	|	| V	|
17+10	0.0505	0.05	Q	|	|	| V	|
17+15	0.0508	0.04	Q	|	|	| V	|
17+20	0.0511	0.04	Q	|	|	| V	|
17+25	0.0514	0.04	Q	|	|	| V	|
17+30	0.0516	0.04	Q	|	|	| V	|
17+35	0.0518	0.03	Q	|	|	| V	|
17+40	0.0521	0.03	Q	|	|	| V	|
17+45	0.0523	0.03	Q	|	|	| V	|
17+50	0.0525	0.03	Q	|	|	| V	|
17+55	0.0527	0.03	Q	|	|	| V	|
18+ 0	0.0529	0.03	Q	|	|	| V	|
18+ 5	0.0531	0.03	Q	|	|	| V	|
18+10	0.0533	0.03	Q	|	|	| V	|
18+15	0.0534	0.03	Q	|	|	| V	|
18+20	0.0536	0.03	Q	|	|	| V	|
18+25	0.0538	0.03	Q	|	|	| V	|
18+30	0.0540	0.02	Q	|	|	| V	|
18+35	0.0541	0.02	Q	|	|	| V	|
18+40	0.0543	0.02	Q	|	|	| V	|
18+45	0.0545	0.02	Q	|	|	| V	|
18+50	0.0546	0.02	Q	|	|	| V	|
18+55	0.0548	0.02	Q	|	|	| V	|
19+ 0	0.0549	0.02	Q	|	|	| V	|
19+ 5	0.0551	0.02	Q	|	|	| V	|
19+10	0.0552	0.02	Q	|	|	| V	|
19+15	0.0554	0.02	Q	|	|	| V	|
19+20	0.0555	0.02	Q	|	|	| V	|
19+25	0.0556	0.02	Q	|	|	| V	|
19+30	0.0558	0.02	Q	|	|	| V	|
19+35	0.0559	0.02	Q	|	|	| V	|
19+40	0.0560	0.02	Q	|	|	| V	|
19+45	0.0562	0.02	Q	|	|	| V	|
19+50	0.0563	0.02	Q	|	|	| V	|
19+55	0.0564	0.02	Q	|	|	| V	|
20+ 0	0.0566	0.02	Q	|	|	| V	|
20+ 5	0.0567	0.02	Q	|	|	| V	|
20+10	0.0568	0.02	Q	|	|	| V	|
20+15	0.0569	0.02	Q	|	|	| V	|
20+20	0.0571	0.02	Q	|	|	| V	|
20+25	0.0572	0.02	Q	|	|	| V	|
20+30	0.0573	0.02	Q	|	|	| V	|
20+35	0.0574	0.02	Q	|	|	| V	|
20+40	0.0575	0.02	Q	|	|	| V	|
20+45	0.0576	0.02	Q	|	|	| V	|
20+50	0.0578	0.02	Q	|	|	| V	|
20+55	0.0579	0.02	Q	|	|	| V	|
21+ 0	0.0580	0.02	Q	|	|	| V	|
21+ 5	0.0581	0.02	Q	|	|	| V	|

21+10	0.0582	0.02	Q	|	|	|	V |
21+15	0.0583	0.02	Q	|	|	|	V |
21+20	0.0584	0.02	Q	|	|	|	V |
21+25	0.0585	0.02	Q	|	|	|	V |
21+30	0.0586	0.02	Q	|	|	|	V |
21+35	0.0587	0.02	Q	|	|	|	V |
21+40	0.0588	0.01	Q	|	|	|	V |
21+45	0.0589	0.01	Q	|	|	|	V |
21+50	0.0590	0.01	Q	|	|	|	V |
21+55	0.0591	0.01	Q	|	|	|	V |
22+ 0	0.0592	0.01	Q	|	|	|	V |
22+ 5	0.0593	0.01	Q	|	|	|	V |
22+10	0.0594	0.01	Q	|	|	|	V |
22+15	0.0595	0.01	Q	|	|	|	V |
22+20	0.0596	0.01	Q	|	|	|	V |
22+25	0.0597	0.01	Q	|	|	|	V |
22+30	0.0598	0.01	Q	|	|	|	V |
22+35	0.0599	0.01	Q	|	|	|	V |
22+40	0.0600	0.01	Q	|	|	|	V |
22+45	0.0601	0.01	Q	|	|	|	V |
22+50	0.0602	0.01	Q	|	|	|	V|
22+55	0.0603	0.01	Q	|	|	|	V|
23+ 0	0.0604	0.01	Q	|	|	|	V|
23+ 5	0.0605	0.01	Q	|	|	|	V|
23+10	0.0606	0.01	Q	|	|	|	V|
23+15	0.0606	0.01	Q	|	|	|	V|
23+20	0.0607	0.01	Q	|	|	|	V|
23+25	0.0608	0.01	Q	|	|	|	V|
23+30	0.0609	0.01	Q	|	|	|	V|
23+35	0.0610	0.01	Q	|	|	|	V|
23+40	0.0611	0.01	Q	|	|	|	V|
23+45	0.0612	0.01	Q	|	|	|	V|
23+50	0.0612	0.01	Q	|	|	|	V|
23+55	0.0613	0.01	Q	|	|	|	V|
24+ 0	0.0614	0.01	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 08/25/22

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

Program License Serial Number 4070

2-YR, 24-HR STORM POST-DEVELOPED CONDITION – DA8
TR 20527, CITY OF VICTORVILLE
TRIBUTARY AREA A4-B
FILE: 18345HYDROA4BPOST2DA8.OUT

Storm Event Year = 2

Antecedent Moisture Condition = 3

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 (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
2.35	1	0.39
Rainfall data for year 2		
2.35	6	0.87
Rainfall data for year 2		
2.35	24	1.61

++

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

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	2.35	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
1.41	0.600	32.0	52.0	8.05	0.000
0.94	0.400	98.0	98.0	0.20	0.862

Area-averaged catchment yield fraction, Y = 0.345
Area-averaged low loss fraction, Yb = 0.655
User entry of time of concentration = 0.201 (hours)
++
Watershed area = 2.35(Ac.)
Catchment Lag time = 0.161 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 51.8758
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.655 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.186(In)
Computed peak 30-minute rainfall = 0.318(In)
Specified peak 1-hour rainfall = 0.392(In)
Computed peak 3-hour rainfall = 0.640(In)
Specified peak 6-hour rainfall = 0.871(In)
Specified peak 24-hour rainfall = 1.610(In)

Rainfall depth area reduction factors:
Using a total area of 2.35(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.186(In)
30-minute factor = 1.000 Adjusted rainfall = 0.318(In)
1-hour factor = 1.000 Adjusted rainfall = 0.392(In)
3-hour factor = 1.000 Adjusted rainfall = 0.640(In)
6-hour factor = 1.000 Adjusted rainfall = 0.871(In)
24-hour factor = 1.000 Adjusted rainfall = 1.610(In)

U n i t H y d r o g r a p h
++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 28.42 (CFS))	
1	4.221	1.200
2	32.694	8.092
3	62.190	8.383

4	75.000	3.641
5	82.431	2.112
6	87.463	1.430
7	90.862	0.966
8	93.392	0.719
9	95.270	0.534
10	96.686	0.402
11	97.672	0.280
12	98.275	0.172
13	98.881	0.172
14	99.466	0.166
15	99.826	0.102
16	100.000	0.049

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1860	0.1860
2	0.2290	0.0430
3	0.2586	0.0296
4	0.2819	0.0233
5	0.3014	0.0195
6	0.3184	0.0169
7	0.3334	0.0151
8	0.3471	0.0136
9	0.3595	0.0125
10	0.3711	0.0115
11	0.3819	0.0108
12	0.3920	0.0101
13	0.4062	0.0142
14	0.4198	0.0136
15	0.4329	0.0131
16	0.4456	0.0126
17	0.4578	0.0122
18	0.4696	0.0118
19	0.4810	0.0115
20	0.4922	0.0111
21	0.5030	0.0108
22	0.5135	0.0105
23	0.5238	0.0103
24	0.5338	0.0100
25	0.5436	0.0098
26	0.5532	0.0096
27	0.5626	0.0094
28	0.5718	0.0092
29	0.5808	0.0090
30	0.5896	0.0088
31	0.5983	0.0087
32	0.6068	0.0085
33	0.6152	0.0084
34	0.6235	0.0082
35	0.6316	0.0081
36	0.6396	0.0080
37	0.6474	0.0079
38	0.6552	0.0077

39	0.6628	0.0076
40	0.6703	0.0075
41	0.6777	0.0074
42	0.6850	0.0073
43	0.6922	0.0072
44	0.6994	0.0071
45	0.7064	0.0070
46	0.7134	0.0070
47	0.7202	0.0069
48	0.7270	0.0068
49	0.7337	0.0067
50	0.7404	0.0066
51	0.7469	0.0066
52	0.7534	0.0065
53	0.7598	0.0064
54	0.7662	0.0064
55	0.7725	0.0063
56	0.7787	0.0062
57	0.7849	0.0062
58	0.7910	0.0061
59	0.7970	0.0060
60	0.8030	0.0060
61	0.8090	0.0059
62	0.8149	0.0059
63	0.8207	0.0058
64	0.8265	0.0058
65	0.8322	0.0057
66	0.8379	0.0057
67	0.8435	0.0056
68	0.8491	0.0056
69	0.8546	0.0055
70	0.8601	0.0055
71	0.8656	0.0055
72	0.8710	0.0054
73	0.8763	0.0053
74	0.8816	0.0053
75	0.8869	0.0053
76	0.8921	0.0052
77	0.8973	0.0052
78	0.9024	0.0051
79	0.9076	0.0051
80	0.9126	0.0051
81	0.9177	0.0050
82	0.9227	0.0050
83	0.9276	0.0050
84	0.9326	0.0049
85	0.9375	0.0049
86	0.9423	0.0049
87	0.9472	0.0048
88	0.9520	0.0048
89	0.9568	0.0048
90	0.9615	0.0047
91	0.9662	0.0047
92	0.9709	0.0047

93	0.9756	0.0047
94	0.9802	0.0046
95	0.9848	0.0046
96	0.9894	0.0046
97	0.9940	0.0046
98	0.9985	0.0045
99	1.0030	0.0045
100	1.0075	0.0045
101	1.0119	0.0045
102	1.0164	0.0044
103	1.0208	0.0044
104	1.0252	0.0044
105	1.0295	0.0044
106	1.0338	0.0043
107	1.0382	0.0043
108	1.0424	0.0043
109	1.0467	0.0043
110	1.0510	0.0042
111	1.0552	0.0042
112	1.0594	0.0042
113	1.0636	0.0042
114	1.0677	0.0042
115	1.0719	0.0041
116	1.0760	0.0041
117	1.0801	0.0041
118	1.0842	0.0041
119	1.0882	0.0041
120	1.0923	0.0040
121	1.0963	0.0040
122	1.1003	0.0040
123	1.1043	0.0040
124	1.1083	0.0040
125	1.1122	0.0040
126	1.1161	0.0039
127	1.1201	0.0039
128	1.1240	0.0039
129	1.1278	0.0039
130	1.1317	0.0039
131	1.1356	0.0038
132	1.1394	0.0038
133	1.1432	0.0038
134	1.1470	0.0038
135	1.1508	0.0038
136	1.1546	0.0038
137	1.1583	0.0038
138	1.1621	0.0037
139	1.1658	0.0037
140	1.1695	0.0037
141	1.1732	0.0037
142	1.1769	0.0037
143	1.1805	0.0037
144	1.1842	0.0037
145	1.1878	0.0036
146	1.1914	0.0036

147	1.1951	0.0036
148	1.1987	0.0036
149	1.2022	0.0036
150	1.2058	0.0036
151	1.2094	0.0036
152	1.2129	0.0035
153	1.2164	0.0035
154	1.2199	0.0035
155	1.2235	0.0035
156	1.2269	0.0035
157	1.2304	0.0035
158	1.2339	0.0035
159	1.2373	0.0035
160	1.2408	0.0034
161	1.2442	0.0034
162	1.2476	0.0034
163	1.2510	0.0034
164	1.2544	0.0034
165	1.2578	0.0034
166	1.2612	0.0034
167	1.2646	0.0034
168	1.2679	0.0034
169	1.2712	0.0033
170	1.2746	0.0033
171	1.2779	0.0033
172	1.2812	0.0033
173	1.2845	0.0033
174	1.2878	0.0033
175	1.2911	0.0033
176	1.2943	0.0033
177	1.2976	0.0033
178	1.3008	0.0032
179	1.3041	0.0032
180	1.3073	0.0032
181	1.3105	0.0032
182	1.3137	0.0032
183	1.3169	0.0032
184	1.3201	0.0032
185	1.3232	0.0032
186	1.3264	0.0032
187	1.3296	0.0032
188	1.3327	0.0031
189	1.3358	0.0031
190	1.3390	0.0031
191	1.3421	0.0031
192	1.3452	0.0031
193	1.3483	0.0031
194	1.3514	0.0031
195	1.3545	0.0031
196	1.3576	0.0031
197	1.3606	0.0031
198	1.3637	0.0031
199	1.3667	0.0030
200	1.3698	0.0030

201	1.3728	0.0030
202	1.3758	0.0030
203	1.3788	0.0030
204	1.3818	0.0030
205	1.3848	0.0030
206	1.3878	0.0030
207	1.3908	0.0030
208	1.3938	0.0030
209	1.3967	0.0030
210	1.3997	0.0030
211	1.4026	0.0029
212	1.4056	0.0029
213	1.4085	0.0029
214	1.4115	0.0029
215	1.4144	0.0029
216	1.4173	0.0029
217	1.4202	0.0029
218	1.4231	0.0029
219	1.4260	0.0029
220	1.4289	0.0029
221	1.4317	0.0029
222	1.4346	0.0029
223	1.4375	0.0029
224	1.4403	0.0029
225	1.4432	0.0028
226	1.4460	0.0028
227	1.4488	0.0028
228	1.4517	0.0028
229	1.4545	0.0028
230	1.4573	0.0028
231	1.4601	0.0028
232	1.4629	0.0028
233	1.4657	0.0028
234	1.4685	0.0028
235	1.4712	0.0028
236	1.4740	0.0028
237	1.4768	0.0028
238	1.4795	0.0028
239	1.4823	0.0028
240	1.4850	0.0027
241	1.4878	0.0027
242	1.4905	0.0027
243	1.4932	0.0027
244	1.4959	0.0027
245	1.4987	0.0027
246	1.5014	0.0027
247	1.5041	0.0027
248	1.5068	0.0027
249	1.5095	0.0027
250	1.5121	0.0027
251	1.5148	0.0027
252	1.5175	0.0027
253	1.5202	0.0027
254	1.5228	0.0027

255	1.5255	0.0027
256	1.5281	0.0026
257	1.5308	0.0026
258	1.5334	0.0026
259	1.5360	0.0026
260	1.5386	0.0026
261	1.5413	0.0026
262	1.5439	0.0026
263	1.5465	0.0026
264	1.5491	0.0026
265	1.5517	0.0026
266	1.5543	0.0026
267	1.5569	0.0026
268	1.5595	0.0026
269	1.5620	0.0026
270	1.5646	0.0026
271	1.5672	0.0026
272	1.5697	0.0026
273	1.5723	0.0026
274	1.5748	0.0025
275	1.5774	0.0025
276	1.5799	0.0025
277	1.5824	0.0025
278	1.5850	0.0025
279	1.5875	0.0025
280	1.5900	0.0025
281	1.5925	0.0025
282	1.5950	0.0025
283	1.5975	0.0025
284	1.6000	0.0025
285	1.6025	0.0025
286	1.6050	0.0025
287	1.6075	0.0025
288	1.6100	0.0025

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0025	0.0016	0.0009
2	0.0025	0.0016	0.0009
3	0.0025	0.0016	0.0009
4	0.0025	0.0016	0.0009
5	0.0025	0.0016	0.0009
6	0.0025	0.0016	0.0009
7	0.0025	0.0017	0.0009
8	0.0025	0.0017	0.0009
9	0.0025	0.0017	0.0009
10	0.0025	0.0017	0.0009
11	0.0026	0.0017	0.0009
12	0.0026	0.0017	0.0009
13	0.0026	0.0017	0.0009
14	0.0026	0.0017	0.0009
15	0.0026	0.0017	0.0009

16	0.0026	0.0017	0.0009
17	0.0026	0.0017	0.0009
18	0.0026	0.0017	0.0009
19	0.0026	0.0017	0.0009
20	0.0026	0.0017	0.0009
21	0.0026	0.0017	0.0009
22	0.0026	0.0017	0.0009
23	0.0027	0.0017	0.0009
24	0.0027	0.0017	0.0009
25	0.0027	0.0017	0.0009
26	0.0027	0.0018	0.0009
27	0.0027	0.0018	0.0009
28	0.0027	0.0018	0.0009
29	0.0027	0.0018	0.0009
30	0.0027	0.0018	0.0009
31	0.0027	0.0018	0.0009
32	0.0027	0.0018	0.0009
33	0.0027	0.0018	0.0009
34	0.0028	0.0018	0.0009
35	0.0028	0.0018	0.0010
36	0.0028	0.0018	0.0010
37	0.0028	0.0018	0.0010
38	0.0028	0.0018	0.0010
39	0.0028	0.0018	0.0010
40	0.0028	0.0018	0.0010
41	0.0028	0.0019	0.0010
42	0.0028	0.0019	0.0010
43	0.0028	0.0019	0.0010
44	0.0029	0.0019	0.0010
45	0.0029	0.0019	0.0010
46	0.0029	0.0019	0.0010
47	0.0029	0.0019	0.0010
48	0.0029	0.0019	0.0010
49	0.0029	0.0019	0.0010
50	0.0029	0.0019	0.0010
51	0.0029	0.0019	0.0010
52	0.0029	0.0019	0.0010
53	0.0030	0.0019	0.0010
54	0.0030	0.0019	0.0010
55	0.0030	0.0020	0.0010
56	0.0030	0.0020	0.0010
57	0.0030	0.0020	0.0010
58	0.0030	0.0020	0.0010
59	0.0030	0.0020	0.0010
60	0.0030	0.0020	0.0010
61	0.0031	0.0020	0.0011
62	0.0031	0.0020	0.0011
63	0.0031	0.0020	0.0011
64	0.0031	0.0020	0.0011
65	0.0031	0.0020	0.0011
66	0.0031	0.0020	0.0011
67	0.0031	0.0021	0.0011
68	0.0031	0.0021	0.0011
69	0.0032	0.0021	0.0011

70	0.0032	0.0021	0.0011
71	0.0032	0.0021	0.0011
72	0.0032	0.0021	0.0011
73	0.0032	0.0021	0.0011
74	0.0032	0.0021	0.0011
75	0.0033	0.0021	0.0011
76	0.0033	0.0021	0.0011
77	0.0033	0.0022	0.0011
78	0.0033	0.0022	0.0011
79	0.0033	0.0022	0.0011
80	0.0033	0.0022	0.0011
81	0.0034	0.0022	0.0012
82	0.0034	0.0022	0.0012
83	0.0034	0.0022	0.0012
84	0.0034	0.0022	0.0012
85	0.0034	0.0022	0.0012
86	0.0034	0.0022	0.0012
87	0.0035	0.0023	0.0012
88	0.0035	0.0023	0.0012
89	0.0035	0.0023	0.0012
90	0.0035	0.0023	0.0012
91	0.0035	0.0023	0.0012
92	0.0035	0.0023	0.0012
93	0.0036	0.0023	0.0012
94	0.0036	0.0023	0.0012
95	0.0036	0.0024	0.0012
96	0.0036	0.0024	0.0013
97	0.0037	0.0024	0.0013
98	0.0037	0.0024	0.0013
99	0.0037	0.0024	0.0013
100	0.0037	0.0024	0.0013
101	0.0037	0.0024	0.0013
102	0.0038	0.0025	0.0013
103	0.0038	0.0025	0.0013
104	0.0038	0.0025	0.0013
105	0.0038	0.0025	0.0013
106	0.0038	0.0025	0.0013
107	0.0039	0.0025	0.0013
108	0.0039	0.0026	0.0013
109	0.0039	0.0026	0.0014
110	0.0040	0.0026	0.0014
111	0.0040	0.0026	0.0014
112	0.0040	0.0026	0.0014
113	0.0040	0.0026	0.0014
114	0.0041	0.0027	0.0014
115	0.0041	0.0027	0.0014
116	0.0041	0.0027	0.0014
117	0.0042	0.0027	0.0014
118	0.0042	0.0027	0.0014
119	0.0042	0.0028	0.0015
120	0.0042	0.0028	0.0015
121	0.0043	0.0028	0.0015
122	0.0043	0.0028	0.0015
123	0.0044	0.0029	0.0015

124	0.0044	0.0029	0.0015
125	0.0044	0.0029	0.0015
126	0.0045	0.0029	0.0015
127	0.0045	0.0029	0.0016
128	0.0045	0.0030	0.0016
129	0.0046	0.0030	0.0016
130	0.0046	0.0030	0.0016
131	0.0047	0.0031	0.0016
132	0.0047	0.0031	0.0016
133	0.0047	0.0031	0.0016
134	0.0048	0.0031	0.0016
135	0.0048	0.0032	0.0017
136	0.0049	0.0032	0.0017
137	0.0049	0.0032	0.0017
138	0.0050	0.0033	0.0017
139	0.0050	0.0033	0.0017
140	0.0051	0.0033	0.0018
141	0.0051	0.0034	0.0018
142	0.0052	0.0034	0.0018
143	0.0053	0.0034	0.0018
144	0.0053	0.0035	0.0018
145	0.0054	0.0035	0.0019
146	0.0055	0.0036	0.0019
147	0.0055	0.0036	0.0019
148	0.0056	0.0037	0.0019
149	0.0057	0.0037	0.0020
150	0.0057	0.0038	0.0020
151	0.0058	0.0038	0.0020
152	0.0059	0.0039	0.0020
153	0.0060	0.0039	0.0021
154	0.0060	0.0040	0.0021
155	0.0062	0.0040	0.0021
156	0.0062	0.0041	0.0021
157	0.0064	0.0042	0.0022
158	0.0064	0.0042	0.0022
159	0.0066	0.0043	0.0023
160	0.0066	0.0043	0.0023
161	0.0068	0.0044	0.0023
162	0.0069	0.0045	0.0024
163	0.0070	0.0046	0.0024
164	0.0071	0.0047	0.0025
165	0.0073	0.0048	0.0025
166	0.0074	0.0049	0.0026
167	0.0076	0.0050	0.0026
168	0.0077	0.0051	0.0027
169	0.0080	0.0052	0.0028
170	0.0081	0.0053	0.0028
171	0.0084	0.0055	0.0029
172	0.0085	0.0056	0.0029
173	0.0088	0.0058	0.0031
174	0.0090	0.0059	0.0031
175	0.0094	0.0061	0.0032
176	0.0096	0.0063	0.0033
177	0.0100	0.0066	0.0035

178	0.0103	0.0067	0.0035
179	0.0108	0.0071	0.0037
180	0.0111	0.0073	0.0038
181	0.0118	0.0077	0.0041
182	0.0122	0.0080	0.0042
183	0.0131	0.0086	0.0045
184	0.0136	0.0089	0.0047
185	0.0101	0.0066	0.0035
186	0.0108	0.0071	0.0037
187	0.0125	0.0082	0.0043
188	0.0136	0.0089	0.0047
189	0.0169	0.0111	0.0058
190	0.0195	0.0128	0.0067
191	0.0296	0.0194	0.0102
192	0.0430	0.0282	0.0148
193	0.1860	0.0393	0.1467
194	0.0233	0.0153	0.0080
195	0.0151	0.0099	0.0052
196	0.0115	0.0076	0.0040
197	0.0142	0.0093	0.0049
198	0.0126	0.0083	0.0044
199	0.0115	0.0075	0.0040
200	0.0105	0.0069	0.0036
201	0.0098	0.0064	0.0034
202	0.0092	0.0060	0.0032
203	0.0087	0.0057	0.0030
204	0.0082	0.0054	0.0028
205	0.0079	0.0051	0.0027
206	0.0075	0.0049	0.0026
207	0.0072	0.0047	0.0025
208	0.0070	0.0046	0.0024
209	0.0067	0.0044	0.0023
210	0.0065	0.0043	0.0022
211	0.0063	0.0041	0.0022
212	0.0061	0.0040	0.0021
213	0.0059	0.0039	0.0020
214	0.0058	0.0038	0.0020
215	0.0056	0.0037	0.0019
216	0.0055	0.0036	0.0019
217	0.0053	0.0035	0.0018
218	0.0052	0.0034	0.0018
219	0.0051	0.0033	0.0018
220	0.0050	0.0033	0.0017
221	0.0049	0.0032	0.0017
222	0.0048	0.0032	0.0017
223	0.0047	0.0031	0.0016
224	0.0046	0.0030	0.0016
225	0.0046	0.0030	0.0016
226	0.0045	0.0029	0.0015
227	0.0044	0.0029	0.0015
228	0.0043	0.0028	0.0015
229	0.0043	0.0028	0.0015
230	0.0042	0.0028	0.0014
231	0.0041	0.0027	0.0014

232	0.0041	0.0027	0.0014
233	0.0040	0.0026	0.0014
234	0.0040	0.0026	0.0014
235	0.0039	0.0026	0.0014
236	0.0039	0.0025	0.0013
237	0.0038	0.0025	0.0013
238	0.0038	0.0025	0.0013
239	0.0037	0.0024	0.0013
240	0.0037	0.0024	0.0013
241	0.0036	0.0024	0.0013
242	0.0036	0.0024	0.0012
243	0.0036	0.0023	0.0012
244	0.0035	0.0023	0.0012
245	0.0035	0.0023	0.0012
246	0.0034	0.0023	0.0012
247	0.0034	0.0022	0.0012
248	0.0034	0.0022	0.0012
249	0.0033	0.0022	0.0012
250	0.0033	0.0022	0.0011
251	0.0033	0.0021	0.0011
252	0.0032	0.0021	0.0011
253	0.0032	0.0021	0.0011
254	0.0032	0.0021	0.0011
255	0.0032	0.0021	0.0011
256	0.0031	0.0020	0.0011
257	0.0031	0.0020	0.0011
258	0.0031	0.0020	0.0011
259	0.0030	0.0020	0.0011
260	0.0030	0.0020	0.0010
261	0.0030	0.0020	0.0010
262	0.0030	0.0019	0.0010
263	0.0029	0.0019	0.0010
264	0.0029	0.0019	0.0010
265	0.0029	0.0019	0.0010
266	0.0029	0.0019	0.0010
267	0.0029	0.0019	0.0010
268	0.0028	0.0019	0.0010
269	0.0028	0.0018	0.0010
270	0.0028	0.0018	0.0010
271	0.0028	0.0018	0.0010
272	0.0028	0.0018	0.0010
273	0.0027	0.0018	0.0009
274	0.0027	0.0018	0.0009
275	0.0027	0.0018	0.0009
276	0.0027	0.0018	0.0009
277	0.0027	0.0017	0.0009
278	0.0026	0.0017	0.0009
279	0.0026	0.0017	0.0009
280	0.0026	0.0017	0.0009
281	0.0026	0.0017	0.0009
282	0.0026	0.0017	0.0009
283	0.0026	0.0017	0.0009
284	0.0025	0.0017	0.0009
285	0.0025	0.0017	0.0009

286	0.0025	0.0017	0.0009
287	0.0025	0.0016	0.0009
288	0.0025	0.0016	0.0009

Total soil rain loss = 0.97(In)
Total effective rainfall = 0.64(In)
Peak flow rate in flood hydrograph = 1.40(CFS)

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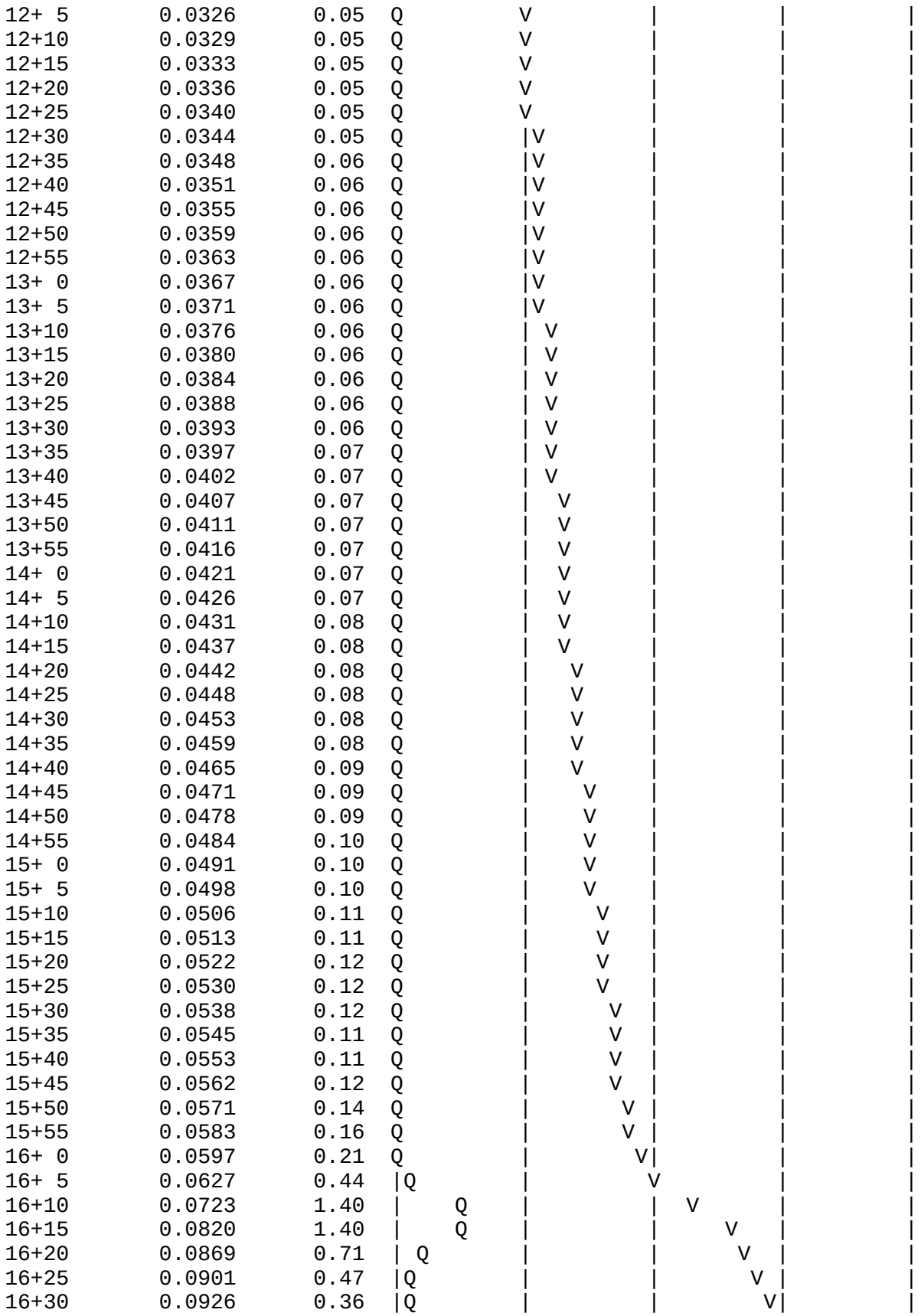
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0003	0.02	Q				
0+25	0.0004	0.02	Q				
0+30	0.0006	0.02	Q				
0+35	0.0007	0.02	Q				
0+40	0.0009	0.02	Q				
0+45	0.0011	0.02	Q				
0+50	0.0012	0.02	Q				
0+55	0.0014	0.02	Q				
1+ 0	0.0016	0.02	Q				
1+ 5	0.0017	0.02	Q				
1+10	0.0019	0.02	Q				
1+15	0.0021	0.03	Q				
1+20	0.0022	0.03	Q				
1+25	0.0024	0.03	Q				
1+30	0.0026	0.03	Q				
1+35	0.0028	0.03	Q				
1+40	0.0029	0.03	Q				
1+45	0.0031	0.03	Q				
1+50	0.0033	0.03	QV				
1+55	0.0035	0.03	QV				
2+ 0	0.0037	0.03	QV				
2+ 5	0.0038	0.03	QV				
2+10	0.0040	0.03	QV				
2+15	0.0042	0.03	QV				
2+20	0.0044	0.03	QV				
2+25	0.0045	0.03	QV				
2+30	0.0047	0.03	QV				
2+35	0.0049	0.03	QV				
2+40	0.0051	0.03	QV				
2+45	0.0053	0.03	QV				
2+50	0.0055	0.03	QV				
2+55	0.0056	0.03	QV				
3+ 0	0.0058	0.03	QV				

3+ 5	0.0060	0.03	QV	|	|	|	|
3+10	0.0062	0.03	QV	|	|	|	|
3+15	0.0064	0.03	Q V	|	|	|	|
3+20	0.0066	0.03	Q V	|	|	|	|
3+25	0.0068	0.03	Q V	|	|	|	|
3+30	0.0070	0.03	Q V	|	|	|	|
3+35	0.0071	0.03	Q V	|	|	|	|
3+40	0.0073	0.03	Q V	|	|	|	|
3+45	0.0075	0.03	Q V	|	|	|	|
3+50	0.0077	0.03	Q V	|	|	|	|
3+55	0.0079	0.03	Q V	|	|	|	|
4+ 0	0.0081	0.03	Q V	|	|	|	|
4+ 5	0.0083	0.03	Q V	|	|	|	|
4+10	0.0085	0.03	Q V	|	|	|	|
4+15	0.0087	0.03	Q V	|	|	|	|
4+20	0.0089	0.03	Q V	|	|	|	|
4+25	0.0091	0.03	Q V	|	|	|	|
4+30	0.0093	0.03	Q V	|	|	|	|
4+35	0.0095	0.03	Q V	|	|	|	|
4+40	0.0097	0.03	Q V	|	|	|	|
4+45	0.0099	0.03	Q V	|	|	|	|
4+50	0.0101	0.03	Q V	|	|	|	|
4+55	0.0103	0.03	Q V	|	|	|	|
5+ 0	0.0105	0.03	Q V	|	|	|	|
5+ 5	0.0107	0.03	Q V	|	|	|	|
5+10	0.0109	0.03	Q V	|	|	|	|
5+15	0.0111	0.03	Q V	|	|	|	|
5+20	0.0113	0.03	Q V	|	|	|	|
5+25	0.0115	0.03	Q V	|	|	|	|
5+30	0.0117	0.03	Q V	|	|	|	|
5+35	0.0119	0.03	Q V	|	|	|	|
5+40	0.0121	0.03	Q V	|	|	|	|
5+45	0.0124	0.03	Q V	|	|	|	|
5+50	0.0126	0.03	Q V	|	|	|	|
5+55	0.0128	0.03	Q V	|	|	|	|
6+ 0	0.0130	0.03	Q V	|	|	|	|
6+ 5	0.0132	0.03	Q V	|	|	|	|
6+10	0.0134	0.03	Q V	|	|	|	|
6+15	0.0136	0.03	Q V	|	|	|	|
6+20	0.0139	0.03	Q V	|	|	|	|
6+25	0.0141	0.03	Q V	|	|	|	|
6+30	0.0143	0.03	Q V	|	|	|	|
6+35	0.0145	0.03	Q V	|	|	|	|
6+40	0.0147	0.03	Q V	|	|	|	|
6+45	0.0150	0.03	Q V	|	|	|	|
6+50	0.0152	0.03	Q V	|	|	|	|
6+55	0.0154	0.03	Q V	|	|	|	|
7+ 0	0.0156	0.03	Q V	|	|	|	|
7+ 5	0.0159	0.03	Q V	|	|	|	|
7+10	0.0161	0.03	Q V	|	|	|	|
7+15	0.0163	0.03	Q V	|	|	|	|
7+20	0.0166	0.03	Q V	|	|	|	|
7+25	0.0168	0.03	Q V	|	|	|	|
7+30	0.0170	0.03	Q V	|	|	|	|

