PRELIMINARY DRAINAGE REPORT

The Merge
Northeast corner of Archibald Ave. and Limonite Ave.
Eastvale, California

July 2018

PREPARED FOR:

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PRELIMINARY DRAINAGE REPORT

FOR

THE MERGE

EASTVALE, CALIFORNIA

July 2018

TABLE OF CONTENTS

Report **page**

Project Description and Report Purpose. 2
Calculation Methodology 2
Description of Site 3
Results Summary and Discussion 5
References 6

Tables

Table 1 - Post-Development Condition Runoff Summary 4
Table 2 - Detention Basin Calculation Summary 5
Table 3 - Pre- vs. Post-Development Condition Runoff Summary 5

Exhibits

Exhibit 1 – Location Map 7
Exhibit 2 – FEMA Flood Insurance Rate Maps 8
Exhibit 3 – Pre-Development Drainage Conditions 9
Exhibit 4 – Post-Development Drainage Conditions 10
Exhibit 5 – Riverside County Flood Control Master Drainage Plan (MDP) Map 11

Appendices

Appendix A - Hydrologic / Hydraulic Reference Material
Appendix B - Rational Method Calculation Results
Appendix C - Hydrograph Calculation Results
Appendix D - Detention Basin Calculation Results
Appendix E – Riverside County Flood Control Calculations for the Master Drainage Plan

Project Description and Report Purpose

The proposed project is located on an approximately 26.3-acre site located on the northeast corner of Archibald Avenue and Limonite Avenue in the City of Eastvale, Riverside County, California. For reference, see ***Exhibit 1***, *Location Map*.

The project consists of a commercial/retail and industrial development. The proposed development will include the construction of eight industrial buildings of varying sizes consisting of approximately 336,500 square feet and commercial/retail development consisting of approximately 72,000-square feet, including three pads, retail shops, a car wash, a grocery store, a drugstore and a gas station. Improvements within the site will provide parking facilities, driveway entrances connecting to existing roads, site utilities, bio filtration units, storm drain system and underground detention.

There is an existing 48 in. storm sewer pipe (Lateral A-2) that is part of Riverside County's Master Drainage Plan (MDP) that runs west adjacent to the site in Limonite, turning south in Archibald Avenue. Under the Project storm water management system concept, storm water from the developed site would be discharged to this existing 48 in. storm sewer pipe.

As part of the MDP, the County developed hydrology calculations with an impervious ratio that assumes undefined single-family residential development of the subject site. The hydrology calculations appropriately assumed relatively low percentages of impervious coverage and relatively long times of concentration.

Since the Project proposes Commercial/Retail and Industrial uses, rather than the single-family residential uses assumed in the MDP, the percentage of impervious coverage has increased when compared to the MDP estimates. Additionally, due to more precise overland flow lengths that can be calculated based on the current Project development concept, the time of concentration has decreased. As a result, the site peak flow rates from the developed Project site would be greater than the planned flow rates reflected in the MDP.

To accommodate the increase in peak flows that would result from the Project, and avoid potential exceedance of the area storm drain system capacities, the Project storm water management system incorporates on-site detention basins. These detention basins have been designed to attenuate the 100-year storm event peak flow difference between runoff that would result from the County's MDP assumed residential development of the site and runoff from the site resulting from development of the currently proposed Project.

The purpose of this report is to provide information about the design of the Storm Water Management System (SWMS) for the proposed project. This investigation was conducted to evaluate the hydrologic and hydraulic conditions of the project described above. The purpose is also to determine the impact that the proposed development has on the local drainage system and to ensure that the post development peak flows will not increase beyond the level at which the Riverside County's Master Drainage Plan designed the storm sewer lateral along Limonite and Archibald to hold.

Calculation Methodology

The design criteria for the hydrologic and hydraulic calculations for this project have been conducted per requirements as outlined in the Riverside County Hydrology Manual, April 1978 (Hydrology Manual). See ***Appendix A***, *Hydrologic / Hydraulic Reference Material*.

Runoff calculations were performed using the rational method computer program developed by Advanced Engineering Software (AES). This method calculates time of concentration and runoff rates using criteria as specified in the Hydrology Manual. Intensity values were obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Loss rates were calculated using soil data obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey for Riverside County, California, Santa Ana River Area. Existing elevation data for travel flowpaths were obtained from an ALTA/ACSM land title survey completed for the project site March 5, 2018. Results from these calculations are included with this report as ***Appendix B***, *Rational Method Calculation Results*.

Hydrograph calculations were performed using a computer program developed by Advanced Engineering Software (AES). This method calculates a unit hydrograph using lag time, maximum watershed loss rates, low loss fraction, and an S-graph as specified in the Hydrology Manual. Lag was calculated using the time of concentration calculated from the rational method analysis. The maximum watershed loss rate was obtained directly from the rational method analysis. The low loss fraction was calculated using soil data obtained from the NRCS Web Soil Survey for Riverside County, California, Santa Ana River Area. The Valley: Developed S-graph was used to develop the unit hydrograph. Results from these calculations are included with this report as ***Appendix C***, *Hydrograph Calculation Results*.

The computer program Pond Pack was used to design and model the proposed detention basin and outlet structure for this project. Pond Pack routes a hydrograph through a detention basin according to the requirements specified in the Hydrology Manual. The unit hydrograph was input directly along with proposed stage-storage-discharge information. See **Appendix D**, *Detention Basin Calculation Results*.

Description of Site

Our site is located in the Federal Emergency Management Administration (FEMA), Flood Insurance Rate Map (FIRM) panel number 06065C0677G. The flood map for this area has a status of "Not Printed" for the panel where the project site is located. The "FIRMette" shows it as an "Area of Minimal Flood Hazard". Per conversations with Federal Emergency Management Administration (FEMA) Flood Insurance Rate Map (FIRM) technicians and considering adjacent panel 06065C0679G, it has been determined that the project site is located within Zone X Flood Zone Designation. Zone X is defined by FEMA as the area determined to be outside the 500- year flood and protected by levee from 100-year flood. No portion of the site is within the special flood hazard area inundated by the 100-year flood.

For an exhibit of the adjacent FIRM Panel 06065C0679G see ***Exhibit 2,*** *FEMA Flood Insurance Rate Maps*.

Pre-development Condition

The entire existing site is considered as one subbasin and lies within a Master Drainage Plan (MDP). All pre-development runoff sheet-flows to the south and west property lines, discharging in to the Limonite and Archibald right of way. Currently there exists a catch basin adjacent to the site in Limonite, approximately 210' west of the east property line and a headwall/pipe located at the southwest corner of the site. These inlets discharge into Lateral A-2. Lateral A-2 begins approximately 1300 feet east of Archibald Ave on Cloverdale Rd., runs west on Cloverdale Rd. before turning south on Archibald Ave. and travels 2640 feet to confluence with Line A. Lateral A-2, at the point where site runoff enters the underground pipe, has a diameter of 48 in. and an anticipated flow of 104 cfs, Lateral A-2 ultimately discharges into Line A. Line A begins 650 feet north of Cloverdale Rd. on Harrison Ave., runs south on Harrison Ave. for 2600 feet, then east for 5200 feet in Cherry St. before discharging into Cucamonga Creek. Line A is sized with a diameter of 108 in. and an allowable flow of 488 cfs at the Lateral A-2 connection.

For an exhibit of the existing conditions drainage, see ***Exhibit 3***, *Pre-Development Drainage Condition*.

Post-Development Condition

The existing storm sewer system was designed and constructed for a peak site discharge of 39.61 cfs. However, due to higher than planned impervious ratios and lower times of concentration, a higher peak undetained flow of 56.08 cfs has been estimated. Detention basins will be implemented into the site design in order to maintain the peak discharge of 39.61 cfs based on the County's hydrology calculations, for which the Master Drainage Plan storm sewer system was designed to hold along Archibald Avenue.

The proposed conditions drainage area is comprised of thirty-six (36) sub-areas. Each sub-area has a corresponding biofiltration system that it drains to. The biofiltration systems are connected to an underground storm sewer system and the flow is conveyed to one of two underground detention systems, located near Limonite Rd. The site detention basins have been designed to have a maximum outflow of 39.61 cfs discharging into Lateral A-2 in Limonite Rd.

For an exhibit of the post-development drainage condition, see ***Exhibit 4***, *Post-Development Drainage Condition*. ***Table 1*** contains a summary of the post-development condition runoff.

Table 1 - Post-Development Condition Runoff Summary

Location	Storm Frequency/Duration (cfs)	
	100-year 24-hour	
	In-Flow	Out-Flow
Detention Basin A	31.96 cfs	
Detention Basin B	24.12 cfs	
Total		**39.61**

Detention Basins

Two on-site below-ground detention basin are located near the south end of the site. See proposed hydrology map. Detention basin A is designed to maintain a peak discharge of 24.01 cfs that will drain via a weir into existing storm drain which runs along Limonite Avenue. The detention basin has been designed to store 6,663 cubic feet of stormwater runoff. Detention basin B is designed to maintain a peak discharge of 14.91 cfs that will drain via a weir into existing storm drain which runs along Limonite Avenue. The detention basin has been designed to store 7,423 cubic feet of stormwater runoff to offset peak inflow and outflow discharges of 56.08 and 39.61 cfs, respectively. The time to reach the peak discharge rate for Basin A is 20.69 min. The time to reach the peak discharge rate for Basin A is 12.50 min. The entire site shall drain to the detention basin via the underground storm sewer system before leaving the site.

Table 2 - Detention Basin Calculation Summary

Detention Basin	Pipe Diameter	Volume	Pipe Length
	(inches)	(CF)	(feet)
Detention Basin A	60	6663	170
Detention Basin B	60	7423	200

The detention basins are designed to control the discharge leaving the site and entering the MDP storm system to maintain a peak outflow discharge of 39.61 cfs for which the MDP storm sewer system was designed for at this location. These flows will exit the south and southeast corner of the project site into an underground storm sewer system (Lateral A-2 of MDP). The proposed storm sewer system including the detention basins are designed to mimic proposed peak runoff flow from the MDP with a proposed detention basin to mitigate any additional discharge due to the change in development to Industrial and Commercial Retail.

Results Summary and Discussion

The proposed site will have an underground storm sewer system that will collect stormwater runoff via strategically dispersed biofiltration systems and will covey the runoff to an underground detention system. The detention basin has been designed to mitigate the impacts of peak runoff, which is higher than the County's design hydrology for its downstream system. More specifically, the detention basin shall be able to receive an inflow discharge exceeding 56.08 cfs, while still maintaining a maximum 100-yr outflow discharge of 39.61 cfs, which is the County storm sewer design peak discharge. See ***Table 3****, Allowable- vs. Post-Development Condition Runoff Summary (Undetained), and* ***Table 4****, Allowable- vs. Post-Development Condition Runoff Summary (Detained)*.

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Table 3 - Allowable- vs. Post-Development Condition Runoff Summary (Undetained)

Condition	Storm Frequency/Duration (cfs)
	100-year 24-hour
Allowable Discharge	39.61
Post-Development (undetained)	56.08

Difference: 17.08

Table 4 - Allowable- vs. Post-Development Condition Runoff Summary (Detained)

Condition	Storm Frequency/Duration (cfs)
	100-year 24-hour
Allowable Discharge	39.61
Post-Development (undetained)	39.61

Difference: 0.00

REFERENCES

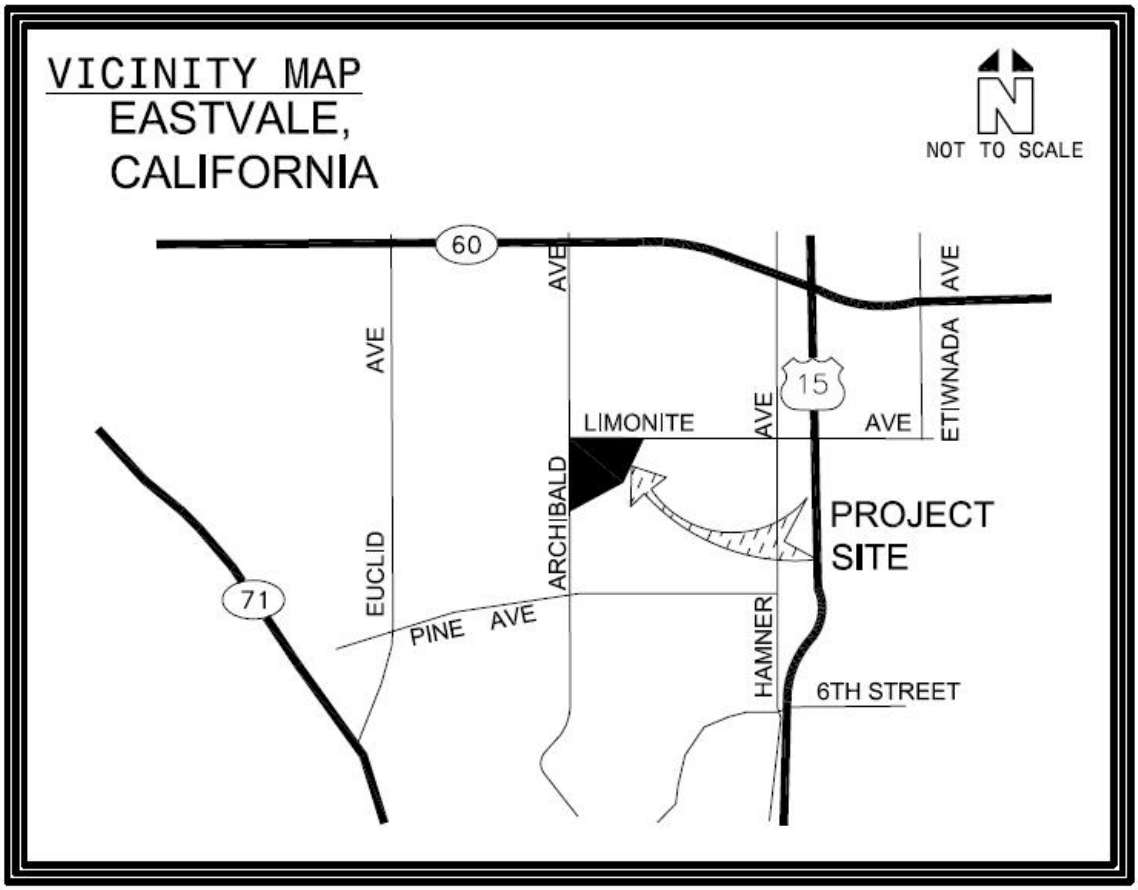
1) Riverside County Hydrology Manual, April 1978.

2) Riverside Hydrology Manual Addendum for Arid Regions, April 2010.

3) National Oceanic and Atmospheric Administration Atlas 14, volume 6, version 2, 2015.

EXHIBITS

Exhibit 1: Location Map



Project Site
Woodside Homes
Rose Petal Way
Kensington Ave
Crown Ct
E Arbor Ln
Remington Ave
Victory Ln
Harrison Ave
Archibald Ave
Limonite Ave
Rolling Meadow St
Buckhart St
Micah St
Providence Way
Google
Imagery ©2018 Google, Map data ©2018 Google
United States

Exhibit 2: Federal Emergency Management Agency Flood Insurance Rate Maps (FEMA FIRM)

Attached in the following order:

- Map Index (Sheet 1 of 2)
- Panel 06065C0679G (South of Site)
- Panel 06065C0681G (East of Site)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

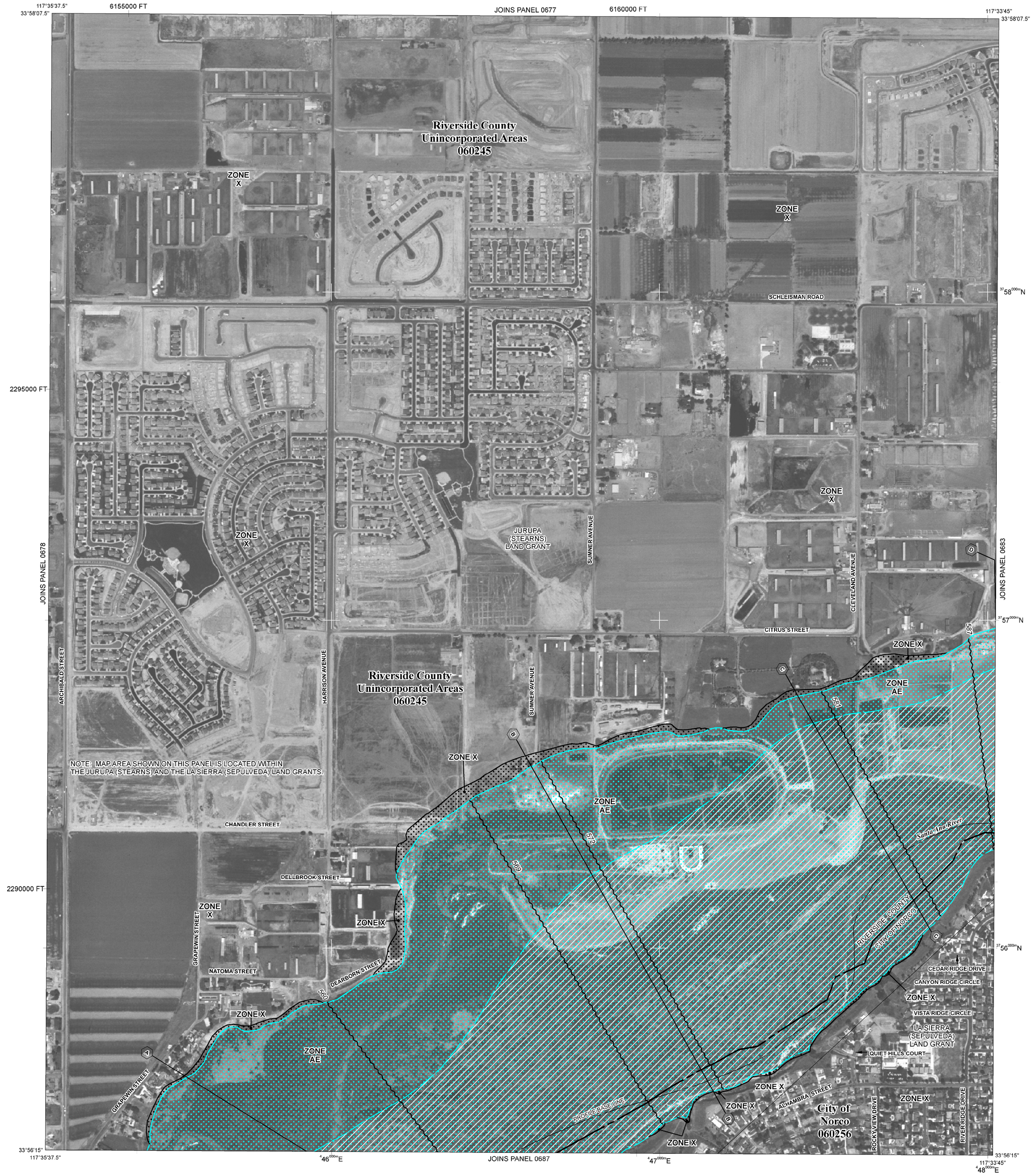
This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - - - -(23)	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
3776000mN	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0679G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 679 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NORCO, CITY OF	060256	0679	G
RIVERSIDE COUNTY	060245	0679	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

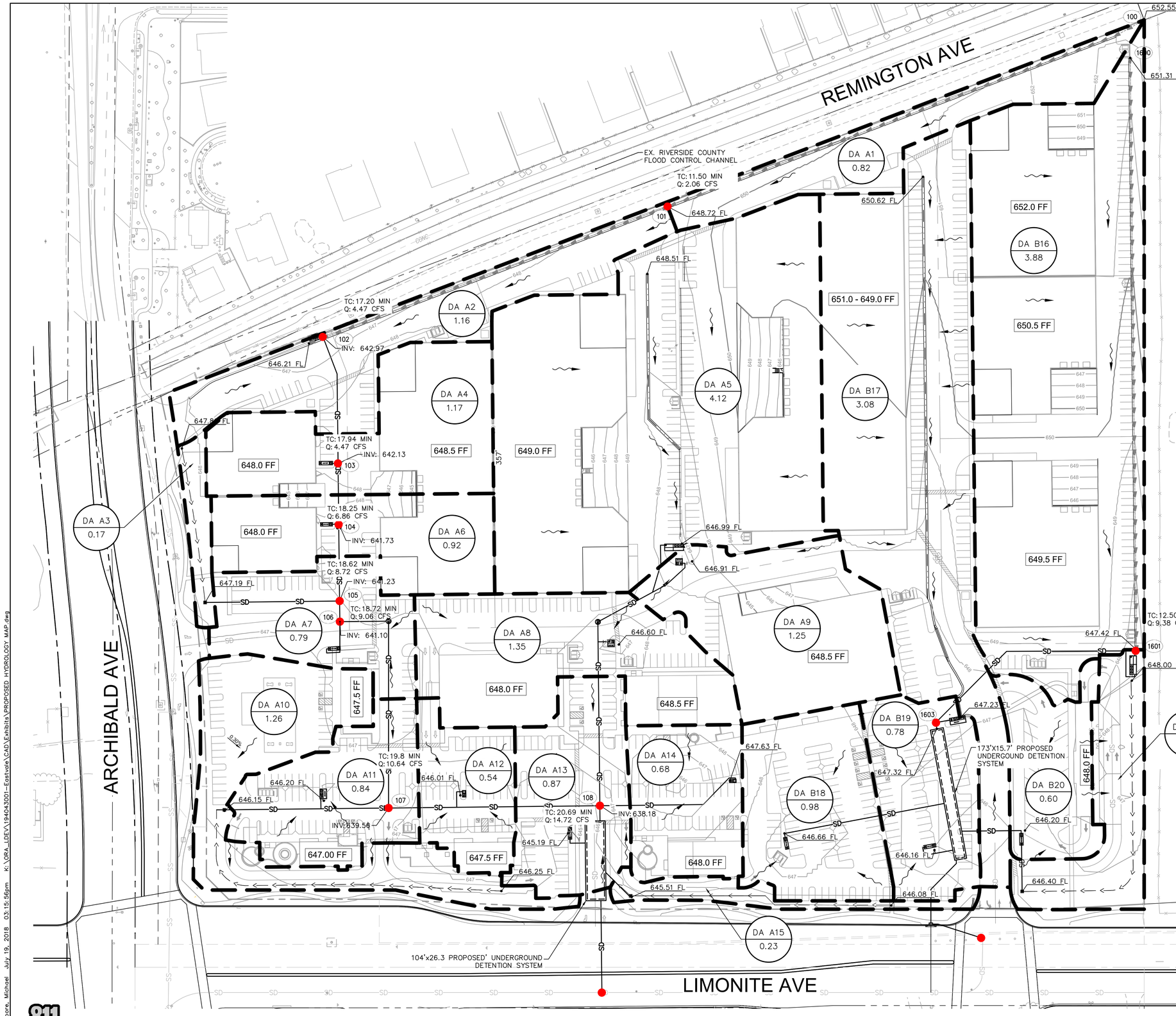
MAP NUMBER
06065C0679G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

Exhibit 3: Pre-Development Drainage Conditions

Exhibit 4: Post-Development Drainage Conditions



LEGEND

- RIGHT OF WAY/ PROPERTY LINE
- CENTERLINE
- DRAINAGE BOUNDARY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- FLOW LINE
- FLOW PATH
- VEGETATED SWALE/ BIORETENTION
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- (XX.XX TC) (XX.XX FS) EXISTING SPOT GRADE
- XX.XX TC XX.XX FS PROPOSED SPOT GRADE
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN MANHOLE
- DIRECTION OF WATER FLOW
- PROPOSED MODULAR WETLAND
- CONFLUENCE POINT
- XXX NODE
- PROPOSED UNDERGROUND DETENTION SYSTEM
- DA ID / ACRES DRAINAGE AREA LABEL

FLOOD ZONE

FLOOD ZONE X : AREA OF MINIMAL FLOOD HAZARD

NORTH

GRAPHIC SCALE IN FEET 0 30 60 120

Know what's below. Call 811 before you dig.

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2018 KIMLEY-HORN AND ASSOCIATES, INC.
765 THE CITY DRIVE, SUITE 200, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488
WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL
JASON MARECHAL
CA LICENSE NUMBER 63164
DATE: ____