7+35	0.0173	0.03	Q	V	|	|	|	|
7+40	0.0175	0.03	Q	V	|	|	|	|
7+45	0.0177	0.03	Q	V	|	|	|	|
7+50	0.0180	0.03	Q	V	|	|	|	|
7+55	0.0182	0.03	Q	V	|	|	|	|
8+ 0	0.0185	0.03	Q	V	|	|	|	|
8+ 5	0.0187	0.04	Q	V	|	|	|	|
8+10	0.0189	0.04	Q	V	|	|	|	|
8+15	0.0192	0.04	Q	V	|	|	|	|
8+20	0.0194	0.04	Q	V	|	|	|	|
8+25	0.0197	0.04	Q	V	|	|	|	|
8+30	0.0199	0.04	Q	V	|	|	|	|
8+35	0.0202	0.04	Q	V	|	|	|	|
8+40	0.0204	0.04	Q	V	|	|	|	|
8+45	0.0207	0.04	Q	V	|	|	|	|
8+50	0.0209	0.04	Q	V	|	|	|	|
8+55	0.0212	0.04	Q	V	|	|	|	|
9+ 0	0.0215	0.04	Q	V	|	|	|	|
9+ 5	0.0217	0.04	Q	V	|	|	|	|
9+10	0.0220	0.04	Q	V	|	|	|	|
9+15	0.0222	0.04	Q	V	|	|	|	|
9+20	0.0225	0.04	Q	V	|	|	|	|
9+25	0.0228	0.04	Q	V	|	|	|	|
9+30	0.0230	0.04	Q	V	|	|	|	|
9+35	0.0233	0.04	Q	V	|	|	|	|
9+40	0.0236	0.04	Q	V	|	|	|	|
9+45	0.0239	0.04	Q	V	|	|	|	|
9+50	0.0241	0.04	Q	V	|	|	|	|
9+55	0.0244	0.04	Q	V	|	|	|	|
10+ 0	0.0247	0.04	Q	V	|	|	|	|
10+ 5	0.0250	0.04	Q	V	|	|	|	|
10+10	0.0253	0.04	Q	V	|	|	|	|
10+15	0.0256	0.04	Q	V	|	|	|	|
10+20	0.0258	0.04	Q	V	|	|	|	|
10+25	0.0261	0.04	Q	V	|	|	|	|
10+30	0.0264	0.04	Q	V	|	|	|	|
10+35	0.0267	0.04	Q	V	|	|	|	|
10+40	0.0270	0.04	Q	V	|	|	|	|
10+45	0.0273	0.04	Q	V	|	|	|	|
10+50	0.0276	0.04	Q	V	|	|	|	|
10+55	0.0279	0.04	Q	V	|	|	|	|
11+ 0	0.0283	0.04	Q	V	|	|	|	|
11+ 5	0.0286	0.05	Q	V	|	|	|	|
11+10	0.0289	0.05	Q	V	|	|	|	|
11+15	0.0292	0.05	Q	V	|	|	|	|
11+20	0.0295	0.05	Q	V	|	|	|	|
11+25	0.0298	0.05	Q	V	|	|	|	|
11+30	0.0302	0.05	Q	V	|	|	|	|
11+35	0.0305	0.05	Q	V	|	|	|	|
11+40	0.0308	0.05	Q	V	|	|	|	|
11+45	0.0312	0.05	Q	V	|	|	|	|
11+50	0.0315	0.05	Q	V	|	|	|	|
11+55	0.0319	0.05	Q	V	|	|	|	|
12+ 0	0.0322	0.05	Q	V	|	|	|	|


12+ 5 0.0326 0.05 Q V | | |
12+10 0.0329 0.05 Q V | | |
12+15 0.0333 0.05 Q V | | |
12+20 0.0336 0.05 Q V | | |
12+25 0.0340 0.05 Q V | | |
12+30 0.0344 0.05 Q |V | | |
12+35 0.0348 0.06 Q |V | | |
12+40 0.0351 0.06 Q |V | | |
12+45 0.0355 0.06 Q |V | | |
12+50 0.0359 0.06 Q |V | | |
12+55 0.0363 0.06 Q |V | | |
13+ 0 0.0367 0.06 Q |V | | |
13+ 5 0.0371 0.06 Q |V | | |
13+10 0.0376 0.06 Q | V | | |
13+15 0.0380 0.06 Q | V | | |
13+20 0.0384 0.06 Q | V | | |
13+25 0.0388 0.06 Q | V | | |
13+30 0.0393 0.06 Q | V | | |
13+35 0.0397 0.07 Q | V | | |
13+40 0.0402 0.07 Q | V | | |
13+45 0.0407 0.07 Q | V | | |
13+50 0.0411 0.07 Q | V | | |
13+55 0.0416 0.07 Q | V | | |
14+ 0 0.0421 0.07 Q | V | | |
14+ 5 0.0426 0.07 Q | V | | |
14+10 0.0431 0.08 Q | V | | |
14+15 0.0437 0.08 Q | V | | |
14+20 0.0442 0.08 Q | V | | |
14+25 0.0448 0.08 Q | V | | |
14+30 0.0453 0.08 Q | V | | |
14+35 0.0459 0.08 Q | V | | |
14+40 0.0465 0.09 Q | V | | |
14+45 0.0471 0.09 Q | V | | |
14+50 0.0478 0.09 Q | V | | |
14+55 0.0484 0.10 Q | V | | |
15+ 0 0.0491 0.10 Q | V | | |
15+ 5 0.0498 0.10 Q | V | | |
15+10 0.0506 0.11 Q | V | | |
15+15 0.0513 0.11 Q | V | | |
15+20 0.0522 0.12 Q | V | | |
15+25 0.0530 0.12 Q | V | | |
15+30 0.0538 0.12 Q | V | | |
15+35 0.0545 0.11 Q | V | | |
15+40 0.0553 0.11 Q | V | | |
15+45 0.0562 0.12 Q | V | | |
15+50 0.0571 0.14 Q | V | | |
15+55 0.0583 0.16 Q | V | | |
16+ 0 0.0597 0.21 Q | V| | |
16+ 5 0.0627 0.44 |Q | V | |
16+10 0.0723 1.40 | Q | | V | |
16+15 0.0820 1.40 | Q | | V | |
16+20 0.0869 0.71 | Q | | V | |
16+25 0.0901 0.47 |Q | | V | |
16+30 0.0926 0.36 |Q | | V| |

16+35	0.0945	0.28	|Q	|	|	V	|
16+40	0.0961	0.24	Q	|	|	V	|
16+45	0.0975	0.20	Q	|	|	|V	|
16+50	0.0987	0.17	Q	|	|	|V	|
16+55	0.0997	0.15	Q	|	|	|V	|
17+ 0	0.1006	0.12	Q	|	|	| V	|
17+ 5	0.1014	0.12	Q	|	|	| V	|
17+10	0.1022	0.11	Q	|	|	| V	|
17+15	0.1028	0.10	Q	|	|	| V	|
17+20	0.1034	0.09	Q	|	|	| V	|
17+25	0.1039	0.08	Q	|	|	| V	|
17+30	0.1044	0.07	Q	|	|	| V	|
17+35	0.1049	0.07	Q	|	|	| V	|
17+40	0.1054	0.07	Q	|	|	| V	|
17+45	0.1058	0.06	Q	|	|	| V	|
17+50	0.1062	0.06	Q	|	|	| V	|
17+55	0.1067	0.06	Q	|	|	| V	|
18+ 0	0.1071	0.06	Q	|	|	| V	|
18+ 5	0.1074	0.06	Q	|	|	| V	|
18+10	0.1078	0.06	Q	|	|	| V	|
18+15	0.1082	0.05	Q	|	|	| V	|
18+20	0.1086	0.05	Q	|	|	| V	|
18+25	0.1089	0.05	Q	|	|	| V	|
18+30	0.1093	0.05	Q	|	|	| V	|
18+35	0.1096	0.05	Q	|	|	| V	|
18+40	0.1099	0.05	Q	|	|	| V	|
18+45	0.1103	0.05	Q	|	|	| V	|
18+50	0.1106	0.05	Q	|	|	| V	|
18+55	0.1109	0.05	Q	|	|	| V	|
19+ 0	0.1112	0.04	Q	|	|	| V	|
19+ 5	0.1115	0.04	Q	|	|	| V	|
19+10	0.1118	0.04	Q	|	|	| V	|
19+15	0.1121	0.04	Q	|	|	| V	|
19+20	0.1124	0.04	Q	|	|	| V	|
19+25	0.1127	0.04	Q	|	|	| V	|
19+30	0.1129	0.04	Q	|	|	| V	|
19+35	0.1132	0.04	Q	|	|	| V	|
19+40	0.1135	0.04	Q	|	|	| V	|
19+45	0.1138	0.04	Q	|	|	| V	|
19+50	0.1140	0.04	Q	|	|	| V	|
19+55	0.1143	0.04	Q	|	|	| V	|
20+ 0	0.1145	0.04	Q	|	|	| V	|
20+ 5	0.1148	0.04	Q	|	|	| V	|
20+10	0.1150	0.04	Q	|	|	| V	|
20+15	0.1153	0.04	Q	|	|	| V	|
20+20	0.1155	0.04	Q	|	|	| V	|
20+25	0.1158	0.04	Q	|	|	| V	|
20+30	0.1160	0.03	Q	|	|	| V	|
20+35	0.1163	0.03	Q	|	|	| V	|
20+40	0.1165	0.03	Q	|	|	| V	|
20+45	0.1167	0.03	Q	|	|	| V	|
20+50	0.1170	0.03	Q	|	|	| V	|
20+55	0.1172	0.03	Q	|	|	| V	|
21+ 0	0.1174	0.03	Q	|	|	| V	|

21+ 5	0.1176	0.03	Q	|	|	|	V |
21+10	0.1179	0.03	Q	|	|	|	V |
21+15	0.1181	0.03	Q	|	|	|	V |
21+20	0.1183	0.03	Q	|	|	|	V |
21+25	0.1185	0.03	Q	|	|	|	V |
21+30	0.1187	0.03	Q	|	|	|	V |
21+35	0.1189	0.03	Q	|	|	|	V |
21+40	0.1191	0.03	Q	|	|	|	V |
21+45	0.1193	0.03	Q	|	|	|	V |
21+50	0.1195	0.03	Q	|	|	|	V |
21+55	0.1198	0.03	Q	|	|	|	V |
22+ 0	0.1200	0.03	Q	|	|	|	V |
22+ 5	0.1202	0.03	Q	|	|	|	V |
22+10	0.1204	0.03	Q	|	|	|	V |
22+15	0.1206	0.03	Q	|	|	|	V |
22+20	0.1207	0.03	Q	|	|	|	V |
22+25	0.1209	0.03	Q	|	|	|	V |
22+30	0.1211	0.03	Q	|	|	|	V |
22+35	0.1213	0.03	Q	|	|	|	V |
22+40	0.1215	0.03	Q	|	|	|	V |
22+45	0.1217	0.03	Q	|	|	|	V |
22+50	0.1219	0.03	Q	|	|	|	V|
22+55	0.1221	0.03	Q	|	|	|	V|
23+ 0	0.1223	0.03	Q	|	|	|	V|
23+ 5	0.1224	0.03	Q	|	|	|	V|
23+10	0.1226	0.03	Q	|	|	|	V|
23+15	0.1228	0.03	Q	|	|	|	V|
23+20	0.1230	0.03	Q	|	|	|	V|
23+25	0.1232	0.03	Q	|	|	|	V|
23+30	0.1233	0.03	Q	|	|	|	V|
23+35	0.1235	0.03	Q	|	|	|	V|
23+40	0.1237	0.03	Q	|	|	|	V|
23+45	0.1239	0.03	Q	|	|	|	V|
23+50	0.1240	0.03	Q	|	|	|	V|
23+55	0.1242	0.02	Q	|	|	|	V|
24+ 0	0.1244	0.02	Q	|	|	|	V|

4.3 BMP Selection and Sizing

Complete the following forms for each project site DA to document that the proposed treatment (LID/Bioretention) BMPs conform to the project DCV developed to meet performance criteria specified in the Phase II Small MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the Phase II Small MS4 Permit (see Section 5.3 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design Measures (Form 4.3-2)
- Retention and Infiltration BMPs (Form 4.3-3) or
- Biotreatment BMPs (Form 4.3-4).

> Please note that the selected BMPs may also be used as dual purpose for on-site, hydromodification mitigation and management.

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Form 4.3-2 to determine the feasibility of applicable Site Design BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable Site Design BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of site design, retention and/or infiltration BMPs is unable to mitigate the entire DCV, then the remainder of the volume-based performance criteria that cannot be achieved with site design, retention and/or infiltration BMPs must be managed through biotreatment BMPs. If biotreatment BMPs are used, then they must be sized to provide equivalent effectiveness based on Template Section 4.3.4.

4.3.1 Exceptions to Requirements for Bioretention Facilities

Contingent on a demonstration that use of bioretention or a facility of equivalent effectiveness is infeasible, other types of biotreatment or media filters (such as tree-box-type biofilters or in-vault media filters) may be used for the following categories of Regulated Projects:

1) Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., smart growth projects), and having at least 85% of the entire project site covered by permanent structures;

2) Facilities receiving runoff solely from existing (pre-project) impervious areas; and

3) Historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity.

Form 4.3-1 Infiltration BMP Feasibility (DA 1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8)
Feasibility Criterion – Complete evaluation for each DA on the Project Site
[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒ *Refer to Section 5.3.2.1 of the TGD for WQMP*
If Yes, Provide basis: (attach)
[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒ (Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert): • The location is less than 50 feet away from slopes steeper than 15 percent • The location is less than ten feet from building foundations or an alternative setback. • A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.
If Yes, Provide basis: (attach)
[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒
If Yes, Provide basis: (attach)
[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒
If Yes, Provide basis: (attach)
[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒
If Yes, Provide basis: (attach)
[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒ *See Section 3.5 of the TGD for WQMP and WAP*
If Yes, Provide basis: (attach)
[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒ *If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Selection and Evaluation of Biotreatment BMP.* *If no, then proceed to Item 8 below.* [8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒ *If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Site Design BMP.* *If no, then proceed to Item 9, below.* [9] All answers to Item 1 through Item 6 are "No": *Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.* *Proceed to Form 4.3-2, Site Design BMPs.*

4.3.2 Site Design BMP

Section E.12.e. of the Small Phase II MS4 Permit emphasizes the use of LID preventative measures; and the use of Site Design Measures reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable Site Design Measures shall be provided except where they are mutually exclusive

with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of Site Design BMPs. If a project cannot feasibly meet BMP sizing requirements or cannot fully address hydromodification, feasibility of all applicable Site Design BMPs must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design BMP. Refer to Section 5.4 in the TGD for more detailed guidance.

Form 4.3-2 Site Design BMPs (DA1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3):		$V_{retention}$ *=Sum of Item 4 for all BMPs*	
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft) (min. 0.5 ft.)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft) (min. 1 ft.)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3):		$V_{retention}$ *=Sum of Item 12 for all BMPs*	

Form 4.3-2 Site Design BMPs (DA1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8)

14 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 14-18. If no, proceed to Item 19*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Number of Street Trees			
16 Average canopy cover over impervious area (ft^2)			
17 Runoff volume retention from street trees (ft^3) $V_{retention}$ *= Item 15 * Item 16 * (0.05/12) assume runoff retention of 0.05 inches*			
18 Runoff volume retention from street tree BMPs (ft^3):	$V_{retention}$ *= Sum of Item 17 for all BMPs*		
19 Total Retention Volume from Site Design BMPs:	*Sum of Items 5, 13 and 18*		

4.3.3 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix C of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

4.3.3.1 Allowed Variations for Special Site Conditions

The bioretention system design parameters of this Section may be adjusted for the following special site conditions:

1) Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project may incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.

2) Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures may incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a “flow-through planter”).

3) Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible, may omit the underdrain.

4) Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites may be required to provide adequate pretreatment to address pollutants of concern unless these high-risk areas are isolated from storm water runoff or bioretention areas with no chance of spill migration.

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,655.57 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	6.34		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.17		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	12.68		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	12.68		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,100		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	0.0		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	3,454		

16 Total Retention Volume from LID Infiltration BMPs: 3,454 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 208.6 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 2)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,864.44 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 2 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	6.34		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.17		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	12.68		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	12.68		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,155		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	0.0		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	3,638		

16 Total Retention Volume from LID Infiltration BMPs: 3,638 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 203.74 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 3)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,655.57 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	6.34		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.17		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	12.68		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	12.68		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,100		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	0.0		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	3,638		

16 Total Retention Volume from LID Infiltration BMPs: 3,638 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 170.8% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 4)

1 Remaining LID DCV not met by site design BMP (ft^3): 2,569.82 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	6.34		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.17		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	12.68		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	12.68		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,177		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	0.0		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	3,716		

16 Total Retention Volume from LID Infiltration BMPs: 3,716 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 132.6 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 5)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,024.91 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	10.07		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	5.03		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	20.12		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	20.12		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	1,035		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	1,359		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0.0		

16 Total Retention Volume from LID Infiltration BMPs: 1,359 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 132.6 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 6)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,395.02 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	10.07		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	5.03		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	20.12		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	20.12		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	990		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	1,302		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0.0		

16 Total Retention Volume from LID Infiltration BMPs: 1,302 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 93.3 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 7)

1 Remaining LID DCV not met by site design BMP (ft^3): 1,566.50 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	10.07		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	5.03		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	20.12		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	20.12		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	900		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	1,180		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0.0		

16 Total Retention Volume from LID Infiltration BMPs: 1,180 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 84.53 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 8)

1 Remaining LID DCV not met by site design BMP (ft^3): 2,079.29 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Underground Chamber	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	10.07		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	5.03		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	20.12		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	20.12		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	2,457		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0.0		
10 Amended soil porosity	0.0		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.0		
12 Gravel porosity	0.40		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	4,304		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0.0		

16 Total Retention Volume from LID Infiltration BMPs: 4,304 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 149.61 % *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-4 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV. Biotreatment computations are included as follows:

- Use Form 4.3-5 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-6 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-7 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-4 Selection and Evaluation of Biotreatment BMP (DA 1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8)

1 Remaining LID DCV not met by site design , or infiltration, BMP for potential biotreatment (ft^3): *Form 4.2-1 Item 7 - Form 4.3-2 Item 19 – Form 4.3-3 Item 16*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-5 and 4.3-6 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-7 to compute treated flow*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-5 Item 15 + Form 4.3-6 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-5 Volume Based Biotreatment (DA 1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-6 Volume Based Biotreatment (DA 1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (E.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-7 Flow Based Biotreatment (DA 1, DA2, DA3, DA4, DA5, DA6, DA7 & DA8)

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w = *(Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} = *(Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-8 to demonstrate how on-site LID DCV is met with proposed site design, infiltration, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 1,655.58 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 3,454 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 2)

1 Total LID DCV for the Project DA-1 (ft^3): 1,785.62 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 3,638 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 3)

1 Total LID DCV for the Project DA-1 (ft^3): 2,129.3 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 3,638 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 4)

1 Total LID DCV for the Project DA-1 (ft^3): 2,802.51 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 3,716 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 5)

1 Total LID DCV for the Project DA-1 (ft^3): 1,024.91 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 1,359 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 6)

1 Total LID DCV for the Project DA-1 (ft^3): 1,395.03 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 1,302 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 7)

1 Total LID DCV for the Project DA-1 (ft^3): 1,396.05 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 1,180 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Form 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 8)

1 Total LID DCV for the Project DA-1 (ft^3): 2,876.8 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 0.0 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 4,304 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0.0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0.0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

4.3.6 Hydromodification Control BMP

Use Form 4.3-9 to compute the remaining runoff volume retention, after Site Design BMPs are implemented, needed to address hydromodification, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential hydromodification. Describe the proposed hydromodification treatment control BMP. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-9 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 2,462.59 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): -1,309.77 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 3,454

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 2)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 2,644.35 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): -993.65 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 3,638

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 3)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 2,962.90 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): -753.10 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 3,716

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 4)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 3,608.37 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): -107.63 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 3,716

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 5)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 1,103.76 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): -255.24 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 1,359

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 6)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 1,414.51 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): 112.51 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 1,302

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

Form 4.3-9 Hydromodification Control BMPs (DA 7)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 1,321.25 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): 141.25 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 1,180

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

4.4 Alternative compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance.

Alternative Designs — Facilities, or a combination of facilities, of a different design than in Permit Section E.12.e.(ii)(f) may be permitted if all of the following measures of equivalent effectiveness are demonstrated:

1) Equal or greater amount of runoff infiltrated or evapotranspired;

2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment;

3) Equal or greater protection against shock loadings and spills;

4) Equal or greater accessibility and ease of inspection and maintenance.

The Project Proponent will need to obtain written approval for an alternative design from the Lahontan Regional Water Board Executive Officer (see Section 6 of the TGD for WQMP).

Form 4.3-9 Hydromodification Control BMPs (DA 8)

1 Volume reduction needed for hydromodification performance criteria (ft^3): 2,144.23
*(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*

2 On-site retention with site design and infiltration, BMP (ft^3): *Sum of Form 4.3-8 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving hydromodification volume reduction*

3 Remaining volume for hydromodification volume capture (ft^3): -2,159.77 *Item 1 – Item 2*

4 Volume capture provided by incorporating additional on-site BMPs (ft^3): 4,304

5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site BMP ☒
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐

6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, hydromodification performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site retention BMPs ☒

SECTION 5

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMPs included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and a Maintenance Agreement. The Maintenance Agreement must also be attached to the WQMP.

Note that at time of Project construction completion, the Maintenance Agreement must be completed, signed, notarized and submitted to the County Stormwater Department

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Infiltration Trench with underdrain pipe	City	Maintain vegetation as needed	Ongoing before annual storms & following rainfall events
Infiltration Trench with underdrain pipe (Cont.)	City	Remove debris and litter from entire basin to minimize clogging and improve aesthetics	Ongoing before annual storms & following rainfall events
Infiltration Trench with underdrain pipe (Cont.)	City	Check for obvious problems & repair as needed. Address odor, insects and overgrowth issues associated with stagnant water in basin bottom. There should be no long-term ponding water.	Ongoing before annual storms & following rainfall events
Infiltration Trench with underdrain pipe (Cont.)	City	Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment integrity, as well as damage to any structural element.	Ongoing before annual storms & following rainfall events

Landscape	Owner	Maintain vegetation through Mowing, trimming, weeding and remove accumulation of trash and debris. Inspect for leaks and adjust irrigation as needed to prevent over-watering	Twice a Month
Irrigation System	Owner	Replace/repair leaky or broken sprinkler check for over watering and adjust as needed.	Inspect irrigation system monthly. Practice water conservation and landscape maintenance throughout life of the project.
Under-ground Infiltration Chambers	City	Remove trash and debris. Check for damage and standing water. Contact manufacturer for repair recommendations if needed.	Ongoing, before annual storms and following rainfall events.
Under-ground Infiltration Chambers (Cont.)	City	Inspection of hydraulic and structural facilities. Examine the inlet for blockage as well as damage to any structural element. Check chambers for sediment build up and reduced total capacity.	Annually, if possible, schedule these inspection within 72 hours after significant rainfall.
Catch basin Insert Filter	City	Clean/Replace/Repair as needed to ensure proper function. Replace oil absorbent pouch as needed.	Before and after rainy season (Oct-May) and after each storm events

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C,C&R's & Lease Agreements

Attachment 1 – Site/Drainage Plan

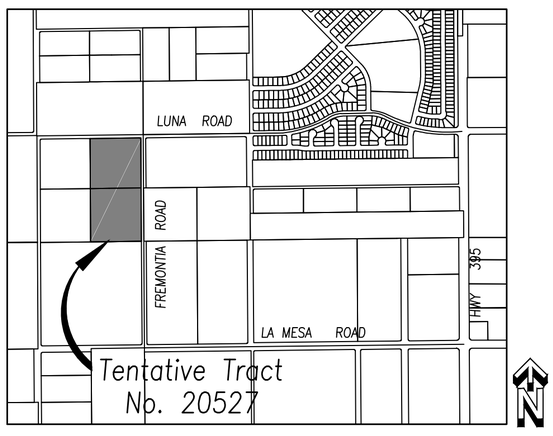
MAPS

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

WATER QUALITY MANAGEMENT PLAN
TENTATIVE TRACT MAP No.20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING AUGUST 2022



VICINITY MAP
NOT TO SCALE

0 60' 120'
SCALE: 1" = 60'

LEGEND

- DRAINAGE AREAS
- SITE BOUNDARY
- INDICATES DIRECTION OF FLOW
- PROPOSED BUILDING
- PROPOSED A/C PAVING AREAS
- PROPOSED LANDSCAPING AREAS
- DA1 / 85,813 SQ.FT. / 33.35%IMP — INDICATES DRAINAGE AREA NUMBER; INDICATES TOTAL AREA; INDICATES PERCENTAGE OF IMPERVIOUS AREA

FIRE ACCESS: Luna Road east to existing

APN 3096-321-01

36" DIA. RCP STORM DRAIN PIPE OUTLET

LUNA ROAD

DA4 125,017 SQ.FT. 40.51%IMP

DA8 102,366 SQ.FT. 52.95%IMP

DA7 50,529.6 SQ.FT. 51.44%IMP

DA3 101,059 SQ.FT. 37.47%IMP

DA2 91,476 SQ.FT. 33.88%IMP

DA6 51,836 SQ.FT. 50.00%IMP

DA1 85,813 SQ.FT. 33.35%IMP

DA5 40,075 SQ.FT. 47.30%IMP

AXTOLL LANE

FELIX COURT

HUXLEY WAY

HIXON PLACE

FREMONTIA ROAD

TRACT 16507

BASIN A4-A:
2-36"DIA.x 105'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 107'(L) GRAVEL
PROVIDED VOLUME= 3,716 CU.FT.
MAX. WATER DEPTH= 5.78 FT
Q100(OUTFLOW)= 4.3 CFS
D.C.V.= 2,802.5 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

BASIN A3-A:
2-36"DIA.x 105'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 107'(L) GRAVEL
PROVIDED VOLUME= 3,716 CU.FT.
MAX. WATER DEPTH= 4.9 FT
Q100(OUTFLOW)= 3.2 CFS
D.C.V.= 2,129.63 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

BASIN A2-A:
2-36"DIA.x 101'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 105'(L) GRAVEL
PROVIDED VOLUME= 3,638 CU.FT.
MAX. WATER DEPTH= 4.8 FT
Q100(OUTFLOW)= 3.1 CFS
D.C.V.= 1,785.62 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 2% INV @ 4.5' FROM BOT.

BASIN A1-A:
2-36"DIA.x 96'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 100'(L) GRAVEL
PROVIDED VOLUME= 3,454 CU.FT.
MAX. WATER DEPTH= 4.7 FT
Q100(OUTFLOW)= 2.9 CFS
OUTLET PIPE= 12'DIA. CMP @ 0.5%
D.C.V.= 1,655.57 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 0.5% INV @ 4' FROM BOT.

BASIN A4-B:
546 L.F. INFILTRATION TRENCH WITH 6"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.= 4,304 CU.FT.
MAX. DEPTH OF WATER= 2.99 FT
Q100(OUTFLOW)=2.0 CFS
Q10=1.78 CFS
D.C.V.= 2,876.8 CU.FT.

3.5'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3224.77 INV/FL

BASIN A3-B:
200 L.F. INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.=1,180 CU.FT.
Q100(OUTFLOW)=2.69 CFS
Q10=0.95 CFS
MAX. DEPTH OF WATER= 2.95 FT
D.C.V.= 1,396.05 CU.FT.

2.0'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3228.33 INV/FL

BASIN A2-B:
220 L.F.INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDE VOL.= 1,302 CU.FT.
Q100(OUTFLOW)=2.72 CFS
Q10=0.88 CFS
MAX. DEPTH OF WATER= 2.96 FT
D.C.V.= 1,395 CU.FT

2.5'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3232.22 INV/FL

BASIN A1-B:
230 L.F. INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.= 1,359 CU.FT.
Q100(OUTFLOW)=1.92 CFS
Q10=0.53 CFS
MAX. DEPTH OF WATER= 2.99 FT
D.C.V.= 1,024.9 CU.FT.

2.0'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
36.65INV/FL

EXISTING EASEMENT TO BE VACATED
EXISTING DRAINAGE EASEMENT AS SHOWN ON PMB 8362, PMB 87/60-61 & RS 71/53
50' BSL TO BE VACATED
50' BSL
210'
WESTERLY LINE OF PROPOSED DRAINAGE EASEMENT
WESTERLY LINE OF EXISTING DRAINAGE EASEMENT
APN 3096-341-05
APN 3096-341-10
APN 3096-351-01
ANGLE POINT OF EXISTING DRAINAGE EASMENT
BALDY MESA WATER PLAN OF DRAINAGE LINE 8-01
TRACT BOUNDARY
PROP. EP
EXIST. F.H.
EXIST. ST. LT.
EXIST. C&G
EXIST. EP

FORM 4.1-1 NON-STRUCTURAL SOURCE CONTROL BMPs:

- (~) N1 - EDUCATION OF PROPERTY OWNERS, TENANTS AND OCCUPANTS ON STORMWATER BMPs
- (~) N2 - ACTIVITY RESTRICTIONS
- (1) N3 - LANDSCAPE MANAGEMENT
- (~) N4 - BMP MAINTENANCE
- (~) N6 - LOCAL WATER QUALITY ORDINANCES
- (~) N11 - LITTER/DEBRIS CONTROL PROGRAM
- (~) N12 - EMPLOYEE TRAINING
- (2) N14 - CATCH BASIN INSPECTION PROGRAM
- (3) N15 - VACUUM SWEEPING OF PRIVATE STREETS AND PARKING LOTS
- (~) N17- COMPLY WILL ALL OTHER APPLICABLE NPDES PERMITS

PROPOSED TREATMENT CONTROL BMPs:

- [1] INFILTRATION BMP (RETENTION VOLUME PER PLAN)
- [2] UNDERGROUND BMP(RETENTION VOLUME PER PLAN)
  2 - 36" DIAMETER X 105 THRU 107 LF. CORRUGATION ALUMINIZED TYPE II UNDERGROUND DETENTION SYSTEM WRAP WITH 4OZ. NON-WOVEN GEOTEXTILE FABRIC. WITH FREE DRAINING ANGULAR WASHED STONE ¾" - 2" AROUND PIPE ENVELOPED . CSP CAGE PER AASHTO SECTION 12. MATERIAL PERFORATION TO COMPLY WITH "CLASS II" & ASTM A760 SECTION 8.3.2.2. ALL PERFORATION SHALL BE ⅜" DIAMETER
- [3] PROVIDE NY OPLAST SHORT CATCH BASIN INSERT OR EQUAL
- [4] PROVIDE FLAT GRATE/AREA DRAIN FILTER INSERT OR EQUAL

FORM 4.1-2 NON-STRUCTURAL SOURCE CONTROL BMPs:

- (4) S1 - PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE (CASQA NEW DEVELOPMENT BMP HANDBOOK SD-13)
- (5) S3 - DESIGN AND CONSTRUCTION TRASH AND WASTE STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION (CASQA NEW DEVELOPMENT BMP HANDBOOK SD-32)

DA1 : IMP=33.4%

IMPERVIOUS:	
BUILDING =	15,750 SF
PAVEMENT, S/W & C & G=	10,227 SF
DRIVE WAY=	2,240 SF
10' WIDE TRAIL DG= 1000 x 40% = 400 SF	
TOTAL =	28,617 SF
LANDSCAPE=	57,196 SF
TOTAL AREA A1-A = 85,813 SF	
DCV= 1,655.6 CU.FT.	

DA5:IMP=47.3%

IMPERVIOUS:	
BUILDING =	4,500 SF
PAVEMENT, S/W & C & G=	13,815 SF
DRIVE WAY=	640 SF
TOTAL =	18,955 SF
LANDSCAPE=	21,120. SF
TOTAL AREA A1-B = 40,075 SF	
DCV= 1,024.9 CU.FT.	

DA2: IMP=33.9%

IMPERVIOUS:	
BUILDING =	18,000 SF
PAVEMENT, S/W & C & G=	11,831 SF
DRIVE WAY=	2,560 SF
10' WIDE TRAIL DG= 1067 x 40% = 427 SF	
TOTAL =	32,818 SF
LANDSCAPE=	58,658 SF
TOTAL AREA A2-A = 91,476 SF	
DCV= 1,785.6 CU.FT.	

DA6: IMP=50.0%

IMPERVIOUS:	
BUILDING =	9,000 SF
PAVEMENT, S/W & C & G=	15,648 SF
DRIVE WAY=	1,280 SF
TOTAL =	25,928 SF
LANDSCAPE=	25,908 SF
TOTAL AREA A2-B = 51,836 SF	
DCV= 1,395.0 CU.FT.	

DA3: IMP=37.5%

IMPERVIOUS:	
BUILDING =	20,250 SF
PAVEMENT, S/W & C & G=	13,977 SF
DRIVE WAY=	3,200 SF
10' WIDE TRAIL DG= 1070 x 40% = 428 SF	
TOTAL =	37,855 SF
LANDSCAPE=	63,204 SF
TOTAL AREA A3-A = 101,059 SF	
DCV= 2,129.6 CU.FT.	

DA7: IMP=51.4%

IMPERVIOUS:	
BUILDING =	9,000 SF
PAVEMENT, S/W & C & G=	15,711 SF
DRIVE WAY=	1,280 SF
TOTAL =	25,991 SF
LANDSCAPE=	24,539 SF
TOTAL AREA A3-B = 50,530 SF	
DCV= 1,396.0 CU.FT.	

DA4: IMP=40.5%

IMPERVIOUS:	
BUILDING =	27,000 SF
PAVEMENT, S/W & C & G=	19,383 SF
DRIVE WAY=	3,840 SF
10' WIDE TRAIL DG= 1070 x 40% = 428 SF	
TOTAL =	50,651 SF
LANDSCAPE=	74,366 SF
TOTAL AREA A4-A = 125,017 SF	
DCV= 2,802.5 CU.FT.	

DA8: IMP=52.3%

IMPERVIOUS:	
BUILDING =	13,500 SF
PAVEMENT, S/W & C & G=	38,792 SF
DRIVE WAY=	1,920 SF
TOTAL =	54,212 SF
LANDSCAPE=	48,174 SF
TOTAL AREA A4-B = 102,386 SF	
DCV= 2,877 CU.FT.	

REGISTERED PROFESSIONAL ENGINEER — JEFFREY MARTIN ASHBAKER — No. 91606 — CIVIL — STATE OF CALIFORNIA

Ludwig Engineering ASSOCIATES, INC.
Civil Engineering • Surveying • Planning
109 East Third Street, San Bernardino, CA 92410, Phone: 909-884-8217, Fax: 909-889-0153
5890 Hwy. 95, Ste. B, Fort Mohave, AZ 88426, Phone: 928-768-1857, Fax: 928-768-7086
15252 Seneca Rd., Victorville, CA 92392, Phone: 760-951-7676, Fax: 760-241-0573
2126 McCulloch Blvd., Ste. 8, Lake Havasu City, AZ 86403, Phone: 928-680-6060, Fax: 928-854-6530

LUNA ROAD AND FREMONTIA ROAD

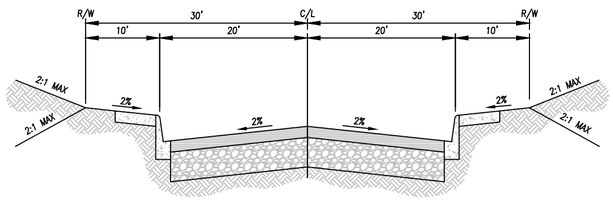
DATE: AUGUST 2022

SHEET 1 OF 2

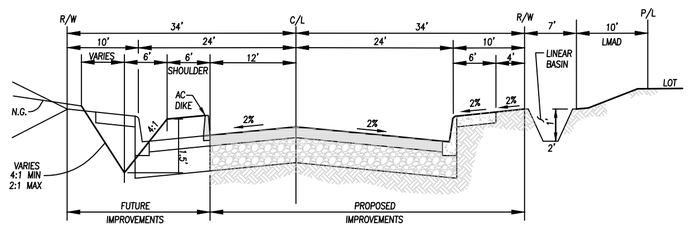
WQMP MAP
TTM NO. 20527

PROJECT NUMBER
CA-_____

PROJECT LOCATION & NAME: V:\plans\TR. 20527 (Canada)\Hydrology Drainage\Revised Jan. 2022\Acad\20527_WQMP Map.dwg PLOT TIME: 8/30/2022 10:16 AM LAYOUT: WQMP



LOCAL STREETS
TYPICAL SECTION (60' R/W)
NTS



LUNA ROAD (Looking East)
TYPICAL SECTION (68'R/W)
NTS

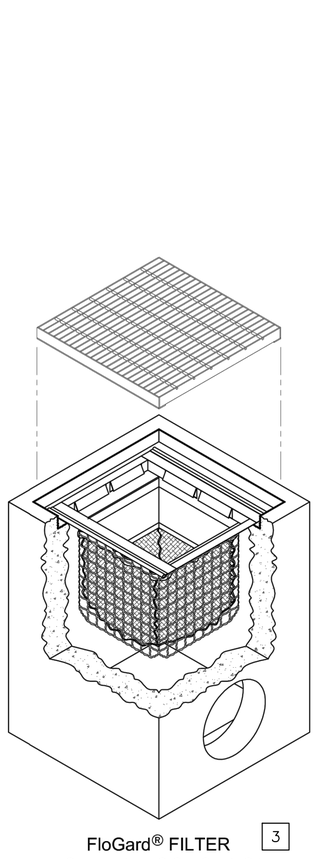
IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

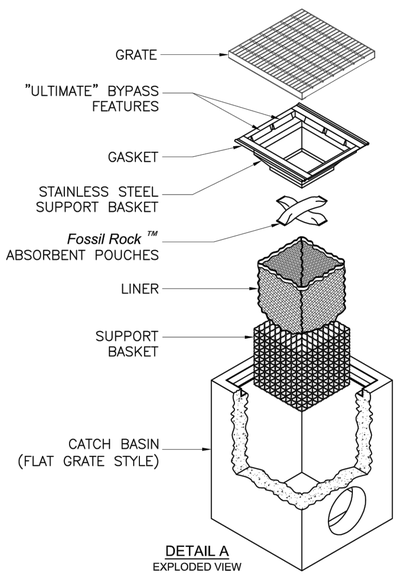
WATER QUALITY MANAGEMENT PLAN
TENTATIVE TRACT MAP No.20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING AUGUST 2022

FGP-0001





DETAIL A
EXPLODED VIEW

FloGard® FILTER 3
-INSTALLED INTO CATCH BASIN-

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

U.S. PATENT # 6,00,023 & 6,877,029

FloGard®
Catch Basin Insert Filter
Grated Inlet Style
Inlet Filtration

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com
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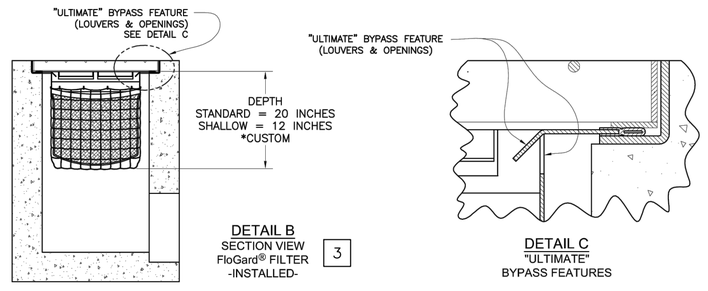
DRAWING NO.	REV.	ECO	DATE	
FGP-0001	G	ECO-0142 JPR 7/13/16	JPR 11/3/06	SHEET 1 OF 2

FGP-0001

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FloGard® FILTER 3
-INSTALLED-

DETAIL C
"ULTIMATE" BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columns is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85

FloGard®
Catch Basin Insert Filter
Grated Inlet Style
Inlet Filtration

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com
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DRAWING NO.	REV.	ECO	DATE	
FGP-0001	G	ECO-0142 JPR 7/13/16	JPR 11/3/06	SHEET 2 OF 2

OWNER/DEVELOPER

SHERR DEVELOPMENT CORPORATION
31300 ORCHARD LAKE ROAD, SUITE 200
FARMINGTON HILLS, MI 48334
PH: (248) 626-9099

ENGINEER

LUDWIG ENGINEERING
109 E. THIRD STREET
SAN BERNARDINO, CA 92410
(909)884-8217

ASSESSOR'S PARCEL NO.

APN:3096-341-04,07

ZONING & LAND USE

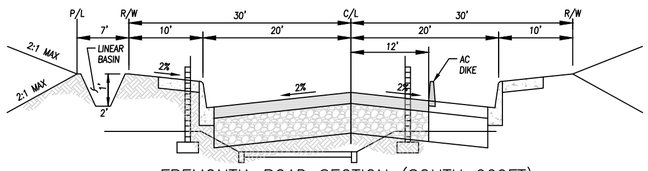
PRESENT: RESIDENTIAL, LOW DENSITY
PROPOSED: RESIDENTIAL, LOW DENSITY

GENERAL PLAN DESIGNATION

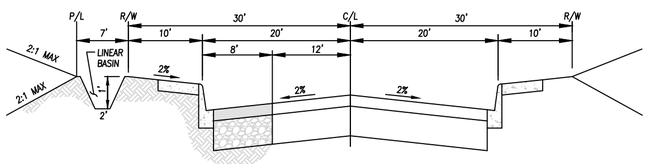
PRESENT: R1 SINGLE FAMILY
PROPOSED: R1 SINGLE FAMILY

AREAS

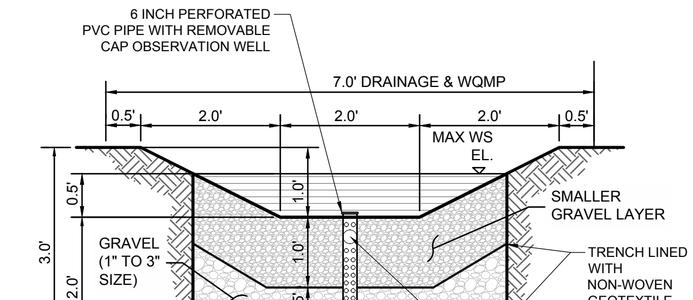
TOTAL GROSS ACREAGE	20.07 AC
TOTAL NET ACREAGE	18.61 AC
TOTAL NUMBERED LOTS	53 LOTS
UNITS PER ACRE RES.	2.64 U.P.A.
MINIMUM LOT SIZE RES.	7,200 S.F.
TOTAL LETTERED LOTS	10 LOTS



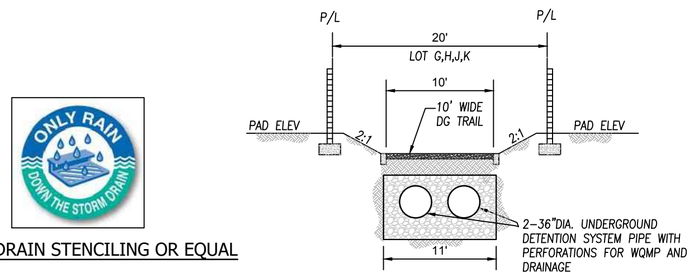
FREMONTIA ROAD SECTION (SOUTH 660FT)
TYPICAL SECTION (60' R/W) NTS



FREMONTIA ROAD SECTION (NORTH 660FT)
TYPICAL SECTION (60' R/W) NTS



1 TYP. INFILTRATION TRENCH
SECTION "A-A"
NOT TO SCALE

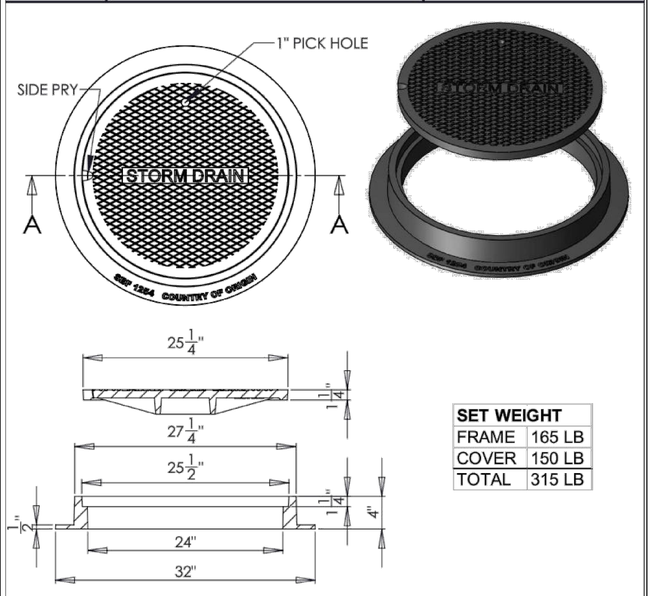


2 TYPICAL SECTION B-B
PROPOSED TRAIL AND WQMP & DRAINAGE STORAGE
SCALE: 1"=10'

4 STORM DRAIN STENCILING OR EQUAL

South Bay Foundry
WWW.SOUTHBAYFOUNDRY.COM
PHONE: (619) 956-2780 FAX: (619) 956-2788

SBF 1254-4
FRAME AND COVER
STORM DRAIN
A3500 / A3566



SET WEIGHT	
FRAME	165 LB
COVER	150 LB
TOTAL	315 LB

SECTION A-A

GENERAL INFORMATION
*MATERIALS CONFORM TO ASTM A48 CLASS 35B
*FRAME AND COVER BEARING SURFACES MACHINED FOR CLOSE, QUIET FIT
*CASTINGS SHALL BE DIPPED IN BLACK BITUMINOUS PAINT
*FRAME AND COVER EXCEEDS H-20 WHEEL LOADING

APPROVED
BY:
TITLE:
AGENCY:
DATE:

NOTES: UNDERGROUND SYSTEM 2

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE.
3. NORMAL ROADWAY EMBANKMENT FILL PLACED 8" LIFTS AND COMPACTED TO MIN. 90% STANDARD DENSITY
4. PER AASHTO T-99. 12" MIN. FOR DIAMETERS THROUGH 96". 18" MIN. FROM DIA. 102" AND UP. MEASURE FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF PIPE TO TOP OF RIGID PAVEMENT.
5. FREE DRAINING ANGULAR WASHED STONE $\frac{3}{4}$"-2" AROUND PIPE ENVELOPED AS SHOWN OR OTHERWISE NOTED.
6. CSP GAGE PER AASHTO SECTION 12.
7a. MATERIAL PERFORATION TO COMPLY WITH "CLASS II" PERFORATIONS PER AASTO M-36 SECTION 8.3.2.2 & ASTM A760 SECTION 8.3.2.2
7b. ALL PERFORATION SHALL BE $\frac{3}{8}$" DIAMETER
8. LISTED SPACING CHART IS FOR MULTIPLE PIPE INSTALLATION. FOR SINGLE RUN, THE TRENCH REQUIRES ONLY THE BOTTOM WIDTH OF THE PIPE'S SPAN, PLUS ROOM FOR COMPACTION EQUIPMENT.

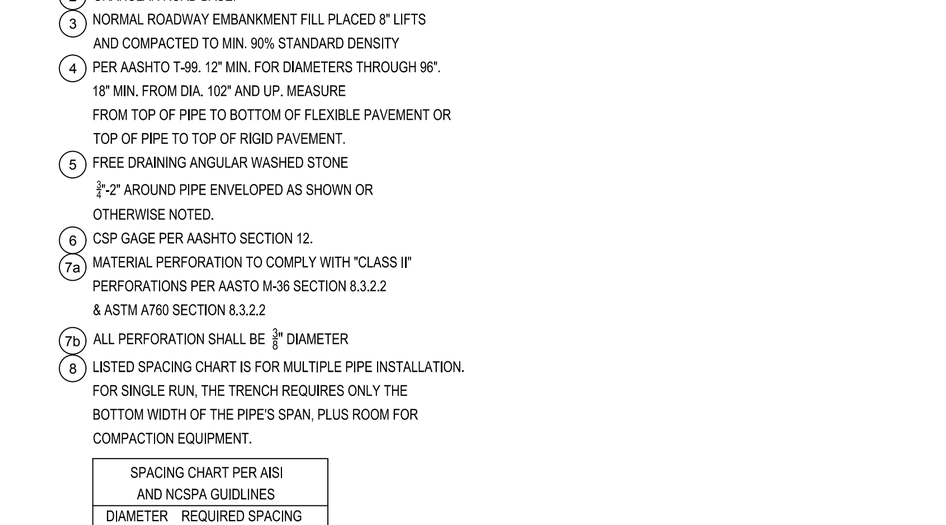
SPACING CHART PER AISI AND NCSPA GUIDLINES	
DIAMETER	REQUIRED SPACING
UP TO 24"	12"
24" - 72"	$\frac{1}{2}$ PIPE DIA.
72" AND UP	36"

9. 4 OZ. NON WOVEN GEOTEXTILE FABRIC.
10. RELATIVELY LOOSE GRANULAR BEDDING ROUGHLY SHAPED TO FIT BOTTOM OF PIPE, 4" TO 6" IN DEPTH. (#57 OR #8 OR OTHER SUITABLE GRANULAR).

DESIGN INFORMATION:

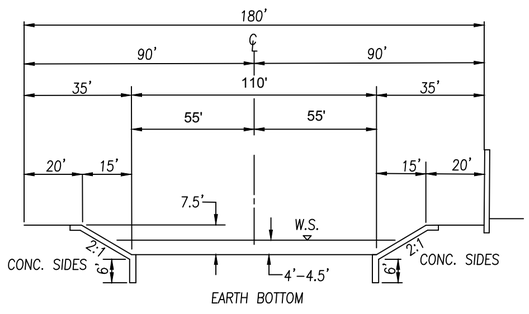
MATERIAL FINISH = ALZD. TYPE II
PIPE GAUGE = 16GA.
PERFORATED = YES
DIAMETER = 36"
LOADING = H20/H25

BMP 1 THRU BMP 4: 2- 36" DIA. ALUMINIZED TYPE II UNDERGROUND DETENTION SYSTEM WRAP WITH 4 OZ. NON-WOVEN GEOTEXTILE FABRIC. WITH FREE DRAINING ANGULAR WASHED STONE $\frac{3}{4}$" - 2" AROUND PIPE ENVELOPED . CSP CAGE PER AASHTO SECTION 12. MATERIAL PERFORATION TO COMPLY WITH "CLASS II" & ASTM A760 SECTION 8.3.2.2. ALL PERFORATION SHALL BE $\frac{3}{8}$" DIAMETER



DETAIL SECTION "B-B" 2
N.T.S.

2 - 36" DIA . CORRUGATION, ALUMINIZED TYPE II CSP UNDERGROUND DETENTION SYSTEM WRAP WITH NON-WOVEN GEOTEXTILE MEMBRANE
FULL PERFORATION SEE NOTE #7



TYPICAL SECTION C-C PROPOSED CHANNEL
BALDY MESA MASTER PLAN OF DRAINAGE
LINE A-01

PROFILE VIEW
SECTION B-B
UNDER GROUND CHAMBER 2
2- 36" DIA. PERFORATED CMP PIPE
N.TS.

REGISTERED PROFESSIONAL ENGINEER
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Lake Havasu City, AZ 86403
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Fax: 928-854-6530

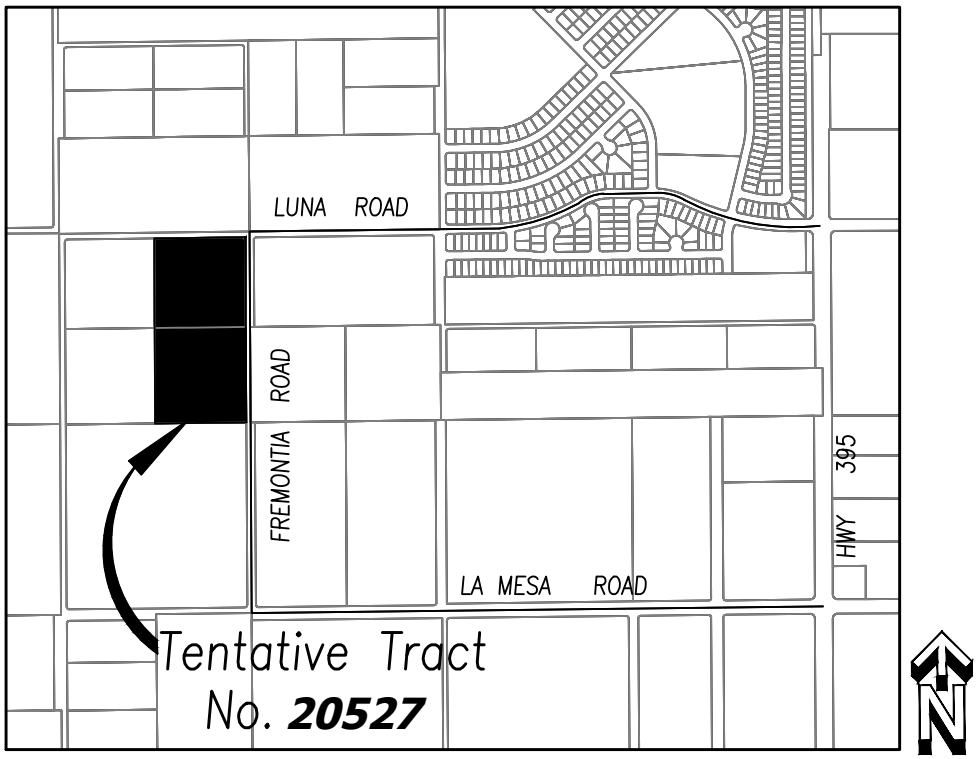
LUNA ROAD AND FREMONTIA ROAD

W.Q.M.P. DETAILS
TTM NO. 20527

DATE: AUGUST 2022

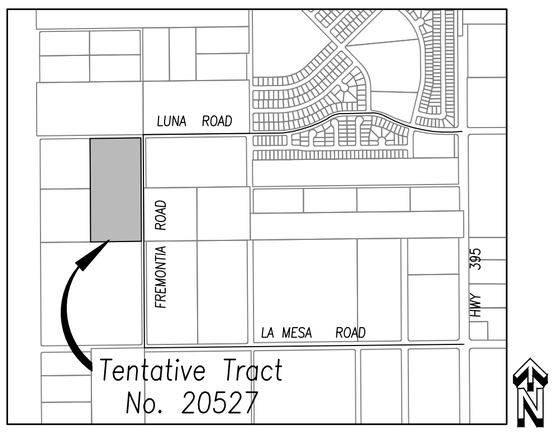
SHEET 2 OF 2

PROJECT NUMBER
CA-_____



VICINITY MAP
NOT TO SCALE

PREPARED BY:
Ludwig Engineering
ASSOCIATES, INC.
Civil Engineering • Surveying • Planning
California
Corporate
109 East Third Street, San Bernardino, CA 92410
Phone: 909-884-8217 Fax: 909-341-7447



VICINITY MAP
NOT TO SCALE

SOIL GROUP A

LEGEND

AX | XX.X AC — INDICATES SUBAREA, INDICATES ACREAGE
XXX L.F. — INDICATES RUN-OFF TRAVEL LENGHT

DRAINAGE AREA BOUNDARY

SUBAREA BOUNDARY

FLOW LINE

X — EL.=XXX.X — NODE NUMBER AND ELEVATION

INDICATES DIRECTION OF FLOW

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

TENTATIVE TRACT MAP No. 20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING JUNE 2022

ONSITE PRE-DEVELOPED DRAINAGE MAP

RATIONAL METHOD
Q100=3.8 CFS
Q10=1.8 CFS
Q2=0.5 CFS
FOR AA8:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100= 3.62 CFS
Q10= 1.92 CFS

EL.=3222
112

105
EL.=3221
L.P.

APN 3096-321-01

RATIONAL METHOD
CONFLUENCE FLOW
Q100= 62.1 CFS
Q10= 32.1CFS

LUNA ROAD

SEE POST DEVELOPED DRAINAGE MAP
Q100= 11.4 CFS
Q10=5.9 CFS

9.1
EL.=3222.89

EL.=3225.88
HP
23.2

RATIONAL METHOD
Q100=14.2 CFS
Q10=6.0 CFS
Q2=1.1 CFS
FOR AA4:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100= 16.24 CFS
Q10= 2.88 CFS

RATIONAL METHOD
Q100=48.1 CFS
Q10= 25.9CFS

DA 4
AA8 | 1.71 AC
388 L.F.
RATIONAL METHOD
Q100=3.3 CFS

DA 8
AA4 | 3.48 AC
458 L.F.
RATIONAL METHOD
Q100=6.2 CFS

SOIL "A"

RATIONAL METHOD
Q100=1.1 CFS
Q10=0.6 CFS
Q2=0.2 CFS
FOR AA7:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100= 1.13 CFS
Q10= 0.60 CFS

111
EL.=3228.5

104
EL.=3227.6

TRACT 16507

A8 | 2.1 AC
975 L.F.

A9 | 5.8 AC
1000 L.F.

EL.=3228.28
HP
23.1

APN 3096-341-05

RATIONAL METHOD
Q100=10.5 CFS
Q10=4.7 CFS
Q2=1.1 CFS
FOR AA3:

DA 3
AA7 | 0.58 AC
323 L.F.
RATIONAL METHOD
Q100=1.1 CFS

SOIL "A"

DA 7
AA3 | 3.08 AC
319 L.F.
RATIONAL METHOD
Q100=5.9 CFS

FREMONTIA ROAD

EL.=3229.90
HP
23

RATIONAL METHOD
Q100=2.5 CFS
Q10=1.2 CFS
Q2=0.5 CFS
FOR AA6:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100= 2.51 CFS
Q10= 1.30 CFS

110
EL.=3232.8

103
EL.=3231

22
EL.=3231

RATIONAL METHOD
Q100=6.3 CFS
Q10=3.0 CFS
Q2=0.9 CFS
FOR AA2:

109
EL.=3230

BALDY MESA MASTER PLAN OF DRAINAGE LINE A-01

APN 3096-341-01

Q100= 12.2 CFS
Q10=5.6 CFS
SEE POST DEVELOPED DRAINAGE MAP

DA 2
AA6 | 1.18 AC
355 L.F.
RATIONAL METHOD
Q100=2.5 CFS

SOIL "A"

DA 6
AA2 | 2.13 AC
326 L.F.
RATIONAL METHOD
Q100=4.3 CFS

RATIONAL METHOD
Q100= 38.2 CFS
Q10= 18.4CFS

107
EL.=3234.9

102
EL.=3236

RATIONAL METHOD
Q100=2.9 CFS
Q10=1.7 CFS
Q2=0.6 CFS
FOR AA1:

108
EL.=3238

A7 | 9.0 AC
975 L.F.

APN 3096-341-10

RATIONAL METHOD
Q100=2.6 CFS
Q10=1.3 CFS
Q2=0.5 CFS
FOR AA5:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100= 2.66 CFS
Q10= 1.46 CFS

DA 1
AA5 | 1.42 AC
369 L.F.
RATIONAL METHOD
Q100=2.6 CFS

SOIL "A"

DA 5
AA1 | 1.47 AC
356 L.F.
RATIONAL METHOD
Q100=2.9 CFS

APN 3096-341-01

106
EL.=3238.6
H.P.

101
EL.=3242
H.P.

13

SEE OVERALL DRAINAGE MAP AREA A1, A2, A3, A4 & A5

SEE OFFSITE DRAINAGE MAP
Q100=56.3CFS
Q10= 15.0CFS

7
EL.=3239.8

SEE OFFSITE DRAINAGE MAP
AREA A6 & A6.1

SEE OFFSITE DRAINAGE MAP
Q100=26.1 CFS
Q10= 10.3 CFS

6.1
6

5
4
3
2
1

SEE OVERALL OFFSITE DRAINAGE MAP
LINE A-01

BALDY MESA MASTER PLAN OF DRAINAGE REGIONAL FACILITY
LINE A-01
Q100= 5243 CFS ; b=68' ; h= 10' ; Z= 0.035
SEE OFFSITE OVERALL DRAINAGE MAP

N

0 60' 120'
SCALE: 1" = 60'

RATIONAL METHOD ONSITE PER INDIVIDUAL AREA TIME OF CONCENTRATION			
FLOW PATH (NODE)	Q2 (MIN)	Q10 (MIN)	Q100 (MIN)
101 -> 102	16.7	16.7	16.7
102 -> 103	20.9	19.7	19.4
103 -> 104	25.3	23.1	22.0
104 -> 105	30.8	26.8	25.0

RATIONAL METHOD ONSITE PER INDIVIDUAL AREA TIME OF CONCENTRATION			
FLOW PATH (NODE)	Q2 (MIN)	Q10 (MIN)	Q100 (MIN)
106 -> 107	18.8	18.8	18.8
108 -> 109	15.7	15.7	15.7
110 -> 111	16.9	16.9	16.9
112 -> 113	22.6	21.2	20.9

REGISTERED PROFESSIONAL ENGINEER
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Fax: 928-854-6530

LUNA ROAD AND FREMONTIA ROAD

PRE-DEVELOPED DRAINAGE MAP
TTM NO. 20527

DATE: JUNE 2022

SHEET 1 OF 3

PROJECT NUMBER
CA-_____

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

TENTATIVE TRACT MAP No.20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

SCALE: 1" = 60'

LUDWIG ENGINEERING

JUNE 2022

POST DEVELOPED DRAINAGE MAP

100-YR, 24-HR STORM
TOTAL ONSITE
POST DEVELOPED
OUTFLOW ONLY
Q100= 22.9 CFS

PRE-DEVELOPED
ONSITE FLOW ONLY
Q100=25.0 CFS

ONSITE(ONLY) POST DEVELOPED OUTFLOW TOWARDS EXISTING FLOWLINE FOR AREA A1B THRU A4B
Q100= 9.4 CFS

COMBINE OFFSITE/ONSITE FLOW
Q100= 53.6 CFS
Q10= 26.9 CFS

FIRE ACCESS: Luna Road east to existing

APN 3096-321-01

36" DIA. RCP STORM DRAIN PIPE OUTLET

12 EL.=3221 LP

BALDY MESA MASTER PLAN OF DRAINAGE REGIONAL FACILITY LINE A-01
Q100= 5243 CFS ; b=68' ; h= 10' ; Z= 0.035
SEE OFFSITE OVERALL DRAINAGE MAP

LUNA ROAD

RATIONAL METHOD
Q2=2.0 CFS
Q10=4.3 CFS
Q100=8.0 CFS
FOR A4-A:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 6.57 CFS

A4-A 2.87 AC
406 L.F.

A4-B 2.35 AC
1000 L.F.

CONFLUENCE
Q100= 53.6 CFS
Q10= 26.9 CFS

9.1 EL.=3222.89

Q100= 11.4 CFS
Q10=5.9 CFS

EL.=3225.88 HP 23.2

BASIN A4-B:
546 L.F. INFILTRATION TRENCH WITH 6"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.= 4,304 CU.FT.
MAX. DEPTH OF WATER= 2.99 FT
Q100(OUTFLOW)=2.0 CFS
Q10=1.78 CFS
D.C.V.= 2,079.3 CU.FT.

3.5'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3224.77 INV/FL

TOTAL ONSITE POST DEVELOPED OUTFLOW ONLY-WEST AREAS FOR AREA A1-A THRU A4-A
Q100= 13.5 CFS

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

BASIN A4-A:
2-36"DIA.x 105'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 107'(L) GRAVEL
PROVIDED VOLUME= 3,716 CU.FT.
MAX. WATER DEPTH= 5.78 FT
Q100(OUTFLOW)= 4.3 CFS
D.C.V.= 2,569.82 CU.FT.

AXTOLL LANE

DA 4

DA 8

RATIONAL METHOD
Q2=0.9 CFS
Q10=2.3 CFS
Q100=4.6 CFS
FOR A4-B:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 4.81 CFS

EL.=3228.28 HP 23.1

A8 2.1 AC
662 L.F.

A9 5.8 AC
1000 L.F.

TRACT 16507

TR. 16507

HOMEL AND STREET

EL.=3229.4 H.P. 10

RATIONAL METHOD
Q2=1.8 CFS
Q10=3.8 CFS
Q100=7.1 CFS
FOR A3-A:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 5.87 CFS

BASIN A3-B:
200 L.F. INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.=1,180 CU.FT.
Q100(OUTFLOW)=2.69 CFS
Q10=0.95 CFS
MAX. DEPTH OF WATER= 2.95 FT
D.C.V.= 1,366.27 CU.FT.

A3-A 2.32 AC
346 L.F.

2.0'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3228.33 INV/FL

EL.=3228.33 9

FELIX COURT

DA 3

DA 7

RATIONAL METHOD
Q2=1.0 CFS
Q10=2.1 CFS
Q100=3.9 CFS
FOR A3-B:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)=3.32 CFS

EL.=3229.90 HP 23

FREMONTIA ROAD

A3-B 1.16 AC
291 L.F.

CONFLUENCE
Q100= 40.2 CFS
Q10=18.6 CSF

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

BASIN A3-A:
2-36"DIA.x 105'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 107'(L) GRAVEL
PROVIDED VOLUME= 3,716 CU.FT.
MAX. WATER DEPTH= 4.9 FT
Q100(OUTFLOW)= 3.2 CFS
D.C.V.= 2,129.63 CU.FT.

EL.=3232.7 H.P. 7

22 EL.=3231

RATIONAL METHOD
Q2=1.9 CFS
Q10=3.9 CFS
Q100=7.1 CFS
FOR A2-A:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 6.05 CFS

BASIN A2-B:
220 L.F.INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDE VOL.= 1,302 CU.FT.
Q100(OUTFLOW)=2.72 CFS
Q10=0.88 CFS
MAX. DEPTH OF WATER= 2.96 FT
D.C.V.= 1,395 CU.FT

Q100= 12.2 CFS
Q10=5.6 CFS

BASIN A2-A:
2-36"DIA.x 101'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 105'(L) GRAVEL
PROVIDED VOLUME= 3,638 CU.FT.
MAX. WATER DEPTH= 4.8 FT
Q100(OUTFLOW)= 3.1 CFS
D.C.V.= 1,785.62 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 1% INV @ 4.2' FROM BOT.

ANGLE POINT OF EXISTING DRAINAGE EASEMENT

A2-B 1.19 AC
292 L.F.

A2-A 2.10 AC
279 L.F.

HUXLEY WAY

DA 2

DA 6

2.5'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
3232.22 INV/FL

CONFLUENCE
Q100= 27.0 CFS
Q10= 12.0 CFS

RATIONAL METHOD
Q2=1.0 CFS
Q10=2.2 CFS
Q100=4.0 CFS
FOR A2-B:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 3.39 CFS

EL.=3236.5 H.P. 4

BASIN A1-B:
230 L.F. INFILTRATION TRENCH WITH 4"DIA PERFORATED PIPE (4.5'WIDE X 2.5'DEPTH)
PROVIDED VOL.= 1,359 CU.FT.
Q100(OUTFLOW)=1.92 CFS
Q10=0.53 CFS
MAX. DEPTH OF WATER= 2.99 FT
D.C.V.= 1,024.9 CU.FT.

RATIONAL METHOD
Q2=1.8 CFS
Q10=3.6 CFS
Q100=6.6 CFS
FOR A1-A:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 5.68 CFS

A1-A 1.97 AC
261 L.F.

A7 9.0 AC
975 L.F.

APN 3096-341-01

TR. 16536

EL.=3236.65 3

2.0'WIDE x 4"DEPTH REVERSE PARKWAY DRAIN @ 1.0% INLET INTO INFILTRATION TRENCH
36.65INV/FL

HIXON PLACE

DA 1

DA 5

RATIONAL METHOD
Q2=0.9 CFS
Q10=1.9 CFS
Q100=3.4 CFS
FOR A1-B:
100-YR, 24-HR
UNIT HYDROGRAPH
Q100(PEAK)= 2.84 CFS

A1-B 0.92 AC
231 L.F.

BASIN A1-A:
2-36"DIA.x 96'(L)PERFORATED CMP PIPE UNDERGROUND DETENTION WRAPPED WITH 11'(W) x 100'(L) GRAVEL
PROVIDED VOLUME= 3,454 CU.FT.
MAX. WATER DEPTH= 4.7 FT
Q100(OUTFLOW)= 2.9 CFS
OUTLET PIPE= 12"DIA. CMP @ 0.5%
D.C.V.= 1,655.57 CU.FT.

OUTFLOW 12"DIA. CMP STORM DRAIN PIPE @ 0.5% INV @ 4' FROM BOT.

EL.=3240.8 H.P. 1

EL.=3245 HP 21

APN 3096-351-01

EL.=3239.8 7

SEE OFFSITE DRAINAGE MAP Q100=261 CFS Q10= 103 CFS

BALDY MESA MASTER PLAN OF DRAINAGE REGIONAL FACILITY LINE A-01
Q100= 5243 CFS ; b=68' ; h= 10' ; Z= 0.035
SEE OFFSITE OVERALL DRAINAGE MAP

SEE OVERALL OFFSITE DRAINAGE MAP LINE A-01

SEE OFFSITE DRAINAGE MAP AREA A1, A2, A3, A4 & A5

SEE OFFSITE DRAINAGE MAP Q100=58.0CFS Q10= 15.0CFS

SEE OFFSITE DRAINAGE MAP AREA A6 & A6.1

13 5 4 3 2 1 6.1 6

SOIL GROUP A

LEGEND

AX XX.X AC
XXX L.F. O

INDICATES SUBAREA
INDICATES ACREAGE
INDICATES RUN-OFF TRAVEL LENGHT

DRAINAGE AREA BOUNDARY

SUBAREA BOUNDARY

INDICATES FLOW LINE

X EL.=XXX.X

NODE NUMBER AND ELEVATION

INDICATES DIRECTION OF FLOW



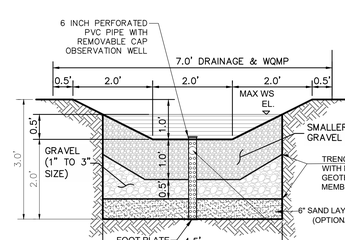
VICINITY MAP
NOT TO SCALE

NOTES

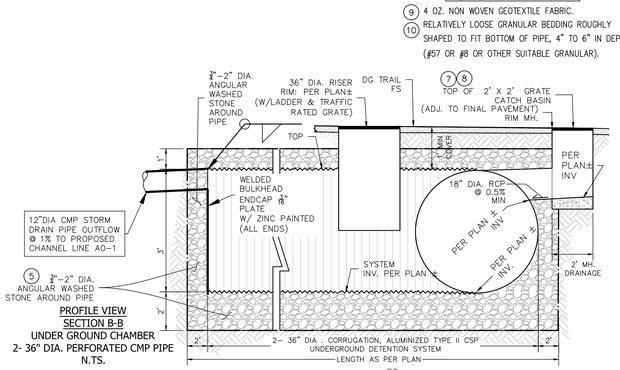
1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE.
3. NORMAL ROADWAY EMBANKMENT FILL PLACED 8" LIFTS AND COMPACTED TO MIN. 90% STANDARD DENSITY
4. PER AASHTO T-99. 12" MIN. FOR DIAMETERS THROUGH 96". 18" MIN. FROM DIA. 102" AND UP. MEASURE FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF PIPE TO TOP OF RIGID PAVEMENT.
5. FREE DRAINING ANGULAR WASHED STONE ¾"-2" AROUND PIPE ENVELOPED AS SHOWN OR OTHERWISE NOTED.
6. CSP GAGE PER AASHTO SECTION 12.
7. MATERIAL PERFORATION TO COMPLY WITH "CLASS II" PERFORATIONS PER AASTO M-36 SECTION 8.3.2.2 & ASTM A760 SECTION 8.3.2.2
8. ALL PERFORATION SHALL BE ½" DIAMETER
9. LISTED SPACING CHART IS FOR MULTIPLE PIPE INSTALLATION. FOR SINGLE RUN, THE TRENCH REQUIRES ONLY THE BOTTOM WIDTH OF THE PIPE'S SPAN, PLUS ROOM FOR COMPACTION EQUIPMENT.

SPACING CHART PER AIS AND NCSPA GUIDLINES	
DIAMETER	REQUIRED SPACING
UP TO 24"	12"
24" – 72"	½ PIPE DIA.
72" AND UP	36"

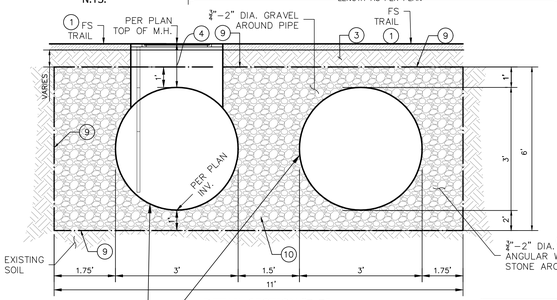
9. 4 OZ. NON WOVEN GEOTEXTILE FABRIC.
10. RELATIVELY LOOSE GRANULAR BEDDING ROUGHLY SHAPED TO FIT BOTTOM OF PIPE, 4" TO 6" IN DEPTH. (#57 OR #8 OR OTHER SUITABLE GRANULAR).



TYP. INFILTRATION TRENCH SECTION "A-A" & "C-C" 1
NOT TO SCALE

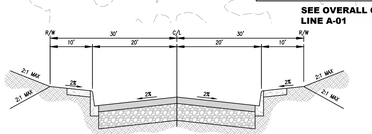


PROFILE VIEW SECTION B-B
UNDER GROUND CHAMBER
2- 36" DIA. PERFORATED CMP PIPE
N.TS.

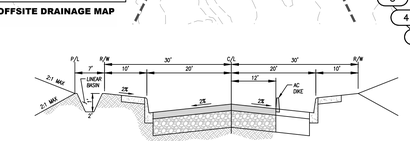


DETAIL SECTION "B-B"
N.T.S.