KHA PROJECT 194043001
DATE 7/19/2018
SCALE AS SHOWN
DESIGNED BY BG
DRAWN BY CBK
CHECKED BY ML

PRELIMINARY HYDROLOGY EXHIBIT

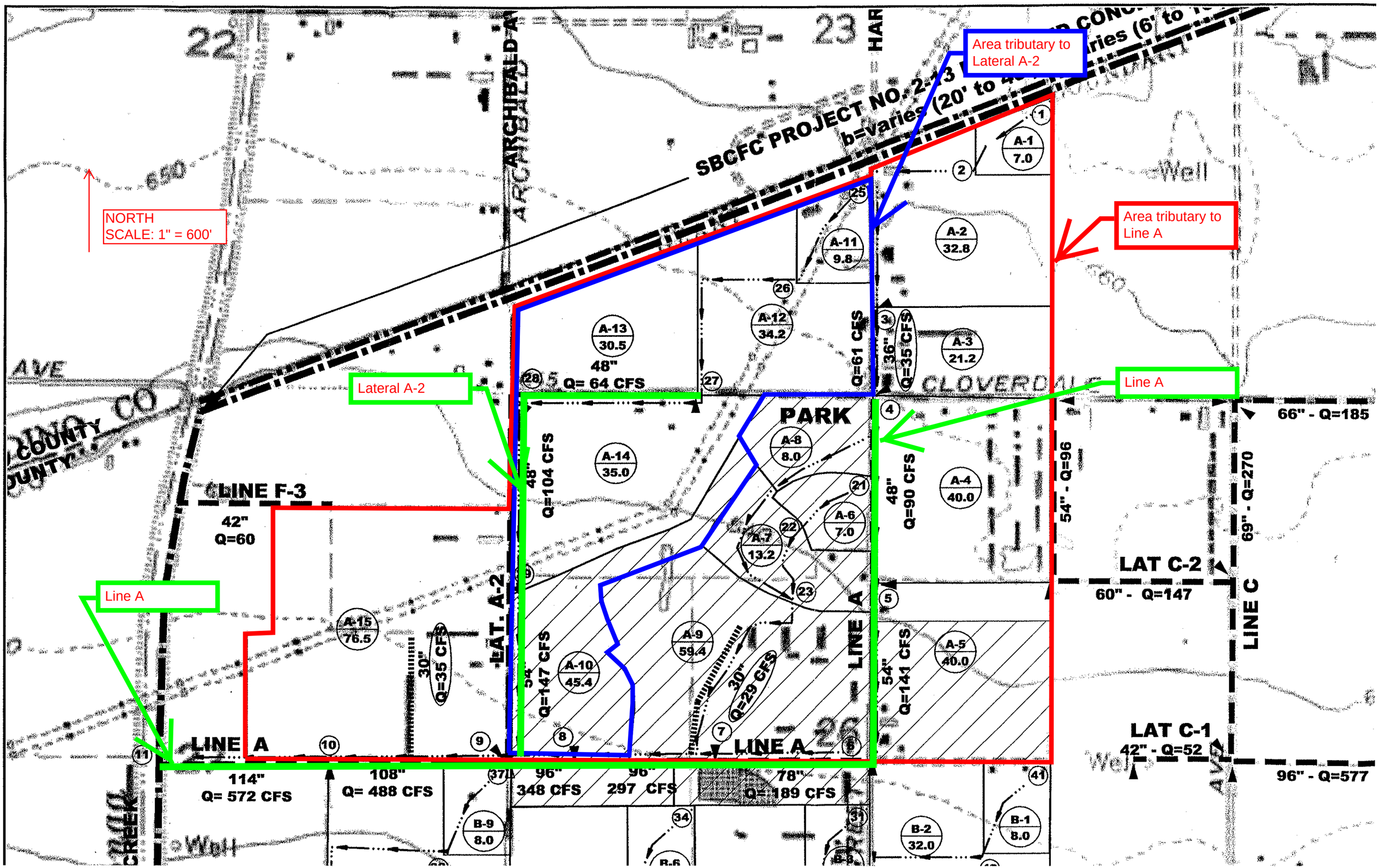
THE MERGE

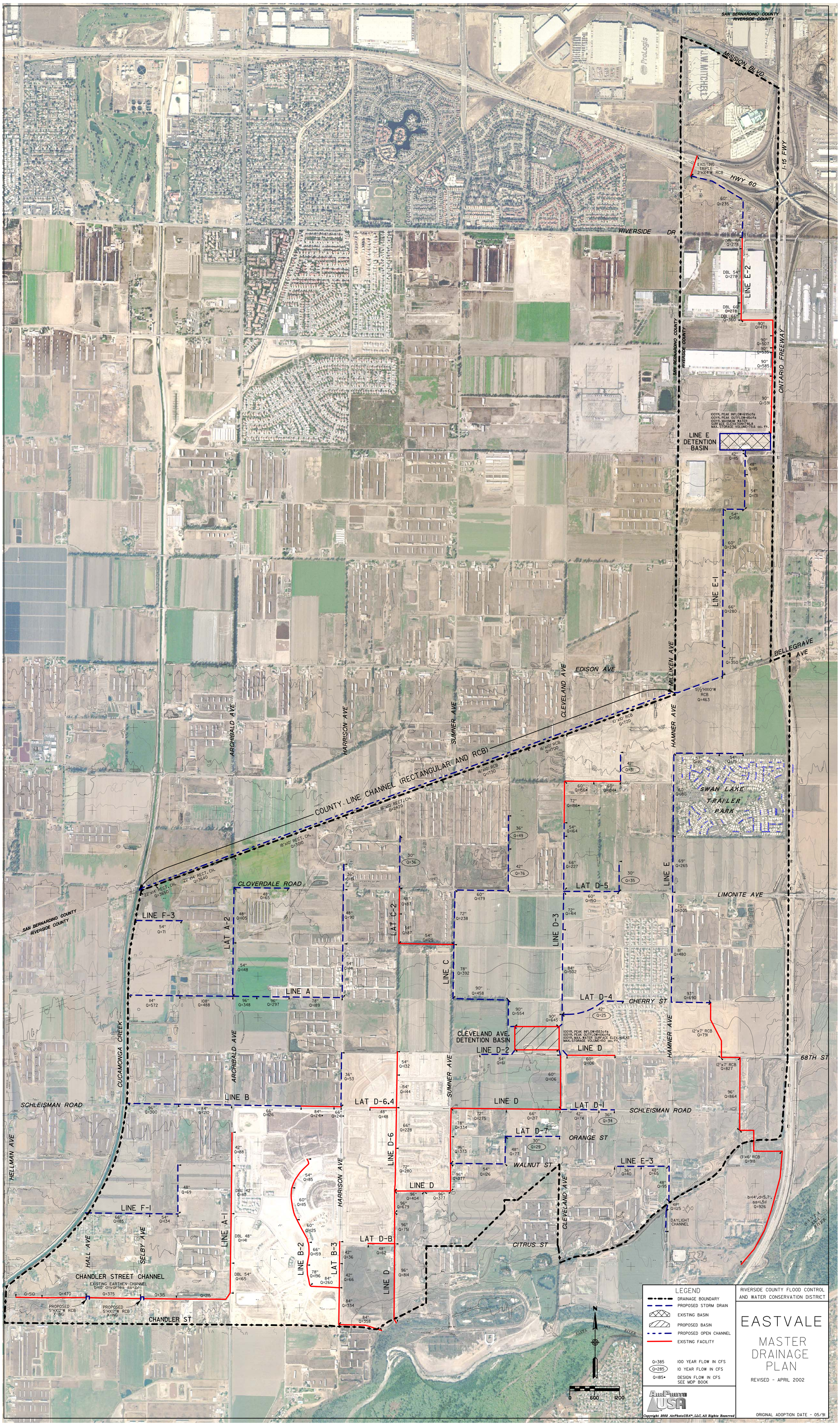
PREPARED FOR
THE MERGE COMPANY I, L.L.C.
280 NEWPONT CENTER DRIVE, SUITE 240
EASTVALE NEWPORT BEACH, CA 92660 CA

SHEET NUMBER
1

Plotted By:Lepore, Michael July 19, 2018 03:15:56pm K:\ORA_LDEV\194043001-Eastvale\CAD\Exhibits\PROPOSED HYDROLOGY MAP.dwg

Exhibit 5: Riverside County Flood Control Master Drainage Plan (MDP) Map


Area tributary to Lateral A-2
Area tributary to Line A
NORTH
SCALE: 1" = 600'
SBCFC PROJECT NO. 2-13
b=varies (20' to
b=varies (6' to
ARCHIBALD AVE
CLOVERDALE
A-1 7.0
A-2 32.8
A-3 21.2
A-4 40.0
A-5 40.0
A-6 7.0
A-7 13.2
A-8 8.0
A-9 59.4
A-10 45.4
A-11 9.8
A-12 34.2
A-13 30.5
A-14 35.0
A-15 76.5
B-1 8.0
B-2 32.0
B-6
B-9 8.0
48" Q= 64 CFS
Q=61 CFS
36" Q=35 CFS
48" Q=104 CFS
48" Q=90 CFS
54" - Q=96
66" - Q=185
69" - Q=270
PARK
LINE F-3
42" Q=60
Lateral A-2
Line A
LAT. A-2
54" Q=147 CFS
30" Q=35 CFS
30" Q=29 CFS
LINE A
54" Q=141 CFS
LAT C-2
60" - Q=147
LINE C
LAT C-1
42" - Q=52
96" - Q=577
114" Q= 572 CFS
108" Q= 488 CFS
96" 348 CFS
96" 297 CFS
78" Q= 189 CFS


SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
MISSION BLVD.
J.W. MITCHELL
ProLogis
I-15 FWY
EXISTING TRIPLE 2'HX4'W RCB
HWY 60
60" Q=235
RIVERSIDE DR
DBL 51" Q=278
DBL 54" Q=278
LINE E-2
DBL 66" Q=278
DBL 66" Q=360
90" Q=479
90" Q=507
90" Q=535
90" Q=585
90" Q=591
ONTARIO FREEWAY
100YR. PEAK INFLOW=695cfs
100YR. PEAK OUTFLOW=115cfs
100YR. MAXIMUM WATER SURFACE ELEVATION=746.8
MAX. STORAGE VOLUME=79.6 ac. ft.
LINE E DETENTION BASIN
42" Q=115
48" Q=115
54" Q=131
54" Q=158
60" Q=236
LINE E-1
66" Q=280
72" Q=350
BELLEGRAVE AVE
MILLIKEN AVE
5½'HX10'W RCB Q=463
EDISON AVE
CLEVELAND AVE
HAMNER AVE
ARCHIBALD AVE
HARRISON AVE
SUMNER AVE
10'x10' RCB Q=720
16'x10' RCB Q=1700
16'x10' RCB Q=1730
COUNTY LINE CHANNEL (RECTANGULAR AND RCB)
16'x10' RECT. CH. Q=2420
18'x10' RECT. CH. Q=3010
22'x14' RECT. CH. Q=3640
22'x14' RECT. CH. Q=3650
SWAN LAKE TRAILER PARK
57" Q=110
54" Q=75
60" Q=180
42" Q=51
60" Q=156
60" Q=104
72" Q=186
54" Q=164
66" Q=227
30" Q=35
LAT D-5
LINE E
69" Q=265
LIMONITE AVE
75" Q=305
CLOVERDALE ROAD
LINE F-3
LAT A-2
LAT C-2
LINE C
LINE D-3
LINE A
LAT D-4
CHERRY ST
CLEVELAND AVE. DETENTION BASIN
100YR. PEAK INFLOW=1553cfs
100YR. PEAK OUTFLOW=106cfs
100YR. MAX. WATER SURFACE ELEV.=618.43
MAX. STORAGE VOLUME=150 ac. ft.
LINE D-2
LINE D
12'x7' RCB Q=791
12'x7' RCB Q=827
68TH ST
CUCAMONGA CREEK
LINE B
LAT D-6.4
SCHLEISMAN ROAD
LAT D-1
LAT D-7
ORANGE ST
WALNUT ST
LINE E-3
13'x6' RCB Q=918
b=14',d=5.7', ss=1.5:1 Q=926
DAYLIGHT CHANNEL
SANTA ANA RIVER
HELLMAN AVE
LINE F-1
LINE A-1
LINE B-2
LAT B-3
LAT D-B
LINE D-6
CITRUS ST
HALL AVE
SELBY AVE
CHANDLER STREET CHANNEL
EXISTING EARTHEN CHANNEL b=10' d=varies ss=2:1
PROPOSED 5'HX12'W RCB X-ING
CHANDLER ST
LEGEND
DRAINAGE BOUNDARY
PROPOSED STORM DRAIN
EXISTING BASIN
PROPOSED BASIN
PROPOSED OPEN CHANNEL
EXISTING FACILITY
Q=385 100 YEAR FLOW IN CFS
Q=285 10 YEAR FLOW IN CFS
Q=185* DESIGN FLOW IN CFS SEE MDP BOOK
0 600 1200
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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
EASTVALE
MASTER DRAINAGE PLAN
REVISED - APRIL 2002
ORIGINAL ADOPTION DATE - 05/91

Appendix

Appendix A - Hydrologic / Hydraulic Reference Material

- USDA Soils Map and Descriptions
- Pages C-2, C-3, PLATE C-1.14, D-5.3, D-5.5, and E-6.2 from the Riverside County Hydrology Manual, dated 1978

oil Group — Summary By Map Unit

Summary by Map Unit — San Bernardino County Southwestern Part, California (CA677)
Summary by Map Unit — Western Riverside Area, California (CA679)

nit — San Bernardino County Southwestern Part, California (CA677)

ol	Map unit name	Rating	Acres in AOI
	Delhi fine sand	A	0.0
	Hilmar loamy fine sand	B	0.9
Survey Area			**0.9**

nit — Western Riverside Area, California (CA679)

ol	Map unit name	Rating	Acres in AOI
	Delhi fine sand	A	4.7
	Hilmar loamy very fine sand, 0 to 2 percent slopes	A	21.8
	Hilmar loamy fine sand	C	12.9
Survey Area			**39.4**
Interest			**40.3**

gic Soil Group

e based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are t
n long-duration storms.

tates are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a hig

moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture
a moderate rate of water transmission.

slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine
r transmission.

very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, so
he surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D a

rologic Soil Group

Dominant Condition

utoff: *None Specified*

Appendix B - Rational Method Calculation Results

```
****************************************************************************
  INTEGRATED RATIONAL METHOD/UH METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                      (Rational Tabling Version 18.0)
                  Release Date: 07/01/2011  License ID 1499

                           Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                 *
* PROPOSED CONDITIONS                                                      *
* PRELIMINARY HYDROLOGY AREA A                                             *
 ***************************************************************************

  FILE NAME: PEV100A.DAT
  TIME/DATE OF STUDY: 06:08 06/28/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.960
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.857
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.060
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.340
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4617035
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4608571
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.340
  SLOPE OF INTENSITY DURATION CURVE = 0.4609
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
```

```
  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    VALLEY S-GRAPH USED.
    * 1-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
    RIVERSIDE COUNTY DEPTH-AREA FACTORS USED (See Page B-3.)
    LOW LOSS RATE PERCENTAGE =  0.90
  *PRECIPITATION ZONE NUMBER (PZN) = 2.0
  *ANTECEDENT MOISTURE CONDITION (AMC) =  0.00 ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   670.00
  UPSTREAM ELEVATION(FEET) =    652.55
  DOWNSTREAM ELEVATION(FEET) =    648.72
  ELEVATION DIFFERENCE(FEET) =      3.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.869
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  COMMERCIAL                 B        0.82     0.8759       56   11.50
  SUBAREA RUNOFF(CFS) =      2.06
  TOTAL AREA(ACRES) =      0.82   TOTAL RUNOFF(CFS) =      2.06

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    648.72  DOWNSTREAM(FEET) =    646.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   504.00   CHANNEL SLOPE =  0.0050
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.013   MAXIMUM DEPTH(FEET) =   0.50
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.383
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                 B        1.16     0.8725       56
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.47
AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   5.71
Tc(MIN.) =   17.20
SUBAREA AREA(ACRES) =     1.16       SUBAREA RUNOFF(CFS) =    2.41
TOTAL AREA(ACRES) =        2.0         PEAK FLOW RATE(CFS) =       4.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.90; 30M = 0.00; 1HR = 0.00; 3HR = 0.00; 6HR = 0.00; 24HR = 0.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   1.55
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1174.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   642.97  DOWNSTREAM(FEET) =   642.13
FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.015
DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   3.84
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       4.47
PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   17.94
LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1344.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.337
SUBAREA Tc AND LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                 B        1.17     0.8721       56
SUBAREA AREA(ACRES) =    1.17   SUBAREA RUNOFF(CFS) =    2.39
TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =       6.86
TC(MIN.) =   17.94

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   642.13  DOWNSTREAM(FEET) =   641.73
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.31
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.86
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   18.25
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =    1423.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.319
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        0.92     0.8720       56
  SUBAREA AREA(ACRES) =    0.92   SUBAREA RUNOFF(CFS) =    1.86
  TOTAL AREA(ACRES) =        4.1   TOTAL RUNOFF(CFS) =       8.72
  TC(MIN.) =   18.25

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   641.73  DOWNSTREAM(FEET) =   641.23
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.47
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.72
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   18.62
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =    1523.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.298
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        0.17     0.8718       56
  SUBAREA AREA(ACRES) =    0.17   SUBAREA RUNOFF(CFS) =    0.34
  TOTAL AREA(ACRES) =        4.2   TOTAL RUNOFF(CFS) =       9.06
  TC(MIN.) =   18.62

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   641.23  DOWNSTREAM(FEET) =   641.10
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.40
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.06
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   18.72
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.292
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        0.79     0.8718       56
  SUBAREA AREA(ACRES) =    0.79   SUBAREA RUNOFF(CFS) =    1.58
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      10.64
  TC(MIN.) =   18.72

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   641.10  DOWNSTREAM(FEET) =   639.56
  FLOW LENGTH(FEET) =   308.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.76
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.64
  PIPE TRAVEL TIME(MIN.) =   1.08    Tc(MIN.) =   19.80
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    107.00 =    1858.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.234
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        2.10     0.8713       56
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    4.09
  TOTAL AREA(ACRES) =        7.1   TOTAL RUNOFF(CFS) =      14.72
  TC(MIN.) =   19.80

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

******************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   639.56  DOWNSTREAM(FEET) =   638.18
  FLOW LENGTH(FEET) =   276.00   MANNING'S N =  0.015
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.17
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.72
  PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =   20.69
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    108.00 =    2134.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.189
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

```
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                 B        9.04     0.8709       56
SUBAREA AREA(ACRES) =    9.04   SUBAREA RUNOFF(CFS) =   17.23
TOTAL AREA(ACRES) =       16.2   TOTAL RUNOFF(CFS) =      31.96
TC(MIN.) =   20.69

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
==============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       16.2  TC(MIN.) =     20.69
PEAK FLOW RATE(CFS)   =      31.96
==============================================================================
==============================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
  INTEGRATED RATIONAL METHOD/UH METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                      (Rational Tabling Version 18.0)
                  Release Date: 07/01/2011  License ID 1499

                           Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                 *
* PROPOSED CONDITIONS                                                      *
* PRELIMINARY HYDROLOGY AREA B                                             *
 ***************************************************************************

  FILE NAME: PEV100B.DAT
  TIME/DATE OF STUDY: 06:33 06/28/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.960
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.857
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.060
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.340
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4617035
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4608571
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.340
  SLOPE OF INTENSITY DURATION CURVE = 0.4609
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
```