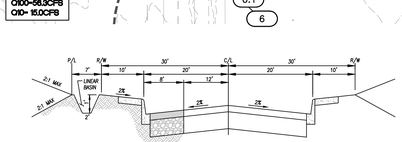
2 – 36" DIA . CORRUGATION, ALUMINIZED TYPE II CSP UNDERGROUND DETENTION SYSTEM WRAP WITH NON-WOVEN GEOTEXTILE MEMBRANE
FULL PERFORATION SEE NOTE #7



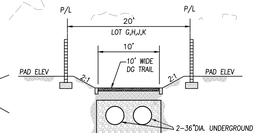
LOCAL STREETS
TYPICAL SECTION (60' R/W) NTS



FREMONTIA ROAD SECTION (SOUTH 660FT)
TYPICAL SECTION (60' R/W) NTS



FREMONTIA ROAD SECTION (NORTH 660FT)
TYPICAL SECTION (60' R/W) NTS



TYPICAL SECTION B-B
PROPOSED TRAIL AND WQMP & DRAINAGE STORAGE
SCALE: 1"=10'

DESIGN INFORMATION:

MATERIAL FINISH = ALZD, TYPE II
PIPE GAUGE = 16GA.
PERFORATED = YES
DIAMETER = 36"
LOADING = H20/H25

BASIN A1-A THRU BASIN A4-A:
2- 36" DIA. ALUMINIZED TYPE II UNDERGROUND DETENTION SYSTEM WRAP WITH 4 OZ. NON-WOVEN GEOTEXTILE FABRIC WITH FREE DRAINING ANGULAR WASHED STONE ¾" - 2" AROUND PIPE ENVELOPED .
CSP CAGE PER AASHTO SECTION 12. MATERIAL PERFORATION TO COMPLY WITH "CLASS II" & ASTM A760 SECTION 8.3.2.2. ALL PERFORATION SHALL BE ½" DIAMETER

PREPARED BY:

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REGISTERED PROFESSIONAL ENGINEER JEFFREY MARTIN ASHWORTH No. 91606 CIVIL STATE OF CALIFORNIA

PLOT STYLE: NCS US Standard.stb PROJECT LOCATION & NAME: V:\Admin\TR. 16545 (Cranelby)\Hydrology Drainage\Revised Jan. 2022\Asbuilt16545_Post-Developed Drainage Map.dwg PLOT TIME: Tuesday, July 12, 2022 12:34:10 PM LAYOUT: POST ONSITE

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

TENTATIVE TRACT MAP No. 20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING JUNE 2022

OFFSITE OVERALL PRE-DEVELOPED DRAINAGE MAP

SOIL GROUP A

LEGEND

AX | XX.X AC — INDICATES SUBAREA
XXX L.F. — INDICATES ACREAGE
INDICATES RUN-OFF TRAVEL LENGHT

DRAINAGE AREA BOUNDARY

SUBAREA BOUNDARY

INDICATES FLOW LINE

X — NODE NUMBER AND ELEVATION
EL.=XXX.X

INDICATES DIRECTION OF FLOW

CHANNEL FLOWS Q100= 5243.0 CFS (FACILITY A-01) BALDY MESA MASTER PLAN OF DRAINAGE

CHANNEL FLOWS Q100= 5243.0 CFS (FACILITY A-01) BALDY MESA MASTER PLAN OF DRAINAGE

180' WIDE CHANNEL FLOW
Q_{100}= 5497.0 CFS
Q_{10} = 3180.0 CFS

CHANNEL FLOWS Q100= 2632 CFS (FACILITY A-03) BALDY MESA MASTER PLAN OF DRAINAGE

CHANNEL FLOWS Q100= 2067CFS (FACILITY A-03) BALDY MESA MASTER PLAN OF DRAINAGE

CHANNEL FLOWS Q100= 3624 CFS (FACILITY A-01) BALDY MESA MASTER PLAN OF DRAINAGE

SOIL TYPE "B"
5 DU/AC
MANNINGS = 0.025
AP = 0.6

SOIL TYPE "B"
1 DU/AC
MANNINGS = 0.025
AP = 0.6

SOIL TYPE "B"
0.05-0.4 DU/AC
MANNINGS = 0.04
AP = 0.9

SOIL TYPE "C"
0.05-0.4 DU/AC
MANNINGS = 0.045
AP = 1.0

CULVERT NO.11
4nos. - 8' WIDE X 7' HIGH RCB MIN.

CULVERT NO.10 WITH DISSIPATOR
2nos. - 12'WIDE X 7'HIGH OPENING
MIN. 2 - 12'WIDE X 6'HIGH CHANNEL

CULVERT NO.9
2nos. - 12'WIDE X 7'HIGH OPENING
MIN. 2 - 12'WIDE X 6'HIGH CHANNEL

CULVERT NO.12 WITH DISSIPATOR
10'WIDE X 7' HIGH RCB OPENING
MIN. 6'X10' CHANNEL WITH STANDARD OUTLET

CULVERT NO.13
4nos. - 6'WIDE X 10.5' HIGH RCB

CULVERT NO.14
10'WIDE X 7'HIGH

FILE: 18345CULVERT1.OUT
CULVERT NO.1
36" CMP
H=20FT
Q_{100}= 118 CFS

24" CMP
H=11FT

CULVERT NO.2
1'9" HIGH X2'4"WIDE
ARCH CMP
H=5FT
FILE: 18345CULVERT2.OUT
Q_{100}= 30 CFS

CULVERT NO.3
24" CMP H=5FT
FILE: 18345CULVERT3.OUT
Q_{100}= 29 CFS

48" CMP
H=26.6FT
CULVERT NO.4
FILE: 18345CULVERT4.OUT
Q_{100}= 270.7 CFS

FILE: 18345CULVERT5.OUT
CULVERT NO.5
48" CMP
H=31.4FT
Q_{100}= 277.5CFS

FILE: 18346CULVERT6.OUT
CULVERT NO.6
36" CMP
H=9.5FT
Q_{100}= 99.4 CFS

36" CMP
H=13.7FT
CULVERT NO.7
FILE: 18345CULVERT7.OUT
Q_{100}= 111.6 CFS

FILE: 18345CULVERT8.OUT
CULVERT NO.8
36" CMP
H=19.4FT
Q_{100}= 123.4 CFS

NODE② EXISTING DETENTION BASIN

ELEV. (FT)	AREA (SQ.FT.)	AREA (AC.)	VOLUME (AC.FT.)
3740	52272	1.200	0.000
3755	1396486	32.06	121.50

NODE⑥ AND ⑨ EXISTING DETENTION BASIN

ELEV. (FT)	AREA (SQ.FT.)	AREA (AC.)	VOLUME (AC.FT.)
3708	20688	0.500	0.000
3728	357656	8.200	87.00
3746	600386	13.80	175.00

NODE⑫ EXISTING DETENTION BASIN

ELEV. (FT)	AREA (SQ.FT.)	AREA (AC.)	VOLUME (AC.FT.)
3724	11782	0.810	0.000
3740.55	914743	21.00	180.40

Q_{100}= 1818.54 CFS
Q_{10} = 942.0 CFS

Q_{100}= 3432.4 CFS
Q_{10} = 2108.0 CFS

Q_{100}= 1710.0 CFS
Q_{10} = 894.0 CFS

Q_{100}= 3787.0 CFS
Q_{10} = 2286.0 CFS

Q_{100}= 177 CFS BASE FLOW

Q_{100}= 882.6 CFS BASE FLOW

Q_{100}= 25.28 CFS
Q_{100}= 30.19 CFS

AVE. DEPTH = 15.0'
EXISTING DETENTION BASIN= 121.5 AC.FT.

DITCH H = 3'
W= 15'-20'

EXISTING DETENTION BASIN= 175 AC.FT.

DEPTH = 26.0'
DEPTH = 31.0'
EXISTING DETENTION BASIN= 261.6 AC.FT.

DEPTH = 9.5'
EXISTING DETENTION BASIN= 22 AC.FT.

DEPTH = 13.7'
EXISTING DETENTION BASIN= 51 AC.FT.

DEPTH = 19.4'
EXISTING DETENTION BASIN= 81.85 AC.FT.

TOTAL AREAS = 603 AC.
TOTAL LENGHT = 11494 FT
UPSTREAM LENGHT = 4758 FT

TOTAL LENGHT = 11940 FT
TOTAL AREAS = 643 AC.
UPSTREAM LENGHT = 4270 FT

TOTAL AREAS = 1286 AC.
TOTAL LENGHT = 15337 FT
UPSTREAM LENGHT = 6095 FT

UPSTREAM LENGHT = 7160 FT
TOTAL LENGHT = 17155 FT
TOTAL AREAS = 2390 AC.

TOTAL LENGHT = 27811 FT
UPSTREAM LENGHT = 16882 FT
TOTAL AREAS = 1643 AC.

TOTAL AREAS = 1731 AC.
TOTAL LENGHT = 25191 FT
UPSTREAM LENGHT = 10469 FT

TOTAL AREAS = 1640 AC.
TOTAL LENGHT = 23142 FT
UPSTREAM LENGHT = 9733 FT

TOTAL AREAS = 1966 AC.
TOTAL LENGHT = 16380 FT
UPSTREAM LENGHT = 7643 FT

SCALE: 1" = 1600'

Ludwig Engineering ASSOCIATES, INC.
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109 East Third Street, San Bernardino, CA 92410, Phone: 909-884-8217, Fax: 909-889-0153
15252 Seneca Rd., Victorville, CA 92392, Phone: 760-951-7676, Fax: 760-241-0573
5890 Hwy. 95, Ste. B, Fort Mohave, AZ 88426, Phone: 928-768-1857, Fax: 928-768-7086
2126 McCulloch Blvd., Ste. 8, Lake Havasu City, AZ 86403, Phone: 928-680-6060, Fax: 928-854-6530

REGISTERED PROFESSIONAL ENGINEER — JEFFREY MARTIN ASHBAKER — No. 91606 — CIVIL — STATE OF CALIFORNIA

LUNA ROAD AND FREMONTIA ROAD

DATE: JUNE 2022

SHEET 3 OF 3

OFFSITE DRAINAGE MAP
TR NO. 20527

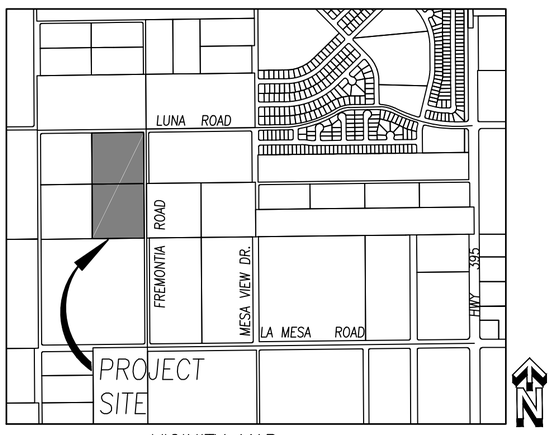
PROJECT NUMBER
CA-_____

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

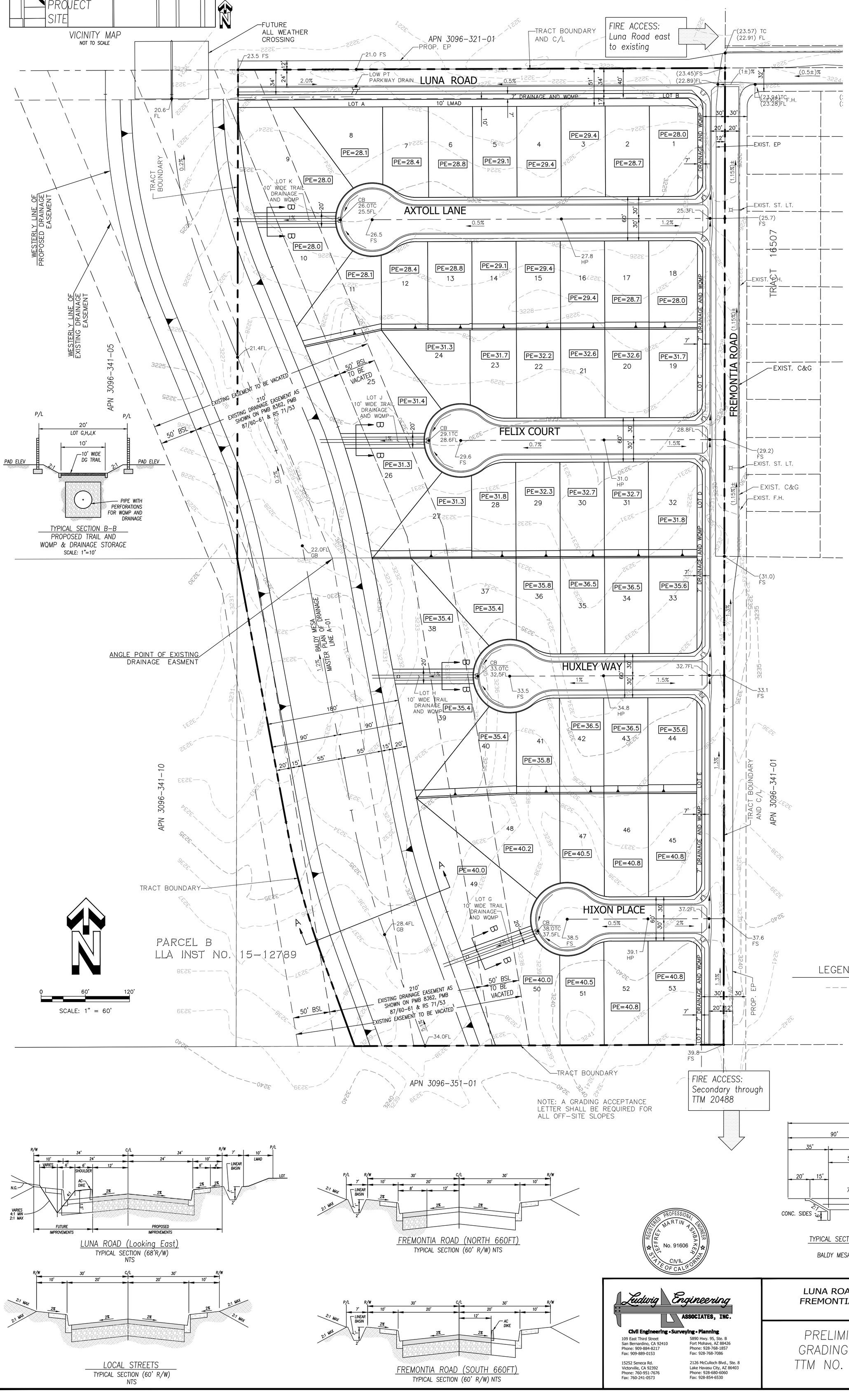
TENTATIVE TRACT MAP No. 20527

PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA, PER RECORDED INSTRUMENT No. 15–12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING — JUNE 2022



VICINITY MAP
NOT TO SCALE



TYPICAL SECTION B–B
PROPOSED TRAIL AND WQMP & DRAINAGE STORAGE
SCALE: 1"=10'

SCALE: 1" = 60'

LEGEND

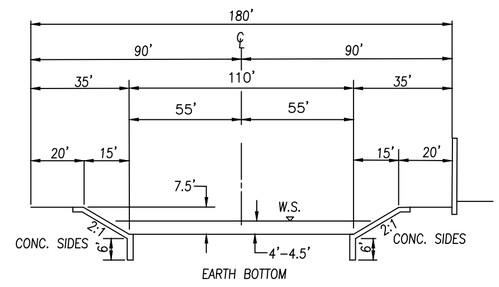
3200	EXIST. CONTOURS
FS	FINISH SURFACE
FL	FLOW LINE
GB	GRADE BREAK
EP	EDGE OF PAVEMENT
PE	PAD ELEVATION
HP	HIGH POINT

LUNA ROAD (Looking East)
TYPICAL SECTION (68'R/W)
NTS

FREMONTIA ROAD (NORTH 66OFT)
TYPICAL SECTION (60' R/W) NTS

LOCAL STREETS
TYPICAL SECTION (60' R/W)
NTS

FREMONTIA ROAD (SOUTH 66OFT)
TYPICAL SECTION (60' R/W) NTS



TYPICAL SECTION A–A PROPOSED CHANNEL
NTS
BALDY MESA MASTER PLAN OF DRAINAGE
LINE A–01

REGISTERED PROFESSIONAL ENGINEER
JEFFREY MARTIN ASHBAKER
No. 91606
CIVIL
STATE OF CALIFORNIA

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LUNA ROAD AND FREMONTIA ROAD

PRELIMINARY GRADING PLAN
TTM NO. 20527

DATE: JUNE 2022

SHEET 2 OF 3

PROJECT NUMBER

Attachment 2 - Electronic Data Submittal

This is a digital submittal. A separate electronic copy will not be provided.

Attachment 3 - Post Construction

RECORDING REQUESTED BY:
County of San Bernardino
Department of Public Works

AND WHEN RECORDED MAIL TO:
County of San Bernardino
Department of Public Works
825 E. Third Street, Room 117
San Bernardino, CA 92415-0835

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN AND STORMWATER BEST MANAGEMENT PRACTICES TRANSFER, ACCESS AND MAINTENANCE

THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION

Covenant and Agreement Regarding Water Quality Management Plan and Stormwater Best Management Practices Transfer, Access and Maintenance

OWNER NAME: Roger Sherr

PROPERTY ADDRESS: Southwest Corner of Luna Road and Fremontia Road

Victorville, CA 92392

APN: **0396-341-04 & 0396-341-09**

THIS AGREEMENT is made and entered into in

_____ ,California, this _____ day of

_____ , by and between

_____ , hereinafter

referred to as Owner, and the COUNTY OF SAN BERNARDINO, a political subdivision of the State of California, hereinafter referred to as "the County";

WHEREAS, the Owner owns real property ("Property") in the County of San Bernardino, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of initial approval of development project known as

TR 20527 within the Property described herein, the County required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff; and

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, dated _____, on file with the County and incorporated herein by this reference, hereinafter referred to as "WQMP", to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff; and

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the County; and

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs.

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Owner shall comply with the WQMP.

2. All maintenance or replacement of BMPs proposed as part of the WQMP are the sole responsibility of the Owner in accordance with the terms of this Agreement.

3. Owner hereby provides the County's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the County Director of Public Works, no advance notice, for the purpose of inspection, sampling, testing of the BMPs, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 5 below. The County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property. Denial of access to any premises or facility that contains WQMP features is a breach of this Agreement and may also be a violation of the County's Pollutant Discharge Elimination System regulations, which on the effective date of this Agreement are found in County Code Sections 35.0101 et seq. If there is reasonable cause to believe that an illicit discharge or breach of this Agreement is occurring on the premises then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction in addition to other enforcement actions. Owner recognizes that the County may perform routine and regular inspections, as well as emergency inspections, of the BMPs. Owner or Owner's successors or assigns shall pay County for all costs incurred by County in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of County invoice.

4. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the County, the Owner shall provide the County with documentation identifying the material(s) removed, the quantity, and disposal destination), testing construction or reconstruction.

5. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) business days of being given written notice by the County , the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense against the Property and/or to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the County Code from the date of the notice of expense until paid in full. Owner or Owner's successors or assigns shall pay County within thirty (30) calendar days of County invoice.

6. The County may require the owner to post security in form and for a time period satisfactory to the County to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the County may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the surety(ies) to perform the obligations of this Agreement.

7. The County agrees, from time to time, within ten (10) business days after request of Owner, to execute and deliver to Owner, or Owner's designee, an estoppel certificate requested by Owner, stating that this Agreement is in full force and effect, and that Owner is not in default hereunder with regard to any maintenance or payment obligations (or specifying in detail the nature of Owner's default). Owner shall pay all costs and expenses incurred by the County in its investigation of whether to issue an estoppel certificate within thirty (30) calendar days after receipt of a County invoice and prior to the County's issuance of such certificate. Where the County cannot issue an estoppel certificate, Owner shall pay the County within thirty (30) calendar days of receipt of a County invoice.

8. Owner shall not change any BMPs identified in the WQMP without an amendment to this Agreement approved by authorized representatives of both the County and the Owner.

9. County and Owner shall comply with all applicable laws, ordinances, rules, regulations, court orders and government agency orders now or hereinafter in effect in carrying out the terms of this Agreement. If a provision of this Agreement is terminated or held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall remain in full effect.

10. In addition to any remedy available to County under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the County if said cure reasonably requires more than the subject time, the County may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the County may recover any damages to which the County may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. This Agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the County, including interest as herein above set forth, subject to foreclosure in event of default in payment.

12. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to hold the County harmless and pay all costs incurred by the County in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

13. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

14. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an

interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.

15. Time is of the essence in the performance of this Agreement.

16. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

17. Owner agrees to indemnify, defend (with counsel reasonably approved by the County) and hold harmless the County and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the County on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the County's "active" as well as "passive" negligence but does not apply to the County's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section 2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the County under this Agreement..

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IF TO COUNTY :

Director of Public Works

825 E. Third Street, Room 117

San Bernardino, CA 92415-0835

IF TO OWNER:

Roger Sherr

31300 Orchard Lake Road, Suite 200,

Farmington, MI 48334

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

OWNER:

Company/Trust: _____

Signature: _____

Name: Roger Sherr

Title: Owner

Date: _____

OWNER:

Company/Trust: _____

Signature: _____

Name: _____

Title: _____

Date: _____

FOR: Maintenance Agreement, dated

_____, for the

project known as

_____

_____

(APN)_____,

As described in the WQMP dated

_____.

NOTARIES ON FOLLOWING PAGE

A notary acknowledgement is required for recordation.

ACCEPTED BY:

BRENDON BIGGS, M.S., P.E., Director of Public Works

Date: _____

Attachment: Notary Acknowledgement

ATTACHMENT 1
Notary Acknowledgement)

EXHIBIT A

(Legal Description)

Real property in the City of Victorville, County of San Bernardino, State of California, described as follows:

PARCEL 1 OF PARCEL MAP NO. 8362, IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 87, PAGES 60 AND 61, OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
PURSUANT TO CERTIFICATE OF COMPLIANCE RECORDED OCTOBER 19, 1987 AS INSTRUMENT NOS. 87-373661 AND 87-373662, BOTH OF OFFICIAL RECORDS.
RESERVING THERE FROM A ½ INTEREST IN AND TO ALL OILS, MINERALS, COALS, PETROLEUM, GAS AND KINDRED SUBSTANCES UNDER AND IN SAID LAND, BUT WITHOUT THE RIGHT OF THE SURFACE THERETO.
APN: 0396-341-04

PARCEL A AS SHOWN ON LOT LINE ADJUSTMENT OR PARCEL MERGER NO. ADM14-00066, AS EVIDENCED BY DOCUMENT RECORDED JANUARY 13, 2015, AS INSTRUMENT NO. 15-12789 OF OFFICIAL RECORDS, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
THAT PORTION OF PARCEL 4 OF PARCEL MAP NO. 8362 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AS FILED IN BOOK 87 OF PARCEL MAPS, AT PAGES 60 THROUGH 61, IN THE OFFICIAL RECORDS OF SAID COUNTY, DESCRIBED AS FOLLOWS:
BEGINNING AT THE SOUTHEAST CORNER OF SAID PARCEL 4, SAID POINT ALSO BEING THE CENTERLINE OF FREMONTIA ROAD,
THENCE N 00° 05' 07" E ALONG THE EAST LINE OF SAID PARCEL AND SAID CENTERLINE A DISTANCE OF 662.53 FEET TO THE NORTHEAST CORNER OF SAID PARCEL.
THENCE S 89° 44' 59" W ALONG THE NORTH LINE OF SAID PARCEL, A DISTANCE OF 661.07 FEET TO THE NORTHWEST CORNER OF SAID PARCEL.
THENCE S 10° 29' 51" E A DISTANCE OF 363.61 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVED NORTHEASTERLY, HAVING A RADIUS OF 1090.00 FEET.
THENCE SOUTHERLY AND SOUTHEASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF
9°59'56", AN ARC DISTANCE OF 190.22 FEET.
THENCE S 19° 59' 43" E A DISTANCE OF 128.28 FEET TO A POINT ON THE SOUTH LINE OF SAID PARCEL 4,
THENCE S 89° 46' 42" W ALONG THE SOUTH LINE OF SAID PARCEL, A DISTANCE OF 500.81 FEET TO THE POINT OF BEGINNING.
SAID PORTION OF PARCEL 4 CONTAINS 9.03 ACRES MORE OR LESS.
EXCEPTING THEREFROM A ½ INTEREST IN AND TO OILS, MINERALS, COALS, PETROLEUM, GAS AND KINDRED SUBSTANCES UNDER AND IN SAID LAND, BUT WITHOUT THE RIGHT OF THE SURFACE THERETO.

EXHIBIT B
(Map/illustration)

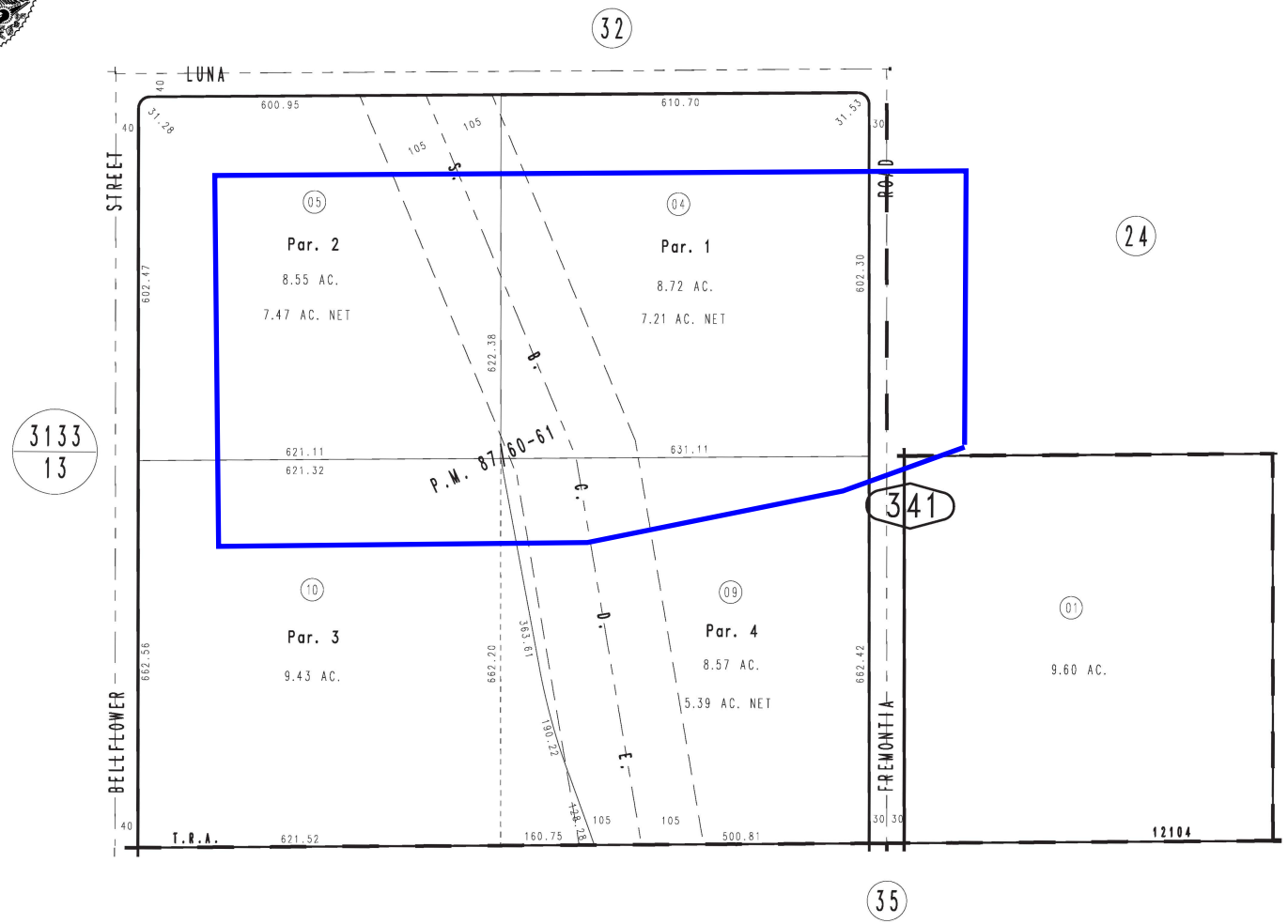
THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY.

N. 1/2, S.W.1/4, Sec. 28, T.5N., R.5W., S.B.M.

City of Victorville
Tax Rate Area
12104

3096 – 34

1"=200'



DEC. 1991

Parcel Map No. 8362, P.M. 87/60-61

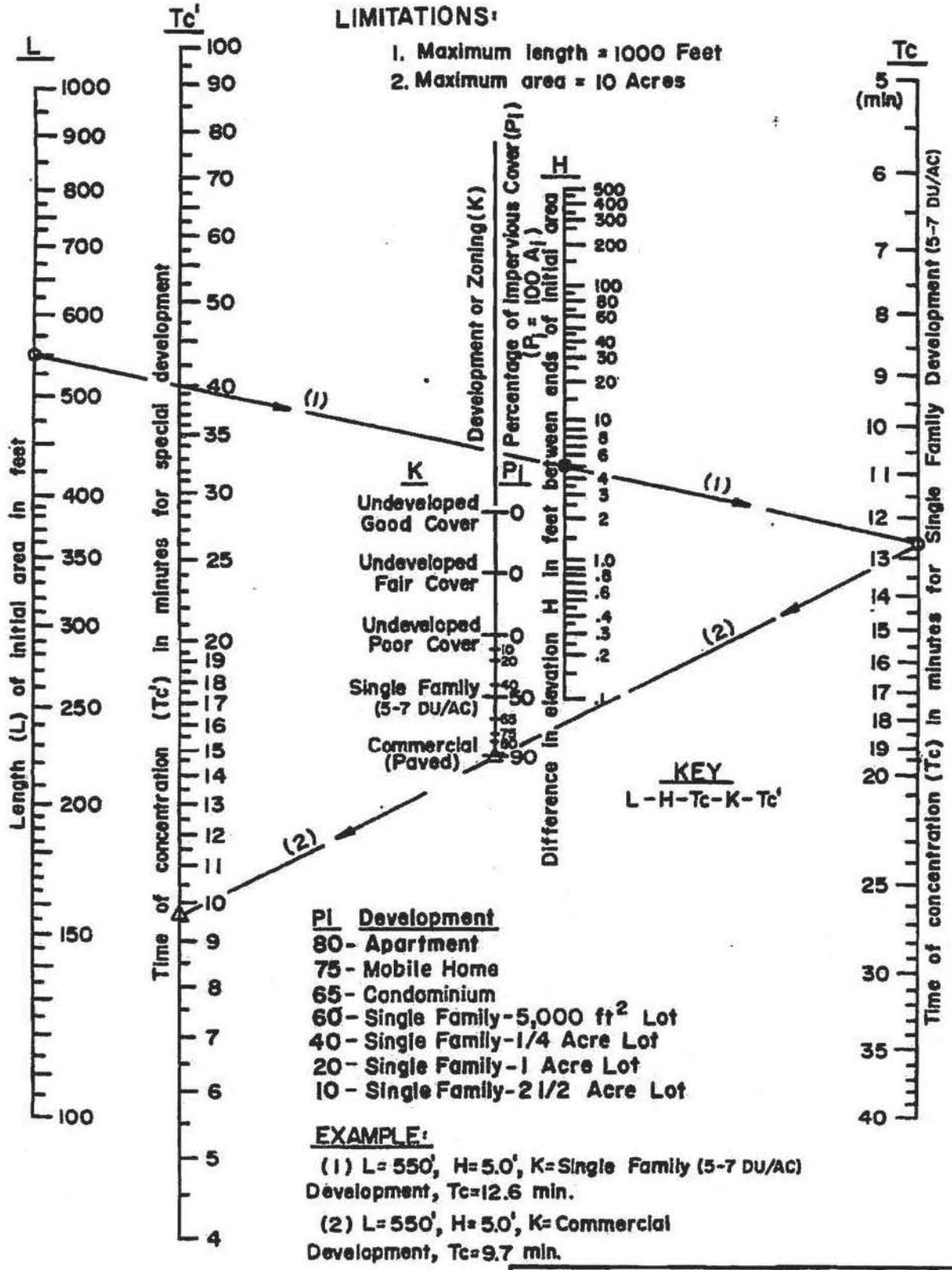
Assessor's Map
Book 3096 Page 34
San Bernardino County

REVISED
04/14/15 KC
04/15/15 KC

APPENDIX “C”

Appendix C – San Bernardino County Hydrology Manual (Selected Figures)

Appendix C-1 – SB County Hydrology Manual Figure D-1, Time of Concentration Nomograph



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Appendix C - 2 – SB County Hydrology Manual Figure C-3, Curve Numbers of Hydrologic Soil

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

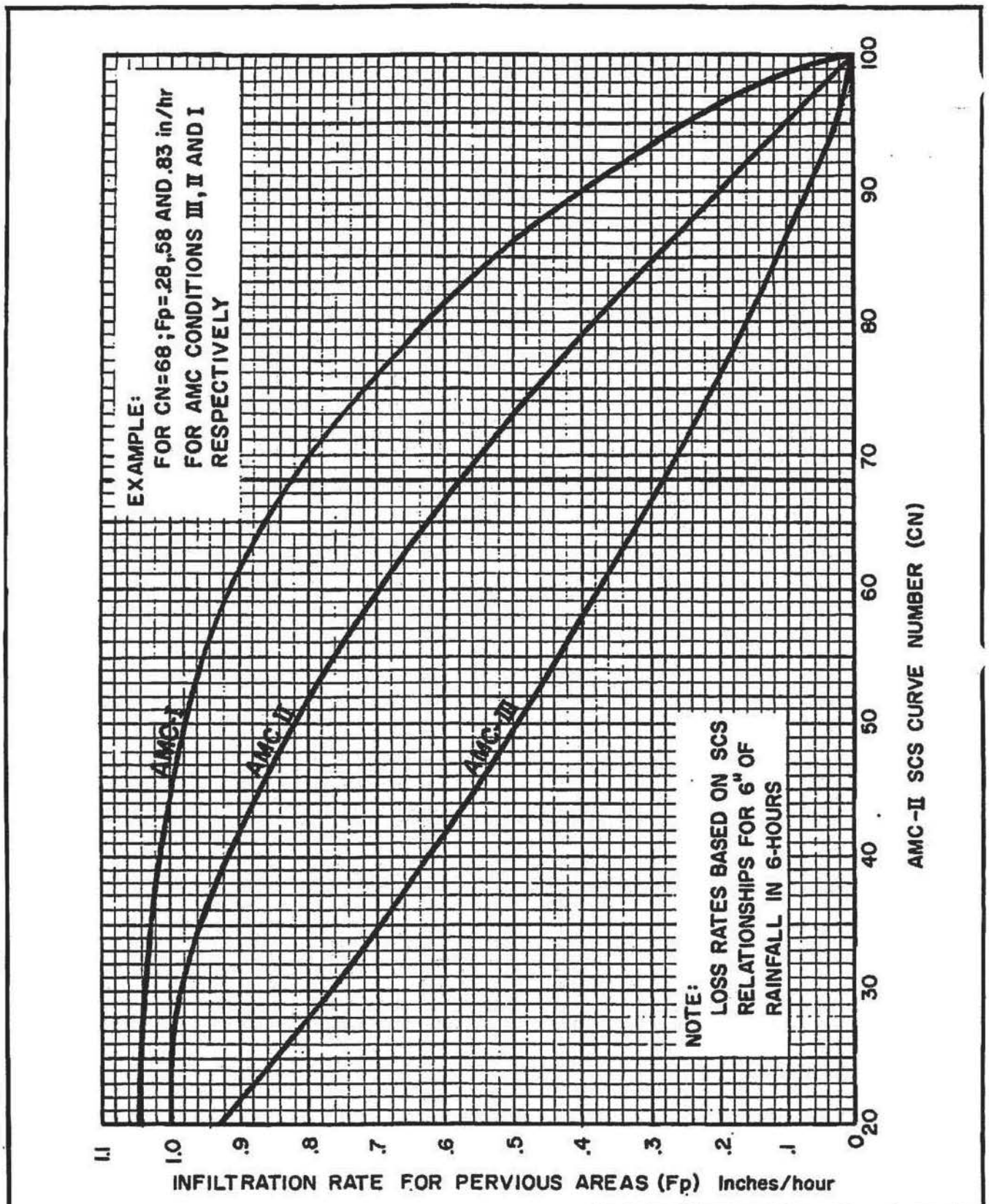
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)

Appendix C - 3 – SB County Hydrology Manual Figure C-6, Infiltration Rate for Pervious Areas versus SCS Curve Numbers

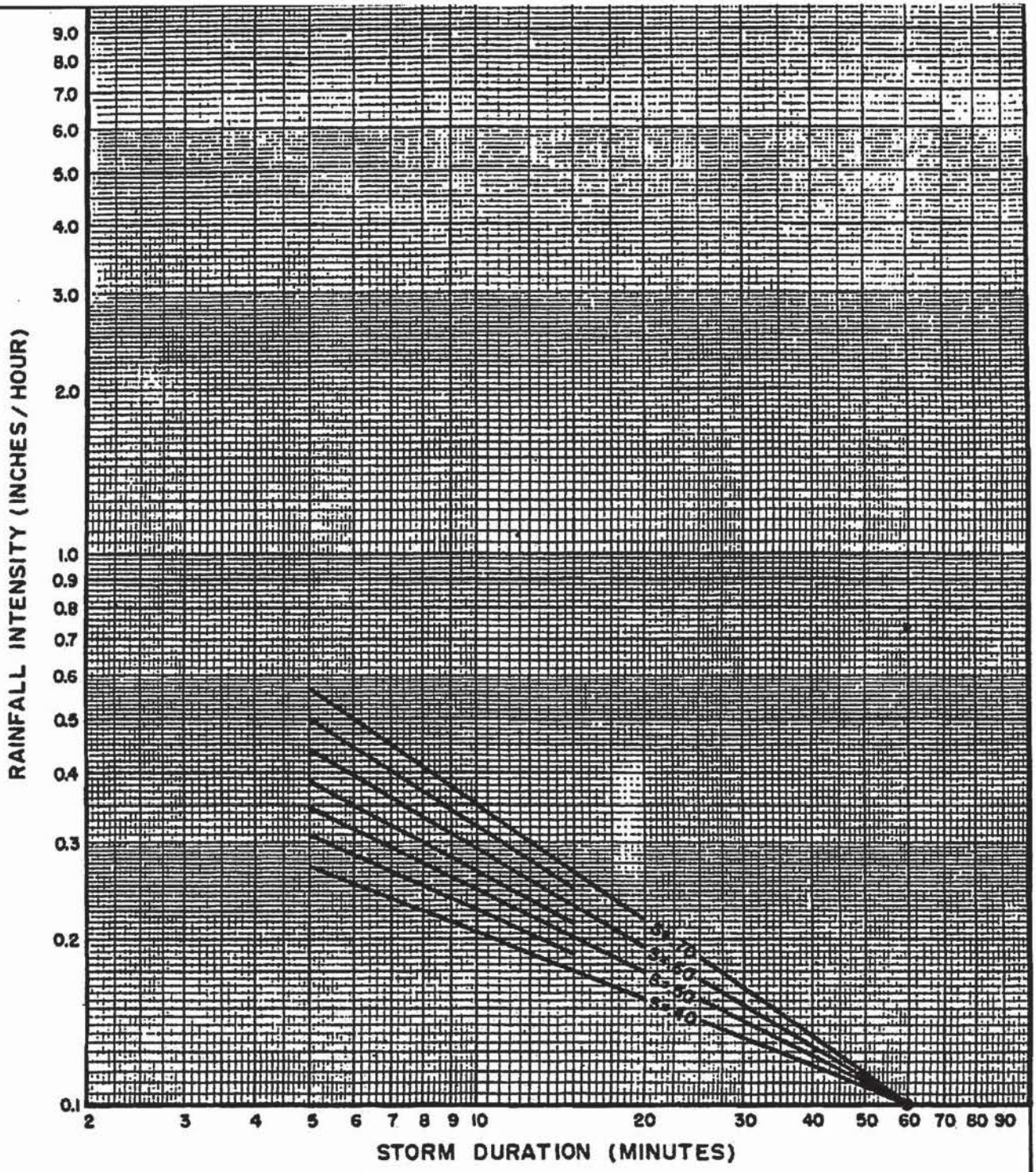


SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS SCS CURVE NUMBERS

Figure C-6

Appendix C - 4 – SB County Hydrology Manual Figure D-3, Intensity – Duration Curves Calculation Sheet



DESIGN STORM FREQUENCY = _____ YEARS

ONE HOUR POINT RAINFALL = _____ INCHES

LOG-LOG SLOPE = _____

PROJECT LOCATION = _____

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

INTENSITY - DURATION CURVES CALCULATION SHEET

FIGURE D-3

EXHIBIT B
(Map/illustration)



Looking southwest @ intersection of
Luna Rd. & Fremontia Rd.


PROJECT SITE
Looking northwest @ Fremontia Rd.
southeast corner of the project site.
Fremontia Rd


PROJECT SITE
650ft east of
Bellflower St.
Luna Rd.
Bellflower St.
Looking southeast @ intersection of
Luna Rd. & Bellflower St.

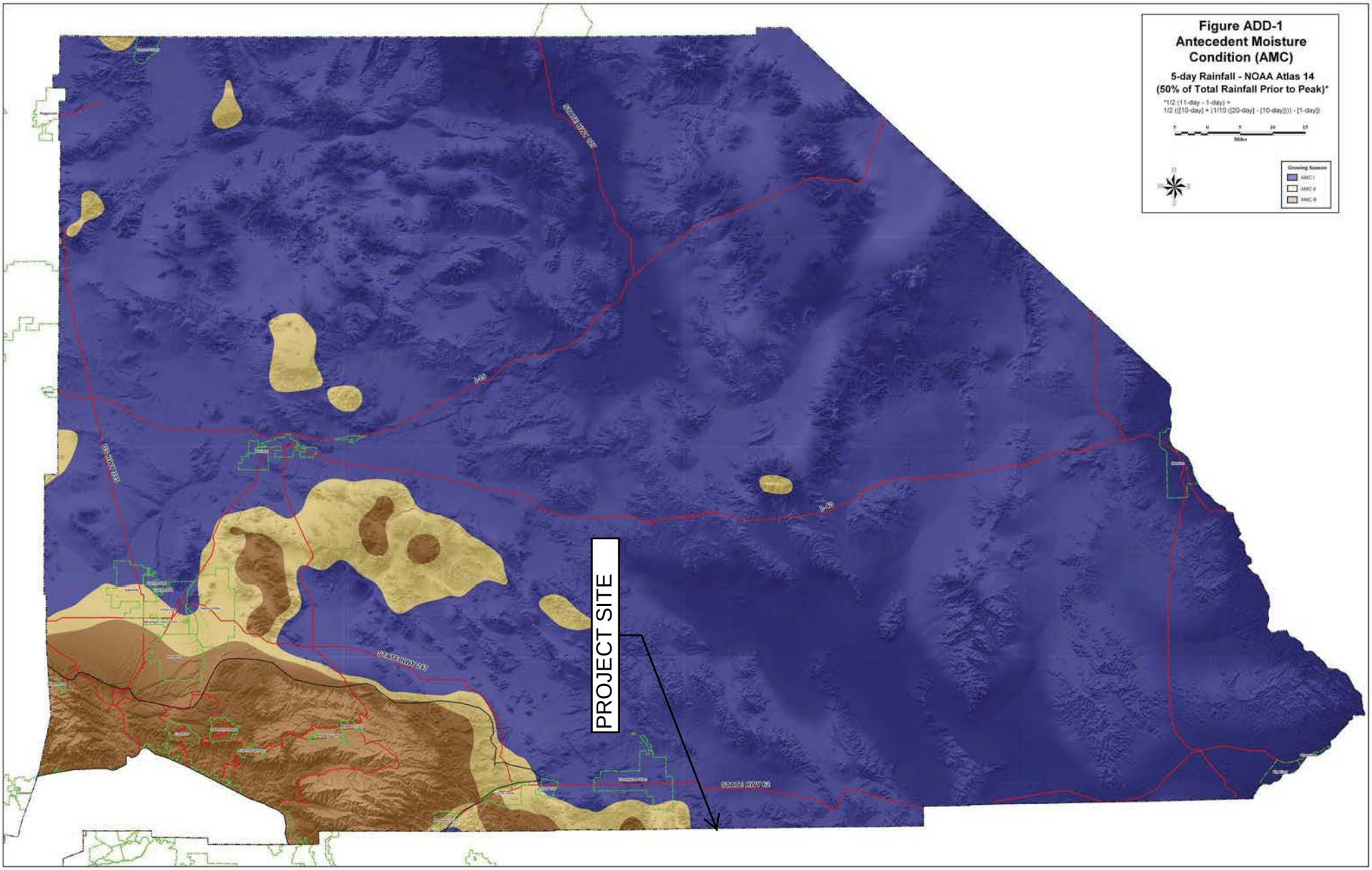


Figure ADD-1
Antecedent Moisture Condition (AMC)
5-day Rainfall - NOAA Atlas 14
(50% of Total Rainfall Prior to Peak)*
*1/2 (11-day - 1-day) =
1/2 ([10-day] + (1/10 ([20-day] - [10-day]))) - [1-day])
Miles
Growing Season
AMC I
AMC II
AMC III
PROJECT SITE
STATE HWY 79
STATE HWY 74
I-10

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					6.34
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.17

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-1

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-1

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					6.34
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.17

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**2**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-**2**

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					6.34
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.17

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**3**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-3

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					6.34
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.17

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**4**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-**4**

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					10.07
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					5.03

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**5**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-**5**

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					10.07
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					5.03

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**6**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-**6**

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					10.07
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					5.03

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-7

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-7

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1.00	0.25
		Predominant soil texture	0.25	1.00	0.25
		Site soil variability	0.25	1.00	0.25
		Depth to groundwater / impervious layer	0.25	1.00	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3.00	0.75
		Level of pretreatment/ expected sediment loads	0.25	1.00	0.25
		Redundancy	0.25	3.00	0.75
		Compaction during construction	0.25	1.00	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					2.00
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					10.07
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					5.03

Supporting Data

Briefly describe infiltration test and provide reference to test forms: For BMP-**8**

Infiltration test done by LOR Geotechnical Group, Inc. dated July 25,2021, Borehole percolation tests were conducted in general accordance with the Shallow Test Procedure as outlined in the Technical Guidance Document for WQMP(CDM Smith, 2013). Test borings were drilled 10 feet below existing ground surface. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4inch gravel was placed between the outside of the pipe and the hole wall. Testing took place the next day July 26, 2022 within 26 hours but not before 15hours of the pre-soak. The holes filled using water from 200 gallon water tank. Test period consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled.

DA-**8**

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

August 17, 2022

Sherr Development Corporation
31300 Orchard Lake Road, Suite 200
Farmington Hills, Michigan 48334

Project No. 33837.1

Attention: Mr. Stuart Sherr

Subject: Preliminary Geotechnical and Infiltration Feasibility Investigation, Proposed Residential Development, Tentative Tract Map No. 20527, APNs 0396-341-04 and -09, Victorville, California.

LOR Geotechnical Group, Inc., is pleased to present this report of our geotechnical investigation for the subject project. In summary, it is our opinion that the proposed development is feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction. However, the contents of this summary should not be solely relied upon.

To provide adequate support for the proposed structures, we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. Any undocumented fill material and any loose, compressible alluvial materials should be removed from structural areas and areas to receive engineered compacted fills. The data developed during this investigation indicates that removals on the order of approximately 2 to 3 feet will be required from currently planned development areas. The given removal depths are preliminary and the actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Very low expansion potential and good R-value quality generally characterize the upper onsite soil materials tested. Near completion and/or at the completion of site grading, additional foundation and subgrade soils should be tested, as necessary, to verify their expansion potential, soluble sulfate content, and R-value quality.

Good infiltration rates were obtained for the soils tested.

LOR Geotechnical Group, Inc.

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INTRODUCTION

During July and August of 2022, a Preliminary Geotechnical and Infiltration Feasibility Investigation was performed by LOR Geotechnical Group, Inc., for Tentative Tract Map No. 20527, a proposed residential development of Assessor's Parcel Numbers (APNs) 3096-341-04 and -09, in Victorville, California. The purpose of this investigation was to provide a technical evaluation of the geologic setting of the site and to provide geotechnical design recommendations for the proposed development. The scope of our services included:

- Review of available geotechnical literature, reports, maps, and agency information pertinent to the study area;
- Interpretation of aerial photographs of the site and surrounding regions dated 1952 through 2022;
- Geologic field reconnaissance mapping to verify the areal distribution of earth units and significance of surficial features as compiled from documents, literature, and reports reviewed;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed development;
- Percolation testing via the borehole test method to determine infiltration characteristics;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading and foundation design; and
- Preparation of this report summarizing our findings, and providing conclusions and recommendations for site development.

The approximate location of the site is shown on the attached Index Map, Enclosure A-1, within Appendix A.

PROJECT CONSIDERATIONS

To orient our investigation at the site, a Preliminary Grading plan prepared by Ludwig Engineering Associates, Inc., dated June 2022, was furnished for our use. The current site conditions, proposed lot layout, streets, and landscape areas were Indicated on this plan. The Preliminary Grading Plan was utilized as a base map for our field investigation and is presented as Enclosure A-2, within Appendix A.

As noted on the site plan, development of the site will include 53 single family residential structures, with the remainder of the property used for interior streets, and landscape areas. The buildings are anticipated to be of wood frame and stucco or similar type construction and light to moderate foundation loads are anticipated with these structures.

Based on the plan provided, cuts and fills of up to 6± feet will be required to create level surfaces for the proposed development.

AERIAL PHOTO ANALYSIS

The aerial photographs reviewed consisted of vertical aerial photograph images of varying scales. We reviewed imagery available from Google Earth Pro (2022) computer software and from online Historic Aerials (2022).

To summarize briefly, the site remained vacant, natural land from prior to 1952, through 2022. A natural drainage meanders through the eastern portion of the site, from the southeast corner of the site to just off-site of the northwest corner. No evidence for the presence of faults traversing the site area or mass movement features was noted during our review of the photographs covering the site and nearby vicinity.

EXISTING SITE CONDITIONS

The approximate 20-acre site is vacant land located along the south side of Luna Road and along the west side of Fremontia Road in the city of Victorville. Topographically, the site is relatively planar with a gentle fall towards the north-northwest. A natural drainage traverses the eastern portion of the site from the southeast corner to the north. Vegetation consist of desert flora typical of the area. Wind blown trash and other dumped trash (furniture, tires, etc.) are present scattered about the site.

Luna Road, a dirt roadway, borders the site to the north, with vacant land beyond. Vacant land lies to the west and east of the site. Fremontia Road, a partially improved roadway, borders the site on the east with a tract of single family residences beyond the north half of the site and vacant land beyond the south half of the site.

SUBSURFACE FIELD INVESTIGATION

Our subsurface field exploration program was conducted on July 25, 2022. The work consisted of advancing a total of 5 exploratory borings using a truck-mounted drill rig

equipped with 8-inch diameter hollow stem augers. The approximate locations of our exploratory borings are presented on Enclosure A-2, within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. The borings were drilled to depths of approximately 21.5 and 51.5 feet below the existing ground surface. Relatively undisturbed and bulk samples were obtained at a maximum depth interval of 5 feet, and returned to our geotechnical laboratory in sealed containers for further testing and evaluation.

A detailed description of the subsurface field exploration program and the boring logs is presented in Appendix B.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to geotechnical laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, and corrosion. A detailed description of the geotechnical laboratory testing program and the test results are presented in Appendix C.

GEOLOGIC CONDITIONS

Regional Geologic Setting

The site is situated along the southern edge of the Mojave Desert on a series of coalescing alluvial fans and terraces collectively referred to as the Cajon Fan. These fans and terraces have formed from sediment eroded from the San Gabriel and San Bernardino Mountains in Pleistocene and Recent times. The subject site is generally located on a large, wide fan region within the Cajon Fan series, referred to as the Baldy Mesa Fan. The Baldy Mesa Fan slopes to the northeast and is composed predominantly of silty sand and poorly graded to well graded sand, with lesser amounts of clayey sand and sandy clay. These fans lie on a very thick sequence of terrestrial sedimentary rocks, which in turn overlie crystalline bedrock (Dibblee, 1967).

This area north of the San Gabriel Mountains lies along the southeastern portion of a larger geomorphic province in southern California known as the Mojave Desert. The Mojave Desert geomorphic province is essentially a very large, wedge shaped, alluviated plain of comparatively low relief, containing irregularly trending bedrock hills and low mountains.

The Mojave Desert province is bounded on the southwest by the San Andreas fault zone and on the north by the Garlock fault zone. The eastern boundary of the Mojave Desert geomorphic province is not distinct, but gradually converges with the Basin and Range geomorphic province east of Death Valley and into Arizona and Nevada. The province is broken by many internal, major but discontinuous faults, predominately trending to the northwest showing rough parallelism with the trend of the San Andreas. Most of these faults have been active within the last 1.6 million years and many are still considered to be active or potentially active.

The closest known active fault to the subject site noted in the documents reviewed during our study is the North Frontal fault located approximately 21.6 kilometers (13.4 miles) southeast of the site. A complete listing of the distances to known active faults in relation to the site is given in the Faulting section of this report.

The site and the regional geologic setting are shown on Enclosure A-3 within Appendix A.

Site Geologic Conditions

Alluvium: Alluvial materials were encountered within all of our exploratory borings to the maximum depths explored. These units were noted to mainly consist of silty sand, well graded sand, well graded sand with silt and minor units of poorly graded sand and sandy silt. These materials were typically brown in color, dry, and the fine grained units were noted to contain some secondary calcite. The alluvial materials were in a relatively medium dense state upon first encounter, becoming dense to very dense quickly with depth based on our equivalent Standard Penetration Test (SPT) data and in-place density testing.

A detailed description of the subsurface soil conditions as encountered within our exploratory borings, is presented on the Boring Logs within Appendix B.

Groundwater Hydrology

Groundwater was not encountered within any of exploratory borings as advanced to a maximum depth of approximately 51.5 feet below the existing ground surface.

In order to estimate the approximate depth to groundwater in the site area, a search was conducted for local groundwater (well) level measurements within the State of California Department of Water Resources online database (CDWR, 2022).

Numerous wells were identified near Palmdale Road, located approximately 1.6 kilometers (1 mile) to the north of the site. Groundwater records were sparse of each of these wells, however, data indicates groundwater depths of greater than 100 feet.

Based on the information above, groundwater at the site appears to be greater than 100 feet below the lowest ground surface at the site.

Mass Movement

The site lies on a relatively flat surface. The occurrence of mass movement failures such as landslides, rockfalls, or debris flows within such areas is generally not considered common, and no evidence of mass movement was observed on the site.

Faulting

No active or potentially active faults are known to exist at the subject site. In addition, the subject site does not lie within a current State of California Earthquake Fault Zone (Hart and Bryant, 2003) nor does the site lie within a County of San Bernardino fault zone. No evidence of faulting projecting into or crossing the site was noted during our aerial photograph review or our review of published geologic maps.

As previously mentioned, the closest known active fault is the North Frontal fault, located approximately 21.6 kilometers (13.4 miles) to the southeast. In addition, other relatively close active faults include the Cleghorn fault located approximately 21.8 kilometers (13.5 miles) to the south, the San Andreas fault located about 23.2 kilometers (14.4 miles) to the southwest, and the Helendale fault located approximately 28 kilometers (17.4 miles) to the northeast.

The North Frontal fault zone of the San Bernardino Mountains is a zone consisting of numerous fault segments, many of which have their own names. The primary sense of slip is south dipping thrust. This fault seems to be offset (right-laterally) by the Helendale fault. It is believed that the North Frontal fault zone is capable of producing an earthquake magnitude on the order of 6.0 to 7.1.

The Cleghorn fault of the San Bernardino Mountains is a left-lateral strike-slip fault. The exact nature of the activity of this fault is questionable. The local landscape does not seem to express the reported slip rate (0.3 mm/yr) and some have dismissed Holocene displacement and rupture surfaces as caused by landsliding, not faulting. However, it is believed that the Cleghorn fault is capable of producing an earthquake magnitude on the order of 6.5.

The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific Plate and the North American Plate. While estimates vary, the San Andreas fault is generally thought to have an average slip rate on the order of 24mm/yr and capable of generating large magnitude events on the order of 7.5.

The Helendale fault is a right-lateral strike slip fault. This fault has been active very recently. It is believed that the Helendale fault is capable of producing an earthquake magnitude on the order of 6.5 to 7.3.

Current standards of practice included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. However, while there are other large earthquake faults within a 100 kilometer (62-mile) radius of the site, none of these are considered as relevant to the site as the faults described above, due to their closer distance and larger anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the historical seismic search website of the U.S.G.S. (2022). This website conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto a map. At the time of our search, the database contained data from January 1, 1932 through August 16, 2022.

In our first search, the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile) radius of the site, in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As depicted on Enclosure A-4, within Appendix A, the site lies within a relatively active region associated with the San Andreas fault and various Mojave Desert fault to the east.

In the second search, the micro seismicity of the area lying within a 15 kilometer (9.2 mile) radius of the site was examined by selecting an epicenter map listing events on the order of 1.0 and greater since 1978. The results of this search is a map that presents the seismic history around the area of the site with much greater detail, not permitted on the larger map. The reason for limiting the time period for the events on the detail map is to enhance the accuracy of the map. Events recorded prior to the mid to late1970's are generally

considered to be less accurate due to advancements in technology. As depicted on this map, Enclosure A-5, a few events are present in the area, none appear to be associated with any known faults.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring in the region around the subject site. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seismic-induced settlement, seiches and tsunamis, earthquake induced flooding, landsliding, and rockfalls.

Liquefaction: The potential for liquefaction generally occurs during strong ground shaking within granular loose sediments where the groundwater is usually less than 50 feet below the ground surface. As groundwater is anticipated to lie greater than 50 feet beneath the site and the site is underlain by relatively dense to very dense alluvial materials, the possibility of liquefaction at the site is considered nil.

Seiches/Tsunamis: The potential for the site to be affected by a seiche or tsunami (earthquake generated wave) is considered nil due to absence of any large bodies of water near the site.

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or near the site which could possibly rupture during in earthquake and affect the site by flooding.

Seismically-Induced Landsliding: Due to the low relief of the site and surrounding region, the potential for landslides to occur at the site is considered nil.

Rockfalls: No large, exposed, loose or unrooted boulders are present above the site that could affect the integrity of the site.

Seismically-Induced Settlement: Settlement generally occurs within areas of loose, granular soils with relatively low density. Since the site is underlain by relatively dense to very dense alluvial materials, the potential for settlement is considered very low.

In addition, the recommended earthwork operations to be conducted during the development of the site should mitigate any near surface loose soil conditions.

SOILS AND SEISMIC DESIGN CRITERIA (California Building Code 2019)

Design requirements for structures can be found within Chapter 16 of the 2019 California Building Code (CBC) based on building type, use, and/or occupancy. The classification of use and occupancy of all proposed structures at the site, shall be the responsibility of the building official.

Site Classification

Chapter 20 of the ASCE 7-16 defines six possible site classes for earth materials that underlie any given site. Bedrock is assigned one of three of these six site classes and these are: A, B, or C. Soil is assigned as C, D, E, or F. Per ASCE 7-16, Site Class A and Site Class B shall be measured on-site or estimated by a geotechnical engineer, engineering geologist or seismologist for competent rock with moderate fracturing and weathering. Site Class A and Site Class B shall not be used if more than 10 feet of soil is between the rock surface and bottom of the spread footing or mat foundation. Site Class C can be used for very dense soil and soft rock with Ñ values greater than 50 blows per foot. Site Class D can be used for stiff soil with Ñ values ranging from 15 to 50 blows per foot. Site Class E is for soft clay soils with Ñ values less than 15 blows per foot. Our investigation, mapping by others, and our experience in the site region indicates that the materials beneath the site are considered Site Class D stiff soils.

CBC Earthquake Design Summary

Earthquake design criteria have been formulated in accordance with the 2019 CBC and ASCE 7-16 for the site based on the results of our investigation to determine the Site Class and an assumed Risk Category II. However, these values should be reviewed and the final design should be performed by a qualified structural engineer familiar with the region. In addition, the building official should confirm the Risk Category utilized in our design (Risk Category II). Our design values are provided within Appendix D.

INFILTRATION TEST RESULTS

Four borehole percolation tests were conducted at the locations and depths requested. Testing was conducted in general accordance with the Shallow Percolation Test procedure as outlined in the Technical Guidance Document for Water Quality Management Plans

(CDM Smith, 2013). The general locations of our tests are illustrated on Enclosure A-2 and were conducted at the requested locations and depth. Test borings were drilled to depths of approximately 10 feet below the existing ground surface on July 25, 2021. Subsequent to drilling, a 3-inch diameter, perforated PVC pipe wrapped in filter fabric was placed within each test hole and 3/4-inch gravel was placed between the outside of the pipe and the hole wall. Test holes were pre-soaked the same day as drilling. Testing took place the next day, July 26, 2022, within 26 hours but not before 15 hours, of the pre-soak. The holes were filled using water from a 200 gallon water tank. Test periods consisted of allowing the water to drop in 10-minute intervals. After each reading, the hole was refilled. Testing was terminated after a total of 12 readings were recorded.

Infiltration test results are summarized in the following table:

Test No.	Depth*	Infiltration Rate** (in/hr)
P-1	2.7	7.10
P-2	2.9	13.04
P-3	7.0	9.06
P-4	6.9	3.63
* depth measured below existing ground surface ** Porchet Method determined clear water rate		

The results of this testing are presented as Enclosures E-1 through E-4 in Appendix E. The test results indicate good infiltration characteristics for the soils tested.

CONCLUSIONS

This investigation provides a broad overview of the geotechnical and geologic factors which are expected to influence future site planning and development. On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc., that the proposed development of the site for the proposed use is feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

It should be noted that the subsurface conditions encountered in our exploratory borings are indicative of the locations explored and the subsurface conditions may vary. If conditions are encountered during the construction of the project that differ significantly

from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided.

Foundation Support

To provide adequate support for the proposed structure, we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. The construction of this compacted fill mat will allow for the removal of the existing fill material which was loose and any current subsurface improvements, such as utilities, foundations, etc., that may be present locally.

Conventional foundation systems utilizing either individual spread footings and/or continuous wall footings will provide adequate support for the anticipated downward and lateral loads when utilized in conjunction with the recommended fill mat.

Soil Expansiveness

Our observations and testing indicate the onsite soils are granular and therefore are considered to have a very low. For very low expansive soils, specialized construction procedures to resist expansive soil activity are not considered necessary.

Careful evaluation of onsite soils and any import fill for their expansion potential should be conducted during the grading operation.

Corrosion Protection

Select representative samples from our borings were taken to Project X Corrosion Engineering for full corrosion series testing. Results from soil corrosivity testing completed by Project X Corrosion Engineering are presented within Appendix C and summarized in the table below:

SOIL CORROSIVITY RESULTS					
Boring	**Depth (feet)**	**pH**	**Sulfates (% by weight)**	**Chloride (% by weight)**	**Saturated Resistivity (ohm-cm)**
B-1	0-3	7.9	0.0015	0.0007	10,720
B-3	0-3	7.3	0.0007	0.0003	10,050
B-5	0-3	7.3	0.0098	0.0045	13,400

The corrosivity test results indicate that soluble sulfate concentrations in the samples was less than 0.10 percent by weight. These concentrations indicate an exposure class S0 for sulfate. No special mitigation methods are considered necessary.

The corrosivity test results indicate that chloride concentrations were below 500 ppm. This concentration indicates an exposure class C1 for chloride. Mitigation measures are not considered necessary.

Soil pH for the samples was 7.3 to 7.9, neutral to slightly basic. Therefore, the need for specialized design is anticipated.

Concentrations of ammonium and nitrate indicate the soil may be aggressive towards copper.

The electrical resistivity (resistance to the flow of electric current) is a major factor in determining the corrosivity of a soil sample. Corrosion currents are inversely proportional to soil resistivity, thus a lower resistivity value for a selected sample translates to a more corrosive material. A qualitative table of this correlation is presented below:

RESISTIVITY – CORROSIVITY CORRELATION	
Soil Resistivity (ohm-cm)	Corrosivity Category
>10,000	Mildly Corrosive
2,000 to 10,000	Moderately Corrosive
1,000 to 2,000	Corrosive
<1,000	Severely Corrosive

When soil is saturated, resistivity is at approximately its lowest value. Therefore, for the laboratory testing, measurements of resistivity were taken after saturation with distilled water. Following the table above, resistivity results for the samples were in the moderately corrosive range.

Based on the resistivity results above, this soil is classified as mildly to moderately corrosive to ferrous metals and potentially aggressive towards copper. The laboratory data above should be reviewed and corrosion design should be completed by a qualified corrosion engineer.

In lieu of corrosion design for metal piping, ABS/PVC may be used. Soil corrosion is not considered a factor with ABS/PVC materials. ABS/PVC is considered suitable for use due to the corrosion potential of the on-site soils with respect to metals.

LOR Geotechnical does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer could be consulted.

Infiltration

The results of our field investigation and test data indicates the site soils at the depths tested are conducive to infiltration. Recommendations for design and maintenance of the proposed system are presented within the **RECOMMENDATIONS** section of this report.

Geologic Mitigations

No special mitigation methods are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

Seismicity

Seismic ground rupture is generally considered most likely to occur along pre-existing active faults. Since no known faults are known to exist at, or project into the site, the probability of ground surface rupture occurring at the site is considered nil.

Due to the site's close proximity to the faults described above, it is reasonable to expect a relatively strong ground motion seismic event to occur during the lifetime of the proposed development on the site. Large earthquakes could occur on other faults in the general area, but because of their lesser anticipated magnitude and/or greater distance, they are

considered less significant than the faults described above from a ground motion standpoint.

The effects of ground shaking anticipated at the subject site should be mitigated by the seismic design requirements and procedures outlined in Chapter 16 of the California Building Code. However, it should be noted that the current building code requires the minimum design to allow a structure to remain standing after a seismic event, in order to allow for safe evacuation. A structure built to code may still sustain damage which might ultimately result in the demolishing of the structure (Larson and Slosson, 1992).

No secondary seismic hazards are anticipated to impact the proposed development.

RECOMMENDATIONS

Geologic Recommendations

No special geologic recommendations are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

General Site Grading

It is imperative that no clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An onsite, pre-job meeting with the developer, the contractor, the jurisdictional agency, and the geotechnical engineer should occur prior to all grading related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All areas to be graded should be stripped of significant vegetation and other deleterious materials.

Any undocumented fill encountered during grading should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. It is our recommendation that any existing fills under any proposed flatwork and paved areas be

removed and replaced with engineered compacted fill. If this is not done, premature structural distress (settlement) of the flatwork and pavement may occur.

Cavities created by removal of subsurface obstructions, which are anticipated in areas of the site which were previously developed, should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Initial Site Preparation

The existing fill material and any loose, compressible alluvial soils should be removed from all proposed structural and/or fill areas. The data developed during this investigation indicates that removals on the order of 2 to 3 feet deep will be required from proposed development areas in order to encounter competent alluvium upon which engineered compacted fill can be placed. The given removal depths are preliminary. Deeper fills may be present locally. Removals should expose alluvial materials with an in-situ relative compaction of at least 85 percent (ASTM D 1557). The actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Preparation of Fill Areas

Prior to placing fill, the surfaces of all areas to receive fill should be scarified to a minimum depth of 12 inches. The scarified soil should be brought to near optimum moisture content and compacted to a relative compaction of at least 90 percent (ASTM D 1557).

Engineered Compacted Fill

The onsite soils should provide adequate quality fill material, provided they are free from oversized and/or organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

If required, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use. Fill should be spread in maximum 8-inch uniform, loose lifts, each lift brought to near optimum moisture content, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

Preparation of Foundation Areas

All footings should rest upon at least 24 inches of properly compacted fill material placed over competent alluvium. In areas where the required fill thickness is not accomplished by the recommended removals or by site rough grading, the footing areas should be further subexcavated to a depth of at least 24 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines. The bottom of all excavations should be scarified to a depth of 12 inches, brought to near optimum moisture content, and recompacted to at least 90 percent relative compaction (ASTM D 1557) prior to the placement of compacted fill.

Concrete floor slabs should bear on a minimum of 24 inches of compacted soil. This should be accomplished by the recommendations provided above. The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete.

Short-Term Excavations

Following the California Occupational and Safety Health Act (CAL-OSHA) requirements, excavations 5 feet deep and greater should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements. Short-term excavations of 5 feet deep and greater shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based on our exploratory borings, it appears that Type C soils are the predominant type of soil on the project and all short-term excavations should be based on this type of soil.

Deviation from the standard short-term slopes are permitted using option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term excavation construction and maintenance are the responsibility of the contractor and should be a consideration of his methods of operation and the actual soil conditions encountered.

Slope Construction

Preliminary data indicates that cut and fill slopes should be constructed no steeper than two horizontal to one vertical. Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction, then roll the final slopes to provide dense, erosion-resistant surfaces.

Slope Protection

Since the site soil materials are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces. Slopes at the project should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the irrigation system and to prevent over watering.

Soil Expansiveness

The upper materials encountered during this investigation are considered to have a very low expansion potential. Therefore, specialized construction procedures to specifically resist expansive soil activity are not anticipated at this time.

Additional evaluation of on-site and any imported soils for their expansion potential should be conducted following completion of the grading operation.

Foundation Design

If the site is prepared as recommended, the proposed structure may be safely founded on conventional shallow foundations, either individual spread footings or continuous wall footings, bearing on a minimum of 24 inches of engineered compacted fill placed over competent older alluvial materials. Foundations should have a minimum width of 12 inches and should be established a minimum of 12 inches below lowest adjacent grade.

For the minimum width and depth, footings may be designed using a maximum soil bearing pressure of 2,000 pounds per square foot (psf) for dead plus live loads. This bearing pressure may be increased by 200 psf for each additional foot of width, and by 500 psf for each additional foot of depth, up to a maximum of 4,000 psf.

The above values are net pressures; therefore, the weight of the foundations and the backfill over the foundations may be neglected when computing dead loads. The values apply to the maximum edge pressure for foundations subjected to eccentric loads or overturning. The recommended pressures apply for the total of dead plus frequently applied live loads, and incorporate a factor of safety of at least 3.0. The allowable bearing pressures may be increased by one-third for temporary wind or seismic loading. The resultant of the combined vertical and lateral seismic loads should act within the middle

one-third of the footing width. The maximum calculated edge pressure under the toe of foundations subjected to eccentric loads or overturning should not exceed the increased allowable pressure. The buildings should be setback from slopes as indicted within the California Building Code (2019).

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 260 pounds per square foot per foot of depth. Base friction may be computed at 0.27 times the normal load. Base friction and passive earth pressure may be combined without reduction. These values are for dead load plus live load and may be increased by one-third for wind or seismic loading.

Settlement

Total settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Maximum settlement of shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be on the order of 0.5 inch. Differential settlements between adjacent footings should be about one-half of the total settlement. Settlement of all foundations is expected to occur rapidly, primarily as a result of elastic compression of supporting soils as the loads are applied, and should be essentially completed shortly after initial application of the loads.

Building Area Slab-on-Grade

To provide adequate support, concrete floor slabs-on-grade should bear on a minimum of 24 inches of engineered fill compacted soil. The final pad surfaces should be rolled to provide smooth, dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder/barrier. We recommend that a vapor retarder/barrier be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder/barrier construction. At a minimum, the vapor retarder/barrier should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association, for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand) should be placed under the vapor retarder/barrier.

For slabs in humidity-controlled areas, a layer of dry, granular material (sand) should be placed above the vapor retarder/barrier.

The slabs should be protected from rapid and excessive moisture loss which could result in slab curling. Careful attention should be given to slab curing procedures, as the site area is subject to large temperature extremes, humidity, and strong winds.

Exterior Flatwork

To provide adequate support, exterior flatwork improvements should rest on a minimum of 12 inches of soil compacted to at least 90 percent (ASTM D 1557).

Flatwork surface should be sloped a minimum of 1 percent away from buildings and slopes, to approved drainage structures.

Wall Pressures

The design of footings for retaining walls should be performed in accordance with the recommendations described earlier under Preparation of Foundation Areas and Foundation Design. For design of retaining wall footings, the resultant of the applied loads should act in the middle one-third of the footing, and the maximum edge pressure should not exceed the basic allowable value without increase.

For design of retaining walls unrestrained against movement at the top, we recommend an active pressure of 50 pounds per square foot (psf) per foot of depth be used. This assumes level backfill consisting of compacted, non-expansive, on-site soils placed against the structures and within the back cut slope extending upward from the base of the stem at 35 degrees from the vertical or flatter.

Retaining structures subject to uniform surcharge loads within a horizontal distance behind the structures equal to the structural height should be designed to resist additional lateral loads equal to 0.47 times the surcharge load. Any isolated or line loads from adjacent foundations or vehicular loading will impose additional wall loads and should be considered individually.

To avoid over stressing or excessive tilting during placement of backfill behind walls, heavy compaction equipment should not be allowed within the zone delineated by a 45 degree line extending from the base of the wall to the fill surface. The backfill directly behind the walls should be compacted using light equipment such as hand operated vibrating plates and rollers. No material larger than three inches in diameter should be placed in direct contact with the wall.

Wall pressures should be verified prior to construction, when the actual backfill materials and conditions have been determined. Recommended pressures are applicable only to level, non-expansive, properly drained backfill with no additional surcharge loadings. If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Preliminary Pavement Design

Testing and design for preliminary onsite pavement was conducted in accordance with the California Highway Design Manual.

Based upon our preliminary sampling and testing, and upon an assumed Traffic Index generally used for similar projects, it appears that the structural sections tabulated below should provide satisfactory pavements for the subject on-site pavement improvements:

T.I.*	DESIGN R-VALUE	PRELIMINARY SECTION
5.0 or 6.0	50	0.25’ AC / 0.35' AB

AC - Asphalt Concrete
AB - Class 2 Aggregate Base
* to be determined by project engineer

The above structural sections are predicated upon 90 percent relative compaction (ASTM D 1557) of all utility trench backfills and 95 percent relative compaction (ASTM D 1557) of the upper 12 inches of pavement subgrade soils and of any aggregate base utilized. In addition, the aggregate base should meet Caltrans specifications for Class 2 Aggregate Base.

It should be noted that all of the above pavement design was based upon the results of preliminary sampling and testing, and should be verified by additional sampling and testing during construction when the actual subgrade soils are exposed.