```
  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    VALLEY S-GRAPH USED.
    * 1-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
    RIVERSIDE COUNTY DEPTH-AREA FACTORS USED (See Page B-3.)
    LOW LOSS RATE PERCENTAGE =  0.90
  *PRECIPITATION ZONE NUMBER (PZN) = 2.0
  *ANTECEDENT MOISTURE CONDITION (AMC) =  0.00 ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE   1600.00 TO NODE   1601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   774.00
  UPSTREAM ELEVATION(FEET) =    651.31
  DOWNSTREAM ELEVATION(FEET) =    647.42
  ELEVATION DIFFERENCE(FEET) =      3.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  COMMERCIAL                 B        3.88     0.8752       56   12.50
  SUBAREA RUNOFF(CFS) =      9.38
  TOTAL AREA(ACRES) =      3.88   TOTAL RUNOFF(CFS) =      9.38

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        6.10     0.8752       56
```

```
  SUBAREA AREA(ACRES) =    6.10   SUBAREA RUNOFF(CFS) =   14.74
  TOTAL AREA(ACRES) =       10.0   TOTAL RUNOFF(CFS) =      24.12
  TC(MIN.) =   12.50

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       10.0  TC(MIN.) =     12.50
  PEAK FLOW RATE(CFS)   =      24.12
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix C - Hydrograph Calculation Results

```
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:

                     Kimley-Horn and Associates, Inc.
                            765 The City Drive
                                Suite 200
                             Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                *
* PROPOSED CONDITIONS                                                     *
* UNIT HYDROGRAPH A 1-HR                                                  *
 ***************************************************************************

  FILE NAME: PEVUHA.DAT
  TIME/DATE OF STUDY: 06:58 06/28/2018


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    108.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      16.200 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.280 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.100
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  1.34 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.46)
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000
```

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 29.762

==========

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	2.832	5.549
2	12.933	19.790
3	31.459	36.296
4	51.946	40.138
5	64.569	24.730
6	72.037	14.632
7	77.043	9.807
8	80.853	7.464
9	83.817	5.809
10	86.254	4.774
11	88.211	3.834
12	89.915	3.338
13	91.350	2.811
14	92.585	2.419
15	93.682	2.149
16	94.627	1.852
17	95.502	1.715
18	96.249	1.463
19	96.827	1.133
20	97.405	1.132
21	97.943	1.054
22	98.207	0.518
23	98.421	0.418
24	98.635	0.419
25	98.848	0.418
26	99.062	0.419
27	99.275	0.418
28	99.489	0.418
29	99.702	0.418
30	99.916	0.418
31	100.000	0.165

****

PEVUHA.RES

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0619	0.0083	0.0536
2	0.0652	0.0083	0.0569
3	0.0692	0.0083	0.0609
4	0.0760	0.0083	0.0677
5	0.0800	0.0083	0.0717
6	0.0905	0.0083	0.0822
7	0.1055	0.0083	0.0972
8	0.1155	0.0083	0.1072
9	0.1710	0.0083	0.1627
10	0.3390	0.0083	0.3307
11	0.0979	0.0083	0.0896
12	0.0681	0.0083	0.0598

TOTAL STORM RAINFALL(INCHES) = 1.34
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.24

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.1350
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.6731

↑

==========

1 - 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 FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 7.5 15.0 22.5 30.0
0.083	0.0020	0.30	Q . . . .
0.167	0.0115	1.38	VQ . . . .
0.250	0.0350	3.41	V Q . . . .
0.333	0.0749	5.80	.V Q . . . .
0.417	0.1270	7.56	. V Q . . .
0.500	0.1887	8.96	. V .Q . . .
0.583	0.2600	10.35	. V . Q . . .
0.667	0.3419	11.90	. V . Q . . .
0.750	0.4380	13.95	. V Q . . .
0.833	0.5594	17.63	. . V . Q . .
0.917	0.7171	22.89	. . V . Q .
1.000	0.9039	27.13	. . .V . Q .

```
1.083      1.0842     26.18  .         .         .    V    .   Q     .
1.167      1.2197     19.67  .         .         .     Q  V.         .
1.250      1.3143     13.73  .         .       Q .         .V        .
1.333      1.3793      9.45  .         . Q       .         . V       .
1.417      1.4277      7.02  .        Q.         .         .   V     .
1.500      1.4657      5.53  .      Q  .         .         .    V    .
1.583      1.4969      4.53  .     Q   .         .         .    V    .
1.667      1.5228      3.76  .    Q    .         .         .     V   .
1.750      1.5450      3.22  .   Q     .         .         .     V   .
1.833      1.5639      2.74  .  Q      .         .         .      V  .
1.917      1.5801      2.36  .  Q      .         .         .      V  .
2.000      1.5942      2.05  . Q       .         .         .       V .
2.083      1.6064      1.77  . Q       .         .         .       V .
2.167      1.6171      1.55  . Q       .         .         .       V .
2.250      1.6263      1.33  .Q        .         .         .       V .
2.333      1.6340      1.12  .Q        .         .         .        V.
2.417      1.6408      1.00  .Q        .         .         .        V.
2.500      1.6467      0.85  .Q        .         .         .        V.
2.583      1.6511      0.64  Q         .         .         .        V.
2.667      1.6547      0.53  Q         .         .         .        V.
2.750      1.6579      0.46  Q         .         .         .        V.
2.833      1.6609      0.43  Q         .         .         .        V.
2.917      1.6636      0.40  Q         .         .         .        V.
3.000      1.6662      0.37  Q         .         .         .        V.
3.083      1.6684      0.33  Q         .         .         .        V.
3.167      1.6704      0.29  Q         .         .         .        V.
3.250      1.6720      0.23  Q         .         .         .        V.
3.333      1.6728      0.12  Q         .         .         .        V.
3.417      1.6731      0.04  Q         .         .         .        V.
3.500      1.6731      0.01  Q         .         .         .         V
-------------------------------------------------------------------------------
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	210.0
10%	100.0
20%	75.0
30%	55.0
40%	40.0
50%	35.0
60%	25.0
70%	20.0
80%	15.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                     (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                           Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                *
* PROPOSED CONDITIONS                                                     *
* UNIT HYDROGRAPH A 24-HR                                                 *
 **************************************************************************

  FILE NAME: PEVUHA.DAT
  TIME/DATE OF STUDY: 06:47 06/28/2018


****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    108.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      16.200 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.280 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.100
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.050
         USER-ENTERED RAINFALL =  6.04 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000
```

UNIT HYDROGRAPH TIME UNIT = 15.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 89.286

==========

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	15.741	10.280
2	62.851	30.765
3	80.571	11.572
4	88.127	4.935
5	92.539	2.881
6	95.459	1.907
7	97.392	1.262
8	98.421	0.672
9	99.062	0.418
10	99.625	0.368
11	99.906	0.184
12	100.000	0.061

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0121	0.0109	0.0012
2	0.0181	0.0163	0.0018
3	0.0181	0.0163	0.0018
4	0.0242	0.0217	0.0024
5	0.0181	0.0163	0.0018
6	0.0181	0.0163	0.0018
7	0.0181	0.0163	0.0018
8	0.0242	0.0217	0.0024
9	0.0242	0.0217	0.0024
10	0.0242	0.0217	0.0024
11	0.0302	0.0272	0.0030
12	0.0302	0.0272	0.0030
13	0.0302	0.0272	0.0030
14	0.0302	0.0272	0.0030
15	0.0302	0.0272	0.0030

16	0.0362	0.0326	0.0036
17	0.0362	0.0326	0.0036
18	0.0423	0.0359	0.0064
19	0.0423	0.0354	0.0069
20	0.0483	0.0349	0.0134
21	0.0362	0.0326	0.0036
22	0.0423	0.0340	0.0082
23	0.0483	0.0336	0.0147
24	0.0483	0.0331	0.0152
25	0.0544	0.0327	0.0217
26	0.0544	0.0323	0.0221
27	0.0604	0.0318	0.0286
28	0.0604	0.0314	0.0290
29	0.0604	0.0310	0.0294
30	0.0664	0.0306	0.0359
31	0.0725	0.0301	0.0423
32	0.0785	0.0297	0.0488
33	0.0906	0.0293	0.0613
34	0.0906	0.0289	0.0617
35	0.0966	0.0285	0.0681
36	0.1027	0.0281	0.0746
37	0.1148	0.0277	0.0871
38	0.1208	0.0273	0.0935
39	0.1268	0.0269	0.0999
40	0.1329	0.0265	0.1063
41	0.0906	0.0261	0.0645
42	0.0906	0.0258	0.0648
43	0.1208	0.0254	0.0954
44	0.1208	0.0250	0.0958
45	0.1148	0.0247	0.0901
46	0.1148	0.0243	0.0905
47	0.1027	0.0239	0.0787
48	0.1087	0.0236	0.0851
49	0.1510	0.0232	0.1278
50	0.1570	0.0229	0.1342
51	0.1691	0.0225	0.1466
52	0.1752	0.0222	0.1530
53	0.2054	0.0219	0.1835
54	0.2054	0.0215	0.1838
55	0.1389	0.0212	0.1177
56	0.1389	0.0209	0.1180
57	0.1631	0.0206	0.1425
58	0.1570	0.0202	0.1368
59	0.1570	0.0199	0.1371
60	0.1510	0.0196	0.1314
61	0.1450	0.0193	0.1256
62	0.1389	0.0190	0.1199
63	0.1148	0.0187	0.0960
64	0.1148	0.0185	0.0963

65	0.0242	0.0182	0.0060
66	0.0242	0.0179	0.0063
67	0.0181	0.0163	0.0018
68	0.0181	0.0163	0.0018
69	0.0302	0.0171	0.0131
70	0.0302	0.0168	0.0134
71	0.0302	0.0166	0.0136
72	0.0242	0.0163	0.0078
73	0.0242	0.0161	0.0081
74	0.0242	0.0159	0.0083
75	0.0181	0.0156	0.0025
76	0.0121	0.0109	0.0012
77	0.0181	0.0152	0.0029
78	0.0242	0.0150	0.0092
79	0.0181	0.0148	0.0033
80	0.0121	0.0109	0.0012
81	0.0181	0.0144	0.0037
82	0.0181	0.0142	0.0039
83	0.0181	0.0140	0.0041
84	0.0121	0.0109	0.0012
85	0.0181	0.0137	0.0044
86	0.0121	0.0109	0.0012
87	0.0181	0.0134	0.0047
88	0.0121	0.0109	0.0012
89	0.0181	0.0131	0.0050
90	0.0121	0.0109	0.0012
91	0.0121	0.0109	0.0012
92	0.0121	0.0109	0.0012
93	0.0121	0.0109	0.0012
94	0.0121	0.0109	0.0012
95	0.0121	0.0109	0.0012
96	0.0121	0.0109	0.0012

TOTAL STORM RAINFALL(INCHES) = 6.04
TOTAL SOIL-LOSS(INCHES) = 2.07
TOTAL EFFECTIVE RAINFALL(INCHES) = 3.97

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2.7881
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 5.3629

↑

==========

2 4 - 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 FIVE-MINUTE UNIT INTERVALS(CFS)

PEVUHA.RES

(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	5.0	10.0	15.0	20.0
0.083	0.0001	0.01	Q	.	.	.	.
0.167	0.0002	0.01	Q	.	.	.	.
0.250	0.0003	0.01	Q	.	.	.	.
0.333	0.0006	0.06	Q	.	.	.	.
0.417	0.0010	0.06	Q	.	.	.	.
0.500	0.0014	0.06	Q	.	.	.	.
0.583	0.0020	0.09	Q	.	.	.	.
0.667	0.0026	0.09	Q	.	.	.	.
0.750	0.0032	0.09	Q	.	.	.	.
0.833	0.0040	0.11	Q	.	.	.	.
0.917	0.0047	0.11	Q	.	.	.	.
1.000	0.0055	0.11	Q	.	.	.	.
1.083	0.0063	0.13	Q	.	.	.	.
1.167	0.0072	0.13	Q	.	.	.	.
1.250	0.0081	0.13	Q	.	.	.	.
1.333	0.0089	0.12	Q	.	.	.	.
1.417	0.0097	0.12	Q	.	.	.	.
1.500	0.0105	0.12	Q	.	.	.	.
1.583	0.0113	0.12	Q	.	.	.	.
1.667	0.0121	0.12	Q	.	.	.	.
1.750	0.0129	0.12	Q	.	.	.	.
1.833	0.0138	0.12	Q	.	.	.	.
1.917	0.0147	0.12	Q	.	.	.	.
2.000	0.0155	0.12	Q	.	.	.	.
2.083	0.0165	0.14	Q	.	.	.	.
2.167	0.0175	0.14	Q	.	.	.	.
2.250	0.0185	0.14	Q	.	.	.	.
2.333	0.0195	0.15	Q	.	.	.	.
2.417	0.0205	0.15	Q	.	.	.	.
2.500	0.0216	0.15	Q	.	.	.	.
2.583	0.0227	0.16	Q	.	.	.	.
2.667	0.0238	0.16	Q	.	.	.	.
2.750	0.0249	0.16	Q	.	.	.	.
2.833	0.0261	0.18	Q	.	.	.	.
2.917	0.0273	0.18	Q	.	.	.	.
3.000	0.0286	0.18	Q	.	.	.	.
3.083	0.0299	0.19	Q	.	.	.	.
3.167	0.0312	0.19	Q	.	.	.	.
3.250	0.0325	0.19	Q	.	.	.	.
3.333	0.0338	0.19	Q	.	.	.	.
3.417	0.0351	0.19	Q	.	.	.	.
3.500	0.0364	0.19	Q	.	.	.	.
3.583	0.0378	0.19	Q	.	.	.	.
3.667	0.0391	0.19	Q	.	.	.	.
3.750	0.0404	0.19	Q	.	.	.	.