Infiltration

Based upon our field investigation and infiltration test data, a clear water absorption rate of approximately 3.36 to 13.04 inches per hour was obtained. It is our opinion that a design

clear water rate of 3.36 inches per hour is appropriate for the planned infiltration in the areas and depths tested.

A factor of safety should be applied as indicated by the Technical Guidance Document for Water Quality Management Plans (CDM Smith, 2013). The design infiltration rate should be adjusted using Worksheet H, using the following factor values in determination of the suitability assessment, S_A:

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment method	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater/impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \sum p$			1.00

To ensure continued infiltration capability of the infiltration area, a program to maintain the facility should be considered. This program should include periodic removal of accumulated materials, which can slow the infiltration considerably and decrease the water quality. Materials to be removed from the catch basin areas typically consist of litter, dead plant matter, and soil fines (silts and clays). Proper maintenance of the system is critical. A maintenance program should be prepared and properly executed. At a minimum, the program should be as outlined in the Technical Guidance Document for Water Quality Management Plans (CDM Smith, 2013).

The program should also incorporate the recommendations contained within this report and any other jurisdictional agency requirements.

- Systems should be set back at least 10 feet from foundations or as required by the design engineer.

- Any geotextile filter fabric utilized should consist of such that it prevents soil piping but has greater permeability than the existing soil.

- During site development, care should be taken to not disturb the area(s) proposed for infiltration as changes in the soil structure could occur resulting in a change of the soil infiltration characteristics.

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed by the project geotechnical consultant prior to construction to confirm that the intent of the recommendations presented in this report have been incorporated into the design. Additional R-value, expansion, and soluble sulfate content testing may be needed after/during site rough grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavations prior to the processing and preparation of the bottom areas for fill placement.

3. Scarifying and recompacting prior to fill placement.

4. Foundation excavations.

5. Subgrade preparation for pavements and slabs-on-grade.

6. Placement of engineered compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by Sherr Development Corporation and their design consultants for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations and a surficial site reconnaissance.

The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. If conditions are encountered during the construction of the project, which differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided. Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc., provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than indicated by this report, please contact this office immediately in order that we might evaluate their effect.

Should you have any questions regarding this report, please do not hesitate to contact our office at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

Andrew A. Tardie
Staff Geologist

Robert M. Markoff, CEG
Engineering Geologist

John P. Leuer, GE 2030
President

AAT:RMM:JPL:ss





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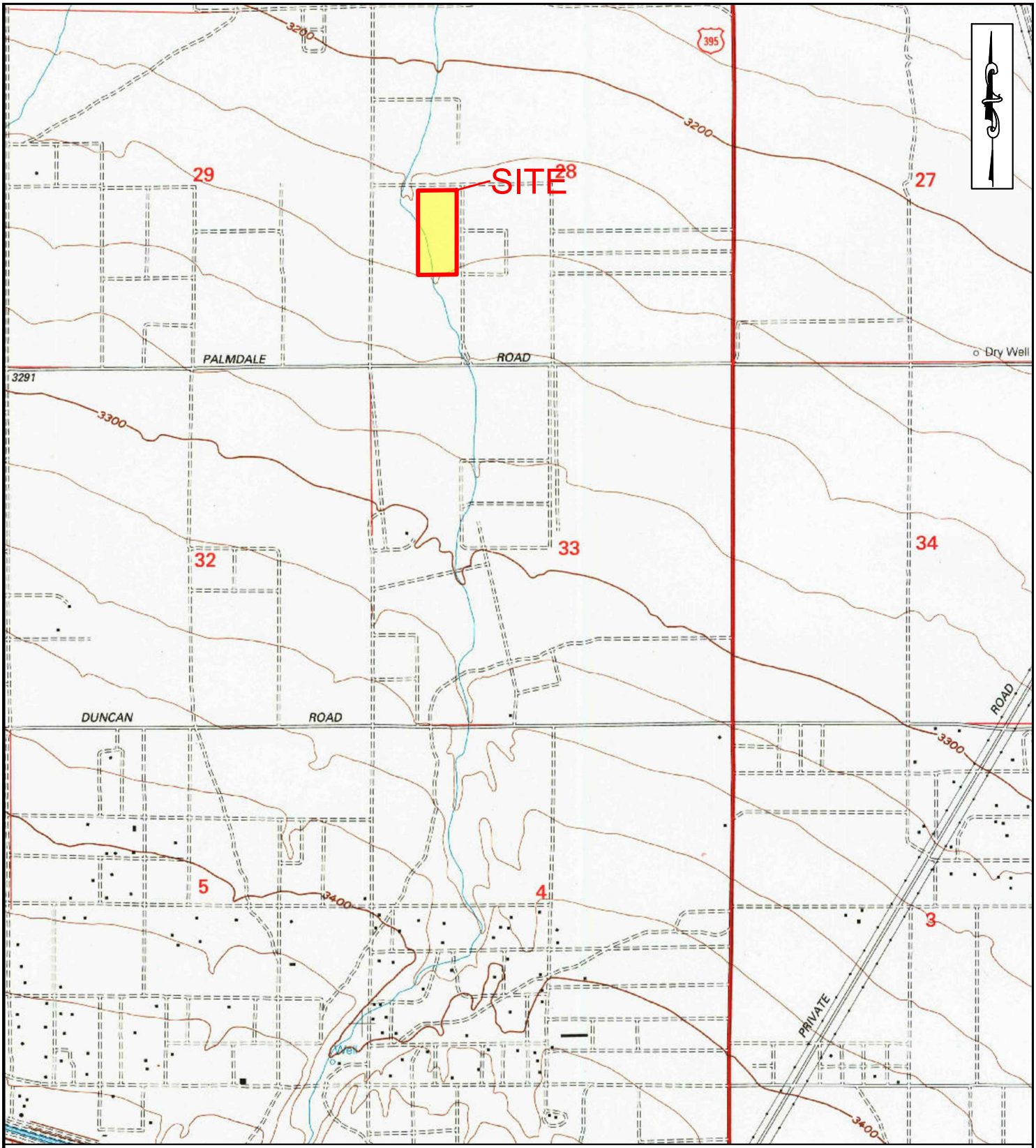
APPENDIX A

Index Map, Site Plan, Regional Geologic Map, and Historical Seismicity Maps



INDEX MAP

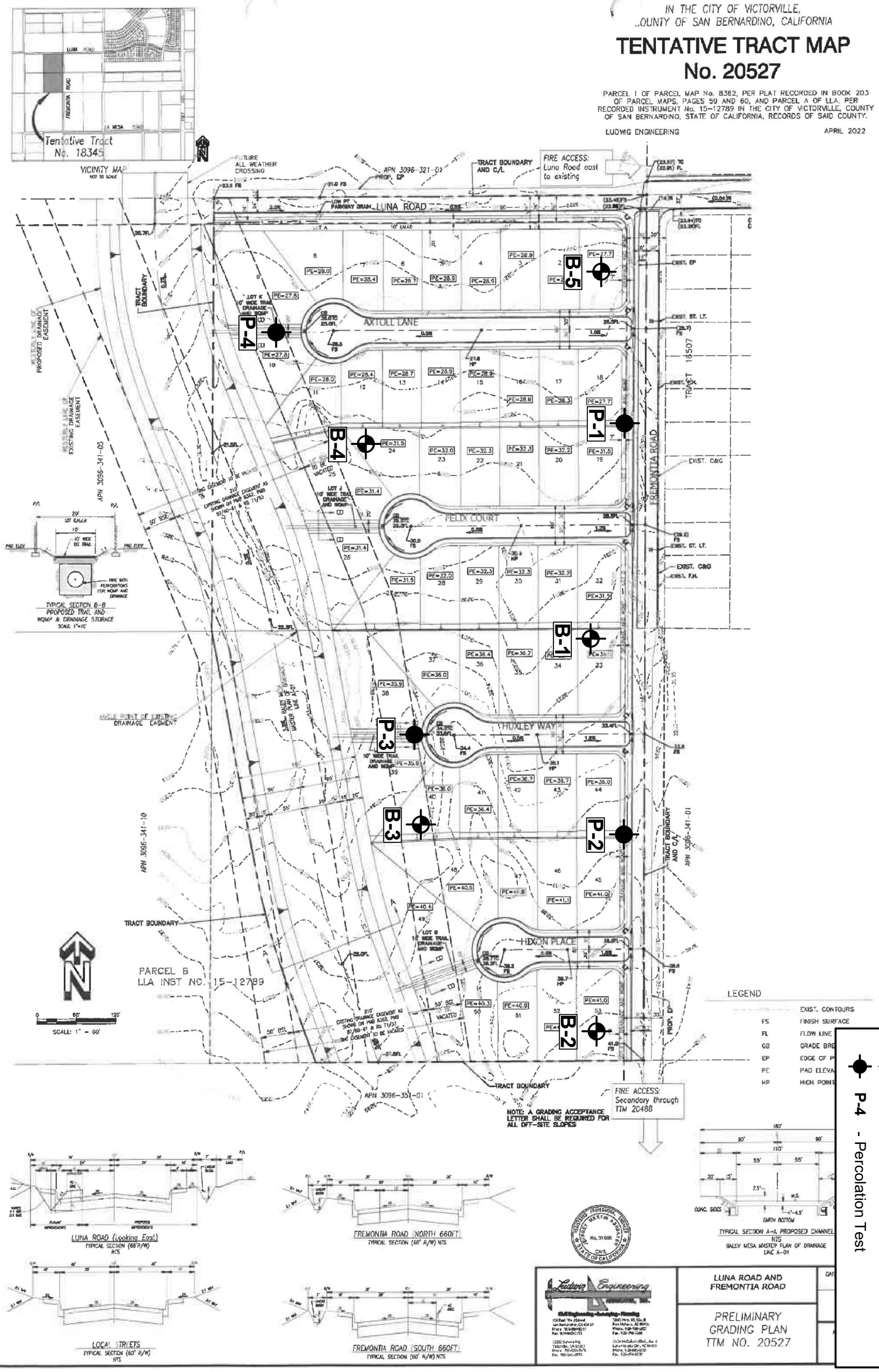
PROJECT:	Tentative Tract Map No. 20527, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	A-1
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022
		SCALE:	1" ≈ 2,000'

IN THE CITY OF VICTORVILLE,
COUNTY OF SAN BERNARDINO, CALIFORNIA

TENTATIVE TRACT MAP No. 20527

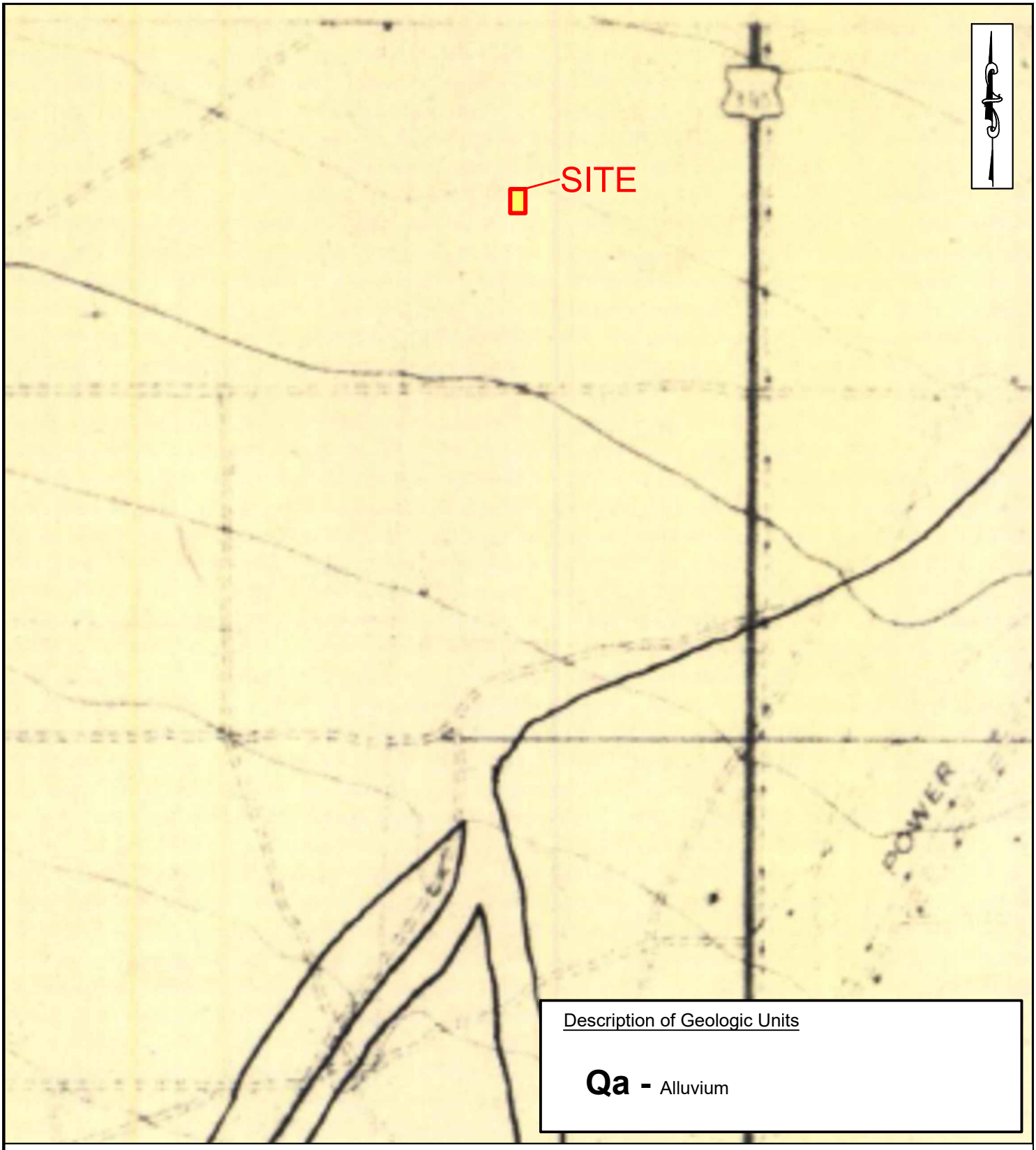
PARCEL 1 OF PARCEL MAP No. 8362, PER PLAT RECORDED IN BOOK 203 OF PARCEL MAPS, PAGES 59 AND 60, AND PARCEL A OF LLA. PER RECORDED INSTRUMENT No. 15-12789 IN THE CITY OF VICTORVILLE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, RECORDS OF SAID COUNTY.

LUDWIG ENGINEERING — APRIL 2022



SITE PLAN

PROJECT:	Tentative Tract Map No. 20527, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	A-2
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022
		SCALE:	1" ≈ 150'



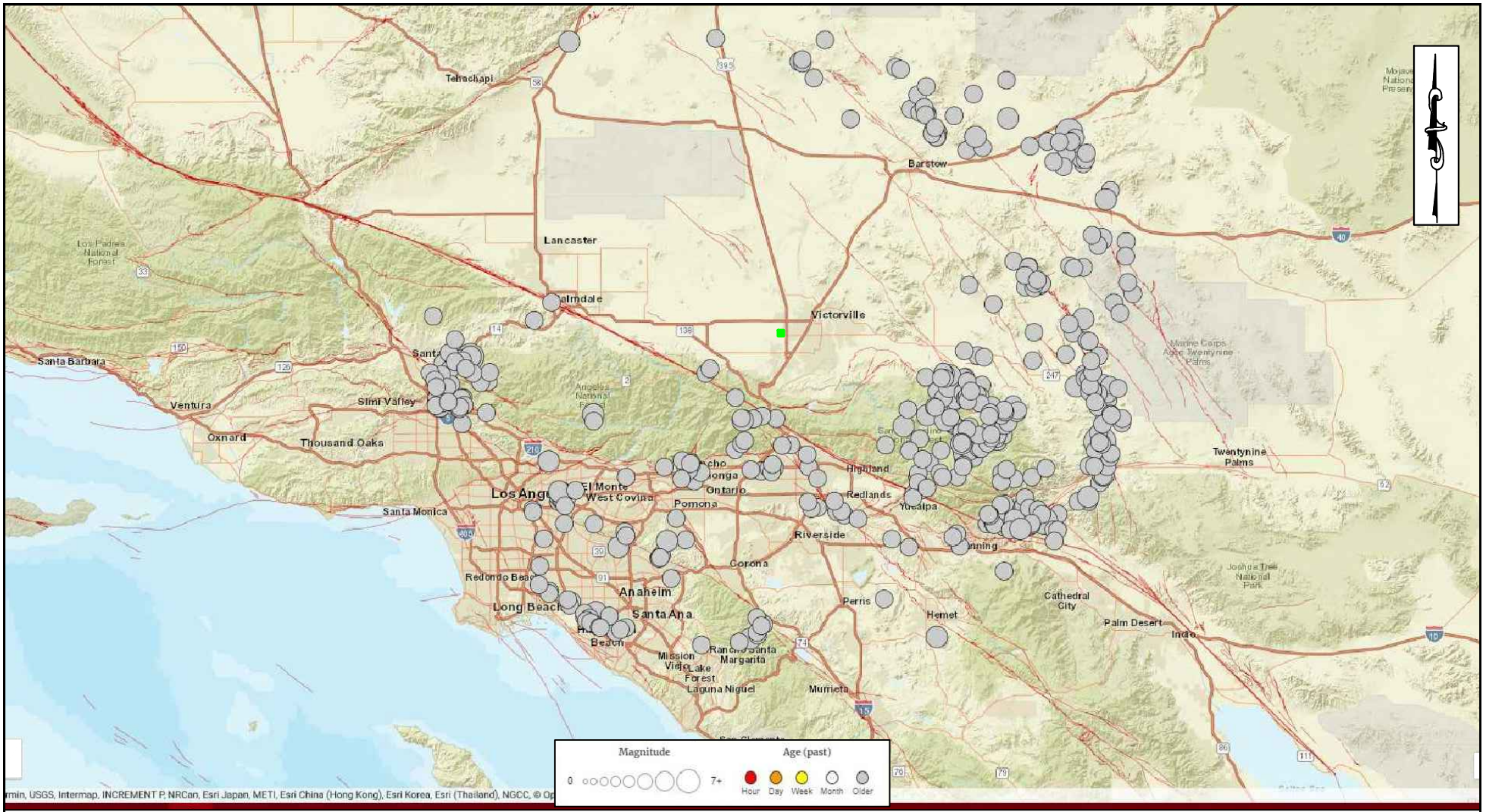
Description of Geologic Units

Qa - Alluvium

REGIONAL GEOLOGIC MAP

(Dibblee, 1965)

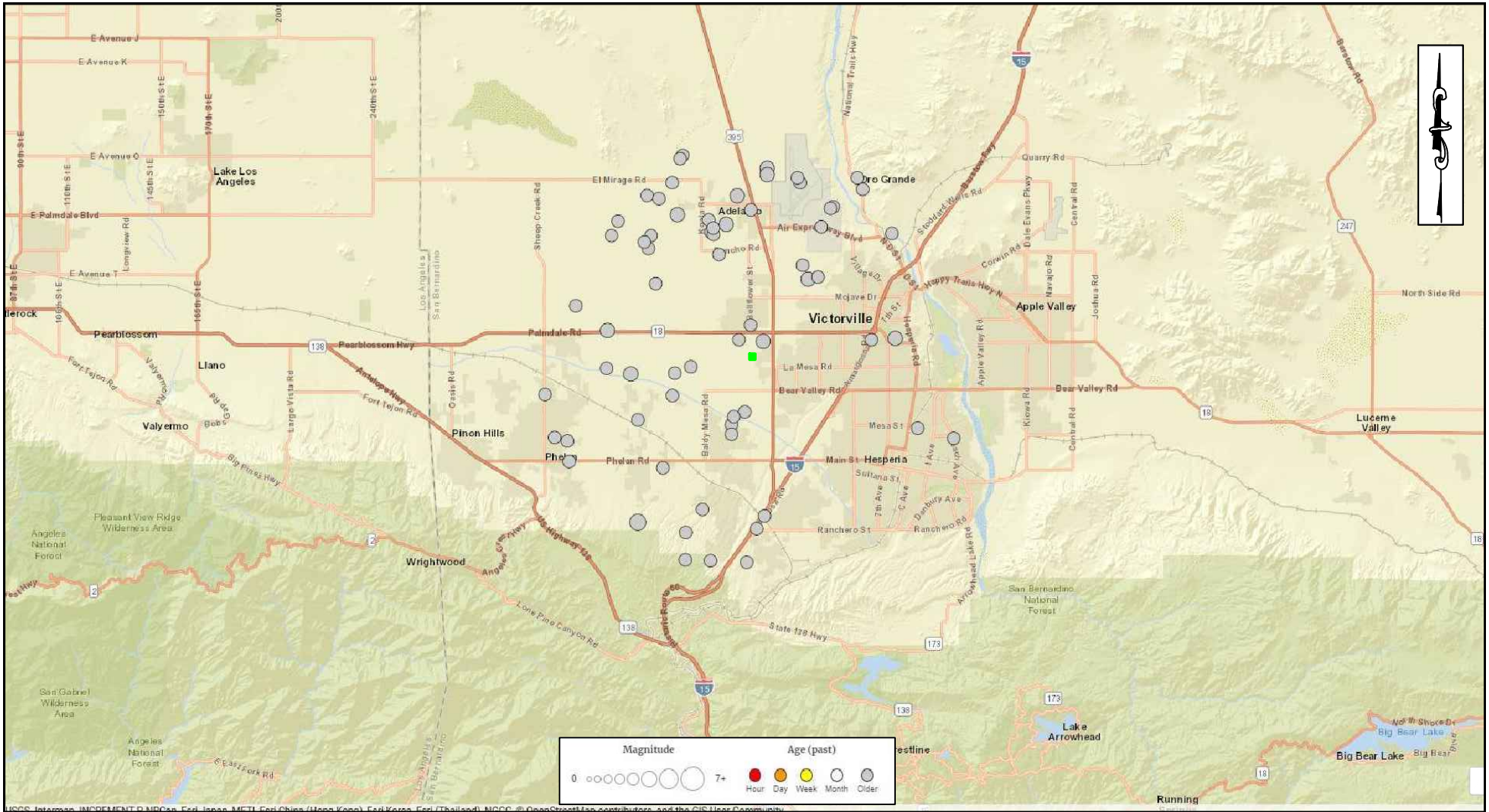
PROJECT:	Tentative Tract Map No. 20527, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	A-3
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022
		SCALE:	1" ≈ 2,000'



U.S. Geologic Survey (2022) real-time earthquake epicenter map. Plotted are 442 epicenters of instrument-recorded events from 01/01/32 to present (08/16/22) of local magnitude 4+ within a radius of ~62 miles (100 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These events are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 100km Radius

PROJECT:	Tentative Tract Map No. 20527, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	A-4
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022
		SCALE:	1" ≈ 40km



U.S. Geologic Survey (2022) real-time earthquake epicenter map. Plotted are 65 epicenters of instrument-recorded events from 01/01/78 to present (08/16/22) of local magnitude 2+ within a radius of ~9.2 miles (15 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These events are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 15km Radius

PROJECT:	Tentative Tract Map No. 20527, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	A-5
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022
		SCALE:	1" ≈ 10km

APPENDIX B

Field Investigation Program and Boring Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

Our subsurface exploration of the site consisted of drilling 5 exploratory borings to depths of approximately 21.5 and 51.5 feet below the existing ground surface using a Mobile B-61 drill rig on July 25, 2022. The approximate locations of the borings are shown on Enclosure A-2 within Appendix A.

The drilling exploration was conducted using a Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers. The soils were continuously logged by a geologist from this firm who inspected the site, created detailed logs of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a maximum interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50 inch inside diameter and 3.25 inch outside diameter or a Standard Penetration Sampler (SPT) from the ground surface to the total depth explored. The samplers were driven by a 140 pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to an equivalent SPT N-value. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-5.

The undisturbed soil samples were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed plastic containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our geotechnical laboratory for storage and testing. Detailed logs of the borings are presented on the enclosed Boring Logs, Enclosures B-1 through B-5. A Boring Log Legend is presented on Enclosure B-i. A Soil Classification Chart is presented as Enclosure B-ii.

CONSISTENCY OF SOIL

SANDS

SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol	Description
	INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE INDICATES BULK SAMPLE INDICATES SAND CONE OR NUCLEAR DENSITY TEST INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1	Atterberg Limits
2	Consolidation
3	Direct Shear (undisturbed or remolded)
4	Expansion Index
5	Hydrometer
6	Organic Content
7	Proctor (4", 6", or Cal216)
8	R-value
9	Sand Equivalent
10	Sieve Analysis
11	Soluble Sulfate Content
12	Swell
13	Wash 200 Sieve

BORING LOG LEGEND

PROJECT:	Proposed Residential Development, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	B-i
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO.200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
12"	3"	3/4"	No . 4	No. 10	No. 40	200	

(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT:	Proposed Residential Development, Victorville, California	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ENCLOSURE:**	B-ii
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	August 2022

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		3, 7, 9, 10						SM	@ 0 feet, ALLUVIUM: SILTY SAND, approximately 5% gravel to 1/2", 20% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, brown, dry, loose.
	19		1.5		115.9			SW	@ 2 feet, WELL GRADED SAND, approximately 10% gravel to 3/4", 20% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 5% silty fines, brown, dry to damp.
5	23		1.4		115.2				
10	41		2.2		116.9			SM	@ 10 feet, SILTY SAND, approximately 5% gravel to 3/4", 15% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 15% silty fines, brown, dry, weakly cemented.
15	46		7.2		115.7				@ 15 feet, slightly finer grained.
20	81		3.5		116.7			SW SM	@ 20 feet, WELL GRADED SAND with SILT, approximately 10% gravel to 1", 25% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 10% silty fines, brown, dry, weakly cemented.
25	42		4.5		112.0			ML	@ 25 feet, SANDY SILT, approximately 30% fine grained sand, 70% silty fines with trace clay, tan-white, dry, moderate calcification.
30	107		4.5					SM	@ 30 feet, SILTY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 40% fine grained sand, 20% silty fines, brown, dry.
35	72		1.6						
40	69		1.0					SW	@ 40 feet, WELL GRADED SAND, approximately 30% coarse grained sand, 35% medium grained sand, 35% fine grained sand, 5% silty fines, gray, dry.
45	83		4.2					ML	@ 45 feet, SANDY SILT, approximately 10% medium grained sand, 25% fine grained sand, 65% silty fines with trace clay, white, dry, moderate calcification.
50	63		0.9					SW	@ 50 feet, WELL GRADED SAND, approximately 5% gravel to 3/4", 25% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 5% silty fines, gray, dry.
55									END OF BORING @ 51.5'
									No fill No groundwater No bedrock

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ELEVATION:**	3,232
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	July 25, 2022
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-1

LOG OF BORING B-2

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SW SM	@ 0 feet, ALLUVIUM: WELL GRADED SAND with SILT, approximately 5% gravel to 1/2", 25% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 10% silty fines, brown, dry, loose.
	22		1.3		119.6			SW	@ 2 feet, WELL GRADED SAND, approximately 5% gravel to 3/4", 30% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 5% silty fines, brown, dry.
5	33		3.4		116.7				@ 5 feet, weakly cemented.
10	36		3.1		117.2			SM	@ 10 feet, SILTY SAND, approximately, 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, brown, dry, weakly cemented.
15	30		1.6		112.1			SW	@ 20 feet, WELL GRADED SAND, approximately 10% gravel to 1", 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 5% silty fines, brown, dry.
20	58		2.3		112.9				
25	42		4.5		104.9			SM	@ 25 feet, SILTY SAND, approximately 5% medium grained sand, 60% fine grained sand, 35% silty fines, tan-white, dry, some calcification.
30									END OF BORING @ 26.5' No fill No groundwater No bedrock

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ELEVATION:**	3,228
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	July 25, 2022
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-2

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0		9, 10						SW SM	@ 0 feet, ALLUVIUM: WELL GRADED SAND with SILT, approximately 5% gravel to 1/2", 25% coarse grained sand, 30% medium grained sand, 10% fine grained sand, brown, dry, loose.
	56		4.3		120.6			SM	@ 2 feet, SILTY SAND, approximately 25% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 25% silty fines, brown, dry, weakly cemented.
5	65		3.0		111.9				
10	52		1.9		122.3			SW	@ 10 feet, WELL GRADED SAND, approximately 5% gravel to 1/2", 30% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 5% silty fines, brown, dry.
15	45		1.6		113.5				@ 15 feet, slightly finer grained.
20	48		3.1		112.4			ML	@ 21.5 feet, SANDY SILT, approximately 20% fine grained sand, 80% silty fines with trace clay, tan-white, dry, heavy calcification.
									END OF BORING @ 21.5'
25									No fill No groundwater No bedrock

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ELEVATION:**	3,241
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	July 25, 2022
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-3

LOG OF BORING B-4

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
									TEST DATA
0	28		1.5		120.8			SW SM	@ 0 feet, ALLUVIUM: WELL GRADED SAND with SILT, approximately 5% gravel to 1/2", 20% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 10% silty fines, brown, dry, loose. @ 2 feet, becomes medium dense, slightly finer grained.
5	44		2.3		115.2			SM	@ 5 feet, SILTY SAND, trace gravel to 1/2" approximately 15% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 25% silty fines, brown, dry.
10	51		2.4		119.4			SW	@ 10 feet, WELL GRADED SAND, approximately 5% gravel to 3/4", 25% coarse grained sand, 35% medium grained sand, 35% fine grained sand, 5% silty fines, brown, dry.
15	71		1.7						@ 15 feet, rings disturbed.
20	67		1.1		109.2			SP	@ 20 feet, POORLY GRADED SAND, approximately 5% coarse grained sand, 20% medium grained sand, 20% fine grained sand, 5% silty fines, light red brown, dry, weakly cemented.
									END OF BORING @ 21.5' No fill No groundwater No bedrock
25									

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ELEVATION:**	3,224
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	July 25, 2022
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-4

LOG OF BORING B-5

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		8, 9, 10						SM	@ 0 feet, ALLUVIUM: SILTY SAND, approximately 5% gravel to 1/2", 20% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, brown, dry, loose.
	19		1.1		114.2				@ 2 feet, becomes medium dense.
5	25		1.3						@ 5 feet, rings disturbed.
10	78		1.7		117.0				@ 10 feet, SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 25% silty fines, dry, moderately cemented.
15	59		1.9		118.5			SW	@ 15 feet, WELL GRADED SAND, approximately 25% coarse grained sand, 35% medium grained sand, 35% fine grained sand, 5% silty fines, red brown, dry, moderately cemented.
20	79		2.8		116.0				END OF BORING @ 21.5' No fill No groundwater No bedrock
25									

TEST DATA

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**ELEVATION:**	3,235
		DATE DRILLED:	July 25, 2022
LOR GEOTECHNICAL GROUP, INC.		**EQUIPMENT:**	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-5

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from the borings were tested in our geotechnical laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, and corrosion. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined for selected undisturbed samples, in accordance with ASTM D 2921 and ASTM D 2216, respectively, and the results are shown on the boring logs, Enclosures B-1 through B-5 for convenient correlation with the soil profile.

Laboratory Compaction

A selected soil sample was tested in the laboratory to determine compaction characteristics using the ASTM D 1557 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Maximum Dry Density (pcf)**	**Optimum Moisture Content (percent)**
B-1	0-3	(SW-SM) Well Graded Sand with Silt	129.0	6.5

Direct Shear Test

Shear tests are performed in general accordance with ASTM D 3080 with a direct shear machine at a constant rate-of-strain (0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear. Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in remolded condition (90 percent relative compaction per ASTM D 1557) and soaked, to represent the worse case conditions expected in the field.

The results of the shear test on a selected soil sample is presented in the following table:

DIRECT SHEAR TEST				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Apparent Cohesion (psf)**	**Angle of Internal Friction (degrees)**
B-1	0-3	(SW-SM) Well Graded Sand with Silt	400	27

Sieve Analysis

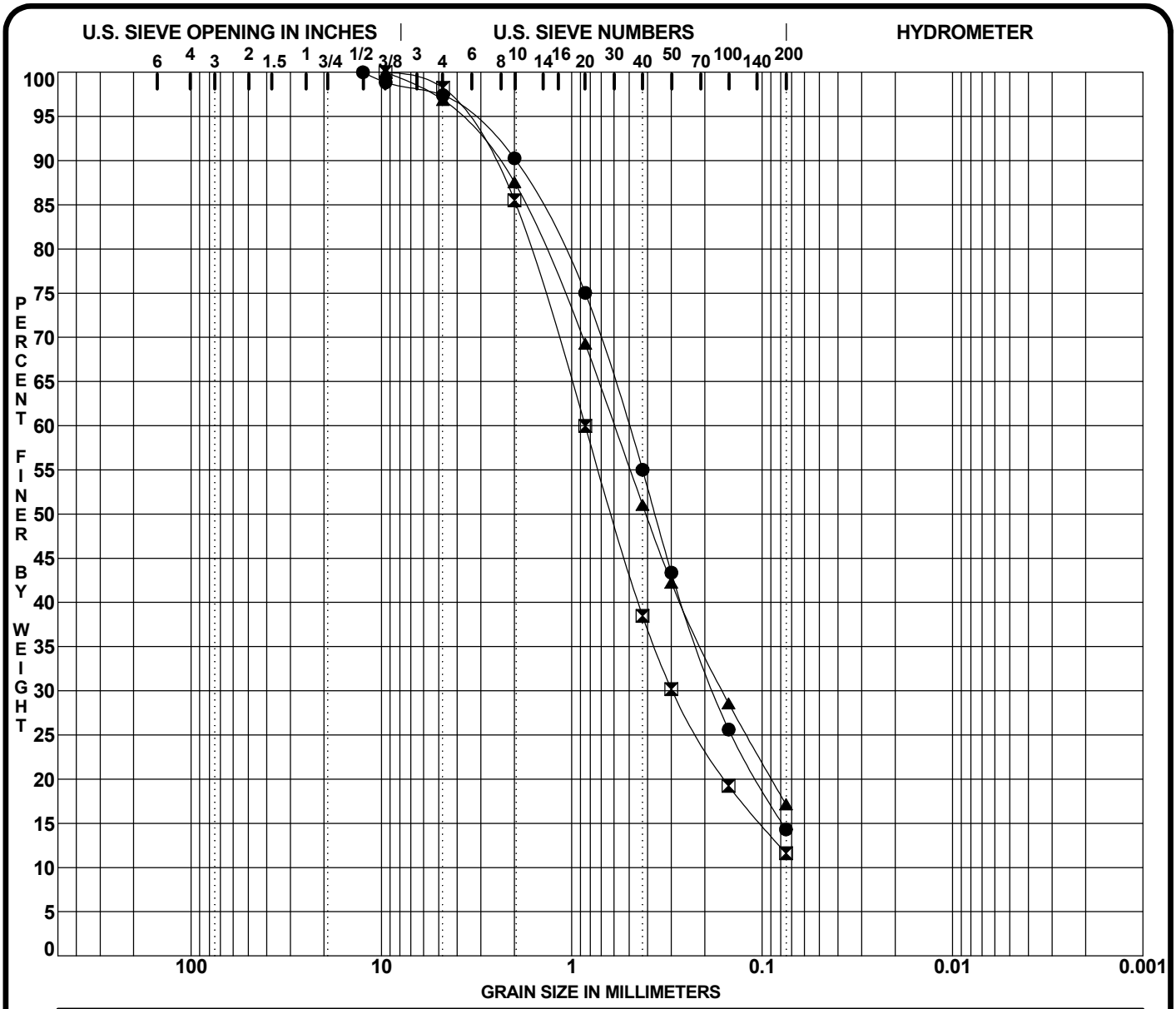
A quantitative determination of the grain size distribution was performed for selected samples in accordance with the ASTM D 422 laboratory test procedure. The determination is performed by passing the soil through a series of sieves, and recording the weights of retained particles on each screen. The results of the grain size distribution analyses are presented graphically on Enclosure C-1.

Sand Equivalent

The sand equivalent of selected soils were evaluated using the California Sand Equivalent Test Method, Caltrans Number 217. The results of the sand equivalent tests are presented with the grain size distribution analyses on Enclosure C-1.

R-Value Test

A soil sample was obtained at probable pavement subgrade level, and was tested to determine its R-value using the California R-Value Test Method, Caltrans Number 301. The results of the R-value test is presented on Enclosure C-1.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Soil Classification	SE	RV	PL	PI	Cc	Cu
●	B-1	@ 0-3'	(SM) Silty Sand	41	--				
⊠	B-3	@ 0-3'	(SW-SM) Well Graded Sand with Silt	40	--			1.60	13.1
▲	B-5	@ 0-3'	(SM) Silty Sand	38	71				

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	@ 0-3'	12.50	0.51	0.178		2.6	83.1	14.3	
⊠	B-3	@ 0-3'	9.50	0.85	0.297		1.8	86.6	11.6	
▲	B-5	@ 0-3'	9.50	0.60	0.161		3.1	79.7	17.2	

PROJECT:	Tract 20527	**PROJECT NO.:**	33837.1
CLIENT:	Sherr Development Corporation	**DATE:**	August 2022

GRADATION CURVES

LOR GEOTECHNICAL GROUP, INC.