3.833	0.0418	0.20	Q	.	.	.	.
3.917	0.0432	0.20	Q	.	.	.	.
4.000	0.0446	0.20	Q	.	.	.	.
4.083	0.0461	0.22	Q	.	.	.	.
4.167	0.0476	0.22	Q	.	.	.	.
4.250	0.0491	0.22	Q	.	.	.	.
4.333	0.0509	0.26	Q	.	.	.	.
4.417	0.0527	0.26	Q	.	.	.	.
4.500	0.0545	0.26	Q	.	.	.	.
4.583	0.0569	0.35	Q	.	.	.	.
4.667	0.0593	0.35	Q	.	.	.	.
4.750	0.0617	0.35	Q	.	.	.	.
4.833	0.0649	0.47	Q	.	.	.	.
4.917	0.0681	0.47	Q	.	.	.	.
5.000	0.0714	0.47	Q	.	.	.	.
5.083	0.0754	0.59	VQ	.	.	.	.
5.167	0.0794	0.59	VQ	.	.	.	.
5.250	0.0835	0.59	VQ	.	.	.	.
5.333	0.0864	0.42	Q	.	.	.	.
5.417	0.0893	0.42	Q	.	.	.	.
5.500	0.0922	0.42	Q	.	.	.	.
5.583	0.0960	0.56	VQ	.	.	.	.
5.667	0.0998	0.56	VQ	.	.	.	.
5.750	0.1036	0.56	VQ	.	.	.	.
5.833	0.1090	0.79	VQ	.	.	.	.
5.917	0.1145	0.79	VQ	.	.	.	.
6.000	0.1199	0.79	VQ	.	.	.	.
6.083	0.1265	0.95	VQ	.	.	.	.
6.167	0.1330	0.95	VQ	.	.	.	.
6.250	0.1396	0.95	Q	.	.	.	.
6.333	0.1478	1.20	.VQ	.	.	.	.
6.417	0.1561	1.20	.VQ	.	.	.	.
6.500	0.1644	1.20	.VQ	.	.	.	.
6.583	0.1738	1.38	.VQ	.	.	.	.
6.667	0.1833	1.38	.VQ	.	.	.	.
6.750	0.1928	1.38	.VQ	.	.	.	.
6.833	0.2040	1.63	.V Q	.	.	.	.
6.917	0.2153	1.63	.V Q	.	.	.	.
7.000	0.2265	1.63	.V Q	.	.	.	.
7.083	0.2386	1.76	.V Q	.	.	.	.
7.167	0.2507	1.76	.V Q	.	.	.	.
7.250	0.2629	1.76	.V Q	.	.	.	.
7.333	0.2759	1.89	. VQ	.	.	.	.
7.417	0.2889	1.89	. VQ	.	.	.	.
7.500	0.3019	1.89	. VQ	.	.	.	.
7.583	0.3171	2.20	. V Q	.	.	.	.
7.667	0.3322	2.20	. V Q	.	.	.	.
7.750	0.3473	2.20	. V Q	.	.	.	.
7.833	0.3649	2.56	. V Q	.	.	.	.

```
 7.917      0.3825      2.56  . V  Q    .         .         .         .
 8.000      0.4002      2.56  . V  Q    .         .         .         .
 8.083      0.4209      3.01  .  V  Q   .         .         .         .
 8.167      0.4416      3.01  .  V  Q   .         .         .         .
 8.250      0.4623      3.01  .  V  Q   .         .         .         .
 8.333      0.4866      3.53  .  V   Q  .         .         .         .
 8.417      0.5109      3.53  .  V   Q  .         .         .         .
 8.500      0.5352      3.53  .  V   Q  .         .         .         .
 8.583      0.5615      3.82  .   V  Q  .         .         .         .
 8.667      0.5878      3.82  .   V  Q  .         .         .         .
 8.750      0.6141      3.82  .   V  Q  .         .         .         .
 8.833      0.6430      4.19  .   V   Q .         .         .         .
 8.917      0.6719      4.19  .    V  Q .         .         .         .
 9.000      0.7008      4.19  .    V  Q .         .         .         .
 9.083      0.7329      4.66  .    V   Q.         .         .         .
 9.167      0.7650      4.66  .    V   Q.         .         .         .
 9.250      0.7971      4.66  .    V   Q.         .         .         .
 9.333      0.8333      5.26  .     V   Q         .         .         .
 9.417      0.8695      5.26  .     V   Q         .         .         .
 9.500      0.9057      5.26  .     V   Q         .         .         .
 9.583      0.9452      5.74  .      V  .Q        .         .         .
 9.667      0.9847      5.74  .      V  .Q        .         .         .
 9.750      1.0243      5.74  .      V  .Q        .         .         .
 9.833      1.0669      6.19  .      V  . Q       .         .         .
 9.917      1.1095      6.19  .       V . Q       .         .         .
10.000      1.1521      6.19  .       V . Q       .         .         .
10.083      1.1943      6.13  .       V . Q       .         .         .
10.167      1.2365      6.13  .        V. Q       .         .         .
10.250      1.2787      6.13  .        V. Q       .         .         .
10.333      1.3132      5.01  .        VQ         .         .         .
10.417      1.3477      5.01  .         Q         .         .         .
10.500      1.3822      5.01  .         Q         .         .         .
10.583      1.4162      4.94  .        QV         .         .         .
10.667      1.4502      4.94  .        QV         .         .         .
10.750      1.4842      4.94  .        Q V        .         .         .
10.833      1.5237      5.73  .         .Q        .         .         .
10.917      1.5631      5.73  .         .Q        .         .         .
11.000      1.6026      5.73  .         .Q        .         .         .
11.083      1.6436      5.95  .         .QV       .         .         .
11.167      1.6846      5.95  .         .QV       .         .         .
11.250      1.7257      5.95  .         .QV       .         .         .
11.333      1.7662      5.88  .         .Q V      .         .         .
11.417      1.8067      5.88  .         .Q V      .         .         .
11.500      1.8472      5.88  .         .Q V      .         .         .
11.583      1.8868      5.76  .         .Q  V     .         .         .
11.667      1.9265      5.76  .         .Q  V     .         .         .
11.750      1.9661      5.76  .         .Q  V     .         .         .
11.833      2.0038      5.48  .         Q   V     .         .         .
11.917      2.0415      5.48  .         Q    V    .         .         .
```

```
12.000      2.0793      5.48  .          Q    V    .          .          .
12.083      2.1205      5.99  .          .Q   V    .          .          .
12.167      2.1617      5.99  .          .Q    V   .          .          .
12.250      2.2030      5.99  .          .Q    V   .          .          .
12.333      2.2538      7.38  .          .   Q V   .          .          .
12.417      2.3046      7.38  .          .   Q  V  .          .          .
12.500      2.3554      7.38  .          .   Q  V  .          .          .
12.583      2.4118      8.19  .          .     QV  .          .          .
12.667      2.4682      8.19  .          .     Q V .          .          .
12.750      2.5247      8.19  .          .     Q V .          .          .
12.833      2.5862      8.93  .          .      Q V.          .          .
12.917      2.6476      8.93  .          .      Q V.          .          .
13.000      2.7091      8.93  .          .      Q  V          .          .
13.083      2.7762      9.74  .          .        QV          .          .
13.167      2.8432      9.74  .          .        Q V         .          .
13.250      2.9103      9.74  .          .        Q V         .          .
13.333      2.9854     10.91  .          .          .QV       .          .
13.417      3.0606     10.91  .          .          .QV       .          .
13.500      3.1358     10.91  .          .          .Q V      .          .
13.583      3.2097     10.73  .          .          .Q V      .          .
13.667      3.2835     10.73  .          .          .Q  V     .          .
13.750      3.3574     10.73  .          .          .Q   V    .          .
13.833      3.4189      8.93  .          .      Q  .    V    .          .
13.917      3.4804      8.93  .          .      Q  .    V    .          .
14.000      3.5420      8.93  .          .      Q  .     V   .          .
14.083      3.6010      8.57  .          .      Q  .     V   .          .
14.167      3.6599      8.57  .          .      Q  .      V  .          .
14.250      3.7189      8.57  .          .      Q  .      V  .          .
14.333      3.7812      9.03  .          .       Q .       V .          .
14.417      3.8434      9.03  .          .       Q .       V .          .
14.500      3.9056      9.03  .          .       Q .        V.          .
14.583      3.9676      9.01  .          .       Q .        V.          .
14.667      4.0297      9.01  .          .       Q .         V          .
14.750      4.0918      9.01  .          .       Q .         V          .
14.833      4.1533      8.93  .          .      Q  .         V          .
14.917      4.2147      8.93  .          .      Q  .          V         .
15.000      4.2762      8.93  .          .      Q  .          V         .
15.083      4.3359      8.67  .          .      Q  .         . V        .
15.167      4.3956      8.67  .          .      Q  .         . V        .
15.250      4.4554      8.67  .          .      Q  .         .  V       .
15.333      4.5130      8.37  .          .     Q   .         .  V       .
15.417      4.5706      8.37  .          .     Q   .         .   V      .
15.500      4.6283      8.37  .          .     Q   .         .   V      .
15.583      4.6824      7.85  .          .    Q    .         .   V      .
15.667      4.7364      7.85  .          .    Q    .         .    V     .
15.750      4.7905      7.85  .          .    Q    .         .    V     .
15.833      4.8387      7.00  .          .  Q      .         .     V    .
15.917      4.8869      7.00  .          .  Q      .         .     V    .
16.000      4.9351      7.00  .          .  Q      .         .     V    .
```

```
16.083      4.9746      5.74  .          .Q        .          .      V  .
16.167      5.0142      5.74  .          .Q        .          .      V  .
16.250      5.0537      5.74  .          .Q        .          .      V  .
16.333      5.0731      2.82  .    Q     .         .          .      V  .
16.417      5.0925      2.82  .    Q     .         .          .      V  .
16.500      5.1119      2.82  .    Q     .         .          .       V .
16.583      5.1233      1.65  .  Q       .         .          .       V .
16.667      5.1347      1.65  .  Q       .         .          .       V .
16.750      5.1460      1.65  .  Q       .         .          .       V .
16.833      5.1530      1.01  . Q        .         .          .       V .
16.917      5.1600      1.01  . Q        .         .          .       V .
17.000      5.1669      1.01  . Q        .         .          .       V .
17.083      5.1723      0.78  .Q         .         .          .       V .
17.167      5.1777      0.78  .Q         .         .          .       V .
17.250      5.1830      0.78  .Q         .         .          .       V .
17.333      5.1893      0.91  .Q         .         .          .       V .
17.417      5.1956      0.91  .Q         .         .          .       V .
17.500      5.2019      0.91  .Q         .         .          .       V .
17.583      5.2082      0.92  .Q         .         .          .       V .
17.667      5.2146      0.92  .Q         .         .          .       V .
17.750      5.2209      0.92  .Q         .         .          .       V .
17.833      5.2267      0.84  .Q         .         .          .       V .
17.917      5.2325      0.84  .Q         .         .          .        V.
18.000      5.2383      0.84  .Q         .         .          .        V.
18.083      5.2428      0.66  .Q         .         .          .        V.
18.167      5.2474      0.66  .Q         .         .          .        V.
18.250      5.2519      0.66  .Q         .         .          .        V.
18.333      5.2559      0.59  .Q         .         .          .        V.
18.417      5.2600      0.59  .Q         .         .          .        V.
18.500      5.2640      0.59  .Q         .         .          .        V.
18.583      5.2675      0.50  .Q         .         .          .        V.
18.667      5.2710      0.50  .Q         .         .          .        V.
18.750      5.2744      0.50  .Q         .         .          .        V.
18.833      5.2765      0.30  Q          .         .          .        V.
18.917      5.2786      0.30  Q          .         .          .        V.
19.000      5.2807      0.30  Q          .         .          .        V.
19.083      5.2821      0.21  Q          .         .          .        V.
19.167      5.2835      0.21  Q          .         .          .        V.
19.250      5.2850      0.21  Q          .         .          .        V.
19.333      5.2869      0.28  Q          .         .          .        V.
19.417      5.2888      0.28  Q          .         .          .        V.
19.500      5.2907      0.28  Q          .         .          .        V.
19.583      5.2936      0.41  Q          .         .          .        V.
19.667      5.2964      0.41  Q          .         .          .        V.
19.750      5.2992      0.41  Q          .         .          .        V.
19.833      5.3010      0.27  Q          .         .          .        V.
19.917      5.3029      0.27  Q          .         .          .        V.
20.000      5.3048      0.27  Q          .         .          .        V.
20.083      5.3061      0.19  Q          .         .          .        V.
```

20.167	5.3074	0.19	Q	.	.	.	V.
20.250	5.3087	0.19	Q	.	.	.	V.
20.333	5.3102	0.23	Q	.	.	.	V.
20.417	5.3118	0.23	Q	.	.	.	V.
20.500	5.3134	0.23	Q	.	.	.	V.
20.583	5.3151	0.25	Q	.	.	.	V.
20.667	5.3168	0.25	Q	.	.	.	V.
20.750	5.3186	0.25	Q	.	.	.	V.
20.833	5.3201	0.23	Q	.	.	.	V.
20.917	5.3217	0.23	Q	.	.	.	V.
21.000	5.3233	0.23	Q	.	.	.	V.
21.083	5.3245	0.18	Q	.	.	.	V.
21.167	5.3257	0.18	Q	.	.	.	V.
21.250	5.3269	0.18	Q	.	.	.	V.
21.333	5.3284	0.21	Q	.	.	.	V.
21.417	5.3298	0.21	Q	.	.	.	V.
21.500	5.3313	0.21	Q	.	.	.	V.
21.583	5.3325	0.17	Q	.	.	.	V.
21.667	5.3336	0.17	Q	.	.	.	V.
21.750	5.3348	0.17	Q	.	.	.	V.
21.833	5.3363	0.22	Q	.	.	.	V.
21.917	5.3378	0.22	Q	.	.	.	V.
22.000	5.3393	0.22	Q	.	.	.	V.
22.083	5.3405	0.18	Q	.	.	.	V.
22.167	5.3417	0.18	Q	.	.	.	V.
22.250	5.3429	0.18	Q	.	.	.	V.
22.333	5.3445	0.22	Q	.	.	.	V.
22.417	5.3460	0.22	Q	.	.	.	V.
22.500	5.3475	0.22	Q	.	.	.	V.
22.583	5.3485	0.14	Q	.	.	.	V.
22.667	5.3495	0.14	Q	.	.	.	V.
22.750	5.3504	0.14	Q	.	.	.	V.
22.833	5.3512	0.11	Q	.	.	.	V.
22.917	5.3519	0.11	Q	.	.	.	V.
23.000	5.3527	0.11	Q	.	.	.	V.
23.083	5.3533	0.10	Q	.	.	.	V.
23.166	5.3540	0.10	Q	.	.	.	V.
23.250	5.3547	0.10	Q	.	.	.	V.
23.333	5.3553	0.09	Q	.	.	.	V.
23.416	5.3559	0.09	Q	.	.	.	V.
23.500	5.3565	0.09	Q	.	.	.	V.
23.583	5.3571	0.09	Q	.	.	.	V.
23.666	5.3577	0.09	Q	.	.	.	V.
23.750	5.3583	0.09	Q	.	.	.	V.
23.833	5.3589	0.08	Q	.	.	.	V.
23.916	5.3594	0.08	Q	.	.	.	V.
24.000	5.3600	0.08	Q	.	.	.	V.
24.083	5.3605	0.07	Q	.	.	.	V.
24.166	5.3609	0.07	Q	.	.	.	V.

```
  24.250      5.3614      0.07  Q          .          .          .         V.
  24.333      5.3616      0.03  Q          .          .          .         V.
  24.416      5.3618      0.03  Q          .          .          .         V.
  24.500      5.3621      0.03  Q          .          .          .         V.
  24.583      5.3622      0.02  Q          .          .          .         V.
  24.666      5.3623      0.02  Q          .          .          .         V.
  24.750      5.3624      0.02  Q          .          .          .         V.
  24.833      5.3625      0.01  Q          .          .          .         V.
  24.916      5.3625      0.01  Q          .          .          .         V.
  25.000      5.3626      0.01  Q          .          .          .         V.
-------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
             0%                             1500.0
            10%                              630.0
            20%                              540.0
            30%                              480.0
            40%                              435.0
            50%                              375.0
            60%                              225.0
            70%                              195.0
            80%                              120.0
            90%                               30.0
 ==============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
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              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                     (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                           Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                *
* PROPOSED CONDITIONS                                                     *
* UNIT HYDROGRAPH B 1-HR                                                  *
 ***************************************************************************

  FILE NAME: PEVUHB.DAT
  TIME/DATE OF STUDY: 07:12 06/28/2018


****************************************************************************
  FLOW PROCESS FROM NODE   1600.00 TO NODE   1603.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      10.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.170 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.100
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         USER-ENTERED RAINFALL =  1.34 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.46)
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000
```

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 49.020

==========

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	5.760	6.966
2	31.035	30.567
3	60.163	35.227
4	73.395	16.003
5	80.484	8.573
6	85.206	5.711
7	88.568	4.066
8	91.143	3.114
9	93.136	2.410
10	94.755	1.959
11	96.098	1.623
12	97.082	1.190
13	97.948	1.047
14	98.364	0.504
15	98.716	0.425
16	99.068	0.426
17	99.420	0.425
18	99.771	0.425
19	100.000	0.276

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0619	0.0083	0.0536
2	0.0652	0.0083	0.0569
3	0.0692	0.0083	0.0609
4	0.0760	0.0083	0.0677
5	0.0800	0.0083	0.0717
6	0.0905	0.0083	0.0822
7	0.1055	0.0083	0.0972
8	0.1155	0.0083	0.1072

9	0.1710	0.0083	0.1627
10	0.3390	0.0083	0.3307
11	0.0979	0.0083	0.0896
12	0.0681	0.0083	0.0598

TOTAL STORM RAINFALL(INCHES) = 1.34
TOTAL SOIL-LOSS(INCHES) = 0.10
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.24

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0833
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.0328

↑

==========

1 - 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 FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 7.5 15.0 22.5 30.0
0.083	0.0026	0.37	Q . . . .
0.167	0.0166	2.03	V Q . . . .
0.250	0.0445	4.05	.V Q . . . .
0.333	0.0803	5.19	. V Q . . . .
0.417	0.1221	6.08	. V Q . . . .
0.500	0.1698	6.91	. V Q. . . .
0.583	0.2239	7.86	. V Q . . . .
0.667	0.2865	9.09	. .VQ . . . .
0.750	0.3602	10.70	. . VQ . . . .
0.833	0.4596	14.43	. . V Q. . . .
0.917	0.5996	20.33	. . . V Q . . . .
1.000	0.7365	19.88	. . . Q V . . . .
1.083	0.8292	13.46	. . Q . . V . . . .
1.167	0.8887	8.65	. .Q . . . V . . . .
1.250	0.9253	5.32	. Q . . . V . . . .
1.333	0.9508	3.69	. Q . . . V . . . .
1.417	0.9699	2.77	. Q . . . V . . . .
1.500	0.9847	2.15	. Q . . . V . . . .
1.583	0.9965	1.71	. Q . . . V . . . .
1.667	1.0057	1.35	.Q . . . V . . . .
1.750	1.0128	1.03	.Q . . . V . . . .
1.833	1.0184	0.80	.Q . . . V . . . .
1.917	1.0221	0.54	Q . . . V . . . .
2.000	1.0251	0.43	Q . . . V . . . .

```
    2.083      1.0275      0.35  Q         .         .         .        V.
    2.167      1.0296      0.30  Q         .         .         .        V.
    2.250      1.0313      0.25  Q         .         .         .        V.
    2.333      1.0323      0.15  Q         .         .         .        V.
    2.417      1.0327      0.05  Q         .         .         .        V.
    2.500      1.0328      0.02  Q         .         .         .         V
-------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                 Duration
        Peak Flow Rate                      (minutes)
    ========================                =========
               0%                             150.0
              10%                              85.0
              20%                              60.0
              30%                              45.0
              40%                              35.0
              50%                              25.0
              60%                              20.0
              70%                              15.0
              80%                              10.0
              90%                              10.0
 ==============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

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****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                     (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                           Analysis prepared by:

                      Kimley-Horn and Associates, Inc.
                             765 The City Drive
                                 Suite 200
                              Orange, CA 92868

 ************************** DESCRIPTION OF STUDY **************************
* EASTVALE                                                                *
* PROPOSED CONDITIONS                                                     *
* UNIT HYDROGRAPH B 24-HR                                                 *
 **************************************************************************

  FILE NAME: PEVUHB.DAT
  TIME/DATE OF STUDY: 07:04 06/28/2018


****************************************************************************
  FLOW PROCESS FROM NODE   1600.00 TO NODE   1603.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      10.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.170 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.100
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.050
         USER-ENTERED RAINFALL =  6.04 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000
```

UNIT HYDROGRAPH TIME UNIT = 15.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 147.059

==========

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	32.319	13.029
2	79.695	19.098
3	90.949	4.537
4	95.978	2.028
5	98.343	0.953
6	99.328	0.397
7	99.731	0.163
8	99.933	0.081
9	100.000	0.027

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0121	0.0109	0.0012
2	0.0181	0.0163	0.0018
3	0.0181	0.0163	0.0018
4	0.0242	0.0217	0.0024
5	0.0181	0.0163	0.0018
6	0.0181	0.0163	0.0018
7	0.0181	0.0163	0.0018
8	0.0242	0.0217	0.0024
9	0.0242	0.0217	0.0024
10	0.0242	0.0217	0.0024
11	0.0302	0.0272	0.0030
12	0.0302	0.0272	0.0030
13	0.0302	0.0272	0.0030
14	0.0302	0.0272	0.0030
15	0.0302	0.0272	0.0030
16	0.0362	0.0326	0.0036
17	0.0362	0.0326	0.0036
18	0.0423	0.0359	0.0064

19	0.0423	0.0354	0.0069
20	0.0483	0.0349	0.0134
21	0.0362	0.0326	0.0036
22	0.0423	0.0340	0.0082
23	0.0483	0.0336	0.0147
24	0.0483	0.0331	0.0152
25	0.0544	0.0327	0.0217
26	0.0544	0.0323	0.0221
27	0.0604	0.0318	0.0286
28	0.0604	0.0314	0.0290
29	0.0604	0.0310	0.0294
30	0.0664	0.0306	0.0359
31	0.0725	0.0301	0.0423
32	0.0785	0.0297	0.0488
33	0.0906	0.0293	0.0613
34	0.0906	0.0289	0.0617
35	0.0966	0.0285	0.0681
36	0.1027	0.0281	0.0746
37	0.1148	0.0277	0.0871
38	0.1208	0.0273	0.0935
39	0.1268	0.0269	0.0999
40	0.1329	0.0265	0.1063
41	0.0906	0.0261	0.0645
42	0.0906	0.0258	0.0648
43	0.1208	0.0254	0.0954
44	0.1208	0.0250	0.0958
45	0.1148	0.0247	0.0901
46	0.1148	0.0243	0.0905
47	0.1027	0.0239	0.0788
48	0.1087	0.0236	0.0851
49	0.1510	0.0232	0.1278
50	0.1570	0.0229	0.1342
51	0.1691	0.0225	0.1466
52	0.1752	0.0222	0.1530
53	0.2054	0.0219	0.1835
54	0.2054	0.0215	0.1838
55	0.1389	0.0212	0.1177
56	0.1389	0.0209	0.1180
57	0.1631	0.0206	0.1425
58	0.1570	0.0202	0.1368
59	0.1570	0.0199	0.1371
60	0.1510	0.0196	0.1314
61	0.1450	0.0193	0.1256
62	0.1389	0.0190	0.1199
63	0.1148	0.0187	0.0960
64	0.1148	0.0185	0.0963
65	0.0242	0.0182	0.0060
66	0.0242	0.0179	0.0063
67	0.0181	0.0163	0.0018

68	0.0181	0.0163	0.0018
69	0.0302	0.0171	0.0131
70	0.0302	0.0168	0.0134
71	0.0302	0.0166	0.0136
72	0.0242	0.0163	0.0078
73	0.0242	0.0161	0.0081
74	0.0242	0.0159	0.0083
75	0.0181	0.0156	0.0025
76	0.0121	0.0109	0.0012
77	0.0181	0.0152	0.0029
78	0.0242	0.0150	0.0092
79	0.0181	0.0148	0.0033
80	0.0121	0.0109	0.0012
81	0.0181	0.0144	0.0037
82	0.0181	0.0142	0.0039
83	0.0181	0.0140	0.0041
84	0.0121	0.0109	0.0012
85	0.0181	0.0137	0.0044
86	0.0121	0.0109	0.0012
87	0.0181	0.0134	0.0047
88	0.0121	0.0109	0.0012
89	0.0181	0.0131	0.0050
90	0.0121	0.0109	0.0012
91	0.0121	0.0109	0.0012
92	0.0121	0.0109	0.0012
93	0.0121	0.0109	0.0012
94	0.0121	0.0109	0.0012
95	0.0121	0.0109	0.0012
96	0.0121	0.0109	0.0012

TOTAL STORM RAINFALL(INCHES) = 6.04
TOTAL SOIL-LOSS(INCHES) = 2.07
TOTAL EFFECTIVE RAINFALL(INCHES) = 3.97

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.7211
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.3105

↑

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2 4 - 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 FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS) VOLUME(AF) Q(CFS) 0. 2.5 5.0 7.5 10.0