ENCLOSURE: C-1

Results Only Soil Testing for Tentative Tract Map No. 20527

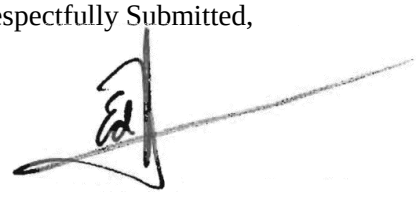
July 29, 2022

Prepared for:

Andrew Tardie
LOR Geotechnical
6121 Quail Valley Ct
Riverside, CA
atardie@lorgeo.com

Project X Job#: S220728A
Client Job or PO#: 33837.1

Respectfully Submitted,



Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com



Soil Analysis Lab Results

Client: LOR Geotechnical
Job Name: Tentative Tract Map No. 20527
Client Job Number: 33837.1
Project X Job Number: S220728A
July 29, 2022

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
RV-1 - B-1 - (SW-SM) Well Graded Sand w/ Silt	0-3	15.2	0.0015	6.6	0.0007	569,500	10,720	7.9	146	0.78	22.5	1.4	0.02	10.3	6.4	2.0	5.2	0.5	3.9
RV-2 - B-3 - (SW-SM) Well Graded Sand w/ Silt	0-3	6.8	0.0007	3.1	0.0003	>737,000	10,050	7.3	151	0.57	20.2	2.3	ND	4.1	12.5	1.1	3.4	0.6	0.4
RV-3 - B-5 - (SW-SM) Well Graded Sand w/ Silt	0-3	98.4	0.0098	44.9	0.0045	462,300	13,400	7.5	143	0.84	6.8	2.7	0.02	46.4	7.9	2.9	6.4	1.2	0.4

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com
Ship Samples To: 29990 Technology Dr, Suite 13, Murrieta, CA 92563

Project X Job Number: S220728A LOR 33837.1 Tract Map 20527 3 Full

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Company Name:	LOR Geotechnical Group, Inc.	**Contact Name:**	Andrew Tardie
Mailing Address:	6121 Quail Valley	**Contact Email:**	atardie@lorgeo.com
Accounting Contact:	John Leuer	**Invoice Email:**	atardie@lorgeo.com
Client Project No:	33837.1	**Project Name:**	Tentative Tract Map No. 20527
P.O. #:	--	**Phone No:**	951-653-1760

(Business Days) Turn Around Time: 3-5 Day Standard ● | 3 Day Guarantee 50% mark-up | 24 Hour RUSH 100% mark-up

For Corrosion Control Recommendations (350g soil sample):
NEED (1) Groundwater depth and
(2) Soil Sample Locations Map

FOR THERMAL RESISTIVITY PROVIDE (1,500g soil sample):
(1) Optimal Moisture %
(2) Dry Density{PCF}
(3) Desired Compaction
Date & Received By:

METHOD ANALYSIS REQUESTED (Please circle)

	SAMPLE ID - BORE # - Description	DEPTH (ft)	DATE COLLECTED
360 1	RV-1 - B-1 - (SW-SM) Well Graded Sand w/ Silt	0-3	07/25/22
361 2	RV-2 - B-3 - (SW-SM) Well Graded Sand w/ Silt	0-3	07/25/22
362 3	RV-3 - B-5 - (SW-SM) Well Graded Sand w/ Silt	0-3	07/25/22
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Default Method	Geo Quad	Full Corrosion Series																	Reports													
	Soil Resistivity	pH	Sulfate	Chloride	Redox Potential	Sulfide	Ammonia	Nitrate	Flouride	Phosphate	Lithium	Sodium	Potassium	Magnesium	Calcium	Full Corrosion Series	Soil Corrosivity Evaluation Report	Water Corrosivity Mini Report	Moisture Content	Total Alkalinity	Soil Remolding	Thermal Resistivity	(ANC) Alk Neutr Cap	(SRB) Sulfate Reducing	Puckorius Index	XRF Elemental Analysis	Water Hardness
	Caltrans CTM643	Caltrans CTM643	Caltrans CTM417	Caltrans CT422												350g Sample	*Req: Min. 3 Samples, site map, and groundwater info						1,500g Sample			ASTM A751	
	AASHTO T2888	AASHTO T 289	AASHTO T 290	AASHTO T 291	SM 2580B		SM 4500-NH3	SM 4500-NO3																		ASTM D4322		
	ASTM G187	ASTM G-51	ASTM D4327	ASTM D4327	ASTM G200	SM 4500-S2	ASTM D4327	ASTM D4327	SM 2320B	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D4327				ASTM D2216	SM 2520B	ASTM D2216	ASTM D5334 8-inch				ASTM E1621		
																			ASTM D698			IEEE 442 6-inch		HACH	BART			

APPENDIX D

Seismic Design Spectra

Project: Tentative Tract Map No. 20527
Project Number: 33837.1
Client: Sherr Development Corporation
Site Lat/Long: 34.4903 / -117.4136
Controlling Seismic Source: North Frontal

REFERENCE	NOTATION	VALUE
Site Class	C, D, D default, or E	D measured
Site Class D - Table 11.4-1	F_a	1.0
Site Class D - 21.3(ii)	F_v	2.5
$0.2*(S_{D1}/S_{DS})$	T_0	0.139
S_{D1}/S_{DS}	T_S	0.694
Fundamental Period (12.8.2)	T	Period
Seismic Design Maps or Fig 22-14	T_L	8
Equation 11.4-4 - $2/3*S_{M1}$	S_{D1}	0.6129*
Equation 11.4-2 - F_V*S_1	S_{M1}	0.9193*

REFERENCE	NOTATION	VALUE
Fv (Table 11.4-2)[Used for General Spectrum]	F_v	1.8
Design Maps	S_s	1.325
Design Maps	S_1	0.515
Equation 11.4-1 - F_A*S_S	S_{MS}	1.325*
Equation 11.4-3 - $2/3*S_{MS}$	S_{DS}	0.883*
Design Maps	PGA	0.5
Table 11.8-1	F_{PGA}	1.1
Equation 11.8-1 - $F_{PGA}*PGA$	PGA_M	0.55*
Section 21.5.3	80% of PGA_M	0.440
Design Maps	C_{RS}	0.932
Design Maps	C_{R1}	0.913

RISK COEFFICIENT

Cr - At Perods <=0.2, Cr=C_{RS}	C_{RS}	0.932
Cr - At Periods >=1.0, Cr=C_{R1}	C_{R1}	0.913

Cr - At Periods between 0.2 and 1.0 use trendline formula to complete

Period	Cr
0.200	0.932
0.300	0.930
0.400	0.927
0.500	0.925
0.600	0.923
0.680	0.921
1.000	0.913

* **Code based design value**. See accompanying data for Site Specific Design values.

Mapped values from https://hazards.atcouncil.org/

LOR GEOTECHNICAL GROUP, INC.

PROBABILISTIC SPECTRA[1]
2% in 50 year Exceedence

Project No: 33837.1

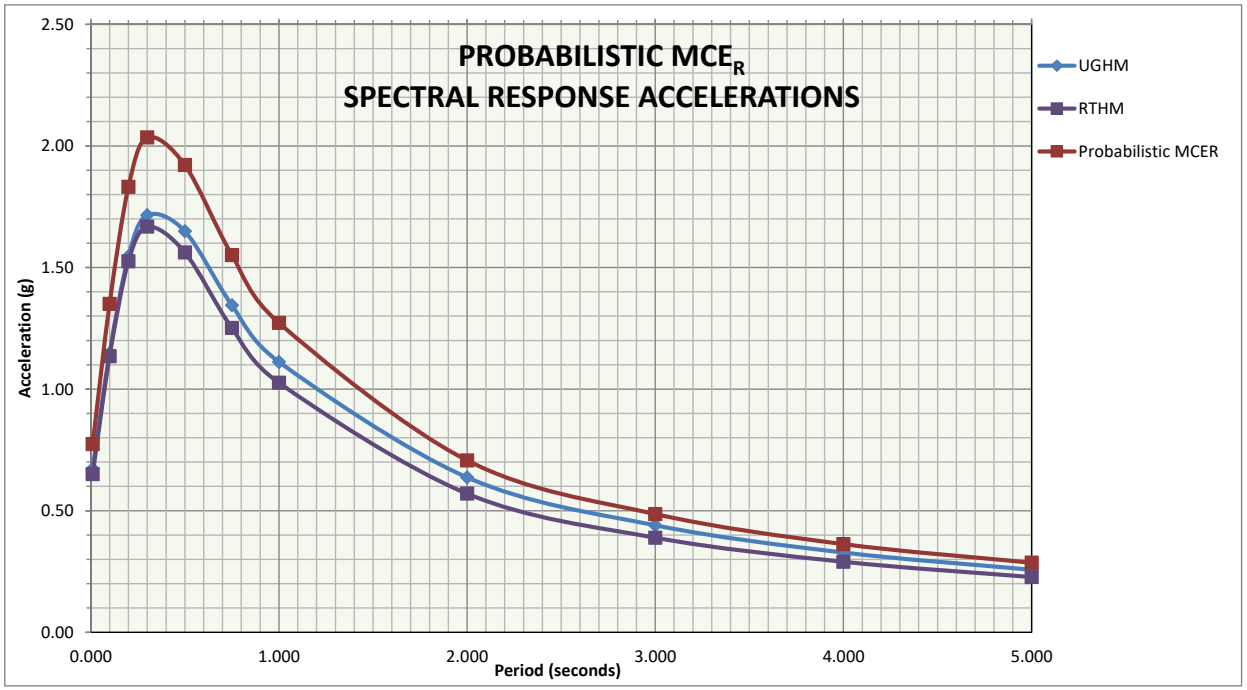
Period	UGHM	RTGM	Max Directional Scale Factor[2]	Probabilistic MCE
0.010	0.673	0.650	1.19	0.774
0.100	1.148	1.135	1.19	1.351
0.200	1.546	1.526	1.20	1.831
0.300	1.715	1.668	1.22	2.035
0.500	1.649	1.562	1.23	1.921
0.750	1.345	1.251	1.24	1.551
1.000	1.112	1.026	1.24	1.272
2.000	0.637	0.570	1.24	0.707
3.000	0.440	0.389	1.25	0.486
4.000	0.328	0.290	1.25	0.363
5.000	0.257	0.227	1.26	0.286

Probabilistic PGA: 0.673

Is Probabilistic $Sa_{(max)}$<1.2F_a? NO

[1] Data Sources:
https://earthquake.usgs.gov/hazards/interactive/
https://earthquake.usgs.gov/designmaps/rtgm/

[2] Shahi-Baker RotD100/RotD50 Factors (2014)



DETERMINISTIC SPECTRUM

Largest Amplitudes of Ground Motions Considering All Sources Calculated using Weighted Mean of Attenuation Equations[1]

Controlling Source: North Frontal

Is Probabilistic $Sa_{(max)}$<1.2Fa? NO

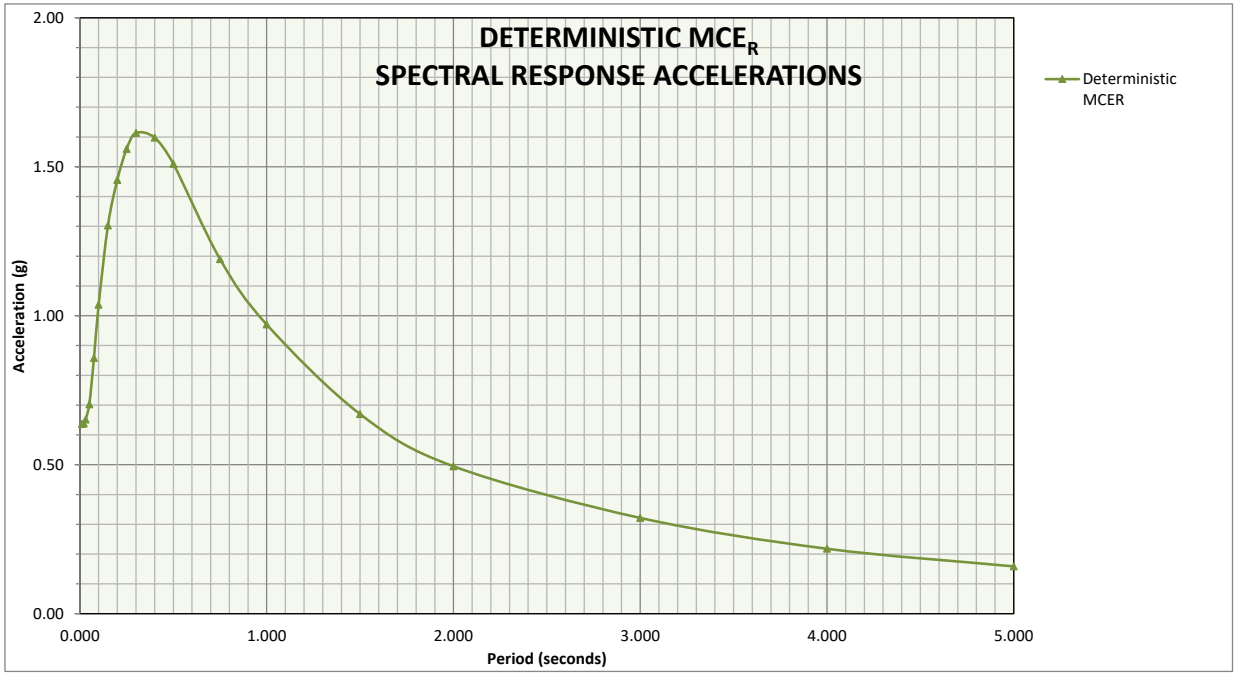
Period	Deterministic PSa Median + 1.σ for 5% Damping	Max Directional Scale Factor[2]	Deterministic MCE	Section 21.2.2 Scaling Factor Applied
0.010	0.535	1.19	0.637	0.637
0.020	0.537	1.19	0.639	0.639
0.030	0.548	1.19	0.652	0.652
0.050	0.591	1.19	0.703	0.703
0.075	0.721	1.19	0.858	0.858
0.100	0.871	1.19	1.037	1.037
0.150	1.086	1.20	1.303	1.303
0.200	1.213	1.20	1.456	1.456
0.250	1.289	1.21	1.560	1.560
0.300	1.323	1.22	1.614	1.614
0.400	1.299	1.23	1.598	1.598
0.500	1.228	1.23	1.510	1.510
0.750	0.960	1.24	1.190	1.190
1.000	0.783	1.24	0.970	0.970
1.500	0.540	1.24	0.670	0.670
2.000	0.399	1.24	0.495	0.495
3.000	0.257	1.25	0.321	0.321
4.000	0.174	1.25	0.218	0.218
5.000	0.126	1.26	0.159	0.159

Project No: 33837.1

Is Determinstic $Sa_{(max)}$<1.5*Fa?	NO
Section 21.2.2 Scaling Factor:	N/A
Deterministic PGA:	~~0.535~~
Is Deterministic PGA >=F_{PGA}*0.5?	NO
Deterministic PGA:	0.550

[1] NGAWest 2 GMPE worksheet and Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) - Time Dependent Model

[2] Shahi-Baker RotD100/RotD50 Factors (2014)



SITE SPECIFIC SPECTRA

Period	Probabilistic MCE	Deterministic MCE	Site-Specific MCE	Design Response Spectrum (Sa)
0.010	0.774	0.637	0.637	0.425
0.100	1.351	1.037	1.037	0.691
0.200	1.831	1.456	1.456	0.971
0.300	2.035	1.614	1.614	1.076
0.500	1.921	1.510	1.510	1.007
0.750	1.551	1.190	1.190	0.793
1.000	1.272	0.970	0.970	0.647
2.000	0.707	0.495	0.495	0.330
3.000	0.486	0.321	0.321	0.214
4.000	0.363	0.218	0.218	0.145
5.000	0.286	0.159	0.159	0.106

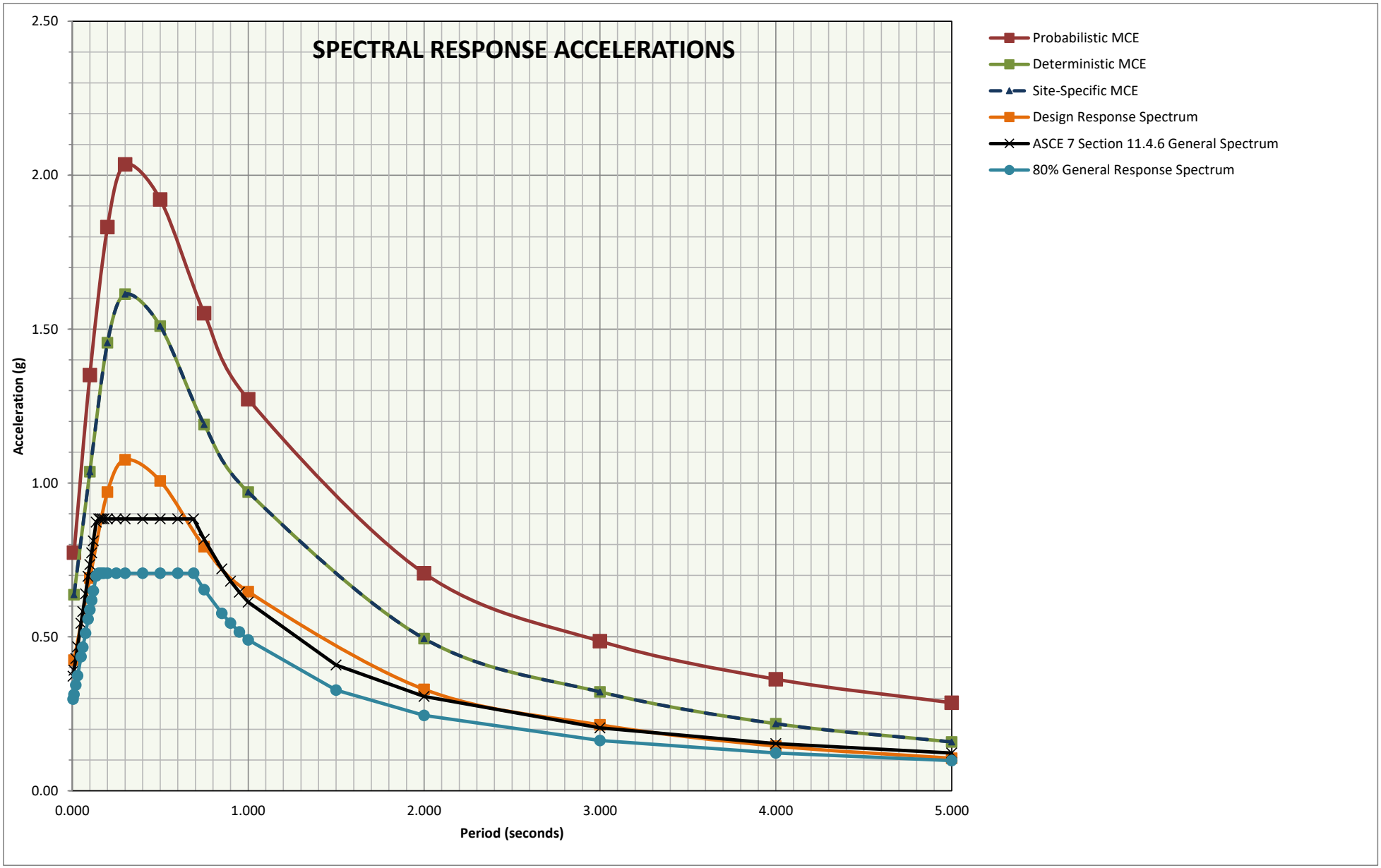
ASCE 7-16: Section 21.4
Site Specific

	Calculated Value	Design Value
SDS:	0.968	0.968
SD1:	0.659	0.659
SMS:	1.452	1.452
SM1:	0.989	0.989
Site Specific PGAm:	0.550	0.550
Site Class:	D measured	

Seismic Design Category - Short* D
Seismic Design Category - 1s* D
* Risk Categories I, II, or III

Period	ASCE 7 SECTION 11.4.6 General Spectrum	80% General Response Spectrum
0.005	0.372	0.298
0.010	0.392	0.313
0.020	0.430	0.344
0.030	0.468	0.374
0.050	0.544	0.435
0.060	0.583	0.466
0.075	0.640	0.512
0.090	0.697	0.558
0.100	0.735	0.588
0.110	0.773	0.619
0.120	0.812	0.649
0.136	0.873	0.698
0.150	0.883	0.707
0.160	0.883	0.707
0.170	0.883	0.707
0.180	0.883	0.707
0.200	0.883	0.707
0.250	0.883	0.707
0.300	0.883	0.707
0.400	0.883	0.707
0.500	0.883	0.707
0.600	0.883	0.707
0.690	0.883	0.707
0.750	0.817	0.654
0.850	0.721	0.577
0.900	0.681	0.545
0.950	0.645	0.516
1.000	0.613	0.490
1.500	0.409	0.327
2.000	0.306	0.245
3.000	0.204	0.163
4.000	0.153	0.123
5.000	0.123	0.098

Project No: 33837.1



Project No: 33837.1

APPENDIX E

Infiltration Test Results

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Tentative Tract Map No. 20527	Test Date:	July 26, 2022
Project No.:	33837.1	Test Hole No.:	P-1
Soil Classificaiton:	(SW) Well graded sand	Effective Hole Dia.*:	4.8 in.
Depth of Test Hole:	2.7 ft.	Date Excavated:	July 26, 2022
Tested By:	A.L.		

READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	(min/in)
1	9:17 AM	9:27 AM	10	0.17	0.17	12.00	29.00	32.04	32.00	17.00	11.52	0.6
2	9:27 AM	9:37 AM	10	0.17	0.33	12.00	27.00	32.00	32.00	15.00	12.50	0.7
3	9:37 AM	9:47 AM	10	0.17	0.50	12.00	26.50	32.00	32.00	14.50	12.75	0.7
4	9:47 AM	9:57 AM	10	0.17	0.67	12.00	26.00	32.00	32.00	14.00	13.00	0.7
5	9:57 AM	10:07 AM	10	0.17	0.83	12.00	26.00	32.00	32.00	14.00	13.00	0.7
6	10:07 AM	10:17 AM	10	0.17	1.00	12.00	26.00	32.00	32.00	14.00	13.00	0.7
7	10:17 AM	10:27 AM	10	0.17	1.17	12.00	26.00	32.00	32.00	14.00	13.00	0.7
8	10:27 AM	10:37 AM	10	0.17	1.33	12.00	26.00	32.00	32.00	14.00	13.00	0.7
9	10:37 AM	10:47 AM	10	0.17	1.50	12.00	26.00	32.00	32.00	14.00	13.00	0.7
10	10:47 AM	10:57 AM	10	0.17	1.67	12.00	26.00	32.00	32.00	14.00	13.00	0.7
11	10:57 AM	11:07 AM	10	0.17	1.83	12.00	26.00	32.00	32.00	14.00	13.00	0.7
12	11:07 AM	11:17 AM	10	0.17	2.00	12.00	26.00	32.00	32.00	14.00	13.00	0.7

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	20.00	
H_f	6.00	
ΔH	14.00	
H_{avg}	13.00	
I_t	**7.10**	in/hr (clear water rate)

* diameter adjusted to an effective diameter due to the loss in volume of water because of gravel packing

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Tentative Tract Map No. 20527	Test Date:	July 26, 2022
Project No.:	33837.1	Test Hole No.:	P-2
Soil Classificaiton:	(SW) Well graded sand	Effective Hole Dia.*:	4.8 in.
Depth of Test Hole:	2.9 ft.	Date Excavated:	July 25, 2022
Tested By:	A.L.		

READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	(min/in)
1	9:33 AM	9:43 AM	10	0.17	0.17	12.00	35.00	34.80	35.00	23.00	11.40	0.4
2	9:43 AM	9:53 AM	10	0.17	0.33	12.00	35.00	35.00	35.00	23.00	11.50	0.4
3	9:53 AM	10:03 AM	10	0.17	0.50	12.00	35.00	35.00	35.00	23.00	11.50	0.4
4	10:03 AM	10:13 AM	10	0.17	0.67	12.00	35.00	35.00	35.00	23.00	11.50	0.4
5	10:13 AM	10:23 AM	10	0.17	0.83	12.00	35.00	35.00	35.00	23.00	11.50	0.4
6	10:23 AM	10:33 AM	10	0.17	1.00	12.00	35.00	35.00	35.00	23.00	11.50	0.4
7	10:33 AM	10:43 AM	10	0.17	1.17	12.00	35.00	35.00	35.00	23.00	11.50	0.4
8	10:43 AM	10:53 AM	10	0.17	1.33	12.00	35.00	35.00	35.00	23.00	11.50	0.4
9	10:53 AM	11:03 AM	10	0.17	1.50	12.00	35.00	35.00	35.00	23.00	11.50	0.4
10	11:03 AM	11:13 AM	10	0.17	1.67	12.00	35.00	35.00	35.00	23.00	11.50	0.4
11	11:13 AM	11:23 AM	10	0.17	1.83	12.00	35.00	35.00	35.00	23.00	11.50	0.4
12	11:23 AM	11:33 AM	10	0.17	2.00	12.00	35.00	35.00	35.00	23.00	11.50	0.4

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	23.00	
H_f	0.00	
ΔH	23.00	
H_{avg}	11.50	
I_t	**13.04**	in/hr (clear water rate)

* diameter adjusted to an effective diameter due to the loss in volume of water because of gravel packing

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Tentative Tract Map No. 20527	Test Date:	July 26, 2022
Project No.:	33837.1	Test Hole No.:	P-3
Soil Classificaiton:	(SW) Well graded sand	Effective Hole Dia.*:	4.8 in.
Depth of Test Hole:	7.0 ft.	Date Excavated:	July 25, 2022
Tested By:	A.L.		

READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	(min/in)
1	11:53 AM	12:03 PM	10	0.17	0.17	36.00	77.00	84.00	84.00	41.00	27.50	0.2
2	12:03 PM	12:13 PM	10	0.17	0.33	36.00	75.00	84.00	84.00	39.00	28.50	0.3
3	12:13 PM	12:23 PM	10	0.17	0.50	36.00	74.00	84.00	84.00	38.00	29.00	0.3
4	12:23 PM	12:33 PM	10	0.17	0.67	36.00	74.50	84.00	84.00	38.50	28.75	0.3
5	12:33 PM	12:43 PM	10	0.17	0.83	36.00	74.00	84.00	84.00	38.00	29.00	0.3
6	12:43 PM	12:53 PM	10	0.17	1.00	36.00	74.00	84.00	84.00	38.00	29.00	0.3
7	12:53 PM	1:03 PM	10	0.17	1.17	36.00	74.00	84.00	84.00	38.00	29.00	0.3
8	1:03 PM	1:13 PM	10	0.17	1.33	36.00	74.00	84.00	84.00	38.00	29.00	0.3
9	1:13 PM	1:23 PM	10	0.17	1.50	36.00	74.00	84.00	84.00	38.00	29.00	0.3
10	1:23 PM	1:33 PM	10	0.17	1.67	36.00	74.00	84.00	84.00	38.00	29.00	0.3
11	1:33 PM	1:43 PM	10	0.17	1.83	36.00	74.00	84.00	84.00	38.00	29.00	0.3
12	1:43 PM	1:53 PM	10	0.17	2.00	36.00	74.00	84.00	84.00	38.00	29.00	0.3

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	48.00	
H_f	10.00	
ΔH	38.00	
H_{avg}	29.00	
I_t	**9.06**	in/hr (clear water rate)

* diameter adjusted to an effective diameter due to the loss in volume of water because of gravel packing

BOREHOLE METHOD PERCOLATION TEST RESULTS

Project:	Tentative Tract Map No. 20527	Test Date:	July 26, 2022
Project No.:	33837.1	Test Hole No.:	P-4
Soil Classificaiton:	(SM) Silty sand	Effective Hole Dia.*:	4.8 in.
Depth of Test Hole:	6.9 ft.	Date Excavated:	July 25, 2022
Tested By:	A.L.		

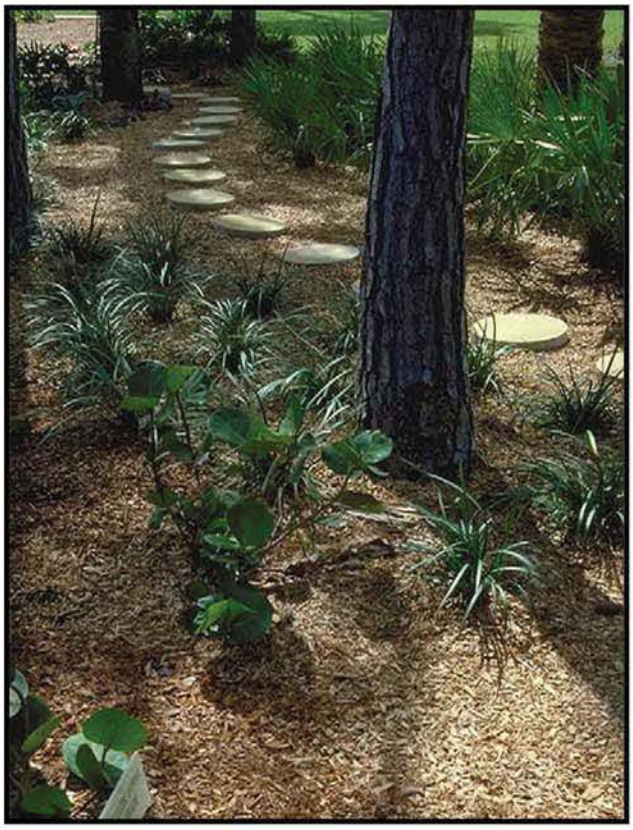
READING	TIME START	TIME STOP	TIME INTERVAL		TOTAL TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	INITIAL HOLE DEPTH	FINAL HOLE DEPTH	CHANGE IN WATER LEVEL	AVERAGE WETTED DEPTH	PERCOLATION RATE
			min	hr.	hr.	in.	in.	in.	in.	in.	in.	(min/in)
1	11:58 AM	12:08 PM	10	0.17	0.17	36.00	59.00	82.80	82.00	23.00	34.90	0.4
2	12:08 PM	12:18 PM	10	0.17	0.33	36.00	57.00	82.00	82.00	21.00	35.50	0.5
3	12:18 PM	12:28 PM	10	0.17	0.50	36.00	56.50	82.00	82.00	20.50	35.75	0.5
4	12:28 PM	12:38 PM	10	0.17	0.67	36.00	56.00	82.00	82.00	20.00	36.00	0.5
5	12:38 PM	12:48 PM	10	0.17	0.83	36.00	55.00	82.00	82.00	19.00	36.50	0.5
6	12:48 PM	12:58 PM	10	0.17	1.00	36.00	55.00	82.00	82.00	19.00	36.50	0.5
7	12:58 PM	1:08 PM	10	0.17	1.17	36.00	55.00	82.00	82.00	19.00	36.50	0.5
8	1:08 PM	1:18 PM	10	0.17	1.33	36.00	55.00	82.00	82.00	19.00	36.50	0.5
9	1:18 PM	1:28 PM	10	0.17	1.50	36.00	55.50	82.00	82.00	19.50	36.25	0.5
10	1:28 PM	1:38 PM	10	0.17	1.67	36.00	55.00	82.00	82.00	19.00	36.50	0.5
11	1:38 PM	1:48 PM	10	0.17	1.83	36.00	55.00	82.00	82.00	19.00	36.50	0.5
12	1:48 PM	1:58 PM	10	0.17	2.00	36.00	55.00	82.00	82.00	19.00	36.50	0.5

PERCOLATION RATE CONVERSION (Porchet Method):

H_O	46.00	
H_f	27.00	
ΔH	19.00	
H_{avg}	36.50	
I_t	**3.63**	in/hr (clear water rate)

* diameter adjusted to an effective diameter due to the loss in volume of water because of gravel packing

Site Design & Landscape Planning SD-10



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

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- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

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Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

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Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

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- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Landscape Maintenance SC-73



Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

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- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

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Drainage System Maintenance SC-74



Photo Credit: Geoff Brosseau

Objectives

- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Suggested Protocols

Catch Basins/Inlet Structures

- Municipal staff should regularly inspect facilities to ensure the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC-75 Waste Handling and Disposal).
- Clean catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.

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- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream.
- Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge from cleaning a storm drain pump station or other facility to reach the storm drain system.
- Conduct quarterly routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.
- Sample collected sediments to determine if landfill disposal is possible, or illegal discharges in the watershed are occurring.

Open Channel

- Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies

(SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS

Illicit Connections and Discharges

- During routine maintenance of conveyance system and drainage structures field staff should look for evidence of illegal discharges or illicit connections:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections
  - Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of up gradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
  - Once the origin of flow is established, require illicit discharger to eliminate the discharge.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

- The State Department of Fish and Game has a hotline for reporting violations called Cal TIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).
- The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Only properly trained individuals are allowed to handle hazardous materials/wastes.
- Train municipal employees from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report illegal dumping.
- Train municipal employees and educate businesses, contractors, and the general public in proper and consistent methods for disposal.
- Train municipal staff regarding non-stormwater discharges (See SC-10 Non-Stormwater Discharges).

Spill Response and Prevention

- Refer to SC-11, Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Cleanup activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and disposal of flushed effluent to sanitary sewer may be prohibited in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Private property access rights may be needed to track illegal discharges up gradient.

- Requirements of municipal ordinance authority for suspected source verification testing for illicit connections necessary for guaranteed rights of entry.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget. A careful study of cleaning effectiveness should be undertaken before increased cleaning is implemented. Catch basin cleaning costs are less expensive if vacuum street sweepers are available; cleaning catch basins manually can cost approximately twice as much as cleaning the basins with a vacuum attached to a sweeper.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary. Encouraging reporting of illicit discharges by employees can offset costs by saving expense on inspectors and directing resources more efficiently. Some programs have used funds available from "environmental fees" or special assessment districts to fund their illicit connection elimination programs.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.

- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.

- Arrangements must be made for proper disposal of collected wastes.

- Requires technical staff to detect and investigate illegal dumping violations, and to coordinate public education.

Supplemental Information

Further Detail of the BMP

Storm Drain flushing

Sanitary sewer flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in sanitary sewer systems. The same principles that make sanitary sewer flushing effective can be used to flush storm drains. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as to an open channel, to another point where flushing will be initiated, or over to the sanitary sewer and on to the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. The deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to

cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce the impacts of stormwater pollution, a second inflatable device, placed well downstream, may be used to re-collect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to re-collect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75 percent for organics and 55-65 percent for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm drain flushing.

Flow Management

Flow management has been one of the principal motivations for designing urban stream corridors in the past. Such needs may or may not be compatible with the stormwater quality goals in the stream corridor.

Downstream flood peaks can be suppressed by reducing through flow velocity. This can be accomplished by reducing gradient with grade control structures or increasing roughness with boulders, dense vegetation, or complex banks forms. Reducing velocity correspondingly increases flood height, so all such measures have a natural association with floodplain open space. Flood elevations laterally adjacent to the stream can be lowered by increasing through flow velocity.

However, increasing velocity increases flooding downstream and inherently conflicts with channel stability and human safety. Where topography permits, another way to lower flood elevation is to lower the level of the floodway with drop structures into a large but subtly excavated bowl where flood flows we allowed to spread out.

Stream Corridor Planning

Urban streams receive and convey stormwater flows from developed or developing watersheds. Planning of stream corridors thus interacts with urban stormwater management programs. If local programs are intended to control or protect downstream environments by managing flows delivered to the channels, then it is logical that such programs should be supplemented by management of the materials, forms, and uses of the downstream riparian corridor. Any proposal for steam alteration or management should be investigated for its potential flow and stability effects on upstream, downstream, and laterally adjacent areas. The timing and rate of flow from various tributaries can combine in complex ways to alter flood hazards. Each section of channel is unique, influenced by its own distribution of roughness elements, management activities, and stream responses.

Flexibility to adapt to stream features and behaviors as they evolve must be included in stream reclamation planning. The amenity and ecology of streams may be enhanced through the landscape design options of 1) corridor reservation, 2) bank treatment, 3) geomorphic restoration, and 4) grade control.

Corridor reservation - Reserving stream corridors and valleys to accommodate natural stream meandering, aggradation, degradation, and over bank flows allows streams to find their own form and generate less ongoing erosion. In California, open stream corridors in recent urban developments have produced recreational open space, irrigation of streamside plantings, and the aesthetic amenity of flowing water.

Bank treatment - The use of armoring, vegetative cover, and flow deflection may be used to influence a channel's form, stability, and biotic habitat. To prevent bank erosion, armoring can be done with rigid construction materials, such as concrete, masonry, wood planks and logs, riprap, and gabions. Concrete linings have been criticized because of their lack of provision of biotic habitat. In contrast, riprap and gabions make relatively porous and flexible linings. Boulders, placed in the bed reduce velocity and erosive power.

Riparian vegetation can stabilize the banks of streams that are at or near a condition of equilibrium. Binding networks of roots increase bank shear strength. During flood flows, resilient vegetation is forced into erosion-inhibiting mats. The roughness of vegetation leads to lower velocity, further reducing erosive effects. Structural flow deflection can protect banks from erosion or alter fish habitat. By concentrating flow, a deflector causes a pool to be scoured in the bed.

Geomorphic restoration – Restoration refers to alteration of disturbed streams so their form and behavior emulate those of undisturbed streams. Natural meanders are retained, with grading to gentle slopes on the inside of curves to allow point bars and riffle-pool sequences to develop. Trees are retained to provide scenic quality, biotic productivity, and roots for bank stabilization, supplemented by plantings where necessary.

A restorative approach can be successful where the stream is already approaching equilibrium. However, if upstream urbanization continues new flow regimes will be generated that could disrupt the equilibrium of the treated system.

Grade Control - A grade control structure is a level shelf of a permanent material, such as stone, masonry, or concrete, over which stream water flows. A grade control structure is called a sill, weir, or drop structure, depending on the relation of its invert elevation to upstream and downstream channels.

A sill is installed at the preexisting channel bed elevation to prevent upstream migration of nick points. It establishes a firm base level below which the upstream channel can not erode.

A weir or check dam is installed with invert above the preexisting bed elevation. A weir raises the local base level of the stream and causes aggradation upstream. The gradient, velocity, and erosive potential of the stream channel are reduced. A drop structure lowers the downstream invert below its preexisting elevation, reducing downstream gradient and velocity. Weirs and drop structure control erosion by dissipating energy and reducing slope velocity.

When carefully applied, grade control structures can be highly versatile in establishing human and environmental benefits in stabilized channels. To be successful, application of grade control structures should be guided by analysis of the stream system both upstream and downstream from the area to he reclaimed.

Examples

The California Department of Water Resources began the Urban Stream Restoration Program in 1985. The program provides grant funds to municipalities and community groups to implement stream restoration projects. The projects reduce damages from streambank aid watershed instability arid floods while restoring streams' aesthetic, recreational, and fish and wildlife values.

In Buena Vista Park, upper floodway slopes are gentle and grassed to achieve continuity of usable park land across the channel of small boulders at the base of the slopes.

The San Diego River is a large, vegetative lined channel, which was planted in a variety of species to support riparian wildlife while stabilizing the steep banks of the floodway.

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Infiltration Trench TC-10



Design Considerations

- Accumulation of Metals
- Clogged Soil Outlet Structures
- Vegetation/Landscape Maintenance

Description

An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. Infiltration trenches perform well for removal of fine sediment and associated pollutants. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

- ● Low
- ▲ Medium
- ■ High

California Experience

Caltrans constructed two infiltration trenches at highway maintenance stations in Southern California. Of these, one failed to operate to the design standard because of average soil infiltration rates lower than that measured in the single infiltration test. This highlights the critical need for appropriate evaluation of the site. Once in operation, little maintenance was required at either site.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- An important benefit of infiltration trenches is the approximation of pre-development hydrology during which a significant portion of the average annual rainfall runoff is infiltrated rather than flushed directly to creeks.
- If the water quality volume is adequately sized, infiltration trenches can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

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- As an underground BMP, trenches are unobtrusive and have little impact of site aesthetics.

Limitations

- Have a high failure rate if soil and subsurface conditions are not suitable.
- May not be appropriate for industrial sites or locations where spills may occur.
- The maximum contributing area to an individual infiltration practice should generally be less than 5 acres.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration trenches once clogged.

Design and Sizing Guidelines

- Provide pretreatment for infiltration trenches in order to reduce the sediment load. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice, easing the long-term maintenance burden. Pretreatment is important for all structural stormwater management practices, but it is particularly important for infiltration practices. To ensure that pretreatment mechanisms are effective, designers should incorporate practices such as grassed swales, vegetated filter strips, detention, or a plunge pool in series.
- Specify locally available trench rock that is 1.5 to 2.5 inches in diameter.
- Determine the trench volume by assuming the WQV will fill the void space based on the computed porosity of the rock matrix (normally about 35%).
- Determine the bottom surface area needed to drain the trench within 72 hr by dividing the WQV by the infiltration rate.

$$d = \frac{WQV + RFV}{SA}$$

- Calculate trench depth using the following equation:

where:

D = Trench depth

WQV	=	Water quality volume
RFV	=	Rock fill volume
SA	=	Surface area of the trench bottom

- The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).
- Provide observation well to allow observation of drain time.
- May include a horizontal layer of filter fabric just below the surface of the trench to retain sediment and reduce the potential for clogging.

Construction/Inspection Considerations

Stabilize the entire area draining to the facility before construction begins. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction. Stabilize the entire contributing drainage area before allowing any runoff to enter once construction is complete.

Performance

Infiltration trenches eliminate the discharge of the water quality volume to surface receiving waters and consequently can be considered to have 100% removal of all pollutants within this volume. Transport of some of these constituents to groundwater is likely, although the attenuation in the soil and subsurface layers will be substantial for many constituents.

Infiltration trenches can be expected to remove up to 90 percent of sediments, metals, coliform bacteria and organic matter, and up to 60 percent of phosphorus and nitrogen in the infiltrated runoff (Schueler, 1992). Biochemical oxygen demand (BOD) removal is estimated to be between 70 to 80 percent. Lower removal rates for nitrate, chlorides and soluble metals should be expected, especially in sandy soils (Schueler, 1992). Pollutant removal efficiencies may be improved by using washed aggregate and adding organic matter and loam to the subsoil. The stone aggregate should be washed to remove dirt and fines before placement in the trench. The addition of organic material and loam to the trench subsoil may enhance metals removal through adsorption.

Siting Criteria

The use of infiltration trenches may be limited by a number of factors, including type of native soils, climate, and location of groundwater table. Site characteristics, such as excessive slope of the drainage area, fine-grained soil types, and proximate location of the water table and bedrock, may preclude the use of infiltration trenches. Generally, infiltration trenches are not suitable for areas with relatively impermeable soils containing clay and silt or in areas with fill.

As with any infiltration BMP, the potential for groundwater contamination must be carefully considered, especially if the groundwater is used for human consumption or agricultural purposes. The infiltration trench is not suitable for sites that use or store chemicals or hazardous materials unless hazardous and toxic materials are prevented from entering the trench. In these areas, other BMPs that do not allow interaction with the groundwater should be considered.

The potential for spills can be minimized by aggressive pollution prevention measures. Many municipalities and industries have developed comprehensive spill prevention control and countermeasure (SPCC) plans. These plans should be modified to include the infiltration trench and the contributing drainage area. For example, diversion structures can be used to prevent spills from entering the infiltration trench. Because of the potential to contaminate groundwater, extensive site investigation must be undertaken early in the site planning process to establish site suitability for the installation of an infiltration trench.

Longevity can be increased by careful geotechnical evaluation prior to construction and by designing and implementing an inspection and maintenance plan. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration trench. Pretreatment structures, such as a vegetated buffer strip or water quality inlet, can increase longevity by removing sediments, hydrocarbons, and other materials that may clog the trench. Regular maintenance, including the replacement of clogged aggregate, will also increase the effectiveness and life of the trench.

Evaluation of the viability of a particular site is the same as for infiltration basins and includes:

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30 percent clay or more than 40 percent of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15 percent should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Maintenance

Infiltration trenches required the least maintenance of any of the BMPs evaluated in the Caltrans study, with approximately 17 field hours spent on the operation and maintenance of each site. Inspection of the infiltration trench was the largest field activity, requiring approximately 8 hr/yr.

In addition to reduced water quality performance, clogged infiltration trenches with surface standing water can become a nuisance due to mosquito breeding. If the trench takes more than 72 hours to drain, then the rock fill should be removed and all dimensions of the trench should be increased by 2 inches to provide a fresh surface for infiltration.

Cost

Construction Cost

Infiltration trenches are somewhat expensive, when compared to other stormwater practices, in terms of cost per area treated. Typical construction costs, including contingency and design costs, are about \$5 per ft^3 of stormwater treated (SWRPC, 1991; Brown and Schueler, 1997). Actual construction costs may be much higher. The average construction cost of two infiltration trenches installed by Caltrans in southern California was about \$50/ft^3; however, these were constructed as retrofit installations.

Infiltration trenches typically consume about 2 to 3 percent of the site draining to them, which is relatively small. In addition, infiltration trenches can fit into thin, linear areas. Thus, they can generally fit into relatively unusable portions of a site.

Maintenance Cost

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly sited or maintained, infiltration trenches have a high failure rate. In general, maintenance costs for infiltration trenches are estimated at between 5 percent and 20 percent of the construction cost. More realistic values are probably closer to the 20-percent range, to ensure long-term functionality of the practice.

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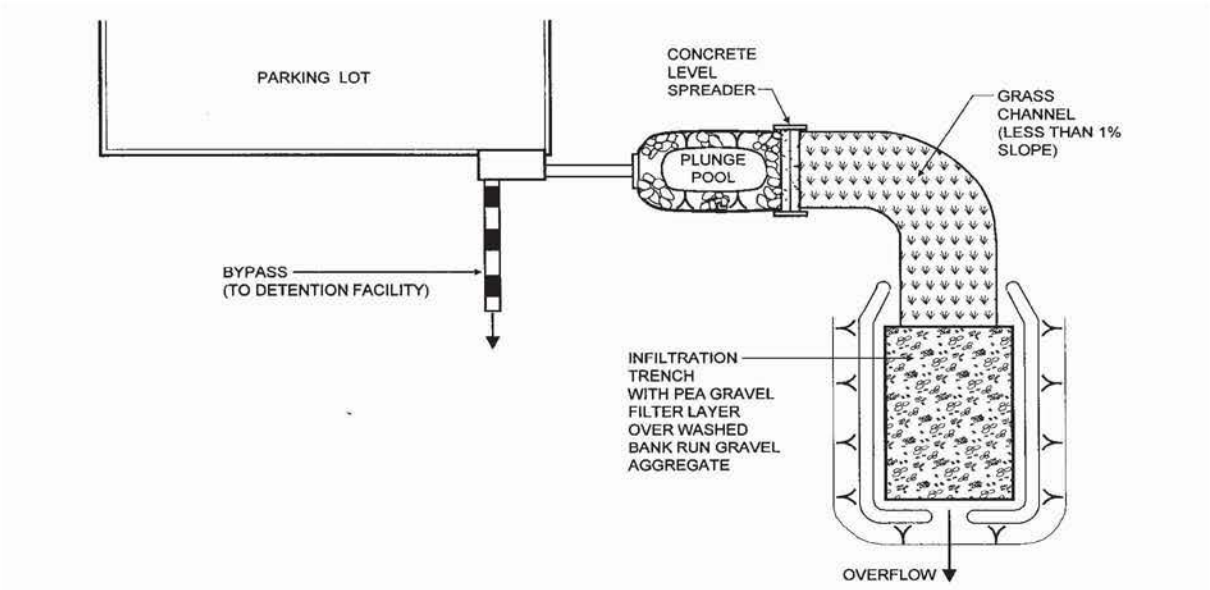
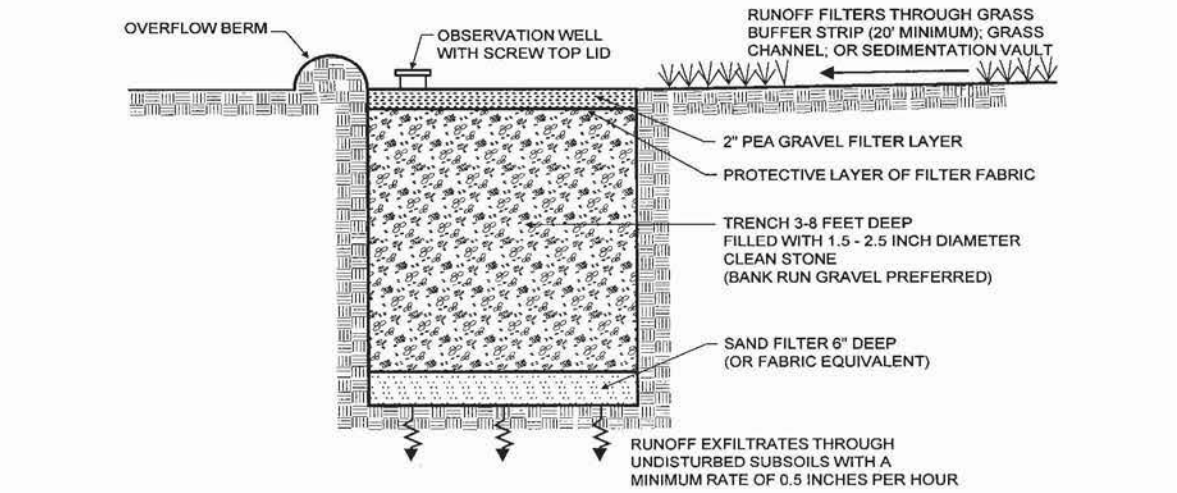


PLAN VIEW



SECTION

Stormwater Pollution Prevention

Best Management Practices for Homeowner's Associations, Property Managers and Property Owners

Your Guide To Maintaining Water Friendly Standards In Your Community

sbcountystormwater.org

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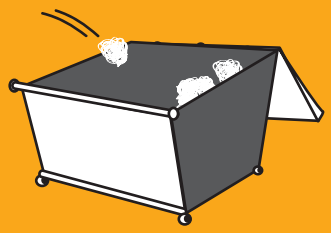
COMMERCIAL TRASH ENCLOSURES

FOLLOW THESE **REQUIREMENTS** TO **KEEP OUR WATERWAYS CLEAN**

Trash enclosures, such as those found in commercial and apartment complexes, typically contain materials that are intended to find their way to a landfill or a recycling facility. **These materials are NOT meant to go into our local lakes and rivers.**

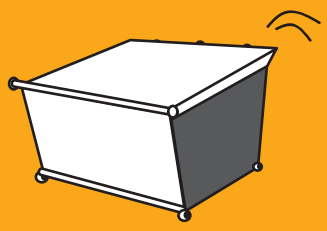
PROTECT WATER QUALITY BY FOLLOWING THESE SIMPLE STEPS

PUT TRASH INSIDE



Place trash inside the bin (preferably in sealed bags)

CLOSE THE LID



Prevent rain from entering the bin in order to avoid leakage of polluted water runoff

KEEP TOXICS OUT



- Paint
- Grease, fats and used oils
- Batteries, electronics and fluorescent lights

SOME ADDITIONAL GUIDELINES, INCLUDE

✓ **SWEEP FREQUENTLY**
Sweep trash enclosure areas frequently, instead of hosing them down, to prevent polluted water from flowing into the streets and storm drains.

✓ **FIX LEAKS**
Address trash bin leaks immediately by using dry clean up methods and report to your waste hauler to receive a replacement.

✓ **CONSTRUCT ROOF**
Construct a solid cover roof over the existing trash enclosure structure to prevent rainwater from coming into contact with trash and garbage. Check with your local City/County for Building Codes.

In San Bernardino County, stormwater pollution is caused by food waste, landscape waste, chemicals and other debris that are washed into storm drains and end up in our waterways - untreated! You can be part of the solution by maintaining a water-friendly trash enclosure.

THANK YOU FOR HELPING TO KEEP SAN BERNARDINO COUNTY CLEAN AND HEALTHY!

San Bernardino County STORMWATER PROGRAM

In the event of a spill or discharge to a storm drain or waterway, contact San Bernadino County Stormwater immediately: (877) WASTE18 | sbcountystormwater.org/report

sbcountystormwater.org

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CESQG PROGRAM

Conditionally Exempt Small Quantity Generator

WHAT IS A CESQG?

Businesses that generate 27 gallons or 220 lbs. of hazardous waste, or 2.2 lbs. of extremely hazardous waste per month are called "Conditionally Exempt Small Quantity Generators," or CESQGs. San Bernardino County Household Hazardous Program provides waste management services to CESQG businesses. The most common CESQGs in San Bernardino County are painters, print shops, auto shops, builders, agricultural operators and property managers, but there are many others. When you call, be ready to describe the types and amounts of waste your business generates in a typical month. If you generate hazardous waste on a regular basis, you must:

- Register with San Bernardino County Fire Department (909) 386-8401 as a hazardous waste generator.
- To obtain an EPA ID# and application form from the State visit www.dtsc.ca.gov.
- Manage hazardous waste in accordance with all applicable local, state and federal laws and regulations.

HOW DO I GET SERVICE?

To arrange an appointment for the CESQG Program, call 1-800-OILY CAT or 909-382-5401. Be ready to describe the type and amount of hazardous waste your business is ready to dispose of, and the types and size(s) of containers that the waste is in.

Waste Type and Cost

There is a small handling fee involved in the collection of hazardous waste from your business. Disposal costs depend on the type of waste.

Aerosols	$1.29/lb.
Automobile motor oil	$.73/gal.
Anti-freeze	$1.57/gal.
Contaminated oil	$4.48/gal.
Car batteries	$.62/ea.
Corrosive liquids, solids	$2.80/lb.
Flammable solids, liquids	$1.57/lb.
Latex Paint	$.73/lb.
Mercury	$10.08/lb.
NiCad/Alkaline Batteries	$2.13/lb.
Oil Base Paints	$1.00/lb.
Oil Filters	$.56/ea.
Oxidizers	$9.63/lb.
PCB Ballasts	$5.94/lb.
Pesticides (most)	$2.91/lb.
Photofixer, developer	$4.31/gal.
Television & Monitors	$11.20/ea.
Additional Handling	$138.00/hr.

Rates subject to change without notice

WE CANNOT ACCEPT

- Radioactives
- Water reactives
- Explosives
- Compressed gas cylinders
- Medical or biohazardous waste
- Asbestos
- Remediation wastes

HAZARDOUS WASTE

WHY IS THE FIRE DEPARTMENT COLLECTING HAZARDOUS WASTE?

Small Quantity Generators often have difficulty disposing of small quantities of hazardous waste. Hazardous waste companies usually have a minimum amount of waste that they will pick up, or charge a minimum fee for service. Typically, the minimum fee exceeds the cost of disposal for the hazardous waste. This leaves the small quantity generator in a difficult situation. Some respond by storing hazardous waste until it becomes economical for the hazardous waste transporter to pick it up, putting the business out of compliance by exceeding regulatory accumulation time limits. Other businesses simply store their hazardous wastes indefinitely, creating an unsafe work environment and exceeding accumulation time limits. Yet other businesses attempt to illegally dispose of their waste at household hazardous waste collection facilities. These facilities are not legally permitted to accept commercial wastes, nor are prepared to provide legal documentation for commercial hazardous waste disposal. In answer to the problems identified above, the San Bernardino County Fire Department Household Hazardous Program instituted the Conditionally Exempt Small Quantity Generator Program.

PAYMENT FOR SERVICES

The CESQG Program will prepare an invoice for your business at the time of service. You can pay at the time of service with cash or a check, or you can mail your payment to the Fire Department within 30 days. Please note that we do not accept credit card payments. The preferred method of payment is to handle payment at time of service. Additional charges may apply for accounts not paid within 30 days.

ARE THERE ANY OTHER WAYS THAT I CAN SAVE MONEY ON HAZARDOUS WASTE DISPOSAL?

Yes! First, start by reducing the amount of waste that you produce by changing processes or process chemicals, at your business. Next, examine if there is a way that you can recycle your waste back into your processes. Network with similar businesses or trade associations for waste minimization and pollution prevention solutions.

WHAT IF YOUR BUSINESS DOES NOT QUALIFY?

Call the San Bernardino County Fire Department Field Services Division for assistance with hazardous waste management at 909-386-8401. If you reduce the amount of waste you generate each month to 27 gallons or less, you may qualify in the future.

WHAT HAPPENS TO YOUR HAZARDOUS WASTE?

Hazardous waste collected by the CESQG Program is transported to a state permitted processing facility in San Bernardino. The waste is further processed at this point and packaged for off-site recycling (oil filters, oil, latex paint, antifreeze, and batteries) or destructive incineration (pesticides, corrosives, flammables, oil based paint).

San Bernardino County Fire Department
CESQG Program
2824 East "W" Street
San Bernardino, CA 92415-0799
Phone: 909-382-5401
Fax: 909-382-5413
www.sbcfire.org/hazmat/hhw.asp
Email: jschwab@sbcfire.org

WHEN WORKING OUTDOORS USE THE 3Cs

CUANDO TRABAJE AL AIRE LIBRE UTILICE LAS 3Cs

CONTROL | CONTROL



Locate the nearest storm drain and ensure nothing can enter or be discharged into it.
Ubique el desagüe de aguas pluviales más cercano y asegúrese de que nada pueda ingresar a éste ni descargarse en él.

CONTAIN | CONTENER



Isolate your area to prevent material from potentially flowing or being blown away.
Aísle su área para evitar que el material pueda discurrirse o ser llevado por el viento.

CAPTURE | CAPTURAR



Sweep up debris and place it in the trash. Clean up spills with an absorbent material (e.g. kitty litter) or vacuum with a Wet-Vac and dispose of properly.
Recoja los restos y colóquelos en la basura. Limpie los derrames con un material absorbente (como la arena para gatos) o aspírelos con una Wet-Vac (aspiradora de humedad) y deséchelos correctamente.

COMMERCIAL LANDSCAPE

DISCHARGE TO THE STORM DRAIN, **ACCIDENTAL OR NOT**, COULD LEAD TO ENFORCEMENT ACTIONS, WHICH COULD INCLUDE FINES.

Follow the best practices below to **prevent water pollution from landscaping activities.**

RECYCLE YARD WASTE



- Recycle leaves, grass clippings and other yard waste.
- Do not blow, sweep, rake or hose yard waste into the street or catch basin.
- **Try grasscycling:** the natural recycling of grass by leaving clippings on the lawn when mowing.

  For more information, please visit: **www.calrecycle.ca.gov/organics/grasscycling**

USE FERTILIZERS, HERBICIDES AND PESTICIDES SAFELY



- Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use natural and non-toxic alternatives as often as possible.
- If you must use chemical fertilizers, herbicides or pesticides:
  - Spot apply, rather than blanketing entire areas.
  - Avoid applying near curbs and driveways, and **never** before a rain.
  - Apply fertilizers as needed: when plants could best use it and when the potential runoff would be low.
  - Follow the manufacturer's instructions carefully—this will not only give the best results, but will save money.

USE WATER WISELY



- Control the amount of water and direction of sprinklers. Sprinklers should only be on long enough to allow water to soak into the ground, but not so long as to cause runoff.
- Periodically inspect, fix leaks and realign sprinkler heads.
- Plant native vegetation to reduce the need of water, fertilizers, herbicides and pesticides.

HOMEOWNERS

KEEP THESE TIPS IN MIND WHEN HIRING PROFESSIONAL LANDSCAPERS AND REMIND AS NECESSARY.



Leftover pesticides, fertilizers, and herbicides contaminate landfills and should be disposed of through a Hazardous Waste Facility.

For more information on proper disposal call,

(909) 382-5401 or 1-800-OILY CAT.

*FREE for San Bernardino County residents only. Businesses can call for cost inquiries and to schedule an appointment.

In the event of a spill or discharge to a storm drain or waterway, contact San Bernadino County Stormwater immediately: (877) WASTE18 | sbcountystormwater.org/report

sbcountystormwater.org

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SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. Fountain water containing chlorine and copperbased algaecides is toxic to aquatic life. Proper inspection, cleaning, and repair of pedestrian areas and HOA owned surfaces and structures can reduce pollutant runoff from these areas. Maintaining these areas may involve one or more of the following activities:

1. **Surface Cleaning**
2. **Graffiti Cleaning**
3. **Sidewalk Repair**
4. **Controlling Litter**
5. **Fountain Maintenance**

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for sidewalk, plaza, and fountain maintenance and cleaning include:

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).
- Once per year, educate HOA staff and tenants on pollution prevention measures.

MODEL PROCEDURES:

1. Surface Cleaning

Discharges of wash water to the storm water drainage system from cleaning or hosing of impervious surfaces is prohibited.
Sidewalks, Plazas

✓ Use dry methods (e.g. sweeping, backpack blowers, vacuuming) whenever practical to clean sidewalks and plazas rather than hosing, pressure washing, or steam cleaning. DO NOT sweep or blow material into curb; use devices that contain the materials.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

Parking Areas, Driveways, Drive-thru

✓ Parking facilities should be swept/vacuumed on a regular basis. Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

✓ Sweep all parking lots at least once before the onset of the wet season.

✓ Use absorbents to pick up oil; then dry sweep.

✓ Appropriately dispose of spilled materials and absorbents.

OPTIONAL:

- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc.

Building Surfaces, Decks, etc., without loose paint

✓ Use high-pressure water, no soap.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

Unpainted Building Surfaces, Wood Decks, etc.

✓ If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

✓ Use biodegradable cleaning agents to remove deposits.

✓ Make sure pH is between 6.5 and 8.5 THEN discharge to landscaping (if cold water without a cleaning agent) otherwise dispose of properly.

2. Graffiti Cleaning

Graffiti Removal

✓ Avoid graffiti abatement activities during rain events.

✓ When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal in the Roads, Streets, and Highway Operation and Maintenance procedure sheet.

✓ Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

✓ Note that care should be taken when disposing of waste since it may need to be disposed of as hazardous waste.

OPTIONAL:

• Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

3. Sidewalk Repair

Surface Removal and Repair

✓ Schedule surface removal activities for dry weather if possible.

✓ Avoid creating excess dust when breaking asphalt or concrete.

✓ Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up material.

✓ Designate an area for clean up and proper disposal of excess materials.

✓ Remove and recycle as much of the broken pavement as possible.

✓ When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains shovel or vacuum the slurry, remove from site and dispose of properly.

✓ Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Discharge wash water to landscaping, pump to the sanitary sewer if permitted to do so or contain and dispose of properly.

Concrete Installation and Repair

✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site. Only mix what is needed for the job.

✓ Wash concrete trucks off-site or in designated areas on-site, such that there is no discharge of concrete wash water into storm drain inlets, open ditches, streets, or other storm water conveyance structures. (See Concrete Waste Management BMP WM – 8)

SIDEWALK, PLAZA, ENTRY MONUMENT & FOUNTAIN MAINTENANCE

- ✓ Store dry and wet concrete materials under cover, protected from rainfall and runoff and away from drainage areas. After job is complete remove temporary stockpiles (asphalt materials, sand, etc.) and other materials as soon as possible.
- ✓ Return leftover materials to the transit mixer. Dispose of small amounts of excess concrete, grout, and mortar in the trash.
- ✓ When washing concrete to remove fine particles and expose the aggregate, contain the wash water for proper disposal.
- ✓ Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stock pile, or dispose in the trash.
- ✓ Protect applications of fresh concrete from rainfall and runoff until the material has hardened.

4. Litter Control

- ✓ Enforce anti-litter laws.
- ✓ Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- ✓ Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.

OPTIONAL:

- Post "No Littering" signs.

5. Fountain Maintenance

- ✓ Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.
- ✓ Allow chlorine to dissipate for a few days and then recycle/reuse water by draining it gradually onto a landscaped area. Water must be tested prior to discharge to ensure that chlorine is not present (concentration must be less than 0.1 ppm).
- ✓ Contact local agency for approval to drain into sewer or storm drain.
- ✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site. Only mix what is needed for the job.

EQUIPMENT MAINTENANCE & REPAIR

Vehicle or equipment maintenance has the potential to be a significant source of stormwater pollution. Engine repair and service (parts cleaning, spilled fuel, oil, etc.), replacement of fluids, and outdoor equipment storage and parking (dripping engines) can all contaminate stormwater. Conducting the following activities in a controlled manner will reduce the potential for stormwater contamination:

1. **General Maintenance and Repair**
2. **Vehicle and Machine Repair**
3. **Waste Handling/Disposal**

Related vehicle maintenance activities are covered under the following program headings in this manual: "Vehicle and Equipment Cleaning", "Vehicle and Equipment Storage", and "Vehicle Fueling".

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for equipment maintenance and repair include:

- Review maintenance activities to verify that they minimize the amount of pollutants discharged to receiving waters. Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible. Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- Once per year, educate HOA staff and tenants on pollution prevention measures.

EQUIPMENT MAINTENANCE & REPAIR

MODEL PROCEDURES:

1. General Maintenance and Repair

General Guidelines

➔ *Note: Permission must be obtained for any discharge of wash water to the sanitary sewer from the local sewering agency.*

- ✓ Review maintenance activities to verify that they minimize the amount of pollutants discharged to receiving waters. Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ✓ Regularly inspect vehicles and equipment for leaks.
- ✓ Move activity indoors or cover repair area with a permanent roof if feasible.
- ✓ Minimize contact of stormwater with outside operations through berming the local sewering and drainage routing.
- ✓ Place curbs around the immediate boundaries of the process equipment.
- ✓ Clean yard storm drain inlets regularly and stencil them.

Good Housekeeping

- ✓ Avoid hosing down work areas. If work areas are washed and if discharge to the sanitary sewer is allowed, treat water with an appropriate treatment device (e.g. clarifier) before discharging. If discharge to the sanitary sewer is not permitted, pump water to a tank and dispose of properly.
- ✓ Collect leaking or dripping fluids in drip pans or container. Fluids are easier to recycle or dispose of properly if kept separate.
- ✓ Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, any discharge of or remove other parts. Place a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
- ✓ Educate employees on proper handling and disposal of engine fluids.
- ✓ Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- ✓ Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- ✓ Post signs at sinks and stencil outdoor storm drain inlets.

2. Vehicle Repair

General Guidelines

- ✓ Perform vehicle fluid removal or changing inside of a building or in a contained covered area, where feasible, to prevent the run-on of stormwater and the runoff of spills.
- ✓ Regularly inspect vehicles and equipment for leaks, and repair as needed.

EQUIPMENT MAINTENANCE & REPAIR

- ✓ Use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- ✓ Immediately drain all fluids from wrecked vehicles. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- ✓ Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- ✓ Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- ✓ Oil filters disposed of in trash cans or dumpsters can leak oil. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- ✓ Store cracked batteries in a non-leaking secondary container and dispose of properly at recycling facilities or at County hazardous waste disposal site.

Vehicle Leak and Spill Control

- ✓ Use absorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- ✓ Place a stockpile of spill cleanup materials where it will be readily accessible.
- ✓ Sweep floor using dry absorbent material.

3. Machine Repair

- ✓ Keep equipment clean; don't allow excessive build-up of oil or grease.
- ✓ Minimize use of solvents.
- ✓ Use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- ✓ Perform major equipment repairs at the corporation yard, when practical.
- ✓ Following good housekeeping measures in Vehicle Repair section.

4. Waste Handling/Disposal

Waste Reduction

- ✓ Prevent spills and drips of solvents and cleansers to the shop floor.
- ✓ Do liquid cleaning at a centralized station so the solvents and residues stay in one area. Recycle liquid cleaners when feasible.

✓ Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

OPTIONAL:

- If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

  -Use non-caustic detergents instead of caustic cleaning for parts cleaning.

  -Use a water-based cleaning service and have tank cleaned. Use detergent-based or water-based cleaning systems in place of organic solvent degreasers.

  -Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.

  -Choose cleaning agents that can be recycled.

Recycling

OPTIONAL:

- Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).
- Purchase recycled products to support the market for recycled materials.

LIMITATIONS:

Space and time limitations may preclude all work being conducted indoors. It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours. Dry floor cleaning methods may not be sufficient for some spills – see spill prevention and control procedures sheet. Identification of engine leaks may require some use of solvents.

POOL MAINTENANCE

Pool chemicals and filter solids, when discharged to the City streets, gutters or storm drans, DO NOT GET TREATED before reaching the Santa Ana River. Chlorine, acid cleaning chemicals and metal-based algaecides used in pools can kill beneficial organisms in the food chain and pollute our drinking water.

When emptying your swimming pool, spa or fountain, please use one of the following best management practices to prevent water pollution:

- Reuse the water as landscape irrigation
- Empty the water into the sewer between midnight and 6:00 am
- Remove solids and floating debris and dispose of in the trash, de-chlorinate the water to a chlorine residual = 0, wait 24 hours, then discharge the water to the street or storm drain
- Try not to use metal-based algaecides (i.e. copper sulfate) in your pool or spa. If you have, empty your pool or spa into the sewer. *Prior to discharging pool water into the sanitary sewer system, contact your local agency.*
- If the pool contains algae and mosquito larvae, discharge the water to the sewer

When acid cleaning or other chemical cleaning:

- Neutralize the pool water to pH of 6.5 to 8.5, then discharge to the sewer

For swimming pool and spa filter backwash:

- Dispose of solids into trash bag, then wash filter into a landscape area
- Settle, dispose of solids in trash and discharge water to the sewer, never to the storm drain

» For Residents

The following is a preview of the information we have available to residents. For more fact sheets, visit ***sbcountystormwater.org***

Household Hazardous Waste Center Locations

TOO TOXIC TO TRASH

Dispose of your **HOUSEHOLD HAZARDOUS WASTE** (HHW) at a **FREE** HHW Center near you. Examples of items collected: pesticides, fertilizers, paints, cleaners, antifreeze, batteries, motor oil, oil filters, and electronic waste.

SERVICE AREA	LOCATION	DAYS OPEN	HOURS
Big Bear Lake (does not accept E-waste)	42040 Garstin Dr. (cross: Big Bear Blvd.)	Saturdays	9 a.m. - 2 p.m.
Chino	5050 Schaefer Ave. (cross: 4th St.)	2nd & 4th Sat.	8 a.m. - 1 p.m.
Fontana (Fontana residents only)	16454 Orange Way (cross: Cypress Ave.) Note: Provide a trash bill and a driver's license as proof of residency.	Saturdays	8 a.m. - 12 p.m.
Ontario	1430 S. Cucamonga Ave. (cross: Belmont St.)	Fri. & Sat.	9 a.m. - 2 p.m.
Rancho Cucamonga	8794 Lion Street. (Off 9th St, between Vineyard and Hellman)	Saturdays	8 a.m. - 12 p.m.
Redlands	500 Kansas St. (cross: Park Ave.)	Saturdays	9:30 a.m. - 12:30 p.m.
Rialto (does not accept E-waste)	246 Willow Ave. (cross: Rialto Ave.)	2nd & 4th Fri. & Sat.	8 a.m. - 12 p.m.
San Bernardino	2824 East 'W' St., 302 (cross: Victoria Ave.)	Mon. – Fri.	9 a.m. - 4 p.m.
Upland	1370 N. Benson Ave. (cross: 14th St.)	Saturdays	9 a.m. - 2 p.m.

San Bernardino County STORMWATER PROGRAM

To report illegal dumping, call (877) WASTE18 or visit sbcountystormwater.org

Artwork Courtesy of the City of Los Angeles Stormwater Program. Printed on recycled paper.

TAKE ONE





WE DID IT OURSELVES AND WE DID IT RIGHT

When painting your home, protect your family and community.

- **PAINTS** that are water-based are less toxic and should be used whenever possible.
- **BRUSHES** with water-based paint should be washed in the sink. Those with oil-based paint should be cleaned with paint thinner.
- **SAFELY** dispose of unwanted paint and paint thinner. The County of San Bernardino offers 9 HHW Centers that accept paint and other household hazardous waste from residents FREE of charge. For a list of acceptable materials, location information, and hours of operation call 1-800-OILY CAT.

VEHICLE MAINTENANCE

Oil, grease, anti-freeze and other toxic automotive fluids often make their way into the San Bernardino County storm drain system, and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution and protect public health.

Cleaning Auto Parts

Scrape parts with a wire brush or use a bake oven rather than liquid cleaners. Arrange drip pans, drying racks and drain boards so that fluids are directed back into the parts washer or the fluid holding tank. Do not wash parts or equipment in a sink, parking lot, driveway or street.

Storing Hazardous Waste

Keep your liquid waste segregated. Many fluids can be recycled via hazardous waste disposal companies if they are not mixed. Store all materials under cover with spill containment or inside to prevent contamination of rainwater runoff.

Preventing Leaks and Spills

Conduct all vehicle maintenance inside of a garage. Place drip pans underneath vehicle to capture fluids. Use absorbent materials instead of water to clean work areas.

Cleaning Spills

Use dry methods for spill cleanup (sweeping, absorbent materials). To report accidental spills into the street or storm drain call (877) WASTE18 or 911.

Proper Disposal of Hazardous Waste

Dispose of household hazardous waste by taking it to your nearest household hazardous waste center. For more information, call 1-800-OILY CAT or check out sbcountystormwater.org/Disposal.html

PET WASTE DISPOSAL

FREE

DOGGIE WASTE BAGS

Remember to pick up after your pet every time to keep San Bernardino County clean and healthy!



San Bernardino County STORMWATER PROGRAM

In the event of a spill or discharge to a storm drain or waterway, contact San Bernadino County Stormwater immediately: (877) WASTE18 | sbcountystormwater.org/report

sbcountystormwater.org

Big Bear • Chino • Chino Hills • Colton • Fontana • Grand Terrace • Highland • Loma Linda • Montclair • Ontario • Rancho Cucamonga
Redlands • Rialto • San Bernadino • San Bernadino County • San Bernadino County Flood Control District • Upland • Yucaipa

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