0.083	0.0001	0.02	Q	.	.	.	.
0.167	0.0002	0.02	Q	.	.	.	.
0.250	0.0003	0.02	Q	.	.	.	.
0.333	0.0006	0.05	Q	.	.	.	.
0.417	0.0010	0.05	Q	.	.	.	.
0.500	0.0013	0.05	Q	.	.	.	.
0.583	0.0017	0.06	Q	.	.	.	.
0.667	0.0022	0.06	Q	.	.	.	.
0.750	0.0026	0.06	Q	.	.	.	.
0.833	0.0031	0.08	Q	.	.	.	.
0.917	0.0037	0.08	Q	.	.	.	.
1.000	0.0042	0.08	Q	.	.	.	.
1.083	0.0048	0.08	Q	.	.	.	.
1.167	0.0053	0.08	Q	.	.	.	.
1.250	0.0059	0.08	Q	.	.	.	.
1.333	0.0064	0.08	Q	.	.	.	.
1.417	0.0069	0.08	Q	.	.	.	.
1.500	0.0075	0.08	Q	.	.	.	.
1.583	0.0080	0.07	Q	.	.	.	.
1.667	0.0085	0.07	Q	.	.	.	.
1.750	0.0090	0.07	Q	.	.	.	.
1.833	0.0095	0.08	Q	.	.	.	.
1.917	0.0101	0.08	Q	.	.	.	.
2.000	0.0107	0.08	Q	.	.	.	.
2.083	0.0113	0.09	Q	.	.	.	.
2.167	0.0119	0.09	Q	.	.	.	.
2.250	0.0126	0.09	Q	.	.	.	.
2.333	0.0132	0.10	Q	.	.	.	.
2.417	0.0139	0.10	Q	.	.	.	.
2.500	0.0145	0.10	Q	.	.	.	.
2.583	0.0153	0.10	Q	.	.	.	.
2.667	0.0160	0.10	Q	.	.	.	.
2.750	0.0167	0.10	Q	.	.	.	.
2.833	0.0175	0.12	Q	.	.	.	.
2.917	0.0183	0.12	Q	.	.	.	.
3.000	0.0191	0.12	Q	.	.	.	.
3.083	0.0199	0.12	Q	.	.	.	.
3.167	0.0208	0.12	Q	.	.	.	.
3.250	0.0216	0.12	Q	.	.	.	.
3.333	0.0224	0.12	Q	.	.	.	.
3.417	0.0232	0.12	Q	.	.	.	.
3.500	0.0241	0.12	Q	.	.	.	.
3.583	0.0249	0.12	Q	.	.	.	.
3.667	0.0257	0.12	Q	.	.	.	.
3.750	0.0266	0.12	Q	.	.	.	.
3.833	0.0275	0.13	Q	.	.	.	.
3.917	0.0284	0.13	Q	.	.	.	.
4.000	0.0292	0.13	Q	.	.	.	.

```
4.083      0.0302      0.14  Q          .          .          .          .
4.167      0.0312      0.14  Q          .          .          .          .
4.250      0.0322      0.14  Q          .          .          .          .
4.333      0.0334      0.18  Q          .          .          .          .
4.417      0.0346      0.18  Q          .          .          .          .
4.500      0.0359      0.18  Q          .          .          .          .
4.583      0.0376      0.24  Q          .          .          .          .
4.667      0.0392      0.24  Q          .          .          .          .
4.750      0.0409      0.24  Q          .          .          .          .
4.833      0.0433      0.35  VQ         .          .          .          .
4.917      0.0457      0.35  VQ         .          .          .          .
5.000      0.0481      0.35  VQ         .          .          .          .
5.083      0.0505      0.35  VQ         .          .          .          .
5.167      0.0529      0.35  VQ         .          .          .          .
5.250      0.0553      0.35  VQ         .          .          .          .
5.333      0.0571      0.26  VQ         .          .          .          .
5.417      0.0589      0.26  VQ         .          .          .          .
5.500      0.0607      0.26  VQ         .          .          .          .
5.583      0.0635      0.40  VQ         .          .          .          .
5.667      0.0663      0.40  VQ         .          .          .          .
5.750      0.0690      0.40  VQ         .          .          .          .
5.833      0.0728      0.54  V Q        .          .          .          .
5.917      0.0765      0.54  V Q        .          .          .          .
6.000      0.0802      0.54  V Q        .          .          .          .
6.083      0.0848      0.67  .VQ        .          .          .          .
6.167      0.0894      0.67  .VQ        .          .          .          .
6.250      0.0940      0.67  .VQ        .          .          .          .
6.333      0.0996      0.81  .V Q       .          .          .          .
6.417      0.1052      0.81  .V Q       .          .          .          .
6.500      0.1107      0.81  .V Q       .          .          .          .
6.583      0.1172      0.94  .V Q       .          .          .          .
6.667      0.1237      0.94  .V Q       .          .          .          .
6.750      0.1302      0.94  .V Q       .          .          .          .
6.833      0.1377      1.09  .V  Q      .          .          .          .
6.917      0.1452      1.09  .V  Q      .          .          .          .
7.000      0.1527      1.09  .V  Q      .          .          .          .
7.083      0.1606      1.14  .V  Q      .          .          .          .
7.167      0.1684      1.14  . V Q      .          .          .          .
7.250      0.1763      1.14  . V Q      .          .          .          .
7.333      0.1849      1.25  . V  Q     .          .          .          .
7.417      0.1936      1.25  . V  Q     .          .          .          .
7.500      0.2022      1.25  . V  Q     .          .          .          .
7.583      0.2123      1.47  . V  Q     .          .          .          .
7.667      0.2224      1.47  . V  Q     .          .          .          .
7.750      0.2326      1.47  . V  Q     .          .          .          .
7.833      0.2443      1.71  . V   Q    .          .          .          .
7.917      0.2561      1.71  .  V  Q    .          .          .          .
8.000      0.2679      1.71  .  V  Q    .          .          .          .
8.083      0.2820      2.04  .  V    Q .          .          .          .
```

```
 8.167      0.2960      2.04  .  V    Q .          .          .          .
 8.250      0.3101      2.04  .  V    Q .          .          .          .
 8.333      0.3262      2.33  .  V     Q.          .          .          .
 8.417      0.3423      2.33  .   V    Q.          .          .          .
 8.500      0.3583      2.33  .   V    Q.          .          .          .
 8.583      0.3756      2.51  .   V     Q          .          .          .
 8.667      0.3929      2.51  .   V     Q          .          .          .
 8.750      0.4101      2.51  .   V     Q          .          .          .
 8.833      0.4290      2.75  .    V    Q          .          .          .
 8.917      0.4480      2.75  .    V    Q          .          .          .
 9.000      0.4669      2.75  .    V    Q          .          .          .
 9.083      0.4881      3.08  .    V    . Q        .          .          .
 9.167      0.5094      3.08  .     V   . Q        .          .          .
 9.250      0.5306      3.08  .     V   . Q        .          .          .
 9.333      0.5544      3.45  .     V   .  Q       .          .          .
 9.417      0.5781      3.45  .     V   .  Q       .          .          .
 9.500      0.6019      3.45  .      V  .  Q       .          .          .
 9.583      0.6277      3.74  .      V  .   Q      .          .          .
 9.667      0.6534      3.74  .      V  .   Q      .          .          .
 9.750      0.6792      3.74  .       V .   Q      .          .          .
 9.833      0.7068      4.01  .       V .     Q    .          .          .
 9.917      0.7344      4.01  .       V .     Q    .          .          .
10.000      0.7620      4.01  .        V.     Q    .          .          .
10.083      0.7871      3.64  .        V.   Q      .          .          .
10.167      0.8122      3.64  .        V.   Q      .          .          .
10.250      0.8373      3.64  .         V   Q      .          .          .
10.333      0.8573      2.90  .         VQ         .          .          .
10.417      0.8773      2.90  .         VQ         .          .          .
10.500      0.8973      2.90  .         VQ         .          .          .
10.583      0.9189      3.14  .         .VQ        .          .          .
10.667      0.9406      3.14  .         .VQ        .          .          .
10.750      0.9622      3.14  .         .VQ        .          .          .
10.833      0.9874      3.66  .         .V  Q      .          .          .
10.917      1.0126      3.66  .         . V Q      .          .          .
11.000      1.0378      3.66  .         . V Q      .          .          .
11.083      1.0633      3.70  .         . V Q      .          .          .
11.167      1.0888      3.70  .         .  VQ      .          .          .
11.250      1.1142      3.70  .         .  VQ      .          .          .
11.333      1.1393      3.64  .         .  VQ      .          .          .
11.417      1.1644      3.64  .         .   Q      .          .          .
11.500      1.1895      3.64  .         .   Q      .          .          .
11.583      1.2136      3.50  .         .  QV      .          .          .
11.667      1.2376      3.50  .         .  QV      .          .          .
11.750      1.2617      3.50  .         .  Q V     .          .          .
11.833      1.2848      3.35  .         .  Q V     .          .          .
11.917      1.3079      3.35  .         .  Q V     .          .          .
12.000      1.3310      3.35  .         .  Q  V    .          .          .
12.083      1.3584      3.98  .         .    QV    .          .          .
12.167      1.3858      3.98  .         .    QV    .          .          .
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12.250      1.4132      3.98  .          .    Q V  .          .          .
12.333      1.4468      4.88  .          .      V Q.          .          .
12.417      1.4805      4.88  .          .      V Q.          .          .
12.500      1.5141      4.88  .          .       VQ.          .          .
12.583      1.5510      5.36  .          .       V .Q         .          .
12.667      1.5879      5.36  .          .        V.Q         .          .
12.750      1.6248      5.36  .          .        V.Q         .          .
12.833      1.6648      5.80  .          .         V  Q       .          .
12.917      1.7047      5.80  .          .         V  Q       .          .
13.000      1.7446      5.80  .          .          V Q       .          .
13.083      1.7889      6.43  .          .         .V   Q     .          .
13.167      1.8331      6.43  .          .         . V  Q     .          .
13.250      1.8774      6.43  .          .         . V  Q     .          .
13.333      1.9262      7.09  .          .         .  V    Q .          .
13.417      1.9751      7.09  .          .         .  V    Q .          .
13.500      2.0239      7.09  .          .         .   V   Q .          .
13.583      2.0681      6.41  .          .         .   VQ    .          .
13.667      2.1122      6.41  .          .         .    Q    .          .
13.750      2.1564      6.41  .          .         .    QV   .          .
13.833      2.1924      5.23  .          .         Q     V   .          .
13.917      2.2284      5.23  .          .         Q     V   .          .
14.000      2.2645      5.23  .          .         Q      V  .          .
14.083      2.3009      5.29  .          .         .Q     V  .          .
14.167      2.3373      5.29  .          .         .Q      V .          .
14.250      2.3738      5.29  .          .         .Q      V .          .
14.333      2.4121      5.57  .          .         . Q      V.          .
14.417      2.4505      5.57  .          .         . Q      V.          .
14.500      2.4888      5.57  .          .         . Q       V          .
14.583      2.5268      5.52  .          .         . Q       V          .
14.667      2.5648      5.52  .          .         . Q       V          .
14.750      2.6028      5.52  .          .         . Q        V         .
14.833      2.6403      5.45  .          .         .Q        .V         .
14.917      2.6778      5.45  .          .         .Q         . V       .
15.000      2.7153      5.45  .          .         .Q         . V       .
15.083      2.7516      5.27  .          .         .Q         .  V      .
15.167      2.7879      5.27  .          .         .Q         .  V      .
15.250      2.8242      5.27  .          .         .Q         .   V     .
15.333      2.8590      5.06  .          .         Q          .   V     .
15.417      2.8938      5.06  .          .         Q          .   V     .
15.500      2.9286      5.06  .          .         Q          .    V    .
15.583      2.9603      4.60  .          .       Q .          .    V    .
15.667      2.9920      4.60  .          .       Q .          .     V   .
15.750      3.0236      4.60  .          .       Q .          .     V   .
15.833      3.0519      4.10  .          .     Q   .          .     V   .
15.917      3.0802      4.10  .          .     Q   .          .      V  .
16.000      3.1084      4.10  .          .     Q   .          .      V  .
16.083      3.1277      2.81  .          .Q        .          .      V  .
16.167      3.1471      2.81  .          .Q        .          .       V .
16.250      3.1664      2.81  .          .Q        .          .       V .
```

```
16.333      3.1735      1.03  .   Q     .         .         .       V .
16.417      3.1805      1.03  .   Q     .         .         .       V .
16.500      3.1876      1.03  .   Q     .         .         .       V .
16.583      3.1913      0.54  . Q       .         .         .       V .
16.667      3.1950      0.54  . Q       .         .         .       V .
16.750      3.1988      0.54  . Q       .         .         .       V .
16.833      3.2006      0.26  .Q        .         .         .       V .
16.917      3.2024      0.26  .Q        .         .         .       V .
17.000      3.2042      0.26  .Q        .         .         .       V .
17.083      3.2062      0.30  .Q        .         .         .       V .
17.167      3.2083      0.30  .Q        .         .         .       V .
17.250      3.2104      0.30  .Q        .         .         .       V .
17.333      3.2136      0.47  .Q        .         .         .       V .
17.417      3.2168      0.47  .Q        .         .         .       V .
17.500      3.2201      0.47  .Q        .         .         .       V .
17.583      3.2236      0.51  . Q       .         .         .       V .
17.667      3.2271      0.51  . Q       .         .         .       V .
17.750      3.2307      0.51  . Q       .         .         .        V.
17.833      3.2338      0.46  .Q        .         .         .        V.
17.917      3.2369      0.46  .Q        .         .         .        V.
18.000      3.2401      0.46  .Q        .         .         .        V.
18.083      3.2425      0.36  .Q        .         .         .        V.
18.167      3.2450      0.36  .Q        .         .         .        V.
18.250      3.2474      0.36  .Q        .         .         .        V.
18.333      3.2498      0.34  .Q        .         .         .        V.
18.417      3.2522      0.34  .Q        .         .         .        V.
18.500      3.2545      0.34  .Q        .         .         .        V.
18.583      3.2564      0.26  .Q        .         .         .        V.
18.667      3.2582      0.26  .Q        .         .         .        V.
18.750      3.2600      0.26  .Q        .         .         .        V.
18.833      3.2609      0.13  Q         .         .         .        V.
18.917      3.2618      0.13  Q         .         .         .        V.
19.000      3.2627      0.13  Q         .         .         .        V.
19.083      3.2635      0.10  Q         .         .         .        V.
19.167      3.2642      0.10  Q         .         .         .        V.
19.250      3.2649      0.10  Q         .         .         .        V.
19.333      3.2663      0.20  Q         .         .         .        V.
19.417      3.2676      0.20  Q         .         .         .        V.
19.500      3.2690      0.20  Q         .         .         .        V.
19.583      3.2707      0.24  Q         .         .         .        V.
19.667      3.2724      0.24  Q         .         .         .        V.
19.750      3.2740      0.24  Q         .         .         .        V.
19.833      3.2749      0.13  Q         .         .         .        V.
19.917      3.2758      0.13  Q         .         .         .        V.
20.000      3.2767      0.13  Q         .         .         .        V.
20.083      3.2775      0.11  Q         .         .         .        V.
20.167      3.2783      0.11  Q         .         .         .        V.
20.250      3.2790      0.11  Q         .         .         .        V.
20.333      3.2800      0.15  Q         .         .         .        V.
```

20.417	3.2810	0.15	Q	.	.	.	V.
20.500	3.2820	0.15	Q	.	.	.	V.
20.583	3.2831	0.15	Q	.	.	.	V.
20.667	3.2841	0.15	Q	.	.	.	V.
20.750	3.2852	0.15	Q	.	.	.	V.
20.833	3.2861	0.12	Q	.	.	.	V.
20.917	3.2869	0.12	Q	.	.	.	V.
21.000	3.2878	0.12	Q	.	.	.	V.
21.083	3.2885	0.11	Q	.	.	.	V.
21.167	3.2893	0.11	Q	.	.	.	V.
21.250	3.2901	0.11	Q	.	.	.	V.
21.333	3.2909	0.12	Q	.	.	.	V.
21.417	3.2917	0.12	Q	.	.	.	V.
21.500	3.2926	0.12	Q	.	.	.	V.
21.583	3.2934	0.11	Q	.	.	.	V.
21.667	3.2941	0.11	Q	.	.	.	V.
21.750	3.2949	0.11	Q	.	.	.	V.
21.833	3.2958	0.12	Q	.	.	.	V.
21.917	3.2966	0.12	Q	.	.	.	V.
22.000	3.2975	0.12	Q	.	.	.	V.
22.083	3.2983	0.12	Q	.	.	.	V.
22.167	3.2991	0.12	Q	.	.	.	V.
22.250	3.2999	0.12	Q	.	.	.	V.
22.333	3.3008	0.13	Q	.	.	.	V.
22.417	3.3017	0.13	Q	.	.	.	V.
22.500	3.3026	0.13	Q	.	.	.	V.
22.583	3.3031	0.07	Q	.	.	.	V.
22.667	3.3036	0.07	Q	.	.	.	V.
22.750	3.3041	0.07	Q	.	.	.	V.
22.833	3.3045	0.06	Q	.	.	.	V.
22.917	3.3049	0.06	Q	.	.	.	V.
23.000	3.3053	0.06	Q	.	.	.	V.
23.083	3.3056	0.05	Q	.	.	.	V.
23.166	3.3060	0.05	Q	.	.	.	V.
23.250	3.3063	0.05	Q	.	.	.	V.
23.333	3.3067	0.05	Q	.	.	.	V.
23.416	3.3070	0.05	Q	.	.	.	V.
23.500	3.3074	0.05	Q	.	.	.	V.
23.583	3.3077	0.05	Q	.	.	.	V.
23.666	3.3081	0.05	Q	.	.	.	V.
23.750	3.3084	0.05	Q	.	.	.	V.
23.833	3.3087	0.05	Q	.	.	.	V.
23.916	3.3091	0.05	Q	.	.	.	V.
24.000	3.3094	0.05	Q	.	.	.	V.
24.083	3.3097	0.03	Q	.	.	.	V.
24.166	3.3099	0.03	Q	.	.	.	V.
24.250	3.3101	0.03	Q	.	.	.	V.
24.333	3.3102	0.01	Q	.	.	.	V.
24.416	3.3102	0.01	Q	.	.	.	V.

```
  24.500      3.3103      0.01  Q         .         .         .        V.
-------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1470.0
10%	615.0
20%	525.0
30%	480.0
40%	420.0
50%	330.0
60%	210.0
70%	180.0
80%	60.0
90%	45.0

```
===============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

Appendix D - Detention Basin Calculation Results

Detention Basin Calculations

Scenario Summary	
ID	1
Label	Base
Notes	
Active Topology	Base Active Topology
Hydrology	Base Hydrology
Rainfall Runoff	Base Rainfall Runoff
Physical	Base Physical
Initial Condition	Base Initial Condition
Boundary Condition	Base Boundary Condition
Infiltration and Inflow	Base Infiltration and Inflow
Output	Base Output
User Data Extensions	Base User Data Extensions
PondPack Engine Calculation Options	Base Calculation Options

Output Summary			
Output Increment	5.000 min	Duration	300.000 min

Rainfall Summary			
Return Event Tag		Rainfall Type	(N/A)
Total Depth	(N/A) in	Storm Event	(N/A)

Executive Summary (Nodes)

Label	Scenario	Return Event (years)	Truncation	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
DA A	Base	0	None	72,890.00	60.000	27.13	(N/A)	(N/A)
DA B	Base	0	None	44,979.00	55.000	20.33	(N/A)	(N/A)
Detention A (IN)	Base	0	None	72,944.00	60.000	27.13	(N/A)	(N/A)
Detention A (OUT)	Base	0	None	72,944.00	65.000	23.87	104.90	6,645.00
Detention B (IN)	Base	0	None	45,159.00	55.000	20.33	(N/A)	(N/A)
Detention B (OUT)	Base	0	None	45,766.00	65.000	14.91	104.90	7,814.00
O-1	Base	0	None	118,708.00	65.000	38.78	(N/A)	(N/A)

Executive Summary (Links)

Label	Type	Location	Hydrograph Volume (ft³)	Peak Time (min)	Peak Flow (ft³/s)	End Point	Node Flow Direction
Outlet-1	Pond Outlet	Upstream	72,944.00	60.000	27.13	Detention A	Pond Inflow
Outlet-1	Pond Outlet	Outflow	72,944.00	65.000	23.87	Detention A	Pond Outflow
Outlet-1	Pond Outlet	Link	72,942.00	65.000	23.87		
Outlet-1	Pond Outlet	Downstream	118,708.00	65.000	38.78	O-1	

Detention Basin Calculations

Executive Summary (Links)

Label	Type	Location	Hydrograph Volume (ft³)	Peak Time (min)	Peak Flow (ft³/s)	End Point	Node Flow Direction
Outlet-3	Pond Outlet	Upstream	45,159.00	55.000	20.33	Detention B	Pond Inflow
Outlet-3	Pond Outlet	Outflow	45,766.00	65.000	14.91	Detention B	Pond Outflow
Outlet-3	Pond Outlet	Link	45,766.00	65.000	14.91		
Outlet-3	Pond Outlet	Downstream	118,708.00	65.000	38.78	O-1	

Messages

Message Id	40
Scenario	Base
Element Type	Pond
Element Id	25
Label	Detention B
Time	(N/A)
Message	Mass balance for routing volumes vary by more than 0.5 %. (1.3 % of Outflow Volume))
Source	Warning
Message Id	43
Scenario	Base
Element Type	Pond
Element Id	25
Label	Detention B
Time	(N/A)
Message	Outflow > 0 for first rating table elevation.
Source	Warning

Appendix E – Riverside County Flood Control Calculations for the Master Drainage Plan

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2000 Advanced Engineering Software (aes)
            Ver. 1.5A Release Date: 01/01/2000  License ID 1500

                        Analysis prepared by:

                           Tetra Tech, Inc
                     17770 Cartwright Road, Suite 500
                           Irvine, CA 92614
                           (949)250-6788

----------------------------------------------------------------------------
  FILE NAME: LINEA100.DAT
  TIME/DATE OF STUDY: 08:13 08/16/2001
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.960
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.760
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.100
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.200
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.5287434
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.5296918
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.200
  SLOPE OF INTENSITY DURATION CURVE = 0.5297
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   20.0     12.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE       1.00 TO NODE       2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =   800.00
  UPSTREAM ELEVATION =    668.00
  DOWNSTREAM ELEVATION =    663.00
  ELEVATION DIFFERENCE =      5.00
  TC = 0.393*[(  800.00**3)/(     5.00)]**.2 =   15.704
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.441
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7649
  SOIL CLASSIFICATION IS "B"
  SUBAREA RUNOFF(CFS) =     13.07
  TOTAL AREA(ACRES) =      7.00   TOTAL RUNOFF(CFS) =     13.07

****************************************************************************
  FLOW PROCESS FROM NODE       2.00 TO NODE       3.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  663.00  DOWNSTREAM ELEVATION(FEET) =  653.70
  STREET LENGTH(FEET) =  1550.00   CURB HEIGHT(INCHES) =  8.0
```

```
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.01
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.65
  HALFSTREET FLOOD WIDTH(FEET) =   24.41
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.01
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.95
STREET FLOW TRAVEL TIME(MIN.) =   8.59   Tc(MIN.) =  24.29
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.937
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7421
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) =   33.00      SUBAREA RUNOFF(CFS) =   47.44
TOTAL AREA(ACRES) =   40.00        PEAK FLOW RATE(CFS) =      60.51

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  33.56
FLOW VELOCITY(FEET/SEC.) =  3.34   DEPTH*VELOCITY(FT*FT/SEC.) =   2.50
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1550.0 FT WITH ELEVATION-DROP =   9.3 FT, IS   52.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE      3.00
LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =  2350.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   651.40  DOWNSTREAM(FEET) =   648.00
FLOW LENGTH(FEET) =   650.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   8.09
ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     60.51
PIPE TRAVEL TIME(MIN.) =   1.34    Tc(MIN.) =  25.63
LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =  3000.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.883
SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7391
SOIL CLASSIFICATION IS "B"
SUBAREA AREA(ACRES) =   21.20   SUBAREA RUNOFF(CFS) =   29.51
TOTAL AREA(ACRES) =    61.20   TOTAL RUNOFF(CFS) =   90.02
TC(MIN) =  25.63

****************************************************************************
FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   648.00  DOWNSTREAM(FEET) =   642.00
FLOW LENGTH(FEET) =  1320.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  48.0 INCH PIPE IS  38.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   8.33
ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     90.02
PIPE TRAVEL TIME(MIN.) =   2.64    Tc(MIN.) =  28.27
LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =  4320.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6241
 SOIL CLASSIFICATION IS "A"
 SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   22.31
 TOTAL AREA(ACRES) =    81.20   TOTAL RUNOFF(CFS) =  112.33
 TC(MIN) =  28.27

******************************************************************************
 FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7871
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   28.14
 TOTAL AREA(ACRES) =   101.20   TOTAL RUNOFF(CFS) =  140.47
 TC(MIN) =  28.27

******************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   642.00  DOWNSTREAM(FEET) =   632.00
 FLOW LENGTH(FEET) =  1320.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  54.0 INCH PIPE IS  38.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.49
 ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    140.47
 PIPE TRAVEL TIME(MIN.) =   1.91    Tc(MIN.) =  30.18
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      6.00 =  5640.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.727
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6204
 SOIL CLASSIFICATION IS "A"
 SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   21.43
 TOTAL AREA(ACRES) =   121.20   TOTAL RUNOFF(CFS) =  161.90
 TC(MIN) =  30.18

******************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.727
 SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7841
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   27.08
 TOTAL AREA(ACRES) =   141.20   TOTAL RUNOFF(CFS) =  188.98
 TC(MIN) =  30.18

******************************************************************************
 FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   632.00  DOWNSTREAM(FEET) =   627.40
 FLOW LENGTH(FEET) =  1500.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  69.0 INCH PIPE IS  53.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.71
 ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    188.98
 PIPE TRAVEL TIME(MIN.) =   2.87    Tc(MIN.) =  33.06
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =  7140.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE      1.00 TO NODE      7.00 IS CODE =   1
------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  33.06
  RAINFALL INTENSITY(INCH/HR) =   1.65
  TOTAL STREAM AREA(ACRES) =  141.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     188.98

******************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =   550.00
  UPSTREAM ELEVATION =    641.00
  DOWNSTREAM ELEVATION =    638.00
  ELEVATION DIFFERENCE =      3.00
  TC = 0.393*[(  550.00**3)/(     3.00)]**.2 =   13.891
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.605
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7500
  SUBAREA RUNOFF(CFS) =     13.67
  TOTAL AREA(ACRES) =      7.00   TOTAL RUNOFF(CFS) =     13.67

******************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  61
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  638.00  DOWNSTREAM ELEVATION(FEET) =  634.00
  STREET LENGTH(FEET) =   800.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   21.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.49
  STREET FLOW TRAVEL TIME(MIN.) =   5.25   Tc(MIN.) =  19.14
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.198
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7320
  SUBAREA AREA(ACRES) =   13.20      SUBAREA RUNOFF(CFS) =   21.24
  TOTAL AREA(ACRES) =   20.20        PEAK FLOW RATE(CFS) =      34.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  24.73
  FLOW VELOCITY(FEET/SEC.) =  2.77   DEPTH*VELOCITY(FT*FT/SEC.) =   1.81
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =  1350.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.198
  *USER SPECIFIED(SUBAREA):
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6100
  SUBAREA AREA(ACRES) =    8.00   SUBAREA RUNOFF(CFS) =   10.73
  TOTAL AREA(ACRES) =    28.20   TOTAL RUNOFF(CFS) =   45.64
  TC(MIN) =  19.14

******************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE      7.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   634.00  DOWNSTREAM(FEET) =   627.40
  FLOW LENGTH(FEET) =  1700.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.69
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     45.64
  PIPE TRAVEL TIME(MIN.) =   4.24    Tc(MIN.) =  23.38
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE      7.00 =  3050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE      7.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.977
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6349
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =   29.70   SUBAREA RUNOFF(CFS) =   37.28
  TOTAL AREA(ACRES) =    57.90   TOTAL RUNOFF(CFS) =   82.92
  TC(MIN) =  23.38

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE      7.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.977
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7954
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =   29.70   SUBAREA RUNOFF(CFS) =   46.70
  TOTAL AREA(ACRES) =    87.60   TOTAL RUNOFF(CFS) =  129.62
  TC(MIN) =  23.38

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE      7.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  23.38
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =   87.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    129.62

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       188.98    33.06       1.646        141.20
     2       129.62    23.38       1.977         87.60

 ***********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       263.27    23.38       1.977
     2       296.87    33.06       1.646

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    296.87   Tc(MIN.) =   33.06
  TOTAL AREA(ACRES) =    228.80
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =  7140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   627.40  DOWNSTREAM(FEET) =   625.30
  FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  65.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.60
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    296.87
  PIPE TRAVEL TIME(MIN.) =   1.22    Tc(MIN.) =  34.27
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      8.00 =  7840.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.614
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6133
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =   22.70   SUBAREA RUNOFF(CFS) =   22.48
  TOTAL AREA(ACRES) =   251.50   TOTAL RUNOFF(CFS) =  319.34
  TC(MIN) =  34.27

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.614
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7782
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =   22.70   SUBAREA RUNOFF(CFS) =   28.52
  TOTAL AREA(ACRES) =   274.20   TOTAL RUNOFF(CFS) =  347.86
  TC(MIN) =  34.27

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   625.30  DOWNSTREAM(FEET) =   624.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  87.0 INCH PIPE IS  65.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.42
  ESTIMATED PIPE DIAMETER(INCH) =  87.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    347.86
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =  34.91
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =  8240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      9.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  34.91
  RAINFALL INTENSITY(INCH/HR) =   1.60
  TOTAL STREAM AREA(ACRES) =  274.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    347.86

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH =   970.00
  UPSTREAM ELEVATION =    660.00
  DOWNSTREAM ELEVATION =    655.00
  ELEVATION DIFFERENCE =      5.00
  TC = 0.393*[(  970.00**3)/(     5.00)]**.2 =   17.629
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.296
```

```
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7370
  SUBAREA RUNOFF(CFS) =      16.58
  TOTAL AREA(ACRES) =       9.80   TOTAL RUNOFF(CFS) =      16.58

****************************************************************************
  FLOW PROCESS FROM NODE      26.00 TO NODE      27.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  655.00  DOWNSTREAM ELEVATION(FEET) =  646.00
  STREET LENGTH(FEET) =  1300.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   24.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.11
  STREET FLOW TRAVEL TIME(MIN.) =   6.69   Tc(MIN.) =  24.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.936
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7190
  SUBAREA AREA(ACRES) =   34.20      SUBAREA RUNOFF(CFS) =   47.61
  TOTAL AREA(ACRES) =   44.00        PEAK FLOW RATE(CFS) =      64.19

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  29.37
  FLOW VELOCITY(FEET/SEC.) =  3.64   DEPTH*VELOCITY(FT*FT/SEC.) =   2.71
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1300.0 FT WITH ELEVATION-DROP =   9.0 FT, IS   54.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     27.00
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     27.00 =  2270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      27.00 TO NODE      28.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.00  DOWNSTREAM(FEET) =   641.00
  FLOW LENGTH(FEET) =  1300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.29
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.19
  PIPE TRAVEL TIME(MIN.) =   2.97    Tc(MIN.) =  27.29
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     28.00 =  3570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      27.00 TO NODE      28.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.822
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7130
  SUBAREA AREA(ACRES) =   30.50   SUBAREA RUNOFF(CFS) =   39.61
  TOTAL AREA(ACRES) =    74.50   TOTAL RUNOFF(CFS) =  103.81
  TC(MIN) =  27.29

****************************************************************************
  FLOW PROCESS FROM NODE      28.00 TO NODE      29.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   641.00  DOWNSTREAM(FEET) =   635.00
  FLOW LENGTH(FEET) =  1300.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  39.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.73
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    103.81
  PIPE TRAVEL TIME(MIN.) =   2.48    Tc(MIN.) =  29.77
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     29.00 =  4870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.739
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7070
  SUBAREA AREA(ACRES) =   35.00   SUBAREA RUNOFF(CFS) =   43.04
  TOTAL AREA(ACRES) =   109.50   TOTAL RUNOFF(CFS) =  146.85
  TC(MIN) =  29.77

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   635.00  DOWNSTREAM(FEET) =   626.00
  FLOW LENGTH(FEET) =  1350.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  42.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.91
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    146.85
  PIPE TRAVEL TIME(MIN.) =   2.06    Tc(MIN.) =  31.83
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE      9.00 =  6220.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE      9.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  31.83
  RAINFALL INTENSITY(INCH/HR) =   1.68
  TOTAL STREAM AREA(ACRES) =  109.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    146.85

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       347.86    34.91       1.599        274.20
     2       146.85    31.83       1.679        109.50

 ***********************************WARNING***********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       464.02    31.83       1.679
     2       487.70    34.91       1.599

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    487.70   Tc(MIN.) =   34.91
  TOTAL AREA(ACRES) =    383.70
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =  8240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   624.00  DOWNSTREAM(FEET) =   621.00
  FLOW LENGTH(FEET) =  1350.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 108.0 INCH PIPE IS  78.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.89
  ESTIMATED PIPE DIAMETER(INCH) = 108.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    487.70
  PIPE TRAVEL TIME(MIN.) =   2.27    Tc(MIN.) =  37.19
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     10.00 =  9590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.546
  *USER SPECIFIED(SUBAREA):
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7110
  SUBAREA AREA(ACRES) =   76.50   SUBAREA RUNOFF(CFS) =   84.10
  TOTAL AREA(ACRES) =   460.20   TOTAL RUNOFF(CFS) =  571.80
  TC(MIN) =  37.19

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   621.00  DOWNSTREAM(FEET) =   617.00
  FLOW LENGTH(FEET) =  1250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  83.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.56
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    571.80
  PIPE TRAVEL TIME(MIN.) =   1.80    Tc(MIN.) =  38.99
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     11.00 = 10840.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    460.20  TC(MIN.) =     38.99
  PEAK FLOW RATE(CFS)    =    571.80
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

1